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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 second quarter of 2012 from April 1 through June 30. This is the twenty-ninth 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.

April 27, 2012

- Submitted to EPA – 2003-2011 Sanitary Sewer Overflow Evaluation Report

April 30, 2012

- Submitted to EPA – Quarterly Progress Report 1st quarter 2012

June 29, 2012

- Submitted to EPA – SEP Periodic Progress Report 1st period 2012
- Submitted to EPA – SEP Completion Report

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.
- **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** – Project is in design. The expected completion date for construction is June 2013.

Second Creek

1. **2-2 Lower Second Creek Replacement/Rehabilitation at Woodland** – Construction has been completed on the lower trunk sewer work. The permitting process was slowed by redesign required by the railroad operators, Due to the dependency on railroad approval, KUB extended the project into FY 11/12. The project is under construction. KUB requested, and EPA approved, an additional extension to January 31, 2013, due to construction delays caused by a 750-foot tunnel beneath multiple railroads and Second Creek.

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 5,100 ft of 18-30" pipe with 36" diameter pipe. Phase III construction is expected to start in August 2012. **Mynderse, Western, and Canna** – This is additional work that was completed to help address wet-weather capacity restrictions resulting in overflows near Pleasant Ridge Road. Replaced approximately 1,700 ft of 8" sewer and pipe-burst approximately 3,400 ft of 8" up to 10" and 12" 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

1. **W-5 Groner Avenue Rehabilitation Project** – Project is under construction. The expected completion date is FY 12/13.

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 MG wet-weather storage tank to control sewer overflows near Old Broadway during rain events. Designed and built 5 million gallon (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 feet of existing 42 inch and 130 feet of 24 inch 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 of 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 lf 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 3 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 1959 ft; CIPP was used to rehab 2,313 ft, 29 manholes were rehabbed, and 50 laterals were reinstated.
2. **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.
3. **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.
4. **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.

5. **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.
6. **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.
7. **2-9 Second Creek Trunk Sewer Improvements Phase I** – Replaced approximately 4,100 ft of existing trunkline with 30" sewer.
8. **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
9. **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.
10. **2-12 Camelia Road Rehabilitation Project** – Replaced 430 ft of 8" pipe and two manholes. 220 ft of 8" pipe was rehabbed using CIPP.
11. **2-13 Cedar Heights Road Rehabilitation Project** – Replaced 123 ft of 8" pipe and rehabbed 263 ft of 8" pipe with CIPP.
12. **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.
13. **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.
14. **2-16 1600 Block Elm Street Rehabilitation Project** – Pipe burst 285 ft of existing 8" sewer and replaced two manholes.
15. **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.
16. **2-18 Nicholas Road - Clinton Highway Rehabilitation Project** – Replaced 405 ft of 8" pipe and one manhole.
17. **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.
18. **2-20 Sierra Road Rehabilitation Project** – CIPP was used to rehab 969 ft of 8" pipe.
19. **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.
20. **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 improve 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%. 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-6 Selma Avenue – Harrison Street Rehabilitation Project** – Replaced 650 ft with 8" PVC and four manholes, and rehabbed 600 ft of 8" concrete.
6. **W-7 Sunset Avenue Rehabilitation Project** – Replaced 102 ft with 8" PVC.
7. **W-8 South Elmwood Street Rehabilitation Project** – Replaced 200 ft with 8" PVC and three manholes, and rehabbed 400 ft of 8" concrete.
8. **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%. 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 2013.
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 2013.

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. This project is currently in the design phase and 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.

All construction projects are on schedule with the plan outlined in the approved CCP.

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

Construction started in June 2011 and is currently at 98% complete. The final construction inspection has not yet been scheduled. The new gravity sludge thickener is in operation with only minor adjustments and landscaping remaining. The Chemically Enhanced Primary Treatment (CEPT) process is installed but not yet operational. The vendors are making final modifications prior to the startup and completion of the O&M training. This project is scheduled to be complete prior to the December 2012 deadline.

Kuwahee WWTP Phase I, Contract II

Construction started in August 2011 and is currently at 85% complete. Demolition of the mixing equipment in the UNOX basins, the old intermediate pump station and the mechanical equipment removal from the secondary clarifiers is complete with only a moderate amount of remaining concrete to be removed. The accumulated sludge has been removed from the secondary clarifiers. The diversion box walls and base have been constructed and the insertion of the gravity pipe into the old personnel tunnel is nearly complete. The new inlet gates and submersible pumps have been installed in the secondary clarifier tanks. Modified plans for the distribution box have been proposed to avoid conflicts with several uninterruptable circuits and the associated underground electrical conduits serving the intermediate pump station. Future tasks include the completion of the distribution box, installation of the large diameter piping to isolate the UNOX tanks, insertion of the baffle wall into the intermediate wet well, modifications to the old cryogenics building, and process start up. The project is scheduled to be complete prior to the December 2012 deadline.

Fourth Creek WWTP Phase I

The Fourth Creek WWTP Phase I is under construction and scheduled to be complete before the EPA completion date of December 2013. Construction is 20% complete. To date the contractor has completed utility relocations and demolition of an out of service aeration basin. The contractor is now working on the foundation for the new High Rate Clarification (HRC) Structure and Chemical Building. Additionally, it has set the wet well for the drain pump station and is excavating for the new HRC pump. Major tasks include a new wet weather screening structure, High Rate Clarification Pump Station, Chemical Storage Building, High Rate Clarifier, Drain Pump Station, Generator Building, Chlorine Contact Tank, Effluent Pumps, and transformer replacement.

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 nine times during this reporting period resulting in no 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 2003-2011 Sanitary Sewer Overflow Evaluation Report Annual Update

Consent Decree language, page 21: *“Beginning on April 30, 2005, and on an annual basis thereafter, until termination of this Consent Decree, KUB shall submit an update to the SSOER to address those conditions that caused the SSOs that occurred during the previous Calendar Year, in accordance with subparagraphs (b) through (e) below (“Annual SSOER Update”).”*

On April 27, 2012, KUB submitted to EPA and placed in the PDR the 2003 – 2011 Sanitary Sewer Overflow Evaluation Report Annual Update. This Review Level 1 Deliverable was available for public comment from April 27, 2011, until May 18, 2012.

6.1.2 Quarterly Progress Report Fourth Quarter 2011

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 April 30, 2012, KUB submitted to EPA and placed in the PDR the Quarterly Progress Report for the first quarter 2012. This deliverable was not subject to the Public Review Requirement of Section VI.A.2, but was available for public comment from April 30, 2012, until May 21, 2012. No comments were received during that period.

6.1.3 SEP Periodic Report First Period 2012

Consent Decree language, page 61: *“While the SEP is being planned and implemented, KUB shall submit semiannual reports to the Parties describing the progress of the SEP up to and during the most recent Calendar Quarter within one (1) Month after the end of the second and fourth Calendar Quarters following the Date of Entry.”*

On June 29, 2012, KUB submitted the SEP Periodic Report for the second period 2011 to EPA. This deliverable was not subject to public review but was posted in the PDR at the time of submission.

6.1.4 SEP Completion Report

Consent Decree language, page 60: *“KUB shall complete the SEP within eight (8) years from the Date of Entry. KUB shall submit a SEP Completion Report to the Parties within thirty (30) days after the completion of the SEP.”*

On June 29, 2012, KUB submitted the SEP Completion Report to EPA. This deliverable was not subject to public review but was posted in the PDR at the time of submission.

6.2 Violations Subject to Stipulated Penalties

During this reporting period, KUB incurred five 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 first 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 | 4/5/2012 | 1216 Watercress Drive | Heavy Rainfall |
| Unpermitted Discharge | 4/9/2012 | 5603 Summer Grove Lane | Blockage |
| Unpermitted Discharge | 5/12/2012 | 403 West Oldham Avenue | Broken Pipe |
| Unpermitted Discharge | 5/14/2012 | 1216 Watercress Drive | Heavy Rainfall |
| Unpermitted Discharge | 5/25/2012 | 4601 Seminole Road | 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 15 SSO events. Of that number, six were due to blockage, four were due to heavy rainfall, one was due to construction failure, one was due to grinder pump failure, one was due to broken pipe, one was due to vandalism, and one was due to a process failure at the WWTP.

Of the 15 SSO events, 12 were in the 0 – 1,000 gallons volume range, 1 was in the 1,001 – 10,000 range, and two events totaled greater than 10,000 gallons. Durations for events during this period are as follows: 12 ranged from 0 – 2 hours, three ranged from 2.1 - 5 hours, and no events were greater than 5 hours.

7.2 Building Backups

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

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 Diversions 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 conducting routine monitoring in all creeks, and responding to Sanitary Sewer Overflows (SSOs), KUB Water Quality personnel conducted some investigative sampling in Baker and Goose Creeks. KUB continues to utilize RT-PCR Bacteroides analysis if necessary to investigate the source of any high *E. coli* counts that reoccur.

First Creek

The bacteriological results associated with the routine monitoring for First Creek (Routine Water Quality Monitoring Report – Appendix D) have been below the water quality standard of 941cfu/100 ml for some time. This quarter samples collected on 5/8/12 and one on 6/19/12 had results above the water quality standard. In both cases rain had occurred just prior to sampling. Although not recorded by the NOAA weather site, localized rainfall of at least 0.3 inches fell in the vicinity of First Creek on 5/7/12. Runoff brings potential contamination from other sources to the stream and likely contributed to the high counts observed on those two dates.

Second Creek

The routine samples that had *E. coli* results above the water quality standard of 941cfu/100 ml were collected on 5/9/12 and 6/11/12 when the area received at least a quarter inch of rain just prior to sampling (Routine Water Quality Monitoring Report – Appendix D). Runoff contamination likely contributed to the high counts observed on those dates. An SSO did occur on 5/12/12 near the stream at 403 W. Oldham Avenue, but spill response monitoring did not indicate that the stream’s water quality was impacted. Additional monitoring just downstream of the SSO location on 6/11/12 confirmed the routine monitoring results were not related to the previous SSO on 5/12/12. (See Spill Impact Report – ix D)

Third Creek

The routine monitoring sample for Site 0.87 sampled on 4/16/12 is unavailable due to a nearby mulch fire that impacted the stream near the sampling site. The City of Knoxville was immediately notified about the darkness of the stream. Although KUB analyzed the sample that was it was affected by run-off from the fire-fighting effort. Results are included in Table 3 – Appendix D. There were two routine samples for this quarter that had an *E. coli* result above the water quality standard of 941cfu/100 ml. They were both collected on 5/16/12 when the area had received a cumulative 2.28 inches of rain within the three days prior to sampling (Routine Water Quality Monitoring Report – Appendix D). Runoff likely contributed to the high counts observed on that date.

Fourth Creek

There were no *E. coli* results above the water quality standard for any monitoring done on Fourth Creek during this quarter (Routine Water Quality Monitoring Report – Appendix D). Bacteriological counts have continued to be below the water quality standard over the last several quarters.

Loves Creek

The bacteriological results associated with the routine monitoring for Loves Creek during this quarter (Routine Water Quality Monitoring Report – Appendix D) have been below the water

quality standard of 941cfu/100 ml for some time. During this quarter one of the samples taken on 4/18/12 was above the water quality standard for *E. coli*. A quarter inch of rain fell on this date. Runoff likely contributed to the isolated high counts observed.

Williams Creek

There were five routine samples for this quarter that had an *E. coli* result above the water quality standard of 941cfu/100 ml, for Williams Creek (Routine Water Quality Monitoring Report – Appendix D). All were associated with either localized or widespread rainfall. Runoff likely contributed to the high counts observed, but those samples are being submitted for human source testing to determine if further investigation is needed.

Baker Creek

Some investigation still continues in this creek because of elevated counts observed in previous quarters along a tributary that enters the stream at mile 0.36. Since the elevations are inconsistent and seen primarily during wet weather in this largely residential area, a leaking septic system or defective private lateral is suspect. Although wet weather no doubt affected the results obtained for this monitoring period, KUB is investigating the high counts with source testing to try to narrow the location of the source (Table 1 – Appendix D). PCR data will be reported next quarter when it becomes available.

Goose Creek

There were five routine 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). Although not recorded by the NOAA weather site, localized rainfall impacted four of those samples. Site 1.19E is currently under investigation. (Table 2 – 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. The area upstream and near site 1.19E is being investigated to determine the potential source of the contamination and more monitoring of nearby tributaries is continuing.

Spill Impact Monitoring

In addition to the Spill Impact Report in Appendix D, there was some additional monitoring included in Table 4 that relates to a SSO on Western Avenue on 4/29/12. That monitoring was proactive. Subsequent investigation confirmed that the SSOs that occurred in that area did not result in an unpermitted discharge. The data also supports the final determination.

8.2 Projected Data Collection

During the third quarter of 2012, 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 third quarter of 2012:

Sample Locations by Creek Mile or Site Number

| Creek Name | Creek Mile # | Creek Mile # | Creek Mile # |
|-----------------------|---------------------|---------------------|---------------------|
| First Creek | 1.74 | 2.57 | 6.33 |
| Second Creek | 0.30 | 1.54 | 5.11 |
| Third Creek | 0.87 | 2.08E | 4.80W |
| Fourth Creek | 1.75 | 2.79 | 3.29 |
| Baker Creek | 0.36 | 0.53 | 1.45 |
| Goose Creek | 0.40 | 1.19E | 1.80E |
| Loves Creek | 0.85 | 1.89 | 3.45 |
| Williams Creek | 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 Avar 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 |

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 |
|-----------|----------|----------|--------------------|-------|--------------|-------|-----------------------|--|-----------------|---|------------------------|----------------------------|--------------------------------|------------------|-----------------------|
| 4/2/2012 | 8:00 PM | 1909 | Jefferson Avenue | KUW | First Creek | 24 | Lateral Cleanout | Lateral Cleanout to Soil Saturation | | Rainfall in the area produced I & I and high flows in sewer mains. | 40 | 0 | 40 | 1 | No |
| 4/5/2012 | 11:40 PM | 1216 | Watercress Drive | KUW | First Creek | 7 | Manhole 29-9 | Pavement to Ground to Unnamed Tributary to First Creek & Soil Saturation | First Creek | Rainfall in the area produced I & I and high flows in sewer mains. | 200 | 0 | 200 | 2 | Yes |
| 4/7/2012 | 4:40 PM | 1925 | Ailor Avenue | KUW | Third Creek | 29 | Lateral Cleanout | Lateral Cleanout to Soil Saturation & Pavement to Storm Drain to Recovery | | Blockage - Debris. The area was cleaned. | 200 | 150 | 50 | 1 | No |
| 4/7/2012 | 10:32 AM | 2304 | Woods Creek Road | LC | Loves Creek | 105 | Grinder Pump | Wet Well to Soil Saturation | | The grinder pump was repaired and the area was cleaned. | 5 | 0 | 5 | 1 | No |
| 4/9/2012 | 3:50 PM | 5603 | Summer Grove Lane | FC | Fourth Creek | 49 | Manhole 19-63 | Ground to Unnamed Tributary to Grassy Creek & Soil Saturation | Grassy Creek | Blockage - Debris. The area was cleaned. | 100 | 0 | 100 | 1 | Yes |
| 4/28/2012 | 11:53 PM | 1816 | Sterchi Street | KUW | Third Creek | 22 | Manhole 11-44 | Pavement to Soil Saturation | | Blockage - Debris. The sewer main was flushed & area was cleaned. | 30 | 0 | 30 | 1 | No |
| 4/28/2012 | 6:10 PM | 6532 | Westside Drive | FC | Fourth Creek | 32a | Manhole 49-5 | Ditch to Soil Saturation & Recovery | | Vandalism. Blockage was removed & area cleaned. | 66,000 | 4,500 | 61,500 | 5 | No |
| 5/3/2012 | 2:54 PM | 2010 | Cumberland Avenue | KUW | Third Creek | 35b | Unconnected Lateral | Pavement to Ground to Soil Saturation and Storm Drain to Recovery | | Construction Failure - Unconnected Lateral. Lateral was reconnected & area cleaned. | 50 | 30 | 20 | 1.5 | No |
| 5/10/2012 | 2:03 PM | 3560 | Talahi Drive | KUW | Third Creek | 38 | Lateral Cleanout | Lateral Cleanout to Soil Saturation and Pavement to Storm Drain to Recovery | | Blockage - Debris. The sewer main was flushed & area was cleaned. | 400 | 200 | 200 | 3 | No |
| 5/12/2012 | 12:29 PM | 403 | West Oldham Avenue | KUW | Second Creek | 15 | Unnamed Manhole | Pavement to Ground to Second Creek | Second Creek | Broken Gravity Main. The sewer main was repaired & the area cleaned. | 47,000 | 0 | 47,000 | 4 | Yes |
| 5/14/2012 | 8:19 AM | 4600 | Upchurch Road | KUW | First Creek | 7 | Manhole 45 | Ground to Soil Saturation | | Rainfall in the area produced I & I and high flows in sewer mains. | 50 | 0 | 50 | 1 | No |
| 5/14/2012 | 6:42 PM | 1216 | Watercress Drive | KUW | First Creek | 7 | Manhole 29-9 | Pavement to Ground to Unnamed Tributary to First Creek & Soil Saturation | First Creek | Rainfall in the area produced I & I and high flows in sewer mains. | 100 | 0 | 100 | 1 | Yes |
| 5/15/2012 | 2:19 PM | 2015 | Neyland Drive | KUW | Third Creek | 35b | #2 Digester | Soil Saturation | | WWTP Process Failure. WWTP process was reinstated & area cleaned. | 100 | 0 | 100 | 0.33 | No |
| 5/25/2012 | 6:04 PM | 4601 | Seminole Road | KUW | Third Creek | 7 | Broken Gravity Main | Subsurface to Ground to Unnamed Tributary to First Creek and Soil Saturation | First Creek | Blockage - Debris. The sewer main was flushed & area was cleaned. | 3,800 | 2,000 | 1,800 | 2 | Yes |
| 6/4/2012 | 1:45 PM | 5412 | Maywood Road | KUW | Third Creek | 12 | Manhole 20-16 & 20-20 | Soil Saturation | | Blockage - Grease and Roots. The sewer main was flushed & area was cleaned. | 70 | 0 | 70 | 1 | No |

Appendix C

Building Backups

BBUs

| 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) |
| 4/3/2012 | 12:48 PM | 3819 | Glenfield Drive | KUW | Third Creek | 38 | BBU | Construction Failure - Sewer Main Flushing | 10 | 10 | 0 | 0.25 |
| 4/20/2012 | 8:56 AM | 616 | Luttrell Street | KUW | First Creek | 24 | BBU | Construction Failure - Unconnected Lateral. Lateral was reconnected. | 5 | 5 | 0 | 0.5 |
| 6/9/2012 | 8:52 AM | 5034 | Rowan Road | KUW | Second Creek | 5 | BBU | Blockage-Roots. Sewer Main flushed & Area & Bldg Cleaned. | 10 | 5 | 5 | 0.5 |

Appendix D

Water Quality Monitoring Program Sampling Results



Routine Water Quality Monitoring Report

4/1/2012 Through 6/30/2012

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* |
|----------------------------|-------------|-------------|-----|-----------------|-------------------------|-----------------------------|---------------|---------------------|---------|
| <u>First Creek</u> | | | | | | | | | |
| 1.74 | 4/5/2012 | 10:11 | 8.0 | 17 | 8.6 | 480 | 440 | Wet | R |
| 2.57 | 4/5/2012 | 10:54 | 8.2 | 18 | 9.1 | 450 | 440 | Wet | R |
| 6.33 | 4/5/2012 | 10:37 | 7.7 | 17 | 7.3 | 460 | 610 | Wet | R |
| 1.74 | 5/8/2012 | 08:59 | 7.9 | 19 | 7.3 | 1300 | 980 | Dry | R |
| 2.57 | 5/8/2012 | 09:11 | 8.1 | 19 | 7.7 | 1700 | 2400 | Dry | R |
| 6.33 | 5/8/2012 | 09:21 | 7.7 | 18 | 6.4 | 2000 | 2000 | Dry | I |
| 1.74 | 6/19/2012 | 09:49 | 8.0 | 22 | 7.5 | 640 | 610 | Wet | R |
| 2.57 | 6/19/2012 | 09:27 | 8.1 | 21 | 7.9 | 910 | 580 | Wet | R |
| 6.33 | 6/19/2012 | 09:10 | 7.6 | 19 | 7.0 | 1200 | 1700 | Wet | I |
| <u>Second Creek</u> | | | | | | | | | |
| 0.30 | 4/10/2012 | 09:41 | 8.2 | 14 | 9.4 | 730 | 550 | Dry | R |
| 1.54 | 4/10/2012 | 09:53 | 8.0 | 14 | 9.0 | 730 | 550 | Dry | R |
| 5.11 | 4/10/2012 | 09:20 | 7.8 | 16 | 7.0 | 18 | 24 | Dry | R |
| 0.30 | 5/9/2012 | 09:12 | 8.1 | 18 | 8.4 | 730 | 650 | Dry | R |
| 1.54 | 5/9/2012 | 09:23 | 7.9 | 18 | 7.5 | 1700 | 1400 | Dry | I |
| 5.11 | 5/9/2012 | 09:01 | 7.5 | 18 | 6.3 | 480 | 580 | Dry | R |
| 0.30 | 6/11/2012 | 10:56 | 7.8 | 21 | 7.9 | 11000 | > 2400 | Wet | R |
| 1.54 | 6/11/2012 | 10:48 | 7.9 | 20 | 8.2 | 4100 | > 2400 | Wet | I |
| 5.11 | 6/11/2012 | 09:24 | 7.3 | 20 | 6.4 | 260 | 220 | 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.



Routine Water Quality Monitoring Report

4/1/2012 Through 6/30/2012

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* |
|----------------------------|-------------|-------------|-----|-----------------|-------------------------|-----------------------------|---------------|---------------------|---------|
| <u>Third Creek</u> | | | | | | | | | |
| 2.08E | 4/16/2012 | 11:39 | 8.1 | 18 | 8.9 | 330 | 250 | Dry | R |
| 4.80W | 4/16/2012 | 11:12 | 7.7 | 16 | 9.0 | 260 | 320 | Dry | R |
| 0.87 | 5/16/2012 | 09:29 | 8.2 | 17 | 8.5 | 1400 | 1100 | Wet | R |
| 2.08E | 5/16/2012 | 09:17 | 8.2 | 17 | 7.9 | 2100 | 2400 | Wet | R |
| 4.80W | 5/16/2012 | 09:01 | 7.8 | 16 | 8.3 | 540 | 650 | Wet | R |
| 0.87 | 6/20/2012 | 09:16 | 8.1 | 21 | 7.9 | 350 | 290 | Dry | R |
| 2.08E | 6/20/2012 | 10:57 | 7.9 | 24 | 6.3 | 640 | 460 | Dry | R |
| 4.80W | 6/20/2012 | 09:36 | 7.8 | 19 | 8.0 | 150 | 180 | Dry | R |
| <u>Fourth Creek</u> | | | | | | | | | |
| 1.75 | 4/11/2012 | 09:17 | 8.0 | 13 | 9.5 | 240 | 160 | Dry | R |
| 2.79 | 4/11/2012 | 09:30 | 7.9 | 13 | 9.1 | 170 | 98 | Dry | R |
| 3.29 | 4/11/2012 | 09:46 | 8.0 | 14 | 9.6 | 81 | 46 | Dry | R |
| 1.75 | 5/17/2012 | 09:53 | 8.0 | 17 | 8.7 | 420 | 440 | Wet | R |
| 2.79 | 5/17/2012 | 09:39 | 8.0 | 16 | 8.5 | 490 | 260 | Wet | R |
| 3.29 | 5/17/2012 | 09:28 | 8.2 | 16 | 9.1 | 170 | 170 | Wet | R |
| 1.75 | 6/21/2012 | 09:38 | 7.9 | 19 | 8.5 | 310 | 320 | Wet | R |
| 2.79 | 6/21/2012 | 09:21 | 7.9 | 19 | 8.3 | 290 | 140 | Wet | R |
| 3.29 | 6/21/2012 | 09:07 | 8.1 | 18 | 9.3 | 200 | 160 | 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
Report

Routine Water Quality Monitoring Report

4/1/2012 Through 6/30/2012

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* |
|---------------------------|-------------|-------------|-----|-----------------|-------------------------|-----------------------------|---------------|---------------------|---------|
| <u>Baker Creek</u> | | | | | | | | | |
| 0.36 | 4/26/2012 | 10:05 | 7.8 | 16 | 7.8 | 20000 | > 2400 | Wet | I |
| 0.53 | 4/26/2012 | 10:14 | 7.8 | 16 | 7.9 | 11000 | > 2400 | Wet | I |
| 1.45 | 4/26/2012 | 09:55 | 7.7 | 16 | 7.9 | 10000 | > 2400 | Wet | I |
| 0.36 | 5/29/2012 | 09:58 | 7.7 | 19 | 7.3 | 3900 | > 2400 | Dry | I |
| 0.53 | 5/29/2012 | 10:09 | 7.9 | 19 | 7.9 | 2000 | 1200 | Dry | I |
| 1.45 | 5/29/2012 | 10:15 | 7.6 | 18 | 7.8 | 2000 | > 2400 | Dry | I |
| 0.36 | 6/28/2012 | 09:38 | 7.8 | 18 | 7.7 | 3500 | > 2400 | Dry | I |
| 0.53 | 6/28/2012 | 09:43 | 8.0 | 18 | 8.3 | 1500 | 1700 | Dry | I |
| 1.45 | 6/28/2012 | 09:55 | 7.8 | 18 | 7.9 | 460 | 490 | Dry | R |
| <u>Goose Creek</u> | | | | | | | | | |
| 0.40 | 4/24/2012 | 10:41 | 7.8 | 12 | 9.1 | 1400 | 1300 | Dry | R |
| 1.19E | 4/24/2012 | 10:27 | 7.9 | 12 | 9.2 | 2600 | 2400 | Dry | I |
| 1.80E | 4/24/2012 | 09:59 | 7.9 | 12 | 9.2 | 5200 | > 2400 | Dry | R |
| 0.40 | 5/10/2012 | 08:40 | 7.8 | 15 | 7.7 | 910 | 650 | Dry | R |
| 1.19E | 5/10/2012 | 08:53 | 8.0 | 15 | 8.5 | 1600 | 1200 | Dry | I |
| 1.80E | 5/10/2012 | 09:50 | 8.0 | 14 | 8.5 | 220 | 100 | Dry | R |
| 0.40 | 6/25/2012 | 11:17 | 7.7 | 20 | 6.4 | 2800 | 690 | Dry | R |
| 1.19E | 6/25/2012 | 10:45 | 7.4 | 21 | 7.6 | 820 | 1100 | Dry | I |
| 1.80E | 6/25/2012 | 10:56 | 8.0 | 19 | 8.3 | 500 | 610 | Dry | 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.



Routine Water Quality Monitoring Report

4/1/2012 Through 6/30/2012

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Water Quality Laboratory
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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* |
|------------------------------|-------------|-------------|-----|-----------------|-------------------------|-----------------------------|---------------|---------------------|---------|
| <u>Loves Creek</u> | | | | | | | | | |
| 0.85 | 4/18/2012 | 10:17 | 7.8 | 15 | 8.2 | 1400 | 770 | Wet | R |
| 1.89 | 4/18/2012 | 10:29 | 7.5 | 15 | 8.0 | 180 | 150 | Wet | R |
| 3.45 | 4/18/2012 | 09:26 | 7.6 | 16 | 8.1 | 2500 | > 2400 | Wet | R |
| 0.85 | 5/7/2012 | 09:18 | 7.9 | 18 | 7.3 | 340 | 230 | Wet | R |
| 1.89 | 5/7/2012 | 09:35 | 7.5 | 18 | 6.5 | 230 | 140 | Wet | R |
| 3.45 | 5/7/2012 | 09:55 | 7.8 | 20 | 6.8 | 220 | 110 | Wet | R |
| 0.85 | 6/14/2012 | 08:45 | 7.8 | 18 | 7.8 | 560 | 690 | Wet | R |
| 1.89 | 6/14/2012 | 08:56 | 7.5 | 18 | 7.4 | 410 | 230 | Wet | R |
| 3.45 | 6/14/2012 | 09:21 | 7.7 | 19 | 7.1 | 280 | 150 | Wet | R |
| <u>Williams Creek</u> | | | | | | | | | |
| 0.89 | 4/23/2012 | 10:35 | 9.7 | 13 | 8.0 | 390 | 310 | Dry | R |
| 1.70 | 4/23/2012 | 10:08 | 7.7 | 14 | 7.9 | 290 | 160 | Dry | R |
| 2.02 | 4/23/2012 | 09:54 | 8.1 | 14 | 8.7 | 2100 | 2000 | Dry | I |
| 0.89 | 5/9/2012 | 09:59 | 8.1 | 18 | 8.3 | 1400 | 1400 | Dry | I |
| 1.70 | 5/9/2012 | 09:45 | 7.8 | 19 | 6.4 | 540 | 550 | Dry | R |
| 2.02 | 5/9/2012 | 09:37 | 7.9 | 18 | 7.3 | 1300 | 410 | Dry | R |
| 0.89 | 6/12/2012 | 11:09 | 7.9 | 23 | 7.6 | 8000 | > 2400 | Wet | I |
| 1.70 | 6/12/2012 | 09:40 | 7.7 | 23 | 6.8 | 10000 | > 2400 | Wet | R |
| 2.02 | 6/12/2012 | 09:24 | 7.6 | 21 | 6.7 | 14000 | > 2400 | Wet | I |

*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.

Knoxville Utilities Board

Water Quality Monitoring Program

Investigative Water Quality Monitoring Report

7/1/2010 Through 6/30/2012

Table 1: Baker Creek Investigative Sampling

| Location | Collection Date | Weather | Dissolved Oxygen | Water Temp | Water pH | Fecal Coliform | E. coli | Total Bacteriodes | Human Bacteriodes |
|-----------------------------------|-----------------|---------|------------------|------------|----------|----------------|---------|-------------------|-------------------|
| | | | (mg/L) | (°C) | S.U. | (CFU/ 100mL) | (MPN) | (mg/L) | (mg/L) |
| Left Bank Tributary Above SM 0.36 | 7/27/2010 | Dry | 8 | 23 | 8.2 | 11000 | 290 | 22.1 | < 5 |
| Left Bank Tributary Above SM 0.36 | 10/20/2010 | Wet | 7.6 | 14 | 7.8 | 5500 | 1400 | < 5 | < 5 |
| Left Bank Tributary Above SM 0.36 | 11/9/2010 | Dry | 9.7 | 8 | 8.2 | 730 | 1700 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 12/20/2010 | Dry | 11.5 | 3 | 8.0 | 810 | 1300 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 1/27/2011 | Wet | 11.7 | 5 | 7.0 | 22000 | 1300 | < 5 | < 5 |
| Left Bank Tributary Above SM 0.36 | 2/28/2011 | Wet | 8.8 | 13 | 7.9 | 5300 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 3/24/2011 | Wet | 9.8 | 12 | 8.2 | 2300 | 1000 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 4/21/2011 | Wet | 9.2 | 15 | 7.8 | 1300 | 1100 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 5/25/2011 | Dry | 8.5 | 18 | 8.0 | 13000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 6/28/2011 | Wet | 7.7 | 20 | 8.5 | 8000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 7/21/2011 | Wet | 7.6 | 22 | 7.2 | 11000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 8/22/2011 | Dry | 7.7 | 22 | 8.0 | 16000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 9/28/2011 | Wet | 9.0 | 16 | 7.9 | 5300 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 10/20/2011 | Wet | 9.0 | 12 | 7.7 | 2000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 10/27/2011 | Dry | 8.6 | 13 | 7.7 | 2800 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 11/29/2011 | Wet | 8.6 | 11 | 7.6 | 590 | 1600 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 12/27/2011 | Wet | 10.0 | 9 | 7.6 | 4000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 1/23/2012 | Wet | 9.8 | 11 | 7.4 | 10000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 1/31/2012 | Dry | 11.0 | 7 | 7.9 | 480 | 550 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 2/27/2012 | Dry | 10.0 | 10 | 9.0 | 1500 | 2000 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 3/27/2012 | Wet | 9.3 | 15 | 8.1 | 560 | 550 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 4/26/2012 | Wet | 8.4 | 15 | 8.0 | 31000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 5/29/2012 | Dry | 7.8 | 20 | 7.9 | 11000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 | 6/28/2012 | Dry | 8.4 | 19 | 8.0 | 9000 | > 2400 | N/A | N/A |

| Location | Collection Date | Weather | Dissolved Oxygen | Water Temp | Water pH | Fecal Coliform | E. coli | Total Bacteriodes | Human Bacteriodes |
|---|-----------------|---------|------------------|------------|----------|----------------|---------|-------------------|-------------------|
| | | | (mg/L) | (°C) | S.U. | (CFU/ 100mL) | (MPN) | (mg/L) | (mg/L) |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 3/24/2011 | Wet | 9.7 | 12 | 8.2 | 540 | 650 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 10/20/2011 | Wet | 9.5 | 12 | 8.0 | 4500 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 10/27/2011 | Dry | 9.1 | 14 | 7.9 | 3300 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 1/23/2012 | Wet | 9.6 | 11 | 7.4 | 11000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 1/31/2012 | Dry | 10.0 | 8 | 8.3 | 420 | 490 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 2/27/2012 | Dry | 10.0 | 11 | 8.4 | 1000 | 730 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 3/27/2012 | Wet | 9.1 | 16 | 7.9 | 270 | 230 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 4/26/2012 | Wet | 8.4 | 15 | 7.9 | 10000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 5/29/2012 | Dry | 8.4 | 18 | 8.0 | 4500 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Mayfair Dr. | 6/28/2012 | Dry | 8.2 | 19 | 8.2 | 4000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 Between Peachtree & Mayfair | 2/27/2012 | Dry | 9.5 | 13 | 8.2 | 1000 | 650 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 Between Peachtree & Mayfair | 3/27/2012 | Wet | 8.9 | 16 | 7.9 | 320 | 360 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 Between Peachtree & Mayfair | 4/26/2012 | Wet | 8.4 | 15 | 7.9 | 5400 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 Between Peachtree & Mayfair | 5/29/2012 | Dry | 8.3 | 18 | 8.1 | 4300 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 Between Peachtree & Mayfair | 6/28/2012 | Dry | 8.5 | 18 | 8.2 | 5000 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 1/23/2012 | Wet | 9.4 | 12 | 7.4 | 3700 | 2400 | N/A | N/A |

| Location | Collection Date | Weather | Dissolved Oxygen | Water Temp | Water pH | Fecal Coliform | E. coli | Total Bacteriodes | Human Bacteriodes |
|---|-----------------|---------|------------------|------------|----------|----------------|---------|-------------------|-------------------|
| | | | (mg/L) | (°C) | S.U. | (CFU/ 100mL) | (MPN) | (mg/L) | (mg/L) |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 1/31/2012 | Dry | 10.0 | 9 | 8.1 | 150 | 280 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 2/27/2012 | Dry | 9.9 | 12 | 8.9 | 380 | 360 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 3/27/2012 | Wet | 9.1 | 16 | 7.9 | 520 | 340 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 4/26/2012 | Wet | 8.4 | 15 | 7.8 | 3900 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 5/29/2012 | Dry | 8.4 | 18 | 8.1 | 1200 | > 2400 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 2335 Peachtree St. | 6/28/2012 | Dry | 8.8 | 18 | 8.2 | 4900 | > 2400 | N/A | N/A |

| | | | | | | | | | |
|--|------------|-----|-----|----|-----|------|------|-----|-----|
| Left Bank Tributary Above SM 0.36 near Gilbert at McClung | 3/24/2011 | Wet | 9.1 | 12 | 7.7 | 730 | 580 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Gilbert at McClung | 10/20/2011 | Wet | 8.7 | 13 | 7.6 | 1000 | 920 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Gilbert at McClung | 10/27/2011 | Dry | 8.5 | 15 | 7.6 | 530 | 160 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Gilbert at McClung | 1/23/2012 | Wet | 9.0 | 11 | 7.3 | 1900 | 2000 | N/A | N/A |
| Left Bank Tributary Above SM 0.36 near Gilbert at McClung | 1/31/2012 | Dry | 9.6 | 9 | 7.8 | 200 | 260 | N/A | N/A |
| Discontinued: 2/27/12 | | | | | | | | | |

Knoxville Utilities Board

Water Quality Monitoring Program

Investigative Water Quality Monitoring Report

10/1/2011 - 6/30/2012

Table 2: Goose Creek Investigative Sampling

| Location | Collection Date | Weather | Dissolved Oxygen (mg/L) | Water Temp (°C) | Water pH s.u. | Fecal Coliform (CFU/ 100mL) | E. coli (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 |
| 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 |

Knoxville Utilities Board

Water Quality Monitoring Program

Investigative Water Quality Monitoring Report

4/1/12 - 6/30/12

Table 3: Investigative Sampling

| | Collection Date | Dissolved Oxygen | Water Temp | Water pH | Fecal Coliform | E. coli |
|-----------------------|-----------------|------------------|------------|----------|----------------|---------|
| | | (mg/L) | (°C) | s.u. | (CFU/ 100mL) | (MPN) |
| Third Creek Site 0.87 | 4/16/2012 | 5.4 | 18 | 7.5 | >60000 | > 2400 |
| | | | | | | |

Knoxville Utilities Board

Water Quality Monitoring Program

Investigative Water Quality Monitoring Report

4/1/2012 - 6/30/2012

Table 4: SSO Investigation

| Location | Collection Date | Dissolved Oxygen | Water Temp | Water pH | Fecal Coliform | E. coli |
|-------------------------|-----------------|------------------|------------|----------|----------------|---------|
| | | (mg/L) | (°C) | s.u. | (CFU/ 100mL) | (MPN) |
| | | | | | | |
| 2322 Western Dr (Above) | 4/29/2012 | 8.4 | 16 | 8.1 | 640 | 650 |
| 2322 Western Dr (Below) | 4/29/2012 | 8.6 | 16 | 8.0 | 120 | 190 |
| | | | | | | |
| | | | | | | |



Water Quality Monitoring
Report

Spill Impact Sampling Results
Water Quality Monitoring Program

Knoxville Utilities Board
Water Quality Laboratory
Debbie Ailey, Lab Supervisor
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Knoxville, Tennessee 37915
(865) 594-8286 Fax: (865)594-8245

Event Date 4/9/2012
Street Address: 5603 Summer Grove Ln.
Description: Blockage-Debris

Ground to Un-named Tributary to Grassy Creek

Estimated unrecovered volume 100 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 |
| | 4/9/2012 | 0 | 0.03 |

| Sample Location | Sample Date | Sample Time | Dissolved Oxygen | Temperature (Celsius) | pH | Fecal Coliform | E-Coli (MPN) |
|-----------------------------|-------------|-------------|------------------|-----------------------|-----|----------------|--------------|
| Upstream of SSO Discharge | 4/9/2012 | 18:36 | 8.0 | 21 | 8.3 | < 9 | 28 |
| Downstream of SSO Discharge | 4/9/2012 | 18:40 | 6.8 | 20 | 8.2 | 2000 | 380 |
| Upstream of SSO Discharge | 4/13/2012 | 11:35 | 7.6 | 17 | 8.3 | < 9 | 10 |
| Downstream of SSO Discharge | 4/13/2012 | 11:32 | 8.7 | 17 | 8.2 | 45 | 26 |



Water Quality Monitoring
Report

Spill Impact Sampling Results
Water Quality Monitoring Program

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Event Date 5/12/2012
Street Address: 403 W.Oldham Ave.
Description: Broken Gravity Main

Pavement to Ground to Second Creek

Estimated unrecovered volume 47,000 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 |
|--------------------------------------|-----------|----------------------|----------------------|
| | 5/12/2012 | 0 | 0.01 |

| Sample Location | Sample Date | Sample Time | Dissolved Oxygen | Temperature (Celsius) | pH | Fecal Coliform | E-Coli (MPN) |
|-----------------------------|-------------|-------------|------------------|-----------------------|-----|----------------|--------------|
| Upstream of SSO Discharge | 5/12/2012 | 15:00 | 9.0 | 19 | 8.4 | 280 | 320 |
| Downstream of SSO Discharge | 5/12/2012 | 15:12 | 8.9 | 18 | 8.3 | 730 | 770 |
| Downstream of SSO Discharge | 6/11/2012 | 10:29 | 8.5 | 20 | 8.1 | 2200 | 1700 |



Water Quality Monitoring
Report

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

Knoxville Utilities Board
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Event Date 5/25/2012
Street Address: 4601 Seminole Road
Description: Blockage-Debris

Subsurface to Ground to Un-named Tributary to First Creek

Estimated unrecovered volume 1800 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 |
|---|-----------|----------------------|----------------------|
| | 5/25/2012 | 0 | 0.33 |

| Sample Location | Sample Date | Sample Time | Dissolved Oxygen | Temperature (Celsius) | pH | Fecal Coliform | E-Coli (MPN) |
|-----------------------------|-------------|-------------|------------------|-----------------------|-----|----------------|--------------|
| Upstream of SSO Discharge | 5/26/2012 | 07:48 | 7.2 | 17 | 7.8 | 2400 | 1300 |
| Downstream of SSO Discharge | 5/26/2012 | 07:56 | 7.1 | 17 | 7.8 | 21000 | > 2400 |
| Upstream of SSO Discharge | 6/1/2012 | 08:05 | 6.3 | 19 | 7.6 | 14000 | 1100 |
| Downstream of SSO Discharge | 6/1/2012 | 08:10 | 6.4 | 19 | 7.6 | 18000 | 1300 |
| Upstream of SSO Discharge | 6/11/2012 | 09:45 | 7.6 | 18 | 7.9 | 4500 | 2400 |
| Downstream of SSO Discharge | 6/11/2012 | 09:50 | 7.8 | 18 | 7.9 | 3800 | > 2400 |

Appendix E

Unpermitted Discharges Subject to Stipulated Penalties

Second Quarter 2012 Unpermitted Discharge Data and Analysis

Appendix E lists any SSO that occurred during the second 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 five unpermitted discharges that occurred during the second quarter of 2012, three were caused by heavy rainfall, one was due to electrical failure, and one was due to blockage.

The table below summarizes events 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. | 3 |
| Intensity > 0.84 in/hr | 0 |

| 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 | 1000 | First Creek | Heavy Rainfall | 1.27 | 2.16 | 0.49 | |
| 1st 2012 | 1/23/2012 | 1500 Lyons Bend Road | Unpermitted Discharge | 40000 | Fourth Creek | Heavy Rainfall | 1.27 | 2.16 | 0.49 | |
| 1st 2012 | 1/24/2012 | 3741 Eakers Street | Unpermitted Discharge | Unknown | Baker Creek | Heavy Rainfall | 0 | 1.27 | | |
| 1st 2012 | 2/8/2012 | 736 Greenmeadows Drive | Unpermitted Discharge | 250 | Knob Creek | Blockage | 0 | 0 | | |
| 1st 2012 | 3/7/2012 | 1500 Lyons Bend Road | Unpermitted Discharge | 97300 | Fourth Creek | Electrical Failure | 0 | 0 | | |
| 2nd 2012 | 4/5/2012 | 1216 Watercress Drive | Unpermitted Discharge | 200 | First Creek | Heavy Rainfall | 0.96 | 1.44 | 0.55 | |
| 2nd 2012 | 4/9/2012 | 5603 Summer Grove Lane | Unpermitted Discharge | 100 | Grassy Creek | Blockage | 0 | 0 | | |
| 2nd 2012 | 5/12/2012 | 403 West Oldham Avenue | Unpermitted Discharge | 47000 | Second Creek | Broken Gravity Main | 0 | 0 | | |
| 2nd 2012 | 5/14/2012 | 1216 Watercress Drive | Unpermitted Discharge | 100 | First Creek | Heavy Rainfall | 1.61 | 2.18 | 0.53 | |
| 2nd 2012 | 5/25/2012 | 4601 Seminole Road | Unpermitted Discharge | 1800 | First Creek | Blockage | 0 | 0.27 | 0.3 | |
| *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 | | | | | | | | | | |