



**ACME TOWNSHIP BOARD SPECIAL MEETING
6042 Acme Rd., Williamsburg MI 49690
Tuesday, August 17, 2021, 6:00 p.m.**

CALL TO ORDER WITH PLEDGE OF ALLEGIANCE at 6:17 p.m.

ROLL CALL: Members present: D. White, C. Dye, P. Scott, J. Aukerman, D. Stevens

Members excused: D. Hoxsie, A. Jenema

Staff present: None

A. LIMITED PUBLIC COMMENT:

Brian Kelley, Acme resident, concerned with growth factor and expense if public water became available. Written comments submitted.

Paul Rundhaug, 3733 Bunker Hill Rd. not in favor of tribal water hookup.

B. APPROVAL OF AGENDA:

Motion by Aukerman, supported by Dye, to approve the *Acme Township Special Board Meeting Agenda, August 17, 2021 Agenda* as presented. No discussion. Voice vote. Motion carried unanimously.

C. OLD BUSINESS:

1. Continued Water Feasibility study discussion.

White introduced the Water Feasibility Study as this has never been done before and because of the lack of public water it has been noted as a hindrance for new businesses wanting to develop in Acme Township. The Board agreed that the information provided by this study is of importance.

Tim Korson and Mark Hurley from Gosling Czuback Engineering Sciences presented the Board with a review of the Draft preliminary findings for three options to create a public water supply in Acme Township.

- **Scenario 1** - Develop the Townships own sources of supply, treatment, backup power, storage, and water distribution network. Construction Cost \$8,083,697.
- **Scenario 2** - The Township constructs a water distribution system and connects to East Bay Township water supply system. Construction Cost \$6,086,978.
- **Scenario 3** - The Township constructs a water distribution system and connects to the Grand Traverse Band of Ottawa and Chippewa Indians (GTBOCI) water supply system. Construction Cost \$4,354,684.

Review of the financing, operations and maintenance followed. The cost to construct each of the scenarios will require the projects to be financed with 40-year loan through Rural Development (RD). Two options pay back the loan were evaluated. The first option is through water rates and second option is by use of a Special Assessment District (SAD) and water rates. Properties within the SAD will be charged through their taxes based on the REU value. The SAD will pay for 85% of the loan, and water rates will cover 15% of the loan, RRI and Bond costs, O&M and the cost of water. When SAD is created, the RD will require a loan rate of 3.25% instead of 2.25% when the loan is paid for through water rates.

When RD finances a loan they require funds be held in reserve for both a Loan Bond and a Repair

APPROVED

Replacement Investment account. Payments will need to be made into these two accounts for about 10 to 15 years and held for the duration of the loan. They each amount to around 10% of the annual payment. Annual Operations and Maintenance Costs were estimated based on systems of similar size and complexity.

Purchasing water from either East Bay or GTBOCI is also included in the annual payment based on each utilities water rate and purchasing water in a volume equal to 150 gallons per day per residential equivalency unit (REU). Financing the project through a combination of SAD and water rates results in lower water rates, the overall cost with SAD is greater as compared to financing the loan repayment from water rates alone.

Option 1- Financing with water rates. The annual cost to finance and operate a water supply system for each scenario by water rates alone are as follows:

- **Scenario 1** – Acme Water Supply \$490,351
- **Scenario 2** – East Bay Water Supply \$421,471
- **Scenario 3** – GTBOCI Water Supply \$297,092

Option 2- Financing with Special Assessment District and Water rates. The annual cost to finance and operate a water supply system for each scenario with a SAD and water rates are as follows:

- **Scenario 1** – Acme Water Supply \$554,851 (SAD \$310,733 + rates \$244,118)
- **Scenario 2** – East Bay Water Supply \$472,349 (SAD \$234,311 + rates \$238,038)
- **Scenario 3** – GTBOCI Water Supply \$334,406 (SAD \$168,010 + rates \$166,397)

User Costs- Under the two financing options the water rates will be different due to the higher interest rate and miscellaneous fees associated with the SAD. For this study, the Township's Sewer Customer REU values were used to determine the cost per customer. There are 86 total active customers equating to 325 REU's. For the SAD, undeveloped properties were assigned a minimum of 1 REU and maximum of 10 REU's for large properties for a total of 341 REU's.

Option 1- Rates. The rates per REU per year to finance and operate a water supply system for each scenario by water rates alone are as follows:

- **Scenario 1** – Acme Water Supply \$1,509 / Yr (\$126 Monthly)
- **Scenario 2** – East Bay Water Supply \$1,297 / Yr (\$108 Monthly)
- **Scenario 3** – GTBOCI Water Supply \$914 / Yr (\$76 Monthly)

Option 2- Rates and SAD. The annual cost per REU for properties in the SAD are as follows:

- **Scenario 1** – Acme Water Supply \$912 / Yr (\$76 Monthly)
- **Scenario 2** – East Bay Water Supply \$688 / Yr (\$57 Monthly)
- **Scenario 3** – GTBOCI Water Supply \$493 / Yr (\$41 Monthly)

The rates per REU per year to finance and operate a water supply system for each scenario by water rates with a SAD are as follows:

- **Scenario 1** – Acme Water Supply \$752 / Yr (\$63 Monthly)
- **Scenario 2** – East Bay Water Supply \$733 / Yr (\$61 Monthly)
- **Scenario 3** – GTBOCI Water Supply \$513 / Yr (\$43 Monthly)

Total cost for SAD and water rates per REU are as follows:

- **Scenario 1** – Acme Water Supply \$912 + \$752 = \$1,664 / Yr (\$139 Monthly)
- **Scenario 2** – East Bay Water Supply \$688 + \$733 = \$1,421 / Yr (\$118 Monthly)
- **Scenario 3** – GTBOCI Water Supply \$493 + \$513 = \$1,006 / Yr (\$84 Monthly)

Connection Charge: As vacant properties are developed, the new occupants will connect to the water system. To pay for the benefit of the system, the Township can collect a onetime connection charge per REU. Connection charges can vary as shown in the following options. Under Financing Option 1 (Water Rates Only), the connection charge is based on the total number of REU's at build out. For Financing Option 2 (SAD and Water Rates), the connection charge is based on the construction cost financed through the SAD divided by the total number of REU's at build out.

APPROVED

Option 1- Financing with Water rates – Connection Charge. The Connection charge under Financing for each scenario are as follows:

- **Scenario 1** – Acme Water Supply \$12,030
- **Scenario 2** – East Bay Water Supply \$ 9,058
- **Scenario 3** – GTBOCI Water Supply \$ 6,481

Option 2- Financing with SAD and Water Rates – Connection Charge are as follows.

- **Scenario 1** – Acme Water Supply \$17,217
- **Scenario 2** – East Bay Water Supply \$15,274
- **Scenario 3** – GTBOCI Water Supply \$10,952

A detailed draft report with map of the service boundary for the specific area of this study pertaining to Acme Growth and Investment area was presented, this also included addresses for the area involved. This study was not for the entire area of Acme Township. The Board reviewed and inquired about construction regulations, inspections/testing, and maintenance of the three scenarios. All three scenarios would be required to follow Federal regulations for construction and inspections. Grand Traverse County would take care of operations such as scheduling any maintenance repairs, billing of the water utilities including remittance and inspections.

Discussion on possibility of the water system being done in phases. The scenarios given as presented are for 100% completion. The Board agreed to wrap up the Draft study as a final.

PUBLIC COMMENT & OTHER BUSINESS THAT MAY COME BEFORE THE BOARD

Brian Kelley, Acme resident concerned with the gap, from the time of project completion to hookup of potential commercial business.

ADJOURN: Motion by Scott, supported by White, to adjourn. Voice vote. Motion carried unanimously.

Meeting adjourned at 8:30 p.m.

CERTIFICATION

I hereby certify that the foregoing is a true and complete copy of a document from the official records of the township.


Cathy Dye, CMMC, Acme Township Clerk

To: Acme Township Trustees
From: Brian Kelley

August 17, 2021

Good evening,

What I hear from John Iacoangeli's comments in the Ticker and at our meetings is that this public water is intended to push large development projects forward.

In the Feb 5, 2021 issue of The Ticker, he says "The property owners, in some of the larger parcels of property, will not be able to afford the necessary well water in order to accommodate the requirements under the fire suppression systems"

The Ticker said Iacoangeli told trustees that Acme is "never going to see the level of commercial development or residential development that it should see without potable water."

Unfortunately, no mention is made of this growth on traffic.

We hear that public water would initially only be in the commercial district, but what then? We all know this will be expanded into residential areas, for high density development. Our new Draft Zoning Ordinance encourages that.

Where is the capacity modeling for our sewer system, and modeling of that cost? How will it be expanded, and which residents will be forced to connect?

I found An Analysis of Mandatory Hookup Law: Cases & Statutes, by the Water Quality Council. I'll be sending that to you via email.

Sprawl

"Mandatory hookup activity continues to increase dramatically across the country, with a push in many areas for public water. Extension of water lines into rural or suburban areas, say local governments, promotes economic development. The evidence fails to support this contention. To the contrary, extension of water lines often promotes sprawl and strip development along the lines by making development possible in previously rural areas."

This is all about intense growth. Where is the analysis of the impact on our quality of life? Past attempts at rapid growth and big projects in Acme have not gone according to the many promises.

Thank you,

Brian Kelley



ACME TOWNSHIP SPECIAL BOARD MEETING
ACME TOWNSHIP HALL
6042 Acme Road, Williamsburg MI 49690
Tuesday, August 17, 6:00 p.m.

GENERAL TOWNSHIP MEETING POLICIES

- A. All cell phones shall be switched to silent mode or turned off.**
- B. Any person may make a video, audio, or other record of this meeting. Standing equipment, records, or portable microphones must be located so as not to block audience view.**

CALL TO ORDER WITH PLEDGE OF ALLEGIANCE
ROLL CALL

A. LIMITED PUBLIC COMMENT:

Public Comment periods are provided at the beginning and end of each meeting agenda. Members of the public may address the Board regarding any subject of community interest during these periods. Comment during other portions of the agenda may or may not be entertained at the moderator's discretion.

B. APPROVAL OF AGENDA:

C. OLD BUSINESS:

- 1. Continued Water Feasibility study discussion**

PUBLIC COMMENT & OTHER BUSINESS THAT MAY COME BEFORE THE BOARD:

ADJOURN



TECHNICAL MEMORANDUM

Acme Township Water Supply Study Preliminary Findings

To: Acme Township Board

Date: August 4, 2021

From: Tim Korson, P.E.

Re: Acme Township Water Supply Study
Preliminary Findings

cc: Mark Hurley, P.E.

1.0 INTRODUCTION

Acme Township has contracted with Gosling Czuback Engineering Sciences (GCES) to study three options for creating a public water supply.

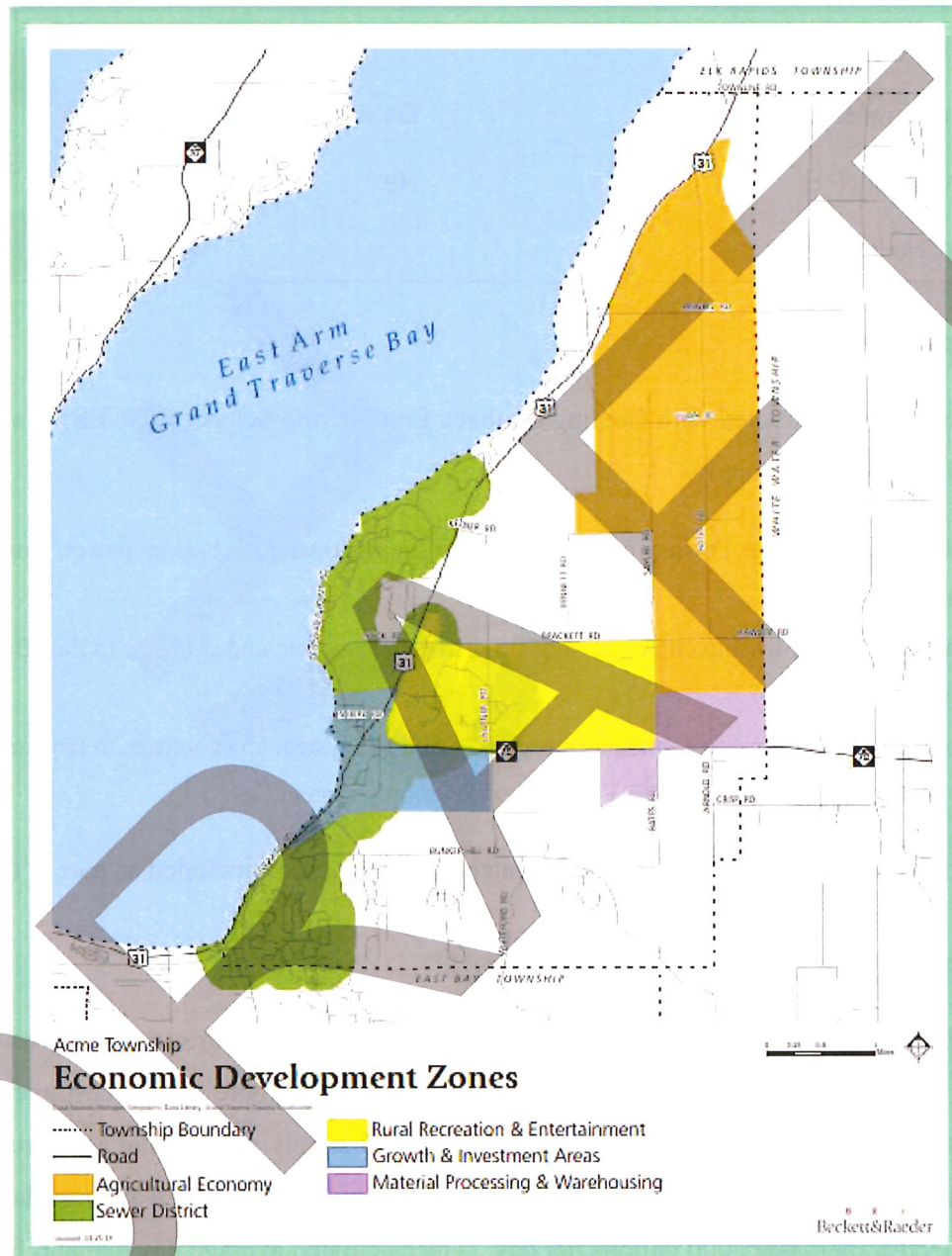
- Scenario 1- Develop the Townships own sources of supply, treatment, backup power, storage, and water distribution network.
- Scenario 2 – The Township constructs a water distribution system and connects to East Bay Townships water supply system.
- Scenario 3 – The Township constructs a water distribution system and connects to the Grand Traverse Band of Ottawa and Chippewa Indians (GTBOCI) water supply system.

Summaries of the calculations and conceptual water system maps are included as part of this memo.

2.0 WATER SYSTEM DEMANDS

The primary area of water supply is commonly referred to as the Acme Growth and Investment Areas as described in the Acme Township Master Plan 2019 and shown on Figure 1. The customers will include both residential and commercial customers but will primarily supply commercial accounts. The three water supply scenarios will all supply the same areas and customers. The calculated average day demand for the current active customers is 65,000 gallons per day. The calculated average day demand for the system if each property is developed is 134,400 gallons per day.

Figure 1 - Acme Township Economic Development Zone Map



3.0 CONSTRUCTION COSTS

Construction costs for each scenario were estimated and include the water main, hydrants, valves, services, meters, incidentals, construction contingencies at 10% of construction and engineering costs at 15% of construction. When applicable, legal and financing fees are also included. The construction costs for each scenario are as follows:

1. Scenario 1 – Acme Water Supply \$8,083,697
2. Scenario 2 – East Bay Water Supply \$6,086,978
3. Scenario 3 – GTBOCI Water Supply \$4,354,684

4.0 FINANCING AND OPERATIONS AND MAINTENANCE

The cost to construct each of the scenarios will require the projects to be financed with a 40 year loan through Rural Development (RD). Two options to pay back the loan were evaluated. The first options is through water rates and the second option is by use of a Special Assessment District (SAD) and water rates. Properties within the SAD will be charged through their taxes based on their REU value. The SAD will pay for 85% of the loan, and water rates will cover 15 % of the loan, RRI and Bond costs, O&M and the cost of water. When a SAD is created, the RD will require a loan rate of 3.25% instead of 2.25% when the loan is paid for through water rates.

When RD finances a loan they require funds be held in reserve for both a Loan Bond and a Repair Replacement Investment account. Payments will need to be made into these two accounts for about 10 to 15 years and held for the duration of the loan. They each amount to around 10% of the annual loan payment.

Annual Operations and Maintenance Costs were estimated based on systems of similar size and complexity.

Purchasing water from either East Bay or GTBOCI is also included in the annual payment based on each utilities water rate and purchasing water in a volume equal to 150 gallons per day per residential equivalency unit (REU)

Financing the project through a combination of SAD and water rates results in lower water rates, but as shown in Section 4, the overall cost with the SAD is greater as compared to financing the loan repayment from water rates alone.

4.1 Option 1 - Financing with Water Rates

The annual cost to finance and operate a water supply system for each scenario by water rates alone are as follows:

- | | |
|---------------------------------------|-----------|
| 1. Scenario 1 – Acme Water Supply | \$490,351 |
| 2. Scenario 2 – East Bay Water Supply | \$421,471 |
| 3. Scenario 3 – GTBOCI Water Supply | \$297,092 |

4.2 Option 2 – Financing with Special Assessment District and Water Rates

The annual cost to finance and operate a water supply system for each scenario with a SAD and water rates are as follows:

- | | |
|---------------------------------------|---|
| 1. Scenario 1 – Acme Water Supply | \$554,851 (SAD \$310,733 + RATES \$244,118) |
| 2. Scenario 2 – East Bay Water Supply | \$472,349 (SAD \$234,311 + RATES \$238,038) |
| 3. Scenario 3 – GTBOCI Water Supply | \$334,406 (SAD \$168,010 + RATES \$166,397) |

5.0 USER COSTS

Under the two financing options the water rates will be different due to the higher interest rate and miscellaneous fees associated with the SAD. For this study, the Township's Sewer Customer REU values were used to determine the cost per customer. There are 86 total active customers equating to 325 REU's. For the SAD, undeveloped properties were assigned a minimum of 1 REU and maximum of 10 REU's for large properties for a total of 341 REU's.

5.1 Option 1 - Rates

The rates per REU per year to finance and operate a water supply system for each scenario by water rates alone are as follows:

- | | |
|---------------------------------------|------------------------------|
| 1. Scenario 1 – Acme Water Supply | \$1,509 / Yr (\$126 Monthly) |
| 2. Scenario 2 – East Bay Water Supply | \$1,297 / Yr (\$108 Monthly) |
| 3. Scenario 3 – GTBOCI Water Supply | \$914 / Yr (\$76 Monthly) |

5.2 Option 2 - Rates and SAD

The annual cost per REU for properties in the SAD are as follows:

- | | |
|---------------------------------------|---------------------------|
| 1. Scenario 1 – Acme Water Supply | \$912 / Yr (\$76 Monthly) |
| 2. Scenario 2 – East Bay Water Supply | \$688 / Yr (\$57 Monthly) |
| 3. Scenario 3 – GTBOCI Water Supply | \$493 / Yr (\$41 Monthly) |

The rates per REU per year to finance and operate a water supply system for each scenario by water rates with a SAD are as follows:

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Total cost for SAD and water rates per REU are as follows:

- | | |
|---------------------------------------|--|
| 1. Scenario 1 – Acme Water Supply | $\$912 + \$752 = \$1,664$ / Yr (\$139 Monthly) |
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| 3. Scenario 3 – GTBOCI Water Supply | $\$493 + \$513 = \$1,006$ / Yr (\$84 Monthly) |

6.0 CONNECTION CHARGE

As vacant properties are developed, the new occupants will connect to the water system. To pay for the benefit of the system, the Township can collect a onetime connection charge per REU. Connection charges can vary as shown in the following options. Under Financing Option 1 (Water Rates Only), the connection charge is based on the total construction cost divided by the total number of REU's at build out. For Financing Option 2 (SAD and Water Rates), the connection charge is based on the construction cost financed through the SAD divided by the total number of REU's at build out.

6.1 Option 1 Financing with Water Rates – Connection Charge

The connection charge under Financing Option 1 for each scenario are as follows:

- | | |
|---------------------------------------|----------|
| 1. Scenario 1 – Acme Water Supply | \$12,030 |
| 2. Scenario 2 – East Bay Water Supply | \$ 9,058 |
| 3. Scenario 3 – GTBOCI Water Supply | \$ 6,481 |

6.2 Option 2 – Financing with SAD and Water Rates - Connection Charge

The connection charge under Financing Option 2 for each scenario are as follows:

- | | |
|---------------------------------------|----------|
| 1. Scenario 1 – Acme Water Supply | \$17,217 |
| 2. Scenario 2 – East Bay Water Supply | \$15,274 |
| 3. Scenario 3 – GTBOCI Water Supply | \$10,952 |





ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Summary of Calculations

Water Supply Description	Scenario 1 Acme Water Supply Own Sources	Scenario 2 Acme Water Supply East Bay Twp.	Scenario 3 Acme Water Supply GTBOCI
Potential Res. Customers Current Total	38	38	38
Potential Com. Customers Current Total	48	48	48
Potential Customers Current Total	86	86	86
Potential REU's Total Current	325	325	325
Potential REU's Total Build Out	672	672	672
Average Day Flow (200 GPD per REU)	65,000	65,000	65,000
Max Day Flow (Average x 4) GPD	260,000	260,000	260,000
Average Day Flow Build Out (200 GPD per REU)	134,400	134,400	134,400
Max Day Flow Build Out (Average x 4) GPD	537,600	537,600	537,600
Max Day Flow Build Out (Average x 4) GPM	373	373	373
Needed Fire Flow (gpm)	2,000	1,200*	1,700**
Recommended Firm Capacity (gpm)	250	N/A	N/A
Storage Requirements (gallons)	250,000	N/A	N/A
Booster Station Capacity (gpm)	2,000	N/A	N/A
Construction Costs (\$)	\$ 8,083,697.60	\$ 6,086,978.65	\$ 4,354,684.65
Construction Cost Per REU	\$ 24,872.92	\$ 18,729.17	\$ 13,399.03
Debt Repayment Costs 40 yr @ 2.25% Interest (\$)	\$ 308,625.92	\$ 232,385.70	\$ 166,262.48
Payment Bond and RRI	\$ 61,725.18	\$ 46,477.14	\$ 33,252.50
Annual O&M Costs (\$)	\$ 120,000.00	\$ 50,000.00	\$ 50,000.00
Annual Cost of Water (\$)	\$ -	\$ 92,608.38	\$ 47,576.87
Total Annual Costs (\$)	\$ 490,351.11	\$ 421,471.22	\$ 297,091.85
Annual Cost Per REU	\$ 1,508.77	\$ 1,296.83	\$ 914.13
Monthly Cost Per REU	\$ 125.73	\$ 108.07	\$ 76.18
Connection Charge	\$ 12,029.76	\$ 9,058.04	\$ 6,480.65

* Available Fire Flow per East Bay Twp. Engineer

** Available Fire Flow based on preliminary hydrant flow tests and model results



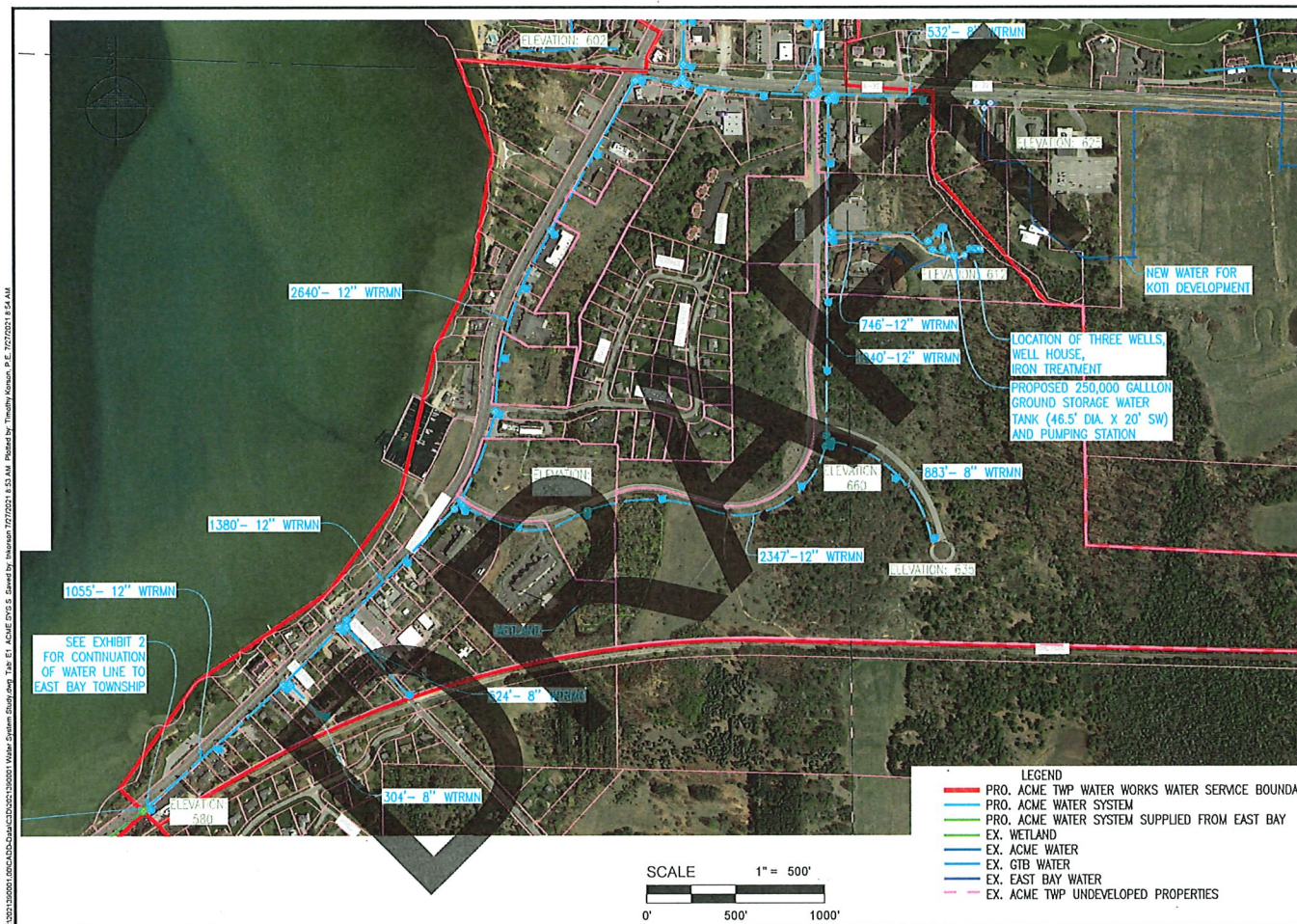
ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Summary of Calculations - SAD

Water Supply Description	Scenario 1 Acme Water Supply Own Sources	Scenario 2 Acme Water Supply East Bay Twp.	Scenario 3 Acme Water Supply GTBOCI
Potential Res. Customers Current Total	38	38	38
Potential Com. Customers Current Total	48	48	48
Potential Customers Current Total	86	86	86
Potential REU's Total Current	325	325	325
Potential REU's Total Build Out	672	672	672
Average Day Flow (200 GPD per REU)	65,000	65,000	65,000
Max Day Flow (Average x 4) GPD	260,000	260,000	260,000
Average Day Flow Build Out (200 GPD per REU)	134,400	134,400	134,400
Max Day Flow Build Out (Average x 4) GPD	537,600	537,600	537,600
Max Day Flow Build Out (Average x 4) GPM	373	373	373
Needed Fire Flow (gpm)	2,000	1,200*	1,700**
Recommended Firm Capacity (gpm)	250	N/A	N/A
Storage Requirements (gallons)	250,000	N/A	N/A
Booster Station Capacity (gpm)	2,000	N/A	N/A
Construction Costs (\$)	\$ 8,083,697.60	\$ 6,086,978.65	\$ 4,284,684.65
Construction Cost Per REU	\$ 24,872.92	\$ 18,729.17	\$ 13,183.65
Existing Customers Debt Repayment Costs 40 yr @ 3.25% Interest (\$)	\$ 54,835.23	\$ 41,349.01	\$ 29,175.98
SAD Annual Payment Costs 40 yr	\$ 310,732.99	\$ 234,311.07	\$ 165,330.53
Payment Bond and RRI	\$ 69,282.32	\$ 54,168.59	\$ 38,586.10
Annual O&M Costs (\$)	\$ 120,000.00	\$ 50,000.00	\$ 50,000.00
Annual Cost of Water (\$)	\$ -	\$ 92,520.05	\$ 47,531.49
Total Annual Costs (\$)	\$ 554,850.55	\$ 472,348.72	\$ 330,624.10
Annual Cost Per REU	\$ 751.85	\$ 733.12	\$ 509.08
Monthly Cost Per REU	\$ 62.65	\$ 61.09	\$ 42.42
Annual Cost Per REU + SAD	\$ 1,663.92	\$ 1,420.88	\$ 994.36
Monthly Cost Per REU + SAD	\$ 138.66	\$ 118.41	\$ 82.86
Connection Charge	\$ 17,217.29	\$ 15,273.95	\$ 10,777.34

* Available Fire Flow per East Bay Twp. Engineer

** Available Fire Flow based on preliminary hydrant flow tests and model results



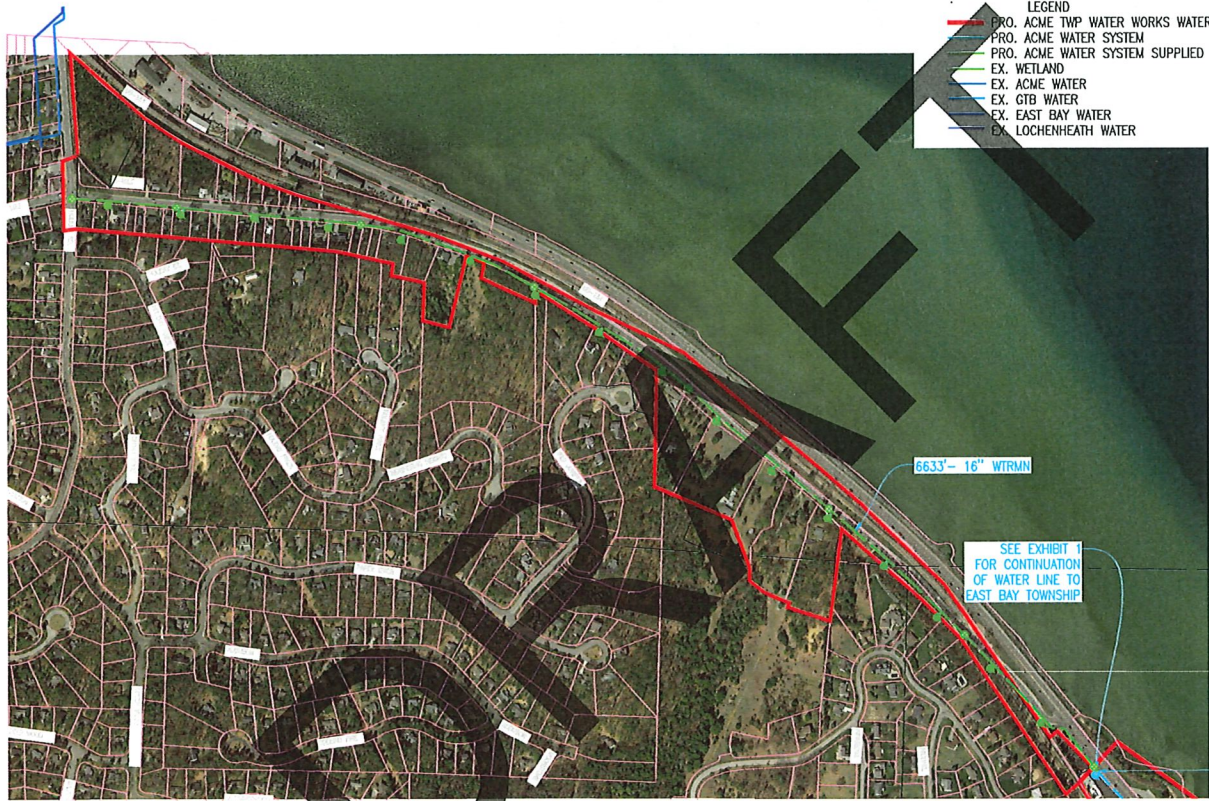
Gosling
engineering sciences, inc.
1380 Business Park Drive, Tropic City, Michigan
231-946-9191 800-918-1022
www.goslingcs.com info@goslingcs.com

EXHIBIT 1
ACME TOWNSHIP WATER STUDY
ACME TOWNSHIP

Check 1

ING | ENVIRONMENTAL SERVICES | GEOTECHNICAL
T | DRILLING | LANDSCAPE ARCHITECT

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- LEGEND
- PRO. ACME TWP WATER WORKS WATER SERVICE BOUNDARY
 - PRO. ACME WATER SYSTEM
 - PRO. ACME WATER SYSTEM SUPPLIED FROM EAST BAY
 - EX. WETLAND
 - EX. ACME WATER
 - EX. GTB WATER
 - EX. EAST BAY WATER
 - EX. LOCHENHEATH WATER

SCALE 1" = 500'

0' 500' 1000'



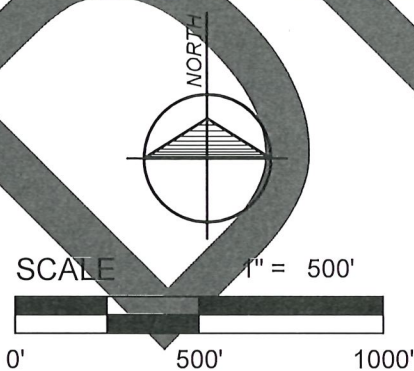
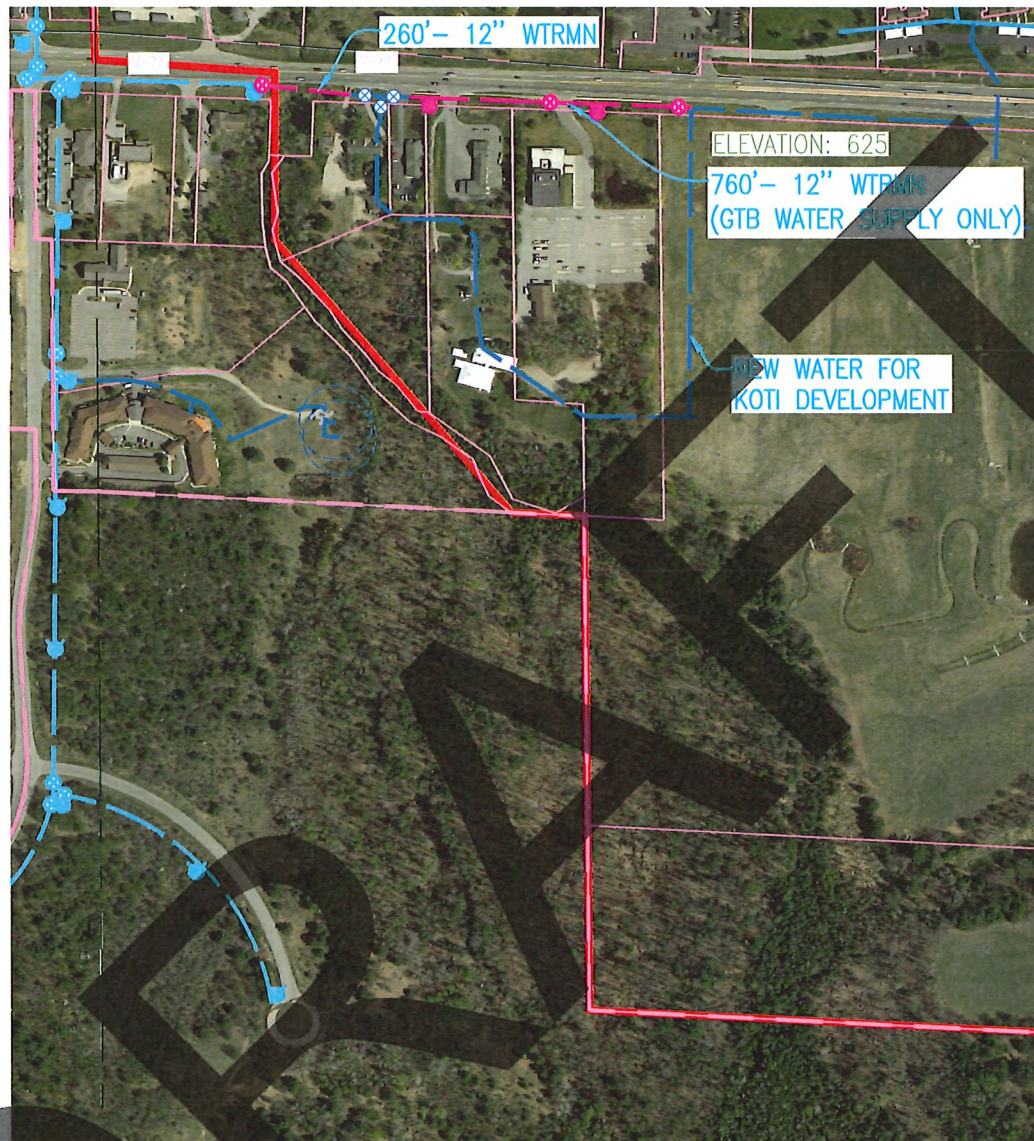
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Drawn: TJK
Checked: MH
Rev.: -

EXHIBIT 3
ACME TOWNSHIP WATER STUDY
ACME TOWNSHIP

Location: ACME TOWNSHIP

Sheet 2

WATER SUPPLIED BY THE GTBOCI



- LEGEND**
- PRO. ACME TWP WATER WORKS WATER SERVICE BOUNDARY
 - PRO. ACME WATER SYSTEM
 - PRO. ACME WATER SYSTEM SUPPLIED FROM GTBOCI
 - EX. WETLAND
 - EX. ACME WATER
 - EX. GTB WATER
 - EX. EAST BAY WATER
 - EX. ACME TWP UNDEVELOPED PROPERTIES

Sheet 4
ACME TOWNSHIP WATER STUDY
ACME TOWNSHIP

Job #: 2021390001
 Date: 7/26/2021
 Scale: 1" = 500'
 Drawn: TNK
 Chk'd.: MJH
 Rev.:



Gosling & Zubak

engineering sciences, inc.
 1280 Business Park Drive, Traverse City, Michigan
 231-946-9191 800-968-1062
 www.goslingczubak.com info@goslingczubak.com

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 CONSTRUCTION SERVICES | DRILLING | LANDSCAPE ARCHITECTURE



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
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Undeveloped Properties	1
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Construction Quantities	2
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Water Rates	1
Customer Costs	1
Project Costs - SAD	4
Water Rates - SAD	1
Customer Costs - SAD	1



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Acme Water Wells

Acme Well Capacity P1 2016 Testing

Flow (gpm)	Head (ft)
201	304
221	254
226	196
244	138

P2 2016 Testing

Flow (gpm)	Head (ft)
115	285
122	275
125	263
131	249
134	234
137	218

East Bay Water Supply (Water Model Data)

Flow (gpm)	Head (psi)
0	87 Static Pressure
4000	20 Assumed Minimum Pressure

GTBOCI Water Supply (Flow Test Data for KOTI Dev.)

Flow (gpm)	Head (psi)
0	65 Static Pressure
1680	47
3200	20

Existing Sewer Customers

Count	86	
REU Total	364	
Flow ADD	72,738 GPD	51 GPM
Peak Flow	290,952 GPD	202 GPM

Undeveloped Property Estimated Flow

Undeveloped Acres	149	
REU Total	308	2 REU's Per Acre
GPD per REU	200	
Flow ADD	61,600 GPD	43 GPM
Peak Flow	246,400 GPD	171 GPM

Build Out Flow

REU Total	672	
Flow ADD	134,338 GPD	93 GPM
Peak Flow	537,352 GPD	373 GPM



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Acme Water Wells

Storage (Existing Wells)

Fire Flow (gpm)	2,000	
Peak Flow Buildout (gpm)	373	
Firm Capacity (gpm)	200	
Needed Flow From Storage (gpm)	2,173	
Fire Duration (hr)	2	
Average Day Flow (gal)	134,338	
Needed Storage (gal)	395,117	W/ 1 Day ADF
Needed Storage (gal)	260,779	W/ Out 1 Day ADF

Storage (Recommend Wells)

Fire Flow (gpm)	2,000	
Peak Flow Build Out (gpm)	373	
Recommended Firm Capacity (gpm)	250	
Needed Flow From Storage (gpm)	2,123	
Fire Duration (hr)	2	
Average Day Flow (gal)	134,338	
Needed Storage (gal)	389,117	W/ 1 Day ADF
Needed Storage (gal)	254,779	W/ Out 1 Day ADF



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021

Existing Potential Customers in the Acme Growth and Investment Area

Customers

Customer Count 86

REU Total 363.69

Flow Average Day 72,738 GPD

Peak Flow 290,952 GPD

50.51 GPM

202.05 GPM

352

Res 38

Com 48

Account No.	Address	Street	Classification	REU
1002411	5673	US 31 NORTH	R1	1
1002311	5683	US 31 NORTH	R1	1
1002211	5691	US 31 NORTH	R1	1
1002011	5700	US 31 NORTH	C	4.18
1002511	5703	US 31 NORTH	R1	1
1001011	5705	US 31 NORTH	R1	1
1003011	5748	US 31 NORTH	C	1
1002822	5750	US 31 NORTH	C	2.3
1000911	5751	US 31 NORTH	R1	12
1002833	5754	US 31 NORTH	C	1
1002862	5756	US 31 NORTH	C	1
1002922	5762	US 31 NORTH	C	1.1
1002841	5766	US 31 NORTH	C	1
1002851	5770	US 31 NORTH	C	1
1002932	5774	US 31 NORTH	C	1
1002942	5778	US 31 NORTH	C	1
1002952	5782	US 31 NORTH	C	1
1001621	5872	US 31 NORTH	C	2
1052411	5875	US 31 NORTH	G	1
1096511	5908	US 31 NORTH	RES	4.7
1041511	5927	US 31 NORTH	C	2.3
1001211	5940	US 31 NORTH	C	1
1001221	5942	US 31 NORTH	C	1
1001111	5980	US 31 NORTH	C	3.7
1004211	5356	US 31 NORTH	C	2.2
1003611	5368	US 31 NORTH	C	4.8



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study

2021390001

7/27/2021

Existing Potential Customers in the Acme Growth and Investment Area

1003711	5396	US 31 NORTH	C	2
1003911	5408	US 31 NORTH	R1	1
1004011	5415	US 31 NORTH	C	1.3
1036411	5430	US 31 NORTH	C	1.6
1134211	5517	US 31 NORTH	C	1
1127811	5520	US 31 NORTH	C	38
1054411	5600	US 31 NORTH	C	2.9
1004321	3585	BUNKER HILL	C	1
1005211	3590	BUNKER HILL	R1	1
1003311	3593	BUNKER HILL	C	5
1003412	3593	BUNKER HILL	C	1
1005111	3594	BUNKER HILL	R1	1
1005311	3606	BUNKER HILL	R1	1
1005611	3618	BUNKER HILL	R1	1
1005411	3630	BUNKER HILL	R1	1
1003211	3647	BUNKER HILL	R1	2
1005011	5074	US 31 NORTH	C	21
1004811	5112	US 31 NORTH	R1	1
1004911	5112	US 31 NORTH	C	1.24
1005711	5148	US 31 NORTH	R1	1
1005811	5152	US 31 NORTH	C	2
1004711	5168	US 31 NORTH	C	1.6
1006811	5200	US 31 NORTH	C	4.3
1006011	5220	US 31 NORTH	C	2.9
1006621	5229	US 31 NORTH	C	6
1006611	5251	US 31 NORTH	R1	1
1004411	5252	US 31 NORTH	C	2
1006311	5253	US 31 NORTH	R1	1
1006411	5271	US 31 NORTH	R1	1
1006511	5285	US 31 NORTH	R1	1
1006111	5300	US 31 NORTH	R1	1.59
1005911	3536	KIRKLAND	R1	1
1004511	3619	KIRKLAND	R1	2
1004611	3620	KIRKLAND	R1	2
1130611	3536	MOUNT HOPE	C	47
1122421	4354	MOUNT HOPE	R-AL	53.5
1099711	4400	MOUNT HOPE	CH	1.8
1128011	4472	MOUNT HOPE	C	2.3
1128021	4480	MOUNT HOPE	C	2.3



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study

2021390001

7/27/2021

Existing Potential Customers in the Acme Growth and Investment Area

1041211	6353	US 31 NORTH	C	1
1041111	6455	US 31 NORTH	C	38
1009411	6010	ACME	C	1
1009511	6042	ACME	C	1
1034011	6151	ACME	R1	1
1034211	6173	ACME	R1	1
1035811	6178	ACME	R1	1
1038111	6198	ACME	R1	1
1038811	6209	ACME	R1	3
1034911	6212	ACME	R1	1
1039511	6226	ACME	R1	1
1038911	6229	ACME	R1	2
1008911	5992	HOLT	R1	1
1016311	6000	HOLT	R1	6
1036911	6009	HOLT	R1	1
1016011	6022	HOLT	R1	6
1016111	6056	HOLT	R1	6
1016211	6088	HOLT	R1	6
1121811	6060	US 31 NORTH	C	4.08
1087111	6100	US 31 NORTH	C	2.6
1035821	6170	US 31 NORTH	C	1.4



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study

2021390001

7/27/2021

Undeveloped Properties in the Acme Growth and Investment Area

Area (SQRFT)	Area (ACRES)	REU	Flow per REU (GPD)	Total Flow (GPD)
9,056	0.21	2	200	400
18,598	0.43	2	200	400
4,823,564	110.73	222	200	44,400
693,372	15.92	32	200	6,400
15,867	0.36	2	200	400
19,084	0.44	2	200	400
24,530	0.56	2	200	400
26,558	0.61	2	200	400
463,218	10.63	22	200	4,400
152,549	3.50	8	200	1,600
242,177	5.56	12	200	2,400
TOTAL	148.96	308		61,600.00

Total Area SQRFT	15,334,581
Total Area Acres	352
Total Developed Area Acres	203
Total REU's Current	364
REU's per Acre	1.79



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Acme Township Population

Average Change	45
Average %	1.1%

Year	Population	Change	Percent Change
1990	3459		
1991	3552	93	2.7%
1992	3652	100	2.8%
1993	3741	89	2.4%
1994	3821	80	2.1%
1995	3911	90	2.4%
1996	4001	90	2.3%
1997	4047	46	1.1%
1998	4133	86	2.1%
1999	4212	79	1.9%
2000	4393	181	4.3%
2001	4390	-3	-0.1%
2002	4430	40	0.9%
2003	4470	40	0.9%
2004	4513	43	1.0%
2005	4538	25	0.6%
2006	4535	-3	-0.1%
2007	4565	30	0.7%
2008	4599	34	0.7%
2009	4619	20	0.4%
2010	4374	-245	-5.3%
2011	4449	75	1.7%
2012	4502	53	1.2%
2013	4556	54	1.2%
2014	4593	37	0.8%
2015	4613	20	0.4%
2016	4665	52	1.1%
2017	4694	29	0.6%
2018	4717	23	0.5%



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Summary of Calculations

Water Supply Description	Scenario 1 Acme Water Supply Own Sources	Scenario 2 Acme Water Supply East Bay Twp.	Scenario 3 Acme Water Supply GTBOCI
Potential Res. Customers Current Total	38	38	38
Potential Com. Customers Current Total	48	48	48
Potential Customers Current Total	86	86	86
Potential REU's Total Current	325	325	325
Potential REU's Total Build Out	672	672	672
Average Day Flow (200 GPD per REU)	65,000	65,000	65,000
Max Day Flow (Average x 4) GPD	260,000	260,000	260,000
Average Day Flow Build Out (200 GPD per REU)	134,400	134,400	134,400
Max Day Flow Build Out (Average x 4) GPD	537,600	537,600	537,600
Max Day Flow Build Out (Average x 4) GPM	373	373	373
Needed Fire Flow (gpm)	2,000	1,200*	1,700**
Recommended Firm Capacity (gpm)	250	N/A	N/A
Storage Requirements (gallons)	250,000	N/A	N/A
Booster Station Capacity (gpm)	2,000	N/A	N/A
Construction Costs (\$)	\$ 8,083,697.60	\$ 6,086,978.65	\$ 4,354,684.65
Construction Cost Per REU	\$ 24,872.92	\$ 18,729.17	\$ 13,399.03
Debt Repayment Costs 40 yr @ 2.25% Interest (\$)	\$ 308,625.92	\$ 232,385.70	\$ 166,262.48
Payment Bond and RRI	\$ 61,725.18	\$ 46,477.14	\$ 33,252.50
Annual O&M Costs (\$)	\$ 120,000.00	\$ 50,000.00	\$ 50,000.00
Annual Cost of Water (\$)	\$ -	\$ 92,608.38	\$ 47,576.87
Total Annual Costs (\$)	\$ 490,351.11	\$ 421,471.22	\$ 297,091.85
Annual Cost Per REU	\$ 1,508.77	\$ 1,296.83	\$ 914.13
Monthly Cost Per REU	\$ 125.73	\$ 108.07	\$ 76.18
Connection Charge	\$ 12,029.76	\$ 9,058.04	\$ 6,480.65

* Available Fire Flow per East Bay Twp. Engineer

** Available Fire Flow based on preliminary hydrant flow tests and model results



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Construction Quantities

Acme Growth and Investment Area

Pipe

Street	From	To	Length	Size
Cul-de-sac	Dead End	Mt Hope RD	883	8
M72	East	Mt Hope Rd	532	8
M 72	Mt Hope Rd	US 31	1082	12
Kirkland Ct	3504	3622	304	8
Bunkerhill	US 31	end	524	8
US 31	Bay View Bar	Kirkland Ct	1055	12
US 31	Kirkland Ct	Mt Hope Rd	1380	12
US 31	M 72	Mt Hope Rd	2640	12
Mt Hope Rd	US 31	Culdesac Tee	2347	12
Mt Hope Rd	Cul-de-sac	M 72	1940	12
Holt Rd	M72	end	714	8
Huffman	Acme	Holt	760	8
Gilbert	Huffman	end	200	8
Acme	M 72	Shore	1450	12
Shore	Acme	US 31	430	8
Back of Toms Grocery	Shore	end	918	8

Total 8"	5,265
Total 12"	9,254
US-31 12"	4,967
12" Not in US-31	4,287

Total Fire Hydrants	41
8" Valves	17
12" Valves	22

Service Customer Connections	
Existing Sewer Customers	86
Residential	38
Commerical	48



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Construction Quantities

Acme Well Site

Street	From	To	Length	Size
Well Location	Well	Mt Hope RD	746	12
Well Site Yard Piping	n/a	n/a	300	12

Total Fire Hydrants	0
8" Valves	0
12" Valves	6

East Bay Supply

Street	From	To	Length	Size
Five Mile	Holiday	M 72	6633	16

Total Fire Hydrants	13
16" Valves	8

Service Customer Connections	
Existing Sewer Customers	0
Residential	0
Commerical	0

GTBOCI Supply

Street	From	To	Length	Size
M-72	Town Center Dr	Acme Creek	1020	12

Total Fire Hydrants	2
16" Valves	3

Service Customer Connections	
Existing Sewer Customers	0
Residential	0
Commerical	0



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Construction Quantities

Meters - Acme Commercial

Meter Size	Meter Cost (\$)	Labor (\$)	Total Meter Cost (\$)	Flow Range (gpm)	Count Acme Com.
3/4"	\$ 350	\$ 400	\$ 750	.5 - 25	64
1"	\$ 300	\$ 400	\$ 700	1.25 - 70	11
1.5"	\$ 1,300	\$ 400	\$ 1,700	2.5 to 120	5
2"	\$ 3,100	\$ 400	\$ 3,500	.5 - 200	1
4"	\$ 5,800	\$ 400	\$ 6,200	.75 - 1000	5

Meters - East Bay Supply

Meter Size	Meter Cost (\$)	Labor (\$)	Total Meter Cost (\$)	Flow Range (gpm)	Count East Bay Res.
3/4"	\$ 350	\$ 400	\$ 750	.5 - 25	41



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township - Water Study

2021039001

2021390001

7/27/2021

Water System Costs

Water Main - Acme Growth and Investment Area

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 70,000	\$ 70,000
2	Audio- Video Route Survey	1	LS	\$ 2,500	\$ 2,500
3	Traffic Control	1	LS	\$ 40,000	\$ 40,000
4	Soil Erosion and Sediment Control	1	LS	\$ 3,000	\$ 3,000
5	8" Watermain	5,265	FT	\$ 90	\$ 473,850
6	12" Watermain	4,967	FT	\$ 105	\$ 521,535
7	12" Watermain - US-31	5,265	FT	\$ 145	\$ 763,425
8	8" Gate Valve & Box	17	EA	\$ 1,600	\$ 27,200
9	12" Gate Valve & Box	28	EA	\$ 3,200	\$ 89,600
10	Service Connection (Residential)	38	EA	\$ 4,000	\$ 152,000
11	Service Connection (Commercial)	48	EA	\$ 5,000	\$ 240,000
12	6" Fire Service (Commercial Properties Only)	48	EA	\$ 6,000	\$ 288,000
13	3/4" Meter	64	EA	\$ 750	\$ 48,000
14	1" Meter	11	EA	\$ 700	\$ 7,700
15	1.5" Meter	5	EA	\$ 1,700	\$ 8,500
16	2" Meter	1	EA	\$ 3,500	\$ 3,500
17	4" Meter	5	EA	\$ 6,200	\$ 31,000
18	Hydrant Assembly	41	EA	\$ 5,000	\$ 205,000
19	Restoration	1	LS	\$ 50,000	\$ 50,000

Construction Sub-Total			\$ 3,024,810
Contingencies 1	at	10%	\$302,481
Engineering 1	at	15%	\$499,094
Legal & Financing 1			\$60,000
Total Project Cost			\$ 3,886,385



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township - Water Study
2021039001
2021390001
7/27/2021
Water System Costs

Water Main - East Bay Supply

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 20,000	\$ 20,000
2	Audio- Video Route Survey	1	LS	\$ 1,000	\$ 1,000
3	Traffic Control	1	LS	\$ 20,000	\$ 20,000
4	Soil Erosion and Sediment Control	1	LS	\$ 3,000	\$ 3,000
5	16" Watermain	6,633	FT	\$ 200	\$ 1,326,600
6	16" Gate Valve & Box	8	EA	\$ 5,000	\$ 40,000
7	Service Connection (Residential)	41	EA	\$ 4,000	\$ 164,000
8	Service Connection (Commercial)	-	EA	\$ 4,000	\$ -
9	3/4" Meter	-	EA	\$ 750	\$ -
10	Hydrant Assembly	13	EA	\$ 5,000	\$ 65,000
11	Master Meter & Vault	1	LS	\$ 50,000	\$ 50,000
12	Restoration	1	LS	\$ 50,000	\$ 50,000

Construction Sub-Total \$ 1,739,600
Contingencies 1 at 10% \$173,960
Engineering 1 at 15% \$287,034
Total Project Cost \$ 2,200,594

Water Main - GTBOCI Supply

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 10,000	\$ 10,000
2	Audio- Video Route Survey	1	LS	\$ 500	\$ 500
3	Traffic Control	1	LS	\$ 5,000	\$ 5,000
4	Soil Erosion and Sediment Control	1	LS	\$ 1,500	\$ 1,500
5	12" Watermain	1,020	FT	\$ 145	\$ 147,900
6	12" Gate Valve & Box	3	EA	\$ 3,200	\$ 9,600
7	Service Connection (Residential)	-	EA	\$ 4,000	\$ -
8	Service Connection (Commercial)	-	EA	\$ 4,000	\$ -
9	3/4" Meter	-	EA	\$ 750	\$ -
10	Hydrant Assembly	2	EA	\$ 5,000	\$ 10,000
11	Master Meter & Vault	2	LS	\$ 50,000	\$ 100,000
12	Restoration	1	LS	\$ 50,000	\$ 50,000

Construction Sub-Total \$ 334,500
Contingencies 1 at 10% \$33,450
Engineering 1 at 15% \$100,350
Total Project Cost \$ 468,300



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township - Water Study
2021039001
2021390001
7/27/2021
Water System Costs

Well Improvements, Storage, Booster Station

No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 45,000	\$ 45,000
2	Well No. 2 Upgrades	1	LS	\$ 11,000	\$ 11,000
3	New Well No. 3	1	LS	\$ 275,000	\$ 275,000
4	12" Watermain	1,046	FT	\$ 105	\$ 109,830
5	12" Gate Valve & Box	6	EA	\$ 3,200	\$ 19,200
6	New Well House with Prepackaged Iron Treatment	1	LS	\$ 1,000,000	\$ 1,000,000
7	System Controls	1	LS	\$ 75,000	\$ 75,000
8	Well Back up Power	1	LS	\$ 50,000	\$ 50,000
9	250,000 Gal Ground Storage Tank	1	LS	\$ 950,000	\$ 950,000
10	Booster Station	1	LS	\$ 700,000	\$ 700,000

Construction Sub-Total \$ 3,235,030

Contingencies 1 at 10% \$323,503

Engineering 1 at 15% \$533,780

Land Acquisition 1 \$75,000

Legal & Financing 1 \$30,000

Wells, Storage, and Booster Station TOTAL \$ 4,197,313

Cost Acme Water Supply Own Sources	\$8,083,697.60
Cost Acme Water Supplied by East Bay	\$6,086,978.65
Cost Acme Water Supplied by GTBOCI	\$4,354,684.65



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Water Rates

Acme Sources

Annual Loan Repayment	\$	308,625.92	
Loan Bond (10%)	\$	30,862.59	Estimated
RRI (10%)	\$	30,862.59	Estimated
O&M	\$	120,000.00	
Total Annual Cost	\$	490,351.11	

Total REU's		325
Annual Cost per REU	\$	1,508.77
Monthly Cost per REU	\$	125.73

East Bay Source

Annual Loan Repayment	\$	232,386
Loan Bond (10%)	\$	23,239
RRI (10%)	\$	23,239
O&M	\$	50,000
Total Annual Cost	\$	328,863

Min Average Daily Water Use (150 GPD per REU)		48,750
Annual Water Use (Gallons)		17,793,750
Annual Water Use (100 CFT)		23,788
Min Annual Cost of Water (\$3.89/100 CFT)	\$	92,608.38
Min Annual Cost of Water (\$1.95/100 CFT)	\$	46,387.45

Total Annual Cost of Water (\$3.89/100 CFT)	\$	421,471.22
Total Annual Cost of Water (\$1.95/100 CFT)	\$	375,250.29

Total REU's (\$3.89/100 CFT)		325
Annual Cost per REU (\$3.89/100 CFT)	\$	1,296.83
Monthly Cost per REU (\$3.89/100 CFT)	\$	108.07

Total REU's (\$1.95/100 CFT)		325
Annual Cost per REU (\$1.95/100 CFT)	\$	1,154.62
Monthly Cost per REU (\$1.95/100 CFT)	\$	96.22



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Water Rates

GTBOCI Source

Annual Loan Repayment	\$	166,262
Loan Bond (10%)	\$	16,626
RRI (10%)	\$	16,626
O&M	\$	50,000
Total Annual Cost	\$	249,515

Min Average Daily Water Use (150 GPD per REU)		48,750
Annual Water Use (Gallons)		17,793,750
Annual Water Use (100 CFT)		23,788
Min Annual Cost of Water (\$2.00/100 CFT)	\$	47,576.87

Total Annual Cost of Water (\$2.00/100 CFT)	\$	297,091.85
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Total REU's (\$2.00/100 CFT)		325.00
Annual Cost per REU (\$2.00/100 CFT)	\$	914.13
Monthly Cost per REU (\$2.00/100 CFT)	\$	76.18

	Acme Sources	East Bay @ 3.89	GTBOCI
Annual Cost	\$ 490,351.11	\$ 421,471.22	\$ 297,091.85
Total REU's	325	325	325.00
Annual Cost Per REU	\$ 1,508.77	\$ 1,296.83	\$ 914.13
Monthly Cost per REU	\$ 125.73	\$ 108.07	\$ 76.18
Buildout REU's	672.00	672.00	\$ 672.00
Connection Charge per REU (Debt / Total Full Buildout REU's)	\$ 12,030	\$ 9,058	\$ 6,481



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Customer Costs

Customer REU's	Customer Count	GPD (200 GPD per REU)	Peak Flow (gpm)	Estimated Service Size (in)	Estimated Meter Size (in)	Service Install Cost (\$)	Abandon Well (\$)	Total Customer Cost (\$)
1	43	200	10	1	0.75	\$ 1,500	\$ 500	\$ 86,000
1.1	1	220	11	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.24	1	248	12.4	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.3	1	260	13	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.4	1	280	14	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.59	1	318	15.9	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.6	2	320	16	1	0.75	\$ 1,500	\$ 500	\$ 4,000
1.8	1	360	18	1	0.75	\$ 1,500	\$ 500	\$ 2,000
2	8	400	20	1	0.75	\$ 1,500	\$ 500	\$ 16,000
2.2	1	440	22	1	0.75	\$ 1,500	\$ 500	\$ 2,000
2.3	4	460	23	1	0.75	\$ 1,500	\$ 500	\$ 8,000
2.6	1	520	26	1	1	\$ 1,500	\$ 500	\$ 2,000
2.9	2	580	29	1	1	\$ 1,500	\$ 500	\$ 4,000
3	1	600	30	1	1	\$ 1,500	\$ 500	\$ 2,000
3.7	1	740	37	1	1	\$ 1,500	\$ 500	\$ 2,000
4.08	1	816	40.8	1	1	\$ 1,500	\$ 500	\$ 2,000
4.18	1	836	41.8	1	1	\$ 1,500	\$ 500	\$ 2,000
4.3	1	860	43	1	1	\$ 1,500	\$ 500	\$ 2,000
4.7	1	940	47	1	1	\$ 1,500	\$ 500	\$ 2,000
4.8	1	960	48	1	1	\$ 1,500	\$ 500	\$ 2,000
5	1	1000	50	1	1	\$ 1,500	\$ 500	\$ 2,000
6	5	1200	60	2	1.5	\$ 3,000	\$ 500	\$ 17,500
12	1	2400	120	2	2	\$ 3,000	\$ 500	\$ 3,500
21	1	4200	210	4	4	\$ 6,000	\$ 500	\$ 6,500
38	2	7600	380	4	4	\$ 6,000	\$ 500	\$ 13,000
47	1	9400	470	4	4	\$ 6,000	\$ 500	\$ 6,500
53.5	1	10700	535	4	4	\$ 6,000	\$ 500	\$ 6,500



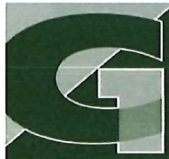
ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Summary of Calculations - SAD

Water Supply Description	Scenario 1 Acme Water Supply Own Sources	Scenario 2 Acme Water Supply East Bay Twp.	Scenario 3 Acme Water Supply GTBOCI
Potential Res. Customers Current Total	38	38	38
Potential Com. Customers Current Total	48	48	48
Potential Customers Current Total	86	86	86
Potential REU's Total Current	325	325	325
Potential REU's Total Build Out	672	672	672
Average Day Flow (200 GPD per REU)	65,000	65,000	65,000
Max Day Flow (Average x 4) GPD	260,000	260,000	260,000
Average Day Flow Build Out (200 GPD per REU)	134,400	134,400	134,400
Max Day Flow Build Out (Average x 4) GPD	537,600	537,600	537,600
Max Day Flow Build Out (Average x 4) GPM	373	373	373
Needed Fire Flow (gpm)	2,000	1,200*	1,700**
Recommended Firm Capacity (gpm)	250	N/A	N/A
Storage Requirements (gallons)	250,000	N/A	N/A
Booster Station Capacity (gpm)	2,000	N/A	N/A
Construction Costs (\$)	\$ 8,083,697.60	\$ 6,086,978.65	\$ 4,284,684.65
Construction Cost Per REU	\$ 24,872.92	\$ 18,729.17	\$ 13,183.65
Existing Customers Debt Repayment Costs 40 yr @ 3.25% Interest (\$)	\$ 54,835.23	\$ 41,349.01	\$ 29,175.98
SAD Annual Payment Costs 40 yr	\$ 310,732.99	\$ 234,311.07	\$ 165,330.53
Payment Bond and RRI	\$ 69,282.32	\$ 54,168.59	\$ 38,586.10
Annual O&M Costs (\$)	\$ 120,000.00	\$ 50,000.00	\$ 50,000.00
Annual Cost of Water (\$)	\$ -	\$ 92,520.05	\$ 47,531.49
Total Annual Costs (\$)	\$ 554,850.55	\$ 472,348.72	\$ 330,624.10
Annual Cost Per REU	\$ 751.85	\$ 733.12	\$ 509.08
Monthly Cost Per REU	\$ 62.65	\$ 61.09	\$ 42.42
Annual Cost Per REU + SAD	\$ 1,663.92	\$ 1,420.88	\$ 994.36
Monthly Cost Per REU + SAD	\$ 138.66	\$ 118.41	\$ 82.86
Connection Charge	\$ 17,217.29	\$ 15,273.95	\$ 10,777.34

* Available Fire Flow per East Bay Twp. Engineer

** Available Fire Flow based on preliminary hydrant flow tests and model results



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Construction Quantities

Acme Growth and Investment Area

Pipe

Street	From	To	Length	Size
Cul-de-sac	Dead End	Mt Hope RD	883	8
M72	East	Mt Hope Rd	532	8
M 72	Mt Hope Rd	US 31	1082	12
Kirkland Ct	3504	3622	304	8
Bunkerhill	US 31	end	524	8
US 31	Bay View Bar	Kirkland Ct	1055	12
US 31	Kirkland Ct	Mt Hope Rd	1380	12
US 31	M 72	Mt Hope Rd	2640	12
Mt Hope Rd	US 31	Culdesac Tee	2347	12
Mt Hope Rd	Cul-de-sac	M 72	1940	12
Holt Rd	M72	end	714	8
Huffman	Acme	Holt	760	8
Gilbert	Huffman	end	200	8
Acme	M 72	Shore	1450	12
Shore	Acme	US 31	430	8
Back of Toms Grocery	Shore	end	918	8

Total 8"	5,265
Total 12"	9,254
US-31 12"	4,967
12" Not in US-31	4,287

Total Fire Hydrants	41
8" Valves	17
12" Valves	28

Service Customer Connections	
Existing Sewer Customers	86
Residential	38
Commerical	48



Acme Township
Water System Study
2021390001
7/27/2021
Construction Quantities

Acme Well Site

Street	From	To	Length	Size
Well Location	Well	Mt Hope RD	746	12
Well Site Yard Piping	n/a	n/a	300	12

Total Fire Hydrants	0
8" Valves	0
12" Valves	6

East Bay Supply

Street	From	To	Length	Size
Five Mile	Holiday	M 72	6633	16

Total Fire Hydrants	13
16" Valves	8

Service Customer Connections	
Existing Sewer Customers	0
Residential	0
Commerical	0

GTBOCI Supply

Street	From	To	Length	Size
M-72	Town Center Dr	Acme Creek	1020	12

Total Fire Hydrants	2
16" Valves	3

Service Customer Connections	
Existing Sewer Customers	0
Residential	0
Commerical	0



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Construction Quantities

Meters - Acme Commercial

Meter Size	Meter Cost (\$)	Labor (\$)	Total Meter Cost (\$)	Flow Range (gpm)	Count Acme Com.
3/4"	\$ 350	\$ 400	\$ 750	.5 - 25	64
1"	\$ 300	\$ 400	\$ 700	1.25 - 70	11
1.5"	\$ 1,300	\$ 400	\$ 1,700	2.5 to 120	5
2"	\$ 3,100	\$ 400	\$ 3,500	.5 - 200	1
4"	\$ 5,800	\$ 400	\$ 6,200	.75 - 1000	5

Meters - East Bay Supply

Meter Size	Meter Cost (\$)	Labor (\$)	Total Meter Cost (\$)	Flow Range (gpm)	Count East Bay Res.
3/4"	\$ 350	\$ 400	\$ 750	.5 - 25	41



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township - Water Study
2021039001
2021390001
7/27/2021
Water System Costs

Water Main - Acme Growth and Investment Area

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 70,000	\$ 70,000
2	Audio- Video Route Survey	1	LS	\$ 2,500	\$ 2,500
3	Traffic Control	1	LS	\$ 40,000	\$ 40,000
4	Soil Erosion and Sediment Control	1	LS	\$ 3,000	\$ 3,000
5	8" Watermain	5,265	FT	\$ 90	\$ 473,850
6	12" Watermain	4,967	FT	\$ 105	\$ 521,535
7	12" Watermain - US-31	5,265	FT	\$ 145	\$ 763,425
8	8" Gate Valve & Box	17	EA	\$ 1,600	\$ 27,200
9	12" Gate Valve & Box	28	EA	\$ 3,200	\$ 89,600
10	Service Connection (Residential)	38	EA	\$ 4,000	\$ 152,000
11	Service Connection (Commercial)	48	EA	\$ 5,000	\$ 240,000
12	6" Fire Service (Commercial Properties Only)	48	EA	\$ 6,000	\$ 288,000
13	3/4" Meter	64	EA	\$ 750	\$ 48,000
14	1" Meter	11	EA	\$ 700	\$ 7,700
15	1.5" Meter	5	EA	\$ 1,700	\$ 8,500
16	2" Meter	1	EA	\$ 3,500	\$ 3,500
17	4" Meter	5	EA	\$ 6,200	\$ 31,000
18	Hydrant Assembly	41	EA	\$ 5,000	\$ 205,000
19	Restoration	1	LS	\$ 50,000	\$ 50,000

Construction Sub-Total			\$ 3,024,810
Contingencies 1	at	10%	\$302,481
Engineering 1	at	15%	\$499,094
Legal & Financing 1			\$60,000
Total Project Cost			\$ 3,886,385



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township - Water Study

2021039001

2021390001

7/27/2021

Water System Costs

Water Main - East Bay Supply

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 20,000	\$ 20,000
2	Audio- Video Route Survey	1	LS	\$ 1,000	\$ 1,000
3	Traffic Control	1	LS	\$ 20,000	\$ 20,000
4	Soil Erosion and Sediment Control	1	LS	\$ 3,000	\$ 3,000
5	16" Watermain	6,633	FT	\$ 200	\$ 1,326,600
6	16" Gate Valve & Box	8	EA	\$ 5,000	\$ 40,000
7	Service Connection (Residential)	41	EA	\$ 4,000	\$ 164,000
8	Service Connection (Commercial)	-	EA	\$ 4,000	\$ -
9	3/4" Meter	-	EA	\$ 750	\$ -
10	Hydrant Assembly	13	EA	\$ 5,000	\$ 65,000
11	Master Meter & Vault	1	LS	\$ 50,000	\$ 50,000
12	Restoration	1	LS	\$ 50,000	\$ 50,000

Construction Sub-Total		\$	1,739,600
Contingencies 1	at	10%	\$173,960
Engineering 1	at	15%	\$287,034
Total Project Cost		\$	2,200,594

Water Main - GTBOCI Supply

Item No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 10,000	\$ 10,000
2	Audio- Video Route Survey	1	LS	\$ 500	\$ 500
3	Traffic Control	1	LS	\$ 5,000	\$ 5,000
4	Soil Erosion and Sediment Control	1	LS	\$ 1,500	\$ 1,500
5	12" Watermain	1,020	FT	\$ 145	\$ 147,900
6	12" Gate Valve & Box	3	EA	\$ 3,200	\$ 9,600
7	Service Connection (Residential)	-	EA	\$ 4,000	\$ -
8	Service Connection (Commercial)	-	EA	\$ 4,000	\$ -
9	3/4" Meter	-	EA	\$ 750	\$ -
10	Hydrant Assembly	2	EA	\$ 5,000	\$ 10,000
11	Master Meter & Vault	1	LS	\$ 50,000	\$ 50,000
12	Restoration	1	LS	\$ 50,000	\$ 50,000

Construction Sub-Total		\$	284,500
Contingencies 1	at	10%	\$28,450
Engineering 1	at	15%	\$85,350
Total Project Cost		\$	398,300



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township - Water Study
2021039001
2021390001
7/27/2021
Water System Costs

Well Improvements, Storage, Booster Station

No.	Item Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	\$ 45,000	\$ 45,000
2	Well No. 2 Upgrades	1	LS	\$ 11,000	\$ 11,000
3	New Well No. 3	1	LS	\$ 275,000	\$ 275,000
4	12" Watermain	1,046	FT	\$ 105	\$ 109,830
5	12" Gate Valve & Box	6	EA	\$ 3,200	\$ 19,200
6	New Well House with Prepackaged Iron Treatment	1	LS	\$ 1,000,000	\$ 1,000,000
7	System Controls	1	LS	\$ 75,000	\$ 75,000
8	Well Back up Power	1	LS	\$ 50,000	\$ 50,000
9	250,000 Gal Ground Storage Tank	1	LS	\$ 950,000	\$ 950,000
10	Booster Station	1	LS	\$ 700,000	\$ 700,000

Construction Sub-Total \$ 3,235,030

Contingencies 1 at 10% \$323,503

Engineering 1 at 15% \$533,780

Land Acquisition 1 \$75,000

Legal & Financing 1 \$30,000

Wells, Storage, and Booster Station TOTAL \$ 4,197,313

Cost Acme Water Supply Own Sources	\$8,083,697.60
Cost Acme Water Supplied by East Bay	\$6,086,978.65
Cost Acme Water Supplied by GTBOCI	\$4,284,684.65



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
4/22/2021
Water Rates - SAD

Acme Sources

Annual Loan Repayment	\$	54,835	
Loan Bond (10%)	\$	34,641	Estimated
RRI (10%)	\$	34,641	Estimated
O&M	\$	120,000	
Total Annual Cost	\$	244,118	

Total REU's		325	
Annual Cost per REU Active Existing Customers	\$	752	
Annual Cost per REU SAD	\$	912	
Total Annual Cost Per REU Active Existing Customers	\$	752	
Monthly Cost per REU	\$	63	

East Bay Source

Annual Loan Repayment	\$	41,349	
Loan Bond (10%)	\$	27,084	
RRI (10%)	\$	27,084	
O&M	\$	50,000	
Total Annual Cost	\$	145,518	

Min Average Daily Water Use (150 GPD per REU)		48,704	
Annual Water Use (Gallons)		17,776,778	
Annual Water Use (100 CFT)		23,766	
Min Annual Cost of Water (\$3.89/100 CFT)	\$	92,520	
Min Annual Cost of Water (\$1.95/100 CFT)	\$	46,343	

Total Annual Cost of Water (\$3.89/100 CFT)	\$	238,038
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Total Annual Cost of Water (\$1.95/100 CFT)	\$	191,861
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ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
4/22/2021

Water Rates - SAD

Total REU's (\$3.89/100 CFT) 325

Annual Cost per REU (\$3.89/100 CFT) \$ 733.12

Annual Cost per REU SAD \$ 688

Total Annual Cost Per REU Active Existing Customers \$ 733

Monthly Cost per REU (\$3.89/100 CFT) \$ 61.09

Total REU's (\$1.95/100 CFT) 404.69

Annual Cost per REU (\$1.95/100 CFT) \$ 474.09

Annual Cost per REU SAD \$ 688

Total Annual Cost Per REU Active Existing Customers \$ 474

Monthly Cost per REU (\$1.95/100 CFT) \$ 39.51

GTBOCI Source

Annual Loan Repayment \$ 29,176

Loan Bond (10%) \$ 19,293

RRI (10%) \$ 19,293

O&M \$ 50,000

Total Annual Cost Per REU Active Existing Customers \$ 117,762

Min Average Daily Water Use (150 GPD per REU) 48,704

Annual Water Use (Gallons) 17,776,778

Annual Water Use (100 CFT) 23,766

Min Annual Cost of Water (\$2.00/100 CFT) \$ 47,531.49

Total Annual Cost of Water (\$2.00/100 CFT) \$ 165,293.57

Total REU's (\$2.00/100 CFT) 325

Annual Cost per REU (\$2.00/100 CFT) \$ 509.08

Annual Cost per REU SAD \$ 485.28

Total Annual Cost Per REU Active Existing Customers \$ 509

Monthly Cost per REU (\$3.89/100 CFT) \$ 42.42



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
4/22/2021
Water Rates - SAD

	Acme Sources	East Bay @ 3.89	GTBOCI
Annual Cost	\$ 244,117.55	\$ 238,037.65	\$ 165,293.57
Total REU's	325	325	325
Annual Cost Per REU	\$ 751.85	\$ 733.12	\$ 509.08
Monthly Cost per REU	\$ 62.65	\$ 61.09	\$ 42.42
Annual Cost Per REU + SAD	\$ 1,663.92	\$ 1,420.88	\$ 994.36
Monthly Cost per REU + SAD	\$ 138.66	\$ 118.41	\$ 82.86
Buildout REU's	672	672	672
Connection Charge per REU (Debt / Total Full Buildout REU's)	\$ 17,217	\$ 15,274	\$ 10,777



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township

Water System Funding Analysis - SAD

7/27/2021

Assumes Project funding via Rural Development

	Scenario 1 Acme Water Supply Own Sources	Scenario 2 Acme Water Supply East Bay Twp.	Scenario 3 Acme Water Supply GTBOCI
Financial Information			
Total Project Cost	\$ 8,083,698	\$ 6,086,979	\$ 4,284,685
Rural Development Loan Application and Admin	\$ 35,000	\$ 35,000	\$ 35,000
Less Grant Amount	\$ -	\$ -	\$ -
Less DDA Cash Contribution	\$ -	\$ -	\$ -
Less Township Cash Contribution	\$ -	\$ -	\$ -
Less Connection Charges	\$ -	\$ -	\$ -
Principle Amount Financed	\$ 8,118,698	\$ 6,121,979	\$ 4,319,685
Interest	3.25%	3.25%	3.25%
Period , yrs	40	40	40
Annual Debt Payment	\$ 365,568	\$ 275,660	\$ 194,507
Debt Service Revenue from Special Assessment District			
% of Debt Financed by SAD	85%	85%	85%
Total Amount of Debt Financed by SAD	\$ 6,900,893	\$ 5,203,682	\$ 3,671,732
Total REU's within SAD	341	341	341
SAD Assessment per REU	\$ 17,217	\$ 15,274	\$ 10,777
SAD Assessment per REU. Per year	\$ 912	\$ 688	\$ 485
Hope Village Cost	\$ 48,796	\$ 36,795	\$ 25,963



ACME TOWNSHIP WATER SYSTEM STUDY

Acme Township
Water System Study
2021390001
7/27/2021
Customer Costs

Customer REU's	Customer Count	GPD (200 GPD per REU)	Peak Flow (gpm)	Estimated Service Size (in)	Estimated Meter Size (in)	Service Install Cost (\$)	Abandon Well (\$)	Total Customer Cost (\$)
1	43	200	10	1	0.75	\$ 1,500	\$ 500	\$ 86,000
1.1	1	220	11	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.24	1	248	12.4	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.3	1	260	13	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.4	1	280	14	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.59	1	318	15.9	1	0.75	\$ 1,500	\$ 500	\$ 2,000
1.6	2	320	16	1	0.75	\$ 1,500	\$ 500	\$ 4,000
1.8	1	360	18	1	0.75	\$ 1,500	\$ 500	\$ 2,000
2	8	400	20	1	0.75	\$ 1,500	\$ 500	\$ 16,000
2.2	1	440	22	1	0.75	\$ 1,500	\$ 500	\$ 2,000
2.3	4	460	23	1	0.75	\$ 1,500	\$ 500	\$ 8,000
2.6	1	520	26	1	1	\$ 1,500	\$ 500	\$ 2,000
2.9	2	580	29	1	1	\$ 1,500	\$ 500	\$ 4,000
3	1	600	30	1	1	\$ 1,500	\$ 500	\$ 2,000
3.7	1	740	37	1	1	\$ 1,500	\$ 500	\$ 2,000
4.08	1	816	40.8	1	1	\$ 1,500	\$ 500	\$ 2,000
4.18	1	836	41.8	1	1	\$ 1,500	\$ 500	\$ 2,000
4.3	1	860	43	1	1	\$ 1,500	\$ 500	\$ 2,000
4.7	1	940	47	1	1	\$ 1,500	\$ 500	\$ 2,000
4.8	1	960	48	1	1	\$ 1,500	\$ 500	\$ 2,000
5	1	1000	50	1	1	\$ 1,500	\$ 500	\$ 2,000
6	5	1200	60	2	1.5	\$ 3,000	\$ 500	\$ 17,500
12	1	2400	120	2	2	\$ 3,000	\$ 500	\$ 3,500
21	1	4200	210	4	4	\$ 6,000	\$ 500	\$ 6,500
38	2	7600	380	4	4	\$ 6,000	\$ 500	\$ 13,000
47	1	9400	470	4	4	\$ 6,000	\$ 500	\$ 6,500
53.5	1	10700	535	4	4	\$ 6,000	\$ 500	\$ 6,500