



Southwest and Southeast Water Storage Location Study

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Why is this project necessary?



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

(formerly MDEQ)

REGULATORY REQUIREMENT

Ground or elevated storage systems are required for water systems serving more than 150 living units.

- Southwest Water System: appx. 2,200 units
- Southeast Water system: appx. 750 units



KEY FACTS

GLWA Connection Not Economically Feasible

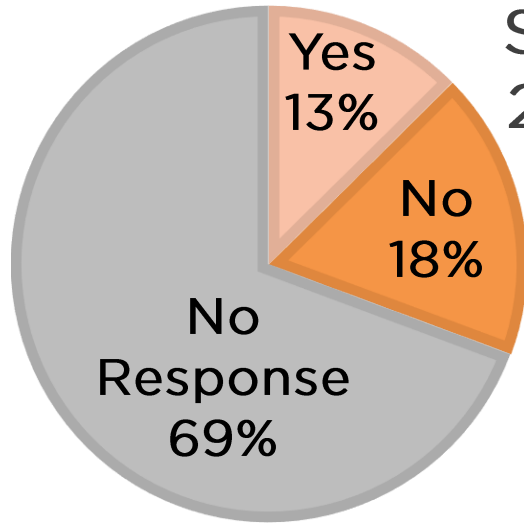


- A 2012 Study investigated various options for connecting some or all of Oakland Township water systems to GLWA water. None of the options were economically feasible.

Iron Removal Not Desired

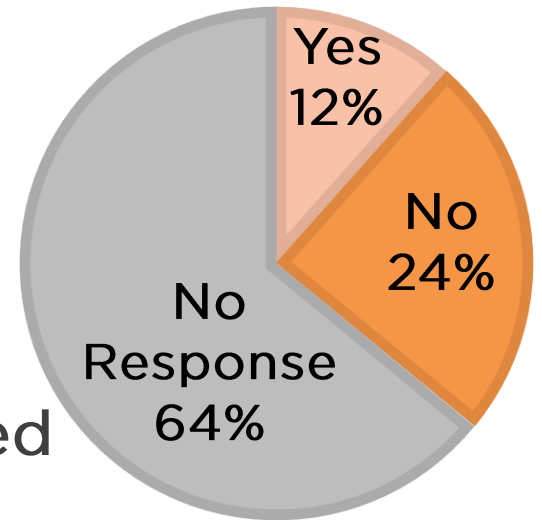
2017 Survey Results:

Users do not want to invest in centralized iron removal



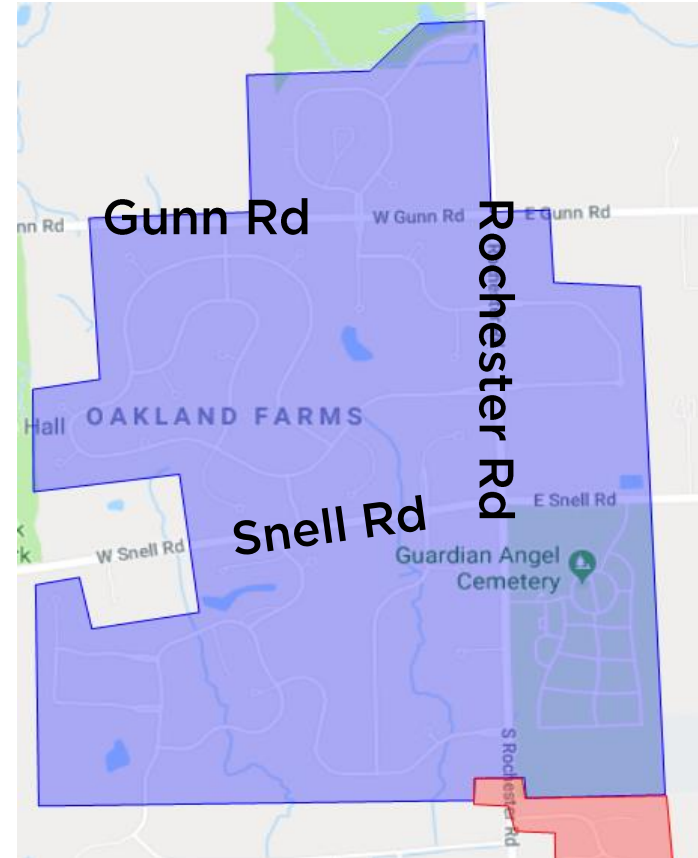
Southwest
2204 Surveyed

Southeast
754 Surveyed



Chlorine and Phosphate

- Once the new tank is in service, all areas in the SE water system will use chlorine and polyphosphate.
- Change affects the north pressure district only.





PROCESS

Project Objectives

Seek Out Potential Locations for Water Storage

Evaluate Technical Requirements

Perform Cost-Benefit Analysis

Compile Site List

2017 Oakland Township Residents Survey

Board Members Recommendations

Previous Lists from Studies in 2014 and 2015

Database and Geographical Searches – Public & Private

Vacant Land Searches Using Realcomp MLS and CoStar

Site List Refinement

1st Pass Criteria

-Within 1,200
feet of existing
water mains

-At least 2 acres
in size

2nd Pass Criteria

-Weighted
scoring for each
site

2nd Pass Criteria

Ownership
Type: Public/
Private

Parcel Size

Compatibility
with Future
Treatment

Visibility

Proximity to
Homes

Environmental
Factors

Wetland /
Hydric soils

Constructability

Location
Consistent
with Resident
Survey Results

Adverse
Community
Impact

2nd Pass Criteria


| ID # | Ownership Type | Ownership | Parcel Size | Compatible with future treatment | Visibility | Proximity to Homes | Environmental / Natural Features | Wetland / Hydric soils | Constructability | Resident Survey | Community Impact | TOTAL WEIGHTED SCORE |
|------|----------------|-----------|-------------|----------------------------------|------------|--------------------|----------------------------------|------------------------|------------------|-----------------|------------------|----------------------|
| 4 | Private | 1 | 2 | 4 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 27 |
| 1 | Private | 1 | 2 | 0 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 23 |
| 2 | Private | 1 | 2 | 4 | 0 | 0 | 2 | 4 | 2 | 4 | 4 | 23 |
| 11 | Private | 1 | 2 | 0 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 23 |
| 3 | Private | 1 | 1 | 4 | 0 | 2 | 2 | 4 | 2 | 2 | 4 | 22 |
| 7 | Private | 1 | 2 | 4 | 2 | 0 | 0 | 4 | 0 | 4 | 4 | 21 |
| 31 | Private | 1 | 1 | 4 | 1 | 2 | 2 | 4 | 2 | 2 | 2 | 21 |
| 6 | Private | 1 | 2 | 4 | 2 | 0 | 0 | 4 | 1 | 2 | 4 | 20 |
| 9 | Private | 1 | 2 | 4 | 1 | 0 | 0 | 4 | 2 | 2 | 2 | 18 |
| 5 | Public | 2 | 2 | 4 | 1 | 2 | 2 | 0 | 2 | 2 | 0 | 17 |
| 12 | Public | 0 | 2 | 0 | 2 | 2 | 2 | 4 | 2 | 2 | 0 | 16 |
| 8 | Private | 1 | 1 | 0 | 1 | 0 | 2 | 4 | 0 | 2 | 4 | 15 |
| 10 | Private | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 2 | 2 | 13 |
| 29 | Public | 2 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 2 | 2 | 12 |

Owner Interactions

16 potential property sellers were approached starting with the highest ranking.



Conceptual site layouts were created for owners that expressed interest in selling or donating property.



County Assessor researched comparable properties to verify fair sale prices.

Technical Analysis

Hydraulic Modeling

System-Wide Infrastructure Improvements

- Ground storage only
- Potential future water treatment to function with a remote or adjacent storage site

Provided Conceptual Pricing for each Option at each Site



CONCEPTUAL PRICING

SE System Pricing*

750 Users

| | Oakland Farms | Bear Creek | Property C | Property D |
|----------------|---------------|------------|------------|------------|
| Ground Storage | \$3.93 M | \$4.30 M | \$4.23 M | \$5.28 M |
| Property | n/a | n/a | \$0.70 M | \$0.20 M |
| Total | \$3.93 M | \$4.30 M | \$4.93 M | \$5.48 M |

*Based on 2017-2018 construction prices

SW System Pricing*

2,200 Users

| | The Crossings | Property F | Property G |
|----------------|---------------|----------------------------|------------|
| Ground Storage | \$4.46 M | \$4.52 M | \$5.02 M |
| Property | 0 | Unknown | \$0.58 M |
| Total | \$4.46 M | \$4.52 M +Property Cost | \$5.60 M |

*Based on 2017-2018 construction prices



SUMMARY

SE System Pros & Cons

| | Pros | Cons | Cost per household over low option |
|---------------------------|--|--|------------------------------------|
| Oakland Farms Pump House* | <ul style="list-style-type: none">• Most economical | <ul style="list-style-type: none">• Costly future treatment,• Social Impact | low option |
| Bear Creek* | <ul style="list-style-type: none">• System reliability | <ul style="list-style-type: none">• Removes parkland,• Social impact | +\$450 |
| Private C* | <ul style="list-style-type: none">• System reliability | <ul style="list-style-type: none">• High capital cost | +\$1,217 |
| Private D* | <ul style="list-style-type: none">• System reliability | <ul style="list-style-type: none">• High capital cost,• High operating cost | +\$1,886 |

*Assumes Potential Future Treatment Plant at Oakland Farms

SW System Pros & Cons

| | Pros | Cons | Cost per household over low option |
|---------------------------|---|--|------------------------------------|
| The Crossings Pump House* | <ul style="list-style-type: none">• Most economical (for storage) | <ul style="list-style-type: none">• Costly future treatment,• Social impact | low option |
| Private F* | <ul style="list-style-type: none">• Minimal social impact,• System reliability,• Low cost | <ul style="list-style-type: none">• Timeline,• Conditions of the sale of property,• Availability of Property | +28 |
| Private G* | <ul style="list-style-type: none">• System reliability | <ul style="list-style-type: none">• Higher capital cost,• High operating cost | +\$518 |

*Assumes Potential Future Treatment Plant at The Crossings Pump House

Expected Rate Changes

SE System - Most Economical Location
\$38.06/MEU/quarter or



SW System - Most Economical Location
\$39.43/MEU/quarter or



Schedule

| | |
|-----------------------------------|-------------------------------|
| Siting Study | • Jan 2018 – Jan 2019 |
| Property Investigations | • Jun 2018 – Dec 2018 |
| Township Board Site Consideration | • Jan 2019 – June 2019 |
| Preliminary Engineering | • Aug 2019 – Nov 2019 |
| Design Phase Engineering | • Oct 2019 – Aug 2020 |
| Construction Phase | • Nov 2020 – Sep 2021 |