

# STORM WATER MANAGEMENT PROGRAM (SWMP)

## Phase II Storm Water Permit For Small Municipal Separate Storm Sewer System (MS4)

*Permit Number: TPDES No. TXR040096*

*For:*

The City of Kemah  
1401 Highway 146  
Kemah, Texas 77565



Revised Plan Date: June 2019

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## Introduction

The first edition of Kemah's Storm Water Management Program was developed in 2008 by LJA Engineering Inc. for the City of Kemah in compliance with the Texas Commission on Environmental Quality (TCEQ) Phase II requirements. This 2019 edition of the Storm Water Management Plan has been revised and updated according to changes to the general permit set forth by the TCEQ.

The TCEQ's storm water program is divided into two phases. The first phase addresses storm water runoff from municipal separate storm water systems (MS4s) with a population of 100,000 or more. The second phase of their storm water program addresses storm water runoff from systems serving populations of less than 100,000. The Phase II areas are classified as follows: (a) urbanized areas; (b) areas that are becoming urbanized; and (c) areas which discharge to surface waters with impaired water quality. At the present time, the storm water system within Kemah's city limits serves a population of approximately 1800 residents (according to the 2010 census) in an urbanized area. Therefore, the City of Kemah is classified as a Small Municipal Storm Water System (MS4) qualifying it for compliance with Phase II requirements.

The primary requirements for an operator of a Small MS4 are as follows: (1) to design a program to reduce the discharge of pollutants to the "maximum extent practicable" (MEP); (2) protect the water quality by effectively prohibiting illicit discharges to the system; and (3) to satisfy the appropriate water quality requirements of the Clean Water Act (CWA).

To achieve the goal of the reduction of pollutant discharge to the MEP, best management practices (BMPs) are developed and implemented to the following minimum control measures listed below:

- Public Education and Outreach
- Public Participation/ Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/ Good Housekeeping
- Industrial stormwater sources

The goal of this revised and updated Storm Water Management Plan is to significantly reduce and/or eliminate the discharge of pollutants in the storm water runoff entering our MS4.

## Storm Water Management Program

### Public Education and Outreach

#### Introduction and Regulatory Requirements

A public education program shall distribute educational materials to the community or conduct equivalent outreach activities that will be used to inform the following groups within the City:

- Residents;
- Visitors;
- City employees;
- Businesses;

## Storm Water Management Program

- Commercial and industrial facilities; and
- Construction site personnel.

The goal of the outreach program is to inform the public about the impacts polluted storm water runoff can have on water quality, hazards associated with illegal discharges and improper disposal of waste, and ways to minimize impact on storm water quality.

The City must ensure that a reasonable attempt was made to reach all constituents within the City to meet this measure. Also, in accordance with *40 CFR 122.34 (b)(1)*, *Implement a public education program to distribute educational materials to the community of contact, equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps the public can take to reduce pollutants in storm water runoff.*

### Best Management Practices and Measurable Goals

The following table presents the various best management practices adopted by the City of Kemah for implementation within the storm water management plan for the City. The table includes practices along with a timeline for which the City intends to proceed or implement with each practice. Each practice is further explained in the following paragraphs.

BMP	Measurable Goals	2019	2020	2021	2022	2023
Add SWMP to City's website	Update Website	X	X			
Update City's Website with general storm water information	Update Website	X	X	X	X	X
Post storm water messages on City's website	Post 2 storm water quality messages	X	X	X	X	X
Educational Pamphlets	Distribute pamphlets at City Hall, Visitor's Center, and other public buildings	X	X	X	X	X
Employee Training & Outreach	Annual presentation of BMPs, pollution prevention, & good housekeeping	X	X	X	X	X
Brochures for Commercial and Industrial Facilities	Review & update brochure	X				
	Distribute brochure during inspections	X	X	X	X	X
Brochure for Construction Personnel	Review & update brochure	X				
	Distribute during construction meetings and permit process	X	X	X	X	X

## Storm Water Management Program

### *Stormwater Website*

The City of Kemah will include a section about storm water on its website. The City of Kemah's website is [www.kemah-tx.gov](http://www.kemah-tx.gov). The website will be updated to include pertinent storm water issues. SWMP topics may include, but are not limited to, lawn care, storm drains and ditches, used oil disposal, native plants, saving water, and household hazardous waste. The website will provide links to other websites that can further educate the public. An electronic mail link will be provided to the City of Administrator for residents to express concerns.

### *Post Storm Water Message on Website*

The City of Kemah will update the website to include a minimum of two postings of general Storm Water Quality information as well as topics of interest to the general public.

### *Educational Pamphlets*

The City of Kemah will revise existing pamphlets and distribute them at City Hall, the Visitor's Center, and other public buildings.

### *Employee Outreach*

The City will develop an employee outreach program discussing storm water quality issues. The outreach program will be in the form of a power point presentation. Annually, the City will present the employee outreach program to the various city departments.

### *Brochures for Commercial and Industrial Facilities*

The City will develop a brochure informing businesses, commercial and industrial facilities about the potential impact polluted storm water runoff can have on water quality, hazards associated with illegal discharges, and the ways they can minimize their impacts on storm water quality. The City will also develop a priority list of businesses that may impact water quality as a result of the services they provide. The City will distribute this brochure during inspections of regulated facilities. The brochure will also be available at City Hall.

### *Brochures for Construction Personnel*

The City will develop an informational brochure for distribution during the permitting process. The brochure will inform the construction industry about the impacts that polluted storm water can have on water quality, hazards associated with illegal discharges and ways to minimize their impact.

## Public Participation/Involvement

### Introduction and Regulatory Requirements

A public involvement and participation program is a requirement of the TPDES program and NPDES Phase II Final Rule. Public involvement differs from public education. It not only informs the public, but also provides opportunities for direct citizen action. When citizens participate in the decision-making process, they are more likely to support the final outcome. This plan describes ways in which Kemah's community members can play an active role in developing and implementing the City's Storm Water Management Program. An informed and involved public can be a valuable information resource and can help build compliance with the program. Participation by the public ensures that the program reflects community values and priorities and thus has the highest potential for success.

The goals of the public involvement activities are as follows:

## Storm Water Management Program

- Raise public awareness about storm water runoff
- Provide opportunities for the public to participate in the implementation of the SWMP
- Develop public support for the SWMP

The City will identify and implement a public involvement and participation program. This includes provisions to allow opportunities for all constituents within the City to participate in the storm water management program development and implementation.

The City will, at a minimum, comply with State and local public notice requirements when implementing a public involvement/participation program.

The City, via documented efforts, will ensure that sufficient opportunities are allotted to involve all constituents interested in participating in the program process to meet this measure.

*Also, in accordance with 40 CFR 122.34 (b) (2), at a minimum, comply with state, tribal and local public notice requirements when implementing a public involvement/participation program. EPA recommends that the public be included in developing, implementing, and reviewing your storm water management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups.*

The effectiveness of this MCM will be evaluated by the completion of each of the measurable goals identified for the BMPs selected.

### Best Management Practices and Measurable Goals

BMP	Measurable Goals	2019	2020	2021	2022	2023
Advisory Committee (Citizen Panel)	Update Committee on implementation of SWMP	X	X	X	X	X
Participate in public outreach event	Participate in one (1) public outreach event, i.e. Earth Day		X	X	X	X
Provide Volunteer Opportunities	Identify Volunteers	X	X			
	Provide support materials	X	X	X	X	X

#### *Advisory Committee*

The City will form an Advisory Committee as part of this Storm Water Management Program. The Committee will represent different segments of the community that will be affected by the City of Kemah's Storm Water Management Program (SWMP) implementation. The Committee will review plans to form the storm water utility and offer recommendations to facilitate implementation. They will also review this Storm Water Management Program and provide recommendations to facilitate implementation. They will be updated periodically regarding the on-going program implementation.

#### *Participate in Outreach Event*

The City will participate in at least one public outreach event in years two thru five.

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### *Provide Volunteer Opportunities*

The City will identify suitable opportunities for volunteers to participate in storm water quality activities and will develop support materials and provide them to interested parties. These volunteer opportunities may include such things as storm drain stenciling, volunteer monitoring, planting campaigns, and Adopt-a-Stream programs.

### Illicit Discharge Detection and Elimination

#### Introduction and Regulatory Requirements

A section within the SWMP must be developed to establish a program to detect and eliminate illicit discharges to the MS4. The SWMP must include the manner, ordinance, or other regulatory mechanism, used to effectively prohibit illicit discharges. The SWMP must list the techniques used for detecting illicit discharges.

The SWMP must include appropriate enforcement procedures and actions for removing the source of an illicit discharge.

A section within the SWMP must be developed to establish a program to detect and address non-storm water discharges and illegal dumping to the MS4. All non-storm water flows must be considered by the City to determine if they are a significant contributor of pollutants to the MS4. All non-storm water discharges that significantly contribute pollutants to the MS4 must be effectively prohibited. The prohibition must be done through an ordinance or other regulatory mechanism. The regulations must include appropriate enforcement procedures and actions.

Firefighting activities are excluded from being prohibited and only need to be addressed if they are determined to be a significant contributor of pollutants to the MS4.

A map of the storm sewer system must be developed and must include the following:

- The location of storm sewer pipes, ditches, and other conveyances owned by the City, or at a minimum, the drainage area for each outfall;
- The location of all major outfalls; and
- The names and locations of all waters of the U.S. that receive discharges from the outfalls.

The SWMP must include the source of information used to develop the storm sewer map including how the outfalls are verified and how the map will be regularly updated.

*In accordance with 40 CFR 122.34 (b) (3), Develop, implement, and enforce a program to detect and eliminate illicit discharges into your small MS4. Develop a storm sewer system map, showing the location of all outfalls and the names and locations of all water of the U.S. that receive discharges from those outfalls. To the extent allowable under state, tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions. Develop and implement a plan to detect and address non-storm water discharges including illegal dumping to your system. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste. Address categories listed in 122.34 (b) (3) (D) (iii) if you determine they are significant contributors of pollutants to MS4.*

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### Best Management Practices and Measurable Goals

BMP	Measurable Goals	2019	2020	2021	2022	2023
Storm water system map	Update current storm water drainage system map and field verify outfall information	X	X			
Ordinance for illicit discharge detection and elimination [see Appendix 3]	Review ordinance #1071 Prohibiting Illicit Discharges (dated 8/12/2012) and make any necessary revisions	X	X			
Illicit discharge detection plan	Evaluate existing program and identify additional resources and training needs	X				
	Field verify 25% of the storm system and make necessary updates		X	X	X	X
Inspection program for regulated businesses	Identify regulated businesses	X				
	Inspect 25% of regulated businesses		X	X	X	X
Provide information to regulated businesses on proper handling of discharges and chemicals	Develop brochure	X				
	Distribute during inspections of regulated businesses		X	X	X	X

#### *Storm Water System Map*

The City will make updates to the current storm water system map and field-verify the locations of all outfalls that discharge into the waters of the United States. During years two through four of the updated plan, the storm drainage system will be field-verified for accuracy. The map will be updated from permitted plans, as new areas are developed within the city limits. All updates will be field-verified.

#### *Ordinance for Illicit Discharge Detection and Elimination*

The City has adopted and implemented Ordinance #1071 (dated 8/2/12) to effectively prohibit non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions. [Refer to Appendix 3] This ordinance will be reviewed annually to ensure it remains current with any changes to State and/or federally mandated requirements.

#### *Illicit Discharge Detection Plan*

The City will evaluate existing programs and identify additional program requirements and resources needed to detect and address non-storm water discharges including illegal dumping to the storm water system. The City will acquire needed resources, training, and personnel to implement this BMP. The City will field verify 25% of the storm water system map in years two through five to have 100% implementation by the end of the next permit term. Staff will be trained using the Training series from

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North Central Texas Council of Governments as well as local training courses available through the Houston-Galveston Area Council (H-GAC).

### *Inspection Program for Regulated Businesses*

The City will develop an inspection program for regulated businesses. The City will identify 25% of regulated businesses in years two through five to have 100% implementation by the end of the permit term.

### *Provide Information for Regulated Businesses*

The City will provide businesses with information about the hazards associated with illegal discharges and improper disposal of waste. Brochures will be designed to target various types of businesses. The types of businesses that will be targeted in the City of Kemah will include (but not limited to); restaurants, service stations, and car washes. The brochures will encourage participation in the elimination of illicit discharges. The Goal is to make the public aware of illicit discharges and to encourage participation in eliminating improper connections. The City will distribute the brochure(s) during inspections of regulated businesses, and they will also be available at City Hall.

## Construction Site Runoff Control

### Introduction and Regulatory Requirements

Without proper management, construction sites can release significant amounts of sediment into storm water and eventually into a municipality's storm water system. Other construction site activities such as storage and handling of construction materials can also release pollutants into the storm water system. In addition, increases in compaction and impervious surfaces at construction sites impact storm water. Pollutants from construction sites that may impact storm water runoff include sediment, solid and sanitary wastes, fertilizer, pesticides, oil and grease, truck washout debris, and construction debris.

The Phase II Final Rule requires that the City of Kemah develop, implement, and enforce a program to reduce pollutants in storm water runoff from construction sites within their jurisdiction. Construction activities to be regulated under this program include activities that would result in a land disturbance greater than or equal to 1 acre in size. In accordance with EPA-recommended guidelines for program development, the City of Kemah construction site storm water control program will be composed of the following components:

- An ordinance or other regulatory mechanism that requires the implementation of proper erosion and sediment controls, and controls to other wastes, on applicable construction sites
- Requirements for construction sites operators to implement appropriate erosion and sediment control BMPs
- Procedures for construction site operators to control wastes, such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at construction sites that may cause adverse impacts on water quality.
- Procedures for site plan review that incorporate consideration of potential water quality impacts
- Procedures for receipt and consideration of information submitted by the public
- Procedures for site inspection and enforcement of control measures
- BMPs and measurable goals for this minimum control measure

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- Requirement for completion of soil stabilization as soon as practicable, but no more than 14 calendar days after initiation of soil stabilization measures

The objective of this program is to provide a system through which construction activities can be monitored for storm water impacts. The effectiveness of this MCM will be evaluated by the completion of each of the measurable goals identified for the BMPs selected.

**Per 40 CFR 122.34 (b)(4), Develop, implement and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Program must include: the development and implementation of (at a minimum) an ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, requirements for construction site operators to implement appropriated erosion and sediment control BMPs, requirements for construction site operators to control waste at the construction site, procedures for site plan review which incorporate consideration of potential water quality impacts, procedures for receipt and consideration of information submitted by the public.**

### Best Management Practices and Measurable Goals

BMP	Measurable Goals	2019	2020	2021	2022	2023
Ordinance for illicit discharge detection and elimination [see Appendix 3]	Review Ordinance #1071 Prohibiting Illicit Discharges (dated 8/2/12) and make necessary revisions	X	X			
Provide information regarding requirements for construction site storm water controls during site plan review	Review brochure & update if needed	X	X			
	Distribute brochure during site plan review	X	X	X	X	X
Reporting mechanism for construction site problems	Review current process for handling of reported problems & update as needed	X	X			
Construction site inspection program and enforcement of control measures	Review inspection process & update as needed	X	X			
	Inspect construction site activities	X	X	X	X	X

### *Ordinance for Erosion and Sediment Controls*

The City of Kemah adopted and implemented Ordinance #1071 on August 2, 2012, which specifies erosion and sediment control provisions to be followed by developers and construction contractors during clearing and grading operations or other construction related operations associated with land

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filling and placement of earth materials on the work site. This ordinance also requires them to employ proper sediment and erosion control measures to the maximum extent possible.

### *Provide Information for Construction Site Storm Water Controls*

The City will provide a public education brochure or flyer to inform the public and construction site operators of the requirements for Construction Site Storm Water Controls. The brochure or flyer will be distributed during either the site plan review or preconstruction meeting, depending on which meeting occurs first. The brochure or flyer will be made available to the general public at City Hall.

### *Reporting Mechanism for Construction Site Problems*

The public can report either construction site problems or suspected illicit discharges directly to the City Hall Customer Service Section at (281) 334-1611. This will facilitate the ability of the public to provide information that will assist in detection of problem discharges. The City will set up a method to forward reports to designated department(s) for investigation and any required remedial actions necessary to correct the reported problem.

### *Construction Site Inspection Program*

Development and implementation of this program will involve both the plan review staff and inspection staff. Their duties will include informing the building permit applicants about the requirements for compliance with the BMPs during and after construction in order to prevent discharges to the MS4. The City will inspect all ongoing construction activities within the city limits either with in-house staff or a third-party inspection service through a City service contract.

## Post-Construction Runoff Control

### Introduction and Regulatory Requirements

The City must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale that will result in disturbance of one or more acres, that discharge into the storm water system. The program must ensure that controls are in place that would prevent or minimize water quality impacts;

- Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for your community;
- Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State and local law (using industry standards);
- Ensure adequate long-term operation and maintenance of BMPs; and
- Most construction will be less than (1) acre.

The purpose of the post-construction program is to provide a mechanism by which ongoing protection of storm water quality can be addressed and attained. The plan will incorporate both structural BMPs (storage practices, infiltration practices, and vegetative practices) as well as non-structural components such as planning procedures and site-based local controls (e.g., buffer strips, riparian zones).

*In accordance with 40 CFR 122.34 (b) (5), Develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects that are less than one acre that are part of a larger*

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*common plan of development or sale, that discharge into your small MS4. Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for your community. Use an ordinance or other regulatory mechanism to address post-construction runoff. Ensure adequate long-term operation and maintenance of BMPs.*

### Best Management Practices and Measurable Goals

BMP	Measurable Goals	2019	2020	2021	2022	2023
Integrate post-construction requirements into site plan review and inspection programs	Review program based on Ordinance #1071 (refer to Appendix 3); update as needed	X	X			
	Inspect post-construction sites for compliance	X	X	X	X	X

#### *Integrate Post-Construction Requirements into Ordinance Criteria*

The City will develop and integrate Post-Construction requirements based on criteria outlined in Ordinance #1071 (see Appendix 3). This ordinance will be reviewed and updated as necessary to ensure that post-construction storm water management for new development and redevelopment remain current. The City will require post-construction runoff best management practices (BMPs) for new development and redevelopment and monitor work sites for proper long-term operation and maintenance of BMPs.

#### *Integrate Post-Construction into Site Plan Review and Inspection Program*

The City will integrate post-construction storm water quality requirements into site plan reviews and inspection programs. Prior to final inspection, the erosion and sediment control devices must be maintained until the new ground cover is 100% established.

## Pollution Prevention/Good Housekeeping

### Introduction and Regulatory Requirements

A section within the SWMP must be developed to establish an operation and maintenance (O & M) program. The O & M program must have the goal of identifying methods and practices for conducting municipal operations in a manner to prevent or reduce pollution in storm water runoff. Good housekeeping and BMPs must be used to reduce or eliminate the discharge of pollutants when runoff from municipal operations is determined to be a significant contributor of pollution to the MS4. Examples of municipal operations and municipally owned areas include, but are not limited to the following items:

- Park and open space maintenance;
- Street, road, and highway maintenance;
- Fleet and building maintenance;
- Storm water system maintenance;
- New construction and land disturbances;
- Municipal parking lots;

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- Vehicle and equipment maintenance and storage yards;
- Waste transfer stations; and
- Salt and sand storage locations.

A training program must be developed for all employees responsible for municipal operations subject to the pollution prevention/good housekeeping program. The training program must include training materials directed at preventing and reducing storm water pollution from municipal operations. Examples or descriptions of training materials being used must be included in the SWMP.

If best management practices include structural controls, maintenance of the controls must be performed at a frequency determined by the City and consistent with maintaining the effectiveness of the BMP. The SWMP must list all the following:

- Maintenance activities;
- Maintenance schedules; and
- Long-term inspection procedures for controls used to reduce floatables and other pollutants.

Waste removed from the MS4, from structural controls, or collected as a result of municipal operations and maintenance activities must be properly disposed. A section within the SWMP must be developed to include procedures for the proper disposal of waste including;

- Dredge spoil;
- Accumulated sediments;
- Floatables; and
- Municipal Operations and Industrial Activities

The SWMP must include a list of all:

- Municipal operations that are subject to the operation, maintenance, or training program developed under the conditions of this section; and
- Municipally owned or operated industrial activities that are subject to TPDES storm water regulations.

The SWMP must include an individual permit number, general permit authorization number, or a copy of a signed NOI or NEC (no exposure certification form for TPDES General Permit TXR050000) for each industrial activity conducted by the MS4 and subject to TPDES storm water regulations. If an NOI or NEC has been submitted, but an acknowledgement has not yet been received from the TCEQ, a copy of the submitted NOI or NEC Form may be made readily available.

Also, in accordance with **40 CFR 122.34 (b) (6)**, ***Develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.***

## Storm Water Management Program

### Best Management Practices and Measurable Goals

BMP	Measurable Goals	2019	2020	2021	2022	2023
Provide spill response and prevention training at city maintenance facility	Inspect facilities for spill kits annually	X	X	X	X	X
	Provide training to city employees annually for	X	X	X	X	X
Evaluate City maintenance facility annually	Verify pollution prevention & good housekeeping practices are followed	X	X	X	X	X
Review SWMP annually	Verify SWMP & BMPs are effective, make necessary updates, & report on annual report	X	X	X	X	X

#### *Provide Training at City Maintenance Facility*

The City will develop curriculum and provide training to applicable city employees in spill response procedures and will provide spill response kits in convenient locations at the facility. Note: Any Contractor Personnel the City hires to work in the Maintenance Department will either have current spill response training or they will receive in-house spill response training to qualify for the job, plus they will comply with all operating procedures.

#### *Evaluate City Maintenance Facility*

The City presently implements a series of BMPs to address activities at the various operational areas of the Public Works Facility. Such activities include designated areas for equipment cleaning and tank clean-outs, and pollution prevention training. To improve upon the present program, the City will evaluate the activities listed in the table below for storm water impact.

#### *Urban Runoff Concerns and Their Sources*

Source/Activity	Urban Runoff Concern
Vehicle washing	Discharge to storm drains
Changing auto fluids	Spills of fluids, especially in outdoor areas
Parked vehicles and equipment	Fuel leaks and drips in outdoor areas
Outdoor waste/materials storage	Release/spill of stored material in uncovered areas with no secondary containment
Illicit connections	Floor drains from work areas and covered areas discharging to storm drains or dry wells
Unpaved/compacted surfaces	Release of dust and sediment due to vehicle movement across such surfaces

## Storm Water Management Program

Note: BMPs have been implemented by the City for many of the areas of concern shown above; however, these areas will continue to be evaluated for storm water quality impacts and further improvements.

### Industrial Stormwater Sources

The City is operating a Level 1 small MS4 therefore this MCM does not apply to the SWMP.

## Summary

The City of Kemah's Storm Water Management Plan was developed in order to comply with the TPDES and Environmental Protection Agency's Phase II requirements. The plan will be reviewed and revised each year, as necessary to maintain the goals of reducing the discharge of pollutant to the "maximum extent practicable" (MEP), protecting the water quality, and satisfying the appropriate water quality requirements of the Clean Water Act.

The best management practices (BMPs) will be reviewed each permit cycle in December and January to verify the measurable goals are being met. At that time, if a measurable is not being met, the BMP will be improved to better meet our goals. The improvement of the SWMP or to any BMP will be included in the annual report. All additions or revisions will be kept on file at the City Hall in Kemah, Texas.

Each permit cycle will be summarized in an annual report. The annual report is required to include the status of our compliance with the permit conditions, an assessment of the appropriateness of the identified BMPs, progress toward achieving the statutory goal of reducing the discharge of pollutants to the MEP, and the measurable goals for each of the minimum control measures. Also required in the annual report are the results of information collected and analyzed, including monitoring data used to assess the success of the program at reducing the discharge of the pollutants to the maximum extent practicable. The annual report will also include a summary of the storm water activities the City plans to undertake during the next reporting cycle.

The City must sign and certify the annual reports, in accordance with Part VII.E.1. (a) of the General Permit. Furthermore, the annual report shall be submitted to the TCEQ by March 31 (of the following year) for each year of the permit term electronically to TCEQ at:

<http://www.tceq.state.tx.us>

The ultimate success of the City of Kemah's Storm Water Management Program will be measured by either meeting or exceeding our goals of reducing the discharge of pollutants to the "maximum extent practicable" (MEP), protecting the water quality, and satisfying the appropriate water quality requirements of the Clean Water Act.

**APPENDIX 1 – PUBLIC EDUCATION AND OUTREACH**

## Storm Drains:

### Untreated Runoff

Stormwater and irrigation runoff carry pollution through the storm drain system to our waterways untreated.

## Sewer System:

### Treated Wastewater

The sanitary sewer system treats wastewater from sinks, showers, and toilets but does not clean stormwater or runoff.



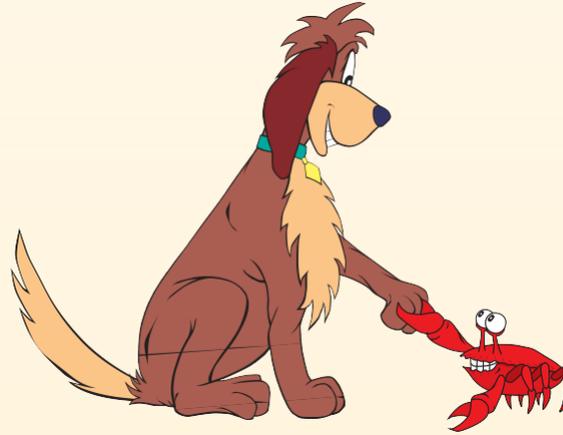
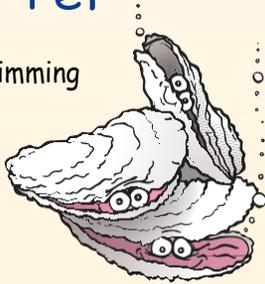
## More Good Reasons to Pick Up After Your Pet

Keep shellfish beds and swimming areas open.

Create a clean, sanitary play area for family activities.

Prevent messes from pet waste being tracked indoors.

Ensure a healthier environment for us all!



Thank you for helping to keep our waters clean!



## Tips for Bagging It

Keep a supply of bags near your dog leash.

Reuse old bags: plastic newspaper bags, bread bags, or sandwich bags.

Or, purchase special bags where pet supplies are sold.

Tie bags on the leash if you don't have a pocket or pack.

For more information call: 409-938-2251 or visit [www.gchd.org](http://www.gchd.org)



# Don't Let Your Pet Pollute!

## How to Safely Dispose of Pet Waste

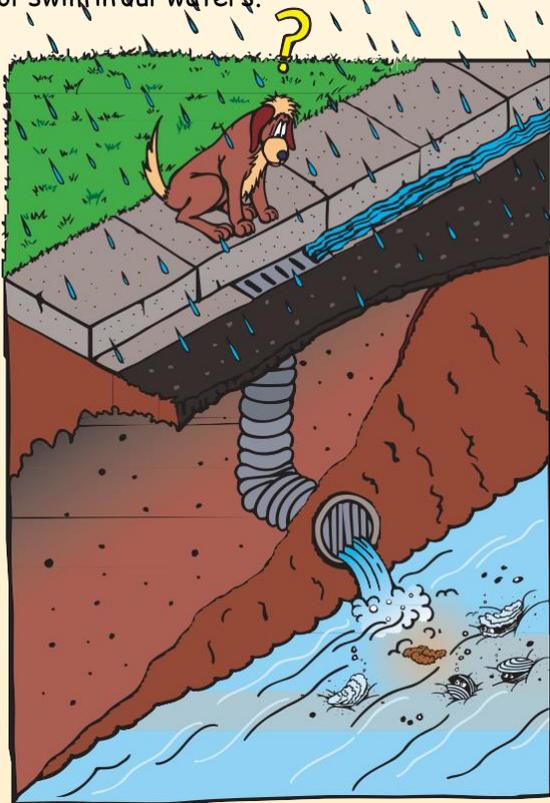


# Dog and Cat Waste Pollutes Our Watersheds!

**D**og poop left on the street or lawn does not

just go away or fertilize the grass. The bacteria in dog waste is often washed down storm drains and into ditches, streams, lakes, and inlets, and can travel for miles in the water.

Kitty litter dumped outside can also be washed into streams. The bacteria in pet waste can make it unsafe to harvest shellfish or swim in our waters.



A little pet waste goes a long way: a day's waste from one large dog can contain 7.8 billion fecal coliform bacteria.

## Proper Pet Waste Disposal

### 1 When Walking

**Bag It** Bring plastic bags with you when you walk your dog. Use a bag to pick up the dog waste. Tie bag closed and place in trash.



!

Bring plastic bags with you when you walk your dog.

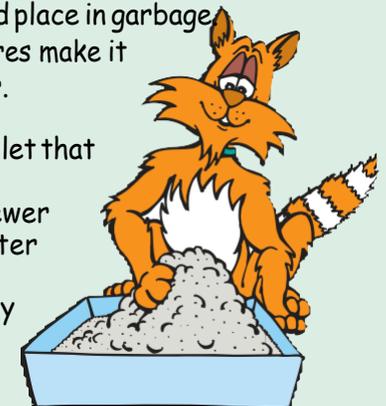
Use a bag to pick up the dog waste.

Tie bag closed and place in trash.

### 2 Options at Home

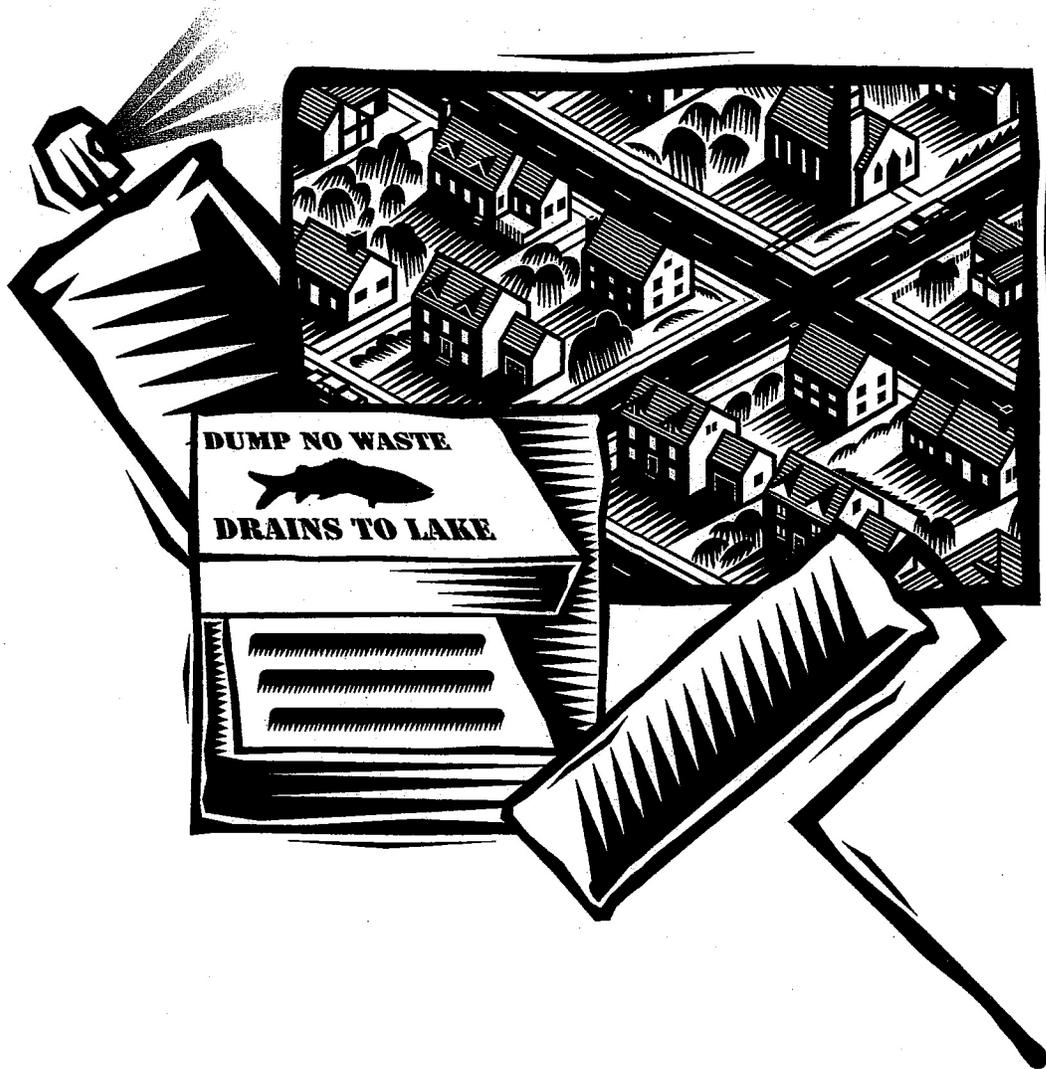
**Trash It** Double bag dog waste or kitty litter, tie securely and place in garbage. Long-handled "pooper scoopers" available at pet stores make it easy to pick up after your dog without stooping over.

**Flush It** Flushing dog (not cat!) waste down the very same toilet that dispenses yours is environmentally sound and earth-friendly. If your home is connected to a sanitary sewer system, the waste will be sent to your local wastewater treatment facility. Private septic systems can be utilized as well; but make sure yours has the capacity to handle the extra load and confirm with the manufacturer that this is an approved use



**APPENDIX 2 – PUBLIC PARTICIPATION/INVOLVEMENT**

# **STORM DRAIN STENCILING**



**A MANUAL FOR COMMUNITIES**

# **STORM DRAIN STENCILING**

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## **A MANUAL FOR COMMUNITIES**

*This manual was produced through a grant awarded under Section 319(h) of  
the Clean Water Act by the Environmental Protection Agency.*



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## **INTRODUCTION**

This manual is a how-to guide for communities interested in starting a Storm Drain Stenciling Program to reduce nonpoint source pollution. It was developed by the Texas Natural Resource Conservation Commission's CLEAN TEXAS 2000 program under a pollution prevention grant from the U.S. Environmental Protection Agency (EPA). The manual covers a range of methods for labeling storm drain inlets and offers examples of programs operating in selected Texas cities. The Texas Natural Resource Conservation Commission (TNRCC) does not endorse one labeling approach over another, and the manual does not represent a complete catalog of programs in Texas. Its purpose is to give cities and community groups the tools to launch a successful citizen-education effort to reduce dumping and protect local water supplies.

## **WHAT IS NONPOINT SOURCE POLLUTION?**

Nonpoint source (NPS) pollution is caused when rainfall carries pollutants from a wide variety of sources into surface water or ground water. The term distinguishes pollution that is diffuse in its origins from pollution that is traceable to a single "point source," like a factory or wastewater treatment plant.

## **WHAT ARE NONPOINT SOURCE POLLUTANTS?**

Many products and materials we use in daily life become nonpoint source pollutants when they reach a body of water. NPS pollutants can be chemicals, like pesticides and fertilizers. They can be automotive products like gasoline, motor oil, antifreeze and road salt. They might be common household items like paint and solvents. They can even be natural materials like soil, animal wastes, grass clippings and fallen leaves.

## **HOW DO NPS POLLUTANTS REACH WATERWAYS?**

Sometimes NPS pollutants wash directly into a creek, river, lake or bay. Construction activity, for example, can send soil and debris directly into nearby creeks and streams. Agricultural activities also may generate NPS pollutants, when fertilizers, pesticides, livestock wastes and eroded soil are not managed properly and are allowed to wash directly into nearby surface waters.

In urban areas, though, the most common route for NPS pollutants is the network of storm drains that carry excess rain water away from streets and directly into waterways. NPS pollutants can be washed by rainfall from lawns and streets into the storm drains, or they can be dumped there deliberately by people who are careless about the environment or who mistakenly think the storm drains flow to a water treatment plant.

## **HOW DO NPS POLLUTANTS AFFECT WATER QUALITY?**

Just as the nature of NPS pollutants varies widely, so do their effects on water quality. Pesticides, antifreeze and motor oil contain toxic chemicals that are harmful to humans,

animals and plants. Just one quart of motor oil can ruin the quality of 250,000 gallons of water. The phosphorus and nitrogen in fertilizers, pet and livestock wastes and decomposing leaves and grass can cause large amounts of algae to grow, which depletes the oxygen level in the water and can lead to fish kills. Animal wastes also introduce harmful bacteria and other pathogens into water supplies. Sediment from soil erosion or construction activity can reduce the clarity of water and block sunlight needed by aquatic plants and fish. Litter and debris, particularly plastic items that float, spoil the beauty of lakes, rivers and bays and can be harmful to fish and birds who mistake them for food.

## **WHAT IS THE STATE DOING ABOUT NONPOINT SOURCE POLLUTION?**

The TNRCC receives funding each year from the EPA to support state and local programs to control and prevent nonpoint source pollution. Since 1990, the TNRCC has funded more than 60 pollution prevention and abatement projects across the state.

Grant projects target water quality problems in both surface and ground water. Some control pollution through the design, building and testing of *structural* improvements, like an artificial wetland or a new type of sedimentation basin. Others focus on *non-structural* management practices, which include such things as replanting roadside ditches with vegetation to better filter storm water runoff and mapping potential pollution sources to protect drinking water wells.

In addition to the NPS grant program, the TNRCC administers programs that encourage **voluntary citizen action** to reduce nonpoint source pollution. These include a household hazardous waste collection program; a used motor oil and filter collection program; "Texas Watch," which trains citizen volunteers to monitor local water quality; an agricultural waste pesticide collection program, which collects canceled or banned pesticides; the Texas Country Cleanup project, which organizes events in rural areas to collect empty pesticide containers, batteries, scrap tires, and used motor oil and oil filters; the Lake and River Cleanup program, which organizes volunteers to remove litter from public waters and shorelines; and the Source Water Protection Program, which assists communities in developing and implementing site-specific programs to protect drinking water.

## **WHAT IS STORM DRAIN STENCILING AND WHY IS IT NECESSARY?**

Many people mistakenly believe storm drain inlets empty to water treatment facilities, so they pour chemicals or sweep debris directly into storm drains. This dumping greatly increases the level of nonpoint source pollutants (leaves, soil, litter, fertilizers, pesticides, street residues) already present in urban storm water runoff and can contribute substantially to a decline in water quality.

More communities are working to reduce nonpoint source pollution by labeling storm drain inlets with messages warning citizens not to dump polluting materials. These storm drain stenciling projects usually are conducted by volunteer groups in cooperation with local authorities. The stenciled messages—usually a simple phrase like "No Dumping! Protect

Our Water"—remind would-be dumpers and passersby that the storm drains connect to local water bodies and that dumping pollutes those waters.

In recent years, as states and local governments have learned more about how nonpoint source pollution degrades water quality, storm drain stenciling efforts have sprung up in communities across the country. The Center for Marine Conservation (CMC), a nationwide environmental organization dedicated to protecting marine life, estimates that 97 groups in 33 states and Canada now are involved in storm drain stenciling. In 1992, the CMC launched its "Million Points of Blight" campaign to educate people about the connection between storm drains and local waterways and to involve them in stenciling efforts. Today, the CMC acts as a clearinghouse for information on storm drain stenciling, referring interested organizations to existing community programs or providing instructions on how to start new programs. The CMC's headquarters in Virginia can be reached at 804/851-6734.

## **WHAT ARE THE BASICS OF STORM DRAIN STENCILING?**

This section describes a range of storm drain stenciling approaches. Projects vary widely from community to community in terms of the materials used, the message conveyed and the physical placement of the message.

### **MATERIALS**

Most communities use stencils and paint to label storm drains. The city of Houston uses a single stencil to imprint its slogan, "You Dump It, You Drink It. No Waste Here," directly onto the concrete above the inlet. Some communities use a two-phase stenciling process. They first paint a rectangular area white to create a background for the message. When this layer is dry, they stencil the message on top of it in a contrasting color. Corpus Christi, for example, uses white paint for the background and green paint for the message "No Dumping! Drains to Bay."

The most commonly used stencils are made of Mylar, a flexible plastic material that can be cleaned and reused many times. Stencils also can be made from cardboard, aluminum or other metal.

Paint (or ink) can be sprayed on or applied by brush or roller. Spray paint is quickest and probably the easiest to apply neatly. However, cities that do not meet federal air-quality standards ("non-attainment areas") may wish to avoid spray paints, since many contain air-polluting propellants. Houston (a non-attainment area) uses rollers and ink pads for this reason. Many Texas cities use special "environmentally friendly" paint that contains no heavy metals and is low in volatile organic compounds (VOCs). Empty steel aerosol cans and paint cans can be recycled in many communities.

Not all communities use stencils and paint to label their storm drains. Some have opted for permanent signs made of aluminum, ceramic, plastic or other durable materials. The city of Plano uses a 6" x 6" ceramic tile. Fort Worth uses a 4" x 8" aluminum plaque. These signs last longer than stenciled messages (Plano expects its tiles to last five to 10 years) and they require only glue to affix them to storm drain inlets. This ease of application is particularly important when volunteers provide much of the labor.

Many city officials prefer the permanent signs because they are neater than stencils, which sometimes look smeared and may be hard to read from a distance. Plano now requires contractors who build storm drains to place the city's storm drain tiles on new and replacement storm drains. On the down side, permanent signs can be more expensive than painted stencils. Ceramic tiles cost \$5 to \$6 each. A Mylar stencil, by contrast, costs about 45 cents per linear inch and can be used for 25 to 500 stencilings, depending on whether paint is sprayed on or applied with a brush or roller. In addition, tiles or plaques can be dislodged by pedestrian traffic if they are disturbed before the glue dries.

### CONTENT OF THE MESSAGE

Nearly all signs and stencils used on storm drain inlets discourage deliberate dumping. Some communities focus on a particular material such as motor oil while others warn against the dumping of chemicals.

Regardless of the materials, the most important idea to get across is that storm drains lead to open waterways. Often communities will specify which water body the inlet drains to, saying for example, "drains to creek" or "drains to lake." Some even name the river, lake or bay. The following are examples of possible messages:

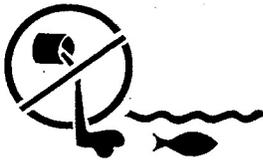


**NO OILS OR CHEMICALS**



**DRAINS TO BAY**

*(Bay City)*



*(North Central Texas COG)*

**NO DUMPING**



**DRAINS TO RIVER**

*(Houston-Galveston Area COG)*

NO DUMPING. DRAINS TO WATER SOURCE.

NO DUMPING. DRAINS TO BAY  
(CREEK, STREAM, RIVER, LAKE, OCEAN).

DON'T DUMP. DRAINS TO CREEK  
(STREAM, RIVER, LAKE, BAY, OCEAN).

DON'T DUMP. PROTECT OUR WATER.

YOU DUMP IT, YOU DRINK IT. NO WASTE HERE.

SI USTED LO TIRA, USTED LO TOMA.

DUMP NO WASTE. DRAINS TO BAY.  
(CREEK, STREAM, RIVER, LAKE, OCEAN)

NO OIL OR CHEMICALS. DRAINS TO BAY.

DO NOT DUMP. FLOWS TO BAY  
(CREEK, STREAM, RIVER, LAKE, OCEAN) .

DO NOT DUMP. FLOWS TO TRINITY RIVER.

Communities often combine words and pictures to convey their message. The graphic portion may reinforce the verbal message by depicting the pathway from storm drain to water body in some stylized fashion. Graphics also may refer to some topic of local interest. For instance, Houston uses a picture of a shrimp on one of its stencils to remind passersby that the Galveston Bay shrimping industry can be hurt by pollutants dumped in Houston. Fort Worth superimposes its anti-dumping message against the silhouette of a largemouth bass, one of the most popular game fish in the southern United States. Others use pictures of windsurfers or sailboats to remind people that dumping pollutants affects the recreational value of local waterways.

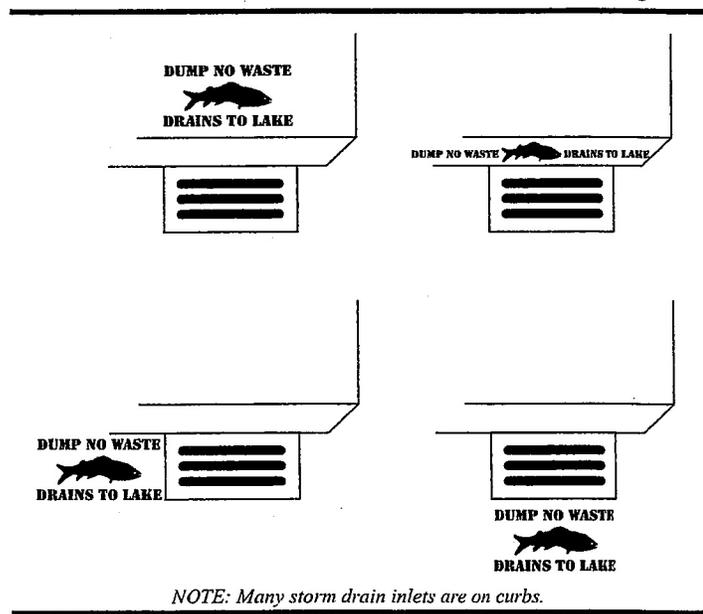
Communities with large numbers of Spanish speakers may wish to develop signs or stencils in both English and Spanish. Houston has done this with its "You Dump It, You Drink It" message. Some communities opt for a simpler approach, using a graphic alone, without words. The North Central Texas Council of Governments offers cities such a stencil. It shows an oil can in a circle with a slash through it.

### PLACEMENT OF THE MESSAGE

Messages may be positioned in several ways. Some are placed flat against the sidewalk surface just above the storm drain inlet. Others are placed on the curb facing the street. Still others are located on the street itself, either just upstream of the storm drain or on the street in front of the drain. However, messages placed on the street may wear out sooner. (See Figure 1.)

Potential dumpers will see the message in any of these locations. The decision about where to place the message also should take into account who *else* will see it. Signs facing the street will be seen more easily by motorists; signs aligned with the sidewalk or with the street itself are more likely to be seen by pedestrians. It's important that even those who would not dump motor oil down a storm drain be exposed to the stenciled messages. Because the signs raise awareness about the connection between storm drains and water bodies, they help deter littering, overfertilizing and other practices that contribute to nonpoint source pollution.

Figure 1



### HOW DO STORM DRAIN STENCILING PROGRAMS OPERATE?

Storm drain stenciling programs are carried out in a variety of ways. In some cases, cities use their own public works staff to do all labeling. The city of Hurst, Texas, (population

30,000) took this approach and has labeled all 1,200 of its storm drain inlets. Plano has used its own crews to place 1,200 ceramic tiles, and Fort Worth has done most of its storm drain labeling in-house as well. Some cities feel that having their own crews do the work produces better results and eliminates liability and safety concerns. Recently, though, Fort Worth sponsored a neighborhood association to label some drains. Both Fort Worth and Plano plan to work with volunteer groups in the future.

A more common arrangement for storm drain stenciling programs is for volunteer groups to provide the labor and the city to provide supplies, safety equipment and other forms of support.

This public-private partnership may be initiated by either side. If a civic association or local environmental group initiates the project, it must be sure to obtain the support and cooperation of local authorities. Storm drains are city property and local ordinances or policies may prohibit marking them without permission. Most cities also will want certain safety measures in place before volunteers set to work.

## **SAFETY**

Since stenciling projects take place on city streets, volunteer safety is of utmost importance. The city may wish to designate lower-traffic residential areas as targets for volunteer stenciling and provide safety equipment and training. Most programs require that stenciling be done in teams, with at least one person designated to watch for traffic. Adult supervision is needed when the volunteers are school children or members of a youth group. Most cities also require participating volunteers (or their parents) to sign a waiver of liability. (See Appendix A for examples of waivers.)

## **THE CITY'S ROLE**

In many cities, the public works or water quality department will designate a person to coordinate stenciling projects by volunteer groups. Coordination may mean any of the following:

- ✍ Providing stenciling kits containing all materials and tools needed to carry out a stenciling project. (See Appendix B for examples of the contents of kits.)
- ✍ Furnishing a list of locations or a map of storm drains to be stenciled.
- ✍ Training volunteers on safety procedures and on the technique for using stencils or affixing signs.
- ✍ Providing safety equipment: traffic cones, safety vests, masks and/or goggles (if spray paint is used) and gloves (if glue is used).
- ✍ Providing incentives and rewards for volunteers (badges, T-shirts, certificates).
- ✍ Providing pollutant tracking forms to collect data on serious instances of dumping.

## **WORKING WITH VOLUNTEERS**

Since most storm drain stenciling programs depend heavily on volunteer labor, organizers or coordinators must be skilled in the art of recruiting, training, managing and recognizing volunteers. This section focuses on how to work successfully with volunteers.

## **RECRUITING VOLUNTEERS**

Cities can spread the word about storm drain stenciling to volunteer organizations through many channels. The North Central Texas Council of Governments distributed a pamphlet on the program to area service organizations. Cities can mail information on the program to civic groups, youth groups, schools, environmental clubs, chambers of commerce or volunteer centers. The city of Houston distributed a brochure to local organizations, placed articles in local magazines and took out newspaper ads to publicize its program. Houston and Corpus Christi both included information about storm drain stenciling in an environmental insert placed in the local newspaper. Program coordinators can make presentations at community meetings and encourage word-of-mouth communications about the program. The city of Plano developed a public service announcement about its program.

Most volunteer groups do their storm drain stenciling projects on a Saturday morning. The program has been popular with Girl Scouts, Boy Scouts, 4-H clubs, environmental clubs, church youth groups, neighborhood associations, grade school classes and a wide range of civic and service organizations.

## **TRAINING VOLUNTEERS**

Before participating in a stenciling project, volunteers need training in three areas: technique, safety and information tracking.

### **TECHNIQUE**

Instructions on how to stencil a storm drain vary with the materials the city uses. Spray painting requires a different technique than rolling or brushing paint onto a stencil. Most projects have certain elements in common as listed below.

- ✎ First, the area to be labeled must be cleaned with a wire brush.
- ✎ Volunteers are warned against applying too much paint, which can make a stencil unreadable.
- ✎ Wait a few minutes before the stencil is removed to avoid paint smearing.
- ✎ Volunteers are advised to wear old clothes.

Appendix C contains sample stenciling instructions.

### **SAFETY**

Storm drain stenciling is normally conducted in teams of two or more people. The following are common safety guidelines.

- ✎ Groups of young people must have an adult supervise each team.
- ✎ One person on each team is assigned to watch for traffic.
- ✎ All participants should wear safety vests provided by the sponsoring city.
- ✎ If spray paint is used for stenciling, participants also should wear goggles or masks.
- ✎ If glue is used to affix permanent signs, participants should wear rubber gloves.
- ✎ If volunteers are working in the street, they must use traffic cones and/or barricades provided by the city.

Sample safety instructions are included in Appendix D.

## **INFORMATION TRACKING**

Storm drain stenciling projects provide cities with valuable information about nonpoint source pollution. Cities typically have thousands of storm drain inlets in their jurisdictions and public works staffs cannot inspect them all. Most cities ask participants in storm drain stenciling projects to note storm drains that are clogged with debris or show obvious signs of dumping. This enables city crews to target cleanup efforts. Volunteers should be instructed on what kinds of pollutants to look for and how to fill out data cards.

Volunteers also should list the locations of all storm drains labeled during the project, so the city can keep track. Sample data cards are included in Appendix E. Regardless of whether tracking forms are used, it is a good idea to assemble the participants after the event to talk about what they have found. Their reactions and impressions can help organizers improve future stenciling projects.

## **RECOGNIZING VOLUNTEERS**

For any volunteer project to be successful, volunteers must feel they have done something worthwhile. Communities active in storm drain stenciling have developed a variety of ways to recognize volunteers. The following are a few examples:

- ✍ Provide each participant with a certificate of appreciation and/or letter of thanks signed by the mayor. (See Appendix F for a sample certificate.)
- ✍ Distribute T-shirts, hats, badges or other gifts to each participant after the event. The city of Austin distributes plastic water bottles to participants *before* the event so they can have a supply of water while they're working. "I helped curb pollution" is the message on the bottles.
- ✍ Hold a picnic or small party after the event, with refreshments donated by a local business.
- ✍ Provide free coupons for pizza, hamburgers, ice cream or movies donated by local merchants.
- ✍ Take pictures of stenciling teams before, during and after the event to create a pictorial record of volunteers' activity.

## **STENCILING AS AN EDUCATIONAL TOOL**

A storm drain stenciling project affords many opportunities for public education. The labeled storm drains themselves become public education tools, reminding potential polluters, motorists, pedestrians and area residents that storm water runoff flows to area water bodies. The knowledge that whatever enters a storm drain enters the nearby creek, river or lake makes people more conscientious about littering, overfertilizing, sweeping grass clippings into the gutter and other practices that aggravate nonpoint source pollution.

Corpus Christi and other cities have volunteers distribute door hangers in the targeted neighborhoods to notify residents that storm drain stenciling is taking place. The hangers also explain the purpose of the project and offer tips on how citizens can reduce nonpoint source pollution. (See Appendix G for a sample door hanger and brochure.)

Cities or community groups can notify daily and weekly newspapers to get advance coverage of the planned stenciling event. A news release issued for the day of the event can

draw TV and/or daily newspaper coverage. (See Appendix H for sample news release.) Newspapers may choose to cover the event itself as an environmental feature story to further heighten public awareness. Public service announcements (PSAs) distributed before the event also will help reinforce the message. Sample PSAs may be found in Appendix I.

It is important to remember that to be effective a city does not have to stencil every storm drain. Large cities have thousands of inlets and it would be impractical to cover all of them. In fact, to do so might defeat the public education purpose because if people see the message on every drain, it may cease to register with them.

It is also important to view storm drain stenciling as one part of a larger educational campaign to reduce nonpoint source pollution. For the message on a storm drain to sink in, people need to hear it explained in other forums. Cities may want to develop TV, radio and print ads or public service announcements to reinforce the idea that storm drains lead to local waterways and that dumping pollutes those waters. Community groups could approach a local television station about producing and running a free PSA on storm drains and nonpoint source pollution. One reason the Texas Department of Transportation's "Don't Mess With Texas" anti-littering campaign succeeded was that the department conveyed its message through TV and radio ads and reinforced the slogan by printing it on the trash barrels located along the highways.

The city of Houston used "You Dump It, You Drink It" as one of its storm drain messages in part because the slogan had already been used in a joint city/TNRCC public education effort to encourage motor oil recycling. The TNRCC can make available to any interested community a television PSA, radio scripts and print ads featuring this slogan (call 512/239-3159).

## **ASSESSING THE EFFECTIVENESS OF STORM DRAIN STENCILING**

By raising public awareness of nonpoint source pollution, storm drain stenciling programs should discourage practices that generate nonpoint source pollutants. As with any public education project, however, it is difficult to precisely measure the effect storm drain stenciling programs have on human behavior. Nor is it easy to measure reductions in certain components of nonpoint source pollution, which by definition is diffuse in origin.

Some cities attempt to assess the effectiveness of storm drain stenciling programs by periodically examining water samples from targeted storm drain *outfalls* (places where storm drains empty into a body of water). If the storm drains leading to a particular outfall have been labeled, and if the level of pollutants from that outfall declines over time, one can assume the labeling has had some deterrent effect.

The city of Fort Worth plans to track pollutant levels at 600 storm drain outfalls over the next five years to determine whether storm drain labeling and other pollution prevention efforts have improved water quality in local creeks. The city of Plano is now collecting baseline water quality data from targeted outfalls and will take periodic samples to measure program results in the future.

Monitoring outfalls is time-consuming, and periodic testing for component NPS pollutants can be expensive. Some cities infer success from increases in the volume of used

motor oil delivered to used-oil recycling centers. Others measure success in terms of how many drains are stenciled and the number of requests received by volunteer groups to participate in the program. They can also take into consideration the number of cleanups conducted by the city as a result of reports made by volunteers.

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### TEXASWATCH

*The TNRCC's Texas Watch program educates individuals about the causes and effects of pollution by training citizen groups to monitor water quality. Currently, there are more than 300 volunteer monitoring groups in Texas. Each volunteer undergoes training in sampling techniques approved for the Texas Watch program by EPA.*

*In addition to training citizens in water quality monitoring, Texas Watch seeks to improve communications and resolve conflicts by coordinating partnerships among citizens, businesses, industry, and local and regional authorities.*

*Texas Watch is an ideal project for science clubs, Boy Scouts, service organizations and citizens interested in preserving water quality in their communities. Since volunteer monitoring efforts are targeted to locations not monitored by the TNRCC field staff, data collected by Texas Watch volunteers is extremely useful to the TNRCC. It helps fill in gaps in the agency's knowledge of local water quality and thereby assists the agency in making environmental decisions.*

---

Citizen groups can be trained to monitor water quality in local waterways through the TNRCC's *Texas Watch* program.

## PROFILES OF FIVE TEXAS PROGRAMS

### CORPUS CHRISTI

*Message: Do Not Dump. Drains to Bay.*

*Graphic: Windsurfer, fish*

*Method: Aluminum stencil; message spray painted in green paint against a white background*

*Program Start Date: October 1993*

Corpus Christi has stenciled about 800 storm drains out of a total of 13,000. The city relies entirely on volunteers to do the stenciling. It coordinates 10 to 12 volunteer stenciling projects each year, working with organizations such as the Girl Scouts and Boy Scouts, the AT&T Telephone Pioneers, the Southwestern Bell Telephone Pioneers and local environmental science clubs.

The city uses metal stencils and spray paint to print the message "Do Not Dump. Drains to Bay" in green letters against a white background. Graphics include a fish and a windsurfer. The stencils cost approximately \$100 each and are paid for through the water department's operating funds. The city has six stenciling kits available for volunteers and provides door hangers for distribution to residents of the neighborhood where stenciling takes place.

Before each event, the city's project coordinator provides volunteer training, which includes an orientation to the program, directions on how to use the stencils and instruction on safety procedures. After the event, each volunteer is given a T-shirt, designed especially for the storm drain stenciling program, and the volunteer group receives a framed certificate of appreciation.

In addition to the stenciling kits, the city provides volunteer groups with safety vests, traffic cones and a traffic flag.

## **HOUSTON**

*Message: You Dump It, You Drink It. No Waste Here.*

*Dump No Waste. Drains to Bay.*

*Graphic: Shrimp (on "Dump No Waste" message)*

*Method: Message rolled in ink across Mylar stencil*

*Program Start Date: Spring 1995*

About 300 storm drains have been labeled in Houston by groups like the Serve Houston Youth Corps, Boy Scouts and Girl Scouts and grade school students.

The city uses a Mylar stencil and ink to roll onto inlets its anti-dumping messages. The "You Dump It, You Drink It" message was also part of an extensive citywide public education campaign to encourage motor oil recycling that had included outdoor billboards and paid radio PSAs.

Ten stenciling kits are available along with safety vests and traffic cones for each event. The Mylar stencils were donated by the Gulf Coast Waste Disposal Authority through the Houston-Galveston Area Council of Governments. HGAC was instrumental in developing the Houston stenciling program and others in the area.

The city distributes an English/Spanish brochure to promote its storm drain stenciling program. It also publicizes the effort through newspapers, magazines and community meetings. Each participant receives a thank-you letter and a certificate of appreciation from the mayor.

## **FORT WORTH**

*Message: Don't Dump! Drains to Creek.*

*Graphic: Large mouth bass*

*Method: Aluminum plaque glued onto inlet*

*Program Start Date: July 1993*

Fort Worth recently switched to reflective aluminum plaques (the material used for highway signs), which are neater, more durable and easier to apply. So far, about 500 storm drains have been labeled.

The 4" x 8" plaque shows the silhouette of a large mouth bass in white against a bright blue background. Superimposed on the image of the fish in blue letters is the slogan "Don't Dump! Drains to Creek." The plaque is placed on top of the storm drain inlet and attached with adhesive glue.

For the most part, Fort Worth has used its own public works staff to mark storm drains. The city sponsored one neighborhood association project in 1995 and plans to use more volunteers in the future.

Fort Worth has developed a sophisticated method for evaluating its program. The city plans to track pollutant levels at 600 storm drain outfalls over the next five years to determine whether storm drain labeling and other pollution prevention efforts have improved water quality in local creeks.

## **PLANO**

*Message: No Dumping. Drains to Water Source.*

*Method: 6" x 6" ceramic tile glued to inlet*

*Program Start Date: Summer 1995*

Plano attaches to the top of its storm drain inlets a bright blue 6" x 6" ceramic tile bearing the message "No Dumping. Drains to Water Source." Plano had these tiles specially designed and manufactured for its storm drain program. The city wanted a marker that would be easy to apply and maintain, durable and aesthetically pleasing. Tiles are paid for through the city's municipal drainage fee program.

Plano has used its own public works crews to label more than 1,200 inlets. No volunteers have been used to date, but the city plans to work with Eagle Scouts and other service groups beginning in the spring of 1996.

The city works closely with Keep Plano Beautiful to educate the public on storm water management practices, composting, and proper disposal of household hazardous waste and motor oil. Plano public schools focused on storm water education for Earth Week 1996, and the city addresses storm water management through newsletters, presentations and exhibits.

The city of Plano now collects baseline water quality data from targeted storm water outfalls and will take periodic samples to measure program results in the future.

## **NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS**

*Message: Don't Dump. Protect Our Water.*

*Graphic: Fish, oil can*

*Method: Spray-painted message using Mylar stencil*

*Program Start Date: May 1993*

The North Central Texas Council of Governments (NCTCOG) has been a major catalyst for community storm drain stenciling programs in the north central Texas region since 1993. The stenciling projects were part of the region's water-quality and pollution-prevention objectives for the Trinity River Basin.

NCTCOG developed two stencils for the regional program. One says "Don't Dump. Protect Our Water" and the other is a stand-alone graphic depicting spilled oil trailing a fish under water. An estimated 7,500 storm drains in 22 communities throughout

the region have been labeled with one of these logos. NCTCOG also developed sample press releases, fact sheets and tracking cards for use by participating communities.

One innovative feature of the NCTCOG program is its use of a state used oil grant to give community groups incentives to stencil storm drains. Under the program, volunteer groups could earn \$140 for stenciling a minimum of 15 storm drains. The program proved very popular with youth groups and other organizations as a means to raise funds.



# **APPENDICES**

**-A-**

**STORM DRAIN STENCILING PROJECT**

**LIABILITY  
WAIVERS FOR  
VOLUNTEERS**

I am authorized to act on behalf of \_\_\_\_\_  
(called the "Sponsor"). I have carefully read and understand the guidelines for the  
Storm Drain Stenciling Project, (called the "Project"). In order to participate in  
the Project the Sponsor assumes the following responsibilities:

1. Participants in the Project are solely under the supervision of the Sponsor.
2. Waivers of Liability will be signed for each participant prior to commencement of the Project.
3. Sponsor will train each participant in pedestrian and other relevant safety rules. All participants will be evaluated by Sponsor to determine if they are responsible individuals who will be able to abide by the rules of the road and use due caution while participating in the project.
4. Sponsor will use stencil kits and instructions as provided by the City of Houston only for the purposes intended.
5. Sponsor will consult with the City of Houston in the selection of Project sites.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Organization

\_\_\_\_\_  
Office or capacity of person signing

**LIABILITY WAVER**

I, the undersigned, being of lawful age or the parent or legal guardian of the volunteer involved in the Storm Drain Stenciling Project (Project), in consideration of being allowed to participate in the Project, I hereby release, discharge and forever acquit the City of Houston, a municipal corporation, and its officers, agents, and employees from any and all actions, causes of action, claims or any other liabilities whatsoever, known or unknown, or may arise in the future, on account of or in any way related to or arising out of my participation in the Project.

Further, I assume liability for any non-participants who accompany me.

PARTICIPANT'S NAME: (Please print)

\_\_\_\_\_

AGE: \_\_\_\_\_

SIGNATURE OF PARTICIPANT OR LEGAL GUARDIAN:

\_\_\_\_\_

DATE: \_\_\_\_\_

# APPENDIX -B-

## SAMPLE MATERIALS LIST

## BORROWING STENCILS

## ORDERING STENCILS

## MATERIALS

Many cities and organizations make it easy for individuals to stencil neighborhood inlets by providing kits which include all the materials needed. Before incurring the expense of assembling these materials, contact your Public Works Department to see if they sponsor a storm drain stenciling program and can provide these kits. If not, contact the Center for Marine Conservation (CMC) to find out if there is a state agency, municipality or organization in your area that is participating in their "Million Point of Blight" program which can loan you at least the stencils.

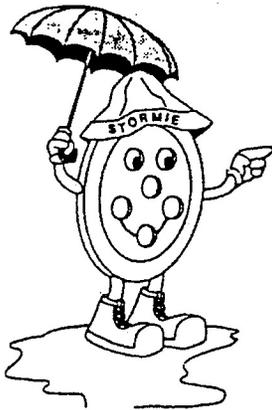
- ✓ Stencil(s) (see enclosed ordering or borrowing information)
- ✓ Paint that meets your state's standards. Make sure the paint meets any standards (color, type) set by the agency that gave you permission to stencil. In some areas, oil-based traffic or highway paints can be purchased at local paint stores. Some areas require a flat water-based latex. CMC recommends either white or green depending on the surface being painted. Read the label/instructions and ask if you can return any unused cans of paint before purchasing.
- ✓ Paint brushes (3") and stirrers (unless you are using spray paint)
- ✓ "WET PAINT" signs
- ✓ Masking tape
- ✓ Drop cloths
- ✓ Trash bags (2) - one for dirt and debris cleaned from the storm drain area and one for soiled stenciling supplies
- ✓ Wire brush
- ✓ Whisk broom and dust pan
- ✓ Paper towels or old rags
- ✓ Traffic safety vests and flags
- ✓ Orange traffic cones, if available
- ✓ Pencil/paper/clipboard/CMC's standardized data card for recording observations and activities
- ✓ For cleanup:
  - Newspaper and rags
  - Coffee cans and lids
  - Mineral spirits or paint thinner (small amount)

### IMPORTANT:

Remember to bring written approval from the agency that gave you permission to stencil.

# BORROWING STENCILS

Center for Marine Conservation



**Susan Macleod/Laurie Halperin**  
**Center for Marine Conservation**  
**306-A Buckroe Avenue**  
**Hampton, VA 23664**  
**(804) 851-6734**  
**(804) 851-4183 FAX**

The Center for Marine Conservation has a list of 89 groups (states, municipalities, and organizations) in 32 states and Canada which are participating in their *Million Points of Blight* Network. Please contact CMC about your stenciling project to find out if any groups in your area have stencils or other materials for loan. If not, mylar stencils (DON'T DUMP - DRAINS TO WATERWAY) can be borrowed from CMC via the STORM DRAIN STENCIL ORDER FORM below.

-----CUT HERE-----

## STORM DRAIN STENCIL ORDER FORM

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name of Group

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
Number of Participants Expected

\_\_\_\_\_  
City/Town, State, Zip Code

\_\_\_\_\_  
City/Town, State of Stenciling

\_\_\_\_\_  
Phone Number - work or home?

\_\_\_\_\_  
Date of Stenciling



Center for Marine Conservation

\_\_\_\_\_  
Date Received

\_\_\_\_\_  
Stencil Number

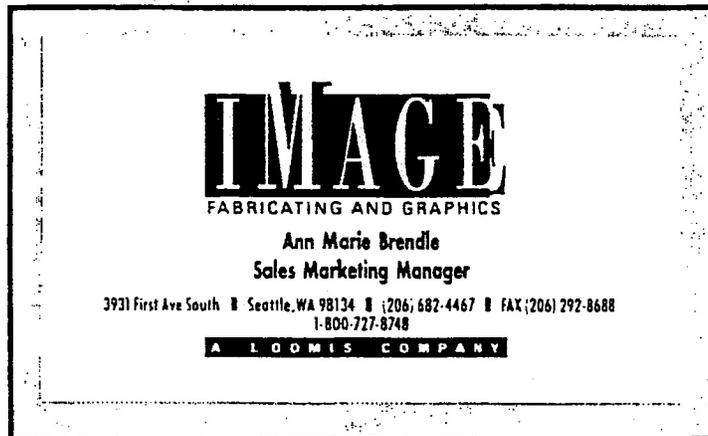
\_\_\_\_\_  
Date Shipped

\_\_\_\_\_  
Comments

For Office Use Only

**APPENDIX B  
(CONT.)**

**ORDERING  
STENCILS SAMPLE**



**Storm Drain Stencils**

**Available From:** Image Fabricating and Graphics

**Material:** 10 Mil Mylar

**Size:** 15" x 26"

**Versions:** DUMP NO WASTE - DRAINS TO LAKE  
DUMP NO WASTE - DRAINS TO RIVER  
DUMP NO WASTE - DRAINS TO STREAM  
DUMP NO WASTE - DRAINS TO BAY  
DUMP NO WASTE - DRAINS TO GROUND WATER

• available with Small Mouth Bass or Salmon •

**Pricing:**

25 @ \$10.25 each	750 @ \$3.95 each
50 @ \$9.57 each	1000 @ \$3.60 each
100 @ \$7.95 each	2500 @ \$2.95 each
250 @ \$5.75 each	5000 @ \$2.50 each
500 @ \$4.50 each	

• Minimum order of 25 quantity must be placed •

*NOTE: CLEAN TEXAS 2000 does not endorse any particular stencil vendor. This page is included as an example of an order form. Please contact CLEAN TEXAS 2000 at 512/239-3156 for information about other stencil vendors and ordering information.*

**HOW TO STENCIL STORM DRAIN INLETS  
STENCILING INSTRUCTIONS**

1. Use a wire brush to remove any dirt or scum by scrubbing briskly.
2. With a whisk broom sweep surface free of dirt.
3. Lay the stencil above the face of the storm sewer, bending the stencil over the beam of the storm sewer. By doing this the first line of the stencil will be on the TOP of the storm sewer and the second line will be on the BEAM. If the stencil does not fit this configuration due to a small beam, use either side of the storm drain. Experiment with how the stencil will best fit and look. Do not stencil the bottom of the storm drain.
4. One or two people should hold the stencil securely in place or tape the stencil in place with heavy tape. Be careful not to move the stencil once in place.
5. If using spray paint or ink – shake can for one minute, hold spray can inverted about five inches from stencil. In a series of wide sweeping motions, spray one line at a time using a side to side motion until letters are uniformly covered. Do not spray too much – paint or ink will run under stencil making the words unreadable.

If using a brush – stir contents well, brush over stencil being careful not to use too much paint or ink as it will run under stencil making the words unreadable.

If using a roller – test that it is well inked by rolling on the pad and then testing on a newspaper. Do not put too much ink on the pad. A roller with too much ink will run making the words unreadable. It is best to roll over the stencil in a back and forth motion a number of times using a constant pressure until the words are legible.

6. When finished carefully lift the stencil.
7. If stenciled message turns out unreadable, do not try to clean it off again. The mess will only get bigger. Go to another storm sewer and learn from your mistakes. It's O.K.
8. Thank You.

**APPENDIX**

**-D-**

**SAMPLE  
SAFETY  
PROCEDURES  
FOR  
VOLUNTEERS**

**SAFETY PROCEDURES AND TIPS  
FOR STORM DRAIN STENCILING TEAM LEADERS**

- Prior to stenciling ALL waivers must be signed and returned.
- Stenciling is a group activity, requiring a minimum of two people.
- There should NEVER be any stenciling done alone.
- Remember to wear clothing you do not mind getting permanent ink or paint on.
- All participants must wear safety vests.
- Bring paper towels or a rag to wipe up.
- Two plastic bags have been included in the stencil kits. One is for the used stencil, and is not garbage. The other is for the paper towels, gloves and any garbage picked up along the way.
- One person must be on the look out for on-coming traffic at all times.
- Traffic cones are used to alert vehicular traffic.
- All storm drains stenciled should be recorded on the Tracking Sheet and returned to the captain upon completion.
- Any storm drain with oil, paint or any other hazardous substance should be noted and reported to the captain.
- If there is a vehicle or other private property too close to the storm drain and stenciling would risk getting ink or paint on it -- do not stencil that storm drain.
- Orally review these safety procedures with your volunteer groups.

## STORM DRAIN DATA CARD

Please fill out one card for all of the drains that you stencil using this kit.

City of Stenciling Project \_\_\_\_\_

Name of Organization \_\_\_\_\_

Contact Person \_\_\_\_\_

Street Address \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Number of Storm Drains Stenciled \_\_\_\_\_

Number of Participants \_\_\_\_\_ Date(s) of Stenciling \_\_\_\_\_

Please return completed data cards to your city contact person.

### Non-Point Source Pollutants

Please keep track of the items found within six feet of each side of the storm drains you stencil by making tick marks in the areas below:

Grass Clippings \_\_\_\_\_

Leaves \_\_\_\_\_

Motor Oil \_\_\_\_\_

Paint \_\_\_\_\_

Pet Wastes \_\_\_\_\_

#### Street Litter/Plastics, including:

Beverage Bottles \_\_\_\_\_

Beverage Cans \_\_\_\_\_

Caps/Lids \_\_\_\_\_

Cigarette Butts \_\_\_\_\_

Clothing/Scraps \_\_\_\_\_

Fast Food Containers \_\_\_\_\_

Foam Plastic Pieces \_\_\_\_\_

Newspaper/Magazines \_\_\_\_\_

Paper Bags \_\_\_\_\_

Plastic Bags/Wrappers \_\_\_\_\_

Plastic or Foam Cups \_\_\_\_\_

Plastic Pieces \_\_\_\_\_

#### Street Litter/Plastics, cont:

Six-Pack Holders \_\_\_\_\_

Straws \_\_\_\_\_

Other \_\_\_\_\_

### Potential Non-Point Sources

Mark the number of storm drains that you stencil near each of the following:

Residential Area \_\_\_\_\_

Shopping Center/Parking Lot \_\_\_\_\_

Golf Course \_\_\_\_\_

Business District \_\_\_\_\_

Service Station \_\_\_\_\_

Farmland \_\_\_\_\_

Other \_\_\_\_\_

# APPENDIX -E-

**SAMPLE DATA  
COLLECTION  
FORMS**

**STORM DRAIN  
DATA CARD**

**STENCIL  
TRACKING  
RECORD**

**APPENDIX E**  
**(CONT.)**

**STENCIL TRACKING RECORD**

**Location**

Street stenciled \_\_\_\_\_

Between streets \_\_\_\_\_ & \_\_\_\_\_

Number stenciled \_\_\_\_\_

Street stenciled \_\_\_\_\_

Between streets \_\_\_\_\_ & \_\_\_\_\_

Number stenciled \_\_\_\_\_

Street stenciled \_\_\_\_\_

Between streets \_\_\_\_\_ & \_\_\_\_\_

Number stenciled \_\_\_\_\_

Street stenciled \_\_\_\_\_

Between streets \_\_\_\_\_ & \_\_\_\_\_

Number stenciled \_\_\_\_\_

Street stenciled \_\_\_\_\_

Between streets \_\_\_\_\_ & \_\_\_\_\_

Number stenciled \_\_\_\_\_

Street stenciled \_\_\_\_\_

Between streets \_\_\_\_\_ & \_\_\_\_\_

Number stenciled \_\_\_\_\_

Total Number Stenciled \_\_\_\_\_

**APPENDIX  
-F-**

**SAMPLE  
RECOGNITION  
CERTIFICATE**

**THANK YOU!**

*(recipient's name here)*

*has made an important contribution  
to the protection of (waterway here), by painting  
the openings of (community here) storm drains.*

**NO DUMPING**



**FLOWS TO BAY**

\_\_\_\_\_  
(Recognizing Agency Name Here)

\_\_\_\_\_  
Date

YOUR CITY SEAL  
GOES HERE

*Based on city of  
Palo Alto, California,  
certificate.*

**APPENDIX**

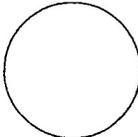
**-G-**

**SAMPLE  
PUBLIC  
EDUCATION  
MATERIALS**

**DOOR  
HANGER**

**CORPUS  
CHRISTI  
FLIER**

**GRAND  
PRAIRIE  
FLIER**



**Neighborhood Partners  
for  
clean water**

---

The storm water drain inlets in your neighborhood have been stenciled with the message, "DO NOT DUMP - FLOWS TO BAY". Volunteer organizations, interested in community projects, are helping to make a difference to protect our local environment. The message is important for several reasons. Storm water drain lines are located throughout the city. They serve to carry rain water off urban streets, parking lots, construction sites, neighborhoods and agricultural lands where it is then channeled into our city's storm dains and ditches. Its final destination is our creeks, bays, lakes and oceans. Often times, such things as trash, grass clippings, hazardous waste and oil are carelessly dumped into the storm water lines. This causes not only pollution to our coastal waters, but results in the clogging of storm water lines that lead to street flooding.

To prevent storm water pollution from occuring in your neighborhood, follow these tips.



- \* Take hazardous waste products, such as batteries, tires, petroleum oil, grease and like items to the City of Corpus Christi Household Hazardous Waste Facility. For more information, call 857-6284.
- \* Recycle products whenever possible.
- \* Prevent grass clippings from floating into storm drains by starting a compost pile. Grass clippings can be used for mulch around flowers beds.
- \* Collect trash in your yard and neighborhood that may float into storm water drain inlets.
- \* Report illicit dumpings immediately to the Storm Water Hotline number.

For more information on storm water pollution or on how your organization can participate in the City's Storm Water Stenciling Program, contact the City of Corpus Christi Water Utilities.



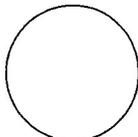
**Storm Water Hotline  
880-3800**



*(back)*

City of Corpus Christi

**DOOR HANGER**



**Do Not  
DUMP  
Flows To  
BAY**



A community project  
to create awareness on  
storm water pollution.

---

-  TRASH
-  MOTOR OIL
-  GRASS CLIPPI
-  GREASE
-  PESTICIDES
-  ANTIFREEZE



*(front)*

# CORPUS CHRISTI FLIER

## Storm Water Stenciling Program . . . a solution to the pollution.

The City of Corpus Christi Storm Water Stenciling Program was developed in 1992 and funded by the City of Corpus Christi Water Division, the Texas Department of Transportation and the Port Authority of Corpus Christi. Through the assistance of volunteers, such as yourself, we are able to stencil a simple message on storm water drain inlets to prevent illegal discharges of pollutants into the City's storm water sewer system. The message, "DO NOT DUMP, FLOWS TO BAY" is important for several reasons.

### Things you should know about Storm Water

Storm water drain lines are located throughout the city. Storm water drain inlets are openings in the street curbs that allow rainwater runoff to enter. They serve to carry rain water off urban streets, parking lots, construction sites, neighborhoods and agricultural lands, where it is then channeled into our city's storm drains and into our ditches. However, nonpoint source pollution (NPS) is washed by rainfall off the land and into our creeks, bays, lakes and oceans.

#### Examples of NPS Pollution

Oil and grease	from	roads, highways, used motor oil dumped into yards.
Dirt and sand	from	lawns, streets, new construction, and farms
Phosphorous	from	fertilizers, phosphate detergents
Nitrogen	from	fertilizers, decaying plants, and leaking sewage
Coliform bacteria	from	feces of wildlife, domestic animals and humans
Other contaminants and litter	from	paint, other chemicals poured into gutters or tossed on yards

### Preparing for your Stenciling Program

The City of Corpus Christi Storm Water Stenciling Program is made possible through the help of volunteer organizations. A presentation will be made by a representative of the City of Corpus Christi Water Division to help you understand your duties. Your team leader or group organizer will be your primary contact person, in case a change of events is made. Your team leader and the City representative have agreed to stencil a specific neighborhood, perhaps your very own.

### Helpful tips

If you've never participated in the Storm Water Stenciling Program, we recommend that you follow these tips on the field day.

- Arrive at the designated meeting place by 8:00 a.m.
- Wear old clothes and comfortable shoes. You may get a bit of paint on them.
- Wear a hat and sun screen.
- Tie a string to a recyclable cup and wear it on a belt loop. Water Division drivers will deliver water to you.
- Let your team leader know if you have a wagon (i.e. Radio Flyer). They are useful for carrying all the supplies.
- Ask your parent(s) or friend(s) to participate in the program with you. The more help we have, the faster we finish our designated stenciling area.

### What will you be doing?

There are plenty of assignments for all volunteers. Your team leader will rotate assignments. One of the primary assignments includes painting a message on the City's storm water drain inlets. Volunteers will be separated into a white team and a green team. The white team

will paint a white stripe on the drain inlet, using a template. After the white paint has dried, the green team will stencil the message, "Do Not Dump, Flows to Bay", using a template. We will designate additional white and green teams depending on the number of volunteers attending.

### Doing the job right.

There are over 13,000 storm water drain inlets in the city. City crews cannot inspect all of them in one year. Often times, such things as trash, grass clippings, plastic bags, and hazardous waste are dumped carelessly into storm water drains. This causes not only pollution to our coastal water, but result in the clogging of storm water lines that lead to street flooding.

You can help be part of the solution to the pollution. Your team can inspect the inlet for trash. This can be done by looking at the storm water drain inlet while standing in front of it. Please report storm water drain inlets that are over polluted with trash and debris. City crew workers will follow-up on your report.

### Prevention is the best medicine.

You will find that the Storm Water Stenciling Program stirs the interest of residents who see you painting on their street curb. For this reason, we ask volunteers to hang a notice on the door to advise residents of the prevention of pollution in their neighborhood. You will not be required to knock on any door or speak to anyone about the program, simply leave the brochure on the door.

### Because you cared enough to help.

We think that you will find the time rewarding and enjoyable. You will have dedicated one Saturday morning to help improve the quality of our waters. In return, we have a special gift for you.



**Of all Americans who change their own oil, only 10% of them dispose of their waste oil in the proper manner. Recycle used oil.**

Last year in the United States alone, roughly 180,000,000 gallons of used motor oil were dumped on the ground or into sewers. That's almost 16 times the amount spilled by the Exxon Valdez. And according to the EPA, one gallon of used oil can ruin 1,000,000 gallons of fresh water!

Oil is insoluble, persistent and it can be very dangerous. Used motor oil often contains toxic chemicals and heavy metals - frequently lead, which has been linked to mental disorders and other serious health problems.

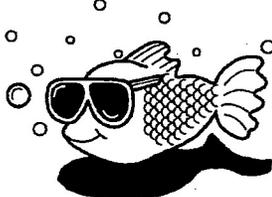
We cannot afford to have our drinking water contaminated. Everyone of us has to share the responsibility for transforming used oil from a national liability into a major asset.

**Don't forget:**

You can make a difference! If you change your own oil, don't dump it. Recycle it!



**You can make a difference!  
If you change your own oil, don't dump it. Recycle it!**



For more information please contact:



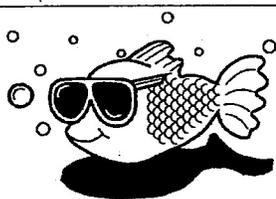
City of Grand Prairie  
Recycling Coordinator  
214-660-8061

Updated 12/1998, Rev. 5/2001

**Look for this message**

**Protect Our Water. Don't Dump! Recycle Used Oil.**

**being stenciled on your neighborhood storm drains.**



**Why not dump oil?**

Because first of all it's against the law! Texas law prohibits dumping used oil for many good reasons. Used oil is also banned from disposal at area landfills. Did you know:

- ┆ The amount of oil in an oil change can ruin a day's water supply for a small city.
- ┆ One oil change from one car engine poured into a storm drain can create an eight-acre oil slick, harming aquatic life and stunting or killing aquatic plants.
- ┆ Oil stays in the environment a long time. It may take decades to biodegrade.
- ┆ Many small oil spills can be as harmful in the long run as one big spill.
- ┆ Used motor oil contains toxic substances such as lead and additives. Through improper disposal, both oil and additives can enter the food chain at any point and be carried into our food.
- ┆ Oil can be reprocessed and reused at a big energy savings.

**Remember:**

Recycling conserves our resources and protects our environment.

**How is used oil recycled?**

**Reprocessing.** Most used oil in Texas is reprocessed into industrial grade fuel oil. Prior to blending with virgin oil, it is treated to remove oil and sediments.

**Re-refining.** Through re-refining, used oil can be used over and over without losing its lubricating quality. Whereas producing 2 1/2 quarts of lubricating oil requires 42 gallons of crude oil, only one gallon of used oil is required! Plus, the waste by-products and remaining oil from the refining process can be used as an asphalt extender and fuel oil.

**Recycling Centers are conveniently located throughout Grand Prairie. Check this list for the center nearest you.**

<b>Chief Auto Parts</b> 2505 S.E. 8th 642-1261	<b>Nineteenth Street Mobil</b> 1402 N.W. 19th Street 641-2861
<b>David's Exxon</b> 701 W. Tarrant Road 262-5303	<b>N. Carrier Parkway Texaco</b> 602 N. Carrier Parkway 237-0083
<b>Gateway Auto Parts</b> 405 W. Highway 303 642-6666	<b>Parkway Exxon</b> 2502 S. Carrier Parkway 641-8000
<b>Harrington's Texaco</b> 1702 W. Main Street 262-8066	<b>PEP Boys</b> 424 E. Highway 303 262-0003
<b>HRB Automotive</b> 1009 Hill Street 237-0084	<b>Warren's Texaco</b> 1715 Dalworth 262-4840
<b>Lynn's Exxon</b> 802 E. Highway 303 254-8822	<b>Western Auto</b> 2059 N. Carrier Parkway 642-0084

**Recycling is as easy as 1, 2, 3!  
Here's how it's done.**



Drain your oil into a reusable, sealable (screw top) container, such as a milk jug, a water jug or a specialized oil drainer.



Take it to a recycling center. The center has agreed to help out by accepting used oil from do-it-yourselfers. There the oil is picked up for recycling. (If you don't find a collection center near you, ask your full service station if they will take your oil.)



When buying motor oil, ask your dealer for re-refined motor oil. Buying recycled products is an important part of recycling.

**Important:**

Don't mix other wastes with used oil. Such mixtures can create a hazardous substance and make recycling more difficult.

(city or organization letterhead)

FOR IMMEDIATE RELEASE  
(Date)

**APPENDIX**  
**- H -**

**SAMPLE NEWS  
RELEASE**

### STORM DRAIN STENCILING PROJECT AIMS TO REDUCE WATER POLLUTION

This (Saturday) (INSERT DAY OR DATE), you might see a group of people painting a \_\_\_\_\_ (INSERT APPROPRIATE DESCRIPTION, i.e., "green and white") sign on the storm drain inlets in your neighborhood. These volunteers are participating in a project to alert residents that dumping in storm drains pollutes lakes, rivers, bays and streams. The city of \_\_\_\_\_ (OR, \_\_\_\_\_ ORGANIZATION) is sponsoring this project as part of its effort to reduce nonpoint source pollution.

Much of the pollution in areas streams and lakes comes from common, every-day materials, like household chemicals, fertilizers, pesticides, gasoline, used motor oil and antifreeze and litter. These substances are washed by rainwater from our streets, yards, driveways and parking lots into storm drain inlets. Contrary to what many people think, these storm drains don't lead to wastewater treatment plants. They carry untreated storm water directly into area lakes and streams.

Deliberate dumping of hazardous materials into storm sewers makes the pollution problem worse. Motor oil is often dumped down storm drains, yet just one quart can ruin the quality of 250,000 gallons of water. Dumping oil and other hazardous substances is illegal in Texas. Residents are encouraged to recycle these materials instead.

The stenciled message \_\_\_\_\_ (SAY WHAT THE MESSAGE IS) is there to remind citizens not to dump waste into storm sewers or contribute more pollutants to ordinary storm water runoff by littering, overfertilizing or sweeping yard debris into the street.

\_\_\_\_\_ (CITY OFFICIAL OR SPOKESPERSON FOR COMMUNITY ORGANIZATION) pointed out that storm drain stenciling has been used successfully in others cities to reduce nonpoint source pollution.

"Every citizen has a role in preventing pollution," he (she) said. "These kinds of projects work because they get government, volunteer groups and businesses working together to solve a common problem."

The \_\_\_\_\_ (VOLUNTEER GROUP) will be stenciling storm drains in the following neighborhoods on \_\_\_\_\_ (DATE): \_\_\_\_\_ (LIST NEIGHBORHOODS)

Several businesses and government agencies are cosponsoring this event. They include (LIST SPONSORS, DONORS, ETC.)

For more information, call \_\_\_\_\_.

# APPENDIX

## - I -

### SAMPLE PUBLIC SERVICE ANNOUNCE- MENTS

#### STORM DRAINS AND WATER POLLUTION

:30 Radio PSA

ANNCR: Contrary to popular belief, the storm drains on our neighborhood streets do not lead to a water treatment plant. They lead to nearby creeks, which flow into the \_\_\_\_\_ River. (Substitute \_\_\_\_\_ Lake or \_\_\_\_\_ Bay.) If hazardous materials like motor oil and antifreeze get dumped into a storm drain, they end up in the (river). And that's bad for all of us. So don't dump waste down your neighborhood storm drains. Help keep our waterways clean. For more information, call \_\_\_\_\_.

Announcement courtesy of \_\_\_\_\_ and this station.

#### STORM DRAINS AND WATER POLLUTION

:60 Radio PSA

ANNCR: Contrary to popular belief, the storm drains on our neighborhood streets do not lead to a water treatment plant. They lead to nearby creeks, which flow into the \_\_\_\_\_ River. (Substitute \_\_\_\_\_ Lake or \_\_\_\_\_ Bay.) So when hazardous materials like motor oil and antifreeze get dumped into a storm drain, or when street trash and garden chemicals wash into the sewer after a rain, they end up in the (river). And that's bad for all of us. You can help keep our waterways clean. Don't litter and don't use fertilizers and pesticides before a rain. And never dump any kind of waste down your neighborhood storm drains.

The \_\_\_\_\_ is looking for volunteers to label storm drains with the message "\_\_\_\_\_." If you can help, call \_\_\_\_\_.

This message brought to you by CLEAN TEXAS 2000 and \_\_\_\_\_.

# Volunteers initiate anti-littering program with stencil message

By **JEFF BRAY**  
ThisWeek Correspondent

Volunteers met just before the downpour Saturday, Oct. 15 to begin stenciling an anti-littering message, "You Dump it, You Drink It - No Waste Here," on Washington Avenue storm drains.

"We just got one done when it started pouring," said Lilly Wells, a staff member with the Texas-Houston-Galveston Council of Governments. "This is an ongoing project, though, so we'll be continuing it."

Wells said the project is sponsored by a collaboration among the city of Houston and Department of Health and Human Services and Department of Public Works and Engineering, the Houston-Galveston Area Council, the Gulf Coast Waste Disposal Authority, and the Texas Natural Resource Conservation Commission.

"Different programs, such as the Texas Clean Rivers Program have public participation requirements to be eligible for funding," said Wells. "The purpose is to involve the public so that they can become more educated about water quality, pollution

problems, and how public behavior affects water quality."

Wells said that the different departments and organizations that came together for the storm sewer project "dovetailed" in their goals.

"Many people don't realize that when you throw something down that storm drain, it doesn't go to a treatment plant like regular sewerage," she pointed out.

## 'You Dump It - You Drink It.'

Campaign message

"It goes directly into the water system, the bayous, and eventually into the (Galveston) Bay and the Gulf (of Mexico)." Wells said that the Oct. 15 gathering featured more than 25 children ready to paint their message on more than 100 storm drains. It was a not so amusing coincidence that the terrible floods came along and

See **DRAINS** on Page 4.



Mark Sterkel photo

Mary Ellen Whitworth, left, environmental advisor for environmental policy to Mayor Bob Lanier, makes the first stencil in the anti-littering campaign. She is assisted by Carlo Monticelli and Demetra Dixon, members of the Serve Houston Youth Corps. Other Serve Houston members hold the banner.

## Drains

Continued from Page 1.

stopped their efforts.

"Another stencil part says, 'Dump No Waste, Drains To Bay,'" Wells said. "You might just end up eating it from fish in the Bay or the Gulf, but it's not meant to be literal. It's really just a way to get people to think about what they're putting down there."

Wells said people dump everything from toxic chemicals such as motor oil, to leaves and lawn clippings.

"The lawn clippings help block the sewers and the bayous," she said. "The blockage helps create worse flooding, not that anything could have prevented the floods we've had recently. I just think people are unaware."

For example, Wells said one quart of motor oil creates an oil sheen on the water the length of a football field.

"There are approximately 2.9 million gallons of oil annually dumped from Houston into the Gulf," she said. "People aren't being malicious, although it is illegal. But it's no wonder the shell fish are tainted."

Wells said the project will continue on Washington Avenue from Wilcrest to Houston Ave. All volunteers are supplied with colorful vests, protective gloves, stencils and paint. They also receive training from a city of Houston employee in how to stencil, and are give protection from cones and barriers in the street.

Those interested in participating in the storm drain stenciling project can call the city of Houston Household Hazardous Waste Department, 247-8589.

# Youth group helps clean up Houston

Houston Post--October 15, 1994

By SCOTT HARPER  
POST ENVIRONMENTAL REPORTER

An estimated 2.9 million gallons of used oil are dumped illegally into Houston streams and bayous every year, according to state statistics.

But beginning today, officials will launch a small but indelible program to help curb such pollution.

Armed with paint cans and stencils, volunteers with Serve Houston Youth Corps will begin printing no-dumping messages on many of the 45,000 storm drains in Houston that are the primary

conduits for used oil and other contaminants getting into area waterways.

**"YOU DUMP IT, YOU DRINK IT — No Waste Here"** is one not-so-subtle message that officials hope will deter would-be polluters from discharging their motor oil, yard clippings, trash and debris into storm drains.

The stenciling has been a hit in other U.S. cities and towns, not only because of its simplicity and effectiveness but also because it's cheap.

City officials estimate that a \$2,500 investment from state, local and private sources should be

enough to paint 30,000 storm drains in Houston.

The first drain on the list, which volunteers will coat this morning after a ceremony and news conference, is at 3811 Washington Avenue at Waugh Drive.

The program is a collaborative effort between the city Department of Health and Human Services, the Department of Public Works and Engineering, the Texas Natural Resources Conservation Commission, the Houston-Galveston Area Council and the Gulf Coast Waste Disposal Authority.

2 The Daily Tribune Friday, June 25, 1993

# Volunteers to man drain project

**Bud Chambers**  
The Daily Tribune

If you see a group of people huddled around a downtown storm drain Saturday morning, it isn't likely that they have spotted a big alligator or "a swamp thing."

More likely, you'll be witnessing part of a major effort by local 4-H Club volunteers to a cooperative pollution prevention project between the City of Bay City and the Houston-Galveston Area Council.

The mission, according to Matagorda County Water Resources Council Chairman Haskell Simon, is the stenciling of an important anti-pollution on 65 curbside storm drains in and around the downtown area.

While it is recognized that there

are many other storm drains and many open stream areas that are vulnerable to this damaging oil and chemical pollution, Simon says, "These 65 storm drains are most important as a symbol and the start of a vital educational process."

For instance, Simon noted that a single vehicle's waste oil dumped into a storm drain can pollute "more than a million gallons of water in our bay system."

Meanwhile, Matagorda County Marine Extension Agent Willie Younger had words of praise for these 4-H volunteers who'll be out early Saturday in three person crews stenciling the anti-pollution warning on storm drains.

"These young people are contributing their time and efforts to a project that is particularly

important in this county," Younger said.

Also, the Bay City Public Works Department has painted a new yellow background on more than one-third of the drains that will be stenciled with this warning.

This background, according to Simon, should make the stenciled wording which reads, "No Oil or Chemicals; Drains Into Bay" especially noticeable to thousands of citizens passing by these prominent locations. The stencil also features the likeness of a shrimp.

Younger's "Marine Memos" column elsewhere in today's *The Daily Tribune* has additional information on this environmentally important subject, including details as to how other communities in the county and area can become involved in this program.

Monday, April 10, 1995 **B3**

CITY & STATE

# Pilot program targets rainwater runoff pollution

■ Campaign shows the dangers in everyday activities to the environment

By ERICA D. SHAFFER  
American-Statesman Staff

A simple act such as washing a car in the driveway, fertilizing the lawn or tossing a cigarette butt could seriously damage environmentally sensitive areas.

It's called nonpoint source pollution — untreated hazardous materials carried into creeks and

lakes by rainwater runoff.

The Watershed Protection Pilot Program, developed by the City Environmental and Conservation Services Department, is aimed at fighting nonpoint source pollution by targeting residential areas. The program targets the 3,000 eas. The program targets the 3,000 households in the Fort Branch Creek, Shoal Creek and East Bouldin Creek watersheds, said

Fatima Paiva, an environmental quality specialist and coordinator of the program.

"In the past, we had done a lot of citywide campaigning," Paiva said. "We also targeted commercial establishments," particularly car repair shops where oil is discarded regularly. "This year we are targeting residential areas."

The campaign, which is budgeted for \$80,000 and will run through August, will focus on lawn care and educating residents on how their activities

could harm people and wildlife downstream. Some workshops already have been held, and the response generally has been positive.

"There are some people who don't understand the value of prevention," said Nancy McClintock, manager of the Environmental Resources Management Division of the city's environmental department. "Prevention is so much cheaper than going in and spending money on water quality problems later."

The campaign includes a storm drain stenciling program scheduled for April 21. Volunteers armed with stencils and environment-friendly paint will mark storm drains to notify the community that serious damage can occur if pollutants are washed or poured into a storm drain.

"It's a meaningful area," McClintock said. "Everything that happens in a watershed affects the creeks. Watersheds don't respect property lines."

# WE WANT TO HEAR FROM YOU

We'd like to know if this manual was helpful to you. Please rank the content of each of the following sections on a scale of 1 to 5, with 1 being not helpful and 5 being very helpful.

Circle the appropriate number:

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. Introduction and discussion of Nonpoint Source Pollution  | 1 | 2 | 3 | 4 | 5 |
| 2. Description of storm drain stenciling (materials, content, placement)   | 1 | 2 | 3 | 4 | 5 |
| 3. How storm drain stenciling programs operate (safety, the city's role)   | 1 | 2 | 3 | 4 | 5 |
| 4. Working with volunteers   | 1 | 2 | 3 | 4 | 5 |
| 5. Stenciling as an educational tool   | 1 | 2 | 3 | 4 | 5 |
| 6. Assessing the effectiveness of storm drain stenciling   | 1 | 2 | 3 | 4 | 5 |
| 7. Profiles of Texas programs  | 1 | 2 | 3 | 4 | 5 |
| 8. Appendices (liability forms, materials list, stenciling instructions, safety procedures, data tracking forms, recognition certificate, public education materials, sample news release, sample PSAs). | 1 | 2 | 3 | 4 | 5 |

Please tell us about your city.

1. Did your city have a storm drain labeling program in place before you received this manual?  Yes  No
2. Did you use this manual to start a storm drain labeling program?  Yes  No
3. Did you use this manual to change or add to an ongoing storm drain labeling program?  Yes  No
4. If there is a storm drain labeling program in your city:  
What method is used?
  - Ceramic tile
  - Aluminum plate
  - Spray-painted message using stencil on painted background
  - Spray-painted message applied directly to inlet (no background)
  - Stencil using ink roller with painted background
  - Stencil using ink roller on inlet (no background)
  - Other (describe) \_\_\_\_\_

When did the program start? \_\_\_\_\_

How many drains have been labeled (approximately)? \_\_\_\_\_

What message is applied to the inlets? \_\_\_\_\_

Who does the storm drain labeling?  City workers  Volunteer groups

Name of person filling out form _____
Affiliation _____
Address _____
Phone _____

# SURVEY

Please fax this form to  
TNRCC (512-239-3175)  
or mail it to CLEAN  
TEXAS 2000, MC 113,  
P.O. Box 13087, Austin,  
Texas 78711-3087.

**APPENDIX 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION**

ORDINANCE NO. 1071

AN ORDINANCE OF THE CITY OF KEMAH, TEXAS, TO PROHIBIT ILLICIT DISCHARGES OF NON-STORM WATER DISCHARGES INTO THE CITY'S STORM WATER SYSTEM AND TO IMPLEMENT APPROPRIATE ENFORCEMENT PROCEDURES AND ACTIONS. PROVIDING A PENALTY IN AN AMOUNT NOT TO EXCEED \$2,000.00 FOR EACH AND EVERY DAY A VIOLATION HEREOF OCCURS; PROVIDING AN APPEAL CLAUSE; AN INJUNCTIVE RELIEF CLAUSE; A SEVERABILITY CLAUSE; AND THE EFFECTIVE DATE THEREOF.

WHEREAS, the City Council of the City of KEMAH, TEXAS, as an operator of a Small Municipal Separate Storm Sewer System (MS4), is required to reduce the discharge of pollutants to the water of the State and the United States to the "maximum extent practicable" to protect water quality; and

WHEREAS, the City Council of the City of KEMAH, TEXAS, in order to provide for the health, safety, and welfare of its citizens, finds that it is necessary to implement procedures to monitor and regulate the discharge of non-storm water pollutants into the City's storm water drainage system in order to comply with Federal and State law, as well as, the Phase II requirements of the City's TCEQ MS4 permit; and

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF KEMAH, TEXAS:

**SECTION 1.**

**Intent of provisions.**

The purpose and objectives of this Ordinance are as follows:

1. To prevent the illicit discharge of contaminated storm water runoff from industrial, commercial, residential, and construction sites into the municipal separate storm water system (MS4) within the City of Kemah.
2. To maintain and improve the quality of the surface water and groundwater within the City of Kemah, the County of Galveston, and the State of Texas.
3. To promote public awareness of the hazards involved in the improper discharge of hazardous substances, petroleum products, household hazardous waste, industrial waste, sediment from construction sites, pesticides, herbicides, fertilizers, and other contaminants into the storm drainage system and natural waters of the City.
4. To encourage the recycling of used motor oil and safe disposal of other hazardous consumer products.
5. To facilitate compliance with State and Federal standards and permits by owners and operators of industrial and construction sites within the City.
6. To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this Article.

## SECTION 2.

### **Applicability.**

This Article shall apply to all water entering the storm drainage system generated on any developed or undeveloped lands unless explicitly exempted by an authorized enforcement agency.

## SECTION 3.

### **Administration.**

The City Administrator, except as otherwise provided herein, shall administer, implement, and enforce the provisions of this Ordinance. The City Administrator may delegate this responsibility to either the City Engineer or the Storm Water Manager, whichever is appropriate, based on current City staffing levels.

## SECTION 4.

### **Definitions.**

The following words, terms, and phrases shall have the meanings ascribed to them in this section, unless the context of their usage clearly indicates another meaning:

1. *Authorized Enforcement Agency* shall mean employees or other personnel designated by the City Administrator for the City of Kemah to enforce this ordinance.
2. *Best Management Practices (BMP)* shall mean schedules of activities prohibitions of practices, general house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to storm water receiving waters, or storm water conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.
3. *City Administrator* shall mean the person hired by the City of Kemah to oversee and manage the day-to day operations of the City.
4. *City* shall mean the City of Kemah.
5. *City Engineer* is the person appointed to the position of City Engineer by the City Administrator for the City of Kemah.
6. *Commercial* pertains to any business, trade, industry, or other activity engaged in for profit activities.
7. *Construction Activity* shall mean activities subject to TPDES Construction Permits. These include construction projects resulting in land disturbance of one (1) acre or more. Such activities include but not limited to clearing and grubbing, grading, excavating, filling, and demolition.

8. **Discharge** is any addition or introduction of any pollutant, storm water, or any other substance whatsoever into the municipal separate storm sewer system (MS4) or into waters of the United States.
9. **Discharger** is any person who causes, allows, permits, or is otherwise responsible for a discharge, including, without limitation, any operator of a construction site or industrial facility.
10. **Facility** is any building, structure, installation, process, or activity from which there is or may be a discharge of a pollutant.
11. **Garbage** shall mean putrescible animal and vegetable waste materials from the handling, preparation, cooking, or consumption of food, including waste materials from markets, storage facilities, and the handling and sale of produce and other food products.
12. **Hazardous Household Waste (HHW)** is any material generated in a household (including single and multiple residences, hotels, and motels, camp grounds, picnic ground, and day use recreational areas) by a consumer which, except for the exclusion provided in 40 CFR 261.4(b)(1), would be classified as a hazardous waste 40 CFR Part 261.
13. **Hazardous Materials** are any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.
14. **Illicit Discharge** is any direct or indirect non-storm water discharge to the storm water system, except as exempted in Section 5 herein.
15. **Illicit Connection** shall mean any drain or conveyance connecting an illicit discharge directly to the storm sewer system, whether on the surface or subsurface, which allows and illicit discharge to enter the storm water system, including, but not limited to, any conveyances that allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drainage system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or, any drain or conveyance system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.
16. **Industrial Waste** is any waterborne liquid or solid substance that results from any process of industry, manufacturing, mining, production, trade, or business.
17. **Municipal Separate Storm Water System (MS4)** is the system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned and operated by the City and designed or used for collecting or conveying storm water, and which is not used for collecting or conveying sewage.
18. **National pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit** shall mean a permit issued by either the EPA or by the State (pursuant to 33 USC 1342(b)) that authorizes the discharge of pollutants to waters

of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

19. **Notice of Intent (NOI)** is a document that is required by either the Industrial General permit or the Construction General Permit.
20. **Non-Storm Water Discharge** is any discharge to the storm water drain system that is not composed entirely of storm water runoff.
21. **Person** shall mean any individual, association, organization, partnership, firm, corporation, or other entity recognized by law and acting as either the owner or the owner's agent.
22. **Pollutant** shall mean anything that causes or contributes to pollution. Pollutants may include, but are not limited to the following: paints, varnishes, and solvents; oil and other automotive or marine vessel fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects; articles and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coli, form and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.
23. **Premises** shall mean any building, lot, parcel of land, or portion of land whether improved or unimproved, including adjacent sidewalks and parking strips.
24. **Release** shall mean any spilling, leakage, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the municipal separate storm water system (MS4) or the waters of the United States.
25. **Storm Water** is any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.
26. **Storm Water Manager** is the person appointed to implement and manage the City's Storm Water Management Program by the City Administrator for the City of Kemah.
27. **Storm Water Pollution Prevention Plan (SWPPP)** shall mean a document that describes the Best Management Practices and activities to be implemented by a person or entity to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to storm water, storm water conveyances system, and/or receiving waters to the maximum extent practicable.
28. **Texas Pollutant Discharge Elimination System (TPDES).**
29. **Uncontaminated** shall mean not containing a harmful quantity of any substance.
30. **Wastewater** shall mean any water or other liquid, other than uncontaminated storm water, discharge from a facility.
31. **Yard Waste** is any leaves, grass clippings, yard and garden debris, and brush that results from landscaping maintenance and land-clearing operations.

## SECTION 5.

### Discharge prohibitions.

- A. Prohibition of Illicit Discharges: It shall be unlawful for any person to discharge or cause to be discharged into the municipal storm drainage system or watercourses any materials, including, but not limited to pollutants or waters containing pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.
- B. Exceptions: The commencement, conduct or continuance of any illicit discharge to the storm water drainage system is prohibited, except as described as follows;
  - (1) The following discharges are exempt from discharge prohibitions established by this Article:
    - a. flushing of water lines or other potable water sources;
    - b. landscape irrigation or lawn watering;
    - c. diverted stream flows;
    - d. rising ground water;
    - e. uncontaminated pumped ground water;
    - f. foundation or footing drains (not including active groundwater dewatering systems);
    - g. crawl space pumps;
    - h. air conditioning condensation;
    - i. springs;
    - j. non-commercial washing of vehicles;
    - k. natural riparian habitat or wetland flows;
    - l. swimming pools, if dechlorinated – typically less than one parts per million (PPM) chlorine);
    - m. firefighting activities;
    - n. any other water source not containing pollutants.
  - (2) Discharges specified in writing by the Authorized Enforcement Agency as being necessary to protect public health and safety.
  - (3) Dye testing, as long as a verbal notification is provided to the Authorized Enforcement Agency prior to the time of the test.
  - (4) Any Non-Storm Water discharge permitted under an NPDES or TPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the United States Environmental protection Agency (EPA) or the Texas Commission on Environmental Quality (TCWQ), provided that the discharger is in full compliance with all the requirements of the permit, waiver, or order and other applicable laws and regulations, and provided further that written approval has been granted for any discharge to the storm drainage system.

C. Specific Prohibitions and Requirements:

- (1) It shall be unlawful to construct, use maintain or continue the existence of illicit connections to the City's storm drainage system.
- (2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under the laws or practices applicable or prevailing at the time of connection.
- (3) A person is considered to be in violation of this Article if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.
- (4) No person shall dump, spill, leak, pump, pour, emit, empty, discharge, leach, dispose, or otherwise introduce or cause, allow, or permit to be introduced any of the following substances into the MS4:
  - a. Any used motor oil, antifreeze, or any other motor vehicle or marine vehicle fluid;
  - b. Any industrial waste;
  - c. Any hazardous waste, including hazardous household waste;
  - d. Any domestic sewage or septic tank waste, grease trap waste, sludge or grit trap waste;
  - e. Any garbage, rubbish, or yard waste;
  - f. Any dumpster or trailer overflow:

All individuals, businesses and /or firms renting dumpsters in the City of Kemah shall be responsible for the following:

- (i) Keeping dumpster(s) covered at all times.
- (ii) Maintaining their dumpster(s) and the area around their dumpsters(s) in a clean and sanitary condition.
- (iii) Providing an adequately sized dumpster with necessary pickups in order to prevent the overflow of refuse.

All individuals, businesses, and/or firms utilizing trailers to store or transport household refuse and/or construction debris, shall keep trailers covered with a secured tarp at all times in order to prevent the release of windblown refuse or debris.

Any individual, business and/or firm failing to maintain a dumpster or trailer in accordance with these regulations shall be subject to a fine of up to two hundred fifty dollars (\$250).

- g. Any waste water from a commercial carwash facility; from any vehicle washing, cleaning, or maintenance at any new or used automobile or other vehicle dealership, rental agency, body shop, repair shop, or maintenance facility; or from any washing, cleaning, or maintenance of any business or

- commercial or public service vehicle, including a truck, bus, or heavy equipment;
- h. Any wastewater from a commercial mobile power washer or from the washing or cleaning of a building exterior that contains any soap, detergent, degreaser, solvent, or any other harmful cleaning substance;
  - i. Any wastewater from commercial floor, rug, or carpet cleaning;
  - j. Any wastewater from the wash down or other cleaning of pavement that contains any harmful quantity of soap, detergent, solvent, degreaser, emulsifier, dispersant, or any other harmful cleaning substances; or any wastewater from the wash down or other cleaning of any pavement where any spill, leak, or other release of oil, motor fuel, or other petroleum or hazardous substance has occurred, unless all harmful quantities of such released material have been previously removed;
  - k. Any effluent from cooling tower, condenser, compressor, emissions scrubber, emissions filter, or the blow down from a boiler;
  - l. Any ready-mixed concrete, mortar, ceramic, or asphalt base material or hydro-mulch material, or from cleaning of vehicles or equipment containing, or used in transporting or applying, such material;
  - m. Any filter backwash from a swimming pool, fountain, or spa;
  - n. Any water from a water curtain in a spray room used for painting vehicles, boats, or equipment;
  - o. Any contaminated runoff from a vehicle wrecking yard;
  - p. Any substance or material that will damage, block, or clog the MS4;
  - q. Any release from a petroleum storage tank (PST), or any leachate or runoff from soil contaminated by leaking PST, or any discharge of pumped, confined, or treated wastewater from the remediation of any such PST release, unless the discharge satisfies all the following criteria: (i) Compliance with all State and Federal standards and requirements; (ii) no discharge containing a harmful quantity of any pollutant; (iii) No discharge containing more than 50 parts per billion of benzene; 500 parts per billion combined total quantities of benzene, toluene, methylbenzene, and xylene (BTEX); or 15/mg/l of total petroleum hydrocarbons (TPH).

- (5) No person shall introduce or cause to be introduced into the MS4 any harmful quantity of sediment, silt, earth, soil, sludge, or other material associated with clearing, grading, excavation, or other construction activities, or associated with land filling or other placement or disposal of soil, rock, or other earth materials, in excess of what could be retained on

site or captured by employing sediment and erosion control measures to the maximum extent practicable.

(6) No person shall connect a line conveying sanitary sewage, domestic or industrial, to the MS4, or allow such a connection to continue.

(7) No person shall cause or allow any pavement wash water from a service station to be discharged into the MS4 unless such wash water has passed through a properly functioning and maintained, grease, oil, and sand interceptor before discharge into the MS4.

(8) Regulation of Pesticides, Herbicides, and Fertilizers:

a. Any sale, distribution, application, labeling, manufacture, transportation, storage, or disposal of a pesticide, herbicide, or fertilizer must comply fully with all State and Federal statutes and regulations including, without limitation, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and all Federal regulations promulgated pursuant to FIFRA; chapters 63, 75, and 76 of the Texas Agriculture Code and all State regulations promulgated pursuant thereto; and any other State or Federal requirement;

b. Any license, permit, registration, certification, or evidence of financial responsibility required by State or Federal law for sale, distribution, application, manufacture, transportation, storage, or disposal of a pesticide, herbicide, or fertilizer must be presented to the City Administrator, City Engineer, Storm Water Manager, or any City law enforcement officer for examination upon request.

c. No person shall use or cause to be used any pesticide or herbicide contrary to any directions for use on any labeling required by State or Federal statute or regulation.

d. No person shall use or cause to be used any pesticide or herbicide, or fertilizer in any manner that the person knows, or reasonably should know, is likely to cause, or does cause, a harmful quantity of the pesticide, herbicide, or fertilizer to enter the MS4 or waters of the United States.

e. No person shall dispose of, discard, store, or transport a pesticide, herbicide, or fertilizer, or a pesticide, herbicide, or fertilizer container, in such a manner that the person knows, or reasonably should know, is likely to cause, or does cause, a harmful quantity of the pesticide, herbicide, or fertilizer to enter the MS4 or waters of the United States.

(9) Used Oil Regulation:

a. No person shall discharge motor vehicle oil into the MS4 or a sewer, drainage system, septic tank, surface water, groundwater, or water course.

- b. No person shall knowingly mix or commingle used oil with solid waste that is to be disposed of in a landfill or knowingly directly dispose of used oil on land or in a landfill.
- c. No person shall apply used oil to a road or land for dust suppression, weed abatement, or other similar use that introduces used oil; into the environment.

## **SECTION 6.**

### **Suspension of MS4 access.**

- A. Suspension due to illegal discharges in emergency situations – The City Administrator, City Engineer, or Storm Water Manager, without prior notice, can suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, the health or welfare of persons, the MS4, or waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the Authorized Enforcement Agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or waters of the United States, or to minimize danger to persons.
- B. Suspension due to the diction of illegal discharge – Any person discharging into the MS4 in violation of this Article may have their MS4 access terminated if such termination would abate or reduce an illegal discharge. The Authorized Enforcement Agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the Authorized Enforcement Agency for a reconsideration and hearing.
- C. Reinstatement without permission – A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the Authorized Enforcement Agency.

## **SECTION 7.**

### **Industrial or construction activity discharges.**

Any person subject to an industrial or construction activity NPDES or TPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the City Administrator prior to allowing discharges to the MS4.

## SECTION 8.

### Submission of Notice of Intent (NOI) to the City.

- A. The operator of a facility, including construction sites, that is required to have a NPDES or TPDES permit to discharge storm water associated with industrial activity shall submit a copy of the Notice of Intent (NOI) to the City Administrator at the same time the operator submits the original NOI to the EPA or the TCEQ, as applicable. The copy of the NOI may be delivered to the City Administrator either in person or by mail.
- B. A person commits an offense if the person operating a facility that is discharging storm water associated with an industrial activity without having submitted a copy of the NOI to do so to the City Administrator.

## SECTION 9.

### Monitoring of discharges.

- A. Applicability – This Section applies to all facilities that have storm water discharges associated with industrial and construction activities.
- B. Access to facilities:
  - (1) The City Administrator, City Engineer, and/or Storm Water Manager shall be permitted to enter and inspect facilities subject to regulation under this Article as often as necessary to determine compliance with this Article. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the Authorized Enforcement Agency.
  - (2) Facility operators shall allow the representatives of the Authorized Enforcement Agency ready access to all parts of the premises for the purpose of the inspection, sampling, examination and copying of records that must be kept under the conditions of a NPDES or TPDES permit to discharge storm water, and to the performance of any additional duties as defined by the State and Federal law.
  - (3) The Authorized Enforcement Agency shall have the right to set up on any permitted facility such devices as are necessary in their opinion to conduct monitoring and/or sampling of the facility's storm water discharge.
  - (4) The Authorized Enforcement Agency has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure storm water flow and quality shall be calibrated to ensure their accuracy.

- (5) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the City Administrator and shall not be replaced. The costs of clearing such access shall be borne by the operator.
- (6) Unreasonable delays in allowing the Authorized enforcement Agency access to a permitted facility is a violation of a storm water discharge permit and of this Article. A person who is the operator of a facility with a NPDES or TPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the Authorized Enforcement Agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this Article.
- (7) If the Authorized enforcement Agency has been refused access to any part of the premises from which storm water is discharged, and this Agency is able to demonstrate probable cause to believe that there may be a violation of this Article, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this Article or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the Authorized Enforcement Agency may seek issuance of a search warrant from any court of competent jurisdiction.

#### **SECTION 10.**

##### **Requirement for owners or operators to use of Best Management Practices (BMPs).**

The City of Kemah will adopt policies identifying Best Management Practices (BMPs) for any activity, operation, or facility which may cause or contribute to pollution or contamination of municipal separate storm sewer system (MS4), or waters of the United States. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the MS4 or watercourses through the use of these structural and non-structural BMPs. Furthermore, any person responsible for a property or premise, which is, or may be, the source of an illegal discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPS to prevent the further discharge of pollutants to the MS4. Compliance with all terms and conditions of a valid NPDES or TPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed in compliance with the provisions of this Section. These BMPs shall be part of a storm water pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES and/or TPDES permit.

## SECTION 11.

### **Watercourse protection.**

Every person who owns property, or is responsible for maintaining an easement through which a watercourse passes, or the lessee of such property, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

## SECTION 12.

### **Notification of spills.**

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for an emergency response for a facility or operation has information of any known or suspected release of materials which are resulting, or may result in illegal discharges or pollutants discharging into storm water or the storm drainage system, or waters of the United States, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials, said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the Authorized Enforcement Agency no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mails to the City Administrator within three (3) business days of the phone notification. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its reoccurrence. Such records shall be retained for at least three (3) years.

## SECTION 13.

### **Enforcement.**

A. Notice of Violation – Whenever the City Administrator finds that a person has violated a prohibition or failed to meet a requirement of this Article, the Authorized Enforcement Agency may order compliance by written notification of the violation to the responsible person. Such notice may require, without limitation:

- (1) The performance of monitoring, analysis, and reporting;
- (2) The elimination of illicit connections or discharges;
- (3) That violating discharges, practices, or operations shall cease and desist;

- (4) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;
- (5) Payment of a fine to cover administrative and remediation costs;
- (6) The implementation of source control or treatment BMPs.

B. If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the specified deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

#### **SECTION 14.**

##### **Appeal of notice of violation.**

Any person receiving a Notice of Violation may appeal the determination of the Authorized Enforcement Agency to the City Administrator. The notice of appeal must be received five (5) business days from the date of the Notice of Violation. A hearing on the appeal before the city Administrator shall take place within fifteen (15) business days from the date of receipt of the notice of appeal. The decision of the City Administrator shall be final.

#### **SECTION 15.**

##### **Enforcement measures after appeal.**

If any violation of which a person received notice as required by Section 12 hereof has not been corrected pursuant to the requirements set forth in the Notice of Violation, or, in the event of an appeal, within ten (10) business days of the decision of the City Administrator, then representatives of the Authorized Enforcement Agency shall enter upon the subject private property and take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent, or person in possession of any premises to refuse to allow the Authorized Enforcement Agency or its designated contractor to enter upon the premises for the purposes set forth above.

#### **SECTION 16.**

##### **Cost of abatement of the violation.**

In the event of action by the Authorized Enforcement Agency, as described in Section 15 above, the owner of the property will be notified of the cost of the abatement, including administrative costs, within thirty (30) calendar days after the abatement of the violation. The property owner may file a written protest objecting to the amount of the assessment within ten (10) business days. If the amount due is not paid within a

timely manner as determined by the decision of the City Administrator, or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this Article shall become liable to the City by reason of such violation.

#### **SECTION 17.**

##### **Injunctive relief.**

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Article. If a person has violated or continues to violate the provisions hereof, the Authorized Enforcement Agency may petition for a preliminary or permanent injunction restraining the person from activities that would create further violations or compelling the person to perform abatement or remediation of the violation.

#### **SECTION 18.**

##### **Violations deemed a public nuisance.**

In addition to the enforcement processes and penalties provided herein, any condition caused or permitted to exist in violation of any of the provisions of this Article is deemed to be a threat to public health, safety and welfare, and is declared to be a public nuisance. Consequently, any such public nuisance may be summarily abated or restored at the violator's expense and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

#### **SECTION 19.**

##### **Criminal penalties.**

Any person who intentionally, knowingly, recklessly, or with criminal negligence violates any of the provisions of this Ordinance shall be deemed guilty of a Class C misdemeanor and, upon conviction, shall be fined, except as otherwise provided herein, a sum not to exceed Two Thousand Dollars (\$2,000.00) for each offense, and a separate offense shall be deemed committed upon each day during or on which a violation occurs or continues.

#### **SECTION 21.**

##### **Severability.**

That if any provision, section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be invalid or unconstitutional by a court of competent jurisdiction,

such invalidity or unconstitutionality shall not affect, impair, or invalidate this Ordinance as a whole or any part or provision hereof other than the part declared to be invalid or unconstitutional; and the City Council of Kemah, Texas declares that it would have passed each and every part of the same notwithstanding the omission of any such part thus declared to be invalid or unconstitutional, whether there be one or more parts.

**SECTION 22.**

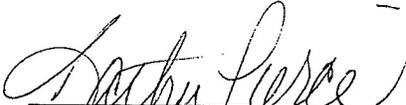
This Ordinance shall become effective after its approval and adoption and the penalty shall be enforceable following publication of the notice of penalty as required by law.

PASSED, APPROVED AND ADOPTED this 2nd day of August, 2012.

CITY OF KEMAH, TEXAS

  
\_\_\_\_\_  
ROBERT M. CUMMINS, MAYOR

ATTEST:

  
\_\_\_\_\_  
CITY SECRETARY

A Guidance Manual for  
Identifying and Eliminating  
Illicit Connections to  
Municipal Separate Storm Sewer Systems (MS4)

Prepared by:  
Galveston County Health District  
Pollution Control Division

In Cooperation with:  
Houston-Galveston Area Council,  
Galveston Bay Estuary Program,  
and  
Texas Commission on Environmental Quality  
(formerly: Texas Natural Resource Conservation Commission)

August 2002

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## Introduction

This guidance manual for identifying and eliminating illicit connections to municipal separate storm sewer systems (MS4) was developed for two reasons. First, as a tool to assist all MS4 operators with Phase I and Phase II storm water program compliance, and second, to address the goals and needs of *The Galveston Bay Plan: The Comprehensive Conservation and Management Plan for Galveston Bay (The Plan)*. This manual outlines MS4 mapping options, dry weather survey procedures, sampling methods and illicit connection investigative techniques. This guidance manual also provides alternative ideas for municipalities to choose what is best suited for them based upon budget, personnel, and time constraints.

**Background:** In 1972, the Federal Water Pollution Control Act was passed with the intent to eliminate the discharge of pollutants into navigable waters, to protect and propagate shellfish and wildlife, to provide for recreation in or on the waters of the nation, and to prohibit the discharge of toxic pollutants in concentrations which would impair the multiple uses of all waters. Over the next thirty years, various legislation was enacted that addressed aspects of both point source and non-point source (NPS) pollution. By 1994, the “National Water Quality Inventory” indicated that storm water discharges from sources such as separate storm sewers, construction sites, waste disposal sites, and resource extraction activities were major causes of water quality impairment. One estuarine survey highlighted in the inventory found nearly fifty percent (50%) of the identified cases of water quality impairment were attributed to storm water runoff or NPS pollution.

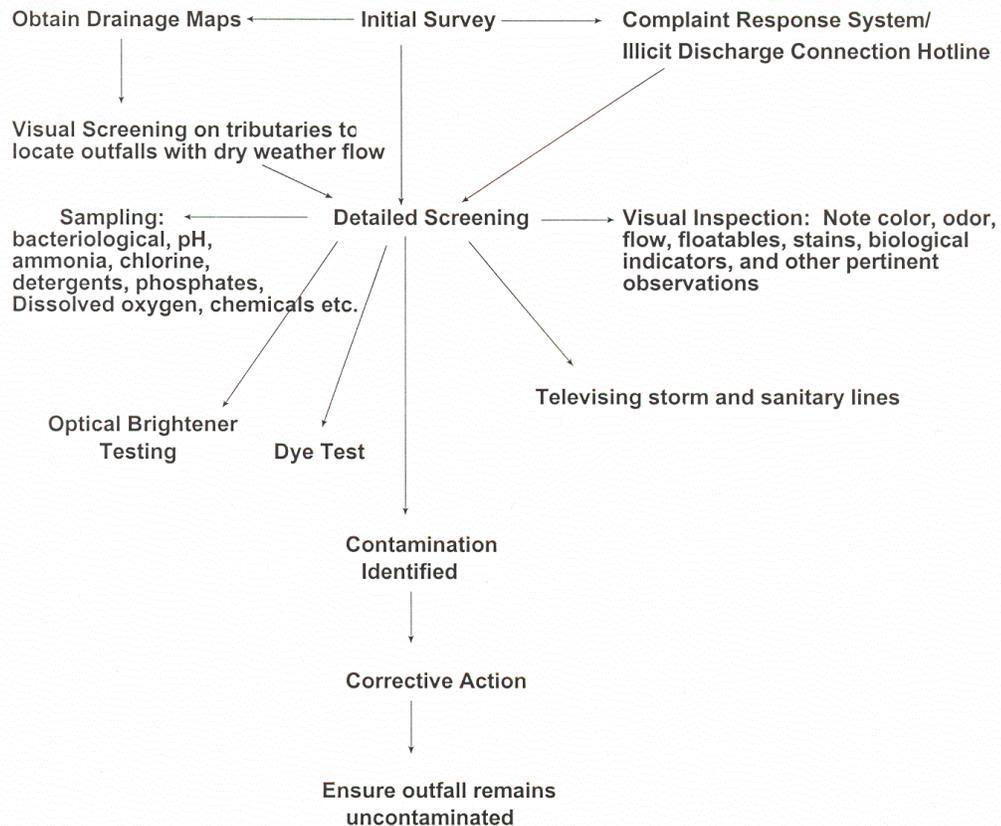
The National Pollutant Discharge Elimination System (NPDES) Phase I Storm Water regulations were developed in response to the 1987 Amendments to the Clean Water Act (CWA). Under Phase I, the Environmental Protection Agency (EPA) mandated medium and large municipal separate storm sewer systems (MS4) located in incorporated communities or counties with populations of 100,000 or more to permit their storm water discharges. Plus, NPDES Phase I permits became required for eleven categories of industrial activities, including any construction activity disturbing five or more acres of land. The regulations included the incentive to adopt “no exposure” practices in commercial and industrial operations and were intended to produce significant reductions in pollutant discharges and improvement in surface water quality. Ultimately, federally mandated Phase II Storm Water Regulations were passed to address the small MS4s (serving less than 100,000 persons).

Effective February 2000, small MS4 operators in urbanized areas and construction sites that disturb one to five acres became regulated. EPA believes that the implementation of the six minimum control measures identified for small MS4s should significantly reduce pollutants in urban storm water compared to existing levels. One of the six measures is the detection and elimination of illicit discharges to the MS4s. Illicit discharges include wastes and wastewater from non-storm water sources. Illicit discharges enter the MS4 through either direct connections such as piping mistakenly or deliberately connected to the storm drains or indirect connections such as infiltration into the MS4 from cracked sanitary sewer pipes.

In 1994, the Galveston Bay National Estuary Program also completed the development of *The Galveston Bay Plan: The Comprehensive Conservation and Management Plan for Galveston Bay (The Plan)*. Galveston Bay provides huge economic benefits to the region and the state. *The Plan* identified the threats to the bay resulting from pollution, development and overuse, then outlined a management strategy to maintain or improve the natural resources of the bay. The bay's second most serious problem was identified as being NPS pollution resulting from storm water runoff. There are sixteen initiatives in *The Plan* to reduce or eliminate NPS pollution. The first initiative is to help local municipalities implement storm water pollution prevention programs.

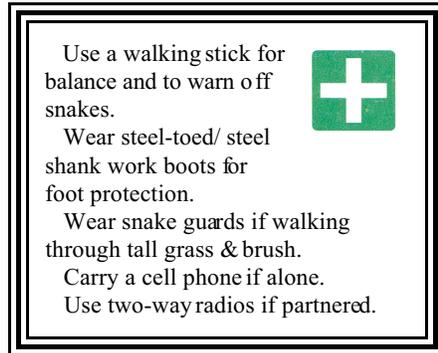
*The Plan* also has six initiatives related to point source pollution. In the past, discharges of pollutants from municipal and industrial wastewater treatment plants have upset the healthy balance of marine life in portions of the Galveston Bay estuary system. However, since the 1970's, the closely regulated permitting process has successfully reduced the pollutant loadings from large municipal and industrial discharges. The primary concerns today relate to wet weather by-passes and overflows, compliance issues with small wastewater treatment plants and illicit storm sewer connections. Initiative PS-5 of *The Plan* requires the implementation of a dry-weather illegal connections program. The objective is to actively search for illicit connections to the MS4s and eliminate them.

Figure 1: Identifying and Eliminating Illicit Connections Flow Chart



## I. Mapping

Mapping is the first critical step in the detection and elimination of illicit connections between the sanitary and storm sewer systems. Accurate maps will enhance record keeping, facilitate investigations, and improve efficiency of field personnel. Detailed maps plus thorough field investigation notes will be invaluable for identifying the sources of the dry weather flows detected throughout any MS4. If maps are not created, the investigator will spend valuable time trying to locate the points of entry which facilitate tracking during the initial and detailed surveys.



**Two options for Mapping:** Owners or operators of the MS4 basically have two options when creating their maps. Either Geographic Informational System (GIS) or AutoCAD (computer assisted drawing) maps can be designed/updated **or** paper maps using U.S. Quadrangles, aerial photos, and/or street maps must be fabricated/created by hand. Combining GIS with AutoCAD provides the greatest flexibility and advantage to the MS4 operator/owner. Electronic mapping is the most desirable because it will meet today's information needs plus prepare the cities/utility districts for federal assets inventory responsibilities in the future.

- Electronic base maps may be acquired from several sources. Cities in Galveston County may acquire base maps with street names, property lines, ownership information, property values, etc. from the Galveston Central Appraisal District. Other cities may choose to get TIGER files from the Census Bureau or digitized base maps may be available from their own county appraisal districts or Houston-Galveston Area Council.

Electronic maps which have sanitary sewer lines (including pipe size and flow direction), manholes and lift stations overlaid with storm sewer lines, manholes, inlets and outfalls are the investigator's most useful tool. Electronic maps can be constructed using different methods. Collecting global positioning satellite (GPS) coordinates on all manholes, outfalls, etc. provide the Geographic Information System (GIS) specialist with the data to "layer" information onto the base map. Conversely, geo-referenced satellite imagery allows all the information to be digitized directly without field GPS coordinates.

- Hand drawn paper maps. U.S. Quadrangles (Quads) have very good scale, topographic lines, and details regarding land uses. However, Quads are not updated on a regular basis. Aerial photos or satellite images, which are taken every few years in some locations, will help update specific Quads for your area but enlarged area street/highway maps may be the best maps to build upon. Since many are given away free of charge, they can be copied and enlarged to draw lines detailing drainage ditches. Arrows can also be used to indicate where and on which side of the ditch a storm water outfall is located.

**Color coding maps.** Color is the easiest way to designate problems and review accumulated data at-a-glance. Color is good for designating which outfalls have dry weather flow and which do not. Color can be used to separate “flows” into categories based upon volume (gallons per minute). Color can also be used to record information about problem areas upstream of an outfall with a dry weather flow. Use what works best for you.

## **II. Initial Dry Weather Flow Survey**

After maps are completed, dry weather flows must be located. Investigators should walk, drive or float each waterway to identify outfalls having flow. Surveys should not be conducted within 12 hours of a rainfall event or until run-off has ceased. GCHD found 72 hours to be necessary after a significant rainfall. Conduct the survey as follows:

- Label map outfalls with appropriate color to indicate flow/non-flow.
- Document physical characteristics of all dry weather flows using the Illicit Discharge/Connection Field Investigation Sheet found in Appendix C.
- Conduct field analyses on each flow and document. See Section III-A.
- Collect lab samples at this time as needed. See Sections III-B, III-C and IV-B.

On rare occasions an illicit connection may be identified during the initial survey but usually multiple detailed investigations are necessary. Physical characteristics, field analyses and laboratory tests are collectively known as “Tracers” and are described in detail in the following section.

## **III. Tracers**

A tracer is a distinct characteristic, parameter or combination of such used to test for the presence of a pollutant(s). An ideal tracer should have the following traits:

- promotes time efficiency for field investigator(s),
- inexpensive,
- easy to perform in the field (requires minimum training to receive good results),
- provides results in the field (exception: laboratory samples),
- measures appropriate detection limits,
- produces a measurable concentration for comparison against a non-polluted standard,
- stable characteristics with no significant concentration change over time due to physical, chemical or biological processes,
- non-toxic to the environment (having no waste to return to lab for proper disposal), and/or
- appropriate to the situation (residential vs. industrial).

## A. Physical Tracers

The presence of color, odor, turbidity, water temperature, estimated flow rates, biological activity, floatables, oil sheens and other observations can be very useful in identifying an illicit connection. Occasionally, these indicators can be used alone but are best used in conjunction with other field and/or lab tests to correctly identify a pollution source.

### 1. Color

The color of water is influenced by the presence or absence of substances such as metallic salts, organic matter, dissolved or suspended materials. Water appearance or color may also be an important indicator of water quality problems. The following are common colors and their possible causes (Kolbe):

<u>Color</u>	<u>Possible Sources</u>
Tan to brown	Runoff from rainfall event, construction, or soil erosion
Blue green/ brown green	Plankton bloom, sewage, fertilizer runoff, vehicular wash water or “tracing dye”
Milky white	Paint, lime, milk, or grease
Milky or dirty dishwater gray	Gray water or wastewater, musty odor present
Black	Septic wastewater, sulfuric acid spill or a turnover of oxygen depleted water. Hydrogen sulfide odor usually present.
Dark red, purple, blue, black	Industry - fabric dye, paper ink
Orange-red	Leachate from iron deposits; Tracing dye; Deposits on stream beds often associated with oil well operations such as brine water discharges; oily sheen or petroleum odor may be present.
Bright yellow green	Anti-freeze, tracing dye or algal bloom



**Figure 2.** Source of brown flow was sediment.



**Figure 3.** Source of blue-green flow was sewage.



**Figure 4.** Source of white flow was grease from a fast food restaurant.



**Figure 5.** Source of blue water was a car wash facility.

Technique #1 - the investigator makes a subjective visual description.

Technique #2 - The New Zealand National Institute of Water and Atmospheric Research developed a technique using a viewing box in conjunction with the Munsell Color Coding System. Comparison cards are used to match the color of the water. A viewing box and set of cards cost approximately \$800.

**Pros:** Easy to track colored water upstream through underground drainage system.

**Cons:** Not every illicit discharge will have a color to trace.

## 2. Odor

Odor has very subjective characteristics and differs from one individual to another. Plus an investigator's ability to detect odors may change during the time of exposure. Because of this phenomenon, odors should be noted when first approaching an outfall or storm drain opening.

The following are some common odors and their probable causes:

<u>Odor</u>	<u>Possible Sources</u>
Musty	Raw or partially treated sewage, livestock waste, algae
Rotten egg/ Hydrogen Sulfide	Raw sewage, sulfuric acid, anaerobic water
Sewage/fecal	Raw sewage
Chlorine	Broken drinking water line, sprinkler runoff, swimming pool backwash water, wastewater treatment plant discharge, industrial discharges
Sharp, pungent odor	Chemicals or pesticides
Gasoline, spent petroleum	Industrial discharge, illegal dumping of wastes or waste water.

**Pros:** An odor can be very helpful in identifying the source of the flow or narrowing the area of focus.

**Cons:** Not every illicit flow will have an odor. Investigators can become de-sensitized to a particular odor within minutes of exposure.

### 3. Turbidity

Turbidity in water is caused by suspended clay particles, silt, finely divided organic and inorganic matter, plankton and microscopic organisms. Movement of the water keeps these materials in suspension and prevents sunlight from filtering through the water. The heavier the turbidity, the more opaque the water appears. Highly turbid water can clog fish gills, reduce photosynthesis, and obscure in-stream habitat. Where a highly turbid flow exists there may be an illicit discharge occurring.

Technique #1 - collect a quantity of water in a white bucket and estimate the turbidity based upon how cloudy the water appears. Assign a ranking such as high, medium, or low turbidity.

Technique #2 - use a turbidity meter. Commercial meters measure the amount of light allowed to pass through a glass tube filled with a solution. However, turbidity meters are not 100% accurate and not every meter is accurate for all conditions. Some meters work best in low turbidity while others are more accurate in medium or heavy turbidity. Others require several correction factors to improve their accuracy.

**Pros:** The “type” of turbidity may help identify the source of the flow.

**Cons:** Turbidity alone will not identify whether multiple sources are present. No single meter is good for all conditions.

#### 4. Water Temperature

The temperature of the dry weather flow can sometimes be useful in identifying flows contaminated by sanitary wastewater. Household and commercial sewage tends to have a consistently warm temperature year round. Therefore, during colder months, any sewage escaping from the sanitary sewer into the storm sewer system may leave a temperature trail.

Technique #1 - collect a quantity of sample in a bucket then submerge the tip of a thermometer in the water. Take the reading while bulb is submerged.

Technique #2 - use a multi-probe meter with a temperature probe, submerge the probe directly in the stream or submerge the probe into a bucket of sample water. Take reading while probe is submerged.

**Pros:** Inexpensive and time efficient.

**Cons:** Only helpful in cold weather otherwise, temperature difference is not significant enough to track.

Allow 1 minute for thermometer or probe to stabilize.

Thermometer, water sample, and sampling container should NOT be in direct sunlight or exposed to a strong breeze.



#### 5. Flow

Determining flow will help set investigation priorities. High flow but minimal contamination may take precedent over a lower flow with higher pollutant level. Two simple and inexpensive techniques that can be used to monitor flow.

Technique #1 - use a bucket and a stopwatch. This method must have a drop space large enough to accommodate a measuring container (bucket) under the lower edge of the outfall. Either the container is held under the outfall for one minute and the volume of the flow is measured **or** the time for “how fast the container fills” is recorded.

#### Case Study #1: Setting investigation priorities based upon flow.

Two outfalls have *E.coli* results of >24,000 mpn/100ml, but one outfall has a flow of 1 gpm and the second outfall has a 3 gpm flow, the outfall with the higher flow rate and higher impact would take priority for investigation. The actual bacteria loading, from a source point to the receiving stream, can be calculated using the bacteria and flow data. The number of bacteria in a 100 ml sample along with the flow in gallons per minute is entered into the following formula:

$$\text{Bacteria (x) gpm (x) 54800*} = \text{bacteria/day.}$$

Either way, the gallons per minute can easily be calculated. This procedure should be conducted at least 3 times and an average taken. The latter option is best suited for very small flows.

Technique #2 - use a tracing dye or floatable item such as a cheese ball, match, or cork, a tape measure, a stop watch, and two people. First, measure the distance from the outfall to the first upstream storm water manhole. Second, one person drops the floatable object into the upstream manhole and starts the stop watch. Third, as the object flows out the pipe, the time is documented. Repeat this procedure two more times and take an average of the results. Next, calculate the volume of the channel segment to finish determining flow.

$$\text{Distance} \div \text{Time} = \text{Velocity}$$

$$\text{Velocity} \times \text{Volume} = \text{Flow}$$

- Pros:** Inexpensive method and time efficient  
Outfall investigations can be prioritized
- Cons:** The flow, using the above methods, is an estimate and not exact  
The end of the pipe can be submerged making the bucket method non-functional.  
The floatable may be hindered or trapped due to uneven substrate or excessive debris within the underground pipe.

Case Study #2: Using flow as an indicator of contamination.

During an intensive survey, a storm water outfall that is usually dry was found to have a heavy flow of 5 gpm. The water was clear with few or no solids. There was no strong odor associated with the flow. But suds were present in the receiving stream. Since there had been no significant rainfall for more than seven (7) days, further investigation was warranted. A sanitary sewer overflow (SSO) was located upstream. The manhole lid was straining the solids and the wastewater was flowing directly into a nearby storm drain inlet.

## 6. Other Relevant Observations

“Other” observations about the outfall, the area surrounding the outfall, or activities occurring in the vicinity will sometimes give clues to the source of a flow or the cause of the pollution. Noting these observations and using them to complete the investigation “puzzle” will provide a complete picture.



**Figure 6.** Trash and debris washed out of the storm drain.



Figure 7. Heavy algal flow.



Figure 8. Oil dumped at a storm drain outfall.

- Debris includes trash, leaves, and grass clippings
- Floatables are from a sanitary waste, commercial or an industrial source
- Vegetation such as algae or “sewer lilies” is present only around and in close proximity of the storm water outfall.
- Lack of any vegetation or stunted plant life may indicate a problem.
- Stains or deposits - dark stains, crystalline, oil, or amorphous powder
- Sewage fungus, *Sphaerotilus natans*, is a soft, gray, filamentous bacteria. When present in large quantities, the bacteria will form a sheet or layer which can be seen with the naked eye. It is found primarily in areas polluted by wastewater or activated sludge and is associated with low dissolved oxygen conditions. The growth of *S. natans* is stimulated by nitrogen and phosphorus
- Surface scum, film, or foam and an associated color may indicate possible sources of contamination.



Figure 9. Paint stained concrete.



Figure 10. Rainbow sheen on water caused by oil.



Figure 11. White foam from soap.



Figure 12. Surface scum from sewage.

### Surface Scum

Tan foam  
White foam  
Yellow, brown, black film  
Rainbow film

### Possible Sources

Harmless, cause is high flow or wave action  
Found around wastewater outfalls, thin, mostly due to soaps  
Tree pollens  
Oil or other fuel type

Activities in the watershed may also indicate causes or sources of contamination:

- Lawn mowing - illegal dumping of organic waste, ie. grass clippings.
- Construction activities - source of sediment, heavy turbidity, petroleum products associated with large equipment.
- Livestock such as horses, cows, etc. - contribute contamination in the form of bacteria, nutrients and organic matter.

## **B. Biological Tracers**

Biological tracers include all things living or that grow. Certain organisms are known to indicate polluted or lesser quality waters.

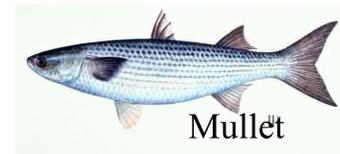
Examples are listed below:

Mullet are an example of an opportunistic fish species that tend to congregate around “easy” nutrients such as sewage solids flowing from a storm water outfall.

Red-eared sliders are turtles which like “easy” nutrients and their presence may indicate a possible storm water outfall problem.

Sewage fungus, *Sphaerotilus natans*

Lush green vegetation around an outfall especially when other vegetation is less green or less dense may indicate a nutrient source.



Red-eared slider

### **1. Bacteria**

Pathogenic organisms are prevalent in fecal contaminated water and pose a great risk to human health. Due to their variety and the complexity involved in identifying individual types of bacteria, indicator organisms are used to assess the potential for presence of pathogens due to fecal contamination (Samadpour). A group of bacteria called fecal coliforms can be detected using a relatively simple laboratory method but they are not specific to warm-

*E.coli* for fresh water  
enterococci for tidal or salt water  
fecal coliform for all water



blooded animals and the test may produce false positives. The species, *Esherichia coli* (*E. coli*), is part of the fecal coliform group and is specific to humans and other warm-blooded animals. EPA recommends it as the best freshwater indicator organism when evaluating health risk for recreational waters. If the water body in question is salt water or tidally influenced waters, enterococci bacteria should be used as the indicator organism due to its ability to survive in high salinity conditions.

Bacterial sampling depends on available funding. Even though relatively inexpensive, collecting ten to twelve samples in one day could cost \$ 100 or more. The bacteriological sampling technique is as follows:

1. Whenever possible, bacteria samples should be collected directly into a sterile, 100 ml bottle. If a sampling device such as a bucket must be used, the bucket must be rinsed several times with the water to be sampled. The bacteria sample shall be collected before any meters are placed in the sampled water.
2. The sample bottle shall be properly labeled with the site ID, date, and analysis desired and placed in ice immediately.
3. Deliver to laboratory for testing. Costs are fairly inexpensive (range \$ 8 - \$ 12 each) and results are usually available within 24 hours.

If bacterial testing was done, the results can be used in conjunction with flow data to determine the bacterial loading to the receiving waters (See case study #3).

- |              |  |
|--------------|--|
| <b>Pros:</b> | Good indicator of pollution sources<br>Inexpensive<br>Easy sampling technique<br>Get results quickly   |
| <b>Cons:</b> | Use sterile conditions to avoid contamination<br>Samples must be returned to laboratory within six (6) hours of collection for results to be valid |

#### Case Study #3: Calculating the Human Equivalence (HE) of a contaminated flow.

If the fecal sample result equals 24,000 mpn/100 ml and the flow from an outfall is measured to be 3 gpm, then the Bacterial Loading will equal 3,945,600,000 fecal coliform. If one adult human is equivalent to 2 billion fecal coliform per day, then  $3,945,600,000 \div 2,000,000,000$  will equal 1.97 adults. This result may indicate that the source is from a very small flow such as a single house or the leak into the storm system if very small.

$$\text{Bacteria results} \times \text{flow (gpm)} \times 54800 = \text{Bacterial Loading (bacteria/day)}$$

$$\text{Bacterial Loading} \div 2,000,000,000 = \text{Human Equivalent (HE)}$$

## C. Chemical Tracers

Measuring the chemical characteristics or make-up of a dry weather flow will help the investigator track the source of the flow and identify the cause of the contamination or vice versa. Chemical tests are needed to supplement the physical parameters noted and confirm contamination. Chemical tracers can either be tested for in the field, if the right equipment is available, or samples may be taken to a laboratory for analyses. The chemical tests - DO, pH, chlorine, ammonia, phosphate, dye testing, and optical brighteners - are described below. Each section includes approximate costs, equipment needs, sampling tips, and the pros and cons of each test. A case study is also included to illustrate how each chemical test was helpful in locating an illicit connection for GCHD.

Salinity, specific conductance, total suspended solids, biological oxygen demand, and fluoride also may be useful indicators on occasion but they have not been discussed in this manual. Plus, other tests available to the investigator (organics, metals, etc.) are not discussed in this manual. Cost per test or requirements such as ultra clean sampling techniques make some tests prohibitive for small entities.

### 1. Dissolved Oxygen

Dissolved oxygen (DO) is essential for the continued survival of most aquatic organisms. The *Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data, 2002* designates aquatic life uses for all water bodies as exceptional, high, intermediate, limited, or no significant aquatic life use. In freshwater, the *absolute minimum criteria* are 4.0, 3.0, 3.0, 2.0, 1.5 milligram per liter (mg/L) respectively. Several factors affect the ability of water to absorb and hold dissolved oxygen. As water temperatures increase, DO generally decreases. Also, an algal bloom will increase the DO during the day while the same bloom will consume or “use” the oxygen at night sometimes causing total depletion. Lastly, bacteria metabolize available DO during the decomposition of organic matter.

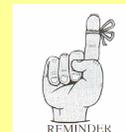
**Methods for measuring Dissolved Oxygen:** There are three methods for measuring DO. The choice of procedure depends on the interferences present, the accuracy desired, and, in some cases, convenience or expedience.

- The Winkler Method is a titration procedure based on the oxidizing property of DO. It involves performing a 5-10 minute analytical test on a quantity of sample water in the field. A field kit can be assembled using equipment from an existing lab or a Digital Titrator/Modified Winkler kit may be purchased for approximately \$200.
- Two (2) colorimetric tests are available from Hach Corporation for screening

#### To collect water samples for DO measurements:

Do NOT agitate/aerate water to be measured.

Submerge probe completely in bucket of sample water and stir slowly (about 1 revolution/second for at least 90 seconds (SWQM)) or until the display stabilizes.



purposes. First, a colored disc comparator is used to match the color of the solution generated by adding chemical reagents. Second, a hand-held colorimeter is used to measure the color intensity after being mixed with the appropriate reagents. Both are read directly from the devices. The methodology for each kit is explained in the instruction manual.

- DO meters use membrane covered electrodes to measure the rate of diffusion of molecular oxygen across a membrane. A DO meter can be purchased as a stand alone meter or as a multi-probe instrument having multiple functions such as temperature, pH, conductivity, and/or salinity. Meter prices range from \$800 to ~\$5,000 depending on the capabilities of the meter.

<b>Pros</b>	Simple, easy to learn procedures. Colorimetric kits: relatively inexpensive. Meters: produce fastest results.
<b>Cons</b>	Low DO is not positive indication of pollution. Low DO may be due to warm water temperatures. Bucket or telescoping pole required to collect sufficient sample volume. Sampling technique will potentially add DO to water. DO meters: require significant initial investment but have low long term costs. Meter: requires regular calibration and maintenance.

## 2. pH

Potential hydrogen (pH) measures the hydrogen ion activity in solution. Waters with a pH less than 7 are considered to be acidic while water with a pH greater than 7 are alkaline or basic. A pH between 6.5 and 8.2 is considered ideal for a healthy environment. Conversely, levels below 5.0 and above 10.5 can cause unhealthy stream conditions for aquatic life. Normal storm water, and even sanitary wastewater, has a pH around 7 or neutral. Since pH is logarithmic, a pH of 4.0 is ten times more acidic than a pH of 5.0. Measuring pH can identify whether the flow is industrial, commercial or domestic in nature.

Not only does pH affect aquatic life, but pH may also influence the toxicity of other chemicals. Ammonia becomes more poisonous in high pH (basic) solutions and heavy metals can leach out of stream sediment in acidic solutions (NVRC). Industries that release low pH (acidic) dry weather discharges include (but are not limited to) textile mills, pharmaceutical manufacturers, metal finishers/ fabricators, as well as companies producing resins, fertilizers and pesticides. In contrast, industries releasing high

### To collect water samples for pH measurements:

Avoid collecting sediment with water to be measured.

Stir probe slowly (about 1 revolution/second for at least 90 seconds (SWQM)) or until the display stabilizes.

Rinse probe with de-ionized water between readings and before storage.

Even if a meter and probe are used,



pH (alkaline) wastes are commonly soap manufacturers, textile mills, metal plating industries, steel mills, and producers of rubber or plastic.

**Methods for measuring pH:** There are three (3) methods for measuring pH.

- pH paper is available in several different ranges. Besides the full range (0-14), they can be purchased for the high, mid, or low ranges.
- Test strips provide semi-quantitative results. One supplier advertised 50 test strips for less than \$10.
- Colorimetric methods such as a color cube kits, color disc kits or a pocket colorimeter use a reagent to produce a color which is then matched to the comparator or measured for light transmission. Colorimeters are more accurate than the color discs which are more accurate than the color cube kits. The methodology for each kit is explained in the instruction manual. Kits range from \$15 - \$55.
- A pH meter with electrode produces the fastest and most accurate results. However, probes are susceptible to fouling by oil and greases. Meter prices range from \$450 to \$1000.

<b>Pros</b>	Method is excellent detector of chemical releases pH paper: very inexpensive, quick and easy to use pH colorimetric tests: relatively inexpensive, accurate results pH meter: moderate in price, best results in fastest time
<b>Cons</b>	Method is insufficient indicator of sanitary sewer discharges pH paper: must be kept dry and stored in cool, dark place pH paper: is not very accurate for small changes pH meters: require routine calibrations and maintenance of probe

#### Case Study #4: Using pH as an indicator of contamination

While performing routine mapping and sampling, a milky white discharge was found flowing from a storm water outfall. A crystalized film had formed on the water surface and a white deposit was settling out on the bottom of the “pool.” A pH of 12 was measured at the outfall but decreased to 9.5 about 10 yards downstream. Upstream of the outfall, a large amount of lime had been spread over a construction site to condition the soil. Because there were no silt fences at the site, rainfall and/or other water runoff was causing the lime slurry to flow into a drainage ditch and thence to the storm drain outfall. Lime is very alkaline in nature and therefore accounts for the high pH measurements.



### Case Study #5: Investigation of contamination using pH levels.

An unusually high flow with a pH of 11.07 was found discharging from a storm water outfall. Investigative tracking of the pH revealed the source to be a car dealership. Paint and vehicular wash water was being discharged to a floor drain which had been plumbed to the ditch instead of the sanitary sewer. A Harris County Pollution Control Department investigator was called in to assist with getting the facility to correct the illegal plumbing.

Before



After



### 3. Chlorine

While beneficial for public health reasons (killing pathogenic organisms), chlorine is also harmful to the environment. Its lethal affect depends on concentration and time of exposure. Final wastewater treatment plant effluent and potable water are usually the only waters disinfected with chlorine. However, chlorine is also used in the production of plastics, cleaning products and insecticides. Therefore, detecting a chlorine residual in a dry weather flow and then tracking it upstream through an underground drainage system will usually result in locating the source of a contaminated discharge or cross-connection. In times of water shortages, it also helps to identify sprinkler systems with excess run-off or breaks in a drinking water line.

Chlorine also interferes with lab tests such as BOD, cyanide and pesticide/herbicide testing. Therefore, samples known to have a  $\text{Cl}_2$  residual must be dechlorinated (treated with sodium thiosulfate to remove the  $\text{Cl}_2$  ions) when the samples are collected or before analysis begins (SWQM, TNRCC).

**Methods for testing chlorine residual:** Water samples are tested for free and/or total  $\text{Cl}_2$  residual depending on the method used. Overall, the process of preparing the sample and reading the results takes a maximum of 5 minutes. Free  $\text{Cl}_2$  residual are read immediately whereas, total  $\text{Cl}_2$  residual tests usually require the sample to stand for a period of time before reading the results. For exact specifications refer to your kit's instruction manual.

- Chlorine test strips can be used to detect higher concentrations of chlorine (0.5, 1.0, 2.0, etc.) as would be found in a discharge from a swimming pool filtration system. Test strips provide semi-quantitative results. The individually wrapped strips cost around 50¢ each.
- colorimetric test kits such as a color cube kit, color disc kit or a pocket colorimeter use a reagent to produce a color which is then matched to a comparator or measured for light transmission. Colorimeters are more accurate than the color discs which are more accurate than the color cube kits. The methodology for each kit is explained in the instruction manual. Kits range from \$55 - \$325.

<b>Pros</b>	All methods are quick and easy to perform Able to identify water line breaks Can detect illegal pool, spa discharges, and vehicular wash water
<b>Cons</b>	Test strips do not detect low concentrations Cost per test strip is moderately high Very few outfalls have a significant enough amount of chlorine to be able to track upstream Meters require regular calibration and maintenance

Case Study #6: Using chlorine as an indicator to locate an illicit discharge.

Using a high-beam cordless spotlight, billowing suds were discovered accumulating within a large concrete storm drain which discharged directly into a creek. The chlorine residual was >3 mg/l. Tracking upstream, the flow became cloudy with a whitish hue and had a pungent odor. The flow originated at a nearby fast-food restaurant that had a large grease spill in the dumpster area. The grease had been sprinkled with hTh chlorine and was being power washed. All wastewater was flowing into an open pipe in the driveway. The open pipe drained directly into the storm drain. Management was notified of the violation and actions were taken to correct the matter immediately.



#### 4. Ammonia

Ammonia (NH<sub>3</sub>) is produced by the decomposition of plant and animal protein. Ammonia is also a main ingredient in fertilizers. Its presence in surface waters usually indicates domestic or agricultural pollution. At certain levels, ammonia is toxic to fish and creates an oxygen demand in the receiving water. It is also an excellent indication of contamination by sanitary wastewater.

**Methods for measuring ammonia:** There are several methods available to test for the presence of ammonia. Some of the methods are less accurate but can still be used as a screening tool. The methods are listed below.

- Ammonia nitrogen test strips are available to measure ammonia in increments of 0, 0.25, 0.5, 1.0, 3.0, & 6.0 parts per million (ppm) or mg/L. Test strips provide semi-quantitative results. Each test strip costs ~ 60¢ and they are available in packages of twenty-five (25).
- Colorimetric test kits such as a color cube kit, color disc kit or a pocket colorimeter use a reagent to produce a color which is then matched to a comparator or measured for light transmission. Colorimeters are more accurate than the color discs which are more accurate than the color cube kits. Most kits are available in ranges - high, medium, and low concentrations. The smallest increment available in any kit is 0.1 mg/L. While not acceptable for determining surface water quality, it can be used to screen for pollution sources. The methodology for each kit is explained in the instruction manual. Kits range from \$30 - \$325.
- Portable ISE meters with ammonia sensing electrodes are available for field use. The cost of a meter with the required electrode will range from \$1,000 - to \$1,500. The methodology for the meter is explained in the owner's instruction manual. There are accuracy issues with the electrodes, see **Cons** below.
- Analytical tests can be conducted in a laboratory. Water samples are collected and returned to the lab for analysis. Costs per test range from \$20 - \$30. This test is the most accurate available but turn-around time for results is a major hindrance.

<b>Pros</b>	Test strips and kits easy to use in the field. Test strips and kits provide results in the field which can facilitate immediate tracking. Good indicator of sanitary sewage.
<b>Cons</b>	Time consuming: depending on which kit is used - can take up to 15-20 minutes per sample analysis. Most of the time values are too small to track. Additional steps must be taken to negate the interferences: saltwater may interfere with test methods reducing accuracy up to 30%; chlorine must be removed from sample prior to testing; iron, sulfides, and extreme hardness in the water will also cause interferences. Regular calibration and maintenance required on all meters.

## Case Study #7: Elevated ammonia levels from sanitary sewage

For more than twenty years, residents had complained about persistent sanitary sewer problems. During an intensive sampling event, investigators noted a foul odor associated with the drainage ditch and storm water outfall. Biological indicators, such as red-eared slider turtles, plus ammonia levels measuring up to 7.32mg/L and high levels of *E. coli* bacteria confirmed the presence of an illicit connection. After several investigation attempts, it was discovered that two residential service lines had been hooked up to the storm sewer instead of the sanitary sewer. Wastewater was draining straight into the drainage ditch behind the owners' property. The proper authorities were contacted and the problem was corrected.



## 5. Phosphates

Phosphorus occurs in natural water and wastewaters almost solely as phosphate. A certain amount of phosphate is essential for most plants and animals, but too much phosphate in water can contribute to eutrophication. Phosphates may enter water from agricultural run-off and biological and industrial wastes. They may be added to water in municipal and industrial water treatment processes to control corrosion. Phosphates ( $\text{PO}_4$ ) were most commonly found in soap and detergent discharges from household and industrial laundering activities and are common ingredients in fertilizers.

**Methods for measuring phosphates:** There are several methods available to test for the presence of phosphates. Some of the methods are less accurate but can still be used as a screening tool. The methods are listed below.

- Orthophosphate test strips are available to measure phosphorus in increments of 0, 5.0, 100, 200, & 500 parts per million (ppm) or mg/L. Test strips provide semi-quantitative results. Each test strip costs ~ 30¢ and they are available in packages of fifty (50).
- Colorimetric test kits such as a color cube kit, color disc kit or a pocket colorimeter use a reagent to produce a color which is then matched to a comparator or measured for light transmission. Colorimeters are more accurate than the color discs which are more accurate than the color cube kits. Most kits are available in ranges - high, medium, and low concentrations. The smallest increment available in any kit is 0.02 mg/L. While these kits are not acceptable for determining surface water quality, they can be used to screen for pollution sources. The methodology for each kit is explained in the instruction manual. Kits range from \$20 - \$325.
- Analytical tests can be conducted in a laboratory. Water samples are collected and returned to the lab for analysis. Costs per test range from \$18 - \$30. This test is the most accurate available but turn-around time for results is a major hindrance.

- Pros** Test strips and kits: easy to use in the field.  
 Test strips and kits: provide results in the field which can facilitate immediate tracking.
- Cons** Test strips: accurate for gross contamination only.  
 Test kits: depending on which kit is used - can take up to 15-20 minutes per sample analysis.  
 Most of the time values are too small to track.  
 Some amount of PO<sub>4</sub> can be found at almost every outfall because it is naturally occurring, fertilizer run-off from lawns is common and residential car washing generally produces a run-off.

**Case Study #8: Using phosphates to identify an illicit discharge**

A outfall was investigated due to elevated bacteria levels detected in a continuous dry weather flow estimated at >5 gpm. The flow was followed to the first manhole upstream where an incoming lateral line that was discharging sudsy water. A PO<sub>4</sub> level of 3.10 mg/L was measured. The lateral line was coming from a car dealership where two problems were identified. First, the shop floor was cleaned by hosing the wastewater outside to a storm drain located in the driveway and, second, vehicles were being washed next to the garage instead of on the car wash pad. All wastewater was flowing directly into the storm grate.



**D. Confirmation Techniques**

**1. Dye Testing**

Dye testing uses a brightly colored, fluorescent substance to detect leaks in the sewage system, locate illegal sewer connections, trace cross connections, monitor flow studies, analyze septic systems and track groundwater movement. Tracing dye is available in many forms - liquid, tablet, powder, wax, and strips.

Liquid dye is very concentrated and disperses quickly. It is easy to use and works well in all volumes of flow. Dye strips are similar to the liquid but are less messy. Powder can be very messy and must dissolve in liquid to reach its full potential. Tablets are compressed powder and

are particularly useful for releasing dye over time. Tablets are less messy than the powder form. All forms of the dye stain hands and clothes so caution should be taken when handling the containers. Latex gloves provide a good barrier and adequate hand protection.

Tracing dye is available in different colors such as blue, red, violet, and yellow-green. Several colors should be kept on hand so multiple lines can be tested at the same time. When dye testing, use the color which creates the greatest contrast with the receiving water. Yellow-green dye is the preferred dye because of its great contrast in color but it disappears quickly in sunlight. Red, however, is most helpful when there is a lot of algae present. Red also withstands sunlight and lingers in the environment longer.

**Equipment needed for dye testing:**

- fluorescent dyes,
- rubber or latex gloves,
- manhole hook or pick ax,
- camera (for documentation),
- high power flashlight,
- two-way radios (if two investigators).

**Methods for conducting dye testing:** Depending on the scenario, there are different techniques for dye testing. It is always helpful to have two people testing but one person can complete the job. Ideally, one person drops the dye and the second person looks for evidence of dye downstream.

- If a residential property is suspect, dye can be placed in the house clean-out and washed downline using a nearby hose (seek permission from the property owner first). If dye surfaces in the storm drain system, then the problem most likely exists in the service line for this private property. The property owner should be informed of the situation and served a notice to make necessary repairs.
- When a commercial property needs to be tested, dye should be flushed down a restroom toilet or washed down the janitor's sink (speak to manager or owners first). Flush quickly and repeatedly to prevent staining. If dye surfaces in the storm system, it is most likely the commercial business responsibility to fix the problem. Inform the manager or owner and serve a notice to make repairs.
- To dye test a sanitary sewer line, choose a sanitary manhole upstream of the storm water outfall **or** upstream of where the sanitary line crosses the storm line **or** upstream of the area of concern. Choose the upstream sanitary manhole that has no odor, color, or any other relevant observations that may signify a pollution source. If dye surfaces in the storm drain system, the problem and responsibility most likely lies with the city or utility district.

- If dye **does not** surface in the storm drain after a period of time **or** if the investigator cannot wait for the dye to surface, secure charcoal packets any place where dye is expected to surface. Leave the packets in place for a week or two then retrieve and analyze. Complete instructions for processing the charcoal packets are provided in Appendix D. The charcoal packets are necessary because dye can take anywhere from a few minutes to days to surface in the storm drainage system. Even though another site visit must be made, the packets save time. Personnel do not have to wait at the site and multiple check-backs and/or risk of missing the dye is avoided.

Heavy flows from rain, a garden hose, or flushing a toilet several times, can speed up the dye testing process.

A partially blocked sanitary sewer line can slow down the dye process or give false results.

A fully charged or blocked sanitary sewer line may be the only time a cross-connection occurs and is detectable.



Case Study #9: Dye testing to confirm sewer leak at private home

Elevated bacteria levels at a storm water outfall led to an upstream investigation and additional sampling. Results narrowed the area of concern and the city storm sewer lines were televised. No problems were located so residential homes were dye tested via clean outs. Dye from one home surfaced in the storm sewer. The residential service line was televised and two breaks were identified. The line was repaired at the owners expense.

Case Study #10: Dye testing a sump pump to confirm an illicit connection

During routine ambient monitoring, a white, 2 inch PVC pipe was found gushing water directly into a creek for about 30 seconds and then the discharge stopped. The pipe was located next to a car repair shop. An investigation revealed a sump pump located in the underground area of the shop. Knowing these units function intermittently, the sump was dye tested. After filling with enough water, the pump turned on and dye discharged out of the PVC pipe at the creek. City representatives were informed of the illicit connection and asked to oversee needed repairs.



- |             |  |
|-------------|--|
| <b>Pros</b> | Dye is water soluble, biodegradable, fairly stable, has a low toxicity and has been used for over 100 years<br>Highly detectable and only a small amount is needed<br>Relatively inexpensive<br>Can narrow down the pollution source area to a street block or even a specific house or building |
| <b>Cons</b> | Can be very time consuming. May require several check backs if charcoal packets are not used.  |

## 2. Optical Brightener

Optical brighteners (OB), or fabric whitening agents, are good tracers because they indicate a presence of laundry effluent which is specific to humans. OB's can be used to identify storm drain cross connections, sewage system exfiltration, and faulty septic systems, plus differentiate between human and animal waste.

**Equipment needed for OB detection:** Below is a brief list of the primary needs. A complete equipment list can be found in Appendix E. Start up costs for all materials can range anywhere from \$100 to \$500, the most expensive item being the UV light.

- Individually wrapped, untreated cotton pads,
- Vinyl-coated “cages” to hold the pads,
- A 4-6 watt fluorescent ultraviolet light box.

**Method for deploying optical brightener traps:** Optical brightener placement is best suited for pipes, storm drains and small streams (out of direct sunlight).

- Insert untreated cotton pad into the vinyl-coated cage and secure the cage shut using a zip tie or rubber band. (See picture at right.)
- Secure the cage in the pipe, storm sewer, or stream using high test monofilament line tied to a rock, a manhole lid (with holes), aluminum (tent) spikes, or a nearby branch.
- Complete *Field Investigation Sheet* (Appendix C) and collect bacterial samples (if needed) on the day of deployment.
- On the *OB Data Sheet* (See Appendix F), list the site ID, date of deployment, and various locations of cage(s). Expose the cage device for approximately 7 days. Leave out longer if heavy rainfall has occurred. (This time frame allows for at least one laundry event to take place.) If dry weather flow contains heavy sediment or debris, shorten the deployment time period.
- Temporarily install a rain gauge at the site if possible.



Figure 13: Optical Brightener Device

- During retrieval, rinse the gauze pads in the receiving water to remove excess sediment.
- Squeeze excess water from the pad and place pad in clean zip lock baggie.
- Label a piece of dark manila folder with the site ID or location, date of placement, amount of rainfall and the date of retrieval and staple to the gauze pad. Place pad with label in a clean baggie and transport in a dark container to minimize exposure to the sun.
- Complete data sheets with the date of retrieval, number of days the pad was exposed to a flow and total rainfall (See Appendix F).
- Return to office or lab and dry pads by hanging them on a clean monofilament line in a dark area.
- After the pads have dried, place the gauze pad (with attached label) under a UV light to check for fluorescence. A UV light box is the simplest method for examining the pads, otherwise use a UV light strip in a darkened room.
- Compare a “control” pad (clean) to the dried pads and rate each as Positive, Negative, or Inconclusive. A pad having a definite glow or fluorescence is positive for exposure to grey water. A pad that looks similar to the control is negative for laundry wastewater. Any pads with an inconclusive or questionable result should have the location retested. Consider lengthening the new pad’s exposure time.
- At least 10% of the dried pads should be re-read by a second trained personnel for Quality Control (See Appendix G). GCHD recommends 100% QC check for confirmation.



**Figure 14:** OB device deployed in storm drain.

**Do NOT touch gauze pad to clothing or hands that may have laundry detergent residual.**



Check cages after heavy rainfall to ensure devices are still secure.

Do NOT use white paper labels. They may contain optical brighteners and will contaminate the sample.

A negative pad may occur at a flow with high bacterial contamination. The source may be from a non-detergent using facility or be agricultural in nature. If only the outfall was tested and the pad was positive, the site should be re-tested along with several upstream sites to narrow down the area of the source. Bacteria sampling at each upstream site is also beneficial. OB success rate may be improved if:

- they are deployed in a constant, dry weather flow rate
- the sampling device (cage) is completely submerged so the entire gauze pad is exposed

- the device is hidden from public view (as much as possible) to avoid tampering
- use an ultra-clean methodology to minimize false positives

Factors decreasing OB success rates include:

- heavy rainfall
- sediment and debris clogging or burying the gauze

<b>Pros</b>	Inexpensive supplies Animal / human waste differentiation Does not require a laboratory to attain results, One field personnel can complete all steps
<b>Cons</b>	Can be time consuming Results are not obtained for at least one week Heavy rains require longer deployment periods.

#### Case Study # 11: Storm drain tracking using OB devices.

Due to elevated bacteria levels (*E. coli* >24,000 mpn/100 ml) and a thick, white colored flow from a storm water outfall, an investigation of a residential area was under taken. The color was tracked and found in five (5) upstream storm water manholes. Between the 5<sup>th</sup> and 6<sup>th</sup> manhole, painters were seen actively painting a home but the painters insisted that their paint brushes and equipment were washed inside the home and not outside. Initially, a break in the service line of this house was suspected but dye testing was negative. Dye surface in the sanitary line only. Next, optical brightener devices were placed at the outfall and in four (4) upstream storm water manholes. The devices were left for eight (8) days, retrieved, dried, and analyzed. At the time of retrieval, the manholes were no longer white and the painting had ceased. The outfall and 1<sup>st</sup> upstream manhole were positive for optical brighteners while the other manholes were negative. Additional *E. coli* and ammonia sampling mirrored the OB results. *E. coli* was >24,000 mpn/100 ml at the outfall and the 1<sup>st</sup> manhole and dropped to 200 mpn/100 ml or below for the remaining upstream manholes. Ammonia was high at the outfall and first manhole, dropping considerably at the second. Using the *E. coli*, ammonia and OB results, the area of concern was localized to about 14 homes. The city televised the storm lines and found no problems so each home was scheduled for dye testing. Ironically, the first house tested revealed a problem and has been referred to the city for repairs. See Appendix H for map of sample sites and data.



### 3. Televising

Cities with budgets capable of supporting a crew for televising have an advantage over those that do not. After the area of a possible pollution source is narrowed down, the surrounding sanitary and/or storm sewer lines can be televised to locate the exact position of the break, infiltration, or cross connection. This method is also much safer than having field personnel do confined space entries to look for pollution sources.

<b>Pros</b>	Best way to pinpoint exact location of breaks, infiltration, and cross connections. Video tapes can be viewed after crew has left the field
<b>Cons</b>	Very expensive to maintain equipment Crews (multiple employees) must be trained to operate equipment Require line cleaning before televising Cameras are limited on the size of pipes they can view Cameras cannot take pictures if pipes are full of liquid

### E. Future Tracers

As this project was being implemented and the manual drafted, ongoing research identified several new and innovative technologies that were being developed to help determine pollution types and their sources. These tracers were not utilized for various reasons but brief discussions have been included for future reference. These new technologies include testing for DNA, caffeine, pharmaceuticals, viruses, and using infrared heat detection. This research should be reviewed periodically to determine whether a technique is applicable to a given situation, if it becomes cost effective, and whether necessary laboratory support is available.

#### 1. DNA

Microbial Source Tracking (MST) uses DNA testing, or “fingerprinting” of *E. coli*, to differentiate between human and non human waste. *E. coli* bacteria is found in all warm-blooded animals but each DNA sequence within every *E. coli* strain is different probably due to differing intestinal environments. This contrast is what will help determine if polluted waterways are actually contaminated with human sewage or animal waste runoff.

The first step in DNA testing requires the building of a library of fingerprints, or isolates, taken from humans, wildlife and domestic animals. For example, waste samples must be obtained from cows, horses, deer, waterfowl, dogs, cats or any other known potential pollution source and analyzed. A few hundred isolates are needed per source to build a large enough library and the larger the library, the easier it is to match isolates. Dr. Samadpour’s laboratory, who developed the MST method, has subtyped more than 65,000 *E. coli* strains. Unfortunately, libraries from other geographical areas should not be relied upon due to possible genetic variances. After the reference library is built, bacteria samples from unknown origins can then be compared to the library for



identification. Antibiotic resistance analysis (ARA) is also recommended to be used in conjunction with the DNA ribotyping to make the results more reliable. ARA uses *E. coli* samples to determine antibiotic resistance. Humans having a higher resistance.

Currently, the number of laboratories set up to analyze these types of samples are limited and the cost per test is significant. If starting from scratch, laboratory costs, including building the library and running DNA and ARA tests, are expensive. For example, the City of Albuquerque compiled a library of eight (8) different animals, including humans, and sampled 16 sites two (2) times each. Their costs were approximately \$100,000 and their results were not absolute. (Over the next two years, the State of New Mexico will be conducting a study on eight (8) different sites testing for ARA and ribotyping). Additionally, highly trained personnel are required to performed the tests due to the risk of error.

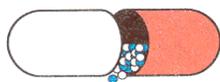
## 2. Caffeine

Caffeine was investigated as a tracer for leaking sanitary sewer lines because it passes through the digestive system virtually unchanged and is persistent in the environment. Caffeine is generally found in human sewage only but may be detected in certain plants such as watermelon. Presently, sample analysis is running about \$100.00 per test which makes it financially infeasible for smaller cities and utility districts. Bench top methods may be run in-house but have a large margin of error.

A study conducted in Puget Sound found caffeine present in more than 160 of the 216 samples collected. Contaminated samples were even found at depths of 640 feet. Scientists believe this wide spread contamination is due to Seattle motorists and coffee cart operators dumping cold coffee along streets and into storm drains. The city has since withdrawn plans to use caffeine as an indicator but there is every indication that caffeine testing may be beneficial for other cities.

## 3. Pharmaceuticals/Drugs

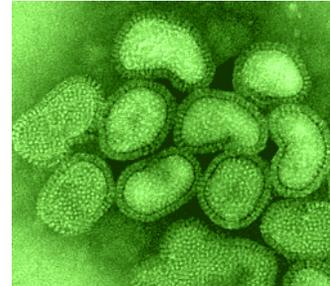
Pharmaceuticals are being investigated due to increased awareness of their presence in major waterways. The FDA has begun asking pharmaceutical manufacturers what ecological effects may be caused by their products. The U.S. Geological Survey (USGS) reported finding “95 pharmaceutical hormones and other organic chemicals in U.S. waters.” Most importantly,



endocrine disrupters which change, imitate or block hormonal functions have been found in these waterways. During a 5-year study in London, England, the environmental agency investigated a decline in human male fertility. In conjunction with findings, male fish in nearby rivers were found to be changing sex due to ethanol estradiol (a synthetic estrogen in urine of women using birth control pills) found in the waters. The decline in male fertility was suggested to be caused by men ingesting ethanol estradiol via drinking water. The chemical is thought to remain active for a month and surface water is the main source of drinking water in the study area. Therefore, it is very possible that the chemical causing male fish to change sex could also be linked to male infertility.

#### 4. Viruses

Researchers have discovered human adenoviruses contaminating surface water along the California coastline. The methodology used to identify the viruses in coastal waters was originally used to trace pathogens in sewage. The presence of these viruses in such waterways supports the idea that the source of contamination is from human waste discharging into waterways. Unfortunately, it is not known whether the viruses are virulent. Interestingly enough, there are no significant correlations between the presence of viruses and bacterial indicator levels (total coliforms, fecal coliforms and Enterococci). This news has serious implications so California has been asked to re-examine their water quality standards for recreational areas. The standards do not address the viral quality of those same waters. This concern brings rise to the question, “Should every state be re-examining their own water quality standards in regards to viral quality?”



#### 5. Infrared heat detection systems (IHDS)

Arkansas Department of Health employee, John Church, devised a technique for locating leaking septic systems while watching the television show COPS. Infrared heat detection systems (IHDS) detect changes or variations in temperature. Based on the theory that human waste is going to be significantly warmer than the ambient ground, the detection system can easily give a visual picture of a leaking septic system. In turn, this system can be used for bodies of water, such as lakes, to locate areas that are slightly warmer possibly due to wastewater inflow. This detection system tends to work best in colder seasons when the warm septic effluent or wastewater can be detected easier. The effectiveness of this system has not been tested in southern states with warmer climates. Nor has a hand held system been tested during ground surveillance. Church also used a state police helicopter with a Forward Looking Infrared (FLIR) imaging system, global positioning system (GPS), video equipment, and maps. Using the IHDS in aerial reconnaissance seemed to be cost effective if usage of the helicopter was donated.

### IV. Sampling

As previously stated, sampling is conducted at the time that a dry weather flow is found or when priorities indicate an area needs to be resampled. Sampling and detailed investigations are best conducted in the morning when there are greater sanitary sewer flows from residential areas, during or after high use periods such as tourist season or holidays, or while tides are ebbing or at their lowest, if applicable. Determine the approximate number of samples to collect on a particular day by considering:

Physical proximity of dry weather flows to office or laboratory. How much time will be spent driving to and from the field sampling area?

Accessibility to the dry weather flows. Must the investigator walk from outfall to outfall or can he/she drive? Can the opening of the outfall be easily reached for sampling or does an upstream manhole have to be sampled?

Many analytical tests have maximum holding times before they must be delivered to the lab and analyzed.

Some laboratories limit the time when samples can be received for same day analysis and/or require pre-notification of plans to sample.

What has the weather been like? (See Section III. Initial Dry Weather Flow Survey.) All outfall sampling should occur only during periods of dry weather.

- Take and consume plenty of drinking water.
- Use sun screen repeatedly.
- Use insect repellent as needed.
- Use safety lights on vehicles, safety cones, and safety vests when working along a roadway.



### A. Preparing to Sample

Once a sampling event is planned and scheduled, notify the laboratory as needed. Gather the appropriate type and number of bottles for the intended tests including extra bottles required for lab duplicates, etc. See Appendix I.

Check bottles for cracks or splits, verify the “sterilized” tab is in-tact.

Follow established standard operating procedures (SOP) for sample preservatives. Acid preservation is placed in the sampling containers at the lab before departure or in the field using an acid kit.

Pre-label bottles, if possible, using a water proof pen or marker. Include sample site i.d., date, preservation information, and analysis requested. Time of sampling and collector’s name will be added in the field.

Assemble coolers with ice for sample preservation and transportation. The ice chests must be able to keep the samples at 4 °C or less for delivery to the lab.

Gather field meters and pre-calibrate according to approved methods. Document calibration and maintenance activities in permanent calibration logs developed for each meter used.

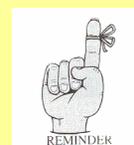
### B. Collecting Samples

Travel to an outfall with a dry weather flow. If receiving water and dry weather flow are mixed and backing up into the drainage pipe, sample at the first upstream storm drain manhole where mixing does not occur.

Complete field sampling sheet or make observations before sampling. See Appendix J.

Collect dry weather flow directly into the sample containers or use a bucket or telescoping

- Pre-rinse the bucket 3 times using the dry weather flow before collecting water to fill sample containers.



- The turkey baster or pump & tubing should be sanitized between outfalls using a dilute chlorine solution. Rinse with dry weather flow before sampling.

sampling pole to collect the water sample. If the flow is too small and/or if the flow does not “fall” into the container or bucket, use a turkey baster, small hand pump or another such device to collect the water.

Preserve samples if still needed.

Immerse filled sample containers in ice for transportation to lab. Deliver samples to lab within required time limit.

Check in samples at lab, complete chain-of-custody papers,

Enter field data into the proper database for later use.



**Figure 15.** Collecting a sample using telescoping sampling pole.

### C. Using the Sample Results

After lab results are obtained:

Label each outfall flow as pathogenic, toxic, nuisance, and/or aquatic life threatening for record keeping purposes. See Appendix K for “Summary of Illicit Connection Investigation.”

Determine priorities for conducting detailed investigations of the underground storm drain system upstream of the outfalls experiencing a contaminated dry weather flow.

- pathogenic and/or toxic problems should be addressed first due to human health risks.
- use the pre-determined screening levels for each parameter plus flow data to identify which discharges pose the greatest threat.

- Enter confined spaces with required training and appropriate equipment only.
- Use proper tool for removing and replacing manhole lids.



Use a combination of physical, biological and chemical tracers to conduct each detailed investigation. Multiple tracers will give a more detailed picture of what is occurring underground. Table 1 in Appendix L indicates the most common pollution sources associated with each tracer. Refer to Section III for specific “how to” instructions for each tracer.

Make an enlarged map of the underground “watershed” for each storm water outfall to be investigated.

Assemble equipment used to perform detailed investigations. Refer to the Investigation Check List in Appendix M.

Begin the investigation by comparing current outfall and discharge conditions with previous information. If the same, choose the “best fit” tracer(s) and begin tracking upstream. Move systematically from manhole to manhole or sample each storm water manhole immediately upstream and downstream of where a sanitary sewer line crosses the storm sewer system. If the flow in the manhole is obviously contaminated, skip to the next upstream location to save time.

Make notations on the underground “watershed” map indicating flows and directions or the lack of flow. Other observations are noted on additional Illicit Discharge Connection Field Investigations Sheets (See Appendix C)

Make observations about above ground conditions such as large trees, broken or shifted concrete or asphalt. Tree roots and shifted pipes are common causes of illicit connections. Compile all information from “Illicit Discharge Connection Field Investigations Sheets” onto a “Tracer Summary Sheet” found in Appendix N. Use this summary sheet to determine the area of concern.

After localizing the area of concern, initiate dye testing or request the sewer line be televised to confirm the exact location of the illicit connection.

Notify the responsible party to make the necessary repairs.

Once a repair is made or a pollution source is eliminated, resample any continuing flow from the outfall to verify there are no additional problems impacting the same storm sewer line.

Repeat investigation efforts if samples are unacceptable.

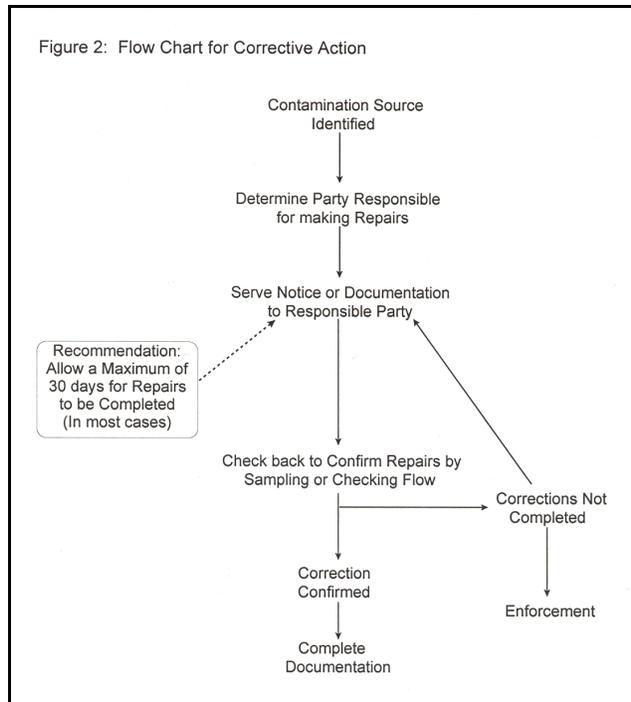
#### Case Study #12: Using multiple tracers in a detailed investigation.

While investigating one particular outfall, a total of thirteen (13) tracers plus other observations were used. They included six (6) physical tracers (color, odor, turbidity, water temperature, flow, and other observation), one biological tracer (*E.coli*), four (4) chemical tracers (pH, chlorine, ammonia, & phosphates) and three (3) confirmation techniques (dye testing, optical brighteners, and televising). Of the thirteen tracers used, only five (5) were helpful in identifying the area of concern in this situation. Dye testing the houses one-at-a-time identified the problem.

## V. Documentation and Reporting

Documenting all steps of an investigation is absolutely essential regardless of whether an investigator reports to a supervisor only, implements enforcement action or writes annual reports for a regulatory authority. Good record keeping will enhance the success and timely corrections of most identified illicit connections. Numerous sheets of paper will be generated during the mapping, surveying and detailed investigation activities. All of this information should be organized, evaluated, and summarized with the idea that legal enforcement action is a possibility.

The process for eliminating identified illicit connections is shown in the flow chart on page 32. After confirming the existence and location of the illicit connection, some type of notice must be issued to the responsible party. The notice may be in the form of a work order to a city/district department or a notice of violation (NOV) delivered to a private citizen. Whatever the case, someone or some entity is responsible for making necessary repairs. The notice must include a time frame in which the repairs need to be made. Next, the investigator should conduct a check



back inspection at the end of the time allowed. Should repairs not be complete and/or the contaminated flow continues, several questions must be answered to determine which strategy to use next. Investigators may find that there is a second illicit connection in the same MS4 or they may choose to issue a second NOV for extenuating circumstances or they may decide that enforcement is the next step towards resolving the problem. If the problem is resolved, all documentation should be completed for reporting purposes.

If enforcement is the option chosen, the investigator has several options. First, city ordinances may be written to mandate repairs and enforcement procedures. Second, cities/districts may have the option of turning the case over to a county agency with

enforcement capabilities; or third, the case may be referred to the state environmental agency for enforcement. Every program should create a standard operating procedure (SOP) so all cases are handled consistently and efficiently.

Every illicit connection to the MS4 is an “unauthorized discharge” to the waters of the state and is a violation of the Texas Water Code §26.121. If the discharge is intentional for the purpose of avoiding pretreatment or disposal costs, immediate enforcement with repairs and mitigation may be the appropriate process. Unintentional discharges such as a cracked pipe caused by shifting soils is still an unauthorized discharge but is usually handled quite differently. Regardless, when wastewater from the sanitary sewer escapes into the MS4 it is considered to be a by-pass of the treatment works and it is a reportable incident. The owner/operator of the sanitary sewer collection system has the responsibility of reporting the discharge as such.

An illicit connections investigator will generate at least three types of reports from the data collected. First, if the municipality or utility district is responsible for making repairs, then work orders for the same should be written and given to the appropriate personnel. Second, periodic summary reports need to be sent to immediate supervisors for management purposes. Third, annual reports on eliminating illicit connections must be compiled for the state regulatory agency, the Texas Commission on Environmental Quality (TCEQ) formerly known as the Texas Natural Resource Conservation Commission (TNRCC).

At this time, each entity determines what their reports will look like and what they will include, however, a sample supervisor’s report has been developed and provided in Appendix K.

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## Glossary

### **Adenovirus (Human)**

A DNA virus that affects the respiratory system (fever, sore throat, runny nose), gastrointestinal tract, or the eye (conjunctivitis). The virus may be latent then become re-activated at a later time. The virus can be passed through contaminated water.

### **Anaerobic decomposition**

Biological metabolism or decomposition in the absence of oxygen.

### **Conductivity**

The measure of a liquid's ability to carry an electrical charge. Expressed in micromhos per centimeter ( $\mu\text{mhos/cm}$ ) at 25 °C. It is dependent on the presence of ions, the total concentration of the ions, their mobility and valence as well as the temperature of the solution.

### **Deposits or stains**

Any type of coating or discoloration that remains at an outfall as a result of dry weather discharges.

### **Direct Connection**

Physical connections of sanitary, commercial, or industrial piping which carry untreated wastewater to a storm sewer system. A direct connection is usually unauthorized and may be accidental or intentional.

### **Discharge**

The volume of water that passes a given point within a given period of time.

### **Dissolved Oxygen**

The oxygen freely available in water. Dissolved oxygen is vital to a fish and other aquatic life and for the prevention of odors. Traditionally, the level of dissolved oxygen has been accepted as the single most important indicator of a water body's ability to support desirable aquatic life.

### **Dry Weather Discharge**

The flow of a liquid from a storm water outfall during dry weather.

### **Effluent**

Treated wastewater that flows out of a treatment plant or industrial outfall (point source), prior to entering a water body

### **Eutrophication**

The accelerated growth of aquatic plant life in a body of water due to excessive dissolved nutrients. Ultimately it results in lowered or depleted dissolved oxygen levels.

**Floatables**

Floating materials (plastic containers, condoms, sanitary napkins, tissues, corks, paper containers, wood, leaves, detritus, grease balls, oil films, slimes, scum, etc.) that are either part of the inappropriate waste streams discharged to a storm water system or are collected by flows which enter a storm water drainage system.

**Illicit Connection**

Any discharge to a MS4 that is not composed entirely of storm water and is not authorized by an NPDES permit. (One exception is fire fighting activities).

**Indicator Organism**

An organism, species, or community that indicates the presence of a certain environmental condition or conditions.

**Infiltration**

The process whereby water or waste water enters an underground storm drainage system through such means as defective pipes, pipe joints, connections, manhole walls, etc.

**Inflow**

The process whereby water enters a sanitary wastewater collection system from surface locations (including but limited to depressed, perforated manhole covers, yard drains, area inlets, or roof leader)

**Lateral**

A drain or sewer that has no other drains or sewers discharging into it, except for service connections or house laterals.

**MS4**

Municipal Separate Storm Sewer System. A conveyance or system of conveyances which includes roadway and drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains. See 40 CFR 122.26(b)(8) Classification: Large MS4 have a population > 250,000, a medium MS4 has a population of 100,000 to 250,000, and a small MS4 is any other system not regulated under Phase I.

**NPDES**

National Pollutant Discharge Elimination System. A permitting program that regulates polluted storm water runoff from MS4's, construction sites, and industrial activities.

**Nuisance and aquatic life threatening pollutant**

A constituent which will cause in impairment in surface waters such as low dissolved oxygen levels, excessive algal growth, floatables, color change, odor, and/or turbidity. The origins of this pollutant is from sanitary wastewater, laundry wastewater, construction sites, automobile wash waters, or lawn runoff.

**Nutrient**

Any substance used by living things to promote growth. The term is generally applied to nitrogen and phosphorus in water and wastewater, but is also applied to other essential and trace elements.

**Outfall**

The point at which a storm water drainage system discharges from a pipe, ditch, or other conveyance to a receiving water. There is sometimes a concrete structure or retaining wall at this location to protect the end of the discharge pipe and prevent erosion of the receiving water bank.

**Pathogenic or toxic pollutant**

A constituent that by itself or in combination with others may cause illness through contact, ingestion, and/or inhalation. Sources include sanitary, commercial, or industrial wastewater plus improper disposal of household hazardous materials, fertilizers and pesticides, and other sources of the like.

**pH**

The measurement of hydrogen-ion activity of water caused by the breakdown of water molecules and presence of dissolved acids and bases. Simply: the measure of a solution's acidity or alkalinity.

**Phosphorus**

Essential nutrient to the growth of organisms and can be the nutrient that limits the primary productivity of water. In excessive amounts, from wastewater, agricultural drainage and certain industrial wastes, it also contributes to the eutrophication of lakes and other water bodies. The nutrient screening level for total phosphorus is 0.2 mg/l. Anything over this is considered high for a body of water.

**Photosynthesis**

The process used by green plants to use light energy to convert carbon dioxide and water to simple sugar and oxygen.

**Point Source**

A single, identifiable location or source from which pollution may be discharged to surface waters (example: a pipe or a ship).

**Pollutant**

Any material, substance, organism, or condition which can alter the physical, thermal, chemical or biological quality of water and render it harmful, detrimental or injurious to humans, animal life, vegetation or property, or to the public's health, safety or welfare, or impairs the usefulness or public enjoyment of the water for any lawful or reasonable purpose.

**Potable Water**

Water which has been treated or is naturally safe for drinking. It contains no toxic constituent which would make it harmful for human consumption.

**Raw sewage**

Untreated wastewater from all sources not permitted to discharge to an MS4.

**Receiving Water**

A river, stream, lake, estuary, or other body of water, natural or manmade, into which storm water or treated wastewater may be discharged.

**Run-off**

That part of precipitation or irrigation water which runs off the land into surface waters or waters of the state.

**Sanitary sewer**

A series of underground pipes which carry sanitary waste or process wastewater to a treatment plant.

**Septic odor**

Rotten egg smell produced by decomposing organic matter and the lack of oxygen.

**Sewage**

Sanitary wastewater or wastewater generated by commercial or industrial operations but does not include storm water.

**Sewer**

A pipe, conduit or drain, generally closed, but not normally flowing full, for carrying sanitary, industrial and commercial wastewater or storm water flows.

**Storm drain**

A pipe, ditch, or natural or manmade channel that is designed to carry storm water, surface runoff, street wash water, and other drainage from a specific area/source to receiving waters.

**Storm Water**

Water resulting from precipitation which either infiltrates into the ground, impounds/puddles, and/or runs freely from the surface, or is captured by storm drainage, a combined sewer, and, to a limited degree, by sanitary sewer facilities.

**Surface Waters or Waters of the State**

Groundwater (percolating or otherwise), lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or

non-navigable, and including the beds and banks of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the state or inside the jurisdiction of the state.

**Tracer**

A distinct component, or combination of components, of a polluting source which is identified in order to confirm the entry of a pollutant to a storm drainage system.

**Turbidity**

The lack of clarity in the water usually caused by suspended particulate and colloidal matter such as clay, silt, finely divided organic and inorganic matter, and plankton and other microscopic organisms. It is measured by interference to light penetration.

**Urbanized Area (UA)**

A land area containing one or more central places. The residential population is at least 50,000 with at least 1,000 people per square mile.

**Watershed**

A confluence of streams or rivers that drain a geographical area to a specified point.



## **Charcoal Packet Processing**

### **Equipment List**

Charcoal: Activated, Coconut, 8-12 Mesh,  
(Use 5 grams per packet)

Packets: Fiberglass mesh (18 x 14)  
Cut into 3.25" x 5.5" pieces, fold in half, fill with charcoal and heat seal or staple closed

KOH Solution: 5% potassium hydroxide dissolved in 70% isopropyl alcohol  
Elute each charcoal packet in 20 ml of solution

Liquid Tracing Dye: Fluorescein

Latex gloves

30 ml glass vials with screw caps

6 ounce whirl pack plastic bags (write on and puncture proof)

Black light

### **Packet Placement**

- Background charcoal packets need to be placed one week prior to dye testing
- Packets are placed at areas where dye is suspected to surface and should be in a shaded or dark location
- Background packets are retrieved and replaced with new test packets, dye is then introduced into the system. Background packets can be analyzed or frozen for later laboratory analysis

### **Packet Retrieval**

- Test packets are retrieved after one week and replaced with a second set of test packets
- Use new latex gloves at each site to prevent cross contamination
- Place each test packet in a separate whirl pak bag
- Label bag with the name of property or resident, retrieval date, and address or exact location

## **Charcoal packet processing and elution**

- Cut corner of test packet and empty charcoal into 30 ml glass vial. Add 20 ml KOH solution to vial
- Label vial with name of property or resident, date, and location with indelible ink
- Visually read the vial for the presence/absence of fluorescent dye within 24 hours of the elution. Take a second reading within 48 hours. This should be done for each packet, therefore there will be two (2) readings for each packet. The first and second reading should be done by different staff persons.
- If the results are difficult to determine, shine a strong beam of light through the sample, in a dark room, to look for fluorescence. Record the results as positive, flashlight positive, or negative.

## **Quality Control**

- When the KOH solution is prepared, use the following control procedure:
  - 1- Fill a 250 ml beaker with 150 ml of cold tap water. Submerge a charcoal packet in the beaker for 15 minutes
  - 2- Fill a second 250 ml beaker with 150 ml cold tap water and a drop of fluorescent dye. Submerge a charcoal packet in this beaker for 15 minutes
  - 3- Follow the elution instructions for both packets
  - 4- Record the results. The packet in the tap water should produce a negative result and the packet in the dye water should produce a positive result. If any other results are observed the quality of the KOH solution, charcoal, dye, etc. should be checked.
- Field duplicates should be completed on 10% of the samples. This means that two (2) packets should be placed together and the results compared for consistency. Place test packets side by side, not one in front of the other.
- All supplies that come into contact with the packets or elutant should be analyzed for tracer dyes prior to packet placement, ie. Placement anchors, glass vials, tape, markers, labels, etc.
- Charcoal packets should be constructed and stored in a way so they are not contaminated

## Optical Brightener Kit Checklist

### *For field:*

Small, dark (non-transparent) rubbermaid container (to hold contents below)  
Untreated cotton pads  
½ in. Wire mesh cages  
Monofilament fishing line (high test)  
Tent stakes  
Wire cutters  
Cable ties  
Zipper seal sandwich bags  
Hand sanitizer/ rubber gloves  
Unexposed, non-fluorescent labels

### *For interpreting results in office:*

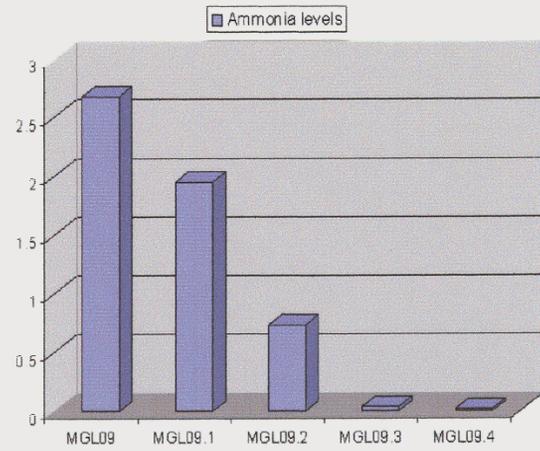
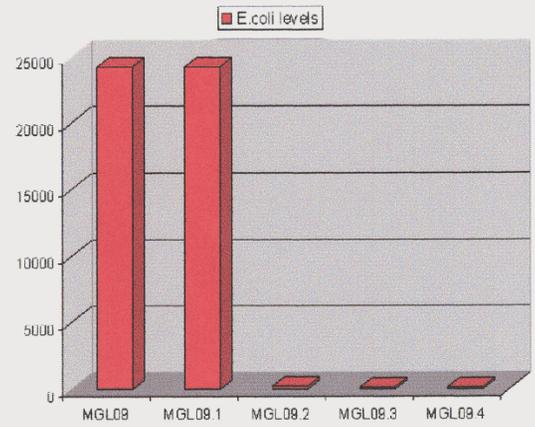
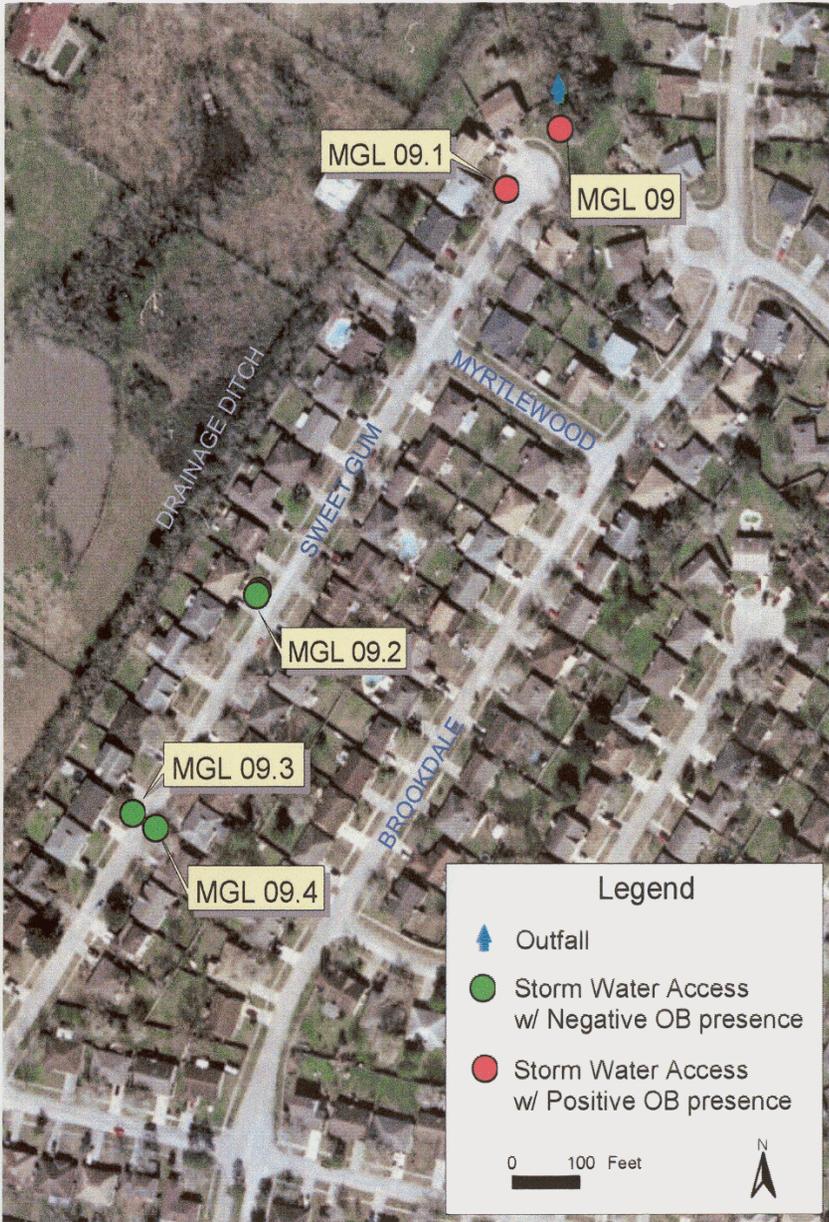
Long wave U.V 4-6 watt fluorescent lamp

### *For cleaning:*

Bucket  
Clorox  
Cleaning brush







Magnolia Creek Station MGL 09

## Sampling Equipment Checklist

Field Maps

Field data sheets

Waterproof marker

Handheld GPS (if available)

Sampling Bottles

Ice chest / Ice

Meters: YSI (DO), pH

Thermometer

Deionized water for cleansing meters after calibration

Bucket with rope

Telescoping sampling stick with attached sampling bottle

Rubber gloves and/or hand sanitizer

High beam cordless spotlight

Rubber boots / Waders

Manhole hooks

Traffic cones / Safety Vests

Spray paint

Cell phone / Two-way radios

Camera/film or Digital

Sunglasses, sunscreen, and bugspray

Other \_\_\_\_\_

Other \_\_\_\_\_

Other \_\_\_\_\_

**Run:**

**Collector:**

**Rain:**

**Wind Dir:**

**Date:**

**Sunrise:**

**Days  
Prior (72053):**

**Wind Spd:**

<b>Station</b>												
<b>Time</b>												
<b>Color (0080)</b>												
<b>Turbidity (82078)</b>												
<b>Sample Depth</b>												
<b>Flow (00061)</b>												
<b>Flow Severity(01351)</b>												
<b>Salinity (00480)</b>												
<b>Conductivity (00094)</b>												
<b>DO (00300)</b>												
<b>pH (00400)</b>												
<b>Air Temp. (00020)</b>												
<b>Water Temp.(00010)</b>												
<b>Observations</b>												

Data Entry Signature: \_\_\_\_\_

QA/QC Signature: \_\_\_\_\_

## Summary of Illicit Connection Investigation

Location of Illicit Connection (Address):

Contamination Effect: Pathogenic Toxic Nuisance  
(Circle all that apply)

Type of Connection: Direct Infiltration Inflow Other \_\_\_\_\_  
Comments:

Flow: Continuous Intermittent GPM's \_\_\_\_\_  
Comments:

Source of Flow: Sewage Potable Water Swimming Pool Other \_\_\_\_\_  
Comments:

Land Use: Residential Commercial Industrial Agricultural  
(Circle all that apply)

What tests were used:

What supplies are needed to fix the problem:

What are the estimated costs of remediation:

Responsibility: City/County/MUD Resident(Customer)  
Comments:

Name of Responsible Party:

if Resident Responsibility: Address: Phone #:

Who Discovered Flow: Citizen Complaint Inspector City Crew Other \_\_\_\_\_  
Comments:

Investigator: Date: Total Manhours:

**Table 1. Field Survey Parameters and Associated Non-Stormwater Flow Source Categories**

Parameter	Natural Water	Potable Water	Sanitary Wastewater	Septic Tank Effluent	Industrial Water	Wash Water	Rinse Water	Irrigation Water
Odor	-	-	+	+	+	+/-	-	-
Color	-	-	-	-	+	-	-	-
Turbidity	-	-	+	+	+	+	+/-	-
Vegetation	-	-	+	+	+	+/-	-	+
Deposit/Stains	-	-	+	-	+	+/-	+/-	-
Floatables	-	-	+	-	+	+/-	+/-	-
Structural Damage	-	-	-	-	+	-	-	-
Temperature Change	-	-	+/-	-	+	+/-	+/-	-
pH	-	-	-	-	+	-	-	-
Ammonia	-	-	+	+	-	-	-	-
Surfactants	-	-	+	-	-	+	-	-
Fluorescence	-	-	+	+	-	+	-	-
Conductivity	-	-	+	+	+	+/-	+	+

+ High Concentration Association  
 - Low Concentration Association  
 +/- Variable Concentration Association

\*Turner, Collie, and Braden Inc.

## Investigation Checklist

Field Maps

Field data sheets

Telescoping sampling stick with attached sampling bottle

Meters

- Ph meter

- DO / Specific Conductivity

Parameter Kits

- Chlorine

- Ammonia

- Phosphate

- Optical Brightener

Fluorescent Tracing Dye

Thermometer

Dye

Manhole hooks

Rubber gloves and/or hand sanitizer

High beam spotlight

Rubber boots

Traffic cones

Cell phone / Two-way radios

Sunglasses, sunscreen, and/or bugspray

Camera/film or Digital

Other \_\_\_\_\_

Other \_\_\_\_\_

Illicit Connections Detection and Elimination Tracer Summary Datasheet

	<b>SITE:</b>					
	<b>TIME:</b>					
	<b>DATE:</b>					
<b>Flow (GPM)</b>	<i>Value</i>					
<b>Turbidity</b>	<i>Value</i>					
<b>Odor</b>	<i>Pos/Neg</i>					
<b>Color</b>	<i>Pos/Neg</i>					
<b>Air Temp</b>	<i>Value</i>					
<b>Water Temp</b>	<i>Value</i>					
<b>pH level</b>	<i>Value</i>					
<b>Ammonia</b>	<i>Value</i>					
<b>Chlorine</b>	<i>Pos/Neg</i>					
<b>PO4</b>	<i>Pos/Neg</i>					
<b>Ecoli</b>	<i>Value</i>					
<b>OB's</b>	<i>Pos/Neg</i>					
<b>Dye Test</b>	<i>Pos/Neg</i>					
	<b>Observation</b>					

**APPENDIX 4 – CONSTRUCTION SITE RUNOFF CONTROL**

# **Storm Water Management Plan**

## **Storm Water MS4 Pollution Control Order**

Erosion and Sediment Control; Illicit Discharge; and  
Post-Construction

**Galveston County Health District**

**ORDER OF THE GALVESTON COUNTY HEALTH DISTRICT ADOPTING RULES  
FOR EROSION AND SEDIMENT CONTROL; ILLICIT DISCHARGE; AND POST-  
CONSTRUCTION**

**Whereas**, the Legislature has enacted legislation, codified as Code of Federal Regulations, Chapter 122, to implement the National Pollutant Discharge Elimination System (NPDES) Program;

**Whereas**, the EPA has delegated authority to issue MS4 storm water discharge permits, in Texas, to the State of Texas. Under the authority of the Texas Water Code and the CWA, the Texas Commission on Environmental Quality ("TCEQ") has issued on August 13, 2007, a Texas Discharge Elimination System ("TPDES") general permit to discharge waste from small MS4 systems to waters of the state (TPDES General Permit No. TXR040000).

**Whereas**, the Environmental Protection Agency (EPA) has established Design Criteria for Municipal Separate Storm Sewer System (MS4) permit holders to provide the citizens of this State with adequate public health protection and a minimum of environmental pollution;

**Whereas**, Chapter 122 of the Code of Federal Regulations authorizes a local governmental entity to implement and enforce rules to regulate the discharge of "pollutants" from any "point source" into "waters of the United States."

**Whereas**, the pollutants from storm water activities such as erosion and sediment control, illicit discharge, and post-construction within the jurisdiction of the Galveston County Health District (GCHD) is or may cause pollution or is or may injure public health;

**Whereas**, the Galveston County Health District has considered the matter and deems it appropriate to enact an order adopting rules regulating erosion and sediment control, illicit discharge, and post-construction to abate or prevent pollution or injury to public health within the jurisdiction of the Galveston County Health District.

**NOW THEREFORE, THIS ORDER OF THE GALVESTON COUNTY HEALTH DISTRICT ADOPTING RULES FOR EROSION AND SEDIMENT CONTROL; ILLICIT DISCHARGE; AND POST-CONSTRUCTION, IS HEREBY ADOPTED AS FOLLOWS:**

## **SECTION I: Erosion and Sediment Control**

### **A. PURPOSE AND INTENT**

During the construction process, soil is the most vulnerable to erosion by wind and water. This eroded soil endangers water resources by reducing water quality, and causing the siltation of aquatic habitat for fish and other desirable species. Eroded soil also necessitates repair of sewers and ditches, and the dredging of lakes. In addition, clearing grading during construction causes the loss of native vegetation necessary for terrestrial and aquatic habitat, and to provide a healthy living environment for the citizens of Galveston County.

As a result, the purpose of this local Order is to safeguard persons, protect property, prevent damage to the environment and promote the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity which disturbs or breaks the topsoil or results in the movement of earth on land within the jurisdiction of the Galveston County Health District..

### **B. DEFINITIONS**

For the purpose of this Order, the following terms shall mean:

1. Clearing – Any activity which removes the vegetative surface cover.
2. Drainage Way – Any channel that conveys surface runoff throughout the site.
3. Erosion Control – Measures that prevent erosion.
4. Erosion and Sediment Control Plan – A set of plans prepared by or under the direction of a licensed professional engineer indicating the specific measures and sequencing to be used controlling sediment and erosion on a development site before, during, and after construction.
5. Grading – Excavation or fill of material, including the resulting conditions thereof.
6. Perimeter Control – A barrier that prevents sediment from leaving a site either by filtering sediment-laden runoff, or diverting it to a sediment trap or basin.
7. Phasing – Clearing a parcel of land in distinct phases, with the stabilization of each phase before the clearing of the next.
8. Sediment Control – Measures that prevent eroded sediment from leaving the site.
9. Settling basin- A basin, in a water conduit, which allows suspended debris, sand, etc., to settle.
10. Site – A parcel of land, or a contiguous combination thereof, where grading work is performed as a single unified operation.
11. Site Development Permit – A permit issued by the Galveston County Health District for

which the construction or alteration of ground improvements and structures for the control of erosion, runoff and grading.

12. Stabilization – The use of practices that prevent exposed soil from eroding.
13. Start of Construction – The first land-disturbing activity associated with a development, including land preparation such as clearing, grading and filling; installation of streets and walkways; excavation for basements, footings, piers or foundations; erection of temporary forms; and installation of accessory buildings such as garages.
14. Watercourse – Any body of water, including, but not limited to lakes, ponds, rivers, streams, and other bodies of water.
15. Waterway – A channel that directs surface runoff to a watercourse, or to the public storm drain.

### **C. APPLICABILITY**

1. This Order shall apply to all Construction Sites within the jurisdiction of the Galveston County Health District.
2. Sites disturbing more than one (1) acre or within a Common Plan of Development that is disturbing more than one (1) acre of land shall comply with all aspects of this Order.
3. Landowners or land users who conduct development within the area subject to the jurisdiction of this Order shall be allowed to conduct such activities without obtaining a permit if the development falls within any one of the following subsections:
  - a. Construction of a single-family residence or associated structure, regardless of the acreage involved
  - b. Operation and maintenance of agricultural entities such as orchards, cultivated crops, pastures, rangelands, and other non-point source agricultural activities.

### **D. PERMITS**

1. No person shall be granted a site development permit for land-disturbing activity which would require the uncovering of one (1) acre without the approval of an Erosion and Sediment Control Plan by the Galveston County Health District.
  - a. No site development permit is required for the following activities:
    - (1) Any emergency activity which is immediately necessary for the protection of life, property or natural resources.
  - b. Each application shall bear the name(s) and address(es) of the owner or developer of the site and of any consulting firm retained by the applicant. Each application must include the name of a principal contact for the owner or developer and consulting firm.
  - c. Each application shall include a statement that any land clearing, construction, or

development involving the movement of earth shall be in accordance with the Erosion and Sediment Control Plan.

2. Review and approval

a. Galveston County Health District will review each application for a site development permit to determine its conformance with the provisions of this Order. Within thirty (30) days after receiving an application, Galveston County Health District shall, in writing:

(1) approve the permit application;

(2) approve the permit application subject to such reasonable conditions as may be necessary to secure substantially the objectives of this Order, and issue the permit subject to these conditions; or

(3) disapprove the permit application, indicating the deficiencies and the procedure for submitting a revised application and/or submission.

(4) Pay all applicable permit fees approved by the Galveston County Board of Health.

b. Failure of the Galveston County Health District to act on original or revised applications within thirty (30) days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and Galveston County Health District. Pending preparation and approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by Galveston County Health District.

**E. EROSION AND SEDIMENT CONTROL PLAN**

1. The Erosion and Sediment Control Plan shall include:

a. Contact Information

The name, address, and telephone number of all persons having a legal interest in the property and the tax reference number and parcel number of the property or properties affected.

b. Topographic Base Map

A 1" = 200' topographic base map of the site and indicates existing surface water drainage including streams, ponds, culverts, ditches, and wetlands; current land use including all existing structures; locations of utilities, roads, and easements; and significant natural and manmade features not otherwise shown.

c. Construction Plan

A plan with estimated start dates for the construction of the development site, including dates for stripping and clearing, rough grading, construction of utilities, infrastructure, and buildings, and final grading and landscaping.

d. Maintenance and Repair Plan

The design and planning of all stormwater management facilities shall include detailed maintenance and repair procedures to ensure their continued function. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment and skills or training necessary. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan.

e. Maintenance Easements

The applicant must ensure access to all stormwater treatment practices at the site for the purpose of inspection and repair by securing all the maintenance easements needed on a permanent basis. These easements will be recorded with the plan and will remain in effect even with transfer of title to the property.

f. Erosion and Sediment Control Plans for Construction of Stormwater Management Measures

All erosion and sediment control measures necessary to meet the objectives of this Order throughout all phases of construction and permanently, after completion of development of the site. Depending upon the complexity of the project, the drafting of intermediate plans may be required at the close of each project

g. Seeding

Any seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures.

h. Other Environmental Permits

The applicant shall assure that all other applicable environmental permits have been acquired for the site prior to approval of the final stormwater design plan.

2. Modifications to the plan

a. Amendments of the erosion and sediment control plan shall be submitted to Galveston County Health District and shall be processed and approved, or disapproved, in the same manner as the original plans.

**F. DESIGN REQUIREMENTS**

1. Clearing and Grading

Clearing and grading of natural resources, such as forests and wetlands, shall not be permitted, except when in compliance all other applicable local, state, or federal regulations.

- a. Phasing shall be required on all sites disturbing greater than thirty acres, with the size of each phase to be established at plan review and as approved by Galveston County Health District.
- b. Clearing, except that necessary to establish sediment control devices, shall not begin until all sediment control devices have been installed and have been stabilized.

- c. Cut and fill slopes shall be no greater than 2:1, except as approved by the Galveston County Health District to meet other community or environmental objectives. Grading shall meet the design criteria set forth in applicable local, state, or federal regulations.
2. Erosion Control
  - a. If vegetative erosion control methods, such as seeding, have not become established within two weeks, Galveston County Health District may require that the site be reseeded, or that a non-vegetative option be employed.
  - b. On steep slopes or in drainage ways, special techniques that meet the design criteria outlined in *Galveston County Drainage District # 1 Drainage Criteria Manual* shall be used to ensure stabilization.
  - c. Soil stockpiles must be stabilized or covered at the end of each work day or located within the protection of temporary erosion controls such as silt fencing or another method that does not require germination to control erosion.
3. Sediment Controls
  - a. Sediment controls shall be provided in the form of settling basins, the use of hay bales, silt fencing, mulch, or any other method approved by the Galveston County Health District for perimeter controls.
  - b. Controls shall be provided to prevent the runoff from soil stockpiles.
  - c. Where possible, settling basins shall be designed in a manner that allows adaptation to detention ponds to provide long term storm water management.
4. Construction Site Access
  - a. A temporary access road shall be provided at all sites.
  - b. Other measures may be required at the discretion of Galveston County Health District in order to ensure that sediment is not tracked onto public streets by construction vehicles, or washed into storm drains.

## **G. WATERWAYS AND WATERCOURSES**

1. All on-site stormwater conveyance channels shall be designed according to the criteria outlined in the *Galveston County Drainage District # 1 Drainage Criteria Manual*.
  - a. Stabilization adequate to prevent erosion must be provided at the outlets of all pipes and paved channels.

## **H. AUTHORITY TO INSPECT**

1. Galveston County Health District shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the permittee wherein the work fails

to comply with the erosion and sediment control plan as approved. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the Galveston County Health District shall be maintained at the site during the progress of the work. In order to obtain inspections, the permittee shall notify Galveston County Health District at least two (2) working days before the following:

- (1) Start of Construction
  - (2) Erosion and sediment control measures are in place and stabilized
  - (3) End of Construction
  - (4) Final Landscaping
2. The permittee or his/her agent shall make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved erosion and sediment control plan(s). The purpose of such inspections will be to determine the overall effectiveness of the control plan, and the need for additional control measures. All inspections shall be documented in written form and submitted to Galveston County Health District at the time interval specified in the approved permit.
  3. Galveston County Health District shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed under 2.

## **SECTION II: Illicit Discharge**

### **A. PURPOSE AND INTENT**

The purpose and intent of this Order is to ensure the health, safety, and general welfare of citizens, and protect and enhance the water quality of watercourses and water bodies in a manner pursuant to and consistent with the Federal Clean Water Act (33 U.S.C. §1251 et seq.) by reducing pollutants in storm water discharges to the maximum extent practicable and by prohibiting non-storm water discharges to the storm drain system.

### **B. DEFINITIONS**

For the purpose of this Order, the following terms shall mean:

1. Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to storm water, receiving waters, or storm water conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.
2. Clean Water Act - The Federal Water Pollution Control Act (33 U.S.C. § 125 1 et seq.), and any subsequent amendments thereto.
3. Construction Activity - Activities subject to NPDES and TPDES Construction Permits. Formerly these included construction projects resulting in land disturbance of five (5) acres or more. As of March 2003, NPDES and TPDES Storm Water Phase I permits have been required for construction projects resulting in land disturbance of one (1) acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.
4. Hazardous Materials - Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.
5. Illegal Discharge - Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section 8 of this Order.
6. Illicit Connections - An illicit connection is defined as either of the following:
  - a) Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency; or

- b) Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or, equivalent records and approved by an authorized enforcement agency.
7. Industrial Activity - Activities subject to NPDES and TPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).
  8. Municipal Separate Storm Sewer System (MS4) - A conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains, that is:
    - a) Owned or operated by a:
      - 1) Federal, state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over storm water, including special districts under state law such as a sewer district, flood control district, or drainage district, or similar entity, or a designated and approved management agency under Section 208 of the Clean Water Act (33 U.S.C. 1288) that discharges into waters of the state; or
      - 2) Privately owned storm water utility, hospital, university, or college having jurisdiction over storm water that discharges into waters of the state.
    - b) Designed or used for collecting or conveying storm water; and
    - c) Not a combined sewer; and
    - d) Not part of a publicly owned treatment works (POTW) as defined by 40 C.F.R. 122.2.
  9. National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit - Means a permit issued by the United States Environmental Protection Agency (USEPA) (or by a State under authority delegated pursuant to 33 USC 5 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.
  10. Non-Storm Water Discharge - Any discharge to the storm drain system that is not composed entirely of storm water.
  11. Order - This Storm Water Illicit Discharge and Connection Order.
  12. Person - Any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.
  13. Pollutant - Anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; nonhazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, policies, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform, E. coli, and pathogens; dissolved and particulate metals; animal

wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

14. Premises - Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.
15. Publicly Owned Treatment Works (POTW) - Publicly-owned water or wastewater treatment facilities.
16. Storm Drainage System - Publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, closed conduit storm drains, pumping facilities, manholes, junction boxes, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.
17. Storm Water - Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.
18. Storm Water Pollution Prevention Plan - A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to Storm Water, Storm Water Conveyance Systems, and/or Receiving Waters to the Maximum Extent Practicable.
19. Texas Pollution Discharge Elimination System (TPDES) Storm Water Discharge Permit – Permit issued by the Texas Commission of Environmental Quality (TCEQ) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.
20. Wastewater - Any water or other liquid, other than uncontaminated storm water, discharged from a facility.
21. Waters of the United States - Any waterway in the United States including rivers, lakes, ponds, streams, seas, and canals as defined by the U.S. Army Corps of Engineers.

### **C. APPLICABILITY**

This Order shall apply to all water entering the storm drain system generated on any developed and undeveloped lands within the jurisdiction of the Galveston County Health District.

### **D. RESPONSIBILITY FOR ADMINISTRATION**

The Galveston County Health District shall administer, implement, and enforce the provisions of this Order.

## **E. ULTIMATE RESPONSIBILITY**

The standards set forth herein and promulgated pursuant to this Order are minimum standards; therefore this Order does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

## **F. DISCHARGE PROHIBITIONS**

### **1. PROHIBITION OF ILLEGAL DISCHARGES**

No person shall discharge or cause to be discharged into the MS4 or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

- a. The following discharges are exempt from discharge prohibitions established by this Order: potable water line flushing; uncontaminated pumped groundwater and other discharges from potable water sources; landscape irrigation and lawn watering; diverted stream flows; rising groundwater; groundwater infiltration to the storm drain system; uncontaminated foundation and footing drains; uncontaminated water from crawl space pumps; air conditioning condensation; uncontaminated nonindustrial roof drains; springs; individual residential car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; street wash waters; and flows from fire fighting.
- b. Discharges specified in writing by the Galveston County Health District as being necessary to protect public health and safety.
- c. The prohibition shall not apply to any non-storm water discharge permitted under an NPDES or TPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the USEPA or TCEQ, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for the discharge to the storm drain system.

### **2. PROHIBITION OF ILLICIT CONNECTIONS**

- a. The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.
- b. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
- c. A person is considered to be in violation of this Order if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

## **G. SUSPENSION OF MS4 ACCESS**

### **1. SUSPENSION DUE TO ILLICIT DISCHARGES IN EMERGENCY SITUATIONS**

The Galveston County Health District may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the Galveston County Health District may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

### **2. SUSPENSION DUE TO THE DETECTION OF ILLICIT DISCHARGE**

Any person discharging to the MS4 in violation of this Order may have their MS4 access terminated if such termination would abate or reduce an illicit discharge. The Galveston County Health District will notify a violator of the proposed termination of its MS4 access. The violator may petition the Galveston County Health District for a reconsideration and hearing. A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the Galveston County Health District.

## **H. WASTE DISPOSAL PROHIBITIONS**

No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, left, or maintained, in or upon any public or private property, driveway, parking area, street, alley, sidewalk, component of the storm drain system, or Waters of the United States, any refuse, rubbish, garbage, litter, or other discarded or abandoned objects, articles, and accumulations, so that the same may cause or contribute to pollution. Wastes deposited in streets in proper waste receptacles for the purposes of collection are exempted from this prohibition.

## **I. DISCHARGES IN VIOLATION OF NPDES OR TPDES STORM WATER DISCHARGE PERMIT**

Any person subject to an NPDES or TPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the Galveston County Health District prior to or as a condition of a subdivision map, site plan, building permit, or development or improvement plan; upon inspection of the facility; during any enforcement proceeding or action; or for any other reasonable cause.

A person who is the operator of a facility commits an offense if the person discharges, or causes to be discharged, storm water associated with construction activity without first having obtained a NPDES or TPDES permit to do so.

## **J. MONITORING OF DISCHARGES**

### **1. APPLICABILITY**

This section applies to all facilities that have storm water discharges associated with construction activity.

## 2. ACCESS TO FACILITIES

- a. The Galveston County Health District shall be permitted to enter and inspect facilities subject to regulation under this Order as often as may be necessary to determine compliance with this Order. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of Galveston County Health District.
- b. Facility operators shall allow the Galveston County Health District ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES or TPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.
- c. The Galveston County Health District shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the Galveston County Health District to conduct monitoring and/or sampling of the facility's storm water discharge.
- d. Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the facility operator at the written or oral request of the Galveston County Health District and shall not be replaced. The costs of clearing such access shall be borne by the discharger.
- e. Unreasonable delays in allowing the Galveston County Health District access to a permitted facility is a violation of a storm water discharge permit and of this Order. A person who is the operator of a facility with a NPDES or TPDES permit to discharge storm water associated with construction activity commits an offense if the person denies the Galveston County Health District reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this Order.

## **K. REQUIREMENT TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTANTS BY THE USE OF BEST MANAGEMENT PRACTICES (BMP)**

The operator of a facility will develop Best Management Practices (BMPs) for any activity, operation, process, or operation identified at the facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or Waters of the United States. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and nonstructural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES or TPDES permit authorizing the discharge of storm water associated with construction activity, to the extent practicable, shall be deemed compliance with the provisions of this section.

### 1. SUBMISSION OF NOI TO THE GALVESTON COUNTY HEALTH DISTRICT

- a. A person who is the operator of a facility, including construction sites, required to have a NPDES or TPDES permit to discharge storm water associated with construction activity shall submit a copy of the Notice of Intent (NOI) to the Galveston County Health District at the same time the operator submits the original Notice of Intent to the EPA or the TCEQ as applicable.

### 3. COMPLIANCE WITH PERMIT

- a. A facility shall be operated in strict compliance with the requirements of its NPDES or TPDES permit to discharge storm water associated with construction activity.

## **L. REQUIREMENT TO ELIMINATE ILLEGAL DISCHARGES**

Notwithstanding the requirements of this Order, the Galveston County Health District may require by written notice that a person responsible for an illegal discharge immediately, or by a specified date, discontinue the discharge and, if necessary, take measures to eliminate the source of the discharge to prevent the occurrence of future illegal discharges.

## **M. REQUIREMENT TO ELIMINATE OR SECURE APPROVAL FOR ILLICIT CONNECTIONS**

The Galveston County Health District may require by written notice that a person responsible for an illicit connection to the storm drain system comply with the requirements of this Order to eliminate or secure approval for the connection by a specified date, regardless of whether or not the connection or discharges to it had been established or approved prior to the effective date of this Order.

If, subsequent to eliminating a connection found to be in violation of this Order, the responsible person can demonstrate that an illegal discharge will no longer occur, said person may request the Galveston County Health District's approval to reconnect. The reconnection or reinstallation of the connection shall be at the responsible person's expense.

## **N. WATERCOURSE PROTECTION**

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property reasonably free of trash, debris, fill, grass clippings, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse. The owner or lessee shall not remove healthy bank vegetation beyond that actually necessary for maintenance, nor remove said vegetation in such a manner as to increase the vulnerability of the watercourse to erosion.

## **O. REQUIREMENT TO REMEDIATE**

Whenever the Galveston County Health District finds that a discharge of pollutants is taking place or has occurred which will result in or has resulted in pollution of storm water, the storm

drain system, or Waters of the United States, the Galveston County Health District may require by written notice to the owner of the property and/or the responsible person that the pollution be remediated and the affected property restored within a specified time.

**P. REQUIREMENT TO MONITOR AND ANALYZE**

The Galveston County Health District may require by written notice of requirement that any person engaged in any activity and/or owning or operating any facility which may cause or contribute to storm water pollution, illegal discharges, and/or non-storm water discharges to the storm drain system or Waters of the United States, to undertake at said person's expense such monitoring and analyses and furnish such reports to the Galveston County Health District as deemed necessary to determine compliance with this Order.

**Q. NOTIFICATION OF SPILLS**

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or Waters of the United States from said facility, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of a hazardous material said person shall immediately notify emergency response officials of the occurrence. In the event of a release of non-hazardous materials, said person shall notify the Galveston County Health District in person or by phone, facsimile, or email no later than 5:00 p.m. of the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the Galveston County Health District within three (3) business days of the phone notice.

If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three (3) years from the date of such discharge notification.

**R. AUTHORITY TO INSPECT**

Whenever necessary to make an inspection to enforce any provision of this Order, or whenever the Galveston County Health District has cause to believe that there exists, or potentially exists, in or upon any premises any condition which constitutes a violation of this Order, the Galveston County Health District and/or the Drainage District #1 may enter such premises at all reasonable times to inspect the same and to inspect and copy records related to storm water compliance. In the event the owner or occupant refuses entry after a request to enter and inspect has been made, the Galveston County Health District and/or the Drainage District #1 is hereby empowered to seek assistance from any court of competent jurisdiction in obtaining such entry.

**S. AUTHORITY TO SAMPLE, ESTABLISH SAMPLING DEVICES, AND TEST**

During any inspection as provided herein, the Galveston County Health District may take any samples and perform any testing deemed necessary to aid in the pursuit of the inquiry or to record site activities.

## **SECTION III: Post-Construction**

### **A. PURPOSE AND INTENT**

The purpose of this Order is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within this jurisdiction. This Order seeks to meet that purpose through the following objectives:

1. Minimize increases in stormwater runoff from any development in order to reduce flooding, siltation, increases in stream temperature, and streambank erosion and maintain the integrity of stream channels;
2. Minimize increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality;
3. Minimize the total annual volume of surface water runoff which flows from any specific site during and following development to not exceed the pre-development hydrologic regime to the maximum extent practicable;

Reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, through stormwater management controls and to ensure that these management controls are properly maintained and pose no threat to public safety.

### **B. DEFINITIONS**

1. Accelerated Erosion – erosion caused by development activities that exceeds the natural processes by which the surface of the land is worn away by the action of water, wind, or chemical action.
2. Applicant – a property owner or agent of a property owner who has filed an application for a storm water management permit.
3. Building – any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal, or property, and occupying more than 100 square feet of area.
4. Channel – a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.
5. Dedication – the deliberate appropriation of property by its owner for general public use.
6. Detention – the temporary storage of storm runoff in a stormwater management practice with the goals of controlling peak discharge rates and providing gravity settling of pollutants.

7. Detention Facility – a detention basin or alternative structure designed for the purpose of temporary storage of stream flow or surface runoff and gradual release of stored water at controlled rates.
8. Developer – a person who undertakes land disturbance activities.
9. Drainage Easement – a legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.
10. Erosion and Sediment Control Plan – a plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities.
11. Hotspot – an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.
12. Hydrologic Soil Group (HSG) – a Natural Resource Conservation Service classification system in which soils are categorized into four runoff potential groups. The groups range from A soils, with high permeability and little runoff production, to D soils, which have low permeability rates and produce much more runoff.
13. Impervious Cover – those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, driveways, etc).
14. Industrial Stormwater Permit – a National Pollutant Discharge Elimination System permit issued to a commercial industry or group of industries which regulates the pollutant levels associated with industrial stormwater discharges or specifies on-site pollution control strategies.
15. Infiltration – the process of percolating stormwater into the subsoil.
16. Infiltration Facility – any structure or device designed to infiltrate retained water to the subsurface. These facilities may be above grade or below grade.
17. Jurisdictional Wetland – an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.
18. Land Disturbance Activity – any activity which changes the volume or peak flow discharge rate of rainfall runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation,, or any activity which bares soil or rock or involves the diversion or piping of any natural or man-made watercourse.
19. Landowner – the legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding proprietary rights in the land.

20. Maintenance Agreement – a legally recorded document that acts as a property deed restriction, and which provides for long-term maintenance of storm water management practices.
21. Nonpoint Source Pollution – pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include, but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.
22. Off-Site Facility – a stormwater management measure located outside the subject property boundary described in the permit application for land development activity.
23. On-Site Facility – a stormwater management measure located within the subject property boundary described in the permit application for land development activity.
24. Recharge – means the replenishment of underground water reserves.
25. Redevelopment – any construction, alteration or improvement exceeding one acre in areas where existing land use is high density commercial, industrial, institutional or multi-family residential.
26. Stop Work Order – an order issued which requires that all construction activity on a site be stopped.
27. Storm Water Management – the use of structural or non-structural practices that are designed to reduce storm water runoff pollutant loads, discharge volumes, peak flow discharge rates and detrimental changes in stream temperature that affect water quality and habitat.
28. Storm Water Retrofit – a stormwater management practice designed for an existing development site that previously had either no stormwater management practice in place or a practice inadequate to meet the stormwater management requirements of the site.
29. Stormwater Runoff – flow on the surface of the ground, resulting from precipitation.
30. Stormwater Treatment Practices (STPs) – measures, either structural or nonstructural, that are determined to be the most effective, practical means of preventing or reducing point source or nonpoint source pollution inputs to stormwater runoff and water bodies.
31. Water Quality Volume (WQ<sub>v</sub>) – the storage needed to capture and treat 90% of the average annual stormwater runoff volume. Numerically (WQ<sub>v</sub>) will vary as a function of long term rainfall statistical data.
32. Watercourse – a permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.

### **C. APPLICABILITY**

This Order shall be applicable to all subdivision or site plan applications, unless eligible for an exemption or granted a waiver. The Order also applies to land development activities that are

smaller than the minimum applicability criteria if such activities are part of a larger common plan of development that meets the following applicability criteria, even though multiple separate and distinct land development activities may take place at different times on different schedules. In addition, all plans must also be reviewed by the Galveston County Health District to ensure that established water quality standards will be maintained during and after development of the site and that post-construction runoff levels are consistent with any local and regional watershed plans.

#### **D. GENERAL PERFORMANCE CRITERIA FOR STORM WATER MANAGEMENT**

Unless judged by the Galveston County Health District to be exempt or granted a waiver, the following performance criteria shall be addressed for stormwater management at all sites:

1. All site designs shall establish stormwater management practices to control the peak flow rates of stormwater discharge associated with specified design storms and reduce the generation of stormwater. These practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots, and landscaped areas to the maximum extent practical to provide treatment for both water quality and quantity.
2. All stormwater runoff generated from new development shall not discharge untreated stormwater directly into a jurisdictional wetland or local water body without adequate treatment. Where such discharges are proposed, the impact of the proposal on wetland functional values shall be in compliance with the Army Corp of Engineers (ACE) and the Texas Commission on Environmental Quality (TCEQ).
3. For new development, structural stormwater treatment practices (STP) shall be designed to remove 80% of the average annual post development total suspended solids load (TSS). It is presumed that a STP complies with this performance standard if it is:
  - a. sized to capture the prescribed water quality volume (WQ<sub>v</sub>),
  - b. designed according to the specific performance criteria outlined in any applicable design manual,
  - c. constructed properly, and
  - d. maintained regularly.
4. Stormwater discharges to critical areas with sensitive resources (i.e., cold water fisheries, shellfish beds, swimming beaches, recharge areas, water supply reservoirs) may be subject to additional performance criteria, or may need to utilize or restrict certain stormwater management practices.
5. Prior to design, applicants are required to consult with the Galveston County Health District to determine if they are subject to additional stormwater design requirements.

## **E. REQUIREMENTS FOR STORM WATER MANAGEMENT PLAN APPROVAL**

### **1. Stormwater Management Plan Required for All Developments.**

No application for development will be approved unless it includes a stormwater management plan detailing in concept how runoff and associated water quality impacts resulting from the development will be controlled or managed. The stormwater management plan(s) shall be referred for comment to all other interested agencies, and any comments must be addressed in a final stormwater management plan. This final plan must be signed by a licensed professional engineer (PE), who will verify that the design of all stormwater management practices meet the submittal requirements outlined in the stormwater design manual. No building, grading, or sediment control permit shall be issued until a satisfactory final stormwater management plan, or a waiver thereof, shall have undergone a review and been approved by the Galveston County Health District after determining that the plan or waiver is consistent with the requirements of this Order.

### **2. Stormwater Management Concept Plan Requirements**

A stormwater management concept plan shall be required with all permit applications and will include sufficient information (e.g., maps, hydrologic calculations, etc) to evaluate the environmental characteristics of the project site, the potential impacts of all proposed development of the site, both present and future, on the water resources, and the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. The intent of this conceptual planning process is to determine the type of stormwater management measures necessary for the proposed project, and ensure adequate planning for management of stormwater runoff from future development. To accomplish this goal the following information shall be included in the concept plan:

- a. A map (or maps) indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural stormwater management and sediment control facilities. The map(s) will also clearly show proposed land use with tabulation of:
  - 1) the percentage of surface area to be adapted to various uses;
  - 2) drainage patterns; locations of utilities, roads and easements;
  - 3) a written description of the site plan and justification of proposed changes in natural conditions may also be required.
- b. Sufficient engineering analysis to show that the proposed stormwater management measures are capable of controlling runoff from the site in compliance with this Order.

- c. A written or graphic inventory of the natural resources at the site and surrounding area as it exists prior to the commencement of the project and a description of the watershed and its relation to the project site. Particular attention should be paid to environmentally sensitive features that provide particular opportunities or constraints for development.

For development or redevelopment occurring on a previously developed site, an applicant shall be required to include within the stormwater concept plan measures for controlling existing stormwater runoff discharges from the site in accordance with the standards of this Order to the maximum extent practicable.

#### **F. FINAL STORM WATER MANAGEMENT PLAN REQUIREMENTS**

After review of the stormwater management concept plan, and modifications to that plan as deemed necessary by the Galveston County Health District and the Drainage District #1, a final stormwater management plan must be submitted for approval .

## **SECTION IV: Enforcement**

### **A. NOTICE OF VIOLATION**

Whenever the Galveston County Health District finds that a person has violated a prohibition or failed to meet a requirement of this Order, the Galveston County Health District may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

- (1) The performance of monitoring, analyses, and reporting;
- (2) The elimination of illicit connections or discharges;
- (3) That violating discharges, practices, or operations shall cease and desist;
- (4) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and
- (5) The implementation of source control or treatment BMPs.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Such notice shall be given by personal delivery or by mail to the last known address of the owner. Such notice shall be effective upon the date of mailing or personal delivery.

### **B. APPEAL OF NOTICE OF VIOLATION**

Any person receiving a Notice of Violation may appeal to Dr. Harlan “Mark” Guidry, MD, MPH, CEO and Health Authority, Galveston County Health District, PO Box 939, La Marque, TX 77568. The notice of appeal must be received in writing within five (5) days from the date of the Notice of Violation. The outcome of the appeal will be issued in writing within 30 days of the receipt of the appeal.

### **C. ENFORCEMENT MEASURES AFTER APPEAL**

If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or, in the event of an appeal, within ten (10) days of the decision of the appeal upholding the decision of the Galveston County Health District, Air and Water Pollution Services, the Galveston County Health District will seek all available legal remedies to enjoin a facility from operating. Any offense under this section is a Class C misdemeanor and each day on which a violation occurs constitutes a separate offense.

### **D. INJUNCTIVE RELIEF**

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Order. If a person has violated or continues to violate the provisions of this Order, the Galveston County Health District may petition for a preliminary or permanent injunction restraining the person from activities which would, create further violations or compelling the person to perform abatement or remediation of the violation.

**E. REMEDIES NOT EXCLUSIVE**

The remedies listed in this Order are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the Galveston County Health District to seek cumulative remedies.

**SECTION V: Effective Date:**

The provisions of this order shall take effect thirty (30) days from adoption by the Galveston County United Board of Health.

INTRODUCED, READ AND PASSED BY AN AFFIRMATIVE VOTE BY THE GALVESTON COUNTY UNITED BOARD OF HEALTH of the GALVESTON COUNTY HEALTH DISTRICT on this the \_\_\_\_ day of \_\_\_\_ 2012.

PASSED AND APPROVED the \_\_\_\_ day of \_\_\_\_, 2012.

APPROVED:

\_\_\_\_\_  
Chairman,  
Galveston County United Board of Health

Signed before me this \_\_\_\_ day of \_\_\_\_, 2012.

\_\_\_\_\_  
Notary Public for the State of Texas

**APPENDIX 5 – POST-CONSTRUCTION RUNOFF CONTROL**

July 2008

# Managing Stormwater in Your Community

## A Guide for Building an Effective Post-Construction Program



CENTER FOR  
**WATERSHED**  
PROTECTION

EPA Publication No: 833-R-08-001

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Post-Construction Program

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# Managing Stormwater in Your Community

## A Guide for Building an Effective Post-Construction Program

David J. Hirschman, *Center for Watershed Protection, Inc.*

John Kosco, PE, *Tetra Tech, Inc.*

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Local stormwater managers in 94 communities who responded to the post-construction research tool.

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## Foreword

Stormwater management is witnessing a growth in creative approaches. Stormwater managers across the country are incorporating stormwater treatment into landscapes and streetscapes. Stormwater is being captured and reused for a variety of beneficial uses. Stormwater treatment is being incorporated from the rooftop to the conveyance system to the stream edge. Stormwater is being integrated with land use plans to enhance community benefits and water quality. A variety of professionals—engineers, landscape architects, community planners, hydrologists, and public works staff (to name a few)—are now engaged in the challenge of managing stormwater in innovative ways.

At the same time, many communities are trying to build adequate programs to meet regulatory and community demands. Stormwater managers are trying to tackle complex issues with limited budgets and staffing.

In putting together the guide, we have polled local stormwater managers from across the country and gleaned important lessons and tips. It is our hope that this guide will provide stormwater professionals with practical guidance, insights, and tools to build effective programs.

The guide is accompanied by several downloadable “tools.” The tools are designed to be used and modified by local stormwater managers to help with program implementation. The tools are described in more detail in Chapter 1, and can also be downloaded from the Center for Watershed Protection at [www.cwp.org/postconstruction](http://www.cwp.org/postconstruction).

**A note on web links:** We have provided numerous web links within the document to ease the task of finding relevant resources. However, links tend to become unreliable through time, especially for references to individual documents (such as pdfs). If you find a broken link, try to shorten the link to the relevant agency or department name to search for the document or page. Also, contact [center@cwp.org](mailto:center@cwp.org) to report broken links.

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**References**

*The following electronic tools are available at [www.cwp.org/postconstruction](http://www.cwp.org/postconstruction):*

- Tool 1 – Post-Construction Stormwater Program Self-assessment
- Tool 2 – Program and Budget Planning Tool
- Tool 3 – Post-Construction Stormwater Model Ordinance
- Tool 4 – Codes and Ordinances Worksheet
- Tool 5 – Manual Builder
- Tool 6 – Checklists
- Tool 7 – Performance Bond Tool
- Tool 8 – BMP Evaluation Tool

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**APPENDIX 6 – POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL  
OPERATIONS**

# What to do When a Spill Occurs

Identify spilled product. If you are NOT familiar with the liquid and its chemical properties, vacate the area and contact proper authorities.



## 1. Risk Assessment

Evaluate the type of material spilled and identify the source.

## 2. Protective Clothing

Wear the appropriate protective gear for the situation. If the source or the material are not identifiable assume the worst.



## 3. Containment

Contain the liquid and seal drains

## 4. Stop the Source

Close valves, rotate punctured drums and plug leaks where it is possible and safe to do so.



## 5. Begin Clean Up

Use XtremeSorb sorbents to absorb spilled liquids.

## 6. Contact Authorities

Report the spill to the proper legal authorities in your community. Be sure to fill out all necessary reports in accordance with local laws.



## 7. Disposal of Used Material

Absorbent materials take on the characteristics of whatever they absorb. Be sure to dispose of used absorbents and spilled liquids in accordance with local laws



## 8. Decontaminate

Clean all tools and reusable materials properly before reuse.

## 9. Restock Materials

Replace absorbent materials and safety equipment used in any clean up operation.



## 10. Review Contingency Plans and Procedures!

PLEASE NOTE: AN XtremeSorb SPILL KIT IS A STOP-GAP MEASURE FOR MINOR SPILL CLEAN-UP. IF A SERIOUS SPILL OCCURS, CONTACT LOCAL AUTHORITIES FOR DIRECTION AND ASSISTANCE FOR THE PROBLEM.

DUE TO THE POSSIBLE TOXIC AND HAZARDOUS FLUIDS ABSORBED,  
SETON DOES NOT RECOMMEND DISPOSAL PROCEDURES.

# Preventing Storm Water Pollution: *What We Can Do*

~Employee Training Series~  
**Materials Storage and Spill Cleanup**

PREPARED IN COOPERATION WITH THE Texas Commission on Environmental Quality AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
The preparation of this report was financed through grants from the  
U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

1

## Materials Storage and Spill Cleanup

- Employees can help reduce waste and water pollution by making sure materials aren't spilled or washed into the storm drain system.
  - Store and Handle Materials Safely
  - Clean Up Spills Properly

2

## Store and Handle Materials Safely

3

## Store and Handle Materials Safely

- Read and follow label or MSDS instructions and local procedures for all materials that you use.
- Store materials in original containers if possible. If not, clearly label replacement containers.




4

## Store and Handle Materials Safely

- Make sure containers are closed or sealed except when they are being filled or emptied.
- Keep material or waste containers in good condition and replace any containers that leak.
- Regularly inspect containers for corrosion or signs of leaks.




5

## Store and Handle Materials Safely

- Store materials and containers as follows:
  - Best: Indoors in sealed containers.
  - Good: Outdoors in sealed containers, within in a covered, paved area.
  - Acceptable: Outdoors in sealed containers, on an uncovered, paved area.




6

### Store and Handle Materials Safely

- Spill trapping devices are recommended:
  - Indoors: store barrels on a spill containment base.
  - Outdoors: storage areas should be bordered by a curb or berm to contain spills.



7

### Store and Handle Materials Safely

- Store materials away from high traffic areas to prevent accidents that might cause spills or cause spilled material to be spread by traffic.
- Report large spills or spills of hazardous materials your supervisor or environmental department personnel.

8

### Clean Up Spills Properly

9

### Clean Up Spills Properly

- Follow cleanup instructions specified on the MSDS and local procedures for the spilled material.
- Contain the spill:
  - Use a drip pan or absorbent material to collect dripping fluids.
  - If a liquid spill might enter a storm drain, use a drain mat to cover the drain.

MATERIAL SAFETY DATA SHEET	
Product Name: RODEO <sup>®</sup> HERBICIDE Manufacturer: Dow AgroSciences Address: 1900 Phone: 214-754-2000 Fax: 214-754-2000	
<b>1. IDENTIFICATION</b> Product Name: RODEO <sup>®</sup> HERBICIDE Synonyms: None CAS No.: 100-101-7 EC No.: 203-203-2	<b>2. HAZARD AND CHEMICAL INFORMATION</b> Hazardous: Yes Hazard Class: Corrosive Hazard Statement: H314 Causes severe skin burns and eye damage. Precautionary Statement: P273 Avoid contact with skin. Signal Word: DANGER
<b>3. COMPOSITION AND INFORMATION</b> Active Ingredient: Glyphosate (as salt) 41.0% Inert Ingredients: 59.0% Total Weight: 100.0%	<b>4. FIRST AID MEASURES</b> Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Skin Contact: Wash with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Eye Contact: Hold eye open and rinse slowly and gently with water for at least 15 minutes. Remove contact lenses, if available and do not increase the amount of water entering the eye. Ingestion: Do not induce vomiting unless directed to do so by a healthcare professional. Rinse mouth with water. Note: Always consult a healthcare professional for any injury or illness.
<b>5. FIRE AND FLAMMABILITY</b> Flammable: No Flash Point: None Autoignition Temperature: None Decomposition Temperature: None Note: Always consult a healthcare professional for any injury or illness.	<b>6. REACTIVITY</b> Reactivity: No Incompatible Materials: None Hazardous Reaction: None Note: Always consult a healthcare professional for any injury or illness.
<b>7. TOXICOLOGICAL INFORMATION</b> LD50 (Oral, Rat): 2000 mg/kg LD50 (Dermal, Rat): 2000 mg/kg LD50 (Inhalation, Rat): 2000 mg/kg Note: Always consult a healthcare professional for any injury or illness.	<b>8. ENVIRONMENTAL INFORMATION</b> Persistence and Mobility: High Biodegradability: High Bioaccumulation: Low Note: Always consult a healthcare professional for any injury or illness.



10

### Clean Up Spills Properly

- Locate the source of the spill and take steps to stop further spillage.
- Clean up spills immediately to minimize safety hazards and deter spreading.



11

### Clean Up Spills Properly

Liquid spills:

- Use absorbent materials or mop up small liquid spills. Do not hose the spill to a storm drain.
- Remove the absorbent materials promptly and follow procedures for proper disposal.



12

### Clean Up Spills Properly

Dry material spills:

- Cover a powder spill with plastic sheeting to keep it from blowing until the spill can be cleaned up.
- **Do not** hose the spill to a storm drain.
- If usable, place spilled material in original or properly marked container.
- Follow procedures for disposal of spilled material that cannot be used.

13

### Clean Up Spills Properly

- Report large spills or spills of hazardous materials to your supervisor or environmental department personnel.
- *[Insert locality-specific contact information or other instructions here.]*

14

### Preventing Storm Water Pollution: *What We Can Do*

*Protecting water quality requires that all employees do their part to prevent storm water pollution.*



The slide features three logos at the bottom. On the left is the 'OUR WATER Take it personally!' logo with a red house and blue water. In the center is the North Central Texas Council of Governments logo with a gear and grid. On the right is the TCEQ logo with a green landscape and blue sky.

15

## Preventing Storm Water Pollution: *What We Can Do*

~Employee Training Series~  
Fleet Maintenance

PREPARED IN COOPERATION WITH THE Texas Commission on Environmental Quality AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
The preparation of this report was funded through grants from the  
U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

1

## Fleet Maintenance

- Employees who service and repair our vehicles and equipment can help reduce water pollution by following precautions in their daily activities.
  - General Guidelines
  - Leaks and Spills
  - Disposal Methods
  - Parts Cleaning
  - Shop and Pavement Cleaning
  - Fueling
  - Washing

2

## General Guidelines

- Conduct all vehicle and equipment maintenance at designated locations, preferably inside the shop or outdoors on a paved, covered surface.
- Park damaged, leaking, or dirty vehicles under cover, if possible, to prevent exposure to rainfall.



3

## General Guidelines

- Keep maintenance areas clean by promptly disposing of trash, debris, old parts, and absorbents used on spills.
- Promptly dispose of fluids that have been collected in drip pans or other open containers.



4

## Leaks and Spills

- Regularly inspect for leaks or stains around vehicles and equipment. Use a drip pan or absorbent material to collect dripping fluids.
- Locate the source of leakage and stop further spillage by fixing the leak or draining the fluid.



5

## Leaks and Spills

- Clean up spills immediately to minimize safety hazards and deter spreading.
- Store cracked batteries in a leak proof container.
- Refer to the Materials Storage and Spill Cleanup module for more information.



Storm Water Pollution Prevention:  
*What We Can Do*

~Employee Training Series~  
Materials Storage and Spill Cleanup

6

## Disposal Methods

- Collect all used anti-freeze, motor oil, transmission fluid, and hydraulic fluid and store them in separate containers by type.
- Make sure storage containers are properly labeled.
- Never mix different types of fluids.



7

## Disposal Methods

- Recycle used fluids, oil, transmission, and hydraulic filters, and batteries.
- Never dispose of used fluids, filters, or batteries in the trash.



8

## Parts Cleaning

- Clean parts indoors and properly dispose of fluids, grease, dirt, and other debris cleaned from parts.
- Allow parts to fully drain before removing from cleaning sink to reduce dripping of cleaning fluid to the floor.
- Keep lids closed on parts cleaning sinks when not in use.



9

## Shop and Pavement Cleaning

- Use dry methods (sweeping, wiping, absorbents) to clean work areas as much as possible.
- Dispose of mop water properly, usually by pouring down a sanitary sewer drain.



10

## Shop and Pavement Cleaning

- Don't hose down outside work areas.
- In addition to regular, periodic cleaning, clean outside work areas when rain is forecast.



11

## Fueling

- Don't top off fuel tanks to prevent spills due to overfilling.
- Be aware of the emergency pump shut-off button location.
- Keep absorbent materials on site for use in prompt cleanup of spills.



12

## Fueling

- Periodically clean fueling areas using approved methods to remove accumulated fuel and grease.
- Transport equipment to a designated fueling area rather than using mobile fueling.
- If mobile fueling is used, keep a spill kit on the fuel truck.



13

## Washing

- Wash equipment and vehicles **ONLY** in designated facilities where the wash water drains to the sanitary sewer system or is collected and recycled.



14

## Preventing Storm Water Pollution: *What We Can Do*

*Protecting water quality requires  
that all employees do their part to  
prevent storm water pollution.*



15

## Preventing Storm Water Pollution: *What We Can Do*

~Employee Training Series~  
Land Disturbances

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U.S. ENVIRONMENTAL PROTECTION AGENCY  
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U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

1

## Land Disturbances

- Employees can help reduce water pollution by making sure dirt and debris aren't washed into the storm drain system.
  - Utility repairs
    - » water and sanitary sewer lines
    - » storm drain system
  - Street repairs
  - Sidewalk construction and repairs
  - Landscaping (parks, buildings, medians)
  - Power pole installation and replacement

2

## Land Disturbances

- Note: Projects that disturb one acre or more must comply with the state's storm water permit for construction activities.
- If a permit is required, your supervisor or environmental coordinator will provide specific instructions.



3

## Land Disturbances

- All projects must be managed to prevent or reduce soil or other pollutants from being washed into storm drains, creeks, or lakes.
- In addition to soil, potential pollutants on construction sites include trash, debris, oil, grease, lime, concrete truck wash water, etc.



4

## Definitions

- Erosion - the removal or wearing away of soil due to the action of water (or wind).
- Sediment - soil particles that settle out of flowing water.



5

## General Principles

- Preventing erosion is more effective than trying to remove sediment from runoff.
- Minimize the amount of disturbed area.
- Divert runoff or flowing water away from disturbed areas.



6

## General Principles

- Locate dirt stockpiles out of the street and away from runoff or flowing water to prevent sediment from washing into storm drains.
- Cover stockpiles or provide a barrier such as an organic filter berm or silt fence around the pile.



7

## Best Management Practices

- Best Management Practices (BMPs) are tools used to reduce or prevent water pollution.
  - Erosion Control BMPs are used to protect disturbed soils from being washed off by rainfall and/or runoff.
  - Sediment Control BMPs are used to trap sediment carried by runoff and keep it on the construction site.
  - Waste Management BMPs are good housekeeping practices to control trash, chemicals, and debris.

8

## Best Management Practices

- Erosion Control BMPs:
  - Vegetation - grasses or other plants that provide “permanent” erosion protection.
  - Mulching - a layer of straw or wood mulch.



9

## Best Management Practices

- Erosion Control BMPs (continued):
  - Erosion control blankets - mesh matting made of straw, wood fiber, or plastic.
  - Plastic sheeting - may be used for short-term protection of disturbed areas or dirt stockpiles.



10

## Best Management Practices

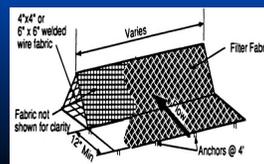
- Sediment Control BMPs:
  - Organic filter berm - a 1 to 3 foot high berm of mulch and compost placed around a disturbed area.
  - Silt fence - filter fabric trenched into the soil and attached to supporting posts.



11

## Best Management Practices

- Sediment Control BMPs (continued):
  - Triangular sediment dike - filter fabric placed over welded wire shaped into a triangle.
  - Inlet protection - filter fabric or stone placed around or in front of a storm drain inlet.



12

## Best Management Practices

### ■ Waste Management BMPs:

- Debris and trash control - use covered trash cans, bins, and/or roll-off boxes for disposing trash and debris.
- Chemical management - follow proper material storage and spill cleanup procedures for chemicals used on construction sites.



13

## Best Management Practices

### ■ Waste Management BMPs (continued):

- Concrete washout - use designated facilities to capture wash water from concrete truck cleaning.



14

## Preventing Storm Water Pollution: *What We Can Do*

*Protecting water quality requires  
that all employees do their part to  
prevent storm water pollution.*



15

## Preventing Storm Water Pollution: *What We Can Do*

~Employee Training Series~  
Parks and Grounds Maintenance

PREPARED IN COOPERATION WITH THE Texas Commission on Environmental Quality AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
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1

## Parks and Grounds Maintenance

- Employees who maintain our parks and landscaped areas can help reduce water pollution by following precautions in their daily activities.
  - Plant Selection
  - Watering
  - Debris Management
  - Soil Management
  - Pesticide and Herbicide Practices

2

## Plant Selection

- Utilize native or adapted perennial vegetation to reduce water, fertilizer, and pesticide needs.
- Use Texas SmartScape™ as a plant selection and plant care tool.



3

## Watering

- Avoid over-watering to prevent excess runoff.
- Avoid runoff by adjusting watering time and direction and volume of spray heads.
- Check soil moisture and water only when the top 4" to 5" of soil is dry.



4

## Watering

- Monitor rainfall and turn off sprinklers during rainy weather.
- Install rain and freeze sensors on automated sprinkler systems where possible.



5

## Debris Management

- Mow grass as high as possible and leave clippings on the lawn.
- Compost leaves for use as a soil amendment or shred and add to flower beds as mulch.



6

## Debris Management

- Sweep paved surfaces or blow clippings and trimmings onto grass rather than hosing down.
- Never dispose of grass clippings, leaves, or other debris in the storm drain.
- Remove accumulated litter and debris from storm drain inlets.



7

## Soil Management

- Aerate and add compost to the soil to reduce fertilizer needs, improve drainage, and promote root growth.
- Have soil tested well before the application season to determine fertilizer needs.
- Limit soil erosion by planting vegetation on bare areas and using mulch or matting for landscaped areas.



8

## Pesticide and Herbicide Practices

- Follow safety, storage and disposal procedures for pesticides and herbicides.
- Follow label directions precisely when mixing or applying pesticides or herbicides.
- Mix pesticides and herbicides where spills will not soak into the ground or runoff into the storm drainage system.



9

## Pesticide and Herbicide Practices

- Use landscaping pesticides and herbicides only as needed.
- Use non-toxic substitutes for chemicals when possible.
- Carefully select the most appropriate product for the problem to be treated.
- Apply pesticides and herbicides to the problem area only, versus application over a wider area.



10

## Pesticide and Herbicide Practices

- Avoid stray product from being deposited on streets or other paved surfaces where it may be washed into the storm drain system.
- Don't apply chemicals near sensitive areas including streams, lakes, wetlands, or drainageways.



11

## Pesticide and Herbicide Practices

- Don't apply during windy conditions or when rain is predicted within 24 hours.
- Report any suspected problems regarding pesticide or herbicide applications.



12

## Preventing Storm Water Pollution: *What We Can Do*

*Protecting water quality requires  
that all employees do their part to  
prevent storm water pollution.*



## Preventing Storm Water Pollution: *What We Can Do*

~Employee Training Series~  
Solid Waste Operations

PREPARED IN COOPERATION WITH THE Texas Commission on Environmental Quality AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
The preparation of this report was financed through grants from the  
U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

1

## Solid Waste Operations

- By taking precautions in their daily activities, Solid Waste employees can help reduce water pollution.
  - Trash Collection Activities
  - Transfer Station/Drop Off Operations
  - Mulching Operations
  - Landfill Operations
  - Composting Operations

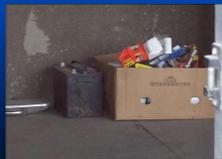
2

## Trash Collection Activities

- Try to identify and do not pick up hazardous wastes (flammables, toxics, explosives, etc.).

Examples include:

- used batteries
- solvents, fuels
- pesticides, herbicides
- fireworks, ammunition
- pool chemicals
- fluorescent bulbs



3

## Trash Collection Activities

- Try to identify and do not pick up liquid wastes.

Examples include:

- used motor oil
- paint
- antifreeze
- cleaning liquids
- cooking oil

- Notify residents of household hazardous waste collection / disposal opportunities.



4

## Trash Collection Activities

- Pick up spilled trash from around cans or bags.
- Notify residents of persistent problems with scattered trash.
- Watch the area around the hopper to avoid leaving litter behind.
- Pick up any material that falls from the truck during compaction.



5

## Trash Collection Activities

- Include spill kits on trash collection trucks and service vehicles.

- Kits could include:
  - broom
  - shovel
  - absorbents
  - pop-up pools.



6

## Trash Collection Activities

- Check vehicle frequently for leaking fluids and notify supervisor of significant leaks.
- Contain spills using absorbents and take steps to stop the leak if possible.
- Immediately clean up spills to minimize safety hazards and deter spreading.



7

## Trash Collection Activities

- Make certain that hopper drain plugs are always sealed during collection.
- Wash collection trucks only in facilities where the wash water drains to the sanitary sewer system or is collected and recycled.



8

## Transfer Stations & Drop Off Centers

- Look for hazardous or liquid wastes. Remove any of these materials and store in designated locations for proper disposal.
- Pick up all windblown litter and rubbish.



9

## Transfer Stations & Drop Off Centers

- Dry sweep litter and rubbish periodically, especially before expected rain or windy conditions.
- Use litter screens to catch windblown trash.
  - chain link fence
  - welded wire mesh fence
  - orange construction fencing



10

## Transfer Stations & Drop Off Centers

- Locate source of spills and prevent further spillage. Immediately clean spills using absorbents.
- Remove the absorbent materials promptly and dispose in accordance with procedures.



11

## Transfer Stations & Drop Off Centers

- Do not overfill collection receptacles.
- Conduct facility wash-down activities as directed by the supervisor.
- Do not hose down work areas that drain into storm sewers or drainage ways.
- Retain spills and prevent them from entering the environment.



12

## Transfer Stations & Drop Off Centers

- Make sure lids on bins and receptacle are closed, especially during rain events.
- Notify haulers and citizens on requirements to cover loads during transport.



13

## Pollution Prevention at Mulching Operations

- Remove trash and foreign materials from brush prior to grinding.
- Place trash and debris in covered containers.
- Use litter screens (fencing) to capture windblown trash.
- Mulch berms can be used to filter runoff from work area.



14

## Landfills and Composting Operations

- These operations will have specific SWPPP requirements governed by either a Multi-Sector General Permit or the facility's individual registration or permit.
- Follow all Best Management Practices, record keeping, training, and reporting requirements detailed in the facility permit.



15

## Preventing Storm Water Pollution: *What We Can Do*

*Protecting water quality requires that all employees do their part to prevent storm water pollution.*



16

## Preventing Storm Water Pollution: *What We Can Do*

~Employee Training Series~  
Streets and Drainage Maintenance

PREPARED IN COOPERATION WITH THE Texas Commission on Environmental Quality AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
The preparation of this report was financed through grants from the  
U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

1

## Streets and Drainage Maintenance

- Employees who maintain and repair our streets and drainage infrastructure can help reduce water pollution by following precautions in their daily activities.
  - Pavement Repair
  - Paint Striping
  - Storm Drain Inlet Cleaning
  - Ditch Maintenance
  - Report Pollution and Illegal Dumping

2

## Pavement Repair

- Vacuum slurry and cuttings during sawcutting operations. Don't allow the slurry to enter the storm drain or to remain on pavement to dry out.
- Properly dispose of slurry in accordance with established procedures.



3

## Pavement Repair

- Require concrete trucks to wash out in a designated location where wash water will not drain to a storm drain, drainage ditch, or creek.
- Locate stockpiles of asphalt patching material on a concrete or other paved surface. Cover to prevent contact with rain.



4

## Pavement Repair

- Mix only the amount of patching material necessary to complete the repair.
- Sweep up and properly dispose of all patching material that is not compacted or is left over from the repair.



5

## Pavement Repair

- Use less harmful products rather than diesel for asphalt patching and cleanup activities.
- Clean trucks, equipment, and tools in designated equipment wash facilities where wash water will not drain to a storm drain, ditch, or creek.



6

## Pavement Repair

- If no wash facility is available, clean equipment over a layer of absorbent material spread on a paved surface and/or heavy plastic sheeting.
- Promptly sweep up absorbent and dispose in accordance with established procedures.



7

## Paint Stripping

- Don't apply paint when rain is likely or during high winds.
- Waste handling for water-based (latex) paint:
  - Pour small quantities of unused paint in open barrels and allow to dry. Dispose of dried paint in trash.
  - Contain wash water used for equipment cleaning and dispose in sanitary sewer.



8

## Paint Stripping

- Waste handling for oil-based paint:
  - Unused oil-based paint must be disposed in accordance with established procedures.
  - Dispose of solvents used for equipment cleaning in accordance with established procedures.



9

## Storm Drain Inlet Cleaning

- Dispose of trash and debris removed from inlets in a sanitary landfill.
- Report suspected dumping or pollution problems to supervisory personnel.
- Apply markers with NO DUMPING message to inlets where there is evidence of dumping.



10

## Ditch Maintenance

- Sample and analyze material that has been removed from ditches if it appears to be contaminated with oil or other pollutants.
- Contaminated sediments must be disposed in accordance with established procedures.



11

## Ditch Maintenance

- Uncontaminated soil may be used onsite (shaped into ditch) or stockpiled and used as fill or other land application.
- Cover soil stockpiles to prevent erosion and/or install silt fence to capture sediment.



12

## Ditch Maintenance

- Apply grass seed to exposed soils. A compost/mulch mixture applied with seed speeds vegetation growth and prevents erosion.
- If the channel experiences high velocities, turf reinforcement mats and/or check dams should be used to protect the channel until vegetation is established.




13

## Report Pollution and Dumping

- Look for signs of pollution at the jobsite and during travel:
  - Oil sheen on water surface
  - Excess trash and debris
  - Odor
  - Colored or cloudy water
  - Dead or dying fish
- Report suspected pollution problems to supervisory personnel or to the local TCEQ office.



14

## Preventing Storm Water Pollution: *What We Can Do*

*Protecting water quality requires that all employees do their part to prevent storm water pollution.*





15

**APPENDIX 7 – IMPLEMENTATION SCHEDULE**

BMP	Measurable Goals	2019	2020	2021	2022	2023
Add SWMP to City's website	Update Website	X	X			
Update City's Website with general storm water information	Update Website	X	X	X	X	X
Post storm water messages on City's website	Post 2 storm water quality messages	X	X	X	X	X
Educational Pamphlets	Distribute pamphlets at City Hall, Visitor's Center, and other public buildings	X	X	X	X	X
Employee Training & Outreach	Annual presentation of BMPs, p	X	X	X	X	X
Brochures for Commercial and Industrial Facilities	Review & update brochure	X				
	Distribute brochure during inspections	X	X	X	X	X
Brochure for Construction Personnel	Review & update brochure	X				
	Distribute during construction meetings and permit process	X	X	X	X	X
Advisory Committee (Citizen Panel)	Update Committee on implementation of SWMP	X	X	X	X	X
Participate in public outreach event	Participate in one (1) public outreach event, i.e. Earth Day		X	X	X	X
Provide Volunteer Opportunities	Identify Volunteers	X	X			
	Provide support materials	X	X	X	X	X
Storm water system map	Update current storm water drainage system map and field verify outfall information	X	X			
Ordinance for illicit discharge detection and elimination [see Appendix 3]	Review ordinance #1071 Prohibiting Illicit Discharges (dated 8/12/2012) and make any necessary revisions	X	X			
Illicit discharge detection plan	Evaluate existing program and identify additional resources and training needs	X				
	Field verify 25% of the storm system and make necessary updates		X	X	X	X
Inspection program for regulated businesses	Identify regulated businesses	X				
	Inspect 25% of regulated businesses		X	X	X	X

BMP	Measurable Goals	2019	2020	2021	2022	2023
Provide information to regulated businesses on proper handling of discharges and chemicals	Develop brochure	X				
	Distribute during inspections of regulated businesses		X	X	X	X
Ordinance for illicit discharge detection and elimination [see Appendix 3]	Review Ordinance #1071 Prohibiting Illicit Discharges (dated 8/2/12) and make necessary revisions	X	X			
Provide information regarding requirements for construction site storm water controls during site plan review	Review brochure & update if needed	X	X			
	Distribute brochure during site plan review	X	X	X	X	X
Reporting mechanism for construction site problems	Review current process for handling of reported problems & update as needed	X	X			
Construction site inspection program and enforcement of control measures	Review inspection process & update as needed	X	X			
	Inspect construction site activities	X	X	X	X	X
Integrate post-construction requirements into site plan review and inspection programs	Review program based on Ordinance #1071 (refer to Appendix 3); update as needed	X	X			
	Inspect post-construction sites for compliance	X	X	X	X	X
Provide spill response and prevention training at city maintenance facility	Inspect facilities for spill kits annually	X	X	X	X	X
	Provide training to city employees annually for	X	X	X	X	X
Evaluate City maintenance facility annually	Verify pollution prevention & good housekeeping practices are followed	X	X	X	X	X
Review SWMP annually	Verify SWMP & BMPs are effective, make necessary updates, & report on annual report	X	X	X	X	X

**APPENDIX 8 – NOTICE OF INTENT (NOI)**



# Notice of Intent (NOI) for Small Municipal Separate Storm Sewer Systems (MS4) authorized under TPDES Phase II MS4 General Permit TXR040000

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## IMPORTANT:

Use the [INSTRUCTIONS](#) to fill out each question in this form.

Once approved, your permit authorization can be viewed at:

<http://www.tceq.texas.gov/goto/wq-dpa>

## APPLICATION FEE:

You must pay the **\$400** Application Fee to TCEQ for the application to be complete.

Payment and NOI must be mailed to separate addresses.

You can pay online at: <http://www.tceq.texas.gov/goto/epay>

Select Fee Type: GENERAL PERMIT MS4 PHASE II STORMWATER DISCHARGE NOI APPLICATION

## Provide your payment information below, for verification of payment:

Mailed      Check/Money Order Number: N/A

Check/Money Order Amount: N/A

Name Printed on Check: N/A

EPAY      Voucher Number: 426553

Is a copy of the Payment Voucher enclosed?     Yes

**One (1) copy of the NOI, Stormwater Management Program (SWMP) cover sheet, and SWMP MUST be submitted with the original NOI, SWMP cover sheet, and SWMP.**

Is the copy attached?     Yes

## REASON FOR APPLICATION:

Select the reason you are submitting this application:

New authorization

Renewal of authorization number: TXR040096

**Note: An authorization cannot be renewed after July 23, 2019**

**TCEQ ePay Voucher Receipt****Transaction Information**

<b>Voucher Number:</b>	426553
<b>Trace Number:</b>	582EA000352796
<b>Date:</b>	07/22/2019 02:24 PM
<b>Payment Method:</b>	CC - Authorization 0000004626
<b>Amount:</b>	\$400.00
<b>Fee Type:</b>	GENERAL PERMIT MS4 PHASE II STORM WATER DISCHARGE NOI APPLICATION
<b>ePay Actor:</b>	Nick Haby

**Payment Contact Information**

<b>Name:</b>	Melissa Chilcote
<b>Company:</b>	City Of Kemah
<b>Address:</b>	1401 Hwy 146, Kemah, TX 77565
<b>Phone:</b>	281-334-1611

**Site Information**

<b>Site Name:</b>	CITY OF KEMAH
<b>Site Address:</b>	1401 HWY 146, KEMAH, TX 77565
<b>Site Location:</b>	CITY OF KEMAH TEXAS

**Customer Information**

<b>Customer Name:</b>	NICK HABY
<b>Customer Address:</b>	1401 HWY 146, KEMAH, TX 77565

## Section 1. OPERATOR (Applicant)

- a) If the applicant is currently a customer with TCEQ, what is the Customer Number (CN) issued to this entity? CN 601013519
- b) What is the exact Legal Name of the entity (applicant) applying for this permit?  
City of Kemah
- c) Complete and attach a Core Data Form (TCEQ-10400) for this customer.

## Section 2. ANNUAL BILLING CONTACT

The operator is responsible for paying the annual water quality fee. The annual fee will be assessed to permits active on September 1 of each year. TCEQ will send a bill to the address provided in this section. The operator is responsible for terminating the permit when it is no longer needed.

Provide the name and contact information of the billing contact.

Prefix (Mr. or Ms.): Ms

First and Last Name: Wendy Ellis

Title: City Administrator

Organization Name: City of Kemah

Phone Number: 281-334-1611

Fax Number: 281-334-6583

Email: wellis@kemah-tx.com

Mailing Address: 1401 Hwy 146

City, State, and Zip Code: Kemah, TX 77565-3002

## Section 3. APPLICATION CONTACT

This is the person TCEQ will contact if additional information is needed about this application.

Provide the name and contact information of the application contact.

Prefix (Mr. or Ms.): Mr.

First and Last Name: Nick Haby

Title: Director of Community Services

Organization Name: City of Kemah

Phone Number: 281.334.1611

Fax Number: [REDACTED]

Email: nhaby@kemah-tx.gov

Mailing Address: 1401 HWY 146

City, State, and Zip Code: Kemah, TX 77565-3002

#### Section 4. REGULATED ENTITY (RE) INFORMATION FOR SITE

- a) If this is an existing permitted site, what is the Regulated Entity Number (RN) issued to this site? RN 105498216
- b) Name of site as known by the local community:  
City of Kemah MS4
- c) Name of the urbanized area(s) the Phase II MS4 is located within:  
Galveston County
- d) Provide a brief description of the regulated MS4 boundaries: *Example: Area within the City of XXXX limits that is located within the xxx urbanized area:*  
Area within the city limits of Kemah Corporate Limits Located within the Urbanized Area of Galveston County Kemah 77565

#### Section 5. GENERAL CHARACTERISTICS

- a) Is this site located on Indian Country Lands?
- Yes, do not submit this form. You must obtain authorization through U.S. EPA Region 6.
- No, continue to item b
- b) Has TCEQ formally “designated” the small MS4 as needing coverage under this general permit?
- Yes. Attach a copy of the documentation sent to the MS4 by TCEQ.
- No
- c) Select the MS4 level, which is based on the population served within the urbanized area (UA) **based on the most recent Decennial Census at the time of issuance of the general permit.**
- Level 1:** Traditional small MS4s with a population of less than 10,000.
- Level 2:** Traditional small MS4s with a population of at least 10,000 but less than 40,000.
- Non-traditional MS4s: This level also includes all non-traditional small MS4s regardless of population unless the non-traditional MS4 can demonstrate that it meets the criteria for a waiver from permit coverage. *Examples of non-traditional small MS4s include counties, drainage districts, transportation entities, military bases, universities, colleges, correctional institutions, municipal utility districts, and other special districts.*
- Level 3:** Traditional small MS4s with a population of at least 40,000 but less than 100,000.
- Level 4:** Traditional small MS4s with a population of 100,000 or more.
- d) What is the estimated current population served by your MS4 (regulated area?)  
1773 People

e) Is the MS4 part of a coalition?

- Yes
- No

f) If yes, list the entity names of the coalition members responsible for implementation of the SWMP *and* their unique TXR04#### number.

- |    |                      |       |                      |
|----|----------------------|-------|----------------------|
| 1. | <input type="text"/> | TXR04 | <input type="text"/> |
| 2. | <input type="text"/> | TXR04 | <input type="text"/> |
| 3. | <input type="text"/> | TXR04 | <input type="text"/> |
| 4. | <input type="text"/> | TXR04 | <input type="text"/> |
| 5. | <input type="text"/> | TXR04 | <input type="text"/> |
| 6. | <input type="text"/> | TXR04 | <input type="text"/> |

If needed, add a copy of this page to add more entities.

g) What is your annual reporting year?

- Calendar year
- Small MS4 General Permit year
- MS4 Fiscal year - What is the last month and day of the fiscal year?

h) Stormwater Management Program (SWMP)

1. I certify that the SWMP submitted with this NOI has been developed according to the provisions of the Small MS4 General Permit TXR040000.  Yes
2. I certify that the SWMP Cover Sheet is completed and attached to the front of the SWMP.  Yes
3. Have the program elements in the previous SWMP been re-assessed and modified and new program elements been developed and implemented, as necessary?
  - Yes
  - No. This facility did not have a previous authorization.
4. Is the optional 7<sup>th</sup> Minimum Control Measure (MCM) for Municipal Construction Activities selected and included with the attached SWMP?
  - No. Continue to Question 5.
  - Yes.
    - If yes, is MCM 7 limited to the regulated area within the urbanized area?
      - Yes. Continue to Question 5.
      - No

If No, then MCM 7 is included in the geographic area or boundary outside of the urbanized area. Note: *In this case, you must incorporate the entire area*

(urbanized and non-urbanized areas) in the SWMP and implement all MCMs 1-7 in the urbanized and non-urbanized areas.

5. Provide the name and contact information of the person responsible for implementing or coordinating implementation of the SWMP.

Prefix (Mr. or Ms.): Mr.

First and Last Name: Nick Haby

Title: Director of Community Services

Organization Name: City of Kemah

Phone Number: 281.334.1611

Fax Number: [REDACTED]

Email: nhaby@kemah-tx.gov

Mailing Address: 1401 HWY 146

City, State, and Zip Code: Kemah, TX 77565-3002

i) Discharge Information

1. What is the name of the waterbody(ies) receiving stormwater discharges from the MS4? Clear Lake Channel
2. What is the classified segment number(s) that the discharges will eventually reach? 2421

Does the small MS4 discharge directly or indirectly into the classified segment(s)?

Directly

Indirectly

3. Are any of the waterbody(ies) receiving discharges from the small MS4 identified as impaired waters (Category 4 or 5) in the *Texas Integrated Report of Surface Water Quality*?

Yes

What is the name of the impaired waterbody(ies) receiving the discharge from the small MS4? [REDACTED]

What is/are the pollutants(s) of concern? [REDACTED]

No

4. Does the impaired water body(ies) have a TMDL (Category 4 waterbody)?

Yes

What is/are the pollutants with a TMDL? [REDACTED]

No

5. Does your MS4 discharge into any other MS4 entity's jurisdiction prior to discharge into water in the state?

Yes

What is the name of the MS4 operator?

No

6. Edwards Aquifer Rule

Is the discharge or potential discharge within the Recharge Zone, Contributing Zone, within the Contributing Zone within the Transition Zone, or zero to ten (0 to 10) miles upstream of the Recharge Zone of the Edwards Aquifer?

Yes - **NOTE: A copy of the agency approved Water Pollution Abatement Plan (WPAP) required by the Edwards Aquifer Rule (30 TAC Chapter 213) must be either included or referenced in the SWMP.**

No

j) Public Participation Process

1. Provide the name and contact information of the person responsible for publishing notice of the executive director's preliminary determination on the MS4's NOI and SWMP?

Prefix (Mr. or Ms.): Ms

First and Last Name: Melissa Chilcote

Title: City Secretary

Company: City of Kemah

Phone Number: 281-334-1611

Fax Number: 281-334-6583

Email: mchilcote@kemah-tx.com

Mailing Address: 1401 Hwy 146

Internal Routing (Mail Code, Etc.):

City, State, and Zip Code: Kemah, TX 77565-3002

2. Provide the name and location of the public place where copies of the NOI, SWMP, Small MS4 General Permit TXR040000, and general permit fact sheet may be viewed and copied by the public?

Name of Public Place: City Hall

Address of Public Place: 1401 State Highway 146, Kemah, TX 77565

County of Public Place: Galveston County

3. Provide the address for the website where the MS4's SWMP and annual report will be posted. http://www.kemah-tx.gov

Do not have a website.

**Section 6. CERTIFICATION**

I certify that I have obtained a copy and understand the terms and conditions of the Phase II (Small) MS4 General Permit TXR040000 issued January 24, 2019.

Yes

I certify that the small MS4 qualifies for coverage under the Phase II (Small) MS4 General Permit TXR040000.

Yes

I understand that a Notice of Termination (NOT) must be submitted when this authorization is no longer needed.

Yes

I understand that authorizations active on September 1<sup>st</sup> of each year will be assessed an Annual Water Quality Fee.

Yes

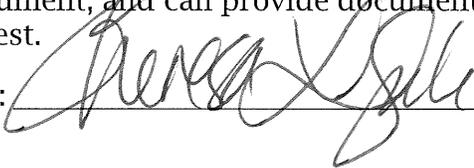
**Operator Certification**

Operator Signatory Name: Terri Gale

Operator Signatory Title: Mayor

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 gather 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature (use blue ink):  Date: 7/17/19

# STORMWATER MANAGEMENT PROGRAM (SWMP) COVER SHEET

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This cover sheet MUST be attached to the front of the SWMP.

## **Operator**

Operator name: City of Kemah

## **Required Program Elements**

The SWMP needs to include:

- BMPs and measurable goals that are clear, specific, and measurable,
- Annual Reporting Year selected, and
- Estimated population served by the MS4.

## **Legal Authorities**

Include in the SWMP the list of local legal authorities (i.e., ordinance, rule) that the MS4 has adopted to implement any of the MCMs. List all and what MCM they each cover.

## **Minimum Control Measures**

For each MCM, complete the table by entering the page number where the required element can be found in the SWMP

### **MCM 1: Public Education, Outreach, and Involvement**

Table 1: Required Elements for MCM 1

MCM 1 Required Elements	SWMP page number
SWMP includes a stormwater education and outreach program to educate public employees, business, and the general public about hazards associated with the illegal discharges and improper disposal of waste and about the impacts stormwater can have on water quality, and steps they can take to reduce pollutants in stormwater	Pg. 1-2
Clearly define the goals and objectives of the program based on high-priority community-wide issues	Pg. 2-4
Identify the target audiences	Pg. 3
Develop or use appropriate educational material	Pg. 3
Procedures to distribute educational material	Pg. 3
Make the educational material available to the target audience at least annually	Pg. 3

<b>MCM 1 Required Elements</b>	<b>SWMP page number</b>
Post the SWMP and annual reports on the MS4's website, if the MS4 has a website	Pg. 3
Include the MS4's website address where the SWMP and annual reports will be found, if the MS4 has a website	Pg. 3
SWMP includes a program that complies with state and local public notice requirements	Pg. 3
Include public input in the implementation of the program	Pg. 3-4
Include opportunities for citizen to participate in implementation of control measures	Pg. 4
Ensure the public can easily can find information about the SWMP.	Pg. 4
SWMP lists Best Management Practices (BMPs) used to fulfill this MCM. Examples of possible BMPs could be stream-clean-ups, storm drain stenciling, volunteer water quality monitoring, brochures, billboards, and websites.	Pg. 2, 4
SWMP includes measurable goals that are clear, specific, and measurable, and the method of measurement, for addressing stormwater quality	Pg. 2, 4
SWMP has been fully implemented, or includes a schedule of implementation not to exceed five (5) years from the general permit issuance date of January 24, 2019	Pg. 2, 4

## **MCM 2: Illicit Discharge Detection and Elimination**

Table 2: Required Elements for MCM 2

<b>MCM 2 Required Elements</b>	<b>SWMP page number</b>
Description of the program that will be used to detect, investigate and eliminate illicit discharges. The program includes a plan to detect and address illicit discharges, including illegal dumping to the MS4 system.	Pg. 5
MS4 map: The map includes: <ul style="list-style-type: none"> <li>• Location of all small MS4 outfalls operated by the MS4 and that discharge into waters of the U.S.;</li> <li>• Location and name of all surface waters receiving discharge from the MS4s outfalls;</li> <li>• For Level 3 and 4 small MS4s: Location of MS4 owned or operated facilities and stormwater controls; and</li> <li>• For Level 4 small MS4s: Location of priority areas.</li> </ul>	Pg. 5-6
Methods for informing and training MS4 field staff	Pg. 5
Procedures for tracing the source of an illicit discharge	Pg. 6-7

<b>MCM 2 Required Elements</b>	<b>SWMP page number</b>
Procedures for removing the source of the illicit discharge	Pg. 6-7
Procedures to facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from the small MS4	Pg. 6-7
Procedures for responding to illicit discharges and spills	Pg. 6-7
Procedures for inspections in response to complaints	Pg. 6-7
<b>For Level 2, 3, and 4 small MS4:</b> Procedures to prevent and correct leaking on-site sewage disposal systems	N/A
<b>For Level 3 and 4 small MS4s:</b> Procedures for follow-up investigation to verify that the illicit discharge has been eliminated	N/A
<b>For Level 4 small MS4s:</b> Procedures for identifying and creating a list of priority areas within the small MS4s likely to have illicit discharges	N/A
<b>For Level 4 small MS4s:</b> Procedures for a dry weather field screening program to assist in detecting and eliminating illicit discharges to the small MS4. Dry weather field screening consists of (1) field observations and (2) field screening.	N/A
<b>For Level 4 small MS4s:</b> Procedures to reduce the discharge of floatables in the small MS4	N/A
SWMP lists BMPs used to fulfill this MCM. Examples of possible BMPs could be hazardous materials disposal opportunities, inspections of the storm sewer system, and dye testing.	Pg. 6
SWMP includes measurable goals that are clear, specific, and measurable, and the method of measurement, for addressing stormwater quality	Pg. 6
SWMP has been fully implemented, or includes a schedule of implementation not to exceed five (5) years from the general permit issuance date of January 24, 2019	Pg. 6

### **MCM 3: Construction Site Stormwater Runoff Control**

Table 3: Required Elements for MCM 3

<b>MCM 3 Required Elements</b>	<b>SWMP page number</b>
Program requires operators of construction sites one acre and greater (including larger common plan) to select, install, implement, and maintain stormwater control measures	Pg. 7
Description of ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under state and local law	Pg. 7-8

MCM 3 Required Elements	SWMP page number
Program requires construction site operators to implement BMPs for erosion and sediment control	Pg. 8-9
Program requires construction site operators to have procedures for initiating and completing soil stabilization measures	Pg. 8-9
Program requires construction site operators to implement BMPs to control pollutants from equipment and vehicle washing and other wash waters	Pg. 8-9
Program requires construction site operators to implement BMPs to minimize exposure to stormwater of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials	Pg. 8-9
Program requires construction site operators to implement BMPs to minimize the discharge of pollutants from spills and leaks.	Pg. 8-9
Program ensures that the construction site has developed a stormwater pollution prevention plan in accordance with the TPDES Construction General Permit TXR150000	Pg. 9
Program prohibits illicit discharges such as wash out wastewater, fuels, oils, soaps, solvents, and dewatering activities	Pg. 8-9
Procedures for construction site plan review to consider water quality impacts	Pg. 9
Procedures for construction site inspections and enforcement of control measures, to the extent allowable under state and local law	Pg. 9
Procedures for receipt and consideration of information submitted by the public	Pg. 9
Procedures for MS4 staff training	Pg. 9
<b>For Level 3, and 4 small MS4s:</b> Procedures to develop and maintain an inventory of all permitted active public and private construction sites greater than one acre (and sites that are less than one acre if part of larger common plan of development or sale)	N/A
SWMP lists BMPs used to fulfill this MCM. Examples may include: notification to discharger of responsibilities under TPDES CGP; hire staff to review construction site plans; provide a web page for public input on construction activities; perform site inspections and enforcement; provide education and training for construction site operators; and mechanism to prohibit discharges into MS4 where necessary.	Pg. 8
SWMP includes measurable goals that are clear, specific, and measurable, and the method of measurement, for addressing stormwater quality	Pg. 8

MCM 3 Required Elements	SWMP page number
SWMP has been fully implemented, or includes a schedule of implementation not to exceed five (5) years from the general permit issuance date of January 24, 2019	Pg. 8

**MCM 4: Post Construction Stormwater Management in New Development and Redevelopment**

Table 4: Required Elements for MCM 4

MCM 4 Required Elements	SWMP page number
Description of a program that will be developed, implemented and enforced, to control stormwater discharges from private and public new development and redeveloped sites that discharge into the small MS4 that disturb one acre or more (and sites that disturb less than one acre that are part of a larger common plan of development or sale)	Pg. 9
Description of ordinance or other regulatory mechanism that is in place or planned which will regulate discharges from new development and redevelopment projects	Pg. 10
Establish, implement, and enforce a requirement that owners or operators of new development and redeveloped sites design, install, implement, and maintain a combination of structural and non-structural BMPs appropriate for the community and that protects water quality	Pg. 10
Procedures to document and maintain records of enforcement actions	Pg. 10
Procedures to ensure long-term operation and maintenance of post construction stormwater control measures	Pg. 10
Operation and maintenance of post construction stormwater control measures is documented	Pg. 10
<b>For Level 4 small MS4s:</b> Develop and implement an inspection program to ensure that all post construction stormwater control measures are operating correctly and are being maintained. Inspections must be documented	N/A
SWMP lists BMPs used to fulfill this MCM. Examples may include: local ordinance in place or planned; guidance document for developers to use; specific BMPs established for particular watersheds; list of appropriate BMPs provided to operators; elimination of curbs and gutters; incentives for use of permeable choices, such as porous pavement; requirements for wet ponds or other BMPs for certain size sites; and xeriscaping.	Pg. 10
SWMP includes measurable goals that are clear, specific, and measurable, and the method of measurement, for addressing stormwater quality	Pg. 10

MCM 4 Required Elements	SWMP page number
SWMP has been fully implemented, or includes a schedule of implementation not to exceed five (5) years from the general permit issuance date of January 24, 2019	Pg. 10

**MCM 5: Pollution Prevention and Good Housekeeping for Municipal Operations**

Table 5: Required Elements for MCM 5

MCM 5 Required Elements	SWMP page number
Description of an operation and maintenance (O&M) program, including an employee training component, to reduce/prevent pollution from municipal activities and municipally owned areas included but not limited to park and open space maintenance; street, road, or highway maintenance; fleet and building maintenance; stormwater system maintenance; new construction and land disturbances; municipal parking lots; vehicle and equipment maintenance and storage yards; waste transfer stations; and salt/sand storage locations	Pg. 10-11
Develop and maintain an inventory of facilities and stormwater controls that are owned or operated by the MS4	Pg. 10-11
Procedures to inform or train staff involved in implementing pollution prevention and good housekeeping practices. Maintain training attendance records	Pg. 12
Procedures to remove and properly dispose of waste from the MS4	Pg. 12-13
Contractors hired by the MS4 must be required to comply with operating procedures. Develop contractor oversight procedures	Pg. 12
Evaluate O&M activities for their potential to discharge pollutants in stormwater for road and parking lot maintenance, bridge maintenance, cold weather operations, right-of-way maintenance, etc.	Pg. 11-12
Identify pollutants of concern that could be discharged from the O&M activities	Pg. 11-12
Develop and implement pollution prevention measures that will reduce discharge of pollutants from O&M activities	Pg. 11
Conduct inspections of pollution prevention measures and maintain inspection log	Pg. 12
Procedures for inspecting and maintaining structural controls	Pg. 12
<b>For Level 3 and 4 small MS4s:</b> Develop and implement an O&M program to reduce the collection of pollutants in catch basins and other surface structures in the storm sewer system	N/A

MCM 5 Required Elements	SWMP page number
<b>For Level 3 and 4 small MS4s:</b> Develop a list of potential problem areas in the storm sewer system for increased inspection (for example, areas with recurring illegal dumping)	N/A
<b>For Level 3 and 4 small MS4s:</b> Implement an O&M program to reduce discharge of pollutants from roads that includes at least a street sweeping and cleaning program, or inlet protection. The program includes an implementation schedule and a waste disposal procedure	N/A
<b>For Level 3 and 4 small MS4s:</b> Assess its facilities for their potential to discharge pollutants into stormwater and identify high priority facilities that have a high potential to generate stormwater pollutants. At a minimum, facilities include the MS4s maintenance yards, hazardous waste facilities, fuel storage locations, and any other facilities at which chemicals or other materials have a high potential to be discharged in stormwater. Document the results of the assessments	N/A
<b>For Level 3 and 4 small MS4s:</b> Develop facility specific stormwater management Standard Operation Procedures for high priority facilities	N/A
<b>For Level 3 and 4 small MS4s:</b> MS4 implements stormwater controls at high priority facilities that address good housekeeping; de-icing and anti-icing storage; fueling operations and vehicle maintenance; equipment and vehicle washing	N/A
<b>For Level 3 and 4 small MS4s:</b> Develop and implement an inspection program that includes high priority facilities	N/A
<b>For Level 4 small MS4s:</b> Develop an application and management program for pesticides, herbicides, and fertilizers used at public open spaces. Implement the following: educational activities, permits, etc for applicators and distributors; encourage of non-chemical solutions for pest management; develop schedules that minimizes discharge of pollutants; ensure collection and proper disposal of unused pesticides, herbicides, and fertilizers	N/A
<b>For Level 4 small MS4s:</b> Evaluate flood control projects. Design, construct, and maintain new flood control structures to provide erosion prevention and pollutant removal from stormwater. Retrofitting of existing structural flood control devices is implemented to the maximum extent practicable (MEP)	N/A
SWMP lists BMPs used to fulfill this MCM. Examples may include: BMPs which address fleet vehicle maintenance/washing; BMPs which address parking lot and street cleaning; catch basin and storm drain system cleaning; landscaping and lawn care (e.g. xeriscaping); waste materials management; road salt application and storage practices; used oil recycling; pest management practices; fire training facilities; BMPs which address roadway and bridge maintenance; golf course maintenance/waste	Pg. 12

<b>MCM 5 Required Elements</b>	<b>SWMP page number</b>
disposal; disposal of cigarette butts; and park maintenance (e.g., providing trash bags).	
SWMP includes measurable goals that are clear, specific, and measurable, and the method of measurement, for addressing stormwater quality	Pg. 12
SWMP has been fully implemented, or includes a schedule of implementation not to exceed five (5) years from the general permit issuance date of January 24, 2019	Pg. 12

### **MCM 6: Industrial Stormwater Sources**

Table 6: Required Elements for MCM 6

<b>MCM 6 Required Elements</b>	<b>SWMP page number</b>
<b>For Level 4 MS4 only:</b> Identify and control industrial stormwater sources that at least includes the MS4's landfills; other treatment, storage, or disposal facilities for municipal waste; hazardous waste treatment, storage, disposal and recovery facilities; and facilities that are subject to Emergency Planning and Community Right-to-Know Act (EPCRA).	N/A
<b>For Level 4 MS4 only:</b> Procedures for inspecting and implementing control measures for discharges from industrial stormwater sources.	N/A

### **Optional MCM 7: Municipal Construction Activities**

This MCM is only applicable where the small MS4 has selected to be the construction site operator for their municipal construction activities. This MCM provides an alternative to the MS4 operator seeking discharge authorization under the Construction Stormwater General Permit TXR150000.

Table 7: Required Elements for MCM 7

<b>MCM 7 Required Elements</b>	<b>SWMP page number</b>
Description of how municipal construction activities will be conducted so as to take into consideration local conditions of weather, soils, and other site specific considerations	N/A
Description of the area that this MCM will address and where the MS4 operator's municipal construction activities are covered (e.g. within the boundary of the urbanized area, the corporate boundary, a special district boundary, an extra territorial jurisdiction, or other similar jurisdictional boundary)	N/A

MCM 7 Required Elements	SWMP page number
If the area included in this MCM includes areas outside of the UA, then all MCMs (MCM 1 through MCM 7) will be implemented over those additional areas as well	N/A
Description of how contractor activities will be supervised or overseen to ensure that the Stormwater Pollution Prevention Plan (SWP3) requirements are properly implemented at the construction site(s); or how the MS4 operator will make certain that contractors have a separate authorization for stormwater discharges if needed	N/A
General description of how a construction SWP3 will be developed for each municipal construction site	N/A
Records of municipal construction activities authorized under this optional MCM	N/A

# Texas Commission on Environmental Quality General Permit Payment Submittal Form

**Use this form to submit your Application Fee only if you are mailing your payment.**

- Complete items 1 through 5 below.
- Staple your check in the space provided at the bottom of this document.
- Do not mail this form with your NOI form.
- Do not mail this form to the same address as your NOI.

**Mail this form and your check to:**

*BY REGULAR U.S. MAIL*

Texas Commission on Environmental  
Quality  
Financial Administration Division  
Cashier's Office, MC-214  
P.O. Box 13088  
Austin, TX 78711-3088

*BY OVERNIGHT/EXPRESS MAIL*

Texas Commission on Environmental  
Quality  
Financial Administration Division  
Cashier's Office, MC-214  
12100 Park 35 Circle  
Austin, TX 78753

Fee Code: GPA

General Permit: TXR040000

1. Check / Money Order No:
2. Amount of Check/Money Order:
3. Date of Check or Money Order:
4. Name on Check or Money Order:
5. NOI INFORMATION

If the check is for more than one NOI, list each Project/Site (RE) Name and Physical Address exactly as provided on the NOI. DO NOT SUBMIT A COPY OF THE NOI WITH THIS FORM AS IT COULD CAUSE DUPLICATE PERMIT ENTRIES.

If more space is needed, you may attach a list.

Project/Site (RE) Name:

Project/Site (RE) Physical Address:

**Staple Check in This Space**

# Instructions for Notice of Intent (NOI) for Small Municipal Separate Storm Sewer Systems (MS4) authorized under TPDES Phase II MS4 General Permit TXR040000

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## GENERAL INFORMATION

### Where to Send the Notice of Intent (NOI)

You are required to submit the original and one copy of the NOI, Core Data Form(s), Stormwater Management Program (SWMP) Cover Sheet, and the SWMP. Submit these documents to one of the following addresses:

#### BY REGULAR U.S. MAIL:

Texas Commission on Environmental  
Quality  
ARP Team (MC-148)  
P.O. Box 13087  
Austin, Texas 78711-3087

#### BY OVERNIGHT/EXPRESS MAIL:

Texas Commission on Environmental  
Quality  
ARP Team (MC-148)  
12100 Park 35 Circle  
Austin, TX 78753

### Fees Associated with this General Permit

The application fee of \$400 is required to be paid at the time the NOI is submitted. Failure to submit payment at the time the application is filed will cause delays in acknowledgment or denial of coverage under the general permit. Payment of the fee may be made by check or money order, payable to TCEQ, or through EPAY (electronic payment through the web).

#### Mailed Payments:

Use the attached General Permit Payment Submittal Form. The application fee is submitted to a different address than the NOI. Read the General Permit Payment Submittal Form for further instructions.

### Where to Send the Payment

#### BY REGULAR U.S. MAIL:

Texas Commission on Environmental  
Quality  
Financial Administration Division  
Cashier's Office, MC 214  
P.O. Box 13088  
Austin, Texas 78711-3087

#### BY OVERNIGHT/EXPRESS MAIL:

Texas Commission on Environmental  
Quality  
Financial Administration Division  
Cashier's Office, MC 214  
12100 Park 35 Circle  
Austin, TX 78753

**ePAY Electronic Payment:** <http://www.tceq.texas.gov/epay>

When making the payment you must select Water Quality, and then select the fee category "General Permit MS4 Phase II Stormwater Discharge NOI Application". You must include a copy of the payment voucher with your NOI. Your NOI will not be considered complete without the payment voucher.

## Annual Water Quality Fee

This fee is assessed to permittees with an active authorization under the general permit on September 1 of each year. The designated billing contact will receive an invoice for payment of the annual fee in November of each year. The payment will be due 30 days from the invoice.

A 5% penalty will be assessed if the payment is not received by TCEQ by the due date. Annual fee assessments cannot be waived as long as the authorization under the general permit is active on September 1.

It is important for the permittees to submit an NOT when coverage under the general permit is no longer required. An NOT is effective on the postmarked date of mailing the form to TCEQ. If the NOT is mailed it is recommended that the NOT be mailed using a method that documents the date mailed and received by TCEQ.

### Mailed Payments:

You must return your payment with the billing coupon provided with the billing statement.

ePAY Electronic Payment: <http://www.tceq.texas.gov/epay>

You must enter your account number provided at the top portion of your billing statement. Payment methods include American Express, MasterCard, Visa, and electronic check payment (ACH).

## TCEQ Contact List

Small Business & Local Government Assistance	800-447-2827
Application – status and form questions:	512-239-4671
Technical questions:	512-239-4671
Environmental Law Division:	512-239-0600
Records Management - obtain copies of forms:	512-239-0900
Reports from databases (as available):	512-239-DATA (3282)
Cashier's office:	512-239-0357 or 512-239-0187

## Notice of Intent Process

When your Core Data Form, NOI, and SWMP are received by the program, the form will be processed as follows:

**Administrative Review:** Each item on the form will be reviewed for a complete response. In addition, the operator's legal name must be verified with Texas Secretary of State as valid and active (if applicable). The address(s) on the form must be verified with the US Postal service as receiving regular mail delivery. Do not give an overnight/express mailing address.

**Notice of Deficiency:** If an item is incomplete or not verifiable as indicated above, a notice of deficiency (NOD) will be mailed to the operator. The operator will have 30 days to respond to the NOD. The response will be reviewed for completeness.

**Technical Review of SWMP:** The NOI and SWMP will be reviewed to verify compliance with the requirements in the general permit. More information may

be requested by phone or technical NOD letter mailed to the SWMP contact. When a determination is made that the SWMP meets the requirements of the general permit, the Executive Director's preliminary determination will be prepared and filed with the TCEQ Office of Chief Clerk (OCC).

**Public Participation Process:** The OCC will mail the Executive Director's preliminary determination to the public participation contact provided in the NOI. This individual must publish the notice in the newspaper of largest circulation in the county where the small MS4 is located.

The comment period begins on the first date the notice is published and ends 30 days later, unless a public meeting is held. If a public meeting is held, the comment period will end at the closing of the public meeting.

The applicant must submit a copy of the newspaper clipping and an affidavit signed by the newspaper staff to the OCC within 60 days of receiving the written instructions from the OCC.

If significant public interest exists, the executive director will direct the applicant to publish notice of the meeting and to hold the public meeting. The applicant must publish the notice of public meeting at least 30 days prior to the public meeting and hold the meeting in the county where the MS4 is located.

**Acknowledgment of Coverage:** An Acknowledgment Certificate will be mailed to the operator. This certificate acknowledges coverage under the general permit.

or

**Denial of Coverage:** Coverage may be denied if the operator fails to respond to the NOD, the response is inadequate, or the NOI and SWMP do not meet the requirements of the general permit. If coverage is denied, the operator will be notified.

## General Permit

Coverage under the general permit begins upon approval of the NOI, Core Data Form, and SWMP by TCEQ and after the public notice process has been completed. You should have a copy of your general permit when submitting your application. You may view and print your permit for which you are seeking coverage, at the following website <http://www.tceq.texas.gov>. Search using keyword TXR040000.

## General Permit Forms

The Notice of Intent (NOI), Notice of Termination (NOT), Notice of Change (NOC) and Core Data Form (including instructions) are available at the TCEQ web site <http://www.tceq.texas.gov>.

## Change in Operator

An authorization under the general permit is not transferable. If the operator changes, the present permittee must submit a Notice of Termination (NOT) and the new operator must submit a Notice of Intent and a Core Data Form. The NOT, NOI and Core Data Form must be submitted no later than 10 days prior to the change in status.

## **INSTRUCTIONS FOR FILLING OUT THE FORM**

**Renewal of General Permit:** Dischargers holding an active authorizations under the expired General Permit are required to submit a NOI to continue coverage. The existing authorization number is required. If the authorization number is not provided or has been terminated, expired, or denied a new permit number will be issued.

This number will begin with TXR04. Do not use TXR040000, it is *the general permit* number *not your* authorization number.

### **Section 1. Operator (Applicant)**

#### **a) Customer Number (CN)**

TCEQ assigns each customer a number that begins with CN, followed by nine digits. This is not a permit number, registration number, or license number. If the applicant is an existing TCEQ customer, the Customer Number is available at the following website: <http://www15.tceq.texas.gov/crpub/>. If the applicant is not an existing TCEQ customer, leave the space for CN blank.

#### **b) Legal Name of Applicant**

Provide the current legal name of the applicant. The name must be provided exactly as filed with the Texas Secretary of State, or on the legal documents forming the entity as filed with the county. If filed in the county, provide a copy of the legal documents showing the legal name.

#### **c) Core Data Form**

Complete and attach a Core Data Form (TCEQ-10400) for each customer.

### **Section 2. Annual Billing Contact**

An annual fee is assessed to each operator holding an active authorization under the general permit on September 1 of each year.

Provide the contact name and complete mailing address where the annual fee invoice should be mailed. Verify the address with the USPS. It must be an address for delivery of regular mail, not overnight express mail.

The phone number should provide contact to the individual responsible for paying the annual fee.

The fax number and e-mail address are optional and should correspond to the individual responsible for paying the annual fee.

### **Section 3. Application Contact**

Provide the name, title and contact information of the person that TCEQ can contact for additional information regarding this application. This contact may be a consultant or entity other than the applicant.

### **Section 4. Regulated Entity (RE) Information For Site**

#### **a) Regulated Entity Reference Number (RN)**

The RN is issued by TCEQ to sites where an activity is regulated by TCEQ. This is not a permit number, registration number, or license number. Search TCEQ's Central Registry to see if the site has an assigned RN at

<http://www15.tceq.texas.gov/crpub/>. If this regulated entity has not been assigned an RN, leave this space blank.

**b) Name of the Project or Site**

Provide the name of the site or project as known by the public in the area where the site is located. The name you provide on this application will be used in the TCEQ Central Registry as the Regulated Entity name.

**c) Name of Urbanized Area**

List the formal name of the urbanized area(s) where the MS4 is located using the 2010 U.S. Census maps referenced in Section 5. c) below. For example: Dallas-Fort Worth-Arlington Urbanized area.

**d) Describe the boundaries of the regulated portion of the small MS4**

Briefly describe the boundaries of the regulated portion of the small MS4.

**Section 5. General Characteristics**

**a) Indian Country Lands**

If your site is located on Indian Country Lands, the TCEQ does not have authority to process your application. Do not submit this application form to TCEQ. You must obtain authorization through EPA, Region 6, in Dallas.

**b) TCEQ “Designated” Small MS4**

A small MS4 that is outside of an urbanized area that is formally “designated” by TCEQ is eligible for coverage under this general permit. The small MS4 Operator must obtain authorization under this general permit or apply for coverage under an individual TPDES stormwater permit within 180 days of notification of their designation. If the small MS4 was already designated, please attach a copy of the documentation sent to the MS4 by TCEQ.

**c) MS4 Level**

The general permit defines MS4s by four different levels, based on the population served within the 2010 U.S. Census urbanized area (UA). “Population served” means the residential population within the regulated portion of the small MS4 based on the 2010 U.S. Census, except for non-traditional small MS4s that are classified as Level 2.

A reference map identifying the 2010 U.S. Census UAs can be found at [www.epa.gov/npdes/urbanized-area-maps-npdes-ms4-phase-ii-stormwater-permits](http://www.epa.gov/npdes/urbanized-area-maps-npdes-ms4-phase-ii-stormwater-permits).

Districts that did not have a population during the 2010 U.S. Census, are required to apply when their population exceeds the population threshold for permit coverage.

**d) Estimated Population**

List the current estimated population served by the MS4. This number will not be used to determine the Levels.

**e) Coalitions of MS4 entities**

Indicate if the MS4 is part of a coalition that share efforts in meeting any or all of the SWMP requirements.

**f) Members of the Coalition**

List the name of each member of the coalition *and* their unique Phase II MS4 authorization number.

**g) Annual Reporting Year**

The annual report must address the previous reporting year. The selected reporting year cannot be changed during the permit term.

- If the MS4 selects the calendar year, then the reporting year is from January 1 through December 31 of each year.
- If the MS4 selects the Phase II MS4 General Permit year, the reporting year is from the effective date of the general permit plus 365 days of each year.
- If the MS4 selects the fiscal year, the reporting year is from the first day of the MS4's fiscal year through the last day of the MS4's fiscal year. Provide the month and last day of the MS4's fiscal year.

**h) SWMP**

1. Certify, by selecting Yes, that the SWMP has been developed in accordance with the general permit requirements and is attached to this NOI.
2. Certify, by selecting Yes, that the SWMP Cover Sheet has been completed and is attached to the front of the SWMP.
3. If the MS4 was previously authorized under the general permit, the program elements in the previous SWMP must be re-assessed and modified. Additionally, new program elements must be developed. Do not submit the exact same SWMP that was previously submitted. Indicate that you have revised the previous SWMP, or that this is a newly regulated MS4.
4. Indicate if the MS4 is seeking coverage under this general permit for the optional MCM 7 for municipal construction activities where the MS4 meets the definition of "construction site operator".  
If Yes, the SWMP must include the geographic area or boundary where MCM 7 will be implemented. If this area extends beyond the geographic area or boundary of the urbanized area, then all MCMs 1-7 must be implemented in the urbanized and non-urbanized areas. The MS4 operator can utilize MCM 7 only in areas that are in compliance with the SWMP's MCMs 1-7. If you do **NOT** incorporate the entire SWMP (MCMs 1-7) in the urbanized and the non-urbanized areas, then the MS4 cannot utilize only MCM 7 outside of the urbanized area.

If No, the MS4 can obtain this coverage at any time during the general permit term by submitting a Notice of Change.

5. Provide the name and contact information of the designated person responsible for implementing or coordinating implementation of the SWMP.

**i) Discharge Information**

1. Provide the name of all waterbodies that receive discharges from the MS4. The discharge eventually reaches a receiving waterbody such as a local stream or lake, possibly via a drainage ditch or even through another MS4 prior to reaching the waterbody. Please note that this general permit does not grant permission to use another MS4 as a conveyance of stormwater and certain non-storm water discharges along the discharge route.
2. Identify the classified segment number(s) that will eventually receive the

discharge. You can find classified segment numbers in the Atlas of Texas Surface Waters at: [www.tceq.texas.gov/publications/gi/gi-316](http://www.tceq.texas.gov/publications/gi/gi-316) or the Surface Water Quality (Segments) Viewer at:

<https://www.tceq.texas.gov/gis/segments-viewer>

Indicate if the discharge is directly into the classified segment or if it reaches the classified segment after being discharged into another waterbody or MS4.

3. Indicate if any waterbodies receiving discharges are identified as impaired waters (Category 4 or 5) in the *Texas Integrated Report of Surface Water Quality*, which is available at:

[http://www.tceq.texas.gov/waterquality/assessment/305\\_303.html](http://www.tceq.texas.gov/waterquality/assessment/305_303.html).

If Yes, provide the name(s) of the impaired waterbodies and the pollutants of concern for those waterbodies. The pollutants of concern are the parameters for which the waterbody is impaired.

4. Indicate if the impaired waterbody has a TMDL and list the pollutants with a TMDL (Category 4 waterbody).
5. Indicate if the discharge is into any other MS4 entity's jurisdiction prior to reaching water in the state.

If Yes, provide the name of the MS4 operator that receives the discharge.

#### 6. Edwards Aquifer Rule

Indicate if the discharge or potential discharge is within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer. See maps on the TCEQ website to determine if the site is located within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer at

<https://www.tceq.texas.gov/permitting/eapp/viewer.html>.

If Yes, additional requirements may exist under the Edwards Aquifer Protection Program (30 TAC Chapter 213). For activities regulated under 30 TAC Chapter 213, any required plans must be included in the SWMP. Compliance with any Edwards Aquifer requirements is in addition to the requirements of this general permit.

#### j) Public Participation

1. Provide the name and contact information of the person responsible for publishing the public notice in the newspaper.
2. Provide the name and location of a public place where copies of the NOI, SWMP, General Permit, and permit fact sheet will be available to the public for viewing. Examples of public places include public libraries, city hall, municipal buildings, etc.
3. Provide the address for the website where the MS4's SWMP and annual report will be posted. Indicate if the MS4 does not have a website.

### Section 6. Certifications

Failure to indicate "Yes" to ALL of the certification items may result in denial of coverage under the general permit. The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code §305.44.

**IF YOU ARE A CORPORATION:**

The regulation that controls who may sign an application form is 30 Texas Administrative Code §305.44(a), which is provided below. According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

**IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:**

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a), which is provided below. According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statutes under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a) (3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512-239-0600.

**30 TEXAS ADMINISTRATIVE CODE §305.44. SIGNATORIES TO APPLICATIONS**

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes

the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

### **SWMP Cover Sheet**

The SWMP cover sheet must be completed and placed on the front of the SWMP. Both the SWMP cover sheet and the SWMP must be submitted with the complete NOI.

Provide the name of the MS4 operator.

For each MCM, complete the table by entering the page number (or page number range) where each required program element can be found in the SWMP.

Note: Some program elements are only required for certain MS4 levels. The tables clearly identify these MS4 level specific requirements. If one of these program element does not apply to the MS4 level for this facility, enter NA.

Additionally, MCM 7 is optional. If you selected "No" on the NOI Section 5.e.4 question, enter NA on Table 7.

**APPENDIX 9 – TPDES GENERAL PERMIT**

# Texas Commission on Environmental Quality

P.O. Box 13087, Austin, Texas 78711-3087



## GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM

under provisions of  
402 of the Clean Water Act  
and Chapter 26 of the Texas Water Code

This permit supersedes and replaces  
TPDES General Permit No. TXRo40000, issued December 13, 2013

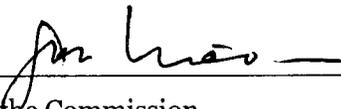
Small Municipal Separate Storm Sewer Systems  
located in the state of Texas  
may discharge directly to surface water in the state

only according to requirements and conditions set forth in this general permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ or Commission), the laws of the State of Texas, and other orders of the the TCEQ. The issuance of this general permit does not grant to the permittee the right to use private or public property for conveyance of stormwater and certain non-stormwater discharges along the discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this general permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.

This general permit and the authorization contained herein shall expire at midnight, five years after the permit effective date.

EFFECTIVE DATE: 1-24-19

ISSUED DATE: 1-24-19

  
\_\_\_\_\_  
For the Commission

**TCEQ GENERAL PERMIT NUMBER TXR040000  
RELATING TO DISCHARGES FROM  
SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS**

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**Part I. Definitions**

**Arid Areas** - Areas with an average annual rainfall of less than ten (10) inches.

**Benchmarks** – A benchmark pollutant value is a guidance level indicator that helps determine the effectiveness of chosen best management practices (BMPs). This type of monitoring differs from “compliance monitoring” in that exceedances of the indicator or benchmark level are not permit violations, but rather indicators that can help identify problems at the MS4 with exposed or unidentified pollutant sources; or control measures that are either not working correctly, whose effectiveness need to be re-considered, or that need to be supplemented with additional BMP(s).

**Best Management Practices (BMPs)** - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

**Catch basins** - Storm drain inlets and curb inlets to the storm drain system. Catch basins typically include a grate or curb inlet that may accumulate sediment, debris, and other pollutants.

**Classified Segment** - A water body that is listed and described in Appendix A or Appendix C of the Texas Surface Water Quality Standards, at 30 Texas Administrative Code (TAC) § 307.10.

**Clean Water Act (CWA)** - The Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et. seq.

**Common Plan of Development or Sale** - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development or sale is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities.

**Construction Activity** - Soil disturbance, including clearing, grading, excavating, and other construction related activities (e.g., stockpiling of fill material and demolition); and not including routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities). Regulated construction activity is defined in terms of small and large construction activity.

**Small Construction Activity** is construction activity that results in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land.

**Large Construction Activity** is construction activity that results in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land.

**Construction Site Operator** - The entity or entities associated with a small or large construction project that meet(s) either of the following two criteria:

- (a) The entity or entities that have operational control over construction plans and specifications (including approval of revisions) to the extent necessary to meet the requirements and conditions of this general permit; or
- (b) The entity or entities that have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a stormwater pollution prevention plan (SWP3) for the site or other permit conditions (for example they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

**Control Measure** - Any BMP or other method used to prevent or reduce the discharge of pollutants to water in the state.

**Conveyance** - Curbs, gutters, man-made channels and ditches, drains, pipes, and other constructed features designed or used for flood control or to otherwise transport stormwater runoff.

**Discharge** – When used without a qualifier, refers to the discharge of stormwater runoff or certain non-stormwater discharges as allowed under the authorization of this general permit.

**Edwards Aquifer** - As defined in 30 TAC §213.3 (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

**Edwards Aquifer Recharge Zone** - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the TCEQ or the TCEQ website.

**Final Stabilization** - A construction site where any of the following conditions are met:

- (a) All soil disturbing activities at the site have been completed and a uniform (for example, evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- (b) For individual lots in a residential construction site by either:
  - (1) The homebuilder completing final stabilization as specified in condition (a) above; or
  - (2) The homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization.

- (c) For construction activities on land used for agricultural purposes (for example pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to a surface water and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.
- (d) In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
  - (1) Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator, and
  - (2) The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.

**General Permit** - A permit issued to authorize the discharge of waste into or adjacent to water in the state for one or more categories of waste discharge within a geographical area of the state or the entire state as provided by Texas Water Code (TWC) §26.040.

**Groundwater Infiltration** - For the purposes of this permit, groundwater that enters a municipal separate storm sewer system (including sewer service connections and foundation drains) through such means as defective pipes, pipe joints, connections, or manholes.

**High Priority Facilities** - High priority facilities are facilities with a high potential to generate stormwater pollutants. These facilities must include, at a minimum, the MS4 operator's maintenance yards, hazardous waste facilities, fuel storage locations, and other facilities where chemicals or other materials have a high potential to be discharged in stormwater. Among the factors that must be considered when giving a facility a high priority ranking are: the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must not be performed outside (for example, changing automotive fluids, vehicle washing), proximity to waterbodies, proximity to sensitive aquifer recharge features, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s).

**Hyperchlorinated Water** – Water resulting from hyperchlorination of waterlines or vessels, with a chlorine concentration greater than 10 milligrams per liter (mg/L).

**Illicit Connection** - Any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

**Illicit Discharge** - Any discharge to a municipal separate storm sewer that is not entirely composed of stormwater, except discharges pursuant to this general permit or a separate authorization and discharges resulting from emergency fire fighting activities.

**Impaired Water** - A surface water body that is identified as impaired on the latest approved CWA §303(d) List or waters with an EPA approved or established TMDL that are found on the latest EPA approved *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)* which lists the category 4 and 5 water bodies.

**Implementation Plan (I-Plan)** – A detailed plan of action that describes the measures or activities necessary to achieve the pollutant reductions identified in the total maximum daily load (TMDL).

**Indian Country** - Defined in 18 USC § 1151 as: (a) All land within the limits of any Indian reservation under the jurisdiction of the United States (U.S.) Government, notwithstanding the

issuance of any patent, and including rights-of-way running through the reservation; (b) All dependent Indian communities within the borders of the U.S. whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state; and (c) All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe.

**Indicator Pollutant** - An easily measured pollutant, that may or may not impact water quality that indicates the presence of other stormwater pollutants.

**Industrial Activity** - Any of the ten (10) categories of industrial activities included in the definition of “stormwater discharges associated with industrial activity” as defined in 40 Code of Federal Regulations (CFR) §122.26(b)(14)(i)-(ix) and (xi).

**Infeasible** - For the purpose of this permit, infeasible means not technologically possible, or not economically practicable and achievable in light of best industry practices. The TCEQ notes that it does not intend for any small MS4 permit requirement to conflict with state water right laws.

**Maximum Extent Practicable (MEP)** - The technology-based discharge standard for municipal separate storm sewer systems (MS4s) to reduce pollutants in stormwater discharges that was established by the CWA § 402(p). A discussion of MEP as it applies to small MS4s is found in 40 CFR § 122.34.

**MS4 Operator** - For the purpose of this permit, the public entity or the entity contracted by the public entity, responsible for management and operation of the small municipal separate storm sewer system that is subject to the terms of this general permit.

**Municipal Separate Storm Sewer System (MS4)** - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- (a) Owned or operated by the U.S., a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under the CWA §208 that discharges to surface water in the state;
- (b) That is designed or used for collecting or conveying stormwater;
- (c) That is not a combined sewer; and
- (d) That is not part of a publicly owned treatment works (POTW) as defined in 40 CFR §122.2.

**Non-traditional Small MS4** - A small MS4 that often cannot pass ordinances and may not have the enforcement authority like a traditional small MS4 would have to enforce the stormwater management program. Examples of non-traditional small MS4s include counties, transportation authorities (including the Texas Department of Transportation), municipal utility districts, drainage districts, military bases, prisons and universities.

**Notice of Change (NOC)** - A written notification from the permittee to the executive director providing changes to information that was previously provided to the agency in a notice of intent.

**Notice of Intent (NOI)** - A written submission to the executive director from an applicant requesting coverage under this general permit.

**Notice of Termination (NOT)** - A written submission to the executive director from a permittee authorized under a general permit requesting termination of coverage under this general permit.

**Outfall** - A point source at the point where a small MS4 discharges to waters of the U.S. and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S. For the purpose of this permit, sheet flow leaving a linear transportation system without channelization is not considered an outfall. Point sources such as curb cuts; traffic or right-of-way barriers with drainage slots that drain into open culverts, open swales or an adjacent property, or otherwise not actually discharging into waters of the U.S. are not considered an outfall.

**Permittee** - The MS4 operator authorized under this general permit.

**Point Source** - (from 40 CFR § 122.22) any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

**Pollutant(s) of Concern** – For the purpose of this permit, includes biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids (TSS), turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from an MS4. (Definition from 40 CFR § 122.32(e)(3)).

**Redevelopment** - Alterations of a property that changed the "footprint" of a site or building in such a way that there is a disturbance of equal to or greater than one (1) acre of land. This term does not include such activities as exterior remodeling, routine maintenance activities, and linear utility installation.

**Semiarid Areas** - Areas with an average annual rainfall of at least ten (10) inches, but less than 20 inches.

**Small Municipal Separate Storm Sewer System (MS4)** – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

- (a) Owned or operated by the U.S., a state, city, town, borough, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under CWA § 208;
- (b) Designed or used for collecting or conveying stormwater;
- (c) Which is not a combined sewer;
- (d) Which is not part of a POTW as defined in 40 CFR § 122.2; and
- (e) Which was not previously regulated under a National Pollutant Discharge Elimination System (NPDES) or a Texas Pollutant Discharge Elimination System (TPDES)

individual permit as a medium or large municipal separate storm sewer system, as defined in 40 CFR §§122.26(b)(4) and (b)(7).

This term includes systems similar to separate storm sewer systems at military bases, large hospitals or prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings. For the purpose of this permit, a very discrete system also includes storm drains associated with certain municipal offices and education facilities serving a nonresidential population, where those storm drains do not function as a system, and where the buildings are not physically interconnected to a small MS4 that is also operated by that public entity.

**Stormwater and Stormwater Runoff** - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

**Stormwater Associated with Construction Activity** - Stormwater runoff from an area where there is either a large construction or a small construction activity.

**Stormwater Management Program (SWMP)** - A comprehensive program to manage the quality of discharges from the municipal separate storm sewer system.

**Structural Control (or Practice)** - A pollution prevention practice that requires the construction of a device, or the use of a device, to capture or prevent pollution in stormwater runoff. Structural controls and practices may include but are not limited to: wet ponds, bioretention, infiltration basins, stormwater wetlands, silt fences, earthen dikes, drainage swales, vegetative lined ditches, vegetative filter strips, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

**Surface Water in the State** - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHW) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

**Total Maximum Daily Load (TMDL)** - The total amount of a substance that a water body can assimilate and still meet the Texas Surface Water Quality Standards.

**Traditional Small MS4** - A small MS4 that can pass ordinances and have the enforcement authority to enforce the stormwater management program. An example of traditional MS4s includes cities.

**Urbanized Area (UA)** - An area of high population density that may include multiple small MS4s as defined and used by the U.S. Census Bureau in the 2000 and the 2010 Decennial Census.

**Waters of the United States** - (According to 40 CFR § 122.2) Waters of the United States or waters of the U.S. means:

- (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (b) All interstate waters, including interstate wetlands;

- (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
  - (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
  - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) All impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) The territorial sea; and
- (g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA are not waters of the U.S. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the U.S. (such as disposal area in wetlands) nor resulted from the impoundment of waters of the U.S. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding the CWA jurisdiction remains with the EPA.

## **Part II. Permit Applicability and Coverage**

This general permit provides authorization for stormwater and certain non-stormwater discharges from small municipal separate storm sewer systems (MS4) to surface water in the state. The general permit contains requirements applicable to all small MS4s that are eligible for coverage under this general permit.

### **Section A. Small MS4s Eligible for Authorization under this General Permit**

Discharges from a small MS4 must be authorized if any of the following criteria are met and may be authorized under this general permit if coverage is not otherwise prohibited.

#### **1. Small MS4s Located in an Urbanized Area**

Operators of small MS4s that are fully or partially located within an urbanized area (UA), as determined by the 2000 or 2010 Decennial Censuses by the U.S. Census Bureau, must obtain authorization for the discharge of stormwater runoff and are eligible for coverage under this general permit unless otherwise prohibited.

#### **2. Designated Small MS4s**

A small MS4 that is outside an urbanized area that is *designated* by TCEQ based on evaluation criteria as required by 40 CFR § 122.32(a)(2) or 40 CFR § 122.26(a)(1)(v) and adopted by reference in Title 30, TAC § 281.25, is eligible for coverage under this general permit. Following designation, operators of small MS4s must obtain authorization under this general permit or apply for coverage under an individual TPDES stormwater permit within 180 days of notification of their designation.

#### **3. Operators of Previously Permitted Small MS4s**

Operators of small MS4s that were covered under the previous TPDES general permit for small MS4s (TXR040000, issued and effective on December 13, 2013) must reapply for permit coverage, or must obtain a waiver if applicable (see Part II.B, related to Obtaining a Waiver.)

#### **4. Regulated Portion of Small MS4**

The portion of the small MS4 that is required to meet the conditions of this general permit are those portions that are located within the UA as defined and used by the U.S. Census Bureau in the 2000 or 2010 Censuses, as well as any portion of the small MS4 that is designated by TCEQ.

For the purpose of this permit, the regulated portion of a small MS4 for a transportation entity is the land owned by the permittee within the UA which functions as, or is integral to a transportation system with drainage conveyance. Non-contiguous property that does not drain into the transportation drainage system is not subject to this general permit.

#### **5. Categories of Regulated Small MS4s**

This permit defines MS4 operators by the following categories, or levels, based on the population served within the 2010 UA. The level of a small MS4 may change during the permit term based on the MS4 operator acquiring or giving up regulated area, such as by annexing land or if land is annexed away. However, the level of a small MS4 will not change during the permit term based on population fluctuation.

The level of an MS4 is based on most the recent Decennial Census at the time of permit issuance. A national Census held during a permit term will not affect the level of an MS4 until the next permit renewal.

- (a) Level 1: Operators of traditional small MS4s that serve a population of less than 10,000 within a UA;
- (b) Level 2: Operators of traditional small MS4s that serve a population of at least 10,000 but less than 40,000 within a UA. This category also includes all non-traditional small MS4s such as counties, drainage districts, transportation entities, military bases, universities, colleges, correctional institutions, municipal utility districts and other special districts regardless of population served within the UA, unless the non-traditional MS4 can demonstrate that it meets the criteria for a waiver from permit coverage based on the population served;
- (c) Level 3: Operators of traditional small MS4s that serve a population of at least 40,000 but less than 100,000 within a UA;
- (d) Level 4: Operators of traditional small MS4s that serve a population of 100,000 or more within a UA.

For the purpose of this section “serve a population” means the residential population within the regulated portion of the small MS4 based on the 2010 Census, except for non-traditional small MS4s listed in (b) above.

### **Section B. Available Waivers from Coverage**

The TCEQ may waive permitting requirements for small regulated MS4 operators if the criteria are met for Waiver Option 1 or 2 below. To obtain Waiver Option 1, the MS4 operator must submit the request on a waiver form provided by the executive director, or, starting from December 21, 2020, complete the form electronically via the online e-permitting system available through the TCEQ website.

To obtain Waiver Option 2, the MS4 operator must contact the executive director and coordinate the activities required to meet the waiver conditions. A provisional waiver from permitting requirements begins 30 days after an administratively complete waiver form is postmarked for delivery to the TCEQ, or starting from December 21, 2020, complete the form electronically via the online e-permitting system available through the TCEQ website.

Following review of the waiver form, the executive director may: (1) Determine that the waiver form is technically complete and approve the waiver by providing a notification and a waiver number; (2) Determine that the waiver form is incomplete and deny the waiver until a completed waiver form is submitted; or (3) Deny the waiver and require that permit coverage be obtained.

If the conditions of a waiver are not met by the MS4 operator, then the MS4 operator must submit an application for coverage under this general permit or a separate TPDES permit application.

At any time the TCEQ may require a previously waived MS4 operator to comply with this general permit or another TPDES permit if circumstances change so that the conditions of the waiver are no longer met. Changed circumstances can also allow a regulated MS4 operator to request a waiver at any time.

At any time the TCEQ can request to review any waivers granted to MS4 operators to determine whether any of the information required for granting the waiver has changed. At

a minimum TCEQ will review all waivers when MS4 operators submit their renewal waiver applications.

For the purpose of obtaining a waiver, the population served refers to the residential population for traditional small MS4s and for certain non-traditional small MS4s with a residential population (such as counties and municipal utility districts). For other non-traditional small MS4s, the population served refers to the number of people using the small MS4 on an average operational day.

Effective December 21, 2020, applicants must submit a waiver using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization.

### **1. Waiver Option 1:**

The small MS4 serves a population of less than 1,000 within a UA and meets the following criteria:

- (a) The small MS4 is not contributing substantially to the pollutant loadings of a physically interconnected MS4 that is regulated by the NPDES / TPDES stormwater program (40 CFR § 122.32(d)); and
- (b) If the small MS4 discharges any pollutant(s) that have been identified as a cause of impairment of any water body to which the small MS4 discharges, stormwater controls are not needed based on wasteload allocations that are part of an EPA approved or established TMDL that addresses the pollutant(s) of concern.

### **2. Waiver Option 2:**

The small MS4 serves a population under 10,000 within a UA and meets the following criteria:

- (a) The TCEQ has evaluated all waters of the U.S., including small streams, tributaries, lakes, and ponds, that receive a discharge from the small MS4;
- (b) For all such waters, the TCEQ has determined that stormwater controls are not needed based on wasteload allocations that are part of an approved or established TMDL that addresses the pollutant(s) of concern or, if a TMDL has not been developed or approved, an equivalent analysis that determines sources and allocations for the pollutant(s) of concern; and
- (c) The TCEQ has determined that future discharges from the small MS4 do not have the potential to exceed Texas surface water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.
- (d) For the purpose of this paragraph (2.), the pollutant(s) of concern include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the small MS4.

**Section C. Allowable Non-Stormwater Discharges**

The following non-stormwater sources may be discharged from the small MS4 and are not required to be addressed in the small MS4's Illicit Discharge and Detection or other minimum control measures, unless they are determined by the permittee or the TCEQ to be significant contributors of pollutants to the small MS4, or they are otherwise prohibited by the MS4 operator:

1. Water line flushing (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life);
2. Runoff or return flow from landscape irrigation, lawn irrigation, and other irrigation utilizing potable water, groundwater, or surface water sources;
3. Discharges from potable water sources that do not violate Texas Surface Water Quality Standards;
4. Diverted stream flows;
5. Rising ground waters and springs;
6. Uncontaminated ground water infiltration;
7. Uncontaminated pumped ground water;
8. Foundation and footing drains;
9. Air conditioning condensation;
10. Water from crawl space pumps;
11. Individual residential vehicle washing;
12. Flows from wetlands and riparian habitats;
13. Dechlorinated swimming pool discharges that do not violate Texas Surface Water Quality Standards;
14. Street wash water excluding street sweeper waste water;
15. Discharges or flows from emergency fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, and similar activities);
16. Other allowable non-stormwater discharges listed in 40 CFR § 122.26(d)(2)(iv)(B)(1);
17. Non-stormwater discharges that are specifically listed in the TPDES Multi Sector General Permit (MSGP) TXR050000 or the TPDES Construction General Permit (CGP) TXR150000;
18. Discharges that are authorized by a TPDES or NPDES permit or that are not required to be permitted; and
19. Other similar occasional incidental non-stormwater discharges such as spray park water, unless the TCEQ develops permits or regulations addressing these discharges.

**Section D. Limitations on Permit Coverage****1. Discharges Authorized by Another TPDES Permit**

Discharges authorized by an individual or other general TPDES permit may be authorized under this TPDES general permit only if the following conditions are met:

- (a) The discharges meet the applicability and eligibility requirements for coverage under this general permit;
- (b) A previous application or permit for the discharges has not been denied, terminated, or revoked by the executive director as a result of enforcement or water quality related concerns. The executive director may provide a waiver to this provision based on new circumstances at the regulated small MS4; and
- (c) The executive director has not determined that continued coverage under an individual permit is required based on consideration of an approved total maximum daily loading (TMDL) model and implementation plan, anti-backsliding policy, history of substantive non-compliance or other 30 TAC Chapter 205 considerations and requirements, or other site-specific considerations.

## **2. Discharges of Stormwater Mixed with Non-Stormwater**

Stormwater discharges that combine with sources of non-stormwater are not eligible for coverage by this general permit, unless either the non-stormwater source is described in Part II.C of this general permit or the non-stormwater source is authorized under a separate TPDES permit.

## **3. Compliance with Water Quality Standards**

Discharges to surface water in the state that would cause, has the reasonable potential to cause, or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses are not eligible for coverage under this general permit except as described in Part II.D.4 below. The executive director may require an application for an individual permit or alternative general permit to authorize discharges to surface water in the state if the executive director determines that an activity will cause has the reasonable potential to cause, or contribute to, a violation of water quality standards or is found to cause, have the reasonable potential to cause, or contribute to the impairment of a designated use of surface water in the state. The executive director may also require an application for an individual permit based on factors described in Part II.F.2.

## **4. Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements**

Discharges of the pollutant(s) of concern to impaired water bodies for which there is a TCEQ and EPA approved TMDL are not eligible for this general permit unless they are consistent with the approved TMDL. A water body is impaired for purposes of the permit if it has been identified, pursuant to the latest TCEQ and EPA approved CWA §303(d) list or the *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)* which lists the category 4 and 5 water bodies, as not meeting Texas Surface Water Quality Standards.

The permittee shall check annually, in conjunction with preparation of the annual report, whether an impaired water within its permitted area has been added to the latest EPA approved 303(d) list or the *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)* which lists the category 4 and 5 water bodies. Within two years following the approval date of the new list(s) of impaired waters, the permittee shall comply with the requirements of Part II.D.4.(b) (with the exception of (b)(1)c), and shall identify any newly listed waters in the annual report (consistent with Part IV.B.2.f) and SWMP (consistent with Part III.A.2.f).

The permittee shall control the discharges of pollutant(s) of concern to impaired waters and waters with approved TMDLs as provided in sections (a) and (b) below, and shall assess the progress in controlling those pollutants.

(a) Discharges to Water Quality Impaired Water Bodies with an Approved TMDL

If the small MS4 discharges to an impaired water body with an approved TMDL, where stormwater has the potential to cause or contribute to the impairment, the permittee shall include in the SWMP controls targeting the pollutant(s) of concern along with any additional or modified controls required in the TMDL and this section.

The SWMP and required annual reports must include information on implementing any targeted controls required to reduce the pollutant(s) of concern as described below:

(1) Targeted Controls

The SWMP must include a detailed description of all targeted controls to be implemented, such as identifying areas of focused effort or implementing additional Best Management Practices (BMPs) to reduce the pollutant(s) of concern in the impaired waters.

(2) Measurable Goals

For each targeted control, the SWMP must include a measurable goal and an implementation schedule describing BMPs to be implemented during each year of the permit term.

(3) Identification of Benchmarks

The SWMP must identify a benchmark for the pollutant(s) of concern. Benchmarks are designed to assist in determining if the BMPs established are effective in addressing the pollutant(s) of concern in stormwater discharge(s) from the MS4 to the maximum extent practicable (MEP). The BMPs addressing the pollutant of concern must be re-evaluated on an annual basis for progress towards the benchmarks and modified as necessary within an adaptive management framework. These benchmarks are not numeric effluent limitations or permit conditions but intended to be guidelines for evaluating progress towards reducing pollutant discharges consistent with the benchmarks. The exceedance of a benchmark is not a permit violation and does not in itself indicate a violation of instream water quality standards.

The benchmark must be determined based on one of the following options:

- a. If the MS4 is subject to a TMDL that identifies a Waste Load Allocation(s) (WLA) for permitted MS4 stormwater sources, then the SWMP may identify it as the benchmark. Where an aggregate allocation is used as a benchmark, all affected MS4 operators are jointly responsible for progress in meeting the benchmark and shall (jointly or individually) develop a monitoring/assessment plan as required in Part II.D.4(a)(6).
- b. Alternatively, if multiple small MS4s are discharging into the same impaired water body with an approved TMDL, with an aggregate WLA for all permitted stormwater MS4s, then the MS4s may combine or share efforts to determine an alternative sub-benchmark value for the pollutant(s) of concern (e.g., bacteria) for their respective MS4. The SWMP must clearly define this alternative approach and must describe how the sub-benchmark value would cumulatively support the aggregate WLA. Where an aggregate benchmark has

been broken into sub-benchmark values for individual MS4s, each permittee is only responsible for progress in meeting its sub-benchmark value.

**(4) Annual Report**

The annual report must include an analysis of how the selected BMPs will be effective in contributing to achieving the benchmark value.

**(5) Impairment for Bacteria**

If the pollutant of concern is bacteria, the permittee shall implement BMPs addressing the below areas, as applicable, in the SWMP and implement as appropriate. If a TMDL Implementation Plan (I-Plan) is available, the permittee may refer to the I-Plan for appropriate BMPs. The SWMP and annual report must include the selected BMPs. Permittees may not exclude BMPs associated with the minimum control measures required under 40 CFR §122.34 from their list of proposed BMPs. Proposed BMPs will be reviewed by the executive director during the NOI and SWMP review and approval process.

The BMPs shall, as appropriate, address the following:

**a. Sanitary Sewer Systems**

- (i) Make improvements to sanitary sewers to reduce overflows;
- (ii) Address lift station inadequacies;
- (iii) Improve reporting of overflows; and
- (iv) Strengthen sanitary sewer use requirements to reduce blockage from fats, oils, and grease.

**b. On-site Sewage Facilities (for entities with appropriate jurisdiction)**

- (i) Identify and address failing systems; and
- (ii) Address inadequate maintenance of On-Site Sewage Facilities (OSSFs).

**c. Illicit Discharges and Dumping**

Place additional effort to reduce waste sources of bacteria; for example, from septic systems, grease traps, and grit traps.

**d. Animal Sources**

Expand existing management programs to identify and target animal sources such as zoos, pet waste, and horse stables.

**e. Residential Education**

Increase focus to educate residents on:

- (i) Bacteria discharging from a residential site either during runoff events or directly;
- (ii) Fats, oils, and grease clogging sanitary sewer lines and resulting overflows;
- (iii) Maintenance and operation of decorative ponds; and
- (iv) Proper disposal of pet waste.

(6) Monitoring or Assessment of Progress

The permittee shall develop a Monitoring/Assessment Plan to monitor or assess progress in achieving benchmarks and determine the effectiveness of BMPs, and shall include documentation of this monitoring or assessment in the SWMP and annual reports. In addition, the SWMP must include methods to be used.

- a. The permittee may use either of the following methods to evaluate progress towards the benchmark and improvements in water quality in achieving the water quality standards as follows:

(i) Evaluating Program Implementation Measures

The permittee may evaluate and report progress towards the benchmark by describing the activities and BMPs implemented, by identifying the appropriateness of the identified BMPs, and by evaluating the success of implementing the measurable goals.

The permittee may assess progress by using program implementation indicators such as: (1) number of sources identified or eliminated; (2) decrease in number of illegal dumping; (3) increase in illegal dumping reporting; (4) number of educational opportunities conducted; (5) reductions in sanitary sewer flows (SSOs); or, (6) increase in illegal discharge detection through dry screening, etc.; or

(ii) Assessing Improvements in Water Quality

The permittee may assess improvements in water quality by using available data for segment and assessment units of water bodies from other reliable sources, or by proposing and justifying a different approach such as collecting additional instream or outfall monitoring data, etc. Data may be acquired from TCEQ, local river authorities, partnerships, and/or other local efforts as appropriate.

- b. Progress towards achieving the benchmark shall be reported in the annual report. Annual reports shall report the benchmark and the year(s) during the permit term that the MS4 conducted additional sampling or other assessment activities.

(7) Observing no Progress Towards the Benchmark

If, by the end of the third year from the effective date of the permit, the permittee observes no progress toward the benchmark either from program implementation or water quality assessments as described in Part II.D.4(a)(6), the permittee shall identify alternative focused BMPs that address new or increased efforts towards the benchmark or, as appropriate, shall develop a new approach to identify the most significant sources of the pollutant(s) of concern and shall develop alternative focused BMPs for those (this may also include information that identifies issues beyond the MS4's control). These revised BMPs must be included in the SWMP and subsequent annual reports.

Where the permittee originally used a benchmark value based on an aggregated WLA, the permittee may combine or share efforts with other MS4s discharging to the same watershed to determine an alternative sub-benchmark value for the pollutant(s) of concern for their respective MS4s, as described in Part II.D.4(a)(3)(b) above. Permittees must document, in their SWMP for the next permit term, the proposed schedule for the development and subsequent adoption

of alternative sub-benchmark value(s) for the pollutant(s) of concern for their respective MS4s and associated assessment of progress in meeting those individual benchmarks.

(b) Discharges Directly to Water Quality Impaired Water Bodies without an Approved TMDL

The permittee shall also determine whether the permitted discharge is directly to one or more water quality impaired water bodies where a TMDL has not yet been approved by TCEQ and EPA. If the permittee discharges directly into an impaired water body without an approved TMDL, the permittee shall perform the following activities:

(1) Discharging a Pollutant of Concern

- a. The permittee shall determine whether the small MS4 may be a source of the pollutant(s) of concern by referring to the CWA §303(d) list and then determining if discharges from the MS4 would be likely to contain the pollutant(s) of concern at levels of concern.
- b. If the permittee determines that the small MS4 may discharge the pollutant(s) of concern to an impaired water body without an approved TMDL, the permittee shall ensure that the SWMP includes focused BMPs, along with corresponding measurable goals, that the permittee will implement, to reduce, the discharge of pollutant(s) of concern that contribute to the impairment of the water body.
- c. In addition, the permittee shall submit an NOC to amend the SWMP in accordance with Part II.E.6 to include any additional BMPs to address the pollutant(s) of concern. This requirement does not apply to BMPs implemented to address impaired waters that are listed after permit authorization pursuant to Part II.D.4.

(2) Impairment of Bacteria

Where the impairment is for bacteria, the permittee shall identify potential significant sources and develop and implement focused BMPs for those sources. The permittee may implement the BMPs listed in Part II.D.4(a)(5) or proposed alternative BMPs as appropriate.

- (3) The annual report must include information on compliance with this section, including results of any sampling conducted by the permittee.

## **5. Discharges to the Edwards Aquifer Recharge Zone**

Discharges of stormwater from regulated small MS4s, and other non-stormwater discharges, are not authorized by this general permit where those discharges are prohibited by 30 TAC Chapter 213 (Edwards Aquifer Rule). New discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone, must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.

For existing discharges, the requirements of the agency-approved Water Pollution Abatement Plan (WPAP) under the Edwards Aquifer Rule are in addition to the requirements of this general permit. BMPs and maintenance schedules for structural stormwater controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in stormwater

runoff are in addition to the effluent limitation requirements found in Part VI.D. of this general permit.

The permittee's agency-approved WPAPs that are required by the Edwards Aquifer Rule must be referenced in the SWMP. Additional agency-approved WPAPs received after the SWMP submittal must be recorded in the annual report for each respective permit year. For discharges originating from the small MS4 permitted area, and located on or within ten stream miles upstream of the Edwards Aquifer recharge zone, applicants must also submit a copy of the MS4 NOI to the appropriate TCEQ Regional Office with each WPAP application.

*Counties:* Comal, Bexar, Medina, Uvalde, and Kinney

*Contact:*

TCEQ, Water Program Manager  
San Antonio Regional Office  
14250 Judson Road  
San Antonio, Texas 78233-4480  
(210) 490-3096

*Counties:* Williamson, Travis, and Hays

*Contact:*

TCEQ, Water Program Manager  
Austin Regional Office  
12100 Park 35 Circle, Bldg. A, Rm 179  
Austin, Texas 78753  
(512) 339-2929

## **6. Discharges to Specific Watersheds and Water Quality Areas**

Discharges of stormwater from regulated small MS4s and other non-stormwater discharges are not authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

## **7. Protection of Streams and Watersheds by Home Rule Municipalities**

This general permit does not limit the authority of a home-rule municipality provided by Texas Local Government Code § 401.002.

## **8. Indian Country Lands**

Stormwater runoff from small MS4s that occur on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES regulations, authority for these discharges must be obtained from the U.S. EPA.

## **9. Endangered Species Act**

Discharges that would adversely affect a listed endangered or threatened species or its critical habitat are not authorized by this permit. Federal requirements related to endangered species apply to all TPDES permitted discharges, and site-specific controls may

be required to ensure that protection of endangered or threatened species is achieved. If a permittee has concerns over potential impacts to listed species, the permittee shall contact TCEQ for additional information prior to submittal of the NOI and SWMP. If adverse impact is determined after submittal of the NOI and SWMP or after permit issuance, the permittee shall contact TCEQ immediately to determine corrective action and potential modification to the MS4's permit.

### **10. Other**

Nothing in Part II of the general permit is intended to negate any person's ability to assert the force majeure (act of God, war, strike, riot, or other catastrophe) defenses found in 30 TAC § 70.7.

This permit does not transfer liability for the act of discharging without, or in violation of, a NPDES or a TPDES permit from the operator of the discharge to the permittee(s).

## **Section E. Obtaining Authorization**

### **1. Application for Coverage**

When submitting a notice of intent (NOI) and SWMP, for coverage under this general permit, as described in Parts II.E.3., II.E.8, and Part III, the applicant must follow the public notice and availability requirements found in Part II.E.16 of this general permit.

Applicants seeking authorization to discharge under this general permit must submit a completed NOI on a form approved by the executive director, and a SWMP as described in Part III. The NOI and SWMP must be submitted to the TCEQ Water Quality Division, at the address specified on the form or starting from December 21, 2020, must be submitted electronically via the online e-permitting system available through the TCEQ website.

Following review of the NOI and SWMP, the executive director may determine that: 1) The submission is complete and the NOI and SWMP are approved, 2) The NOI or SWMP are incomplete and deny coverage and require that a new complete NOI and SWMP be submitted, 3) Approve the NOI and SWMP with revisions and provide a written description of the required revisions along with any compliance schedule(s), or 4) Deny coverage and provide a deadline by which the MS4 operator must submit an application for an individual permit. Where the executive director approves the submittal, either with or without changes, the applicant must then carry out the public participation provisions in Part II.E.12. Following the completion of the public participation process, the applicant is authorized to discharge upon notification by TCEQ, at which point the permittee is subject to the terms of this permit and the approved terms of the SWMP. Denial of coverage under this general permit is subject to the requirements of 30 TAC § 205.4(c). Application deadlines are as follows:

(a) **Small MS4s Located in a 2000 or 2010 UA (Previously regulated Small MS4s)**

Operators of small MS4s described in Part II.A.1 that were required to obtain authorization under the 2013 TPDES General Permit TXR040000 based on the 2000 and 2010 UA maps shall submit an NOI and SWMP within 180 days following the effective date of this general permit.

(b) Designated Small MS4s

Following designation, operators of small MS4s described in Part II.A.2 shall submit an NOI and SWMP, or apply for coverage under an individual TPDES stormwater permit, within 180 days of being notified in writing by the TCEQ of the need to obtain permit coverage.

(c) Individual Permit Alternative

If an operator of a small MS4 described in Part II.A.1. of this general permit elects to apply for an individual permit, the application must be submitted within 90 days following the effective date of this general permit.

Effective December 21, 2020, the NOI and the SWMP must be submitted using the online e-permitting system available through the TCEQ website, unless the permittee requests and obtains an electronic reporting waiver. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

## **2. Late Submission of the NOI and SWMP**

Operators are not prohibited from submitting an NOI and SWMP after the deadlines provided. If a late NOI and SWMP are submitted, then this general permit provides authorization only for discharges that occur after permit coverage is obtained. The TCEQ reserves the right to take appropriate enforcement actions for any unpermitted discharges.

## **3. SWMP General Requirements**

A SWMP must be developed and submitted with the NOI for eligible discharges that will reach waters of the U.S., including discharges from the regulated small MS4 to other MS4s or to privately-owned separate storm sewer systems that subsequently drain to waters of the U.S., according to the requirements of Part III of this general permit. The SWMP must include, as appropriate, the months and years in which the permittee will undertake required actions, including interim milestones and the frequency of the action throughout the permit term.

New elements in the program must be completely implemented within five years of the effective date of this general permit, or within five years of being designated for those small MS4s which are designated following permit issuance. Previously regulated MS4s shall assess existing program elements set forth in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP.

## **4. SWMP Review**

The permittee shall participate in an annual review of its SWMP in conjunction with preparation of the annual report required in Part IV.B.2. Results of the review shall be documented in the annual report.

## **5. SWMP Updates Required by TCEQ**

Changes may be made to the SWMP during the permit term. The TCEQ may notify the permittee of the need to modify the SWMP to be consistent with the general permit, in which case the permittee will have 90 days to finalize such changes to the SWMP.

## 6. SWMP Updates

Changes that are made to the SWMP before the NOI is approved by the TCEQ must be submitted in a letter providing supplemental information to the NOI.

Changes to the SWMP that are made after TCEQ approval of the NOI and SWMP may be made by submittal and approval of a notice of change (NOC) unless the changes are non-substantial and do not change terms and conditions in the SWMP. Changes may be made as follows:

(a) Changes that do not require an NOC

The following changes may be implemented without submitting an NOC form. The changes may be made immediately following revision of the SWMP:

- (1) Adding (but not subtracting or replacing) components, controls, or requirements to the SWMP;
- (2) Adding areas such as by annexing land, or otherwise acquire additional land that expands the boundary of the MS4, or subtracting areas, such as by de-annexing lands;
- (3) Adding impaired water bodies that are identified pursuant to Part II.D.4; and
- (4) Minor modifications to the SWMP that include administrative or non-substantial changes as follows:
  - a. A change in personnel, or a reorganization of departments responsible for implementing the SWMP;
  - b. Minor clarifications to the existing BMPs;
  - c. Correction of typographical errors;
  - d. Other similar administrative or non-substantive comments.

(b) Changes that require an NOC

Modifications to the SWMP that include the following changes require submittal of an NOC along with those portions of the SWMP that are applicable to the change(s). The changes may be implemented once the permittee receives approval of the NOC.

- (1) Replacing a less effective or infeasible BMP specifically identified in the SWMP with an alternative BMP, (for example, replacing a structural BMP with a non-structural BMP would be considered a replacement). The SWMP update must include documentation of the following:
  - a. An analysis of why the BMP is ineffective or infeasible (including cost prohibitive);
  - b. Expectations of the effectiveness of the replacement BMP; and
  - c. An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced;
- (2) Requirement for more frequent monitoring or reporting by the permittee; and

- (3) Interim compliance date change in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

(c) Changes that require an NOC and Public Notice

All other modifications that changes permit terms and conditions must be submitted on an NOC form along with those portions of the SWMP that are applicable to the changes. The changes may only be implemented following public notice and written approval by TCEQ.

- (1) After receiving an NOC, the TCEQ evaluates if the requested change(s) can be approved and might request additional information from the permittee during the review process. If the request can be approved, the MS4 is required to post the notice of the Executive Director's preliminary determination of the NOC and the revised terms of the SWMP on the MS4's website. If the MS4 does not have a website, the MS4 must notify TCEQ and TCEQ will post the notice on the TCEQ website at <https://www.tceq.texas.gov/>.
- (2) The public comment period begins on the first day the notice is posted on the MS4 or the TCEQ website and ends 30 days later. If the 30<sup>th</sup> calendar day falls on a date that TCEQ is not open for business, then the public comment period is extended until 5 pm on the next TCEQ business day. If there is a decision to hold a public meeting, then the public comment period will continue until the public meeting has been held. The public may submit comments regarding the proposed changes to the TCEQ Water Quality Division.
- (3) The Executive Director will hold a public meeting (equivalent to a "public hearing" as required by 40 CFR §122.28(d)(2)(ii)) if it is determined there is significant public interest. The Executive Director will post a notice of the public meeting on the TCEQ website at <https://www.tceq.texas.gov/>. The notice of a public meeting will be posted at least 30 days before the meeting and will be held in the county where the MS4 is located or primarily located. TCEQ staff will facilitate the meeting and provide a sign in sheet for attendees to register their names and addresses. The public meeting held under this general permit is not an evidentiary proceeding. If a public meeting is held, the comment period will end at the conclusion of the public meeting.
- (4) The Executive Director, after considering public comment, shall incorporate the NOC changes into the SWMP. Once the revised terms are incorporated into the SWMP, the Executive Director will notify the permittee and the public on the revised terms and conditions of the SWMP.

## **7. Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation**

The permittee shall implement the SWMP:

- (a) On all new areas added to its portion of the MS4 (or where the permittee becomes responsible for implementation of stormwater quality controls) as expeditiously as possible, but no later than three (3) years from addition of the new area.

Implementation may be accomplished in a phased manner to allow additional time for controls that cannot be implemented immediately.

- (b) Within ninety (90) days of a transfer of ownership, operational authority, or responsibility for SWMP implementation, the permittee shall have a plan for implementing the SWMP in all affected areas. The plan must include schedules for implementation, and information on all new annexed areas. Any resulting updates required to the SWMP shall be submitted in the annual report.

## **8. Contents of the NOI**

The NOI must contain the following minimum information:

- (a) MS4 Operator Information
  - (1) The name, mailing address, electronic mail (email) address, telephone number, and facsimile (fax) number of the MS4 operator; and
  - (2) The legal status of the MS4 operator (for example, federal government, state government, county government, city government, or other government).
- (b) Site Information
  - (1) The name, physical location description, and latitude and longitude of the approximate center of the regulated portion of the small MS4;
  - (2) County or counties where the small MS4 is located;
  - (3) An indication if all or a portion of the small MS4 is located on Indian Country Lands;
  - (4) The name, mailing address, telephone number, email (if available) and fax number of the designated person(s) responsible for implementing or coordinating implementation of the SWMP;
  - (5) A signature and certification on the NOI, according to 30 TAC § 305.44, that a SWMP has been developed according to the provisions of this permit;
  - (6) A statement that the applicant will comply with the Public Participation requirements described in Part II.E.12.;
  - (7) The name of each classified segment that receives discharges, directly or indirectly, from the small MS4. If one or more of the discharge(s) is not directly to a classified segment, then the name of the first classified segment that those discharges reach must be identified;
  - (8) The name of any MS4 receiving the discharge prior to discharge into waters of the U.S.;
  - (9) The name of all surface water(s) receiving discharges from the small MS4 that are on the latest EPA-approved CWA § 303(d) list of impaired waters;
  - (10) An indication of whether the small MS4 discharges within the Recharge Zone, the Contributing Zone or the Contributing Zone within the Transition Zone of the Edwards Aquifer; and
  - (11) Any other information deemed necessary by the executive director.

### **9. Notice of Change (NOC)**

If the MS4 operator becomes aware that it failed to submit any relevant facts, or submitted incorrect information in the NOI, the correct information must be provided to the executive director in an NOC within 30 days after discovery. If any information provided in the NOI changes, an NOC must be submitted within 30 days from the time the permittee becomes aware of the change.

Any revisions that are made to the SWMP must be made in accordance with Parts II.E.4 through 6. Changes that are made to the SWMP following NOI approval must be made using an NOC form, in accordance with Part II.E.6.

Effective December 21, 2020, applicants must submit an NOC using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

### **10. Change in Operational Control of a Small MS4**

If the operational control of the regulated small MS4 changes, the previous operator must submit a Notice of Termination (NOT) and the new operator must submit an NOI and SWMP. The NOT and NOI must be submitted concurrently not more than ten (10) calendar days after the change occurs. Existing permittees who are expanding coverage of their MS4 area (e.g., city annexes part of unincorporated county MS4) are not required to submit a new NOI, but must comply with Part II.E.7.

### **11. Notice of Termination (NOT)**

A permittee may terminate coverage under this general permit by providing a Notice of Termination (NOT) on a form approved by the executive director. Authorization to discharge terminates at midnight on the day that an NOT is postmarked for delivery to the TCEQ, or immediately following confirmation of receipt of the electronic NOT form by the TCEQ. A NOT must be submitted within 30 days after the MS4 operator obtains coverage under an individual permit.

Effective December 21, 2020, applicants must submit an NOT using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

### **12. Signatory Requirement for NOI, NOT, NOC, and Waiver Forms**

NOI, NOT, NOC, and Waiver forms must be signed and certified consistent with 30 TAC § 305.44(a) and (b) (relating to Signatories to Applications).

### **13. Fees**

An application fee of \$ 400.00 must be submitted with each NOI. A fee is not required for submission of a waiver form, an NOT, or an NOC.

A permittee authorized under this general permit must pay an annual Water Quality fee of \$100.00 under TWC § 26.0291 and 30 TAC Chapter 205 (relating to General Permits for Waste Discharges).

Effective December 21, 2020, applicants seeking coverage under an NOI or a waiver must submit their application electronically using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from

the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

#### **14. Permit Expiration**

- (a) This general permit is effective for five (5) years from the permit effective date. Authorizations for discharge under the provisions of this general permit will continue until the expiration date of the general permit. This general permit may be amended, revoked, or canceled by the commission or renewed by the TCEQ for an additional term not to exceed five (5) years.
- (b) If the executive director proposes to reissue this general permit before the expiration date, the general permit will remain in effect until the date on which the commission takes final action on the proposal to reissue this general permit. For existing permittees, general permit coverage will remain in effect after the expiration date of the existing general permit, in accordance with 30 TAC, Chapter 205. No new NOIs will be accepted and no new authorizations will be processed under the general permit after the expiration date.
- (c) Following issuance of a renewed or amended general permit, all permittees, including those covered under the expired general permit, may be required to submit an NOI according to the requirements of the new general permit or to obtain a TPDES individual permit for those discharges. The renewed permit will include a deadline to apply for coverage, and authorization for existing permittees will be automatically extended until the deadline to apply for coverage, or until an application is submitted for renewal, whichever occurs first.
- (d) If the TCEQ does not propose to reissue this general permit within 90 days before the expiration date, permittees must apply for authorization under a TPDES individual permit or an alternative general permit. If the application for an individual permit is submitted before the expiration date of this general permit, authorization under this expiring general permit remains in effect until the issuance or denial of an individual permit.

#### **15. Suspension of Permit Coverage**

The executive director may suspend an authorization under this general permit for the reasons specified in 30 TAC § 205.4(d) by providing the discharger with written notice of the decision to suspend that authority, and the written notice will include a brief statement of the basis for the decision. If the decision requires an application for an individual permit or an alternative general permit, the written notice will also include a statement establishing the deadline for submitting an application. The written notice will state that the authorization under this general permit is either suspended on the effective date of the commission's action on the permit application, unless the commission expressly provides otherwise, or immediately, if required by the executive director.

#### **16. Public Notice Process for NOI submittal**

An applicant under this general permit shall adhere to the following procedures:

- (a) The applicant shall submit an NOI and SWMP to the executive director. The SWMP must include information about:
  - (1) BMPs the applicant will implement for each of the six MCMs and program elements pursuant to Part II.D (relating to Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements), as appropriate;

- (2) The measurable goals for each of the BMPs and program elements pursuant to Part II.D.4 (relating to Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements), including, as appropriate the months and years in which the applicant will take the required actions, including interim milestones and the frequency of the action; and
  - (3) The person or persons responsible for implementing or coordinating the applicants SWMP.
- (b) After the applicant receives written instructions from the TCEQ's Office of Chief Clerk, the applicant must publish notice of the executive director's preliminary decision on the NOI and SWMP.
  - (c) The notice will include the following information, at a minimum:
    - (1) The legal name of the MS4 operator;
    - (2) Indication of whether the NOI is for a new authorization or is a renewal of an existing authorization;
    - (3) The address of the applicant;
    - (4) A brief summary of the information included in the NOI, such as the general location of the small MS4 and a description of the classified receiving waters that receive the discharges from the small MS4;
    - (5) The location and mailing address where the public may provide comments to the TCEQ;
    - (6) The public location where copies of the NOI and SWMP, as well as the executive director's general permit and fact sheet, may be reviewed; and
    - (7) If required by the executive director, the date, time, and location of the public meeting.
  - (d) This notice must be published at least once in a newspaper of general circulation in the municipality or county where the small MS4 is located. If the small MS4 is located in multiple municipalities or counties, the notice must be published at least once in a newspaper of general circulation in the municipality or county containing the largest resident population for the regulated portion of the small MS4. This notice must provide opportunity for the public to submit comments on the NOI and SWMP. In addition, the notice must allow the public to request a public meeting. A public meeting (equivalent to a "public hearing" as required by 40 CFR §122.28(d)(2)(ii)) will be held if the TCEQ determines that there is significant public interest.
  - (e) The public comment period begins on the first date the notice is published and lasts for at least 30 days. If a public meeting is held, the comment period will end at the closing of the public meeting (see paragraph (f) below). The public may submit written comments to the TCEQ Office of Chief Clerk during the comment period detailing how the NOI or SWMP for the small MS4 fails to meet the technical requirements or conditions of this general permit.
  - (f) If significant public interest exists, the executive director will direct the applicant to publish a notice of the public meeting and to hold the public meeting. The applicant shall publish notice of a public meeting at least 30 days before the meeting and hold the public meeting in a county where the small MS4 is located. TCEQ staff will facilitate the meeting.

- (g) If a public meeting is held, the applicant shall describe the contents of the NOI and SWMP. The applicant shall also provide maps and other data on the small MS4. The applicant shall provide a sign in sheet for attendees to register their names and addresses and furnish the sheet to the executive director. A public meeting held under this general permit is not an evidentiary proceeding.
- (h) The applicant shall file with the Chief Clerk a copy and an affidavit of the publication of notice(s) within 60 days of receiving the written instructions from the Chief Clerk.
- (i) The executive director, after considering public comment, will either approve, approve with conditions, or deny the NOI based on whether the NOI and SWMP meet the requirements of this general permit.
- (j) Persons whose names and addresses appear legibly on the sign-in sheet from the public meeting and persons who submitted written comments to the TCEQ will be notified by the TCEQ's Office of Chief Clerk of the executive director's decision regarding the authorization.

## **Section F. Permitting Options**

### **1. Authorization Under the General Permit**

An operator of a small MS4 is required to obtain authorization either under this general permit, or under an individual TPDES permit if it is located in a UA or designated by the TCEQ. Multiple small MS4s with separate operators must individually submit an NOI to obtain coverage under this general permit, regardless of whether the systems are physically interconnected, located in the same UA, or are located in the same watershed. Each regulated small MS4 will be issued a distinct permit number. These MS4 operators may combine or share efforts in meeting any or all of the SWMP requirements stated in Part III of this general permit. MS4 operators that share SWMP development and implementation responsibilities must meet the following conditions:

#### **(a) Participants**

The SWMP must clearly list the name and permit number for each MS4 operator that chooses to contribute to development or implementation of the SWMP, and provide written confirmation that the contributing MS4 operator has agreed to contribute. If a contributing small MS4 has submitted a NOI and SWMP to TCEQ, but has not yet received written notification of approval, along with the accompanying permit authorization number, a copy of the submitted NOI form must be made readily available or be included in the SWMP.

#### **(b) Responsibilities**

Each permittee is entirely responsible for meeting SWMP requirements within the boundaries of its small MS4. Where a separate MS4 operator is contributing to implementation of the SWMP, the SWMP must clearly define each minimum control measure and the component(s) each entity agrees to implement, within which MS4 area(s) each entity agrees to implement and clearly identify the contributing MS4 operator.

### **2. Alternative Coverage under an Individual TPDES Permit**

An MS4 operator eligible for coverage under this general permit may alternatively be authorized under an individual TPDES permit according to 30 TAC Chapter 305 (relating to Consolidated Permits). The executive director may require a MS4 operator, authorized by

this general permit, to apply for an individual TPDES permit because of: the conditions of an approved TMDL or TMDL implementation plan; a history of substantive non-compliance; or other 30 TAC Chapter 205 considerations and requirements; or other site-specific considerations. The executive director shall deny or suspend a facility's authorization for disposal under this general permit based on a rating of "unsatisfactory performer" according to commission rules in 30 TAC §60.3, Use of Compliance History. An applicant who owns or operates a facility classified as an "unsatisfactory performer" is entitled to a hearing before the commission prior to having its coverage denied or suspended, in accordance with TWC § 26.040(h).

### **Part III. Stormwater Management Program (SWMP)**

To the extent allowable under state and local law, a SWMP must be developed, implemented, and enforced according to the requirements of Part III of this general permit for stormwater discharges that reach waters of the U.S., regardless of whether the discharge is conveyed through a separately operated storm sewer system. The SWMP must be developed, implemented, and enforced to reduce the discharge of pollutants from the small MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the CWA and the TWC.

The SWMP must also be implemented and enforced in new MS4 areas added during the permit term. Implementation of appropriate BMPs for the new areas must occur in accordance with Part II.E.7.

A permittee that implements BMPs consistent with the provisions of their permit and SWMP constitutes compliance with the standard of reducing pollutants to the MEP and will be deemed in compliance with Part III of this permit. This permit does not extend any compliance deadlines set forth in the previous permit effective December 13, 2013.

### **Section A. Developing a Stormwater Management Program (SWMP)**

#### **1. SWMP Development and Schedule**

##### **(a) Existing regulated small MS4s**

Permittees who were regulated under the previous TPDES general permit TXR040000, shall update and submit to the TCEQ an updated SWMP under this general permit along with the NOI for coverage. The NOI and SWMP are due within 180 days of the general permit effective date. The permittee shall continue to operate under the conditions of the previous permit and existing SWMP until the revised SWMP is approved.

##### **(b) Implementation of the SWMP**

Existing small MS4 operators shall ensure full implementation of any new elements in the revised SWMP as soon as practicable, but no later than five years from the permit effective date. Previously regulated MS4 operators shall continue to implement existing elements in the approved SWMPs until the revised SWMPs has been approved.

Designated small MS4s must achieve full implementation of the SWMP as soon as practicable, but no later than five years from designation.

## **2. Content of the SWMP**

At a minimum, the permittee shall include the following information in its SWMP:

- (a) A description of Minimum Control Measures (MCM) with measureable goals, including, as appropriate, the months and years when the permittee will undertake required actions, including interim milestones and the frequency of the action for each MCM described in Part III, Section B.
- (b) A measurable goal that includes the development of ordinances or other regulatory mechanisms allowed by state, federal and local law, providing the legal authority necessary to implement and enforce the requirements of this permit, including information on any limitations to the legal authority;
- (c) The measurable goals selected by the permittee must be clear, specific, and measurable.
- (d) A summary of written procedures describing how the permittee will implement the provisions in Parts III and IV of this general permit.
- (e) A description of a program or a plan of compliance with the requirements in Part II.D.4. (relating to Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements)
- (f) Identification of any impaired waters that have been added in accordance with Part II.D.4.

## **3. Legal Authority**

- (a) Traditional small MS4s, such as cities
  - (1) Within two years from the permit effective date, the permittee shall review and revise, if needed, its relevant ordinance(s) or other regulatory mechanism(s), or shall adopt a new ordinance(s) or other regulatory mechanism(s) that provide the permittee with adequate legal authority to control pollutant discharges into and from its small MS4 in order to meet the requirements of this general permit.
  - (2) To be considered adequate, this legal authority must, at a minimum, address the following:
    - a. Authority to prohibit illicit discharges and illicit connections;
    - b. Authority to respond to and contain other releases – Control the discharge of spills, and prohibit dumping or disposal of materials other than stormwater into the small MS4;
    - c. Authority to require compliance with conditions in the permittee's ordinances, permits, contracts, or orders;
    - d. Authority to require installation, implementation, and maintenance of control measures;
    - e. Authority to receive and collect information, such as stormwater plans, inspection reports, and other information deemed necessary to assess compliance with this permit, from operators of construction sites, new or redeveloped land, and industrial and commercial facilities;
    - f. Authority, as needed, to enter and inspect private property including facilities, equipment, practices, or operations related to stormwater discharges to the small MS4;

- g. Authority to respond to non-compliance with BMPs required by the small MS4 consistent with their ordinances or other regulatory mechanism(s);
  - h. Authority to assess penalties, including monetary, civil, or criminal penalties; and
  - i. Ability to enter into interagency or interlocal agreements or other maintenance agreements, as necessary.
- (b) Non-traditional small MS4s, such as counties, drainage districts, transportation entities, municipal utility districts, military bases, prisons, and universities
- (1) Where the permittee lacks the authority to develop ordinances or to implement enforcement actions, the permittee shall exert enforcement authority as required by this general permit for its facilities, employees, contractors, and any other entity over which it has operational control within the portion of the UA under the jurisdiction of the permittee. For discharges from third party actions, the permittee shall perform inspections and exert enforcement authority to the MEP.
  - (2) If the permittee does not have inspection or enforcement authority and is unable to meet the goals of this general permit through its own powers, then, unless otherwise stated in this general permit, the permittee shall perform the following actions in order to meet the goals of the permit:
    - a. Enter into interlocal agreements with municipalities where the small MS4 is located. These interlocal agreements must state the extent to which the municipality will be responsible for inspections and enforcement authority in order to meet the conditions of this general permit; or,
    - b. If it is not feasible for the permittee to enter into interlocal agreements, the permittee shall notify an adjacent MS4 operator with enforcement authority or the appropriate TCEQ Regional Office to report discharges or incidents that it cannot itself enforce against. In determining feasibility for entering into interlocal agreements, the permittee shall consider all factors, including, without limitations, financial considerations and the willingness of the municipalities in which the small MS4 is located.

#### **4. Resources**

It is the permittee's responsibility to ensure that it has adequate resources and funding to implement the requirements of this permit.

#### **5. Effluent Limitations**

The controls and BMPs included in the SWMP constitute effluent limitations for the purposes of compliance with state rules. This includes the requirements of 30 TAC Chapter 319, Subchapter B, which lists the maximum allowable concentrations of hazardous metals for discharge to water in the state.

#### **6. Enforcement Measures**

Permittees with enforcement authority (i.e. traditional small MS4s) shall develop a standard operating procedure (SOP) to respond to violations to the extent allowable under state and local law. When the permittee does not have enforcement authority over the violator, and the violations continue after violator has been notified by the permittee, or the source of the illicit discharge is outside the MS4's boundary, the permittee shall notify either the adjacent MS4 operator with enforcement authority or the appropriate TCEQ Regional Office.

## **Section B. Minimum Control Measures**

Operators of small MS4s seeking coverage under this general permit shall develop and implement a SWMP that includes the following six minimum control measures (MCMs), as applicable.

All program elements must be implemented according to the schedule mentioned in Part III.A. All six MCMs apply to all MS4s regardless of their level as described in Part II.A.5. Specific program elements under each MCM shall be implemented by all MS4 operators, unless it is specifically stated that particular program elements only are applicable for certain levels of small MS4s.

Permittees shall provide justification within the SWMP for any requirements that were not implemented because they were not feasible as described in each MCM.

### **1. Public Education, Outreach, and Involvement**

#### **(a) Public Education and Outreach**

- (1) All permittees shall develop, implement, and maintain a comprehensive stormwater education and outreach program to educate public employees, businesses, and the general public of hazards associated with the illegal discharges and improper disposal of waste and about the impact that stormwater discharges can have on local waterways, as well as the steps that the public can take to reduce pollutants in stormwater.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of this permit term. The program must, at a minimum:

- a. Define the goals and objectives of the program based on high priority community-wide issues (for example, reduction of nitrogen in discharges from the small MS4, promoting previous techniques used in the small MS4, or improving the quality of discharges to the Edwards Aquifer);
  - b. Identify the target audience(s);
  - c. Develop or utilize appropriate educational materials, such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, and websites;
  - d. Determine cost effective and practical methods and procedures for distribution of materials.
- (2) Throughout the permit term, all permittees shall make the educational materials available to convey the program's message to the target audience(s) at least annually.
  - (3) If the permittee has a public website, the permittee shall post its SWMP and the annual reports required under Part IV.B.2. or a summary of the annual report on the permittee's website. The SWMP must be posted no later than 30 days after the approval date, and the annual report no later than 30 days after the due date.
  - (4) All permittees shall annually review and update the SWMP and MCM implementation procedures required by Part III.A.2., as necessary. Any changes

must be reflected in the annual report. Such written procedures must be maintained, either on site or in the SWMP and made available for inspection by the TCEQ.

- (5) MS4 operators may partner with other MS4 operators to maximize the program and cost effectiveness of the required outreach.

(b) Public Involvement

All permittees shall involve the public, and, at minimum, comply with any state and local public notice requirements in the planning and implementation activities related to developing and implementing the SWMP, except that correctional facilities are not required to implement this portion of the MCM.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of this permit term. At a minimum, all permittees shall:

- (1) Consider using public input (for example, the opportunity for public comment, or public meetings) in the implementation of the program;
- (2) Create opportunities for citizens to participate in the implementation of control measures, such as stream clean-ups, storm drain stenciling, volunteer monitoring, volunteer "Adopt-A-Highway" programs, and educational activities;
- (3) Ensure the public can easily find information about the SWMP.

## **2. Illicit Discharge Detection and Elimination (IDDE)**

(a) Program Development

- (1) All permittees shall develop, implement, and enforce a program to detect, investigate, and eliminate illicit discharges into the small MS4. The program must include a plan to detect and address non-stormwater discharges, including illegal dumping to the MS4 system.

Existing permittees must assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of this permit term. (See also Part III.A.1(c).

The Illicit Discharge Detection and Elimination (IDDE) program must include the following:

- a. An up-to-date MS4 map (see Part III.B.2.(c)(1));
- b. Methods for informing and training MS4 field staff (see Part III.B.2.(c)(2));
- c. Procedures for tracing the source of an illicit discharge (see Part III.B.2.(c)(5));
- d. Procedures for removing the source of the illicit discharge (see Part III.B.2.(c)(5));

- e. For Level 2, 3 and 4 small MS4s, if applicable, procedures to prevent and correct any leaking on-site sewage disposal systems that discharge into the small MS4;
  - f. For Level 4 small MS4s, procedures for identifying priority areas within the small MS4 likely to have illicit discharges, and a list of all such areas identified in the small MS4 (see Part III.B.2.(e)(1));
  - g. For Level 4 small MS4s, field screening to detect illicit discharges (see Part III.B.2.(e)(2)); and
  - h. For Level 4 small MS4s, procedures to reduce the discharge of floatables in the MS4. (see Part III.B.2.(e)(3).)
- (2) For non-traditional small MS4s, if illicit connections or illicit discharges are observed related to another operator's MS4, the permittee shall notify the other MS4 operator within 48 hours of discovery. If notification to the other MS4 operator is not practicable, then the permittee shall notify the appropriate TCEQ Regional Office of the possible illicit connection or illicit discharge.
- (3) If another MS4 operator notifies the permittee of an illegal connection or illicit discharge to the small MS4, then the permittee shall follow the requirements specified in Part III.B.2.(c)(3).
- (4) All permittees shall annually review and update as necessary, the SWMP and MCM implementation procedures required by Part III.A.2. Any changes must be reflected in the annual report. Such written procedures must be maintained, either on site or in the SWMP and made available for inspection by the TCEQ.
- (b) Allowable Non-Stormwater Discharges

Non-stormwater flows listed in Part II.C do not need to be considered by the permittee as an illicit discharge requiring elimination unless the permittee or the TCEQ identifies the flow as a significant source of pollutants to the small MS4.

(c) Requirements for all Permittees

All permittees shall include the requirements described below in Parts III.B.2(c)(1)-(6)

(1) MS4 mapping

All permittees shall maintain an up-to-date MS4 map, which must be located on site and available for review by the TCEQ. The MS4 map must show at a minimum the following information:

- a. The location of all small MS4 outfalls that are operated by the permittee and that discharge into waters of the U.S;
- b. The location and name of all surface waters receiving discharges from the small MS4 outfalls; and
- c. Priority areas identified under Part III.B.2.(e)(1), if applicable.

(2) Education and Training

All permittees shall implement a method for informing or training all the permittee's field staff that may come into contact with or otherwise observe an illicit discharge or illicit connection to the small MS4 as part of their normal job responsibilities. Training program materials and attendance lists must be maintained on site and made available for review by the TCEQ.

(3) **Public Reporting of Illicit Discharges and Spills**

All permittees shall publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from the small MS4. The permittee shall provide a central contact point to receive reports; for example by including a phone number for complaints and spill reporting.

(4) All permittees shall develop and maintain on-site procedures for responding to illicit discharges and spills.

(5) **Source Investigation and Elimination**

a. **Minimum Investigation Requirements** – Upon becoming aware of an illicit discharge, all permittees shall conduct an investigation to identify and locate the source of such illicit discharge as soon as practicable.

(i) All permittees shall prioritize the investigation of discharges based on their relative risk of pollution. For example, sanitary sewage may be considered a high priority discharge.

(ii) All permittees shall report to the TCEQ immediately upon becoming aware of the occurrence of any illicit flows believed to be an immediate threat to human health or the environment.

(iii) All permittees shall track all investigations and document, at a minimum, the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

b. **Identification and Investigation of the Source of the Illicit Discharge** –All permittees shall investigate and document the source of illicit discharges where the permittees have jurisdiction to complete such an investigation. If the source of illicit discharge extends outside the permittee's boundary, all permittees shall notify the adjacent permitted MS4 operator or the appropriate TCEQ Regional Office according to Part III.A.3.b.

c. **Corrective Action to Eliminate Illicit Discharge**

If and when the source of the illicit discharge has been determined, all permittees shall immediately notify the responsible party of the problem, and shall require the responsible party to perform all necessary corrective actions to eliminate the illicit discharge.

(6) **Inspections** –The permittee shall conduct inspections, in response to complaints, and shall conduct follow-up inspections to ensure that corrective measures have been implemented by the responsible party.

The permittee shall develop written procedures describing the basis for conducting inspections in response to complaints and conducting follow-up inspections.

(d) **Additional Requirements for Level 3 and 4 small MS4s**

In addition to the requirements described in Parts III.B.2(c)(1)-(6) above, permittees who operate Level 3 and 4 small MS4s shall meet the following requirements:

**Source Investigation and Elimination**

Permittees who operate Level 3 and 4 small MS4 shall upon being notified that the discharge has been eliminated, conduct a follow-up investigation or field screening, consistent with Part III.B.2.(e)(2), to verify that the discharge has been eliminated. The

permittee shall document its follow-up investigation. The permittee may seek recovery and remediation costs from responsible parties consistent with Part III.A.3., and require compensation related costs. Resulting enforcement actions must follow the procedures for enforcement action in Part III.A.3. If the suspected source of the illicit discharge is authorized under an NPDES/TPDES permit or the discharge is listed as an authorized non-stormwater discharge, as described in Part III.C, no further action is required.

(e) Additional Requirements for Level 4 small MS4s

In addition to the requirements described in Parts III.B.2(c)-(d) above, permittees who operate Level 4 small MS4s shall meet the following requirements:

(1) Identification of Priority Areas

Permittees who operate Level 4 small MS4s shall identify priority areas likely to have illicit discharges and shall document the basis for the selection of each priority area and shall create a list of all priority areas identified. This priority area list must be available for review by the TCEQ.

(2) Dry Weather Field Screening

By the end of the permit term, permittees who operate Level 4 small MS4s shall develop and implement a written dry weather field screening program to assist in detecting and eliminating illicit discharges to the small MS4. Dry weather field screening must consist of (1) field observations; and (2) field screening according to item (2)c. below.

If dry weather field screening is necessary, at a minimum, the permittee shall:

- a. Conduct dry weather field screening in priority areas as identified by the permittee in Part III.B.2(e)(1). By the end of the permit term, all of those priority areas, although not necessarily all individual outfalls must be screened.
- b. Field observation requirements – The permittee shall develop written procedures for observing flows from outfalls when there has been at least 72 hours of dry weather. The written procedures must include the basis used to determine which outfalls will be observed. The permittee shall record visual observations such as odor, color, clarity, floatables, deposits, or stains.
- c. Field screening requirements – The permittee shall develop written procedures to determine which dry weather flows will be screened, based on results of field observations or complaint from the public or the permittee's trained field staff. At a minimum, when visual observations indicate a potential problem such as discolored flows, foam, surface sheen, and other similar indicators of contamination, the permittee shall conduct a field screening analysis for selected indicator pollutants. The basis for selecting the indicator pollutants must be described in the written procedures. Screening methodology may be modified based on experience gained during the actual field screening activities. The permittee shall document the method used.

(3) Reduction of Floatables

The permittee shall implement a program to reduce the discharge of floatables (for example, litter and other human-generated solid refuse) in the MS4. The MS4 shall include source controls at a minimum and structural controls and other appropriate controls where necessary.

The permittee shall maintain two locations where floatable material can be removed before the stormwater is discharged to or from the MS4. Floatable material shall be collected at the frequency necessary for maintenance of the removal devices, but not less than twice per year. The amount of material collected shall be estimated by weight, volume, or by other practical means. Results shall be included in the annual report.

### **3. Construction Site Stormwater Runoff Control**

#### **(a) Requirements and Control Measures**

- (1) All permittees shall develop, implement, and enforce a program requiring operators of small and large construction activities, as defined in Part I of this general permit, to select, install, implement, and maintain stormwater control measures that prevent illicit discharges to the MEP. The program must include the development and implementation of an ordinance or other regulatory mechanism, as well as sanctions to ensure compliance to the extent allowable under state, federal, and local law, to require erosion and sediment control.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the the program fully implemented by the end of this permit term.

If TCEQ waives requirements for stormwater discharges associated with small construction from a specific site(s), the permittee is not required to enforce the program to reduce pollutant discharges from such site(s).

#### **(b) Requirements for all Permittees**

All permittees shall include the requirements described below in Parts III.B.3(b)(1)-(7)

- (1) All permittees shall annually review and update as necessary, the SWMP and MCM implementation procedures required by Part III.A.2. Any changes must be included in the annual report. Such written procedures must be maintained on site or in the SWMP and made available for inspection by the TCEQ.
- (2) All permittees shall require that construction site operators implement appropriate erosion and sediment control BMPs. The permittee's construction program must ensure the following minimum requirements are effectively implemented for all small and large construction activities discharging to its small MS4.
  - a. Erosion and Sediment Controls - Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants.
  - b. Soil Stabilization - Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed as soon as practicable, but no more than 14 calendar days after the initiation of soil stabilization measures. In arid, semiarid, and drought-stricken areas, where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed.

The permittee shall develop written procedures that describes initiating and completing stabilization measures for construction sites.

- c. BMPs – Design, install, implement, and maintain effective BMPs to minimize the discharge of pollutants to the small MS4. At a minimum, such BMPs must be designed, installed, implemented and maintained to:
    - (i) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters;
    - (ii) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
    - (iii) Minimize the discharge of pollutants from spills and leaks.
  - d. As an alternative to (a) through (c) above, all permittees shall ensure that all small and large construction activities discharging to the small MS4 have developed and implemented a stormwater pollution prevention plan (SWP3) in accordance with the TPDES CGP TXR150000. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed and described in the written procedure required in item (2)b. above. As an alternative, vegetative stabilization measures may be implemented as soon as practicable.
- (3) Prohibited Discharges - The following discharges are prohibited:
- a. Wastewater from washout of concrete and wastewater from water well drilling operations, unless managed by an appropriate control;
  - b. Wastewater from washout and cleanout of stucco, paint, from release oils, and other construction materials;
  - c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
  - d. Soaps or solvents used in vehicle and equipment washing; and
  - e. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed by appropriate BMPs.

(4) Construction Plan Review Procedures

To the extent allowable by state, federal, and local law, all permittees shall maintain and implement site plan review procedures that describe which plans will be reviewed as well as when an operator may begin construction. For those permittees without legal authority to enforce site plan reviews, this requirement is limited to those sites operated by the permittee and its contractors and located within the permittee's regulated area. The site plan procedures must meet the following minimum requirements:

- a. The site plan review procedures must incorporate consideration of potential water quality impacts.
- b. The permittee may not approve any plans unless the plans contain appropriate site specific construction site control measures that, at a minimum, meet the requirements described in Part III.B.3.(a) or in the TPDES CGP, TXR150000.

The permittee may require and accept a plan, such as a SWP3, that has been developed pursuant to the TPDES CGP, TXR150000.

(5) Construction Site Inspections and Enforcement

To the extent allowable by state, federal, and local law, all permittees shall implement procedures for inspecting large and small construction projects. Permittees without legal authority to inspect construction sites shall at a minimum conduct inspection of sites operated by the permittee or its contractors and that are located in the permittee's regulated area.

- a. The permittee shall conduct inspections based on the evaluation of factors that are a threat to water quality, such as: soil erosion potential; site slope; project size and type; sensitivity of receiving waterbodies; proximity to receiving waterbodies; non-stormwater discharges; and past record of non-compliance by the operators of the construction site.
- b. Inspections must occur during the active construction phase.
  - (i) All permittees shall develop and implement updated written procedures outlining the inspection and enforcement requirements. These procedures must be maintained on-site or in the SWMP and be made available to TCEQ.
  - (ii) Inspections of construction sites must, at a minimum:
    1. Determine whether the site has appropriate coverage under the TPDES CGP, TXR150000. If no coverage exists, notify the permittee of the need for permit coverage;
    2. Conduct a site inspection to determine if control measures have been selected, installed, implemented, and maintained according to the small MS4's requirements;
    3. Assess compliance with the permittee's ordinances and other regulations; and
    4. Provide a written or electronic inspection report.
- c. Based on site inspection findings, all permittees shall take all necessary follow-up actions (for example, follow-up-inspections or enforcement) to ensure compliance with permit requirements and the SWMP. These follow-up and enforcement actions must be tracked and maintained for review by the TCEQ.

For non-traditional small MS4s with no enforcement powers, the permittee shall notify the adjacent MS4 operator with enforcement authority or the appropriate TCEQ Regional Office according to Part III.A.3(b).

(6) Information submitted by the Public

All permittees shall develop, implement, and maintain procedures for receipt and consideration of information submitted by the public.

(7) MS4 Staff Training

All permittees shall ensure that all staff whose primary job duties are related to implementing the construction stormwater program (including permitting, plan review, construction site inspections, and enforcement) are informed or trained to

conduct these activities. The training may be conducted by the permittee or by outside trainers.

(c) Additional Requirements for Level 3 and 4 small MS4s

In addition to the requirements described in Parts III.B.3(b)(1)-(7) above, permittees who operate Level 3 and 4 small MS4s shall meet the following requirements:

Construction Site Inventory

Permittees who operate Level 3 and 4 small MS4s shall maintain an inventory of all permitted active public and private construction sites, that result in a total land disturbance of one or more acres or that result in a total land disturbance of less than one acre if part of a larger common plan or development or sale. Notification to the small MS4 must be made by submittal of a copy of an NOI or a small construction site notice, as applicable. The permittee shall make this inventory available to the TCEQ upon request.

**4. Post Construction Stormwater Management in New Development and Redevelopment**

(a) Post-Construction Stormwater Management Program

- (1) All permittees shall develop, implement, and enforce a program, to the extent allowable under state, federal, and local law, to control stormwater discharges from new development and redeveloped sites that discharge into the small MS4 that disturb one acre or more, including projects that disturb less than one acre that are part of a larger common plan of development or sale. The program must be established for private and public development sites. The program may utilize an offsite mitigation and payment in lieu of components to address this requirement.

Existing permittees shall assess program elements that were described in the previous permit and modify as necessary to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of the permit term.

- (2) All permittees shall use, to the extent allowable under state, federal, and local law and local development standards, an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects. The permittees shall establish, implement, and enforce a requirement that owners or operators of new development and redeveloped sites design, install, implement, and maintain a combination of structural and non-structural BMPs appropriate for the community and that protects water quality. If the construction of permanent structures is not feasible due to space limitations, health and safety concerns, cost effectiveness, or highway construction codes, the permittee may propose an alternative approach to TCEQ. Newly regulated permittees shall have the program element fully implemented by the end of the permit term.

(b) Requirements for all Permittees

All permittees shall include the requirements described below in Parts III.B.4.(b)(1)-(3)

- (1) All permittees shall annually review and update as necessary, the SWMP and MCM implementation procedures required by Part III.A.2. Any changes must be

included in the annual report. Such written procedures must be maintained either on site or in the SWMP and made available for inspection by TCEQ.

- (2) All permittees shall document and maintain records of enforcement actions and make them available for review by the TCEQ.
- (3) Long-Term Maintenance of Post-Construction Stormwater Control Measures  
All permittees shall, to the extent allowable under state, federal, and local law, ensure the long-term operation and maintenance of structural stormwater control measures installed through one or both of the following approaches:
  - a. Maintenance performed by the permittee. (See Part III.B.5)
  - b. Maintenance performed by the owner or operator of a new development or redeveloped site under a maintenance plan. The maintenance plan must be filed in the real property records of the county in which the property is located. The permittee shall require the owner or operator of any new development or redeveloped site to develop and implement a maintenance plan addressing maintenance requirements for any structural control measures installed on site. The permittee shall require operation and maintenance performed is documented and retained on site, such as at the offices of the owner or operator, and made available for review by the small MS4.

(c) Additional Requirements for Level 4 small MS4s

In addition to the requirements described in Parts III.B.5(b)(1)-(3), permittees who operate Level 4 small MS4s shall meet the following requirements:

**Inspections** - Permittees who operate Level 4 small MS4s shall develop and implement an inspection program to ensure that all post construction stormwater control measures are operating correctly and are being maintained as required consistent with its applicable maintenance plan. For small MS4s with limited enforcement authority, this requirement applies to the structural controls owned and operated by the small MS4 or its contractors that perform these activities within the small MS4's regulated area.

**Inspection Reports** - The permittee shall document its inspection findings in an inspection report and make them available for review by the TCEQ.

## **5. Pollution Prevention and Good Housekeeping for Municipal Operations**

(a) Program development

All permittees shall develop and implement an operation and maintenance program, including an employee training component that has the ultimate goal of preventing or reducing pollutant runoff from municipal activities and municipally owned areas including but not limited to park and open space maintenance; street, road, or highway maintenance; fleet and building maintenance; stormwater system maintenance; new construction and land disturbances; municipal parking lots; vehicle and equipment maintenance and storage yards; waste transfer stations; and salt/sand storage locations.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharges of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly

regulated permittees shall have the program fully implemented by the end of this permit term. (See also Part III.A.1.(c))

(b) Requirements for all Permittees

All permittees shall include the requirements described below in Parts III.B.5.(1)-(6) in the program:

(1) Permittee-owned Facilities and Control Inventory

All permittees shall develop and maintain an inventory of facilities and stormwater controls that it owns and operates within the regulated area of the small MS4. The inventory must include all applicable permit numbers, registration numbers, and authorizations for each facility or controls. The inventory must be available for review by TCEQ and must include, but is not limited, to the following, as applicable:

- a. Composting facilities;
- b. Equipment storage and maintenance facilities;
- c. Fuel storage facilities;
- d. Hazardous waste disposal facilities;
- e. Hazardous waste handling and transfer facilities;
- f. Incinerators;
- g. Landfills;
- h. Materials storage yards;
- i. Pesticide storage facilities;
- j. Buildings, including schools, libraries, police stations, fire stations, and office buildings;
- k. Parking lots;
- l. Golf courses;
- m. Swimming pools;
- n. Public works yards;
- o. Recycling facilities;
- p. Salt storage facilities;
- q. Solid waste handling and transfer facilities;
- r. Street repair and maintenance sites;
- s. Vehicle storage and maintenance yards; and
- t. Structural stormwater controls.

(2) Training and Education

All permittees shall inform or train appropriate employees involved in implementing pollution prevention and good housekeeping practices. All permittees shall maintain a training attendance list for inspection by TCEQ when requested.

- (3) Disposal of Waste Material - Waste materials removed from the small MS4 must be disposed of in accordance with 30 TAC Chapters 330 or 335, as applicable.
- (4) Contractor Requirements and Oversight
  - a. Any contractors hired by the permittee to perform maintenance activities on permittee-owned facilities must be contractually required to comply with all of the stormwater control measures, good housekeeping practices, and facility-specific stormwater management operating procedures described in Parts III B.5.(b)(2)-(6).
  - b. All permittees shall provide oversight of contractor activities to ensure that contractors are using appropriate control measures and SOPs. Oversight procedures must be maintained on-site and made available for inspection by TCEQ.
- (5) Municipal Operation and Maintenance Activities
  - a. Assessment of permittee-owned operations

All permittees shall evaluate operation and maintenance (O&M) activities for their potential to discharge pollutants in stormwater, including but not limited to:

    - (i) Road and parking lot maintenance, including such areas as pothole repair, pavement marking, sealing, and re-paving;
    - (ii) Bridge maintenance, including such areas as re-chipping, grinding, and saw cutting;
    - (iii) Cold weather operations, including plowing, sanding, and application of deicing and anti-icing compounds and maintenance of snow disposal areas; and
    - (iv) Right-of-way maintenance, including mowing, herbicide and pesticide application, and planting vegetation.
  - b. All permittees shall identify pollutants of concern that could be discharged from the above O&M activities (for example, metals; chlorides; hydrocarbons such as benzene, toluene, ethyl benzene, and xylenes; sediment; and trash).
  - c. All permittees shall develop and implement a set of pollution prevention measures that will reduce the discharge of pollutants in stormwater from the above activities. These pollution prevention measures may include the following examples:
    - (i) Replacing materials and chemicals with more environmentally benign materials or methods;
    - (ii) Changing operations to minimize the exposure or mobilization of pollutants to prevent them from entering surface waters; and
    - (iii) Placing barriers around or conducting runoff away from deicing chemical storage areas to prevent discharge into surface waters.
  - d. Inspection of pollution prevention measures - All pollution prevention measures implemented at permittee-owned facilities must be visually inspected to ensure they are working properly. The permittee shall develop written procedures that describes frequency of inspections and how they will

be conducted. A log of inspections must be maintained and made available for review by the TCEQ upon request.

(6) Structural Control Maintenance

If BMPs include structural controls, maintenance of the controls must be performed by the permittee and consistent with maintaining the effectiveness of the BMP. The permittee shall develop written procedures that define the frequency of inspections and how they will be conducted.

(c) Additional Requirements for Level 3 and 4 small MS4s:

In addition to the requirements described in Parts.B.5.(b)(1)-(6) above, permittees who operate Level 3 or 4 small MS4s shall meet the following requirements:

(1) Storm Sewer System Operation and Maintenance

- a. Permittees who operate Level 3 or 4 small MS4s shall develop and implement an O&M program to reduce to the maximum extent practicable the collection of pollutants in catch basins and other surface drainage structures.
- b. Permittees who operate Level 3 or 4 small MS4s shall develop a list of potential problem areas. The permittees shall identify and prioritize problem areas for increased inspection (for example, areas with recurrent illegal dumping).

(2) Operation and Maintenance Program to Reduce Discharges of Pollutants from Roads

Permittees who operate Level 3 or 4 small MS4s shall implement an O&M program that includes at least one of the following: a street sweeping and cleaning program, or an equivalent BMP such as an inlet protection program, which must include an implementation schedule and a waste disposal procedure. The basis for the decision must be included in the SWMP. If a street sweeping and cleaning program is implemented, the permittee shall evaluate the following permittee-owned and operated areas for the program: streets, road segments, and public parking lots including, but not limited to, high traffic zones, commercial and industrial districts, sport and event venues, and plazas, as well as areas that consistently accumulate high volumes of trash, debris, and other stormwater pollutants.

- a. Implementation schedules – If a sweeping program is implemented, the permittee shall sweep the areas in the program (for example, the streets, roads, and public parking lots) in accordance with a frequency and schedule determined in the permittee's O&M program.
- b. For areas where street sweeping is technically infeasible (for example, streets without curbs), the permittee shall focus implementation of other trash and litter control procedures, or provide inlet protection measures to minimize pollutant discharges to storm drains and creeks.
- c. Sweeper Waste Material Disposal – If utilizing street sweepers, the permittee shall develop a procedure to dewater and dispose of street sweeper waste material and shall ensure that water and material will not reenter the small MS4.

(3) Mapping of Facilities

Permittees who operate Level 3 or 4 small MS4s shall, on a map of the area regulated under this general permit, identify where the permittee-owned and operated facilities and stormwater controls are located.

(4) Facility Assessment

Permittees who operate Level 3 or 4 small MS4s shall perform the following facility assessment in the regulated portion of the small MS4 operated by the permittee:

- a. Assessment of Facilities' Pollutant Discharge Potential - The permittee shall review the facilities identified in Part III.B.5.(b) once per permit term for their potential to discharge pollutants into stormwater.
- b. Identification of *high priority* facilities - Based on the Part III.B.5.(c)(4)a. assessment, the permittee shall identify as *high priority* those facilities that have a high potential to generate stormwater pollutants and shall document this in a list of these facilities. Among the factors that must be considered in giving a facility a high priority ranking are the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must not be performed outside (for example, changing automotive fluids, vehicle washing), proximity to waterbodies, proximity to sensitive aquifer recharge features, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s). High priority facilities must include, at a minimum, the permittee's maintenance yards, hazardous waste facilities, fuel storage locations, and any other facilities at which chemicals or other materials have a high potential to be discharged in stormwater.
- c. Documentation of Assessment Results - The permittee shall document the results of the assessments and maintain copies of all site evaluation checklists used to conduct the assessments. The documentation must include the results of the permittee's initial assessment, and any identified deficiencies and corrective actions taken.

(5) Development of Facility Specific SOPs

Permittees who operate Level 3 or 4 small MS4s shall develop facility specific stormwater management SOPs. The permittee may utilize existing plans or documents that may contain the following required information:

- a. For each high priority facility identified in Part III.B.5.(c)(4)b., the permittee shall develop a SOP that identifies BMPs to be installed, implemented, and maintained to minimize the discharge of pollutants in stormwater from each facility.
- b. A hard or electronic copy of the facility-specific stormwater management SOP (or equivalent existing plan or document) must be maintained and be available for review by the TCEQ. The SOP must be kept on site when possible and must be kept up to date.

(6) Stormwater Controls for High Priority Facilities

Permittees who operate Level 3 or 4 small MS4s shall implement the following stormwater controls at all high priority facilities identified in Part III.B.5.(c)(4)b. A description of BMPs developed to comply with this requirement must be included in each facility specific SOP:

- a. General good housekeeping – Material with a potential to contribute to stormwater pollution must be sheltered from exposure to stormwater.
- b. De-icing and anti-icing material storage - The permittee shall ensure, to the MEP, that stormwater runoff from storage piles of salt and other de-icing and anti-icing materials is not discharged; or shall ensure that any discharges from the piles are authorized under a separate discharge permit.
- c. Fueling operations and vehicle maintenance - The permittee shall develop SOPs (or equivalent existing plans or documents) that address spill prevention and spill control at permittee-owned and operated vehicle fueling, vehicle maintenance, and bulk fuel delivery facilities.
- d. Equipment and vehicle washing - The permittee shall develop SOPs that address equipment and vehicle washing activities at permittee-owned and operated facilities. The discharge of equipment and vehicle wash water to the small MS4 or directly to receiving waters from permittee-owned facilities is not authorized under this general permit. To ensure that wastewater is not discharged under this general permit, the permittee's SOP may include installing a vehicle wash reclaim system, capturing and hauling the wastewater for proper disposal, connecting to sanitary sewer (where applicable and approved by local authorities), ceasing the washing activity, or applying for and obtaining a separate TPDES permit.

(7) Inspections

Permittees who operate Level 3 or 4 small Ms4s shall develop and implement an inspection program, which at a minimum must include periodic inspections of high priority permittee-owned facilities. The results of the inspections and observations must be documented and available for review by the TCEQ.

(d) Additional Requirements for Level 4 small MS4s:

In addition to all the requirements described in Parts III.B.5(b) and III.B.5.(c) above, permittees who operate Level 4 small MS4s shall meet the following requirements:

(1) Pesticide, Herbicide, and Fertilizer Application and Management

- a. Landscape maintenance - The permittee shall evaluate the materials used and activities performed on public spaces owned and operated by the permittee such as parks, schools, golf courses, easements, public rights of way, and other open spaces for pollution prevention opportunities. Maintenance activities for the turf landscaped portions of these areas may include mowing, fertilization, pesticide application, and irrigation. Typical pollutants include sediment, nutrients, hydrocarbons, pesticides, herbicides, and organic debris.
- b. The permittee shall implement the following practices to minimize landscaping-related pollutant generation with regard to public spaces owned and operated by the permittee:
  - (i) Educational activities, permits, certifications, and other measures for the permittee's applicators and distributors.
  - (ii) Pest management measures that encourage non-chemical solutions where feasible. Examples may include:
    - (a) Use of native plants or xeriscaping;

- (b) Keeping clippings and leaves out the small MS4 and the street by encouraging mulching, composting, or landfilling;
  - (c) Limiting application of pesticides and fertilizers if precipitation is forecasted within 24 hours, or as specified in label instructions;
  - (d) Reducing mowing of grass to allow for greater pollutant removal, but not jeopardizing motorist safety.
- c. The permittee shall develop schedules for chemical application in public spaces owned and operated by the permittee that minimize the discharge of pollutants from the application due to irrigation and expected precipitation.
  - d. The permittee shall ensure collection and proper disposal of the permittee's unused pesticides, herbicides, and fertilizers.
- (2) Evaluation of Flood Control Projects

The permittee shall assess the impacts of the receiving water(s) for all flood control projects. New flood control structures must be designed, constructed, and maintained to provide erosion prevention and pollutant removal from stormwater. The retrofitting of existing structural flood control devices to provide additional pollutant removal from stormwater shall be implemented to the maximum extent practicable.

## **6. Industrial Stormwater Sources**

Permittees operating a Level 4 small MS4 shall include the requirements described below in Part III. B.6(a) and (b) – this requirement is only applicable to Level 4 MS4s

- (a) Permittees who operate Level 4 small MS4s shall identify and control pollutants in stormwater discharges to the small MS4 from permittee's landfills; other treatment, storage, or disposal facilities for municipal waste (for example, transfer stations and incinerators); hazardous waste treatment, storage, disposal and recovery facilities and facilities that are subject to Emergency Planning and Community Right-to-Know Act (EPCRA) Title III, Section 313; and any other industrial or commercial discharge the permittee determines are contributing a substantial pollutant loading to the small MS4.
- (b) The program must include priorities and procedures for inspections and for implementing control measures for such industrial discharges.

## **7. Authorization for Construction Activities where the Small MS4 is the Site Operator**

The development of this MCM for construction activities, where the small MS4 is the site operator, is optional and provides an alternative to the MS4 operator seeking coverage under TPDES CGP, TXR150000 for each construction activity. Permittees that choose to develop this measure will be authorized to discharge stormwater and certain non-stormwater from construction activities where the MS4 operator meets the definition of a construction site operator in Part I of this general permit.

When developing this measure, permittees are required to meet all requirements of, and be consistent with, applicable effluent limitation guidelines for the Construction and Development industry (40 CFR Part 450), TPDES CGP TXR150000, and Part III.B.3 of this permit.

The authorization to discharge under this MCM is limited to the regulated area, such as the portion of the small MS4 located within a UA or the area designated by TCEQ as requiring

coverage. However, an MS4 operator may also utilize this MCM over additional portions of their small MS4 that are also in compliance with all of the MCMs listed in this general permit.

This MCM must be developed as a part of the SWMP that is submitted with the NOI for permit coverage. If this MCM is developed after submitting the initial NOI, an NOC must be submitted notifying the executive director of this change, and identifying the geographical area or boundary where the activities will be conducted under the provisions of this general permit.

Utilization of this MCM does not preclude a small MS4 from obtaining coverage under the TPDES CGP, TXR150000, or under an individual TPDES permit.

This MCM is only available for projects where the small MS4 is a construction site operator or owner, and the MCM does not provide any authorization for other construction site operators at a municipal project.

Controls required under this MCM must be implemented prior to discharge from a municipal construction site into surface water in the state.

The MCM must include:

- (a) A description of how construction activities will generally be conducted by the permittee so as to take into consideration local conditions of weather, soils, and other site-specific considerations;
- (b) A description of the area that this MCM will address and where the permittee's construction activities are covered (for example within the boundary of the urbanized area, the corporate boundary, a special district boundary, an extra territorial jurisdiction, or other similar jurisdictional boundary);
- (c) Either a description of how the permittee will supervise or maintain oversight over contractor activities to ensure that the SWP3 requirements are properly implemented at the construction site; or how the permittee will make certain that contractors have a separate authorization for stormwater discharges;
- (d) A general description of how a SWP3 will be developed for each construction site, according to Part VI of this general permit, "Authorization for Municipal Construction Activities"; and
- (e) Records of municipal construction activities authorized under this optional MCM, in accordance with Part VI of this general permit.

### **Section C. General Requirements**

Permittees shall provide information in the SWMP documenting the development and implementation of the program. At a minimum, the documentation must include:

1. A list of any public or private entities assisting with the development or implementation of the SWMP;
2. If applicable, a list of all MS4 operators contributing to the development and implementation of the SWMP, including a clear description of the contribution;
3. A list of all BMPs and measurable goals for each of the MCMs;
4. A schedule for the implementation of all SWMP requirements. The schedule must include, as appropriate, the months and years in which the permittee will undertake

required actions, including interim milestones and the frequency of the action throughout the permit term.

5. A description of how each measurable goal will be evaluated; and
6. A rationale statement that addresses the overall program, including how the BMPs and measurable goals were selected.

## **Part IV. Recordkeeping and Reporting**

### **Section A. Recordkeeping**

1. The permittee shall retain all records, a copy of this TPDES general permit, and records of all data used to complete the application (NOI) for this general permit and satisfy the public participation requirements, for a period of at least three (3) years, or for the remainder of the term of this general permit, whichever is longer. This period may be extended by request of the executive director at any time.
2. The permittee shall submit the records to the executive director only when specifically asked to do so. The SWMP required by this general permit (including a copy of the general permit) must be retained at a location accessible to the TCEQ.
3. The permittee shall make the NOI and the SWMP available to the public at reasonable times during regular business hours, if requested to do so in writing. Copies of the SWMP must be made available within ten (10) working days of receipt of a written request. Other records must be provided in accordance with the Texas Public Information Act. However, all requests for records from federal facilities must be made in accordance with the Freedom of Information Act.
4. The period during which records are required to be kept shall be automatically extended to the date of the final disposition of any administrative or judicial enforcement action that may be instituted against the permittee.

### **Section B. Reporting**

#### **1. General Reporting Requirements**

##### **(a) Noncompliance Notification**

According to 30 TAC § 305.125(9), any noncompliance which may endanger human health or safety, or the environment, must be reported by the permittee to the TCEQ. Report of such information must be provided orally or by fax to the TCEQ Regional Office within 24 hours of becoming aware of the noncompliance. A written report must be provided by the permittee to the appropriate TCEQ Regional Office and to the TCEQ Enforcement Division (MC-224) within five working days of becoming aware of the noncompliance. The written report must contain:

- (1) A description of the noncompliance and its cause;
- (2) The potential danger to human health or safety, or the environment;
- (3) The period of noncompliance, including exact dates and times;
- (4) If the noncompliance has not been corrected, the anticipated time it is expected to continue; and

- (5) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.

(b) Other Information

When the permittee becomes aware that it either submitted incorrect information or failed to submit complete and accurate information requested in an NOI, NOT, or NOC, or any other report, the permittee shall promptly submit the facts or information to the executive director.

## 2. Annual Report

The MS4 operator shall submit a concise annual report to the executive director within 90 days of the end of each reporting year. For the purpose of this section, the reporting year may include either the permit year, the permittee's fiscal year or the calendar year, as elected by the small MS4 and notified to the TCEQ in the application submittal. The annual report must address the previous reporting year.

The first reporting year for annual reporting purposes shall begin on the permit effective date and shall last for a period of one (1) year (the end of the "permit year"). Alternatively, if the permittee elects to report based on its fiscal year, the first reporting year will last until the end of the fiscal year immediately following the issuance date of this permit. If the permittee elects to report based on the calendar year, then the first reporting year will last until December 31, 2019.

Subsequent calendar years will begin at the beginning of the first reporting year (which will vary based on the previous paragraph) and last for one (1) year. The MS4 operator shall also make a copy of the annual report readily available for review by TCEQ personnel upon request. The report must include:

- (a) The status of the compliance with permit conditions, an assessment of the appropriateness of the identified BMPs, progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP, the measurable goals for each of the MCMs, and an evaluation of the success of the implementation of the measurable goals;
- (b) A summary of the results of information collected and analyzed, during the reporting period, including monitoring data used to assess the success of the program at reducing the discharge of pollutants to the MEP;
- (c) If applicable, a summary of any activities taken to address the discharge to impaired waterbodies, including any sampling results and a summary of the small MS4s BMPs used to address the pollutant of concern;
- (d) A summary of the stormwater activities the MS4 operator plans to undertake during the next reporting year;
- (e) Proposed changes to the SWMP, including changes to any BMPs or any identified measurable goals that apply to the program elements;
- (f) Description and schedule for implementation of additional BMP's that may be necessary, based on monitoring results, to ensure compliance with applicable TMDLs and implementation plans. For waters that are listed as impaired after discharge authorization pursuant to Part II.D.4, include a list of such waters and the pollutant(s) causing the impairment, and a summary of any actions taken to comply with the requirements of Part II.D.4.b.;
- (g) Notice that the MS4 operator is relying on another government entity to satisfy some of its permit obligations (if applicable);

- (h) The number of construction activities where the small MS4 is the operator and authorized under the 7<sup>th</sup> optional MCM, including the total number of acres disturbed; and
- (i) The number of construction activities that occurred within the jurisdictional area of the small MS4 (as noticed to the permittee by the construction operator), and that were not authorized under the 7<sup>th</sup> MCM.

MS4s authorized under the previous version of the permit must prepare an annual report whether or not the NOI and SWMP have been approved by the TCEQ. If the permittee has either not implemented the SWMP or not begun to implement the SWMP because it has not received approval of the NOI and SWMP, then the annual report may include that information.

If permittees share a common SWMP, they shall contribute to and submit a single system-wide report. Each permittee shall sign and certify the annual report in accordance with 30 TAC § 305.128 (relating to Signatories to Reports).

The annual report must be submitted with the appropriate TCEQ reporting forms if available, or as otherwise approved by TCEQ.

The annual report must be submitted to the following address:

Texas Commission on Environmental Quality  
Stormwater Team; MC - 148  
P.O. Box 13087  
Austin, Texas 78711-3087

A copy of the annual report must also be submitted to the TCEQ Regional Office that serves the area of the regulated small MS4, except if the report is submitted electronically.

Effective December 21, 2020, annual reports must be submitted using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver.

## **Part V. Standard Permit Conditions**

- A. The permittee has a duty to comply with all permit conditions. Failure to comply with any permit condition is a violation of the general permit and statutes under which it was issued, and is grounds for enforcement action, for terminating coverage under this general permit, or for requiring a discharger to apply for and obtain an individual TPDES permit.
- B. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- C. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- D. Authorization under this general permit may be suspended or revoked for cause. Filing a notice of planned changes or anticipated non-compliance by the permittee does not stay any permit condition. The permittee shall furnish to the executive director, upon

request and within a reasonable timeframe, any information necessary for the executive director to determine whether cause exists for modifying, revoking, suspending, reissuing or terminating authorization under this general permit. Additionally, the permittee shall provide to the executive director, upon request, copies of all records that the permittee shall maintain as a condition of this general permit.

- E. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used to achieve compliance with the conditions of this permit and with the condition of the permittee's SWMP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed only when the operation is necessary to achieve compliance with the conditions of this permit.
- F. Inspection and entry shall be allowed under the TWC Chapters 26-28, Health and Safety Code §§ 361.032-361.033 and 361.037, and 40 CFR §122.41(i). The statement in TWC § 26.014 that commission entry of a facility shall occur according to an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility or site, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.
- G. The discharger is subject to administrative, civil, and criminal penalties, as applicable, under the TWC, Chapters 26, 27, and 28, and the Texas Health and Safety Code, Chapter 361 for violations including but not limited to the following:
  - 1. Negligently or knowingly violating CWA, §§ 301, 302, 303, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under CWA, § 402; and
  - 2. Knowingly making any false statement, representation, or certification in any record or other document submitted or required to be maintained under a permit, including monitoring reports or reports of compliance or noncompliance.
- H. All reports and other information requested by or submitted to the executive director must be signed by the person and in the manner required by 30 TAC § 305.128 (relating to Signatories to Reports).
- I. Authorization under this general permit does not convey property or water rights of any sort and does not grant any exclusive privilege.
- J. The permittee shall implement its SWMP on any new areas under its jurisdiction that are located in a UA or that are designated by the TCEQ. Implementation of the SWMP in these areas is required three (3) years from acquiring the new area, or five (5) years from the date of initial permit coverage.

**Part VI. Authorization for Municipal Construction Activities – Applicable only if the 7th Optional MCM is selected**

The MS4 operator may obtain authorization under TPDES CGP, TXR150000 to discharge stormwater runoff from each construction activity performed by the MS4 operator that results in a land disturbance of one (1) acre or more of land or less than one (1) acre of land, if the construction activity is part of a larger common plan of development or sale that would disturb one acre or more. Alternatively, the MS4 operator may develop the SWMP to include the optional seventh (7<sup>th</sup>) stormwater MCM listed in Part III.B.7 of this general permit if the eligibility requirements in Part VI.A. below are met.

If an MS4 operator decides to utilize this MCM, then the MS4 operator must include this MCM in its SWMP submitted with the NOI or submit an NOC notifying the executive director of the addition of this MCM to its SWMP. The MS4 operator must identify the geographic area or boundary where the construction activities will be conducted under the provisions of this general permit. If the permittee meets the terms and requirements of this general permit, then discharges from these construction activities may be authorized under this general permit as long as they occur within the regulated geographic area of the small MS4.

An MS4 operator may utilize this MCM over additional portions of their small MS4 if those areas are also in compliance with all MCMs listed in this general permit. Even if an MS4 operator has developed this optional seventh stormwater MCM, the MS4 operator may apply under TPDES CGP TXR150000 for authorization for particular municipal construction activities including those activities that occur during periods of low potential for erosion (for which no SWP3 must be developed).

**Section A. Eligible Construction Sites**

Discharges from construction activities within the regulated area where the MS4 operator meets the definition of construction site operator are eligible for authorization under this general permit. Discharges from construction activities outside of the regulated area, where the MS4 operator meets the definition of construction site operator, are only eligible for authorization under this general permit in those areas where the MS4 operator meets the requirements of Parts III.B.1. through III.B.6 of this general permit, related to MCMs.

**Section B. Discharges Eligible for Authorization**

**1. Stormwater Associated with Construction Activity**

Discharges of stormwater runoff from small and large construction activities may be authorized under this general permit.

**2. Discharges of Stormwater Associated with Construction Support Activities**

Discharges of stormwater runoff from construction support activities, including concrete batch plants, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas may be authorized under this general permit provided:

- (a) The activity is located within a one-mile distance from the boundary of the permitted construction site and directly supports the construction activity;

- (b) A SWP3 is developed according to the provisions of this general permit and includes appropriate controls and measures to control sediment and erosion and discharge of pollutants in stormwater runoff from the supporting construction activity site;
- (c) The construction support activity either does not operate beyond the completion date of the construction activity or obtains separate TPDES authorization for discharges as required; and
- (d) Discharge of stormwater from concrete production facilities must meet the requirements in Section E below

### **3. Non-Stormwater Discharges**

The following non-stormwater discharges from construction sites authorized under this general permit are also eligible for authorization under this MCM:

- (a) Discharges from emergency fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, and similar activities);
- (b) Uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);
- (c) Water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;
- (d) Uncontaminated water used to control dust;
- (e) Potable water sources including waterline flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life);
- (f) Uncontaminated air conditioning condensate; and
- (g) Uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents.

### **4. Other Permitted Discharges**

Any discharge authorized under a separate TPDES or TCEQ permit may be combined with discharges from construction sites operated by the small MS4, provided the discharge complies with the associated permit.

### **Section C. Limitations on Permit Coverage**

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under Part VI of the general permit.

### Section D. Stormwater Pollution Prevention Plan (SWP3) Requirements

Operators of municipal construction activities that qualify for coverage under this general permit and that discharge stormwater associated with construction activities into surface water in the state must:

1. Develop a SWP3 according to the provisions of this general permit that covers the entire site and begin implementation of that plan prior to commencing construction activities;
2. Post a signed copy of a TCEQ approved site notice in a location at the construction site where it is readily available for viewing prior to commencing construction activities and maintain the notice in that location until completion of the construction activity and final stabilization of the site;
3. Ensure the project specifications allow or provide that adequate BMPs may be developed and modified as necessary to meet the requirements of this general permit and the SWP3;
4. Ensure all contractors are aware of the SWP3 requirements, are aware that municipal personnel are responsible for the day-to-day operations of the SWP3, and who to contact concerning SWP3 requirements; and
5. Ensure that the SWP3 identifies the municipal personnel responsible for implementation of control measures described in the plan.

### Section E. Stormwater Runoff from Concrete Batch Plants

Discharges of stormwater runoff from concrete batch plants at regulated construction sites may be authorized under the provisions of this general permit provided that the following requirements are met for concrete batch plant(s) authorized under this permit. If discharges of stormwater runoff from concrete batch plants are not covered under this general permit, then discharges must be authorized under an alternative general permit or an individual permit. This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

#### 1. Benchmark Sampling Requirements

- (a) Operators of concrete batch plants authorized under this section must sample the stormwater runoff from the concrete batch plants according to the requirements of this section of the general permit, and must conduct evaluations of the effectiveness of the SWP3 based on the following benchmark monitoring values:

Table 1. Benchmark Monitoring

Benchmark Parameters	Benchmark Value	Sampling Frequency	Sample Type
Oil and Grease (*1)	15 mg/L	1/quarter (*2)(*3)	Grab (*4)
Total Suspended Solids (*1)	50 mg/L	1/quarter (*2)(*3)	Grab (*4)
pH (*1)	6.0-9.0 S.U.	1/quarter (*2)(*3)	Grab (*4)
Total Iron (*1)	1.3 mg/L	1/quarter (*2)(*3)	Grab (*4)

- (\*1) Analytical data intended for compliance with benchmark monitoring requirements must be analyzed by a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory based on state rules located in 30 TAC Chapter 25. Analysis must be performed using sufficiently sensitive methods for analysis that comply with the rules located in 40 CFR §136.1(c) and 40 CFR §122.44(i)(1)(iv).
- (\*2) When discharge occurs. Sampling is required within the first 30 minutes of discharge. If it is not practicable to take the sample, or to complete the sampling, within the first 30 minutes, sampling must be completed within the first hour of discharge. If sampling is not completed within the first 30 minutes of discharge, the reason must be documented and attached to all required reports and records of the sampling activity.
- (\*3) Sampling must be conducted at least once during each of the following periods. The first sample must be collected during the first full quarter that a stormwater discharge occurs from a concrete batch plant authorized under this general permit.
- January through March
  - April through June
  - July through September
  - October through December

For projects lasting less than one full quarter, a minimum of one sample shall be collected, provided that a stormwater discharge occurred at least once following submission of the NOI.

- (\*4) A grab sample shall be collected from the stormwater discharge resulting from a storm event that is at least 0.1 inches of measured precipitation that occurs at least 72 hours from the previously measurable storm event. The sample shall be collected downstream of the concrete batch plant, and where the discharge exits any BMPs utilized to handle the runoff from the batch plant, prior to commingling with any other water authorized under this general permit.
- (b) The permittee shall compare the results of sample analyses to the benchmark values above, and must include this comparison in the overall assessment of the SWP3's effectiveness. Analytical results that exceed a benchmark value are not a violation of this permit, as these values are not numeric effluent limitations. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. The operator must investigate the cause for each exceedance and must document the results of this investigation in the SWP3 by the end of the quarter following the sampling event.

The operator's investigation must identify the following:

- (1) Any additional potential sources of pollution, such as spills that might have occurred;
- (2) Necessary revisions to good housekeeping measures that are part of the SWP3;
- (3) Additional BMPs, including a schedule to install or implement the BMPs; and
- (4) Other parts of the SWP3 that may require revisions in order to meet the goal of the benchmark values.

Background concentrations of specific pollutants may also be considered during the investigation. If the operator is able to relate the cause of the exceedance to background concentrations, then subsequent exceedances of benchmark values for that pollutant may be resolved by referencing earlier findings in the SWP3. Background concentrations may be identified by laboratory analyses of samples of stormwater run-on to the permitted facility, by laboratory analyses of samples of stormwater run-off from adjacent non-industrial areas, or by identifying the pollutant is a naturally occurring material in soils at the site.

## **2. BMPs and SWP3 Requirements**

Minimum Stormwater Pollution Prevention Plan (SWP3) Requirements - The following are required in addition to other SWP3 requirements listed in this section:

- (a) Description of Potential Pollutant Sources - The SWP3 must provide a description of potential sources (activities and materials) that may reasonably be expected to affect the quality of stormwater discharges associated with concrete batch plants authorized under this permit. The SWP3 must describe practices that that will be used to reduce the pollutants in these discharges to assure compliance with this general permit, including the protection of water quality, and must ensure the implementation of these practices. The following must be developed, at a minimum, in support of developing this description:
  - (1) Drainage – The site map must include the following information:
    - a. The location of all outfalls for stormwater discharges associated with concrete batch plants that are authorized under this permit;
    - b. A depiction of the drainage area and the direction of flow to the outfall(s);
    - c. Structural controls used within the drainage area(s);
    - d. The locations of the following areas associated with concrete batch plants that are exposed to precipitation: vehicle and equipment maintenance activities (including fueling, repair, and storage areas for vehicles and equipment scheduled for maintenance); areas used for the treatment, storage, or disposal of wastes listed in the TPDES CGP TXR150000; liquid storage tanks; material processing and storage areas; and loading and unloading areas; and
    - e. The locations of the following: any bag house or other dust control device(s); recycle or sedimentation pond, clarifier or other device used for the treatment of facility wastewater (including the areas that drain to the treatment device); areas with significant materials; and areas where major spills or leaks have occurred.
  - (2) Inventory of Exposed Materials – A list of materials handled at the concrete batch plant that may be exposed to stormwater and that have a potential to affect the quality of stormwater discharges associated with concrete batch plants that are authorized under this general permit.
  - (3) Spills and Leaks - A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to stormwater and that drain to stormwater outfalls associated with concrete batch plants authorized under this general permit must be developed, maintained, and updated.
  - (4) Sampling Data - A summary of existing stormwater discharge sampling data must be maintained, if available.

- (b) Measures and Controls - The SWP3 must include a description of management controls to regulate pollutants identified in the SWP3's "Description of Potential Pollutant Sources" from Part VI.E.2.(a) of this permit, and a schedule for implementation of the measures and controls. This must include, at a minimum:
- (1) Good Housekeeping - Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.
    - a. Operators must prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), settled dust, or other significant materials from paved portions of the site that are exposed to stormwater.

Measures used to minimize the presence of these materials may include regular sweeping or other equivalent practices. These practices must be conducted at a frequency that is determined based on consideration of the amount of industrial activity occurring in the area and frequency of precipitation, and shall occur at least once per week when cement or aggregate is being handled or otherwise processed in the area.
    - b. Operators must prevent the exposure of fine granular solids, such as cement, to stormwater. Where practicable, these materials must be stored in enclosed silos, hoppers or buildings, in covered areas, or under covering.
  - (2) Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to stormwater runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.
  - (3) Inspections - Qualified facility personnel (for example, a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) must be identified to inspect designated equipment and areas of the facility specified in the SWP3. The inspection frequency must be specified in the SWP3 based upon a consideration of the level of concrete production at the facility, but must be a minimum of once per month while the facility is in operation. The inspection must take place while the facility is in operation and must, at a minimum, include all areas that are exposed to stormwater at the site, including material handling areas, above ground storage tanks, hoppers or silos, dust collection or containment systems, truck wash down and equipment cleaning areas. Follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained and be made readily available for inspection upon request.
  - (4) Employee Training - An employee training program must be developed to educate personnel responsible for implementing any component of the SWP3, or personnel otherwise responsible for stormwater pollution prevention, with the provisions of the SWP3. The frequency of training must be documented in the SWP3, and at a minimum, must consist of one training prior to the initiation of operation of the concrete batch plant.
  - (5) Record Keeping and Internal Reporting Procedures - A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of stormwater discharges, must be included in the SWP3. Inspection and maintenance activities must be documented and records of those inspection and maintenance activities must be incorporated in the SWP3.

- (6) Management of Runoff - The SWP3 shall contain a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.
- (c) Comprehensive Compliance Evaluation – At least once per year, one (1) or more qualified personnel (for example, a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) shall conduct a compliance evaluation of the plant. The evaluation must include the following:
  - (1) Visual examination of all areas draining stormwater associated with regulated concrete batch plants for evidence of, or the potential for, pollutants entering the drainage system. These include but are not limited to: cleaning areas, material handling areas, above ground storage tanks, hoppers or silos, dust collection or containment systems, and truck wash down and equipment cleaning areas. Measures implemented to reduce pollutants in runoff (including structural controls and implementation of management practices) must be evaluated to determine if they are effective and if they are implemented in accordance with the terms of this permit and with the permittee’s SWP3. The operator shall conduct a visual inspection of equipment needed to implement the SWP3, such as spill response equipment.
  - (2) Based on the results of the evaluation, the following must be revised as appropriate within two (2) weeks of the evaluation: the description of potential pollutant sources identified in the SWP3 (as required in Part VI.E.2(a), “Description of Potential Pollutant Sources”); and pollution prevention measures and controls identified in the SWP3 (as required in Part VI.E.2.(b) “Measures and Controls”). The revisions may include a schedule for implementing the necessary changes.
  - (3) The permittee shall prepare and include in the SWP3 a report summarizing the scope of the evaluation, the personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP3, and actions taken in response to the findings of the evaluation. The report must identify any incidents of noncompliance. Where the report does not identify incidences of noncompliance, the report must contain a statement that the evaluation did not identify any incidence(s), and the report must be signed according to 30 TAC §305.128, relating to Signatories to Reports.
  - (4) The Comprehensive Compliance Evaluation may substitute for one of the required inspections delineated in Part VI.E.2.(b)(3) of this general permit.

### **3. Prohibition of Wastewater Discharges**

Wastewater discharges associated with concrete production including wastewater disposal by land application are not authorized under this general permit. These wastewater discharges must be authorized under an alternative TCEQ water quality permit or otherwise disposed of in an authorized manner. Discharges of concrete truck washout at construction sites may be authorized if conducted in accordance with the requirements of Part VI of this general permit.

### **4. Concrete Truck Wash Out Requirements**

This general permit authorizes the wash out of concrete trucks at construction sites regulated under this section of the general permit, provided the following requirements are

met. Authorization is limited to the land disposal of wash out water from concrete trucks. Any other direct discharge of concrete production waste water must be authorized under a separate TCEQ general permit or individual permit.

- (a) Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.
- (b) Concrete truck wash out water shall be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.
- (c) Wash out of concrete trucks during rainfall events shall be minimized. The direct discharge of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck washout as the result of rain.
- (d) The discharge of wash out water shall not cause or contribute to groundwater contamination.
- (e) If a SWP3 is required to be implemented, the SWP3 shall include concrete wash out areas on the associated map.

#### **Section F. Effective Date of Coverage**

Construction activities may not commence under this section until the MS4 NOI and SWMP are approved in writing by the TCEQ. Following approval of the NOI and SWMP, operators of construction activities eligible for coverage under this general permit are authorized to discharge stormwater associated with construction activity immediately upon posting the signed construction site notice required under this section.

#### **Section G. Deadlines for SWP3 Preparation and Compliance**

The SWP3 must:

1. Be completed and initially implemented prior to commencing construction activities that result in soil disturbance;
2. Be updated as necessary to reflect the changing conditions of new contractors, new areas of responsibility, and changes in best management practices; and
3. Provide for compliance with the terms and conditions of this general permit.

#### **Section H. Plan Review and Making Plans Available**

The SWP3 must be retained on-site at the construction site or made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; and to local government officials.

#### **Section I. Keeping Plans Current**

The permittee shall amend the SWP3 whenever either of the following occurs:

1. There is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3; or
2. Results of inspections or investigations by site operators, authorized TCEQ personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

### **Section J. Contents of SWP3**

The SWP3 must include, at a minimum, the information described in this section.

#### **1. Site Description**

A site description, or project description, which must include:

- (a) A description of the nature of the construction activity, potential pollutants and sources;
- (b) A description of the intended schedule or sequence of major activities that will disturb soils for major portions of the site;
- (c) The number of acres of the entire construction site property and the total number of acres of the site where construction activities will occur, including off-site material storage areas, overburden and stockpiles of dirt, and borrow areas;
- (d) Data describing the soil type or the quality of any discharge from the site;
- (e) A map showing the general location of the site (e.g. a portion of a city or county map);
- (f) A detailed site map indicating the following:
  - (1) Drainage patterns and approximate slopes anticipated after major grading activities;
  - (2) Areas where soil disturbance will occur;
  - (3) Locations of all major structural controls either planned or in place;
  - (4) Locations where temporary or permanent stabilization practices are expected to be used;
  - (5) Locations of construction support activities, including off-site activities that are authorized under the permittee's NOI, including material, waste, borrow, fill, or equipment storage areas;
  - (6) Surface waters (including wetlands) either at, adjacent, or in close proximity to the site;
  - (7) Locations where stormwater discharges from the site directly to a surface water body or a MS4; and
  - (8) Vehicle wash areas.
- (g) The location and description of asphalt plants and concrete plants (if any) providing support to the construction site and that are also authorized under this general permit;
- (h) The name of receiving waters at or near the site that will be disturbed or that will receive discharges from disturbed areas of the project; and
- (i) A copy of Part VI of this TPDES general permit.

## **2. Structural and non-structural controls**

The SWP3 must describe the structural and the non-structural controls (BMPs) that will be used to minimize pollution in runoff. The description must identify the general timing or sequence for implementation and the party responsible for implementation. At a minimum, the description must include the following components:

### **Erosion and Sediment Controls**

- (a) Erosion and sediment controls must be designed to retain sediment on-site to the maximum extent practicable with consideration for local topography and rainfall.
- (b) Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications. If periodic inspections or other information indicates a control has been used incorrectly, or that the control is performing inadequately, the operator must replace or modify the control.
- (c) Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50 percent.
- (d) If sediment escapes the site, accumulations must be removed at a frequency to minimize further negative effects. and, whenever feasible, prior to the next rain event.
- (e) Controls must be developed to limit offsite transport of litter, construction debris, and construction materials by stormwater runoff.

## **3. Stabilization Practices**

The SWP3 must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans must ensure that existing vegetation is preserved where possible.

- (a) Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, and other similar measures.
- (b) The following records must be maintained and either attached to or referenced in the SWP3 and made readily available upon request to the parties in Part VI.H. of this general permit:
  - (1) The dates when major grading activities occur;
  - (2) The dates when construction activities temporarily or permanently cease on a portion of the site; and
  - (3) The dates when stabilization measures are initiated.
- (c) Stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily or permanently ceased, and will not resume for a period exceeding 14 calendar days, except as provided in (1) and (2) below.
  - (1) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.
  - (2) Where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable. These

conditions exist in arid areas, semiarid areas, and areas experiencing drought conditions.

#### **4. Structural Control Practices**

The SWP3 must include a description of any structural control practices used to divert flows away from exposed soils, to limit the contact of runoff with disturbed areas, or to lessen the off-site transport of eroded soils.

- (a) Sites with a drainage area of ten (10) or more acres:
- (1) A sediment basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. A sedimentation basin may be temporary or permanent, but must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from off-site areas and flow from on-site areas that are either undisturbed or have already undergone final stabilization, if these flows are diverted around both the disturbed areas of the site and the sediment basin. Capacity calculations must be included in the SWP3.
  - (2) Where rainfall data is not available or a calculation cannot be performed the sedimentation basin must provide at least 3,600 cubic feet of storage per acre drained until the site reaches final stabilization.
  - (3) If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until the site reaches final stabilization. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation pattern, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins.
  - (4) Perimeter Controls – At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.
- (b) Controls for sites with drainage areas less than ten acres:
- (1) Sediment traps and sediment basins may be used to control solids in stormwater runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.
  - (2) Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained may be utilized. Where rainfall data is not available or a calculation cannot be performed, a temporary or permanent sediment basin providing 3,600 cubic feet of storage per acre drained may be provided. If a calculation is performed, then the calculation shall be included in the SWP3.

## **5. Permanent Stormwater Controls**

A description of any measures that will be installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed must be included in the SWP3. Permittees are only responsible for the installation and maintenance of stormwater management measures prior to final stabilization of the site.

## **6. Other Controls**

- (a) Off-site vehicle tracking of sediments and the generation of dust must be minimized.
- (b) The SWP3 must include a description of construction and waste materials expected to be stored on-site and a description of controls to reduce pollutants from these materials.
- (c) The SWP3 must include a description of pollutant sources from areas other than construction (including stormwater discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

## **7. Effluent Limits**

The federal Effluent Limitations Guidelines at 40 CFR § 450.21 apply to all regulated construction activities under this 7<sup>th</sup> optional MCM, where the small MS4 is the operator.

## **8. Approved State and Local Plans**

- (a) The permittee shall ensure the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or stormwater management site plans or site permits approved by federal, state, or local officials.
- (b) SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by state or local official for whom the permittee receives written notice.

## **9. Maintenance**

All erosion and sediment control measures and other protective measures identified in the SWP3 must be maintained in effective operating condition. If through inspections the permittee determines that BMPs are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of stormwater controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.

## **10. Inspections of Controls**

- (a) Personnel provided by the permittee must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, discharge locations, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Personnel conducting these inspections must be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site. Sediment and erosion

control measures identified in the SWP3 must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. Inspections must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized or where runoff is unlikely due to winter conditions (e.g. site is covered with snow, ice, or frozen ground exists), inspections must be conducted at least once every month. In arid or semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, then the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection.

The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of "dry" season and beginning of "wet" season).

- (b) Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas described in Part VI.J.10(a) above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described in Part VI.J.10.(a) above. The conditions of the controls along each inspected 0.25 mile portion may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile portion to either the end of the next 0.25 mile inspected portion, or to the end of the project, whichever occurs first.

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection. The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of "dry" season and beginning of "wet" season).

- (c) In the event of flooding or other uncontrollable situations that prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.
- (d) The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.
- (e) A report summarizing the scope of the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWP3 must be made and retained as part of the SWP3. Major observations should include: The locations of discharges of sediment or other pollutants from the site; locations of BMPs that need to be maintained; locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and locations where additional BMPs are needed.  
  
Actions taken as a result of inspections must be described within, and retained as a part of, the SWP3. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWP3 and this permit. The report must be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).
- (f) The names and qualifications of personnel making the inspections for the permittee may be documented once in the SWP3 rather than being included in each report.

### **11. Pollution Prevention Measures**

The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-stormwater components of the discharge.

### **Section K. Additional Retention of Records**

The permittee shall retain the following records for a minimum period of three (3) years from the date that final stabilization has been achieved on all portions of the site. Records include:

1. A copy of the SWP3; and
2. All reports and actions required by this section, including copies of the construction site notices.

**APPENDIX 10 – Annual Reports to TCEQ**

## Phase II (Small) MS4 Annual Report Form

TPDES General Permit Number TXR040000

### A. General Information

Authorization Number: TXR040096 Annual Reporting Year: (calendar year, permit year, or fiscal year): Calendar year Last day of fiscal year, if applicable: \_\_\_\_\_

MS4 Operator Level: Level 1 Name of MS4/Permittee: City of Kemah

Contact Name: Richard Beverlin Telephone Number: 281-334-1611

Mailing Address: 1401 Highway 146 Kemah, TX 77565

E-mail Address: rbeverlin@kemah-tx.com

### B. Narrative Provisions (Part IV Section B.2. (a))

Provide information on the status of complying with permit conditions: (Part V - Standard Permit Conditions):

	Yes	No	Explain
Permittee is currently in compliance with the SWMP as submitted to and approved by the TCEQ.			
Permittee is currently in compliance with recordkeeping and reporting requirements.			
Permittee meets the eligibility requirements of the permit (e.g., TMDL requirements, Edwards Aquifer limitations, compliance history, etc.)			

2. Provide a general assessment of the appropriateness of the selected BMPs. Use table below or attach a summary, as appropriate (See Example 1 in instructions):

MCM(s)	BMP	BMP is appropriate for reducing the discharge of pollutants in stormwater (yes or no). Explain.
1: Public Education, Outreach and Involvement	Educational material, website, etc.	Yes. Public is more educated on topics such as lawn care, storm drains and ditches, used oil disposal, saving water and household hazardous waste. The development within the MS4 outfalls is mostly residential and light commercial, so this BMP is appropriate because it is directed toward the majority of the MS4 population.

MCM(s)	BMP	BMP is appropriate for reducing the discharge of pollutants in stormwater (yes or no). Explain.
2: Illicit Discharge Detection and Elimination	Illicit discharge detection plan	Yes. MS4 has trained staff to recognize indicators of illicit discharges and conducts dry weather inspections. Any signs of potential illicit discharges are investigated as to source and parameter.
5: Pollution Prevention/ Good Housekeeping	Reduce sediment and pollutants within MS4	Yes. MS4 employs street sweeping on a regular maintenance schedule to minimize sediment entering the storm sewer system.
5: Pollution Prevention/ Good Housekeeping	Provide spill response and prevention training at city maintenance facility	Yes. MS4 provides educational material on proper chemical handling and use of fertilizers and pesticides. Additionally, periodic inspection of city operation facilities are conducted to ensure best management practices are being followed.

3. Describe progress towards reducing the discharge of pollutants to the maximum extent practicable. Summarize any information used (such as monitoring data) to evaluate reductions in the discharge of pollutants. Use a table or attach a narrative description as appropriate:

MCM	BMP	Parameter	Quantity	Units	Does BMP Demonstrate a Direct Reduction in Pollutants? (Yes / No / Explain)
3	Construction inspection	Sediment/debris	2	Inspections	Yes. Ensured Ordinance compliance

4. Provide the measurable goals for each of the MCMs, and an evaluation of the success of the implementation of the measurable goals (See Example 2 in instructions):

MCM(s)	Measurable Goal(s)	Success
1	Public Education: Update website & provide education materials	Met goal. Ongoing website update; Ongoing distribution of educational pamphlets at City Hall
1	Participate in a minimum of one public outreach event.	Met goal. Participated in Bay Day Festival April 26, 2014.
1, 5	Annual Outreach Presentation Program including Good Housekeeping and Spill Prevention Training	Met goal. Annual training with 3 employees from multiple departments (October 2014).
2	Develop list of on-site sewage disposal facilities within the MS4	In progress.
2, 3, 4	Review ordinance effectiveness and existing programs & update as needed.	In progress.
3	Inspect construction sites	Met goal. Conducted inspections on 3 sites

### C. Stormwater Monitoring Data (Part IV Section B.2. (b))

1. The MS4 has conducted monitoring of stormwater quality and submitted in the annual report (i.e. analytical and visual observations).

\_\_\_\_ Yes \_\_\_\_ No

a. Explain below or attach a summary to submit along with any monitoring data used to evaluate the success of the SWMP at reducing pollutants to the maximum extent practicable. Be sure to include a discussion of results:

#### D. Impaired Waterbodies (Part IV Section B.2.(c))

1. If applicable, explain below or attach a summary of any activities taken to address the discharge to impaired waterbodies, including any sampling results and a summary of the small MS4's BMPs used to address the pollutant of concern:

N/A

2. Describe the implementation of targeted controls if the small MS4 discharges to an impaired water body with an approved TMDL (Part II Section D.4.(a)):

N/A

3. Report the benchmark identified by the MS4 and assessment activities (Part II Section D.4.(a)(6)):

Benchmark Parameter (Ex: Total Suspended Solids)	Benchmark Value	Description of additional sampling or other assessment activities	Year(s) conducted

4. Provide an analysis of how the selected BMPs will be effective in contributing to achieving the benchmark (Part II Section D.4.(a)(4)):

Benchmark Parameter	Selected BMP	Contribution to achieving Benchmark

5. If applicable, report on focused BMPs to address impairment (Part II Section D.4.(a)(5)):

Pollutant to Address (Ex: Bacteria)	Description of Focused BMP	Comments/Discussion

6. Describe progress in achieving the benchmark (Part II.D.4.(a)(6)):

For example, the MS4 may use the following indicators:

- number of sources identified or eliminated;
- decrease in number of illegal dumping;
- increase in illegal dumping reporting;
- number of educational opportunities conducted;
- reductions in sanitary sewer flows (SSOs)
- increase in illegal discharge detection through dry screening

Benchmark Indicator	Description/Comments

### E. Stormwater Activities (Part IV Section B.2. (d))

Describe any stormwater activities the MS4 operator has planned for the next reporting year. Use the table or attach a summary, as appropriate:

MCM(s)	BMP	Stormwater Activity	Description/Comments
1	Outreach to regulated businesses	Updated presentation/education material directed regulated businesses	Continue working with regulated businesses so they understand the importance of reducing pollutants to stormwater and employing BMPs & good housekeeping practices.
2	Identify onsite sewage facilities within MS4	Map locations of identified onsite sewage facilities	Identified onsite sewage facilities will be field verified.

MCM(s)	BMP	Stormwater Activity	Description/Comments

F. SWMP Modifications (Part IV Section B.2.(e))

- Changes have been made or are proposed to the SWMP since the NOI or the last annual report, including changes in response to TCEQ's review.  
 Yes  No

If 'Yes', report on changes made to measurable goals and BMPs:

MCM(s)	Measurable Goal(s) or BMP(s)	Implemented or Proposed Changes (Submit NOC as needed)
3	Measurable Goal - Perform site inspections of 25% of all active construction sites.	Revise goal to perform site inspections of 25% of all active construction sites, or a minimum of 50 sites per year. Submitted NOC along with the annual report to reflect this change.

MCM(s)	Measurable Goal(s) or BMP(s)	Implemented or Proposed Changes (Submit NOC as needed)

Note: If changes include additions or substitutions of BMPs, include a written analysis explaining why the original BMP is ineffective or not feasible and why the replacement BMP is expected to achieve the goals of the original BMP.

2. Explain additional changes or proposed changes not previously mentioned (i.e. dates, contacts, procedures, annexation of land etc.):

N/A

### G. Additional BMPs (Part IV Section B.2. (f))

Provide a description and schedule for implementation of additional BMPs that may be necessary, based on monitoring results, to ensure compliance with applicable TMDLs and implementation plans.

BMP	Description	Implementation Schedule (Start Date etc.)	Status / Completion Date (completed, in progress, not started)

H. Additional Information (Part IV Section B.2.(g))

1. Is the permittee relying on another entity/ies to satisfy some of its permit obligations?

\_\_\_ Yes \_\_\_ No

If 'Yes,' provide the name(s) of other entity/ies and an explanation of their responsibilities (add more spaces or pages if needed):

Name and Explanation:

2.a. Is the named permittee sharing a SWMP with other entities?

\_\_\_ Yes \_\_\_ No

2.b. If 'yes,' is this a system-wide annual report including information for all permittees?

\_\_\_ Yes \_\_\_ No

If 'Yes,' list all associated permit numbers and permittee names (add additional spaces or pages if needed):

Authorization Number: \_\_\_\_\_ Permittee: \_\_\_\_\_

I. Construction Activities (Part IV Section B.2.(h-i))

1. The number of construction projects in the jurisdiction of the MS4 where the permittee was not the construction site operator (as provided in submittals to the MS4 operator via notices of intent or site notices) 5

2. a. Does the permittee utilize the optional seventh MCM related to construction?

\_\_\_ Yes \_ \_ No

2. b. If 'yes,' then provide the following information for this permit year:

The number of municipal construction activities authorized under this general permit	0
The total number of acres disturbed for municipal construction projects	0

Note: Though the seventh MCM is optional, implementation must be requested on the NOI or on a NOC and approved by the TCEQ.

## J. Certification

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 evaluated 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.

Name (printed): Bob Cummins Title: Mayor

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name (printed): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name (printed): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name (printed): \_\_\_\_\_ Title: \_\_\_\_\_

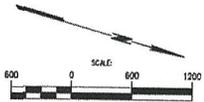
Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name (printed): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Note: If this is this a system-wide annual report including information for all permittees, each permittee shall sign and certify the annual report in accordance with 30 TAC §305.128 (relating to Signatories to Reports).

**APPENDIX 11 – Maps and Photos**

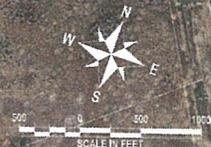


1254.3 ACRES



**Engineering & Surveying, Inc.**  
 East Houston Office Phone 713.450.1300  
 11821 East Freeway, Suite 400 Houston, Texas 77029 Fax 713.450.1395

PREPARED 06/17/2008



**APPENDIX 12 – Miscellaneous Correspondence**



**CITY OF  
KEMAH COPY**

October 31, 2014

To: TCEQ  
Office of the Chief Clerk, MC 105  
Attn: Notice Team  
P.O. Box 13087  
Austin, Texas 78711-3087

Reference: Applicant Name: City of Kemah; Permit Number: TXR040096

Per the instructions outlined in your letter dated 10/7/14, the following documents are provided for your use in finalizing the referenced application;

1. The original Publisher's Affidavit Form.
2. Application Availability Verification Form.
3. An original newspaper clipping that was published on 10/22/14 in the Galveston County Daily News.

If you have any questions or need any additional information, please contact me at (281) 334-1611.

Thank you,

  
James J. Reddington, P.E., CFM, CSI  
City Engineer/Capital Projects Manager

TCEQ-OFFICE OF THE CHIEF CLERK  
MC-105 Attn: Notice Team  
PO BOX 13087  
AUSTIN TX 78711-3087

APPLICANT NAME: CITY OF KEMAH  
PERMIT NO.: TXR040096  
CCO #: 94405  
Notice of Application for Small Municipal  
Separate Storm Sewer System (MS4)

**AFFIDAVIT OF PUBLICATION**

STATE OF TEXAS §  
COUNTY OF Galveston §

Before me, the undersigned authority, on this day personally appeared  
Sandra Villamil, who being by me duly  
(name of person representing newspaper)

sworn, deposes and says that (s)he is the Agent  
(title of person representing newspaper)

of the Galveston B. Daily News; that said newspaper is  
(name of newspaper)

regularly published in Galveston County, Texas, and is generally  
(name of county)

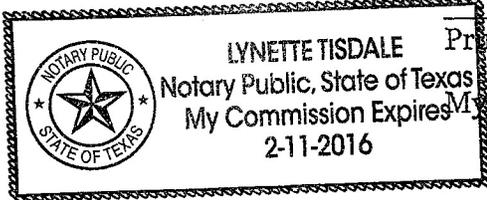
circulated within the following county or counties Galveston  
(name of county or counties)

Texas; that the enclosed notice was published in said newspaper on the following date:  
October 22, 2014

Sandra Villamil  
Newspaper Representative's Signature

Subscribed and sworn to before me this the 22<sup>nd</sup> day of October,  
20 14, to certify which witness my hand and seal of office.

(Seal) Lynette Tisdale  
Notary Public in and for the State of Texas



Lynette Tisdale  
Print or Type Name of Notary Public  
Commission Expires 2-11-16

**APPLICATION AVAILABILITY VERIFICATION FORM**

**Applicant Name:** CITY OF KEMAH

**Permit No.:** TXR040096

**APPLICATION AVAILABILITY:**

- I certify that a copy of the complete notice of intent application and storm water management program (including any subsequent revisions to the application), the Executive Director's Preliminary Decision, and a copy of General Permit Number TXR040000 and the Fact Sheet, were made available for review and copying at a public place in the county where the municipal separate storm sewer system (MS4) is located, as required by the Small MS4 General Permit TXR040000, Part II Section D.12.(6).

**Location where documents were made available:**

City of Kemah City Hall - 1401 Highway 146, Kemah, Texas 77565

**Signed by:**

Marisela Garcia

**Title:**

City Secretary

**Company:**

City of Kemah

**Date:**

10/30/14

Announcements

**006** Legal Notices

(MH) to Agricultural Residential (AR) for 3.075 acres located at 4504 Davis Hall Rd., being Abst 47, Page 5, Lots 40 and 41 (40-1), Mary Hall unrecorded subdivision and Lee replat (2007) Abst 47, Lots 1 and 2, City of Santa Fe, Galveston County, Texas.

Passed and approved on the second and final reading the 9th day of October, 2014.

Published: October 22, 2014  
00371106

**NOTICE TO CREDITORS OF THE ESTATE OF W. L. MOODY, IV., DECEASED**

Notice is hereby given that original Letters Testamentary for the Estate of W. L. Moody, IV., Deceased, who resided in the County of Galveston, Texas, were granted to the undersigned, as Independent Executor, on the 28th day of August, 2014, by the Probate Court of Galveston County, Texas, in Probate Cause No. PR 0075340.

All persons having claims against said Estate are hereby required to present the same to the Independent Executor, Moody National Bank, c/o Frederick E. Black, Greer, Herz & Adams, L.L.P., One Moody Plaza, 18th Floor, Galveston, Texas 77550, within the time and in the manner prescribed by law.

Moody National Bank, Independent Executor of the Estate of W. L. Moody, IV., Deceased

Published: October 22, 2014  
00371409

**CITY OF SANTA FE**

**ORDINANCE #10-2014**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SANTA FE, TEXAS:

An ordinance of the City of Santa Fe, Texas, amending the text of Ordinance No. 02-03, commonly known as the City of Santa Fe Unified Development Code, or the Santa Fe Zoning Ordinance, 2002 Edition, the official zoning map adopted under Section 3.08, by changing the zoning classification from Manufactured Housing (MH) to Agricultural Residential (AR) for 2.562 acres located at 13504 W. 6th Street, being Abst 47, Page 5, Lots 44 and 45 and North 1/2 of Lot 43 (44-1), Mary Hall unrecorded subdivision, City

**020** Lost & Found

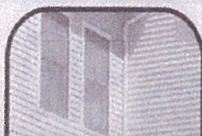
Lost-F-Blind Calico Cat 10/14/14 on 8th & K. Reward (409)502-0297

**022** Adoptions

\*\*\*\*ADOPTION:\*\*\*\*  
Adventurous, Creative, Bilingual, Financially Secure Couple, Travel, Music, LOVE awaits 1st baby. Expence paid. \*\*\* 1-800-354-2608 \*\*\*  
\*\*\* Erin & George \*\*\*



**100-199 FINANCIAL SERVICES**



**200-299 RENTALS**

**203** Furnished Rooms Galveston

**MOVE-IN SPECIAL!**  
Room Rentals, Eff. & 1BDR, A/C, Cable, Fridge, Microwave, All Bills Paid. \$140 to \$225/wk. + dep.  
**409-877-6194**

Starts \$145/wk or \$525/mo Bills paid, dep, cable TV church/20th 409-771-1383

**204** Apartments For Rent Unfurnished Galveston

1 & 2 bd rms Great rental rates. Nice loc., near UTMB. 630-802-5299-Christ

**Graber Family Partnership**  
1614 41st Up, 2/1, \$926  
2203 45th Up, 2/1, \$750  
2501 45th 2/1 CA/H \$750  
1816 53rd Up 1/1 \$650  
4505 Q-1/2 UP 1/1 \$750  
Tenant Pays Utilities  
**409-740-1234**

**006** Legal Notices

**NOTICE OF RECEIPT OF APPLICATIONS AND INTENT TO OBTAIN AIR PERMIT AMENDMENT AND RENEWAL AIR QUALITY PERMIT NUMBER 436**

APPLICATION Union Carbide Corporation has applied to the Texas Commission on Environmental Quality (TCEQ) for an amendment to and renewal of Air Quality Permit Number 436, which would authorize modifications to and continued operation of the Fuel and Raw Materials and Liquid Gas Terminal Unit located at 3301 5th Avenue South, Texas City, Galveston County, Texas 77590. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For exact location, refer to application. [\*\*204\*\* Apartments For Rent Unfurnished Galveston](http://www.tceq.texas.gov/assets/public/hb610/index.html?lat=29.375833&long=-94.945277&zoom=13&type=The existing facility and/or related facilities will emit the following air contaminants: organic compounds, nitrogen oxides, carbon monoxide, sulfur dioxide, and hazardous air pollutants. The applications were submitted to the TCEQ on September 22, 2014.</a></p>
</div>
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ALL Bills Paid West End-SM 1bd/rm Apt. \$650/mo + dep. 409-739-5410

Galveston Island 1,2 & 3 BDRMS Move-In Specials! 409-741-8202 409-739-1026

**GULFWIND APTS**  
8020 Stewart Rd 409-744-4222 2 & 3 Bedrooms

Large 3/1 - Located Between E. Beach & UTMB \$1095 - All BILLS PAID - 409-974-4954

**MOVE-IN by 10/31 1/2 Off 1st Month**  
2 bdsm, CH/A \$575/mo. 409-599-1822 4201 Sealy-Galv.

**Quite-cozy-safe University Apartments** next to Texas A&M Galv, (1 bdsm, Loft & 2 bdsm) furnished, granite, tile, carpet, beautifully maintained community pool & landscape, pet friendly, utilities included water, electric, cable, WiFi. (409)741-9100 [www.uagalveston.com](http://www.uagalveston.com)

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-Assigned Cov. Parking  
-Laundry Facilities  
-Door to Door Trash pick up  
Call now for our specials  
**Fort Crockett Apts.**  
4800 Seawall Blvd. (409)762-4800

**208** House For Rent Galveston

1209 26th St New 2BR fully furnished home C/A/H \$850 409-789-6888

**THE HOUSE COMPANY**  
REAL ESTATE BROKERS

1127 Postoffice up 2/1 \$1200  
2814 N 3/2. \$1450  
1619 23rd 1/1, \$625  
3619 O DN. 3/1, \$925  
409/763-8030

**208** House For Rent Galveston

**Graber Family Partnership**  
5005 M. 1/1, \$750  
8416 Seawall, 3/2, \$1500  
2909 Market, 3/1/5, \$1264  
924 12th Down, 1/1, \$680  
All bills paid (on 924 12th)  
Tenant pays utilities (409) 740-1234

**210** Condos/Townhouse For Rent - Galveston

**Beach Front Corporate Rentals**

Weekly & Monthly Options, Fully Furnished Suites with Gulf View Balconies & Kitchen Amenities, Maid Service, All utilities & WI-FI incl. Meeting Space & 2 Pools  
**Casa del Mar**  
61st & Seawall  
**409-740-2431**

**232** Apartments For Rent Unfurnished Mainland

Texas City **Move-In Special!**  
1 & 2 Bdrms 409-797-4649

**Baypointe Manor**  
2701 13th Ave N - TC Come check out our new upgrades!  
**Special !! \$399**  
**Moves You In!!!!**  
**(409)945-0135**

La Marque **All Bills Paid.**  
1 & 2 Bdrms 409-938-8961

**PINE FOREST APARTMENTS**

1br - \$199 1st month  
2br - \$299 1st month  
3br - \$399 1st month  
**PLUS EQUAL DEPOSIT**  
Section 8 WELCOME  
**281-337-4969**

Texas City **1 & 2 Bdrm Move-In Special**  
409-995-0245

**Village At Morningstar/ Morningstar Villas**  
1 & 2 bedrooms available in 55+ senior property in Texas City. Lots of amenities  
**Open Saturdays!**  
**409-945-0400**

**240** House For Rent Mainland

1 to 5 BR with C/A/H All Appliances Available Galveston & Mainland 409-750-0773

1100 Pirtle St. LM Lg. 3/2/1 CA/H, Appis. Lg. Yard, \$850 mo + Dep (713)269-6942

307 11th Ave N-TC 4/2-1/2, appis, 4 garage

**240** House For Rent Mainland

**Charming 2 bdsm Cottage!**  
809 Shady Lane - LM \$1200/mo. 832-248-1374

**240** House For Rent Mainland

**NICE 2BDR**  
2604 Rosalie w/Appis. A/C, WDC \$525+ deposit Call 409-877-6194

**240** House For Rent Mainland

**TC - North Side Brand New Home**  
2327 33rd Ave N-3/2/1 \$1,550/mo. + \$1,550/dep 409-771-1802

**006** Legal Notices

**Texas Commission on Environmental Quality**



**NOTICE OF APPLICATION FOR SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) General Permit Authorization No. TXR040096**

**APPLICATION.** City of Kemah, 1401 Highway 146, Kemah, Texas 77565, has applied to the Texas Commission on Environmental Quality (TCEQ) under the Texas Pollutant Discharge Elimination System (TPDES) General Permit No. TXR040000 for a renewal of authorization number TXR040096 to discharge from the municipal separate storm sewer system (MS4). The notice of intent (NOI) and stormwater management program were received by the TCEQ on June 9, 2014.

The MS4 is located in the city limits of the City of Kemah within the Houston urbanized area in Galveston County, Texas. The MS4 will discharge to the drainage area of upper Galveston Bay in the Bays and Estuaries Basin.

A copy of the NOI, stormwater management program, general permit, and fact sheet is available for viewing and copying at City of Kemah-City Hall, 1401 Highway 146, Kemah, Texas 77565.

The Executive Director of the TCEQ has made a preliminary decision to approve coverage of this MS4 under TPDES General Permit No. TXR040000.

**PUBLIC COMMENT.** Written public comments may be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of this notice. In addition, the public may request a public meeting. If significant interest exists, the Executive Director will direct the applicant to publish a notice of the public meeting and hold the public meeting. The applicant must publish notice of a public meeting at least 30 days prior to the meeting in a newspaper of general circulation in the county in which the MS4 is located. If the MS4 is located in more than one county, the applicant must publish notice in a newspaper of general circulation in the county containing the largest residential population. The Executive Director will consider all relevant information pertaining to whether the applicant meets the requirements of the general permit and will issue a written determination as to any final action on the NOI for coverage under the general permit.

**INFORMATION.** Written public comments should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, Texas 78711-3087 or electronically at [www.tceq.texas.gov/about/comments.html](http://www.tceq.texas.gov/about/comments.html). For additional information, about the application or the procedure for public participation in the general permit process, individual members of the general public may contact the TCEQ Public Education Program at 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040. General information about the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov).

Issued: October 7, 2014

The documents will be available at Kemah City Hall, 1401 Highway 146, Kemah, Texas 77565 during regular business hours. The hours are as follows: Monday - Thursday 7:30 a.m. - 5:30 p.m. and Fridays 8 a.m. to noon.

**009** Notices

Legal Notices

SANTA FE

#11-2014

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adopted under Section

3.08, by changing the

zoning classification from

Manufactured Housing

(MH) to Agricultural Residential

(AR) for 2.562

acres located at 13504

W. 6th Street, being Abst

47, Page 5, Lots 44 and

45 and North 1/2 of Lot 43

(44-1), Mary Hall un-

recorded subdivision, City

of Santa Fe, Texas.

Passed and approved on the

second and final reading the

9th day of October, 2014.

Published: October 22, 2014

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Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Zak Covar, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
*Protecting Texas by Reducing and Preventing Pollution*

OCTOBER 7, 2014

MS. MARISELA GARCIA  
CITY OF KEMAH  
1401 HIGHWAY 146  
KEMAH, TX 77565-3002

RE: Applicant Name: CITY OF KEMAH  
MS4 Location: GALVESTON County  
Permit Number: TXR040096  
Customer Reference Number: CN601013519  
Regulated Entity Number: RN105498216  
Type of Authorization: RENEWAL

Dear MS. GARCIA:

We have completed the technical review of the above referenced Notice of Intent and Storm Water Management Program (SWMP) and have prepared a Notice of Application.

You are now required to publish notice of your proposed activity. To help you meet the requirements associated with this notice, we have included the following items:

- Notice for Newspaper Publication
- Instructions for Public Notice
- Affidavit of Publication
- Application Availability Verification Form

Please note that it is VERY IMPORTANT that you follow ALL directions in the ENCLOSED INSTRUCTIONS. If you do not, you may be required to republish the notice. One of the most common mistakes we see is the unauthorized changing of notice wording or the characteristics of the font (i.e. bolding, capitalization, underlining). If you have any questions, please contact us before you proceed with publication.

The following items and time limitations are also described in the enclosed instructions. However, due to their importance, we want to highlight them for you.

NLT 11/6/14 • Publish the enclosed notice within **30 calendar days** of the date these instructions are mailed to you.

*DMG/gpk*

Published on 10/22/14  
"The Daily News" Galveston County

- Place a copy of your complete Notice of Intent, technical application (the Storm Water Management Program, including any subsequent revisions), a copy of the Small Municipal Separate Storm Sewer System (MS4) general permit TXR040000, and a copy of the Fact Sheet and Executive Director's Preliminary Decision supporting general permit TXR040000 in a public place in the county where the MS4 is located. These copies must be accessible to the public for review and copying and remain in place until the commission has taken action on the application. The general permit and the fact sheet can be downloaded from the following web site:  
[www.tceq.texas.gov/permitting/stormwater/WQ\\_ms4\\_small\\_TXR04.html](http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXR04.html).

sent to  
QA  
10/31/14  
gpp

- For each publication, submit proof of publication of the notice that shows the publication date and newspaper name to the Office of the Chief Clerk within **60 calendar days** of receiving these written instructions.
- Return the original enclosed Affidavit of Publication to the Office of the Chief Clerk within **60 calendar days** of receiving these written instructions.
- Return the Application Availability Verification Form to the Office of the Chief Clerk within **60 calendar days** of receiving these written instructions.

If you do not comply with all requirements described in the instructions, further processing of your application may be suspended or the agency may take other actions, including denial of the Notice of Intent.

If you have any questions regarding publication requirements, please contact the Office of the Chief Clerk at 512-239-3300. If you have any questions regarding the content of the notice, please contact the individual in the permitting area assigned to your application.

Sincerely,  
*Bridget C. Bohac*

Bridget C. Bohac  
Chief Clerk

Enclosures (4)

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



## INSTRUCTIONS FOR PUBLIC NOTICE For MS4 Notice of Intent

### NOTICE OF SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) APPLICATION

The executive director has completed the technical review of your Notice of Intent (NOI) and Storm Water Management Program (SWMP) and issued a preliminary decision. You must comply with the following instructions:

#### **Please Review Notice**

We have included all of the information we believe is necessary in the attached notice. Please read it carefully and notify us immediately if it contains any errors or omissions. You are responsible for ensuring the accuracy of all information published. You may not change the text or formatting of the notice or affidavit of publication without prior approval from the TCEQ. Changing the text or formatting of the notice may require new publication at your expense and delay processing of your application. There are four steps involved in publishing notice. Complete each step.

#### **Newspaper Notice**

- 1. You must publish the enclosed Notice of Application within 30 calendar days after the date this information was mailed to you (see date of cover letter).**
  - You must publish the enclosed notice at your expense, in the newspaper of largest circulation within the county wherein the small MS4 is located. If the small MS4 is located within multiple counties, then the notice must be published in the newspaper of largest circulation in the county containing the largest residential population.
  - The bold text of the enclosed notice must be printed in the newspaper in a font style or size that distinguishes it from the rest of the notice (i.e., **bold**, *italics*). **Failure to do so may require re-notice.**

#### **Proof of Publication**

Check each publication to ensure that the notices were accurately published. If a notice was not published correctly you may have to republish.

- 2. For each newspaper in which you published, you must submit proof of publication that shows the notice, the date of publication, and the name of**

the newspaper. Please send the proof of publication to the Office of the Chief Clerk within 60 business days after the date of publication. The Office of the Chief Clerk will accept either copies of the published notice or the original newspaper clippings of the published notice as proof of publication. If you choose to submit copies of the published notice to the Office of the Chief Clerk, the copies must be on standard-size 8 1/2 x 11" paper and must show the actual size of the published notice (do not reduce the image when making copies). Published notices longer than 11" must be copied onto multiple 8 1/2 x 11" pages. Please note, submitting a copy of the published notice could result in faster processing of your application. It is recommended that you maintain original newspaper clippings or tear sheets of the notice for your records.

For each newspaper notice, you must submit an original publisher's affidavit to the Office of the Chief Clerk within 60 calendar days after the date of publication. For each required published notice, you must use the appropriate Publisher's Affidavit form that is enclosed with these instructions. The affidavit must clearly identify the applicant's name and permit number. Note: On occasion, newspapers have attempted to provide applicants their own affidavit. The newspaper's affidavit will not be accepted by the Office of the Chief Clerk.

- You are encouraged to submit the Publisher's Affidavit at the same time you submit the proof of publication described above. However, the affidavit must be submitted no later than 60 calendar days after publication of the notice.
- The enclosed affidavit form must be filled out completely by the newspaper. The county or counties of circulation listed on the affidavit form must reflect the county wherein the MS4 is located; or, if the MS4 is located within multiple counties, the county or counties of circulation must reflect the county containing the largest resident population for the MS4.

3. You must complete the attached Application Availability Verification Form. This form must be submitted to the Office of the Chief Clerk with the Publisher's Affidavit within 30 calendar days after publication of the notice.

4. The original Publisher's Affidavit, Application Availability Verification Form, and proof of publication of the published notices must be mailed to:

TCEQ  
Office of the Chief Clerk, MC 105  
Attn: Notice Team  
P.O. Box 13087  
Austin, Texas 78711-3087

- Please ensure that the affidavits you send to the Office of the Chief Clerk are originals and that all blanks on the affidavit are filled in correctly. Photocopies of affidavits will not be accepted.

### **Failure to Publish and Submit Proof of Publication**

If you fail to publish the notice or submit proof of publication by the deadlines set forth above, then the TCEQ may suspend further processing on your application or take other actions.

### **Application in a Public Place**

You must provide a copy of the complete Notice of Intent, technical application (the storm water management program, including any subsequent revisions), copy of the Small Municipal Separate Storm Sewer System (MS4) general permit TXR040000, and a copy of the Fact Sheet and Executive Director's Preliminary Decision (fact sheet) supporting general permit TXR040000 at a public place for review and copying by the public. This place must be in the county in which the MS4 is located. The general permit and the fact sheet can be downloaded from the following web site:

[www.tceq.texas.gov/permitting/stormwater/WQ\\_ms4\\_small\\_TXRO4.html](http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXRO4.html).

- A public place is one that is publicly owned or operated (ex: libraries, county courthouses, or city halls).
- This copy must be accessible to the public for review and copying beginning on the first day of newspaper publication and remain in place until the commission has taken action on the Notice of Intent.
- If the Notice of Intent and technical application ("application") is submitted to the TCEQ with information marked as confidential, you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: "Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the TCEQ Public Information Coordinator, MC 197, P.O. Box 13087, Austin, Texas 78711-3087".

### **General Information**

When contacting the Commission regarding this Notice of Application, please refer to the General Permit Authorization Number at the top of the Notice of Application for Small Municipal Separate Storm Sewer System (MS4).

If you have any questions regarding publication requirements, please contact the Office of the Chief Clerk at 512-239-3300. If you have any questions regarding the content of the notice, please contact the individual in the permitting area assigned to your application. If you wish to obtain an electronic copy of the English version of this notice, please visit our web site at [www.tceq.texas.gov/agency/cc/pub\\_notice.html](http://www.tceq.texas.gov/agency/cc/pub_notice.html). Please be aware that formatting codes may be lost and that any notices downloaded from these web sites must be reformatted by you so that your downloaded copy looks like the notice document you received from us.

# Texas Commission on Environmental Quality



## NOTICE OF APPLICATION FOR SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) General Permit Authorization No. TXR040096

**APPLICATION.** City of Kemah, 1401 Highway 146, Kemah, Texas 77565, has applied to the Texas Commission on Environmental Quality (TCEQ) under the Texas Pollutant Discharge Elimination System (TPDES) General Permit No. TXR040000 for a renewal of authorization number TXR040096 to discharge from the municipal separate storm sewer system (MS4). The notice of intent (NOI) and stormwater management program were received by the TCEQ on June 9, 2014.

The MS4 is located in the city limits of the City of Kemah within the Houston urbanized area in Galveston County, Texas. The MS4 will discharge to the drainage area of upper Galveston Bay in the Bays and Estuaries Basin.

A copy of the NOI, stormwater management program, general permit, and fact sheet is available for viewing and copying at City of Kemah-City Hall, 1401 Highway 146, Kemah, Texas 77565.

The Executive Director of the TCEQ has made a preliminary decision to approve coverage of this MS4 under TPDES General Permit No. TXR040000.

**PUBLIC COMMENT.** Written public comments may be submitted to the Office of Chief Clerk, at the address provided in the information section below, within 30 days of the date of newspaper publication of this notice. In addition, the public may request a public meeting. If significant interest exists, the Executive Director will direct the applicant to publish a notice of the public meeting and hold the public meeting. The applicant must publish notice of a public meeting at least 30 days prior to the meeting in a newspaper of general circulation in the county in which the MS4 is located. If the MS4 is located in more than one county, the applicant must publish notice in a newspaper of general circulation in the county containing the largest residential population. The Executive Director will consider all relevant information pertaining to whether the applicant meets the requirements of the general permit and will issue a written determination as to any final action on the NOI for coverage under the general permit.

**INFORMATION.** Written public comments should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, Texas 78711-3087 or electronically at [www.tceq.texas.gov/about/comments.html](http://www.tceq.texas.gov/about/comments.html). For additional information, about the application or the procedure for public participation in the general permit process, individual members of the general public may contact the TCEQ Public Education Program at 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040. General information about the TCEQ can be found at our web site at [www.tceq.texas.gov](http://www.tceq.texas.gov).

Issued: October 7, 2014

**APPLICATION AVAILABILITY VERIFICATION FORM**

**Applicant Name: CITY OF KEMAH**

**Permit No.: TXR040096**

**APPLICATION AVAILABILITY:**

- I certify that a copy of the complete notice of intent application and storm water management program (including any subsequent revisions to the application), the Executive Director's Preliminary Decision, and a copy of General Permit Number TXR040000 and the Fact Sheet, were made available for review and copying at a public place in the county where the municipal separate storm sewer system (MS4) is located, as required by the Small MS4 General Permit TXR040000, Part II Section D.12.(6).

**Location where documents were made available:**

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**Signed by:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Company:** \_\_\_\_\_

**Date:** \_\_\_\_\_

TCEQ-OFFICE OF THE CHIEF CLERK  
MC-105 Attn: Notice Team  
PO BOX 13087  
AUSTIN TX 78711-3087

APPLICANT NAME: CITY OF KEMAH  
PERMIT NO.: TXR040096  
CCO #: 94405  
Notice of Application for Small Municipal  
Separate Storm Sewer System (MS4)

### AFFIDAVIT OF PUBLICATION

STATE OF TEXAS §

COUNTY OF \_\_\_\_\_ §

Before me, the undersigned authority, on this day personally appeared

\_\_\_\_\_, who being by me duly  
*(name of person representing newspaper)*

sworn, deposes and says that (s)he is the \_\_\_\_\_  
*(title of person representing newspaper)*

of the \_\_\_\_\_; that said newspaper is  
*(name of newspaper)*

regularly published in \_\_\_\_\_ County, Texas, and is generally  
*(name of county)*

circulated within the following county or counties \_\_\_\_\_,  
*(name of county or counties)*

Texas; that the enclosed notice was published in said newspaper on the following date:

\_\_\_\_\_.

\_\_\_\_\_  
Newspaper Representative's Signature

Subscribed and sworn to before me this the \_\_\_\_\_ day of \_\_\_\_\_,  
20\_\_\_\_\_, to certify which witness my hand and seal of office.

(Seal)

\_\_\_\_\_  
Notary Public in and for the State of Texas

\_\_\_\_\_  
Print or Type Name of Notary Public

My Commission Expires \_\_\_\_\_

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TEXAS COMMISSION  
ON ENVIRONMENTAL QUALITY

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[» Questions or Comments:](#)  
[ac@tceq.texas.gov](mailto:ac@tceq.texas.gov)

## We're sorry, but that page has either moved or no longer exists...

We apologize for the inconvenience, but the page you were trying to access is not at this address.

If you are certain you have the correct web address but are encountering an error, please contact the [Site Administration](#).

**Note that with the exception of some of our online applications, we have changed our website domain from *state.tx.us* to *texas.gov*.**

While our old domain name still works at this time, we encourage you to update your bookmarks.

Thank you.

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Last modified Sep 08, 2009

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[Questions or Comments >>](#)[Search Results](#)[Search Again](#)[CR Query](#)[TCEQ Home](#)**Water Quality General Permits and Registration Search****Summary of Authorization TXR040096**

**Permit/Registration Number:** TXR040096  
**Authorization Status:** ACTIVE  
**Date Coverage Began:** 11/09/2009  
**Date Coverage Ended:**

**Authorization Details**

**Site Name on Permit/Registration:** CITY OF KEMAH MS4  
**Authorization Type:** MS4 LEVEL 1  
**7th Minimum Control Measure :** N  
**Impaired Water Body :** UPPER GALVESTON BAY  
**Receiving Water Body :** CLEAR LAKE CHANNEL  
**Segment Number :** 2421

**Permittee or Registrant Information**

**Operator:** CN601013519 - CITY OF KEMAH  
**Address:** 1401 HIGHWAY 146 KEMAH TX 77565 3002  
**Annual Fee Billing Address:** RICHARD BEVERLIN  
 1401 HIGHWAY 146 KEMAH TX 77565 3002

**Permitted Site Information**

**RN:** RN105498216  
**RE Name:** CITY OF KEMAH MS4  
**Site Location:** AREA WITHIN THE CITY LIMITS OF KEMAH CORPORATE LIMITS LOCATED WITHIN THE URBANIZED AREA OF GALVESTON COUNTY KEMAH 77565  
**County:** GALVESTON  
**TCEQ Region:** REGION 12 - HOUSTON  
**Latitude:** 29.534444  
**Longitude:** -95.085277

**Regulated Entity Site Information**

**RE Name:** CITY OF KEMAH MS4  
**Site Location:** AREA WITHIN THE CITY LIMITS OF KEMAH CORPORATE LIMITS LOCATED WITHIN THE URBANIZED AREA OF GALVESTON COUNTY KEMAH 77565  
**County:** GALVESTON  
**TCEQ Region:** REGION 12 - HOUSTON  
**Latitude:** 29.534444  
**Longitude:** -95.085277

**Application History for this Authorization**

Application Type	Status	Received Date	Final Action Date
NOTICE OF INTENT	APPROVED	01/18/2008	11/09/2009
NOTICE OF INTENT	WITHDRAWN-DUPLICATE	06/09/2014	06/09/2014
NOI-RENEWAL	PENDING	06/09/2014	

[Site Help](#) | [Disclaimer](#) | [Web Policies](#) | [Accessibility](#) | [Our Compact with Texans](#) | [TCEQ Homeland Security](#) | [Contact Us](#)  
[Statewide Links: Texas.gov](#) | [Texas Homeland Security](#) | [TRAIL Statewide Archive](#) | [Texas Veterans Portal](#)

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**Texas Commission on Environmental Quality**  
*Protecting Texas by Reducing and Preventing Pollution*

December 11, 2012

**CITY OF KEMAH**  
1401 HIGHWAY 146  
KEMAH, TX 77565-3002

**Re: Renewal of the Phase II (Small) Municipal Separate Storm Sewer System (MS4) General Permit, TXR040000**  
Authorization Number: TXR040096  
Site: CITY OF KEMAH MS4, RN105498216  
Located in GALVESTON COUNTY at: AREA WITHIN THE CITY LIMITS OF KEMAH CORPORATE LIMITS LOCATED WITHIN THE URBANIZED AREA OF GALVESTON COUNTY, KEMAH, TX 77565  
Permittee: CN601013519, CITY OF KEMAH

Dear Permittee,

This letter is a courtesy notification that the Texas Commission on Environmental Quality (TCEQ) has amended and renewed the Texas Pollutant Discharge Elimination System (TPDES) Phase II (Small) MS4 General Permit TXR040000 that became effective on August 13, 2007, which authorizes the discharge of stormwater into surface water in the state. The previous permit expired on August 12, 2012. The renewed permit was adopted by the Commission on December 11, 2013.

A notice of intent to renew the general permit was published in the *Texas Register* on April 13, 2012, to allow administrative continuance of coverage to currently regulated Phase II MS4 entities until the renewed permit was issued.

To continue your authorization under the renewed permit, you will need to submit, within 180 days of permit issuance, a Notice of Intent (NOI) that includes the authorization number being renewed and a revised stormwater management program (SWMP) that meets the requirements in the renewed permit. Your existing authorization will remain active until your newly revised SWMP is approved.

The renewed general permit, factsheet and Response to Comments are available on the TCEQ website at: [http://www.tceq.texas.gov/permitting/stormwater/WQ\\_ms4\\_small\\_TXR04.html](http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXR04.html)

If you had obtained a waiver option from permitting requirements, and if you still qualify, you need to submit a new waiver form that includes the authorization number being renewed. If you no longer qualify for a waiver, you need to submit a NOI and SWMP as stated above.

**You need to apply by paper:**

- Submit the NOI and the revised SWMP **within 180 days after the effective date of the general permit.** (Use new NOI Form No. 20368)
- Application fee is \$100.00.
- Authorization begins when you have been notified that TCEQ has approved your NOI and your SWMP, and you have met the public notice process described in the general permit.
- If you submit a Waiver, provisional coverage will begin thirty (30) calendar days after submittal (postmark date) to the TCEQ. Upon approval of your Waiver or your NOI by the TCEQ, you will receive an authorization certificate that lasts until the expiration of the general permit, unless you cancel coverage before that date.

A new and revised **NOI Form No. 20368** and **Waiver Form No. 20369** for the new general permit are available on the TCEQ website at:

[http://www.tceq.texas.gov/comm\\_exec/forms\\_pubs/search\\_forms.html](http://www.tceq.texas.gov/comm_exec/forms_pubs/search_forms.html)

**Note that the previous NOI and Waiver forms will no longer be valid.**

The specific requirements for information to include in the NOI can be found in the new general permit located on the TCEQ website at:

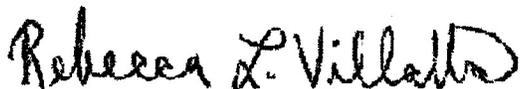
[http://www.tceq.texas.gov/permitting/stormwater/WQ\\_ms4\\_small\\_TXR04.html](http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXR04.html)

You can check the status of your applications and authorizations online. Go to

[http://www2.tceq.texas.gov/wq\\_dpa/index.cfm](http://www2.tceq.texas.gov/wq_dpa/index.cfm) and enter your authorization number to search for the record.

For questions related to your application or existing authorization, please contact the staff on the Stormwater & Pretreatment Team by e-mail at [SWGPA@tceq.texas.gov](mailto:SWGPA@tceq.texas.gov) or by telephone at (512) 239-4671. Please feel free to contact the Small Business & Local Government Assistance Sections (toll-free Hotline at 1-800-447-2827) for further assistance.

Sincerely,



Rebecca Villalba, Team Leader  
Stormwater & Pretreatment Team (MC 148)  
Water Quality Division  
Texas Commission on Environmental Quality



**CITY OF  
KEMAH COPY**

June 4, 2014

TCEQ  
Stormwater & Pretreatment (MC 148)  
P.O. Box 13087  
Austin, Texas 78711-3087

Attention To: Rebecca Villalba, Team Leader  
Water Quality Division

USPS TRACKING # **9114 9011 8986 6356 64**  
& CUSTOMER RECEIPT LABEL (ROLL) For Tracking or inquiries go to US  
or call 1-800-222-1811.

Re: Renewal of Phase II (Small) MS4 general Permit, TXr04000; Authorization Number TXR040096; Site:  
City of Kemah MS4 RN105498216; Permittee CN601013519, City of Kemah.

Dear Ms. Villalba:

In accordance with TCEQ's request letter (see attachment 1), the City of Kemah is submitting our revised 5-Year Storm Water management Plan for your review and approval. Per the instructions, the \$100.00 application fee was sent under a separate cover letter to the cashier's office; a copy of the check is included with the NOI in Appenix-8.

If you have any questions or if you need any additional information, please contact our City Engineer, James Reddington P.E., at 281-334-1611.

Respectfully yours,

Richard B. Beverlin III  
City Administrator  
City of Kemah

Attachments:

1. TCEQ letter to City of Kemah, dated 12/11/12, requesting submission of an updated 5-year Storm Water Management Program (SWMP).
2. Notebook containing revised SWMP and a copy of the NOI Form No. 20368 (see Appendix-8)

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Zak Covar, *Executive Director*



**Texas Commission on Environmental Quality**  
*Protecting Texas by Reducing and Preventing Pollution*

December 11, 2012

CITY OF KEMAH  
1401 HIGHWAY 146  
KEMAH, TX 77565-3002

Re: Renewal of the Phase II (Small) Municipal Separate Storm Sewer System (MS4) General Permit, TXR040000  
Authorization Number: TXR040096  
Site: CITY OF KEMAH MS4, RN105498216  
Located in GALVESTON COUNTY at: AREA WITHIN THE CITY LIMITS OF KEMAH CORPORATE LIMITS LOCATED WITHIN THE URBANIZED AREA OF GALVESTON COUNTY, KEMAH, TX 77565  
Permittee: CN601013519, CITY OF KEMAH

Dear Permittee,

This letter is a courtesy notification that the Texas Commission on Environmental Quality (TCEQ) has amended and renewed the Texas Pollutant Discharge Elimination System (TPDES) Phase II (Small) MS4 General Permit TXR040000 that became effective on August 13, 2007, which authorizes the discharge of stormwater into surface water in the state. The previous permit expired on August 12, 2012. The renewed permit was adopted by the Commission on December 11, 2013.

A notice of intent to renew the general permit was published in the *Texas Register* on April 13, 2012, to allow administrative continuance of coverage to currently regulated Phase II MS4 entities until the renewed permit was issued.

To continue your authorization under the renewed permit, you will need to submit, within 180 days of permit issuance, a Notice of Intent (NOI) that includes the authorization number being renewed and a revised stormwater management program (SWMP) that meets the requirements in the renewed permit. Your existing authorization will remain active until your newly revised SWMP is approved.

The renewed general permit, factsheet and Response to Comments are available on the TCEQ website at: [http://www.tceq.texas.gov/permitting/stormwater/WQ\\_ms4\\_small\\_TXR04.html](http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXR04.html)

If you had obtained a waiver option from permitting requirements, and if you still qualify, you need to submit a new waiver form that includes the authorization number being renewed. If you no longer qualify for a waiver, you need to submit a NOI and SWMP as stated above.

**You need to apply by paper:**

- Submit the NOI and the revised SWMP **within 180 days after the effective date of the general permit.** (Use new NOI Form No. 20368)
- Application fee is \$100.00.
- Authorization begins when you have been notified that TCEQ has approved your NOI and your SWMP, and you have met the public notice process described in the general permit.
- If you submit a Waiver, provisional coverage will begin thirty (30) calendar days after submittal (postmark date) to the TCEQ. Upon approval of your Waiver or your NOI by the TCEQ, you will receive an authorization certificate that lasts until the expiration of the general permit, unless you cancel coverage before that date.

A new and revised **NOI Form No. 20368** and **Waiver Form No. 20369** for the new general permit are available on the TCEQ website at:

[http://www.tceq.texas.gov/comm\\_exec/forms\\_pubs/search\\_forms.html](http://www.tceq.texas.gov/comm_exec/forms_pubs/search_forms.html)

**Note that the previous NOI and Waiver forms will no longer be valid.**

The specific requirements for information to include in the NOI can be found in the new general permit located on the TCEQ website at:

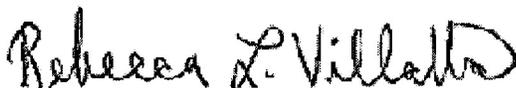
[http://www.tceq.texas.gov/permitting/stormwater/WQ\\_ms4\\_small\\_TXR04.html](http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXR04.html)

You can check the status of your applications and authorizations online. Go to

[http://www2.tceq.texas.gov/wq\\_dpa/index.cfm](http://www2.tceq.texas.gov/wq_dpa/index.cfm) and enter your authorization number to search for the record.

For questions related to your application or existing authorization, please contact the staff on the Stormwater & Pretreatment Team by e-mail at [SWGP@tceq.texas.gov](mailto:SWGP@tceq.texas.gov) or by telephone at (512) 239-4671. Please feel free to contact the Small Business & Local Government Assistance Sections (toll-free Hotline at 1-800-447-2827) for further assistance.

Sincerely,



Rebecca Villalba, Team Leader  
Stormwater & Pretreatment Team (MC 148)  
Water Quality Division  
Texas Commission on Environmental Quality



FEMA

January 22, 2013

COPY

Honorable Bob Cummins  
Mayor, City of Kemah  
1401 State Hwy. 146  
Kemah, TX 77565

Dear Mayor Cummins:

This letter will confirm that on January 8, 2013, a Final Community Coordination Meeting was held to present the preliminary county-wide Flood Insurance Study (FIS) and the preliminary Digital Flood Insurance Rate Map (DFIRM) for Galveston County and incorporated communities. As explained and discussed at the meeting, the Flood Insurance Study revises and updates the previous Flood Insurance Studies and/or Flood Insurance Rate Map for the community.

A certified letter will be sent to you informing you of the dates of publication of the proposed base flood elevations in the local newspaper. The notice will appear twice within a ten-day period. The second notice will initiate the 90-day appeal period. This 90-day period will allow all citizens within the jurisdiction to appeal the base flood elevations as established on the Preliminary Flood Insurance Study dated September 27, 2012 or comment on the study and map. If no appeals are received, the base flood elevations will be determined final and the community will have a period of six months before the flood maps will become effective. During that six month period, the city must adopt an acceptable ordinance that meets or exceeds the minimum requirements of 44 CFR Section 60.3(e). Such an ordinance must be approved by this office prior to the effective date of the Flood Insurance Rate Map (FIRM) to ensure the continued eligibility in the NFIP for Kemah.

“When detailed data is unavailable, as in Zone A areas, the community is required as a participant in the NFIP to “obtain, review, and reasonably utilize any base flood elevation and floodway data available” to enforce floodplain management regulations as stipulated in 44 CFR 60.3. Therefore, data included on the preliminary digital FIRM may be implemented for those purposes. However, the Flood Insurance Study does not become effective for insurance rating purposes until it is officially printed by FEMA with an effective date.

Also, Stakeholder meetings and Open House meetings will be held in Galveston at the Moody United Methodist Church on February 19, 2013 and in League City at the League City Civic Center on February 20, 2013 from 2:00 pm to 8:00 pm. The Stakeholder meetings are targeted for insurance, realtor and lender professionals and will focus on flood insurance and risk communications. The

Honorable Bob Cummins  
January 22, 2013  
Page 2

Open House meetings are public meetings for your citizens that will allow them to interact with FEMA staff and your floodplain management staff to learn about their flood risk, flood insurance, development requirements and mitigation opportunities.

If you should have any questions concerning these efforts, please feel free to contact me at this office by writing to the above address, or by calling (940) 898-5207. You may also e-mail me at [donetta.walsh@fema.dhs.gov](mailto:donetta.walsh@fema.dhs.gov).

Sincerely,



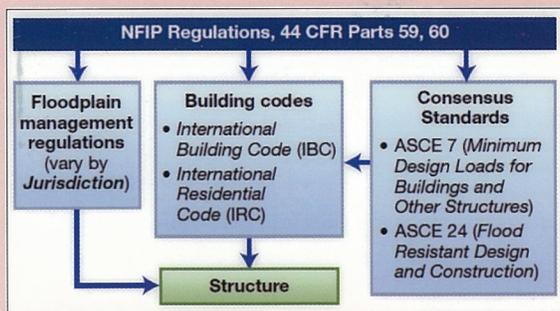
Donetta Walsh, CFM  
Natural Hazards  
Program Specialist

cc: James Reddington, Kemah Floodplain Administrator  
Michael Segner, Texas State NFIP Coordinator

### PRELIMINARY CONSIDERATIONS

This CodeMaster identifies a 12-step procedure for designing a structure for flood loads in accordance with the requirements of the 2009 and 2012 *International Residential Code (IRC)*, the 2009 and 2012 *International Building Code (IBC)*, ASCE 7-05 and 7-10 *Minimum Design Loads for Buildings and Other Structures*, and ASCE 24-05 *Flood Resistant Design and Construction*.

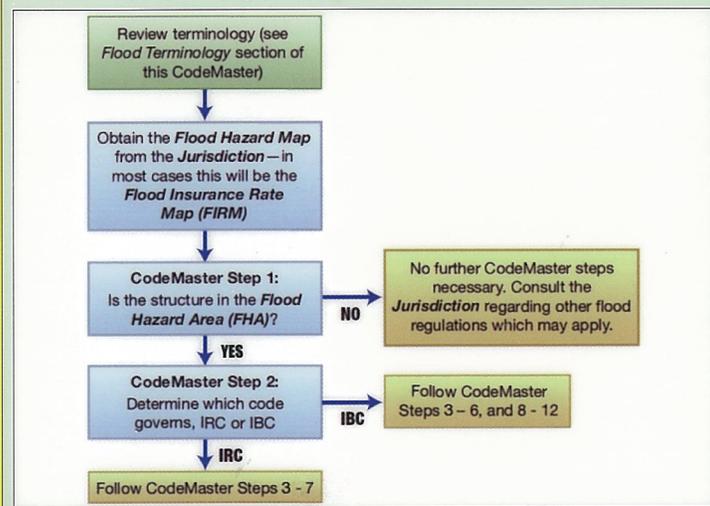
All steps will not be applicable in all cases, but following the applicable steps is necessary to meet the requirements of the **National Flood Insurance Program (NFIP)** – see *Code of Federal Regulations*, Title 44, Parts 59 and 60.



**SECRETS OF THE CODEMASTER:** Contact the **Jurisdiction** to determine if and how their floodplain management regulations and building code requirements vary from the flood resistant design and construction requirements contained in the IRC and IBC. Also inquire if IBC Appendix G (Flood Resistant Construction) has been adopted.

This CodeMaster applies to new construction, which also includes existing structures that are **Substantially Damaged** or **Substantially Improved**.

The flow chart below will guide designers in their use of this CodeMaster.



### FLOOD TERMINOLOGY

This terminology section has been provided so that the designer can easily refer back to these terms and acronyms. These terms have been placed in bold, italics where used in this CodeMaster as a reminder that they are defined here.

**Base Flood:** The flood having a 1-percent chance of being equaled or exceeded in any given year. Also known as the "100-year flood". IBC Section 1612.2.

**Base Flood Elevation (BFE):** The elevation of the **Base Flood**, relative to the datum used on the **Flood Hazard Map**. IBC Section 1612.2.

**Basement:** The portion of a structure having its floor subgrade (below ground level) on all sides. IBC Section 1612.2.

**Breakaway Walls:** Walls designed and constructed to fail due to **Flood Loads** during **Base Flood** or lesser conditions, without causing collapse, displacement or other structural damage to the elevated portion of the structure or foundation system. IRC Section R322.3.4; ASCE 24 Section 1.2.

**Coastal A Zone (CAZ):** A subset of the **A Zone**, that indicates the area subject to Moderate Wave Action (coastal wave heights between 1.5 and 3.0 ft during the **Base Flood**). The **Coastal A Zone (CAZ)** is not typically mapped as a **Flood Zone** on the **Flood Hazard Map**, but will be the area between the **Limit of Moderate Wave Action (LimWA)** and the **V Zone** (or shoreline if a **V Zone** is not mapped). IRC Section R322.2; ASCE 24 Section 1.2.

**Coastal High Hazard Area (CHHA):** **V Zone** areas shown on the **Flood Insurance Rate Map (FIRM)** as Zone VE, V1-30 or V. IRC Section R322.3; ASCE 24 Section 1.2.

**Design Flood:** The greater of: 1) the **Base Flood**, and 2) the flood adopted by the **Jurisdiction** for regulatory purposes. IBC Section 1612.2.

**Design Flood Elevation (DFE):** The elevation of the **Design Flood**, relative to the datum used on the **Flood Hazard Map**. IRC Section R322.1.4; IBC Section 1612.2.

**Digital Flood Insurance Rate Map (DFIRM):** A **Flood Insurance Rate Map (FIRM)**, produced in digital form. Most maps produced since 2000 have been **DFIRMs**.

**Dry Floodproofing:** A combination of structural and non-structural techniques which result in a structure being watertight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist **Flood Loads** under **Design Flood** conditions. IBC Section 1612.2.

**Flood Damage-Resistant Material:** Any construction material capable of withstanding direct and prolonged contact with floodwaters without sustaining any damage that requires more than cosmetic repair. IRC Section R322.1.8; IBC Section 1612.2. Also known as "Flood-Resistant Material".

**Flood Hazard Area (FHA):** The area subject to flooding during the **Design Flood** and shown on the **Flood Hazard Map** adopted by the **Jurisdiction**. **Flood Hazard Areas** have been mapped in riverine, lake, coastal, and other areas subject to flooding. The **Flood Hazard Area (FHA)** will be as large as or larger than the **Special Flood Hazard Area (SFHA)**. IRC Section R322.2; IBC Section 1612.2.

**Flood Hazard Map:** The map adopted by the **Jurisdiction** delineating **Flood Hazard Areas (FHA)**. Typically, the **Flood Insurance Rate Map (FIRM)** is the official **Flood Hazard Map**. It is sometimes referred to as the "Flood Map".

**Flood Hazard Zones:** Areas designated on the **Flood Hazard Map** to indicate the nature and severity of flood hazards. Zones are generally designated as:

- **V Zones:** Zones VE, V1-V30, and V, collectively referred to as **V Zones**, velocity zones, or the **Coastal High Hazard Area (CHHA)**. These zones are subject to high-velocity wave action from storms or seismic sources during the **Base Flood**.
- **A Zones:** Zones AE, A1-A30, AO, and A, collectively referred to as **A Zones**, that identify portions of the **Special Flood Hazard Area (SFHA)** that are outside **V Zones**.
- **B, C and X Zones:** Zones that indicate flooding may occur outside the **Special Flood Hazard Area (SFHA)** during the 500-year or more severe floods. **B and C Zones** were delineated on older **FIRMs**. **X Zones** are delineated on newer **FIRMs**.

**Flood Insurance Rate Map (FIRM):** The official map upon which the Federal Emergency Management Agency (FEMA) has delineated both the **Special Flood Hazard Area (SFHA)** and the applicable risk premium zones (**Flood Hazard Zones**). The newest **FIRMs** are produced as **Digital Flood Insurance Rate Maps (DFIRMs)**. IBC Section 1612.2.

**Flood Insurance Study (FIS):** The official report provided by the FEMA, containing the **Flood Insurance Rate Map (FIRM)** or another **Flood Hazard Map**, and containing **Base Flood Elevations (BFE)**, **Stillwater Elevations (SWEL)**, and supporting technical data. IBC Section 1612.2.

**Flood Loads:** Structural loads caused by standing or moving water. These include: hydrostatic loads, hydrodynamic loads, wave loads, and floodborne debris impact loads.

**Flood Opening:** Openings through the walls surrounding an enclosed area below the **Lowest Floor**, which equalize water levels inside and outside the enclosure.

**Floodway:** The channel of the river, creek, or other watercourse and the adjacent land areas that need to be reserved in order to discharge the **Base Flood** without cumulatively increasing the water surface elevation more than a designated height. IBC Section 1612.2.

**Freeboard:** An additional height that structures need to be elevated above the **Base Flood Elevation (BFE)**. **Jurisdictions** often adopt **Freeboard** as a factor of safety to account for uncertainties in the determination of flood elevations, to provide an increased level of flood protection, and/or to reduce flood insurance premiums for structures in **Flood Hazard Areas**. Some **Jurisdictions** incorporate **Freeboard** into the definition of the **Design Flood Elevation (DFE)**. **Freeboard** may vary with structure type and **Flood Hazard Zone**.

**Free of Obstructions:** Characteristic of the area below the **Lowest Floor** of a structure elevated on an open foundation, constructed without attached objects or components that interfere with the free passage of flood flow and waves. Insect screening, lattice, **Breakaway Walls**, and certain foundation bracing are not considered obstructions by the **National Flood Insurance Program (NFIP)**, but some **Jurisdictions** may limit these elements below the **Lowest Floor**.

**High Risk Flood Hazard Area: Flood Hazard Area (FHA)** where one or more of the following hazards are known to occur: alluvial fan flooding, flash floods, mudslides, ice jams, high velocity flow, coastal wave heights greater than or equal to 1.5 feet, or erosion. ASCE 24 Section 1.2.

**Jurisdiction:** The governmental unit that has adopted a building code and/or floodplain management regulations. IRC Section R202 and IBC Section 202. Also known as the "Authority Having Jurisdiction".

**Limit of Moderate Wave Action (LiMWA):** A line shown on the newest coastal **Flood Hazard Maps** – the **Digital Flood Insurance Rate Map (DFIRM)** – indicating the limit of the 1.5 ft coastal wave height. The **Coastal A Zone (CAZ)** will be the area between the **LiMWA** and the **V Zone** (or the shoreline if a **V Zone** is not mapped).

**Lowest Floor:** The floor of the lowest enclosed area, including **Basement**, but excluding any code-compliant, unfinished or flood resistant enclosure that is intended only for vehicle parking, structure access or limited storage, and excluding a code-compliant crawl space formed by foundation walls. IRC Section R322.1.5; IBC Section 1612.2.

**National Flood Insurance Program (NFIP):** A federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding.

**Special Flood Hazard Area (SFHA):** The land area subject to flood hazards, shown on a **Flood Insurance Rate Map (FIRM)** as **Zones A, AE, A1-30, A99, AR, AO, AH, V, VO, VE, or V1-30**. IBC Section 1612.2.

**Stillwater Elevation (SWEL):** The water surface elevation used for design purposes. In riverine and lake areas, this will be a floodwater surface; in coastal areas, this will be the average water level after any waves that may be present are smoothed out.

**Stillwater Flood Depth ( $d_s$ ):** The vertical distance from the **Stillwater Elevation (SWEL)** to the ground, after accounting for any erosion that is anticipated during the **Design Flood**. Also known as "Flood Depth" and "Stillwater Depth".

**Substantial Damage (SD):** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. IBC Section 1612.2.

**Substantial Improvement (SI):** Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures that have incurred **Substantial Damage (SD)**, regardless of the actual repair work performed. The term does not, however, include: (1) certain improvements of a structure to correct existing violations of State or local health, sanitary, or safety code specifications or (2) alterations of a historic structure, provided that the alterations will not preclude the structure's continued designation as a historic structure. Consult the **Jurisdiction** regarding historic structures and **SI** and **SD** exceptions. IRC Section R112.2.1; IBC Section 1612.2.

## STEP 1

### DETERMINE IF THE STRUCTURE IS IN THE FLOOD HAZARD AREA

Determine if the structure lies in whole or in part in the **Flood Hazard Area (FHA)**, which means it is therefore subject to flooding during the **Design Flood**. If so, then the structure needs to comply with the flood provisions of the applicable building code.

If the structure lies entirely outside the **Flood Hazard Area (FHA)**, then it will not be subject to building code flood provisions unless the **Jurisdiction** has designated additional flood resistant design requirements outside the **FHA**.

If the structure is not subject to building code flood provisions, you may stop here. The **Jurisdiction** should be consulted regarding other flood regulations which may apply.

## STEP 2

### DETERMINE WHICH CODE GOVERNS: IRC OR IBC

Flood resistant design requirements vary depending on the applicable building code. The IRC governs one- and two-family dwellings and townhouses up to three stories in height (see IRC Section R101.2). If this limitation is not met, or if any of the other IRC limitations are not met (see Sections R301.2.4, R322.1, R301.2.1, R301.2.2, R301.2.3 and R403.1.8), then the IBC will govern.

## STEP 3

### DETERMINE FLOOD HAZARD ZONE

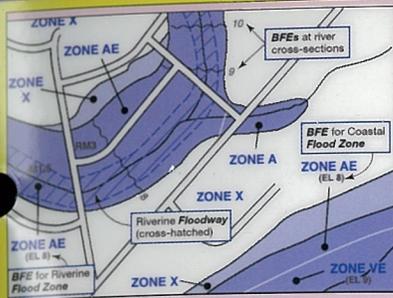
Use the **Flood Hazard Map** and other flood-related regulations or documents provided by the **Jurisdiction** to determine the **Flood Hazard Zone(s)** for the proposed structure footprint. When making this determination, the following questions should be considered.

- Is the structure partially or entirely in the **Flood Hazard Area (FHA)**? If yes, in which **Flood Hazard Zone(s)** does the structure lie? **A Zone? Floodway? Coastal A Zone (CAZ)? V Zone?**
- Is the structure in the 500-year floodplain (**Zones B, C or X**)? If yes, determine whether the **Jurisdiction** extends flood resistant design requirements into the 500-year floodplain or beyond.
- Is the structure partially or entirely in a **High Risk Flood Hazard Area** (IBC Section 1612.4, ASCE 24 Section 3)?
- Is the structure near or affected by levees or flood control structures? Consult the **Jurisdiction** regarding flood hazards, since older **Flood Hazard Maps** may overstate flood protection provided by the levee or flood control structure.

Design and construction requirements vary by **Flood Hazard Zone**. More restrictive requirements apply in the **Floodway, V Zone, Coastal A Zone (CAZ)**, and other **High Risk Flood Hazard Areas**.

**SECRETS OF THE CODEMASTER:** The location of the structure (not the site) determines specific flood resistant design and construction requirements. If any part of the structure lies in the **Flood Hazard Area (FHA)**, then the entire structure is considered "in" and needs to be designed accordingly.

**SECRETS OF THE CODEMASTER:** Structures located in more than one **Flood Hazard Zone** are governed by the design and construction requirements for the more hazardous zone (IRC Sections R322.1, R322.2, R322.3; IBC Section 1612.1).

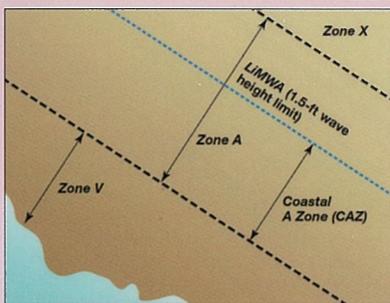


Sample (Old Style) **Flood Insurance Rate Map (FIRM)** Showing **Flood Zones** and **BFEs** for a Riverine **Flood Hazard Area (FHA)** at Top of Map and a Coastal **FHA** at Bottom of Map [Note: **Base Flood Elevation (BFE)** is discussed in Step 4].



Sample (New Style) **DFIRM** for a Riverine Area

**SECRETS OF THE CODEMASTER:** The **Coastal A Zone (CAZ)** is referenced by building codes and standards, but is not shown on the **Flood Insurance Rate Map (FIRM)**. The **CAZ** lies between the **Limit of Moderate Wave Action (LiMWA)** line (if delineated on the **FIRM**) and the **V Zone**. Some **Jurisdictions** may delineate or define a **Coastal A Zone (CAZ)** even where a **LiMWA** is not drawn on the **FIRM**. IRC structures need to meet **CAZ** requirements of the code where the **LiMWA** has been delineated (IRC Section 322.2). IBC structures are governed by ASCE 24 (IBC Section 1612.4), which requires designers to determine if a site will be subject to **CAZ** conditions (ASCE 24 Section 4.1.1).



**Coastal A Zone (CAZ)**

**SECRETS OF THE CODEMASTER:** The IBC requires compliance with ASCE 24 and ASCE 7. Many flood-related design requirements are not addressed explicitly in the IBC, but are captured by the IBC Section 1612.4 reference to ASCE 24.

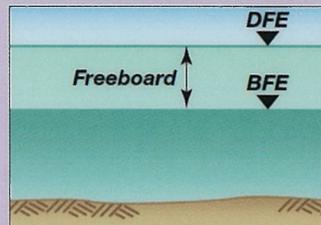
## STEP 4 DETERMINE DESIGN FLOOD ELEVATION (DFE)

The **Design Flood Elevation (DFE)** needs to be determined in accordance with the following since the **DFE** governs many aspects of flood resistant design and construction:

- Determine the **Base Flood Elevation (BFE)** at the structure location.
  - If the **Flood Hazard Map** shows a number in parentheses immediately below the **Flood Zone** within which the structure lies, use that number as the **BFE** for that **Flood Zone**. Coastal and lake **Flood Hazard Maps** will use this mapping style.
  - **Flood Hazard Maps** for riverine areas typically do not have **BFEs** in parentheses below **Flood Zones**, but do have **BFEs** designated beside river cross-section locations. In these cases, interpolation between cross-sections is used to identify the **BFE**, unless the **Jurisdiction** requires selection of the upstream (higher) **BFE**.
  - If more than one **BFE** exists at the structure location, select the highest **BFE**.
- Consult the **Jurisdiction** to determine if its floodplain regulations require design to a more severe flood or require **Freeboard** above the **BFE**.
- Review the adopted building code to determine if **Freeboard** is required. **Freeboard** may vary with structure type and **Flood Hazard Zone** (IRC Sections R322.2.1 and R322.3.2; IBC Section 1612.4; ASCE 24 Sections 2 and 4).

Consult the **Jurisdiction** if there is no **BFE** shown on the **Flood Hazard Map** at a site (IRC Section R322.1.4.1; IBC Section 1612.3.1). In areas designated as **Zone AO**, the **BFE** is the elevation of the highest existing grade at the structure's perimeter plus the depth number (in ft) specified on the map.

**SECRETS OF THE CODEMASTER:** If a **Jurisdiction** only regulates to minimum **National Flood Insurance Program (NFIP)** requirements, the **DFE** is identical to the **BFE**. The **DFE** will be higher than the **BFE** if a **Jurisdiction** chooses to: 1) adopt a **Flood Hazard Map** that delineates a flood that is more severe than the **Base Flood**, 2) add **Freeboard** via its regulations or building code, or 3) otherwise exceed minimum **NFIP** elevation requirements.



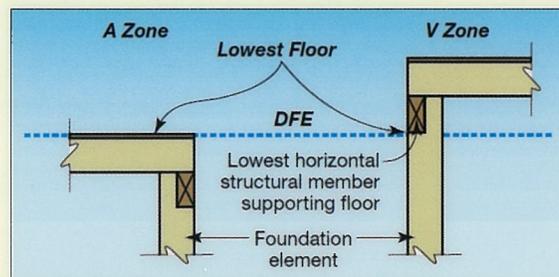
One Common Relationship Between **Base Flood Elevation (BFE)**, **Design Flood Elevation (DFE)** and **Freeboard**

## STEP 5 DETERMINE MINIMUM ELEVATION OF LOWEST FLOOR

The IRC and IBC require the **Lowest Floor** to be elevated to or above the **Design Flood Elevation (DFE)**. The minimum required **Lowest Floor** elevation varies by code and **Flood Hazard Zone** (see Steps 7 and 8).

Unless the **Jurisdiction** specifies higher elevation requirements, the following applies:

- In **A Zones**, the top of the floor (walking surface) is the lowest floor reference and needs to be elevated to or above the **DFE** (IRC Section 322.2.1; IBC Section 1612.4; ASCE 24 Section 2.3).
- In **V Zones**, the bottom of the lowest horizontal structural member (e.g., joist, beam, girder) supporting the **Lowest Floor** (excluding pile caps, grade beams, bracing, etc.) is the **Lowest Floor** reference, and needs to be elevated to or above the **DFE** (IRC Section 322.3.2; IBC Section 1612.4; ASCE 24 Section 4.4).



Location of **Lowest Floor** Relative to **Design Flood Elevation (DFE)**

- In **Coastal A Zones (CAZ)**, the **Lowest Floor** reference will vary by the governing code. The IRC uses the top of the **Lowest Floor** (IRC Section R322.2.1), while the IBC (Section 1612.4) and ASCE 24 (Section 4.4) use the bottom of lowest horizontal structural member supporting the **Lowest Floor**.

Additional guidance on identifying the **Lowest Floor** is contained in FEMA's **F-441 Insurance Agent's Lowest Floor Guide**.

**SECRETS OF THE CODEMASTER:** In addition to elevating the **Lowest Floor**, building codes also require the use of **Flood Damage-Resistant Materials** below the **DFE** or other elevations specified by the code (IRC Section R322.1.8; IBC Sections 801.5, 1612.2, 2009 IBC Section 1403.5 [2012 IBC Section 1403.6]; ASCE 24 Section 5). Additional information is contained in **NFIP Technical Bulletin 2, Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas**.

**SECRETS OF THE CODEMASTER:** Designers and owners should consult qualified insurance agents to understand how certain minimum design requirements – including **Lowest Floor** elevation – can affect the cost of federal flood insurance. Designers should investigate and discuss flood insurance premium implications of design alternatives with owners before designs are finalized.

## STEP 6

### DETERMINE PERMISSIBLE FOUNDATION TYPES

Foundation types permitted by the IRC and IBC vary by **Flood Hazard Zone** and applicable code. However, all foundations need to elevate the **Lowest Floor** to the required elevation and need to be designed, connected, and anchored to resist flotation, collapse or permanent lateral movement during the **Design Flood** (IRC Section R322.1.2; IBC Section 1612.1).

- In **A Zones**, slab-on-fill, solid perimeter wall (creating a crawl space), pile and column foundations are permitted (IRC Section R322.2; IBC Section 1612.4; ASCE 24 Sections 2.4, 2.5, 2.6). Grades in a crawl space need to meet certain requirements (IRC Section R408.7; IBC Section 1805.1.2.1). Limitations for crawlspace construction in some flood hazard areas are contained in *NFIP Technical Bulletin 11, Crawlspace Construction for Buildings Located in Special Flood Hazard Areas*.
- In **A Zones**, **Flood Openings** need to be installed in any walls or partitions enclosing space below the **DFE** (IRC Section R322.2.2; IBC Section 1203.3.2 and ASCE 24 Section 2.6.1). Additional information is contained in *NFIP Technical Bulletin 1, Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas*.
- In **V Zones**, structures need to be elevated on open (pile or column) foundations (IRC Section 322.3.3; IBC Section 1612.4; ASCE 24 Section 4.5). Note that the IBC (via ASCE 24) permits the use of shear walls as foundation walls. Fill cannot be used for structural support in **V Zones** (IRC Section 322.3.2.3; IBC Section 1612.4; ASCE 24 Section 4.5.4).
- In **V Zones**, the area below the **DFE** needs to be **Free of Obstructions** (2012 IRC Section R322.3.3). Although the 2009 IRC and the IBC do not use the term "**Free of Obstructions**", equivalent performance is required by the codes (2009 IRC Section R322.3.4; 2009 and 2012 IBC Section 1612.4; ASCE 24 Section 4.5.1). Additional information is contained in *NFIP Technical Bulletin 5, Free of Obstruction Requirements for Buildings Located in Coastal High Hazard Areas*.
- In **Coastal A Zones (CAZ)**, **A Zone** foundation types are permitted by the IRC (Section R322.2), but IBC Section 1612.4 and ASCE 24 Section 4.5 require **V Zone** foundations.

## STEP 7

### DETERMINE AND APPLY IRC FLOOD PROVISIONS

The table below lists the principal flood resistant design provisions contained in the IRC that need to be checked for applicability. If the IBC governs, go to Step 8.

Topic	IRC Section
Basic Flood Resistant Requirements	R322.1.1, R322.1.2, R322.1.3
<b>Flood Loads</b> and Conditions	R301.1, Table R301.2(1), R322.1.2, R322.3.3
<b>Lowest Floor</b> Elevation	R309.3, R322.2.1, R322.3.2
Foundation	R322.2.3, R322.3.3, R401
Use of Fill	R322.1.4.2, R322.3.2(3) and (4), R401.2, R506.2.1
<b>Basements</b>	R322.2.1, R322.3.2
Use of Enclosed Area Below the <b>Design Flood Elevation (DFE)</b>	R309.3, R322.2.2, R322.3.5
<b>Flood Openings</b> in Below- <b>DFE</b> Enclosures	R322.2.2, R408.7
<b>Breakaway Walls</b>	R322.1.6, R322.3.4
<b>Flood Damage-Resistant Materials</b>	R322.1.8
Mechanical, Electrical Equipment and Systems, Plumbing, Fuel Gas	R322.1.6, M1301.1.1, M1401.5, M1601.4.9, M1701.2, M2001.4, M2201.6, G2404.7, P2601.3, P2602.2, P2705.1, P3001.3, P3101.5
<b>Dry Floodproofing</b>	Not Permitted
<b>High Risk Flood Hazard Areas</b>	See <b>Floodway</b> , <b>V Zone</b> requirements and <b>Coastal A Zone</b> requirements: R301.2.4, R301.2.4.1, R322.1, R322.1.1, R322.2, R322.3

### Topic (Continued)

### IRC Section (Continued)

<b>Substantial Damage</b> and <b>Substantial Improvements</b>	R102.7.1, R105.3.1.1, R112.2.1, R322.3.1
Documentation, Inspections and Certifications <b>Lowest Floor</b> Elevation, <b>Flood Openings</b> , <b>Dry Floodproofing</b> , <b>Breakaway Walls</b> , <b>V Zone</b> Design	R106.1.3, R109.1.3, R322.1.4.1, R322.1.4.2, R322.1.10, R322.2.2, R322.3.3, R322.3.4, R322.3.6, 2012 IRC Section R109.1.6.1

Designers should consult with the **Jurisdiction** to see if additional flood requirements apply to structures governed by the IRC and if a detailed assessment of **Design Flood** conditions is required (if so, see Step 9).

**SECRETS OF THE CODEMASTER:** IRC Sections R301.2.4.1 and R322.1.1 permit use of ASCE 24 as an alternate for structures constructed in whole or in part in a **V Zone**. The same 2012 IRC sections permit use of ASCE 24 as an alternate for structures constructed in delineated **Coastal A Zones (CAZ)**.

## STEP 8

### DETERMINE AND APPLY IBC FLOOD PROVISIONS

The table below lists the principal flood resistant design provisions contained in the IBC that need to be checked for applicability. If the IRC governs, go to Step 7.

Topic	IBC Section	ASCE 24 Section ASCE 7 Section
Basic Flood Resistant Requirements	1612.1, 1612.4	ASCE 24: 1.5
<b>Flood Loads</b> and Conditions	2009 IBC Section 1605.2.2 (2012 IBC Section 1605.2.1), 1605.3.1.2, 1612.4, 3102.7	ASCE 24: 1.6 ASCE 7: 2.3.3, 2.4.2, 5.3.1, 5.3.2, 5.4
<b>Lowest Floor</b> Elevation	1603.1.7, 1612.4	ASCE 24: 2.3, 4.4
Foundation	1612.4, Chapter 18	ASCE 24: 1.5.3, 2.5, 4.5
Use of Fill	1804.4	ASCE 24: 1.5.4, 2.4, 4.5.4
<b>Basements</b>	1612.2	ASCE 24: 1.2, 1.5.2, 2.3
Use of Enclosed Areas Below the <b>Design Flood Elevation (DFE)</b>	see ASCE 24	ASCE 24: 2.6, 4.6
<b>Flood Openings</b> in Below- <b>DFE</b> Enclosures	1203.3.2(5)	ASCE 24: 2.6.1, 2.6.2, 4.6.2
<b>Breakaway Walls</b>	2009 IBC Section 1403.6 (2012 IBC Section 1403.7), 1612.5.2.3	ASCE 24: 1.2, 4.6 ASCE 7: 5.3.3
<b>Flood Damage-Resistant Materials</b>	801.5, 1403.5 (2012 IBC Section 1403.6), 1612.2	ASCE 24: 1.2, 5.0
Mechanical, Electrical Equipment and Systems, Plumbing	2009 IBC Section 1403.6 (2012 IBC Section 1403.7), 3001.2	ASCE 24: 4.6.1, 7.0
<b>Dry Floodproofing</b>	1612.2	ASCE 24: 1.2, 1.5.2, 6.0, 7.1
<b>High Risk Flood Hazard Areas</b>	see ASCE 24	ASCE 24: 3.0, 4.0
<b>Substantial Damage</b> and <b>Substantial Improvements</b>	1612.1, 1612.2, 3403.1, 3403.2, 3404.2, 3405.5, 3412.2.4.1	ASCE 24: 1.1, 1.2, 1.5.1
Documentation, Inspections and Certifications <b>Lowest Floor</b> Elevation, <b>Flood Openings</b> , <b>Dry Floodproofing</b> , <b>Breakaway Walls</b> , <b>V Zone</b> Design	107.2.5, 110.3.3, 1603.1, 1603.1.7, 1612.3.1, 1612.5, 2012 IBC Section 110.3.10.1	Not Applicable

Application of the IBC flood provisions require that **Design Flood** conditions and **Flood Loads** be determined (see Steps 9 – 11). (Note that for structures in areas subject only to riverine and/or lake flooding, Steps 9.6 and 10.4 do not apply).

**STEP 9****DETERMINE DESIGN FLOOD CONDITIONS**

Flood resistant design requires that design flood conditions be determined. Step 9 divides the various **Design Flood** conditions into substeps, describes how each **Design Flood** condition will be used, and provides additional guidance.

Design Flood Condition	Used For	Step	Additional Guidance
<b>Stillwater Elevation (SWEL)</b>	Calculating <b>Stillwater Flood Depth, <math>d_s</math></b>	9.1	Obtain from <b>FIS/FIRM</b> or site-specific determination
Anticipated Eroded Ground Elevation	Calculating <b>Stillwater Flood Depth, <math>d_s</math></b>	9.2	Some sites will not be subject to erosion during <b>Design Flood</b>
<b>Stillwater Flood Depth, <math>d_s</math></b>	Calculating hydrostatic and hydrodynamic loads, coastal wave heights	9.3	Obtain by subtracting anticipated eroded ground elevation from <b>SWEL</b>
Flood Velocity, $V$	Calculating Hydrodynamic Loads	9.4	Estimated from <b>FIS</b> or site-specific determination; ASCE 7 C5.4.3
Floodborne Debris	Calculating debris impact loads	9.5	ASCE 7 C5.4.5
Coastal Wave Height	Calculating breaking wave loads (coastal design only)	9.6	ASCE 7: 5.4.4

**STEP 9.1****DETERMINE STILLWATER ELEVATION (SWEL)**

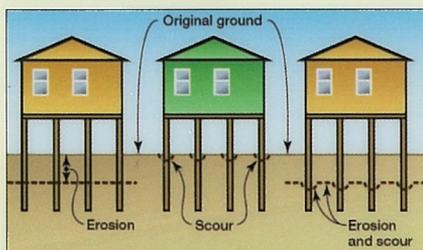
The **Stillwater Elevation (SWEL)** is the water surface elevation used for design purposes. The **SWEL** needs to be referenced to the same datum used to establish the **Base Flood Elevation (BFE)** and **Design Flood Elevation (DFE)**. The **Flood Insurance Rate Map (FIRM)** and the **Flood Insurance Study (FIS)** need to be reviewed, and the **Jurisdiction** needs to be consulted regarding the nature of flooding (riverine/lake versus coastal) and **SWEL** determinations. The **Jurisdiction** has the authority to require use of data from other sources or to require development of flood elevation data (IRC Section R322.1.4.1; IBC Section 1612.3.1).

Unless the **Jurisdiction** has adopted a more severe flood as the **Design Flood**, the **Stillwater Elevation (SWEL)** used for design purposes will be as follows:

- Riverine and lake: the **BFE** published in the **Flood Insurance Study (FIS)** and shown on the **Flood Insurance Rate Map (FIRM)**.
- Coastal: the 100-year **Stillwater Elevation (SWEL)** published in the **Flood Insurance Study (FIS)**.

**STEP 9.2****ADJUST GROUND ELEVATION FOR EROSION AND SCOUR**

In both riverine and coastal areas, floods may erode soil over large areas ("erosion") and can cause localized scour ("scour") around structure foundations as shown below:



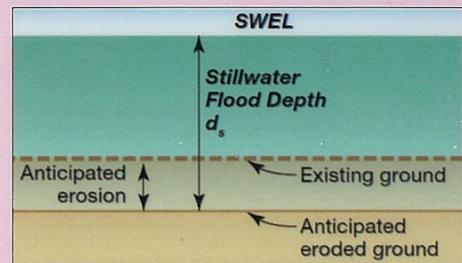
Erosion and Scour

- If erosion has occurred in the vicinity of the structure site during past floods or if the soils are known to be highly erodible, the ground elevation needs to be adjusted (lowered), which will increase the **Stillwater Flood Depth,  $d_s$**  and associated **Design Flood Loads** (IBC Section 1612.4; ASCE 7 Section 5.3.2).
- If local scour has occurred or is likely around structures at or near the site during floods, scour needs to be anticipated and accounted for during foundation design (IBC Section 1612.4; ASCE 7 Section 5.3.2). Note that local scour will affect the required foundation depth, but will not affect the **Stillwater Flood Depth,  $d_s$**  (which is based on the eroded ground elevation); therefore, it will not affect **Flood Loads** calculated using  $d_s$ .

Guidance regarding the amount of the adjustments for erosion and local scour may be limited – check with the **Jurisdiction**, use historical evidence, and consult geotechnical experts. FEMA's *Coastal Construction Manual* will provide guidance on estimating scour and erosion in coastal areas.

**STEP 9.3****CALCULATE STILLWATER FLOOD DEPTH,  $d_s$** 

- For sites not subject to erosion during the **Design Flood**, subtract the existing ground elevation from the **Stillwater Elevation (SWEL)** determined in Step 9.1.
- For sites subject to erosion during the **Design Flood**, subtract the anticipated eroded ground elevation from the **SWEL**.

**Stillwater Flood Depth,  $d_s$** 

**SECRETS OF THE CODEMASTER:** Calculating  $d_s$  is one of the most important flood calculations that will be made because most **Flood Loads** depend on the result.

**STEP 9.4****ESTIMATE FLOOD VELOCITY,  $V$** 

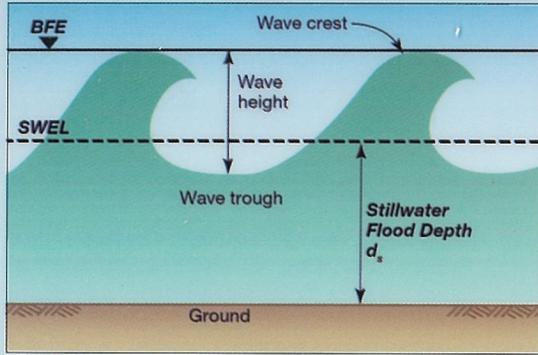
Flood velocity needs to be estimated based on historical evidence, data in the **Flood Insurance Study (FIS)**, flood model results, or approximations developed using simplified methods. Estimating flood velocity will be one of the more difficult aspects of flood resistant design. The **Jurisdiction** or hydraulic/coastal experts should be consulted for help.

**STEP 9.5****CHARACTERIZE FLOODBORNE DEBRIS**

The type, size, weight and velocity of debris likely to be propelled by floodwaters need to be estimated. Guidance can be found in the Commentary to Chapter 5 of ASCE 7.

**STEP 9.6****ESTIMATE COASTAL WAVE HEIGHT**

Wave heights will likely be of importance in areas subject to coastal flooding, especially sites close to the shoreline. Coastal wave heights are limited by **Stillwater Flood Depth,  $d_s$** , and the presence of obstructions (e.g., vegetation or structures). Coastal wave heights decrease as **Stillwater Flood Depth,  $d_s$**  decreases and as the number, size, and density of obstructions increase. Coastal wave height information may be available from government agencies, coastal experts, universities, or the **Jurisdiction**. Absent other information, coastal wave heights used for design can be approximated using information contained in the **Flood Insurance Study (FIS)** and the **Flood Insurance Rate Map (FIRM)**.

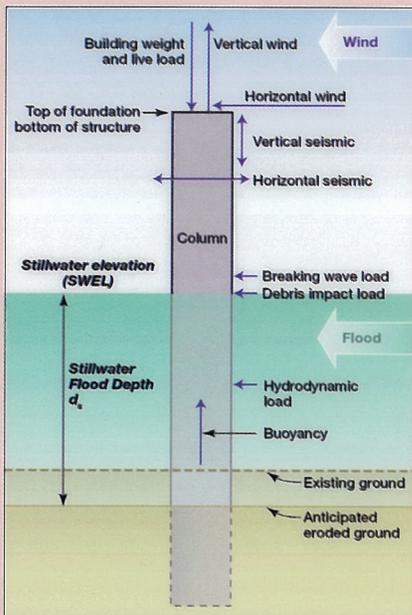


Coastal Wave Height

## STEP 10 CALCULATE DESIGN FLOOD LOADS

**Flood Loads** depend on the flood conditions present at the structure site and on the size and shape of the affected structural elements.

**NOTE for Steps 10.1 through 10.4:** Many structures will not be exposed to all the **Flood Loads** described in Steps 10.1 through 10.4. Designers need to determine which **Flood Loads** will be present during a design-level event, and then complete Steps 10.1 through 10.4, as applicable.



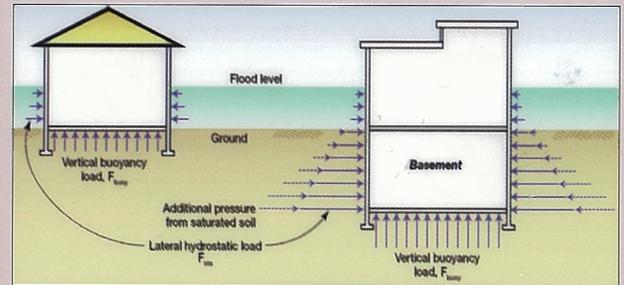
Flood and Other Loads Acting on a Foundation Column

### STEP 10.1 CALCULATE HYDROSTATIC LOADS, $F_{sta}$ AND $F_{buoy}$

Hydrostatic loads are caused by standing or slowly moving floodwaters.

- Lateral hydrostatic loads,  $F_{sta}$ , need to be calculated for any enclosed space below the **Design Flood Elevation (DFE)**, unless it is equipped with **Flood Openings** as specified by IRC Section R322.2.2 or IBC Section 1203.3.2 (and ASCE 24 Sections 2.6.1, 2.6.2, 4.6.2). Lateral hydrostatic loads need not be considered for below-DFE enclosure walls that have properly installed **Flood Openings** that allow water to flow in and out, preventing unbalanced lateral hydrostatic loads. See *NFIP Technical Bulletin 1, Openings in Foundation Walls and Walls of Enclosures*.
- Vertical (buoyant) hydrostatic loads,  $F_{buoy}$ , need to be calculated for any component of the structure that extends below the **Stillwater Elevation (SWEL)** (except for **Breakaway Walls** – see 4<sup>th</sup> bullet). The submerged weights of structural components are less than their weights in air, so buoyancy effects need to be considered when resistance to uplift, overturning and sliding is determined (ASCE 7 Section 3.2.2).

- Lateral and vertical (buoyant) forces in **Dry-Floodproofed** areas and **Basements** are very large and need to be considered carefully in design. Caution: **Basements** are not allowed by the **National Flood Insurance Program (NFIP)**, except for **A Zone** non-residential spaces that are dry floodproofed in accordance with ASCE 24 Section 6.
- In **V Zones**, lateral and vertical hydrostatic loads need not be considered for below-DFE **Breakaway Walls** as specified in IRC Section R322.3.4 or ASCE 24 Section 4.6.1.

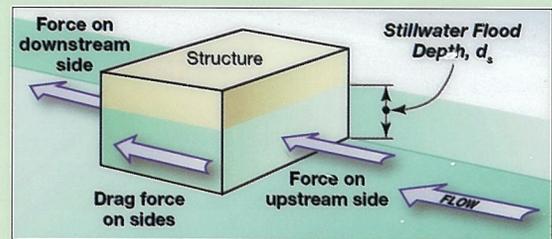


Hydrostatic Loads

### STEP 10.2 CALCULATE HYDRODYNAMIC LOAD, $F_{dyn}$

Hydrodynamic loads are caused by floodwaters flowing past a fixed object, such as a structure or foundation element. The net hydrodynamic load,  $F_{dyn}$ , needs to be calculated in accordance with the following:

- Hydrodynamic loads increase with the size of the object around which floodwaters pass and with the square of the flood velocity. Hydrodynamic loads also vary with the shape of the object and associated drag coefficients.
- Calculation methods are contained in numerous references, including ASCE 7 Section 5.4.3, FEMA-259 *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Buildings*, and FEMA-55 *Coastal Construction Manual*.



Hydrodynamic Loads

### STEP 10.3 CALCULATE FLOODBORNE DEBRIS IMPACT LOAD, $F_i$

Floorborne debris impact loads,  $F_i$ , occur as large objects propelled by moving floodwaters strike a structure. Floorborne debris impact loads vary with the type, size, weight, and velocity of the debris and by the blockage effects of upstream vegetation and structures. Guidance on calculating floorborne debris impact loads is contained in the Commentary to Chapter 5 of ASCE 7.

### STEP 10.4 CALCULATE COASTAL WAVE LOAD, $F_{brk}$

Coastal wave loads occur as wind- or seismically-generated waves propagate across the water surface and strike a structure. The coastal wave load used for design purposes,  $F_{brk}$ , needs to be calculated in accordance with the following:

- Coastal wave loads need to be calculated in **V Zones** and **Coastal A Zones (CAZ)** (IBC Section 1612.4; ASCE 7 Section 5.4.4), and at coastal sites mapped as **A Zones** (outside the **V Zone** and **CAZ**). Designers of structures outside the **V Zone** and the **CAZ** need to check the **Flood Insurance Study (FIS)**, **Flood Hazard Map**, and other available information to determine whether coastal waves will be present during design flood conditions.

- Coastal wave loads are typically calculated for columns and walls. The methods in ASCE 7 Section 5.4.4 assume breaking waves strike those structural elements.

**SECRETS OF THE CODEMASTER:** ASCE 7 Section 5.4.4 permits three methods for calculating wave loads: 1) analytical methods contained in that section of ASCE 7 (which are simple and conservative), 2) more advanced numerical procedures, and 3) laboratory (physical model) tests.

## STEP 11

### DETERMINE FLOOD LOAD $F_a$ FOR LOAD COMBINATIONS

IBC Section 1605.3.1.2 and 2009 IBC Section 1605.2.2 (2012 IBC Section 1605.2.1) specify load combinations for structural design when there are flood loads. The load combinations for structures in **Flood Hazard Areas (FHA)** require calculation of the **Flood Load**,  $F_a$ .  $F_a$  is calculated using combinations of individual **Flood Loads** determined in Steps 10.1 through 10.4.

**SECRETS OF THE CODEMASTER:** ASCE 7 does not specify how individual **Flood Loads** should be combined into  $F_a$ . The following table, adapted from FEMA's *Coastal Construction Manual*, provides guidance. Designers also need to reduce dead loads to account for the effects of vertical buoyant forces,  $F_{buoy}$ , when load combinations are calculated.

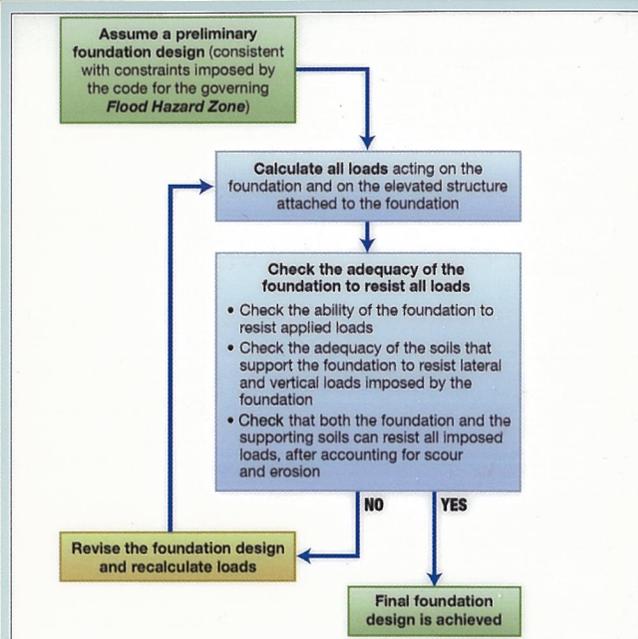
Flood Zone	Foundation Type	$F_a =$
V Zone, or Coastal A Zone (CAZ), or A Zone subject to coastal waves	Pile or Column	Greater of $F_{brk}$ or $F_{dyn}$ (on front row of piles/columns only) + $F_{dyn}$ (on all other piles/columns) + $F_i$ (on one pile/column)
V Zone, or Coastal A Zone (CAZ)	Solid Foundation Wall	Solid foundation walls are not permitted in V Zones or Coastal A Zones (CAZ) by the IBC or ASCE 24 (Section 4). Solid Foundation walls are not permitted in V Zones by the IRC. For IRC structures in CAZ, $F_a = (F_{brk} + F_i)$ or $(F_{dyn} + F_i)$ , whichever is greater
A Zone (riverine or lake flood source)	Pile or Column	$F_{dyn} + F_i$ (on one pile/column)
A Zone (riverine or lake flood source)	Solid Foundation Wall (with Flood Openings)	$F_{dyn} + F_i$
A Zone (riverine or lake flood source)	Solid Foundation Wall (Dry Floodproofed, no Flood Openings)	$F_{sta} + F_{dyn} + F_i$

## STEP 12

### DESIGN THE FOUNDATION

The basic design process for the structure's foundation is as follows:

- The owner and designer need to first agree on the basic structural characteristics necessary to design the elevated portion of the structure (e.g., size, use/occupancy, number and height of stories, type of construction).
- Lateral and vertical loads (from all hazards and conditions affecting the elevated structure, e.g., wind, snow, seismic, dead, live, etc.) need to be determined, along with the reactions the loads impose on the top of the foundation.
- Loads acting directly on foundation elements – including **Flood Loads** – need to be determined, and a preliminary foundation design needs to be developed.
- This will be an iterative process and it will be repeated until an efficient design – capable of resisting all loads on the foundation and elevated structure and meeting owner requirements – is achieved.
- Prescriptive foundation designs have been developed for some **Flood Hazard Areas (FHA)** and may assist designers with the foundation design process (see FEMA P-550, *Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations*).

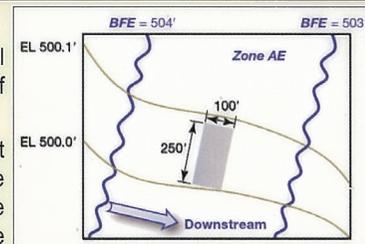


Flood Resistant Foundation Design Process

### EXAMPLE

#### Given:

- Proposed 1-story commercial structure, with a footprint of 100 ft by 250 ft.
- The structure footprint and existing grades are superimposed on the **Flood Hazard Map** (see figure).
- All ground elevations and **Base Flood Elevations (BFEs)** are relative to the National Geodetic Vertical Datum (NGVD).
- The site is subject to riverine flooding and is located outside the **Floodway**.
- The **Jurisdiction** requires 2 ft of **Freeboard** above the **BFE**.



#### Find: Design Flood Conditions and Loads

- Determine if the structure is in the Flood Hazard Area:** The **Flood Hazard Map** indicates that the building is in the **Flood Hazard Area**.
- Determine Which Code Governs:** IRC or IBC: In this case, the IBC governs because it is a commercial structure.
- Determine Flood Hazard Zone(s):** The **Flood Hazard Map** indicates that the entire building is located within **Zone AE**.
- Determine Design Flood Elevation (DFE):** Determine highest **BFE** at footprint – using interpolation, the **BFE** is determined to be 503.5 ft NGVD. Check IBC and contact **Jurisdiction** for **Freeboard** requirements. IBC (via ASCE 24 Table 2-1) requires 1 ft of **Freeboard** for Category II structures. The **Jurisdiction** requires 2 ft. Therefore,  $DFE = 503.5 \text{ ft} + 2 \text{ ft} = 505.5 \text{ ft}$ .
- Determine Minimum Elevation of Lowest Floor:** Per IBC Section 1612.4 and ASCE 24 Section 2.3, the **Lowest Floor** (top of floor) is set at the  $DFE = 505.5 \text{ ft NGVD}$ .
- Determine Permissible Foundation Types:** IBC (via ASCE 24 Section 1.5.3) permits any code-compliant foundation in **A Zones**. For this example, a preliminary foundation design is assumed to be constructed of 12 in thick masonry foundation walls (700 ft of wall forming a crawl space) and 16 in square interior masonry piers (216 piers).
- Determine and Apply IBC Flood Provisions:** See Table in Step 8.

Step 9.1: **Determine Stillwater Elevation (SWEL):** Because the *Jurisdiction* did not adopt a more severe flood than the **Design Flood**, the **SWEL** is equal to the **BFE** at the location of the structure, which is 503.5 ft NGVD.

Step 9.2: **Adjust Ground Elevation for Erosion and Scour:** A geotechnical study and local experience suggest 6 in of erosion will occur during the **Design Flood**. Therefore, 0.5 ft needs to be subtracted from existing ground elevations to account for erosion, and the lowest adjusted ground elevation at the structure location is calculated as 500.0 ft NGVD - 0.5 ft = 499.5 ft NGVD.

Step 9.3: **Calculate Stillwater Flood Depth,  $d_s$ :** The maximum **Stillwater Flood Depth** at the structure is calculated by subtracting the lowest adjusted ground elevation from the **SWEL**, as follows: 503.5 ft NGVD - 499.5 ft NGVD = 4.0 ft.

Step 9.4: **Estimate Flood Velocity,  $V$ :** Data from hydraulic studies supplied by the *Jurisdiction* indicate a flood velocity,  $V$ , of 2.5 ft/sec is expected during the **Design Flood**.

Step 9.5: **Characterize Floodborne Debris:** Commentary for Chapter 5 of ASCE 7 indicates woody debris in riverine areas will average 1,000 to 2,000 lb. Local experience confirms this. Ice is not expected at this site. Use  $W = 1,500$  lb.

Step 9.6: **Estimate Coastal Wave Height:** For the purpose of this example, no waves are expected during the **Design Flood**.

Step 10.1: **Calculate Hydrostatic Loads,  $F_{sta}$  and  $F_{buoy}$ :** Install **Flood Openings** in foundation walls per ASCE 24 Section 2.6.2.1 or 2.6.2.2 to eliminate lateral hydrostatic loads,  $F_{sta}$ , on foundation walls. Using ASCE 24 Section 2.6.2.1, the total net area of **Flood Openings** must be at least 25,000 sq in (1 sq in per sq ft of enclosed area; 100 ft x 250 ft enclosed area). If ASCE 24 Section 2.6.2.2 is used and detailed engineering calculations are performed, the 25,000 sq in net opening area can be reduced. After **Flood Openings** are included in the foundation wall design,  $F_{sta} = 0$  lb.

Next, compute the vertical buoyant force,  $F_{buoy}$ , on foundation walls and interior foundation piers.  $F_{buoy}$  can be calculated using  $F_{buoy} = \gamma \text{Vol}$ , where  $\gamma$  is the specific weight of fresh water (62.4 lb/ft<sup>3</sup>), and Vol is the volume of water displaced by the submerged portion of the foundation. (Note: For this example,  $F_{buoy}$  is calculated for those portions of the foundation above grade and below the **SWEL** and is equal to  $d_s = 4$  ft. For actual designs, buoyant forces also need to be calculated on below-grade portions of foundations).

For each individual pier,  $F_{buoy} = 62.4 \text{ lb/ft}^3 \times (\text{pier width squared}) \times (\text{submerged pier height})$ , or  $(62.4 \text{ lb/ft}^3)(16/12 \text{ ft})(16/12 \text{ ft})(4.0 \text{ ft})$ , or  $F_{buoy} = 443.7 \text{ lb/pier}$ . With 216 piers, the total buoyant load on the piers is  $F_{buoy} = (F_{buoy}/\text{pier}) (\# \text{ of piers}) = 95,839 \text{ lb}$ .

For each linear foot of foundation wall,  $F_{buoy} = 62.4 \text{ lb/ft}^3 \times (\text{wall thickness}) \times (\text{submerged wall height})$ , or  $(62.4 \text{ lb/ft}^3)(1.0 \text{ ft})(4.0 \text{ ft})$ , or  $F_{buoy} = 249.6 \text{ lb/LF}$ . With 700 ft of foundation wall,  $F_{buoy} (\text{walls}) = 174,720 \text{ lb}$ .

The total vertical buoyant force,  $F_{buoy} = F_{buoy} (\text{piers}) + F_{buoy} (\text{walls}) = 95,839 \text{ lb} + 174,720 \text{ lb}$ , or  $F_{buoy} = 270,559 \text{ lb}$ .

Step 10.2: **Calculate Hydrodynamic Load,  $F_{dyn}$ :** Using basic fluid mechanics, compute the lateral hydrodynamic load  $F_{dyn} = 0.5 C_D \rho A V^2$ , where  $C_D$  = drag coefficient,  $\rho$  = mass density of water (1.94 slugs/ft<sup>3</sup>),  $A$  = the foundation wall area subject to flow (sq ft), and  $V$  = flood velocity (ft/sec).  $A$  is found by multiplying the building length by the **Stillwater Flood Depth,  $d_s$**  (250 ft x 4.0 ft = 1,000 sq ft). The drag coefficient  $C_D = 1.75$  is obtained from a hydraulics textbook, and the flood velocity  $V = 2.5$  ft/sec was determined in Step 9.4. The resulting calculation shows  $F_{dyn} = (0.5)(1.75)(1.94 \text{ slugs/ft}^3)(1,000 \text{ ft}^2)(2.5 \text{ ft/sec})^2$ , or  $F_{dyn} = 10,609 \text{ lb}$ . Assume no hydrodynamic loads act on interior foundation piers.

Step 10.3: **Calculate Floodborne Debris Impact Load,  $F_i$ :** Use Equation C5-3 and the procedure outlined in the Commentary of ASCE 7 Chapter 5, with a 1,500 lb object (Step 9.5) moving at  $V = 2.5$  ft/sec (Step 9.4), a **Stillwater Flood Depth,  $d_s = 4.0$  ft** (Step 9.3, which yields a depth

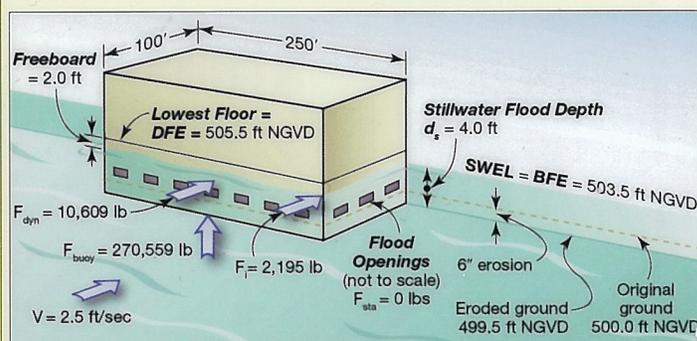
coefficient  $C_D = 0.75$  from ASCE 7 Table C5-2), an importance coefficient  $C_I = 1.0$  (ASCE 7 Table C5-1), an orientation coefficient  $C_O = 0.8$  (ASCE 7 Section C5.4.5), and assuming no debris blockage around the structure ( $C_B = 1.0$  from ASCE 7 Table C5-3). Given an impact duration,  $\Delta t = 0.03$  sec (ASCE 7 Section C5.4.5), and a structure natural period (computed outside this example) = 0.2 sec, the structure response ratio,  $R_{max} = 0.6$  (by interpolation using ASCE 7 Table C5-4). Thus,  $F_i = [\pi WVC_I C_O C_D C_B R_{max}] / [(2g\Delta t)]_1 = [(3.1416)(1,500 \text{ lb})(2.5 \text{ ft/sec})(1.0)(0.8)(0.75)(1.0)(0.6)] / [(2)(32.2 \text{ ft/sec}^2)(0.03 \text{ sec})]$ , or  $F_i = 2,195 \text{ lb}$ .

Step 10.4: **Calculate Coastal Wave Load,  $F_{brk}$ :** There will be no wave load because the structure is only subject to riverine flooding (see Step 9.6).

Step 11: **Determine  $F_a$  for Load Combinations:** Using the Table in Step 11, in an **A Zone** (riverine flood source),  $F_a = F_{dyn} + F_i = 10,609 \text{ lb} + 2,195 \text{ lb}$ , or  $F_a = 12,804 \text{ lb}$ . Designers also need to reduce the structure dead load by the total vertical buoyant force acting on the structure (Step 10.1) when load combinations are calculated.

Step 12: **Design the Foundation:** Use the procedure outlined in the flow chart in Step 12 to finalize the foundation design.

The building, site, and flood conditions and loads described by the steps above are illustrated in the following figure (other loads that may occur are not shown for clarity).



Flood Loads and Conditions at Example Building

## CLOSING COMMENTS

This CodeMaster has presented a step-by-step process for achieving flood resistant design. Some of the topics covered have been treated briefly, and a more detailed consideration of these issues will be required for actual design and construction.

This work is published with the understanding that SKGA, SCI, ICC, FEMA and the authors are supplying information but are not intending to render engineering or other professional services. If such services are required, the assistance of qualified professionals should be sought. SKGA, SCI, ICC, FEMA and the authors DISCLAIM any and all RESPONSIBILITY and LIABILITY for the accuracy of and the application of the information contained in this publication to the full extent permitted by the law.

## RESOURCES

- FEMA. 2001. *NFIP Technical Bulletin 11, Crawlspace Construction for Buildings Located in Special Flood Hazard Areas.*
- FEMA. 2008. *NFIP Technical Bulletin 1, Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas.*
- FEMA. 2008. *NFIP Technical Bulletin 2, Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas.*
- FEMA. 2008. *NFIP Technical Bulletin 5, Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas.*
- FEMA. 2009. *FEMA-441, National Flood Insurance Program, Insurance Agent's Lowest Floor Guide.*
- FEMA. 2009. *FEMA P-550, Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations.*
- FEMA. 2011. *FEMA-55, Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas.*
- FEMA. 2011. *FEMA-259, Engineering Principles and Practices for Retrofitting Flood-Prone Residential Buildings.*



## Boat Sewage Compliance and Enforcement Meeting

July 22<sup>nd</sup>, 2014  
1:30 – 4:00 P.M.

Jimmie Walker Community Center  
800 Harris Avenue  
Kemah, TX 77565

### Agenda

- 1:30      **Check-In, Refreshments, Booths, Networking**
- 2:00      **Introductions**
- 2:10      **Oyster Waters and Jarbo Bayou TMDL Implementation Plans**  
*Charlene Bohanon, Galveston Bay Foundation*  
*Steven Johnston, Houston-Galveston Area Council*
- 2:30      **Boater Waste Project Updates**  
*Charlene Bohanon, Galveston Bay Foundation*
- 3:00      **Partner Presentations**  
*Greg Allison, Gulf Coast Yacht Brokers Association*  
*Frank Muraglia, U.S. Coast Guard Auxiliary*  
*Chief Keith Naker, U.S. Coast Guard – Texas City Station*
- 3:30      **Action Surveys**
- 3:50      **Wrap-up and Questions**

**Questions?** Please contact Charlene Bohanon at [cbohanon@galvbay.org](mailto:cbohanon@galvbay.org)

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To learn more contact your local office of emergency management.

### TERRORISM RESPONSE

Listen to emergency information sources – radio/TV. • Prepare to shelter. • Do not accept packages from strangers. • Report suspicious activity to authorities. • Check utilities/shut off damaged utilities. • Secure pets.



## EMERGENCY ACTION WHEEL FOR SENIOR CITIZENS

### Emergency Contacts

Fire Department

Police Department

Poison Control Center

Nearest Emergency Contact(s)

Out-of-town Contact(s)

Doctor(s)

Dialysis or Treatment Center

Home-Based Care Agency

Transportation Services

Emergency Alert TV/Radio Stations

### Emergency Information

Specific medical conditions/allergies

Medications - Name

Type of Medication & Dosage

Pharmacist (Name & #)

Medical or Assistive Equipment

Who

Type of Equipment & Serial #

Health Insurance (Name & #)

Other Insurance Documentation

SIDE 2

EARTHQUAKE RESPONSE

FLOOD RESPONSE

HURRICANE RESPONSE

DOWNBURSTS RESPONSE

HAZARDOUS MATERIAL INCIDENT RESPONSE

FIRE RESPONSE

EXTREME WEATHER (HEAT AND COLD) RESPONSE

## SHELTER

### BE PREPARED

- Plan 1: Shelter in home – know how to protect yourself/home.
- Plan 2: Shelter with family and friends.
- Plan 3: Public shelter accommodating seniors/disabled.
- Bring your equipment (wheel chair, oxygen), service animals. No pets.



### Make Your Emergency Plan

It's your responsibility to make an emergency plan for you and people you care for. Customize the plan so it fits your abilities and limitations.

#### Your Emergency Plan Includes:

- Emergency Kit
- Extra walking aids nearby
- Preparation physically/mentally for 3 days
- Safe room in house for sheltering in home
- Emergency information list
- How to meet your health/medical/disability needs
  - Sheltering of pets
  - Alternate ways to contact friends/family if telephones and power are disrupted
    - Set NOAA weather radio to alert via sound/visual strobe/vibration alarm
  - **Review, drill, update and test** emergency plans every six months

#### Emergency Supply Kit:

Keep minimum 3 days' supplies. Replace water, food, medicines and batteries as needed.

- Water: at least 1 gal per day per person
- Nonperishable food to meet your dietary needs
- Extra supply of prescriptions/over-the-counter medicines
- Medical equipment and assistive devices
- Standard first aid kit
- Battery-operated radio, flashlights, extra batteries
- Extra car keys
- Cash, credit card, checkbook, ATM card, medical insurance/Medicare card
- Toiletries
- Supplies for service animal
- White distress flag or cloth, whistle, flashlights and/or glow sticks
- Change of clothes

#### Resources

- U.S. Department of Homeland Security • [www.ready.gov](http://www.ready.gov) • (800)BE READY (voice)
- (800)464-6161 (TTY) • American Red Cross • [www.prepare.org](http://www.prepare.org) • [www.redcross.org](http://www.redcross.org)
- call your local chapter • Local emergency management and fire departments for specific planning in your community.
- NOAA weather radio: contact local National Weather Service office or local electronic retail stores.  
<http://www.nws.noaa.gov/nwr/nwrrcvr.htm>

SIDE 1

EVACUATION  
BE PREPARED

PEOPLE TO RELY ON  
BE PREPARED

EMERGENCY INFORMATION  
BE PREPARED

EMERGENCY SUPPLY KIT  
BE PREPARED

EMERGENCY INFORMATION LIST  
BE PREPARED