TDEC Small MS4 Annual Report

Year Five (5)

for

EAST TENNESSEE STATE UNIVERSITY

from

July 1st, 2014 through June 30th, 2015

Report Due September 30th, 2015

Permit Tracking No. TNS075370

City of Johnson City, TN

Municipal and Safety Building
601 East Main Street
P.O. Box 2150
Johnson City, TN 37605-2150
Phone: 423-975-2854

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
(615) 532-0625

Municipal Separate Storm Sewer System (MS4) Annual Report

1. MS4 INFORMATION

City of Johnson City — TNS075370

Name of MS4 — MS4 Permit Number

Andrew Best — abest@johnsoncitytn.org

Name of Contact Person — Email Address

423-975-2854

Telephone (including area code)

P.O. Box 2150

Mailing Address

Johnson City — TN — 37605-2150

City — State — ZIP code

What is the current population of your MS4? 65,123

What is the reporting period for this annual report? From 7-1-14 to 6-30-15

2. WATER QUALITY PRIORITIES (SECTION 3.1)

A. Does your MS4 discharge into waters listed as impaired on TN's most current 303(d) list and/or according to the on-line GIS mapping tool? If yes, please attach a list all impaired waters within your jurisdictional area. ■ Yes ☐ No

B. Does your MS4's jurisdictional area contain any waterbodies where a TMDL has been approved for parameters other than pathogens, siltation and habitat alterations? If yes, please attach a list. ■ Yes ☐ No

C. What specific sources of these pollutants of concern are you targeting? Siltation

D. Do you have discharges to any Exceptional TN Waters (ETWs) or Outstanding National Resource Waters (ONRWs)? If yes, please attach a list. ☐ Yes ■ No

E. Are you implementing additional specific provisions to ensure the continued integrity of ETWs or ONRWS located within your jurisdiction? ☐ Yes ■ No

3. PROTECTION OF STATE OR FEDERALLY LISTED SPECIES (SECTION 3.2.1 General Permit for Phase II MS4s)

A. Are there any state or federally listed species within the MS4's jurisdication? ☐ Yes ■ No

B. Are any of the MS4 discharges or discharge-related activities likely to jeopardize any state or federally listed species? ☐ Yes ■ No

C. Please attach any authorizations or determinations by U.S. Fish & Wildlife Service on the effect of the MS4 discharges on state or federally listed species.

4. PUBLIC EDUCATION AND PUBLIC PARTICIPATION (SECTION 4.2.1 AND 4.2.2)

A. Is your public education program targeting specific pollutants and sources of those pollutants? ■ Yes ☐ No

B Is your public education program targeting specific pollutants and sources of those pollutants, such as Hot Spots?. ■ Yes ☐ No

C. If yes, what are the specific causes, sources and/or pollutants addressed by your public education program? Sedimentation

D. Note specific successful outcome(s) (NOT tasks, events, publications) fully or partially attributable to your public education program during this reporting period. Water Quality Video aired over 25,000 times on local access TV, aired 78 Radio Ads, distributed 75 pamphlets.

E. Do you have an advisory committee or other body comprised of the public and other stakeholders that provides regular input on your stormwater program? ■ Yes ☐ No

F. How do you facilitate, advertise, and publicize public involvement and participation opportunities? Regular Meetings

G. Do you have a webpage dedicated to your stormwater program? If so, what is the link/URL: www.johnsoncitytn.com/publicworks/stormwater/ ■ Yes ☐ No

H. Are you tracking and maintaining records of public education, outreach, involvement and participation activities? Please attach a summary of these activities. ■ Yes ☐ No

5. ILLICIT DISCHARGE DETECTION AND ELIMINATION (SECTION 4.2.3)

A. Have you completed a map of all outfalls and receiving waters of your storm sewer system? ■ Yes ☐ No

B. Have you completed a map of all storm drain pipes of storm sewer system? ☐ Yes ■ No

C. How many outfalls have you identified in your system? 800: 521 Pipes, 279 ditches

D. Have any of these outfalls been screened for dry weather discharges? ■ Yes ☐ No

E. What is your frequency for screening outfalls for illicit discharges? Every outfall once every 5 years

F. Do you have an ordinance that effectively prohibits illicit discharges? ■ Yes ☐ No

G. During this reporting period, how many illicit discharges/illegal connections have you discovered (or been reported to you?) 5

H. Of those illicit discharges/illegal connections that have been discovered or reported, how many have been eliminated? 5

6. CONSTRUCTION SITE STORMWATER RUNOFF (SECTION 4.2.4)

A. Do you have an ordinance or adopted policies stipulating:

Erosion and sediment control requirements?	■ Yes	☐ No
Other construction waste control requirements?	■ Yes	☐ No
Requirement to submit construction plans for review?	■ Yes	☐ No
MS4 enforcement authority?	■ Yes	☐ No

B. How many active construction sites disturbing at least one acre were there in your jurisdiction this reporting period? 67

C. How many of these active sties did you inspect this reporting period? all

D. On average, how many times each, or with what frequency, were these sites inspected (e.g., weekly, monthly, etc.)? Monthly and after rain events

E. Do you prioritize certain construction sites for more frequent inspections? ■ Yes ☐ No

If yes, based on what criteria? Size of site and possibility of construction discharge.

7. PERMANENT STORMWATER CONTROLS (SECTION 4.2.5)

A. Do you have an ordinance or other mechanism to require:

Site plan reviews of all new and redevelopment projects?	■ Yes	☐ No
Maintenance of stormwater management controls?	■ Yes	☐ No
Retrofitting of existing BMPs with green infrastructure BMPs?	☐ Yes	■ No

B. What is the threshold for new/redevelopment stormwater plan review? (e.g., all projects, projects disturbing greater than one acre, etc). projects greater than 1 acre

C. Have you implemented and enforced performance standards for permanent stormwater controls? ☐ Yes ■ No

D. Do these performance standards go beyond the requirements found in Section 4.2.5.2 and require that predevelopment hydrology be met for:

Flow volumes	☐ Yes	■ No
Peak discharge rates	■ Yes	☐ No
Discharge frequency	■ Yes	☐ No
Flow duration	☐ Yes	■ No

E. Please provide the URL/reference where all permanent stormwater management standards can be found . www.johnsoncitytn.org/documents/?doc=stormwater

F. How many development and redevelopment project plans were reviewed for this reporting period? 18 greater than 1 acre

G. How many development and redevelopment project plans were approved? 18

H. How many permanent stormwater management practices/facilities were inspected? 3

I. How many were found to have inadequate maintenance? 0

J. Of those, how many were notified and remedied within 30 days? (If window is different than 30 days, please specify.) 0

K. How many enforcement actions were taken that address inadequate maintenance? none

L. Do you use an electronic tool (e.g., GIS, database, spreadsheet) to track post-construction BMPs, inspections and maintenance? ■ Yes ☐ No

M. Do all municipal departments and/or staff (as relevant) have access to this tracking system? ■ Yes ☐ No

N. Has the MS4 developed a program to allow for incentive standards for this redeveloped sites? ☐ Yes ■ No

O. How many maintenance agreements has the MS4 approved during the reporting period? 10

8. Codes and Ordinances Review and Update (Section 4.2.5.3)

A. Is a completed copy of the EPA Water Quality Scorecard submitted with this report? ☐ Yes ■ No

B. Include status of implementation of code, ordinance and/or policy revisions associated with permanent stormwater management.

9. Stormwater Management for Municipal Operations (Section 4.2.6)

A. Have stormwater pollution prevention plans (or an equivalent plan) been developed for:

All parks, ball fields and other recreational facilities	■ Yes	☐ No
All municipal turf grass/landscape management activities	☐ Yes	■ No
All municipal vehicle fueling, operation and maintenance activities	■ Yes	☐ No
All municipal maintenance yards	■ Yes	☐ No
All municipal waste handling and disposal areas	■ Yes	☐ No

B. Are stormwater inspections conducted at these facilities? ■ Yes ☐ No

If yes, at what frequency are inspections conducted? 1 / year

C. Have standard operating procedures or BMP's been developed for all MS4 field activities? (e.g, road repairs, catch basin cleaning, landscape management, etc). ☐ Yes ■ No

D. Do you have a prioritization system for storm sewer system and permanent BMP inspections? ■ Yes ☐ No

E. On average, how frequently are catch basins and other inline treatment systems inspected? Catch basins are inspected and cleaned on weekly, monthly and quarterly basis

F. On average, how frequently are catch basins and other inline treatment system cleaned out/maintained? Catch basins are inspected and cleaned on weekly, monthly and quarterly basis

G. Do municipal emplopyees in all revelant positions and departments receive comprehensive training on stormwater management? ■ Yes ☐ No

H. If yes, do you also provide regular updates and refreshers? ■ Yes ☐ No

If so, how frequently and/or under what circumstances? All new employees are trained and all relevant employees are trained yearly

10 STORMWATER MANAGEMENT PROGRAM UPDATE (SECTION 4.4)

A. Describe any changes to the MS4 program during the reporting period including but not limited to:

Changes adding (but not subtracting or replacing) components, controls or other requirements (Section 4.4.2.a). N/A

Changes to replace an ineffective or unfeasible BMP (Section4.4.2b). N/A

Information (eg. additional acreage, outfalls, BMP's) on program area expansion based on annexation or newly urbanized areas. There were no additional outfalls as a result of annexation

Changes to the program as required by the division (Section 4.4.3). N/A

11. EVALUATING/MEASURING PROGRESS

A. What indicators do you use to evaluate the overall effectiveness of your Stormwater Management Program, how long have you been tracking them, and at what frequency? Note that these are not measurable goals for individual BMPs or tasks, but large-scale or long-term metrics for the overall program, such as in-stream macroinvertebrate community indices, measures of effective impervious cover in the watershed, indicators of in-stream hydrologic stability, etc?

Indicator	Began Tracking (year)	Frequency	Number of Locations
Example: E. coli	2003	Weekly April–September	20
Tree Cover	2009	10 years	City Wide
Stream Inventory	2007	5 years	Listed Streams

B. Provide a summary of data (e.g., water quality information, performance data, modeling) collected in order to evaluate the performance of permanent stormwater controls installed throughout the system. This evaluation may include a comparison of current and past permanent stormwater

The City performed Habitat and E. Coli sampling for all listed streams in the City. This data will be used to evaluate the permanent stormwater controls.

12. ENFORCEMENT

A. Identify which of the following types of enforcement actions you used during the reporting period, indicate the number of actions, the minimum measure (e.g., construction, illicit discharge, permanent stormwater control) or note those for which you do not have authority:

Action	Construction	Permanent Stormwater Controls	Illicit Discharge	Authority?
Notice of violation	# 3	#	# 4	■ Yes ☐ No
Administrative fines	# N/A	# N/A	# 0	■ Yes ☐ No
Stop Work Orders	# 1	# N/A	# 0	■ Yes ☐ No
Civil penalties	# 0	# 0	# 0	■ Yes ☐ No
Criminal actions	# 0	# N/A	# 0	■ Yes ☐ No
Administrative orders	# N/A	# N/A	# N/A	■ Yes ☐ No
Other _____	# N/A	# N/A	# N/A	

B. Do you use an electronic tool (e.g., GIS, data base, spreadsheet) to track the locations, inspection results, and enforcement actions in your jurisdiction? ■ Yes ☐ No

C. What are the 3 most common types of violations documented during this reporting period? Temporary EPSC stabilzation, no permit

13. PROGRAM RESOURCES (OPTIONAL)

A. What was your annual expenditure to implement the requirements of your MS4 NPDES permit and SWMP this past reporting period? Approximately $875,000

B. What is next year's budget for implementing the requirements of your MS4 NPDES permit and SWMP? Approximately $875,000

C. Do you have an independent financing mechanism for your stormwater program? ■ Yes ☐ No

D. If so, what is it/are they (e.g., stormwater fees), and what is the annual revenue derived from this mechanism?

Source: Stormwater Utility Fee Amount $ 2,150,000

Source: Amount $

E. How many full time employees does your municipality devote to the stormwater program (specifically for implementing the stormwater program vs. municipal employees with other primary responsibilities that dovetail with stormwater issues)? 8

F. Do you share program implementation responsibilities with any other entities? ■ Yes ☐ No

Entity	Activity/Task/Responsibility	Your Oversight/Accountability Mechanism
ETSU	Assist with Public Education	We have monthly meetings

G. Please attach a copy of your Organizational Chart

See attachment

14. CERTIFICATION

This report must be signed by a ranking elected official or by a duly authorized representative of that person. See signatory requirements in sub-part 6.7.2 of the permit.

"I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information 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. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury."

Printed Name and Title	Signature	Date

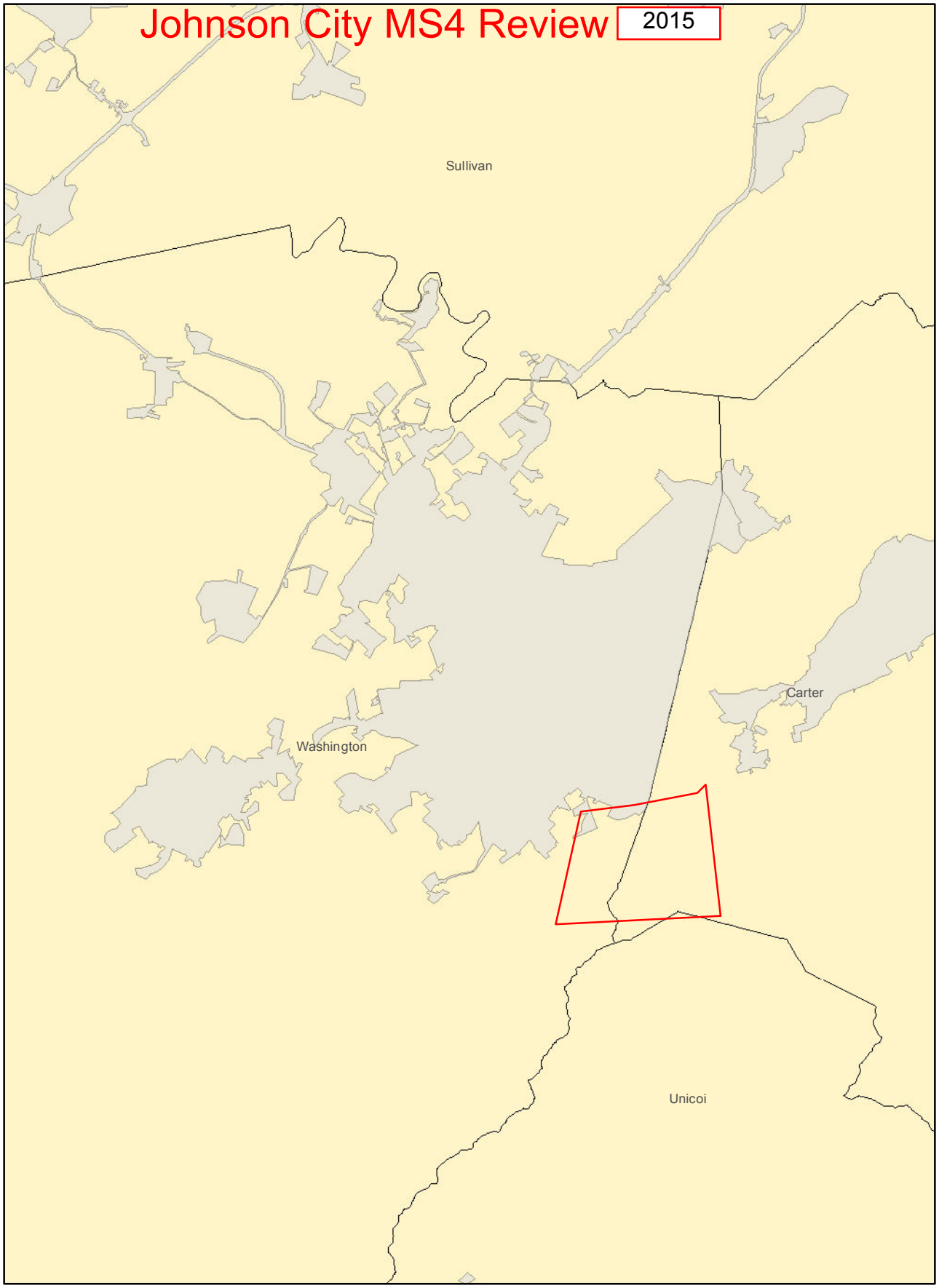
Annual reports must be submitted in accordance with the requirements of subpart 5.4. (Reporting) of the permit. Annual reports must be submitted to the appropriate Environmental Field Office (EFO) by January 31 of each calendar year, as shown in the table below:

EFO	Street Address	City	Zip Code	Telephone
Chattanooga	1301 Riverfront Parkway, Ste 206	Chattanooga	37402	(423) 634-5745
Columbia	1421 Hampshire Pike	Columbia	38401	(931) 380-3371
Cookeville	1221 South Willow Ave.	Cookeville	38506	(931) 432-4015
Jackson	1625 Hollywood Drive	Jackson	38305	(731) 512-1300
Johnson City	2305 Silverdale Road	Johnson City	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	Knoxville	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive	Bartlett	38133	(901) 371-3000
Nashville	711 R S Gass Boulevard	Nashville	37216	(615) 687-7000

Waterbody I.D. #	Cause/TMDL Priority	Approved TMDL		MS4 Assigned to WLA	
Boone Reservoir (TN06010102006-1000)	PCB / Chlordane - Natural Attenuation-Contaminated Sediment	☒ Yes	☐ No	☐ Yes	☒ No
Boones Creek (TN06010103006-1000)	Nitrate+Nitrite L, Loss of biological integrity due to siltation NA, Alteration in stream-side or littoral vegetative cover M, Escherichia coli NA - Discharges from MS4 area Pasture Grazing, Land Development	☒ Yes	☐ No	☒ Yes	☐ No
Brush Creek (TN06010103009-1000)	Nitrate+Nitrite L, Loss of biological integrity due to siltation NA, Other Anthropogenic Habitat Alterations M, Escherichia coli H - Discharges from MS4 area	☒ Yes	☐ No	☒ Yes	☐ No
Carroll Creek (TN06010103006 – 0100)	Nitrate + Nitrite L, Loss of biological integrity due to siltation NA, Alteration in stream-side or littoral vegetative cover M, Escherichia coli H - Discharges from MS4 area Pasture Grazing	☒ Yes	☐ No	☒ Yes	☐ No
Cash Hollow Creek (TN06010103635 – 0100)	Habitat loss due to alteration in stream-side or littoral vegetative cover M, Escherichia coli NA - Discharges from MS4 area	☒ Yes	☐ No	☒ Yes	☐ No
Catbird Creek (TN06010103046 – 0100)	Loss of biological integrity due to siltation M, - Discharges from MS4 area	☐ Yes	☒ No	☐ Yes	☒ No
Cedar Creek (TN06010102702 – 1000)	Loss of biological integrity due to siltation M, Habitat loss due to alteration in stream-side or littoral vegetative cover M, Escherichia coli H - Discharges from MS4 area Pasture Grazing	☐ Yes	☒ No	☐ Yes	☒ No

Cobb Creek (TN06010103635 – 0200)	Alteration in stream-side or littoral vegetative cover M, Loss of biological integrity due to siltation NA, - Discharges from MS4 area	☒ Yes	☐ No	☒ Yes	☐ No
Knob Creek (TN06010103635 – 1000)	Alteration in stream-side or littoral vegetative cover M, Nitrate + Nitrite L, Loss of biological integrity due to siltation NA, Escherichia coli NA - Discharges from MS4 area, Pasture Grazing	☒ Yes	☐ No	☒ Yes	☐ No
Reedy Creek (TN06010103061 – 1000)	Nitrates L, Physical Substrate Habitat Alterations M, Loss of biological integrity due to siltation NA, Escherichia coli H - Discharges from MS4 area, Pasture Grazing, Channelization	☒ Yes	☐ No	☒ Yes	☐ No
Sinking Creek (TN06010103046 – 1000)	Escherichia coli NA - Discharges from MS4 area, Pasture Grazing	☒ Yes	☐ No	☒ Yes	☐ No

Johnson City MS4 Review 2015



U.S. Fish & Wildlife Service

Threatened and Endangered Species

Small Whorled Pogonia

Isotria medeoloides

States where the small whorled pogonia, an orchid, is found.

Photos by USFWS; Sarena Selbo (right) and Susi vonOettingen (left)

The small whorled pogonia is a threatened species. Threatened species are animals and plants that are likely to become endangered in the foreseeable future. Endangered species are animals and plants that are in danger of becoming extinct. Identifying, protecting, and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's endangered species program.

What is the small whorled pogonia?

Appearance - The small whorled pogonia is a member of the orchid family. It usually has a single grayish-green stem that grows about 10 inches tall when in flower and about 14 inches when bearing fruit. The plant is named for the whorl of five or six leaves near the top of the stem and beneath the flower. The leaves are grayish-green, somewhat oblong and 1 to 3.5 inches long. The single or paired greenish-yellow flowers are about 0.5 to 1 inch long and appear in May or June. The fruit, an upright ellipsoid capsule, appears later in the year.

Range - Although widely distributed, the small whorled pogonia is rare. It is found in 17 eastern states and Ontario, Canada. Populations are typically small with less than 20 plants. It has been extirpated from Missouri, New York, Vermont, and Maryland.

Habitat - This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.

What is the small whorled pogonia? (continued)

Reproduction - This pogonia flowers from mid-May to mid-June, with the flowers lasting only a few days to a week. It may not flower every year but when it does flower, one or two flowers are produced per plant. If pollinated, a capsule forms that contains several thousand minute seeds. The pogonia appears to self-pollinate by mechanical processes. The flower lacks both nectar guides and fragrance and insect pollination has not been observed.

Why is the small whorled pogonia threatened?

Habitat Loss and Degradation - The primary threat to the small whorled pogonia is the past and continuing loss of populations when their habitat is developed for urban expansion. Some forestry practices eliminate habitat. Also, habitat may be degraded or individual plants lost because of recreational activities and trampling.

Collection - As with all rare orchids, the small whorled pogonia is vulnerable to collecting for commercial or personal use.

What Is being done to prevent extinction of the small whorled pogonia?

Listing - The small whorled pogonia was added to the U.S. List of Endangered and Threatened Wildlife and Plants in 1982 as an endangered species. In 1994 it was reclassified to threatened.

Recovery Plan - The U.S. Fish and Wildlife Service prepared a recovery plan and revised that plan in 1992. The Recovery Plan describes and prioritizes actions needed to help recover the species.

Research - Many small whorled pogonia populations are being monitored to determine long-term population trends. Habitat management techniques, such as reducing shade through selected tree removal are being investigated.

Habitat Protection - A variety of government and private conservation agencies are working to preserve the small whorled pogonia and its habitat. Voluntary protection agreements have also been made with some private landowners.

What can I do to help prevent extinction of species?

Learn - Learn more about the small whorled pogonia and other endangered and threatened species. Understand how the destruction of habitat leads to loss of endangered and threatened species and our nation's plant and animal diversity.

Volunteer - Volunteer at your local zoo, wildlife refuge or nature center. Work with their staff or other community members to maintain and restore local habitat.

Protect – Protect native plants by cleaning your shoes after hiking to avoid spreading invasive plants seeds and staying on trails if you are hiking in an area with rare plants in the the understory.

Grow Natives - Grow native plants in your lawn and garden but obtain the plants from local nurseries, do not dig up native plants from natural areas. Avoid using invasive, non-native plants in landscaping, such as purple loosestrife, bush honeysuckles and burning bush.

U.S. Fish & Wildlife Service
1 Federal Drive
Fort Snelling, Minnesota 55111
612/713-5350
http://www.fws.gov/midwest/endangered

January 2008

City of Johnson City, TN
East Tennessee State University (Co-Permittee)
Public Information & Education (PIE) Plan

In fulfillment of Minimum Control Measure 1, BMP 1B
TN Small MS4 General NPDES Permit No. TNS075370

December 2011

Prepared by:
AMEC Environment & Infrastructure, Inc.

Table of Contents

1. Introduction 3
2. Diagnosing Potential Stormwater Problems to Identify Targets 4
3. Public Information and Education Activities and Goals 5
4. Public Information and Education Implementation and Metrics 7

1. Introduction

This Public Information and Education (PIE) Plan presents a framework for the City of Johnson City's stormwater public education and outreach program. The PIE plan is required by the State of Tennessee Small Municipal Separate Storm Sewer (MS4) General NPDES (henceforth referred to as "the Small MS4 Permit"). The City, along with its co-permittee, East Tennessee State University, is authorized to use the permit under Permit Tracking No. TNS075370. The requirements of the PIE plan are listed in section 4.2.1 of the small MS4 permit, and must provide for the following actions:

- Detail specific goals and public information events/activities that will occur over the remainder of the permit cycle;
- Incorporate components from outreach campaigns and one-on-one communications;
- Incorporate a mode to evaluate the plan's effectiveness so adjustments can be made (if necessary); and,
- Include targeted educational campaigns addressing the following issues:
    a. general public awareness on the impacts on water quality from general housekeeping maintenance/activities;
    b. home owner associations and other operators of permanent BMPs awareness of the importance of maintenance activities;
    c. local engineering and development community awareness of the stormwater ordinance, regulations, and guidance materials related to long-term water quality impacts;
    d. General public and professional chemical applicators awareness on the proper storage, use, and disposal of pesticides, herbicides and fertilizers use;
    e. General public and professional chemical applicators awareness on the proper storage, use and disposal of oil and other automotive-related fluids;
    f. General public and municipal employees on the awareness of identifying and reporting procedures for illicit connections/discharges, sanitary sewer seepage, spills, etc.
    g. Local engineering, development, and construction community awareness of stormwater ordinances, regulations and guidance materials related to construction phase water quality impacts; and,
    h. Municipal employee/contractor awareness of water quality impacts from daily operations.

The objective of this PIE Plan is to document the City's plan for compliance with these requirements.

The PIE Plan shows that the City's PIE program provides both general information on impacts of stormwater discharges to water bodies and the steps that the public can take to reduce pollutants in stormwater runoff, and more targeted information for specific water resources, audiences, and/or pollutants located within the MS4. In other parts of the Small MS4 Permit, the City, as the MS4 operator, is required to serve as regulator or maintenance provider. The public education requirement engages the City in the more subtle role of educator, and invokes the use of marketing strategies, rather than citations, inspections or physical maintenance activities. The public education requirement is predicated on the idea that awareness of positive and negative behaviors can empower residents within an MS4 to have a positive impact on stormwater quality in their daily activities. Thus, if the MS4 can demonstrate it is promoting awareness, in tandem with its other responsibilities, then it has positioned itself to implement its

stormwater management program to the maximum extent practicable standard, as required by law. In addition to meeting the legal requirement, implementing a stormwater information and education program pays credence to the adage, “an ounce of prevention is worth a pound of cure”. Though results can be difficult to measure, implementing an education program is generally considered more cost-effective than enforcement and/or physical corrective actions..

Most of the public information and education measures documented in this PIE Plan are already in place as part of the City’s on-going Small MS4 Permit compliance program. The PIE Plan incorporates these existing activities and provides for new measures that address targeted geographic areas, people, or pollutants to meet the requirements of the current effective Small MS4 Permit. The plan provides a mode for evaluating effectiveness by establishing a method to record metrics for each educational activity, keeping in mind that the goal is to impress upon, or “touch” people and/or groups. By observing the number of impressions made from year to year, the City can evaluate the extent of its effort and decide whether it is properly allocating its resources, or if changes are needed. The metrics are also useful for the reporting requirement for the small MS4 permit.

2. Diagnosing Potential Stormwater Problems to Identify Targets

One way to identify specific streams and/or pollutants is to use information prepared by the State of Tennessee in the published 303(d) List of impaired streams. It is important to understand that the 303(d) List is prepared for watershed planning purposes, and small MS4s represent one of many watershed stakeholders in the overall process of addressing water quality issues. The City may choose to supplement information gathered from the 303(d) list with information it collected on its own, including, but not limited to visual observations in the field, information obtained from complaints, enforcement activities, or highly effective programs. Through examination of the 303(d) list, the City can determine which local water resources are exhibiting negative impacts, in the form of pollutants, which may be attributed to stormwater runoff from the small MS4. Additionally, the City may tailor its program to include or exclude listed streams in a context-sensitive way to emphasize education efforts for those streams which are substantially impacted by the City’s MS4, i.e. streams with outfalls within the City’s corporate limits. The next step is to consider the individuals or groups whose behaviors may affect the introduction of those pollutants to the MS4, thus identifying the target audience(s). Information and education on how their activities can have an impact on water quality can then be provided by the MS4, with the intent that the target audience will be inclined to change their approach to those activities. Target audiences are selected through a process of determining whose behaviors have the most potential to contribute pollutants to streams. This PIE Plan outlines activities that will be directed toward these targets. This PIE Plan outlines activities that will be directed toward these targets, which are identified in Table 1 below.

Table 1. PIE Plan Targets for the City of Bristol TN

Target Streams	Target Pollutants	Target Audience(s)
- Boone Reservoir - Boones Creek - Brush Creek - Knob Creek - Cash Hollow Creek - Cedar Creek - Cobb Creek - Sinking Creek - Catbird Creek - Carroll Creek - Reedy Creek	- Nitrate + Nitrite - Escherichia Coli - Physical Substrate Habitat Alterations - Habitat Loss Due to Alteration in Stream-Side or Littoral Vegetative Cover - Loss of biological integrity due to siltation -Other Anthropogenic Habitat Alterations	- Land Developers - Engineers - Construction Workers - General Public - Municipal Employees - TBD by MS4 based on information collected in the field.

In addition to targeted information, broad-spectrum information provided to the general public has a place in stormwater information and education programs because it offers opportunities to introduce the concept of stormwater systems and their impacts on receiving waters. People can relate to places where they derive drinking water or recreate. More importantly, they can see the value in protecting those resources, which could result in positive behaviorial changes. An advantage of incorporating general information for a general audience is that materials are typically already developed and available, relieving the City of the burden to develop new ones. Partnerships are often formed for the purpose of delivering stormwater messages to the general public, which also effectively leverages the city's resources. For these reasons, the City has chosen to implement a number of activities that address general information to the general public.

3. Public Information and Education Activities and Goals

A number of public information and education activities are currently being implemented by the City as a result of permit requirements under the 2003 Small MS4 Permit. New educational activities were added as a result of the issuance of the 2010 Small MS4 Permit. The total of these activities comprise the PIE Plan, which is presented in Table 2. The activities and goals are set to meet targets or provide general information with the resources that are available to the City. Each activity is associated with one or more message delivery methods or activity types. The chosen activities correspond with permit requirements.

Table 2. PIE Plan Activities and Goals

#	Description	Goal(s)	Type	Target Groups	Target Pollutants	Target Streams	2010 Permit Citation(s)
1	Website	-To promote awareness on the water quality impacts from general housekeeping and maintenance practices. -To provide information on how to identify and report suspected illicit discharges. -Provides notice to the public for meetings. -To make development and construction community aware of long-term impacts of development and ordinances, policies and guidance materials related to daily activities. ***Includes outreach to professional chemical applicators, (see #8 below).**	Internet	Public	All	All	4.2.1.a, d-h 4.2.2
2	Public Service Announcements (PSAs) via Public Access Cable Channel	To broaden the public understanding of the storm sewer system and how behaviors contribute to water quality.	Radio/TV	Public	All	All	4.2.1.a, d, e, f
3	Public School Outreach	To engage youth by empowering students to make or influence informed choices on behaviors that affect stormwater.	Events, Printed Materials	School Children, Public	All	All	4.2.1
4	Watershed Groups	To provide support to groups which encourage citizens to take ownership of their water resources.	Group Planned Events	Public	Solid Waste/Litter	All	4.2.2
5	Public Notices	To comply with applicable state and local laws governing this activity.	Publications, Internet	Public	N/A	N/A	4.2.2
6	Hazardous Waste Collection Event Advertisements	To promote awareness that the improper disposal of these items has an impact on water quality,	Internet	Public	Household Hazardous Waste	All	4.2.1
7	Municipal Employee Training	To make municipal employees aware of water quality impacts from daily operations, and to education staff on how to identify and report illicit discharges.	Training Event	Municipal Staff	All	All	4.2.1.h
8	Construction Site Operator Information	To provide a vehicle for the development and construction community to access information on the long-term impacts of development	Internet	Developers, Engineers, Construction Workers	Siltation	All	4.2.1.b, c, g
9	Outreach to Professional Chemical Applicators**	To limit the improper storage, use and disposal of pesticides, herbicides fertilizer, and automotive fluids.	Internet, Radio/TV	Landscapers, Automotive	PHFs, Automotive Waste	All	4.2.1.b

***Indicates new activity to be added to existing program. ** Approached through the City's website and PSAs.**

4. Public Information and Education Implementation and Metrics

Under section 4.2.1 of the Small MS4 Permit, the PIE Plan must include a mode for evaluating effectiveness. The City must also track, maintain records and report education and outreach activities in the annual report for the small MS4 permit. The City will accomplish these requirements by providing a specific implementation schedule, with interim goals, and a way to record metrics for activities as they are performed. The annual entry of results verifies that the intended audience is being reached according to the plan. If any results are insufficient, reduced or missing, the City can seek adjustments to properly address inadequacies. Table 3 below outlines the implementation schedule and corresponding metric(s) for each PIE Activity, along with a place to enter results annually.

Table 3. Public Information and Education implementation and Metrics

Activity	Supporting Documentation	Metric	Results	
1. Website	Printed copies of webpages, record of updates, and/or url/	Number of web hits	Permit Year	Not Available
			2	952
			3	2282
			4	1481
			5	1105
2. PSAs	Record showing spot(s) aired on public access channel for the given time period (annual)	Number of Spots Shown per Year and Approximate Number of Potential Viewers in Area	2	144
			3	24
			4	52
			5	25,000 video, 78 radio
3. Public School Outreach	Age/grade appropriate information distributed at schools	Est. Number of Materials Distributed	2	Approx. 200 6th Grade
			3	Approx 30 college students - Education Majors
			4	Approx 62 college students - Education Majors

			5	Approx 35 college students - Education Majors
4. Support/Participate in Watershed Groups	Record of membership, (dues receipts, etc., as appropriate)	Staff Attends Bi-monthly Meetings	2	Staff attends all local meetings
			3	Staff attends all local meetings
			4	Staff attends all local meetings
			5	Staff attends all local meetings
5. Public Notices	Web hit counter, newspaper circulation information, number of posted notices and list of locations where they are placed	Number of Notices/Number of People in Attendance at Hearings and/or Comments Received	2	Bi-monthly-records on file
			3	Bi-monthly-records on file
			4	Bi-monthly-records on file
			5	Bi-monthly-records on file
6. Hazardous Waste Collection Event Advertisements	Web hit counter	Number of Web Hits~~,~~	2	N/A
			3	Could not differentiate between Solid Waste and Hazardous Waste - City will revise
			4	1944
			5	1105
7. Municipal Staff Training	Sign-in sheets with name, date and topic	Number of Staff Trained	2	75
			3	75
			4	79
			5	88
8. Construction Site Operator Information	Link to TNEPSC or equivalent for site operators to receive information on training opportunities	Maintain the Link		Linked

9. Outreach to Professional Chemical Applicators	This item will be addressed on the City's website, see item #1.	See Item #1	2	N/A
			3	N/A
			4	N/A
			5	N.A

Disposal

FURNITURE AND APPLIANCES
Residents may arrange for furniture and appliances to be collected curbside by calling the Solid Waste Division at (423)975-2792. There is no additional charge for this service, but residents must call to have the items placed on the pick-up schedule. This service is available only to City residents. When placing a freezer or refrigerator at the street for collection, it is recommended that the appliance be placed on its lid or door.

TIRES
The City of Johnson City does not collect tires due to state law prohibiting the disposal of tires in sanitary landfills. By law, the county is responsible for the disposal or recycling of all tires from its jurisdiction. Tires are therefore accepted at:
Washington County Tire Center, 190 Lancaster Road, Kingsport, TN 37663
Visit the Washington County Tire Center for more information.

BATTERIES
Household batteries, both rechargeable and non-rechargeable, will be accepted for recycling in curbside bins and in person at the Solid Waste Services Complex at 91 New St., Monday through Friday from 6 a.m. until 5 p.m. Both battery terminals must be taped securely. Batteries must be placed in a plastic sandwich/storage bag with a zipper seal. If depositing batteries via curbside bins, please place baggies on top of other recyclables in the bin.

BUILDING MATERIALS AND CARPET
The City does not pick up building material or carpet. It is the property owner's responsibility to dispose of these items. Call the Washington County Convenience Center at (423)753-1652 or the Iris Glen Environmental Center at (423)926-8375 for rules and/or rates regarding disposal of these items.

COOKING OIL
Used cooking oil will be accepted for recycling via curbside bins. Residents are asked strain food particles from the oil and place it in a clear gallon container with a screw-on lid. Lard, shortening and tallow will not be accepted. While used motor oils (NO kerosene, gasoline, brake or transmission fluids, paint thinner, etc.) are also accepted for recycling, they should not be mixed with cooking oils.

FLUORESCENT BULBS
Fluorescent tubes and compact fluorescent bulbs (CFLs) will be accepted for recycling in person only at the Solid Waste Services Complex at 91 New St., Monday through Friday from 6 a.m. until 5 p.m. Tubes and bulbs should be placed in original packaging or wrapped in newspaper. Only four tubes will be accepted per visit; there is no limit on CFLs. Tubes longer than 4 feet will not be accepted. In the event of breakage: open a window or door, keep away pets and children, wear rubber gloves and pick up fragments/shards. Collect powder with a wet disposable towel. Place all items in a sealable bag, double bag and wash hands thoroughly. Place in regular trash.

HOUSEHOLD HAZARDOUS WASTE
Washington County hosts a household hazardous waste collection day each spring. Items that are accepted

include household chemicals, paint thinners, cleaners, pesticides, pool chemicals, flammables, fertilizers and insecticides. Visit the Washington County Solid Waste website or call (423)753-1652 for more information.

MEDICATIONS
A drop box for unused medications is located in the lobby of the Johnson City Police Department, 601 E. Main St.

PAINT
Let unused paint dry in can, adding dirt or sand if needed. Place lid back on the can and place in your garbage cart for collection.

City of Johnson City, Tennessee © 2012-2013 |

Municipal & Safety Building 601 E. Main Street Johnson City, Tennessee 37601 423.434.6000

Household Hazardous Waste Collection Date

Annual Household Hazardous Waste
Collection Event

Washington County Solid Waste Announces

Household Hazardous Waste Collection for 2015

The annual household hazardous waste collection will be held on Saturday, April 11, 2015 at Daniel Boone High School located at 1440 Suncrest Dr. in Gray. The collection times will be from 9:00a.m. to 1:00p.m.

This event is sponsored and paid for by the Tennessee Department of Environment and Conservation and is for Tennessee Residents only.

Items that will be accepted: Household chemicals, polishes, cleaners, old medicine, gasoline, kerosene, pesticides, herbicides, pool chemicals, fertilizers, paint thinners, lacquers, and rust/wood preservatives.

Not allowed: Medical wastes, explosives, tires, or any of the items that are taken year round at the county convenience centers. Commercial or business items will be accepted by appointment only by calling Clean Harbors Environmental at (615)643-3180.

Important: Batteries, paint, used oil, antifreeze, and electronics can be recycled year round. Contact your Solid Waste Director for more information. (423)753-1652 or visit our website at www.washingtoncountytn.org and click on Solid Waste.

Acceptable Items: Automotive and Marine Products, Home Lawn and Garden Chemicals, Fertilizers, Paint Thinners, Old Medicine, Aerosols, Cleaners, Mercury Thermometers, Flourescent Bulbs, Compressed Gas, Sealers, Stains and Oil Based Paints.

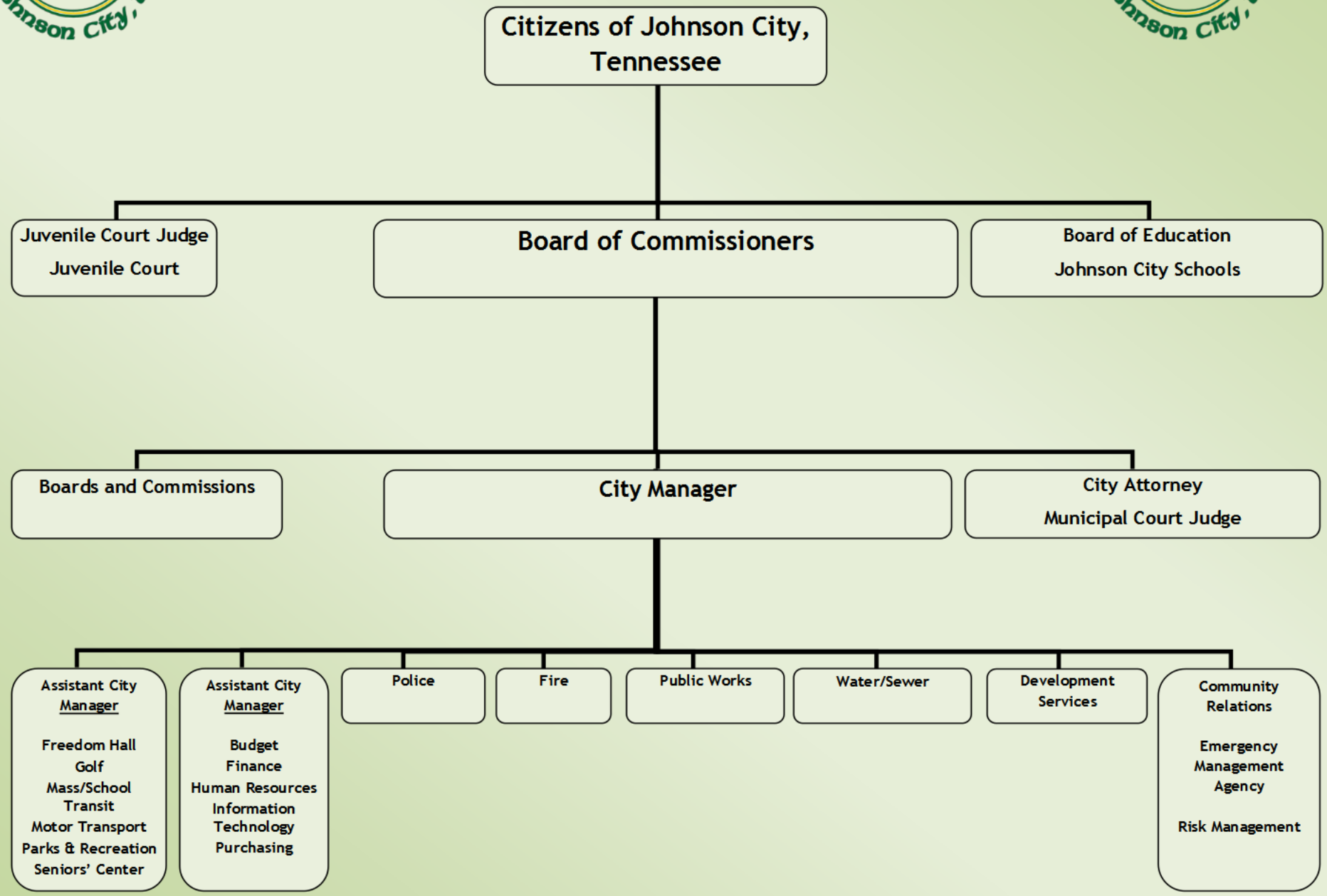
Unacceptable Items: Latex Paint, Medical or Biological Waste, Explosives, Ammunitions, Tires, Radioactives and Vehicle Gas Tanks.

Reminder: We accept paint, used oil, antifreeze, electronic waste and batteries year round at all of our county convenience centers. **These items will not be accepted at this collection event.**

For more information please contact Charles Baines at the Washington County Solid Waste Dept. (423)753-1652 or Visit www.washingtoncountytn.org click on solid waste.

****This events cost is sponsored and paid for by the Tennessee Department of Environment & Conservation.**

CITY OF JOHNSON CITY GOVERNMENT STRUCTURE



Public Works Department

Phil Pindzola - Public Works Director
Nancy Campbell - Admin. Coordinator

1

MSW (.6) **Jim Culbert** WS (.4)
Environmental Specialist

Engineering

Allan Cantrell, P.E. - City Engineer

10

Engineering / Design
Brandon Pachol, P.E. - Civil Engineer III
Lawrence Perry, P.E. - Civil Engineer III
Robert Soyars - Engineering Technician II

Inspection
Paul Easlic - Construction Inspector
Tim Seaton - Construction Inspector

Surveying
Bob Purcott, RLS - Survey Supervisor
Daryl Perdue, RLS - Surveyor
Mike Fairburn - Surveyor
Rob Biller - Survey Technician

Traffic

Anthony Todd - Traffic Manager

11

VACANT - Civil Engineer II

Signal Maintenance
Mark Stidham - Traffic Systems Specialist
Richard King - Traffic Signal Technician
Anthony Miller - Traffic Signal Technician

Signs and Markings
Tim Greene - Traffic Superintendent
Mike Mould - Traffic Signs & Markings Technician
Austin Winters - Traffic Signs & Markings Technician
John Hilton - Traffic Signs & Markings Technician
Nick Estep - Traffic Signs and Markings Technician
David Young - Traffic Signs and Markings Technician

Storm Water

Andy Best, P.E. - Stormwater Director

3

David Rock - Stormwater Inspector
Brooks Lastinger - Stormwater GIS Technician
PROPOSED - Civil Engineer

Solid Waste

Kathy Harsh - Solid Waste Mgr.

50

VACANT - Analyst

Phillip Davis - Assistant Solid Waste Manager

Recycling
Danny Greene - General Supervisor

Roger Morton - SEO
Ethan Franklin - SEO
Andy Bennett - SEO
John Thompson- SEO
Gerald Braasch - SEO
Steve Waycaster - SEO
VACANT - SEO
VACANT - SEO
VACANT - SEO

Administration
Terri Fleenor - Office Manager
Spencer Baumgardner - Customer Service Clerk
Haley Hughes - Customer Service Clerk
Amy Alley - Customer Service Clerk

City Residential
Jerry Roberts - SEO
Doug Ramsey - SEO
Tony Miller - SEO
Anthony Greene - SEO
David Pedersen - SEO
Chris Mitchell - SEO
Randall Miller - SEO
David Moore - SEO
Calvin Lester - SEO
VACANT - SEO

Commercial
Roy Roberts - SEO
Bruce Oler - SEO
Robert Cochran - SEO
Matt Bailey - SEO
Steve Broyles - SEO
Brett Osborne - SEO

Regional Collection
Jeff Chandley - Auto Tech
Dewey Johnson - Auto Tech
Jorge Rivero - SEO
Johnny Isaacs - SEO
Lynn Richardson - SEO
Curtis Hicks - SEO
Eugene Arrowood - SEO
Walter Duke - SEO
Michael Dupree - SEO
Boyd Hughes - SEO

Industrial
Rupert Congleton - SEO
Jeff Thomas - SEO
Charlie Reed - SEO
Larry Kennon - SEO
Jerry Hodges - SEO
Matt Beloat - SEO

Street

Mike Arsenault - Assistant Public Works Director

76

Mike Williams - Design & Construction Technician

Elmer Rush - Street Superintendent

Street Division Administration
Pat Kidd - Office Manager
Linda Fair - Administrative Coordinator
Ginger Whitson - Secretary

Yard Waste / ROW Maintenance
Dean Minier - General Supervisor

Litter Collection
Jonathan Thorp - MEO I

Shop
Paul Robinson - Facility Maintenance Mechanic

Mowing
Danny Franklin - MEO II
Dennis Turbyfield - MEO II
Anthony Hill - MEO II
Robert Jones - MEO II

Sweeping
Tony Haynes - MEO II
J.R. Bunton - MEO II

Yard Waste Collection
Michael Martha - MEO II
Garrett Dykes - MEO II
James Hughes - MEO II
Barbara Williams - MEO I
Craig Cloyd - MEO II
Howell Wiseman - MEO II

Yard Waste Disposal
Nathan Johnson - MEO III

Urban Forestry
Patrick Walding - City Forrester

Jeremy Jones - Crew Supervisor
Gordon Presnell - MEO III
Jason Painter - MEO II
Greg Chapman - MEO II
Harold Keller - MEO II

Brenda Bare - Landscape Supervisor
Steve Goss - Land Worker
Allen Markland - Land Technician
VACANT - MEO II

Facilities Maintenance
VACANT - Facility Maintenance Manager

Allan Garst - Crew Supervisor
Tim Crow - Facility Maintenance Mechanic II
Perry Canter - Maintenance Mechanic II
Douglas Tittle - Facility Maintenance Mechanic
Bill Brown - Facility Maintenance Mechanic II

Custodian
Teresa Tino - Lead Custodian
Randy Campbell - Custodian

Sidewalk Construction
Donnie Campbell - General Supervisor

Mike Doyle - Crew Supervisor
Chuck Hill - Facility Maintenance Mechanic
Richard Hassett - Facility Maintenance Mechanic
Timothy Rapp - Facility Maintenance Mechanic
Carl Bowman - Facility Maintenance Mechanic
Mark Reeves - Facility Maintenance Mechanic
Andy Schaff - MEO III

Pavement Maintenance
Keith Swift - General Supervisor

Roger Ratcliff - MEO I
Billy J. Hickman -MEO III
Brian Harrison - MEO II
Mike Wilson - MEO II
Johnny Wilson - MEO II
Coty White - MEO II
Jason Guinn - MEO II
Ray Combs - MEO II
Russell Day - MEO II
Cody Mitchell - MEO II
Ryan Millhorn - MEO III

Drainage/Construction/Storm Water
David Hurt - General Supervisor

Jerry Ludrosky - Crew Supervisor
Patrick Woodfin - MEO III
Ronald Dunn - MEO II
Robert Tinker - MEO II
Ryan Dougherty - MEO II

Tracy McKinney - Crew Supervisor
Michael Hash - MEO III
VACANT - MEO II
Brian McGee - MEO II
Kenneth Alexander - MEO II

Scotty Higgins - Crew Supervisor
Chris Stout - MEO III
Troy Scalf - MEO II
Keith Greene - MEO II
Ron Bishop - MEO II

08-24-2015

Erosion Prevention and Sediment Control Training for City Staff

Sponsored by the cities of:
Bristol, Elizabethton,
Johnson City & ETSU

2015

amec

Sarah Ketron
Amec Foster Wheeler

TDEC Level 1 Training

- Required for all site inspectors – as of June 17, 2006
- Recommended for developers, contractors, work crews
- Classes are scheduled for the Fall
- Registration forms
  - www.tnepsc.org

If I have to take Level 1 training – why am I here today?

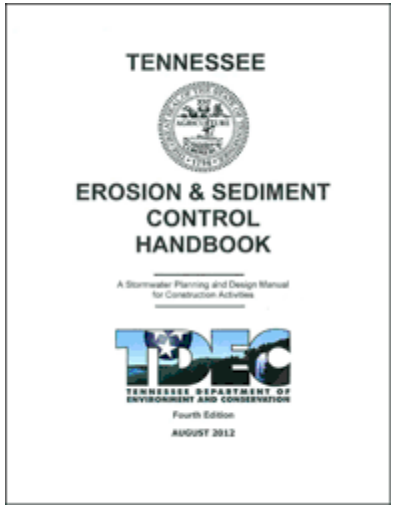
Focus for City Staff

- Be able to recognize when things aren’t right.
- Who to call to report problems
  - J.C.-Andy Best-975-2854
  - Elizabethton-Joe Barnett-547-6240
  - Bristol-Tim Beavers-989-5566
  - ETSU-Dan O’Brien-483-3862

amec

What the Cities are Required to Do:

- Keep ordinances up to date
- Keep design requirements consistent with State law
- Review plans
- Inventory construction sites
- Manage public input
- Perform inspections and do enforcement
- Provide extra attention to “priority” construction sites

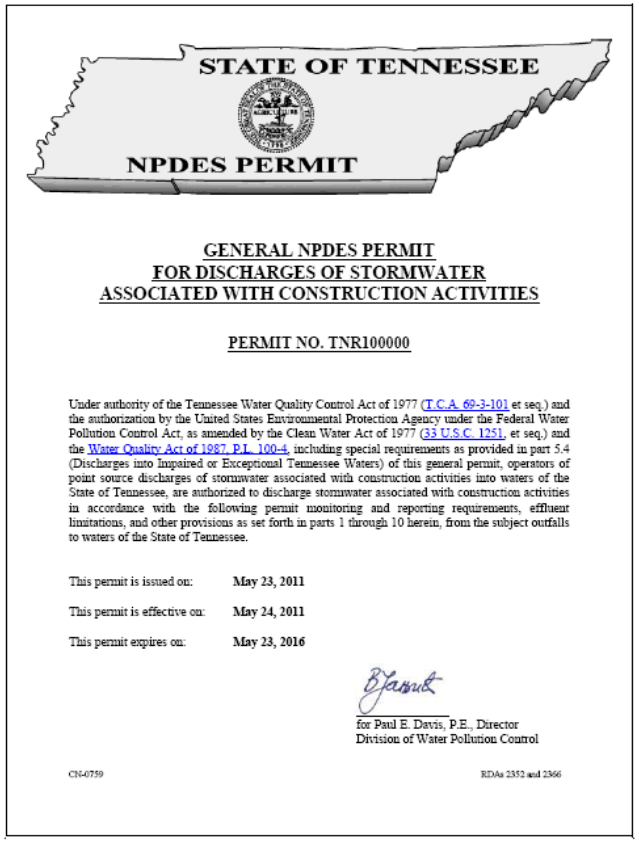


Authority

- TN Construction General Permit (CGP)
- Local ordinances
  - All 3 Cities' ordinances are very similar
  - May be more stringent than state
- **Qualified Local Program**
  - Bristol became a QLP in 2013
  - State CGP administered locally
  - Anticipate more QLPs in the future

NEW!

The Tennessee Construction General Permit



STATE OF TENNESSEE

NPDES PERMIT

GENERAL NPDES PERMIT
FOR DISCHARGES OF STORMWATER
ASSOCIATED WITH CONSTRUCTION ACTIVITIES

PERMIT NO. TNR100000

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the authorization by the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.) and the Water Quality Act of 1987, P.L. 100-4, including special requirements as provided in part 5.4 (Discharges into Impaired or Exceptional Tennessee Waters) of this general permit, operators of point source discharges of stormwater associated with construction activities into waters of the State of Tennessee, are authorized to discharge stormwater associated with construction activities in accordance with the following permit monitoring and reporting requirements, effluent limitations, and other provisions as set forth in parts 1 through 10 herein, from the subject outfalls to waters of the State of Tennessee.

This permit is issued on: **May 23, 2011**

This permit is effective on: **May 24, 2011**

This permit expires on: **May 23, 2016**

for Paul E. Davis, P.E., Director
Division of Water Pollution Control

CN-0759 RDAs 2352 and 2366

Where to get a copy:

- **www.state.tn.us/environment**
- **TDEC Environmental Field Office**
- **New Permit May 24, 2011**

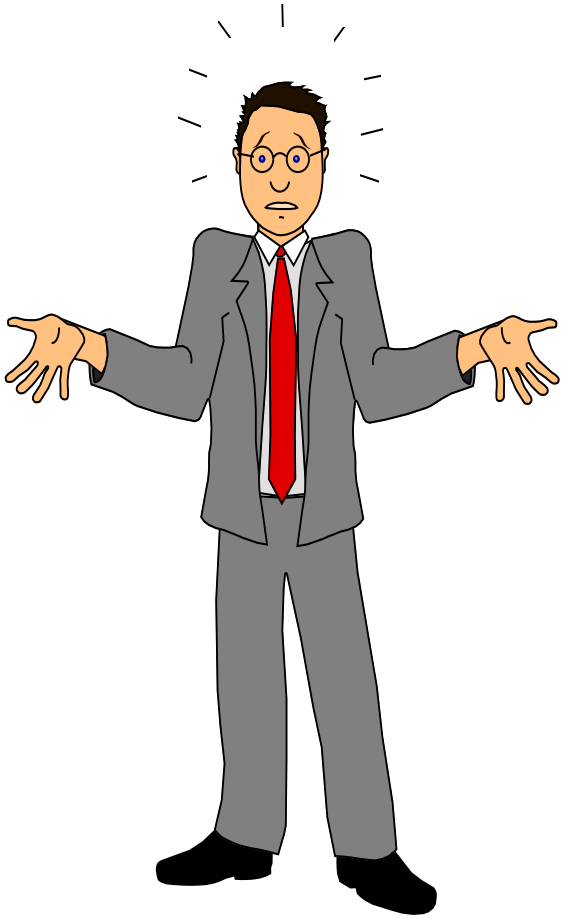
Who needs to apply for the CGP?

- Disturbed area > 1 acre

  OR

- Part of a larger common plan of a development greater than 1 acre
  - Residential subdivisions
  - Commercial/industrial developments

- Local ordinances may be more stringent



TN Construction General Permit Primary Objectives

- No sediment and other solids in stormwater.
- No erosion downstream.
- BMPs designed, installed and maintained during land disturbing activities.
- Local ordinances are generally more stringent

TDEC/QLP Enforcement Tools:

1. Notice of Violation
   - A "courtesy" notice to get corrective actions
2. Administrative Orders (5 types)
   - 5 types (Directors, Consent, etc.)
   - Assesses penalties, sometimes actions or processes
   - Up to $25,000 fines (some per day per violation)
   - Expedited Directors Order
     - Quick "attention getter"
     - Issued from the EFO within 24 hours
     - Approx. 2 per day
3. Criminal Charges

amec

City (Non-QLP) Enforcement Tools:

- Non-monetary tools
  - Citations
  - Stop work orders
  - With-holding permits, bond releases, building inspections, certificate of occupancy
- Civil actions (payment for penalties and damages)
- Fines/Penalties:
  - $50 to $5,000 per day per occurrence

amec

The “Benefits” of Training

- You are the eyes and ears in the field.
- You may help people stay out of trouble.
- **You** help keep the streams cleaner.

Topics for Today

1. **The Tennessee Construction General Permit and SWPPPs/EPSC plans (short and simple, I promise)**
2. **What to look for in the field:**
   a. **BMP Maintenance**
   b. **Construction Related Waste**
   c. **Erosion Prevention**

Pictures!

amec

Outfall
2009.04.13 11:28

Conveyance

Best Management Practice (BMPs)

Inlets

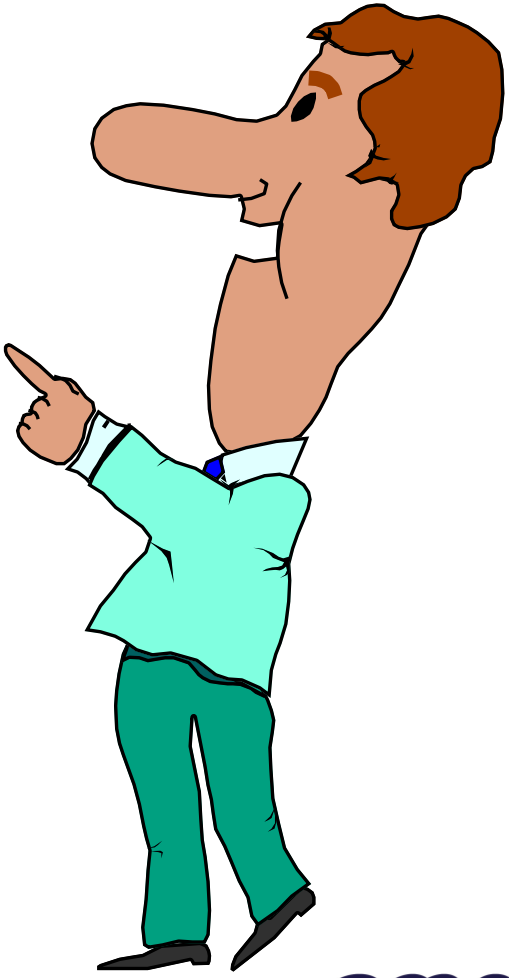
Inlets

Energy Dissipaters

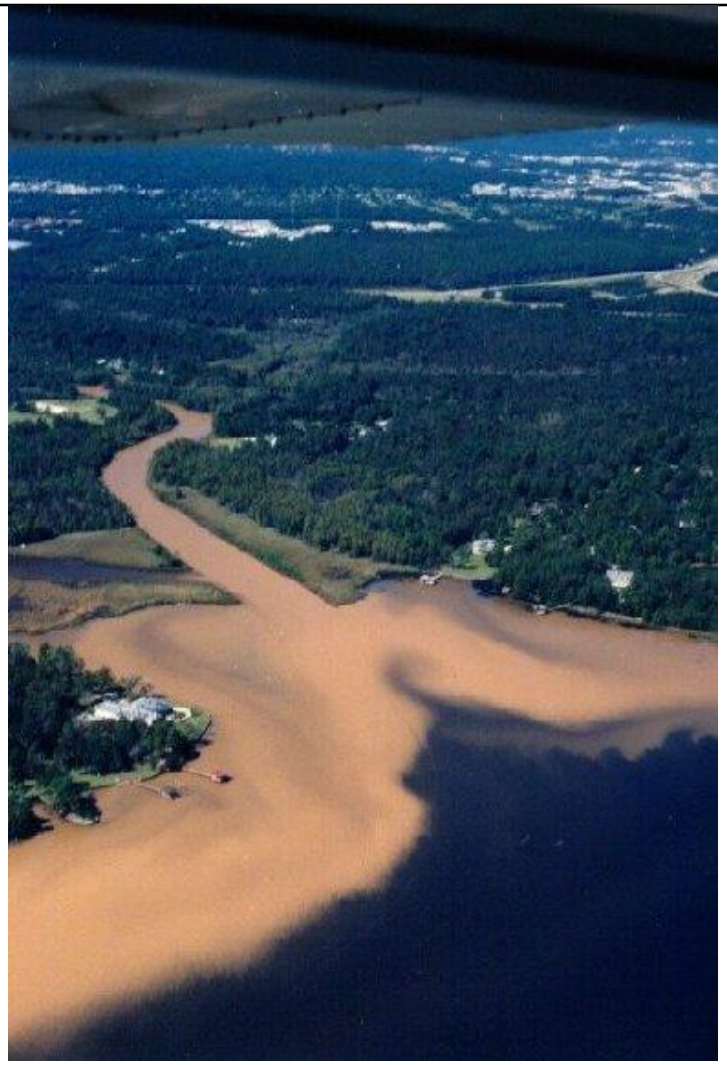
Energy Dissipaters

Minimizing Off-Site Discharges

Routes for sediment and pollutants to leave a construction site…



Offsite Runoff



Dog River, AL

Tracking

Wind

Dewatering

What is covered by the CGP?

- Stormwater discharges associated with construction activities.
  - Clearing, Grading, Excavation
- Stormwater discharges associated with construction **support** activities.
  - Examples to follow

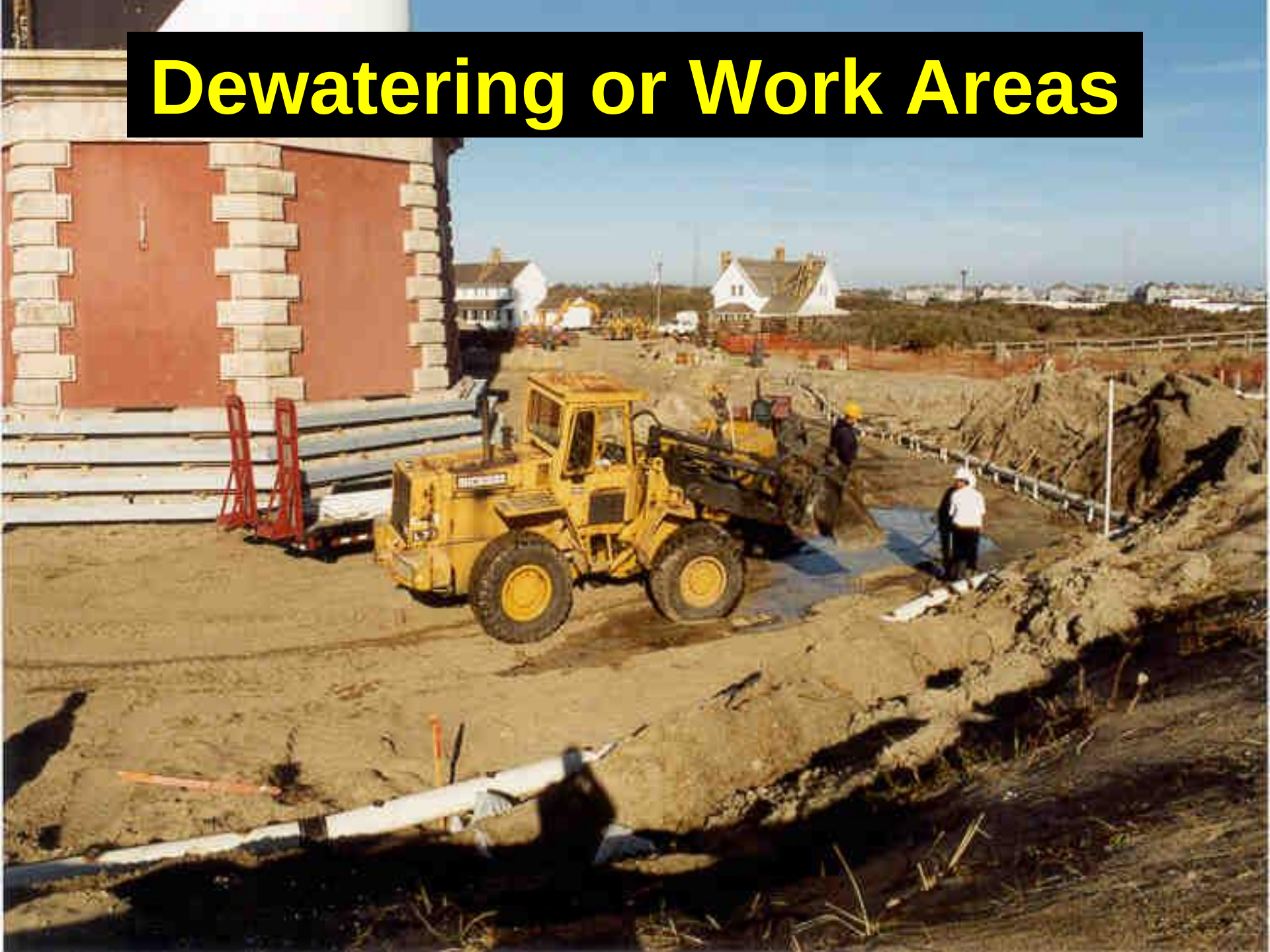
Off-site Concrete or Asphalt Batch Plants

Equipment Storage Areas

Material Storage Areas

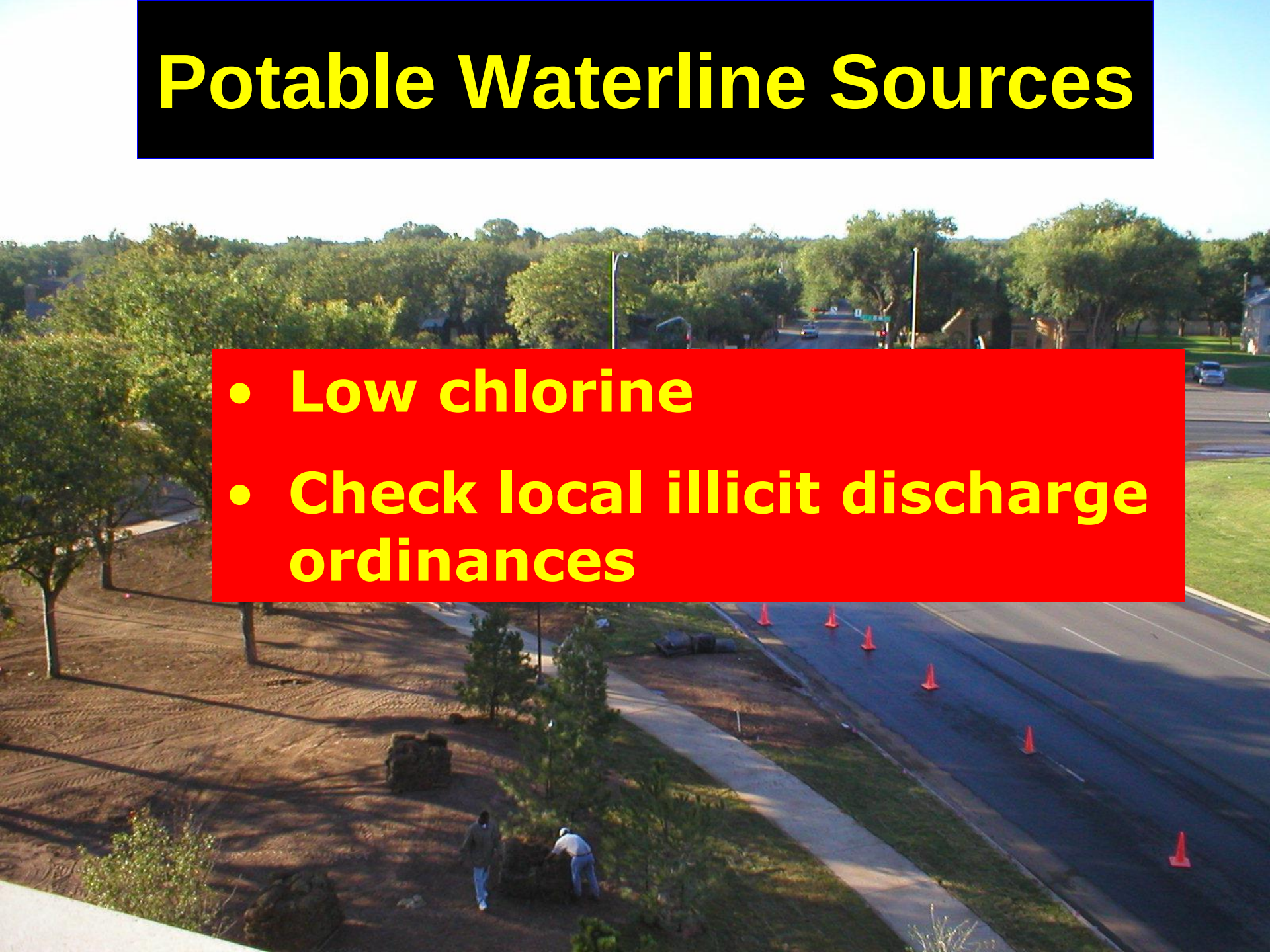
Borrow or Waste Areas

Dewatering or Work Areas



• Dust and Soil
• No detergents!
Vehicle Wash-off Waste Water

Potable Waterline Sources



- Low chlorine
- Check local illicit discharge ordinances

- **No detergents!**

Pressure Washing Water

Stormwater Pollution Prevention Plans

amec

SWPPPs

A.k.a…

- **Grading Plan**
- **Erosion and Sediment Control Plan**
- **Etc….**

What is a SWPPP?

- Written Plan
  - Site map(s)
  - Identification/description of construction and contractor activities
  - Descriptions of BMPs

- A LIVING DOCUMENT!
  - The SWPPP should address all construction–related activities from the date construction commences to the date of termination of permit coverage.

amec

Other requirements…

- Must conform to *TN Erosion and Sediment Control Handbook*
- SWPPP must be approved by TDEC/QLP prior to land disturbance.
- City must have NOC prior to grading permit approval.

amec

SWPPP Mailbox

EPSC Site Inspections

EPSC Site Inspections

- Construction site operators must perform (and document) their own
- The City inspects sites (it has to)
- The State can also inspect sites

Inspection Requirements

Inspection Frequency for Construction Site Operators

- Twice every calendar week, at least 72 hours apart.
- * Once per month in temporarily stabilized, inactive areas

amec

Site Inspector Certification

- Must have TDEC Level I course.
- Re-certification every 3 years.
- A copy of the certification or training record for inspector certification should be kept at the site.

What are City Site Inspectors inspecting?

1. Compliance with the SWPPP
2. Offsite sedimentation

   Causes:

   - The event was larger than the design requirements.
   - Poor maintenance of EPSC measures.
   - Poorly designed SWPPP.

Installation: What's Wrong Here?
Silt Fence

amec

Proper Installation: Silt Fence

Installation: What's Wrong Here?

Silt Fence

amec

Proper Installation: Silt Fence

Installation: What's Wrong Here?
Inlet Protection

amec

Installation: What's Wrong Here?
Inlet Protection

amec

Proper Installation: Inlet Protection

PHOTO: SACRAMENTO BAG

BMP Maintenance

BMP Maintenance

BMP Maintenance

BMP Maintenance

Other Construction Related Waste

Masonry Materials

Erosion Prevention Techniques - Seed and Mulch

Erosion Prevention (cont.) Techniques - Hydroseed

Erosion Prevention (cont.)
Techniques - Erosion Control Blanket

Erosion Prevention (cont.)
Techniques - Sod

Questions?

Staff Training 2015

Water Quality Impacts from Municipal Operations

Everyday Activities

Johnson City Press

Villageoflisle.org

Bristoltn.org

Bristoltn.org

- Street maintenance
- Road construction projects
- Water/sewer projects
- Fleet maintenance
- Vehicle fueling/washing
- Mowing/grounds keeping
- Storm sewer system cleaning

Types of Facilities Maintained

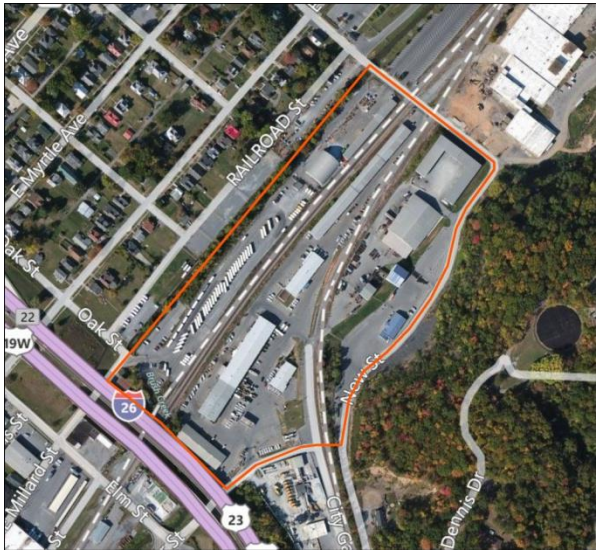
- City buildings/parking lots
- Open Space-schools/parks/golf
- Utilities
- Vehicle maintenance yards
- Recycling facilities
- Emergency facilities

Johnson'sDepot.com

Johnsoncitytn.org

Johnsoncitytn.org

Impacts are Cumulative!

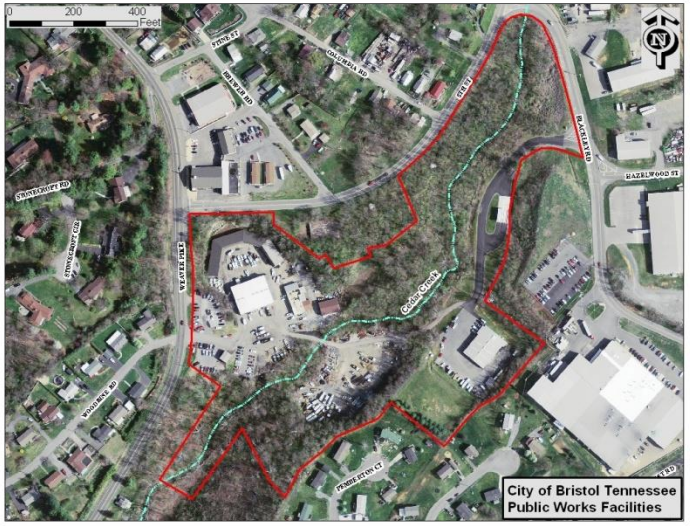


Johnson City Public Works Facility

Consider this, Johnson City alone has:

- Over 1 million square feet of building and office space, including schools, on over 100 acres
- More than 250 acres of golf facilities
- Almost 1,200 acres in parks

Multiply that by the number of cities (and counties) that discharge to any given watershed and you'll find it really adds up!



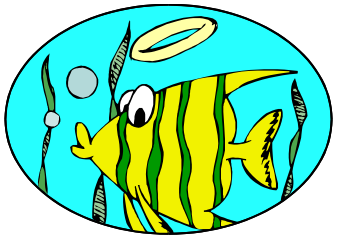
Bristol, TN Public Works Facility

Elizabethton Electric Department

amec

Guiding Principles for ALL Activities and Facilities

- Perform activities under **cover** where possible.
- Use **secondary containment** for storage or transfer of liquids.
- Protect nearby **storm drains.**
- Keep work area **organized** and **clean.**
- **Sweep** instead of hosing down.
- Use **dry cleanup** methods for spills.
- Use proper handling, storage and disposal practices.
- **Never** apply chemicals directly to water bodies unless expressly permitted by TDEC.



Common Pollutants-Sediment

- Blocks sunlight, changes temperature, and reduces oxygenation.
- Provides a medium for pollutants to attach and transport.
- Reduces runoff storage capacity in ponds and lakes.

Source: EPA's *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas*

Common Pollutants-Bacteria

- Failing septic systems, pet waste, sanitary sewer overflows/cross-connections.
- As pet waste decays in a water body, the degradation process uses oxygen and sometimes releases ammonia.
- Low oxygen levels and the presence of ammonia, combined with warm temperatures, can be toxic to fish and aquatic life.
- Carries microbes, such as bacteria, viruses, and parasites, that can pose a health risk to humans and wildlife.

amec

Common Pollutants-Nutrients

- Degrade water quality by stimulating the growth of algae and aquatic weeds.
- Rapid increases in these populations can then deplete oxygen levels to the extent that fish and other aerobic organisms die off.
- Raise temperature and pH, causing chemical responses that are toxic to fish.

& Biochemical oxygen demand (BOD)

- Reduces dissolved oxygen levels as a result of the biological processes that break down organic constituents in runoff.

Sources: EPA's *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas*
LID Center

Common Pollutants-Heavy Metals

- Toxic to many aquatic organisms
- Alters reproduction and can bioaccumulate in fish tissues
- Lead, cadmium, copper, chromium, and nickel are commonly found on roadways due to tire wear, lubricating oil and grease, bearing wear, metal plating, moving engine parts, brake lining wear

Source: EPA's *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas*

Common Pollutants-Hydrocarbons

- Introduced by petroleum products such as motor lubricants, antifreeze, hydraulic fluids
- Are toxic
- Tend to adhere to sediment particles rather than dissolve in water

amec

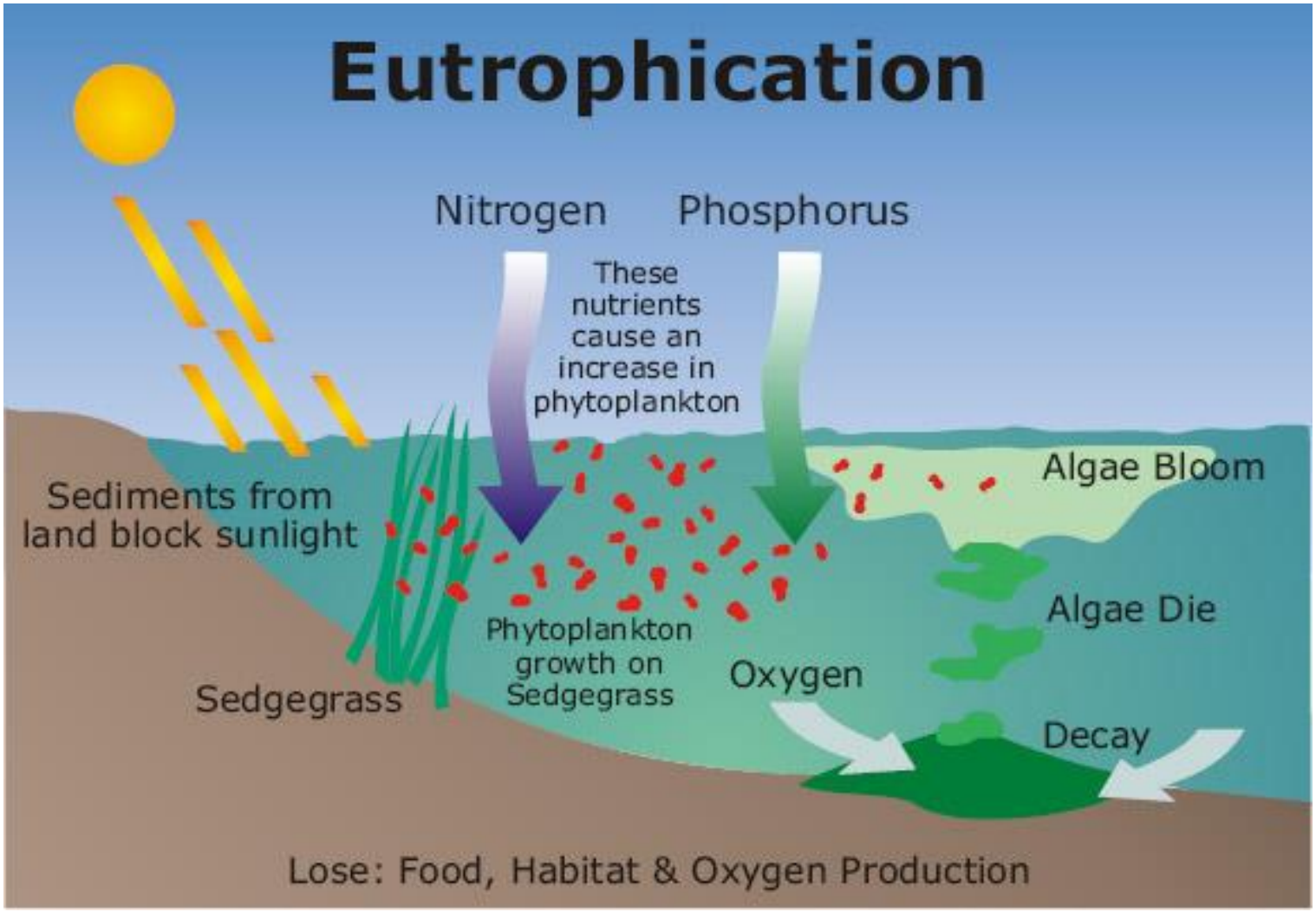
Other Pollutants-Chloride, Sulfates

- Found in deicing salts
- Are corrosive
- Can affect water chemistry

& Cyanide

- Used as an anti-cake agent in deicing salts
- Can have harmful toxic effects when mixed with other compounds

Source: EPA's *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas*



Source: lincoln.ne.gov/city/pworks/watershed/education

Impacts of Construction Projects

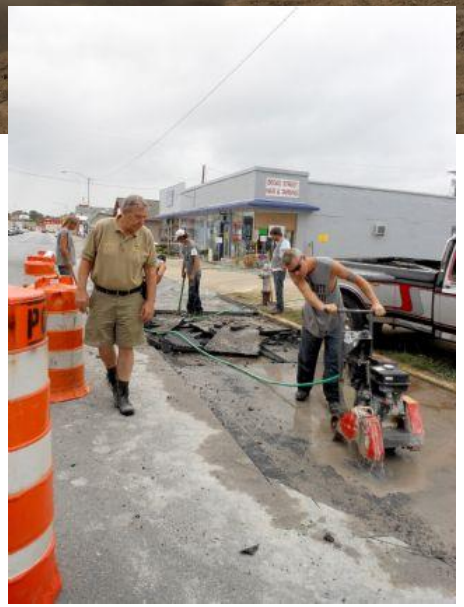
- At any construction site, there is a risk that a number of pollutants could be transported by runoff, including:
  - Sediment
  - Pesticides and fertilizers
  - Petroleum fluids
  - Solid waste
  - Sealants, concrete, wash water

Source: EPA's *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas*

Road and Water/Sewer Construction Project Practices

- Use appropriate procedures for **de-watering.**
- Proper **disposal** methods for **unused** asphalt and marking materials.
- **Avoid runoff** from dust control activities.
- Cover or **berm stockpiles**, if appropriate.
- Use **erosion prevention** and **sediment control** techniques.

Justintimeh2o.com



Johnson City Press

Johnson City Press

Impacts of Right of Way Maintenance

- Motor vehicle use inherently involves a number of pollutants, including:
  - Sediments from pavement wear
  - Heavy metals
  - Hydrocarbons
  - Nutrients (roadside vegetation)
- In addition, deicing activities contribute:
  - Chlorides and sulfates
  - Other potentially toxic pollutants

amec

Right of Way Maintenance Practices

Johnsoncitytn.org

- Maintain a **street sweeping** program.
- Implement **brush/debris pickup** program.
- **Calibrate de-icing equipment** and increase street sweeping after the winter months.
- Apply **herbicides** and **fertilizers** carefully.
- **DO NOT blow grass clippings** into catch basins or storm drains.

amec

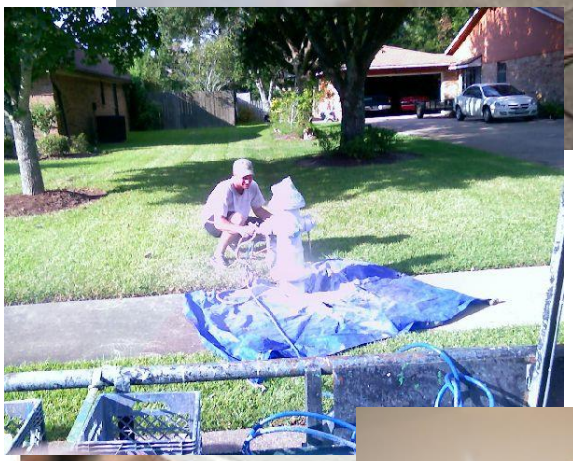
Impacts of Building Maintenance

- Detergents exposed to runoff could result in excess nutrients.
- Debris from sandblasting activities can result in sediments.
- Paint chips and paint-laden water produced by brush cleaning can introduce a variety of toxic substances.
- Emergency sprinkler system may contain chemicals that affect surface water quality.

amec

Building Maintenance Practices

- **Avoid** use of **detergents** or chemicals when pressure washing.
- Dispose of **emergency sprinkler flush water** in the sanitary sewer.
- Use **drop cloth** or tarp for outdoor painting, scraping or sandblasting.
- Do not **clean brushes** outside
- Dispose of **solvents** properly.



Impacts of (City)Parking Lots

- Impervious surfaces have the ability to store and release many pollutants in stormwater runoff, including:
  - Sediment
  - Hydrocarbons
  - Heavy metals
  - Solid waste

Parking Lot Maintenance Practices

Photo credit: unknown

Curb cuts allow parking lot runoff to infiltrate

- **Disconnect** pervious areas, allow runoff to flow to grassy areas.
- Use **hand or mechanical methods** to apply fertilizer/herbicide as an alternative to broadcast methods.
- Use **oil water separators** and/or **sediment traps.**
- **Clean catch basins** regularly, i.e. after 1” rain events.
- Install **permeable pavers.**
- Install tree wells and/or **capture** rainwater for non-potable uses.

Impacts of Vehicle Maintenance Areas

- Each of the pollutants associated with the operation of motor vehicles, such as:
  - Sediments
  - Hydrocarbons
  - Heavy metals
  - Litter
- Plus an increased risk of spills or leaks from accidents or leaky containers

amec

Vehicle Fueling/Maintenance Practices

- **Divert run-on** through the use of berms.
- Post signs with **emergency information.**
- Maintain a supply of **clean up materials.**
- **Spot clean** spills.
- Report **leaky vehicles.**
- Collect **waste oil** and dispose of regularly.
- Mark emergency **shut-off** features.
- Use **secondary containment** around storage tanks.

Scchealth.org

Johnsoncitytn.org

Impacts of Vehicle Washing

- Release of detergents, which contain nutrients
- Other pollutants that may be washed off of vehicles, including:
  - Sediments
  - Oils/grease
  - Heavy Metals
  - Hydrocarbons

amec

Vehicle Washing Practices

- Ensure facilities are **covered** and **plumbed** to the sanitary sewer.
- **Berm the entrance and exit** of wash facilities.
- Add **oil water separators** or consider adding primary treatment to avoid overwhelming the plumbed system in appropriate areas.

amec

Impacts of Open Space Maintenance

- Activities such as grading or clearing can lead to increased sediments.
- Over-application of chemical or organic substances can expose excess nutrients to runoff.
- Improperly stored or disposed items can introduce harmful or toxic materials to runoff
- Increased risk of spills.
- Unsecured trash receptacles can result in litter.

amec

Schools/Parks/Golf Facilities Practices

- Follow pesticide, herbicide, fertilizer guidelines and ensure properly **certified applicators** are involved.
- Manage **grass clippings** and brush waste.
- Maintain and post an **irrigation schedule.**
- Apply fertilizers and other chemicals in **good weather** and minimize **spray drift.**
- **Choose mulch** that stays in place.

Savannaenvironmental.com

Countyofkings.com

Schools/Parks/Golf Courses (cont'd)

Ballparkreviews.com

www.bristoltn.org

- Berm or **cover stockpiles.**
- **Irrigate slowly** to minimize runoff.
- **Clean pavement** after spills and before irrigation.
- Dispose of **empty containers** properly and manage leftover items.
- **Inspect equipment** for leaks and proper calibration.
- Cover and **inspect trash receptacles.**

Types of System Maintenance

- Street sweeping
- Storm drain flushing
- Catch basin cleaning or vacuuming
- Highway, bridge and road maintenance
- Detention ponds and wetlands debris/sediment removal
- Infiltration trench/basin sediment removal
- Open channels (swales, grassed channels)
- Sand filters, bioretention, filter strips

amec

Impacts of Sewer System Maintenance

- Sediment and debris can contain hazardous contaminants and can clog filtration and infiltration practices, reducing their effectiveness over time.
- Natural materials, such as leaves and soils, can accumulate in the system and cause localized flooding.
- Anthropogenic sources, which include oil and grease, heavy metals, deicing materials, and litter, can become adsorbed to leaf litter and sediments.
- The mixed composition of solids that are removed from the storm drain system (termed residuals) can require special handling and treatment, which increases disposal costs.

Source: EPA's *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas*

amec

Questions?

- Johnson City and ETSU-Andy Best, 975-2854
- Bristol- Tim Beavers, 989-5566
- Elizabethton-Joseph Barnett, 547-6240

Illicit Discharge Detection and Elimination

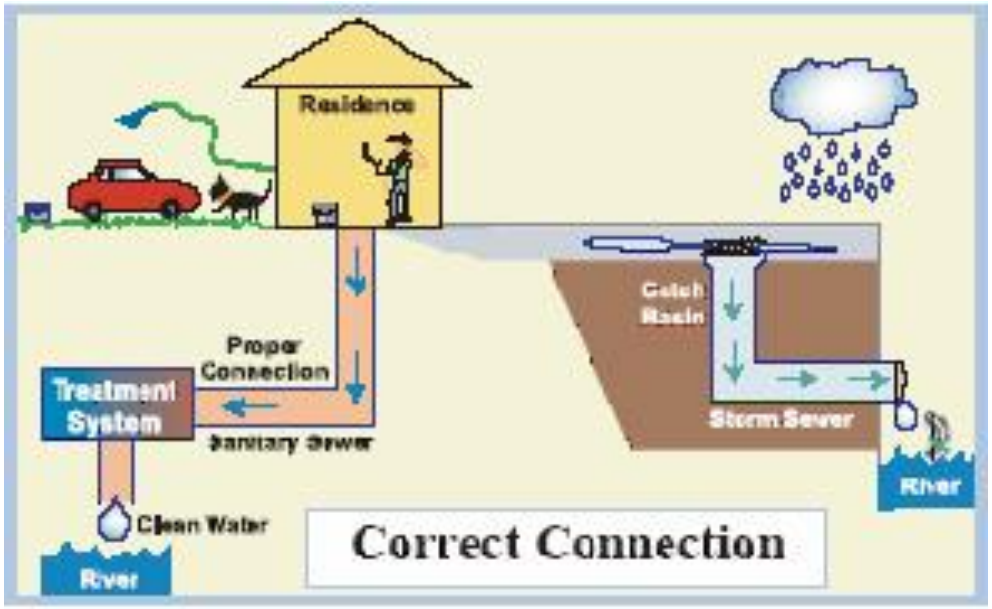
Sarah Ketron

Amec Foster Wheeler

Why learn about Illicit Discharges???

You can make a difference!

You need to understand what is a correct connection!



Agenda

- Definitions
- Pertinent regulations
- Illicit discharge detection
- Illicit discharge elimination

Definitions

The Municipal Separate Storm Sewer System (MS4)

Illicit Discharge

- A discharge to the MS4 that is not entirely composed of stormwater, except allowed discharges and fire-fighting related discharges
- 40 CFR §122.26(b)(2)

Allowed Non-Stormwater Discharges

- Landscape irrigation
- Lawn watering
- Diverted stream flows (permitted)
- Groundwater
  - Rising
  - Pumped
  - Infiltrating
- Foundation or footing drains
- Water discharged from crawl space pumps
- Air conditioning condensate
- Springs
- Individual, residential washing of vehicles
- Discharges from wetlands or stream habitats
- Dechlorinated discharges from swimming pools
- Washwaters from normal street cleaning operations
- Water from fire fighting activities
- NPDES permitted discharges
- Discharges to protect public health and safety
- Permitted dye testing

amec

Hotspot

- Land use or activities that can generate pollutants in excess of those typically found in stormwater.

Concrete/asphalt plants

Auto/Marine
Repair Shops
(chemicals)

Large parking lots
(litter, solids)

Fast Food
Restaurants
(Grease and Litter)

Best Management Practice (BMP)

- Anything that can prevent or reduce the discharge of pollutants

Sources of Illicit Discharges

Industrial/Commercial Dumping

Residential Dumping

Improper Vehicle Washing

amec

Leaking Equipment

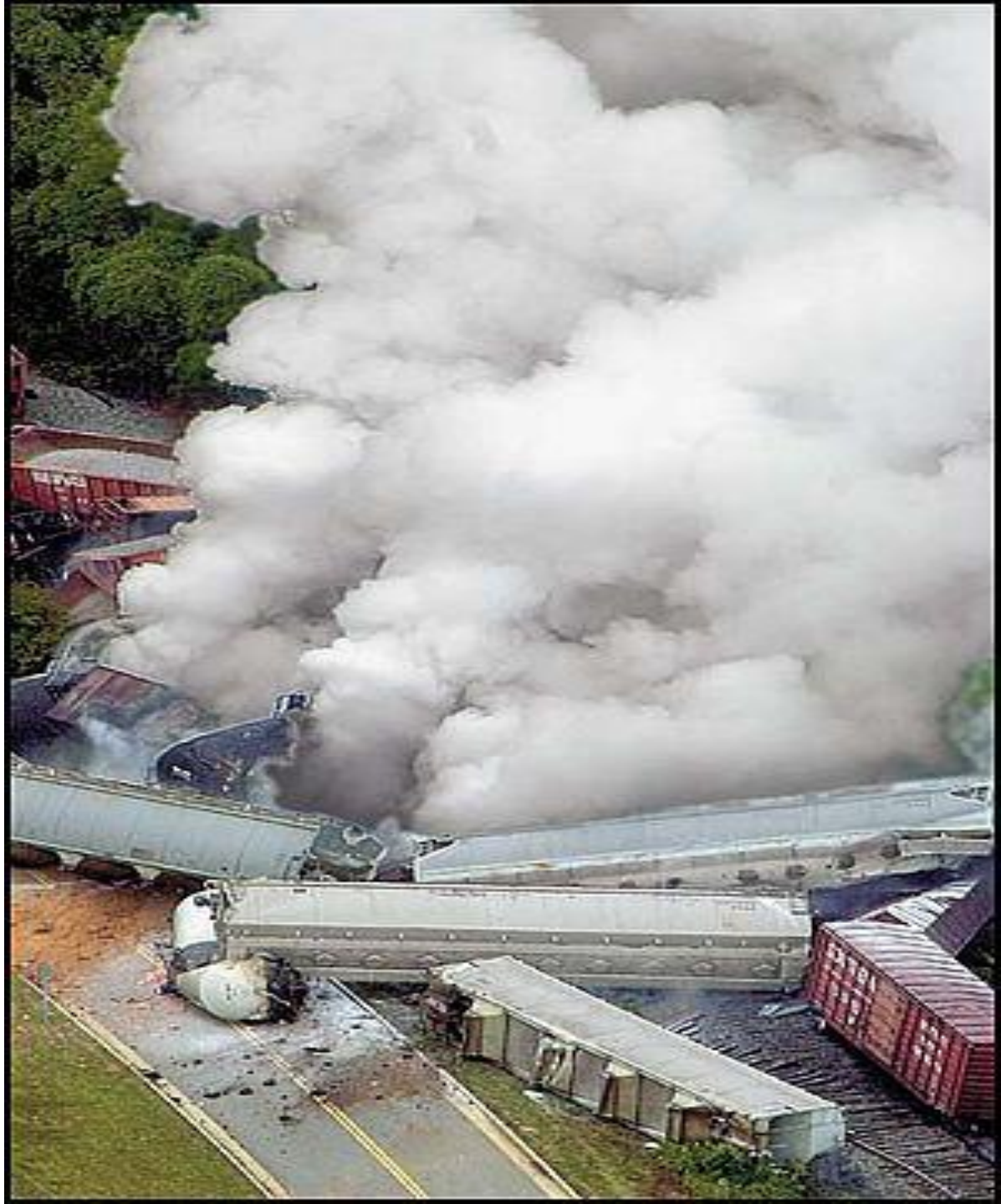
Leaking Dumpsters

Improper Use of Equipment

Poor materials storage practices

amec

Spills and Accidents



Sanitary Sewer Overflows or Cross-Connections

www.co.isle-of-wight.va.us

epa.gov

Poor Erosion and Sediment Control

Even Indoor Activities

Illegal Connection

- Illegal and/or unauthorized connections to the MS4, whether or not such connections result in discharges to the system.

Illegal Connections

Unknown sources

Source: City of Federal Way, WA

Pertinent Regulations

NPDES small MS4 Permit

Illicit Discharge Detection and Elimination (IDDE)

- Cities must:
  - Prohibit illicit discharges <u>by regulation</u>
  - Map stormwater outfalls and inlets
  - Have an effective IDDE program
    - Identify and inspect hotspots and outfalls
    - Respond to citizen complaints
    - Investigate and track to source
    - Enforce and eliminate
  - Public education

amec

Local IDDE Ordinances

- Adopted in 2005
  - Prohibits illicit (non-stormwater) discharges
  - Lists allowed discharges
  - Prohibits illegal connections
  - Requires discharge elimination
    - Corrective actions to clean-up
    - BMPs to eliminate source
  - Requires spill notification
  - Authorizes City inspections
  - Identifies enforcement authority and tools

Illicit Discharge Detection

Your role in the IDDE program

- City staff can serve as the "eyes and ears" of the IDDE program.
- You can help with public education.

What to look for…

Spills

- Pavement staining
- Streams of material or mounds of fertilizer or debris

cleanwaterbrightfuture.com

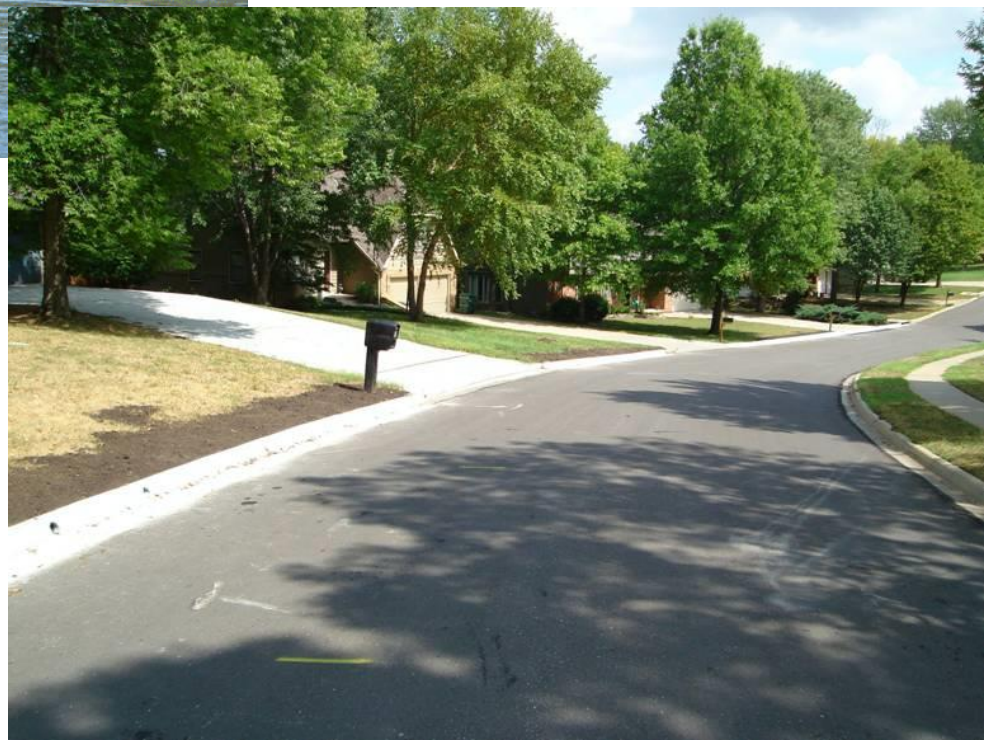
Dtsc.ca.gov

Imgse.com

Dry weather = dry conditions

No flow from pipes

No flow/discoloration in gutters



Dry weather ≠ wet conditions

Source: City of Hopkinsville, KY

Source: Howard County, MD

Oily sheen
(motor oil, fuel, grease)

<u>Common Sources:</u>
Oil dumping
Poor oil containment
Poor cleanup practices

Oily sheen due to natural bacteria

Easily breaks up

Odors

(Sewage, chemicals, hydrocarbons such as fuel)

Common Sources:

- "Straight pipes" to streams
- Illegal dumping
- Poor auto shop practices

Be careful when investigating!!

Discoloration

(anti-freeze, paint, grease)

Source: City of Auburn, AL

<u>Common Sources:</u>
Illegal dumping
Poor waste containment & clean-up practices

Foam and Bubbles
(detergents)

<u>Common Sources:</u>
"Straight pipes" to streams
Cross connections

Fish kills

(chemicals, potable water, stormwater runoff)

<u>Common Sources:</u>
Illegal dumping
Poor clean-up practices
Pool discharges to creeks

Illicit Discharge Inspections

- Check outfalls in dry weather
  - If flowing, find out why?
- Pay attention to key indicators in gutters, ditches, creeks/streams
- Notice hotspots
  - Leaky dumpsters and/or equipment
  - Littered parking lots
  - Materials storage areas
  - Toilet paper or discolorations around storm drains
- Look again after rain events

amec

In-stream Monitoring

- Visual inspections
- HACH “in the field” tests
- Grab samples and chemical testing

Investigation Clues

Discharge Frequency

- Continuous discharges
  - Occur *most or all of the time*
- Intermittent discharges
  - Occur *over a shorter period of time* (few times per day, few days per year)
- Transitory discharges
  - Occur *rarely*, usually in response to a singular event such as a spill, sewer break, accident or illegal dumping episode

amec

Public Education

- State the problem
- If you can, tell them how to fix it
- Notify your City contact

Illicit Discharge Elimination

Enforcement Tools

- First - **STOP THE DISCHARGE** (and clean up)
- Then – **ELIMINATE THE SOURCE**
  - Education and corrective action (and follow-up)
  - Written citation (and follow-up)
  - Get TDEC involved (and follow-up)
  - Stop work order (and follow-up)
  - Public works initiated corrective action (and follow up)
    - And charge the discharger for your work
    - And charge the discharger again
  - Fines and penalties (and follow-up)

amec

Why Follow-Up??

- Old habits die hard:
  - Make sure the discharge has been permanently eliminated.
- The small MS4 permit requires an **effective** IDDE program.
- An opportunity to recognize good "behavior" and environmental stewardship.

amec

How to follow up?

- Educate field staff and do occasional "windshield inspections"
- Increase the frequency of downstream outfall and storm system monitoring
- Perform several follow-up site inspections
- Ask for help from TDEC
- Utilize the opportunity to recognize "good behavior" and environmental stewardship

amec

If you suspect a problem in Johnson City or at ETSU….

- Contact: **Andy Best** in the Stormwater Department
  - 975-2854 or 975-2700 (front desk)
- Andy or his staff will **investigate** and **document**
- Possible **elimination** actions include:
  - Inspection, data gathering, photos, contact with property owner
  - Enforcement
  - Inter-agency coordination
  - Follow-up inspection

amec

If you suspect a problem in Bristol….

- Call the Stormwater Hotline – 423-989-5582
- **Wes Ritchie** (Public Services Manager) will **investigate** and **document**
  - Might include: utility staff, codes, public services, fire dept and/or police
- If found, the discharge will be **eliminated** so it does **not reoccur**.
  - Might include: **education** and/or **enforcement** action if necessary.
- Cost of elimination and clean up may be paid by the responsible party

If you suspect a problem in Elizabethton

- Call the **City Garage** 547-6200 (24 hr).
- Info is given to the Stormwater Coordinator (Joseph Barnett). It will also be tracked in the City Manager's Weekly Report.
- The SW Coordinator will **investigate** and **document**. Possible actions include:
  - Education or possible enforcement action, including verbal or written Cease and Desist, written Stop-Work Orders, Withholding of CO, Denial of Service, Notice of Violation, Civil Damages

amec

The 5 Most Popular BMPs

5. Equipment replacement or repair
   - Install lids, spill barriers, berms, spill pans, etc…
   - Repair leaking equipment
4. Process and procedure changes
   - Clean fuel spills with sand or sorbent materials
   - Wash vehicles in wash bays
3. Dispose of waste properly
   - Provide grease recycle bins, dumpsters, etc…
2. Physical disconnection (retrofits)
   - Reroute drains to waste containers or sewer
   - Install sewer or septic systems

amec

The Top Illicit Discharge BMP is…

1. EDUCATE, EDUCATE, EDUCATE!

Questions?

Municipal Staff Training

Erosion Prevention and Sediment Control, Illicit Discharge Detection

and Municipal Pollution Prevention

June 24, 2015 8:30 AM - 11:30 AM

	Name	City/ETSU	Department
1	Barry Smith	City of Bristol, Tn	Street
2	Gary Tolbert	City of Bristol, Tn	Street
3	SCEE Watley	City of Bristol TN	Street
4	Tim Eads	City of Bristol TN	PW
5	Justin Humpherys	Johnson City TN	ETSU grounds
6	Will Major	Johnson City TN	Turf
7	MARK SIMMONS	Johnson city Tn	Etsu grounds
8	Stephen Brown	ETSU	Etsu Turf
9	JOSH OLINGER	ETSU	TURF
10	Jesse McCormick	ETSU	Turf
11	Adam Hass	ETSU	Turf
12	Cory Johnson	ETSU	TURF
13	David Rock	City of Johnson City	Stormwater
14	Travis Watson	ETSU	Arboriculture/grounds
15	JAKE CHANDLER	City of BRISTOL, TN	PUBLIC WORKS
16	Mike Mitchell	ETSU	Motor Pool
17	MARK JEE	ETSU	Health & Safety
18	Russell Whitaker	City of Bristol TN	Fleet
19	Kenneth Hess	ETSU	Grounds
20	Andy Best	City of Johnson City	Stormwater
21			
22			

Municipal Staff Training

Erosion Prevention and Sediment Control, Illicit Discharge Detection

and Municipal Pollution Prevention

June 24, 2015 8:30 AM - 11:30 AM

	Name	City/ETSU	Department
1	[illegible]	Bristol	Street
2	[illegible]	ETSU	Motor Pool
3	[illegible]	ETSU	Grounds
4	Michael Tomas	Bristol	WH2O
5	[illegible]	Bristol	Water
6	[illegible]	Bristol	Water - Sewer
7	[illegible]	Bristol	Water
8	Frank [illegible]	CITY OF BRISTOL	WTI CITY RS
9	Mark Quickel	City of Bristol	Water Plant
10	Adam Hale	City of Bristol	Water Plant
11	[illegible]	ETSU	EH+S
12	Dan O'Brien	ETSU	EH&S
13	Jeff Guy	City of Elizabethton	WWTP.
14	[illegible]	city of Eliz	WWTP
15	Sean Bowers	City of Eliz.	WWTP
16	Joey Whicker	City of Elizabethton	Street
17	Steven Tredway	City of Elizabethton	Fleet Mainl.
18	Mike Barrett	ETSU	EHS
19	William Morgan	Eliz.	Street
20	David Seagroves	ETSU	Turf
21	Jonathan Scherer	Bristol	P.W. - Engineering
22	Joseph Smith	Elizabethton	Eng.

Municipal Staff Training

Erosion Prevention and Sediment Control, Illicit Discharge Detection

and Municipal Pollution Prevention

June 24, 2015 8:30 AM - 11:30 AM

	Name	City/ETSU	Department
1	Josh Williams	Elizabethton	Sewer
2	George Harrison	Elizabethton	Water
3	Arden Kuhn	Eliz	Sewer
4	ANDREW WALKER	ELIZ	PARK & REC
5	Brodey Taylor	Eliz	Park & Rec
6	Stacy Cole	ground ETSU	
7	Chad Head	ETSU	Housing Maintenance
8	Zane Gray	ETSU	Housing main.
9	Lisa Childers	Elizabethton	Water
10	Josh Rasnick	Elizabethton	Water
11	Lenny Jech	Bristol	water
12	Jonathan Pleasant	Elizabethton	water
13	Kenny Nelson	Bristol	Street
14	Olugbenga Ofuwale	ETSU	Grounds
15	Jonathan Lykins	ETSU JC	Grounds
16	Jerry Cooper	ETSU	Grounds
17	Gary Bond	ETSU	Grounds
18	DUSTIN POWELL	ETSU	GROUNDS
19	Casey Gwyn	ETSU	Grounds
20	Robert Bedler	Bristol	Street
21	Jacob Jenkins	Bristol	Street
22	Tony Mitchell	Bristol	STREET

Municipal Staff Training

Erosion Prevention and Sediment Control, Illicit Discharge Detection

and Municipal Pollution Prevention

June 24, 2015 8:30 AM - 11:30 AM

	Name	City/ETSU	Department
1	Paul Rodifer	Johnson City	Street
2	Michael Hash	J.C	Storm Water
3	Ronald Bishop JR	JC	Storm water
4	TRACY McKinney	J.C.	Storm water.
5	Randy Stafford	EES	LNVE
6	Brandon Shell	EES	Engineering
7	Chad Bowman	EES	Substations
8	Dennis Wagner	City of Bristol Tn.	Water
9	Matthew Kleven	ETSU	Grounds
10	Coty Harris	ETSU	Grounds
11	Okpeyen Musa Rex	ETSU	Grounds.
12	Raheem Ariwoola	ETSU	Grounds.
13	Dale Mills	Bristol, Tn	Street
14	Lance Dysser	ETSU	Grounds
15	Chad Lane	City of Bristol TN	street
16	James Connely	BRISTOL TN	STREET
17	David St-John	City of Bristol TN	U.S.
18	Logan Burleson	ETSU	Grounds
19	Rick Holmes	ETSU	Paintshop
20	Wm Carter	City of Bristol TN	Cont.
21	Richard Conner	city of Bristol tn	Cont.
22	Jeremy Robinson	J.C.	

How can YOU help protect your water?

www.tennesseewaterworks.com
www.mtsu.edu/waterworks
615-898-2660

Many people still think that water pollution comes from a specific source---called 'point source' pollution---like factories or sewage treatment plants---but the Environmental Protection Agency estimates that now **NPS--nonpoint source pollution--is the single biggest factor affecting water quality today.**

"Nonpoint source pollution" (NPS) occurs when water from storms picks up pollutants and deposits them away from the source of the pollution. This runoff finds its way into water sources, through storm drains or directly into streams, from which much of our drinking water comes. Typical nonpoint source pollutants in suburban areas are

- Household chemicals
- Yard waste
- Trash
- Salt and sand
- Excess nutrients (including lawn fertilizers, septic systems and pet wastes)
- Pesticides
- Cleaning agents
- Grease
- Auto products

The cost of this type of pollution is reflected in higher water bills, as drinking water coming from increasingly polluted sources is more expensive to treat.

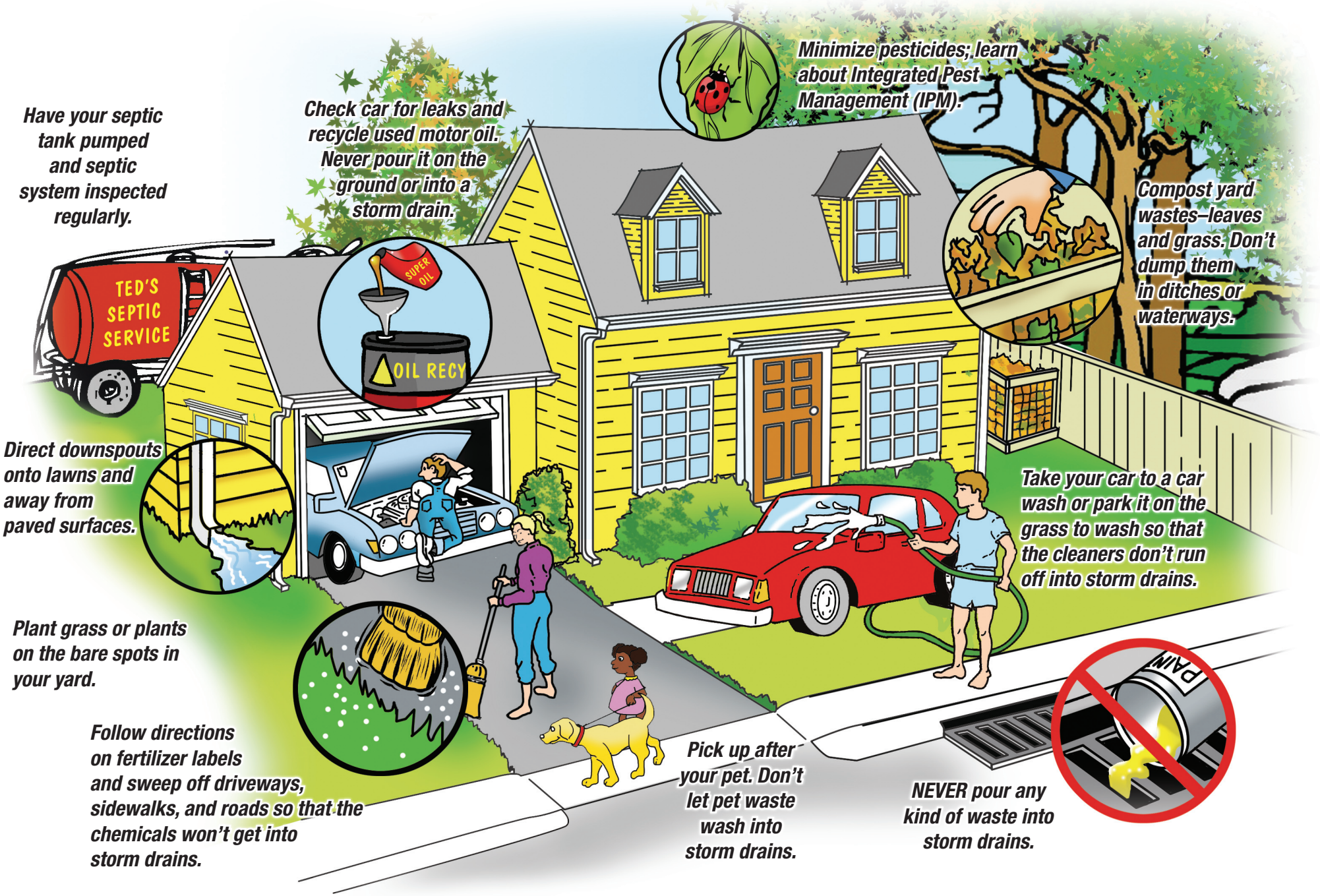
What can you do? **Look inside for helpful hints.**

This project is funded, in part, under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program, and the U.S. Environmental Protection Agency, Assistance Agreement #C9994674-03-0.

City of Johnson City, TN
Public Works - Stormwater
P.O. Box 2150
Johnson City, TN 37601
423-975-2854

City of Johnson City, Tennessee

TENNESSEE HOMEOWNERS' GUIDE TO CLEANER WATER



Clean water begins at home...

www.tennesseewaterworks.com 615-898-2660

Construction Best Management Practices (BMPs)

Protect Natural Features

Minimize the amount of exposed soil and the extent of clearing.
Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
Minimize compaction of soil by limiting heavy equipment use to specific areas; restore any damaged areas.
Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from disturbance by fencing or otherwise clearly marking these areas.

Construction Phasing

Sequence construction activities so that the soil is not exposed for long periods of time.
Limit grading to small areas.
Install key sediment control practices before site grading, such as silt fences (black mesh about six inches into dirt).
Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

Plant Vegetative Buffers

Protect and install vegetative buffers along water bodies to slow and filter storm water runoff.
Maintain buffers by replanting if needed.

Site Stabilization

Apply temporary stabilization to rough-graded areas.
Plant, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

Protect Storm Drain Inlet

Use appropriate controls to prevent sediment, debris, and trash from entering storm water system.
If you use inlet filters, maintain them regularly.

Dirt Stockpiles

Cover or seed all dirt stockpiles.
Surround dirt stockpile with silt fence.

Prevent Erosion

Terrace slopes.
Break up long slopes with sediment barriers or divert storm water away from slopes.

Plan Construction Entrances

Utilize construction exits to minimize vehicle tracking of mud and dirt offsite.
Use properly sized entrances for all anticipated vehicles.
Use geotextile beneath entrance along with 2" to 3" gravel.

Maintain your BMPs!

This project is funded, in part, under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program, and the U.S. Environmental Protection Agency, Assistance Agreement #C9994674-03-0.

City of Johnson City, TN
Public Works - Stormwater
P.O. Box 2150
Johnson City, TN 37601
423-975-2854

TENNESSEE CONSTRUCTION GUIDE TO CLEANER WATER

Maintain your BMPs!
Cover or seed dirt stockpiles.
Stabilize exposed areas with vegetation.
Reduce slope steepness and length by terracing. Use diversion to route clean water away from disturbed areas.
Recycle as much waste as possible.
CONSTRUCTION ENTRANCE
Plan construction entrances to limit runoff.
Physically remove sediment from street or drainage structures immediately.
Landscape after final grading to stabilize exposed areas.
CONSTRUCTION ENTRANCE
Install and maintain appropriate sediment controls.
Use 2-3" sized gravel with geotextile beneath gravel.
Protect and maintain proper controls at storm drain inlets.
For more information, visit
http://www.epa.gov/npdes/stormwater/menuofbmps
Protect existing vegetation.
Protect streams with adequate buffers to limit runoff.
Clean water begins on site...
www.tennesseewaterworks.com
615-898-2660

AGRICULTURE BEST MANAGEMENT PRACTICES (BMPs)

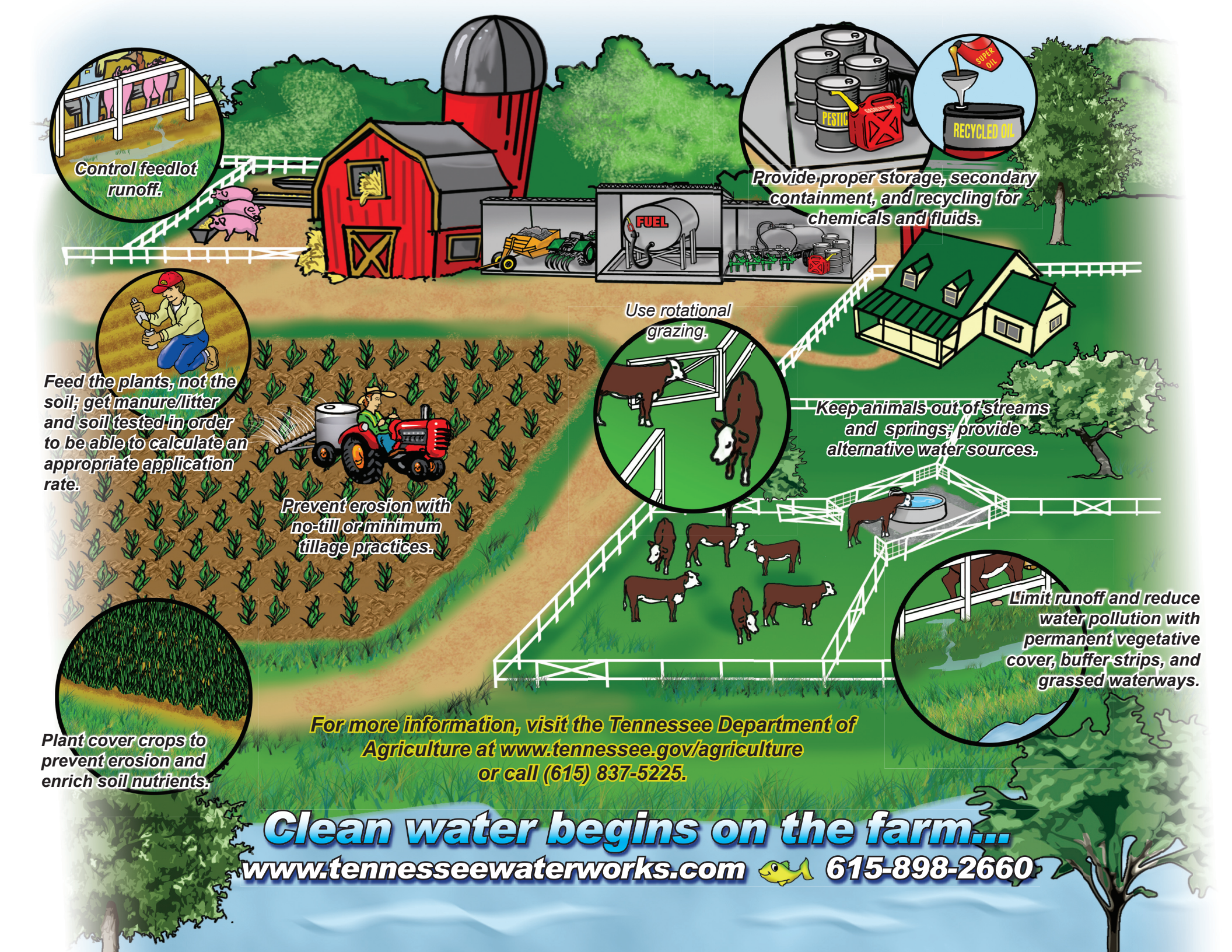
Top 10 Agricultural Best Management Practices for Increasing Farm Profits and Water Quality

1. Maintain a permanently vegetated buffer (preferably woody plants) along stream banks to filter sediment, nutrients, and pesticides by slowing runoff and increasing infiltration.
2. Implement no-till or conservation tillage to reduce erosion, runoff, and fuel and labor costs.
3. Use rotational grazing and keep livestock away from stream banks by providing alternate sources of water.
4. Plant cover crops to prevent erosion and enrich soil nutrients.
5. Implement pasture management practices such as rotational grazing to prevent soil erosion and nutrient runoff.
6. Get manure/litter and soil tested in order to be able to calculate an appropriate application rate. Use the sufficiency approach for nutrient application—feed the plants, not the soil.
7. Calibrate all equipment used to apply pesticides or manure/fertilizer to increase accuracy of application rate (reduces waste and saves money).
8. Create grassed waterways to convert natural drainage ways into wide, shallow channels that prevent formation of gullies, intercept runoff, and increase infiltration.
9. Construct protected heavy-use areas in places that receive heavy traffic from livestock to reduce sediment and organic loads in runoff.
10. Store and handle agricultural chemicals safely (in concrete-floored storage buildings) and recycle fluids.

This project is funded, in part, under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program, and the U.S. Environmental Protection Agency, Assistance Agreement #C9994674-03-0.

City of Johnson City, TN
Public Works - Stormwater
P.O. Box 2150
Johnson City, TN 37601
423-975-2854

TENNESSEE FARMERS' GUIDE TO CLEANER WATER


Control feedlot runoff.
FUEL
PESTIC
SUPER OIL
RECYCLED OIL
Provide proper storage, secondary containment, and recycling for chemicals and fluids.
Use rotational grazing.
Feed the plants, not the soil; get manure/litter and soil tested in order to be able to calculate an appropriate application rate.
Prevent erosion with no-till or minimum tillage practices.
Keep animals out of streams and springs; provide alternative water sources.
Limit runoff and reduce water pollution with permanent vegetative cover, buffer strips, and grassed waterways.
Plant cover crops to prevent erosion and enrich soil nutrients.
For more information, visit the Tennessee Department of Agriculture at www.tennessee.gov/agriculture or call (615) 837-5225.
Clean water begins on the farm...
www.tennesseewaterworks.com
615-898-2660