

INTERLOCAL AGREEMENT NO. 2022-004-WLC

FOR:

**HARRIS-GALVESTON SUBSIDENCE DISTRICT AND
HARRIS COUNTY FRESH WATER SUPPLY
DISTRICT NO. 1A**

CobbFendley Project No. 1912-027-01

AUGUST 9, 2023

FINAL REPORT

Submitted By:

Jennifer Steen, PE



Construction Management ▪ Geographic Information Systems ▪ Hydraulics and Hydrology ▪ Land Development
Public Works ▪ Right-of-Way Acquisition ▪ Site Development ▪ Subsurface Utility Engineering
Surveying ▪ Telecommunications ▪ Transportation ▪ Utility Coordination and Design

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1. Introduction

Harris County Fresh Water Supply District No. 1A (FWSD 1A) entered an interlocal agreement with Harris-Galveston Subsidence District (HGSD) for the purpose of reducing potable water usage for FWSD 1A by inspecting approximately 74,000 feet of waterline for leaks, producing a summary log including the leak location and severity of the leak, and repairing the waterline leaks based on priority.

The following report documents the waterline inspections, leaks repaired and long-term benefits.

2. Timeline and Milestones

FWSD 1A provided a quarterly reimbursement request to HGSD including project status updates for the leak inspections and leak repairs. The full quarterly reports can be found in **Attachment A – D Quarterly Report**.

Figure 1 Quarterly Results

Quarter	Mobilization (\$3,750)	Leak Inspection (\$10,200)	Leak Repair Costs (\$62,500)	No. Repairs From Inspection Report
First Quarter 7/1/22-9/30/22	\$0	Acquired proposals	\$0	0
Second Quarter 10/1/22-12/31/22	\$0	Accurate \$2,000	\$613.16	1-leak repaired
Third Quarter 1/1/23-3/31/23	\$0	SamCo \$13,600	\$38,790.70	3-illegal connections 8-leaks repaired 1-fire hydrant replaced
Fourth Quarter ¹ 4/1/23-7/31/23	\$0	None \$0	\$21,446.14	11- leaks repaired 2-fire hydrant replaced
TOTAL	\$0	\$15,600	\$60,850	

1. The fourth quarter was extended to the end of July, due to additional water line leaks being repaired.

The total grant estimate with contingency was \$76,450. In 2022/2023 FWSD 1A was able to inspect over 74,000 feet of waterlines and repair all the leaks that were discovered during that time.

3. Texas Water Development Board Water Use Survey

FWSD 1A's operator, Municipal Operations and Consulting, submitted the Water Use Survey to the Texas Water Development Board. FWSD 1A has 866 connections. See **Attachment E – Water Use Survey**.

4. Project Recap

In the first quarter FWSD 1A requested proposals for inspecting 74,000 feet of waterlines. Two proposals were received.

In the second quarter FWSD 1A approved Accurate Utility Supply, LLC in October 2022. The entire 74,184 feet of waterlines were leak detected. Only one leak was found. The leak was

repaired. FWSD 1A approved SamCo to complete a second leak detection study of the entire waterline system.

In the third quarter SamCo completed the leak detection inspection, providing a summary log including a list of leaks and the severity. SamCo provided a list of unauthorized water connections. The FWSD 1A operator, Municipal Operations & Consulting, Inc (MOC), provided a leak detection follow-up on each location identified. Unauthorized connections were removed from the system and notified. 8 of the identified leaks were repaired and one fire hydrant was replaced. MOC confirmed and repaired leaks that were submitted by residents.

In the fourth quarter FWSD 1A operator, MOC, repaired 11 identified leaks and replaced 2 damaged fire hydrants. MOC confirmed and repaired leaks that were submitted by residents. The total cost for the repairs exceeded the remaining grant budget; therefore \$21,446.14 was included in the Budget Status Worksheet for the 4th quarter.

5. Calculated Water Savings

FWSD 1A had approximately 10 service line leaks identified and repaired between January and June 2023. A service line leak is assumed to be 15 GPM. From January to May 2023 the amount of potable water received versus the amount billed increased from 51% to 65%.

Figure 2 Gallons Received versus Gallons Billed

2023	January	February	March	April	May
Gallons Received	6,157,000	5,337,000	4,909,000	5,058,000	5,500,000
Gallons Billed	3,169,000	3,084,000	3,055,000	3,096,000	3,566,000
%	51.5%	57.8%	62.2%	61.2%	64.8%

The increase in accounted potable water between January when the leaks were identified and May when all the leaks were repaired is approximately 13.4%. FWSD 1A connections use an average of 4,500 gallons per connection per month for the past five years. FWSD 1A had an increase of approximately 12 connections per year for the past five years. The table below assumes a 13.4% water savings each month. For 2022 there were no leaks repaired. In 2023 all identified leaks were repaired. The repairs were not completed until June; therefore, the gallons saved per year only account for half of the 2023 year.

Figure 3 Water Savings from 2022 through 2028

Year	No. Connections	Gallons Saved Per Year (MG)	Unauthorized Gallon/Year (MG)
2022	866	0	0
2023	878	3.1	0.3
2024	890	6.4	0.5
2025	902	6.5	0.5
2026	914	6.6	0.5
2027	926	6.7	0.5
2028	938	6.8	0.5
TOTAL		36.2 MG	3.0 MG

In addition to the repaired leaks, FWSD 1A was able to identify ten unauthorized connections. The exact volume of potable water stolen by the unauthorized connections is unknown. It is assumed each unauthorized connection used 4,500 gallons per month. The estimated water loss due to unauthorized connections is 45,000 gallons per month.

6. Summary

The purpose of the interlocal agreement between HGSD and FWSD 1A is to reduce the potable water usage by FWSD 1A by identifying waterline leaks and repairing the leaks. The interlocal agreement included full inspection of approximately 74,000 feet of waterline for leaks. The first company selected found one leak. The second company identified leaks on the main line, service line and unauthorized connections. A summary of the repairs is provided in the following table.

Figure 4 Leak Repair Summary

	Address	Date	Estimated Flow (GPM)	Cost of Repair	Type of Leak
6320	Juarez St	11/7/2022	0.25	\$ 613.16	valve
2312	Broad St	12/21/2022	30	\$ 3,736.50	Main line leak
2003	Allen Ln	12/27/2022	15	\$ 86.10	Service line leak
7312	East St	12/31/2022	15	\$ 325.00	Service line leak
7115	Harrison St	1/3/2023		\$ 73.00	low pressure
2319	E Fayle St	1/6/2023		\$ 109.50	Unauthorized connection
2318	Hodges St	1/13/2023	15	\$ 106.00	Service line leak
7232	Kings Dr	1/14/2023	15	\$ 2,571.68	Service line leak
2318	Hodges St	1/15/2023	15	\$ 35.00	Service line leak
7232	Kings Dr	1/15/2023	15	\$ 724.00	Service line leak
2522	Harris St	1/16/2023	0.25	\$ 1,061.26	Blow-off Valve repairs
2318	Hodges St	1/19/2023	15	\$ 2,169.29	Service line leak
2318	Hodges St	1/19/2023	15	\$ 365.00	Service line leak
7122	Kings Dr	1/19/2023	15	\$ 86.10	Service line leak
4602	Morelos Rd	1/23/2023		\$ 59.60	Unauthorized connection
7607	Verdinell st	1/25/2023		\$ 72.80	Unauthorized connection
7228	Kings Dr	1/27/2023	15	\$ 3,678.85	Service line leak
7228	Kings Dr	1/27/2023	15	\$ 147.60	Service line leak
	Godfry & Harrison St	1/31/2023	5	\$ 3,227.79	Fire Hydrant Leak
2427	E Fayle St	2/3/2023		\$ 72.80	Unauthorized connection
7607	Verdinell st	2/3/2023		\$ 72.80	Unauthorized connection
2612	Broad St	2/9/2023		\$ 26.50	Unauthorized connection
7421	Verdinell St	2/9/2023		\$ 26.50	Unauthorized connection
7403	Verdinell St	2/10/2023		\$ 287.74	Unauthorized connection
7407	Washington St	2/10/2023		\$ 79.50	Unauthorized connection
	Frank Rd	2/10/2023	30	\$ 3,917.02	Main line leak
7124	Whiting Rock Dr	2/15/2023	15	\$ 67.00	Service line leak
3870	Morelos Rd	2/22/2023	15	\$ 79.50	Service line leak
7122	Kings Dr	2/28/2023	15	\$ 2,132.65	Service line leak

	Address	Date	Estimated Flow (GPM)	Cost of Repair	Type of Leak
2302	Harris	3/7/2023	30	\$ 109.50	Main line leak
2612	Broad St	3/7/2023	15	\$ 750.00	Service line leak
4514	Johnson Rd	3/7/2023	15	\$ 250.00	Service line leak
4526	Johnson Rd	3/7/2023	15	\$ 222.50	Service line leak
4603	Johnson Rd	3/7/2023	15	\$ 222.50	Service line leak
7127	Harrison St	3/7/2023	15	\$ 291.14	Service line leak
7127	East St	3/7/2023	15	\$ 272.99	Service line leak
7134	East St	3/7/2023	15	\$ 2,236.66	Service line leak
7134	East St	3/7/2023	15	\$ 1,167.33	Service line leak
7407	Washington St	3/7/2023	15	\$ 365.00	Service line leak
7412	Verdinell St	3/7/2023	15	\$ 365.00	Service line leak
2318	Hodges St	3/12/2023	15	\$ 5,358.19	Service line leak
7232	Kings Dr	3/13/2023	15	\$ 1,692.30	Service line leak
	Hodges	3/13/2023	15	\$ 325.00	Service line leak
2439	Hodges St	3/14/2023		\$ 182.50	Unauthorized connection
7619	Harrison St	3/14/2023		\$ 109.50	Unauthorized connection
2323	Hodges	3/16/2023	15	\$ 5,225.00	Service line leak
	Jones Rd & Harris	3/23/2023	5	\$ 3,171.66	Fire Hydrant Leak
7418	Verdinell st	3/27/2023	15	\$ 1,322.78	Service line leak
2515	Broad St	4/27/2023	30	\$ 53.00	Main line leak
	Frank Rd	5/23/2023	15	\$ 3,120.35	Service line leak
2811	Waco St	6/1/2023	15	\$ 370.10	Service line leak
3843	Rivera Rd	6/2/2023	15	\$ 35.00	Service line leak
3843	Rivera Rd	6/5/2023	30	\$ 348.00	Main line leak
7306	Harlem St	6/5/2023	15	\$ 53.00	Service line leak
7115	Harrison St	6/8/2023	15	\$ 1,447.24	Service line leak
7115	Harrison St	6/8/2023	15	\$ 79.50	Service line leak
3810	Morelos Rd	6/15/2023	0.25	\$ 353.00	Valve issues
2407	Short St	6/27/2023		\$ 79.50	Fire Hydrant flushing
3834	Morelos Rd	6/27/2023	15	\$ 2,987.04	Service line leak
7323	Harlem St	6/29/2023	15	\$ 1,204.29	Service line leak
7323	Harlem St	6/29/2023	15	\$ 79.50	Service line leak
3108	Rey Ave	7/10/2023	15	\$ 1,473.70	Service line leak
7306	Harlem St	7/14/2023	15	\$ 1,555.80	Service line leak

FWSD 1A saved approximately 3.5 MG of potable water in 2023. From 2022 through 2028, FWSD 1A should save over 39 MG of potable water due to leak repairs.



Leak Detection Summary

Customer: **HC FWSD #1A**

Date: **11-30-2022**

Surveyed	
Hydrants	✓
Valves	✓
Blow Offs	✓
Backflows	✓
Meters	✓
Leaks by Level	
Level 1 Suggested Repair	1
Level 2 Immediate Repair	
Total	1

Leak Summary	
Connection	
Curb Stop	
Hydrant	
Meter	
Main	
Service Line	
Valve	1
Other	
Total	1

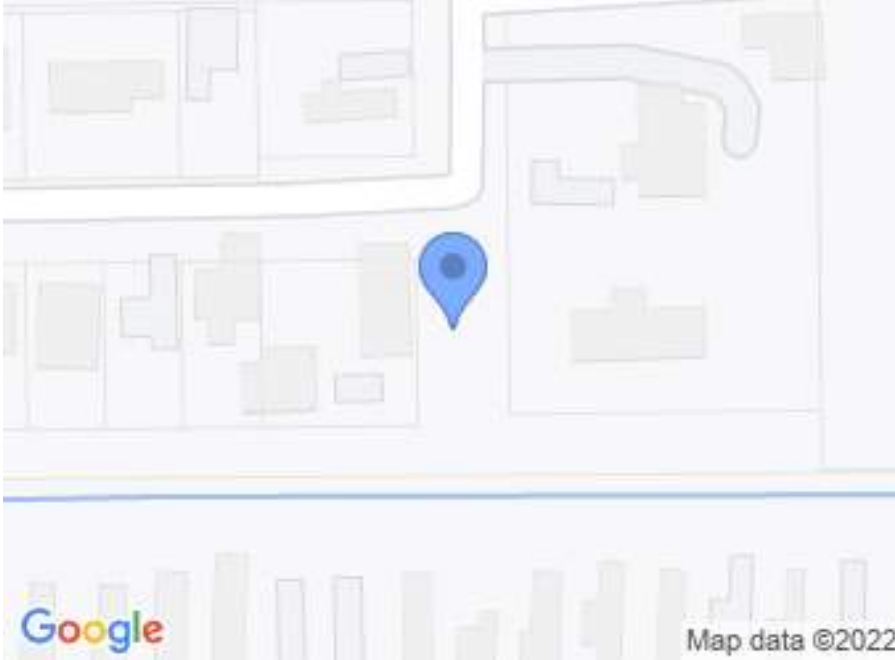
Estimated Water Loss	
Gallons per Minute	0.2
Gallons per Month	10,800

Accurate Meter Backflow, LLC
 5445 Stockdick School Rd, Katy, TX 77449
 (281) 391-8100 (281) 391-8110 Fax
www.accuratemeter.com

Leak Detection Field Report

Customer: HC FWSD #1A
Address: 6320 Juarez St, Baytown, TX 77521

Date: 11-07-2022
Serviced By: Sal G



Leak Marked: No
Est Water Loss: 0.25
Leak Level: Level 1
Operator Notified: No
Cover Type: Soil
Leak Type: Valve
Equipment Used: Visible

Notes









Leak at blow off valve.

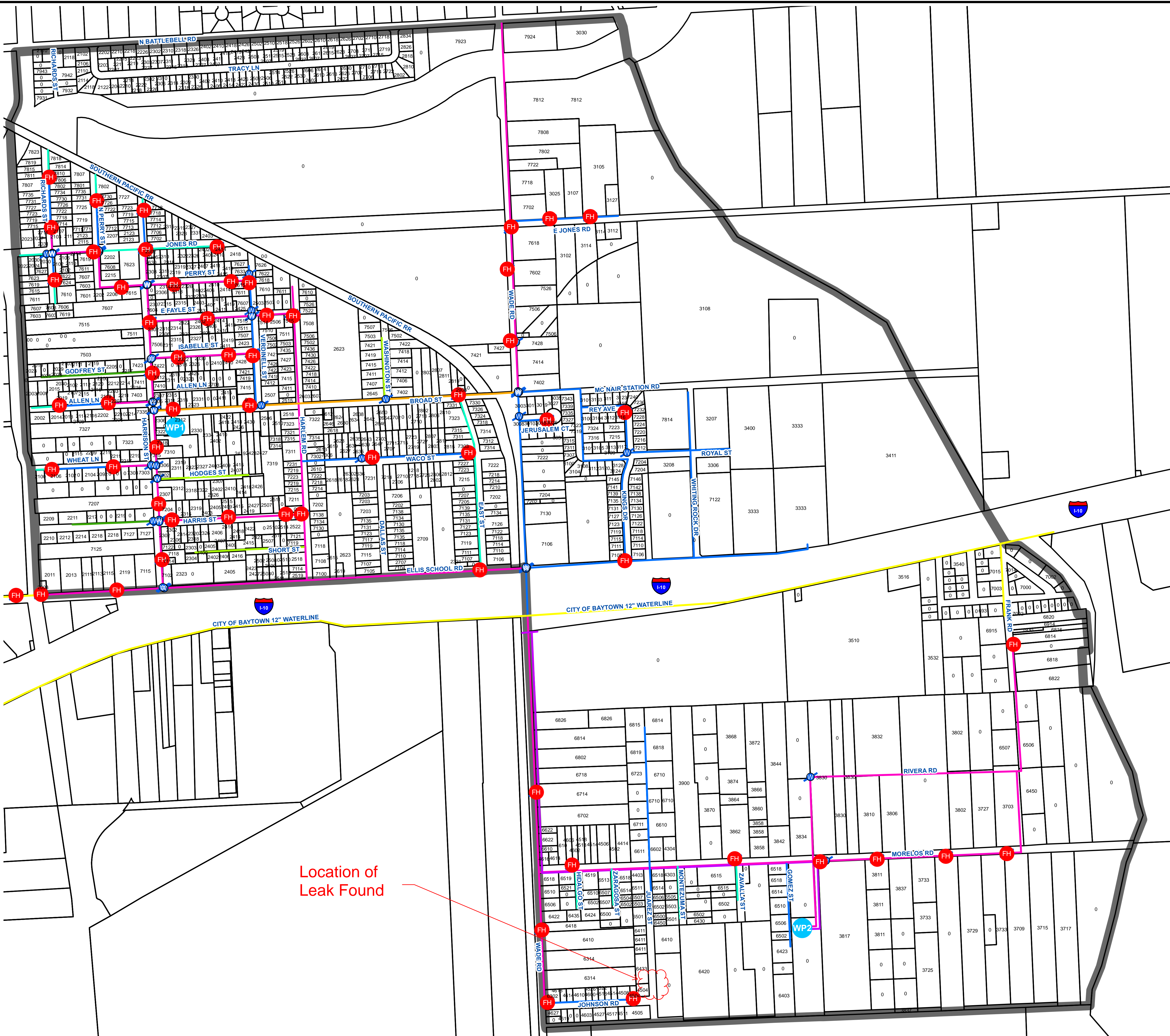
Photographs



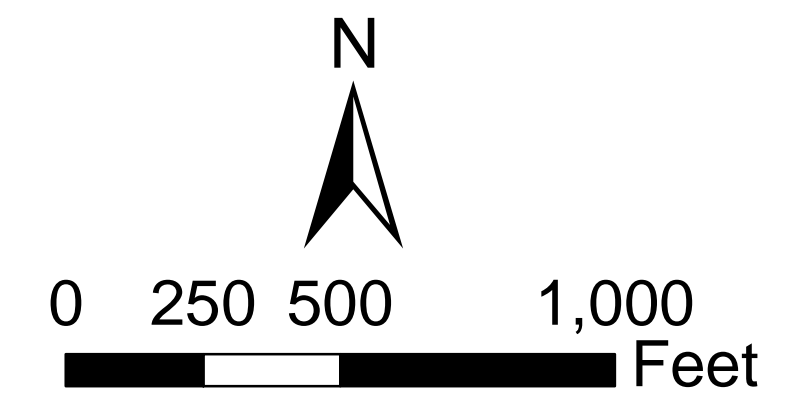
HARRIS COUNTY FWSD 1A WATER SYSTEM

Legend

-  FWSD Waterplant
-  Water Valve
-  Fire Hydrants
-  1.5 Inch WL
-  2 Inch WL
-  3 Inch WL
-  4 Inch WL
-  6 Inch WL
-  8 Inch WL
-  10 Inch WL
-  12 Inch WL
-  8 Inch BAWA Transmission
-  Parcels
-  FWSD Boundary



Location of Leak Found



**EXHIBIT A - SamCo Brochure and
Invoice No. 4126A196**



WE PROVIDE PROFESSIONAL LEAK DETECTION & MAPPING SERVICES.

Critical water shortages, population pressure, and increased funding needed for water production, treatment and distribution facilities make water an increasingly valuable resource. Because water systems are more vulnerable to costly water loss as they age, detecting leaks early—before they grow into massive waterline breaks—is the most cost-effective way to minimize “money down the drain.”

SAMCO’s experienced leak technicians use a “hands-on, in-the-field” approach to locate known and hidden waterline losses. Our comprehensive services are specifically tailored to improve the efficiency and reliability of your system.

Water Loss Consulting

SAMCO has acquired new, state-of-the-art equipment to monitor, measure, and verify flows in water systems eliminating the need to cut existing lines. This capability enables us to determine when, where, and how much water may be escaping from each distribution system. Additionally, we assist clients with robust and proactive water conservation programs, including:

- Leak detection preventive maintenance programs
- Comprehensive bottom-to-top water system evaluations
- GPS data collection
- GPS leak survey mapping

Why SAMCO

Sam Godfrey, founded SAMCO in 1985 in Austin, TX. His 30 years of experience in leak detection services and proven track record for delivering effective solutions to water loss and conservation issues, makes him an expert in the field. As a member of the Texas Water Utilities Association Education Committee, Sam supports the water utilities industry by sharing his leak detection experience through TCEQ training programs, AWWA conventions and teleconferences, as well as TWUA training.

Professional Services to Minimize Water System Losses

We deliver comprehensive water loss surveys by using sensitive listening devices and by completing diligent inspections of system components. This is especially beneficial in seldom-visited sectors where critical system failures and losses often go undetected.

Global Positioning System (GPS) Services

SAMCO supports capital improvement programming, GASB response, maintenance and leak repair implementation, and emergency planning. Our technicians use Global Positioning System (GPS) equipment to track and record water loss locations, as well as collect accurate geographic information for mapping and for Geographic Information Systems (GIS) applications.

Comprehensive Water System Assessments

We look at the big picture, thereby helping client systems close the gap between the volume of water produced and the volume of water billed or otherwise metered to end users.

**EXHIBIT B - SamCo Report dated
February 3, 2023**

Delivering Professional Grade Leak Detection

SAMCO
FINAL LEAK
DETECTION REPORT

Prepared for: MOC – Fresh Water 1A

February 3, 2023

Chris Correas

Its time to call
SAMCO
LEAK DETECTION
Delivering proven results since 1985.

901 Mopac Expressway South
Barton Oaks One, Suite 300
Austin, TX 78746



[REDACTED]



samco-leakservice.com






[REDACTED]




The purpose of the survey was to perform acoustic leak detection in order to identify water leaks and help reduce water loss. The locations and descriptions of the leaks identified during the survey are listed below. The work performed during the project consisted of the following:

- Acoustically inspected water system for leaks and other water loss problems, utilizing sophisticated leak detection technology, within the Fresh water 1A district
- Used Trimble sub-meter GPS to collect leak locations for maintenance mapping updates




During the project there were fourteen (14) leaks that were identified, consisting of; (5) five unauthorized water usage, (8) eight service line leaks, (1) one fire hydrant leak; were identified. The leak location and description is listed below. Please do not hesitate to contact Hunter Skelton at 512-809-3461 if you have any questions or need assistance with the location of the following leaks or water loss issues listed below. All items identified as critical are considered to be in need of immediate attention.





UNAUTHORIZED WATER USAGE


Leak #	Leak Location	Critical	Date Located
1	2427 E Fayle St  	Yes	01/31/2023
2	7421 Verdine St 	Yes	01/31/2023

3	<p>7415 Verdine St</p> 	Yes	01/31/2023
4	<p>2612 Broad St</p> 	Yes	02/01/23
5	<p>7407 Washington St</p> 	Yes	02/01/23


SERVICE LINE LEAKS

Leak #	Leak Location	Critical	Date Located
1	44526 Johnson Rd 	Yes	01/30/2023
2	4514 Johnson Rd 	Yes	01/30/2023
3	4603 Johnson Rd 	Yes	01/30/2023

4	<p>7412 Verdine St</p> 	Yes	01/31/2023
5	<p>7127 Harrison Street</p> 	Yes	02/01/2023
6	<p>7407 Washington St</p> 	Yes	02/01/2023
7	<p>2612 Broad St</p> 	Yes	02/01/2023

8	7131 East St 	Yes	02/01/23
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FIRE HYDRANT LEAK

Leak #	Leak Location	Critical	Date Located
1	Across from intersection of Godfrey St and Harrison St 	Yes	01/31/2023

SUMMARY

After reviewing the system survey results, SAMCO Leak Detection Services recommends MOC Fresh Water 1A take the following steps:

- Investigate and take necessary actions to remove and/or lock out all unauthorized water usage
- Investigate and repair service line leaks
- Investigate, flush, and repair, if necessary, fire hydrant leaks
- Continue to fully complete meter change out program to accurately account for all water usage

Please do not hesitate to contact me if you have any questions concerning this report or need my further assistance.

Sincerely,
Sam Godfrey



- Service Line
- Unauthorized Water Use
- ⊕ Fire Hydrant



MOC

Fresh Water 1A

Leak Detection, 2023



88 Water Engineering, Inc. | 800-233-0000 | 1000 S. 17th St. | Austin, TX 78741 | 512-424-2000

**EXHIBIT C - Municipal Operations & Consulting, Inc
Leak Detection Follow Up**

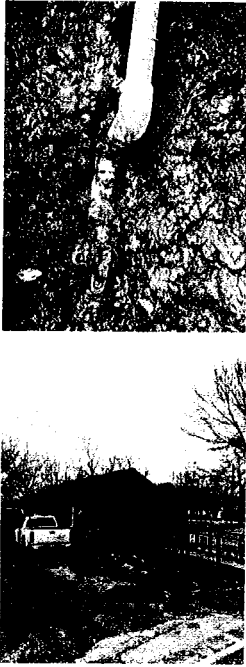
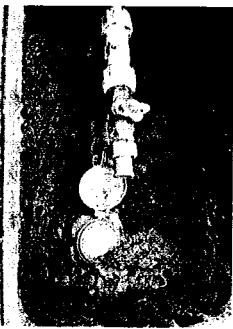
WATER UTILITY OPERATIONS






MUNICIPAL OPERATIONS & CONSULTING, INC.




**Harris County Fresh Water
Supply District No. 1A
Leak Detection Follow Up**





Unauthorized Water Use


Leak #	Leak Location	Critical	Date Located	MOC Follow Up
1	2427 E Fayle St 	Yes	01/31/2023	Investigated illegal connection on 3 separate dates 1/31/23, 2/3/23 and 2/9/23. Found pvc pipe connected straight to curb stop, removed illegal connection twice. On 2/9/23 they were running the water hose from neighbors house. Pulled neighbor's meter.
2	7421 Verdine St 	Yes	01/31/2023	No illegal connection found at this property. This was an old tap, nothing was connected we put a lock on it.

3	<p>7415 Verdine St</p> 	Yes	01/31/2023	<p>Found abandoned irrigation line, nothing connected. Shut off at curb stop, backflow device was broken.</p>
4	<p>2612 Broad St</p> 	Yes	02/01/23	<p>Illegal connection found on 2/9/23. PVC directly connected to curb stop. Cut pvc pipe, put a lock on curb stop and left a door tag.</p>
5	<p>7407 Washington St</p> 	Yes	02/01/23	<p>Illegal connection found on 2/10/23. Two homes on one line, pulled illegal connection and left a door tag to contact our office.</p>


Service Line Leaks

Leak #	Leak Location	Critical	Date Located	MOC Follow Up
1	44526 Johnson Rd 	Yes	01/30/2023	Repairs scheduled
2	4514 Johnson Rd 	Yes	01/30/2023	Repairs scheduled
3	4603 Johnson Rd 	Yes	01/30/2023	Repairs scheduled

4	7412 Verdine St 	Yes	01/31/2023	Repairs scheduled
5	7127 Harrison Street 	Yes	02/01/2023	Repairs scheduled
6	7407 Washington St 	Yes	02/01/2023	Repairs scheduled
7	2612 Broad St 	Yes	02/01/2023	Repairs scheduled

8	7131 East St 	Yes	02/01/23	Repairs scheduled
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Fire Hydrant Leak

Leak #	Leak Location	Critical	Date Located	MOC Follow Up
1	Across from intersection of Godfrey St and Harrison St 	Yes	01/31/2023	Fire hydrant has been replaced and in working order.