Gilleland Creek Plan

Wastewater Treatment Facilities Management Measures — Key Elements

Introduction

This document describes the key elements involved with the implementation of two management measures developed by the Wastewater Treatment Facility (WWTF) Workgroup[1] to address bacteria loading in the Gilleland Creek Watershed. The following measures are two of the management measures proposed for the Gilleland Creek Plan.

- **Monitor and report effluent E. coli concentrations**
- **Identify and repair failing wastewater collection systems.**

These key elements for the WWTFs will be incorporated into the implementation strategy for the Gilleland Creek Plan that will include all of the management measures selected to address bacteria loading in the watershed. The area for implementation of these measures will be the wastewater service areas of each utility within the 76-square-mile Gilleland Creek Watershed. The watershed includes the main stem of Gilleland and its tributaries: Elm Creek, Decker Creek, and Harris Branch. The watershed originates at Hillside Springs northwest of Pflugerville and drains to the southeast to its confluence with the Colorado River upstream of Webberville (Segment 1428).

An adaptive management strategy will be used to adjust the plan as needed since its initial implementation will demonstrate which management measures prove most effective given site-specific watershed conditions. The Texas Commission on Environmental Quality (TCEQ) will assess Gilleland Creek every 2 years as part of updating the Texas Water Quality Inventory and 303(d) List. As proposed changes are made to the Texas Surface Water Quality Standards criteria for contact recreation and changes in the creek's water quality are observed, modifications to this plan will be made. This adaptive management strategy allows for stakeholders to learn and adapt the plan as progress is made. The ultimate goal is for Gilleland Creek's four assessment units to have sufficiently low *E. coli* loading that it can be useable for contact recreation.

Key Element #1

This element identifies the causes of the impairment, in this case the sources of bacteria that need to be controlled by the TMDL and the plan.

Because no specific sources of the impairment were isolated during Gilleland Creek TMDL monitoring, this key element summarizes the results of the study in both dry and wet weather conditions to support the broad ranging approach developed for the Gilleland Creek Plan.

[1] Workgroup members include representatives from Windermere Utility – Southwest Water Corporation, Dessau Fountain Estates – Severn Trent Services, the Cities of Austin and Pflugerville, TCEQ, and LCRA.

Sampling for the Gilleland Creek TMDL occurred between October 2005 and March 2006 and the results of this sampling during dry weather conditions in this period showed that the geometric mean concentration of *E. coli* exceeded the stream criterion of 126 #/100 milliliters at six of 10 sampling locations. The average of the exceedance (>126) was 38.5. Also, some dry weather samples exceeded the single sample criterion of 394 #/100 milliliters. During these conditions, effluent from the wastewater treatment facilities makes up the majority (approximately 83 percent) of flow in Gilleland Creek.

In wet weather conditions, *E. coli* concentrations in all samples taken at the 10 sampling locations exceeded the geometric mean criterion. Using load duration curve analysis, LCRA staff determined that during high flow conditions (greater than 45 f^3/second) and moderate flow conditions (between 16.5 f^3/second and 45 f^3/second), the water quality in the creek exceeded both the geometric mean and single sample criteria. This analysis from the load duration curve showed that in order for the creek to meet the maximum allowable load of bacteria in high and moderate flow conditions, that reductions of 93 percent and 82 percent, respectively, are required. The majority of the *E. coli* bacteria loading to the watershed occurred during moderate to high flow (stormflow) conditions, which is indicative of nonpoint sources of bacteria.

This plan targets both point sources and nonpoint sources of bacteria contamination. The Wastewater Treatment Facilities Management Measures will ensure that the bacteria loadings in the watershed are not due to point sources.

Key Element #2

This element describes the two management measures for the WWTFs that will be implemented to limit bacteria loads to Gilleland Creek from wastewater treatment plants and their collection systems.

1. Monitor and report effluent *E. coli* concentrations.

In 2007, at the start of the planning process for the Gilleland Creek Plan, Stakeholders involved in the operation of the watershed's wastewater treatment facilities, (the Wastewater Treatment Facility Workgroup) agreed to monitor *E. coli* concentrations in their effluents to demonstrate that the bacteria loadings in the watershed are not due to point sources or more specifically their facilities. The *E. coli* monitoring data will offer these facilities an opportunity to characterize the extent to which WWTF effluent is or is not affecting the bacteria loadings of Gilleland Creek.

Subsequently, in 2008, the TCEQ, through an update to the Texas Water Quality Management Plan, adopted *E. coli* limits for all of the WWTFs in the Gilleland Creek Watershed. When the discharge permits for the WWTFs are renewed in 2009, all facilities will have an *E. coli* monitoring requirement of the final effluent at a minimum of once per week, see Table 1. However, those WWTFs that use ultraviolet disinfection will continue to monitor daily. Table 1 identifies each WWTF in the watershed and their relevant information.

Bacteria results will continue to be reported to TCEQ via Discharge Monitoring Reports. The discharge permits will be renewed prior to their expiration so that *E. coli* monitoring will commence with the issuance of the renewed permit in September 2009.

Table 1. WWTFs in the Watershed

Name of Facility	Permit Number	Permit Expiration Date	Disinfection Method	Receiving Stream	Frequency of Monitoring
City of Pflugerville	11845-002	9/1/2009	Chlorine	Gilleland Creek	1/week
Windermere Utility Company	11931-001	9/1/2009	Ultraviolet	Gilleland Creek	7/week
City of Austin Harris Branch	13318-001	9/1/2009	Chlorine	Harris Branch	1/week
City of Austin Wild Horse Ranch	10543-013	9/1/2009	Ultraviolet	Gilleland Creek	7/week
City of Austin Harris Ridge, (formerly Dessau Utilities)	12971-001	9/1/2009	Chlorine	Harris Branch	1/week
City of Austin Whisper Valley[2]	10543-014	9/1/2012	Ultraviolet	Gilleland Creek	7/week

The data produced from this effort will provide valuable information as to the treatment efficiency of each wastewater facility. Minimum analytical limits for the permits will be as required by 30 Texas Administrative Code Chapter 319. Sterile containers will be used to collect bacteria samples for analysis. Monitoring procedures to collect the samples will be as specified in the permit or alternately as required by TCEQ Surface Water Quality Monitoring Procedures, Volume 1 (December 2003). The TCEQ will evaluate the data on a plant by plant basis and can present a summary of the data at an annual LCRA Clean Rivers Program Steering Committee meeting.

2. Identify and repair existing failing wastewater collection systems.

In the Gilleland Creek Watershed, the City of Pflugerville has 68 miles of collection lines; the City of Austin (COA) has 46.1 miles; Windermere Utility has 45.4 miles, and Dessau Fountain Estates has an estimated 40 miles. WWTF staff will initially perform visual inspections on their collection system manholes and piping within 100 feet of the centerline of Gilleland Creek, within the creek bed or its tributaries. Inspection does not include inspection of private laterals. Pipelines to be inspected will be identified using available construction drawings, operator knowledge of the wastewater collection systems, and global positioning system (GPS). The visual inspections will give special attention to manholes. All work will be done from above-ground, with no confined space entry. The WWTFs will visually inspect their collection system and look for failure areas, such as highly eroded areas, exposed pipe or excess green vegetation. After the initial inspection, each utility provider will determine its future inspections work (opening manholes, smoke testing, closed circuit televising, or dye testing) based on the severity of findings.

[2] The City of Austin's Whisper Valley WWTF has not been constructed but the TCEQ has issued a discharge permit containing a provision for *E. coli* monitoring for the facility. An *E. coli* limit of 126 CFU/100 ml is included in the permit.

The WWTF operators will complete reports for the section of the collection system inspected. For consistency in data collection, a template will be used for the visual inspections and is included as an addendum to this document. The initial inspection will be completed within the first year of the implementation of the Gilleland Creek Plan. Identified issues will be mapped and classified as minor or major in the inspection reports; these findings will be communicated at an annual LCRA Clean Rivers Program Steering Committee meeting.

Minor repairs will be made as needed and the resolution documented via a standard data management method. While similar to the requirements of the Texas Administrative Code (Edwards Aquifer rule), the Gilleland Creek Plan will allow up to 2 years to make major or costly repairs. A 2-year timeframe allows time for planning, budgeting, and construction. Additionally, the City of Austin, City of Pflugerville, and Dessau Fountains Estates are considering participating in TCEQ's Sanitary Sewer Overflow (SSO) Initiative Program. The purpose of this voluntary program is to address increases in SSOs due to aging infrastructure. The program encourages proactive repairs to minimize SSOs. WWTFs that choose to participate must:

- Sign an SSO agreement with the TCEQ
- Conduct a detailed sanitary sewer evaluation survey (SSES)
- Develop a plan, that cannot exceed 10 years, to address SSOs that includes corrective measures and milestones for completion
- Submit periodic compliance reports
- Certify compliance

The benefits of the WWTFs participating in the SSO Initiative include:

- Protection from TCEQ and US EPA enforcement action and penalties for future SSO events covered under the SSO plan
- Compliance history rating is not affected by entering into the SSO Agreement
- May facilitate additional funding of the project(s)
- More likely to comply with a more formal agreement

Stakeholders considered the inclusion of subscriber collection systems in this plan, but decided against it because the TCEQ does not have a mechanism to regulate these systems. As stakeholders and TCEQ review and adapt this plan, they will further evaluate the subscriber system issue to determine if specific management measures are needed.

Key Element #3

This element estimates the potential bacteria load reductions that can be achieved by these two management measures if implemented in the Gilleland Creek Watershed.

The Gilleland Creek TMDL waste load allocation (loading contribution from the WWTFs) is 5.55×10^{10} colony forming units (CFU)/day based on a 120 CFU/100 milliliters *E. coli* concentration and total maximum permitted flow allowed from the WWTFs.

The terms "CFU per 100 milliliters (CFU/100 ml)" and "most probable number per 100 milliliters (MPN/100 milliliters)" both refer to the concentration of bacteria and are used interchangeably in the plan. CFUs are typically the reporting unit for membrane filtration analytical methods. Probabilistic analytical methods use reporting units of MPN/100 milliliters. Different analytical methods yield different units of measurement, yet the numeric value can be considered as being the same. It is appropriate to use these terms interchangeably in this plan.

The first of the two management measures, to monitor and report effluent *E. coli* concentrations, will ensure that the WWTF waste load allocation is met and does not increase beyond allowable levels. WWWFs will begin monitoring *E. coli* in their effluents as part of their 2009 discharge permits and will adjust their operations as needed to meet the *E. coli* permit limits. The following activities describe the waste load reductions anticipated from WWTFs in the Gilleland Creek Watershed.

1. Monitor and report effluent *E. coli* concentrations

During the TMDL data collection period, specifically March and June 2006, LCRA performed a regrowth study to determine if *E. coli* concentrations were surviving the disinfection process in all of the WWTF's in the watershed. At that time, unanticipated operational problems were encountered at the City of Pflugerville WWTF due to solids settling in a pipe downstream of the de-chlorination vessel. Both, the City of Pflugerville and LCRA measured *E. coli* concentration in the City's final effluent. The City immediately corrected the problem resulting in the *E. coli* loading reduction of 3.00×10^9 CFU/day. The calculations for determining the load reduction are shown below:

Before operational changes were made:

> 22 CFU/100 ml x 4.4 MGD daily average flow x (1,000,000 gal/MG) x (3.785 L/gallon) x (1000 mL/L) x (100-ml/100 ml) = 3.66×10^9 CFU/day.

After operational changes were made:

> 4 CFU/100 ml x 4.4 MGD daily average flow x (1,000,000 gal/MG) x (3.785 L/gallon) x (1000 mL/L) x (100-ml/100 ml) = 6.66×10^8 CFU/day.

ml = milliliters; MGD= million gallons per day; gal/MG= gallons/million gallons; L/gallon= Liters/gallon

> **Decrease in loading** 3.66×10^9 CFU/day – 6.66×10^8 CFU/day = 3.00×10^9 CFU/day. **This reduction represents 5.40 percent of the TMDL waste load allocation.**

<u>Dessau Fountain Estates / Walnut Creek WWTF consolidation:</u>

A bacteria load reduction is expected as a result of the Dessau Fountain Estates facility taken off-line and connecting to City of Austin, Walnut Creek WWTF. After the connection is made, the effluent will no longer be discharged into Harris Branch and will instead be conveyed to Walnut Creek for treatment and discharge. The final effluent will not be discharged within the Gilleland Creek Watershed. The anticipated load reduction because of this wastewater regionalization effort is 7.15×10^8 CFU/day and the calculation is as follows:

126 CFU/100 ml x 0.15 MGD daily average flow x (1,000,000 gal/MG) x (3.7854 L/gallon) x (10 dL/L) = **7.15×10^8 CFU/day.**
This reduction represents 1.29 percent of the TMDL waste load allocation.

2. Identify and repair existing failing wastewater collection systems

A load reduction is expected from wastewater collection line visual inspections and follow-up repairs. As stated, the WWTFs will inspect the collection systems within 100 feet of the creek and tributaries. There are too many unknowns at this time to calculate a reduction in loading due to collection system improvements resulting from visual inspections. Some unknown factors include: exfiltration rate, proximity of leaking collection system to Gilleland Creek or tributaries, length of collection system near the creeks, pipe material, and quality of installation. These unknowns will be addressed as more is learned about the collections systems near Gilleland Creek.

If some of these factors were known then the load calculation would be determined as follows:

Flow x percentage of flow expected to reach Gilleland Creek or its tributaries x *E. coli* concentration in untreated wastewater (between 10^4 to 10^5 CFU/1 ml) [3] x conversion factors.

The loading reduction calculation would show how much less bacteria would enter the creek as a result of correcting collection system integrity failures.

Key Element #4

This element identifies the technical and financial assistance and the authorities needed to implement these two management measures.

1. Monitor and report effluent *E. coli* concentrations.

Technical assistance

Each WWTF will be responsible for monitoring their effluent as required by their permit. If needed, WWTF operators can attend training to ensure that monitoring is performed as required by the permit. The following TCEQ web site has information on required training for wastewater treatment plant operators:
<www.tceq.state.tx.us/compliance/compliance_support/licensing/ww_lic.html#treatcourses>.

In addition, LCRA can provide information to the WWTFs regarding the laboratory equipment needed for *E. coli* analysis.

Financial assistance

To analyze *E. coli* concentrations, the WWTFs can purchase the necessary laboratory equipment or they can have an outside laboratory perform the analysis. To perform the same analysis in-house, the IDEXX Colilert system, used by many state and health departments throughout Texas,

[3] Metcalf & Eddy, 3rd edition, 1991. Untreated wastewater bacteria concentrations. The concentration for one milliliter is shown.

would need to be purchased at a cost of approximately $4,719. The equipment includes the cost of a sealer ($4000), incubator ($600) and ultraviolet lamp ($119). Consumables are approximately $9/test and include media ($5.95/test), collection vessel ($0.55/test) and Quantitray ($1.50/test).

For the time being, the City of Pflugerville, Windermere, and City of Austin Wild Horse Ranch will continue to have the bacteria analysis performed by the laboratory that they currently use. Representatives from the City of Austin Harris Branch and Harris Ridge facilities hasstated that they will find a laboratory to perform the bacteria testing. The approximate cost for *E. coli* laboratory analysis is $65/sample. Assuming that use of outside labs for analysis continues, the total cost for *E. coli* monitoring for all WWTFs combined is conservatively estimated to be $81,120 per year. This cost does not include the overtime charges for lab analysis performed during holidays. The three WWTFs that use chlorination as a disinfection method would incur a cost of $3,380 per year, based on once a week monitoring. The three WWTFs that use ultraviolet disinfection would incur an additional monitoring cost of $23,660 per year, based on a monitoring frequency of seven days per week. The additional cost for bacteria testing required by the renewed permits will be borne by utility rate customers.

2. Identify and repair existing failing wastewater collection systems.

Technical assistance

WWTF staff will reference available construction drawings or GIS maps to identify collection system components that are not often visually inspected and are within 100 feet of Gilleland Creek. Mapping collection system components that are visually inspected with GPS would be helpful for future map production. WWTFs staff are knowledgeable in identifying collection systems that are likely to fail or those where there is evidence of a failure. WWTF staff will perform visual inspections and complete inspection reports on delineated sections of the collection system to communicate findings to TCEQ TMDL, LCRA staff, and stakeholders.

Financial assistance

Collection Line Inspection Costs – The estimated cost for six WWTFs to visually inspect their collection lines within 100 feet of the creek, is $40,320 per year and $201,600 over a 5-year period. This cost assumes the fringe loaded salary ($35/hour) for two WWTF operators working for 12 days. Inspection only includes the lines within 100 feet of Gilleland Creek or its tributaries. Cost for replacement of collection lines, provided later in this section, is based on the 200-mile collection system length.

Collection System Repair and Replace Costs – Those collection systems that require maintenance or repair due to integrity failure or imminent structural failure will be corrected. Routine inspection and maintenance activities are budgeted as part of regular operation and maintenance activities. Small scale repairs will be made as soon as possible after discovery. If major and costly repairs are required these will be performed within 2 years. This 2-year window will provide the utility the necessary time to determine funding for the repairs. The cost of inspection and repair of failing collection system will be borne by the utility rate payers.

Many factors need to be considered when providing a wastewater collection system replacement/repair cost estimate, such as:

- Total length of pipe within 100 feet of Gilleland Creek
- Pipe material
- Age and condition of the collection system
- Pipe diameters
- Quality of the work in designing and installing the pipe
- Depth of the pipe
- Accessibility of the pipe
- Orientation and position relative to the creek (does pipe cross the creek or run in the creek bed)
- Slope of the pipe
- Previous investment in maintaining the collection system
- Manhole spacing and condition
- Lift station locations
- Clean out locations

Since this level of detail is not readily available, the following planning level costs were estimated. The general estimated cost to repair or replace failing collection system components identified during the visual inspections is $200/linear foot, assuming all pipe diameters are less than 12 inches. Assuming 200 miles of collection lines (1,056,000 linear feet), the estimated cost to replace one hundredth of the collection lines (10,560 linear feet) would be $2,112,000. This cost estimate is made with the qualification that none of the City-specific factors noted above were considered.

Collection Line Replacement – Stakeholders have expressed that the materials used for wastewater collections systems are of good quality and thus less prone to failure. It is unlikely that the entire 200-mile section of collection lines would be replaced. In a worst case scenario, replacement costs would be $1.5 million. The estimates for replacement are based on the entire length of the collection system, not just within 100 feet of Gilleland Creek. Wastewater collection line diameter near Gilleland Creek is typically 24 to 36 inches.

The City of Pflugerville, with 34 percent of the wastewater infrastructure in the watershed, provided a cost estimate of $105,000 for 2008 to repair, rehabilitate, or replace wastewater 68 miles of collection lines in the watershed. This budgeted amount was characterized as a typical value. Assuming the City of Pflugerville costs are comparable for the other WWTFs, the $105,000 per year over 5 years and the portion represented by City of Pflugerville translates to $1,544,118. This $1.5 million represents the approximate cost to perform wastewater collection system maintenance over the approximately 200 miles of collection lines in the Gilleland Creek Watershed over a 5-year period of this plan.

Key Element #5

This element describes the education component to enhance the public understanding of the project and encourage their participation.

For the WWTF management measures, the Education and Outreach Workgroup identified and prioritized education activities and programs that would enhance the understanding of wastewater utility customers.

WWTFs to monitor and report effluent *E. coli* concentrations

One or two monthly utility bills inserts or a separate mailing notifying wastewater customers of the bacteria testing requirement are being considered as an educational component of this plan. The flyer or brochure could explain the bacteria testing being performed and its benefits to Gilleland Creek water quality.

Stakeholders will be able to learn about the status of this plan at TCEQ Clean Rivers Program (CRP) annual steering committee meetings. Gilleland Creek Plan stakeholders are included in the CRP stakeholder list and would be invited to participate in the CRP meetings.

Those interested in reviewing the *E. coli* concentrations as reported by permitees may access an EPA web site. The web site is found at: <www.epa-echo.gov/echo>.

Identify and repair existing failing wastewater collection systems

Information about the visual inspections by WWTF operators may also be included in the educational inserts or as a separate item that are mailed to wastewater utility customers. Here too, the water quality benefits of the inspection and repair of failing wastewater collection systems can be explained.

Information about fats, oils, and grease and their affect on the wastewater collection system may be helpful to reducing SSOs. The City of Austin has educational "Fat Free Sewers" or "Don't Be a Turkey" documents and various web sites that are helpful. These include:

- Austin Water Utility's (AWU's) Pretreatment Program: <www.ci.austin.tx.us/water/wwwssd_iw_main.htm>.
- AWU's Residential Grease Awareness: <www.ci.austin.tx.us/water/grease.htm>.
- Solid Waste Services Department's Residential Oil & Grease Disposal: <www.ci.austin.tx.us/sws/dispose_oil.htm>.

Watershed workshop and tour

The Texas Stream Team [4] will host a watershed workshop and tour to enhance the public and stakeholder understanding of the watershed, to build support for accomplishing the Gilleland Creek Watershed Plan, and to increase the public's knowledge of pollutant reduction

[4] Texas Stream Team, formerly, the Texas Watch Program, is a statewide water-quality monitoring network of concerned volunteers, partners, and institutions.

activities. The watershed tour will include stops to illustrate the progress being made toward implementing the plan such as the flood control ponds retrofitted with automated controls, a wastewater treatment facility, natural features, such as riparian areas, an agricultural best management practice and a water quality monitoring demonstration.

Key Element #6

This element provides a schedule with milestones for implementing these management measures:

- **Monitor and report effluent *E. coli* concentrations**
- **Identify and repair existing failing wastewater collection systems**

Table 2. Implementation Milestones

Year	Monitor and report effluent E. coli concentrations.	Identify and repair existing failing wastewater collection systems.
2009		
	The five existing WWTFs and the one proposed facility shown in this plan have an E. coli monitoring component added to their domestic wastewater discharge permit.	TMDL stakeholder group approves Gilleland Creek Plan.
	TMDL stakeholder group approve the Gilleland Creek Plan.	TCEQ Commissioners adopt the Gilleland Creek Plan.
	TCEQ Commissioners adopt the Gilleland Creek Plan.	WWTFs to gather information to help identify location of wastewater collection system within 100 feet of Gilleland Creek or its tributaries.
	NA	WWTF to begin visual inspection of wastewater collection systems in proximity to Gilleland Creek or its tributaries.
	NA	WWTFs to make repairs as needed as a result of the visual inspections.
2010		
	All WWTFs are monitoring and reporting of E. coli bacteria data as required by individual wastewater permits.	WWTFs to report 2009 visual inspection results to TCEQ TMDL team.
	WWTFs are to make appropriate adjustments to WWTF operations, if E. coli concentrations warrant adjustments to decrease concentrations.	WWTFs to continue visual inspections of problem areas.
2011		
	All WWTFs are monitoring and reporting of E. coli bacteria data as required by individual wastewater permits. All of the E. coli monitoring data for each WWTF is within permit limits.	WWTFs to report 2010 visual inspection results to TCEQ TMDL team staff.
	The TCEQ TMDL team and responsible entities are to review, summarize, and present monitoring data to the stakeholders.	TCEQ and responsible party to report result of 2009-2010 visual inspections to the stakeholders.

Year	Monitor and report effluent E. coli concentrations.	Identify and repair existing failing wastewater collection systems.
2012		
	All WWTFs are monitoring and reporting of E. coli bacteria data as required by individual wastewater permits. All of the E. coli monitoring data for each WWTF is within permit limits.	WWTFs to continue visual inspections of problem areas.
	The TCEQ TMDL team and responsible entities are to review, summarize and present monitoring data to the TMDL stakeholder group.	WWTFs to report 2011 visual inspection results to TCEQ TMDL team.
	Using adaptive implementation strategies, stakeholders adjust the Gilleland Creek Plan as merited by E. coli monitoring results and continue moving forward.	TCEQ and responsible party to report result of 2011 visual inspections to stakeholders.
2013		
	Gilleland Creek meets stream standards for contact recreation.	WWTFs to continue visual inspections of problem areas.
		WWTFs to report 2012 visual inspection results to TMDL and LCRA staffs.
		TCEQ and responsible party to report result of 2012 visual inspections to TMDL stakeholder group.
		Gilleland Creek meets stream standards for contact recreation.

Key Element #7

This element highlights the interim, measurable milestones for each measure that will be used to determine the progress and effectiveness of each management measure.

WWTFs to monitor and report effluent *E. coli* concentrations.

The following are milestones that relate to monitoring and reporting effluent *E. coli* concentrations in the six WWTFs in the watershed.

- Individual monitoring results for the WWTFs are less than the 126 most probably number (MPN)/100 ml permit limit
- If *E. coli* values for a WWTF exceed 126 MPN/100 ml operational changes are made at the WWTF

Identify and repair existing failing wastewater collection systems.

The following are measures of progress that relate to the visual inspection and repair of wastewater collection system include:

- The number of collection system sections that are visually inspected increases from current inspection numbers
- Visual inspection of collection systems do not identify any facilities that are discharging wastewater to Gilleland Creek
- A decrease in the number of SSOs, as reported to TCEQ, due to failure in the wastewater collection system is noted
- Collection system failures or impending failures are repaired quickly to limit impacts to Gilleland Creek
- If resources allow, televise sections of the collection system
- GPS coordinates of collection system components, such as manholes and cleanouts, are added to available GIS layers

Key Element #8

This element defines the indicators that will be used to document improvements in water quality due to the implementation of these management measures.

A reduction in *E. coli* concentrations in the four Gilleland Creek assessment units will be used as an indicator to document water quality improvements. Stakeholders agree that the ultimate measure of progress is that the four Gilleland Creek assessment units will be in compliance with the contact recreation standard.

Key Element #9

This element describes the monitoring component of the Plan to determine the attainment of the water quality standards throughout the watershed.

The following summary describes routine water-quality monitoring activities for each of the four assessment units in the Gilleland Creek Watershed. The LCRA currently monitors in Assessment Unit 1 and 2 and proposes to begin monitoring in Assessment Unit 3. The TCEQ currently monitors in Assessment Unit 4. The purpose of this monitoring is to ensure that enough *E .coli* data is collected in each of the four assessment units to determine water quality standards attainment throughout the watershed.

Beginning with the 2010 assessment, TCEQ will require 10 sample results over a 7- year period to do a full assessment. If 10 samples are not available, TCEQ will use 10 years to obtain the minimum (10) number of samples. With less than 10 sample results, TCEQ can only identify a waterbody as a concern and not impaired.

Also included in this element is a summary of the City of Austin's monitoring activities and the Colorado River Watch Network (volunteer water-quality monitoring) program. An attached map illustrates these monitoring programs in the watershed.

Assessment Unit 1 (AU 1): From the Colorado River upstream to Taylor Lane.

Site 17257, Gilleland Creek at FM 969 is downstream of Webberville Road/FM 969, east of Austin. It will be monitored on a bimonthly basis (six times per year). This is a current and historical site monitored by LCRA and will provide quality assured data for **AU 1**. This site has already compiled enough data for determination of standards attainment.

Assessment Unit 2 (AU 2): From Taylor Lane upstream to Old Highway 20.

Site 12235, Gilleland Creek at FM 973 south of the city of Manor will be monitored on a bimonthly basis (six times per year). This is a current and historical site monitored by LCRA, and will provide quality assured data for **AU 2**. There should be enough data for standards attainment determination for the 2010 assessment.

Assessment Unit 3 (AU 3): From Old Highway 20 to Cameron Road.

Site 12236, Gilleland Creek at US 290 north of Manor has been monitored historically and will potentially be continued by LCRA bimonthly (six times per year) starting in TCEQ's FY 2010. This site should provide quality assured data for **AU 3**. Monitoring at this site should produce enough data to determine standards attainment by the 2014 assessment.

Assessment Unit 4 (AU 4): From Cameron Road to the spring source

Site 20474, Gilleland Creek at Northeast Metropolitan Park, southeast of Pflugerville (at the low water crossing 1.559 kilometers north, 302 meters west to the intersection of Killingsworth Lane and Cameron Road) is a newly established site which TCEQ began monitoring in 2009. It will be monitored quarterly (four times per year). It will provide quality assured data for **AU 4** and should provide enough data to determine standards attainment by the 2014 assessment.

Other sources of data that may or may not be used in the assessment of Gilleland Creek for 305b/303d purposes include: water quality monitoring by City of Austin and monitoring conducted by Colorado River Watch Network (CRWN) volunteers. The City of Austin may submit monitoring results under the quality assurance of the LCRA Clean Rivers Programs Quality Assurance Project Plan. The City of Austin will discuss this possibility with the LCRA at the 2009 Clean Rivers Program Coordinated Monitoring Meeting. At present, Austin's *E. coli* data is analyzed at an in-house, non-MELAC approved lab and therefore can not be used for assessment purposes but will be used by the City to calculate their Environmental Integrity Index, which is a tool developed to monitor and assess the ecological integrity of Austin watersheds. Water chemistry data is collected quarterly and biological and habitat surveys are conducted once per year in the summer.

Certified CRWN volunteer water quality monitors will submit to LCRA a minimum of six data points per year from the following sites: Gilleland Creek at Edgemere, Gilleland Creek below Bohl Park (12239), Gilleland Creek at Picadilly Lane (18763), Gilleland Creek at lower end of Gilleland Park at Railroad, and Gilleland Creek at Grand Avenue Parkway. CRWN data is not TCEQ quality assured and will not be used for assessment purposes. Since CRWN volunteer monitoring data provides more frequently collected data from more locations, it might be utilized to identify problem areas that can then be addressed by professional monitoring data collection efforts.

Key Element #10

This element provides the following list of entities responsible for implementing the management measures.

City of Pflugerville, City of Austin, and Windermere Utilities

- Monitor and report *E. coli* as required by their discharge permit in discharge monitoring reports to TCEQ
- Copy monthly reports to TCEQ TMDL team
- Make operational adjustments to facilities if *E. coli* concentrations merit an adjustment
- Insert educational flyers or brochures in two monthly billing statements or as two separate mailing
- Identify collection system components that are in proximity to Gilleland Creek

City of Pflugerville, City of Austin, Windermere Utilities, and Dessau Fountain Estates

- Visually inspect the collection system to identify failed or imminent failure in the collection system
- Make necessary repairs
- Report findings of the annual inspections to the TCEQ

LCRA - Host annual Clean Rivers Program Steering Committee meetings

Addendum

Wastewater Collection Line System Inspection Form

Purpose: To assess the system integrity
Frequency: Once per year
Location: Within 100 feet from centerline of Gilleland Creek or tributaries
Type of Inspection: Visual (walk)

Date Collection System Inspected:
Inspector(s):
Weather Conditions:

Line Identification Number (from construction drawing, or between 2 manholes):

Location:
GPS Coordinates:

Finding: Problem/No Problem
If Problem, describe:
Quantify wastewater volume (if possible):
Corrective Action: See drop down list sheet 2
Reported to TCEQ?

Photographs taken?
Photo file names:

Components that can be inspected:

Lift station
Manhole
Cleanout
Line
Joint
Lateral