

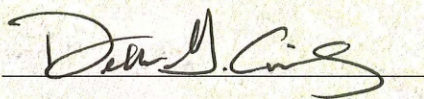
# Quarterly Progress Report

Volume 31

**Fourth Quarter Report  
October 1 through December 31, 2012**

**Submitted to EPA on January 30, 2013**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such 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.



Debbie G. Ailey

1/30/13

Date



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# Executive Summary

On February 11, 2005, the Knoxville Utilities Board (KUB) entered into a Consent Decree with the United States, the State of Tennessee, the Tennessee Clean Water Network, and the City of Knoxville. The following Quarterly Progress Report is submitted to fulfill the reporting requirements described in Section XIX of the Consent Decree.

Consent Decree language, pages 82-83: *“Beginning thirty (30) Days after the first Calendar Quarter following the Date of Entry, and thirty (30) Days after each Calendar Quarter thereafter until termination of the Consent Decree, KUB shall submit to the Parties, and simultaneously place in the PDR, a Quarterly Progress Report. Quarterly Progress Reports shall not be subject to the Public Review Requirement of Section VI.A.2. However, KUB shall receive questions and comments from the public for KUB’s review for a period of twenty (20) Days following placement in the PDR. Each Quarterly Progress Report shall contain:*

1. *A summary of compliance with and activities related to implementation of the Phase 1 CAP/ER and Phase 2 CAP/ER, including: the status of construction projects in comparison to the schedules that have been established pursuant to the Consent Decree for those projects; and schedule deadlines and milestones achieved during Calendar Quarter and expected during the next Calendar Quarter;*
2. *A summary of compliance with and activities related to implementation of the CPE and CCP;*
3. *A summary of implementation of and compliance with the Process Controls Program;*
4. *A summary of the implementation of the Capacity Assurance Program for the Calendar Quarter, including the number of, and anticipated flow from, sewer connections that have been authorized, by Sewerbasin, a description of the projects that have been authorized and the number of credits earned and banked by KUB that will be expended for those projects, by Sewerbasin, and any exceptions granted for connections for essential services;*
5. *Identification of any transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof.*
6. *A description of the status of compliance or non-compliance with the requirements of this Decree and, if applicable, the reasons for non-compliance, including a list of all violations that are subject to stipulated penalties under Section X of this Decree.*
7. *A spreadsheet and summary of all SSOs, Bypasses, Diversions and effluent limit violations that occurred during the previous Calendar Quarter. Information on Building Backups may be provided in separate spreadsheets and summaries from other SSOs. The spreadsheets and summaries shall identify:*
  - a. *For all SSOs, the location, source, date, time, duration, pathway (if any), receiving water (if any), the reason for each SSO, the total SSO volume, the volume returned to the WCTS, and the volume not captured;*
  - b. *For all Bypasses and Diversions, the location, date, time, duration, volume and reason for each Bypass and Diversion; and the total Bypass and Diversion volumes;*
  - c. *For all effluent limit violations, all information required to be reported on KUB’s Discharge Monitoring Reports.*
8. *The water quality monitoring data and other information required pursuant to Section VII.D.1.(e).(v).”*

KUB compiled this Quarterly Progress Report to detail the events that occurred during the fourth quarter of 2012 from October 1 through December 31. This is the thirty-first quarterly report required of KUB under this Consent Decree.

### **Report Organization**

*Section 1: Phase 1 CAP/ER and Phase 2 CAP/ER* – Summarizes the compliance with and activities related to implementation of the Phase 1 CAP/ER and Phase 2 CAP/ER, including the status of construction projects in comparison to the schedules that have been established pursuant to the Consent Decree for those projects; and schedule deadlines and milestones achieved during the Calendar Quarter and expected during the next Calendar Quarter.

*Section 2: Comprehensive Performance Evaluation and Composite Correction Plan* – Summarizes the compliance with and activities related to the implementation of those deliverables.

*Section 3: Process Controls Program* – Summarizes the implementation of and compliance with the deliverable.

*Section 4: Capacity Assurance Program* – Summarizes the implementation of the Capacity Assurance Program for the Calendar Quarter, including the number of, and anticipated flow from, sewer connections that have been authorized, by sewerbasin, a description of the projects that have been authorized and the number of credits earned and banked by KUB that will be expended for those projects, by sewerbasin, and any exceptions granted for connections for essential services.

*Section 5: Transfers of Ownership* – Identifies any transfers of ownership interest, operation, management, or other control of the treatment works, or any portion thereof.

*Section 6: Compliance and Non-Compliance with the Consent Decree* – Describes the status of compliance or non-compliance with requirements of the Consent Decree.

*Section 7: SSOs, Bypasses, Diversions, and Effluent Limit Violations* – Provides a spreadsheet and summary of all SSOs, Bypasses, Diversions, and effluent limit violations.

*Section 8: Water Quality Monitoring Data* – Summarizes all sampling that was conducted, the results of the sampling, and the projected data collection for the reporting period.

### **Status of Deliverables**

Below is a list of significant dates on which KUB submitted deliverables to EPA or received approval for deliverables. To date, KUB has submitted all deliverables in accordance with the schedule set forth in the Consent Decree.

#### October 29, 2012

- Submitted to EPA – Quarterly Progress Report 3<sup>rd</sup> quarter 2012

## Section 1 Phase 1 CAP/ER and Phase 2 CAP/ER

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A summary of compliance with and activities related to implementation of the Phase 1 CAP/ER and Phase 2 CAP/ER, including the status of construction projects in comparison to the schedules that have been established pursuant to the Consent Decree for those projects; and schedule deadlines and milestones achieved during Calendar Quarter and expected during next Calendar Quarter.”*

KUB began developing a Corrective Action Plan/Engineering Report (CAP/ER) in January 2004, following the completion of the Phase I Sanitary Sewer Overflow Evaluation Report (SSOER) required by the Agreed Order with the Tennessee Department of Environment and Conservation (TDEC) and, subsequently, the Consent Decree. The objective of the Phase I CAP/ER is to identify facility improvements needed to address the conditions causing SSOs occurring in the collection system during the period of 2001–2004 with the goal of eliminating the SSO locations on the Long-Term List and to support future growth needs. KUB submitted the Phase 1 CAP/ER to EPA on October 28, 2005. Comments were received from EPA on February 23, 2006. Per EPA’s letter, KUB submitted a 30-day response to EPA’s comments on March 27, 2006. The Revised Phase 1 CAP/ER was submitted to EPA on May 22, 2006, and subsequently approved by EPA on June 30, 2006. All work necessary to meet the objectives of the Phase 1 CAP/ER will be completed by June 30, 2013. The Phase 2 CAP/ER was submitted to EPA on September 9, 2009, and approved on March 22, 2010. All work necessary to meet the objectives of the Phase 2 CAP/ER will be completed by FY 2015.

### **EPA Approved Project Extensions and Changes**

All previously approved project extensions and changes are listed below.

- **1-1 Upper First Creek Collector Project (Mini-basin 1A1, 2A2, and 3D1)** – revised completion date was FY 08/09 and was completed on schedule.
- **1-19 Edgewood Drive Rehabilitation Project** – revised completion date is FY 11/12. Project was completed ahead of schedule.
- **1-20 Vine Middle School Rehabilitation Project** – revised completion date was FY 07/08 and was completed as scheduled.
- **1-21 College Park Rehabilitation Project** – revised completion date was FY 11/12. An additional extension to January 31, 2013, was requested and approved. Project was completed ahead of schedule.
- **2-1 Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** – revised completion date was FY 09/10 and was completed as scheduled.
- **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – revised completion date was FY 10/11. Additional extensions to FY 11/12 and then to January 31, 2013, were requested and approved. Project was completed ahead of schedule.
- **2-4 Dutch Valley Collector Rehabilitation (Sewershed 10B1)** – revised completion date was September 2007 and was completed as scheduled.
- **2-5 Rickard and Wilson Collector Rehabilitation (Sewershed 10C1)** – revised completion date was September 2007 and was completed as scheduled.
- **3-6 Interstate 40 and Middlebrook Pike Trunk Replacement Project** – revised completion date was FY 11/12. An additional extension to FY 12/13 was requested and approved.
- **3-7 Neyland Drive Trunk Replacement (Lower Third Creek Trunk Replacement)** – revised completion date is FY 12/13. Project was completed ahead of schedule.

- **4-2 Gleason Drive Collector Rehabilitation Project** – revised completion date was June 30, 2010, and was completed as scheduled.
- **4-3 Middlebrook Pike Rehabilitation (Sub-basin 27C3)** – revised completion date was June 30, 2010, and was completed as scheduled.
- **4-4 Northshore Drive Trunk Replacement Project** – revised completion date was FY 10/11. An additional extension to FY 11/12 was requested and approved. Project was completed ahead of schedule.
- **4-6 Shadyland Drive Rehabilitation (Sub-basin 36A2) Project** – revised completion date was June 30, 2010, and was completed as scheduled.
- **4-28 Queensridge (Queensbury) Pump Station Upgrade Project** – revised completion date is FY 11/12. Project was completed ahead of schedule.
- **S-1 Ginnbrook Pump Station Rehabilitation** – revised completion date was FY 08/09 and was completed as scheduled.
- **S-5 South Knoxville/Knob Creek Storage Facility** – Project was removed from CAP/ER and replaced with the project below.
- **Revised S-5 Neubert Springs Collector and West Ford Valley Trunk Rehabilitation** – revised completion date was FY 08/09 and was completed as scheduled.

#### **Capital Improvement Plan for FY 04/05 – FY 12/13**

The following is a list of facility improvement projects included in the Capital Improvement Plan for fiscal years 04/05 to 12/13. These projects were in various stages during the reporting period, including preliminary engineering, design, construction, and completion. Many of these projects are “find and fix” rehabilitation projects. Find work is defined as the inspection (i.e. flow monitoring, CCTV, manhole inspections, smoke testing, etc.) and design phase of the project. Fix is defined as the construction phase that may include manhole rehabilitation/replacement, main line rehabilitation/replacement, and lower lateral rehabilitation/replacement. Other projects are trunkline capacity improvements or wet-weather storage. Each of these projects is considered part of the overall Phase 1 CAP/ER.

### **Phase I CAP/ER Ongoing Projects**

#### **First Creek**

1. **1-22 E. Jackson Avenue Rehabilitation Project** – This project is currently under construction and the expected completion date for this work is June 2013.

#### **Second Creek**

All Phase I CAP/ER projects in the Second Creek basin have been completed.

#### **Third Creek**

1. **3-6 Interstate 40 and Middlebrook Pike Trunk Replacement Project (East Fork of Third Creek Trunk Replacement)** – Constructability issues, property acquisitions, and permitting for this large diameter project required that the project completion date be extended until FY 12/13. The project conditions are along commercial, industrial, and transportation (roadway and railroad) corridors with challenging topography. Project will require coordination with future TDOT road improvement projects, extensive railroad permitting, environmental permitting, and property acquisition. The project has been broken into three phases to provide more effective delivery. Phase I, which consisted of the replacement of 3,200 ft of 30” pipe with 36” pipe, is complete. Phase II construction is underway and consists of the replacement of 3,400 ft of 18-30” pipe with 36” diameter

pipe. Phase III construction is underway and consists of replacement of 1,800 ft of 18" pipe with 18-30" pipe.

#### **Fourth Creek**

All Phase I CAP/ER projects in the Fourth Creek basin have been completed.

#### **South Knox**

1. **S-21 Alpine Avenue Rehabilitation Project** – Project is under construction and is scheduled to be completed in FY 12/13.

#### **Loves Creek and Eastbridge**

1. **L-7 Magnolia Avenue Rehabilitation** – Project is under construction. The expected completion date for this project is FY 12/13.

#### **Williams Creek**

All Phase I CAP/ER projects in the Williams Creek basin have been completed.

### **Phase I CAP/ER Completed Projects**

#### **First Creek**

1. **1-1 Upper First Creek Collector Project (Mini-basin 1A1, 2A2, and 3D1)** – Estimated total quantities: 10,235 ft gravity sewer replaced/rehabbed; 32 new manholes installed; 175 manholes rehabbed; 69 private laterals reinstated.
2. **1-2 Lower First Creek Collector Project (Sub-Basin 8B2)** – Replaced approximately 10,525 ft of 8" – 12" sewer, and rehabilitated approximately 14,000 ft of 8" sewer.
3. **1-3 First Creek Storage Tanks** – Designed and built 9 million gallon (MG) wet-weather storage tank to control sewer overflows near Old Broadway during rain events. Designed and built 5 MG wet-weather storage tank to control sewer overflows near North Hoitt Avenue during rain events.
4. **1-4 Lower Fountain City Pipe Replacement Project** – Replaced 20 manholes. Replaced approximately 2,715 ft of sewer mains and rehabilitated 142 ft of sewer.
5. **1-5 Upper Fountain City Trunkline Replacement Project** – Replaced and upgraded approximately 6,000 ft of trunk sewer connecting lines in upper Fountain City to Upper First Creek storage tank. The project addressed SSOs along Broadway, Cedar Lane, and Fountain Road.
6. **1-6 Sub-basin 08A1 Rehabilitation Project** – Rehabilitated approximately 21,067 ft, and replaced approximately 10,273 ft of sewer.
7. **1-11 Fountain City Trunkline Replacement Phase IV Project** – Replaced approximately 2,991 ft of sewer.
8. **1-12 Cedar Lane Area Sanitary Sewer Rehabilitation Project** – Rehabilitated approximately 8,500 ft of sewer.
9. **1-13 Fair Drive Phase II** – Rehabilitated 3,691 ft and replaced 2,458 ft of existing 8-12" gravity sewer along Fair Drive.
10. **1-14 Wilderness Road Area Gravity Sewer Replacement Project** – Replaced approximately 5,440 ft of sewer.
11. **1-15 Replace trunk sewer upstream of lower storage unit** – Replaced 1,600 ft of existing 42" and 130 ft of 24" pipe.
12. **1-16 Clearview Street Sewer Project** – Replaced approximately 4,468 ft of sewer.

13. **1-17 Fountain Road Trunkline Sewer Improvement Project** – Upsized 3,700 ft of gravity sewer using open cut and pipe bursting methods. Replaced manholes and services.
14. **1-18 Greenfield Drive Rehabilitation Project** – Replaced approximately 3,300 ft of existing sewer with 8" and 12" PVC and ductile iron pipe.
15. **1-19 Edgewood Drive Rehabilitation Project** – Replaced 519 ft of 8" sewer, 179 ft of 12" sewer; rehabilitated 22,300 ft of 8" sewer, and 60 ft of 12" sewer using CIPP and pipebursting. Project also included rehabilitation of 662 vertical feet and replacement of 10 manholes.
16. **1-20 Vine Middle School Rehabilitation Project** – Completed find and fix work to identify cause of overflow in the vicinity of 214 Bertrand Street. Replaced approximately 200 ft of 8" and 100 ft of 15" sewer and rehabilitated 987 ft of 16" sewer.
17. **1-21 College Park Rehabilitation Project** – Replaced approximately 446 ft of 8" PVC and rehabilitated 1,581 ft of 8" sewer using pipebursting. Project also included replacement of six manholes.
18. **1-23 Oglewood Avenue Rehabilitation Project** – The summary above for the Edgewood Drive Rehabilitation Project includes the Oglewood Avenue Rehabilitation Project, since those projects were combined.
19. **1-24 Fulton Short Line Project** – Replaced approximately 520 ft of sewer that contributes to the cause of overflow in the vicinity of 214 Bertrand Street.
20. **1-25 First Creek Sub-basins 3 and 4 Rehabilitation Project** – Rehabilitated 26,500 ft of line and replaced 10,500 ft. Project included CCTV, smoke testing, and manhole inspections.
21. **1-26 Cherry Street Rehabilitation Project** – Upsized approximately 1,150 ft of sewer trunklines and replaced two manholes and rehabilitated two manholes.
22. **1-27 Fair Drive Rehabilitation Project** – Preliminary engineering work discovered that 567 ft of 8" gravity main and three manholes were rehabilitated after the SSO occurred. No additional work is necessary to address the overflow at this location.

## **Second Creek**

1. **2-1 Lower Second Creek Replacement/Rehabilitation at I40/I275 Junction** – Replaced 280 ft and three manholes, pipe burst 1,959 ft; CIPP was used to rehab 2,313 ft, 29 manholes were rehabbed, and 50 laterals were reinstated.
2. **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – Replaced approximately 1,700 ft of trunk sewer and rehabilitated approximately 600 ft of trunk sewer and replaced ten manholes.
3. **2-3 Second Creek 23E1** – Inspected a total of 28,067 ft of pipe for find and design rehabilitation needs for Mini-basin 23E1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
4. **2-4 Dutch Valley Collector Rehab (Mini-basin 10B1)** – Assessed and rehabilitated, where needed, approximately 16,400 ft of collector pipe. This project was combined with the Rickard and Wilson Collector Rehab project below.
5. **2-5 Rickard and Wilson Collector Rehab (Mini-basin 10C1)** – Assessed and rehabilitated, where needed, approximately 19,000 ft of collector pipe. Project was combined with Mini-basin 10B1.
6. **2-6 Second Creek Pilleaux PS Collector** – Rehabilitated 19,600 ft of collection system piping in mini-basin 05A4. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
7. **2-8 Second Creek Sub-basin 15 Rehabilitation** – Rehabilitated approximately 23,500 ft of pipe in mini-basin 15D2. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.

8. **2-9 Second Creek Trunk Sewer Improvements Phase I** – Replaced approximately 4,100 ft of existing trunkline with 30" sewer.
9. **2-10 Second Creek Trunk Sewer Improvements Phase II** – Replaced approximately 3,700 ft of existing trunkline with 30" sewer and replaced approximately 1,400 ft of existing trunkline with 36" sewer
10. **2-11 Burnside Rehabilitation Project** – Replaced 517 ft of 8" sewer and 1,651 ft of 12" sewer using pipe bursting. Six manholes were replaced and 3 were rehabbed.
11. **2-12 Camelia Road Rehabilitation Project** – Replaced 430 ft of 8" pipe and two manholes. 220 ft of 8" pipe was rehabbed using CIPP.
12. **2-13 Cedar Heights Road Rehabilitation Project** – Replaced 123 ft of 8" pipe and rehabbed 263 ft of 8" pipe with CIPP.
13. **2-14 Central Avenue Pike Rehabilitation Project** – Replaced 102 ft of 10" pipe, 25 ft of 18" pipe, two manholes. CIPP was used to rehab 659 ft of 8" pipe.
14. **2-15 1000 Block Elm Street Rehabilitation Project** – Replaced 632 ft of 8" sewer and nine manholes. Rehabbed 1,400 ft of 8" sewer using CIPP and rehabbed three manholes. One lateral was reinstated.
15. **2-16 1600 Block Elm Street Rehabilitation Project** – Pipe burst 285 ft of existing 8" sewer and replaced two manholes.
16. **2-17 Shasta Drive Rehabilitation Project** – Replaced 714 ft of 8" pipe and 6 manholes. CIPP was used to rehab 2,149 ft of 8" pipe.
17. **2-18 Nicholas Road - Clinton Highway Rehabilitation Project** – Replaced 405 ft of 8" pipe and one manhole.
18. **2-19 Cumberland Avenue Rehabilitation Project** – Replaced 1,448 ft of 8" sewer and 10 manholes. Rehabbed 525 ft of 8" sewer using CIPP and reinstated 12 laterals.
19. **2-20 Sierra Road Rehabilitation Project** – CIPP was used to rehab 969 ft of 8" pipe.
20. **2-21 Morelia Avenue Rehabilitation Project** – Replaced 382 ft of 8" sewer and two manholes. Rehabbed three manholes, 2,375 ft of 8" sewer using CIPP, and reinstated 74 laterals.
21. **2-22 Dale Avenue Rehabilitation Project** – The 8" main was replaced in 2003 with a 12" ductile iron main in Dale Avenue. No additional overflows have occurred.

### Third Creek

1. **3-2 Third Creek Basin 11** – Assessed and rehabilitated approximately 129,657 ft in Sub-basin 11. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
2. **3-3 Third Creek Basin 9 Phase I** – Assessed and rehabilitated collector sewer in 9A1, 9A2, 9A4, and 9D1 (CAP/ER Scope). **Phase II** – Designed rehabilitation methods for collectors in Sub-basin 9 (approximately 177,900 ft). Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
3. **3-4 Upper McKamey Trunk Sewer Replacement** – Project replaced approximately 1,600 ft of 12" and 15" trunk sewer. This project further enhanced improvements already made in Third Creek to address overflows along McKamey Road. **Third Creek Road Trunk Sewer Replacement** – Project included approximately 3,100 ft of 24" and 30" trunkline. The project replaced and upgraded the trunkline from Western Avenue along Third Creek to the Third Creek storage facility. It addressed overflows occurring at 5600 Western Avenue. Project was extended approximately 2,000 ft to reach the new location of the Third Creek Storage Facility at the KUB Hoskins Center.
4. **3-5 Third Creek Storage Facility** – Designed and constructed 4.5 MG wet-weather storage tank to control sewer overflows near Western Avenue and Third Creek Road during rain events.

5. **3-7 Neyland Drive Trunk Replacement (Lower Third Creek Trunk Replacement)** – Replaced approximately 4,600 ft of sewer with 48" CCFMP, sliplined 685 ft of sewer with 42" CCFMP and replaced 34 manholes. The inverted siphon near the mouth of Third Creek was also replaced.
6. **3-8 Third Creek Bike Trail Trunk Replacement** – Improvements to the sewer hydraulics were made at the connection of the 12" main to a 36" trunk sewer running south of Sutherland Avenue along Third Creek bike trail. Improvements included approximately 50 feet of 12" line and a new manhole. Additionally, rehabilitation in SB 28B1 has reduced the peaks to the 12" line.
7. **3-11 Sutherland Avenue Collector Rehabilitation Project (Sub-basin 28B1)** – Replaced 303 ft of existing sewer and rehabilitated 3,332 ft of existing sewer collectors in mini-basin 28B1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
8. **3-12 Clinch and 21st Street Collector Rehabilitation Project (Sub-basin 35B3)** – Replaced approximately 2,563 ft of existing sewer, rehabilitated 3,094 ft and replaced/rehabbed 25 manholes.
9. **3-14 McKamey Road Interconnection Project** – Analysis that occurred during preliminary engineering for this project determined that it had been adequately addressed by previous construction work.
10. **3-15 Ball Camp Pike Improvement Project** – Analysis that occurred during preliminary engineering for this project determined that it had been adequately addressed by previous construction work.
11. **3-16 Painter Avenue Trunk Replacement Project** – Original scope was changed from trunkline upsizing to collection system rehabilitation/replacement in Mini-basin 28b1. Pipeburst approximately 17,800 ft of existing sewer, rehabilitated 550 ft and replaced/rehabbed 61 manholes
12. **3-17 McKamey Road Relief Project** – Replaced approximately 3,600 ft of 15" and 1,400 ft of 18" sewer.
13. **3-20 Citico Street Rehabilitation Project** – Project was combined with 3-23 Hillvale Circle Rehabilitation Project, 3-24 Montgomery Avenue Rehabilitation Project, and 3-27 Montgomery Avenue Rehabilitation Project. Combined projects replaced approximately 22,500 ft of 8" sewer and 28 manholes.
14. **3-21 Deerfield Road Rehabilitation Project** – Pipeburst approximately 600 ft of existing gravity sewer and replaced two manholes.
15. **3-22 Fountain Drive Rehabilitation Project** – Replaced approximately 750 ft of existing sewer, rehabilitated 800 ft and replaced/rehabbed nine manholes.
16. **3-23 Hillvale Circle Rehabilitation Project** – Project was combined with 3-20 Citico Street Rehabilitation Project, 3-24 Montgomery Avenue Rehabilitation Project, and 3-27 Montgomery Avenue Rehabilitation Project. Combined projects replaced approximately 22,500 ft of 8" sewer and 28 manholes.
17. **3-24 Montgomery Avenue Rehabilitation Project** – Project was combined with 3-20 Citico Street Rehabilitation Project, 3-23 Hillvale Circle Rehabilitation Project, and 3-27 Montgomery Avenue Rehabilitation Project. Combined projects replaced approximately 22,500 ft of 8" sewer and 28 manholes.
18. **3-25 Rolling Ridge Interconnection Project** – Pump station was decommissioned and 1,950 ft of new gravity sewer was installed to divert flow from the station into existing gravity sewer.
19. **3-26 PCP, CPE and CCP** – Completed wastewater evaluation studies of the Kuwahee WWTP.
20. **3-27 Montgomery Avenue Rehabilitation Project** – Project was combined with 3-20 Citico Street Rehabilitation Project, 3-23 Hillvale Circle Rehabilitation Project, and 3-24

Montgomery Avenue Rehabilitation Project. Combined projects replaced approximately 22,500 ft of 8" sewer and 28 manholes.

21. **3-29 Highland Hills Road Rehabilitation Project** – Project was combined with 3-20 Citico Street Rehabilitation Project, 3-23 Hillvale Circle Rehabilitation Project, 3-24 Montgomery Avenue Rehabilitation Project, and 3-27 Montgomery Avenue Rehabilitation Project. Combined projects replaced approximately 22,500 ft of 8" sewer and 28 manholes.

#### **Fourth Creek**

1. **4-1 Chukar Road Rehabilitation** – Replaced 1,600 ft of pipe and nine manholes; rehabbed 900 ft of pipe and nine manholes.
2. **4-2 Gleason Road Rehabilitation** – Replaced 980 ft of 8" pipe and 12 manholes. CIPP was used to rehab 640 ft of 8" pipe and 480 ft of 12" pipe.
3. **4-3 Middlebrook Pike Rehabilitation** – Replaced 190 ft of 8" pipe and two manholes. CIPP was used to rehab 2,000 ft of 8" pipe. Two manholes were rehabbed as well.
4. **4-4 Northshore Drive Trunk Sewer Replacement** – Installed approximately 3,375 ft of 36" trunk sewer, 260 ft of smaller diameter trunk sewer, and replaced 29 manholes.
5. **4-6 Shadyland Drive Rehabilitation** – Replaced 1,700 ft of 10" pipe and 9 manholes. CIPP was used to rehab 1,000 ft.
6. **4-17 Walker Springs Storage Facility** – Designed and constructed 3.25 MG wet-weather storage tank to control sewer overflows near Walker Springs Pump Station during rain events.
7. **4-18 Papermill Drive Phases I, II, and III** – Designed and constructed replacement of approximately 4,000 ft of 15", 18", and 2,100 ft of 36" sewer in the Papermill Drive area to increase conveyance capacity and reduce sewer overflows.
8. **4-19 Northshore Drive Rehabilitation Project** – Raised manholes 6, 7, and 8 to create additional storage in the trunkline upstream of the Fourth Creek WWTP.
9. **4-21 Black Bear Road Project** – Replaced approximately 261 ft of existing 8" sewer and rehabilitated one manhole. Project included CCTV, manhole inspections, and smoke testing.
10. **4-22 Nightingale Lane Project** – Completed repairs of two manholes to address overflows in the vicinity of 6614 and 6617 Nightingale Lane.
11. **4-23 5205 Bent River Blvd Project** – Replaced air release valves, flushed the low pressure force main, and replaced the grinder pump at 5205 Bent River Blvd.
12. **4-24 Kerri Way Project** – Replaced approximately 439 ft of existing 8" sewer and five manholes. Approximately 92 ft of existing 8" sewer was rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
13. **4-25 Lonas Drive Project** – Replaced approximately 326 ft of existing 8" sewer and five manholes. Approximately 4,688 ft of existing 8" sewer and nine manholes were rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
14. **4-26 Midpark Drive Project** – Replaced two manholes. Approximately 440 ft of existing 8" sewer and three manholes were rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
15. **4-27 Southfork Project** – Project was completed in conjunction with 4-1 Chukar Road Rehabilitation Project. Replaced 88 feet of 8 inch pipe and two manholes. Rehabilitated 140 feet of 8 inch pipe using CIPP.
16. **4-28 Queensridge (Queensbury) Pump Station Upgrade Project** – The terminal manhole for the Queensbury force main has been replaced and the piping configuration for this manhole was also adjusted to lessen pressure restrictions allowing access to the force main for cleaning. Both pumps were also replaced.

17. **4-31 Kingston Pike @ Gallaher View Project** – Replaced one manhole. Approximately 1,068 ft of existing 8" sewer and six manholes were rehabilitated. Project included CCTV, manhole inspections, and smoke testing.
18. **4-32 PCP, CPE and CCP** – Completed wastewater evaluation studies of the Fourth Creek WWTP.

#### **South Knox**

1. **S-1 Ginnbrook Pump Station** – Evaluated pump station and force main to ensure adequate capacity. Also included improvements to wet-well, pump system, and valve vault. The force main was re-routed.
2. **S-2 Blount Avenue Trunkline and Goose Creek Siphon Upgrade** – The trunkline upgrades between the siphon inlet structure and manhole 63-2 are complete. This work was included in phases I and II of the Blount Avenue Trunkline Replacement/ Rehabilitation Project. This construction successfully addressed historical overflows.
3. **S-5 (Revised) Neubert Springs Collector and West Ford Valley Trunk Rehabilitation** – Rehabilitated 10,000 ft of 15" to 18" trunk sewer along West Ford Valley Road. Completed find work in sub-basins 41C1, 41C2, and 41A2. Completed trunkline rehabilitation on West Ford Valley. Rehabilitated collector line in sub-basin 41C1, C2, and A2.
4. **S-6 Sevier Avenue and Jones Street Collector Project** – Rehabilitated approximately 3,100 ft of existing sewer and rerouted approximately 352 ft of 8" sewer.
5. **S-9 Ellis Road Rehabilitation Project** – Rehabilitated 2,250 ft of gravity sewer and replaced six MHs.
6. **S-10 Mini-basin 41A6 Rehabilitation Project** – Rehabilitated approximately 21,000 ft of sewer in Sub-basin 41A6.
7. **S-11 Ford Valley Pump Station Rehabilitation Project** – Replaced pump station and added additional pump and generator to convey two-year storm within Capacity Assurance Program requirements.
8. **S-14 Stone Road Rehabilitation** – Rehabilitated approximately 13,500 ft of sewers in Mini-basin 41B1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
9. **S-15 Trunk Replacement in Sub-basin 40A2 Project** – 3411 ft of gravity sewer was replaced, 16 manholes were rehabbed, and 13 laterals were reinstated as part of this completed project.
10. **S-16 Woodson Drive Trunk Replacement and Pump Station Upgrade Project** – Replaced approximately 260 ft of existing sewer and performed upgrades at the pump station.
11. **S-17 Island Home Rehabilitation** – Rehabilitated 9,400 ft and replaced 1,200 ft of collector sewers to reduce I/I.
12. **S-18 South Haven Phase I and Phase II** – Relocated, rehabilitated, and upsized approximately 4,700 ft of existing collector sewers to increase conveyance capacity and reduce inflow and infiltration (I/I).
13. **S-19 Maryville Pike** – Designed and replaced 800–1,200 ft of 24" sewer located in Witherspoon Superfund site. Design rerouted sewer around site.
14. **S-20 Avenue A Rehabilitation Project** – CIPP was used to rehabilitate 1,585 ft of sewer. Seven manholes were rehabilitated, and 25 service lines were replaced.
15. **S-24 East Ford Valley Rehabilitation** – Rehabilitated approximately 16,000 ft of sewers in Mini-basin 41A4. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.

16. **S-25 South Haven Rehabilitation Phase III** – Rehabilitated approximately 21,700 ft of sewers in Mini-basin 40F1. Project included inspection (CCTV, smoke test, manhole inspections), design, and rehabilitation of lines requiring repair.
17. **S-26 Trunk Sewer Replacement Project in Sub-basin 40F1** – This project was constructed as part of the South Haven Phase III work. Replaced 704 ft of 8" sewer and six manholes. Five laterals were reinstated.
18. **S-27 Trunk Sewer Replacement Project in Sub-basin 41A4** – Replaced approximately 175 ft of existing sewer with 12" sewer and 3,700 ft of existing sewer with 15" sewer.
19. **S-28 Trunk Sewer Project** – This project was combined with Project S-2. Please see description above.
20. **S-29 4500 Block Sevierville Pike Rehabilitation Project** – Completed find and fix work to identify and address cause of overflow in the vicinity of 4523 Sevierville Pike.

#### **Loves Creek and Eastbridge**

1. **L-1 Asheville Highway West of I-40 Trunk Replacement** – Upgraded 4,688 ft of existing pipe and replaced 20 manholes. Project was completed in FY 09/10, two years ahead of schedule.
2. **L-2 Boyds Bridge Pike and Holston Hills Trunk Replacement** – Replaced 4,456 feet of trunkline and 31 manholes.
3. **L-3 River View Rehabilitation** – Rehabilitated 4,627 ft of gravity sewer along with eight manholes and replaced one manhole. This work addressed the SSO located on Riverview Drive. Project was completed in FY 09/10.
4. **L-4 Asheville Highway Rehabilitation** – Rehabilitated 1,560 ft of sewer mains and 12 manholes.
5. **L-5 Brentwood Shortline Repair** – Rehabilitated 440 ft of gravity sewer. This work addressed the SSO located on Brentwood Road. Project was completed in FY 09/10.
6. **L-6 Holston Hills Road Rehabilitation** – Rehabilitated 1,356 ft of sewer mains.
7. **L-8 McDonald Drive Rehabilitation** – Rehabilitated 285 ft of sewer main, replaced 316 ft of sewer main and two manholes.
8. **L-9 Shelbourne Road Rehabilitation** – 26,900 ft of gravity sewer was rehabilitated along with 30 manholes in sub-basins 6A4 and 6A5. This work addressed the SSO located on Shelbourne Road.
9. **L-10 Washington Court Rehabilitation** – Rehabilitated 872 ft of gravity sewer. This work addressed the SSO located on Washington Court. Project was completed in FY 09/10.
10. **EB-1 Maloneyville Road Rehabilitation** – Mechanical grinder was installed at Knox County Detention Facility to remove paper debris prior to discharge. Paper debris clogging the pumps was the cause of previous SSOs at Maloney Road pump station.
11. **EB-2 Strawberry Plains Pike Rehabilitation Project** – Replaced approximately 750 ft of 8" PVC and three manholes.

#### **Williams Creek**

1. **W-1 Sub-basin 19A2 Rehabilitation** – Performed rehabilitation in Sub-basin 19A1, 19B1, and 19A2/A3 to reduce R-value to 2 percent. Investigative work was performed on the approximately 105,000 ft in the entire Sub-basin 19 area. Completed rehabilitation projects in 19A1, 19B1, and 19A2/A3. The original CAP/ER completion date for the 19A2 project was in FY 10/11. This project was shifted to higher priority due to the large number of private lateral problems and CSSAP rating. Project coincided with water quality monitoring program work in Williams Creek. Replaced approximately 14,000 ft of 8" – 12" sewer and rehabilitated approximately 9,500 ft of 8" – 12" sewer.

2. **W-2 Williams Creek Trunk Line Replacement** – Designed and replaced approximately 3,700 ft of 24" sewer to correct structural problems. In addition, the following project was completed to address force main issues in the area. **Delrose Force Main Replacement** – Replaced approximately 5,000 ft of 16" ductile iron pipe force main that had severe structural problems.
3. **W-3 Trunk Sewer Rehabilitation** – Replaced approximately 6,100 ft of existing sewer with 24" sewer.
4. **W-4 E. Fifth Avenue Sewer Replacement Project** – Replaced 956 ft with 8" PVC and four manholes.
5. **W-5 Groner Avenue Rehabilitation Project** – Replaced approximately 1,000 ft of sewer and rehabilitated approximately 3,600 ft of sewer and replaced 14 manholes.
6. **W-6 Selma Avenue – Harrison Street Rehabilitation Project** – Replaced 650 ft with 8" PVC and four manholes, and rehabbed 600 ft of 8" concrete.
7. **W-7 Sunset Avenue Rehabilitation Project** – Replaced 102 ft with 8" PVC.
8. **W-8 South Elmwood Street Rehabilitation Project** – Replaced 200 ft with 8" PVC and three manholes, and rehabbed 400 ft of 8" concrete.
9. **W-9 Williams Creek Trunk Line Replacement (Sub-basin 19A1)** – Performed rehabilitation in Sub-basin 19A1, 19B1, and 19A2/A3 to reduce R-value to 2 percent. Investigative work was performed on the approximately 105,000 ft in the entire Sub-basin 19 area. Completed rehabilitation projects in 19A1, 19B1, and 19A2/A3. The original CAP/ER completion date for the 19A2 project was in FY 10/11. This project was shifted to higher priority due to the large number of private lateral problems and CSSAP rating. Project coincided with water quality monitoring program work in Williams Creek. In lieu of replacement of 360 ft of 12" concrete with 15" sewer, problem was addressed by comprehensive rehab of Mini-basin 19A1. Project included replacement with 8,900 ft of 8" PVC, 97 ft with 10" PVC, 179 ft with 12" PVC, and 76 manholes. Also rehabbed 21,200 ft of 8" concrete and 180 ft of 12" concrete.

## Phase II CAP/ER

The Phase II CAP/ER was submitted to EPA on September 9, 2009, and subsequently approved on March 22, 2010.

## Phase II CAP/ER Ongoing Projects

### First Creek

1. **FCR-1 1235 Watercress Drive** – Find and fix project to address overflow in vicinity of 1235 Watercress drive in Mini-basin 07A2. This project is currently under construction. The expected completion date is June 2014.
2. **FCR-2 4600 Upchurch Road** – Find and fix project to address overflow in vicinity of 4600 Upchurch Road in Mini-basin 07A3. This project is currently under construction. The expected completion date is June 2014.

### Second Creek

1. **SCR-1 4105 Central Avenue Pike** – Find and fix work to identify and address overflow in vicinity of 4105 Central Avenue Pike. CCTV, smoke testing, and manhole inspection

have been completed. The construction plans for this project have also been completed and construction is expected to begin in March 2013. This project is expected to be completed in FY 13/14.

#### **Fourth Creek**

1. **4TH-2 Ten Mile Pump Station Removal** – Removal of Ten Mile pump station. This project is scheduled to be complete in late 2013.

#### **South Knox**

1. **STH-1 820 Goldfinch Drive** – Find and fix work to identify and address overflow in vicinity of 820 Goldfinch Drive. This project is under construction and is scheduled to be completed in FY 12/13.

### **Phase II CAP/ER Completed Projects**

#### **Fourth Creek**

1. **4TH-1 6540 Creekhead Drive** – Sewer rehabilitation completed in Mini-basin 32A4 via the following projects.
2. **Pinebrook Drive Sewer Replacement** – Replaced 330 ft of 8" gravity sewer partially exposed by erosion of the bank of the adjacent drainage channel.
3. **Walker Springs Rehabilitation (Mini-Basin 32A4)** – Performed a two-phased construction project to address issues in Mini-basin 32A4. Replaced approximately 275 ft of 8" gravity sewer.

#### **Loves Creek and Eastbridge**

1. **LVS-1 1815 Wayland Road** – Replace approximately 19,000 ft of 10" and 12" sewer.
2. **EBR-1 7612 Bud Hawkins Road** – Replaced the pump station with a gravity sewer system consisting of approximately 1,400 ft of 8" sewer, 2,100 ft of 12" sewer, 7,100 ft of 18" sewer and 6,000 ft of 20" sewer.

## **Section 2 Comprehensive Performance Evaluation Program (CPE) and Composite Correction Plan (CCP)**

Consent Decree language, pages 82-83: *"Each Quarterly Progress Report shall contain... A summary of compliance with and activities related to implementation of the CPE and CCP."*

The CPE was submitted to EPA on February 24, 2006, and was approved on July 24, 2006.

The CCP was submitted to the EPA on July 23, 2007. EPA disapproved it on January 4, 2008. The Revised CCP was submitted to EPA on January 5, 2009, and subsequently approved on January 20, 2009.

### **Kuwahee Wastewater Treatment Plant (WWTP) Phase I, Contract I**

Construction started in June 2011 and is complete. This construction project was completed prior to the December 31, 2012, deadline.

### **Kuwahee WWTP Phase I, Contract II**

Construction started in August 2011 and is substantially complete. This construction project was completed prior to the December 31, 2012, deadline.

### **Fourth Creek WWTP Phase I**

The Fourth Creek WWTP Phase I is currently under construction and expected to be completed prior to the EPA substantial completion date of December 31, 2013. To date, construction is 40 percent complete. The contractor has completed all concrete work at the High Rate Clarifier, chemical building, wet weather screening structure, and generator building. The contractor is currently working on masonry, as needed, for these buildings. Additionally, the contractor is 50 percent complete with yard piping and electrical duct bank installation. Major milestones this quarter will be starting work on the new chlorine contact tank and wet-weather screening structure.

## Section 3 Process Controls Program

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A summary of implementation of and compliance with the Process Controls Program.”*

The Process Controls Program (PCP) was initiated 14 times during this reporting period but did not result in any Diversion events.

## Section 4 Capacity Assurance Program

Consent Decree language, pages 82-83: *"Each Quarterly Progress Report shall contain... A summary of the implementation of the Capacity Assurance Program for that Calendar Quarter, including the number of, and anticipated flow from, sewer connections that have been authorized, by Sewerbasin, a description of the projects that have been authorized and the number of credits earned and banked by KUB that will be expended for those projects, by Sewerbasin, and any exceptions granted for connections for essential services."*

The Capacity Assurance Program (CAP) was submitted to EPA for review on February 8, 2006. EPA reviewed and approved the program on April 7, 2006. KUB started reviewing building permits based on the approved CAP on June 6, 2006, which was within the 60-day timeframe for implementing the program after receiving EPA approval.

To review building permits more efficiently using the CAP criteria agreed on with the EPA, KUB worked with a consultant, Camp, Dresser, & McKee, to develop an Information Management System (IMS). The IMS assists KUB in managing the CAP program by determining the amount of wastewater each proposed building would add to KUB's wastewater system based on its location. The IMS also helps track rehabilitation credits that KUB earns through its CAP/ER and Management, Operations, and Maintenance (MOM) programs.

Appendix A includes a list of capital projects that KUB performed to gain rehabilitation credit in its sewer system. As stated in the Consent Decree, the list of authorized sewer connections was maintained and updated as necessary until full implementation of the CAP as approved by EPA. Therefore, the list will no longer be included as part of this quarterly report.

There were no exceptions granted for connections for essential services during this reporting period.

## Section 5 Transfers of Ownership

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... Identification of any transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof.”*

There has been no transfer of an ownership interest, operation, management, or other control of the Treatment Works, or any portion thereof, during this reporting period.

## Section 6 Compliance and Non-Compliance With the Consent Decree

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain...A description of the status of compliance or non-compliance with the requirements of this Decree and, if applicable, the reasons for non-compliance, including a list of all violations that are subject to stipulated penalties under Section X of this Consent Decree.”*

### 6.1 Submission of Deliverables

To date, KUB has submitted all deliverables in accordance with the schedule set forth in the Consent Decree. The following sections detail all activity related to deliverables that occurred during the past quarter. Also noted are the dates each submittal was available for public comment in the Public Document Repository (PDR), when the deliverable was submitted to EPA, when EPA responded with comments, when KUB responded to those comments, and when EPA approval was received.

#### 6.1.1 Quarterly Progress Report Third Quarter 2012

Consent Decree language, pages 82-83: *“Beginning thirty (30) Days after the first Calendar Quarter following the Date of Entry, and thirty (30) Days after each Calendar Quarter thereafter until termination of the Consent Decree, KUB shall submit to the Parties, and simultaneously place in the PDR, a Quarterly Progress Report.”*

On October 29, 2012, KUB submitted to EPA and placed in the PDR the Quarterly Progress Report for the third quarter 2012. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from October 29, 2012, until November 19, 2012. No comments were received during that period.

### 6.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred four Unpermitted Discharges. Table 1 below lists all violations subject to stipulated penalties as outlined in the Consent Decree. Appendix E lists any SSO that occurred during the fourth quarter 2012 that resulted in an unpermitted discharge along with its cause, volume, one- and three-day rainfall totals, and rainfall intensity.

**Table 1. Violations Subject to Stipulated Penalties**

Violation	Date	Address	Cause
Unpermitted discharge	11-5-2012	4923 Ball Road	Broken force main
Unpermitted discharge	11-26-2012	5016 Wilford Road	Construction Failure
Unpermitted discharge	12-9-2012	1814 E. Glenwood Avenue	Blockage
Unpermitted discharge	12-20-2012	3006 Coram Street	Blockage

## Section 7 SSOs, Bypasses, Diversions, and Effluent Limit Violations

Consent Decree language, pages 82-83: *“Each Quarterly Progress Report shall contain... A spreadsheet and summary of all SSOs, Bypasses, Diversions, and effluent limit violations that occurred during the previous Calendar Quarter. Information on Building Backups may be provided in separate spreadsheets and summaries from other SSOs. The spreadsheets and summaries shall identify:*

- a. For all SSOs, the location, source, date, time, duration, pathway (if any), receiving water (if any), the reason for each SSO, the total SSO volume, the volume returned to the WCTS, and the volume not captured;*
- b. For all Bypasses and Diversions, the location, date, time, duration, volume and reason for each Bypass and Diversion; and the total Bypass or Diversion volumes;*
- c. For all effluent limit violations, all information required to be reported on KUB’s Discharge Monitoring Reports.”*

### 7.1 SSOs

Appendix B lists all SSOs that occurred during this reporting period. During this period, there were 22 SSO events. Of that number, ten were due to blockage, five were due to grinder pump failure, four were due to broken pipe, two were due to construction failure, and one was due to heavy rainfall.

Of the 22 SSO events, 18 were in the 0 – 1,000 gallons volume range, three were in the 1,001 – 10,000 range, and one event totaled greater than 10,000 gallons. Durations for events during this period are as follows: 18 ranged from 0 – 2 hours, three ranged from 2.1 – 5 hours, and one event was greater than five hours.

### 7.2 Building Backups

Appendix C lists all Building Backups that occurred during this reporting period. During this period, there were eight Building Backups. Four of those events were due to construction failure, three were due to blockage, and one event was due to grinder pump failure.

### 7.3 Bypasses

All Bypasses that occurred during this reporting period were in compliance with the Process Controls Program. For purposes of this report, any Bypass in compliance with the Process Controls Program shall be referred to as a “Diversion” (see below). All Bypasses not in compliance with the Process Controls Program shall be referred to as a “Bypass.”

Table 2 contains all Diversion event information that occurred during this reporting period. During this reporting period, there were no Diversion events at Kuwahee, Fourth Creek, Loves Creek, or Eastbridge. No Bypasses occurred during this reporting period.

### 7.4 Effluent Limit Violations

Table 3 contains all effluent limit violations that occurred during this reporting period. The table contains the information as it is reported in KUB’s Discharge Monitoring Reports. During this reporting period, there were no Effluent Limit Violations for Kuwahee, Fourth Creek, Loves Creek, or Eastbridge WWTPs.

**Table 2: Diversions**

WWTP	Did a Diversion occur?	Date Diversion gate opened	Time Diversion gate opened	Date Diversion gate closed	Time Diversion gate closed	Date Diversion flow reported	Duration (hrs)	Volume (MG)	Total Event Duration (hrs)	Total Event Volume (MG)	Reason for Event
Fourth Creek	No										
Kuwahee	No										
Loves Creek	No										
Eastbridge	No										

**Table 3: Effluent Limit Violations**

WWTP	Did an event occur?	Date	Parameter	Type	Limit	Value
Kuwahee	No	-	-	-	-	-
Fourth Creek	No	-	-	-	-	-
Loves Creek	No	-	-	-	-	-
Eastbridge	No	-	-	-	-	-
SS - Settleable Solids	mg/l - milligrams per liter					
TSS - Total Suspended Solids	cfu –Colony Forming Unit					
ml/l – milliliters per liter	lbs - Pounds					

## Section 8 Water Quality Monitoring Data

Consent Decree language, pages 82-83: *"Each Quarterly Progress Report shall contain... The water quality monitoring data and other information required pursuant to Section VII.D.1.(e).(v)."*

### 8.1 Sampling Conducted and Results

Appendix D lists all sampling that was conducted during this reporting period and the results thereof. In addition to routine monitoring in all creeks, and responding to Sanitary Sewer Overflows (SSOs), KUB Water Quality Personnel conducted some investigative sampling in Goose Creek. KUB continues to use RT-PCR Bacteroides analysis if necessary to investigate the source of any high *E. coli* counts that reoccur.

#### First Creek

All of the bacteriological results associated with the routine monitoring for First Creek (Routine Water Quality Monitoring Report – Appendix D) were below the water quality standard of 941cfu/100 ml, except for two samples taken during wet-weather conditions on 11/7/12. Runoff brings potential contamination from other sources into the stream and likely contributed to the high counts observed on this date. No other samples for the quarter were above the limit. No investigation is warranted.

#### Second Creek

The one routine sample that had an *E. coli* result slightly above the water quality standard of 941cfu/100 ml was collected on 12/17/12 when the area had received nearly two inches of rain within the day of and prior to sampling (Routine Water Quality Monitoring Report – Appendix D). It is probable that contamination from storm runoff contributed to the high count observed on this date.

#### Third Creek

There were no samples for this quarter that had an *E. coli* result above the water quality standard of 941cfu/100 ml (Routine Water Quality Monitoring Report – Appendix D). Investigative sampling for this creek is not necessary.

#### Fourth Creek

There were some *E. coli* results above the water quality standard for monitoring done on Fourth Creek during this quarter (Routine Water Quality Monitoring Report – Appendix D). These results were obtained on 10/15/12 and 12/18/12 when a significant amount of rain fell. Due to runoff, the rainfall likely produced these high counts. Investigative sampling is unnecessary at this time.

#### Loves Creek

The bacteriological results associated with the routine monitoring for Loves Creek (Routine Water Quality Monitoring Report – Appendix D) have been below the water quality standard of 941cfu/100 ml for some time. That continues to be the case this quarter with no high counts to report.

#### Williams Creek

There were two dates for this quarter that had *E. coli* results above the water quality standard of 941cfu/100 ml for Williams Creek (Routine Water Quality Monitoring Report – Appendix D). They were both sampled on days that were associated with heavy rainfall, 10/8/12, and 12/11/12. The source of possible contamination is being investigated because of the results obtained in the last two quarters.

### Baker Creek

There were three routine samples taken on 10/22/12 and 12/4/12 that were slightly above the water quality standard of 941cfu/100 ml (Routine Water Quality Monitoring Report – Appendix D) for Baker Creek. KUB has investigated this area of the creek in the past because of elevated counts observed in previous quarters along a tributary that enters the stream at mile 0.36. Two of the three samples that were above the water quality standard were sampled at this site. The tributary is small and dries up during warm and dry weather. Since these count elevations are inconsistent and seen primarily during wet weather near this tributary in this largely residential area, a leaking septic system or defective private lateral is suspect. Baker Creek data continues to be reviewed closely.

### Goose Creek

There was one routine sample for this quarter that had an *E. coli* result slightly above the water quality standard of 941cfu/100 ml (Routine Water Quality Monitoring Report – Appendix D). The sample was taken at Site 1.19E, which is currently under investigation (Table 1 – Appendix D). *E. coli* results above the water quality standard of 941cfu/100 ml have been obtained during both wet- and dry-weather conditions near Site 1.19E in the past. The area upstream and near site 1.19E is currently being investigated to determine the potential source of the contamination. More monitoring of nearby tributaries will continue as the “right fork” of the stream above Site 1.19 has recently had some higher counts during wet weather.

### Spill Impact Monitoring

In addition to the Spill Impact Report in Appendix D, there was some additional sampling that was conducted this quarter in association with overflows that did not reach the Waters of the State. One of the overflows was determined to be associated with a private lateral failure rather than a wastewater system issue. These results are included in Table 2 – Appendix D and confirm there were no impacts to nearby waterways.

## **8.2 Projected Data Collection**

During the first quarter of 2013, KUB will continue to monitor the 24 routine sampling locations in the sewer basins of eight area creeks. KUB will collect samples from the following locations during the first quarter of 2013:

### ***Sample Locations by Creek Mile or Site Number***

<b><i>Creek Name</i></b>	<b><i>Creek Mile #</i></b>	<b><i>Creek Mile #</i></b>	<b><i>Creek Mile #</i></b>
<b>First Creek</b>	1.74	2.57	6.33
<b>Second Creek</b>	0.30	1.54	5.11
<b>Third Creek</b>	0.87	2.08E	4.80W
<b>Fourth Creek</b>	1.75	2.79	3.29
<b>Baker Creek</b>	0.36	0.53	1.45
<b>Goose Creek</b>	0.40	1.19E	1.80E
<b>Loves Creek</b>	0.85	1.89	3.45
<b>Williams Creek</b>	0.89	1.70	2.02

## **Appendix A**

### **Capital Projects and Rehabilitation Credits**

## Capital Projects and Rehabilitation Credits

	Project Name	Credit Type	Basin	WWTP	Credits Banked (gpd)	Status
1	Comprehensive Rehab 03B1a	Comprehensive Rehabilitation	1st Creek	Kuwahee	321,030	Project Complete
2	Comprehensive Rehab 03B2a	Comprehensive Rehabilitation	1st Creek	Kuwahee	302,366	Project Complete
3	Comprehensive Rehab 04B1a	Comprehensive Rehabilitation	1st Creek	Kuwahee	334,626	Project Complete
4	Comprehensive Rehab 08A1	Comprehensive Rehabilitation	1st Creek	Kuwahee	1,589,952	Project Complete
5	McC Campbell Lane Sewer Replacement	Find & Fix Gravity Main	1st Creek	Kuwahee	25,543	Project Complete
6	Knox Road Trunkline Replacement	Find & Fix Gravity Main	1st Creek	Kuwahee	36,728	Project Complete
7	vented manhole cover replacement (7A1)	Manhole Cover	1st Creek	Kuwahee	13,333	Project Complete
8	vented manhole cover replacement (7A1)	Manhole Cover	1st Creek	Kuwahee	13,333	Project Complete
9	vented manhole cover replacement (7A1)	Manhole Cover	1st Creek	Kuwahee	13,333	Project Complete
10	Comprehensive Rehab 15D2	Comprehensive Rehabilitation	2nd Creek	Kuwahee	1,450,008	Project Complete
11	Comprehensive Rehab 05A4 & 05A3	Comprehensive Rehabilitation	2nd Creek	Kuwahee	43,904	Project Complete
12	Comprehensive Rehab 09A2	Comprehensive Rehabilitation	3rd Creek	Kuwahee	296,664	Project Complete
13	Comprehensive Rehab 09A1	Comprehensive Rehabilitation	3rd Creek	Kuwahee	219,345	Project Complete
14	Walker Springs Storage Tank	Storage Tank	4th Creek	Fourth Creek	3,250,000	Project Complete
15	Comprehensive Rehab 40F1	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	83,600	Project Complete
16	Comprehensive Rehab 41A4	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	371,994	Project Complete
17	Comprehensive Rehab 41B1	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	152,958	Project Complete
18	Wilson Ave, Chesnut St., Donnell St. (Asset Replacement)	Find & Fix Gravity Main	Williams Creek	Kuwahee	28	Project Complete
19	Williams Creek Trunkline Replacement	Find & Fix Gravity Main	Williams Creek	Kuwahee	168,667	Project Complete
20	Rushland Park Off Site Sewer Rehabilitation	Find & Fix Gravity Main	Loves Creek	Loves Creek	3,803	Project Complete
21	Emily Avenue Pump Station Abandonment	Find & Fix Gravity Main	Loves Creek	Loves Creek	141,600	Project Complete
22	Fair Drive - Phase I	Find & Fix Gravity Main	1st Creek	Kuwahee	130,928	Project Complete
23	Comprehensive Rehab 23E1	Comprehensive Rehabilitation	2nd Creek	Kuwahee	4,215,003	Project Complete
24	vented manhole cover replacements (08B2)	Manhole Cover	1st Creek	Kuwahee	4,669	Project Complete
25	vented manhole cover replacement (16B1)	Manhole Cover	1st Creek	Kuwahee	667	Project Complete
26	vented manhole cover replacements (28C1)	Manhole Cover	3rd Creek	Kuwahee	1,334	Project Complete
27	10" mainline replacement (33A2)	Find & Fix Gravity Main	4th Creek	Fourth Creek	5,409	Project Complete
28	vented manhole cover replacements (22C2)	Manhole Cover	3rd Creek	Kuwahee	16,002	Project Complete
29	vented manhole cover replacements (63)	Manhole Cover	Sinking Creek	Loves Creek	66,665	Project Complete
30	10" mainline replacement (6C1)	Find & Fix Gravity Main	Loves Creek	Loves Creek	24,620	Project Complete
31	Comprehensive Rehab 06A5	Comprehensive Rehabilitation	Loves Creek	Loves Creek	263,358	Project Complete
32	Comprehensive Rehab 06A4	Comprehensive Rehabilitation	Loves Creek	Loves Creek	386,304	Project Complete
33	vented manhole cover replacement (39D2)	Manhole Cover	South Knox / Knob Creek	Kuwahee	667	Project Complete
34	vented manhole cover replacement (39D4)	Manhole Cover	South Knox / Knob Creek	Kuwahee	667	Project Complete
35	vented manhole cover replacement (39D3)	Manhole Cover	South Knox / Knob Creek	Kuwahee	2,668	Project Complete
36	vented manhole cover replacement (20A6)	Manhole Cover	Loves Creek	Loves Creek	1,334	Project Complete
37	vented manhole cover replacement (20A7)	Manhole Cover	Loves Creek	Loves Creek	667	Project Complete
38	vented manhole cover replacement (13A2)	Manhole Cover	3rd Creek	Kuwahee	667	Project Complete
39	vented manhole cover replacement (13B1)	Manhole Cover	3rd Creek	Kuwahee	13,335	Project Complete
40	vented manhole cover replacement (28B1)	Manhole Cover	3rd Creek	Kuwahee	1,334	Project Complete
41	12" mainline replacement (44)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	4,278	Project Complete
42	manhole frame seal repair (67)	Manhole Repair	Loves Creek	Loves Creek	2,304	Project Complete
43	Whites Creek Trunk Line Replacement (02)	Find & Fix Gravity Main	1st Creek	Kuwahee	50,106	Project Complete
44	Comprehensive Rehab 09D1	Comprehensive Rehabilitation	3rd Creek	Kuwahee	381,376	Project Complete
45	Comprehensive Rehab 09A4	Comprehensive Rehabilitation	3rd Creek	Kuwahee	408,317	Project Complete
46	Lower First Creek Storage Tank	Storage Tank	1st Creek	Kuwahee	5,000,000	Project Complete
47	vented manhole cover replacement (11B2)	Manhole Cover	3rd Creek	Kuwahee	13,333	Project Complete
48	vented manhole cover replacement (13C1)	Manhole Cover	3rd Creek	Kuwahee	2,667	Project Complete
49	vented manhole cover replacement (22A2)	Manhole Cover	3rd Creek	Kuwahee	667	Project Complete
50	vented manhole cover replacement (22B1)	Manhole Cover	3rd Creek	Kuwahee	667	Project Complete
51	Creek Head Drive sewer line replacement (32A4)	Find & Fix Gravity Main	4th Creek	Fourth Creek	11,132	Project Complete
52	Manhole replacement (19A3)	Find & Fix Gravity Main	Williams Creek	Kuwahee	207	Project Complete
53	Papermill drive sewer line replacement (33A2)	Find & Fix Gravity Main	4th Creek	Fourth Creek	103,769	Project Complete
54	Wells Rd sewer line replacement (39C2)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	1,728	Project Complete
55	Power Park Manhole Rehab (45)	Find & Fix Gravity Main	Knob Creek	Kuwahee	3,596	Project Complete
56	Blount Ave abandoned lateral (39A1)	Disconnect abandoned lateral	South Knox / Knob Creek	Kuwahee	2,000	Project Complete
57	Woodbine Ave sewerline Rehab (19A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	2,683	Project Complete
58	Pleasant Ridge Rd Sewer line improvements (09A1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	207	Project Complete
59	Papermill drive sewer line replacement (27A1)	Find & Fix Gravity Main	Fourth Creek	Fourth Creek	18,211	Project Complete
60	Wilson Rd Manhole Rehab (10C1)	Find & Fix Gravity Main	2nd Creek	Kuwahee	831	Project Complete
61	Maryville Pike Trunk Replacement (39C1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	72,880	Project Complete
62	Upper McKamey Trunk Replacement (11B1 11B2)	Find & Fix Gravity Main	3rd Creek	Kuwahee	64,324	Project Complete
63	Fox Manor Blvd sewer line replacement (32A4)	Find & Fix Gravity Main	4th Creek	Fourth Creek	31,510	Project Complete
64	Power Park Manhole Rehab (47)	Manhole Repair	South Knox / Knob Creek	Kuwahee	7,700	Project Complete
65	Sutherland Ave Sewer Line Replacement (28B1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	20,383	Project Complete
66	Fountain City Trunkline Replacement (03B1 03B2)	Find & Fix Gravity Main	1st Creek	Kuwahee	72,512	Project Complete
67	vented manhole cover replacement (11B2)	Manhole Cover	4th Creek	Fourth Creek	13,333	Project Complete
68	vented manhole cover replacement (39D2)	Manhole Cover	South Knox / Knob Creek	Kuwahee	13,333	Project Complete
69	Comprehensive Rehabilitation 19A2	Comprehensive Rehabilitation	Williams Creek	Kuwahee	521,631	Project Complete
70	17B1 Manhole Replacement	Find & Fix Gravity Main	1st Creek	Kuwahee	1,803	Project Complete
71	Vine Middle School sewerline Rehab (24D1)	Find & Fix Gravity Main	1st Creek	Kuwahee	23,491	Project Complete
72	Comprehensive Rehabilitation (08B2)	Comprehensive Rehabilitation	1st Creek	Kuwahee	841,370	Project Complete
73	Third Creek Storage Tank (21A1)	Storage Tank	3rd Creek	Kuwahee	4,000,000	Project Complete
74	Comprehensive Rehabilitation (19A1)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	313,938	Project Complete
75	Comprehensive Rehabilitation (19B1)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	328,300	Project Complete
76	Comprehensive Rehabilitation (10B1)	Comprehensive Rehabilitation	2nd Creek	Kuwahee	191,698	Project Complete
77	Comprehensive Rehabilitation (10C1)	Comprehensive Rehabilitation	2nd Creek	Kuwahee	67,840	Project Complete
78	Disconnected Stormwater Detention Pond Sevier Ave (40C1)	Disconnect Storm Sewer	South Knox / Knob Creek	Kuwahee	97,333	Project Complete
79	Sub Basin 63 Sinking Creek Drainage rehabilitation (63)	Comprehensive Rehabilitation	South Knox / Knob Creek	Loves Creek	72,110	Project Complete
80	West Ford Valley Trunkline replacement (41A1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	236,704	Project Complete
81	Blount Avenue Trunkline Replacement (39A1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	225,376	Project Complete
82	Brookvale Point Repairs (02A3)	Find & Fix Gravity Main	1st Creek	Kuwahee	52,079	Project Complete
83	Park Pump Point Repairs (45)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	11,522	Project Complete
84	Wayland Road Storage Tank (67)	Storage Tank	Loves Creek	Loves Creek	20,000	Project Complete
85	Comprehensive Rehab (19A3)	Comprehensive Rehabilitation	Williams Creek	Kuwahee	325,090	Project Complete
86	Comprehensive Rehab (41A2)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	39,330	Project Complete
87	Comprehensive Rehab (41A5)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	119,327	Project Complete
88	Jersey Ave sewer rehabilitation (SubBasin 23)	Find & Fix Gravity Main	1st Creek	Kuwahee	419	Project Complete
89	East Magnolia sewer rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	846	Project Complete
90	Walker Blvd Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	1086	Project Complete

Capital Projects and Rehabilitation Credits

91	Kingston Court Sewer Rehabilitation (SubBasin 29)	Find & Fix Gravity Main	3rd Creek	Kuwahee	3727	Project Complete
92	Clinch Ave Sewer Rehabilitation (SubBasin 30)	Find & Fix Gravity Main	1st Creek	Kuwahee	442	Project Complete
93	Badgett Drive Sewer Rehabilitation (SubBasin 22)	Find & Fix Gravity Main	3rd Creek	Kuwahee	214	Project Complete
94	Dickson Street Sewer Rehabilitation (SubBasin 20)	Find & Fix Gravity Main	Loves Creek	Loves Creek	417	Project Complete
95	W New Street Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	2844	Project Complete
96	Rennoc Rd Sewer Rehabilitation (SubBasin 4)	Find & Fix Gravity Main	1st Creek	Kuwahee	2853	Project Complete
97	Spicewood Lane Sewer Rehabilitation (SubBasin 13)	Find & Fix Gravity Main	3rd Creek	Kuwahee	216	Project Complete
98	Chapman Highway Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	212	Project Complete
99	McCroskey Ave Sewer Rehabilitation (SubBasin 17)	Find & Fix Gravity Main	1st Creek	Kuwahee	1,076	Project Complete
100	East 5th Ave Sewer Rehabilitation (SubBasin 24)	Find & Fix Gravity Main	1st Creek	Kuwahee	447	Project Complete
101	Simms Rd Sewer Rehabilitation (SubBasin 39)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,955	Project Complete
102	Maynard Ave Sewer Rehabilitation (SubBasin 16)	Find & Fix Gravity Main	1st Creek	Kuwahee	423	Project Complete
103	Minibasin 10B1 & 10C1 find & fix	Find & Fix Gravity Main	2nd Creek	Kuwahee	15,689	Project Complete
104	Third Creek Trunkline Replacement	Find & Fix Gravity Main	3rd Creek	Kuwahee	483,793	Project Complete
105	Disconnected Stormwater 15" discharge pipe Island Home blvd	Disconnect Storm Sewer	South Knox / Knob Creek	Kuwahee	1,720,000	Project Complete
106	Paved Manhole Rehabilitation 40A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	20,140	Project Complete
107	Paved Manhole Rehabilitation 40F2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	6,515	Project Complete
108	Paved Manhole Rehabilitation 40G1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,571	Project Complete
109	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	2,576	Project Complete
110	Paved Manhole Rehabilitation 03C1	Find & Fix Gravity Main	1st Creek	Kuwahee	3,615	Project Complete
111	Paved Manhole Rehabilitation 02A1	Find & Fix Gravity Main	1st Creek	Kuwahee	6,491	Project Complete
112	Paved Manhole Rehabilitation SB 38	Find & Fix Gravity Main	3rd Creek	Kuwahee	5,797	Project Complete
113	Paved Manhole Rehabilitation 18A1	Find & Fix Gravity Main	1st Creek	Kuwahee	4,540	Project Complete
114	Paved Manhole Rehabilitation 39E1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	34,671	Project Complete
115	Paved Manhole Rehabilitation 39D1	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	8,000	Project Complete
116	Paved Manhole Rehabilitation 39A2	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	13,335	Project Complete
117	Paved Manhole Rehabilitation 39C3	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	26,670	Project Complete
118	Broken Manhole Lid Replacement (67)	Find & Fix Gravity Main	Loves Creek	Loves Creek	26,666	Project Complete
119	Manhole Replacement (61)	Find & Fix Gravity Main	Loves Creek	Loves Creek	2,304	Project Complete
120	Woodbine Awer Sewer Rehab Phase II (19A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	855	Project Complete
121	Comprehensive Sewer Rehab (41A6)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	951,328	Project Complete
122	Comprehensive Sewer Rehab (41C1)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	161,680	Project Complete
123	Comprehensive Sewer Rehab (41C2)	Comprehensive Rehabilitation	South Knox / Knob Creek	Kuwahee	94,332	Project Complete
124	Davenport Trunkline Replacement (15A1)	Find & Fix Gravity Main	2nd Creek	Kuwahee	86,423	Project Complete
125	Forks of the River Trunkline Replacement (60)	Find & Fix Gravity Main	Riverdale	Kuwahee	62,037	Project Complete
126	Brooks & Ester Sewer Rehabilitation (25A2)	Find & Fix Gravity Main	Williams Creek	Kuwahee	14,186	Project Complete
127	Grand Ave Sewer Rehabilitation (23B1)	Find & Fix Gravity Main	2nd Creek	Kuwahee	885	Project Complete
128	Clinch Ave & 21st Rehabilitation (35B3)	Find & Fix Gravity Main	3rd Creek	Kuwahee	15,453	Project Complete
129	Blount Ave Trunkline phase II (39A2)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	124,150	Project Complete
130	Trunkline at Woodland Ave	Trunkline Replacement	2nd Creek	Kuwahee	106,558	Project Complete
131	Keowee Ave, Sandusky Rd, and Sutherland Ave	Find & Fix Gravity Main	3rd Creek	Kuwahee	6,367	Project Complete
132	Antietam Rd	Find & Fix Gravity Main	1st Creek	Kuwahee	1,760	Project Complete
133	Cheyenne Dr	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	1,760	Project Complete
134	Chambliss Ave	Find & Fix Gravity Main	3rd Creek	Kuwahee	2,642	Project Complete
135	Godfrey St	Find & Fix Gravity Main	1st Creek	Kuwahee	218	Project Complete
136	Shortline-Ave B	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	7,332	Project Complete
137	Second Creek SSO Abatement	Find & Fix Gravity Main	2nd Creek	Kuwahee	163,471	Project Complete
138	Shortline- Maplehurst	Find & Fix Gravity Main	1st Creek	Kuwahee	6,062	Project Complete
139	Shortline- Parkhill	Find & Fix Gravity Main	4th Creek	Fourth Creek	1,755	Project Complete
140	Shortline- Essary	Find & Fix Gravity Main	1st Creek	Kuwahee	215	Project Complete
141	Shortline- Ridgecrest	Find & Fix Gravity Main	1st Creek	Kuwahee	3,058	Project Complete
142	4th Creek SSO Abatement Project	Find & Fix Gravity Main	4th Creek	Fourth Creek	266,200	Project Complete
143	Ashville Highway Trunkline Replacement (20A3)	Find & Fix Gravity Main	Loves Creek	Kuwahee	372,780	Project Complete
144	Minibasin 06A2 & 06A3 Comprehensive Rehabilitation	Comprehensive Rehabilitation	Loves Creek	Loves Creek	275,630	Project Complete
145	Sevier Ave & Jones Ave Find & Fix Rehabilitation (40C1)	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	50,537	Project Complete
146	Manhole Rehabilitation - National Drive (60)	Find & Fix Gravity Main	Riverdale	Kuwahee	4,608	Project Complete
147	Washington Ave Sewer Replacement (24B1)	Find & Fix Gravity Main	1st Creek	Kuwahee	14,643	Project Complete
148	Second Creek SSO Abatement phase II	Find & Fix Gravity Main	2nd Creek	Kuwahee	40,973	Project Complete
149	Highland Hills (37A3)	Find & Fix Gravity Main	4th Creek	Fourth Creek	13,017	Project Complete
150	Moses Ave (29D1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	1,761	Project Complete
151	Dance Ave (28A1)	Find & Fix Gravity Main	3rd Creek	Kuwahee	1,889	Project Complete
152	Texas Ave (SB 15)	Find & Fix Gravity Main	2nd Creek	Kuwahee	85,030	Project Complete
153	Ellis Road find & fix (41A3)	Find & Fix Gravity Main	Knob Creek	Kuwahee	61,614	Project Complete
154	Ford Valley Pump Station & gravity sewer	Find & Fix Gravity Main	Knob Creek	Kuwahee	14,520	Project Complete
155	Crestwood Pump Station & Gravity Sewer	Find & Fix Gravity Main	Loves Creek	Loves Creek	3,950	Project Complete
156	Washington Pike Manhole Rehab MH IPID 20414153	Find & Fix Gravity Main	Eastbridge	Eastbridge	576	Project Complete
157	Wassman & 8th Ave	Find & Fix Gravity Main	1st Creek	Kuwahee	8,750	Project Complete
158	Lebanon Street Sewer Improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	13,145	Project Complete
159	Minibasin 35B2 UT sewer improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	39,952	Project Complete
160	Minibasin 35B3 UT sewer improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	27,132	Project Complete
161	Boyd's Bridge Trunkline Replacement	Find & Fix Gravity Main	Loves Creek	Loves Creek	137,695	Project Complete
162	Minibasin 17B1 & 01A1	Find & Fix Gravity Main	1st Creek	Kuwahee	69,883	Project Complete
163	Lake Forest Sewer Improvements 41A6	Find & Fix Gravity Main	Knob Creek	Kuwahee	35,202	Project Complete
164	Bennett Place Sewer Improvements 32B	Find & Fix Gravity Main	4th Creek	Fourth Creek	25,112	Project Complete
165	40A2 Phase I Trunkline Replacement	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	195,583	Project Complete
166	Jersey Ave, Ball Camp & Hiwassee Sewer Improvments	Find & Fix Gravity Main	3rd Creek	Kuwahee	13,059	Project Complete
167	W Glenwood, Nathaniel & Boyd St Shortline project 22B1, 17A1, 01A1	Find & Fix Gravity Main	1st Creek	Kuwahee	13,059	Project Complete
168	Minibasin 23D1/F1	Comprehensive Rehabilitation	2nd Creek	Kuwahee	50,577	Project Complete
169	Minibasin 18B1 find & fix	Find & Fix Gravity Main	1st Creek	Kuwahee	4,929	Project Complete
170	Second Creek Storage Tank	Storage Tank	2nd Creek	Kuwahee	5,500,000	Project Complete
171	Lower Third Creek Storage Tank	Storage Tank	3rd Creek	Kuwahee	6,500,000	Project Complete
172	Noelton Drive Sewer Improvements	Find & Fix Gravity Main	3rd Creek	Kuwahee	5,042	Project Complete
173	Old Kingston Pike Sewer improvments	Find & Fix Gravity Main	3rd Creek	Kuwahee	301	Project Complete
174	Northshore Trunkline Replacement	Find & Fix Gravity Main	4th Creek	Fourth Creek	183,777	Project Complete
175	Subbasin 37 Sewer Improvements	Find & Fix Gravity Main	4th Creek	Fourth Creek	85,039	Project Complete
176	Second Creek SSO Abatement	Find & Fix Gravity Main	2nd Creek	Kuwahee	827	Project Complete
177	Minibasin 42 & 42A1	Comprehensive Rehabilitation	4th Creek	Fourth Creek	118,001	Project Complete
178	East Fork of Third Creek Trunkline	Find & Fix Gravity Main	3rd Creek	Kuwahee	192,992	Project Complete
179	Minibasin 04C1 Trunkline	Find & Fix Gravity Main	1st Creek	Kuwahee	36,480	Project Complete
180	South Knox SSO Abatement	Find & Fix Gravity Main	South Knox / Knob Creek	Kuwahee	50,280	Project Complete
181	Minibasin 22A2 & 22C2 rehabilitation	Find & Fix Gravity Main	3rd Creek	Kuwahee	16,061	Project Complete

## **Appendix B**

### **SSOs**

Date	Time	Street #	Street	Plant	Watershed	Basin	Overflow Location	Pathway	Receiving Water	Cause of SSO/KUB Response	Total Volume (Gallons)	Recovered Volume (Gallons)	Non-Recovered Volume (Gallons)	Duration (Hours)	Unpermitted Discharge
10/1/2012	10:13 AM	3902	Oakland Drive	KUW	First Creek	2	Lateral Cleanout	Soil Saturation		Blockage - Roots. Blockage was removed & the area was cleaned.	1,100	0	1,100	1	No
10/5/2012	6:48 AM	2015	Neyland Drive	KUW	Third Creek	35b	Broken Force Main	Pavement to Soil Saturation		Broken System - Broken Force Main. Force main was repaired & area cleaned.	100	0	100	1	No
10/8/2012	10:39 AM	5032	Lyons View Pike	FC	Fourth Creek	37	Grinder Pump	Wet Well to Soil Saturation		Grinder Pump Failure- Residential. Pump repaired & area cleaned.	4	2	1.5	1.5	No
10/12/2012	3:46 PM	521	Taliwa Drive	KUW	South Knox	40	Broken Gravity Main	Broken Gravity Main to Storm Drain to Recovery & Soil Saturation		Broken System - Broken Gravity Main. Sewer main was repaired & area cleaned.	50	50	0	3	No
10/15/2012	3:31 PM	108	Caron Drive	KUW	Second Creek	5	Manhole 16-57	Ground to Storm Drain to Wet Weather Conveyance to Soil Saturation and Recovery		Blockage-Roots. Sewer main was flushed & area cleaned.	1,150	850	300	2	No
10/16/2012	1:30 PM	1219	Hilton Road	KUW	Third Creek	21	Manhole 10-64	Pavement to Storm Drain and Recovery		Blockage-Roots. Sewer main was flushed & area cleaned.	400	400	0	1	No
10/16/2012	10:35 AM	409	North Bellemeade Ave	KUW	Third Creek	28	Manhole 3-53	Ground to Soil Saturation		Rainfall in the area produced I & I and high flows in the sewer mains.	35	0	35	1	No
10/20/2012	1:49 PM	313	Forestal Drive	KUW	First Creek	8	Manhole 7-72	Pavement to Soil Saturation and Recovery		Blockage - Debris. Sewer main was flushed & area cleaned.	100	50	50	1.5	No
10/22/2012	4:41 PM	5253	Bent River Boulevard	FC	Fourth Creek	43	Grinder Pump	Wet Well to Soil Saturation		Grinder Pump Failure- Residential. Pump was repaired & area cleaned.	2	0	2	1	No
10/24/2012	2:00 PM	5408	Green Valley Drive	LC	Loves Creek	26	Air Release Valve	Pavement to Soil Saturation		Broken System - Air Release Valve Failure. Valve replaced & area cleaned.	5	0	5	0.25	No
10/28/2012	5:15 PM	4500	East End Road	KUW	South Knox	39	Lateral Cleanout	Ground to Soil Saturation and Recovery		Blockage-Roots. Sewer main was flushed & area cleaned.	20	10	10	1	No
11/5/2012	6:30 PM	4923	Ball Road	FC	Fourth Creek	49	Force Main	Ground to Grassy Creek and Soil Saturation	Grassy Creek	Broken System - Broken Force Main. Force main was repaired and area cleaned.	28,500	0	28,500	8	Yes
11/5/2012	2:00 PM	8455	Strawberry Plains Pike	EB	Eastbridge	72	Force Main	Ditch to Soil Saturation and Recovery		Construction Failure - Dig-In. Force main was repaired and area cleaned.	460	440	20	4	No
11/8/2012	9:52 AM	5219	Bent River Boulevard	FC	Fourth Creek	43	Residential Grinder Pump & BBU	Wet Well to Soil Saturation & BBU		Grinder Pump Failure. Pump was replaced & area cleaned.	4	2	2	1	No
11/15/2012	7:47 PM	4517	North Wahli Drive	KUW	First Creek	7	Mainhole 39	Ground to Wet Weather Conveyance to Soil Saturation & Recovery		Blockage - Roots. Main was flushed & the area was cleaned.	725	625	100	2	No
11/18/2012	4:36 PM	4315	Clinton Highway	KUW	Second Creek	10	Lateral Cleanout	Lateral Cleanout to Soil Saturation and Recovery		Blockage - Roots. Main was flushed & the area was cleaned.	2,050	1,025	1,025	1	No
11/24/2012	6:13 PM	7920	Washington Pike	EB	Eastbridge	113	Residential Grinder Pump	Wet Well to Soil Saturation and Recovery		Grinder Pump Failure - Residential	5	2	3	0.5	No
11/26/2012	9:26 PM	5016	Wilford Road	KUW	Second Creek	5	Manhole 2	Ground to Second Creek and Soil Saturation and Recovery	Second Creek	Construction Failure - Dig-In. Sewer main was repaired & area cleaned.	750	250	500	1	Yes
11/30/2012	11:54 AM	5032	Lyons View Pike	FC	Fourth Creek	37	Residential Grinder Pump	Wet Well to Soil Saturation		Grinder Pump Failure-Residential. Pump was repaired & area cleaned.	5	2	3	1.5	No
12/9/2012	8:28 PM	1814	E. Glenwood Avenue	KUW	First Creek	24	Manhole 25-49	Pavement to Wet Weather Conveyance to Storm Drain to First Creek and Soil Saturation	First Creek	Blockage - Grease. Main was flushed & area was cleaned.	410	0	410	3	Yes
12/12/2012	10:50 AM	5704	Waynewood Road	KUW	Second Creek	5	Mahole 16-22	Pavement to Soil Saturation and Recovery		Blockage - Roots. Main was flushed & area was cleaned.	360	180	180	2	No
12/20/2012	2:42 PM	3006	Coram Street	KUW	Second Creek	14	Manhole 10-27 & Lateral Cleanout at 222 Radford Place & BBU	BBU & Pavement to Lateral Cleanout to Wet Weather Conveyance to Storm Drain to Second Creek to Soil Saturation & Recovery	Second Creek	Blockage - Roots. The sewer main was flushed and the area was cleaned. The building was cleaned by Service Master.	1,550	400	1,150	2	Yes

## **Appendix C**

### **Building Backups**

1	2	3	4	5	6	7	8	9	10	11	12	13
Date	Time	Street #	Street	Plant	Watershed	Basin	Overflow Location	Cause of SSO/KUB Response	Total Volume (Gallons)	Recovered Volume (Gallons)	Non-Recovered Volume (Gallons)	Duration (Hours)
10/16/2012	10:20 AM	1001	Flanders Lane- Apartments 101, 102, & 103	FC	Fourth Creek	42	BBU	Construction Failure - Unconnected Lateral. Lateral was reinstated & building was cleaned by Serv-Pro.	10	10	0	1
11/8/2012	9:52 AM	5219	Bent River Boulevard	FC	Fourth Creek	43	BBU	Grinder pump failure. Pump was replaced and area cleaned.	4	2	2	1
12/3/2012	9:32 PM	3843	Debonair Drive	KUW	Third Creek	9	BBU	Construction Failure - Protruding Lateral. The lateral was trimmed & sewer main was flushed. Building was cleaned by Service Master.	10	10	0	1
12/2/2012	12:30 PM	6220	Western Avenue	KUW	Third Creek	11	BBU	Blockage - Debris. Sewer Main was flushed. The building was cleaned by Service Master.	1	1	0	0.5
12/3/2012	9:43 PM	3839	Debonair Drive	KUW	Third Creek	9	BBU	Construction Failure - Protruding Lateral. The lateral was trimmed & sewer main was flushed. Building was cleaned by Service Master.	15	15	0	1
12/18/2012	8:45 AM	6412	Western Avenue	KUW	Third Creek	11	BBU	Blockage - Roots. Sewer Main was flushed & area cleaned. Building was cleaned by Disaster Cleaning & Restoration.	20	20	0	0.5
12/17/2012	1:11 PM	2423	Cecil Avenue	KUW	First Creek	18	BBU	Construction Failure - Flushing. Building cleaned by Service Master.	3	3	0	0.25
12/20/2012	2:42 PM	3006	Coram Street	KUW	Second Creek	14	BBU	Blockage - Roots. The sewer main was flushed and the area was cleaned. The building was cleaned by Service Master.	1,550	400	1,150	2

## **Appendix D**

### **Water Quality Monitoring Program Sampling Results**



**Water Quality Monitoring  
Report**

**Routine Water Quality Monitoring Report**

**10/1/2012 Through 12/31/2012**

**Knoxville Utilities Board**

Water Quality Laboratory  
Debbie Ailey, Lab Supervisor  
835 East Jackson Avenue  
Knoxville, Tennessee 37915  
(865) 594-8286 Fax: (865) 594-8245

Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<b><u>First Creek</u></b>									
1.74	10/10/2012	09:13	8.0	13	9.3	420	210	Wet	R
2.57	10/10/2012	09:03	7.9	13	9.4	910	650	Wet	R
6.33	10/10/2012	08:48	7.7	14	8.3	200	200	Wet	R
1.74	11/7/2012	11:53	8.0	12	10	1400	1000	Wet	R
2.57	11/7/2012	12:06	8.1	11	11	910	870	Wet	R
6.33	11/7/2012	11:37	7.5	13	7.6	3900	> 2400	Wet	R
1.74	12/5/2012	10:03	7.9	13	8.7	110	200	Dry	R
2.57	12/5/2012	09:53	8.0	13	9.6	170	120	Dry	R
6.33	12/5/2012	09:42	7.7	15	7.5	280	160	Dry	R
<b><u>Second Creek</u></b>									
0.30	10/11/2012	10:12	8.1	14	9.9	250	77	Wet	R
1.54	10/11/2012	09:52	7.9	14	9.2	220	93	Wet	R
5.11	10/11/2012	09:35	7.3	17	7.3	9	2	Wet	R
0.30	11/15/2012	09:47	8.1	10	10	130	120	Wet	R
1.54	11/15/2012	10:01	7.9	10	9.7	72	84	Wet	R
5.11	11/15/2012	09:13	7.5	11	6.3	180	200	Wet	R
0.30	12/17/2012	10:43	7.9	13	9.4	1100	1000	Wet	R
1.54	12/17/2012	10:21	7.7	13	8.2	560	380	Wet	R
5.11	12/17/2012	10:00	7.2	14	5.6	360	280	Wet	R

\*Status: I = Site Under Investigation, R = Reportable for monitoring purposes

Precipitation event = "Wet" if the total amount of rainfall for four days prior to the sample was greater than 0.1 inches.



Water Quality Monitoring  
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Routine Water Quality Monitoring Report

10/1/2012 Through 12/31/2012

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<b><u>Third Creek</u></b>									
0.87	10/16/2012	10:06	8.0	14	8.9	500	410	Wet	R
2.08E	10/16/2012	09:52	7.9	14	8.2	230	190	Wet	R
4.80W	10/16/2012	09:31	7.8	14	9.0	300	210	Wet	R
0.87	11/8/2012	10:42	8.1	11	11	200	180	Wet	R
2.08E	11/8/2012	10:35	7.9	10	8.6	1200	770	Wet	R
4.80W	11/8/2012	10:20	7.9	11	10	540	230	Wet	R
0.87	12/6/2012	09:27	8.0	11	9.5	180	170	Dry	R
2.08E	12/6/2012	09:16	7.4	10	4.6	540	580	Dry	R
4.80W	12/6/2012	08:55	7.8	12	9.1	120	96	Dry	R
<b><u>Fourth Creek</u></b>									
1.75	10/15/2012	10:16	7.5	18	8.0	4000	> 2400	Wet	I
2.79	10/15/2012	10:03	7.5	17	7.8	3200	> 2400	Wet	R
3.29	10/15/2012	09:53	7.7	17	8.7	1500	1100	Wet	R
1.75	11/12/2012	09:29	7.8	14	8.9	140	130	Wet	R
2.79	11/12/2012	09:05	7.9	14	8.3	110	88	Wet	R
3.29	11/12/2012	09:16	8.0	14	9.7	32	53	Wet	R
1.75	12/18/2012	10:40	7.7	12	9.4	1100	1400	Wet	I
2.79	12/18/2012	09:43	7.7	13	8.5	730	610	Wet	R
3.29	12/18/2012	09:55	7.8	13	9.7	540	390	Wet	R

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<b><u>Baker Creek</u></b>									
0.36	10/22/2012	12:18	7.7	15	7.9	460	1000	Dry	I
0.53	10/22/2012	11:35	7.9	15	8.6	640	980	Dry	R
1.45	10/22/2012	11:46	7.6	15	8.0	250	240	Dry	R
0.36	11/9/2012	10:23	7.9	11	9.7	910	730	Wet	R
0.53	11/9/2012	10:16	7.9	11	9.9	420	410	Wet	R
1.45	11/9/2012	10:39	7.8	11	9.2	150	320	Wet	R
0.36	12/4/2012	09:37	7.6	12	10	1500	1600	Dry	I
0.53	12/4/2012	09:49	8.0	12	9.4	260	520	Dry	R
1.45	12/4/2012	09:20	7.6	13	8.2	470	360	Dry	R
<b><u>Goose Creek</u></b>									
0.40	10/23/2012	10:47	7.9	14	8.3	460	360	Dry	R
1.19E	10/23/2012	10:32	7.8	14	8.2	540	770	Dry	R
1.80E	10/23/2012	10:02	7.9	14	8.6	230	200	Dry	R
0.40	11/19/2012	10:03	7.6	10	8.6	300	340	Dry	R
1.19E	11/19/2012	10:12	7.7	10	9.8	640	980	Dry	R
1.80E	11/19/2012	11:07	7.9	10	9.9	36	53	Dry	R
0.40	12/12/2012	11:27	7.5	9	9.3	540	440	Wet	R
1.19E	12/12/2012	10:47	7.7	9	10	1200	920	Wet	R
1.80E	12/12/2012	11:15	8.1	9	10	320	310	Wet	R

\*Status: I = Site Under Investigation, R = Reportable for monitoring purposes

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Creek Mile #	Sample Date	Sample Time	pH	Sample Temp (C)	Dissolved Oxygen (mg/l)	Fecal Coliform (CFU/100 ml)	E. Coli (MPN)	Precipitation Event	Status*
<b><u>Loves Creek</u></b>									
0.85	10/3/2012	10:03	7.7	18	8.0	1000	610	Wet	R
1.89	10/3/2012	10:16	7.3	18	7.0	420	460	Wet	R
3.45	10/3/2012	10:37	7.6	19	7.8	280	120	Wet	R
0.85	11/1/2012	10:38	7.9	10	9.1	150	160	Dry	R
1.89	11/1/2012	10:25	7.6	11	8.2	130	130	Dry	R
3.45	11/1/2012	10:15	7.8	11	8.8	63	50	Dry	R
0.85	12/3/2012	10:47	7.9	12	10	86	70	Dry	R
1.89	12/3/2012	10:36	7.4	13	9.6	340	460	Dry	R
3.45	12/3/2012	10:23	7.8	12	9.7	18	22	Dry	R
<b><u>Williams Creek</u></b>									
0.89	10/8/2012	10:32	7.9	13	9.7	3300	2000	Wet	I
1.70	10/8/2012	10:09	7.6	15	8.8	20000	> 2400	Wet	I
2.02	10/8/2012	10:19	7.4	14	9.4	21000	> 2400	Wet	I
0.89	11/8/2012	11:35	8.0	12	10	54	32	Wet	R
1.70	11/8/2012	11:22	7.8	14	8.3	140	71	Wet	R
2.02	11/8/2012	11:10	7.9	14	8.8	280	290	Wet	R
0.89	12/11/2012	09:10	7.5	11	9.7	1800	1600	Wet	I
1.70	12/11/2012	09:43	7.5	12	8.2	1900	2400	Wet	I
2.02	12/11/2012	09:35	7.6	14	8.7	1500	1700	Wet	I

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Precipitation event = "Wet" if the total amount of rainfall for four days prior to the sample was greater than 0.1 inches.

# Knoxville Utilities Board

## Water Quality Monitoring Program

### Investigative Water Quality Monitoring Report

10/1/2011 - 12/31/2012

**Table 1: Goose Creek Investigative Sampling**

Location	Collection Date	Weather	Dissolved Oxygen	Water Temp	Water pH	Fecal Coliform	E. coli
			(mg/L)	(°C)	s.u.	(CFU/ 100mL)	(MPN)
Right Fork Above Site 1.19E	11/1/2011	Dry	11	10	8.3	90	260
	1/30/2012	Wet	10	10	8.8	140	150
	2/22/2012	Wet	10	11	8.3	90	96
	3/26/2012	Wet	9.4	14	8.0	430	220
	4/24/2012	Wet	9.8	12	8.1	2900	> 2400
	5/10/2012	Wet	8.8	15	8.2	570	770
	6/25/2012	Dry	7.7	21	8.1	410	460
	7/27/2012	Dry	7.9	21	8.1	360	310
	8/27/2012	Dry	8.0	20	8.1	1100	1300
	9/26/2012	Dry	8.8	16	7.9	3400	> 2400
	10/23/2012	Dry	8.5	14	7.7	270	340
	11/19/2012	Dry	10	9	8.1	470	870
	12/12/2012	Wet	9.0	10	8.1	34000	> 2400
Left Fork Above Site 1.19E	11/1/2011	Dry	9.3	11	8.0	590	580
	1/30/2012	Wet	8.7	11	8.1	530	550
	2/22/2012	Wet	9.0	12	7.9	1900	730
	3/26/2012	Wet	8.8	16	7.7	640	490
	4/24/2012	Wet	8.5	13	7.7	1700	1400
	5/10/2012	Wet	7.8	15	7.7	1800	2400
	6/25/2012	Dry	7.3	20	7.7	2100	1200
	7/27/2012	Dry	6.6	21	7.3	1200	1700
	8/27/2012	Dry	8.4	21	7.5	1800	1300
	9/26/2012	Dry	7.7	17	7.5	1400	1200
	10/23/2012	Dry	7.6	15	7.6	680	460
	11/19/2012	Dry	9.6	11	7.6	1200	770
	12/12/2012	Wet	9.5	10	7.5	1300	1100

## Knoxville Utilities Board

Water Quality Monitoring Program  
Investigative Water Quality Monitoring Report  
10/1/2012 - 12/31/2012

**Table 2: Investigation of SSO**

Location	Collection Date	Rainfall Total	Dissolved Oxygen	Water pH	Water Temp	Fecal Coliform	E. coli
			(mg/L)	s.u.	(°C)	(CFU/ 100mL)	(MPN)
521 Taliwa Dr. - Above	10/12/2012	Dry	7.8	7.7	16	540	290
521 Taliwa Dr. - Below	10/12/2012	Dry	8.2	7.7	17	420	650
Lateral at 200 Liberty St.- Above	10/17/2012	Wet	9.4	8	18	200	240
Lateral at 200 Liberty St. - Below	10/17/2012	Wet	9.4	8.1	17	8000	920
200 Liberty St. - Above (Follow Up)	11/28/2012	Wet	9.5	7.8	10	200	180
200 Liberty St. - Below (Follow Up)	11/28/2012	Wet	9.5	7.8	10	230	170



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**Spill Impact Sampling Results**  
**Water Quality Monitoring Program**

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**Event Date** 11/5/2012  
**Street Address:** 4923 Ball Rd.  
**Description:** Broken Force Main

**Estimated unrecovered volume** 28,500 gallons

**Sampling Notes:** There was no industry upstream of the SSO, therefore no Priority Pollutant samples were collected.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	11/5/2012	0	0.01

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	11/6/2012	08:31	8.2	11	7.6	54	18
Downstream of SSO Discharge	11/6/2012	08:40	7.3	11	7.3	< 9	< 1



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**Event Date** 11/26/2012  
**Street Address:** 5016 Wilford Rd.  
**Description:** Construction Failure Dig-In

**Estimated unrecovered volume** 500 gallons

**Sampling Notes:** There was no industry upstream of the SSO, therefore no Priority Pollutant samples were collected.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	11/26/2012	0.22	0.22

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	11/27/2012	11:06	4.1	13	7.2	820	920
Downstream of SSO Discharge	11/27/2012	10:50	4.3	13	7.3	7000	> 2400
Upstream of SSO Discharge	11/30/2012	08:51	6.1	10	7.5	140	82
Downstream of SSO Discharge	11/30/2012	08:42	7.0	11	7.4	180	110



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Event Date 12/9/2012  
Street Address: 1814 E.Glenwood Avenue  
Description: Blockage-Grease

Light Rain during overflow heavy rain when sampled

Estimated unrecovered volume 410 gallons

Sampling Notes: There was no industry upstream of the SSO, therefore no Priority Pollutant samples were collected.

Precipitation (McGhee-Tyson Airport)	Date	Total - Day of Event	Total - Prior 4 Days
	12/9/2012	0	0.01

Sample Location	Sample Date	Sample Time	Dissolved Oxygen	Temperature (Celsius)	pH	Fecal Coliform	E-Coli (MPN)
Upstream of SSO Discharge	12/10/2012	08:37	8.7	14	7.9	14000	> 2400
Downstream of SSO Discharge	12/10/2012	08:25	8.7	15	7.6	26000	> 2400
Upstream of SSO Discharge	12/19/2012	08:23	10	10	8.0	550	580
Downstream of SSO Discharge	12/19/2012	08:40	9.8	9	7.9	440	400

## **Appendix E**

### **Unpermitted Discharges Subject to Stipulated Penalties**

Appendix E										
Unpermitted Discharges in 2012										
		Overflow volume of 500 gallons or less			1-day rainfall greater than 3"					
		Overflow volume of 501 - 1000 gallons			3-day rainfall greater than 4"					
		Vandalism			Intensity > 0.84 in/hr					
		Electrical or mechanical failure								
Reporting Period	Date	Location	Event	Unrecovered Volume (Gal.)	Receiving Stream	Cause	Rainfall Totals		Peak Rainfall Intensity (in/hr)	Force Majeure event
							1-Day*	3-Day**		
1st 2012	1/23/2012	1216 Watercress Drive	Unpermitted Discharge	1,000	First Creek	Heavy Rainfall	1.27	2.16	0.49	No
1st 2012	1/23/2012	1500 Lyons Bend Road	Unpermitted Discharge	40,000	Fourth Creek	Heavy Rainfall	1.27	2.16	0.49	No
1st 2012	1/24/2012	3741 Eakers Street	Unpermitted Discharge	Unknown	Baker Creek	Heavy Rainfall	0	1.27		No
1st 2012	2/8/2012	736 Greenmeadows Drive	Unpermitted Discharge	250	Knob Creek	Blockage	0	0		No
1st 2012	3/7/2012	1500 Lyons Bend Road	Unpermitted Discharge	97,300	Fourth Creek	Electrical Failure	0	0		No
2nd 2012	4/5/2012	1216 Watercress Drive	Unpermitted Discharge	200	First Creek	Heavy Rainfall	0.96	1.44	0.55	No
2nd 2012	4/9/2012	5603 Summer Grove Lane	Unpermitted Discharge	100	Grassy Creek	Blockage	0	0		No
2nd 2012	5/12/2012	403 West Oldham Avenue	Unpermitted Discharge	47,000	Second Creek	Broken Gravity Main	0	0		No
2nd 2012	5/14/2012	1216 Watercress Drive	Unpermitted Discharge	100	First Creek	Heavy Rainfall	1.61	2.18	0.53	No
2nd 2012	5/25/2012	4601 Seminole Road	Unpermitted Discharge	1,800	First Creek	Blockage	0	0.27	0.3	No
3rd 2012	7/18/2012	1216 Watercress Drive	Unpermitted Discharge	400	First Creek	Construction Failure	0.23	0.23	0.65	No
3rd 2012	7/20/2012	516 N Beaman Street	Unpermitted Discharge	Unknown	Chilhowee Park Lake	Heavy Rainfall	1.72	1.95	2.06	No
3rd 2012	8/17/2012	524 Ben Hur Avenue	Unpermitted Discharge	60	Williams Creek	Blockage	0.04	0.2	0.49	No
3rd 2012	9/18/2012	2004 Riverside Drive	Unpermitted Discharge	200,000	Williams Creek	Heavy Rainfall	3.43	5.80	1.49	Yes
3rd 2012	9/18/2012	517 Bernard Avenue	Unpermitted Discharge	120,000	Second Creek	Heavy Rainfall	3.43	5.80	1.49	Yes
3rd 2012	9/18/2012	6410 S Northshore Drive	Unpermitted Discharge	40,000	Fourth Creek	Heavy Rainfall	3.43	5.80	1.49	Yes
3rd 2012	9/18/2012	1500 Lyons Bend Road	Unpermitted Discharge	1,823,600	Fourth Creek	Electrical Failure	3.43	5.8	1.49	Yes
3rd 2012	9/18/2012	5760 Sandis Lane	Unpermitted Discharge	1,000,800	Loves Creek	Electrical Failure	3.43	5.8	1.49	No
3rd 2012	9/18/2012	1309 Adair Drive	Unpermitted Discharge	2,000	First Creek	Heavy Rainfall	3.43	5.80	1.49	Yes
3rd 2012	9/18/2012	2004 Neyland Drive	Unpermitted Discharge	100,000	Tennessee River	Heavy Rainfall	3.43	5.80	1.49	No
3rd 2012	9/18/2012	5915 Neubert Springs Road	Unpermitted Discharge	90,000	Knob Creek	Mechanical Failure	3.43	5.8	1.49	Yes
4th 2012	11/5/2012	4923 Ball Road	Unpermitted Discharge	28,500	Grassy Creek	Broken Force Main	0	0.07	0.10	No
4th 2012	11/26/2012	5016 Wilford Road	Unpermitted Discharge	500	Second Creek	Construction Failure	0.10	0.11	0.12	No
4th 2012	12/9/2012	1814 E. Glenwood Avenue	Unpermitted Discharge	410	First Creek	Blockage	0.07	0.20	0.42	No
4th 2012	12/20/2012	3006 Coram Street	Unpermitted Discharge	1,150	Second Creek	Blockage	0.78	0.81	0.41	No
*1-Day Rainfall Total is the rain that occurred on the day of the SSO										
**3-Day Rainfall Total is the total amount of rain that occurred on the day of the SSO and the the 2 days prior										

## Fourth Quarter 2012 Unpermitted Discharge Data and Analysis

Appendix E lists any SSO that occurred during the fourth quarter of 2012 that resulted in an unpermitted discharge along with its cause, volume, one- and three-day rainfall totals, and rainfall intensity.

Of the four unpermitted discharges that occurred during the fourth quarter of 2012, two were due to blockage, one was due to construction failure, and one was due to a broken force main. The table below summarizes unpermitted discharges listed in Appendix E for this quarter that were impacted by factors that were difficult to control or events that had minimal impact on the environment due to their low volume.

Category	Count
Mech/Elec. Failure	0
Vandalism	0
3-day rain > 4 in.	0
1-day > 3 in.	0
Vol 501 - 1000 gal	0
Vol < 500 gal.	2
Intensity > 0.84 in/hr	0