

**LEAK DETECTION / LOCATION SURVEY REPORT
FOR
THE CITY OF MARION**

625-73

September 9, 1996

May 1, 1996 -- May 31, 1996

Mayor Glenn A. Hill

City of Marion

P.O. Box 158

Marion, TX 78104

By

John E. Gapinski and James R. Shipley
of the

EDWARDS AQUIFER AUTHORITY

Dear Mayor Hill:

Division of Planning and Environmental Management

Leak Detection / Location Program

August, 1996

We are pleased to submit this report to you. This report is the result of a leak detection survey conducted on the City of Marion's water distribution system. This report lists findings by response categories for your consideration.

The Edwards Aquifer Authority (Authority), formerly the Edwards Underground Water District, appreciates the cooperation and assistance the city has provided during the survey. Special thanks to Public Works Supervisor, Manuel T. Martinez, for his assistance and participation during the survey. The Authority hopes that the information provided herein will be beneficial to the City in identifying and correcting areas of actual water loss and potential water loss.

This survey has demonstrated the water saving potential of the Leak Detection program. Identifying the best possible program is critical in order to maximize the impact. For this reason, the Authority is providing you with a list of recommendations and any suggestions you may have for the program.

Please respond to this report on or before September 15, 1996. Your response will be used to support positive recommendations.

**Edwards Aquifer Authority
1615 N. St. Mary's
P. O. Box 15830
San Antonio, Texas 78212-9030
210-222-2204**

Mayor Glenn A. Hild
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EDWARDS AQUIFER AUTHORITY

Please copy and distribute this report to David K. ...
...in this project. The Edwards Aquifer Authority ...
...information regarding this report ...
...please do so - hand-deliver or call.

6.25-7.5

September 9, 1996

Mayor Glenn A. Hild
City of Marion
P.O. Box 158
Marion, TX 78124

James R. Hild
James R. Hild
Leak Detection Technician II

Dear Mayor Hild:

We are pleased to submit this final report of the leak detection survey performed on City of Marion's water distribution system. This report lists findings by separate categories for your convenience.

The Edwards Aquifer Authority (Authority), formerly the Edwards Underground Water District appreciates the cooperation and assistance the city has provided during the survey. Special thanks to Public Works Supervisor, Manuel T. Martinez, for his attention and patience during the survey. The Authority hopes that the information provided herein will be beneficial to the City in identifying and targeting areas of actual water loss and potential water loss.

This survey has demonstrated the water saving potential of the Leak Detection Program. Maintaining the best possible program is vital in order to continue the successes realized. For this reason, the Authority is soliciting your comments, both positive and negative, and any suggestions you may have on how to improve our program.


Please respond to this request candidly, as the Authority cannot improve on deficiencies or support positive measures without the knowledge of such conditions.

Mayor Glenn A. Hild
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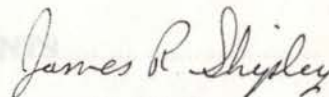
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Please convey our commendations and thanks to David Koepp and Walter Farias for their assistance in this project. The Edwards Authority sincerely appreciates your water conservation efforts. Should you require additional information regarding this report or have any water related questions, please do not hesitate to call.

Sincerely,



John E. Gapinski
Leak Detection Technician I



James R. Shipley
Leak Detection Technician II

JEP:JRS/ bmc
Enclosures

002jrs

Revised Master Water System Distribution Plans

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SUMMARY

On March 15, 1996, the Edwards Aquifer Authority (EAA), formerly the Edwards Underground Water District received a request from the City of Marion to perform a leak detection / location survey on its water distribution system. A pre-survey conference was held April 4, 1996 at the City of Marion to discuss the work to be performed. It was agreed that EAA would perform sonic leak detection on all available access points and computerized leak location as needed. A final report, including any unusual system condition found and an updated master water plat would be submitted to the City of Marion by EAA at the conclusion of the survey.

John E. Gapinski of EAA began the survey on May 1, 1996, and the survey was concluded on May 31, 1996. Over the course of the survey, a total of 817 access points were surveyed including 615 customer service connections, 34 fire hydrants, 158 valves, and 10 other access points covering 25.42 miles of distribution and transmission main.

Fourteen utility side leaks and eleven customer side leaks were detected for a total of 25 leaks. The utility side leaks included 4 service leaks, 7 meter box leaks, 1 fire hydrant leak, and 2 main leaks. An estimated 14,697 gallons of water per day has been saved by the repair of 14 utility side leaks as of June 15, 1996. The leaks discovered during the survey range from 3,960 gallons per day to small meter box leaks.

I. Meter Box Leaks: 7

121 Seidel Street	Repaired 2/3/96	43 GPD
301 Meadow Drive	Repaired 6/16/96	60 GPD
316 Seguin Street	Repaired 5/30/96	80 GPD
108 East Kemper Street	Repaired 6/18/96	17 GPD
302 Kemper Street	Repaired 6/18/96	9 GPD
314 Kemper Street	Repaired 6/18/96	4 GPD
Creek Road	Repaired 6/17/96	45 GPD

II. Service Leaks: 4

818 West Cypress Lane	Repaired 6/13/96	3,960 GPD
223 West Cypress Lane	Repaired 5/14/96	34 GPD
1711 Old Mission Road	Repaired 5/9/96	3,960 GPD
500 E. 2nd St.	Repaired 5/30/96	3,960 GPD

III. Main Leaks: 1

La Verne Street @ Seguin Street	Repaired 6/17/96	25 GPD
West Cypress Lane	Repaired 6/13/96	1,080 GPD

DISCUSSION

A. Total Access Points Surveyed: 817

The following is an outline of the various access points used during the survey:

Customer Service Connections:	615
Main Valves:	158
Fire Hydrants:	34
Others:	10

B. Total Miles of Distribution Main Surveyed: 25.42

C. Total Leaks Detected: 25

Service line, fire hydrant, and main leaks were located by acoustic leak detection, or by visual inspection. Meter box leaks and customer side leaks were located through house to house surveying.

I. Meter Box Leaks: 7

121 Seidel Street	Repaired 2/5/96	43 GPD
301 Meadow Drive	Repaired 6/18/96	60 GPD
316 Seguin Street	Repaired 5/30/96	60 GPD
108 East Kreuger Street	Repaired 6/18/96	17 GPD
302 Barnett Street	Repaired 6/18/96	9 GPD
314 Kreuger Street	Repaired 6/18/96	4 GPD
Creek Road	Repaired 6/17/96	45 GPD

II. Service Leaks: 4

# 14 Wild Coyote Lane	Repaired 6/13/96	3,960 GPD
# 22 Wild Coyote Lane	Repaired 6/14/96	34 GPD
1711 Old Marion Road	Repaired 5/9/96	3,960 GPD
509 F.M. 465	Repaired 5/30/96	3,960 GPD

III. Main Leaks: 2

La Vernia Street @ Seguin Street	Repaired 6/17/96	25 GPD
Wild Coyote Lane	Repaired 6/13/96	1,080 GPD

IV. Fire Hydrant Leaks: 1

Hackberry Street @ Seguin Street	Repaired 5/9/96	1,440 GPD
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V. Customer Side Leaks: 11

221 Wetz Street	Notified By Door Tag
218 Seguin Street	Notified By Door Tag
307 Kreuger Street	Notified In Person
104 Seguin Street	Notified In Person
211 La Vernia Street	
Baseball Field	
313 South La Vernia Street	Notified In Person
New House On Schulz Street	Notified In Person
Bank on F.M.78	Notified In Person
Savanah Church	
335 San Antonio Street	Notified By Door Tag

D. Total Estimated Water Saved by Repair of Detected Utility Side Leaks in Gallons Per Day As Of June 15,1996: 14,697

Leakage estimates for service lines and mains are based on hole size and system pressure in pressure per square inch. This information was furnished by City of Marion personnel when EAA was not on site at the time of repair.

Meter Box:	238 GPD
Service:	11,914 GPD
Mains:	1,105 GPD
Fire Hydrant:	1,440 GPD

Customer leaks were generally small. No attempt was made to estimate this leakage. Customers were notified by door tag or in person when possible or will be notified by City of Marion personnel.

E. Miscellaneous

Henke @ Wald Road	Meter needs change out.
South of Weil Road and west of Creek Rd.	Four inch cast iron main exposed in bar ditch.
200 Meadow Drive	Unable to locate valve.
308 Meadow Drive	Valve stack needs repair.

F. Master Water System Distribution Plats Included With This Report

The water distribution plat for the City of Marion's service area inside the city limits has been revised by EAA. The City of Marion's Water Distribution System & Certified Service Area plat and the surveyor's field notes were used as a guide. This section of the service area has been divided into two 24" x 36" plats with a scale of 1" x 200'.

The three plats depicting the water transmission main from the Comal County well site to the city limits were hand drawn by EAA. Green Valley Special Utility District and New Braunfels Utilities water distribution plats were used as a guide to develop these 24" x 36" plats with a scale of 1" x 400'.

These plats have been drawn to reflect what was found in the field survey. All main line locations, main sizes, and types of material were furnished by City of Marion personnel. The Edwards Aquifer Authority does not certify the scale, or the accuracy of these drawings or their content.

All mains were surveyed from all available access points.

All valves were surveyed. When direct contact could not be made a probe rod was used.

Fire hydrants depicted as fire hydrants without lead valves are hydrants where the lead valve could not be located or does not exit.

All mains, services, fire hydrants, and valves added to the plats are for access point accounting. The location and placement of these items on the plats are intended to indicate what was actually found during the field survey. Placement of main valves on the plat is the surveyor's best guess of what they control. Every effort was made to ensure the accuracy of these plats, but EAA does not guarantee their accuracy.

RECOMMENDATIONS AND COMMENTS

Revise master water distribution plats from "As built" plans, EAA plats, and utilizing the knowledge and expertise of long term field employees. Master plats should show locations of all main valves, fire hydrants, blow off valves, drain or flush valves, air relief valves, and pressure regulating valves. Revised plats should be made available to field maintenance personnel for use in the operation and maintenance of the water distribution system.

Placement of well flow meters should be checked against meter manufacturer specifications for recommended straight pipe lengths both upstream and downstream of meter. All meters have limitations due to piping configurations. An improperly located or installed meter will degrade the inherent specified accuracy below an acceptable level. Meters installed in close proximity to a bend, valve, or other fitting that is likely to disturb the flow conditions at the meter could invalidate the manufactures meter calibration. EAA recommends that all well meters and a percentage of large commercial meters be tested in place yearly for accuracy.

Install meters and check valves on pre-lubrication lines at all wells for water use accounting. Establish accounting system for water used for fire fighting, sewer cleaning, main flushing, etc.

During the course of the survey, EAA noted numerous residential meters in need of replacement. We recommend the initiation of a system-wide customer meter maintenance program. System meters should be upgraded through an ongoing meter change out program. This program should involve replacing a specified number of meters each period with new or rebuilt meters, until all system meters have been replaced.

All meter installations should be reviewed to determine whether the meter is properly sized and the correct type for the current use and flow demand.

Water meters are designed to deliver a maximum flow for a short period and a lower flow for long periods without sustaining damage or above normal wear. If a meter is operating outside its intended range, it cannot register all flow, even though it may be calibrated.

Consider connecting the following four existing mains along F.M. 465: The two inch main south of Carranza Ln. to the two inch main north of Seidel St., the six inch main south of Seidel St. to the six inch main north of Meadow Dr., and the six inch main at Meadow Dr. to the six inch main on Wetz St..

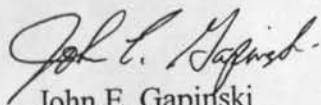
Physically separate the abandoned Creek Road well from the water distribution system. This cross connection has the potential for water loss if valve failure occurs on the existing well header.

Review the existing water distribution system and planned water system improvements to ensure sufficient access points are in place to facilitate future leak detection / location surveys.

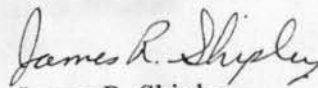
Consider ductile iron pipe for the primary main line material used for new installation and main replacement. As the production cost of water increase, the need for routine system-wide leak detection surveys will also increase. Leak sounds generated in metallic pipe are louder and have a tendency to travel further than those developed in non-metallic pipe. Ductile iron pipe has a proven history of long service life and its sound carrying characteristics for leak detection are far superior to any other type of pipe material.

Your efforts and timely repair of the leaks discovered in this survey have saved a significant amount of precious water. Our thanks to all the staff for your efforts in helping to conserve the Edwards Aquifer.

Sincerely,



John E. Gapinski
Leak Detection Technician I



James R. Shipley
Leak Detection Technician II