THE CITY OF KNOXVILLE
TENNESSEE

NPDES Permit Annual Report

National Pollutant Discharge Elimination System
Stormwater Discharge Permit TNS068055
July 1, 2002 - June 30, 2003

Signature and Certification

NPDES STORMWATER PERMIT TNS068055
2002/2003 MUNICIPAL ANNUAL REPORT

FOR: City of Knoxville, Tennessee

Federal regulations, 40 CFR 122.22 (a) (3) and 122.22 (d), require the application and reports for the NPDES permit to be signed and certified as follows:

> *For a municipality, State, Federal, or other public facility, by either a principal executive officer or ranking elected official.*
>
> *"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 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."*

xxxxxxx xxxxxxx *12/15/03*

Victor H. Ashe — Date
Mayor

xxxxxxx xxxxxxx *12/15/03*

Samuel L. Parnell, Jr., P.E. — Date
Engineering Director

xxxxxxx xxxxxxx *12/15/03*

Michael Kelley — Date
Law Director

xxxxxxx xxxxxxx *12/15/03*

Randolph B. Vineyard — Date
Finance Director

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Cover Photo of SSO taken at Fountain City Lake on February 16, 2003

1.0 INTRODUCTION

The Tennessee Department of Environment and Conservation, Division of Water Pollution Control issued the City of Knoxville a National Pollutant Discharge Elimination System (NPDES) Permit (TNS068055) for the discharge of stormwater from the municipal separate storm drain system (MS4). Stormwater from the City of Knoxville discharges directly to the Tennessee River and to major creeks that drain to the Tennessee River. Only a small portion of the MS4 runoff will drain to sinkholes, ponds, and lakes throughout the area. The current NPDES Permit was issued on July 1, 1996 and expired on June 28, 2001. The City submitted a reapplication as part of the Year Four annual report in December 2000.

The NPDES Permit requires an annual progress report for the Stormwater Management Program outlined in the Part I and Part II applications. The annual report was completed in accordance with the reporting requirements of Part VI of the permit and will complete the requirements for the seventh permit year from July 1, 2002 through June 30, 2003.

The Stormwater Quality Section of the City of Knoxville Engineering Department coordinated preparation and submittal of the system-wide Annual Report. Information for the annual report has been provided by the Engineering Department, Public Service Department, and Knoxville/Knox County Emergency Management Agency (KEMA). The Engineering Department has compiled the available information into the format outlined in Part VI of the current NPDES Permit.

2.0 CONTACTS LIST

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3.0 STORMWATER MANAGEMENT PROGRAM (SWMP) EVALUATION

The objective of the City of Knoxville's SWMP is to protect the taxpayer's health, safety, and welfare through an economically viable comprehensive stormwater quality and quantity program. The City is proud to report some of the major accomplishments related to the SWMP that occurred during the seventh year of the NPDES permit term. Although it would be impossible to list all of the City's water quality related accomplishments in this report, the City has listed some of the significant water quality achievements during year seven.

- In compliance with the new bacteria TMDL, the City began installing improved bacteria warning signs along the impacted creeks. The locations for the new signs may be limited initially to public parks, greenways, schools, and other places with easy public access. The signs include the prominent warning, a list of possible sources, and a phone number to report problems or obtain information. The photo to the right is the first sign placed at Tyson Park on 6-16-03.

- For the second consecutive Christmas holiday season, penalty funds paid by polluters were used to finance a series of radio PSAs relating to stormwater pollution prevention and best management practices. A series of 10 second "Traffic Liners" also aired during heavy commute times in July and August. The objective of this radio campaign was to educate the public in water quality "do's and don'ts" and to promote the Water Quality Hotline.

- In February 2003, a thermography study was conducted on eight of the City's urban creeks in an effort to locate unknown illicit discharges and sanitary seepage.

- On March 18, 2003, the first "Pooper Scooper" ordinance was approved by City Council for the downtown area known as the Central Business Improvement District (CBID). The ordinance requires the owner or custodian of any animal within the CBID to be responsible for the removal of any solid waste deposited by said animal. This may satisfy one of the anticipated requirements of Knoxville's bacteria TMDLs.

- The new Stormwater and Streets ordinance adopted during year seven included significant changes for water quality protection. One landmark provision protects a streamside buffer zone along blue-line creeks. The three-tier restricted buffer zone requirement varies from 100' to 30' centered on the centerline of the creek depending on the whether the creek is a FEMA studied named creek, unstudied named creek, or unnamed tributary. The ordinance also requires new pollution prevention measures for new development of sites known to be high-risk stormwater pollution hotspots.

- On July 18 and again on November 8, 2002, the City hosted events to release hundreds of Tennessee River Sturgeon at the mouth of First Creek on the banks of Ft. Loudoun Lake. Sponsors of the sturgeon recovery project include TVA, TWRA, the TN Aquarium, and many others. The City and Water Quality Forum promoted and hosted the release events to help educate the public and business owners in the First Creek watershed about the importance of preventing pollution discharges to the streams and river.

- The City continued to sponsor and support an Americorp Water Quality team. The team assists the City with community water quality education, creek bank stabilization projects, water quality testing, and creek cleanups. Americorp coordinates the Adopt-a-Watershed program in 15 area schools.

- In January 2003, the City realized major success in the effort to reduce the amount of uncontrolled raw sewage discharges in the public parks and waterways. TDEC issued a $100,000 penalty and order to the main discharger of untreated waste. Although the order was later weakened and the penalty forgiven, the resulting order is a significant milestone in the long-term effort to reduce bacteria levels and health risks in the urban streams.

- In a monumental effort to supplement TVA and TDEC biological sampling data, the City contracted the Tennessee Izaak Walton League to perform additional biological studies on seven urban streams. The results of these studies may help provide a baseline to gauge the overall impacts of the NPDES program over time.

During the first seven years of the stormwater quality program, the City defined a baseline to compare future surface water improvements and/or degradations. Although the improvements may not be measured quantitatively at this time, many programs initiated during the first seven years have undeniably made improvements in the state of water quality throughout the city. The long-term results should become apparent in future years. The City implemented many of the SWMP tasks beyond the minimum permit requirements and will continue to advance the water quality programs beyond the minimum requirements as economically feasible.

4.0 STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

SWMP activity summary tables for the seventh year of the NPDES permit program were compiled in accordance with the reporting requirements specified in Part VI(A)(2)(c) of the permit. Although the following summary tables concisely document many program activities, some activities could not be quantified and have therefore been omitted. The summary tables are included on the next few pages.

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

MONITORING TASKS WET/DRY WEATHER	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Repeat High Parameter Sites	20 Outfalls repeated from year six	Yes	20	Each outfall tested at least four times this year
Field Screening Industrial Outfalls	Visits to Industrial outfalls	No	20	Continued retesting outfalls from Industrial areas (four times)
Total Field Screening Outfalls	High Parameter repeats + 30 to 40	Yes	126	All field data sheets available for inspection. Outfalls tested four times this year.
Full Suite Stormwater Analysis (one station per year)	One Station pr year	Yes	1	One Full Suite sample obtained at Loves Creek, however two were scheduled for this year.
Storms Sampled at 5 monitoring stations	1 Storm / Quarter / 5 Sites	No	17	Summer: 5 storms, Fall: 5 storms, Winter: 4 storms, Spring: 3 storms
Storm Drain Televised	As Needed	Yes	6577 ft. / 93 pipes	Pipes are defined as sections between inlets, catch basins, junction boxes, or outlets.
Aerial Thermography	1 time fly-over	Yes	7 urban creeks	Creeks were flown and photographed using a thermography camera to locate illicit discharges.

STORMWATER MANAGEMENT & INDUSTRIAL PROGRAM TASKS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Stormwater Quantity Requests for Service (Received / Resolved)	As Needed	Yes	623/399	Complaints are investigated as received and resolved as solutions or resources are available
Stormwater Quality Requests for Service (Received / Resolved)	As Needed	Yes	281/246	Complaints are investigated as received and resolved as solutions or resources are available
Site Develop Workshop	Annually	Yes	111 attended	Included Engineers, contractors, developers, & surveyors involved in land disturbing activities.
Stormwater and Street Ordinance Workshop	As Required	Yes	22 attended	Included area surveyors and draftsman.
Spills Response & Emergency Management Coordination	As Required	Yes	No accidents	The Knoxville Emergency Mgmt. Agency responds to spills and trains COK staff.
Collect NOI's for Industries	Collect in Year 1 plus ongoing	Yes	0	All NOI's were collected in year 1. No new NOI's were received this year.

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

STRUCTURAL CONTROLS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Street Cleaning	Daily/Bi-Weekly	Yes	35,145 Miles	Daily for downtown streets. Frequency varies for other streets.
Litter Pick-up, Hand	As Needed	Yes	115,018 Bags	Routine Schedule
Curb and Gutter Repair	As Needed	Yes	207 Feet	Per work order and requests
Catch Basin Cleaning and Repair	As Needed	Yes	6,235 Jobs	Per work order and requests
Ditching: Hand, Truck, & Track/Gradall	As Needed	Yes	68,236 Feet	Per work order and requests
Storm Drain Installation & Repair	As Needed	Yes	268 Jobs	Per work order and requests
Brush & Leaf Pick-up	Bi-Weekly	Yes	17,386 Loads	Bi-Weekly curb pick-up
Seed/Sod, ROW	As Needed	Yes	81 Jobs	Per work order and requests
Storm Drain Cleaning	As Needed	Yes	21,395 Feet	Per work order and requests
Grate Replacement	As Needed	Yes	25 Jobs	As Needed
Field Inventory & Inspection of On-Site Detention Facilities	Within 60 Months	Yes	100% of City Completed	All new facilities are mapped after construction is complete. Existing facility's inventory is complete.
Creek Cleaning by Creek Restoration Crew	As Needed	Yes	122 Jobs	Creeks are inspected and cleaned on a routine schedule
Tree and Plant Planting	When Applicable	Yes	3,180 trees and plants	About 65% planted by Americorp volunteers
Total Waste Recycled	As Brought In	Yes	38,403 Tons	5,384 tons of paper, metal, plastic, glass, etc. and over 33,019 tons of yard wastes

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

EDUCATIONAL PROGRAM TASKS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Publicize Hotline Number	Within 24 Months	Yes	Undetermined	Hotline number has been published in phone book, on road signs, pamphlets, magnets, radio PSA's, etc.
River Rescue	Annual Event	Yes	1 day event	12.5 tons of trash and 87 tires removed by 636 volunteers from 37 sites.
Water Quality Forum	Meets Monthly and Quarterly	Yes	Undetermined	Three committees meet monthly to plan projects focused on urban water quality.
Storm Drain Marking	As Needed or by volunteers	Yes	Approx. 525	Catch Basins marked with decals labeled "Dump No Waste-Drains to Waterway"
Volunteer Creek Cleanups	Volunteers	Yes	Several sites on several creeks	46 volunteers at 5 sites removed 4,122 lbs. of trash from local creeks
Waterfest	Annual Event	Yes	1 Day Educational Event	A unique community event dedicated to educate citizens about water quality. Approx. 750 youths participated.

NEW DEVELOPMENT PROGRAM TASKS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
New Development Inspections	As Required	Yes	Approx. 880	As Required
Building Permits Reviewed/Issued	As Required	Yes	1,006/619	As Required
Site Development Permits Inspected	As Required	Yes	Approx. 623	As Required
Right of Way Permits Investigated	As Required	Yes	Approx. 120	As Required
Citizen Concerns Investigated	As Required	Yes	Approx. 500	Development Complaints include erosion, sediment, grading, dumping, etc.

5.0 NARRATIVE REPORT

The following narrative report is divided into the five main programs of the SWMP. The SWMP is described in the program element schedules listed in Part II of the permit application and Part III of the permit. The main programs are listed as follows:

5.1 Residential and Commercial Program (RC).
5.2 Illicit Discharges and Improper Disposal Program (ILL).
5.3 Industrial and Related Facilities Program (IN).
5.4 Construction Site Runoff Program (CS).
5.5 Educational Activities and Public Outreach.

Each of the above programs are further divided into separate program elements and related tasks that correspond to the Implementation Schedules listed in Part IV of the Permit and to the requirements listed in 40 CFR 122.26(d)(2)(iv). Each specific task is briefly discussed in accordance with the reporting guidelines outlined in Part VI of the NPDES Permit. This report may be an abbreviated version of earlier reports since no new programs were required in year seven. Some of the proposed changes for the new permit are discussed where applicable.

5.1 RESIDENTIAL AND COMMERCIAL PROGRAM (RC)

Program of Structural and Source Controls for Reducing Pollutants to the Municipal Separate Storm Sewer System, 40 CFR 122.26(d)(2)(iv)(A).

RC-1 Maintenance Activities for Structural Controls

SWMP Task: Continue Existing Maintenance Activities from Part 2 application, pp. 5-5 to 5-9.
Status: Ongoing

The City's Public Service Department (PSD) currently performs maintenance of the municipal stormwater system. The PSD has developed and maintained an extensive database to track work tasks performed during the year. The database not only tracks labor category (e.g., Equipment Operator) and labor hours devoted to each task, but also includes equipment type and costs. The PSD database produces summary reports for monthly and annual work production and costs. The database includes more than 80 task activities of which 18 were identified as relating directly or indirectly to stormwater management. Only a small portion of the stormwater conveyance system is located on public rights-of-way and city-held easements. The City generally assumes no responsibility for maintenance or improvements on private property even though the new creek crew may work in some of those areas.

Maintenance by the City within rights-of-way and easements is normally performed on an as-needed basis by the PSD. Approximately 75 percent of the storm drainage system maintenance work performed by the PSD is in response to direct calls from property owners and requests from the Engineering Department. The remainder of the storm drainage system maintenance work is in

response to maintenance needs detected by the PSD, such as repairing collapsed pipes. Under normal conditions, the PSD can respond to all complaints that are the responsibility of the City as defined by the City's stormwater policy.

Under the current system, the PSD has divided the City into six geographic maintenance zones, for routine work. Duties performed in each zone relating to stormwater are brush collection, leaf collection, street sweeping, and the cleaning of curb inlets. Catch basins are inspected annually. Cleaning and maintenance of catch basins are performed "as-needed". Most drainage facility maintenance is performed in response to complaints or known problems. The PSD logs all complaints by address and by category into the computerized database. The Construction Division of the PSD performs non-routine storm drain maintenance and installation.

Two seven-person crews perform storm drain installation. Their primary responsibilities include installing various sizes of corrugated metal pipe and reinforced concrete pipe, major repair to existing storm drains, and building catch basins. Each of the two crews has seven employees, a backhoe, two single-axle dump trucks, and one 3/4-ton pickup truck. A 12-ton tool truck services both crews. These crews also provide emergency response in the event of flooding. The Storm Drain Maintenance Crew has five employees. They perform such tasks as: clearing culverts of debris, flushing storm drains, hand and mechanical ditching, and performing minor catch basin repair. A Storm Drain Vacuum Machine, a ditching machine, and a 3/4-ton pickup truck with a small crane are used to perform these tasks.

SWMP Task: Stream Restoration and Channel Maintenance Program. Status: Ongoing

Stream restoration and channel maintenance has typically been addressed with two new programs during the first permit cycle. These programs include stream bank stabilization projects to reduce erosion and sediment and a creek restoration crew to remove litter, debris, and flow blockages. In year seven, the PSD supplemented this program by providing a grant to the Izaak Walton League for debris and blockage removal on the major urban creeks.

In the first seven years, several bank stabilization projects have been completed with the help of TDEC, TVA, USCOE, UTK, and CAC Americorps along urban creeks throughout the city. The first demonstration project was completed Fall 1997 at Inskip Ball field by using natural fiber coconut rolls and jute fiber mats and a synthetic mattress to protect the grass and live stakes during high water. Similar projects have been completed on Goose Creek, First Creek, Love Creek, and along Second Creek above the Worlds Fair Park.

Since sediment is one of the most common non-point source pollutants in our urban creeks, the City will continue to complete at least two bank stabilization projects per year during the new permit term. Although these projects will certainly vary in scope, biostabilization techniques will be used instead of concrete or riprap. Whenever possible, the adjacent riparian zone will be enhanced with trees and native vegetation to provide cooling effects and help restore habitat. The City will work with TDEC to obtain the appropriate ARAP permits before work begins.

The 4-person Creek Restoration Crew was added to the PSD in August 1996. This crew is primarily responsible for implementing a routine schedule of inspections and maintenance on the major creeks and tributaries. It has a knuckle boom and a single-axle dump truck assigned to aid in performing these duties. The crew routinely removes trash and debris from habitual dumpsites and responds to citizen requests and specific work orders. Often the crew is used to assist with illicit

discharge investigations in the MS4.

This program will continue to focus on stream restoration and channel maintenance along the major creeks and the riverfront in the city. The creek crew has a laminated GIS field book, which contains every urban creek within the city limits. Each creek has been further divided into workable sections or map pages that show significant surrounding details such as topography, planimetrics, stormwater features, outfalls, streets, and addresses. This allows the crew to efficiently inspect and clear each segment of the creek before moving on to the next task. The PSD field crews have been instructed to document and report signs or incidences of illicit discharges and/or improper disposal as they are identified.

SWMP Task: Implement Structural Controls To Prevent Floating Discharges To The TN River.
Status: Ongoing.

Since the summer of 1999, the City has been coordinating with TVA, UTK, TDEC, USACOE, the Isaac Walton League, Keep America Beautiful and area businesses to reduce the amount of floating pollution entering the river from the urban creeks. The City has studied and identified several possible solutions. Short-term solutions have included increasing the frequency of the creek crew maintenance at the mouths of the major creeks, adding more trash receptacles at bus stops, increasing public awareness, installing temporary skimmers, etc. Long-term solutions have been researched and may include permanent skimmers on the major creeks, increased manpower on the river, and improved public awareness and participation. Current activities include working with volunteers to distribute BMPs and pollution prevention information to area restaurants and businesses. The City donated a new boat and hundreds of feet of trash skimmers to help the Izaak Walton League collect litter and debris along the riverfront within the city limits. Although the focus of this initiative has largely been to reduce unsightly trash from entering the river, the floating trash skimmer at the mouths of the creeks has effectively detained several spills until remediation personnel could respond. The progress of this floating pollution initiative will be reported annually throughout the new permit term.

SWMP Task: Standard Maintenance Agreement for On-site Facilities. Status: Ongoing.

Since 1997, permanent maintenance covenants have been required for all new stormwater detention facilities and special pollution abatement devices (i.e. oil/water separators). The Stormwater and Streets Ordinance section 22.5-33 requires the owner of the property to sign a covenant and have that covenant recorded on the plat before the construction permit is approved.

The City will retain the right to inspect and insure that the stormwater facilities are

properly maintained, however, the responsibility for the maintenance of stormwater facilities will remain with the property owner unless legally transferred to another person or entity by a properly recorded legal agreement. If the property owner does not maintain the facility properly, the City may authorize the maintenance to be completed and place a lien against the property for double the cost. The standard agreement for underground facilities (i.e. detention or oil/water separators) requires a minimum of quarterly visual inspections and annual maintenance.

SWMP Task: Require Routine / major maintenance of BMP facilities. Status: Ongoing.

All stormwater facilities constructed since 1997 must have maintenance agreements and must be maintained according to the specific requirements in that agreement. All other stormwater ponds or water quality facilities must be maintained as required by the Stormwater & Streets ordinance section 22.5-33. At a minimum, woody vegetation must be cut annually and sediment must be removed as necessary to maintain proper function of the facility. Although the City may evaluate the possibility of assisting property owners with maintenance in the future, the maintenance responsibility currently remains with the property owner.

Sediment from the maintenance of detention/water quality ponds or from stream restoration activities must be removed from the stormwater facility and disposed in a proper classified landfill or used as fill outside the stormwater drainage system. The City does not propose to duplicate TDEC's efforts to regulate contaminated sediments.

RC-2 Planning for New Development

SWMP Task: Revise And Implement Stormwater Detention Ordinance To Incorporate Water Quality Considerations And To Require Water Quality BMP's For New Development.
Status: Complete.

The City of Knoxville adopted a new Stormwater and Streets ordinance during year one and revised it in years two and seven. The ordinance was updated to accommodate anticipated changes to the City's NPDES permit. The ordinance is included in appendix A of this report and may also be accessed on the City's web page at www.ci.knoxville.tn.us/engineering/stormwater. A brief summary of the current development requirements for stormwater detention and water quality control is included in the following paragraphs.

When a stormwater quantity detention pond is required, the engineer must design the pond to control the runoff from the 1-year, 2-year, 5-year, 10-year and 100-year return frequency 24-hour storm events. Quantity ponds may not be mandatory on developments discharging directly into a main stream (i.e. TN River) if the engineer submits supporting hydrologic and hydraulic computations.

Water quality control is required for residential development with five lots and/or five acres, commercial development of one acre or more, or any development or redevelopment that includes one-half acre of impervious surface. The standard management method includes first flush control outlets in the quantity pond or in a separate quality pond. The quality pond must be designed to collect the first one-half inch of direct runoff from the contributing drainage basin or the first 4500 cubic feet of stormwater runoff, whichever is greater, and attenuate that runoff for a

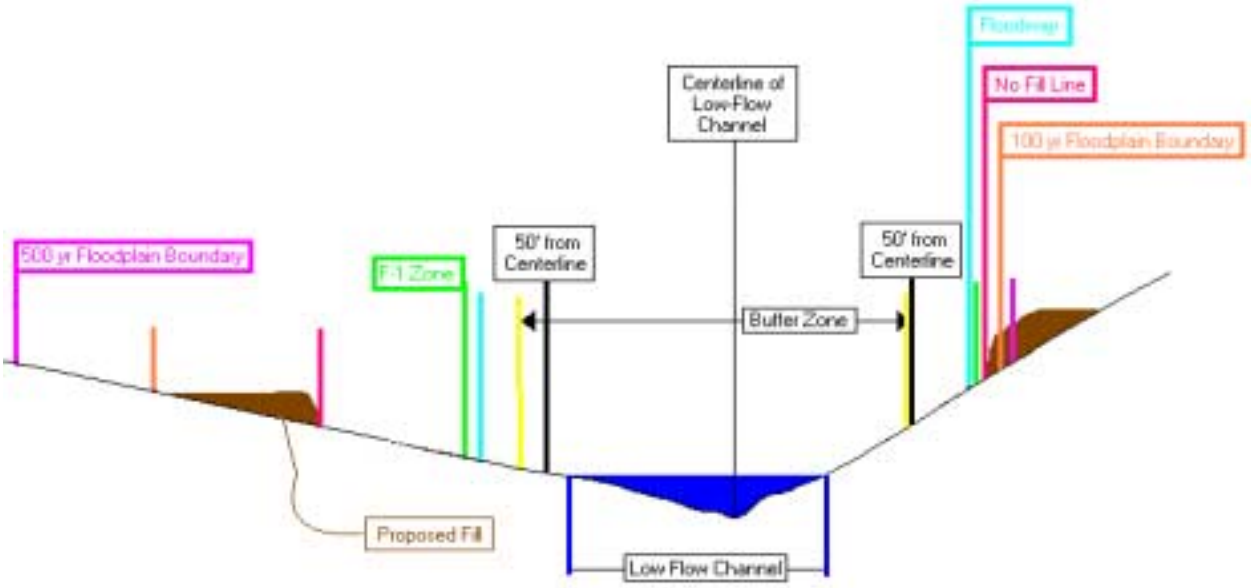
minimum 24-hour period. Alternate treatment methods are accepted if they provide equivalent or better pollutant removal efficiencies than the standard first flush detention ponds. The target removal efficiencies for the first flush treatment were estimated from the chart provided by the Metropolitan Washington Council of Governments' 1987 report titled "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs." The target removal efficiencies are as follows: TSS – 76%, Lead – 81%, Zinc – 47%, Total Phosphorus – 44%, COD – 40%, and Total Nitrogen – 33%.

In addition to first flush treatment, Section 22.5-36 of the ordinance requires special pollution abatement for certain land uses that are known to contribute a disproportionate amount of stormwater pollution (a.k.a. hotspots). The typical special pollution abatement requirement has been a minimum of an oil/water separator for large parking lots of 400 spaces or 120,000 square feet of area. Other special land uses include any type of vehicle maintenance, fueling, washing, and storage areas; scrap and recycling facilities; restaurants; grocery stores; animal housing facilities; and other areas with concentrated bacteria sources. Most of these land uses are expected to have a much higher potential for either floatable pollutants (e.g. oil, grease, hydrocarbons) or soluble pollutants (e.g. bacteria, nutrients) that will not be collected in a standard first flush pond. However, the City may include other development types when special control is warranted.

SWMP Task: Implement Master Plan pursuant to Part II, Application. Status: Complete

The comprehensive stormwater management program (SWMP) submitted for TDEC approval on May 13, 1993 as Section 5 of the Part II Application was implemented by the City as required by federal regulations except as amended by the NPDES Permit effective July 1, 1996.

The new Stormwater and Streets ordinance adopted during year seven included significant changes for water quality protection. One landmark provision protects a streamside buffer zone along blue-line creeks. The three-tier restricted buffer zone requirement varies from 100', to 70' to 30', centered on the centerline of the creek, depending on the whether the creek is



a FEMA studied named creek, unstudied named creek, or unnamed tributary respectively. The natural streamside buffer zone must be shown on the plat and maintained in a stable condition.

During the seven years of implementing the SWMP, the City has developed and implemented many system-wide requirements as a direct result of watershed based study and research. Best Management Practices (BMPs) and Stormwater Pollution Prevention Plans (SWPPPs) are now required as part of the new development process or retroactively on problem sites. A brief description of these requirements is included in the previous section and may be accessed in full on the web site as part of the ordinance and published BMP manual.

SWMP Task: Plan and site location for regional BMP facilities for areas of new development.

Status: Ongoing

During the term of the permit, the City will target large development projects or strategically located smaller developments that are suitable for siting regional BMPs. Regional BMPs would serve multiple upstream developments and typically have drainage areas ranging from 50 acres to several hundred acres. Since most development activity within the City is primarily "infill" that occurs on the limited number of remaining vacant parcels, there are limited opportunities for siting regional BMPs without impacting existing developments.

SWMP Task: Develop guidance criteria for BMP's. Status: Ongoing

The City has successfully completed a comprehensive BMP manual. The manual may be accessed at www.ci.knoxville.tn.us/engineering/stormwater on the Engineering Department's web page. The guidance criteria describe acceptable types of BMPs, design standards, and maintenance requirements for BMPs to be used throughout the City to meet the requirements of the new Stormwater and Streets Ordinance. The guidance criteria will be kept on file in the Engineering Department and distributed to developers as the official reference to ensure proper selection, design and maintenance criteria for BMPs.

Because maintenance of BMPs is critical to their long-term effectiveness in reducing pollutant loading from stormwater, the guidance criteria incorporates maintenance considerations with the design criteria to ensure that effective and maintainable BMPs are constructed in the City. The guidance criteria addresses the goals of the NPDES stormwater program by only allowing BMPs which are effective in reducing pollutants targeted by the NPDES stormwater regulations.

This manual is intended to be a live document that changes as new technology or future needs develop. Therefore, the website version is the preferred method of free distribution while CDs and paper copies may be made available for a fee at a local copy center. Free CD versions were made available during year seven during our new development seminars and in the office while they lasted. The website and BMP content will be updated at least annually.

TDEC and the UT Water Resources Research Center have adopted the BMP manual as a basic model for use by Phase II NPDES communities. The City has authorized modifications by the State for this purpose.

RC-3 Maintenance Activities for Public Streets, Roads, and Highways

SWMP Task: Street maintenance activities outlined in Part 2 application, p. 5-8.
Status: Ongoing

Street cleaning is performed daily for downtown streets and less frequently for all other streets. Streets with curbing are swept, while streets without curbing are flushed. Mowing is performed on a two to four week schedule between the months of April and September.

Snow removal, anti-icing and de-icing of roadways is performed by the PSD and is an essential program to ensure public safety. Sodium chloride, stored undercover at the Loraine Street facility, mixed with liquid calcium chloride is applied to highways and streets by spreaders as necessary. Application of de-icing/anti-icing materials targets highways and major arteries first, and residential streets secondarily. Priorities follow the adopted Major Roads Plan of the City of Knoxville. Because of the importance of maintaining public safety and public commerce, the City aggressively pursues its road clearing operations.

RC-4 Evaluation of Flood Management Projects

SWMP Task: Evaluate regional BMP facilities for water quality retrofit. Status: Ongoing

Only two regional detention facilities that were built prior to 1997 still exist in Knoxville today. Those facilities include the detention pond adjacent to Middlebrook Pike and Weisgarber Road at the Acker Place development and the detention pond located at Knoxville Center Mall. Although the regional detention basins were designed for flood control, it may be possible to retrofit these facilities to achieve additional water quality benefits. All ponds built since 1997 were required to comply with the water quality requirements for new development.

The City has assumed the responsibility of continued maintenance and water quality improvements at the large regional pond (Acker Place) in the Fourth Creek Watershed. The City restored a large section of Fourth Creek downstream of the pond in the first permit term. In order to reduce the vast amount of sediment in the stormwater effluent and to prevent future accumulation of sediment down stream, two rock check dams and an 18-inch weir plate were placed in the pond's low flow channel. These velocity dissipaters allow the sediment time to settle out of the stormwater while still in the pond. The sediment is removed annually to prevent migration into Fourth Creek. A riparian zone vegetation farm has been planted in the pond with red osier, silky dogwood, black willow, and willow oak in addition to the existing species of white pine, cedar, and red oak trees. During year seven, further enhancements were designed in to reduce bank erosion of the low flow channel.

SWMP Task: Plan and implement inspection program to inventory on-site facilities.
Status: Complete.

During the last seven years, the City has implemented a systematic method of inventorying the existing detention ponds by using a GIS grid of the city. Field crews inspected drainage features in each map grid and recorded the detention facilities in the GIS with a circled D. Since all new development must be certified to confirm that constructed facilities were built

as planned, any new stormwater facilities will be properly recorded in the GIS after construction.

Engineering staff will maintain and update the existing inventory of ponds, pipes, water quality facilities and other drainage features as part of an ongoing GIS maintenance program.

RC-5 Monitoring of Solid Waste Facilities

This program is described in the management section IN-3 for industrial facilities.

RC-6 Management Program for Pesticides, Herbicides, and Fertilizer

SWMP Task: Evaluate effect of fertilizers as part of the City's ongoing monitoring program.
Status: Ongoing.

Pesticides, herbicides, and fertilizer used by the City are stored in a building at the Loraine Street Operations Center. This building is in compliance with all regulations regarding the storage of hazardous materials. The PSD Division of Horticulture and Grounds Maintenance is responsible for the application of pesticides, herbicides, and fertilizer. The herbicide "Roundup" is applied annually to City parks and rights-of-way to control unwanted weed growth. PSD personnel, who have been certified and licensed by the University of Tennessee, spray the herbicide. Fertilizer is only used for minor landscaping projects and stormwater runoff from these projects is not considered a threat to receiving water quality.

The City does not currently require registration by commercial applicators; however, commercial applicators must be licensed under State and Federal Regulations. There are no regulations restricting the use of these substances by individual landowners; however, a household hazardous waste collection facility has been opened to collect all types of hazardous wastes including pesticides, herbicides, and fertilizer.

For pesticide, herbicide, and fertilizer pollutants, the control program is difficult to define since the presence of pesticides, herbicides, and fertilizers in urban runoff is not always evident. Current problems with pesticide, herbicide, and fertilizer pollutants are not believed to be significant. As part of the ongoing stormwater-monitoring program, the City will continue to monitor the significance of these pollutants. Pesticides, PCBs, and nutrients are tested as part of the ongoing monitoring program described in Sections 5.5 and 6.0 of this report. To date, no significant traces of pesticides have been detected in the annual full-suite grab sample.

SWMP Task: Public education program as part of the illicit connection and improper disposal program. Status: Ongoing.

Public education programs for pesticides, herbicides, and fertilizer use have already been implemented in conjunction with City public education programs for collection and recycling of household hazardous waste. In addition to the solid waste and household hazardous waste informational programs, the City has developed a stormwater pollution program that includes helpful information regarding pesticide and fertilizer use.

The HHW collection program, which includes collection of pesticide, herbicide, and fertilizer waste material, was officially implemented when the facility opened on April 22, 1997.

More information about the HHW facility is included in the Illicit Discharges and Improper Disposal Program section ILL-6.

5.2 THE ILLICIT DISCHARGES AND IMPROPER DISPOSAL PROGRAM

Program to Detect and Remove Illicit and Improper Discharges to the Municipal Storm Sewer System, 40 CFR 122.26(d)(2)(iv)(B).

ILL-1 Ordinances.

SWMP Task: Develop/Implement New City Ordinances Prohibiting Non-stormwater Discharges
Status: Complete.

The Stormwater and Street ordinance was developed and implemented during the first permit term to specifically prohibit non-stormwater discharges, increase penalties for illegal discharges, and to provide water quality regulations for new development. The ordinance may be accessed on the Internet at www.ci.knoxville.tn.us/engineering/stormwater.

The ordinance section 22.5-52 specifically prohibits illicit discharges and illegal dumping to any portion of the MS4 or any area draining to the MS4. Illicit discharges were defined according to 40 CFR 122.26(b)(2) as any non-stormwater discharge to the MS4. This definition, along with the $5,000 penalty for violations, has formed the cornerstone of our successful enforcement program and will remain in place during the next permit term.

Exemptions to this prohibition were listed in the ordinance in accordance with the list in 40 CFR 122.26(d)(2)(iv)(B)(1). The City has reevaluated these exemptions and included the revisions in appendix A.

ILL-2 Field Screening

SWMP Task: Perform follow-up analysis at all high-risk field screening sites.
Status: Ongoing.

The Dry-Weather Screening Program was developed and implemented during the first permit term to evaluate both randomly chosen outfalls and high-risk outfalls that were tested the previous year. Each of the high-risk stormwater outfalls was checked for flow after a period of dry weather. If flow was present, the discharge was tested with a Chemetrics colorimetric field test kit for the following parameters: phenols, ammonia, detergents, copper, chlorine, pH, turbidity, color, temperature, and flow rate. If ammonia is greater than one part per million, then a fecal coliform sample is collected for laboratory testing. The outfall test was repeated again between four and forty-eight hours after the first test. After one month, this process was repeated for each outfall to complete a total of four tests each year.

Since this program has successfully identified many illegal dumps and illicit discharges during the first permit term, the City will continue to annually retest all sites that have high parameters or signs of illegal dumping until the outfall is clean during all four annual visits.

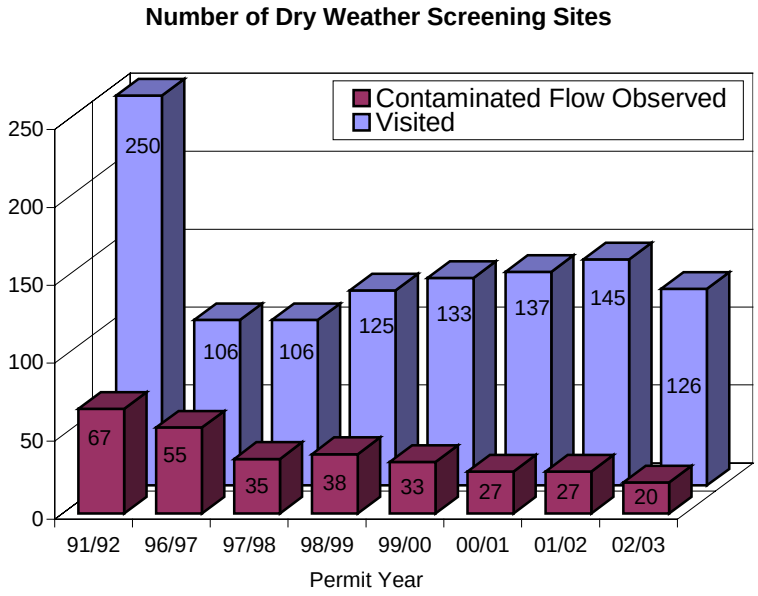
Once the outfall has tested clean during four site visits in a single year, it will only be retested if randomly selected from the list of inventoried outfalls.

The City previously developed and submitted the standard inspection guidelines for investigating illicit connections or illegal dumping in the first annual report. Any changes to these standard guidelines will be reported as they are implemented. As illustrated by the bar graph, the number of high-risk outfalls continues to decrease each year since the program began in 1996. The number of high-risk outfalls that need to be retested each year will obviously vary depending on the tested results of the previous year.

As required by Part VI (A)(2)(f)(ii) of the NPDES permit, the results of the dry-weather screening are included in the appendix of this report. Of the 3773 outfall visits since the beginning of the program, flow from the outfall was only observed during 1203 of those visits. The results from each of the 1203 screenings are tabulated in our database by outfall identification number, testing date, and visit number. The testing results from the year seven outfall screenings are included in appendix B of this report.

SWMP Task: Investigate 30 to 40 new field screening sites per year. Status: Ongoing.

To insure that all outfalls are eventually tested, the City will continue to monitor a minimum of 150 outfalls each year in the new permit cycle. The current permit required testing of the original 67 contaminated outfalls plus 40 additional sites. The City met the minimum criteria by testing 126 outfalls during year seven. The tested outfalls consisted of the previous year's 27 high-risk outfalls and 99 randomly selected outfalls from the general outfall inventory. The randomly selected sites were selected from areas of primarily industrial use and from areas that had not been previously tested. The City also selected outfalls throughout the city with some preference given to the highly developed areas.



The Engineering Department has developed an outfall database to maintain the testing data and site information for each outfall in the inventory. This outfall database is linked to the GIS to allow data access geographically for a single point or by report/query functions for many outfalls at a time. By maintaining a history of each outfall, illicit discharge trends may become apparent and therefore be resolved with education or enforcement.

The dry-weather-screening program has been one of the most successful programs in the current permit term and will continue to be a high priority in the new permit cycle.

ILL-3 Investigation of the Storm Drain System

SWMP Task: Develop and implement procedures for mapping, field surveys, and upstream source identification. Status: Complete.

The procedures for mapping, field surveys and upstream source identification were developed and included in the Part II Application section 5.3.5. These procedures were adopted as policy and successfully implemented during the first permit term. The City will continue to utilize and modify these procedures to increase the effectiveness of the Illicit Discharge and Illegal Dumping Program. These updated procedures for the first permit term were included for the Division's review in monitoring section 6.1.3 of the first annual report. Any updates during the first year of the new permit cycle will be included in the following annual report.

SWMP Task: Implement enforcement procedures and follow-up monitoring/ inspections. Status: Complete.

The schedule for this task appropriately coincided with the schedule for ordinance revisions. The Stormwater and Streets ordinance defined the existing enforcement procedures. An Enforcement policy was implemented immediately after the ordinance was effective in 1997.

Depending on the violation, a first-time offender is typically educated and asked to remediate the damage or correct the violation if possible. This is usually followed up with a letter to inform the violator of the City's expectations and to provide helpful BMPs to prevent future problems. More severe or repeated violations will merit a Notice of Violation (NOV), which is issued in the field directly to the violator. Copies of the NOV are distributed to the property owner or developer, the City Law Department, and the Engineering Department. The NOV may order specific remedies and require the violator to submit reports and/or pollution prevention plans. Penalties, if any, are only issued after the NOV expires so the violation and remedies may be fully evaluated.

A violator may appeal their penalty before a five-member Environmental Appeals Board. The five volunteer members of the Environmental Appeals Board were appointed by the Mayor and consists of individuals with an expertise as follows:

1) One licensed professional engineer with civil engineering expertise.
2) One licensed professional engineer.
3) One representative of the development or industrial community.
4) One neighborhood representative.
5) One member at large.

Board members will serve a 5-year term and may be reappointed at the end of their term.

Follow-up monitoring and inspections will be a combination of City and self-inspections by industries. Enforcement actions resulting from the dry-weather screening program will be followed as defined within that program as a minimum. Any outfall that is tested for high parameters or identified as an illicit connection/ illegal dump source, will be tested four times a year, every year, until the outfall is dry or clean on all four visits. Sources of pollution identified by other means will be monitored as needed or specified for the individual situation.

SWMP Task: Coordinate with Knoxville Utility Board (KUB) sanitary sewer inspections.

Status: Ongoing.

The City will continue to coordinate with KUB to identify and correct sanitary sewer discharges. A standard procedure has been developed to insure that each possible contamination source is investigated after a problem is identified during dry weather screening. When high ammonia or fecal coliform levels are detected in the MS4, KUB and City personnel cooperate to identify the contamination source through dye testing or manhole by manhole testing. Once a source has been identified, KUB will be responsible for correcting problems in the main sanitary sewer system while the City will work with private property owners to correct problems on private property. KUB has been reluctant to share their five-year plans and annual reports with the City, but TDEC has been able to provide that information from the field office. The City is currently resolving this issue to allow better coordination and timely resolution of sanitary sewer overflows and cross connections. Although KUB has not accepted the authority of the City of Knoxville, the City is confident that we do have adequate legal authority over KUB and have therefore complied with the terms of our NPDES permit. The Knox County Circuit Court confirmed the City's legal authority over KUB. The court's ruling is included in the appendix.

The City does coordinate illicit connection investigations with KUB when appropriate. These inspections have identified private residences, industries, and businesses that had plumbing or floor drains connected to the MS4 instead of the sanitary sewer system. This type of close coordination is essential for solving illicit discharges to the MS4.

ILL-4 Spill Response Program

SWMP Task: Coordinate with Knoxville Emergency Response Team (KERT) and TDEC.

Status: Ongoing.

The City of Knoxville Stormwater Quality Section of the Engineering Department will continue to coordinate with both the KERT and TDEC during emergency situations. Each agency has specific roles to play during an emergency event. The City Stormwater Quality Section assists in information gathering, investigations, GIS support, follow-up monitoring, and enforcement when necessary.

The Knoxville- Knox County Emergency Management Agency (KEMA) and Knoxville Fire Department (KFD) coordinate most major spills when they are called in to 911. KEMA also coordinates routine training and simulations for various situations throughout the year. Workshops are provided to simulate real scenarios and allow coordination of the field teams and the Emergency Operations Center (EOC). Engineering Department staff participates in the EOC while the KEMA, KFD, Police Department, and Rural Metro units perform the field exercises.

The KFD and Engineering Department coordinate to respond to small spills and possible hazards as they are reported. The two departments will continue to work closely together to contain and remediate discharges in the street, stormdrain system, creeks or wherever necessary. The KFD maintains a fireboat downtown on the waterfront to assist with spills discharging into the river. When a responsible party is identified, the Engineering Department staff will follow normal investigation and enforcement procedures to order the containment and remediation at the

violator's expense.

Engineering staff will continue to closely coordinate with other emergency personnel at the monthly Local Emergency Planning Committee meetings and by maintaining a supervisor on call after hours and weekends to help respond to water quality emergencies as they occur.

ILL-5 Reporting of Illicit Discharges

SWMP Task: Establish and monitor "Water Quality Hotline" for public reporting.

Status: Ongoing.

The Water Quality Hotline for public reporting of water quality concerns was established as planned during year one of the first permit term. The hotline was operational in November of 1996 but did not receive mass publicity until December 1996. The hotline phone number is a local Greater Knoxville Area number listed in the blue pages as follows:

WATER QUALITY HOTLINE-
To Report Illegal Dumping Into Ditches
Creeks Or Catch Basins 24-Hours/Day……215-4147

The hotline has received a variety of calls including: industrial discharges, gray water discharges, broken laterals, commercial washing, and neighbors dumping, etc. The hotline has been a popular and convenient method for callers to anonymously report problems that they have witnessed or created. Common calls are from neighbors or dissatisfied employees of polluters. This program has been very successful and will be continued throughout the new permit term.

The Water Quality Hotline is a dedicated phone line attached to a phone in the Stormwater Quality Section of the Engineering Department. Employees in the section also have the hotline linked as a second line on their individual office phones so anyone may answer the phone during the day. After hours and on weekends, the messages are recorded and routinely retrieved by the on-call supervisor. If the water quality concern is within the City limits, the Engineering Department investigates the problem. Otherwise, the problem is referred to the Knox County Health Department, TDEC field office, or other appropriate agency.

SWMP Task: Publicize the "Water Quality Hotline". Status: Ongoing.

The objective of this task is to increase the public awareness of the City's role in water quality issues and to create a quick and anonymous method for citizens to report water quality concerns. The publicity of the hotline has already provided a consistent and convenient resource for concerned citizens.

The City currently publicizes the Water Quality Hotline on the Engineering Departments website at www.ci.knoxville.tn.us/engineering/stormwater and annually in the blue pages of the Greater Knoxville Area BellSouth phone book.

The City includes the hotline number in thousands of mass produced stormwater pollution prevention educational handouts such as magnets, brochures, presentations, and routine correspondence with residents. The hotline is prominently displayed at the bottom of the Second Creek watershed boundary road signs to let travelers know where they may report water quality concerns.

The City will continue to seek out and develop innovative methods to advertise this successful program as a method for citizens to anonymously report complaints. Future opportunities to advertise may include: utility bills, public access TV, radio PSAs, signs on city buses, refrigerator magnets, pamphlets, brochures, BMP manual CDs, permits, etc. The innovative methods of publicity will vary each year as opportunities are developed.

ILL-6 Used Oil & Toxic Materials Program

SWMP Task: Implementation and Coordination of Recycling Program. Status: Ongoing.

The Solid Waste Division manages the City of Knoxville's recycling program. The entire annual report of these programs is included in the appendix of this report.

SWMP Task: Maintain and Operate Household Hazardous Waste Facility. Status: Ongoing.

The City continues to operate the Household Hazardous Waste (HHW) Collection Center, which first opened on April 22, 1997. This is the first permanent HHW Collection Center in the State of Tennessee, which is open five days a week. The center accepts HHW from both Knoxville and Knox County residents. Knox County shares the annual costs of operation. The capital expenditures associated with construction of this facility were paid for through a $500,000 grant from the State of Tennessee. Activities at the center include:

- < diverting reusable products;
- < collecting, blending and recycling latex paint;
- < collecting car batteries, oil and antifreeze;
- < diverting selected acid and bases to waste water treatment;
- < venting aerosol containers and recycling the empty containers;
- < bulking flammable materials;
- < packing miscellaneous HHW materials for safe shipment and disposal.

Upon entering the HHW Collection Center, individuals pull into a covered drive-through where staff removes HHW from vehicles. Material that is collected and is still "good" is separated and made available for pickup by the public free of charge. "Good" material includes containers that have never been opened or material that has not exceeded its useful shelf life. The staff then processes materials that are not reusable. This includes testing of unknown materials, diverting selected acids and bases to the wastewater treatment facility, venting aerosols, bulking flammable materials, lab packing, and blending paint. Latex paint is sent to a local firm to be re-manufactured and returned for use by the City. After the material is processed, it is put into 55-gallon drums, which are placed in one of two prefabricated storage units. Each of these units has electronic monitoring and security, fire suppression systems, and drainage/spill containment systems. The hazardous materials are then stored in the units and held until sufficient quantities are collected. The City has hired a chemist and technician to operate the collection center. Due to the capital investment and success of this program, the City will likely maintain and operate the facility throughout the next permit term.

ILL-7 Control Infiltration

SWMP Task: Assess Rehabilitation Study from outside consultant & recommend capital improvements. Status: Complete.

Since the KUB and other small utilities maintain control and operation of the City's municipal sanitary sewer, compliance with the requirement to control infiltration is reflected in the City's maintenance of adequate legal authority over illicit discharges from the KUB and others. Although the City does engage in some communications with KUB to resolve any illicit connections or unauthorized discharges to the MS4, KUB maintains complete control over capital project planning and scheduling. Any suggested changes to the schedule are typically resisted or ignored by KUB unless the City provides project specific funding. The City has recommended and provided funding for several sanitary sewer rehabilitation projects during the permit term.

During year seven, the City's stormdrain system continued to be plagued by illegal discharges from KUB's sanitary sewer system. The dramatic increase of SSOs from the KUB sewer system indicated that the pollution problem might be escalating out of control. Although the sewage was entering the City's storm drains and creeks, KUB refused to report, respond, remediate, or control the raw sewage discharges. In November 2002, the City issued the first Notice of Violation (NOV) to KUB for illegally discharging sewage to the MS4 and for failing to report the illegal discharge of sewage to the City. The City continued to issue NOVs for illegal SSOs from that point forward. After the City issued civil penalties to KUB for repeatedly discharging sewage into the stormdrain system, KUB appealed the penalties and lost before the Environmental Appeals Board. KUB appealed the board's decision to uphold the penalties for the illegal sewage discharges to the City's stormdrain system. The Knox County Circuit Court reviewed the City's charter along with the applicable state and local laws and declared that the City has the authority and mandate to protect the stormdrain and creeks from KUB's illegal discharges. The court's ruling is included in the appendix. To this point, the City has attempted to persuade KUB to reduce infiltration and eliminate SSOs. The City has prohibited, investigated, and diligently enforced the raw sewage discharges in an effort to reduce infiltration and exfiltration of the sanitary sewer system.

In February 2003, the City, partnered with the state and the Tennessee Izaak Walton League to fund a pilot thermography project in Knoxville. Eight 303(d) streams were selected for investigation including: Love Creek, Williams Creek, First Creek, Second Creek, Third Creek, Fourth Creek, Baker Creek and Goose Creek. The thermography anomalies are still being investigated and the results will be included in a future report. Investigation of the first few anomalies indicated that at least two sewer manholes were leaking into First Creek. The City shared this preliminary information with KUB so they could seal their leaking manholes.

5.3 THE INDUSTRIAL AND RELATED FACILITIES PROGRAM (IN).

Program to Monitor and Control Runoff from TSD and Industrial Facilities Subject to SARA Title III, Section 313, requirements, 40 CFR 122.26(d)(2)(iv)(C).

IN-1 Ordinances

SWMP Task: Develop/Implement New City Ordinance Prohibiting Non-stormwater Discharges. Status: Complete.

The Stormwater and Street ordinance was developed during year one to specifically prohibit non-stormwater discharges, increase penalties for illegal discharges, and to provide water quality regulations for new development. The ordinance was updated this year to include specific examples of illegal non-stormwater discharges for clarification only. The non-stormwater discharge prohibition was not altered in the ordinance. The new stormwater and street ordinance is included in the appendix of this report and may be accessed on the Engineering Department's web page at www.ci.knoxville.tn.us/engineering/stormwater.

The ordinance section 22.5-52 specifically prohibits illicit discharges and illegal dumping to any portion of the MS4 or any area draining to the MS4. Illicit discharges were defined according to 40 CFR 122.26(b)(2) as any non-stormwater discharge to the MS4. This definition, along with the $5,000 penalty for violations, has formed the cornerstone of our successful enforcement program and will remain in place during the next permit term.

IN-2 Inspection Element

SWMP Task: Collect and analyze NOIs from Industrial Permit applicants. Status: Ongoing.

During year seven, the City continued to coordinate with TDEC and industrial facilities to make sure that all Notices of Intent (NOIs) are received by the City. As the NOIs are received, the City reviews and evaluates the NOIs for the potential impact of stormwater runoff to the municipal storm drain system. In the past, the NOIs have been instrumental in locating and removing discharges from local industries. During inspections or enforcement actions with an industry, the City will verify that an NOI has been filed. If an NOI has not been filed, the City will coordinate with TDEC to obtain the NOI. Future NOIs may be obtained annually from TDEC in bulk or electronically.

An electronic database will be completed during the next permit term that should allow geographical linkages to the GIS. The prototype industrial database has been developed and may be converted to the City's new Sierra Permit Tracking system. Since several City Departments are converting databases to this system, there is no way to determine when the industrial database will be completed. The current industrial information is maintained by hard copies on file.

SWMP Task: Collect and analyze KUB inspection reports. Assess impact to the MS4.
Status: Program Terminated.

KUB had agreed to provide the City with the one-page inspection reports at the end of the year in which they were collected. At the beginning of year six, KUB notified the City that the inspection reports would no longer be collected. Since the inspection reports had been collected in previous years from the same group of industries, it is not likely that any significant new information would have been gathered. City employees will replace this program during the new permit term with a more effective inspection program.

SWMP Task: Identify potential industrial discharges through Illicit Connection and Improper Disposal Program. (Both stormwater & non-stormwater discharges). Status: Ongoing.

The illicit connection and improper disposal program defined in the City's Part II NPDES stormwater permit application and in the previous section of this report, primarily addresses runoff from industrial facilities. The majority of dry weather screening occurs from areas of industrial use or outfalls indicated by a "300" in the identification number. Illicit connections or improper disposal from industrial facilities that are discovered while inspecting the storm drain system under this program are recorded in the facilities' file in the database. The City contacts the industrial facility directly, along with TDEC if necessary, to identify the problem and work on an appropriate solution. If enforcement action is necessary, the City will track the situation until the illicit connection is corrected, the illegal dumping stopped, or until the facility receives a valid NPDES permit for the discharge.

In addition to the illicit connection and improper disposal program inspections, the City routinely performs inspections at commercial and industrial sites through a random selection process using the MPC inventory of industrial space and in response to citizen concerns reported to the water quality hotline. Some inspections have occurred as the City gains experience with common sources of pollution. Since areas such as loading docks, food distributors, fuel storage/sales, restaurants, and car lots have become reoccurring areas for enforcement, they are now being targeted for education and inspection to prevent discharges. Some of these land uses are targeted during the pre-development phase with the new Special Pollution Abatement Permit. This will be an ongoing program in the new permit term.

SWMP Task: Develop inspection program as part of Pollution Prevention Plans for Municipal Industrial Facilities. Conduct annual inspections at MIFs. Status: Ongoing.

During the first permit term, the City developed an inspection and pollution prevention program for municipal industrial facilities. Currently only four municipal industrial facilities are operated in the City. These facilities include:

- the Solid Waste Management Facility (SWMF) on Baxter Avenue, and
- the fleet truck & heavy equipment garage on Loraine Street, and
- the fleet and police garage at Prosser Road, and
- the Knoxville Area Transit (KAT bus station) on Magnolia Avenue.

Each facility has been evaluated and inspected regularly by Engineering personnel during the first

permit term and will continue to be inspected at least annually in the future. Since the bus terminal is owned by the City but managed by KAT, they developed their own PPP, which was submitted in the first annual report in 1997.

Some structural pollution control measures have been implemented at several MIF sites. The bus station had two large Stormceptor stormwater treatment devices installed in November 1999. The total project cost was nearly $300,000. A strip of the concrete parking lot along First Creek was removed and replaced with a slope directed away from the creek. The reversed slope and a large curb prevent the runoff from entering First creek directly. The runoff is routed through the two oil/water separators before being discharged. Other measures at KAT include their commitment for ongoing fleet upgrades to new lower pollution buses.

The SWMF has installed some above ground filters and catch basin inserts to mitigate potential pollution. The entire transfer facility is covered and the drain in the loading dock for the transfer trucks is routed to the sanitary sewer system. Both maintenance garages have adopted spill protection policies and all mechanical work is done inside. A hydrocarbon absorbent boom is maintained in a trench drain at the police garage as a secondary control for emergency spills. A retrofit project is being designed to add an underground stormwater treatment structure before the outfall from the Loraine Street facility. All of the maintenance vehicles and equipment are parked at this facility when they are not in use. The retrofit project will update the facility to comply with the new ordinance requirements for vehicle storage and maintenance facilities. Funding for the project may not be available until the next permit term.

IN-3 Monitoring Element

SWMP Task: Collect Monitoring Data from permitted industrial stormwater dischargers and/or from TDEC. Assess impacts to the storm drain system. Status: Ongoing.

As part of the NPDES Permit for stormwater discharges associated with industrial activity, applicants are required to monitor, at least bi-annually, representative stormwater outfalls identified on the facilities' Pollution Prevention Plans. Applicants must monitor in accordance with TDEC Rule 1200-4-10-.04. The City currently receives copies of the results of the industrial outfall self-monitoring from some of the regulated industries. The City will continue to work with TDEC or directly with the industrial discharger to obtain copies of the information, as it becomes available. The City will maintain this information in the City's industrial files, and will assess the impact of the monitored discharges on the water quality of the storm drain system on an annual basis. If the City determines that additional data needs to be provided in the monitoring program for an industry (reports on additional parameters, etc.), requirements for an expanded program for subsequent monitoring events will be coordinated with TDEC and/or the industrial discharger.

The Stormwater and Streets ordinance authorizes the City to require additional monitoring from industries not covered under the TDEC programs whenever necessary. This will usually be required in conjunction with some enforcement action after a problem has been observed.

SWMP Task: Develop ongoing monitoring program pursuant to 40 CFR 122.26(d)(2)(iv)(c)(2). Identify pollutants/sources as applicable. Status: Ongoing.

In the first permit cycle, the City's Ongoing Monitoring Program, defined in the Part 2 NPDES stormwater permit application, included the monitoring of stormwater runoff from two areas of industrial facilities (e.g. industrial parks). Stormwater samples were collected, analyzed, and recorded for 12 to 15 storms per year per site using flow weighted composites from ISCO monitoring stations. Each of the monitoring locations received runoff from small watersheds approximately 1/4 square mile with several different industries included. Therefore specific pollutants were not easily traced back to a specific industry but the general data did allow implementation of industry wide BMPs.

In addition to the stormwater sampling above, all outfalls from industrial areas have been tested as part of the dry weather field-screening program to identify potential specific sources of the pollutants. Each year the City will continue to choose random outfalls from industrial areas as the primary dry weather screening locations. These outfalls are tested with field screening kits with additional laboratory tests as necessary.

Additional monitoring and reports from TSDs and industrial facilities subject to SARA Title III, Section 313 may be required when a problem has occurred, when the City has reason to believe a pollution problem exists, when TDEC or EPA do not already require sufficient testing, or if the City is mandated to test and report those facilities. The Stormwater & Streets ordinance Section 22.5-54 states, *"The Director of Engineering may require any person engaging in any activity or owning any property, building or facility (including but not limited to a site of industrial activity) to undertake such reasonable monitoring of any discharge(s) to the stormwater system operated by the City and to furnish periodic reports of such discharges."* The City will maintain this legal authority to require monitoring from all facilities necessary when the Stormwater & Streets ordinance is updated in the next permit term.

SWMP Task: Analyze results from ongoing monitoring program. Status: Complete.

A summary of the analysis from the ongoing monitoring program was included in the appendix of the year five annual report. This detailed analysis will be repeated at the end of next permit term and included once more in the year five annual report for the new permit.

Some routine parameters associated with industrial activities have been extremely low or non-existent. Phenols were essentially below non-detection limits for the first three years of sampling and were therefore removed from the monitoring program.

Although oil, grease, and hydrocarbons are not routine parameters, analysis and investigation of visual inspections have helped the City trace several problems back to the industrial source where they have been corrected. Changes to the Special Pollution Abatement Permit program should prevent many of these problems from occurring on new development.

SWMP Task: Develop, Manage, and Conduct Monitoring Program at MIFs. Status: Ongoing.

The monitoring program for the municipal industrial facilities was developed during the first permit term and was included in the 96/97 annual report. The program specified that the

only municipal industries included in the City's monitoring program will be limited to the Knoxville Area Transit station, the Prosser Road fleet and passenger vehicle garage, and the Loraine Street maintenance and storage facility. However, the City also added addition monitoring and testing of the parking lot runoff from the Solid Waste Management Facility (SWMF) on Elm Street during the first permit term. This monitoring program was developed as a Best Management Practices test site to evaluate the usefulness and effectiveness of catch basin filters on ultra-urban land uses. The City partnered with the University of Tennessee Civil & Environmental Engineering Department and with Remedial Solutions to put two catch basin filters in place. One filter was installed at the SWMF and one was located on Phillip Fulmer Way outside Neyland Stadium.

During year seven, each MIF outfall was inspected at least once for non-stormwater flow in dry weather. If flow is observed, the normal dry weather screening parameters are analyzed, recorded, and investigated. The City had proposed to initiate a wet-weather sampling program from these facilities in the new permit term. However, since the permit was not issued before the end of year seven, the wet-weather grab samples will start at the beginning of year eight. Both sampling programs will continue to be conducted at least annually in the new permit term.

5.4 THE CONSTRUCTION SITE RUNOFF PROGRAM (CS).

Program to Implement and Maintain BMP Plans to Reduce Construction Site Runoff to the Municipal Storm Sewer System, 40 CFR 122.26(d)(2)(iv)(D).

CS-1 Site Planning

SWMP Task: Revise City Ordinances to require construction sites greater than 10,000-sq. ft. to submit Erosion and Sediment (E&S) Control Plans. Status: Complete.

The Stormwater and Street ordinance was developed during year one to specifically require construction sites greater than 10,000 square feet to provide erosion and sediment control plans according to section 22.5-28(4)(c). The ordinance was revised in year seven but the requirement for erosion control plans was only strengthened. The current ordinance may be accessed on the Internet at www.ci.knoxville.tn.us/engineering/stormwater for review or download. The ordinance is also located in the appendix of this report.

SWMP Task: Provide training for City plans review staff. Status: Ongoing.

In an effort to fully train the Stormwater Management staff, the City has participated in several stormwater seminars around the region during year seven. Most staff members at the Engineer level will attend at least one, but typically more, seminars or training workshops annually. Typical seminars attended each year include: stormwater modeling, NAFSMA conference, regulatory updates, erosion control certification, NPDES updates, ASCE seminars, software workshops, and others. In addition to the stormwater management seminars attended, the Engineering staff have sponsored, planned, and presented a series of annual workshops/seminars to better educate the staff and development community about the

development and plans review processes. Some of the topics of the City sponsored development process training sessions include:

- ***Technical Requirements of the Stormwater & Streets Ordinance***
- ***Erosion and Sediment Control on plans and construction sites***.
- ***Site Development Permit Review Seminar***
- ***Performance and Indemnity Agreements, Permanent Maintenance Agreements for Stormwater Facilities***
- ***Plat Review Process and Procedures***

The City will continue to provide training to the Engineering staff by participating in seminars locally and outside the city; in-house training by professional engineers; tuition reimbursement for university engineering classes; cooperating with TDOT, TDEC, TVA, UTK, and other agencies to provide professional training for the staff. Training of the plans review and inspections staff is an ongoing program within the Engineering Department.

SWMP Task: Require Site Plans Submittals per TN E/S Control Handbook. Status: Complete.

The Stormwater and Streets ordinance requires all erosion and sediment control plan submittals and all site development work to comply with the Erosion and Sediment Control Handbook produced by TDEC, dated July 1992, or as amended by TDEC or its successor and any supplemental regulations by the Engineering Department.

SWMP Task: Develop minimum criteria for plan review and checklists. Status: Complete.

Although the TDEC Erosion and Sediment Control Handbook does provide a checklist for review of Erosion and Sediment Control Plans, the City developed a list of minimum criteria to supplement the State checklist for various categories of site plans (residential, commercial, etc.). The City plans review staff uses the minimum criteria and checklists to insure consistency in the plan review process.

CS-2 BMP Requirements

SWMP Task: Require Construction BMPs per the TN E/S Control Handbook. Status: Complete.

As outlined in the new Stormwater and Street ordinance section 22.5-28(b)(4), all erosion and sediment control plans must comply with the Erosion and Sediment Control Handbook produced by TDEC, dated July 1992, or as amended by TDEC or its successor and any supplemental regulations by the Engineering Department.

SWMP Task: Require construction site “good housekeeping” practices. Status: Ongoing.

To ensure that construction sites are kept clean and orderly, and to minimize pollutants in stormwater runoff as a result of other construction activities, the City will continue to require

good housekeeping measures on all active construction sites. The good housekeeping regulations included in the new BMP manual address the following considerations:

- Designated areas for construction equipment maintenance and repair and prohibiting discharges of oil and grease into the storm drain system or receiving waters.
- Designated areas for construction equipment washing provided with a gravel or rock base and ensuring the wash waters are discharged to a regularly maintained temporary holding basin or sediment control device.
- Provision of storage areas for construction materials and receptacles for liquids (solvents, paints, acids) and solids in accordance with manufacturers recommendations.
- Provision of adequate waste storage areas and ensuring that the locations for collection of waste materials do not receive concentrated runoff.
- Provision of adequate sanitary facilities on construction sites in accordance with Health Department Regulations.

Many of these "good housekeeping" issues will be reviewed with the contractor, engineer, and developer during the pre-construction assistance meeting.

SWMP Task: Evaluate new BMP requirements/design modifications. Status: Ongoing.

The Stormwater and Streets ordinance section 22.5-22 authorizes the Engineering Department to compose a development design manual as the standard for which the ordinance requirements will be met. The BMP manual may be accessed on the Engineering Department web site at www.ci.knoxville.tn.us/engineering/stormwater.

The guidance criteria in the new manual describe acceptable types of BMPs, design standards, and maintenance requirements for BMPs to be used throughout the City to meet the requirements of the new Stormwater and Streets Ordinance. The guidance criteria are maintained on the Internet and distributed to developers as the official reference to ensure proper selection, design and maintenance criteria for BMPs. To ensure that effective and maintainable BMPs are constructed in the City, a standard maintenance covenant is executed before any construction plans are approved. The guidance criteria address the goals of the NPDES stormwater program by allowing only BMPs, which are effective in reducing pollutants, targeted in the NPDES stormwater regulations.

CS-3 Inspection / Enforcement

SWMP Task: Expand inspections program to include smaller (single family) construction sites. Status: Ongoing.

In the first year of the permit term, the City of Knoxville expanded new development construction inspections to include single-family residential sites. These single-family residential inspections will continue as an ongoing program during the next permit term.

SWMP Task: Increase penalties for violations to: $5000. Status: Complete

The Stormwater and Streets ordinance, section 22.5-8 Penalties, increased the penalty for violations up to $5,000 per day per violation. This ordinance was effective during year one and was included in that report. The ordinance was revised in year seven and is included in the appendix. It may be accessed on the Internet at www.ci.knoxville.tn.us/engineering/stormwater . The City has successfully implemented and collected penalties under this law.

SWMP Task: Implement Scheduled Site inspections: rough grading, E&S control installation, final grading, and final stabilization. Status: Ongoing.

The Engineering Department continues to implement site inspections for subdivision and commercial developments. These inspections are not a new program and have been occurring since at least 1994. Inspections are performed during rough grading, final grading, and at various other times during the construction process. Although the site inspections are not scheduled with the contractor or developer, the City staff may visit the construction sites approximately every week. The time frame for some project inspections will vary due to the specific project.

These inspections are performed to insure compliance with the erosion and sediment control plan, good housekeeping, and the approved design plan.

A significant improvement in this process was implemented in year seven. The developer is now allowed to begin installation of erosion controls after the submitted site development plan is approvable. After the e/s controls are in place, a licensed engineer or architect must certify the installation has been completed according to the e/s control plan. Once the certification has been received by the Engineering Department, the plan will be approved.

CS-4 Training Programs

SWMP Task: Co-Sponsor E&S Control Practice Seminars for City staff, developers, Engineers and contractors. Status: Annually.

The City and other Water Quality Forum members developed and presented free erosion and sediment control workshops throughout the first permit term. To maximize participation the workshops are typically presented in the early spring or late fall while construction activities are least intense. The workshops have been very successful.

During year seven, the City assisted UT and TDEC with promotion and presentation of the new TDEC erosion control certification program. This new certification program effectively duplicates the information the City had been providing in our annual seminars. To reduce the amount of competition for the two programs, the City will likely continue to promote and support the TDEC certification program in place of a separate erosion control workshop.

SWMP Task: Evaluate training materials from other jurisdictions. Status: Ongoing.

During the first permit term, the City of Knoxville Engineering Department has evaluated training materials and programs from various Federal, State, and local jurisdictions around the

country. This program will continue throughout the next permit term in an effort to continuously improve training programs provided and cosponsored by the City. The City will continue to evaluate training programs and materials to incorporate into the SWMP. This ongoing task should allow the City's SWMP to stay comparable with the other MS4's in the region.

Much of the information collected and reviewed by the City was used to develop the City of Knoxville's Best Management Practices manual. The manual may be used for training or information for contractors, businesses, and citizens. The City distributes the manual by free compact disk at our annual seminars and on the Internet for free download. The BMP manual may be accessed at www.ci.knoxville.tn.us/engineering/stormwater on the Engineering Department web site. The City was pleased to provide the electronic file copy of the BMP manual to the University of Tennessee Water Resources Research Center to be used as a base model BMP manual for the Phase II NPDES communities in Tennessee.

In addition to the Tennessee E&S Control Handbook, some of the training materials already compiled, reviewed, and used by the City include but are not limited to:

- ASCE & IECA Soil Erosion & Sediment Control Videos
- Beaufort County Manual for Stormwater Best Management Practices
- California Stormwater Best Management Practices Handbooks
- Caltrans Stormwater Quality Handbook
- Charlotte-Mecklenburg Stormwater Management/ Land Development Manual
- Chattanooga Stormwater Management BMP Manual (1993)
- Fairfax County, Virginia E&S Control Inspector Training Video
- Kentucky Best Management Practices for Construction Activities
- MSD Erosion Prevention and Sediment Control
- Nashville Storm Water Management Manual
- North Carolina Erosion and Sediment Control Practices Video Modules (1991)
- North Carolina Sediment Control Planning and Design Manual (1988)
- Ohio Department of Natural Resources Keeping Soil on Construction Sites Video
- State of Florida Department of Environmental Regulation, The Florida Development Manual: A Guide to Sound Land and Water Management
- State of Maine Stormwater Best Management Practices Manual
- USEPA Developing Pollution Prevention Plans and Best Management Practices for Storm Water Management for Construction Activities (1992)
- USEPA NPDES Best Management Practices Manual (1993)
- Virginia Erosion and Sediment Control Handbook (Third Edition, 1992)

5.5 EDUCATIONAL ACTIVITIES and PUBLIC OUTREACH

River Rescue — Status: Ongoing

The year 2003 was the 14th year for the River Rescue. The spring 2003 River Rescue attracted hundreds of volunteers who collected many tons of trash and tires from the shores of the Tennessee River. This annual event is coordinated through Ijams Nature Center in cooperation

with the City of Knoxville and Sea Ray Boats and more than 20 other partners, including members of the business community, government agencies, private organizations, and individuals. There are over 30 sites or "zones" that stretch from the forks of the river above Knoxville to Fort Loudoun Dam. River Rescue is also held in partnership with Lake User groups on Watts Bar Lake, Melton Hill Lake, and the Clinch River. Ijams Water Quality Specialists plan for this event throughout the year by recruiting volunteers, surveying riverbank conditions, securing additional sponsors, and pinpointing areas in need of cleanup.

Operation Storm Drain — Status: Ongoing

The Blue Thumb Coalition started this ongoing program in 1994 in an effort to educate the public that there is a difference between the stormdrain system and the sanitary sewer. Operation Storm Drain attempts to reduce the amount of pollutants dumped into our waterways through education instead of enforcement.

The message "DUMP NO WASTE, DRAINS TO STREAM" was stenciled on over ten thousand storm drains earlier in the permit term. In the last few years, the City and Ijam's Nature Center replaced the stenciling program with DAS curb markers. These brightly colored plastic disks are affixed to the curb irons and carry the message "Dump no Wastes, Drains to Stream". Although the curb markers are a temporary retrofit for the existing storm drains, they are more economical and environmentally friendly since they do not wear off as quickly as the painted stencils. When the disks were first introduced, volunteers and City staff placed several thousands of markers on storm drains in the city. Currently, several hundred of the informational disks are purchased and distributed to volunteers each year to attach to curb irons.

In the City's new permit application, a permanent version of this educational program was proposed. The City has already adopted a new development standard for all new curb irons and solid stormwater manhole covers. The new standard requires the iron to be cast with the educational message include on the top of all new curb irons and solid manhole lids. In an effort to make the curb irons more eye-catching, several foundries have cast into the iron a graphic of a fish to in addition to the environmental message. The foundries offer these designs to the surrounding communities to simplify their stock requirements. This program should offer long-term educational benefits as citizens become familiar with the message and it's meaning.

Water Quality Forum — Status: Ongoing

The Water Quality Forum was initiated in 1990 by the City of Knoxville as a cooperative network of organizations and agencies charged with monitoring and regulating regional water quality. Currently the Forum consists of 35 participating groups including but not limited to the City, CAC Americorps, TVA, UTK-WRRC, USGS, NRCS, TDEC, KKB, etc. The Forum meets quarterly as a large group and monthly within the committees.

Adopt-a-Watershed — Status: Ongoing

Currently, fifteen area high schools are participating in the program. The City of Knoxville sponsor Americorp volunteers who coordinate the program with the individual

schools. This program has helped implement the goals of the NPDES program and increased public awareness of water quality issues. The primary goals of the Adopt-a-Watershed program include:

- Characterizing the school's watershed using, at minimum, two AAW characterization tools (e.g., watershed inventory, watershed mapping, windshield survey, stream walk).
- Monitor the school's watershed stream(s), conducting, at minimum, chemical testing twice and a biological (i.e. macroinvertebrate and/or fish) assessment once.
- Conduct at least one water quality improvement activity (e.g., tree planting, storm drain stenciling, stream cleanup, stream bank restoration, presentations to school groups/community organizations on the "state of the watershed" as determined by the students' characterization/monitoring efforts).

The City will continue working with the schools and provide support such as information, solid waste support for cleanups, GIS maps, stencils, testing supplies, training, and etc.

Radio Spots- PSA's — Status: Ongoing

During the 2002/2003 Christmas/ New Year holiday season, penalty funds were used to finance water quality educational media campaign broadcast on Local News Talk Radio 99 WNOX. A series of sixty-second and thirty-second informational advertisements relating stormwater pollution prevention concepts and best management practices were produced and aired by Citadel Communications. There was also a series of 10 second "Traffic Liners" broadcast with this package in the summer and some PSAs during the radio broadcast of the Peach Bowl, which featured the University of Tennessee Volunteers. The Objective of this radio campaign was to educate the public in water quality "do's and don'ts". For maximum results, this should be considered the beginning of an ongoing educational/imaging campaign for the City of Knoxville Stormwater Management Section.

Public Displays And Presentations — Status: Ongoing

In cooperation with the COK Solid Waste Office staff presented displays and informational materials at several public events including the Dogwood Arts Festival Home Show and Earth Day Celebration. Presentations were also made to citizens through groups such as the Kuwanis Club, Boy Scouts, University of Tennessee classes and others.

6.0 MONITORING REPORTS SUMMARY

6.1 Dry-Weather Screening Program - New Outfall Inventory.

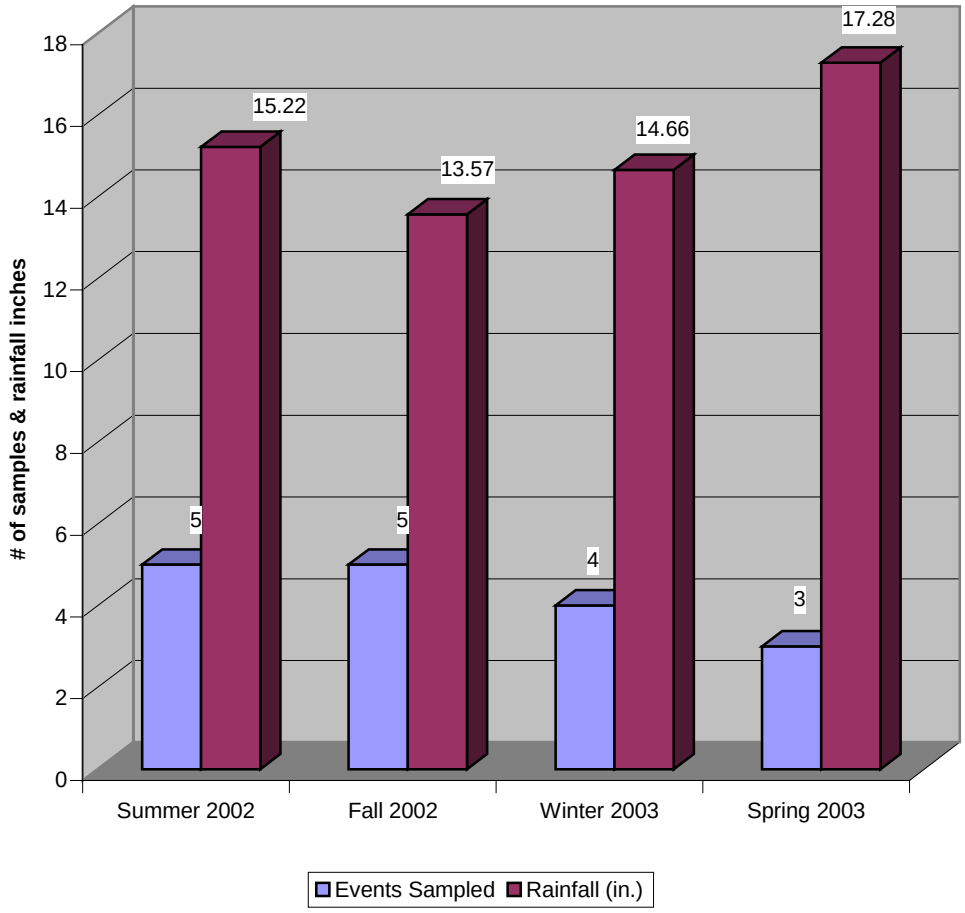
During the past Permit year, three outfalls were added to the City's outfall inventory and one outfall was removed. Outfalls are typically added as a result of re-development or annexations and removed as a result of drainage alterations. The outfalls added to the system are as follows: 00-400-0072, 02-100-0102, 02-100-0097. Due to redevelopment, outfall 01-400-0060 was deleted. All outfalls are clearly marked on the inventory map located in the appendix.

6.2 Ongoing Stormwater Monitoring Program.

6.2.1 Area Rainfall Data & Storm Event Summary.

During the July 1, 2002 to June 30, 2003 monitoring period, an average of 60.73 inches of rainfall was recorded and 17 storm events were sampled from the City's five ISCO monitoring stations. The sampling frequency requirements as described in section V of the NPDES Permit were amended this year to one storm event per season per station. However, due to equipment malfunctions and a lack of qualified storm events, the winter storm event for Loves Creek and spring storm events for First Creek and Loves Creek were not sampled (see noncompliance section 6.2.3). The graph below shows the relationship between the amount of rainfall and number of events sampled per season. Monitoring data summaries for each of the sampling locations are included for TDEC's review on the following pages.

Rainfall & Storm Event Summary



Acker Place Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2002	AP091802	Composite	8.0	147269	0.58	5	U	590	110	0.52	0.08	U	U	13	116	0.08
Quarter Average			8.0	147269	0.58	5	U	590	110	0.52	0.08	U	U	13	116	0.08
FALL 2002	AP101602	Composite	6.0	230592	0.89	2	U	103	69	0.42	0.05	0.30	0.25	3.0	68.0	0.1
Quarter Average			6.0	230592	0.89	2	U	103	69	0.42	0.05	0.30	0.25	3.0	68.0	0.1
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.46
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 125

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2003	AP013003	Composite	6.0	169896	1.09	5	U	284	128	0.57	0.05	0.26	0.2	7.0	106	0.02
Quarter Average			6.0	169896	1.09	5.0	U	284	128	0.57	0.05	0.26	0.2	7.0	106	0.02
SPRING 2003	AP050603	Composite	6.0	1349945	3.47	3	17.9	214	46	0.12	U	U	U	7	72	0.02
Quarter Average			6.0	1349945	3.47	3	17.9	214	46	0.12	U	U	U	7	72	0.02
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.46
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 125

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

First Creek Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2002	FC071102	Composite	8.0	156298	0.58	9	70	156	105	0.79	U	0.44	0.44	19.000	106.00	0.09
Quarter Average			8.0	156298	0.58	9	70	156	105	0.79	U	0.44	0.44	19.000	106.00	0.09
FALL 2002	FC121102	Composite	6.0	195862	0.53	5	9.73	308	143	1.30	0.09	0.14	U	31.000	100.000	0.050
Quarter Average			6.0	195862	0.53	5	9.73	308	143	1.30	0.09	0.14	U	31.000	100.0	0.05
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2003	FC020403	Composite	7.0	242587	0.50	7	lab error	743	133	0.84	0.0	U	U	50.000	165.000	0.08
Quarter Average			7.0	242587	0.50	7.0	----	743	133	0.84	0.0	U	U	50.000	165.000	0.08
SPRING 2003		Composite	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Quarter Average			----	----	----	----	----	----	----	----	----	----	----	----	----	----
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Loves Creek Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2002	LC080102	Composite		1212898	----	4	U	167	194	0.66	U	0.25	0.3	15.000	58.000	0.04
Quarter Average			#DIV/0!	1212898	----	4	U	167	194	0.66	U	0.25	0.3	15.000	58.000	0.04
FALL 2002	LC123102	Composite	6.5	----	0.55	3	U	81	171	0.89	0.0	0.19	0.15	5.000	30.00	0.01
Quarter Average			6.5	----	0.55	3	U	81	171	0.89	0.0	0.19	0.15	5.000	30.00	0.01
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2003		Composite	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Quarter Average			----	----	----	----	----	----	----	----	----	----	----	----	----	----
SPRING 2003		Composite	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Quarter Average			----	----	----	----	----	----	----	----	----	----	----	----	----	----
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Second Creek Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2002	SC092302	Composite	7.5	----	2.55	4	U	50	181	1.26	U	0.3	0.3	11.00	35.00	0.05
Quarter Average			7.5	----	2.55	4	U	50	181	1.26	U	0.3	0.3	11.00	35.00	0.05
FALL 2002	SC120502	Composite	6.0	5980653	1.92	8	17.9	83	106	0.54	0.1	0.21	0.1	21.000	89.000	0.04
Quarter Average			6.0	5980653	1.92	8	17.9	83	106	0.54	0.1	0.21	0.1	21.000	89.000	0.04
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2003	SC012203	Composite	7.5	1333639	0.33	13	21	108	388	1.5	0.5	0.85	0.4	24.000	132.000	0.029
Quarter Average			7.5	1333639	0.33	13	21	108	388	1.5	0.5	0.85	0.4	24.000	132.0	0.029
SPRING 2003	SC050603	Composite	6.0	981901	3.59	10	22	170	33	0.2	U	0.11	0.1	36.000	104.0	0.070
Quarter Average			6.0	981901	3.59	10	22	170	33	0.2	U	0.11	0.1	36.000	104.0	0.070
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Walden Drive Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2002	WD072502	Composite	6.5	871117	1.61	8	10.3	476	41	1.210	U	0.26	0.26	23.00	107.000	0.29
Quarter Average			6.5	871117	1.61	8	10.3	476	41	1.210	U	0.26	0.26	23.00	107.000	0.29
FALL 2002	WD120502	Composite	6.0	1199925	1.71	8	12.9	138	90	0.59	0.10	0.15	U	6.000	59.000	0.03
Quarter Average			6.0	1199925	1.71	8	12.9	138	90	0.59	0.10	0.15	U	6.000	59.00	0.03
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia	Organic nitrogen + Total nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l

WINTER 2003	WD013003	Composite	6.5	568841	1.19	12	U	1070	125	0.4	0.100	0.35	0.3	48.000	327.000	0.10
Quarter Average			6.5	568841	1.19	12	U	1070	125	0.4	0.100	0.35	0.3	48.000	327.000	0.10
SPRING 2003	WD061803	Composite	7.0	2070905	1.41	8	17.6	700	33	0.66	U	0.17	0.170	31	175	0.080
Quarter Average			7.0	2070905	1.41	8	17.6	700	33	0.66	U	0.17	0.170	31	175	0.080
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Seasonal Ambient Grab Samples 2002-2003

Summer 2002	Date	pH	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite Nitrogen	Ammonia Nitrogen	Total Kjeldahl Nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Acker Place	9/4/02	7.0	U	U	U	238	1.03	0.02	0.2	0.18	1	6	0.006
First Creek	9/4/02	8.0	U	U	U	229	1.11	0.08	0.24	0.16	2	8	0.008
Loves Creek	9/4/02	8.0	U	U	U	291	2.60	0.06	0.12	U	U	8	0.005
Second Creek	9/4/02	8.0	U	U	U	268	1.79	0.14	0.25	0.11	U	18	0.05
Walden Drive	9/4/02	8.0	U	U	11	247	1.53	U	U	U	2	16	0.009
Average		7.8	----	----	U	255	1.61	0.08	0.2	0.15	2	11	0.016

Fall 2002	Date	pH	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite Nitrogen	Ammonia Nitrogen	Total Kjeldahl Nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Acker Place	12/30/02	6.5	U	<5	U	220	1.03	<0.02	<0.1	<0.1	U	8	0.006
First Creek	12/30/02	6.0	U	<5	U	227	2.01	<0.02	0.57	0.57	2	12	0.02
Loves Creek	12/30/02	6.5	U	<5	U	288	1.76	0.16	0.29	0.13	U	11	0.03
Second Creek	12/30/02	7.0	U	<5	U	270	1.93	<0.02	0.13	0.13	U	11	0.01
Walden Drive	12/30/02	6.5	U	<5	U	233	1.26	<0.02	<0.1	<0.1	U	12.000	<0.004
Average		6.5	----	<5	U	248	1.60	0	0	0	2	10.800	0.02

Winter 2003	Date	pH	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite Nitrogen	Ammonia Nitrogen	Total Kjeldahl Nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Acker Place	3/13/03	7.5	U	U	U	205	1	0.12	U	U	U	6	U
First Creek	3/13/03	8.0	U	U	U	206	1.75	0.07	U	U	U	7	U
Loves Creek	3/13/03	8.0		U			1.66	0.4	0.24	U	U	10	0.01
Second Creek	3/13/03	8.0	U	U	U	246	1.88	U	U	U	U	13	0.01
Walden Drive	3/13/03	7.5	U	U	14	239	1.28	0.19	U	U	U	13	U
Average		7.8	----	----	----	224	1.5	0	0	----	----	9.800	0.0

Spring 2003	Date	pH	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite Nitrogen	Ammonia Nitrogen	Total Kjeldahl Nitrogen	Total Organic Nitrogen	Lead	Zinc	Total Phosphate
Acker Place	6/25/03	8.0	U	U	U	229	0.82	U	U	U	U	9	U
First Creek	6/25/03	8.0	U	U	11	234	1.57	U	U	U	2	14	0.009
Loves Creek	6/25/03	8.0	U	U	U	267	1.35	U	U	U	U	14	U
Second Creek	6/25/03	8.0	U	U	U	273	1.87	U	U	U	U	11	0.008
Walden Drive	6/25/03	8.0	U	U	68	241	1.17	U	U	U	5	57	0.02
Average		8.0	----	----	40	249	1.4	----	----	----	4	21.00	0.01

U = Analyte requested but not detected

Laboratory Analysis Summary - Seasonal Storm Sampling Program
July 1, 2002 thru June 30, 2003

Site	Quarter	pH	Average Sampled Volume	Rainfall per Event	BOD	COD	Suspended Residue	Dissolved Residue	Nitrate + Nitrite nitrogen	Ammonia nitrogen	Kjeldahl nitrogen	Total organic nitrogen	Lead	Zinc	Total phosphate
Units			cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
AP	Sum. '02	8.0	147269	0.58	5	U	590	110	0.52	0.08	U	U	13	116	0.08
	Fall '02	6.0	230592	0.89	2	U	103	69	0.42	0.05	0.3	0.25	3	68	0.09
	Wtr. '03	6.0	169896	1.09	5.0	U	284	158	0.57	0.05	0.26	0.2	7.0	106	0.02
	Spr. '03	6.0	1349945	3.47	3	17.9	214	46	0.12	U	U	U	7	72	0.02
FC	Sum. '02	8.0	156298	0.58	9	69.5	156	105	0.79	U	0.44	0.44	19	106	0.09
	Fall '02	6.0	195862	0.53	5	9.73	308	143	1.30	0.09	0.14	U	31	100	0.05
	Wtr. '03	7.0	242587	0.50	7	----	743	133	0.84	0	U	U	50	165	0.08
	Spr. '03	----	----	----	----	----	----	----	----	----	----	----	----	----	----
LC	Sum. '02		1212898	----	4	U		167	0.66	U	0.25	0.250	15	58	0.035
	Fall '02	6.5	----	0.55	3.0	U	81	171.0	0.9	0	0.19	0.150	5	30	0.01
	Wtr. '03	----	----	----	----	----	----	----	----	----	----	----	----	----	----
	Spr. '03	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SC	Sum. '02	7.5	----	2.55	4	U	50.0	181	1.26	U	0.27	0.27	11	35	0.05
	Fall '02	6.0	5980653	1.92	0.10	17.9	83	106	0.54	0.10	0.21	0.11	21	89	0.04
	Wtr. '03	7.5	1333639	0.33	13	21	108	388	1.5	0.5	0.85	0.4	24	132	0.029
	Spr. '03	6.0	981901	3.59	10	22	170	33	0.2	U	0.11	0.1	36	104	0.07
WD	Sum. '02	6.5	871117	1.61	8	10.3	476	41	1.21	U	0.26	0.26	23	107	0.29
	Fall '02	6.0	1199925	1.71	8	12.9	138	90	0.59	0.1	0.15	U	6	59	0.03
	Wtr. '03	6.5	568841	1.19	12	U	1070	125	0.4	0.1	0.35	0.3	48	327	0.1
	Spr. '03	7.0	2070905	1.41	8	17.6	700	33	0.66	U	0.17	0.17	31	175	0.08
National NURP Study Average					11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.46
Characteristics of Urban Stormwater Range					1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 125

-The above chart is comprised of seasonal averages from the data collected from each individual storm event.

-Winter (Jan., Feb., and March); Spring (April, May, and June); Summer (July, Aug., and Sept.); Fall (Oct., Nov., and Dec.)

-The Characteristics of Urban Stormwater and National NURP Study Average data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS

-AP = Acker Place Monitoring Station -LC = Loves Creek Monitoring Station

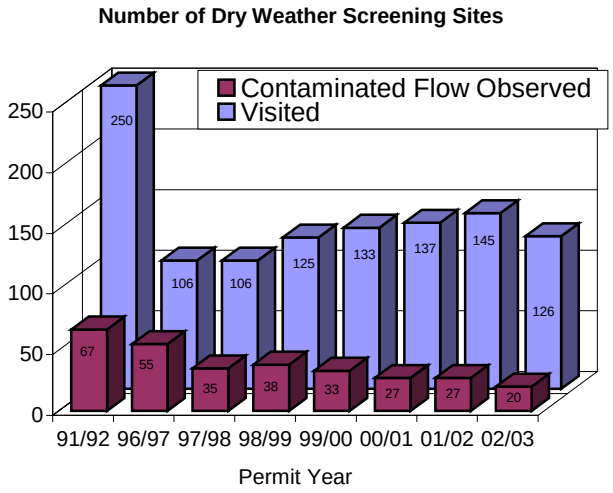
-FC = First Creek Monitoring Station -WD = Walden Drive Monitoring Station

-SC = Second Creek Monitoring Station

6.2.3 Noncompliance.

The City of Knoxville has complied with all monitoring requirements during year seven with the exception of the winter storm event for Love Creek and the spring storm event for First Creek and Love Creek. During year seven, many of the rain events were not suitable and/or the conditions were not desirable for sampling. Also, faulty equipment from the manufacturer caused malfunctions that resulted in missed storm samples at these locations.

As reported earlier in the ILL-2 section for dry-weather screening, the number of outfalls sampled in year seven was down from the expected total of 140. For several years, the City has relied on help from Americorp volunteers to perform a portion of the dry-weather screening. This year, the outfall results and field-testing forms from two watersheds were missing at the end of the year. The City staff and Americorp volunteers searched but could not find the forms or determine whether or not the outfalls had been assigned. Even without the missing outfall tests, the City still visited 126 sites four times and performed the required sampling. To minimize this type of confusion in the future, the City will reduce our reliance on outside volunteers for critical sampling. The Americorp volunteers will continue to be a vital part of the water quality efforts in the City of Knoxville but may be utilized in other capacities.



6.2.4 Estimated Runoff from Major Watersheds within the MS4 Area.

Part VI (A)(2)(e)(i)(3) of the NPDES permit requires an estimate of the total volume of urban runoff discharged by the City of Knoxville for the year. This estimate is to be based on total rainfall for the year and the estimated imperviousness of different land uses. The total rainfall for year seven was determined to be an average of the annual rainfall recorded during year seven from the five City of Knoxville monitoring stations located throughout the city and the National Weather Service rain gage at the McGhee Tyson Airport. During year seven, the average annual rainfall amount was 60.73 inches.

To estimate the total runoff volume, the City utilized the GIS to determine approximate areas for each watershed within the city limits along with the corresponding land uses. Each land use is assigned an approximated impervious percentage according to the Camp Dresser and McKee Watershed Management Model described in the Part 2 application, pages 4-14 to 4-18.

It was assumed for each watershed that 95 percent of the rainfall from the impervious fraction, and 15 percent of the rainfall from the pervious fraction of each land use was converted to runoff. Therefore the impervious runoff coefficient and the pervious runoff coefficient were assumed to be 0.95 and 0.15, respectively. For example, based upon an average annual rainfall volume of 42.99 inches/year, the average annual runoff from a single-family residential land use

(25% impervious) is 15.05 in/yr (42.99*[(0.15*0.75)+(0.95*0.25)]). The runoff coefficient for a single land use is the sum of the impervious percentage multiplied times the impervious runoff coefficient plus the pervious percentage multiplied by the pervious runoff coefficient. For the previous example, the average runoff coefficient for the single-family residential land use is 0.35 ([0.15*0.75]+[0.95*0.25]). For a watershed, the average runoff coefficient is an area weighted average of each land use runoff coefficients times the percentage of the area of each land use.

The runoff from the major watersheds within the MS4 area was estimated by a formula in Camp Dresser & Mckee's Watershed Management Module shown below:

$$Qi = P \times Ci \times Ai$$

Where,

P = total precipitation (inches/year) = 60.73 in./yr. = 5.0608 ft./yr.

C = land use area weighted runoff coefficient = 0.15*Pervious% + 0.95*Impervious%

A = drainage area (acres) = acres x (4.35E4 ft2/acre) = ft2

Q = ΣQi = total runoff rate / E6 = Mgal

Please find the analysis for the each watershed and for the entire city in table 6.2.4 on the following page.

6.3 IN-STREAM AMBIENT MONITORING PROGRAM

Ambient monitoring has evolved throughout the permit term from field testing at many locations on several creeks to laboratory analysis of grab samples. During year four, the storm event monitoring stations were relocated to in-stream locations to enhance the ambient monitoring program. Beginning in year four and throughout year seven, quarterly grab samples were taken at the monitoring station locations and delivered to the laboratory for analysis. The samples were analyzed for all of the routine parameters listed in the seasonal monitoring program requirements. Collecting the ambient samples from the same locations and analyzing them for the same parameters, as the storm event samples will establish a baseline to compare the wet and dry flows. The ambient sampling results from year seven are included in the previous section of this report.

6.4 BIOLOGICAL SAMPLING PROGRAM.

During year seven, the City contracted with the Tennessee Izaak Walton League (IWL) to study the biological health of seven urban streams Williams Creek, Baker Creek, First Creek, Second Creek, Third Creek, Fourth Creek, and Goose Creek. The IWL collected the field data and determined an Index of Biotic Integrity (IBI) for multiple locations on each creek except First Creek and Goose Creek. Those two creeks will be analyzed and included in the next annual report. The results of the IBI studies are included in the appendix.

The City has encouraged TVA to continue selecting sites within the urban environment to help track any improvement or degradation of the urban streams. Although TVA will likely be the primary source of biological testing data, the City of Knoxville will seek opportunities to expand or supplement the existing TVA biological sampling program in the new permit term.

6.2.4 ESTIMATED RUNOFF FROM MAJOR WATERSHEDS WITHIN THE MS4

Watershed	Agricul./ Forest/ Vacant, Public Parks	Vacant (>10)	Rural Res.	Single Family Res.	Private Rec., Public Land	Multi-Family Res., Church	Insti-tutional	Mining, Office/ Service	Manu-facturing/ Whole-sale	Commer., Trans./ Utility/ Commun.	Major Roads/ Hwys/ ROWs	Under Const.	Not Loaded	Total Acres in Watershed	Acres in the City Limits	Est. % Imperv-ious	C Value	Rainfall during Permit year 01/02 (in./yr)	Total Runoff for 01/02 (Mgal/yr)
Baker Cr.	412	2	107	640	90	77	32	1	1	3	269	13	27	1,674	1,674	32	0.41	60.73	1,125
East Fork	313	0	10	475	302	78	73	31	195	235	584	33	180	2,509	2,509	53	0.57	60.73	2,366
First Cr.	724	0	300	3,152	544	501	110	157	127	556	1,412	51	116	7,750	7,750	44	0.50	60.73	6,370
Fourth Cr.	965	57	423	2,026	468	406	93	206	201	568	881	61	414	6,769	5,920	41	0.48	60.73	4,654
Goose Cr.	639	40	126	669	213	67	8	21	77	131	327	34	29	2,381	1,755	35	0.43	60.73	1,236
Grassy Cr.	2,230	176	561	610	215	24	0	14	31	95	211	39	95	4,301	433	17	0.29	60.73	204
Holston R.	2,362	69	371	1,222	417	45	5	2	219	33	805	32	50	5,632	2,455	28	0.37	60.73	1,501
Inman Br.	563	33	214	138	4	12	0	0	0	0	145	0	34	1,143	99	21	0.31	60.73	51
Knob Cr.	1,719	195	481	843	125	84	1	19	1	29	296	4	169	3,966	989	19	0.30	60.73	496
Knob Fork	1,659	26	398	675	182	56	5	93	6	124	257	19	252	3,752	823	22	0.33	60.73	444
Love Cr.	1,735	102	505	1,625	311	212	51	94	178	408	1,038	46	103	6,408	5,090	36	0.44	60.73	3,697
Second Cr.	443	0	90	1,281	346	247	29	107	140	542	1,161	35	82	4,503	4,498	53	0.57	60.73	4,230
Sinking Cr.	1,614	146	459	1,266	284	90	17	33	31	267	881	12	347	5,447	2,434	33	0.41	60.73	1,663
Swanpond Cr.	3,892	303	833	604	121	36	4	79	240	232	457	65	285	7,151	499	19	0.30	60.73	250
Ten Mile Cr.	1,879	0	638	3,421	165	895	55	115	58	615	1,500	24	641	10,006	3,921	38	0.45	60.73	2,909
Third Cr.	1,757	79	436	3,003	406	512	184	124	225	443	1,252	98	220	8,739	8,417	37	0.45	60.73	6,192
TN River	7,197	503	2,269	4,681	2,910	403	187	72	170	238	990	121	1,113	20,854	8,232	22	0.33	60.73	4,437
Toll Cr.	535	69	154	222	42	26	1	0	37	4	93	42	4	1,229	767	22	0.32	60.73	407
Turkey Cr.	3,353	235	603	2,693	264	343	121	104	91	442	1,161	68	738	10,216	1,677	29	0.38	60.73	1,061
Whites Cr.	2,733	154	782	1,298	575	59	31	11	49	126	608	51	578	7,055	1,634	23	0.34	60.73	907
Williams Cr.	358	11	47	561	46	96	125	17	10	61	276	3	30	1,641	1,605	37	0.45	60.73	1,189
Woods Cr.	1,220	106	281	371	0	26	0	2	140	43	261	1	157	2,608	143	23	0.33	60.73	79
Sink-East	1,226	0		728	9	17	0	17	3	27	0	0	0	2,027	91	12	0.24	60.73	37
Beaver Cr	21,174	0	0	21,230	1,292	845	4	259	283	712	0	160	0	45,959	162	16	0.28	60.73	74
Tuckahoe	4,293	0	0	1,829	18	14	0	8	2	1	0	4	0	6,169	229	8	0.22	60.73	82
Fr.Broad riv	8,954	0	0	2,744	73	40	24	24	497	117	0	166	0	12,639	551	11	0.24	60.73	217
COK Total	73,949	2,306	10,088	58,007	9,422	5,211	1,160	1,610	3,012	6,052	14,865	1,182	5,664	192,528	64,357	25	0.35	60.73	45,878

The runoff from the major watersheds within the MS4 area was estimated by a formula in Camp Dresser & Mckee's Watershed Management Module. Q = P x C x A

where, P = total precipitation (inches/year) = 60.73 in./yr. = 5.06 ft./yr.

C = land use area weighted runoff coefficient = 0.15*Pervious% + 0.95*Impervious%

A = drainage area (acres) = acres in watershed x (4.35E4 ft2/acre) = Ai ft2

Q = total runoff rate = sum of each watershed's Qi.

Total estimated runoff for Year One = 45,878 Mgal

Approximate area and land use for each watershed was determined through the City's GIS. Total yearly rainfall amount was determined by averaging the amount of rain collected from the City's five monitoring stations located throughout the city (refer to map in appendix). Runoff coefficient (C) was calculated by adding 15 % of the pervious fraction to 95% of the impervious fraction in each watershed. This assumes that the fraction of rainfall producing runoff is 15% and 95% from pervious and impervious surfaces respectively. The summary of the runoff calculations are provided in the table above. Calculations for some of the watersheds were left out due to the insignificant amount of runoff that would be produced.

7.0 ASSESSMENT OF CONTROLS: ESTIMATED POLLUTANT LOADING REDUCTIONS FROM THE MS4.

During the seven years of the NPDES permit, the City of Knoxville has developed and implemented all of the scheduled programs. The Ongoing Monitoring Program was started in January of 1997 and resulted in the collection of 78 months of storm event data through year seven. The dry weather-screening program was implemented in year one and has continued throughout the permit term.

Any quantitative estimates of pollutant loading reductions or groundwater impacts from the MS4 may still be premature or impossible to make at this point in the program. However, as described in the dry weather-screening program (ILL-2), noticeable reductions in contaminated outfalls have been observed in the first seven years.

Although no testing data is available to substantiate all the illicit discharges and illegal dumping problems resolved, the qualitative effect on water quality within the MS4 and waters-of-the State is irrefutable. Several industries have removed illicit discharges, sections of leaking or broken sanitary sewers have been repaired and/or replaced, the last known sections of the combined sewers have been separated, unknown combined sewer systems have been located and planned for repair, creek restoration and cleanup activities have begun, and many educational and volunteer programs have been sponsored, conducted, and/or coordinated to reduce dumping.

Structural controls include two stormwater treatment oil/water separators installed at the KAT facility on First Creek and at many private developments throughout the city. Trash skimmers were installed near the mouth of some of the major creeks to capture floating pollutants before they discharge to the river. All new development of over ½ acre since 1997 has been required to install some structural controls for water quality control. Covenants are in place to require that these water quality facilities are maintained and/or replaced as needed.

All of the programs implemented to improve water quality in the creeks and river throughout the city should provide some quantitative evidence of improvement in future years. This data will be reported, as it becomes apparent.

8.0 SUMMARY OF MODIFICATIONS TO THE SWMP.

Many modifications of the SWMP are planned for year one of the new permit cycle. The proposed SWMP was updated in February of 2003 to accommodate the TMDL requirements and other issues that occurred after the reapplication was originally submitted in 2000. Since the public comment period ended on March 31, 2003, TDEC continued to accept comments and chose to alter the City's new permit to accommodate the interests of the number one polluter within the City limits (by reported volume and frequency of illegal discharges). Due to these significant changes, the City has been forced to appeal the new permit and SWMP schedule. The City is hopeful that the new unacceptable language will be removed from the polluted version of the new permit so the City's work to protect water quality may continue. Future modifications to the new SWMP will be made in accordance with 40 CFR 122.62, 122.63, 124.5 and with Part VIII of the NPDES Permit or as negotiated when the new permit is finally issued.

9.0 FISCAL ANALYSIS

The Fiscal Analysis for the seventh annual report will list the seventh permit year budget sources and amounts along with estimates for year one of the new permit. Sources of funds are listed for each major program. Due to complexity, all of the support activities such as purchasing, payroll, legal support, information systems, fleet management, and human resources are not reflected in the table. Actual funding sources for future years are subject to change in the new permit cycle due to the possibility of implementing a stormwater utility fee.

Program Description	**Fund Source**	**Actual FY 02/03**	**Est. FY 03/04**
Solid Waste Recycling (includes: composting, education, staff, etc.)	General Fund	$ 1,372,750	$ 1,390,740
Household Hazardous Waste Facility & Operation	General & Grant Funds	$ 166,530	$ 170,000
Stormwater Management Operating expenses	501 Fund or new 220 Fund	$ 1,369,240 (501 Fund)	$ 1,396,600 (220 Fund)
Service Department Operating and Maintenance (including: brush, leaf, & litter pickup; street cleaning; curb & gutter repair; catch basin cleaning and repair; ditching; storm drain repair, installation, & cleaning; seed/ sod in R.O.W.; grate replacement; water pumping; tree trimming, removal, and planting.	General Fund	$3,555,150	$2,994,479
Northwest Crossing drainage project	Bond Funds	$ 148,898	$ 351,101
Papermill Road Culverts @ 4th Creek	Bond Funds	$ 94,930	$ 1,326,569
Second Creek Floodway Study	Bond Funds	$ 6,703	0
Other Capital Improvements	Bond Funds	$ 400,000	$ 425,000
Total Estimated Stormwater Management Program Costs		**$ 7,114,201**	**$ 8,054,489**

APPENDIX A

Revised Stormwater and Streets Ordinance

Effective June 2, 2003

ARTICLE I. IN GENERAL

Section 22.5-1. Title of chapter.

This chapter shall be known and may be cited as the Stormwater and Street Ordinance of the City of Knoxville. (Ord. No. O-224-97, 6-20-97)

Section 22.5-2. Purpose.

The purpose of this chapter is to consolidate all regulations pertaining to the stormwater and local street system and to accomplish the following:

(a) Improve stormwater management;
(b) Control the discharge of pollutants to the stormwater system;
(c) Improve public safety;
(d) To comply with the City of Knoxville's NPDES Permit;
(e) Establish procedures to accomplish the above purposes.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 1, 12-30-97)

Section 22.5-3. Administration of chapter.

The Engineering Director and the engineering staff under the Director's supervision shall administer the provisions of this article. (Ord. No. O-224-97, 6-20-97)

Section 22.5-4. Definitions.

Unless specifically defined in this section, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage, and to give this chapter its most reasonable application.

1-year frequency storm - A storm event defined to be 2.5 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

2-year frequency storm - A storm event with a fifty (50) percent chance of being equaled or exceeded in a given year. Defined to be 3.3 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

5-year frequency storm - A storm event with a twenty (20) percent chance of being equaled or exceeded in any given year. Defined to be 4.1 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

10-year frequency storm - A storm event with a ten (10) percent chance of being equaled or exceeded in any given year. Defined to be 4.8 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

25-year frequency storm - A storm event with a four (4) percent chance of being equaled or exceeded in any given year. Defined to be 5.5 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

50-year frequency storm - A storm event with a two (2) percent chance of being equaled or exceeded in any given year. Defined to be 6.1 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

100-year frequency storm –A storm event with a one (1) percent chance of being equaled or exceeded in any given year. Defined to be 6.5 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

500-year frequency storm - A storm event with a one-fifth (1/5) of one (1) percent chance of being equaled or exceeded in any given year. Defined to be 7.6 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

Best Management Practices Manual (BMP Manual) – A manual produced by the City of Knoxville containing best management practices that are used on site development plans and are used on construction projects.

Blue Line Stream – Any stream shown on the 7.5 minute USGS Quad Maps.

Board of Environmental Appeals – Appointed by the Mayor and confirmed by Council to hear appeals filed by any person incurring a civil penalty or damage assessment imposed pursuant to Section 22.5-8 of the Stormwater and Street Ordinance.

Condominium (Condo) Development - A development of attached or detached units where the individual units take access from a private drive that is neither a Joint Permanent Easement nor City Right-of-Way.

Covenants for Permanent Maintenance of Stormwater Facilities – A document executed by the Property Owner and recorded with the Knox County Register of Deeds guaranteeing perpetual and proper maintenance of stormwater facilities.

Detention - A practice to store stormwater runoff by collection as a temporary pool of water and provide for its gradual (attenuated) release and thereby control peak discharge rates.

Development Certification – As built field verified plans signed and sealed by a registered professional engineer licensed to practice in the State of Tennessee, showing contours, elevations, grades, locations, drainage and hydraulic structures, and detention basin volumes.

Development, large residential and commercial - Any development, commercial, office, industrial, multiple single family lots, any non-residential use, or any development of a single residential lot with a disturbed area of ten thousand (10,000) square feet, etc.

Development, small single family residential - Development of a single recorded residential lot with less than ten thousand (10,000) square feet of disturbed area.

Discharge - Dispose, deposit, spill, pour, inject, seep, dump, leak or place by any means, or that which is disposed, deposited, spilled, poured, injected, seeped, dumped, leaked, or placed by any means including any direct or indirect entry of any solid or liquid matter into the stormwater system by any means intentional or otherwise.

Disturbed Area – Portion of any site that has been altered from existing conditions, including but not limited to the following: providing access to a site, clearing of vegetation, grading, earth moving, providing utilities and other services such as parking facilities, stormwater management and erosion control systems, potable water and wastewater systems, altering land forms, or construction or demolition of a structure on the land.

Erosion - The removal of soil particles by the action of water, wind, ice or other geological agents, whether naturally occurring or acting in conjunction with or promoted by anthropogenic activities or effects.

Extended detention - A practice to store stormwater runoff by collection as a temporary pool of water and provide for its gradual (attenuated) release over a minimum of twenty-four (24) hours and no more than seventy-two (72) hours and thereby control peak discharge rates and allow for gravity-driven settling of some types of pollutants. A practice which is used to control peak discharge rates, and which provides gravity settling of pollutants.

First flush - The initial or early stages of stormwater runoff from a storm event which commonly delivers a disproportionately large amount of previously accumulated pollutants due to the rapid rate of runoff. The first flush is defined as the first one-half (1/2) inch of direct runoff from the contributing drainage basin.

Floodplain - For a given flood event, that area of land temporarily covered by water which adjoins a watercourse.

Hydraulic - Pertaining to, involving, moved or operated by a fluid, especially water, under pressure or under a gravity-driving force.

Hydrologic - Pertaining to the scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

Illicit discharge - Any discharge to the stormwater system that is not composed entirely of stormwater and not specifically exempted in Article III.

Impervious area - Impermeable surfaces, such as pavement or rooftops, which prevent the percolation of water into the soil.

Infiltration - A practice designed to promote the recharge of groundwater by containment and concentration of stormwater in porous soils.

Infiltration basin - An impoundment made by excavation or embankment construction to contain and infiltrate runoff into the soil layer.

Land Development Manual (LDM) – Manual produced by the City of Knoxville that provides additional information about the specifics of the Stormwater and Street Ordinance.

Main stream - A stream on which floods are controlled by the Tennessee Valley Authority reservoir system, i.e., the Tennessee and Holston Rivers.

Major storm - A 100-year design storm or a storm that has a probability of one (1) percent chance in any given year.

Natural Resources Conservation Service (NRCS) – An organization within the U.S. Department of Agriculture that has published standard drainage procedures in the form of Technical Release No. 55. Formerly known as the Soil Conservation Service (SCS).

Outfall - The terminus of a stormwater system where the contents are released.

Parking Area – The off-street facility including parking spaces along with adequate provision for drivers and aisles for maneuvering and giving access, and for entrance and exit, designed to be usable for the parking of vehicles.

Peak flow - The maximum instantaneous rate of flow of water at a particular point resulting from a storm event.

Peak flow attenuation - The reduction of the peak discharge of a storm.

Performance & Indemnity Agreement – A contract between the Property Owner or Developer and the City that assures construction and compliance as per site development plans approved by the Department of Engineering.

Person - Any individual, firm, corporation, partnership, association, organization or the entity, including governmental entities, or any combination thereof.

Redevelopment - The improvement of 50% of the assessed value of the lot, building, or lot use.

Restaurant - An establishment or facility where food is prepared and sold.

Retention - A practice designed to store stormwater runoff by collection as a permanent pool of water without release except by means of evaporation, infiltration, or attenuated release when runoff volume exceeds storage capacity of the permanent pool.

Riprap - A combination of large stone, cobbles and boulders used to line channels, stabilize stream banks, and reduce runoff velocities.

Runoff - The water resulting from precipitation that is not absorbed by the soil.

Sanitary sewer - A system of underground conduits that collect and deliver sanitary wastewater to a wastewater treatment plant.

Sanitary wastewater - Wastewater from toilets, sinks and other plumbing fixtures.

Sewage - Human wastes carried by water from residences, buildings, industrial establishments or other places, together with such industrial wastes, stormwater or other water as may be present; or any substance discharged from a sanitary sewer collection system.

Sinkhole - (1) A naturally occurring depression where drainage collects in the earth's surface that is a minimum of two (2) feet deep. These depressions are typically denoted as closed contours and are shown as hatchered contours on the City of Knoxville's Geographic Information System.

(2) A hole, fissure or other opening in the ground, often underlain with limestone, dolomite or other rock formation that provides for and is being designated as a natural conduit for the passage of stormwater.

Site Development – To make a site available for use by physical alteration. Site development includes but is not limited to providing access to a site, clearing of vegetation, grading, earth moving, providing utilities and other services such as parking facilities, stormwater management and erosion control systems, potable water and wastewater systems, altering land forms, or construction or demolition of a structure on the land.

Stormwater - Runoff from rain, snow or other forms of precipitation, resulting in surface runoff and drainage.

Stormwater system - The system of roadside drainage, roadside curbs and gutters, curb inlets, swales, catch basins, manholes, gutters, ditches, pipes, lakes, ponds, sinkholes, channels, creeks, streams, storm drains, and similar conveyances and facilities, both natural and manmade, located within the city which are designated or used for collecting, storing, or conveying stormwater, or through which stormwater is collected, stored or conveyed, whether owned or operated by the municipality or other person.

Swale - A natural or manmade depression or wide shallow ditch used to route or filter runoff.

Vegetation - Collection of plant life, including trees, shrubs, bushes, and grass.

Wastes, industrial/commercial - Liquid or other wastes resulting from any process of industry, manufacture, trade or business, or from the development of any natural resources.

Wastes, other - Decayed wood; sawdust; shavings; fallen bark; fallen leaves; lawn clippings; animal wastes; used or previously applied lime; garbage; trash; refuse, loose used paper, paper products, plastic containers, or metal containers; ashes, offal, discarded tar; discarded paint; discarded or uncontained solvents; used, discarded, or spilled petroleum products, antifreeze, motor vehicle fluids; used or discarded tires, gas tanks, or chemicals; or any other used, uncontained, or unpackaged, or disposed of materials which may discharge to or otherwise enter the stormwater system.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, §§ 2--13, 12-30-97)

Section 22.5-5. Performance and Indemnity Agreement.

In order to ensure that any site development complies with the requirements of this chapter, the Engineering Director shall have the authority to require a Performance and Indemnity Agreement, together with a letter of credit, a cashier's check, or a surety bond from an approved financial institution or insurance carrier which guarantees satisfactory completion of the project and names the city as beneficiary. The security shall be in a form and in an amount to be determined by the Department of Engineering based on submission of plans and actual construction or potential remediation expenses. (Ord. No. O-224-97, 6-20-97)

Section 22.5-6. Right of entry.

The Engineering Director or his designated representatives may enter upon any property which discharges or contributes, or is believed to discharge or contribute, to stormwater runoff or the stormwater system; stream; natural drainage way; or other stormwater system during all reasonable hours to monitor, remove foreign objects or blockages, and to inspect for compliance with the provisions of this chapter.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 14, 12-30-97)

Section 22.5-7. Notice of Violation.

Whenever the Engineering Director or his representative determines that a violation of any provision of this chapter has occurred, or that work does not have a required plan or permit, or that work does not comply with an approved plan or permit, the representative may issue a Notice of Violation to the property owner, utility, facility operator, lessee, contractor, permittee, and/or the equipment operator doing work on the site. The Notice of Violation shall:

(a) Be in writing;
(b) Include a description of the property sufficient for identification of where violation has occurred;
(c) List the violation;
(d) State the action required;
(e) Provide a deadline for compliance or to stop work.

(Ord. No. O-224-97, 6-20-97)

Section 22.5-8. Penalties.

(a) Any person violating the provisions of this chapter shall be guilty of a misdemeanor and punished as provided in the general provisions of the City Code. Each day that a continuing violation of this chapter is maintained or permitted to remain shall constitute a separate offense.

(b) Any person violating the provisions of this chapter may be assessed a civil penalty by the city of not less than fifty dollars ($50.00) or more than five thousand dollars ($5,000.00) per day for each day of violation. Each day of violation shall constitute a separate violation. The city may also recover all damages proximately caused to the municipality by such violations.

(c) In assessing a civil penalty, the municipality may consider:

(1) The harm done to the public health or the environment;

(2) Whether the civil penalty imposed will be a substantial economic deterrent to the illegal activity;

(3) The economic benefit gained by the violator;

(4) The amount of effort put forth by the violator to remedy this violation;

(5) Any unusual or extraordinary enforcement costs incurred by the municipality;

(6) The amount of penalty established by ordinance or resolution for specific categories of violations; and

(7) Any equities of the situation that outweigh the benefit of imposing any penalty or damage assessment.

(d) In addition to the civil penalty in subsection (b) above, the city may recover all damages proximately caused by the violator to the municipality, which may include any reasonable expenses incurred in investigating violations and enforcing violations of this chapter.

(e) The city may bring legal action to enjoin the continuing violation of this chapter, and the existence of any other remedy, at law or in equity, shall be no defense to any such actions.

(f) The remedies set forth in this section shall be cumulative, not exclusive, and it shall not be a defense to any action, civil or criminal that one (1) or more of the remedies set forth herein has been sought or granted.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 15, 12-30-97)

Section 22.5-9. Board of Environmental Appeals.

(a) There is created a Board of Environmental Appeals (BEA) to hear appeals filed by any person incurring a civil penalty or damage assessment imposed pursuant to the Stormwater and Street Ordinance.

(b) The BEA may issue subpoenas requiring attendance of witnesses and production of such evidence as requested, administer oaths, and take testimony, as the board deems necessary to fulfill its purpose.

(c) The BEA shall be composed of five members appointed by the Mayor and confirmed by Council.

(1) The Mayor shall select appointees so that the BEA will consist of individuals with an expertise as follows:

(A) One licensed professional engineer with three (3) years of civil engineering experience as a professional engineer;

(B) One licensed professional engineer with three (3) years of experience as a professional engineer;

(C) One representative of the development or industrial community.

(D) One neighborhood representative;

(E) One member at large.

(2) BEA members shall serve for a term of five (5) years. A BEA member shall continue to serve, however, until a successor has been appointed, or until the BEA member has been reappointed. The terms of the original BEA members shall be staggered so that the term of one member shall expire each year.

(3) An appointment to succeed a BEA member who is unable to serve said member's full term shall be for the remainder of said member's term.

(4) BEA members may be reappointed, but they do not succeed themselves automatically.

(5) BEA members shall serve without compensation.

(d) The BEA shall annually select one of its members to serve as chair and another member to serve as vice-chair of the BEA by a majority vote of all members.

(e) The BEA shall keep complete and accurate records of the proceedings of all their meetings. The Department of Engineering shall designate a person to serve as secretary to the BEA.

(f) No BEA member shall participate in the appeal of any matter in which the member has a direct personal or financial interest.

(g) Three members of the BEA shall constitute a quorum, and the concurrence of a majority of the BEA present and voting in any matter shall be required for a determination of any matter within its jurisdiction.

(Ord. No. O-247-98, § 2, 5-19-98)

Section 22.5-10. Appeals.

Any person aggrieved by the imposition of a civil penalty or damage assessment as provided by this chapter may appeal said penalty or damage assessment to the Board of Environmental Appeals (BEA).

(a) The appeal shall be in writing and filed with the Law Department within thirty (30) days after the damage assessment or civil penalty is served in any manner authorized by law.

(b) Upon receipt of an appeal, the BEA shall hold a public hearing within sixty (60) days, or a later date mutually agreed upon by the parties. Ten (10) days prior notice of the time, date, and location of said hearing shall be published in a daily paper of general circulation. Ten (10) days notice shall be provided to the aggrieved party at the address provided at the time of appeal.

(c) Any alleged violator may appeal a decision of the BEA pursuant to the provisions of title 27, chapter 8 of Tennessee Code Annotated.

(d) If a petition for review of such damage assessment or civil penalty is not filed within thirty (30) days after the damage assessment or civil penalty is served in any manner authorized by law, the violator shall be deemed to have consented to the damage assessment or civil penalty, and it shall become final.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-247-98, § 1, 5-19-98)

Section 22.5-11. Severability.

Each separate provision of this chapter is deemed independent of all other provisions herein so that if any provision or provisions of this chapter shall be declared invalid, all other provisions thereof shall remain enforceable.

(Ord. No. O-224-97, 6-20-97)

Sections 22.5-12--22.5-19. Reserved.

ARTICLE II. SITE DEVELOPMENT CRITERIA

Section 22.5-20. Purpose.

This article is adopted to improve public safety, to control the rate of flow of stormwater, to minimize increases in the peak flow rates of stormwater runoff caused by site development within the city, to control new site development, to minimize any detrimental effect on water quality by the completed facility, and to avoid such effects during construction.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 16, 12-30-97)

Section 22.5-21. General design criteria.

(a) The Engineering Director or his representative has the authority to adopt site development design criteria.

(b) The standard method of drainage computation shall be as set forth in Article II, Hydrologic and hydraulic computations.

(c) The stormwater system, excluding stormwater detention ponds, water quality control facilities and sinkholes, shall be designed to accommodate a 10-year return frequency 24-hour duration storm, except for those facilities which would flood public roads classified as locals, collectors or arterials. A 25-year storm runoff prevention plan shall be used to prevent flooding of local roads and collectors, and a 50-year storm runoff prevention plan shall be used to prevent flooding of arterial streets. A 100-year design storm shall be used to prevent flooding of all new structures and have no additional impact on existing structures. For site development on blue line streams included in the Flood Insurance Study, the Flood Damage Protection Ordinance, O-347-90 (Chapter 12 of the City Code) shall govern.

(d) For drainage generated by areas greater than 200 acres, the flow for a 100-year storm shall be computed. Such flow may exceed the capacity of facilities designed to comply with the requirements of lesser floods as noted in paragraph (c) above, and shall be contained in the public right-of-way or a permanent drainage easement on the property being improved or developed. Pipes and culverts designed for a 100-year storm shall be constructed of reinforced concrete if such pipes or culverts lie in public lands or easements. Pipe materials other than reinforced concrete may be used on privately owned lands if there exists industrial, commercial, or engineering standards for use of such pipes in the application on the private land in question, and the Department of Engineering approves the use of such materials in such private applications.

(e) Where buildings are located close to a stormwater system, the proposed drainage shall be designed to prevent structural flooding in the event of a 100-year design storm.

(f) To comply with Federal mandates, protect stream water quality, and to reduce flood insurance rates for the City of Knoxville residents, development or significant redevelopment of land adjacent to or containing a blue line stream shall include the following permanent protection measures.

(1) Construction fill that alters the conveyance and/or storage capacity of the regulated floodplain is prohibited in the flood fringe one-half the linear distance between the floodway line and the 100-year floodplain line. This requirement may be waived if a drainage study prepared by a registered professional engineer licensed to practice in the State of Tennessee shows a rise of less than 0.00 ft on existing properties within 0.5 miles (upstream or downstream) of the proposed development using a method widely accepted among engineering professionals.

(2) All blue line stream banks shall be left in a stabilized condition upon completion of the project. No actively eroding bare or unstable vertical stream banks shall remain unless TDEC has determined there is no better alternative. Placement of riprap and other hard armor is only allowed when bioengineering alternatives are not feasible.

(3) A naturally vegetated and pervious streamside buffer zone shall be created, maintained, and protected from clearing, grading, filling, paving, building, or other destruction of the naturally vegetated state. Acceptable uses of this buffer zone may include but are not limited to: yards, picnic areas, walking trails, greenways, landscaped areas, wildlife habitat, primitive areas, and other non-polluting uses approved by the director. Specifically prohibited uses include but are not limited to: parking lots, dumpster storage, grease bin storage, vehicle storage/maintenance, concentrated animal lots or kennels, or other uses known to contribute pollutants to waterways. The buffer zone will extend the length of the blue line stream. The width of the buffer zone will be determined by the following criteria:

(A) Blue line streams where a floodway profile has been computed, as part of the Flood Insurance Study shall require a natural buffer measured fifty (50) feet from the center of the low flow channel or the width of the floodway, whichever is greater.

(B) Blue line streams where a floodway profile has not been computed, as part of the Flood Insurance Study but are named on the USGS 7.5 minute quadrangle map shall require a natural buffer zone measured thirty-five (35) feet from the center of the low flow channel.

(C) Blue line streams and tributaries where a floodway profile has not been computed, as part of the Flood Insurance Study and are not named on the USGS 7.5 minute quadrangle map shall require a natural buffer zone measured fifteen (15) feet from the center of the low flow channel.

(g) When existing or documented flooding problems are present, the Engineering Director has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 17, 12-30-97)

Section 22.5-22. Site development design manuals.

The Department of Engineering is authorized to adopt additional policies, criteria, specifications, and standards, for the proper implementation of the requirements of this chapter in a Land Development Manual (LDM) and a Best Management Practices (BMP) Manual. The policy, criteria, and requirements of the Land Development Manual dated February 2002, and the Best Management Practices Manual dated March 2001, as amended by the City of Knoxville's Department of Engineering, shall be enforceable consistent with other provisions of this chapter. (Ord. No. O-224-97, 6-20-97)

Section 22.5-23. Stormwater detention.

(a) The requirement for stormwater detention ponds shall apply to the following:

(1) All road construction exceeding one-half (1/2) acre of impervious area;

(2) All commercial, industrial, educational, institutional, and recreational developments of one (1) acre or more of disturbed area;

(3) Large single-family or duplex residential developments of five (5) acres or more of disturbed area or five (5) lots or more;

(4) Any site development which contains one-half (1/2) acre or more of additional impervious area.

(b) For areas of redevelopment, the engineer is charged with determining the predeveloped (before any site development had occurred) conditions, including the Curve Number. If the engineer cannot determine the predeveloped conditions, then a maximum predeveloped curve number of seventy (70) may be used to compute the predeveloped flow and satisfy the requirement. If the downstream system (to the second existing road crossing or blue line stream) is examined and found to be adequate to carry the 2 and 10-year 24-hour storms, the requirement for detention for areas of redevelopment may be waived.

(c) If in the developer's judgment, stormwater detention is either unwarranted or impractical, hydrologic and hydraulic computations to support such a conclusion and demonstrate that stormwater runoff shall not be increased in peak rate for storm events identified in the design standards for detention ponds in this chapter shall be furnished to the Department of Engineering for review.

(d) Where the development's stormwater discharges directly into a main stream, detention for peak flow attenuations is not required unless deemed necessary by the Department of Engineering. This does not exempt the developer from providing the water quality requirements.

(e) When existing or documented flooding problems are present, the Engineering director has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, §§ 18, 19, 12-30-97)

Section 22.5-24. Approval of plan required prior to issuance of building permit.

No building permit shall be issued until the required site development plan and stormwater facilities are approved by the Department of Engineering, and the portion of the property required for stormwater facilities is recorded as a permanent drainage easement.

(Ord. No. O-224-97, 6-20-97)

Section 22.5-25. Erosion and sediment control.

To comply with state, federal, and local regulations, erosion and sediment control shall be regulated by this article because of the following water quality impacts:

(a) Stormwater runoff can carry pollutants into receiving water bodies, thereby degrading water quality;

(b) The increase in nutrients in stormwater runoff such as phosphorus and nitrogen accelerates eutrophication of receiving waters;

(c) Construction requiring land clearing and the alteration of natural topography tend to increase erosion;

(d) Siltation of water bodies resulting from increased erosion decreases their capacity to hold and transport water, interferes with navigation, and harms flora and fauna;

(e) Substantial economic losses can result from these adverse impacts on community waters.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 20, 12-30-97)

Section 22.5-26. Objectives of erosion and sediment control.

In order to protect, maintain and enhance the immediate and long-term health, safety and general welfare of the citizens of the city, this article has the following objectives:

(a) Control erosion and sedimentation to limit deposition in streams and other water bodies;

(b) Facilitate the removal of pollutants in stormwater runoff to perpetuate the natural biological functions of streams.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 21, 12-30-97)

Section 22.5-27. Site development permit required before site development.

No person shall:

(a) Grade, dump, alter natural or existing topography, move or place fill material, excavate, remove any vegetation not exempted by the tree protection ordinance, or begin any site development activities without first obtaining a site development permit from the Department of Engineering.

(b) Alter any natural or manmade drainage system so as to divert, constrict, increase or change in any manner the natural or existing flow of any stream, or natural or existing drainage of any area without obtaining a site development permit from the Department of Engineering.

(c) Commence site development and/or construction of any building or structure without obtaining a site development permit from the Department of Engineering.

(d) Clear any site by means that causes disturbance of soil without first obtaining a site development permit from the Department of Engineering.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 22, 12-30-97)

Section 22.5-28. Site development permit requirements.

(a) A site development plan shall be required for any site development except when:

(1) The developed area is used for gardening or agricultural purposes;

(2) The proposed work does not, in the opinion of the Department of Engineering, affect the drainage on the site or the quality of stormwater runoff from the site;

(b) All portions of an approved site development permit for residential construction must comply with the Development Certification submitted and approved prior to the Department of Engineering signing the subdivision plat.

(c) A site development plan shall contain the following:

(1) The name, address, and telephone number of all persons having a legal interest in the property;

(2) The tax map number, group, and parcel number of the property or properties affected;

(3) Information that complies with the requirements of the Tree Protection Ordinance and the City Arborist.

(d) Additional information required on site development plans for sites based on the type of development.

(1) Small Single Family Residential Development - requires a topographic map showing the proposed area of land disturbance, the layout of the structure(s), identification of all areas of depression, blue line streams, easements, and stormwater system, and other information as required by the Engineering Director.

(2) Large Residential and Commercial Development - requires plans showing existing and proposed 2-foot contours as they relate to the roadway, parking lot, drainage facilities, cut and fill slopes, all stormwater pipe size, material and location, identification of all areas of depression, blue line streams, easements, erosion and sediment control measures, detention pond data including size, location, slope of bottom, outlet, invert, top elevations, spillway size and elevation, and the detention easement and an adequately sized traversable access easement. Also, catch basin location, elevation, slope, swales, ditches, and their stabilization treatment. Building pad contours and building pad elevations are also required when existing elevations are altered by more than 4 feet. When this site development plan includes a street to be dedicated to the city, a complete set of roadway plans must be submitted including profiles, grades, and cross sections showing cross slope, limits of construction, clear zone, utility strip, greenway/pedestrian space, signage plan, and a street-lighting plan.

(3) Plans shall be prepared and stamped by a competent licensed engineer, landscape architect, or architect registered to practice in the State of Tennessee with the following conditions:

(A) Portions of the Site Development Plan that require hydraulic or hydrology calculations and design must be prepared and stamped by a competent licensed professional engineer licensed to practice in the State of Tennessee

(B) All roads and Joint Permanent Easements that are required to be designed and built to Public Road Standards shall be designed and stamped by a competent licensed professional engineer registered in the State of Tennessee.

(e) Prior to any plat being recorded or bond being released, a Development Certification must be completed showing that all roadway lines, grades, cross slopes, locations, contours, elevations, drainage structures or facilities, and detention basin volumes, size, slopes, locations, elevations, and hydraulic structures have been field verified, represent the as-built field conditions, and comply with the approved plans. This certification must be stamped by the appropriate design professional required to stamp the original Site Development Permit as stated in Section 22.5-28(d)(3) as well as a registered land surveyor licensed to practice in the State of Tennessee.

(f) When the Department of Engineering has determined the site development plan is approvable, it will send a letter authorizing the installation of the erosion and sediment control measures. When the erosion and sediment control plan has been implemented on site, the appropriate design professional required to stamp the erosion and sediment control portion of the site development permit, will provide a letter to the Department of Engineering stating that he has inspected the site and the erosion control has been implemented as shown on the approved erosion and sediment control plan. This letter must be signed and sealed by the appropriate design professional. Once this letter is received by the Department of Engineering, the site development permit can be issued.

(g) The City Arborist and the Zoning Inspector must approve all plans prior to the issuance of a site development permit. The Metropolitan Planning Commission must approve all plans in a planned zone and overlays prior to the issuance of a site development permit.

(h) A registered Land Surveyor licensed to practice in the State of Tennessee shall prepare and submit a plat for all plans that propose stormwater facilities. The plat shall locate, establish, and define an easement around each facility and traversable access to it. The plat must be approved and recorded with the Knox County Register of Deeds before a building permit can be issued.

(i) When existing or documented flooding problems are present, the Engineering Director has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

(j) An erosion and sediment control plan must be provided as follows:

(1) Small Single Family Residential Development requires no erosion and sediment control plan except if the residential development, exclusive of agricultural, gardening, farming, and similar areas of activity, results in disturbance of more than 10,000 square feet or except as deemed necessary by the Engineering Director. When a plan is deemed necessary, the erosion and sediment control must comply with the Erosion and Sediment Control Handbook produced by the Tennessee Department of Environment and Conservation, dated July 1992, as amended by that organization or its successor, or the City of Knoxville's Best Management Practices (BMP) Manual, whichever is more restrictive.

(2) Large Residential and Commercial Development requires an erosion and sediment control plan that is stamped by a competent registered professional engineer, architect, or landscape architect licensed to practice in the State of Tennessee and complies with the Erosion and Sediment Control Handbook produced by the Tennessee Department of Environment and Conservation, dated July 1992, as amended by that organization or its successor, or the City of Knoxville's Best Management Practices (BMP) Manual, whichever is more restrictive.

(3) Portions of the erosion and sediment control plan that require hydrology or hydraulic calculations and design shall be prepared and stamped by a competent licensed professional engineer registered in the State of Tennessee.

(k) A surety bond, cashier's check, or letter of credit must be provided as follows:

(1) A Performance and Indemnity Agreement is required prior to the issuance of a site development permit for rough grading or site development when there is a potential for runoff to adversely impact city rights-of-way and other property, when sites drain into sinkholes, or when the site is used for a borrow pit. The Performance and Indemnity Agreement shall be guaranteed in the form of a cashier's check, a letter of credit, or a surety bond.

(2) A Performance and Indemnity Agreement is required for Large Residential Development when there is a potential for runoff to adversely impact city rights-of-way and other property, when sites drain into sinkholes, when the site is used for a borrow pit, a detention pond is required, or there is construction of a joint permanent easement or public road. The Performance and Indemnity Agreement shall be guaranteed in the form of a cashier's check, a letter of credit, or a surety bond. The actual amount is based on a remediation and completion estimate as determined by the Department of Engineering, with a minimum amount of $10,000.

(3) A Performance and Indemnity Agreement is required for Commercial Development when there is a potential for runoff to adversely impact city rights-of-way and other property, when sites drain into sinkholes, when the site is used for a borrow pit, a detention pond is required, or there is construction of a joint permanent easement or public road. The amount is based on the project cost estimate that includes roadway facilities, drainage facilities, and erosion and sediment control remediation. The Performance and Indemnity Agreement shall be guaranteed in the form of a cashier's check, a letter of credit, or a surety bond. The actual amount is based on a remediation and completion estimate as determined by the Department of Engineering, with a minimum amount of $10,000.

(4) A bond, cashier's check, or letter of credit is not required for Small Single Family Residential Development except when deemed necessary by the Engineering Director based on site conditions and the adverse impact on downstream conditions or other properties.

(5) The Engineering Director may refuse brokers or financial institutions the right to provide a surety bond, letter of credit, etc. based on past performance, ratings of the financial institution, or other appropriate sources of reference information.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, §§ 23--25, 12-30-97)

Section 22.5-29. Fees.

(a) The following fees shall be charged for reviewing site development plans and will be required upon the submittal of the Site Development Plans.

(1) Administrative Plat Site Development Plans:

(A)	Small Single Family Residential	$0.00
(B)	Less Than one (1) acre:	$150.00
(C)	One (1) acre to five (5) acres:	$150.00 + $20/acre (acres 1-5)
(D)	More than five acres:	$250.00 + $10/ acre (acres 6+)
(E)	Condominium Developments:	$150.00 + $5/ unit

(2) Subdivisions

(A)	One (1) to fifty (50) lots:	$150.00 + $12/ lot (lots 1-50)
(B)	Fifty-One (51) lots or more:	$750.00 + $8/ lot (lots 51+)

(b) The following fees shall be charged for site development permits and will be required before the issuance of the permit.

(1) Administrative Plat Site Development Plans without a bond:

(A)	Small Single Family Residential:	$10.00
(B)	All other projects:	$50.00

(2) Administrative Plat Site Development Plans with a bond:

(A)	Projects of less than (1) acre:	$350.00
(B)	Projects of one (1) acre or more:	$350.00 + $15/ acre
(C)	Condominium Developments:	$350.00 + $5/ unit

(3) Subdivisions:

(A)	One (1) to four (4) lots:	$150.00 + $10/ lot (lots 1-4)
(B)	Five (5) to fifty (50) lots:	$350.00 + $20/ lot (lots 1-50)
(C)	Fifty-One (51) lots or more:	$1350.00 + $5/ lot (lots 51+)

(c) The fee for a site development permit issued after site development has begun without a permit shall be ten times the standard fee.

(d) A Site Development Permit is valid for one year. A permit may be renewed before it expires at no additional cost. Once a permit expires, the appropriate permitting fee shall be charged for the renewal.

(e) If an individual permit for grading, erosion control, or drainage is requested, the appropriate permitting fee will be charged for each permit.

(f) The cost of each special pollution abatement permit shall be one hundred dollars ($100.00), which will cover the entire period of the permit.

(g) The following fees shall be charged for reviewing final plats and will be required before approval of plat:

(1)	Administrative Plat	$80.00
(2)	Exempt Subdivision and Corrected Plats	$70.00
(3)	All Other Plats:	
(A)	One (1) to fifty (50) lots	$100 + $10/ lot
(B)	Fifty-One (51) or more lots	$600 + $6/ lot (lots 51+)

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 26, 12-30-97)

Section 22.5-30. Violation of a site development permit.

No person shall perform site development work that does not conform to an approved site development plan. (Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 27, 12-30-97)

Section 22.5-31. Design standards for detention and/or retention ponds.

(a) The calculated peak flow rate of stormwater runoff resulting from a 1-year, 2-year, 5-year, 10-year, and 100-year return frequency 24-hour duration storm shall be no greater after site development of the site than that which would result from a 1-year, 2-year, 5-year, 10-year, and 100-year return frequency 24-hour duration storm on the same site prior to site development.

(b) Adequate attention must be given to safety and sanitation in the design of any detention facility. This includes, but is not limited to, a minimum of 2% slope in the bottom of all detention ponds, a minimum of 3:1 (H:V) side slopes or with traversable access to the pond's vegetated bottom and side slopes for maintenance, 15% additional storage based on the largest required design storm, a minimum of 4500 cubic feet of storage volume, and a minimum of one (1) foot of freeboard from the highest water surface elevation for the largest required design storm to the top of the berm.

(c) The plans shall include sufficient design information to show that the facility will operate as required. This shall include the existing (or before site development) peak flow discharges, the after site development peak flow discharges, and/or volumes of stormwater runoff based on the proposed site development, as well as all necessary computations used to determine the reduced peak flow rates for the design storms. The capacity of the facility shall be sufficient to control the volume of stormwater runoff resulting from 1-year, 2-year, 5-year, 10-year, and 100-year frequency 24-hour duration storms within the peak rate of flow requirements stated in the subsection.

(d) Discharge from the stormwater detention pond shall be routed to an approved ditch, channel, or stormwater facility. Calculations showing the capacity of the receiving stormwater facility and its capability to convey a 10-year frequency storm shall be provided. If the receiving stormwater facility is incapable of conveying a 10-year frequency storm, calculations showing the capacity of the receiving stormwater facility

and its capability to convey a 2-year frequency storm shall also be provided. The above calculations will be routed to the closer of the second existing street crossing or blue line stream.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 28, 12-30-97)

Section 22.5-32. Requirements for developments draining to a sinkhole.

(a) Site development on property that includes a sinkhole will require copies of the appropriate permits from the Tennessee Department of Environment and Conservation prior to site development approval. After review of the State permit, the Engineering Director may require additional information related to structural integrity and flood protection.

(b) For site development or redevelopment projects requiring attenuation or retention of the 1-year, 2-year, 5-year, 10-year, and a 100-year frequency 24-hour duration storms with sinkholes entirely on site, partially on site, or ultimately drain to a sinkhole, calculations shall be provided showing that 100-year 24-hour design storm will not flood any structures assuming plugged conditions (0 cfs outflow) for the sinkhole. These calculations must include the entire contributing watershed for the sinkhole. An easement is required around the sinkhole to include an area that is a minimum of five (5) feet horizontally outside the highest closed contour.

(c) For site development or redevelopment projects requiring attenuation or retention of the 1-year, 2-year, 5-year, 10-year, and 100-year frequency 24-hour duration storms with sinkholes partially on site, calculations must be provided showing that there will not be a rise in water surface elevations between the 100-year predeveloped and the 100-year postdeveloped design storm. An easement is required at a minimum of five (5) feet horizontally outside the highest closed contour or the section of the sinkhole located on the developed property. A rise in the 100-year water surface elevation is allowable when all parties with ownership of the sinkhole agree to allow the rise. In this case, an easement is required around the sinkhole to include an area that is a minimum of five (5) feet horizontally outside the highest closed contour.

(d) Total retention of the difference in the 100-year predeveloped and the 100-year post developed design storm is required in the following critical watersheds for site development or redevelopment projects requiring attenuation or retention of the 1-year, 2-year, 5-year, 10-year, and 100-year frequency 24-hour duration storms:

(1) Ten Mile Creek
(2) Sinking Creek
(3) Emily Ave and Timothy Ave area
(4) Harrell Hills watershed (near Cranberry Dr, Clairmont Dr, and Gaines Rd)
(5) Prosser Road #1 (immediately between north of the railroad crossing and Cherry Street)
(6) Prosser Road #2 (approximately halfway between Knoxville Zoo Dr and Magnolia Ave)
(7) Pamela Lane
(8) All areas draining to a sinkhole
(9) Any area of known flooding where deemed necessary by the Engineering Director.

(e) The overflow for the retention pond in the 1-year, 2-year, 5-year, 10-year, and 100-year design storms must meet the predeveloped discharges in addition to retaining the difference in the predeveloped and postdeveloped 100-year design storm. In basins or

sub-basins where there is a documented historical draw down time for the sinkhole or region being drained to, it may be acceptable for a detention pond to be used instead of retention. For detention to be approvable, the draw down time of the detention pond must be a minimum of one and a half times the draw down time for the region.

(f) When existing or documented flooding problems are present, the Engineering Director has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 33, 12-30-97)

Section 22.5-33. Hydrologic and hydraulic computations.

(a) All hydrologic and hydraulic computations utilized in the design of stormwater detention facilities must be prepared by a registered engineer proficient in the field of hydrology and hydraulics and licensed to practice engineering in the State of Tennessee.

(b) The required hydrologic and hydraulic computations shall be in accordance with NRCS (formerly known as the SCS) unit hydrograph procedures using AMC II curve numbers and Type II rainfall distribution, or other criteria that the Engineering Director shall establish based on scientific and engineering information. All post developed conditions must be routed at appropriately small time intervals through the detention pond using either hand calculations or computer models that are widely accepted among engineering professionals. The BMP Manual contains accepted methods and procedures.

(Ord. No. O-224-97, 6-20-97)

Section 22.5-34. Maintenance of stormwater facilities.

(a) The property owner is responsible for maintaining stormwater and/or water quality facilities located on their property. Prior to the issuance of a site development permit, the property owner shall execute and record a legal document entitled "Covenants for Permanent Maintenance of Stormwater Facilities" in the office of the Knox County Register of Deeds. The location of the facility, the recorded location of the Covenants document, and a note stating the owners' responsibility shall be shown on a plat that is also recorded in the office of the Knox County Register of Deeds.

(b) The Covenants shall specify minimum maintenance requirements and intervals to be performed by the property owner.

(c) In order to provide access to stormwater and/or water quality facilities by personnel, vehicles and equipment, the Property Owner will provide a traversable twenty (20) foot wide access within an easement from a public street in strict accord with the Plan and any conditions required by the Department of Engineering.

(d) The Covenants shall grant the City permission to enter the property to inspect any stormwater facility for proper functioning and maintenance. If the facility is not being maintained as required, the City will notify the property owner in writing. If property owner fails to repair or maintain the facility within the allotted time, the Engineering Director may authorize the work to be performed by the City or others. In such cases, property owner shall reimburse the City for double its direct and related expenses. If the property owner fails to reimburse the City, the City is authorized to file a lien for said costs against the property.

(e) Sediment removal and disposal shall be performed in accordance with all local, state, and federal laws. Guidelines for sediment removal and disposal are given in the City's LDM. The Engineering Director may stipulate additional guidelines if deemed necessary for public safety.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 29, 12-30-97)

Section 22.5-35. Acceptance of streets and stormwater systems within public rights-of-way.

No street or stormwater system shall be dedicated to the city for public use or maintained by the city as a public street, until said street and stormwater facilities have been accepted in writing by the Engineering Director. The Engineering Director shall only approve streets constructed according to the current version of "A Policy on Geometric Design of Highways and Streets", published by the American Association of State Highway and Transportation Officials, and designed by a registered engineer licensed to practice in the State of Tennessee. The design speeds for local streets in residential subdivisions shall be a minimum of thirty (30) miles per hour, unless the Engineering Director deems a different design speed appropriate. Additionally, the stormwater system and streets must conform to the city standard specifications and the city construction standards.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 30, 12-30-97)

Section 22.5-36. Water quality requirements for detention ponds.

(a) The requirements of this article shall not apply to those developments built or approved before the passage of this article.

(b) All requirements of sections 22.5-20 through 22.5-35 shall apply to this article.

(c) All stormwater detention ponds that are required under section 22.5-23 and which are approved after the adoption of this article shall be built to control water quality by using the best management practices outlined in this section. The standard management method shall be to collect the first flush or the first 4,500 cubic feet, whichever is greater, of stormwater runoff in a pond and release that runoff over a minimum 24-hour and a maximum of a 72-hour period. The Engineering Director may approve other methods of controlling water quality if valid documentation is provided which indicates that a higher level of water quality will result from the alternate method.

(Ord. No. O-224-97, 6-20-97)

Section 22.5-37. Additional permits required.

(a) Specific land uses are known to produce pollutants that are detrimental to water quality that would not be corrected by the standard methods outlined in the preceding section. A Special Pollution Abatement Permit is required to ensure that best management practices are used to control water quality for these uses. A Special Pollution Abatement Permit will be valid for a period of five (5) years, at which point it must be renewed. At the time of renewal, any deficiency in the management method must be corrected. Any development that occurs without a required permit shall be a violation of this chapter of the code.

(b) Where a federal National Pollutant Discharge Elimination System (NPDES) permit has been issued for NPDES regulated stormwater discharges from a facility, no local permit will be required for those NPDES regulated stormwater discharges from the facility for which such permit has been issued.

(c) A Special Pollution Abatement Permit shall be required for the following land uses:

(1) Vehicle, truck or equipment maintenance, fueling, washing or storage areas including but not limited to: automotive dealerships, automotive repair shops, and car wash facilities;

(2) Any property containing more than 400 parking spaces, or 120,000 square feet of impervious parking area;

(3) Recycling and/or salvage yard facilities;

(4) Restaurants, grocery stores, and other food service facilities;

(5) Commercial facilities with outside animal housing areas including animal shelters, fish hatcheries, kennels, livestock stables, veterinary clinics, or zoos;

(6) Other producers of pollutants identified by the Engineering Director by information provided to or collected by him or his representatives, or reasonably deduced or estimated by him or his representatives from engineering or scientific study.

(d) Permits may be required from various state and federal agencies before a site development permit will be issued by the City of Knoxville.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 31, 12-30-97)

Section 22.5-38. Technical requirements for Special Pollution Abatement permits.

Technical requirements for the permit shall be based on the current best management practices subject to the approval of the Department of Engineering. (Ord. No. O-224-97, 6-20-97)

Section 22.5-39. NPDES permits.

(a) Any person who holds an individual National Pollutant Discharge Elimination System (NPDES) permit shall provide a copy of such permit to the Engineering Director no later than sixty (60) calendar days after issuance or renewal of the permit.

(b) Any person who holds an NPDES general permit and/or multi-sector permit (as distinct and different from an individual permit) shall provide either a copy of such permit or the permit number assigned to them by the Tennessee Department of Environment and Conservation to the Engineering Director no later than sixty (60) calendar days after issuance of the permit.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 34, 12-30-97)

Sections 22.5-40--22.5-49. Reserved.

ARTICLE III. ILLICIT CONNECTIONS AND ILLEGAL DUMPING

Section 22.5-50. Findings of fact.

The city council finds that the uncontrolled discharge of pollutants to the stormwater system has an adverse impact upon the water quality of the receiving waters.

(a) The 1987 amendments to the Federal Water Pollution Control Act, commonly known as the Clean Water Act, established the National Pollutant Discharge Elimination System (NPDES) program, which requires permits for discharges from stormwater systems into waters of the United States. The Environmental Protection Agency has promulgated regulations implementing the NPDES program.

(b) The NPDES regulations for stormwater discharges require certain municipalities, including the City of Knoxville, to:

(1) Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to municipal stormwater systems by stormwater discharges associated

with industrial activity and the quality of stormwater discharged from sites of industrial activity;

(2) Prohibit through ordinance, order or similar means, illicit discharges to the stormwater system;

(3) Control through ordinance, order or similar means, discharges to the stormwater system of spills, dumping or disposal of materials other than stormwater;

(4) Require compliance with conditions in ordinances, permits, contracts or orders; and

(5) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions, including the prohibition of illicit discharges to the stormwater system.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 36, 12-30-97)

Section 22.5-51. Objectives.

This chapter is adopted as part of the city stormwater management program in order to prevent certain non-stormwater discharges to, and improper disposal of substances in, the stormwater system, as to reduce, to the maximum extent practicable, pollutants that may be present in discharges from the stormwater system. (Ord. No. O-224-97, 6-20-97)

Section 22.5-52. Prohibitions.

(a) No person shall:

(1) Connect, or allow to be connected, any sanitary sewer to the stormwater system, including any sanitary sewer connected to the stormwater system as of the date of adoption of this chapter; Illicit discharges include, but are not limited to:

(A) Sewage discharges or overflows, including Sanitary Sewer Overflows (SSOs);

(B) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;

(C) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;

(D) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc;

(E) Discharges of wash water from the cleaning or hosing of impervious surfaces in industrial and commercial areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards, and outdoor eating or drinking areas, etc.;

(F) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;

(G) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(H) Discharges of sediment, or construction-related wastes, etc.;

(I) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

(2) Cause or allow an illicit discharge to the stormwater system, or any component thereof, or onto driveways, sidewalks, parking lots, sinkholes, creek banks, or other areas draining to the stormwater system.

(b) Subject to the provisions of subsection (c), the following discharges shall not be in violation of this chapter:

(1) Water line flushing;

(2) Landscape irrigation;

(3) Diverted stream flows or rising groundwater;

(4) Infiltration of uncontaminated groundwater [as defined at 40CFR35.2005(20)] to separate storm drains;

(5) Pumping of uncontaminated groundwater;

(6) Discharges from potable water sources, foundation drains, uncontaminated air conditioning condensation, irrigation waters, springs, water from crawl space pumps, or footing drains;

(7) Lawn watering;

(8) Individual noncommercial car washing on residential properties; or car washing of less than two (2) consecutive days in duration for a charity, nonprofit fund raising, or similar noncommercial purpose;

(9) Flows from riparian habitats and wetlands;

(10) Dechlorinated swimming pool discharges;

(11) Incidental street wash water from street cleaning equipment designed for cleaning paved surfaces and limiting waste discharges;

(12) Street deicing for public safety;

(13) Any activity authorized by a valid NPDES permit; and

(14) Any flows resulting from firefighting.

(c) If the Engineering Director finds that any of the activities listed in subsection (b) above are found to cause or may cause sewage, industrial wastes or other wastes to be discharged into the stormwater system, the Director shall so notify the person performing such activities, and shall order that such activities be stopped or conducted in such a manner as to avoid the discharge of sewage, industrial wastes or other wastes into the stormwater system.

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, §§ 37--41, 12-30-97)

Section 22.5-53. Notification of spills and illicit discharges.

As soon as any person has knowledge of any illicit spills or discharges to the stormwater system in violation of this chapter, such person shall immediately notify the Engineering Director by telephone of this discharge. If such person is directly or indirectly responsible for such discharge or responsible for the operation of the system or business, then such person shall also take immediate action to ensure the containment and cleanup of such discharge and shall confirm such telephone notification with a written report to the Engineering Director within three (3) calendar days. At a minimum, the written report for any illicit discharge shall include:

i. Date and time of the discharge
ii. Location of the discharge
iii. Material or substance discharged
iv. Duration and rate of flow
v. Total volume discharged

vi. Total volume recovered
vii. Cause or reason for the discharge
viii. Remediation and containment action taken
ix. Material Safety Data Sheets (MSDS) for the discharged material
x. Action taken to prevent further discharges
xi. Description of any environmental impact

(Ord. No. O-224-97, 6-20-97; Ord. No. O-666-97, § 42, 12-30-97)

Section 22.5-54. Requirements for monitoring.

The Engineering Director may require any person engaging in any activity or owning any property, building or facility (including but not limited to a site of industrial activity) to undertake such reasonable monitoring of any discharge(s) to the stormwater system operated by the city and to furnish periodic detailed reports of such discharges.
(Ord. No. O-224-97, 6-20-97)

Sections 22.5-55—22.5-60. Reserved.

This Ordinance shall take effect seventeen days from and after its passage, the welfare of the City requiring it.

Mayor Victor Ashe
Presiding Officer of the Council

Cindy Mitchell
Recorder

APPENDIX B

Summary of Dry Weather Screening Results

1. List of outfalls tested during year seven with status (5 pages)
2. Table of testing results for outfalls with dry-weather flow (5 pages)

Dry Weather Screening – Sample Events for 2003

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
00-400-0050	DRY	08/23/2002	08/23/2002	10/02/2002	10/02/2002
00-400-0060	DRY	09/30/2002	09/30/2002	10/31/2002	10/31/2002
00-400-0065	DRY	07/12/2002	07/12/2002	08/16/2002	08/16/2002
00-400-0070	DRY	07/12/2002	07/12/2002	08/16/2002	08/16/2002
00-500-0075	ILLICIT CONNECTION	08/23/2002	08/23/2002	10/02/2002	10/02/2002
00-400-0080	DRY	07/12/2002	07/12/2002	08/16/2002	08/16/2002
00-400-0085	DRY	07/12/2002	07/12/2002	08/16/2002	08/16/2002
00-400-0090	DRY	07/12/2002	07/12/2002	08/16/2002	08/16/2002
00-400-0095	DRY	07/12/2002	07/12/2002	08/16/2002	08/16/2002
00-500-0100	DRY	08/23/2002	08/23/2002	10/02/2002	10/02/2002
00-400-0105	DRY	07/22/2002	07/22/2002	08/22/2002	08/22/2002
00-500-0110	DRY	07/22/2002	07/22/2002	08/22/2002	08/22/2002
00-100-0115	DRY	07/22/2002	07/22/2002	08/22/2002	08/22/2002
00-400-0120	DRY	07/22/2002	07/22/2002	08/22/2002	08/22/2002
00-400-0125	DRY	07/25/2002	07/25/2002	08/29/2002	08/29/2002
00-400-0130	DRY	07/25/2002	07/25/2002	08/29/2002	08/29/2002
00-400-0135	DRY	07/25/2002	07/25/2002	08/29/2002	08/29/2002
00-100-0140	DRY	07/25/2002	07/25/2002	08/29/2002	08/29/2002
00-400-0145	DRY	08/23/2002	08/23/2002	10/02/2002	10/02/2002
00-400-0150	DRY	07/25/2002	07/25/2002	08/29/2002	08/29/2002
00-400-0155	DRY	08/23/2002	08/23/2002	10/02/2002	10/02/2002
00-500-0160	DRY	10/03/2002	10/03/2002	11/14/2002	11/14/2002
00-100-0165	DRY	08/05/2002	08/05/2002	09/11/2002	09/12/2002
00-400-0170	DRY	09/30/2002	09/30/2002	10/31/2002	10/31/2002
00-200-0175	DRY	10/03/2002	10/03/2002	11/14/2002	11/14/2002

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
00-100-0180	DRY	08/05/2002	08/05/2002	09/11/2002	09/12/2002
00-100-0185	DRY	08/05/2002	08/05/2002	09/11/2002	09/12/2002
00-400-0190	DRY	08/05/2002	08/05/2002	09/11/2002	09/12/2002
00-400-0215	ILLICIT CONNECTION	08/21/2002	08/21/2002	10/01/2002	10/01/2002
00-400-0265	WET	08/21/2002	08/21/2002	10/01/2002	10/01/2002
00-300-0285	ILLICIT CONNECTION	10/18/2002	10/18/2002	11/20/2002	11/20/2002
00-100-0290	DRY	08/21/2002	08/21/2002	10/01/2002	10/01/2002
00-100-0300	ILLICIT DUMP	08/21/2002	08/21/2002	10/01/2002	10/01/2002
00-400-0340	ILLICIT CONNECTION	10/03/2002	10/03/2002	11/14/2002	11/14/2002
00-400-0365	ILLICIT DUMP	10/18/2002	10/18/2002	11/20/2002	11/20/2002
00-500-0490	DRY	10/03/2002	10/03/2002	11/14/2002	11/14/2002
00-400-0495	DRY	08/13/2002	08/13/2002	09/30/2002	09/30/2002
00-400-0500	DRY	08/13/2002	08/13/2002	09/30/2002	09/30/2002
00-100-0505	DRY	08/13/2002	08/13/2002	09/30/2002	09/30/2002
00-400-0510	DRY	08/13/2002	08/13/2002	09/30/2002	09/30/2002
01-300-0060	ILLICIT CONNECTION	12/30/2002	12/30/2002	03/11/2003	03/11/2003
01-300-0095	ILLICIT CONNECTION	12/30/2002	12/30/2002	03/11/2003	03/11/2003
01-300-0150	WET	10/22/2002	10/23/2002	11/25/2002	11/25/2002
01-300-0160	ILLICIT CONNECTION	10/22/2002	10/22/2002	11/25/2002	11/25/2002
01-100-0230	ILLICIT CONNECTION	10/22/2002	10/23/2002	11/25/2002	11/25/2002
01-300-0520	ILLICIT DUMP	10/22/2002	10/23/2002	11/25/2002	11/25/2002
02-400-0045	ILLICIT CONNECTION	12/30/2002	12/30/2002	03/11/2003	03/12/2003
02-400-0050	ILLICIT CONNECTION	12/30/2002	12/30/2002	03/11/2003	03/12/2003
02-400-0115	DRY	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-400-0120	WET	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-400-0125	DRY	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-100-0130	DRY	03/10/2003	03/10/2003	01/07/2003	01/07/2003

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
02-100-0135	DRY	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-400-0140	ILLICIT CONNECTION	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-400-0145	DRY	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-400-0150	DRY	03/10/2003	03/10/2003	01/07/2003	01/07/2003
02-300-0165	ILLICIT CONNECTION	01/08/2003	01/09/2003	03/27/2003	03/27/2003
		06/10/2003	06/10/2003		
02-400-0169	ILLICIT CONNECTION	01/08/2003	01/09/2003	03/27/2003	03/27/2003
		06/10/2003	06/10/2003		
03-300-0005	DRY	05/29/2003	05/29/2003	06/18/2003	06/19/2003
03-100-0045	WET	05/29/2003	05/29/2003	06/18/2003	06/19/2003
03-100-0490	DRY	01/09/2003	01/09/2003	02/03/2003	02/03/2003
03-400-0495	DRY	01/09/2003	01/09/2003	02/03/2003	02/03/2003
03-400-0500	DRY	01/09/2003	01/09/2003	02/03/2003	02/03/2003
03-400-0505	DRY	01/09/2003	01/09/2003	02/03/2003	02/03/2003
03-400-0510	DRY	01/09/2003	01/09/2003	02/03/2003	02/03/2003
03-400-0515	DRY	01/09/2003	01/09/2003	02/03/2003	02/03/2003
03-300-0615	WET	01/09/2003	01/09/2003	03/27/2003	03/27/2003
		06/18/2003	06/19/2003	07/08/2002	07/08/2002
03-300-0625	DRY	07/08/2002	07/08/2002		
03-300-0630	DRY	07/08/2002	07/08/2002		
03-300-0640	DRY	07/08/2002	07/08/2002		
03-300-0645	DRY	07/08/2002	07/08/2002		
03-300-0655	WET	01/09/2003	01/09/2003	03/27/2003	03/27/2003
		06/18/2003	06/18/2003	07/08/2002	07/08/2002
03-300-0660	DRY	07/08/2002	07/08/2002		
03-400-0665	WET	07/08/2002	07/08/2002		
03-300-0670	DRY	07/08/2002	07/08/2002		

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
03-300-0675	DRY	07/08/2002	07/08/2002		
05-500-0205	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
05-400-0230	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-400-0035	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-400-0040	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-400-0045	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-200-0050	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-400-0070	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-400-0075	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-400-0080	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
06-100-0085	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
07-400-0070	ILLICIT CONNECTION	04/02/2003	04/02/2003	05/13/2003	05/13/2003
07-400-0150	DRY	01/10/2003			
07-400-0155	DRY	01/10/2003			
07-400-0160	DRY	01/10/2003			
07-400-0165	DRY	01/10/2003			
07-400-0170	DRY	01/10/2003			
07-100-0175	DRY	01/10/2003			
07-400-0180	DRY	01/10/2003			
07-400-0185	DRY	01/10/2003			
07-400-0190	DRY	01/10/2003			
07-400-0195	DRY	01/10/2003			
08-200-0005	DRY	05/13/2003	05/13/2003	04/02/2003	04/02/2003
		06/10/2003	06/10/2003		
08-400-0025	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
08-200-0030	DRY	05/27/2003	05/27/2003		
08-400-0035	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
08-400-0040	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
08-400-0045	DRY	05/27/2003	05/27/2003	06/27/2003	06/27/2003
10-500-0025	DRY	05/30/2003	05/30/2003	06/30/2003	06/30/2003
10-500-0035	DRY	05/30/2003	05/30/2003	06/30/2003	06/30/2003
10-500-0045	DRY	05/30/2003	05/30/2003	06/25/2003	06/26/2003
10-200-0050	DRY	05/30/2003	05/30/2003	06/25/2003	06/26/2003
10-400-0055	DRY	05/30/2003	05/30/2003	06/25/2003	06/26/2003
10-400-0060	DRY	05/30/2003	05/30/2003	06/25/2003	06/26/2003
10-500-0065	DRY	05/30/2003	05/30/2003	06/25/2003	06/26/2003
11-200-0600	WET	04/30/2003	05/01/2003	06/20/2003	06/20/2003
11-300-0602	DRY	04/30/2003	05/01/2003	06/20/2003	06/20/2003
11-500-0620	ILLICIT CONNECTION	05/01/2003	05/01/2003	06/20/2003	06/20/2003
12-400-0005	DRY	05/27/2003	05/27/2003	06/23/2003	06/24/2003
12-400-0010	DRY	05/27/2003	05/27/2003	06/23/2003	06/24/2003
12-400-0015	DRY	05/27/2003	05/27/2003	06/23/2003	06/24/2003
12-500-0020	DRY	05/27/2003	05/27/2003	06/23/2003	06/24/2003
12-500-0025	DRY	05/27/2003	05/27/2003	06/23/2003	06/24/2003
13-300-0135	ILLICIT CONNECTION	05/28/2003	05/28/2003	06/23/2003	06/24/2003
13-300-0190	WET	05/28/2003	05/28/2003	06/23/2003	06/24/2003
53-400-0110	ILLICIT DUMP	05/28/2003	05/29/2003	06/24/2003	06/25/2003
53-100-0115	DRY	05/28/2003	05/29/2003	06/24/2003	06/25/2003
53-500-0120	DRY	05/28/2003	05/29/2003	06/24/2003	06/25/2003
71-400-0600	DRY	05/27/2003	05/28/2003	06/24/2003	06/25/2003
79-500-0005	WET	05/27/2003	05/28/2003	06/24/2003	06/25/2003
91-100-0500	WET	05/29/2003	05/29/2003	06/24/2003	06/25/2003

Dry Weather Screening Data

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
00-100-0300																
2003	8/21/02	1	Yes	19	7.0	0.30	0	0	0	0	No	0	25	No	No	No
	8/21/02	2	Yes	19	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	10/01/02	3	Yes	7	7.0	0.30	0	0	0	0.40	No	0	0	No	No	No
	10/01/02	4	Yes	14	7.0	0.80	0	0	0	0	No	0	0	No	No	No
00-300-0285																
2003	10/18/02	1	Yes	30	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	10/18/02	2	Yes	30	7.0	0.60	0	0	0	0	No	0	0	No	No	No
	11/20/02	3	Yes	TOO LOW	7.0	0	0	0	0.50	0	No	0	0	No	No	No
	11/20/02	4	Yes	TOO LOW	8.0	0	0	0	0	0	No	0	0	No	No	No
00-400-0215																
2003	8/21/02	1	Yes	0.83	6.0	0.40	0	0	0	1.50	No	0	0	No	No	No
	8/21/02	2	Yes	0.76	6.0	0.40	0	0	0	1.50	No	0	0	No	No	No
	10/1/02	3	Yes	0.95	5.0	0.80	0	0	0	1.00	No	0	0	No	No	No
	10/1/02	4	Yes	0.95	5.0	0.80	0	0	0	1.00	No	0	0	No	No	No
00-400-0265																
2003	8/21/02	1	Yes	2	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	8/21/02	2	Yes	2	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	10/1/02	3	Yes	0.30	7.5	1.00	0	0	0	0	No	0	0	No	No	No
	10/1/02	4	Yes	0.30	7.0	1.00	0	0	0	0	No	0	0	No	No	No
00-400-0340																
2003	10/3/02	1	Yes	0.45	6.0	0.60	0	0.10	0	10.00	No	0	30	No	No	No
	10/3/02	2	Yes	0.45	6.0	0.60	0	0.40	0	10.00	Yes 210	0	40	No	No	No
	11/14/02	3	Yes	0.09	6.0	0.40	0	0.20	0	10.00	No	0	30	No	No	No
	11/14/02	4	Yes	0.09	6.5	0.60	0.60	0.20	2	10.00	No	0	100	No	No	No
00-400-0365																
2003	10/18/02	1	Yes	TLTM	7.0	0	0.10	0	0.75	0	No	0	0	No	No	No
	11/20/02	3	Yes	SAMPLED	7.0	0	0.20	0	0	0	No	0	0	No	No	No
	11/20/02	4	Yes	SAMPLED	7.0	0.60	0.20	0	0	0	No	0	0	No	No	No

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
00-500-0075																
2003	10/2/02	3	Yes	0.11	8.0	0.80	0	0	0	0.80	No	0	65	No	No	No
	10/2/02	4	Yes	0.11	8.0	0.30	0.40	0	0	2.00	Yes 27,000	0	100	No	No	No
01-100-0230																
2003	10/22/02	1	Yes	0.60	7.0	0.20	0	0	0	0	No	0	0	No	No	No
	10/23/02	2	Yes	0.60	7.0	0	0.10	0	0	0	No	0	0	No	No	No
	11/25/02	3	Yes	0.63	7.0	0.30	0	0	3	0.30	No	0	0	No	No	No
	11/25/02	4	Yes	0.63	7.0	0	0	0	2	0.40	No	0	0	No	No	No
01-300-0060																
2003	12/30/02	1	Yes	0.59	7.5	0.10	1.00	0	0.25	0.80	No	0	0	No	No	No
	12/30/02	2	Yes	0.59	7.5	0.10	0	0	0	1.00	Yes 20,000	0	0	No	No	No
	3/11/03	3	Yes	1	7.0	0.10	0	0	0	0.60	No	0	20	No	No	No
	3/11/03	4	Yes	1	7.5	0.40	0	0	0	0.80	No	0	0	No	No	No
01-300-0095																
2003	12/30/02	1	Yes	0.32	6.5	2.50	0	0	0	0	No	0	0	No	No	No
	12/30/02	2	Yes	0.32	6.5	3.00	0	0	0	0	No	0	0	No	No	No
	3/11/03	3	Yes	TLTM	6.5	0.30	0	0	0	0	No	0	0	No	No	No
	3/11/03	4	Yes	TLTM	7.0	0.80	0	0	0	0	No	0	0	No	No	No
01-300-0150																
2003	10/22/02	1	Yes	2	7.0	0.20	0	0	0	0	No	0	0	No	No	No
	10/23/02	2	Yes	2	7.0	0.60	0	0	0	0	No	0	0	No	No	No
	11/25/02	3	Yes	38	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	11/25/02	4	Yes	38	7.0	0.10	0	0	0	0	No	0	0	No	No	No
01-300-0160																
2003	10/22/02	1	Yes	7	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	10/22/02	2	Yes	7	7.0	0.80	0	0	0	0	No	0	0	No	No	No
	11/25/02	3	Yes	19	7.0	0.90	0	0	0	0	No	0	0	No	No	No
	11/25/02	4	Yes	19	7.0	0.60	0	0	0	0	No	0	0	No	No	No
01-300-0520																
2003	10/22/02	1	Yes	2	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	10/23/02	2	Yes	2	7.0	0.60	0	0	0.25	0	No	0	0	No	No	No
	11/25/02	3	Yes	11	7.0	0.60	0	0	0	0	No	0	0	No	No	No
	11/25/02	4	Yes	11	7.0	0	0	0	0	0	No	0	0	No	No	No

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
02-300-0165																
2003	1/8/03	1	Yes	SLOW PC	7.0	0	0	0	0	0	No	0	0	No	No	No
	1/9/03	2	Yes	SLOW PC	7.5	0	0	0	0	0	No	0	0	No	No	No
	3/27/03	3	Yes	SLOW	7.0	0.80	0	0	0	0	No	0	0	No	No	Yes
	3/27/03	4	Yes	SLOW	7.0	0.30	0	0	0	0	No	50	20	**	OILY	No
	6/10/03	5	Yes	IMMEASU	7.0	0.60	0	0	0	0	No	0	0	No	No	No
02-400-0045																
2003	12/30/02	1	Yes	0.79	7.0	0.40	0	0	0	0	No	0	20	No	No	No
	12/30/02	2	Yes	0.79	6.0	0	0	0	0	0	No	0	0	No	No	No
	3/11/03	3	Yes	1	7.0	0.60	0.10	0	0	0.30	No	0	0	No	No	No
	3/12/03	4	Yes	0.90	7.0	0.80	0.10	0	0.25	0.10	No	0	0	No	No	No
02-400-0050																
2003	12/30/02	1	Yes	0.08	6.5	3.00	0	0	0	0	No	0	0	No	No	No
	12/30/02	2	Yes	0.08	6.5	3.00	0	0	0	0	No	0	0	No	No	No
	3/11/03	3	Yes	0.12	6.0	3.00	0	0	0	0	No	0	0	No	No	No
	3/12/03	4	Yes	0.12	7.0	3.00	0	0	0	0	No	0	0	No	No	No
02-400-0120																
2003	1/7/03	3	Yes	0.03	6.0	0	0	0	0	0	No	0	0	No	No	No
	1/7/03	4	Yes	0.52	5.5	0	0	0	0	0	No	0	0	No	No	No
	3/10/03	1	Yes	0.04	5.5	0.60	0	0	0	0	No	0	0	No	No	No
	3/10/03	2	Yes	0.05	6.0	0.40	0	0	0	0.10	No	0	0	No	No	No
02-400-0140																
2003	1/7/03	3	Yes	2	5.0	0.40	0	0	0	9.00	Yes 46,000	30	30	***	****	No
	1/7/03	4	Yes	SIGNIFIC							No		0	No	No	No
	3/10/03	1	Yes	SIGNIFIC							No		0	No	No	No
	3/10/03	2	Yes	SIGNIFIC							No		0	No	No	No
02-400-0169																
2003	1/8/03	1	Yes	5	7.0	0	0	0	0	0	No	0	0	No	No	No
	1/9/03	2	Yes	5	7.5	0	0	0	0	0	No	0	0	No	No	No
	3/27/03	3	Yes	10	7.0	0.80	0	0	0	0.10	No	0	0	No	No	No
	3/27/03	4	Yes	10	7.5	0.40	0	0	0.50	0.30	No	0	0	No	No	No
	6/10/03	5	Yes	3	7.5	0.30	0	0	0	0	No	0	0	No	No	No
	6/10/03	6	Yes	3	7.5	0.60	0	0	0	0	No	0	0	No	No	No

** PETROL *** SEWAGE **** FLOATIES

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
03-100-0045																
2003	5/29/03	1	Yes	18	7.0	0	0	0	0	0	No	0	0	No	No	No
03-300-0615																
2003	1/9/03	1	Yes	SLOW PC	7.0	0	0	0	0	0	No	0	30	No	0	No
	1/9/03	2	Yes	SLOW PC	7.0	0	0	0	0	0	No	0	30	**	***	Yes
	3/27/03	3	Yes	TRICKLE	7.0	0.30	0	0	0	0	No	0	30	No	No	No
	3/27/03	4	Yes	TRICKLE	7.0	0	0	0	0	0	No	0	0	No	No	No
	6/18/03	5	Yes	IMMEASU	7.0	0	0	0	1	0	No	0	0	No	No	No
	6/19/03	6	Yes	IMMEASU	7.0	0.30	0	0	0.50	0	No	0	0	No	No	No
03-300-0655																
2003	1/9/03	1	Yes	0.71	7.0	0	0	0	0	0	No	0	0	No	No	No
	1/9/03	2	Yes	0.88	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	6/18/03	6	Yes	6	7.0	0.40	0	0	0.25	0	No	50	30	No	No	No
03-400-0665																
2003	7/8/02	1	Yes	0.29	8.0	0	0	0	0	0	No	0	0	No	No	No
	7/8/02	2	Yes	0.29	8.0	0	0	0	0	0	No	0	0	No	No	No
07-400-0070																
2003	4/2/03	1	Yes	0.80	7.0	0.60	0	0	0	0.80	No	50	0	No	No	No
	4/2/03	2	Yes	0.95	7.0	0.40	0	0	0	0.60	No	0	25	No	No	No
	5/13/03	3	Yes	1	7.0	0.60	0	0	0.50	0.10	No	0	0	No	No	No
	5/13/03	4	Yes	1	7.0	0.30	0	0	0.25	0.10	No	0	0	No	No	No
11-200-0600																
2003	4/30/03	1	Yes	IMMEASU	7.0	0.20	0	0	0	0	No	0	0	No	No	No
	5/1/03	2	Yes	IMMEASU	7.5	0	0	0	0	0	No	0	0	No	No	No
11-500-0620																
2003	5/1/03	1	Yes	STANDIN	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	5/1/03	2	Yes	STANDIN	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	6/20/03	3	Yes	IMMEASU	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	6/20/03	4	Yes	IMMEASU	7.0	0.20	0	0	0	0	No	0	0	No	No	No

** DIESEL FUEL *** ORANGE SCUM

Outfall *Permit Year*	***Date***	***Visit #***	***Flow ?***	***Flow Rate (gpm)***	***PH (su)***	***Chlorine (ppm)***	***Copper (ppm)***	***Phenol (ppm)***	***Detergents (ppm)***	***Ammonia (ppm)***	***Fecal Sample (mpn/100ml)***	***Turbidity (ntu)***	***Color***	***Odor?***	***Surface Scum***	***Oil Sheen***
13-300-0135																
2003	5/28/03	1	Yes	IMMEASU	7.0	0	0	0	0	10.00	No	0	0	No	No	No
	5/28/03	2	Yes	IMMEASU	7.0	0	0	0	0	10.00	No	0	0	No	No	No
	6/23/03	3	Yes	IMMEASU	7.0	0.40	0	0	0	10.00	No	0	0	No	No	No
	6/24/03	4	Yes	IMMEASU	7.0	0.30	0	0	0	10.00	No	0	0	No	No	No
13-300-0190																
2003	5/28/03	1	Yes	IMMEASU	7.0	0.30	0.10	0	0	0	No	0	0	No	No	No
	5/28/03	2	Yes	IMMEASU	7.0	0.30	0	0	0	0	No	0	20	No	No	No
	6/23/03	3	Yes	IMMEASU	7.0	0	0	0	0	0	No	0	0	No	No	No
	6/24/03	4	Yes	IMMEASU	7.0	0	0	0	0	0	No	0	0	No	No	No
53-400-0110																
2003	5/28/03	1	Yes	2	7.0	2.00	0	0	0	0	No	0	0	No	No	No
	5/29/03	2	Yes	2	7.0	2.00	0	0	0	0	No	0	0	No	No	No
79-500-0005																
2003	5/27/03	1	Yes	TOO LOW	7.0	0	0	0	0	0	No	0	0	No	No	No
	5/28/03	2	Yes	TOO LOW	7.0	0	0	0	0	0	No	0	0	No	No	No
	6/24/03	3	Yes	IMMEASU	7.0	0	0	0	0	0	No	0	0	No	No	No
	6/25/03	4	Yes	IMMEASU	7.0	0	0	0	0	0	No	0	0	No	No	No
91-100-0500																
2003	5/29/03	1	Yes	76	7.0	0	0	0	0	0	No	0	0	No	No	No
	5/29/03	2	Yes	76	7.0	0	0	0	0	0	No	0	0	No	No	No
	6/25/03	3	Yes	38	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	6/26/03	4	Yes	38	7.0	0	0	0	0	0	No	0	0	No	No	No

Shaded rows (representing samples which contain elevated levels for at least 1 sampled parameter) are not shown in the online version of this report.

Elevated readings have been underlined.

Record Selection Criteria: SELECT * FROM qryAllData WHERE (((flow)=Yes)) and ((PermitYear)="2003")

Below is a listing of sample parameters and their elevated reading criteria:

pH	<=6 or >8 su
Chlorine	>=0.3 ppm
Copper	>=0.1 ppm
Phenol	>=0.1 ppm
Detergents	>=0.25 ppm
Ammonia	>=1 ppm
Fecal Sample	>=200 mpn/100ml

APPENDIX C

Summary Reports for Year Seven IBI Studies

Index of Biotic Integrity

Williams Creek - Riverside Dr (mile 0.8) - 07/ 25/ 2002
Drainage Area: 2.39 sq.mi.

Ecoregion: Central Appalachian Ridges and Valleys

Metric Description	Scoring Criteria			Observed	Score
	1	3	5		
Total number of native fish species	< 10	(10 - 19)	> 19	6	1
Number of darter species	< 2	2	> 2	0	1
Number of sunfish species, less Micropterus	< 2	2	> 2	1	1
Number of sucker species	< 2	2	> 2	1	1
Number of intolerant species	< 2	2	> 2	0	1
Percent of individuals as tolerant species	> 33%	17% - 33%	< 17%	67.00%	1
Percent of individuals as omnivores and stoneroller species	> 40%	21% - 40%	< 21%	67%	1
Percent of individuals as specialized insectivores	< 19%	19% - 36%	< 2	0.00%	1
Percent of individuals as piscivores	< 2%	2% - 4%	> 4%	0.00%	1
Catch rate (average number of fish per 300 sq. ft. sampling unit)	< 22	22 - 43.8	> 43.8	20	1
Percent of individuals as hybrids	> 1%	TR-1 %	0%	0%	5
Percent of individuals as disease, tumors, fin damage, and other anomalies	> 5%	2% - 5%	< 2%	0.00%	5
IBI					**20**
IBI Classification					**Very Poor**

Index of Biotic Integrity

Williams Creek - Riverside Dr (mile 0.8) - 08/ 01/ 2002
Drainage Area

Ecoregion: Central Appalachian Ridges and Valleys

Metric Description	Scoring Criteria			Observed	Score
	1	3	5		
Total number of native fish species	< 10	(10 - 19)	> 19	6	1
Number of darter species	< 2	2	> 2	0	1
Number of sunfish species, less Micropterus	< 2	2	> 2	2	3
Number of sucker species	< 2	2	> 2	1	1
Number of intolerant species	< 2	2	> 2	0	1
Percent of individuals as tolerant species	> 33%	17% - 33%	< 17%	80.00%	1
Percent of individuals as omnivores and stoneroller species	> 40%	21% - 40%	< 21%	60%	1
Percent of individuals as specialized insectivores	< 19%	19% - 36%	< 2	0.00%	1
Percent of individuals as piscivores	< 2%	2% - 4%	> 4%	0.00%	1
Catch rate (average number of fish per 300 sq. ft. sampling unit)	< 22	22 - 43.8	> 43.8	26	3
Percent of individuals as hybrids	> 1%	TR-1 %	0%	0%	5
Percent of individuals as disease, tumors, fin damage, and other anomalies	> 5%	2% - 5%	< 2%	0.00%	5
IBI					**24**
IBI Classification					**Poor**

Index of Biotic Integrity

Baker Creek - JH Parkway (mile 0.8) - 08/ 01/ 2002
Drainage Area: 1673.49 acres

Ecoregion: Central Appalachian Ridges and Valleys

Metric Description	Scoring Criteria			Observed	Score
	1	3	5		
Total number of native fish species	< 10	(10 - 19)	> 19	11	3
Number of darter species	< 2	2	> 2	0	1
Number of sunfish species, less Micropterus	< 2	2	> 2	3	5
Number of sucker species	< 2	2	> 2	1	1
Number of intolerant species	< 2	2	> 2	2	3
Percent of individuals as tolerant species	> 33%	17% - 33%	< 17%	50.00%	1
Percent of individuals as omnivores and stoneroller species	> 40%	21% - 40%	< 21%	33%	3
Percent of individuals as specialized insectivores	< 19%	19% - 36%	< 2	17.00%	1
Percent of individuals as piscivores	< 2%	2% - 4%	> 4%	9.00%	5
Catch rate (average number of fish per 300 sq. ft. sampling unit)	< 22	22 - 43.8	> 43.8	13	1
Percent of individuals as hybrids	> 1%	TR-1 %	0%	0%	5
Percent of individuals as disease, tumors, fin damage, and other anomalies	> 5%	2% - 5%	< 2%	0.00%	5
IBI					**34**
IBI Classification					**Poor**

Index of Biotic Integrity

Second Creek - UTK (mile 0.2) - 05/ 20/ 2003
Drainage Area: 4502 acres

Ecoregion: Central Appalachian Ridges and Valleys

Metric Description	Scoring Criteria			Observed	Score
	1	3	5		
Total number of native fish species	< 10	(10 - 19)	> 19	11	3
Number of darter species	< 2	2	> 2	1	1
Number of sunfish species, less Micropterus	< 2	2	> 2	0	1
Number of sucker species	< 2	2	> 2	2	3
Number of intolerant species	< 2	2	> 2	2	3
Percent of individuals as tolerant species	> 33%	17% - 33%	< 17%	67.00%	1
Percent of individuals as omnivores and stoneroller species	> 40%	21% - 40%	< 21%	25%	3
Percent of individuals as specialized insectivores	< 19%	19% - 36%	< 2	8.30%	1
Percent of individuals as piscivores	< 2%	2% - 4%	> 4%	8.30%	5
Catch rate (average number of fish per 300 sq. ft. sampling unit)	< 22	22 - 43.8	> 43.8	9.8	1
Percent of individuals as hybrids	> 1%	TR-1 %	0%	0%	5
Percent of individuals as disease, tumors, fin damage, and other anomalies	> 5%	2% - 5%	< 2%	19.00%	1
IBI					**28**
IBI Classification					**Poor**

IBI Range: 0 = No fish; 12-22 = Very Poor;
28-34 = Poor; 40-44 = Fair; 48-52 = Good;
59-60 = Excellent

E.P.T. Families Present **Score: 1 (Very Poor)**

E: none
P: none
T: Glossosomatidae

Comments: Extremely poor bug diversity.

Index of Biotic Integrity

Third Creek - UTK (mile 2.3) - 05/ 28/ 2003
Drainage Area: 8737.2 acres

Ecoregion: Central Appalachian Ridges and Valleys

Metric Description	Scoring Criteria			Observed	Score
	1	3	5		
Total number of native fish species	< 10	(10 - 19)	> 19	12	3
Number of darter species	< 2	2	> 2	1	1
Number of sunfish species, less Micropterus	< 2	2	> 2	2	3
Number of sucker species	< 2	2	> 2	1	1
Number of intolerant species	< 2	2	> 2	2	3
Percent of individuals as tolerant species	> 33%	17% - 33%	< 17%	83.00%	1
Percent of individuals as omnivores and stoneroller species	> 40%	21% - 40%	< 21%	17%	5
Percent of individuals as specialized insectivores	< 19%	19% - 36%	< 2	8.30%	1
Percent of individuals as piscivores	< 2%	2% - 4%	> 4%	8.30%	5
Catch rate (average number of fish per 300 sq. ft. sampling unit)	< 22	22 - 43.8	> 43.8	14.6	1
Percent of individuals as hybrids	> 1%	TR-1 %	0%	0%	5
Percent of individuals as disease, tumors, fin damage, and other anomalies	> 5%	2% - 5%	< 2%	15.10%	1
IBI					**30**
IBI Classification					**Poor**

IBI Range: 0 = No fish; 12-22 = Very Poor;
28-34 = Poor; 40-44 = Fair; 48-52 = Good;
59-60 = Excellent

E.P.T. Families Present **Score: 1 (Very Poor)**

E: none
P: none
T: Hydropsychidae

Comments: Extremely poor bug diversity.

APPENDIX D

City of Knoxville Solid Waste Office 2002 Annual Report

CITY OF KNOXVILLE
SOLID WASTE OFFICE
2002 ANNUAL REPORT

Victor Ashe, Mayor
Bob Whetsel, Public Service Director
Steve Roberts, Deputy Manager

Printed on Recycled Paper

INTRODUCTION

In 2002, we continued to make positive progress in the development of our solid waste programs. This year we instituted an on-site paint recycling program at the Solid Waste Management Facility, continued active enforcement of the solid waste ordinances, and completed our fifth full year of operations at the Household Hazardous Waste Collection Center. The Solid Waste Office has taken over the responsibility of garbage collection and recycling in the Central Business District at a cost savings of $30,000 per year. All of these programs have been successful and reflect the continued interest in and growth of our comprehensive solid waste management program.

The following pages summarize our activities for the calendar year 2002.

The last page is a residential waste stream analysis that reflects some notable statistics:

* The total waste stream increased by 18,844.17 tons over 2001.
* The diversion rate increased to 57.80% from 54.65% in 2001.
* The recycling rate decreased to 27.95% from 31.35% in 2001.

The total waste stream shows an increase for the first time in four years. This is attributed to increased use of the City transfer station. Diversion and recycling rates remain level over the last five years.

I. RECYCLING

A total of 5,383.51 tons of recyclables was collected at the City's twelve drop-off recycling centers in 2002. This number is up almost 10% from 2001. All commodities increased except aluminum and cardboard, with steel and glass products showing the largest gains.

Goodwill Industries won a new 5-year contract to assist in on-site operation of the recycling centers. The contract that was negotiated with SP Recycling to haul newspapers pays the City current market value for materials collected. This, and the contract with Waste Management for the other materials, combined to save the City $28,300 over previous years' costs. Second year options were approved with both companies.

In 2002, the City continued processing and marketing cardboard brought to the Solid Waste Management Facility (SWMF). Fifty tons were processed in 2002. Businesses, in particular, are encouraged to bring recyclables to the SWMF free of charge.

II. GARBAGE (MSW)

A total of 47,792.99 tons of garbage was collected from Knoxville homes in 2002 as part of the weekly garbage collection service the City offers via its contractor, Waste Connections (formerly BFI). This number reflects a 1% increase from the previous year. The City is currently in a five year contract with Waste Connections that expires in 2006. Current collection costs per this contract are:

* Curbside Collection $5.74 / house/month
* Backdoor Collection $7.18 / house/month

All garbage is disposed of at the Chestnut Ridge Landfill operated by Waste Management of Knoxville. The City is currently in a 10-year contract with Waste Management that expires in 2010. Disposal costs for 2002 were as follows:

* Jan - Sep. $21.50 / ton
* Oct. - Dec. $22.22 / ton

III. COMPOSTING

A total of 33,018.63 tons of yard waste was collected by City crews in 2002. This number is down by about 89.12 tons from last year. The Solid Waste Department attributes this reduction to our programs of educating residents about proper yard waste practices. All yard waste is taken to Shamrock Organic Products where it is turned into mulch or compost products. The City is currently in a 6-year contract with Shamrock that expires in 2006. Costs for disposal in 2002 at Shamrock were:

* Jan. - Dec. $33 / ton

IV. SOLID WASTE MANAGEMENT FACILITY

Transfer Station

When the Transfer Station was redesigned in 1997, one of our goals was to be able to separate construction waste (C&D) from MSW. This would allow us to save money by sending C&D waste to a Class III landfill and also enable us to comply with the State mandate calling for a reduction in the volume of waste placed in Class I landfills. In 2002, we diverted 30,125 tons of C&D waste to a Class III landfill. This was 71% of the waste received at the Transfer Station.

Household Hazardous Waste (HHW) Collection Center

Staffed by City Solid Waste personnel, the HHW Facility is operated jointly by the City and County for all residents. The County contributes 50% of the operating costs and a prorated portion of the materials disposal costs based on City/County usage. In 2002, this facility was visited by 4, 344 vehicles and processed 135 tons of HHW, 47% of which was latex paint.

Rather than pay to dispose of the latex paint by the City's contracted hazardous materials hauler, we have developed an in-house paint re-manufacturing facility. Last year, we produced 2,573 gallons of high quality paint which was made available to Knox County Schools and to City and County Maintenance Departments. We were also able to contribute 700 gallons of paint to the Morgan County tornado relief fund.

V. EDUCATION

The Solid Waste Office engaged in many activities and special programs throughout 2002 to educate Knoxvillians about waste reduction, recycling, composting, and other solid waste issues.

America Recycles Day - The City of Knoxville, along with several other local organizations, participated in the sixth annual America Recycles Day, a national education campaign aimed at increasing citizens' commitment to recycling and buying recycled goods.

Telephone Book Recycling - Once again this year the Solid Waste Office coordinated the Knoxville/Knox County schools telephone book recycling program. Forty-three Knox County schools competed for cash prizes donated by Waste Management and Kroger. Over 165 tons of old books was collected from the schools and six City of Knoxville drop-off centers.

Earth Day - The Solid Waste Office was a part of a city-wide steering committee that developed Earthfest 2002, which celebrated the 32nd anniversary of Earth Day. Over 6,000 people attended the event which had 80 + exhibitors from environmental community.

One Day Computer Collection Event - One-day computer collection events were held in January and November at Staples with ten sponsors contributing to the success of the event. One thousand one hundred residents participated in the two events with just over 46 tons of materials collected. The material was recycled at the Oak Ridge National Recycling Center, Oak Ridge, TN.

Tennessee Recycling Coalition - The Tennessee Recycling Coalition held their 2002 annual conference in Knoxville TN in October. Approximately 125 people attended the sessions held at the Knoxville Hilton. The attendees visited the Museum of Appalachia during an after-hours social event. Technical tours included visits to the Knox County Greenwaste Facility, NuCycle Recycling, Rock-Tenn Recycling, and the City Household Waste Collection Center. The conference was such a success that the Coalition will return to Knoxville in October 2003.

Other - In 2002, the Solid Waste Office continued to produce and distribute educational information. Brochures about recycling, composting, and other solid waste issues are now available for citizens at City Hall at the Knoxville Center Mall. Members of the Solid Waste Office participated in several educational events in 2002 using our exhibit booth display at events including Kids Day America/International, the Dogwood Arts' House and Garden Show, and America Recycles Day Events. Over 200 school children toured the SWMF and listened to a presentation at the HHW facility.

Annual Report 2002	Kroger 5003	Food City 8526	Kroger 4501	Kroger 5425	Kroger 4818	Kroger 2217	Kroger 4409	Kroger 9305	Kroger 4440	Food City 5941	Food City 2939	
Drop Off Centers	**N. Broadway**	**Kingston Pk.**	**Asheville Hwy**	**Clinton Hwy**	**Kingston Pk.**	**N. Broadway**	**Chapman Hwy.**	**Kingston Pk.**	**Western Av.**	**Kingston Pk.**	**Alcoa Hwy.**	**Totals**
Aluminum	8388 lbs	8223 lbs	2500 lbs	5062 lbs	11003 lbs	4015 lbs	6730 lbs	11829 lbs	2585 lbs	1124 lbs	1205 lbs	31.33 tons
Steel	31545 lbs	33295 lbs	16240 lbs	22715 lbs	35196 lbs	16735 lbs	31985 lbs	39050 lbs	11325 lbs	0 lbs	0 lbs	119.04 tons
Plastics	59592 lbs	50045 lbs	30110 lbs	38385 lbs	66827 lbs	32720 lbs	39415 lbs	62470 lbs	34718 lbs	1595 lbs	3325 lbs	209.60 tons
Clear Glass	69405 lbs	65179 lbs	36662 lbs	39609 lbs	148265 lbs	52668 lbs	74586 lbs	118906 lbs	25380 lbs	0 lbs	0 lbs	315.33 tons
Brown Glass	52879 lbs	49659 lbs	27931 lbs	30178 lbs	112962 lbs	40128 lbs	56826 lbs	89746 lbs	18581 lbs	0 lbs	0 lbs	239.45 tons
Green Glass	42976 lbs	40362 lbs	22707 lbs	24533 lbs	91793 lbs	32624 lbs	46258 lbs	73228 lbs	15099 lbs	0 lbs	0 lbs	194.79 tons
Newspaper	588827 lbs	428018 lbs	287640 lbs	426360 lbs	557568 lbs	269740 lbs	358690 lbs	683340 lbs	238420 lbs	36086 lbs	62614 lbs	1,968.65 tons
Mixed Paper	409880 lbs	475660 lbs	238280 lbs	292710 lbs	662100 lbs	230580 lbs	357620 lbs	635168 lbs	171780 lbs	19000 lbs	30060 lbs	1,761.42 tons
Cardboard	71210 lbs	126750 lbs	77290 lbs	36700 lbs	132920 lbs	16260 lbs	100640 lbs	138880 lbs	69060 lbs	0 lbs	0 lbs	384.86 tons
City Cardboard	68600 lbs	0 lbs	0 lbs	75680 lbs	32000 lbs	49780 lbs	0 lbs	92020 lbs	0 lbs	0 lbs	0 lbs	159.04 tons
Drop Off Center Totals	**701.65 tons**	**638.60 tons**	**369.68 tons**	**495.97 tons**	**925.32 tons**	**372.63 tons**	**536.38 tons**	**972.32 tons**	**293.47 tons**	**28.90 tons**	**48.60 tons**	**5,383.51 tons**

KPD / Lorain St. Cardboard / Paper	22.64 tons
Downtown Recycling	123.98 tons
Phone Books	165.15 tons

	Leaves	Brush	Total
Compost Site	6653.48 tons	26365.15 tons	33018.63 tons

	Scrap Metal	Cardboard	Rec. Tlr. / Backing	HHW REC.	HHW Divert.	Pallets
Transfer Station	858.51 tons	49.63 tons	12.88 tons	58.98 tons	63.66 tons	743.58 tons

	C&D	Compacted	Computers	Tires	Total
Transfer Station Cont.	30125.00 tons	13556.69 tons	52.77 tons	155.72 tons	45,677.42 tons
				14752	

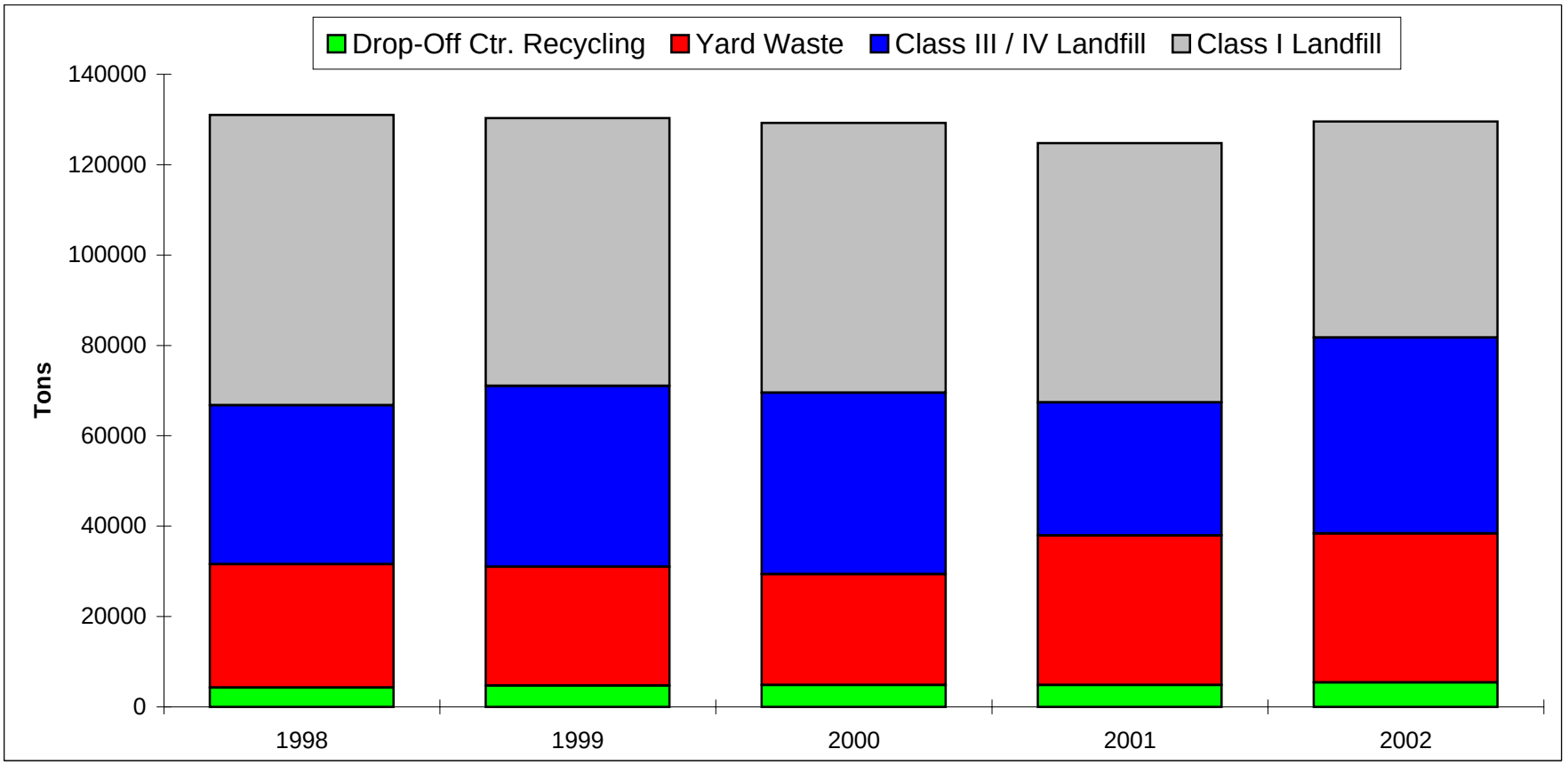
	Household Trash
Landfill Class I	47792.99 tons

	Transfer Station	Construction	Codes	Total
Landfill Class III	30,125.00 tons	10838.00 tons	2380.00 tons	43,343.00 tons

Total Waste Recycled	40,645.98 tons
Total Waste Diverted, Class III & Rec.	84,052.64 tons
Total Waste Landfilled, Class I	61,349.68 tons
Total Wastestream	145,402.32 tons

Recycling	27.95%
Diversion	57.81%

Destination of Knoxville's Residential Waste Stream, 1998 - 2002



Diversion Rate	**51.16%**	**54.83%**	**54.15%**	**54.65%**	**57.81%**
Recycling Rate	**24.42%**	**24.28%**	**23.29%**	**31.35%**	**27.95%**

APPENDIX E

Knox County Circuit Court Legal Authority Ruling

IN THE CIRCUIT COURT FOR KNOX COUNTY, TENNESSEE

KNOXVILLE UTILITIES BOARD,	)	
	)	
Plaintiff	)	No. 3-292-03
	)	
v.	)	and
	)	
	)	No. 3-605-03
THE CITY OF KNOXVILLE, TENNESSEE, et al.	)	
	)	
	)	
Defendants	)	

MEMORANDUM OPINION

These cases involve a dispute about the application of the City of Knoxville's Stormwater Ordinance to Knoxville Utilities Board (KUB).

KUB operates a waste water (or sanitary) sewer system in the City of Knoxville. The City of Knoxville (City) operates a stormwater sewer system in the same locale. In December, 2002, and February, 2003, KUB' s sanitary sewer system overflowed, allowing sewage to escape into the City's storm water system.

The City's engineering department responded to KUB's sewage overflows by notifying KUB that it had violated the City's Stormwater Ordinance and assessing substantial penalties against KUB for the alleged violations.

KUB appealed the penalty assessments to the City's Board of Environmental Appeals, a review board created by the Stormwater Ordinance. That Board, for the most part, affirmed the City's penalty assessments.

KUB thereupon appealed the decisions of the Board of Environmental Appeals to this Court by Writs of Certiorari and Supersedeas. In each of these cases bringing the decisions of the Board of Environmental Appeals before this Court for review, KUB argues that the City and its Board of Environmental Appeals are without jurisdiction to apply the Stormwater Ordinance to KUB. The City, of course, argues with equal force that it can legally apply the Stormwater Ordinance to KUB, and can assess civil penalties against KUB for violation of the ordinance.

Both KUB and the City have moved this alleged jurisdictional issue to the forefront of this litigation by filing Motions for Summary Judgment. The threshold issue presented by these motions can be stated in a variety of ways:

"Can the City legally apply its Stormwater Ordinance to KUB?"

"Is KUB subject to the City's Stormwater Ordinance?"

"Can the City assess civil penalties against KUB for violation of the Stormwater Ordinance?"

"Is KUB exempt from the provisions of the City's Stormwater Ordinance?"

It appears that no matter how the issue is framed the answer to these questions must be derived from a proper construction of the legislation applicable to these cases. That legislation consists of the 1939 Private Act establishing KUB, the City Charter provisions based on that Private Act, the Stormwater Ordinance, and the Tennessee Stormwater Management Act. In other words, this dispute involves a problem of statutory construction; it presents a matter of law for the Court to determine.

In the first instance, it should be noted that the Stormwater Ordinance clearly applies to the circumstances of these cases. Two of the principal purposes of that ordinance are to "control the

discharge of pollutants to the stormwater system" and "improve public safety."

The Stormwater Ordinance applies generally to "any person" who violates the provisions of the ordinance. Any person who violates the provisions of the ordinance is subject to the assessment of a civil penalty by the City. A "person" is defined by the ordinance to include "governmental entities".

Nowhere in the ordinance is KUB exempted from its application.

Despite the general applicability of the Stormwater Ordinance, KUB strenuously argues that it cannot be subjected to the provisions of the ordinance because, to do so, would violate the City Charter. KUB's argument is largely based on Article XI, Section 1106 of the City Charter which provides:

> (A) *Independent Control.* Except as expressly provided in this article, the board shall have and exercise and is hereby granted all the powers and duties possessed by the City of Knoxville to construct, acquire, expand or operate the system. The board, either by itself or by its duly authorized officers and employees, shall have and maintain full control and complete jurisdiction over the management and operation of the system and may make all contracts and do any and all acts and things that are necessary, convenient or desirable in order to operate, maintain, enlarge, extend, preserve and promote an orderly, economic and businesslike administration of the system. Except as expressly provided in this article, the system shall be free from the jurisdiction, direction or control of other city officers, employees, and of the city council.

This Section of Article XI of the City Charter is taken from Section 32-A(6) of the 1939 Private Act that created KUB. (It is a verbatim quote with the exception that the seventh word in the "exception" clauses of the Private Act is "Section"; and in Article XI, Section 1106 that word is "Article".)

The gist of KUB's argument is that this section of the charter evinces a legislatitive intent to

free KUB from compliance with any ordinance of general applicability that affects KUB in its management and operation of the utility system.

The Court respectfully submits that KUB' s construction of this provision of the City Charter does not give proper consideration and due emphasis to all of the significant provisions of the Private Act, and The City Charter provisions based on that Act.

To properly discern the meaning and intent of the Private Act establishing KUB, and the Charter provisions patterned after that Act, the entire body of the Act (and Article XI of the Charter) must be considered and the several parts harmonized. When that is done it appears that the legislature intended to invest KUB with complete (and independent) control over the management and operation of the utilities system, subject, however, to its compliance with laws of general applicability that everyone else is expected to obey. In the opinion of the Court, the scheme adopted by the legislature grants KUB that degree of independence that it would enjoy if it were a private company operating a similar business in the City; but it does not grant to KUB any greater degree of independence.

The legislative goal was to create an entity that could operate the utility system in "an orderly, economic and businesslike" manner, free of political influence and considerations.

Nothing in the Private Act suggests that the legislature intended for KUB to be exempt from those regulations and ordinances that everyone else is required to comply with for the protection of the public's health, safety and welfare.

For example, Article XI, Section 1101 (Sections 32-A(1) of the Private Act), says:

> Except as otherwise provided in this charter and in the general law, the purchase, production, sale and distribution of utility services by the City of Knoxville, both within and without the limits of the city,

> and the agencies and facilities used for such purposes, shall be under the jurisdiction, control and management of a board to be known as "Knoxville Utilities Board," to be constituted as hereinafter set forth. (Emphasis added)

This section clearly and expressly makes "the purchase, production, sale and distribution of utility services" by KUB subject to other provisions of "this charter" and "the general law".

KUB labors to distinguish the terms "purchase, production, sale and distribution of utility services" in Section 1101 from the terms "management and operation of the system" in Section 1106. The Court respectfully submits, however, that when the Act is read as a whole, it is evident that those terms refer to the same thing, i.e., the management and operation of the utility system. Thus, the qualifying terms "Except as otherwise provided in this charter and in the general law" found in Section 1101 apply equally to Section 1106. Section 1106 makes those introductory terms of Section 1101 applicable to Section 1106 by stating at two places that Section 1106 obtains "Except as expressly provided in this article ...". "This article", i.e., Article XI, in Section 1101, makes KUB subject to other provisions in "this charter" and "the general law."

The "exception" clauses in these two sections of the Charter would have been unnecessary if the legislature had intended to grant KUB absolute and unfettered freedom in the operation of the utility system. The legislature obviously inserted these provisions in the Charter to assure that KUB would understand that it was required to conduct its business in accord with the rules and regulations of general applicability adopted by the City to secure the general health, welfare and safety of the City's inhabitants.

The conclusion that the legislature intended KUB's independent control, management and operation of the utility system to be subject to compliance with other provisions of the City Charter

and the general law is further evident in Section 6 of the Private Act which provides:

> Section 6. *Be it further enacted,* That it is the intent and purpose of this Act to create the Board as a separate unit of city government insofar as control, management and operation of the electric power and water properties are concerned, but nothing in this Act shall be construed to release or relieve the Board. its officers or employees from the provisions of the city charter except as herein provided. This act shall be liberally construed to accomplish the purpose and intent expressed herein. (Emphasis added)

This section of the Private Act expressly subjects KUB to the application of ordinances authorized by the City Charter and adopted by the City "to secure the general health, welfare and safety", or "to prevent, abate and remove nuisances" pursuant to Article II, § 205 of the charter; or ordinances "to regulate the collection, and provide for disposal of ... refuse" pursuant to Article II § 216; or ordinances "to regulate or prohibit other environmental hazards" pursuant to A.rticle II, § 228. The Stormwater Ordinance is precisely the kind of regulation described by these various sections of the City Charter.

The "exception" clauses in Sections 1101 and 1106 of Article XI cannot be ignored or treated as inferior to the other provisions of those sections. Those clauses limit and qualify the authority granted to KUB by the legislature to operate the utility system as an independent and separate unit of city government. The legislature added Section 6 of the Private Act to those provisions found in Article XI, Sections 1101 and 1106 to make it abundantly clear that as a separate and independent unit of City Government KUB was expected to comply with lawfully adopted ordinances of general applicability.

In the opinion of the Court, when properly construed, the Private Act, and the City Charter provisions creating KUB compel the conclusion that KUB is not exempt from the requirements of

the Stormwater Ordinance; the City can apply the Ordinance to KUB, and can assess civil penalties against KUB for violation of that Ordinance.

The Court is of the opinion that the same conclusion is mandated by the Tennessee Stormwater Management Act, TCA 68-221-1101 et seq. That Act provides in pertinent part:

> **68-221-1105. Municipal authority.** – (a) In order to protect the public health, municipalities authorized to provide storm water and flood control facilities by this part are authorized by appropriate ordinance or resolution to:
>
> …..
>
> (7) Regulate and prohibit discharges into storm water facilities of sanitary, industrial, or commercial sewage or waters that have otherwise been contaminated; . . .

The Stormwater Management Act further provides:

> **68-221-1106. Civil penalty for violation of ordinance.** – (a) A municipality may establish by ordinance or resolution that any person who violates the provisions of any ordinance or resolution regulating storm water discharges or facilities shall be subject to a civil penalty of not less than fifty dollars ($50.00) or more than five thousand dollars ($5,000) per day for each day of violations. Each day of violation may constitute a separate violation. A municipality shall give the violator reasonable notice of the assessment of any penalty. A municipality may also recover all damages proximately caused to the municipality by such violations.
>
> (b) In assessing a civil penalty, the following factors may be considered:
>
> (1) The harm done to the public health or the environment;
>
> (2) Whether the civil penalty imposed will be substantial economic deterrent to the illegal activity;
>
> (3) The economic benefit gained by the violator;
>
> (4) The amount of effort put forth by the violator to remedy this violation;
>
> (5) Any unusual or extraordinary enforcement costs incurred by the municipality;
>
> (6) The amount of penalty established by ordinance, or resolution for specific categories of violations; and
>
> (7) Any equities of the situation which outweigh the benefit of

> imposing any penalty or damage assessment.
>
> (c) The municipality may also assess damages proximately caused by the violator to the municipality which may include any reasonable expenses incurred in investigating and enforcing violations of this part, or any other actual damages caused by the violation.
>
> (d) The municipality shall establish a procedure for a review of the civil penalty or damage assessment by either the governing body of the municipality or by a board established to hear appeals by any person incurring a damage assessment or a civil penalty. If a petition for review of such damage assessment or civil penalty is not filed within thirty (30) days after the damage assessment or civil penalty is served in any manner authorized by law, the violator shall be deemed to have consented to the damage assessment or civil penalty and it shall become final. The alleged violator may appeal a decision of the governing body or board pursuant to the provisions of title 27, chapter 8.

The Stormwater Management Act is a general law of the state; it unequivocally authorizes the City to adopt and enforce the Stormwater Ordinance that is the subject of these cases. KUB is subject to this general law by the terms of Section 1101 of the City Charter, and more importantly because the legislature has declared that the Act confers upon municipalities powers that they did not have before the adoption of the Act. The Stormwater Management Act says:

> **68-221-1109. Powers in addition to other municipal powers. -**
> The powers conferred by this part are in addition and supplemental to the powers conferred by any other law, charter, or home rule provision. [Acts 1993, ch. 257, § 9.]

The Court is therefore constrained to conclude that the legislature has specifically authorized the City to adopt the Stormwater Ordinance and enforce it against KUB, notwithstanding any Charter provision which might arguably suggest otherwise.

KUB argues that the City's enforcement of the Stormwater Ordinance against it is an "attempt by certain City officials to gain jurisdiction, direction or control over KUB' s operation and management of the wastewater utility system". In this regard it should be noted that the ordinance

contains no provision directed solely at KUB. The ordinance applies to "any person" who violates it. The stated purpose of the ordinance is to control stormwater runoff and pollution; it is not to control KUB. The ordinance affects KUB only if KUB violates the ordinance. The application of the ordinance to KUB does not constitute an attempt to gain control over KUB any more than the application of the ordinance to a private business violator would amount to an attempt by the City to gain control of that business. In the opinion of the Court the application of the ordinance to KUB does not, as heretofore pointed out, offend any charter provision designed to clothe KUB with independent control of the utility system.

KUB alludes to numerous City requests for meetings and information about KUB's operation and management of the wastewater utility system as evidence of the City's" attempt" to gain control of KUB. That evidence is simply not relevant to the legal issue presented to the Court by the parties' respective Motions for Summary Judgment. The issue raised by those Motions is whether the City can legally enforce the Stormwater Ordinance against KUB, a matter which the Court has decided in the affirmative.

The remedies available to the City in the event of a violation of the Stormwater Ordinance appear to be unambiguously defined by the ordinance. Whether the City is entitled to make the kinds of requests or demands attributed to the City by KUB as a means of enforcing the Ordinance may be an issue in the subsequent proceedings to be had in these cases, but those matters have no bearing on the question now being decided, and the Court expresses no opinion at this time about those matters.

KUB also argues that neither federal, state, or local law, or the City's NPDES permit require the City to exercise jurisdiction over KUB. That argument, too, may be pertinent to issues later to

be decided in these cases. However, that argument simply "misses the mark" with respect to the issue here being decided. At this point it should simply be noted that although these legal provisions may not require the City to apply the Stormwater Ordinance to KUB, they do not prevent the City from doing so.

KUB further asserts that it is "stringently regulated by the Tennessee Department of Environment and Conservation." It suggests that regulation by the State should be sufficient to assure local water quality, and regulation by the City is unnecessary. KUB does not, however, point to any authority which would preclude a duplicity of regulation. In fact, the Stormwater Management Act contemplates regulation of water quality by both the State and municipalities. After giving municipalities the power to regulate water quality by ordinance the legislature said:

> **68-221-1111. Water quality regulation authority not limited by this part.** – Nothing herein shall be construed to limit the power or authority of the department of environment and conservation or of the water quality control board with respect to regulation of the waters of the state. Any ordinances or regulations adopted or imposed by municipalities shall be subject to regulation and oversight by the Department of Environment and Conservation or the Water Quality Control Board. [Act 1993, ch. 257, § 11.]

This part of the Act clearly indicates that municipalities may regulate by adopting the kind of ordinances authorized by TCA § 68-221-1105 and 1106, and the Department of Environment and Conservation and the Water Quality Control Board may also regulate pursuant to their statutory authority. The only limitation on such duplication of regulation is that the municipal ordinances are subject to regulation and oversight by the Department of Environment and Conservation or the Water Quality Control Board, and those ordinances must be consistent with all requirements of state and federal law that apply to such activities, i.e., water quality and water quality control.

Thus, the City may apply the Stormwater Ordinance to KUB notwithstanding the fact that the State also regulates KUB's activities with respect to water quality and water quality control.

Whether the City should attempt to regulate KUB's wastewater activities when the State is also doing so may, or may not, be pertinent to the other issues to later be dealt with in these cases. And the fact that the State is engaged in regulating KUB's activities may have some bearing on whether the City should assess penalties against KUB, or the amount of such penalties. See TCA 68-221-1106. Those matters, however, are not before the Court at this time and the Court expresses no opinion about the relevance or effect of concurrent regulation of KUB by the State, except to say that this circumstance is not dispositive of the alleged jurisdictional question now being decided.

Finally, KUB says that the Court should grant KUB's Motion for Summary Judgment because "the City has no authority to sue itself." This argument is based on the fact that KUB is a part of the City, notwithstanding that it is established as a "separate" unit of City government and is accorded a large measure of independence from the remainder of the municipality. KUB's advocacy of this theory is a bit puzzling because the City has not brought suit against anyone in these cases. The suits were brought by KUB, and if KUB's argument were carried to its logical conclusion, KUB would have no authority to sue the City and its Board of Environmental Appeals.

The Court, however, is of the opinion that this argument is without merit for a different reason. As has been repeatedly emphasized in these cases, KUB was created by the legislature as a separate unit of government insofar as control, operation and management of the utility system is concerned, and it has been given the greatest measure of independence possible which is consistent with KUB' s responsibility to comply with the general law and other provisions of the City Charter. This grant of independence, coupled with KUB's responsibility to exercise its independence

consistently with general law and other City Charter provisions, means that KUB must be treated as an independent entity, completely separate and apart from the City, in those situations where the City is entitled to hold KUB accountable for its failure to discharge its legal responsibilities.

The power granted the City to assess civil penalties against KUB for violation of the Stormwater Ordinance would be ineffectual and meaningless if the City did not have the authority to sue KUB (or others) for the collection of such penalties when not paid. In fact the legislature has given municipalities such power to sue. TCA § 68 - 221-1106(e) provides:

> (e) Whenever any damage assessment or civil penalty has become final because of a person's failure to appeal the municipality's damage assessment or civil penalty, the municipality may apply to the appropriate chancery court for a judgment and seek execution of such judgment. The court, in such proceedings, shall treat the failure to appeal such damage assessment or civil penalty as a confession of judgment. [Act 1993, ch. 257, § 6.]

The Court, therefore, concludes that in these cases, the City has authority to sue KUB, and KUB has authority to sue the City.

For the reasons set forth herein the Court respectfully concludes that KUB' s argument that the City is without jurisdiction to apply the Stormwater Ordinance to KUB is not well taken. The City is correct in its assertion that it can apply the Ordinance to KUB and can assess appropriate civil penalties against KUB for any violation of the Ordinance.

Accordingly, KUB' s Motion for Summary Judgment is overruled, and the City's Motion for Partial Summary Judgment is sustained.

Counsel for the City is requested to prepare appropriate Orders consistent with this Opinion

for entry in each of the captioned cases, circulate those Orders to the other parties for approval, and then submit such Orders to the Court for entry.

This 8th day of December , 2003 .

_____

WHEELER A. ROSENBALM
CIRCUIT JUDGE

war/cmc/diskette3

APPENDIX F

Department of Justice Letter to KUB

U.S. Department of Justice

Environment and Natural Resources Division

BG:plh
90-5-1-1-08186

Environmental Enforcement Section
P.O. Box 7611
Washington, DC 20044-7611

Telephone (202) 307-1242
Facsimile (202) 514-2583

December 1, 2003

CONFIDENTIAL RULE 40B MATERIAL
FOR SETTLEMENT PURPOSES ONLY
VIA FEDERAL EXPRESS

Hiram G. Tipton, Esq.
Hodges. Doughty & Carson, PLLC
617 Main Street
Knoxville, TN 37901
(865) 292-2307

Michael D. Pearigan, Esq.
Waller, Lansden, Dortch & Davis
511 Union Street, Ste. 2100
Nashville, TN 372l9
(865) 244-6360

Re: Knoxville Utilities Board

Dear Counsel:

I understand that you represent the Knoxville Utilities Board ("KUB"). You are hereby notified that the United States Department of Justice, at the request of the Environmental Protection Agency, is preparing to bring a federal court action against KUB. The complaint would seek injunctive relief and the assessment of civil penalties against KUB for the discharge of pollutants from four wastewater treatment plants, and their collection and transmission systems, in violation of Section 301 of the Clean Water Act, 33 U.S.C. § 1311. The State of Tennessee would join the complaint as a plaintiff pursuant to Section 309(e) of the Act, 33 U.S.C. § 13l9(e).

Before filing the complaint, we would like to extend to your client the opportunity to settle this matter, to save it and the federal and state governments the burden and expense of litigation. Such a settlement would be filed simultaneously with

the governments' complaint. Any settlement would be embodied in a consent decree to be lodged with the United States District Court for the Eastern District of Tennessee, and is subject to the final approval of the Assistant Attorney General, and other government officials.

If your client is interested in resolving this matter short of litigation, we would like to arrange a meeting with you. We propose to meet from 11:00 to 4:00 p.m. on January 12, 2004, at EPA's regional offices in Atlanta, Georgia. If that date is not convenient for you, we suggest that you propose an alternative date during the period January 20-23, 2003.

It is our hope that we can resolve this matter without litigation. Please respond within 10 days of the date of this letter indicating that you are interested in discussing a settlement, and confirming your availability for a meeting. If we do not hear from you, we will continue to take the steps that are necessary to file the complaint.

Thank you very much for your prompt attention to this important matter.

Sincerely,

Patricia L. Hurst
Trial Attorney
Environmental Enforcement Section
U.S. Department of Justice

cc: William Bush, U.S. EPA
John T. Buckingham, U.S. Attorney's Office
Lisa McCarter, Tennessee Attorney General's Office

APPENDIX G

Notice of Appeal to the Unacceptable NPDES Permit Language

VICTOR ASHE
MAYOR
(865) 215-2040

MICHAEL S. KELLEY
DIRECTOR OF LAW
(865) 215-2050
FAX: (865) 215-2643

THE CITY OF KNOXVILLE, TENNESSEE

October 15, 2003

VIA HAND DELIVERY, REGULAR FIRST CLASS MAIL, and FACSIMILE TRANSMISSION

Commissioner Betsy Child
Tennessee Dept. of Environment and Conservation
401 Church Street, L & C Tower
21st Floor
Nashville, TN 37243-1548

Re: In the Matter of City of Knoxville, Tennessee, Petition for Appeal of NPDES Permit No. TNS068055

Dear Commissioner Child:

Pursuant to the requirements of Tennessee law, the City of Knoxville files the enclosed originals of the City's Petition for Appeal of NPDES Permit No. TNS068055, dated 10/9/03. At this time, all matters therein are being appealed. As stated in Ms. Eberting's letter to you of October 7, 2003, there are significant changes to the permit and the rationale since the City last received the draft permit eight months ago, in February.

We are particularly troubled about the timing and circumstances surrounding the issuance of the Permit, especially since the Knoxville Utilities Board ("KUB") has already attempted to use certain limited portions of the addendum to the rationale in the Permit for a tactical advantage in a pending action between KUB and the City in Knox County Chancery Court. The relevant dates are as follows:

* 12/2000 City submits draft NPDES Permit to TDEC for review
* 2/2003 TDEC and City agree on language for permit, prior to public comment period
* 3/31/03 Public Comment period officially ends
* 4/01/03 TDEC reopens comment period and takes additional comments from KUB

* 9/30/03 TDEC submits new version of permit to City with material changes

* Subsequent to 9/30/03, City makes verbal request for 30 days to review new version of Permit; Request denied by TDEC

* 10/7/03 City sends written request for 30 days to Commissioner Child (letter attached); Request denied by Commissioner Child

* 10/9/03 Permit issued to City by TDEC

* 10/10/03 KUB files addendum to rationale in Knox County Circuit Court in support KUB's motion for summary judgment against the City.

In addition, I would note that KUB has also utilized the Agreed Order between TDEC and KUB in the pending Circuit Court action.

I would appreciate your stamping the extra copy of the Petition as having been filed and returning it to us in the enclosed envelope. Also, as stated in the Petition, it may be possible to limit and narrow the issues for appeal at a subsequent time.

Sincerely,

Michael S. Kelley

MSK:mab

cc: Paul E. Davis, DWPC Director
E. Joseph Sanders, Esq., TDEC General Counsel
Pamela Myers
Members of Water Quality Control Board
EPA Division 4, Regional Administrator

STATE OF TENNESSEE
WATER QUALITY CONTROL BOARD

IN THE MATTER OF	**)**	**DOCKET NO._____**
CITY OF KNOXVILLE,	**)**	
TENNESSEE,	**)**	
	)	
PETITIONER	**)**	

PETITION FOR APPEAL OF COMMISSIONER'S IMPOSITION OF TERMS AND CONDITIONS IN NPDES PERMIT NO. TN S068055 (MUNICIPAL STORM DRAIN SYSTEM)

The City of Knoxville (hereinafter City) hereby appeals the Commissioner's imposition of terms and conditions in NPDES Permit No. TN S068055 pursuant to T.C.A. § 69-3-105(I); § 69-3-110, and § 4-5-301, et seq. The City of Knoxville is required by Federal and State law to have an NPDES permit for the operation of its storm drain system pursuant to the provisions of the Clean Water Act of 1972 and the regulations promulgated thereunder. 33 U.S.C. § 1251 et. seq., 40 C.F.R. § 122.1(b)(1). Due to the fact that this new permit contains many conflicts and inconsistencies with the TMDL and includes some impossible burdens on the City, the City appeals the entire permit and the Rationale, including the Addendum to the Rationale, at this time. Further, the Knoxville Utilities Board ("KUB") has already attempted to use the language in the Addendum to the Rationale and the Agreed Order between TDEC and KUB for a tactical advantage in certain pending litigation in Knox County Circuit Court between KUB and the City.

The City plans to file more detailed comments regarding our appeal within the thirty-day period allowed by law, and the City may be able to limit the scope of the appeal in that filing. However, the City appeals the entire permit at this time.

Respectfully submitted,

_____

Michael S. Kelley
Law Director
City of Knoxville Law Department
P.O. Box 1631
Knoxville, Tennessee 37901
(865) 215-2050

CERTFICATE OF SERVICE

This to certify that I have this day served a true and exact copy of the within and foregoing Petition For Appeal of Commissioner's Imposition of Terms and Conditions in NPDES Permit No. TN S068055 (Municipal Storm Drain System) upon all parties by placing the same in the United States mail, properly addressed, postage prepaid to counsel of record for the parties as follows:

Commissioner Betsy Child (via Hand Delivery)
Tennessee Dept. of Environment and Conservation
401 Church Street, L & C Tower
21st Floor
Nashville, TN 37243-1548

Mr. Paul E. Davis (via U.S. Mail)
Director, Division of Water Pollution Control, and
Technical Secretary, Tennessee Water Quality Control Board
L & C Annex, 6th Floor
401 Church Street
Nashville, TN 37243-1534

E. Joseph Sanders, Esq. (via U.S. Mail)
General Counsel
Tennessee Department of Environment & Conservation
Tennessee Tower, 25th Floor
312 8th Avenue, North
Nashville, TN 37243-1548

On this the 16th day of October, 2003.

_____

Michael S. Kelley

VICTOR ASHE
MAYOR
(865) 215-2040

MICHAEL S. KELLEY
DIRECTOR OF LAW
(865) 215-2050
FAX: (865) 215-2643

THE CITY OF KNOXVILLE, TENNESSEE

October 7, 2003

BY FASCIMILE TRANSMISSION (615) 532-0120 & U.S. MAIL

The Honorable Betsy Child
Commissioner
Tennessee Department of Environment & Conservation
401 Church Street, L&C Tower
21st Floor
Nashville, TN 37243-1548

Re: City of Knoxville Municipal Separate Storm Drain System (MS4) Permit

Dear Commissioner Child:

The City of Knoxville received a copy of its proposed MS4 permit on September 30, 2003 by the Division of Water Pollution Control. The City of Knoxville is eager to have this permit finalized given the fact that the Department of Engineering submitted its proposed permit to the State in December of 2000. However, there are significant changes to the permit and rationale since the City last received the draft permit in February, 2003, therefore, the City requests a period of thirty days to review and make suggestions regarding this version.

After a cursory review of the permit, the Engineering Department has already indicated to Ms. Qualls several minor changes which need to be made. However, there are some substantive changes that need to be reviewed and discussed internally to determine the impact on the City and its citizens. In particular, the Addendum to Rationale document which was prepared on September 30, 2003, directly conflicts with the language in the permit regarding TMDLs on page 20. Without the removal of the addendum, the City will not be able to comply with the TMDL requirements in Table 8.

If this requested period to review is not acceptable, please contact our office as quickly as possible. I can be reached at (865) 215-2050. My fax number is (865) 215-2643.

Sincerely,

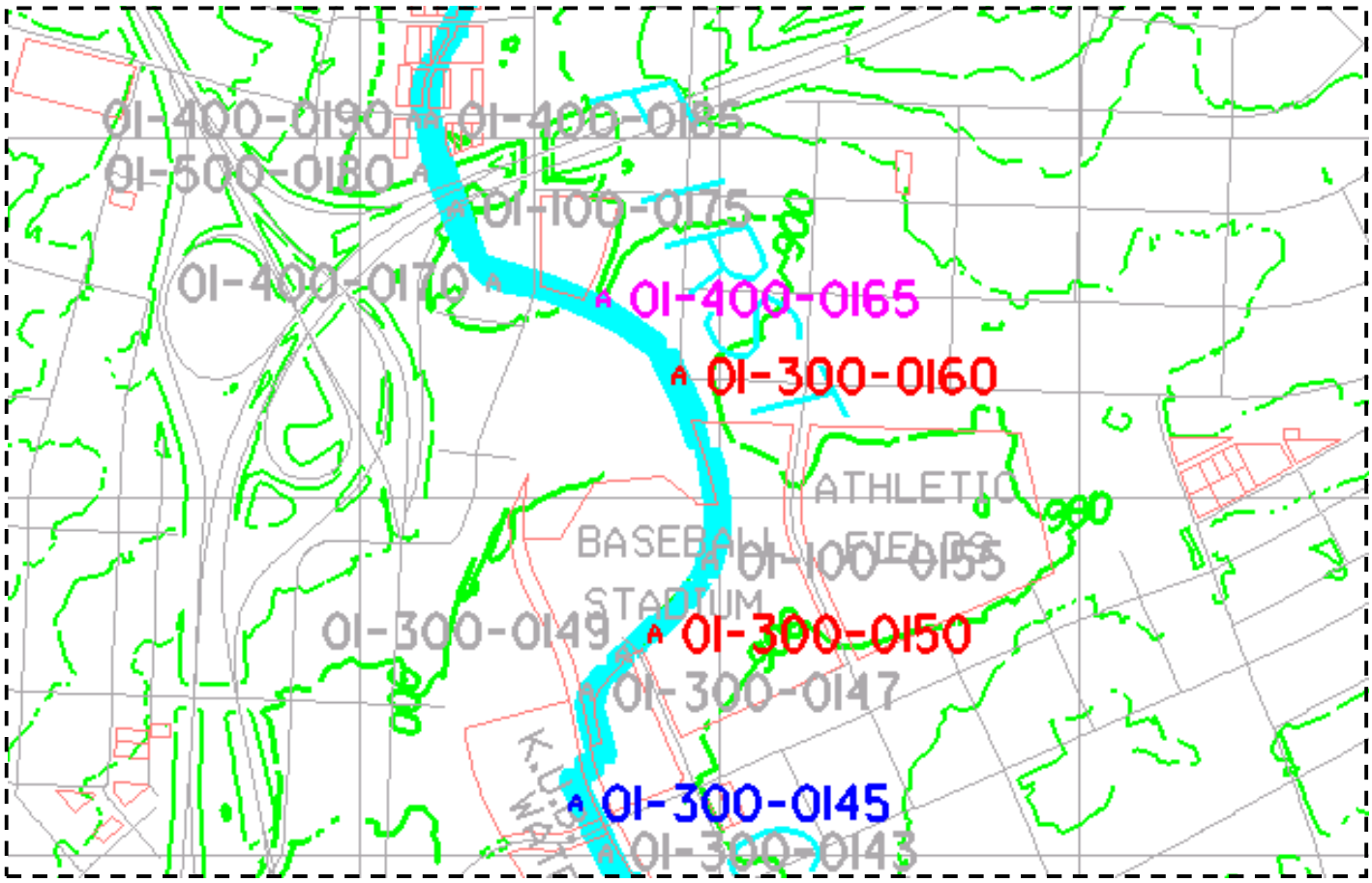
Alyson A. Eberting
Assistant City Attorney

cc: Mr. Patrick Parker
Mr. Paul E. Davis
Ms. Saya Qualls

APPENDIX H

NPDES Permit Program Inventory Map

(Attached separately)



Excerpt from NPDES Permit Program Inventory Map within Year 7 Annual Report:

Portion of a MicroStation drawing near I-40 and Broadway junction
(also near Fifth Avenue, Sixth Avenue, Magnolia Avenue and Glenwood)

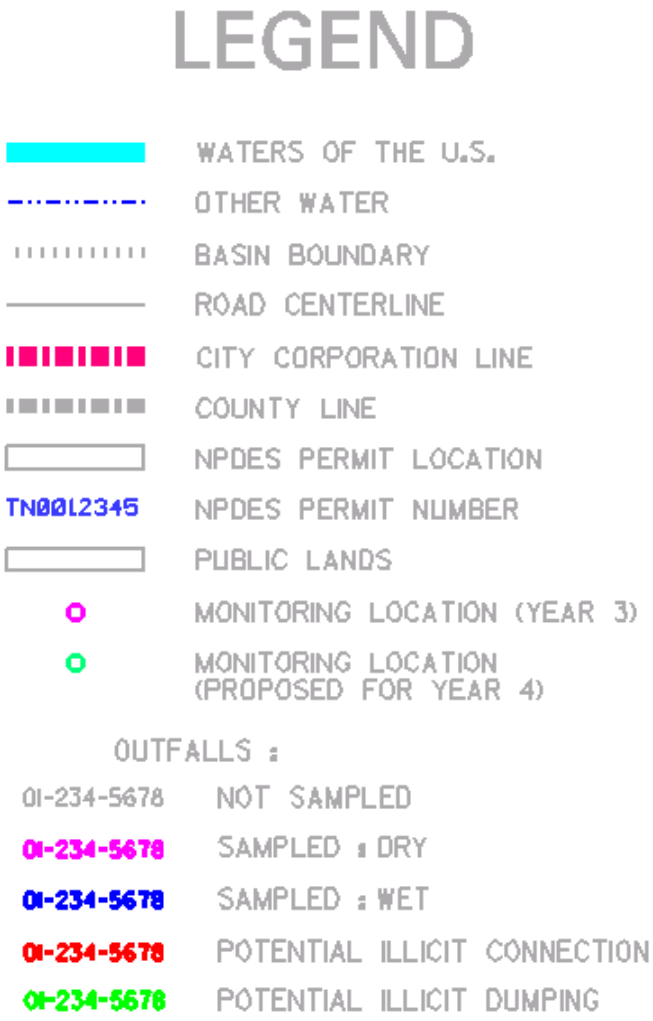
The entire inventory map is not reproduced as part of the online version of the Year 7 Annual Report. The entire inventory map is approximately 66" x 32" (or 33 miles x 16 miles) at a scale of 1 inch equals 0.5 miles.

DEPARTMENT OF ENGINEERING
STORMWATER DIVISION

Suite 480
City–County Building
400 Main Street
Knoxville, Tennessee 37902
865–215–2148

MAP DATA TAKEN FROM 1985 AERIAL SURVEY OF KNOXVILLE AND KNOX COUNTY. THIS MAP IS IS INTENDED TO MEET NATIONAL MAP ACCURACY STANDARDS AT THE COMPILATION SCALE.

DATE	TECH	VERSION
Oct. 31, 2003	DED	Year 7



Watershed ID	Watershed Name
00	Tennessee River
01	First Creek
02	Second Creek
03	Third Creek
04	Fourth Creek
05	Goose Creek
06	Baker Creek
07	Williams Creek
08	Knob Creek
09	Toll Creek
10	Ten Mile Creek
11	Whites Creek
12	Turkey Creek
13	East Fork
15	Spring Creek
16	DeArmond Spring Branch
18	Sinking Creek
30	French Broad River
50	Holston River
51	Swanpond Creek
52	Inman Branch
53	Loves Creek
54	Woods Creek
70	Clinch River
71	Beaver Creek
77	Grassy Creek
79	Knob Fork
90	Little River
91	Stock Creek
99	Unnamed Creek (at McClure Ln)

Outfall Type	Description	Criteria for Type
100	Major Pipe	Pipe diameter >= 36"
200	Major Channel	Drainage area >= 50 acres
300	Major Industrial	Pipe diameter >= 12" or zoned industrial - drainage area > 2 acres
400	Minor Pipe	Pipe diameter < 36"
500	Minor Channel	Drainage area < 50 acres