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DOCKET NO. 53184

JACOB AND JENNIE HILBIG'S APPEAL OF THE COST OF OBTAINING SERVICE FROM AQUA WATER SUPPLY CORPORATION	§ § § § §	**PUBLIC UTILITY COMMISSION OF TEXAS**

AQUA WATER SUPPLY CORPORATION'S RESPONSE TO COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION

Pursuant to 16 Texas Administrative Code ("TAC") § 22.144, comes now Aqua Water Supply Corporation ("Aqua WSC"), and files this Response to the Staff of the Public Utility Commission of Texas' ("Commission Staff") First Request for Information ("RFI"). Aqua WSC received the RFI on February 9, 2022. Therefore, this Response is timely filed. Pursuant to 16 TAC §22.144(c)(2)(F), Aqua WSC stipulates that this Response may be treated by all parties as if the answers were filed under oath.

Respectfully submitted,

/s/ Ty H. Embrey
Ty H. Embrey
State Bar No. 24025346
Lloyd, Gosselink, Rochelle & Townsend, P.C.
816 Congress Avenue, Suite 1900
Austin, Texas 78701
(512) 322-5800 phone
(512) 472-0532 facsimile
tembrey@lglawfirm.com

ATTORNEY FOR AQUA WATER SUPPLY CORPORATION

CERTIFICATE OF SERVICE

I certify that, unless otherwise ordered by the presiding officer, notice of the filing of this document was provided to all parties of record via electronic mail on March 1, 2022, in accordance with the Order Suspending Rules, issued in Project No. 50664.

/s/ Ty H. Embrey
Ty H. Embrey

2

AQUA WSC'S RESPONSE TO COMMISSION STAFF'S FIRST RFI
QUESTION NOS. STAFF 1-1 THROUGH 1-7

STAFF 1-1: Please provide all correspondence between the appellants and Aqua WSC.

RESPONSE: Aqua WSC is providing the attached emails between Jennie Hilbig and David Fleming, P.E., retired Manager of Engineering for Aqua WSC, and Aqua WSC Board Member J.D. Mican as **Attachment A**.

STAFF 1-2 Please provide a copy of Aqua Water Supply Corporation's distribution system map and include the water line size and existing connections for each line.

RESPONSE: Aqua WSC is providing the attached map of its distribution system as **Attachment B**.

STAFF 1-3 Identify all water lines that are out of compliance with TCEQ rules in Aqua WSC's distribution system.

RESPONSE: None of the water lines in Aqua WSC's distribution system are out of compliance with the Texas Commission on Environmental Quality's rules.

STAFF 1-4 List all of the employees of Aqua WSC and indicate whether each one is paid salary or hourly wages.

RESPONSE: Aqua WSC is providing the attached Excel spreadsheet listing all of its employees by department, including their titles and exempt or non-exempt status as **Attachment C**.

STAFF 1-5 Please provide any capital improvement plans that Aqua WSC has.

RESPONSE: Aqua WSC is providing the attached 5 Year Capital Improvement Program for fiscal year 2015 to fiscal year 2019 prepared by Steger Bizzell as **Attachment D**. Additionally, Aqua WSC is providing the attached map of Aqua WSC's 5 Year Capital Improvement Program dated October 2014 as **Attachment E**.

3

STAFF 1-6 Please provide any funding applied for or secured for the capital improvement plan.

RESPONSE: Aqua WSC is providing the attached Construction Progress Report Summary and Loan Schedule Estimates for 2021 through 2022 as **Attachment F** and **Attachment G**. All capital improvements are funded through cash-on-hand or loans obtained from CoBank.

STAFF 1-7 Please provide an updated inventory list.

RESPONSE: Aqua WSC is providing the attached Inventory Worksheet dated February 28, 2022 as **Attachment H**.

Prepared by: Ty Embrey
Sponsored by: David McMurry

4

Attachment A

From: David Fleming
To: Jennie Hilbig
Cc: Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject: Re: 714 Lee Rd. - Quote for water
Date: Wednesday, December 22, 2021 9:17:10 PM

Hi, Jennie:

I do not see the attachment (I assume it is a Feasibility Study). Maybe it's an iPhone issue. I'll check on my office computer in the morning.

Thanks,

DF
(iPhone)

> On Dec 22, 2021, at 8:51 PM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
>
> Hi Mr. Fleming,
>
> I received a quote for service at 714 Lee rd.The quote, attached, is for $59,164.00.
> The water code states that a water company must provide services to a residence in the CCN at a reasonable cost. I do not believe this quote is reasonable for a single family residence.
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> I have asked and was told that the customer representative doesn't know, they just get the quotes from their engineers. I was given your name from a board member.
>
> I appreciate your time and any assistance you may have.
>
> Thank you,
>
> Jennie Hilbig
> Attorney at Law

From:	Jennie Hilbig
To:	David Fleming
Cc:	Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject:	Re: 714 Lee Rd. - Quote for water
Date:	Wednesday, December 22, 2021 9:21:35 PM
Attachments:	Jacob & Jenni Hilbig Aqua PCS.pdf

Oh goodness, that was any fault. I failed to attach it.
Here it is.

Jennie Hilbig

> On Dec 22, 2021, at 9:17 PM, David Fleming <dfleming@aquawsc.com> wrote:
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> Hi, Jennie:
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>> Jennie Hilbig
>> Attorney at Law

Proposed Water System Improvements
AQUA WATER SUPPLY CORPORATION
Bastrop, Texas

Jacob & Jennie Hilbig
Account #: 2200010895
Bastrop County, Texas

PRELIMINARY COST SUMMARY
(December 20, 2021)

Item/Description	Quantity	Unit Price	Estimated Cost
4" SDR-21 PVC	220 LF	$18	$3,960.00
4" Certa-Lok Yelomine Pipe	140 LF	$30	$4,200.00
Sand Bedding	260 LF	$7	$1,820.00
12-ga. Tracer Wire (taped to pipe twice per joint)	360 LF	$0.65	$234.00
M.J. SSB cl-350 D.I. Fittings w/ Restraint Glands	200 Lbs	$5	$1,000.00
Bore w/ 8" PVC Casing at Creek Crossing and Road Crossing	100 LF	$165	$16,500.00
4" Gate Valve w/ Valve Box and Restraint Glands	4 Ea	$1,150	$4,600.00
4" Wet Connection	1 Ea	$4,000	$4,000.00
2" Flush Valve w/ 2 1/2" Fire Hose Adapter	1 Ea	$1,250	$1,250.00
Erosion Control w/ Silt Fencing	260 LF	$4	$1,040.00
Clearing & Chipping	260 LF	$2	$520.00
Trench Safety	260 LF	$2	$520.00

Construction Total:	**$39,644.00**
5/8" x 3/4" Meter	$4,280.00
Contingencies (approx. 10% of const.)	$3,960
Engineering (approx. 12% of const.)	$4,760
Capacity Reservation Fee ($600 x 1 LUE)	$600
Membership Fee ($100 per connection)	$100
Customer Service Inspection Fee ($70 per connection)	$70
Surveying & Staking	$3,900
Legal	$2,000
Easements & Right-of-Way	By Developer
LESS $150 none-refundable deposit paid 12/8/21	-$150

Grand Total:	**$59,164.00**

NOTE: This is a preliminary cost summary and not an actual contractual construction cost quote. It is not based on any prepared plans or on-site inspections by this office. After surveying and plans are prepared and reviewed, a more accurate estimate can then be provided. This preliminary cost summary shall be valid for 90-days from the date listed above.

Steger Bizzell Project No. 19970.519

From: David Fleming
To: Jennie Hilbig
Cc: Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject: Re: 714 Lee Rd. - Quote for water
Date: Wednesday, December 22, 2021 9:26:36 PM

Could you send the letter, as well? I will need to see what the engineers determined and ask questions from there. If the letter is not readily available, I can get the Development Services Manager to provide a file copy.

Thanks,

DF
(iPhone)

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>> Jennie Hilbig
>> Attorney at Law
<Jacob & Jenni Hilbig Aqua PCS.pdf>

From: Jennie Hilbig
To: David Fleming
Cc: Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject: Re: 714 Lee Rd. - Quote for water
Date: Wednesday, December 22, 2021 9:29:25 PM
Attachments: image001.png

Certainly, attached is the letter we received with the previous document.

On Dec 22, 2021, at 9:26 PM, David Fleming <dfleming@aquawsc.com> wrote:

Could you send the letter, as well? I will need to see what the engineers determined and ask questions from there. If the letter is not readily available, I can get the Development Services Manager to provide a file copy.

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AQUA
WATER SUPPLY CORPORATION
Safe · Reliable · Sustainable

December 20, 2021

Jacob & Jennie Hilbig
714 Lee Rd.
Bastrop, Texas 78602

RE: Pending Application for Water Service
Account #: 2200010895

After reviewing your request for water service, the following marked items are needed from you at this time in order to finalize your application package:

- ☑ Bastrop County Exemption Letter *(Please contact Sonia Thomas at 512-581-4076)*
- ☑ Payment Needed for Meter Set: **$59,164.00 (Please find cost summary attached)**
- ☑ Water Line Easement executed in the presence of a Notary Public will be prepared, after payment is received.
- ☑ This project will require additional easement research, after payment is received.
- ☑ **Please note that your meter will not be set until the Bastrop County Exemption Letter is received by our office.**

For security purposes, Aqua accepts all forms of payment *except cash.*
Our office must receive the above items before proceeding with setting your water meter. This estimate is valid for **60 days** from the date of this letter. After this estimate expires, you will be required to start the meter set process again and pay all applicable fees should you still wish to receive a meter. Should you have any questions, please contact our office at (512) 303-3943.

Sincerely,
Aqua Water Supply Corporation
PO Drawer P
415 Old Austin Hwy
Bastrop Tx, 78602

Jennie Hilbig
Attorney at Law

From: David Fleming
To: Jennie Hilbig
Cc: Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject: Re: 714 Lee Rd. - Quote for water
Date: Wednesday, December 22, 2021 9:31:59 PM
Attachments: image001.png

Got it. Let me do some checking. Is there a phone number where you can be reached?

DF
(iPhone)

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<Jacob & Jenni Hilbig Aqua PCS.pdf>

From: David Fleming
To: Jennie Hilbig
Cc: Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject: Re: 714 Lee Rd. - Quote for water
Date: Wednesday, December 22, 2021 9:40:12 PM

No problem. I'll be in touch.

Thanks,

DF
(iPhone)

> On Dec 22, 2021, at 9:39 PM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
>
> Yes, my contact number is 512.573.4964.
>
> I appreciate your assistance and even more so, your prompt response.
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> > On Dec 22, 2021, at 9:32 PM, David Fleming <dfleming@aquawsc.com> wrote:
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<Jacob & Jenni Hilbig Aqua PCS.pdf>

From:	David Fleming
To:	Jennie Hilbig
Cc:	Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject:	RE: 714 Lee Rd. - Quote for water
Date:	Thursday, December 23, 2021 10:59:58 AM
Attachments:	Preliminary Service Map - Service for #8722861.pdf

Map attached per our conversation.

David Fleming, PE
Manager of Engineering
(512) 581-3451

From: Jennie Hilbig <jennie.bagwell@icloud.com>
Sent: Wednesday, December 22, 2021 9:39 PM
To: David Fleming <dfleming@aquawsc.com>
Cc: Dave McMurry <dmcmurry@aquawsc.com>; Patricia Hernandez <PHernandez@aquawsc.com>; Frank Pacheco <FPacheco@aquawsc.com>
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Yes, my contact number is 512.573.4964.

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<Jacob & Jenni Hilbig Aqua PCS.pdf>


19970.519 Service for Tract #8722861
Write a description for your map.
N
1000 ft
ANDREW MAYS LEAGUE
ABSTRACT NO. 248
JAMES OLIVER ESKEW
VOL. 586, PG. 202
R.O.W. NOT TO SCALE
LEE ROAD
211
TRACT 1
11.87 AC.
TRACT 2
10.78 AC.
TRACT 3
11 AC.
TRACT 4
TRACT 5
TRACT 7
10.88 AC.
TRACT 8
10.50 AC.
TRACT 9
10.25 AC.
TRACT 10
10.37 AC.
CONNECT SERVICES TO PROPOSED 4" WATER LINE (APPROXIMATE LOCATION SHOWN)
PROPOSED DEVELOPMENT
207
WETSEL
PG. 196
RONNA L. McGUIRE
VOL. 1749, PG. 102
Walterson School Rd
Walterson Rd
Google Earth
STEGER BIZZELL
22

From: Jennie Hilbig
To: David Fleming
Cc: Dave McMurry; Patricia Hernandez; Frank Pacheco
Subject: Re: 714 Lee Rd. - Quote for water
Date: Thursday, December 23, 2021 11:18:18 AM
Attachments: Preliminary Service Map - Service for #8722861.pdf

---

Would you happen to have the map for Dustin Wilhelm's request? I guess it's past the 60 days but if you have it, that would be fantastic!

Jennie Hilbig
Attorney at Law

> On Dec 23, 2021, at 11:00 AM, David Fleming <dfleming@aquawsc.com> wrote:
>
> Map attached per our conversation.
>
> *David Fleming, PE*
> *Manager of Engineering*
> *(512) 581-3451*
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> **Sent:** Wednesday, December 22, 2021 9:39 PM
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> **Cc:** Dave McMurry <dmcmurry@aquawsc.com>; Patricia Hernandez <PHernandez@aquawsc.com>; Frank Pacheco <FPacheco@aquawsc.com>
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> (iPhone)
>
>> On Dec 22, 2021, at 8:51 PM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
>>
>> Hi Mr. Fleming,
>>
>> I received a quote for service at 714 Lee rd.The quote, attached, is for $59,164.00.
>> The water code states that a water company must provide services to a residence in the CCN at a reasonable cost. I do not believe this quote is reasonable for a single family residence.
>> In addition, it is frustrating that there is currently a water line/s on our street. We have not received any evidence to the fact that the current waterline/s is/are not sufficient for our single family residence. The tariff states that if the line is sufficient, it would be a first come first serve basis for tapping in. Can you please advise as to the sufficiency of the current waterlines of Lee rd?
>> I have asked and was told that the customer representative doesn't know, they just get the

quotes from their engineers. I was given your name from a board member.
>>
>> I appreciate your time and any assistance you may have.
>>
>> Thank you,
>>
>> Jennie Hilbig
>> Attorney at Law
<Jacob & Jenni Hilbig Aqua PCS.pdf>

From: David Fleming
To: Jennie Hilbig
Cc: Patricia Hernandez; Frank Pacheco; Dave McMurry
Subject: RE: 714 Lee Rd. - Quote for water
Date: Thursday, December 23, 2021 11:24:12 AM

Same to you.

David Fleming, PE
Manager of Engineering
(512) 581-3451

From: Jennie Hilbig <jennie.bagwell@icloud.com>
Sent: Thursday, December 23, 2021 11:22 AM
To: David Fleming <dfleming@aquawsc.com>
Subject: Re: 714 Lee Rd. - Quote for water

Thanks a ton!
I really appreciate your time.
Hope you have a Merry Christmas.

Jennie Hilbig
Attorney at Law

> On Dec 23, 2021, at 11:20 AM, David Fleming <dfleming@aquawsc.com> wrote:
>
> I don't. I will have to get Patricia to send it to you when she gets back to the office.
>
> *David Fleming, PE*
> *Manager of Engineering*
> *(512) 581-3451*
>
> **From:** Jennie Hilbig <jennie.bagwell@icloud.com>
> **Sent:** Thursday, December 23, 2021 11:15 AM
> **To:** David Fleming <dfleming@aquawsc.com>
> **Cc:** Dave McMurry <dmcmurry@aquawsc.com>; Patricia Hernandez <PHernandez@aquawsc.com>; Frank Pacheco <FPacheco@aquawsc.com>
> **Subject:** Re: 714 Lee Rd. - Quote for water
>
> Would you happen to have the map for Dustin Wilhelm's request? I guess it's past the 60 days but if you have it, that would be fantastic!
>
> Jennie Hilbig
> Attorney at Law

On Dec 23, 2021, at 11:00 AM, David Fleming <dfleming@aquawsc.com> wrote:

Map attached per our conversation.

David Fleming, PE
Manager of Engineering
(512) 581-3451

From: Jennie Hilbig <jennie.bagwell@icloud.com>
Sent: Wednesday, December 22, 2021 9:39 PM
To: David Fleming <dfleming@aquawsc.com>
Cc: Dave McMurry <dmcmurry@aquawsc.com>; Patricia Hernandez <PHernandez@aquawsc.com>; Frank Pacheco <FPacheco@aquawsc.com>
Subject: Re: 714 Lee Rd. - Quote for water

Yes, my contact number is 512.573.4964.

I appreciate your assistance and even more so, your prompt response.

Jennie Hilbig
Attorney at Law

> On Dec 22, 2021, at 9:32 PM, David Fleming <dfleming@aquawsc.com> wrote:
>
> Got it. Let me do some checking. Is there a phone number where you can be reached?
>
> DF
> (iPhone)
>
> > On Dec 22, 2021, at 9:29 PM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
> >
> > Certainly, attached is the letter we received with the previous document.
> >
> > <image001.png>

Jennie Hilbig
Attorney at Law

> On Dec 22, 2021, at 9:26 PM, David Fleming <dfleming@aquawsc.com> wrote:
>
> Could you send the letter, as well? I will need to see what the engineers determined and ask questions from there. If the letter is not readily available, I can get the Development Services Manager to provide a file copy.
>
> Thanks,
>
> DF
> (iPhone)
>
> > On Dec 22, 2021, at 9:21 PM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
> >
> > Oh goodness, that was any fault. I failed to attach it.
> > Here it is.
> >
> > Jennie Hilbig
> >
> > > On Dec 22, 2021, at 9:17 PM, David Fleming <dfleming@aquawsc.com> wrote:
> > >
> > > Hi, Jennie:
> > >
> > > I do not see the

attachment (I assume it is a Feasibility Study). Maybe it's an iPhone issue. I'll check on my office computer in the morning.
>
> Thanks,
>
> DF
> (iPhone)
>
>> On Dec 22, 2021, at 8:51 PM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
>>
>> Hi Mr. Fleming,
>>
>> I received a quote for service at 714 Lee rd.The quote, attached, is for $59,164.00.
>> The water code states that a water company must provide services to a residence in the CCN at a reasonable cost. I do not believe this quote is reasonable for a single family residence.
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not sufficient for our single family residence. The tariff states that if the line is sufficient, it would be a first come first serve basis for tapping in. Can you please advise as to the sufficiency of the current waterlines of Lee rd?
>> I have asked and was told that the customer representative doesn't know, they just get the quotes from their engineers. I was given your name from a board member.
>>
>> I appreciate your time and any assistance you may have.
>>
>> Thank you,
>>
>> Jennie Hilbig
>> Attorney at Law
<Jacob & Jenni Hilbig Aqua PCS.pdf>

From: David Fleming
To: Jennie Hilbig
Cc: Patricia Hernandez; Frank Pacheco; Dave McMurry
Subject: Re: 714 Lee Rd. - Quote for water
Date: Saturday, December 25, 2021 3:17:01 PM

Merry Christmas, Jennie.

No. Aqua has very strict specifications regarding installation of lines that the membership will have to maintain in perpetuity.

DF
(iPhone)

> On Dec 25, 2021, at 10:06 AM, Jennie Hilbig <jennie.bagwell@icloud.com> wrote:
>
> Hi Mr. Fleming,
>
> Merry Christmas! I had a quick question.
> Would Aqua allow the resident to do the boaring (so) and trenching to save cost?
>
> Jennie Hilbig
> Attorney at Law
>
> > On Dec 23, 2021, at 11:24 AM, David Fleming <dfleming@aquawsc.com> wrote:
> >
> > Same to you.
> >
> > *David Fleming, PE*
> > *Manager of Engineering*
> > *(512) 581-3451*
> >
> > **From:** Jennie Hilbig <jennie.bagwell@icloud.com>
> > **Sent:** Thursday, December 23, 2021 11:22 AM
> > **To:** David Fleming <dfleming@aquawsc.com>
> > **Subject:** Re: 714 Lee Rd. - Quote for water
> >
> > Thanks a ton!
> > I really appreciate your time.
> > Hope you have a Merry Christmas.
> >
> > Jennie Hilbig
> > Attorney at Law

----- Forwarded Message -----
From: Jennie Hilbig <jennie.hilbig@gmail.com>
To: J. D. Mican <jdmicancpa@yahoo.com>
Sent: Wednesday, December 22, 2021, 01:55:09 PM CST
Subject: Re: Quote for new water line/meter

Thank you.

Jennie Hilbig

On Dec 22, 2021, at 1:53 PM, J. D. Mican <jdmicancpa@yahoo.com> wrote:

I do not have Dave McMurray's cell phone number or other personal telephone number. You need to contact the office of Aqua Water and they should be able to provide you with a contact number for Dave McMurray. He may be taking some personal time of during the Christmas season.

On Wednesday, December 22, 2021, 01:35:00 PM CST, Jennie Hilbig <jennie.hilbig@gmail.com> wrote:

Thank you Mr. Micah for your prompt response.
Do you have contact information for Dave McMurray?

Thank you again,

Jennie Hilbig
Attorney at Law

On Dec 22, 2021, at 1:15 PM, J. D. Mican <jdmicancpa@yahoo.com> wrote:

Your email inquiry indicates that a water line currently exists on your street. I am not knowledgeable of the circumstances surrounding your situation; consequently, I would suggest that you arrange for a meeting with Mr. Dave McMurray, Aqua's general manager to answer you questions.

On Wednesday, December 22, 2021, 12:12:46 PM CST, Jennie Hilbig <jennie.hilbig@gmail.com> wrote:

My apologies, I failed to attach the quote. Here it is.

Jennie Hilbig
Attorney at Law

On Dec 22, 2021, at 12:06 PM, Jennie Hilbig <jennie.hilbig@gmail.com> wrote:

Hi Mr. Mican,

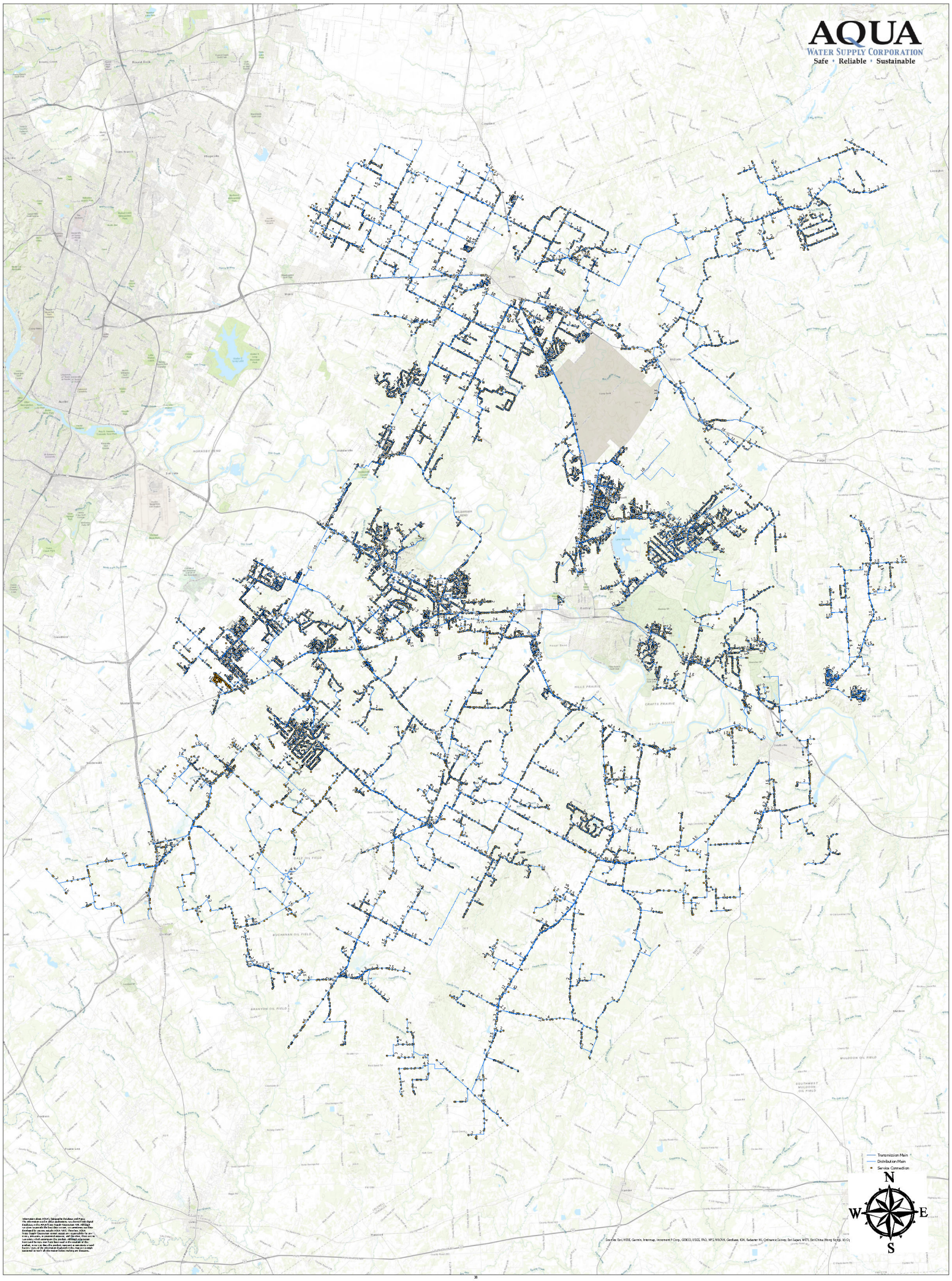
I am contacting you to make a complaint and see if there is anything we can do to resolve my frustrations.
I received a quote for service at 714 Lee rd. The quote, attached, is for $59,164.00.
The water code states that a water company must provide services to a residence in the CCN at a reasonable cost. I do not believe this quote is reasonable for a single family residence.
In addition, it is frustrating that there is currently a water line on our street. We have not received any evidence to the fact that the current waterline is not sufficient for our single family residence. I have asked and was told that the customer representative doesn't know, they just get the quotes from their engineers.
In addition, should we pay the full amount for a new waterline, it seems unfair that all future residents can tap into the waterline without having to foot the bill, as we have.

I appreciate your time and any assistance you may have.

Thank you,

Jennie Hilbig
Attorney at Law

Attachment B


AQUA
WATER SUPPLY CORPORATION
Safe • Reliable • Sustainable
Transmission Main
Distribution Main
Service Connection
N
W
E
S

Attachment C*

*Excel file attached separately

Attachment D

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
PHONE 512.930.9412
FAX 512.930.9416
WEB STEGERBIZZELL.COM
TEXAS REGISTERED ENGINEERING FIRM F-181
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

5 Year Capital Improvement Program (FY 2015 – FY 2019)

for

Aqua Water Supply Corporation

Bastrop County, Texas

October, 2014

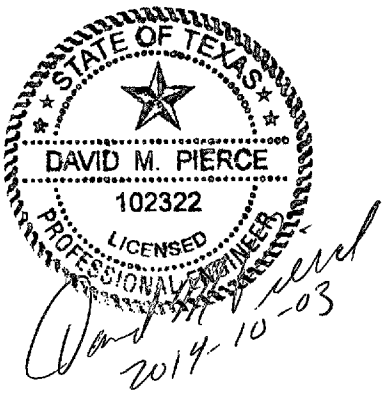
5 Year Capital Improvement Program (FY 2015 – FY 2019)

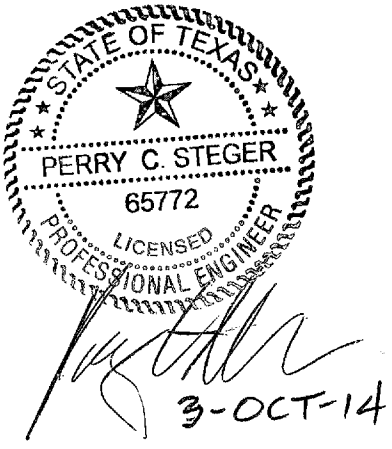
for

Aqua Water Supply Corporation

Bastrop County, Texas

October, 2014





5 Year Capital Improvement Program (FY 2015 – FY 2019)

for

Aqua Water Supply Corporation

Bastrop County, Texas

October, 2014

Board Members:

Cliff Kessler	President
Earl W. Steinbach	Vice-President
William F. "Bill" Tomsu	Secretary-Treasurer
Craig Williams	Director
Joe Flahive	Director
David Glass	Director
Shawn Griffin	Director
H.C. "Duke" Ducharme	Director

Management:

Dave McMurry	General Manager
David Fleming, PE	Manager of Engineering

Prepared by:

STEGER BIZZELL

Table of Contents

Appendices

Executive Summary

Based on historical population growth, Aqua Water Supply Corporation is projected to more than double the existing number of connections in its system by the year 2035. This Capital Improvement Program (CIP) includes an analysis of Aqua's existing water system, a population growth analysis, a discussion of Aqua's long-term water supply planning, and a series of capital improvement project recommendations that will help increase water production, storage, and transmission capacity, allowing Aqua to meet its current and future demands.

This CIP predicts a system-wide average annual growth rate of 4.5% for the next 21 years, resulting in growth from 18,694 Living Unit Equivalents (LUEs) to 49,534 LUEs. Peak day water supply requirements are projected to be as high as 41.3 MGD (0.6 GPM per LUE) in 2035.

The total proposed project cost for FY2015 is $5,538,988, and the total proposed project cost for the Capital Improvement Program through 2019 is $27,713,719. Here is a summary of the 5-year recommended water system improvement projects through 2019:

North of the Colorado River	12,221,847
South of the Colorado River	7,791,872
Tank Painting	2,500,000
Undesignated Miscellaneous	1,000,000
TxDOT Projects	2,500,000
Facility Upgrades – Engineering	500,000
Facility Upgrades - Distribution	250,000
Facility Upgrades – Production	950,000
Total 5-Year Capital Improvement Projects	**$27,713,719**

This CIP describes a construction sequence for the recommended projects that will keep Aqua compliant with TCEQ regulations while increasing the system's capacity in time to accommodate the area's projected growth. The CIP also includes a discussion on long-term water supply planning to ensure that Aqua meets its water supply needs for the next 50 years. As the Capital Improvement Program projects are implemented, Aqua WSC will see the following benefits:

- Increased water supply sources to meet long-term future demands
- Improved system operating efficiency by increasing transmission line capacity, adding elevated storage, and decommissioning older existing pump stations
- Increased ability to transmit water from high well production areas in the eastern portion of Aqua's CCN to high population areas in the western portion of Aqua's CCN
- Efficient, cost-effective use of capital expenditures to meet future growth demands

Background

Aqua Water Supply Corporation is a rural non-profit water supply corporation with a 993 square-mile CCN that includes most of Bastrop County as well as portions of Caldwell, Lee, and Travis Counties. Aqua WSC began in the 1970s as a result of loans and grants from the U.S. Farm and Home Administration intended to provide safe drinking water at reasonable prices to rural areas. Today, Aqua's system consists of 19 interlocking pressure planes and over 1,800 miles of pipeline. Aqua services over 18,071 connections and has a current well production capacity of 17,017 GPM, a total storage capacity of 14.2 MG (6.5 MG of elevated storage), and a total pumping capacity of 50,324 GPM.

Scope

Based on historical population growth, Aqua is projected to more than double the existing number of connections in its system over the next 21 years. This CIP includes an analysis of Aqua's existing system, a projected population growth analysis, a discussion of Aqua's long-term water supply planning, and a series of capital improvement project recommendations that will increase water production, storage, pumping, and transmission capacity which Aqua needs in order to meet 21-year growth demands.

Design Requirements

The Texas Commission on Environmental Quality (TCEQ) regulates and inspects public drinking water supplies. Minimum Water System Capacity Requirements, as defined in Texas Administrative Code Chapter 290, require community water systems with more than 250 customers to have at least 2 wells with a total capacity of 0.6 GPM per connection, a total storage capacity of 200 gallons per connection, and an elevated storage capacity of 100 gallons per connection. If fewer than 2,500 connections are served, a hydropneumatic tank (HPT) with a minimum capacity of 20 gallons per connection is an acceptable replacement for elevated storage. Generally, large community water systems are required to have at least 2 pumps with a total capacity of 2.0 GPM per connection or a total capacity of 1000 GPM and the ability to meet peak hourly demands with the largest pump offline at each pump station or pressure plane. However, systems with an elevated storage capacity of 200 gallons per connection can also meet TCEQ pumping requirements by having 2 service pumps at each pump station or pressure plane with a combined pumping capacity of at least 0.6 GPM per connection. The TCEQ also requires that Aqua maintain a minimum pressure of 35 psi for each connection under normal conditions and 20 psi for each connection under fire flow conditions. Additionally, there are restrictions on the number of connections allowed on a dead-end line, in accordance with this chart.

Minimum Line Size	Maximum Number of Connections
2"	10
2.5"	25
3"	50
4"	100
5"	150
6"	250
8" and larger	>250

The above chart is appropriate for determining when to upsize small lines. For new developments, lines should be at least 6" to support fire flow.

Design Philosophy

The CIP is based on a set of guidelines that help create the most cost-effective plan possible. Planning too far in advance creates unnecessarily large and costly projects that could remain underused for years, leading to higher capital expenditures and maintenance costs. Planning with too close a horizon results in the replacement or paralleling of recently installed undersized facilities, which can be considerably more expensive than building larger facilities in the first place. This plan uses different design timeframes for different system components, as detailed in the following chart:

Component	Time Frame
Water Supply	40-60 Years
Pipelines	15-25 Years
Pump Stations	15-25 Years
Elevated Storage	12-22 Years
Water Treatment Plants	10-20 Years
Pump Installation	5-7 Years
Water Treatment Plant Expansion	5-7 Years
Water Wells	5-7 Years

Because the cost of increasing the diameter of a proposed water line in order to double capacity typically only increases the initial installed cost by 20%, pipeline construction warrants a 20-year planning horizon. Although water treatment facilities are designed with a 10 to 20-year horizon, capacities can be increased incrementally, and 5 to 7 years is an appropriate design timeframe for these expandable facilities.

Operating and maintenance (O&M) costs are factored in when determining appropriate design timeframes for different system components. For example, O&M expenses for a pipeline are relatively low compared to construction costs; therefore, it is more cost-effective to design pipelines for a longer timeframe than it is to operate and maintain intensive facilities, such as water treatment plants and storage tanks. Similarly, in designing pump stations it makes sense to size the pump building and yard piping for twenty years but to install sufficient pumping capacity for 5 years of projected growth.

Existing Water System

Hydraulic modeling software was used to simulate Aqua's current system and identify any areas where the system was deficient in production, storage, or transmission capacity. An audit of the entire Aqua WSC system was performed, checking for TCEQ compliance in terms of well supply, total and elevated storage capacity, and pumping capacity.

Production Capacity

The TCEQ requires Aqua to have 0.6 GPM of water supply per connection in its system. For the audit, actual withdrawal rates for each well from April 2014 were used in order to accurately represent Aqua's well capacity. Aqua's CCN was divided into the 4 production zones listed below with their associated growth regions.

Northwest: Camp Swift, County Line North, County Line South, ET, and Webberwood

Northeast: Blue, Butler/McDade North, Butler/McDade South, HT, Lotman, and Rocky Hill

Southwest: Flag Hill, FM812, Highview, McMahan, Nuse, S, Sandhills, Texas Hill North, Texas Hill South, and Texas Hill West

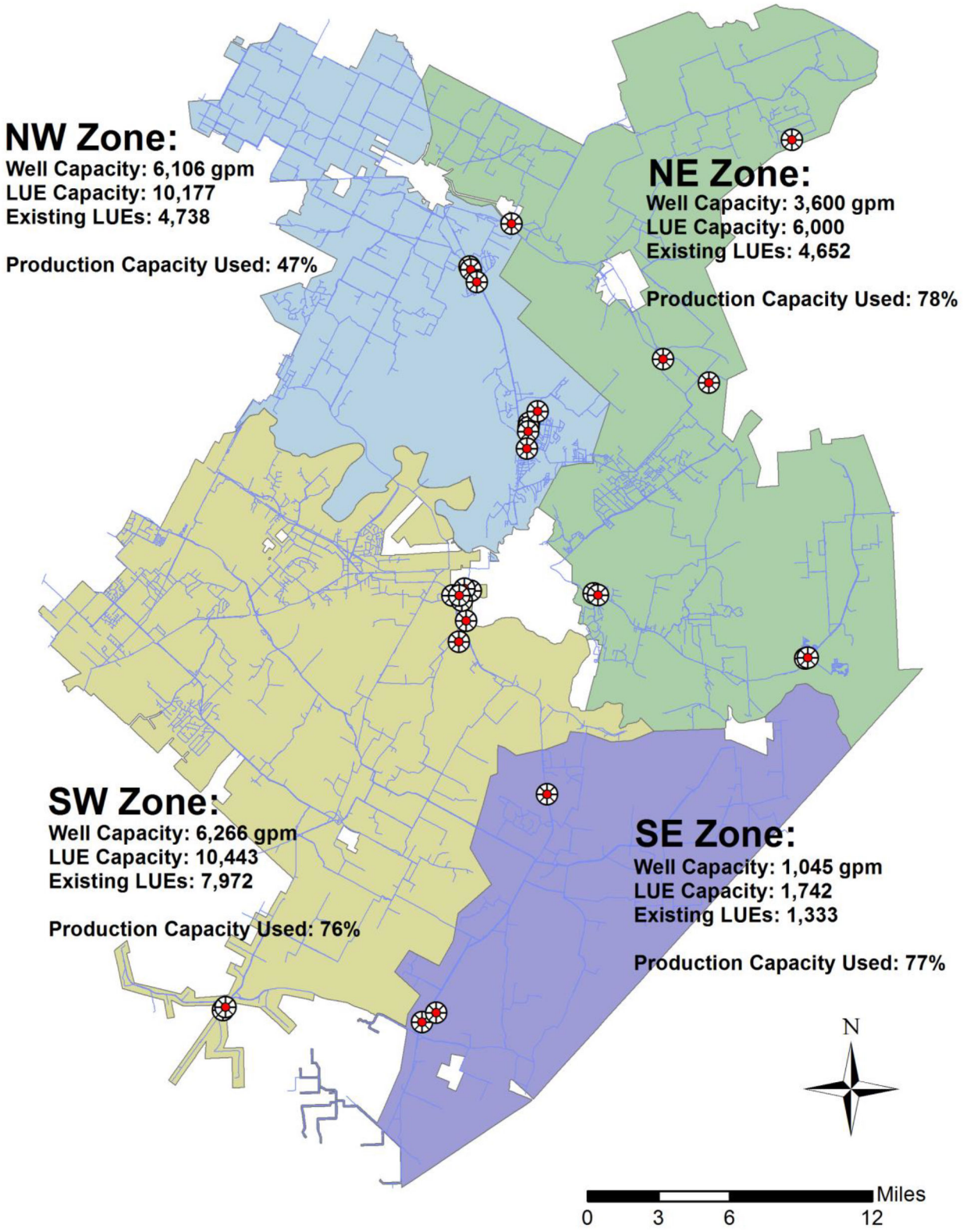
Southeast: OH, Smithville, and Texas Hill East

Aqua's current production capacity in each of the production zones is above the TCEQ's minimum, and overall, the system's wells produce 57% more than required. These findings are summarized in Table 1. Here, a 0% margin indicates that the requirements are met exactly, and a negative margin indicates that more production is necessary to meet regulations. The map on the following page shows well locations in each production zone and the production capacity in terms of LUEs.

Table 1: TCEQ Production Requirements

Current Production Capacity		Rule: 0.6 GPM/connection		
Production Zone	**Number of Connections**	**Required (GPM)**	**Actual (GPM)**	**Margin**
Northwest	4,580	2,748	6,106	122%
Northeast	4,496	2,698	3,600	33%
Southwest	7,706	4,624	6,266	36%
Southeast	1,289	773	1,045	35%
All North	9,076	5,446	9,706	78%
All South	8,995	5,397	7,311	35%
Entire System	18,071	10,843	17,017	57%

Production Capacity and Well Locations



The monthly production from Aqua's wells during 2013 is shown in Table 2. The maximum daily production in 2013 was 9,099 GPM, which is considerably less than the system's production capacity of 17,957 GPM. The system's peaking factor, the ratio of maximum daily production to average production, is 1.79. This peaking factor was used as the demand multiplier in the 2013 model to illustrate Aqua's system on a high demand day.

Table 2: Total Monthly Production in 2013

2013 Water Production Summary					
	Monthly	Daily			
	Total (gal)	**Min (gal)**	**Max (gal)**	**Avg (gal)**	**Max (GPM)**
January	194,193,200	5,466,680	7,142,920	6,264,297	4,960
February	172,461,753	5,417,640	7,098,270	6,159,348	4,929
March	207,840,387	5,760,540	7,817,660	6,704,529	5,429
April	206,048,180	5,597,340	9,066,060	6,868,273	6,296
May	221,688,020	5,557,890	9,016,170	7,151,226	6,261
June	290,228,300	6,849,280	13,102,380	9,674,277	9,099
July	295,802,620	6,717,900	12,093,430	9,542,020	8,398
August	303,179,940	7,951,520	11,442,720	9,779,998	7,946
September	226,964,600	6,105,900	10,672,330	7,565,487	7,411
October	188,698,970	5,322,560	6,880,220	6,087,064	4,778
November	171,815,580	5,092,620	6,360,980	5,727,186	4,417
December	185,556,590	5,267,420	7,027,580	5,985,696	4,880
	2013 Yearly Total (gal)	**Min Day (gal) (Nov. 3rd)**	**Max Day (gal) (June 30th)**	**Avg Day (gal)**	**Max Day (GPM)**
	2,664,478,140	**5,092,620**	**13,102,380**	**7,299,940**	**9,099**
			Peaking Factor:	**1.79**	

Storage Capacity

The TCEQ stipulates that Aqua must have a total storage capacity of 200 gallons per connection and an elevated storage capacity of 100 gallons per connection in its system. If fewer than 2,500 connections are served, a hydropneumatic tank (pressure tank) with a minimum capacity of 20 gallons per connection is an acceptable replacement for elevated storage. Currently, there are 13.4 MG of storage capacity, 5.8 MG of which are elevated. Aqua's tank capacities, both total and elevated, are well above the TCEQ's minimum in all of the storage zones. The pressure planes making up each storage zone are listed in the first column in Table 3, which summarizes Aqua's current elevated storage capacity. Similarly, Table 4 summarizes Aqua's current total storage capacity.

Each of the defined storage zones meets the TCEQ standard for storage capacity. Aqua has 221% excess elevated storage capacity and 272% excess total storage capacity in the system as a whole. The Butler/McDade and ET storage zone includes the capacity of the Circle D elevated storage tank. Without Circle D, there are 350,000 gallons of elevated storage (26% margin) and 1,427,800 gallons of total storage (158% margin). It should be noted that the overall system elevated storage margins do not take

pressure tanks into account. Additional information about how the storage zones were chosen is given in Appendix C.

Table 3: TCEQ Elevated (or Hydropneumatic) Storage Capacity Requirements

Current Elevated/HPT Storage Capacity				Rule: 100 gal Elevated or 20 gal HPT/connection		
Storage Zone	**Number of Connections**	**Required Elevated (gal)**	**Actual Elevated (gal)**	**Actual HPT (gal)**	**Elevated Storage Margin**	**HPT Storage Margin**
Blue	395	39,500	49,000	0	24%	-
Bulter/McDade and ET	2,769	276,900	1,100,000	0	297%	-
Camp Swift	1,758	175,800	500,000	0	184%	-
County Line	1,803	180,300	602,000	0	234%	-
HT and Rocky Hill	1,842	184,200	750,000	0	307%	-
Lotman	107	10,700	23,500	0	120%	-
Webberwood	402	40,200	250,000	0	522%	-
Flag Hill and Sand Hills	169	16,900	100,000	0	492%	-
FM 812	955	95,500	200,000	0	109%	-
Highview	833	83,300	500,000	0	500%	-
McMahan	33	660	0	14,500	-	2097%
OH	186	18,600	37,000	0	99%	-
S	720	72,000	500,000	0	594%	-
Smithville and Texas Hill (south)	1,565	156,500	500,000	0	219%	-
Texas Hill (north) and Nuse	4,534	453,400	1,425,000	0	214%	-
Total North	9,076	907,600	3,274,500	0	261%	-
Total South	8,995	896,200	3,262,000	14,500	264%	-
Entire System	18,071	1,803,800	6,536,500	14,500	262%	-

Table 4: TCEQ Total Storage Capacity Requirements

Current Total Storage Capacity		Rule: 200 gal Total/connection		
Storage Zone	**Number of Connections**	**Required Total (gal)**	**Actual Total (gal)**	**Total Storage Margin**
Blue	395	79,000	98,000	24%
Bulter/McDade and ET	2,769	553,800	2,177,800	293%
Camp Swift	1,758	351,600	3,250,000	824%
County Line	1,803	360,600	1,102,000	206%
HT and Rocky Hill	1,842	368,400	950,400	158%
Lotman	107	21,400	93,500	337%
Webberwood	402	80,400	250,000	211%
Flag Hill and Sand Hills	169	33,800	144,000	326%
FM 812	955	191,000	325,000	70%
Highview	833	166,600	650,000	290%
McMahan	33	6,600	64,500	877%
OH	186	37,200	121,000	225%
S	720	144,000	2,239,500	1455%
Smithville and Texas Hill (south)	1,565	313,000	659,500	111%
Texas Hill (north) and Nuse	4,534	906,800	2,067,000	128%
Total North	9,076	1,815,200	7,921,700	336%
Total South	8,995	1,799,000	6,270,500	249%
Entire System	18,071	3,614,200	14,192,200	293%

Pumping Capacity

Aqua has over 200 gallons of elevated water storage per connection in most its system, and for these areas, the TCEQ requires that Aqua also have at least 2 service pumps with a combined capacity of at least 0.6 GPM per connection with the largest pump out of service at each pump station or pressure plane. Table 5 summarizes Aqua's current rated pumping capacity for the regions qualifying for the 0.6 GPM per connection standard. The pump stations were grouped based on shared distribution areas throughout the CCN; Appendix C has more information on the pressure plane groupings. The capacity of each group of pump stations meets the TCEQ pumping capacity requirement. The Booth, L, and M pump stations, which serve the HT and Rocky Hills pressure planes, have the lowest available capacity of 14%.

Table 5: TCEQ Pumping Capacity Requirements

Current Pumping Capacity		Rule: 0.6 GPM / connection at each pump station		
Pump Stations	**Number of Connections**	**Required (GPM)**	**Actual Rated (GPM)**	**Margin**
Booth, L, and M	1,842	1,105	1,260	14%
C, McDade, Hwy 21, and FM 1441	2,152	1,291	3,540	174%
Camp Swift, MISD, and ER	4,580	2,748	12,800	366%
Pine Hills	107	64	100	56%
Delhi and Watterson	1,565	939	1,540	64%
Eskew, S (TU), and TU	4,534	2,720	15,440	468%
FM 812 and XH	955	573	740	29%
S (Watterson)	720	432	465	8%
Sandhills	169	101	148	46%
Highview	833	500	700	40%
Total North	8,714	5,209	17,700	240%
Total South	8,995	5,704	19,957	250%
Entire System	17,709	10,912	37,657	245%

The areas which do not qualify for the 0.6 GPM per connection standard are the Blue, OH, and McMahan pressure planes, which are all isolated from the rest of Aqua's system. Blue's well and elevated storage within the pressure plane allow it to meet TCEQ guidelines. Based on TCEQ regulations, OH and McMahan must provide 2.0 GPM of pumping capacity per connection. McMahan, having only about 33 connections and a rated pumping capacity of 740 GPM meets this standard easily. OH currently has around 186 connections, requiring 372 GPM rated capacity, and only 368 GPM total pumping capacity at the O Pump Station. The OH pressure plane has 50% less than the mandated capacity; any growth in this region will result in a larger discrepancy. A CIP project has been included to add a third pump at the O Pump Station as a short-term solution that will bring OH up to TCEQ standards. A long term solution, replacing the OH standpipe with an elevated storage tank, is also proposed.

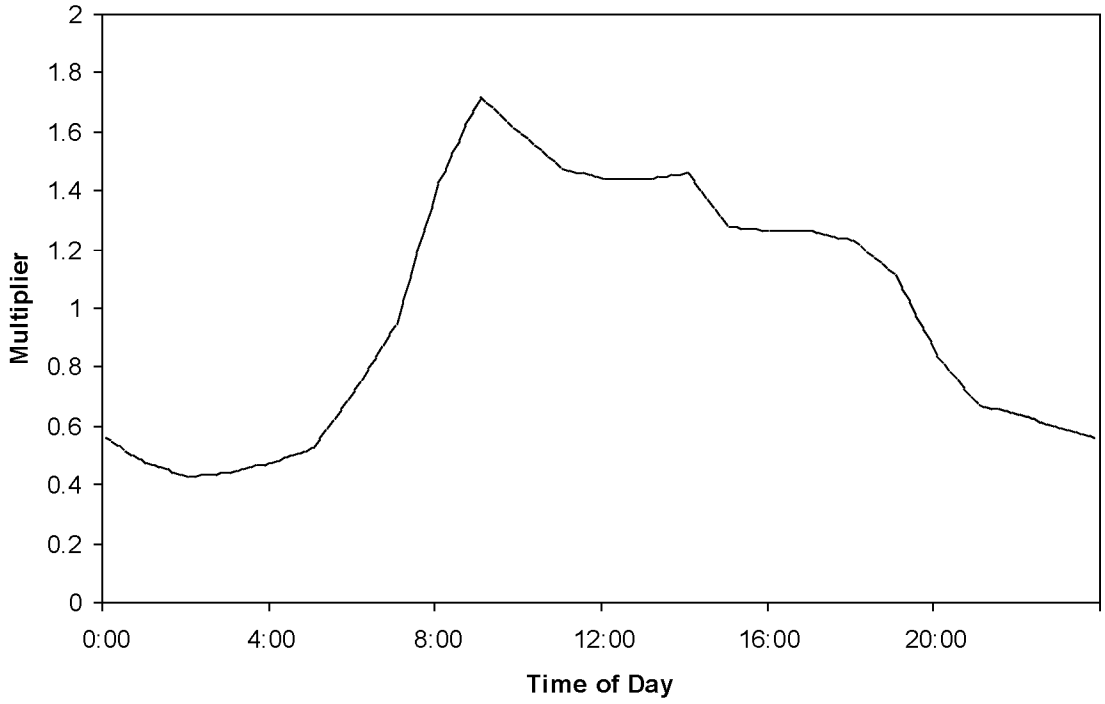
Design Methodology

Software developed by Steger Bizzell was used to create an EPANET[1] model of Aqua's water system based on Aqua's geographic information system (GIS) database. The model captures the entire existing distribution network, including all pump stations, storage tanks, wells, treatment facilities, and pipe lengths, diameters, and material types. To simulate Aqua's system as accurately as possible, the model

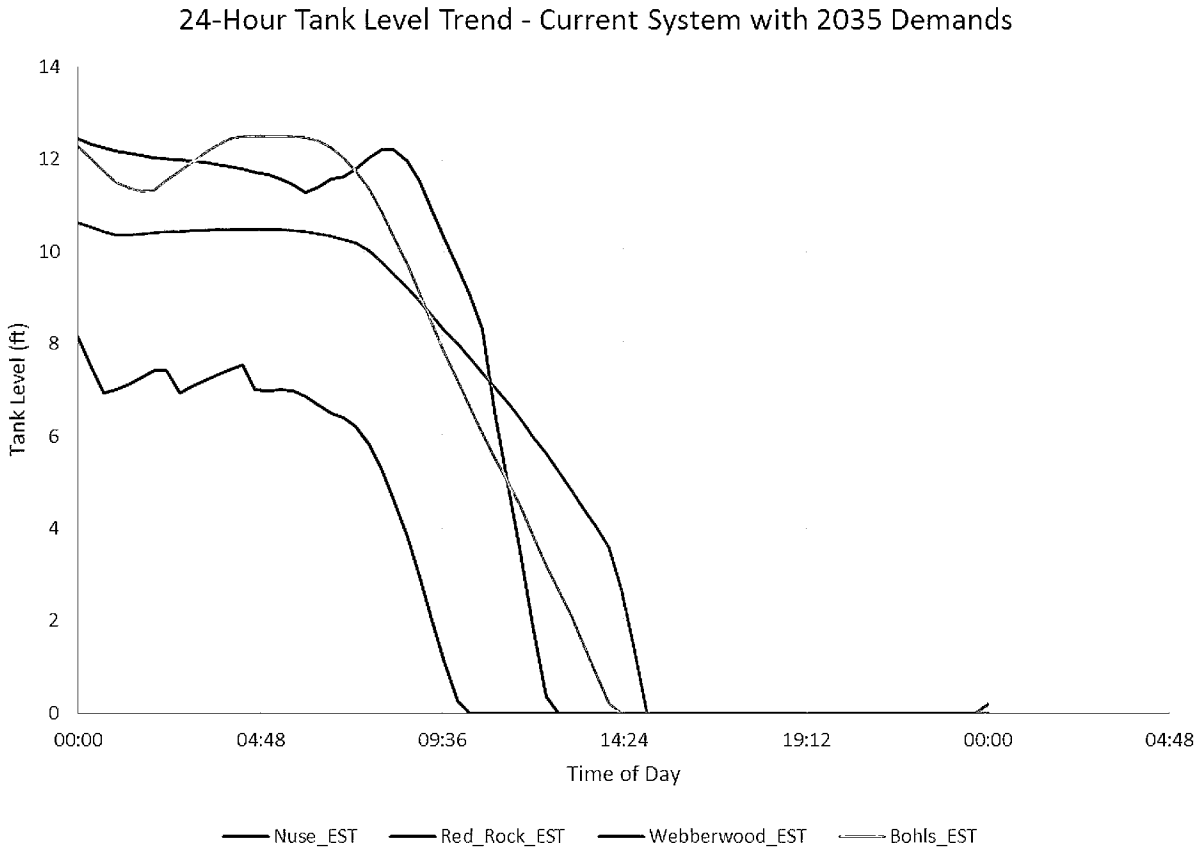
[1] EPANET is a software package for hydraulic modeling freely available from the Environmental Protection Agency.

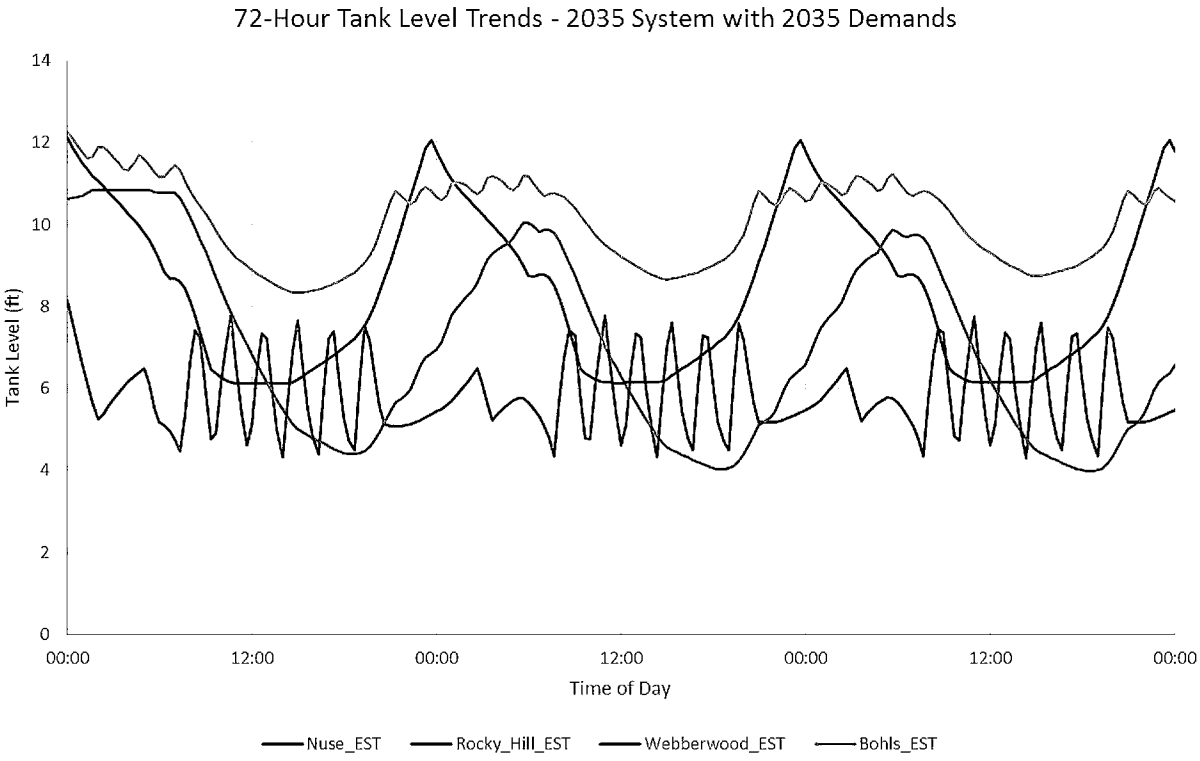
uses actual water demands for each meter in the system. Models were created for Aqua's existing system and with infrastructure added to meet projected 2020 and 2035 demands.

This software made it possible to perform extended period simulations predicting system behavior over three or more consecutive peak-demand days, including the operation of pumps, control valves, and the emptying and filling of storage tanks. A 24-hour demand-multiplier pattern (see the chart on the next page) was applied to each connection in the model to simulate real-world, peak-day demand patterns typical for a retail water system. As the chart below shows, demand is highest during mid-morning hours and lowest during early morning hours. The simulation was run for at least three consecutive peak demand days, long enough to show that the system could meet demand, maintain tank levels, and maintain customer pressures even if the high demand persisted indefinitely.



The top chart on the following page shows elevated storage tank behavior for the existing system with 21-year demands added. As the chart indicates, the existing system does not have the production, storage, and transmission capacity to handle the projected demands of the next 21 years. The bottom chart shows elevated storage tank behavior with 21-year demands after all the improvements recommended in this CIP were added to Aqua's system model. Tank levels are able to fully recover at the end of each day, indicating that the system will have adequate production, storage, and transmission capacity to meet 21-year demands with the proposed improvements.


24-Hour Tank Level Trend - Current System with 2035 Demands
Tank Level (ft)
14
12
10
8
6
4
2
0
00:00
04:48
09:36
14:24
19:12
00:00
04:48
Time of Day
Nuse_EST
Red_Rock_EST
Webberwood_EST
Bohls_EST

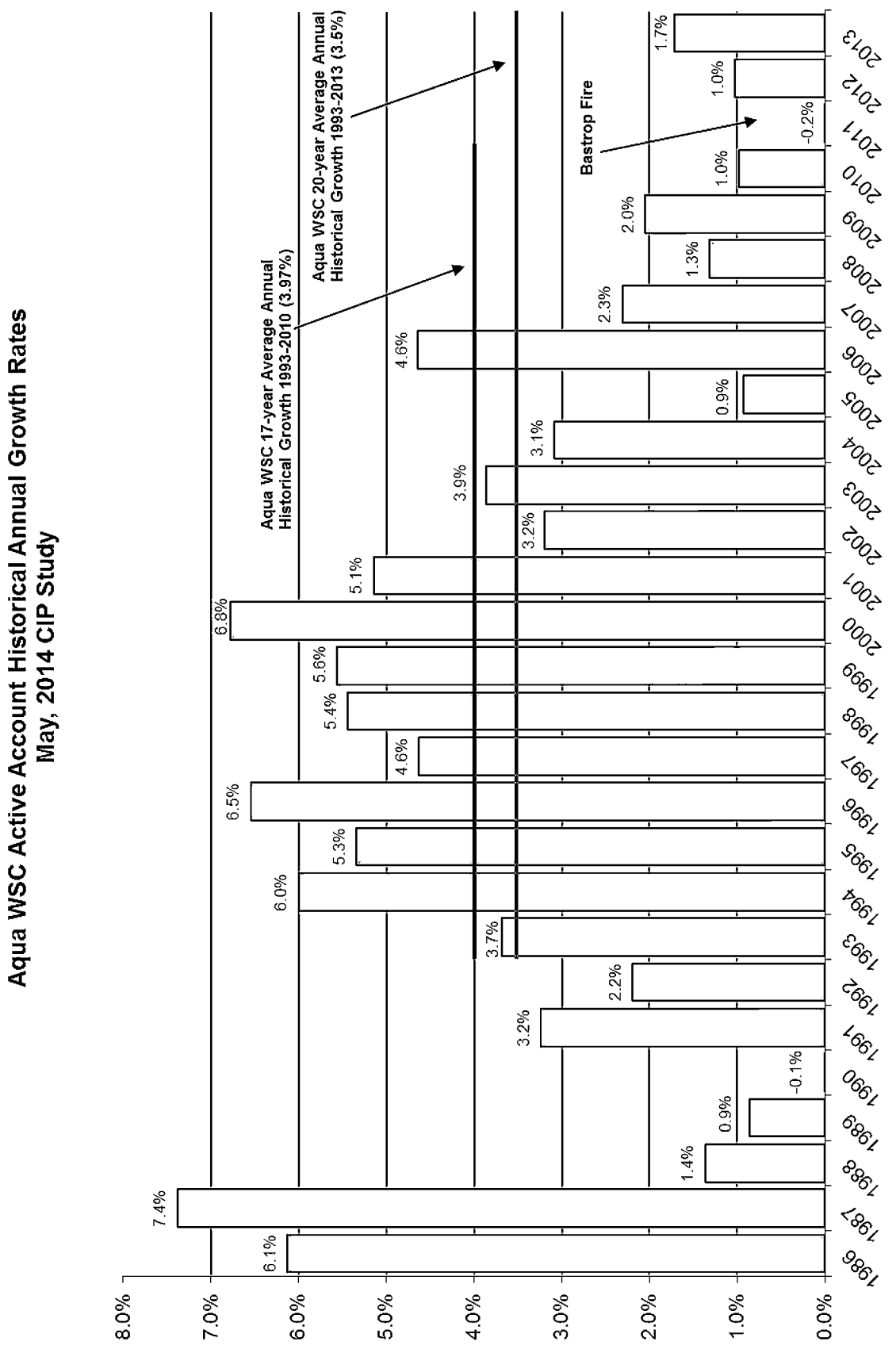

72-Hour Tank Level Trends - 2035 System with 2035 Demands
Tank Level (ft)
14
12
10
8
6
4
2
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
Time of Day
Nuse_EST
Rocky_Hill_EST
Webberwood_EST
Bohls_EST

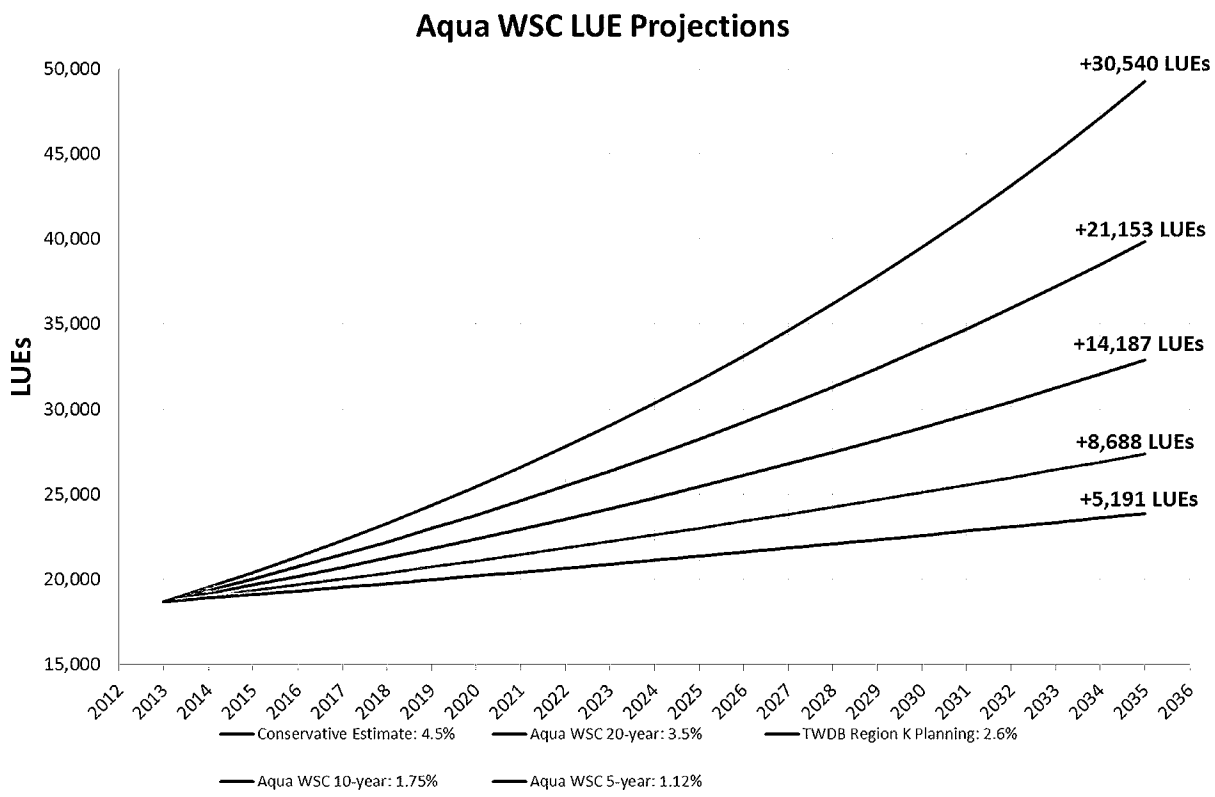
Population Growth Analysis

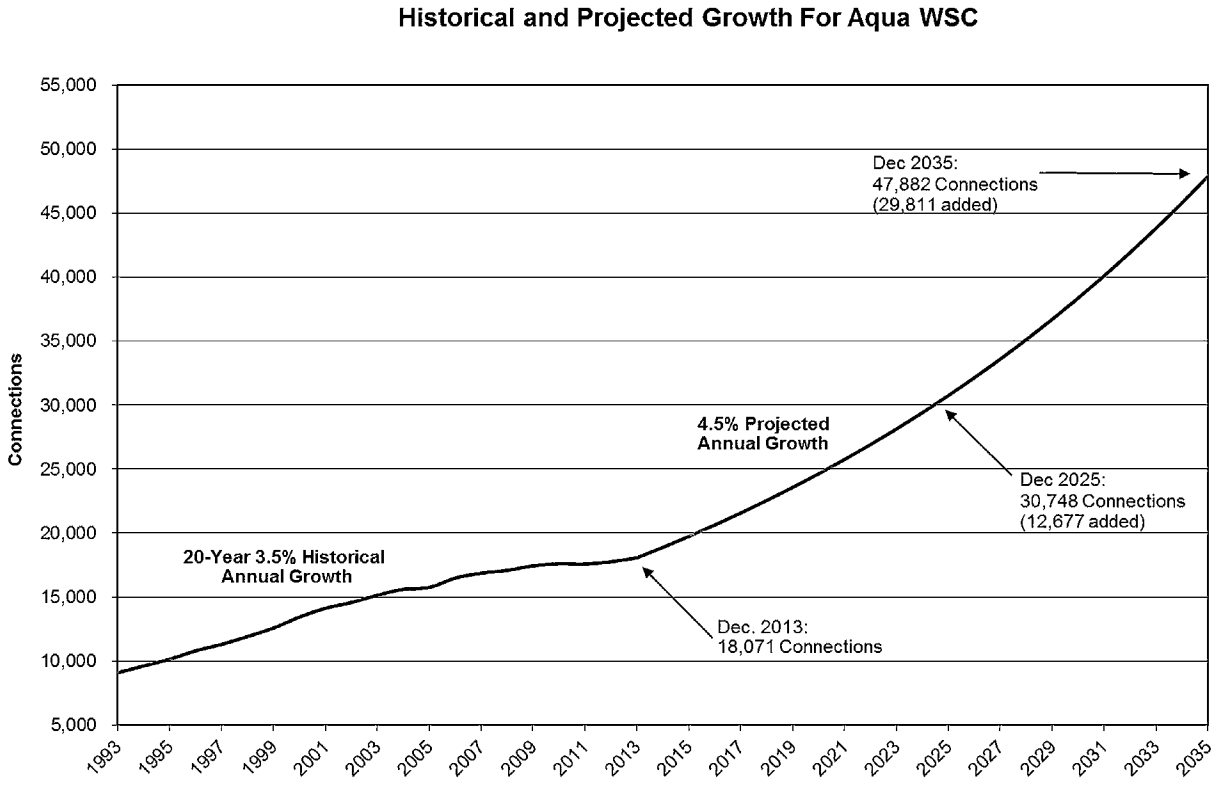
As the bar chart on the next page indicates, Aqua's system grew at an average annual rate of 3.5% over the last 20 years. The graph at the top of page 16 shows the projected number of LUEs in Aqua's system based on the 20-year, the 10-year, and the 5-year average annual growth rates, as well as the growth rate expected by TWBD for Aqua WSC. The 2011 Bastrop fire negatively impacted Aqua's growth; however, the average annual growth rate for the 17 years prior to the fire was 3.97%. Taking known developments, such as XS Ranch into account, a conservative estimate for future growth is 4.5% now that Bastrop has recovered from the fire. A plot of the historical and anticipated growth in terms of the number of connections is on page 16.

In order to accurately model Aqua's system, the CCN was divided into 24 growth regions based on common population trends and each was assigned an annual growth rate factor ranging from a "very low" growth rate of 1% to a "very high" growth rate of 5%. These factors were chosen based on the size of any known developments, the growth rates of meters, parcels, and population in each region. There are 2 exceptions to this system. Because the population growth in the County Line North area has been so high (11.3% annually), it was assigned a 10.0% growth rate factor. XS Ranch, a major new development in Camp Swift, will be a new wholesale customer for Aqua and is expected to grow linearly to reach 7,431 LUEs by 2035. The remainder of Camp Swift was given a growth rate factor of 0.5% to account for any population growth outside of XS Ranch. The other growth regions' contributions were adjusted slightly to produce the overall projected annual system growth rate of 4.5%.

ArcGIS tools were used to count the number of meters, parcels, and residents in each growth region for two different years and calculate the average annual growth rate. Data, growth calculations, and maps illustrating the historical growth for each region are in Appendix A, which includes a more detailed description of the analysis process. The table on page 17 summarizes the growth projections for each region in Aqua's CCN, and Appendix B has a series of maps describing the distribution of current and future LUEs throughout the system.


Aqua WSC Active Account Historical Annual Growth Rates
May, 2014 CIP Study
Aqua WSC 17-year Average Annual Historical Growth 1993-2010 (3.97%)
Aqua WSC 20-year Average Annual Historical Growth 1993-2013 (3.5%)
Bastrop Fire
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
6.1%
7.4%
1.4%
0.9%
-0.1%
3.2%
2.2%
3.7%
6.0%
5.3%
6.5%
4.6%
5.4%
5.6%
6.8%
5.1%
3.9%
4.6%
3.1%
0.9%
2.3%
2.0%
1.3%
1.0%
1.0%
-0.2%
1.7%

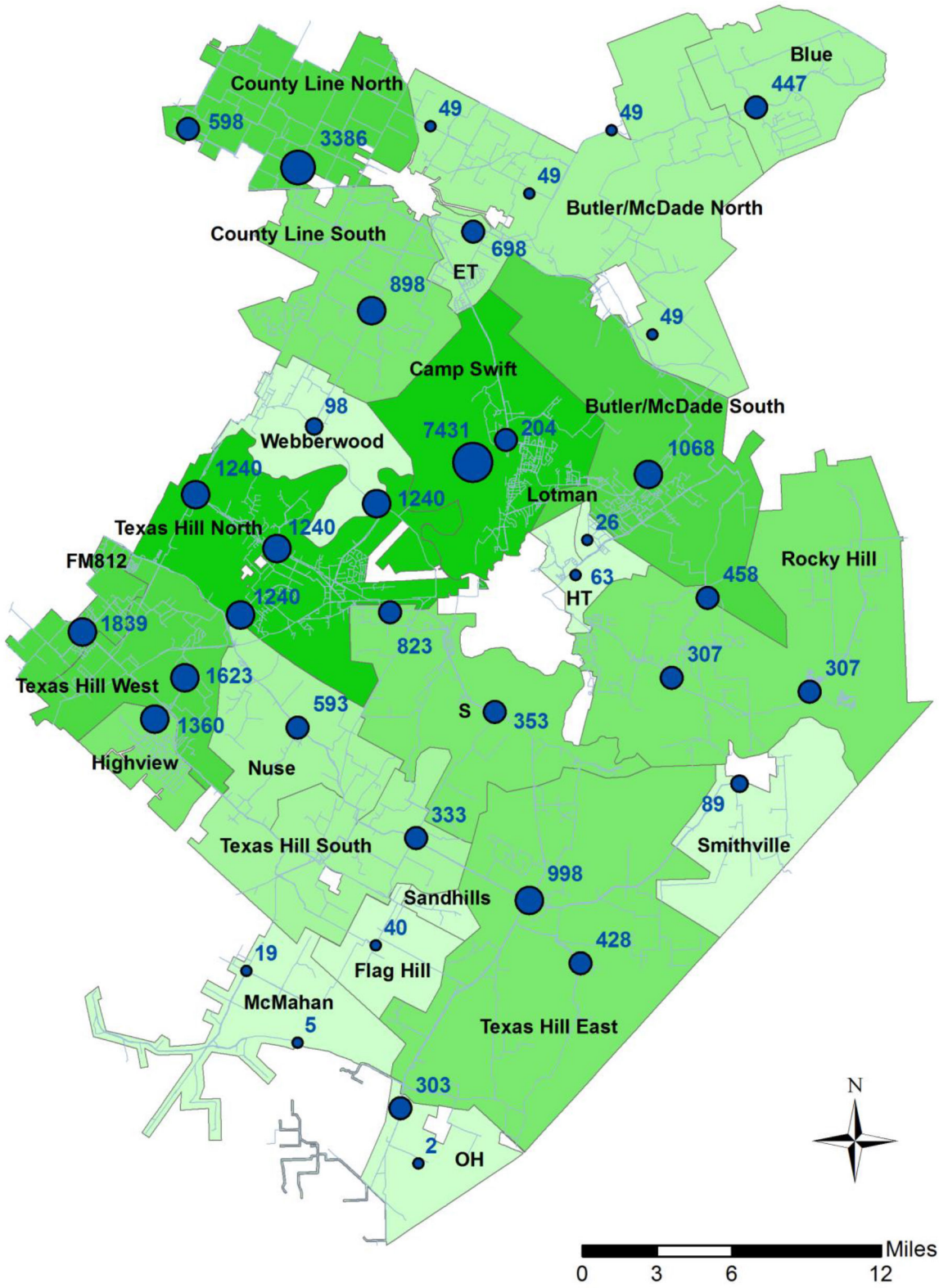

Aqua WSC LUE Projections
LUEs
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
+30,540 LUEs
+21,153 LUEs
+14,187 LUEs
+8,688 LUEs
+5,191 LUEs
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036
Conservative Estimate: 4.5%
Aqua WSC 20-year: 3.5%
TWDB Region K Planning: 2.6%
Aqua WSC 10-year: 1.75%
Aqua WSC 5-year: 1.12%


Historical and Projected Growth For Aqua WSC
Connections
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
Dec 2035:
47,882 Connections
(29,811 added)
4.5% Projected
Annual Growth
Dec 2025:
30,748 Connections
(12,677 added)
20-Year 3.5% Historical
Annual Growth
Dec. 2013:
18,071 Connections
1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035

Growth Region	Growth Category	Growth Rate Factor	Existing LUEs 2013 (using 1 LUE = 0.2 gpm)	Projected LUEs 2035	Additional LUEs Needed
Blue	Medium-High	3.5%	409	871	463
Butler/McDade North	Very Low	1.0%	832	1,035	203
Butler/McDade South	Medium-High	3.5%	1,395	2,973	1,578
Camp Swift	Very High	0.5%	1,818	2,029	211
Camp Swift (XS Ranch)	Very High	Linear	0	7,431	7,431
County Line North	Very High	10.0%	577	4,698	4,121
County Line South	Medium-Low	2.5%	1,288	2,217	929
ET	Medium-High	3.5%	638	1,361	722
Flag Hill	Low	1.5%	107	148	41
FM812	Very High	5.0%	988	2,890	1,902
Highview	High	4.5%	861	2,268	1,407
HT	Very Low	1.0%	267	333	65
Lotman	Very Low	1.0%	111	138	27
McMahan	Medium-Low	2.5%	35	60	25
Nuse	Medium-High	3.5%	542	1,156	614
OH	High	4.5%	192	506	314
Rocky Hill	Low	1.5%	1,638	2,273	635
S	High	4.5%	744	1,961	1,216
Sandhills	High	4.5%	68	180	112
Smithville	Low	1.5%	239	331	92
Texas Hill East	High	4.5%	903	2,378	1,475
Texas Hill North	Very High	5.0%	2,665	7,795	5,131
Texas Hill South	Medium-Low	2.5%	477	821	344
Texas Hill West	Medium-High	3.5%	1,484	3,163	1,679
Webberwood	Very Low	1.0%	416	518	102
Total:			**18,694**	**49,534**	**30,840**

With 18,694 LUEs at the end of 2013 and a 4.5% average annual growth rate, Aqua should expect to have about 49,534 LUEs by the end of 2035 - an addition of 30,840 LUEs. This is equivalent to adding 29,811 meters, or connections, into Aqua's current system, resulting in a total of 47,882 meters at the end of 2035. The meter to LUE conversion was based on the 2013 average demand of 0.2069 GPM per meter. The growth rate factors made it possible to proportionally distribute this added demand as new connections throughout the hydraulic model. Thirty-six major locations on larger mains were selected for these connections. The map on the following page shows these 37 locations and the number of meters added at each intersection. In addition to today's excess production capacity, Aqua will require an addition of at least 12,000 GPM to meet projected growth demands through 2035.

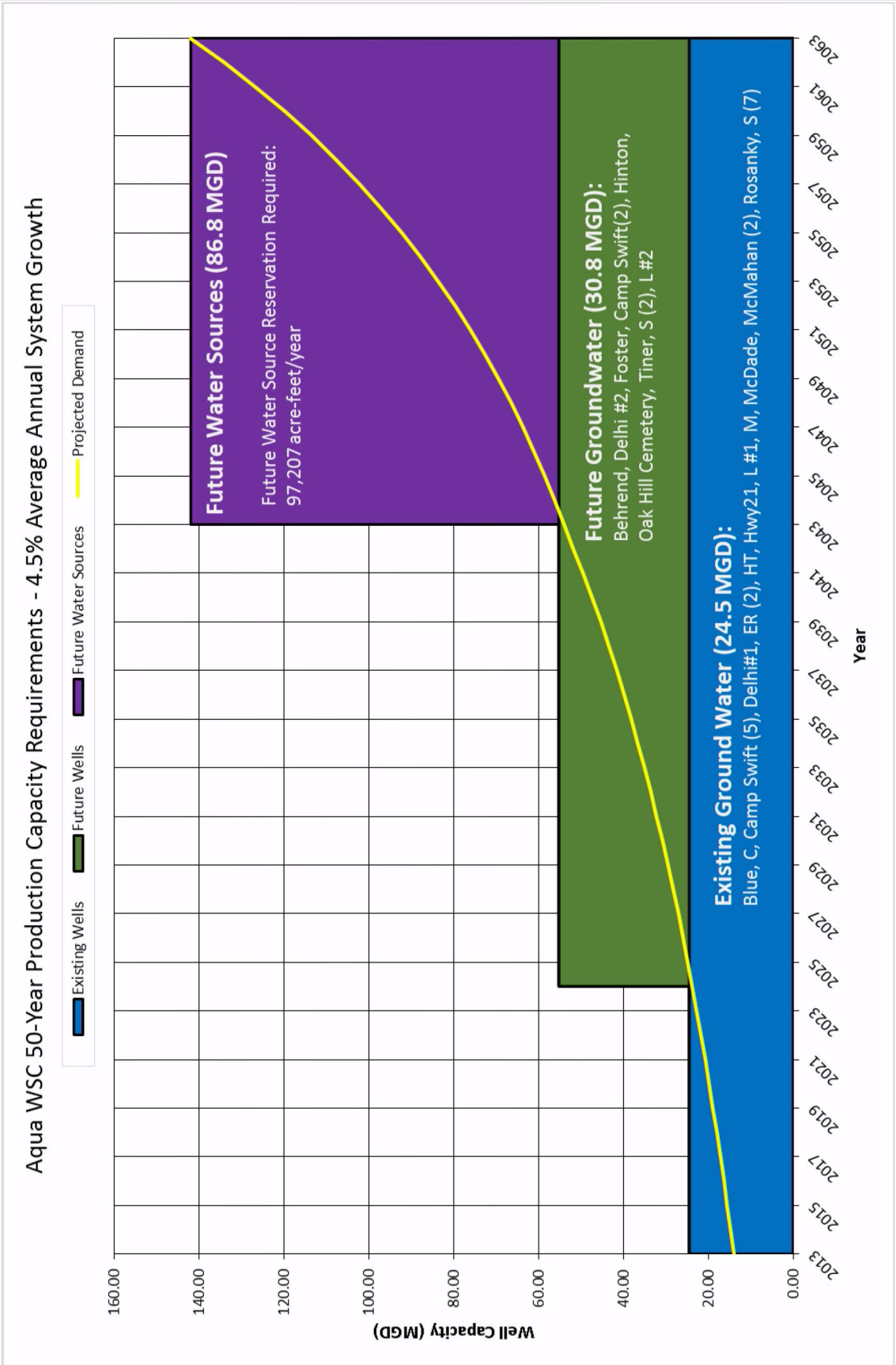
Distribution of Projected Future Demand - Connections

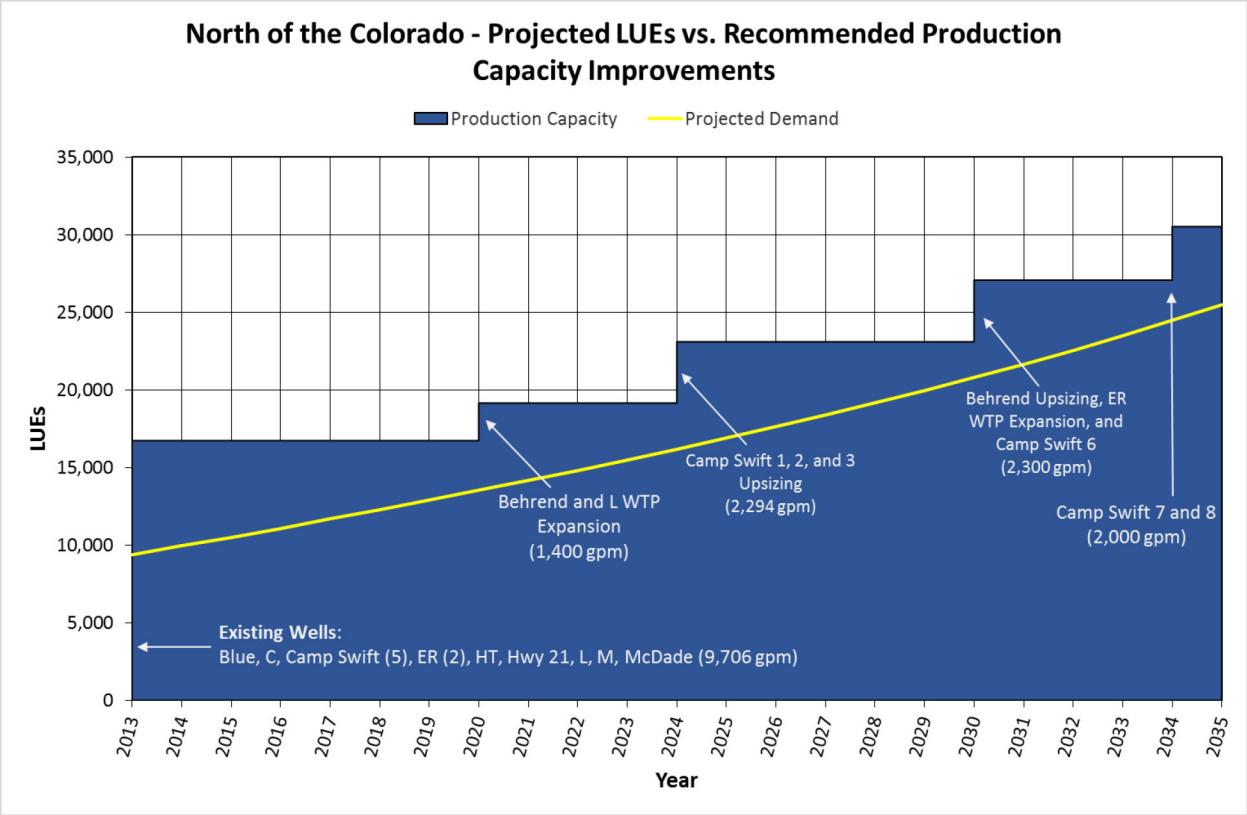


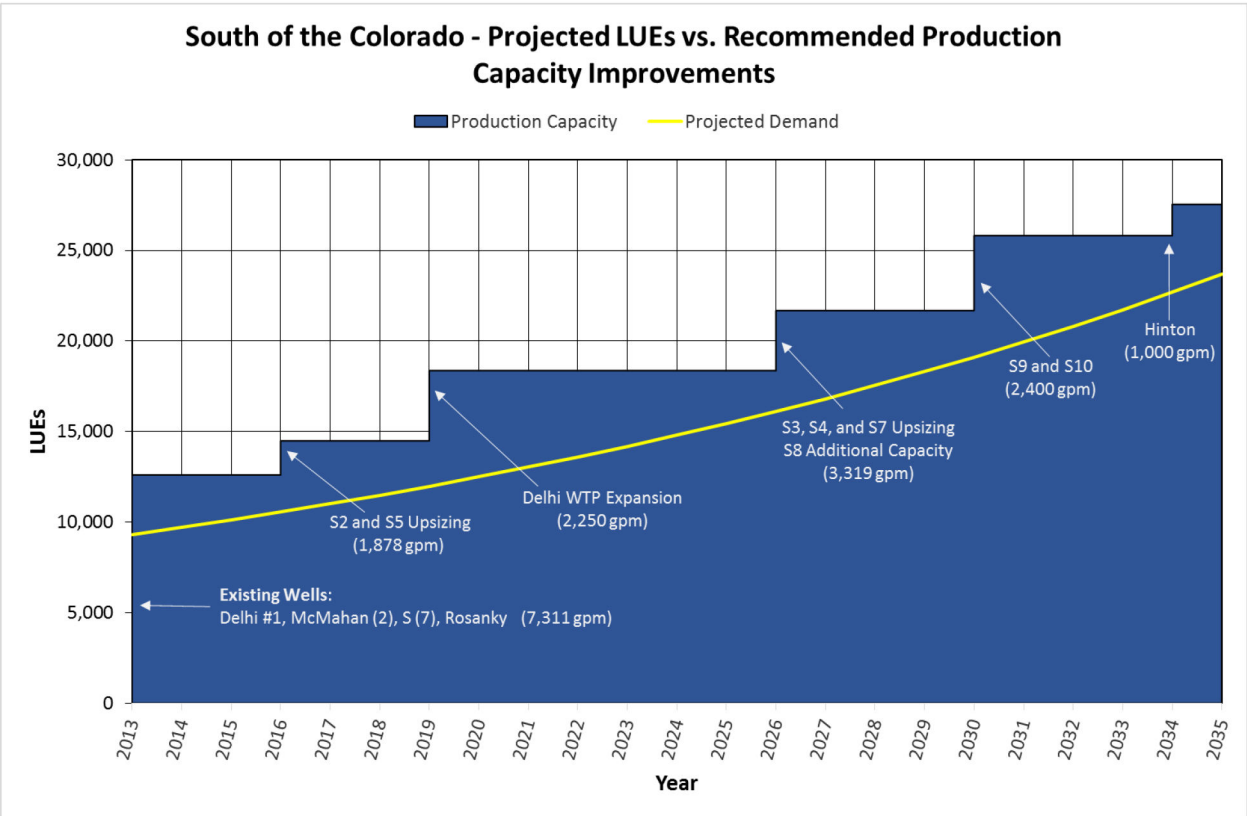
Long-Term Water Supply Planning

Currently, Aqua gets its entire water supply from groundwater sources. However, Aqua's required production capacity will eventually exceed the groundwater resources available, due both to the finite capacity of the Corrizo-Wilcox Aquifer and to restrictions set by the Lost Pines Groundwater Conservation District (LPGCD). In addition to all existing and planned future wells, Aqua will need an additional 86.8 MGD of production capacity, as shown on the chart on the next page.

The charts on page 21 compare the system's growing demand to the available ground water supply for the CCN north and south of the Colorado River. The primary purpose of these charts is to show the year in which a well capacity improvement project will be required for Aqua to maintain a water supply surplus in its CCN. An excess of at least 1,200 GPM was maintained to ensure Aqua has a good margin of production capacity. Based on projected growth, the northern half of the system will need three wells added at Camp Swift, in addition to upgrades on the existing wells, to keep up with demands and provide wholesale water to XS Ranch. It will also be necessary to upgrade the Behrend well so that it can provide 2,000 GPM by 2035 and upgrade the L Water Treatment Plant so that both wells may be used simultaneously. In the south, upgrades in the existing S field, two additional S wells, and expanding the Delhi Water Treatment Plant to accommodate both existing wells and 1,000 GPM from Hinton will provide enough production to keep Aqua within TCEQ guidelines.


Aqua WSC 50-Year Production Capacity Requirements - 4.5% Average Annual System Growth
Existing Wells
Future Wells
Future Water Sources
Projected Demand
Future Water Sources (86.8 MGD)
Future Water Source Reservation Required:
97,207 acre-feet/year
Future Groundwater (30.8 MGD):
Behrend, Delhi #2, Foster, Camp Swift(2), Hinton,
Oak Hill Cemetery, Tiner, S (2), L #2
Existing Ground Water (24.5 MGD):
Blue, C, Camp Swift (5), Delhi#1, ER (2), HT, Hwy21, L #1, M, McDade, McMahan (2), Rosanky, S (7)
Well Capacity (MGD)
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Year
2013
2015
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045
2047
2049
2051
2053
2055
2057
2059
2061
2063


North of the Colorado - Projected LUEs vs. Recommended Production Capacity Improvements
Production Capacity
Projected Demand
LUEs
Year
Behrend and L WTP Expansion (1,400 gpm)
Camp Swift 1, 2, and 3 Upsizing (2,294 gpm)
Behrend Upsizing, ER WTP Expansion, and Camp Swift 6 (2,300 gpm)
Camp Swift 7 and 8 (2,000 gpm)
Existing Wells:
Blue, C, Camp Swift (5), ER (2), HT, Hwy 21, L, M, McDade (9,706 gpm)


South of the Colorado - Projected LUEs vs. Recommended Production Capacity Improvements
Production Capacity
Projected Demand
LUEs
Year
S2 and S5 Upsizing (1,878 gpm)
Delhi WTP Expansion (2,250 gpm)
S3, S4, and S7 Upsizing S8 Additional Capacity (3,319 gpm)
S9 and S10 (2,400 gpm)
Hinton (1,000 gpm)
Existing Wells:
Delhi #1, McMahan (2), S (7), Rosanky (7,311 gpm)

Summary of Proposed Capital Improvements through 2019

With the projected demands added to the computer hydraulic model, the next step was the involved process of developing numerous capital improvement scenarios to determine the most cost-effective combination of improvements that would meet the projected demands while maintaining an acceptable level of service to all existing and future customers. The modeled system improvements were then divided into discrete, specific capital improvement projects.

After defining a set of capital improvement projects to meet future demand, Steger Bizzell and Aqua staff met to discuss and prioritize each project based on need and to determine which projects to schedule in the next five years and which to defer. A detailed cost estimate was produced for each of the 5-year projects. A 5-year schedule of recommended capital improvement projects was created to coincide with Aqua's annual budget beginning in fiscal year 2015. A brief description of the projects planned for the next 5 years is given in this section, with detailed descriptions and cost estimates for each individual project included in Appendix D.

North of the Colorado River

Aqua currently has enough production capacity north of the Colorado to stay within TCEQ regulations for the next 5 years. With the completion of the Behrend well and raw water line, Aqua's northern production is predicted to be sufficient through 2026.

Pumping, transmission, and storage improvement projects include the Manor ISD Elevated Storage Tank, which will provide pressure for future demands in the high growth north-western section of Aqua's CCN. The ER-to-Elgin transmission main is the first step toward improving the connectivity between this high growth area and Aqua's northern wells. It also provides redundancy to the JM 24" PVC line that runs between the ER pump station and the County Line area. The McDade-to-C transmission main will allow water from the McDade area wells to be sent to Elgin East EST, taking some production load off of the Camp Swift. A transmission main running along Hwy 71 will allow the Booth Booster pumps to be decommissioned while improving meter pressures along Cottletown Road.

The proposed Lund pressure plane includes a 5,000 gallon hydropneumatic tank and a booster pump station. The new pressure plane will improve pressures in this high elevation region and allow Aqua to decommission the Pleasant Grove pump station after a few lines in the area are upsized. This system will be able to serve up to 250 LUEs, which given the current growth rate of around 1%, will be sufficient until 2035. If higher growth occurs, it may be necessary to replace the pressure tank with an elevated storage tank sometime in the next 20 years.

The total CIP budget for North of the Colorado River through 2019 is $ 12,221,847.

South of the Colorado River

Production and treatment improvement projects south of the Colorado River include expanding the Delhi Water Treatment Plant so that both of the existing Delhi wells can be used simultaneously. This project is the first step toward ultimately supplying FM 812 with water from the Delhi area.

With the new FM 812 pump station, the old FM 812 pump station can be decommissioned. Improvements to the pumps at the TU and S pump stations will provide enough pumping capacity to meet future demands.

Transmission improvement projects include finishing an 18" transmission main on SH 304 so that it runs all the way to the Delhi Water Treatment Plant. This, along with the FM 535 transmission main will improve pressures in the Smithville pressure plane and allow the expanded Delhi Water Treatment Plant to be used to its full potential. A 24" line from Hwy 21 to the Watts Elevated Storage Tank will ensure that Watts does not run dry during future peak demands, and by 2035, this line will be used move Delhi water toward Highview and eventually FM 812.

The total CIP budget for South of the Colorado River through 2019 is $7,791,872.

Miscellaneous System-Wide Projects

System-wide projects include tank painting, undesignated miscellaneous, and facility upgrades, which include unforeseen capital projects such as TxDOT Highway Relocation projects and unexpected major maintenance projects.

The total CIP budget for Miscellaneous System-Wide projects through 2019 is $7,700,000.

Conclusions

This Capital Improvement Program outlines an affordable approach to improve current customers' service, while comfortably meeting the projected growth of Aqua's system for the next 21 years. If the water system continues to grow at the projected rates, the projects and schedules herein will comfortably meet growing demands. If the system grows at a slower rate, Aqua will have the ability to adjust capital spending by deferring future projects without unexpected rate adjustments. If the system grows more quickly than expected, the project schedules can be accelerated to increase system capacity quicker and fewer rate adjustments may be needed.

The recommendations in this plan should be reviewed annually to make adjustments as new information becomes available. The plan makes general assumptions about the location of future development, and it is a near certainty that development patterns will vary from the assumptions herein. Uncertain and uncontrollable factors, including future growth rates, unusually wet or dry summers, escalating construction costs and operation and maintenance costs, changes in regulatory requirements or taxes, interest rates and system-wide development patterns, make it prudent to regularly review this plan.

APPENDIX A: Population Studies

Meter Growth

We analyzed meter growth in each growth region between 2005 and 2013 and between 2007 and 2013. Using the Join feature in ArcMap, meter data were spatially joined to growth regions and attributes were summarized as a count. In this way, we tallied the number of meters inside each growth region for each year which allowed us to calculate total percent growth and average annual growth rates based on the difference in the meter count from 2005 to 2013 and from 2007 to 2013. Although the cities of Elgin, Bastrop, Smithville, and McDade are included as separate regions on the map, we only had meter data for Aqua's CCN. The data for these 4 regions are not accurate representations of the meter growth.

Parcel Growth

For parcels, we performed the same steps as with the meter data. Parcel data from 2004 and 2011 were spatially joined to the growth regions and attributes were summarized as a count. Total percent growth and annual growth rates were calculated based on the difference in the parcel count between 2004 and 2011. Note that only Bastrop County parcels were used when measuring parcel growth for County Line North, County Line South, and FM812. These regions also contain Travis County parcels, which were not included because parcel data for Travis County was not available for the years studied in this growth measurement. Only the acreage within Bastrop County was used for the parcel density calculations for these bordering growth regions.

Population Growth

We found population growth rates using 2000 and 2010 census data. The Capital Area Council of Governments website (http://www.capcog.org/data-maps-and-reports/geospatial-data/) provided the 2010 census block data and population totals for each block as a shapefile. The 2000 census block data were also downloaded from this site, but we obtained the population totals for the 2000 census blocks through the United States Census Bureau's American FactFinder website (http://factfinder2.census.gov) using the Advanced Search: "Topic = Population, Geography = Block." After downloading an Excel file of the population totals from the FactFinder site, we joined the totals to the 2000 census block shapefile allowing us to then spatially join the census blocks from both years to the growth regions in ArcGIS. The attributes were summarized as a sum, and we were able to calculate total percent growth and annual growth rates based on the populations in 2000 and 2010.

Sample Calculations

Sample calculations for total percent growth and average annual growth rate are given below, followed by a series of tables and maps that summarize our findings. The last table also includes the growth rate factors that appropriately describe the expected growth for each growth region in Aqua's CCN.

Total Percent Growth:

$$= 100 \cdot \frac{No.\,of\ Meters, 2013 - No.\,of\ Meters, 2005}{No.\,of\ Meters, 2005}$$

$$= 100 \cdot \frac{1835 - 1614}{1614}$$

$$= 13.7\%$$

Average annual growth rate:

$$= 100 \cdot \left[\left(1 + \frac{No.\,of\ Meters, 2013 - No.\,of\ Meters, 2005}{No.\,of\ Meters, 2005}\right)^{\frac{1}{2013-2005}} - 1\right]$$

$$= 100 \cdot \left[\left(1 + \frac{1835 - 1614}{1614}\right)^{\frac{1}{8}} - 1\right]$$

$$= 1.62\%$$

Table 1: Meter Growth per Growth Region, 2005 - 2013

Growth Region	No. of Meters (2005)	No. of Meters (2013)	Total Growth (%)	Annual Growth Rate (%)
Blue	377	403	6.90	0.84
Butler/McDade North	726	822	13.22	1.56
Butler/McDade South	1267	1379	8.84	1.06
Camp Swift	1614	1817	12.58	1.49
City of Bastrop	44	50	13.64	1.61
City of McDade	36	38	5.56	0.68
City of Smithville	0	0	0.00	0.00
County Line North	418	493	17.94	2.08
County Line South	1188	1297	9.18	1.10
Elgin	20	22	10.00	1.20
ET	565	644	13.98	1.65
Flag Hill	93	108	16.13	1.89
FM812	761	930	22.21	2.54
Highview	770	866	12.47	1.48
HT	215	247	14.88	1.75
Lotman	105	112	6.67	0.81
McMahan	1	24	2300.00	48.77
Nuse	498	548	10.04	1.20
OH	170	179	5.29	0.65
Rocky Hill	1471	1627	10.61	1.27
S	646	749	15.94	1.87
Sandhills	65	69	6.15	0.75
Smithville	209	234	11.96	1.42
Texas Hill East	798	912	14.29	1.68
Texas Hill North	2321	2687	15.77	1.85
Texas Hill South	426	476	11.74	1.40
Texas Hill West	1320	1489	12.80	1.52
Webberwood	351	396	12.82	1.52

Table 2: Meter Growth per Growth Region, 2007 - 2013

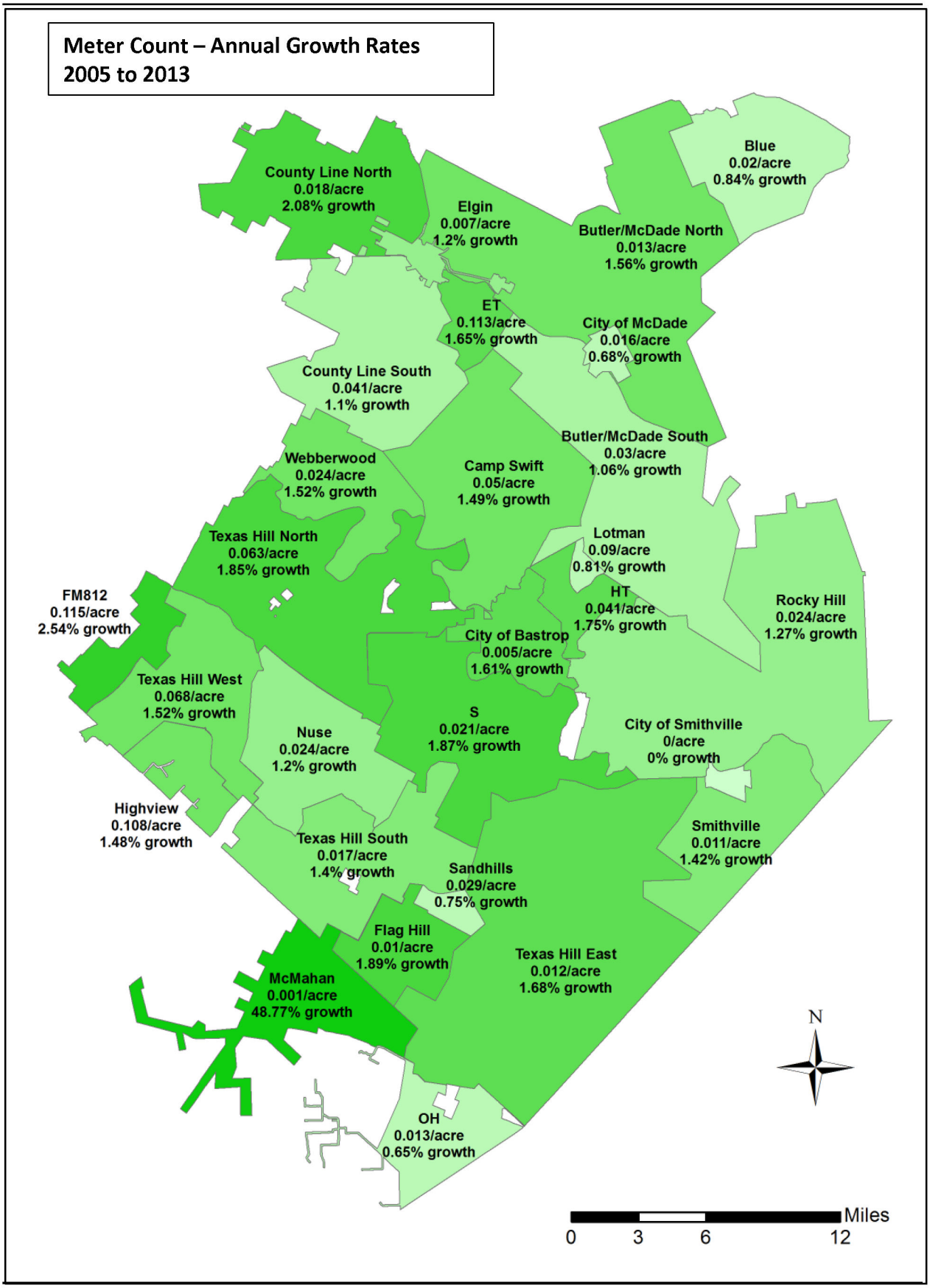
Growth Region	No. of Meters (2007)	No. of Meters (2013)	Total Growth (%)	Annual Growth Rate (%)
Blue	377	403	6.90	1.12
Butler/McDade North	723	822	13.69	2.16
Butler/McDade South	1267	1379	8.84	1.42
Camp Swift	1614	1817	12.58	1.99
City of Bastrop	44	50	13.64	2.15
City of McDade	36	38	5.56	0.91
City of Smithville	0	0	0.00	0.00
County Line North	420	493	17.38	2.71
County Line South	1194	1297	8.63	1.39
Elgin	20	22	10.00	1.60
ET	565	644	13.98	2.21
Flag Hill	93	108	16.13	2.52
FM812	786	930	18.32	2.84
Highview	770	866	12.47	1.98
HT	215	247	14.88	2.34
Lotman	105	112	6.67	1.08
McMahan	10	24	140.00	15.71
Nuse	499	548	9.82	1.57
OH	170	179	5.29	0.86
Rocky Hill	1470	1627	10.68	1.71
S	646	749	15.94	2.50
Sandhills	65	69	6.15	1.00
Smithville	209	234	11.96	1.90
Texas Hill East	798	912	14.29	2.25
Texas Hill North	2329	2687	15.37	2.41
Texas Hill South	426	476	11.74	1.87
Texas Hill West	1325	1489	12.38	1.96
Webberwood	351	396	12.82	2.03

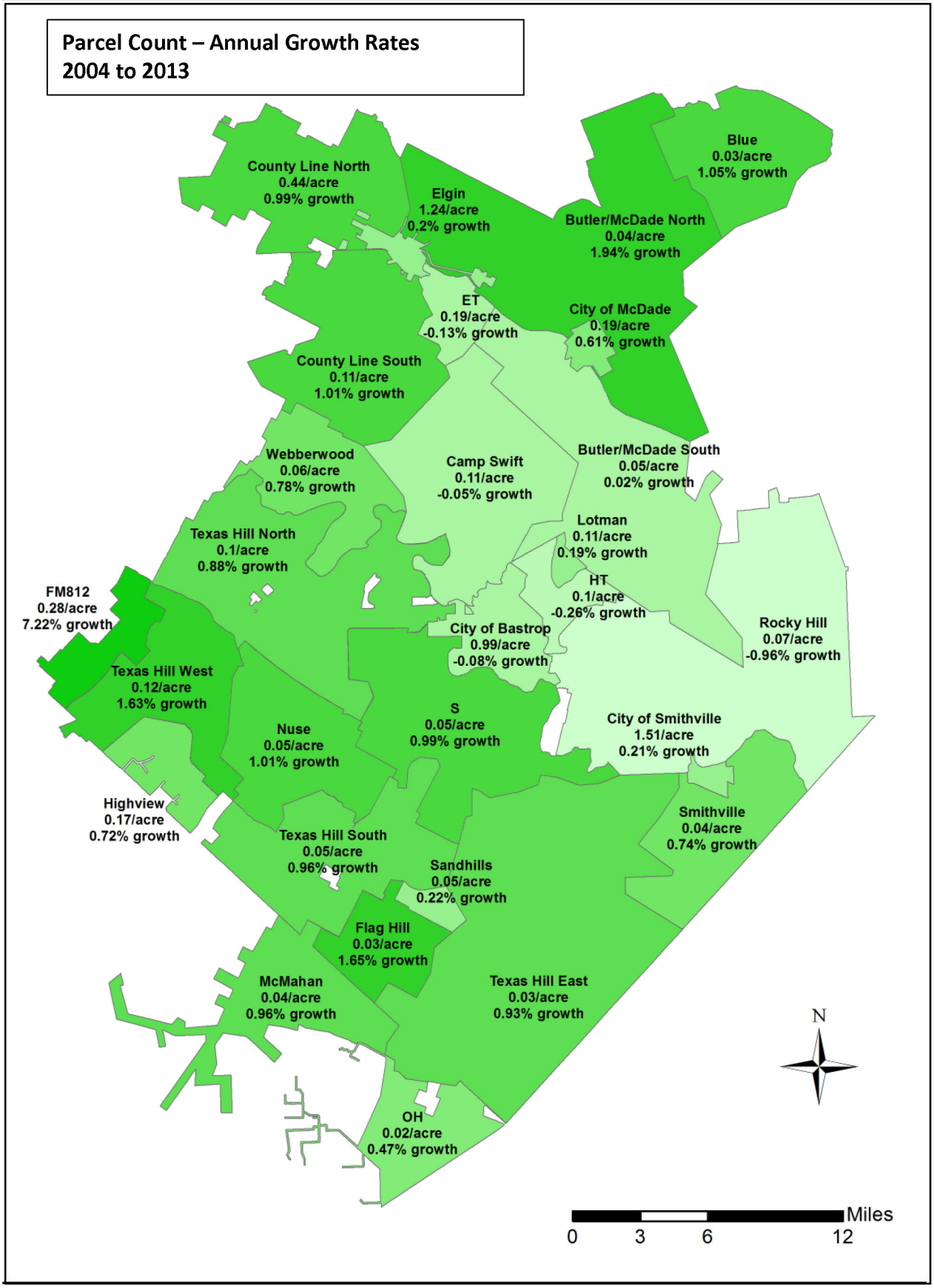
Table 3: Parcel Growth per Growth Region, 2003/2004 - 2011

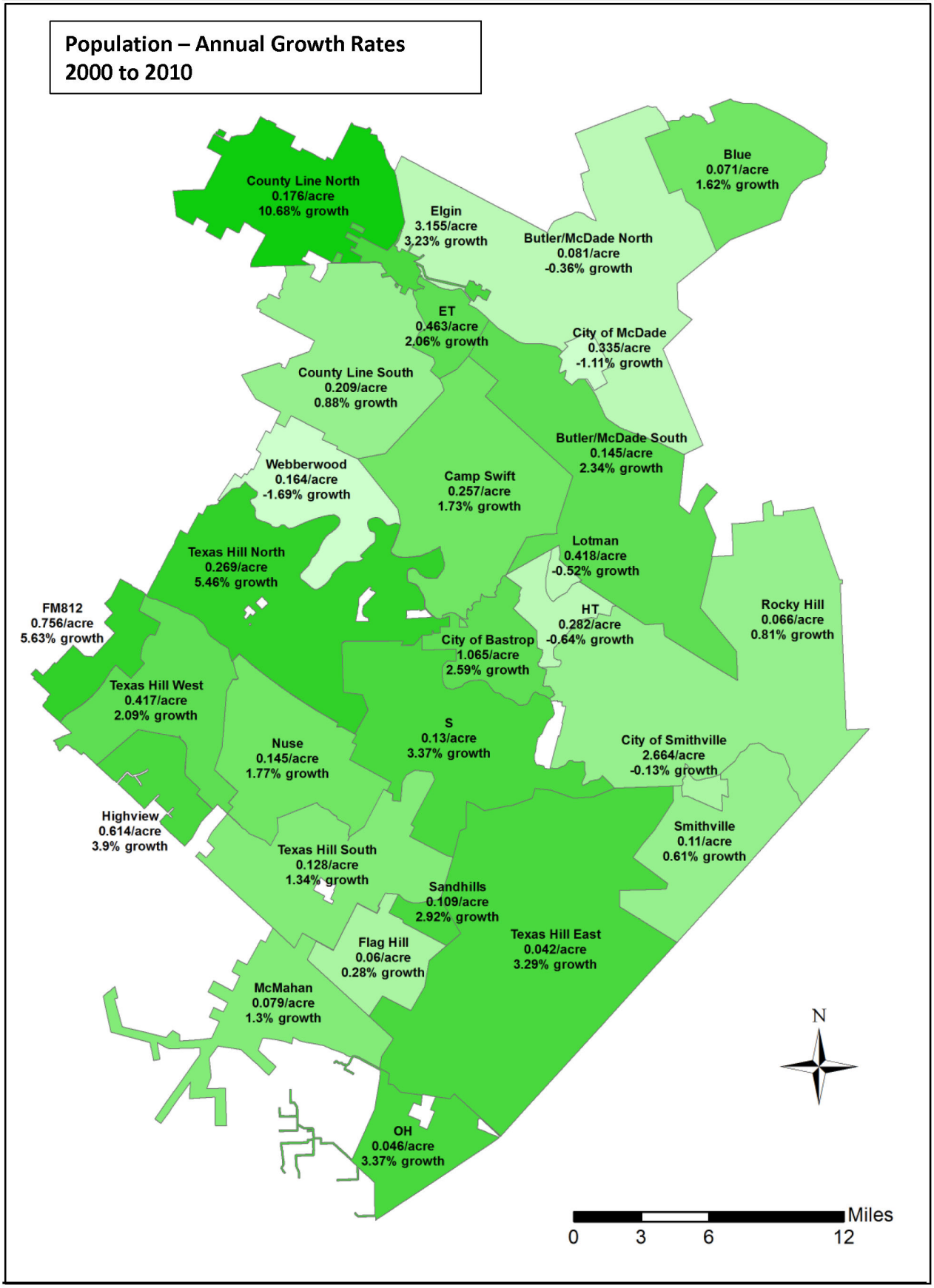
Growth Region	No. of Parcels (2003/2004)	No. of Parcels (2011)	Total Growth (%)	Annual Growth Rate (%)
Blue	644	700	8.70	1.05
Butler/McDade North	2030	2368	16.65	1.94
Butler/McDade South	2393	2397	0.17	0.02
Camp Swift	4113	4096	-0.41	-0.05
City of Bastrop	10841	10776	-0.60	-0.08
City of McDade	418	439	5.02	0.61
City of Smithville	2106	2141	1.66	0.21
County Line North	61	66	8.20	0.99
County Line South	1394	1511	8.39	1.01
Elgin	3250	3303	1.63	0.20
ET	1078	1067	-1.02	-0.13
Flag Hill	251	286	13.94	1.65
FM812	601	1050	74.71	7.22
Highview	1271	1346	5.90	0.72
HT	585	573	-2.05	-0.26
Lotman	129	131	1.55	0.19
McMahan	720	777	7.92	0.96
Nuse	1030	1116	8.35	1.01
OH	312	324	3.85	0.47
Rocky Hill	5523	5112	-7.44	-0.96
S	1649	1784	8.19	0.99
Sandhills	112	114	1.79	0.22
Smithville	825	875	6.06	0.74
Texas Hill East	2112	2274	7.67	0.93
Texas Hill North	3750	4022	7.25	0.88
Texas Hill South	1224	1321	7.92	0.96
Texas Hill West	1918	2183	13.82	1.63
Webberwood	752	800	6.38	0.78

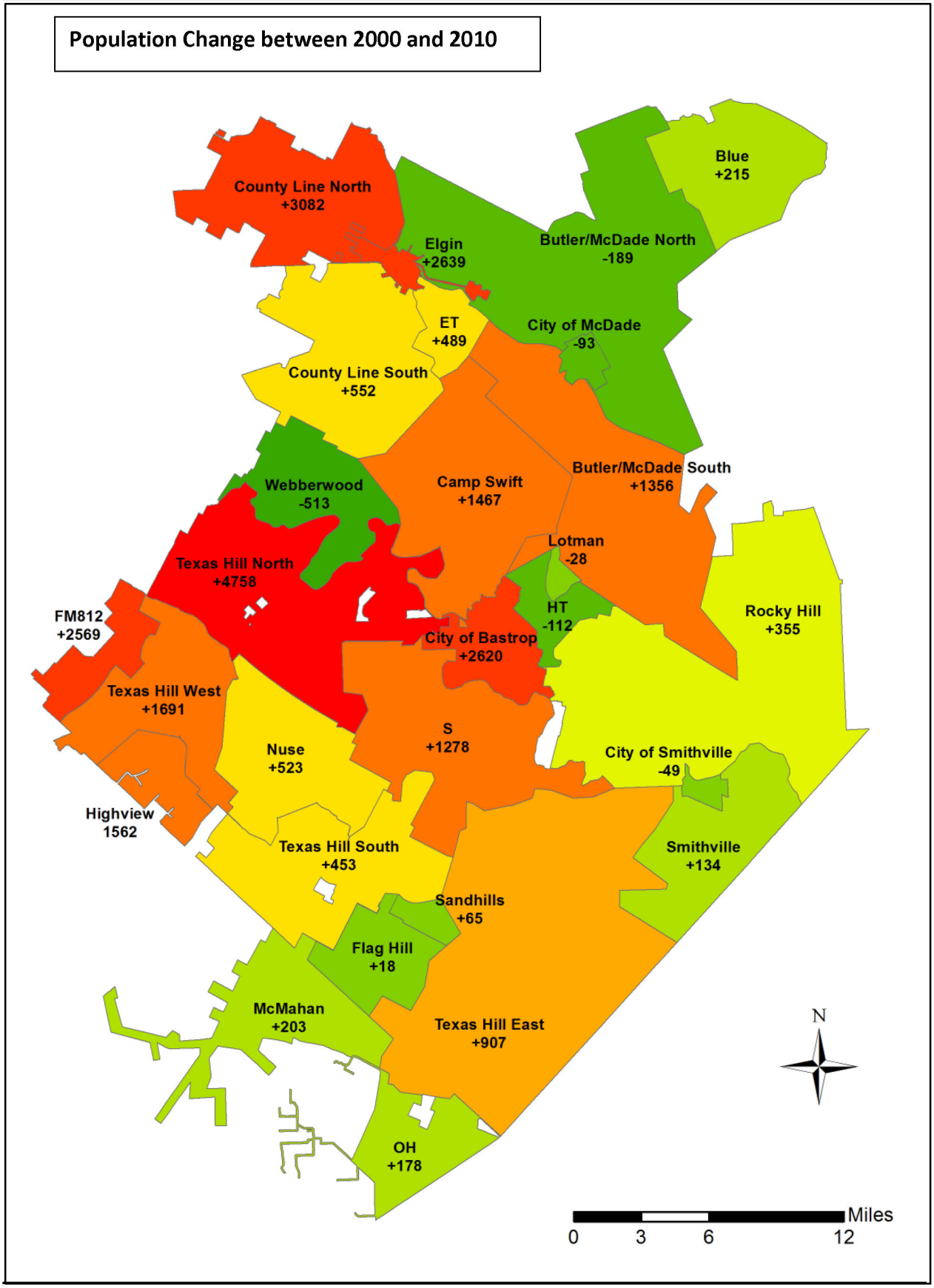
Table 4: Population Growth per Growth Region

Growth Region	Population (2000)	Population (2010)	Total Growth (%)	Annual Growth Rate (%)
Blue	1236	1451	17.39	1.62
Butler/McDade North	5295	5106	-3.57	-0.36
Butler/McDade South	5218	6574	25.99	2.34
Camp Swift	7862	9329	18.66	1.73
City of Bastrop	9007	11627	29.09	2.59
City of McDade	882	789	-10.54	-1.11
City of Smithville	3872	3823	-1.27	-0.13
County Line North	1752	4834	175.91	10.68
County Line South	6055	6607	9.12	0.88
Elgin	7064	9703	37.36	3.23
ET	2162	2651	22.62	2.06
Flag Hill	644	662	2.80	0.28
FM812	3520	6089	72.98	5.63
Highview	3348	4910	46.65	3.90
HT	1802	1690	-6.22	-0.64
Lotman	550	522	-5.09	-0.52
McMahan	1470	1673	13.81	1.30
Nuse	2726	3249	19.19	1.77
OH	453	631	39.29	3.37
Rocky Hill	4242	4597	8.37	0.81
S	3257	4535	39.24	3.37
Sandhills	195	260	33.33	2.92
Smithville	2131	2265	6.29	0.61
Texas Hill East	2369	3276	38.29	3.29
Texas Hill North	6775	11533	70.23	5.46
Texas Hill South	3173	3626	14.28	1.34
Texas Hill West	7375	9066	22.93	2.09
Webberwood	3269	2756	-15.69	-1.69


Meter Count – Annual Growth Rates
2005 to 2013
County Line North
0.018/acre
2.08% growth
Elgin
0.007/acre
1.2% growth
Blue
0.02/acre
0.84% growth
Butler/McDade North
0.013/acre
1.56% growth
ET
0.113/acre
1.65% growth
City of McDade
0.016/acre
0.68% growth
County Line South
0.041/acre
1.1% growth
Butler/McDade South
0.03/acre
1.06% growth
Webberwood
0.024/acre
1.52% growth
Camp Swift
0.05/acre
1.49% growth
Texas Hill North
0.063/acre
1.85% growth
Lotman
0.09/acre
0.81% growth
FM812
0.115/acre
2.54% growth
HT
0.041/acre
1.75% growth
Rocky Hill
0.024/acre
1.27% growth
City of Bastrop
0.005/acre
1.61% growth
Texas Hill West
0.068/acre
1.52% growth
S
0.021/acre
1.87% growth
City of Smithville
0/acre
0% growth
Nuse
0.024/acre
1.2% growth
Highview
0.108/acre
1.48% growth
Texas Hill South
0.017/acre
1.4% growth
Smithville
0.011/acre
1.42% growth
Sandhills
0.029/acre
0.75% growth
Flag Hill
0.01/acre
1.89% growth
Texas Hill East
0.012/acre
1.68% growth
McMahan
0.001/acre
48.77% growth
OH
0.013/acre
0.65% growth
N
Miles
0
3
6
12


Parcel Count – Annual Growth Rates
2004 to 2013
County Line North
0.44/acre
0.99% growth
Elgin
1.24/acre
0.2% growth
Blue
0.03/acre
1.05% growth
Butler/McDade North
0.04/acre
1.94% growth
ET
0.19/acre
-0.13% growth
City of McDade
0.19/acre
0.61% growth
County Line South
0.11/acre
1.01% growth
Webberwood
0.06/acre
0.78% growth
Camp Swift
0.11/acre
-0.05% growth
Butler/McDade South
0.05/acre
0.02% growth
Texas Hill North
0.1/acre
0.88% growth
Lotman
0.11/acre
0.19% growth
FM812
0.28/acre
7.22% growth
HT
0.1/acre
-0.26% growth
City of Bastrop
0.99/acre
-0.08% growth
Rocky Hill
0.07/acre
-0.96% growth
Texas Hill West
0.12/acre
1.63% growth
S
0.05/acre
0.99% growth
City of Smithville
1.51/acre
0.21% growth
Nuse
0.05/acre
1.01% growth
Highview
0.17/acre
0.72% growth
Smithville
0.04/acre
0.74% growth
Texas Hill South
0.05/acre
0.96% growth
Sandhills
0.05/acre
0.22% growth
Flag Hill
0.03/acre
1.65% growth
McMahan
0.04/acre
0.96% growth
Texas Hill East
0.03/acre
0.93% growth
OH
0.02/acre
0.47% growth
N
Miles
0
3
6
12

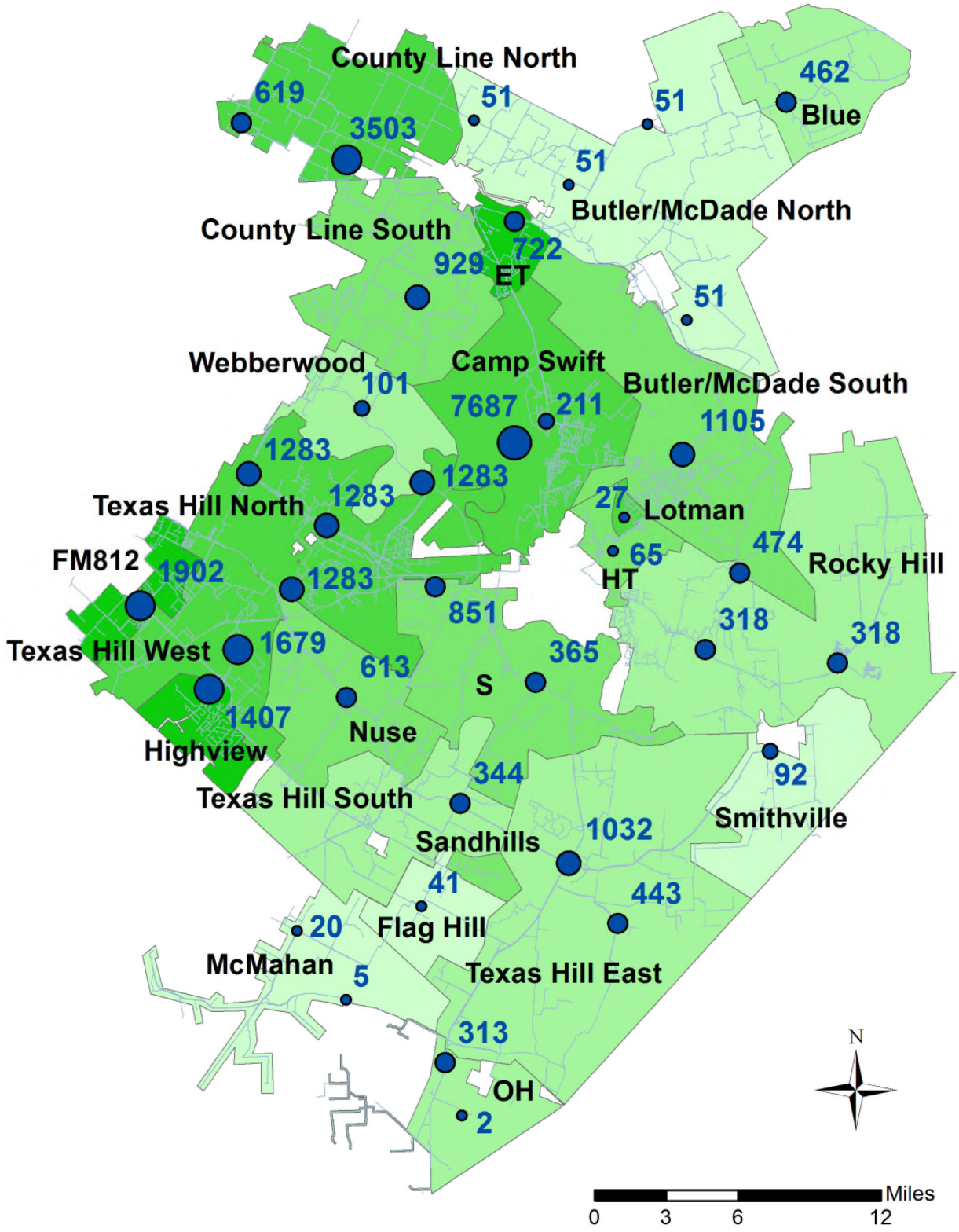

Population – Annual Growth Rates
2000 to 2010
County Line North
0.176/acre
10.68% growth
Elgin
3.155/acre
3.23% growth
Butler/McDade North
0.081/acre
-0.36% growth
Blue
0.071/acre
1.62% growth
ET
0.463/acre
2.06% growth
City of McDade
0.335/acre
-1.11% growth
County Line South
0.209/acre
0.88% growth
Butler/McDade South
0.145/acre
2.34% growth
Webberwood
0.164/acre
-1.69% growth
Camp Swift
0.257/acre
1.73% growth
Lotman
0.418/acre
-0.52% growth
Texas Hill North
0.269/acre
5.46% growth
FM812
0.756/acre
5.63% growth
HT
0.282/acre
-0.64% growth
Rocky Hill
0.066/acre
0.81% growth
City of Bastrop
1.065/acre
2.59% growth
Texas Hill West
0.417/acre
2.09% growth
S
0.13/acre
3.37% growth
Nuse
0.145/acre
1.77% growth
City of Smithville
2.664/acre
-0.13% growth
Highview
0.614/acre
3.9% growth
Smithville
0.11/acre
0.61% growth
Texas Hill South
0.128/acre
1.34% growth
Sandhills
0.109/acre
2.92% growth
Flag Hill
0.06/acre
0.28% growth
Texas Hill East
0.042/acre
3.29% growth
McMahan
0.079/acre
1.3% growth
OH
0.046/acre
3.37% growth
N
Miles
0
3
6
12

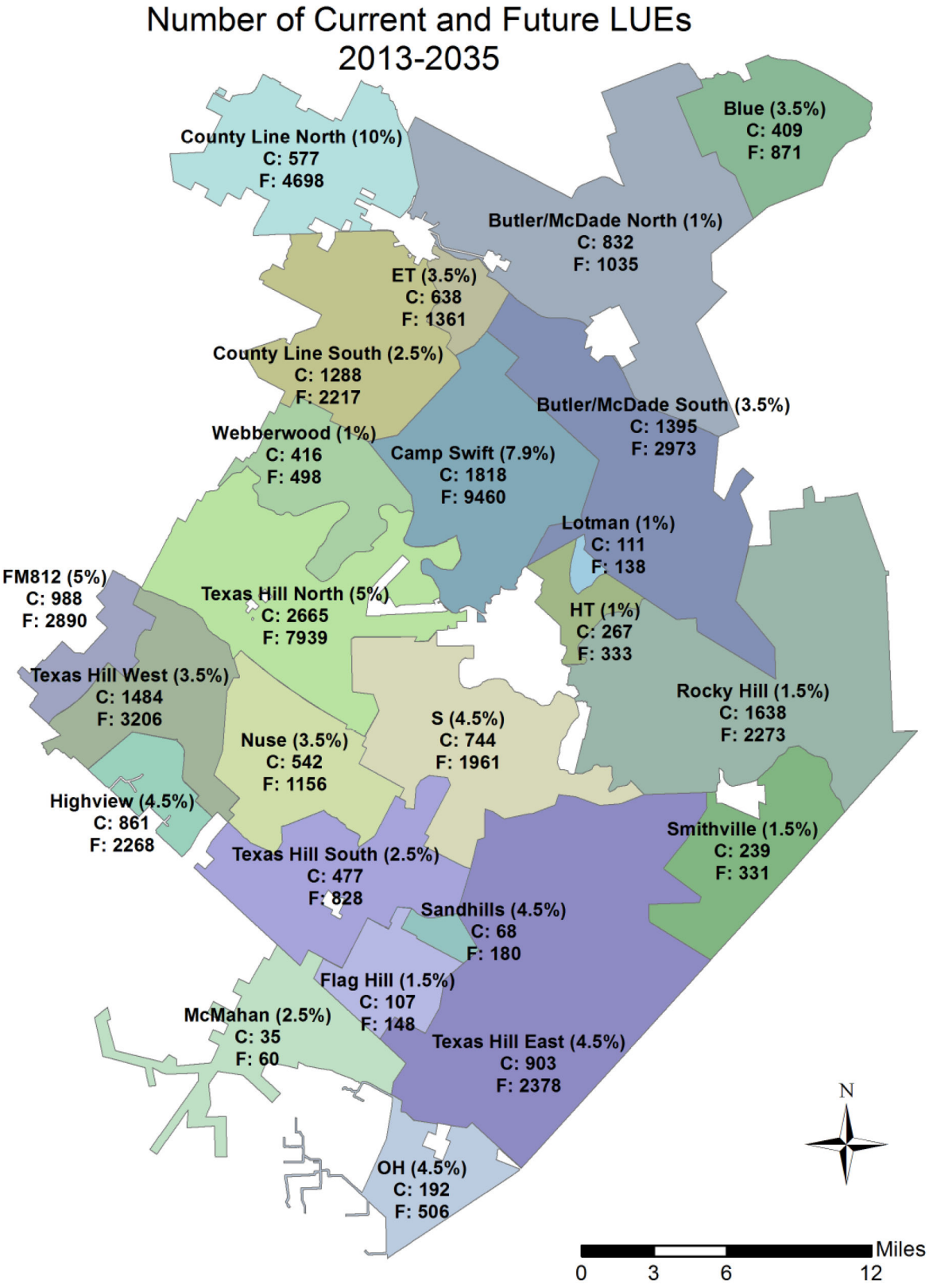

Population Change between 2000 and 2010
County Line North
+3082
Elgin
+2639
Blue
+215
Butler/McDade North
-189
ET
+489
City of McDade
-93
County Line South
+552
Webberwood
-513
Camp Swift
+1467
Butler/McDade South
+1356
Lotman
-28
Texas Hill North
+4758
FM812
+2569
HT
-112
Rocky Hill
+355
City of Bastrop
+2620
Texas Hill West
+1691
S
+1278
Nuse
+523
City of Smithville
-49
Highview
1562
Texas Hill South
+453
Smithville
+134
Sandhills
+65
Flag Hill
+18
McMahan
+203
Texas Hill East
+907
OH
+178
N
Miles
0
3
6
12

Growth Region	Meter-based Annual Growth Rates (%) 2005 to 2013	Meter-based Annual Growth Rates (%) 2007 to 2013	Parcel-based Annual Growth Rates (%) 2004 to 2012	Census-based Annual Growth Rates (%) 2000 to 2010	Annual Growth Rate Factors (%)
Blue	0.84	1.12	1.05	1.62	3.5
Butler/McDade North	1.56	2.16	1.94	-0.36	1
Butler/McDade South	1.06	1.42	0.02	2.34	3.5
Camp Swift (with XS Ranch)	1.49	1.99	-0.05	1.73	7.9
County Line North	2.08	2.71	0.99	10.68	10
County Line South	1.10	1.39	1.01	0.88	2.5
ET	1.65	2.21	-0.13	2.06	3.5
Flag Hill	1.89	2.52	1.65	0.28	1.5
FM812	2.54	2.84	7.22	5.63	5
Highview	1.48	1.98	0.72	3.90	4.5
HT	1.75	2.34	-0.26	-0.64	1
Lotman	0.81	1.08	0.19	-0.52	1
McMahan	48.77	15.71	0.96	1.30	2.5
Nuse	1.20	1.57	1.01	1.77	3.5
OH	0.65	0.86	0.47	3.37	4.5
Rocky Hill	1.27	1.71	-0.96	0.81	1.5
S	1.87	2.50	0.99	3.37	4.5
Sandhills	0.75	1.00	0.22	2.92	4.5
Smithville	1.42	1.90	0.74	0.61	1.5
Texas Hill East	1.68	2.25	0.93	3.29	4.5
Texas Hill North	1.85	2.41	0.88	5.46	5
Texas Hill South	1.40	1.87	0.96	1.34	2.5
Texas Hill West	1.52	1.96	1.63	2.09	3.5
Webberwood	1.52	2.03	0.78	-1.69	1
City of Bastrop			-0.08	2.59	
City of McDade			0.61	-1.11	
City of Smithville			0.21	-0.13	
Elgin			0.20	3.23	

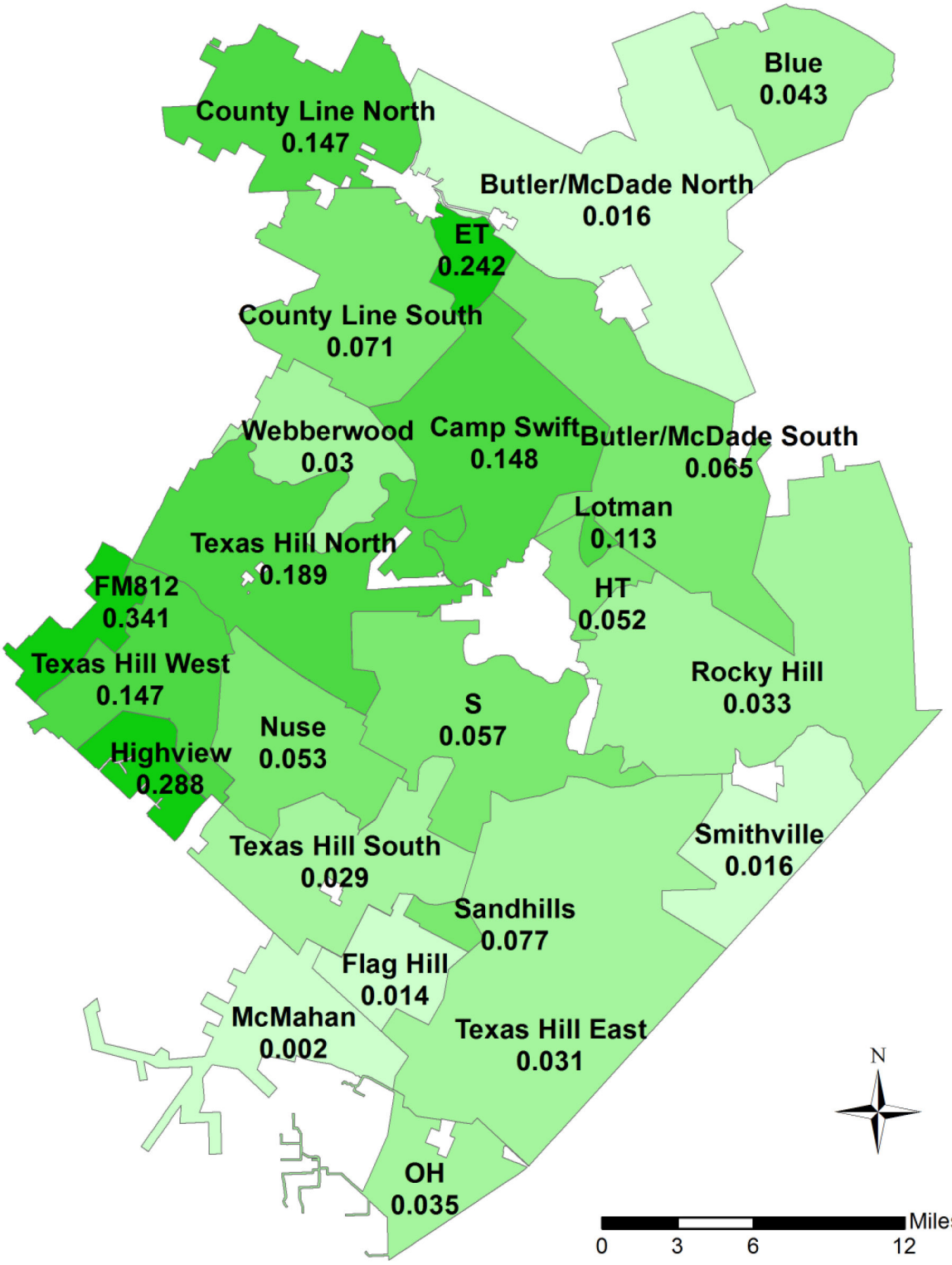
APPENDIX B: Current and Future LUEs

Distribution of Projected Future Demand - LUEs




Number of Current and Future LUEs
2013-2035
County Line North (10%)
C: 577
F: 4698
Blue (3.5%)
C: 409
F: 871
Butler/McDade North (1%)
C: 832
F: 1035
ET (3.5%)
C: 638
F: 1361
County Line South (2.5%)
C: 1288
F: 2217
Butler/McDade South (3.5%)
C: 1395
F: 2973
Webberwood (1%)
C: 416
F: 498
Camp Swift (7.9%)
C: 1818
F: 9460
Lotman (1%)
C: 111
F: 138
FM812 (5%)
C: 988
F: 2890
Texas Hill North (5%)
C: 2665
F: 7939
HT (1%)
C: 267
F: 333
Texas Hill West (3.5%)
C: 1484
F: 3206
Rocky Hill (1.5%)
C: 1638
F: 2273
S (4.5%)
C: 744
F: 1961
Nuse (3.5%)
C: 542
F: 1156
Highview (4.5%)
C: 861
F: 2268
Smithville (1.5%)
C: 239
F: 331
Texas Hill South (2.5%)
C: 477
F: 828
Sandhills (4.5%)
C: 68
F: 180
Flag Hill (1.5%)
C: 107
F: 148
McMahan (2.5%)
C: 35
F: 60
Texas Hill East (4.5%)
C: 903
F: 2378
OH (4.5%)
C: 192
F: 506
N
Miles
0
3
6
12

Projected 2035 Demand Density [LUEs/acre]



Appendix C: Storage and Pumping Capacity Zone Breakdown

This table indicates which storage tanks were grouped together based on the areas that they serve. If a standpipe acts as elevated storage, then ½ of that standpipe's capacity was included in the calculations. If a standpipe acts as ground storage, the total capacity was used. Additionally, in cases where 1 tank contributed to 2 storage zones, ½ of the tank's capacity was used in these calculation of each zone.

Storage Zone	Ground Tanks	Elevated Tanks	HPT Tanks
Blue	1/2 Blue SP	1/2 Blue SP	-
Bulter/McDade and ET	1/2 ER GST, McDade GST, Hwy 21 SP	ET, Elgin East, Butler, Circle D	-
Camp Swift	CS old GST, CS new GST	Camp Swift	-
County Line	1/2 ER GST	Bolhs, County Line	MISD HPT
HT and Rocky Hill	Booth SP, L1 and L2 GST, M1 and M2 GST	HT, Rocky Hill	-
Lotman	Pine Hills SP	1/2 Lotman	-
Webberwood	-	Webberwood	-
Flag Hill and Sand Hills	Sand Hills1 and 2 GST	1/2 Flag Hill SP	-
FM 812	XH SP, FM812 SP	FM 812	-
Highview	Watts EST	Highview	-
McMahan	McMahan GST, 713 GST	-	McMahan, 713
OH	O1 and 2 GST	1/2 OH SP	-
S	S1, 2 and 3 GST	Weaver	-
Smithville and Texas Hill (south)	1/2 Rosanky, Delhi GST	Red Rock, Wilhelm, Delhi EST	-
Texas Hill (north) and Nuse	TU A and B SP, Eskew SP	Herrin, Hwy 71, Texas Hill, St Marys, Nuse	-

To calculate the pumping capacity, pressure planes were grouped together based on the area served by each pump station. In some cases, such as with the ER pump station, more than 1 pressure plane is served by the same pump station.

Pump Stations	Pressure Planes Served
Booth, L, and M	HT and Rocky Hill
C, McDade, Hwy 21, and FM 1441	Bulter/McDade
Camp Swift, MISD, and ER	Camp Swift, County Line, ET, and Webberwood
Pine Hills	Lotman
Delhi and Watterson	Texas Hill (south) and Smithville
Eskew, S (TU), and TU	Nuse
FM 812 and XH	FM 812
McMahan 713 and McMahan Main	McMahan
O	OH
S (Watterson)	S
Sandhills	Sandhills and Flag Hill
Highview	Highview

APPENDIX D: Capital Improvement Program
Detailed Project Cost Summaries

5-Year

North of the Colorado
5-year Projects

Lund Pump Station and Hydropneumatic Tank

MAP KEY: 101

This project includes a pump station and hydropneumatic tank for the new Lund pressure plane. The current number of LUEs in the proposed pressure plane area is about 170. The pressure tank is sized for an ultimate build out of 250 LUEs. The decision whether to use the existing Lund tank for ground storage or to add a new ground storage tank will be made after obtaining an estimate to refurbish the Lund tank.

Ultimately, it may be necessary to install a new elevated storage tank for this pressure plane. There are many variables that would affect the optimal location, elevation, and capacity of a new Lund elevated tank. These include the location of the proposed Manor elevated tank, whether the new Lund tank will be needed to improve pressures in the northwest corner of the County Line pressure plane, and the growth rate in the Lund area. Therefore, we recommend installing a hydropneumatic tank that will meet projected demands for the next five years or longer, depending on growth in the area. If and when an elevated tank is installed, the hydropneumatic tank and pumps can be decommissioned and used elsewhere.

This cost summary does not include the costs of upsizing small lines in the area that will be needed to meet future demands.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Qty.*	*Units*	*Unit Cost*	*Total Cost*
6" Wet Connection	2	ea	1,000.00	2,000.00
50,000-gallon ground welded steel storage tank				80,000.00
Booster Pump Station				150,000.00
5000-gallon Pressure Tank				50,000.00
Yard Piping and Pump Building Piping				20,000.00
Electrical, Controls, & Telemetry				20,000.00
Chain Link Fencing				27,000.00
Site Improvements w/gravel access road				24,000.00
Master Meter				8,000.00
Demo Pleasant Grove in-line pump station				5,000.00
Construction Subtotal				386,000.00
Engineering, Surveying, Legal (12.5%)				48,250.00
Contingencies				77,200.00
Surveying and Staking				2,500.00
Land				20,000.00
TOTAL				**$533,950.00**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Red Town Water Line, 4"

MAP KEY: 102

This project includes installing a 4" water line along Red Town Road in the new Lund pressure plane. It improves pressure in this higher elevation area, allowing Aqua to decommission the Pleasant Grove pump station.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*		*Unit Cost*	*Total Cost*
4" SDR-21 PVC w/tracer wire	6900	LF	7.50	51,750.00
4" Fittings	7	ea	400.00	2,800.00
4" Gate Valve w/valve box	2	ea	750.00	1,500.00
4" Wet Connection	2	ea	750.00	1,500.00
2" Automatic Air/Vacuum Release Valves w/ vaults	3	ea	2,500.00	7,500.00
Open Cut Road Crossing w/8" PVC casing	300	LF	55.00	16,500.00
Bore w/8" PVC casing	50	LF	80.00	4,000.00
4" Sand Bedding	6900	LF	4.50	31,050.00
2" Flush Valve w/ 2 1/2" Fire Hose Adapter	2	ea	1,250.00	2,500.00
Erosion Control w/Silt Fence	6900	LF	2.50	17,250.00
Clearing & Chipping : moderately wooded	6900	LF	2.00	13,800.00
4" Trench Safety	6900	LF	1.00	6,900.00
Construction Subtotal				157,050.00
Engineering, Surveying, Legal (12.5%)				19,631.25
Contingencies (10%)				15,705.00
Easements, R.O.W: Rural	6900	LF	2.00	13,800.00
TOTAL				**$206,186.25**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Behrend Well Raw Water Line, 16" to McDade, Old Potato Road

MAP KEY: 103

This project includes installing a 16" raw water line from the proposed Behrend well to the existing McDade Water Treatment Plant and a 12" treated water main from McDade WTP to Old Potato Road.

The raw water line shares a trench with the treated water line.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
16" C-905 DR-25 PVC w/tracer wire	6708	LF	45.00	301,860.00
12" SDR-21 PVC w/tracer wire	6708	LF	25.00	167,700.00
12" SDR-21 PVC w/tracer wire	3680	LF	25.00	92,000.00
M.J. Ductile Iron Fittings SSB cl-350 w/restraint glands	3220	LB	5.00	16,100.00
Butterfly Valve 16"	2	ea	3,500.00	7,000.00
12" Gate Valve w/valve box	2	ea	2,500.00	5,000.00
1" Automatic Air/Vacuum Release Valves w/ vaults	7	ea	1,250.00	8,750.00
12" Fire Hydrant Assembly (w/ valve and tee)	3	ea	5,000.00	15,000.00
2" Flush Valve w/ 2 1/2" Fire Hose Adapter	1	ea	1,250.00	1,250.00
16" Fittings	2	ea	2,625.00	5,250.00
12" Fittings	2	ea	1,500.00	3,000.00
Driveway Crossing w/o casing	80	L.F.	15.00	1,200.00
16" Sand Bedding	6708	LF	10.00	67,080.00
12" Sand Bedding	3680	LF	7.50	27,600.00
Erosion Control w/silt fence	10388	LF	2.50	25,970.00
Clearing & Chipping : heavily wooded	10388	LF	2.50	25,970.00
16" Trench Safety	10388	LF	1.00	10,388.00
Construction Subtotal				781,118.00
Engineering, Surveying, Legal (12.5%)				97,639.75
Contingencies (10%)				78,111.80
Easements, R.O.W: Rural	10388	LF	2.00	20,776.00
TOTAL				**$977,645.55**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Behrend Well – Completion

MAP KEY: 104

This project includes completing the Behrend well including well head piping, electrical, building, fence, and gravel driveway.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
Well Head Piping		LS		50,000.00
Electrical Building		LS		45,000.00
Electrical & Controls		LS		125,000.00
Chain Link Fencing and Gravel Drive		LS		15,000.00

Construction Subtotal	235,000.00
Engineering, Surveying, Legal (12.5%)	29,375.00
Contingencies	47,000.00
Easements, R.O.W., etc.	
TOTAL	**$311,375.00**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Transmission Main, ER to Elgin, Phase 1, 15300', 18"

MAP KEY: 105

The ER to Elgin transmission main will complement the existing 24" and 12" lines from ER to the County Line Elevated Tank to meet demands in the County Line North growth region, which are projected to grow by as much as 10% per year in the next 20 years.

Additionally, this line will also provide a redundant path from ER to the County Line tank, needed if it is necessary to take the existing 24" line out of service for maintenance.

Phase 1 begins near Jordan Lane and Hwy 95 where the 24" and 12" PVC lines head west from the highway. It ends at an existing 10" line at the intersection of FM1704 and VFW Road.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*		*Unit Cost*	*Total Cost*
18" DI w/tracer wire	15500	LF	65.00	1,007,500.00
18" Fittings	10	ea	3,500.00	35,000.00
Butterfly Valve 18"	2	ea	4,000.00	8,000.00
24" Wet Connection	1	ea	5,000.00	5,000.00
18" Wet Connection	1	ea	3,000.00	3,000.00
2" Automatic Air/Vacuum Release Valves w/ vaults	5	ea	2,500.00	12,500.00
Open Cut Road Crossing w/24" PVC casing	500	LF	130.00	65,000.00
Bore w/24" PVC casing	500	LF	200.00	100,000.00
Open Cut Road Crossing w/24" PVC casing	100	LF	130.00	13,000.00
18" Sand Bedding	15500	LF	12.50	193,750.00
18" Fire Hydrant Assembly (w/ valve and tee)	5	ea	7,000.00	35,000.00
Erosion Control w/Silt Fence	15500	LF	2.50	38,750.00
Clearing & Chipping : moderately wooded	15500	LF	2.00	31,000.00
18" Trench Safety	15500	LF	2.00	31,000.00
Construction Subtotal				1,578,500.00
Engineering, Surveying, Legal (12.5%)				197,312.50
Contingencies (10%)				157,850.00
Easements, R.O.W: Rural	15500	LF	2.00	31,000.00
TOTAL				**$1,964,662.50**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Transmission Main, Highway 290E, McDade to C Pump Station

MAP KEY: 106

This project consists of a 12" water line which runs from the McDade Water Treatment Plant to the C Pump Station.

The purpose of this project is to deliver water from the McDade WTP west to the Butler and Elgin East elevated storage tanks. This project will allow an additional 1,000 GPM to flow from the McDade WTP west along Highway 290.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
12" SDR-21 PVC w/tracer wire	52000	LF	25.00	1,300,000.00
12" Fittings	30	ea	1,500.00	45,000.00
12" Gate Valve w/valve box	7	ea	2,500.00	17,500.00
6" Gate Valve w/valve box	8	ea	1,000.00	8,000.00
4" Gate Valve w/valve box	2	ea	750.00	1,500.00
12" Fire Hydrant Assembly (w/ valve and tee)	6	ea	5,000.00	30,000.00
1" Automatic Air/Vacuum Release Valves w/ vaults	8	ea	1,250.00	10,000.00
12" Sand Bedding	52000	LF	7.50	390,000.00
Bore w/18" PVC casing	400	LF	160.00	64,000.00
18" or smaller Cement Stabilization	100	LF	25.00	2,500.00
Open Cut Road Crossing w/18" PVC casing	200	LF	100.00	20,000.00
10" Wet Connection	2	ea	1,750.00	3,500.00
8" Wet Connection	2	ea	1,500.00	3,000.00
6" Wet Connection	2	ea	1,000.00	2,000.00
4" Wet Connection	2	ea	750.00	1,500.00
Erosion Control w/Silt Fence	52000	LF	2.50	130,000.00
Clearing & Chipping : moderately wooded	52000	LF	2.00	104,000.00
12" Trench Safety	52000	LF	1.00	52000
Construction Subtotal				2,184,500.00
Engineering, Surveying, Legal (12.5%)				273,062.50
Contingencies (10%)				218,450.00
Easements, R.O.W: Rural	52000	LF	2.00	104,000.00
TOTAL				**$2,780,012.50**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Transmission Main, Dry Creek to Webberwood Tank

MAP KEY: 107

This is the first phase of the project to improve the supply of water to the Webberwood Elevated Tank. This line parallels the existing 8" line from near Ingrid Drive, running southwest to the tank. Future projects will extend this line northwest to Hog Eye Road.

This line is needed to maintain the level in the Webberwood tank as new demands are added in the County Line South growth region.

NOTE: According to the hydraulic model, this line can be deferred if the Colorado River crossing along FM1209 is used and has no restrictions (partially closed valves). The status of this crossing and whether Aqua wants to keep it in service will need to be addressed before proceeding with this project.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*		*Unit Cost*	*Total Cost*
8" SDR-21 PVC w/tracer wire	*8440*	LF	14.00	118,160.00
8" Fittings	10	ea	825.00	8,250.00
8" Gate Valve w/valve box	2	ea	1,500.00	3,000.00
8" Wet Connection	2	ea	1,500.00	3,000.00
1" Automatic Air/Vacuum Release Valves w/ vaults	2	ea	1,250.00	2,500.00
Open Cut Road Crossing w/12" PVC casing	300	LF	85.00	25,500.00
8" Sand Bedding	8440	LF	6.00	50,640.00
8" Fire Hydrant Assembly (w/ valve and tee)	2	ea	4,000.00	8,000.00
Erosion Control w/Silt Fence	8440	LF	2.50	21,100.00
Clearing & Chipping : moderately wooded	8440	LF	2.00	16,880.00
8" Trench Safety	8440	LF	1.00	8,440.00
Construction Subtotal				265,470.00
Engineering, Surveying, Legal (12.5%)				33,183.75
Contingencies (10%)				26,547.00
Easements, R.O.W: Rural	8440	LF	2.00	16,880.00
TOTAL				**$342,080.75**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

New "L" Water Treatment Plant and Pump Station

MAP KEY: 108

This project will allow both of the "L" wells to run simultaneously with a total production capacity of 800 GPM. With this improvement, the Rocky Hill, HT, and Lotman pressure planes can function independently from the rest of Aqua's CCN with about 26% excess production capacity in 2035.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
8" SDR-21 PVC w/tracer wire	1600	LF	14.00	22,400.00
Bore w/12" PVC casing	162	LF	120.00	19,440.00
8" Sand Bedding	1600	LF	6.00	9,600.00
8" Gate Valve w/valve box	3	ea	1,500.00	4,500.00
Erosion Control w/silt fence	1600	LF	2.50	4,000.00
Dual media pressure filter, piping, appurtenances		LS		450,000.00
Fiberglass Contact Tank		LS		140,000.00
Chlorination		LS		70,000.00
800 GPM Pump Station		LS		270,000.00
100,000 gal Welded Steel Ground Storage Tank		LS		160,000.00
Yard Piping		LS		170,000.00
Clearing & Chipping : moderately wooded	1600	LF	2.00	3,200.00

Construction Subtotal	1,323,140.00
Engineering, Surveying, Legal (12.5%)	165,392.50
Contingencies (10%)	132,314.00
TOTAL	**$1,620,846.50**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Manor ISD Stadium 500,000-Gallon Elevated Tank

MAP KEY: 109

This project consists of a 500,000-gallon elevated storage tank at the Manor ISD site in the County Line pressure plane. This tank will have an overflow elevation of 680.5 feet MSL to match the existing County Line elevated tank. The purpose of this tank project is to provide additional elevated storage to the County Line pressure plane to meet future population growth projections.

NOTE: Before plans are finalized for this tank, we will revisit the assumption that its overflow elevation will match County Line. Because of higher customer elevations in the west, northwest, and north areas of the County Line North growth region, it may be beneficial to use a higher overflow elevation.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*		*Unit Cost*	*Total Cost*
Tank Foundation		LS		105,000.00
500,000-gal. x 100' ht. Pedesphere		LS		900,000.00
Painting & sandblasting		LS		120,000.00
Yard Piping w/control Valve w/vault & bypass & tank drain flush valve		LS		26,000.00
Electrical		LS		9,000.00
Telemetry Controls		LS		15,000.00
Site Improvements (gravel drive, etc.)		LS		6,000.00
Chain Link Fencing (400'x 400')		LS		by others
Construction Subtotal				1,181,000.00
Engineering, Legal				102,250.00
Contingencies				236,200.00
Surveying and Staking				2,500.00
Land				existing
TOTAL				**$1,521,950.00**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Transmission Main, Hwy 71 East

MAP KEY: 110

The portion of Aqua's system south of the Booth Standpipe does not always meet TCEQ mandated pressure requirements of 35 psi. Additionally, customers along Highway 71 east in low-lying areas experience high pressures during low demand periods due to insufficient line sizes. This project remedies the problem by installing 27,200 L.F. of 10" and 8" water line along highway 71 from eastern Bastrop to Kellar Road.

The purpose of this line is to move water from the HT Elevated Tank to the area south of the Booth Standpipe.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
12" SDR-21 PVC w/tracer wire	16600	LF	25.00	415,000.00
8" SDR-21 PVC w/tracer wire	10600	LF	14.00	148,400.00
6" SDR-21 PVC w/tracer wire	500	LF	10.00	5,000.00
12" Fittings	20	ea	1,500.00	30,000.00
10" Gate Valve w/valve box	7	ea	2,000.00	14,000.00
6" Gate Valve w/valve box	5	ea	1,000.00	5,000.00
4" Gate Valve w/valve box	20	ea	750.00	15,000.00
12" Fire Hydrant Assembly (w/ valve and tee)	3	ea	5,000.00	15,000.00
8" Fire Hydrant Assembly (w/ valve and tee)	2	ea	4,000.00	8,000.00
1" Automatic Air/Vacuum Release Valves w/ vaults	8	ea	1,250.00	10,000.00
12" Sand Bedding	27200	LF	7.50	204,000.00
Bore w/18" steel casing	200	LF	200.00	40,000.00
Bore w/10" steel casing	500	LF	125.00	62,500.00
18" or smaller Cement Stabilization	100	LF	25.00	2,500.00
Driveway Crossing w/o casing	200	L.F.	15.00	3,000.00
12" Wet Connection	1	ea	2,000.00	2,000.00
8" Wet Connection	1	ea	1,500.00	1,500.00
4" Wet Connection	10	ea	750.00	7,500.00
Disconnect & Reconnect Meter	10	ea	350.00	3,500.00
6" Pressure Reducing Valve w/valve box	1	ea	15,000.00	15,000.00
4" Pressure Reducing Valve w/valve box	2	ea	12,500.00	25,000.00
2" Pressure Reducing Valve w/valve box	2	ea	10,000.00	20,000.00
Erosion Control w/Silt Fence	27200	LF	2.50	68,000.00
Clearing & Chipping : moderately wooded	27200	LS	2.00	54,400.00
12" Trench Safety	27200	LS	1.00	27,200.00
Construction Subtotal				1,201,500.00
Engineering, Surveying, Legal (12.5%)				150,187.50
Contingencies (10%)				120,150.00
Easements, R.O.W., etc.	27200			35,000.00
TOTAL				**$1,506,837.50**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Transmission Main, Blue

MAP KEY: 111

With projected future demands in the Blue pressure plane, this proposed 4" line running from FM 696 to FM 341 solves the problem of low pressures in the northeastern section of Aqua's CCN.

NOTE: Because of the high cost per customer of this line, it will be worth exploring alternative solutions such as a small hydropneumatic tank, or re-commissioning the AH standpipe.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
4" SDR-21 PVC, construction costs	13500	LF	24.00	324,000.00
Construction Subtotal				324,000.00
Engineering, Surveying, Legal (12.5%)				40,500.00
Contingencies				64,800.00
Easements, R.O.W: Rural	13500	LF	2.00	27,000.00
TOTAL				**$456,300.00**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

South of the Colorado
5-year Projects

Upgrade Small McMahan Lines, 4", 6"

MAP KEY: 201

The TCEQ has limitations on the number of meters that can be served by a specific size dead-end line. When a dead-end line exceeds the number of allowable meters served by that line, the line must either be looped or paralleled with an additional water line to meet compliance.

The purpose of this project is to meet TCEQ requirements for pipe sizes in the McMahan area. This project will also improve pressures for customers in the McMahan area by eliminating bottlenecks in the McMahan pipe network.

Most of this project has been completed as part of the previous Capital Improvement Program. Approximately $250,000 worth of upgrades remain.

Increase Well Capacity – S Well #2

MAP KEY: 202

This project includes the upsizing of the S2 well column pipe from 4" to 6". With an 8.625" casing and 6" column pipe, a 125 HP pump and motor can be installed at a new depth of 249 feet. This pump will be capable of producing 725 GPM for an added capacity of 389 GPM.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
Remove old well pump	1	LS	5,000.00	5,000.00
Install new 125-hp submersible pump	1	LS	43,000.00	43,000.00
Install 125-hp VFD for well pump	1	LS	25,000.00	25,000.00
Electrical Shelter	1	LS	35,000.00	35,000.00
Install submersible level transmitter	1	LS	3,000.00	3,000.00
20' sections of 6" column pipe	13	EA	344.20	4,474.60
Electrical & controls	1	EA	15,000.00	15,000.00

Construction Subtotal	130,474.60
Engineering, Surveying, Legal (12.5%)	16,309.33
Contingencies (10%)	13,047.46
TOTAL	**$159,831.39**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.

Station S – Replace 200-hp Pumps with 250-hp Pumps

MAP KEY: 203

This project replaces the three existing 200-hp pumps and motors that pump to the Weaver tank and TU pump station with 250-hp pumps and motors. The increased capacity at the Station S pump station is needed to match increased demand due to growth in Zones 2 and 2A and increased supply resulting from upsizing the S wells.

New switchgear will not be required since the recently upgraded switchgear was sized for 250-hp pumps. New motor cables and conduits may be required if split-case pumps are used.

NOTE: Significant plumbing changes will be required if the vertical turbine pumps are replaced with split-case pumps, as proposed in this cost summary. The alternative is to upsize the impellers in the existing pumps.

Preliminary Cost Summary

(Producer Price Index 199.1 based on WPSSOP 3000, January, 2014)

Item	*Quantity*	*Units*	*Unit Cost*	*Total Cost*
Three (3) bronze fitted cast iron constructed horizontal split case pumps with 250-hp 4-pole 460-V ODP motors mounted on baseplate.		LS	100,000.00	100,000.00
Remove three (3) 200-hp pumps and motors and install three (3) new 250-hp pumps and motors, including piping and valves.		LS	60,000.00	60,000.00
Modify suction and discharge headers for split-case pumps.		LS	30,000.00	30,000.00

Construction Subtotal	190,000.00
Engineering, Surveying, Legal (12.5%)	23,750.00
Contingencies	38,000.00
TOTAL	**$251,750.00**

NOTE: This is a preliminary cost summary based on similar work on the Aqua WSC system and not an actual cost quote. It has not been based on any engineering plans or survey. A revised and more accurate estimate can be provided after engineering plans have been prepared and/or actual construction bids have been received and tabulated.