



**A Report to the
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**Office of the
City Auditor**

City Auditor
Corrie E. Stokes
CIA, CGAP, CFE

Deputy City Auditor
Jason Hadavi
CPA, CFE

Sewer Overflow Prevention and Response Audit

June 2015



REPORT SUMMARY

The Austin Water Utility has developed and is in the process of implementing a risk-based approach to reduce the likelihood of future wastewater spills. The Austin Water Utility properly reported 93% of reportable overflows within the audit scope to the Texas Commission on Environmental Quality; however, improvements are needed to increase the reliability of data within the system to track overflow data and increase compliance with reporting requirements.

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GOVERNMENT AUDITING STANDARDS COMPLIANCE

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

AUDIT TEAM

Katie Houston, CPA, CFE, CLEA, Assistant City Auditor
Robert Elizondo, CIA, CGAP, CICA, CRMA, Auditor-in-Charge
Andrew Keegan, CIA, CGAP
Caroline Kirschner

Office of the City Auditor
phone: (512)974-2805
email: oca_auditor@austintexas.gov
website: <http://www.austintexas.gov/auditor>

Copies of our audit reports are available at <http://www.austintexas.gov/page/archive-auditor-reports>



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Report Highlights

Why We Did This Audit

This audit was conducted, in part, because media attention about spills of untreated wastewater indicated sewer overflows present risk to the City.

What We Recommend

The Austin Water Utility Director should update Utility's system to track overflow data with additional information technology controls and implement a quality assurance review process to validate all reportable events are properly communicated to oversight entities.

Further, the Austin Water Utility Director should ensure public notifications regarding overflows meet all notification requirements set forth in the Texas Administrative Code.



SEWER OVERFLOW PREVENTION AND RESPONSE AUDIT

BACKGROUND

- Wastewater collection systems move wastewater from homes and buildings to treatment plants.
- A sewer overflow occurs when wastewater spills into the environment prior to being treated at a wastewater treatment plant.
- The likelihood of overflows can be reduced with ongoing preventative maintenance, including regularly inspecting and cleaning pipes.
- In 2013, the City voluntarily entered into a Sanitary Sewer Overflow agreement with the Texas Commission on Environmental Quality (TCEQ). This agreement outlines the Utility's goal of reducing and addressing sewer overflows before they harm human health, safety, or the environment and before they become enforcement issues.

OBJECTIVE AND SCOPE

The objective of the audit was to evaluate the Austin Water Utility's efforts to prevent and respond to sewer overflows from pipes and lift stations. The audit scope included Austin Water Utility wastewater operations in fiscal years 2013 and 2014.

WHAT WE FOUND

The Austin Water Utility has developed a risk-based approach to prioritize areas of the wastewater collection system for preventative maintenance.

- Austin Water plans to start targeting future preventative maintenance of the wastewater system based on the likelihood the basin will have an overflow and the impact such an overflow would have on the basin.
- Factors to be considered in this risk-based ranking include: the characteristics of the pipe (e.g., age and pipe material), the history of overflows in that basin, and the effect an overflow would have on schools, hospitals, and major roads.

During the scope period, a total of 1,138 overflows were recorded by Austin Water. We found that 148 of these overflows were required to be reported to the TCEQ. 137 (93%) of 148 reportable wastewater overflows were properly reported to the TCEQ; however, Austin Water currently relies heavily on one employee to report overflows, and data may not be complete and accurate because the system for tracking overflows lacks certain information technology controls.

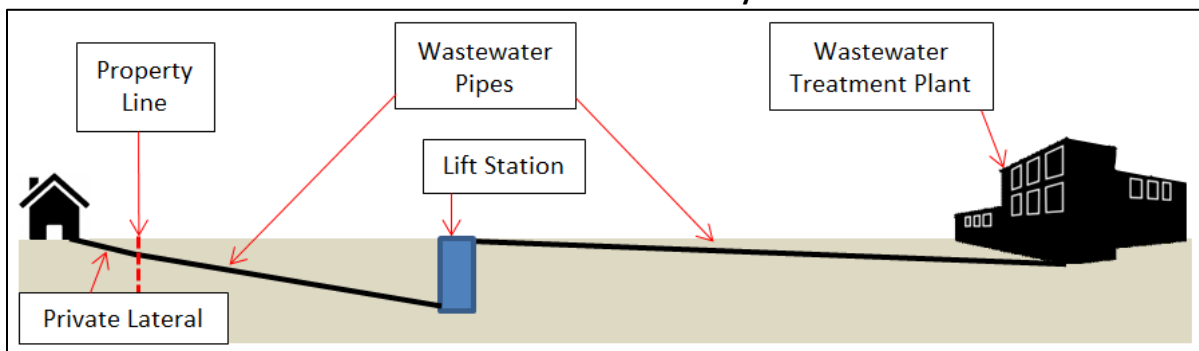
- Current limitations of the tracking system: fields may be blank, work order end times may occur before work order start times, and names of data fields used to identify reportable events do not match what they represent, making it difficult to identify reportable from non-reportable overflows.

Lastly, Austin Water did not properly submit two reports required by the voluntary agreement; further, some public notifications relating to overflows did not include all elements required by the Texas Administrative Code.

BACKGROUND

Wastewater collection systems move wastewater from homes and buildings to treatment plants. The City of Austin's wastewater collection system consists of about 2,700 miles of wastewater pipes, 124 lift stations¹, and two wastewater treatment plants². Wastewater pipes located on private property are called private laterals and are not owned or maintained by the City. Exhibit 1 shows a simplified wastewater collection system.

Exhibit 1
Wastewater Collection System



SOURCE: Diagram of a wastewater collection system, Office of the City Auditor, April 2015

A sanitary sewer overflow (overflow) occurs when wastewater spills into the environment prior to being treated at a wastewater treatment plant. Many factors may cause overflows, including:

- grease, tree roots, or other debris in pipes;
- flood waters seeping into the system;
- breakdown/failure of pipes or other infrastructure; and
- construction damage, vandalism, or other issues (e.g., the system lacks adequate capacity to collect or store flows for treatment).

Operators of wastewater collection systems can reduce the likelihood of overflows with ongoing preventative maintenance, including regularly inspecting and cleaning pipes.

Wastewater operations are regulated nationwide by the United States Environmental Protection Agency, and within Texas by the Texas Commission on Environmental Quality (TCEQ). The TCEQ issues permits and licenses allowing the City to operate wastewater treatment plants, and state regulations require that the Austin Water Utility notify the TCEQ when certain overflows occur. Specifically, Austin Water must notify the TCEQ within 24 hours of an overflow and submit a written report of actions taken to stop the overflow within 5 days. Austin Water must also notify the media and government officials in certain events³. In 2013, the City voluntarily entered into a Sanitary Sewer Overflow agreement with the TCEQ. This agreement outlines the Utility's goal of reducing and addressing sewer overflows before they harm human health, safety, or the environment and before they become enforcement issues. The TCEQ agreed to withhold further enforcement action if Austin Water follows this agreement.

¹ Austin's wastewater collection system relies on gravity; lift stations raise wastewater from lower to higher elevations.

² Areas north of the Colorado River drain to Walnut Creek Wastewater Treatment Plant, and southern areas drain to South Austin Regional Wastewater Treatment Plant.

³ All overflows exceeding 100,000 gallons, overflows exceeding 50,000 gallons that meet certain criteria (e.g., within ½ mile of a drinking water source), or any spill regardless of volume that will adversely affect a public or private source of drinking water.

OBJECTIVE, SCOPE, AND METHODOLOGY

The Sewer Overflow Prevention and Response Audit was conducted as part of the Office of the City Auditor's Fiscal Year 2015 Strategic Audit Plan, as presented to the City Council's Audit and Finance Committee and included in the plan due, in part, to media attention about spills of untreated wastewater that indicate sewer overflows present risk to the City.

Objective

The objective of the audit was to evaluate Austin Water Utility's (Austin Water) efforts to prevent and respond to sanitary sewer overflows from pipes and lift stations.

Scope

The audit scope included Austin Water's wastewater operations in fiscal years 2013 and 2014.

Methodology

To accomplish our audit objectives, we performed the following steps:

- reviewed Austin Water's plans and procedures for managing the wastewater collection system;
- interviewed Austin Water employees associated with overflow prevention, response, and reporting;
- reviewed reporting requirements in Texas Statutes and Administrative Code⁴
- interviewed TCEQ personnel associated with evaluating Austin Water's compliance with the wastewater discharge permits;
- reviewed and evaluated internal controls, including relevant information systems, related to the prevention, response, and reporting of sewer overflows from pipes and lift stations;
- reviewed TCEQ records related to overflows reported by Austin Water;
- reviewed the Environmental Protection Agency's *Guide for Evaluating Capacity, Management, Operation, and Maintenance Plan Programs at Sanitary Sewer Collection Systems*;
- analyzed data recorded within Hansen, the City's system to track overflow data;
- reviewed Austin Water's overflow notifications to the TCEQ, the media, and the public; and
- assessed the reliability of information systems determined to be significant to the audit objective.

⁴ Legislative changes to limit overflow reporting requirements to overflows in excess of 1,000 gallons were recently passed and will go into effect September 1, 2015.

WHAT WE FOUND

The Austin Water Utility has developed and is in the process of implementing a risk-based approach to reduce the likelihood of future wastewater spills. Also, Austin Water properly reported 93% of reportable overflows within the audit scope to the TCEQ. However, improvements are needed to increase the reliability of data within the Utility's system to track overflow data and increase compliance with reporting requirements.

Finding 1: The Austin Water Utility has developed a risk-based approach to prioritize areas of the wastewater collection system for cleaning and inspection.

The Austin Water Utility recently changed its approach for planning preventative maintenance of the wastewater collection system. In the past, Austin Water inspected and cleaned areas of the wastewater collection system on a rotating basis, so each basin⁵ was scheduled to receive preventative maintenance about every 7 years, or about every 4 years for basins in environmentally-sensitive areas. Austin Water's new process involves targeting future preventative maintenance based on the likelihood the basin will have a wastewater overflow and the impact such an overflow would have on the basin. Austin Water determines the likelihood of an overflow by evaluating the characteristics of the pipe (e.g., age and pipe material) and the history of overflows in that basin. Also, when judging the potential impact of an overflow, Austin Water plans to consider the effect an overflow would have on schools, hospitals, and major roads. This new approach is in line with Environmental Protection Agency guidelines, called *Guide for Evaluating Capacity, Management, Operation, and Maintenance Programs at Sanitary Sewer Collection Systems*.

Finding 2: The Austin Water Utility properly reported the majority of overflows as required. However, issues with the reliability of overflow data and reliance on one employee for quality control may reduce Austin Water's ability to identify reportable overflows and comply with regulations.

During the scope period, a total of 1,138 overflows were recorded by Austin Water. Overflows that were within the City's collection system and reached water in the state⁶ are required to be reported to TCEQ. We found that 148 of the overflows during our scope met that criteria, based on Austin Water's records. 137 (93%) of these 148 overflows were properly reported to the TCEQ, while 11 (7%) were not reported. These were not reported due to inconsistent and incorrect data entry into the Utility's system to track overflow data as well as inadequate quality review of overflow reporting.

According to Environmental Protection Agency guidance, information management systems should be "kept current with accurate information" to ensure the wastewater collection system is effectively managed.

⁵ A drainage basin is an area of land in which all of the water that falls within that basin drains into the same place. Austin Water's preventative maintenance efforts are divided amongst the approximately 50 drainage basins throughout the City.

⁶ Under Texas Water Code Section 26.001 "water in the state" means groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state, and all other bodies of surface water that are wholly or partially inside or bordering the state or inside the jurisdiction of the state.

Austin Water's data may not be complete and accurate because the system to track overflow data lacks certain IT controls. As a result, fields may be blank, and work order end times may occur before work order start times. Also, names of data fields used to identify reportable events do not always match what they represent. Personnel do not consistently use the comment fields to identify the cause and location of overflows, making it difficult to identify reportable from non-reportable overflows⁷. As a result, Austin Water did not always accurately identify and report overflows to the TCEQ as required.

Additionally, Austin Water relies heavily on one employee currently charged with identifying reportable events and ensuring they are reported properly to the TCEQ. This employee's review was performed on only 13% of all overflows recorded by Austin Water in fiscal years 2013 and 2014 because the review is limited to a certain field in the system to track overflow data. The other 87% of overflows were not reviewed to confirm that reporting to the TCEQ was not necessary. Austin Water does not have a quality assurance review of data entries and identification of overflows that need to be reported.

Further, as mentioned Austin Water entered into a voluntary agreement with the TCEQ in 2013 that outlines the Austin Water's goal of reducing and addressing sewer overflows before they harm human health, safety, or the environment and before they become enforcement issues. However, Austin Water did not properly submit two reports required by the voluntary agreement: an interim report due 90 days after the agreement started and the first annual report due January 31, 2014. Austin Water submitted this annual report in December 2014 after receiving a *Notification of Non-Compliance* from the TCEQ. Austin Water management asserts that the reports were late due to misinterpretation of the program reporting requirements.

Lastly, Austin Water issued public notifications for all required overflows, and assert they maintain constant communication with the TCEQ to keep oversight entities apprised of overflow events requiring public notification. However, some public notifications did not include all elements required by the Texas Administrative Code. If Austin Water's public notifications do not contain all elements required by State regulations, the public may not have all necessary information.

The Texas Administrative Code states water utilities must notify the media of a wastewater spill:

- of 100,000 gallons or more;
- of 50,000 gallons or more where the spill occurs near a source of drinking water; and
- of any spill regardless of volume, that will adversely affect a public or private source of drinking water.

Additional Observations

As noted above, Environmental Protection Agency guidelines recommend utilities have comprehensive, documented plans detailing how they review the capacity, management, operation, and maintenance of their wastewater systems to shift preventative maintenance activities from "reactive" to "proactive". While Austin Water has documented parts of the 12 Environmental Protection Agency-recommended elements that apply to overflows, 3 are not included in Austin Water's Capacity, Management, Operation, and Maintenance plan, and 7 are only partially included⁸. Further, there is not currently a documented process to review and update this plan regularly.

⁷ Because we relied on data from this system, there is a risk that we did not identify all reportable events during testing.

⁸ Elements not included relate to: pump stations, hydrogen sulfide monitoring and control, and sewer system capacity evaluation – testing and inspection. Partially included elements relate to: legal authority, emergency preparedness and response, monitoring, planning and unplanned maintenance, modeling, mapping, and new construction.

Additionally, as described in Finding 1, the Austin Water Utility is shifting preventative maintenance activities from “reactive” to “proactive,” but this new approach has not been formally documented in Austin Water’s procedures and business plans nor has it been fully implemented.

RECOMMENDATIONS

1. The Austin Water Utility Director should:

- update the Utility’s system to track overflow data with additional information technology controls to ensure all essential fields are completed, data entered is reliable, and reportable overflows can be easily identified; and
- implement a quality assurance review process to validate that all reportable events are properly communicated to oversight entities.

MANAGEMENT RESPONSE: **CONCUR.** Refer to Appendix A for management response and action plan.

2. The Austin Water Utility Director should ensure all wastewater regulations and requirements of the TCEQ agreement are routinely monitored and met to avoid potential penalties for non-compliance.

MANAGEMENT RESPONSE: **CONCUR.** Refer to Appendix A for management response and action plan.

3. The Austin Water Utility Director should ensure public notifications regarding overflows meet all notification requirements set forth in the Texas Administrative Code and that the public has all of the information necessary in the event of an overflow either by use of the media notification template provided by the TCEQ or through the use of an internally created template detailing the notification requirements.

MANAGEMENT RESPONSE: **CONCUR.** Refer to Appendix A for management response and action plan.

MANAGEMENT RESPONSE



MEMORANDUM

To: Corrie Stokes, City Auditor

From: Greg Meszaros, Director, Austin Water

Date: June 19, 2015

Subject: Management Response to SSO Prevention Audit

Austin Water has reviewed the Sanitary Sewage Overflow (SSO) Prevention Audit findings, and concurs with the three recommendations provided by the City auditors. We will incorporate these audit recommendations, including:

- A major upgrade of our computerized maintenance management system (Hansen 8) which is currently in process.
- Implementation of a structured review process at periodic intervals to strengthen data quality and reliability.
- Establish a process to track and monitor when reports are due and submit in accordance with the requirements in the TCEQ agreement.

Two of the three recommendations will be completed within the next 90 days.

ACTION PLAN

Sewer Overflow Prevention and Response Audit

Recommendation	Concurrence and Proposed Strategies for Implementation	Status of Strategies	Proposed Implementation Date
1. The Austin Water Director should: - Update the Utility's system to track overflow data with additional information technology controls to ensure all essential fields are completed, data entered is reliable, and reportable overflows can be easily identified; and - Implement a quality assurance review process to validate that all reportable events are properly communicated to oversight entities.	Austin Water concurs and a major upgrade of our computerized maintenance management system (Hansen 8) is currently in process and expected to become live in fiscal year 2016. As part of this major upgrade, specific information technology controls will be installed, including updates to data fields. We believe that this major upgrade and associated improvements will provide the information technology controls to insure all data and fields are completed, reliable, and that all reportable overflows can be easily identified.	Underway	December 31, 2016
	As a result of this audit, Austin Water will implement a structured review process at periodic intervals to strengthen data quality and reliability. This quality assurance review process will validate all reportable events are properly communicated to oversight agencies. Austin Water plans to assign staff to lead the QA process and will provide supervisory review of the QA process. In addition, Austin Water will identify a back-up for all roles in the QA process and provide cross-training to ensure coverage at all times.	Planned	December 31, 2015
2. The Austin Water Director should ensure all wastewater regulations and requirements of the TCEQ agreement are routinely monitored and met to avoid potential penalties for non-compliance.	Austin Water concurs and will establish a process to track and monitor when reports are due. Management will be assigned to oversee and insure all items are submitted in accordance with the requirements in the TCEQ agreement.	Planned	September 30, 2015

APPENDIX A

Recommendation	Concurrence and Proposed Strategies for Implementation	Status of Strategies	Proposed Implementation Date
3. The Austin Water Director should ensure public notifications regarding overflows meet all notification requirements set forth in the Texas Administrative Code and that the public has all of the information necessary in the event an overflow either by use of the media notification template provided by the TCEQ or through the use of an internally created template detailing the notification requirements.	Austin Water concurs. In order to address the findings of the City Audit on SSO's we will return to using the standardized TCEQ language and template in all our notifications. In order to reduce the undue concern and confusion that will result in returning to using all the standard language in our notifications we will continue to include additional information that is more specific and detailed for each SSO. It is important to note that Austin Water has not received any TCEQ public notice violations in at least eight years. Our Public Information Office works closely with our internal regulatory office and TCEQ staff to ensure that all proper notifications are made in accordance with TCEQ public notification requirements.	Planned	August 1, 2015