



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
SAMPLE SITING PLAN - BACTERIOLOGICAL

Issued under authority of 1976 PA 399 and Administrative Rules, as amended. Administrative Rule R 325.10704c requires a water supply to monitor for total coliform bacteria according to a written sample siting plan subject to department review and revision. This form is provided as a convenience to the water supply to develop the plan.

Water Supply Information

Supply Name <u>City of Swartz Creek</u>	WSSN <u>6505</u>
Address <u>8083 Civic Dr</u>	5,000 <u>5,557</u>
City, State, Zip <u>Swartz Creek, mi 48473</u>	Population Served <u>Genesee</u>
	County <u>Genesee</u>

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DEQ Drinking Water District Engineer Name		Telephone <u>1-800-292-4706</u>
Pollution Emergency Alerting System Information (PEAS)		Telephone <u>()</u>
Call PEAS number if unable to contact DEQ staff.		Telephone <u>()</u>

Local Official	E-mail	Telephone <u>()</u>
Local Official <u>Genesee Co. Public Health</u>	E-mail	Telephone <u>(810) 257-3612</u>
Health Department	E-mail	Telephone <u>()</u>

DEQ
RESOURCE MANAGEMENT DIVISION
APR 07 2016
LANSING DISTRICT

Public Notification

Means of Public Notification <u>Newspaper</u>		
Newspaper Name and City <u>Swartz Creek View</u>	E-mail <u>shulber@mihomepaper.com</u>	Telephone <u>()</u>
Radio/Television Name and Address or City	E-mail	Telephone <u>()</u>

This Cover Sheet Updated

Date 3-17-16

6 ~~8~~ **Bacteriological Sampling Requirements** Collect at least 6 routine samples per month from the routine sites listed. For a chlorinated system, measure and record the chlorine residual at the same time and place as every routine and repeat sample collected. Results from all routine and repeat sites are used to determine compliance. Results from other sites might not be allowed for compliance.

Distribution System Sample Sites

Dist. Site #	Routine Site Address	# of samples per month	Upstream Site Address*	Downstream Site Address*	Site Code of All Sources That Serve The Routine Site* (Not required for surface water supplies)
1	8197 Miller Rd	1	8179 Miller	8215 Miller	
2	5121 Morrish	1	7466 Grove	5116 Morrish	
3	8083 Civic	1	8100 Civic	8084 Miller	
4	3259 Elms	1	3235 Elms	3391 Elms	
5	1 Dragon Dr.	1	5094 Fairchild	8354 Canyon	

* When a routine sample is positive for total coliform or E.coli, collect samples from repeat sites in the distribution system. Groundwater supplies must also sample all raw water sources (wells) for each positive routine sample result. With DEQ approval, source water collection may be limited to those wells that were in use at anytime within the 72-hour period prior to the collection of the routine positive sample. Supplies that purchase their source water must notify their supplier of water within 24 hours of a positive routine sample result. Surface water supplies are not required to sample their source water.

Source Sample Sites* and Other Non-distribution Sites (raw water, common header, entry point aka plant tap)

Site Code	Well # or Other Designation	Location or Address	Comments:
		Gen. Co. water system	Surface water purchased from Genesee County Water System.

* All sources **MUST** be sampled if a routine distribution sample is positive for total coliform or E. coli.

Laboratory Certified to Analyze Bacteriological Samples - for more labs certified in total coliform, visit <http://www.michigan.gov/deqlab>.

State of Michigan
 Laboratory Name - Primary: State of Michigan
 Address: 3350 N MLK Blvd, Lansing, MI 48906
 City: Lansing, State: MI, Zip: 48906

E-mail: KaneM4@Michigan.gov
 Telephone: (517) 335-8184

Laboratory Name - Alternate: _____ Address, City, State, Zip: _____
 E-mail: _____ Telephone: _____

Plan Completed/Updated and Reviewed

Thomas Sireek
 Name: Thomas Sireek Date Completed: 3-17-16
 City of Swartz Creek
 Water Supply Name: City of Swartz Creek County: Genesee
 WSSN: _____
 DEQ Environmental Assistance Center
 Phone: 1-800-662-9278

For DEQ Use Only
 Sample site plan reviewed by DEQ. No revisions necessary.
 Revisions necessary. Contact DEQ.
 DEQ Staff: Mohamed
 Date: 4/19/2016

Bacteriological Sampling Requirements Collect at least 6 routine samples per month from the routine sites listed. For a chlorinated system, measure and record the chlorine residual at the same time and place as every routine and repeat sample collected. Results from all routine and repeat sites are used to determine compliance. Results from other sites might not be allowed for compliance.

Distribution System Sample Sites

Dist. Site #	Routine Site Address	# of samples per month	Upstream Site Address*	Downstream Site Address*	Site Code of All Sources That Serve The Routine Site * (Not required for surface water supplies)
1	3462 Dye	1	3440 Dye	Saxle Miller	
2	5300 Oakview	1	5248 Oakview	SASA Dunwood	
3	8230 Crapo	1	8102 Crapo	8280 Crapo	
4					
5					

* When a routine sample is positive for total coliform or *E.coli*, collect samples from repeat sites in the distribution system. Groundwater supplies must also sample all raw water sources (wells) for each positive routine sample result. With DEQ approval, source water collection may be limited to those wells that were in use at anytime within the 72-hour period prior to the collection of the routine positive sample. Supplies that purchase their source water must notify their supplier of water within 24 hours of a positive routine sample result. Surface water supplies are not required to sample their source water.

Source Sample Sites* and Other Non-distribution Sites (raw water, common header, entry point aka plant tap)

Site Code	Well # or Other Designation	Location or Address	Comments:
	Gen. Co. Water System		Surface water purchased from Genesee County Water System.

* All sources MUST be sampled if a routine distribution sample is positive for total coliform or *E. coli*.

Laboratory Certified to Analyze Bacteriological Samples - for more labs certified in total coliform, visit <http://www.michigan.gov/deqlab>.

State of Michigan
 Laboratory Name - Primary 33350 N MLK Blvd, Lansing, MI 48906 KaneM4@Michigan.gov
 Address, City, State, Zip

Telephone (517) 335-8184
 Telephone ()
 Telephone

Laboratory Name - Alternate _____ Address, City, State, Zip _____
 E-mail _____ E-mail _____

Plan Completed/Updated and Reviewed

Name _____ Date Completed _____
 WSSN _____ Water Supply Name _____ County _____
 DEQ Environmental Assistance Center
 Phone: 1-800-662-9278

For DEQ Use Only
 Sample site plan reviewed by DEQ. No revisions necessary.
 Revisions necessary. Contact DEQ.

DEQ Staff: Michael J. ...
 Date: 4/19/2016

EGLE Revised: **4/8/2021** Brittany Earles
 www.michigan.gov/deq
 EQP 5950 (Rev. 12/2015)

CEC Report within Renewal Period

For: Robert J. Binesik

OPERID: 13784

CERTIFIED: ISSUE DATE: 11/14/2019

EXPIRATION DATE: 01/15/2023

WSSN: 2310

DISTRICT: 92

Certification(s) Held: F-4, S-1

DATE	COURSE CODE	COURSE TITLE	LOCATION	TECH	MGR	OTHER
02/08/2022	2657	Infrastructure Funding Seminar	Lansing		0.2	
02/08/2022	344	Joint Expo	Lansing			0.2
12/31/2021	307	AWWA Membership	Varies			0.1
12/31/2020	307	AWWA Membership				0.1
02/05/2020	344	Joint Expo	Lansing			0.2
12/31/2019	307	AWWA Membership				0.1
<i>CEC'S Earned:</i>				0.0	0.2	0.7

CEC'S Required: 2.4

CEC'S Required in Technical/Managerial: 1.8

CEC'S Earned: 0.9

CEC'S Needed in Technical/Managerial: 1.6

CEC's Needed for Renewal: 1.6

This data is provided as a service. DEQ is not responsible for the accuracy of the data.

CEC Report within Renewal Period

For: Adam H. Zettel

OPERID: 13803

CERTIFIED: ISSUE DATE: 12/10/2021

EXPIRATION DATE: 01/15/2025

WSSN: 6505

DISTRICT: 11

Certification(s) Held: S-2

DATE	COURSE CODE	COURSE TITLE	LOCATION	TECH	MGR	OTHER
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CEC'S Earned: 0.0 0.0 0.0

CEC'S Required: 2.4

CEC'S Required in Technical/Managerial: 1.8

CEC'S Earned: 0.0

CEC'S Needed in Technical/Managerial: 1.8

CEC's Needed for Renewal: 2.4

This data is provided as a service. DEQ is not responsible for the accuracy of the data.

CEC Report within Renewal Period

For: David L. Wright

OPERID: 7935

CERTIFIED: ISSUE DATE: 03/05/2021

EXPIRATION DATE: 04/15/2024

WSSN: 6505

DISTRICT: 11

Certification(s) Held: S-4

DATE	COURSE CODE	COURSE TITLE	LOCATION	TECH	MGR	OTHER
02/08/2022	344	Joint Expo	Lansing			0.2
02/08/2022	338	Operators' Day	Lansing	0.6		
<i>CEC'S Earned:</i>				0.6	0.0	0.2

CEC'S Required: 1.2

CEC'S Required in Technical/Managerial: 0.6

CEC'S Earned: 0.8

CEC'S Needed in Technical/Managerial: 0.0

CEC's Needed for Renewal: 0.4

This data is provided as a service. DEQ is not responsible for the accuracy of the data.

CEC Report within Renewal Period

For: Jay E. Sandford

CERTIFIED: ISSUE DATE: 05/01/2019

WSSN: 6505

Certification(s) Held: S-3

OPERID: 14059

EXPIRATION DATE: 07/15/2022

DISTRICT: 11

Renewal is submitted and pending

DATE	COURSE CODE	COURSE TITLE	LOCATION	TECH	MGR	OTHER
04/20/2022	2107	Water Certification Review: Distribution S1 & S2	Bloomfield Hills	1.2		
02/08/2022	344	Joint Expo	Lansing			0.2
02/08/2022	338	Operators' Day	Lansing	0.6		
02/04/2021	338	Operators' Day	Virtual	0.2		
02/05/2020	344	Joint Expo	Lansing			0.2
02/05/2020	338	Operators' Day	Lansing	0.3		
<i>CEC'S Earned:</i>				2.3	0.0	0.4

CEC'S Required: 2.6

CEC'S Required in Technical/Managerial: 1.2

CEC'S Earned: 2.7

CEC'S Needed in Technical/Managerial: 0.0

CEC's Needed for Renewal: 0.0

This data is provided as a service. DEQ is not responsible for the accuracy of the data.

CEC Report within Renewal Period

For: Rebecca M. Bosas

CERTIFIED: ISSUE DATE: 05/01/2019

WSSN: 6505

Certification(s) Held: S-3

OPERID: 19352

EXPIRATION DATE: 07/15/2022

DISTRICT: 11

Renewal is submitted and pending

DATE	COURSE CODE	COURSE TITLE	LOCATION	TECH	MGR	OTHER
04/20/2022	2107	Water Certification Review: Distribution S1 & S2	Bloomfield Hills	1.2		
02/08/2022	344	Joint Expo	Lansing			0.2
02/08/2022	338	Operators' Day	Lansing	0.3		
02/04/2021	338	Operators' Day	Virtual	0.2		
07/23/2020	2894	Excavation/Trenching Safety and Competent Person Training Online	Online			0.5
02/05/2020	344	Joint Expo	Lansing			0.2
02/05/2020	338	Operators' Day	Lansing	0.3		
<i>CEC'S Earned:</i>				2.0	0.0	0.9

CEC'S Required: 2.6

CEC'S Required in Technical/Managerial: 1.2

CEC'S Earned: 2.9

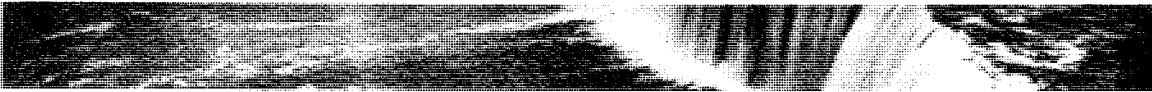
CEC'S Needed in Technical/Managerial: 0.0

CEC's Needed for Renewal: 0.0

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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY



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W

Wright, David L.

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Name: David L. Wright

Operator ID: 7935

Home Address Updated:* 3/2/2021

*If you have since relocated please contact the [OTCP unit](#) to update your home address.

WSSN: 6505

District Number: 11

ERG Eligible: No [More info](#)

Certification Information

Certifications

S-4

Issue Date

03/05/2021

Expiration Date

04/15/2024

Renewal Information

CECs Required:	1.2
CECs Required in Technical Or Managerial:	0.6
CECs Earned:	
Technical:	0.0
Managerial:	0.0
Other:	0.0
CECs Needed in Technical or Managerial:	0.6
Total CECs Needed:	1.2

CEC and Application Information

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CITY OF SWARTZ CREEK

Water Reliability Study Update

September 2021



ARCHITECTS. ENGINEERS. PLANNERS

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Purpose and Scope

The report is intended to satisfy the Michigan Department of Environment, Great Lakes and Energy (EGLE) Michigan Safe Drinking Water Act Part 12 Water Reliability Study (WRS), and Part 16 General Plan Requirements. This report serves as an update to the WRS completed by Rowe Professional Service Company in 2013 for the City of Swartz Creek.

A Water Reliability Study was prepared for the City of Swartz Creek in 2013. The analysis included hydraulic modeling of the water system in order to identify any areas with less than desired pressures and fire protection. Several capital improvements were recommended as a result of the Water Reliability Study and the City has been implementing improvements based on their Capital Improvement Plan. A new model of the existing water system was prepared for this Reliability Study update and is described in this report.

Specific tasks for this study include the following:

- Compilation and reporting of current population and number of service connections.
- Compilation and reporting of water production and consumption data for the City including average day, maximum day, and peak hour demands and pressures over the last three years.
- Data collection and review using the previous water model and the new water model to include system improvements to represent the existing system.
- Hydrant testing and water model calibration.
- Water model analysis for average day, maximum day, peak hour, and fire protection using present conditions and proposed future.

I. Existing Water System

A. Service Area

Figure 1 shows the City of Swartz Creek’s existing water main distribution system, and major wholesale water service connections (as obtained by the City’s most current GIS information). The map also shows the largest water consumers in the City.

The City’s water supply is provided by the Genesee County Drain Commission (GCDC). The City has three inflow metered connections operated and managed by GCDC which feed the City’s demand from Flint, and Clayton Township. The City water main network is part of a GCDC transmission main which services water demands for Gaines Township to the South, Clayton Township to the West and Flint Township to the North. The City operates and maintains its own distribution system.

B. Transmission and Distribution Mains

The City’s water system is comprised of 6-inch through 12-inch water mains with a total of 89,255 feet or approximately 16.9 miles of water main, as shown in Table 1 below. The City’s water system construction began in the 1960s through the present. A variety of pipe materials have been used but the predominate materials are ductile iron and cast iron.

The City is waiting on grant assistance for Asset Management Planning before performing any exploratory projects to complete their water main database with install dates and materials. Currently, their GIS only houses diameter data. No regional, above ground water storage facilities or pumping stations are active within the City’s water distribution system. There is one inactive elevated water storage tank located southwest of the Miller Road and Winston Road intersection. In 1994, the elevated storage tank was taken out of service. The GCDC could adequately supply water to the whole city and the tank was no longer needed. No maintenance has occurred on the tank since it was drained in 1994.

Table 1: Distribution Main by Size

Diameter (in)	Length (ft)	Percent of Total System (%)
6	18,756	21
8	36,280	41
10	15,658	17
12	18,561	21
Total	89,255	100

II. Population and Water Use

A. Population

According to the United States Census Bureau, as of 2020 the current residential population of the City of Swartz Creek is estimate at 5,897 people. Based on previous United States Census Bureau information, there is a slight increase in population (approximately 2-percent) between 2010 and 2020. These growth estimates are considered minimal and are not anticipated to substantially impact demand usage in the City. For the purpose of this analysis, a 10-percent growth was used for future modeling projections.

B. Service Connections and Residential Equivalent Unites (REUs)

The City has 2,265 service connections. The City provided water account and meter size information, which was used to calculate REUs. Table 2 shows the calculations for REUs. The number of water accounts was given for each meter size. Currently, the City has approximately 3,403 REUs (using an equivalent factor based on 5/8” meter size).

Table 2: Service Connections and Residential Equivalent Unit Calculation

Meter Size (in)	Water Accounts	Equivalent Factor	Total Water Equivalents
5/8"	2,090	1.0	2,090
1"	25	2.5	43
1 1/2"	48	5	240
2"	90	8	720
3"	6	15	90
4"	4	25	100
6"	2	50	100
Total Accounts	2,265	Total REUs	3,403

C. Existing Water Usage

GCDC provided 2019 and 2020 City usage data. The City’s demands were evaluated for average day, maximum day and peak hour demands. That average day demand is the average demand that the City experiences. The maximum day demand represents the largest 24-hour average demand that occurs. The peak hour demand is the demand rate that occurs during the highest demand hour which is typically on the maximum demand day. The City’s average day, maximum day, and peak hour demands are listed in Table 3 along with the maximum day and peak hour peaking factors. Table 4 below summarizes the demands per capita for each demand scenario.

Table 3: Summary of Water Demands

Demand	GPM	MGD	Peaking Factor
Average Day	332	0.48	-
Maximum Day (July 31, 2019)	547	0.79	1.64
Peak Hour (July 18, 2019 @ 2:00 p.m.)	803	1.16	2.42

Table 4: Demand per Capita

Population: 5,897		
Demand	gpm/person	Gpcpd
Average Day	0.07	81
Maximum Day	0.09	134
Peak Hour	0.14	197

D. Top System Users

The City has primarily residential and commercial with some industrial water users that are served by the distribution system. The largest water users within the City, as determined over the demand time period, include General Motors, Swartz Creek Estates, and Burkeshire Point. The City’s top 8 largest users and their demands are listed in Table 5.

Table 5: Top 10 Largest System Users

Address	User	2018-2020 Average Day Demand (gpm)
6060 Bristol Road	General Motors	63
4373 Seymour Road	Swartz Creek Estates	12
8250 Miller Rd	Burkeshire Point	12
5152 Morrish Rd	Riverside Manor	12
4141 Morrish Rd	Meijer	4
4935 Ita Court	Mari-Dan Miller Farms	3
4276 Kroger Road	Springvale Assisted Living	2
8240 Miller Road	Courtyard Manor of Swartz Creek	2

E. Water Shortage Plan

The City of Swartz Creek has three direct metered connections to GCDC water transmission mains. Figure 1 displays each of these connections as a meter vault. Each connections provides redundancy, which allows the City to have system demand support in the event one of these connections were to fail or requires maintenance. The City has completed and submitted certification of their Risk and Resiliency Assessment per the 2018 America’s Water Infrastructure Act (AWIA) requirements and is currently working on their Emergency Response Plan (ERP)

F. Future Water Demands

The City’s future population growth estimates based on U.S. Census Bureau information are considered minimal and an increase in demand is not anticipated. For the purpose of this study, an estimated increase in demand of 10-percent was applied. The projected future demands are shown in Table 6.

Table 6: City Projected Water Demand

Scenario	Water Service Population	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Peak Hour Demand (MGD)
Existing	5,897	0.48	0.79	1.16
Future	6,487	0.53	0.87	1.28

G. Fire Protection

In addition to providing water at adequate pressure to the system users, a secondary purpose of a water system is to provide available water for fire protection. Although this is a secondary purpose of a water system, frequently the considerations for available fire protection can control the design of a water system. For this reason, it is important to define the fire protection that a system should achieve and evaluate the ability of the system to provide the recommended available fire protection.

The recommended fire protection used for this study was determined based on the City’s historical recommended fire protection rates and the fire protection rating system used by the Insurance Services Office (ISO) as seen in Table 7.

Table 7: Recommended Fire Protection per Zoning District

Recommended Fire Protection (gpm)	Zoning District
1,000	Residential
1,000	Multi-Family Residential
2,500	Commercial
2,500	Industrial

The hydraulic model was utilized to estimate available fire protection flow throughout the system. See the “Hydraulic Analysis” section of this report for results of this analysis.

III. Analysis of Non-Revenue Water

The annual volume of water purchased by the City from GCDC was compared to the annual volume of water billed to customers to quantify unaccounted-for water. The available data between 2018 – 2020 showed an average of 8.4% of the purchased water was unaccounted for in the billed quantity. The maximum acceptable water loss threshold is typically considered to be 10-15%. Table 8 shows water billed to customers and water purchased from GCDC. Since 2018, the percent water loss has been trending downward. It is assumed this is a result of the City’s commitment to identifying and repairing and/or replacing issues as they arise. The City has done significant updates to their water distribution network, specifically updates involved in their USDA Phase I projects and updates to the Elms Rd and Miller Rd transmission mains.

Unaccounted-for water can be attributed to any of the following:

- Water loss from the system (i.e., water main breaks, leaky valves, etc.)
- Hydrant flushing
- Water used for fighting fires
- Water used for construction
- Water used for maintenance
- Other unmetered uses

Table 8: Water Consumed vs. Water Purchased

Year	Purchased from GCDC (MGD)	Billed City Usage (MGD)	Percent Water Loss
2018	0.51	0.45	13.1%
2019	0.50	0.45	9.1%
2020	0.45	0.43	3.0%
Average	0.49	0.44	8.4%

IV. Hydraulic Analysis

A hydraulic model was used to evaluate the ability of the water system to provide adequate pressures and fire protection for the City of Swartz Creek based on current and assumed future conditions. The model results were used to identify areas of low pressure and fire protection values. The model used for this analysis was created using the GIS database of the water system as provided by the City and combined it with information used in the previous model from the 2013 Water Reliability Study.

A. Computer Model

The computer program InfoWater was used by OHM Advisors for the creation and analysis of the water system. This program is broadly used for analysis of municipal water systems.

The water distribution system within the model is represented by pipes and junctions. A junction in the model is where pipes are connected and can be used to represent the water demands within the system. In order to complete an analysis using the model, information such as pipe length, diameter, roughness, and pipe material are taken into consideration. That information is input by the user. Each junction is given a demand and elevation above sea level. The program simulates the water flowing through the system and determines flow rates and pressures throughout the system.

B. Demand Distribution

The appropriate system demands shown in Table 3 were compiled from the provided GCDC and City data. The top users in the City were determined as listed in Table 5, and specific demands were assigned to each of these top users. The remaining flow not assigned to the top users was allocated evenly across the rest of the system junctions.

C. Calibration

The model was calibrated using hydrant flow tests performed in May 2021. These tests measured the static pressure under existing system conditions and residual pressure with a flowing hydrant at each test location. The flow rate at each test hydrant was measured. The hydrant test locations are shown in Figure 2. The calibration process involved determining boundary condition pressure settings during the time of the hydrant tests as well as City system average demands. Subsequently, several factors were modified in order to make modeled pressures and fire protection predictions such as pipe friction factors, closed valves, and restricting diameters to mimic losses. The following is a list of closed valves and diameter restrictions that were assumed to be true in order to calibrate the model.

- Closed valve at Bristol Road and Miller Road intersection (Pipe ID: P1781)
- Closed valve at Morrish Road and Miller Road intersection (Pipe ID: P589)
- Closed valve at Brady Street and Miller Road intersection (Pipe ID: P119)
- Closed valve at Wade Street and Morrish Road intersection (Pipe ID: P463)
- Restricted Elms Road Meter Pit discharge pipe to simulate a partially closed valve
- Restricted Morrish Road Meter Pit discharge pipe to simulate a partially closed valve
- Restricted pipe diameter on Seymour Road north of Miller Rd to simulate a partially closed valve

It is recommended that the City conduct valve exercising at the locations listed above to ensure all valves are open throughout the system. Closed or partially closed valves can restrict flow and reduce pressure throughout the system.

As a result, the model was calibrated within a degree of confidence to match the conditions exhibited by the

system during hydrant testing. Much of the data is within the desired tolerance (10% for static pressures and 25% for residual pressures). Final calibration results are shown in Table 9.

By comparing the collected field data during hydrant testing to the calibrated model, two sets of errors were calculated. The net error was the average of the positive and negative percent difference between observed and modeled values. In other words, some instances the model would over-predict and sometimes under-predict the observations. This calculation is a measure of how much bias there is in the model predictions. The second error is the average of the absolute percent difference between the observed and modeled results. This method is intended to show the absolute error in the prediction process. Table 9 below shows the actual, net, and absolute error values at the individual hydrant locations. These calibration errors are considered reasonable.

The hydrant test results at location HYD-1236 (location 1) did not match the model results even after reasonable adjustment of the pipe friction factors, and partially or completely closing valves in the vicinity of HYD-1236 in the model. This location may have a local issue with a partially closed valve(s), an issue with the hydrant itself or testing results may have been skewed due to a deduct meter nearby. The City plans to investigate this area to identify any issues. Thus, this hydrant test was not used in the model calibration process and was not considered in the net and absolute error calculations. There are currently issues with HYD-1230 (location 13) limiting its functionality. Because of this, test location 13 was abandoned and not included in the analysis.

Table 9: Hydrant Flow Testing Results

Test Location	Model ID	Static Pressures (PSI)			Residual Pressures (PSI)		
		Hydrant	Model	% Difference	Hydrant	Model	% Difference
1	HYD-1236	60	62	-3	38	49	-29
2	J1886	46	50	-9	34	41	-21
3	HYD-1115	56	61	-9	35	37	-6
4	HYD-1342	60	65	-8	47	52	-11
5	HYD-1176	56	61	-9	40	48	-20
6	HYD-1143	60	64	-7	46	53	-15
7	STATIC_MEIJER	56	61	-9	46	52	-13
8	HYD-1263	50	55	-10	44	50	-14
9	J1894	60	64	-7	52	55	-6
10	HYD-1036	64	66	-3	56	61	-9
11	HYD-1228	52	55	-6	40	47	-18
12	HYD-1060	52	55	-6	35	41	-17
13	HYD-1230	-	-	-	-	-	-
14	HYD-1054	59	63	-7	44	49	-11
Net Error				-8			-14
Absolute Error				8			14

D. Existing Pressure and Fire Protection

Existing System Modeling:

The existing system model was run in order to analyze pressure in three different scenarios: average day, maximum day, and peak hour. Figures 3-5 show the existing system pressures for average day, maximum day, and peak hour scenarios. The pressure scenarios are based on the following assumptions:

1. Existing demands from Table 3 of the report.
2. Existing system hydraulic conditions.

Existing Pressure Results:

The average day model results show that the system pressure ranges between 48 psi and 75 psi, which is a desirable range. The maximum day model results ranged between 47 and 74 psi. The peak hour results range between 47 and 74 psi. All pressures are above the EGLE minimum pressure requirement of 35 psi. See Table 10 for the range of modeled pressures for the existing system.

Table 10: Range of Operating Pressures in Existing System Model

Average Day	Max Day	Peak Hour
48 – 75 psi	47 – 74 psi	47 – 74 psi

Existing Fire Protection Results:

Analysis of the existing fire protection was performed based on the following assumptions:

1. Existing maximum day demands from Table 3 of the report.
2. Existing system hydraulic conditions, not including any proposed improvements.
3. Residual pressure of 20 psi at each node individually.

Each node in the system was assigned a desired fire protection value based on existing zoning of the parcels at the location of that given node. The Township’s zoning map was used to determine the desired fire protection rate at each junction.

The desired fire protection for the different zoning classifications is shown in Table 7. A fire flow analysis was run for the system to determine the available fire protection at each hydrant without dropping system pressures below 20 psi.

Percent of desired fire protection was calculated by dividing available fire protection at each hydrant node by that node’s determined desired fire protection. Figure 6 shows the results of the fire protection analysis of the existing water system. The City is largely well served in terms of available fire protection. There are some pockets with lower fire protection that could be improved by completing some loops within the system and eliminating dead ends. The only area with less than 50-percent of desired fire protection is the dead-end water main on Dye Road, north of Miller Rd.

E. Analysis of Future Conditions

Future System Modeling:

The system was analyzed for future conditions based on a 10-percent increase in demand. The future conditions also assumed the completion of the current USDA Phase I, construction to be finished this year, and proposed USDA Phase II water main replacement projects, listed below, and as shown in Figure 7.

1. Miller Road from Raubinger Road to Elms Road, 12-inch water main (Phase I).

2. Heritage Connection to Flint Township, 8-inch water main (Phase II).
3. Winshall Drive, 8-inch water main (Phase II).
4. Whitney Court, 8-inch water main (Phase II).
5. Norbury Drive, 8-inch water main (Phase II).
6. Durwood Drive, 8-inch water main (Phase II).
7. Greenleaf Drive, 8-inch water main (Phase II).
8. Seymour Road from Durwood Drive to Oakview Drive, 10-inch water main (Phase II).

The future scenarios were reviewed for average day, maximum day, and peak hour demand scenarios. The future scenarios are based on the following assumptions:

1. Future demands from Table 6.
2. Existing system hydraulic conditions with incorporated future USDA Phase I and proposed USDA Phase II projects.
3. Remaining 6-inch distribution line upsized to 8-inch.

Future Pressure Results:

The future average day model results show that the system pressure ranges between 54 psi and 81 psi, which is a desirable range. The future maximum day model results ranged between 60 and 86 psi. The future peak hour results range between 59 and 86 psi. All pressures are above the EGLE minimum pressure requirement of 35 psi. See Table 11 for the range of modeled pressures for the future system.

Table 11: Range of Operating Pressures in Future System Model

Average Day	Max Day	Peak Hour
54 – 81 psi	60 – 86 psi	59 – 86 psi

Future Fire Protection Modeling:

Analysis of future fire protection was performed based on the following assumptions:

1. Future maximum day demands from Table 6 of the report.
2. Existing system hydraulic conditions with incorporated future USDA Phase I and proposed USDA Phase II projects.
3. Remaining 6-inch distribution line is upsized to 8-inch.
4. Residual pressure of 20 psi at each node individually.

Using the same approach as the existing fire protection model, each node in the system was assigned a desired fire protection based on the property classification surrounding or adjacent to each node. This was done by utilizing the City’s zoning map.

The desired fire protection for the different zoning classifications is shown in Table 7. A fire flow analysis was run for the system to determine the available fire projection at each hydrant without dropping system pressure below 20 psi.

In the future, the City still appears to be largely well served in terms of available fire protection as shown in Figure 11. As a result of the current USDA Phase I, proposed USDA Phase II projects, and upsizing all 6-inch water min to 8-inch, there are no areas with less than 50-percent of desired fire protection. However, there are still some pockets with lower fire protection that could be improved by completing some loops within the system or connecting to adjacent systems.

V. Capital Improvement Plan

A CIP is a core component of the General Plan. It is an essential planning tool that allows a community to properly plan for high cost, non-recurring projects. A CIP should detail capital needs related to future and upcoming regulations, major asset replacements, system expansions, system consolidation or regionalization, and improved technology.

The CIP, which is outlined in Sections A and B, aides the City in identifying, prioritizing, and implementing water distribution system capital projects in the future. Based on the findings of this study and consultation with the City, the following improvements are recommended for the City's water system.

A. Operational Recommendations

In addition to specific improvements identified in the water system CIP, operational recommendations were also generated. During the calibration process it was assumed several valves were partially or completely closed. These areas are listed in the calibration section of the report. Specific areas of concern are near the Elms Road meter vault and the Miller Road and Bristol Road area. These areas are experiencing losses and should be the focus for a valve exercising to determine if there are any partially or completely closed valves in these areas. These assumptions were made based on the abnormally low flows observed during hydrant flow testing and high residual pressures during modeling. These flows were consistent with prior hydrant flow testing results per the previous Reliability Study. The following operations and maintenance strategies are recommended:

- Perform valve exercising, specifically in the pipes and surrounding system listed in the calibrations assumptions for closed or partially closed valves.
- Continue a valve turning exercise program throughout the City.

In addition to the recommended water main improvements, the following are system-wide operational recommendations for the City:

Refine GIS Database: It is recommended the City continues to update their GIS Geodatabase as additional information such as asset age, material, and size are learned and continues to make updates as new construction occurs.

Pressure Surge Investigation: The City's water system is part of the GCDC network and is used in part as a transmission main for water demands in neighboring communities, because of this it is assumed recent and past water main breaks are a result of "water hammers" or pressure surges in the system. It is recommended the City populate a break history database. This data can be used in conjunction with available incoming source pressure data to help investigate potential water hammer issues.

Lead and Copper Rule/Inventory of Water Services: The City completed and submitted their preliminary distribution system material inventory to EGLE. The City has no known lead services lines (LSLs) based on institutional knowledge and observations made during water main replacements in the City's oldest neighborhoods. The City will continue to update their water main and water service material inventory as the information becomes available to them through construction such as replacement of water main, curb-stop-boxes and service lines. Additionally, the City is identifying water service materials as part of a cross connections inspection project at residential locations throughout the City.

B. Water Main Improvements

In addition to the USDA Phase I and Phase II projects as shown in Figure 7, it is recommended the City replaces all 6-inch distribution water main with a minimum of 8-inch water main. There is approximately 18,750 feet of 6-inch distribution main in the system currently. At a base construction cost of \$396 per linear foot to increase to 8-inch, this would generate a total CIP cost of approximately \$7,425,000. This unit price is based on the USDA Phase II costs for constructing 8-inch water main including the cost of roadway, sidewalk, curb, and driveway removal and reconstruction within the influence of the water mains, along with the included cost of gate valves, hydrants, curb stop boxes and disinfection. This does not include the cost of mobilization, soil erosion practices and maintaining traffic.

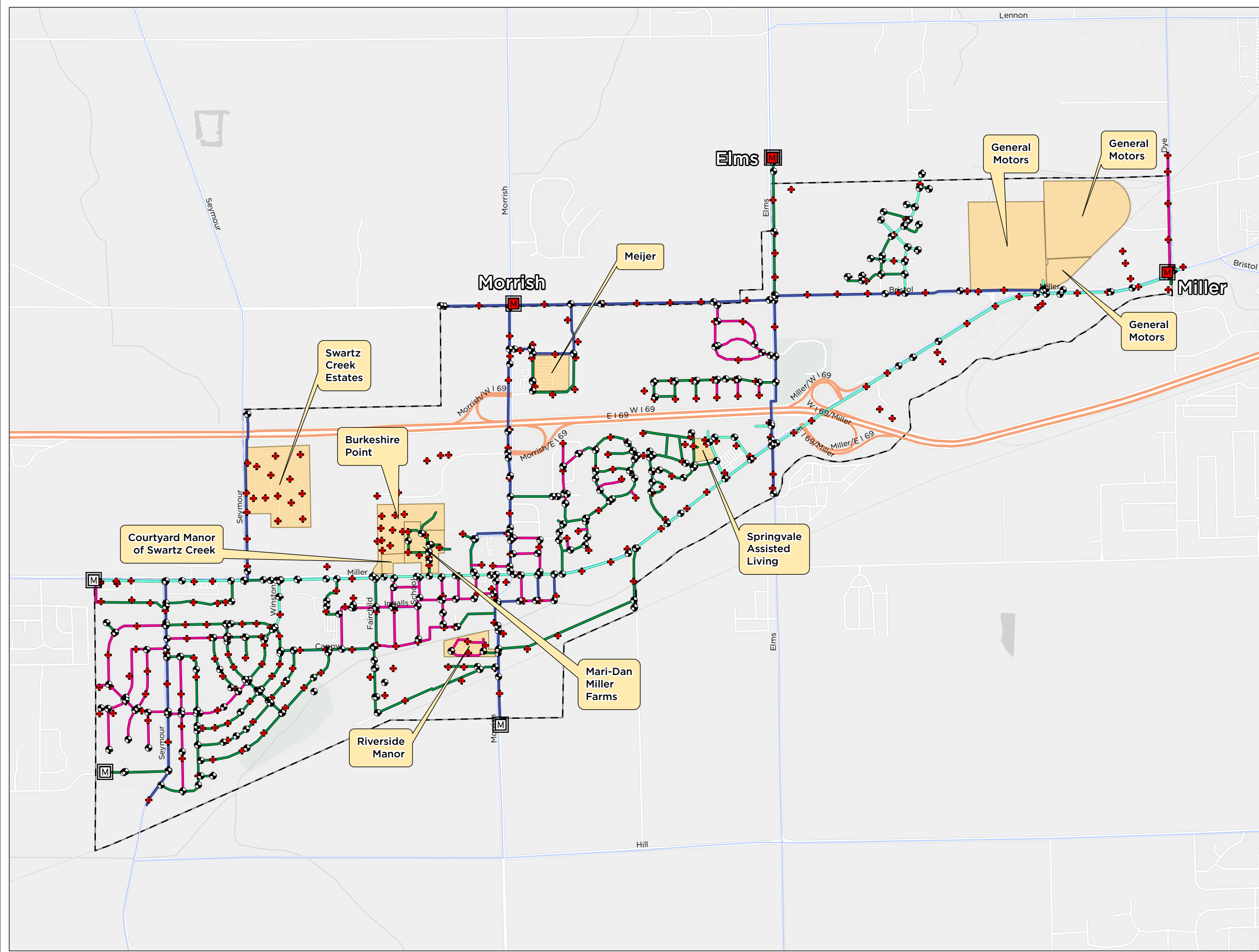
The analysis of the future system, including the assumptions listed previously in the report, showed an increase in the fire protections rates along Dye Road but still did not meeting the 75% of desired threshold. The City and GCDC are investigating the possibility of either installing a parallel water main on Dye Road and connecting all Swartz Creek services in this area to the new water main or connecting the services to an existing GCDC water main located on the east side of Dye Road. Costs for these options would range from approximately \$107,000 to \$587,000 depending on the course of action taken. This price is based on the USDA Phase II Costs for construction and include the estimated cost of water main, service lines, hydrants, valves, removal and construction of impervious surfaces and abandonment of existing water main.

Since construction, labor, and material prices are known to be volatile, and potential conflicts with existing infrastructure in the utility corridor may increase installations costs, these prices should be validated prior to commencing design phase efforts. Pipe replacement costs may be increased or decreased if pipe installation methods such as directional drilling or pipe bursting are used. Projects will be prioritized based on anticipated road projects and coordination with the City. Prices for these projects should be validated before commencing design phase efforts.

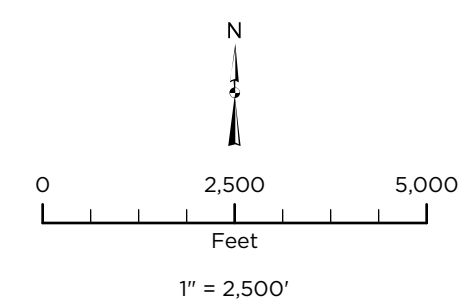
Report Figures



Water Master Plan Figure 1 General Plan Map



- Water Distribution Main
- ≤6"
 - 8"
 - 10"
 - 12"
- M Meter Vault
 - M Deduct Meter Vault
 - ⊕ Water System Valve
 - ⊕ Hydrant
 - Largest Water Consumers
 - Municipal Boundary



Source: Data provided by the City of Swartz Creek and Esri. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

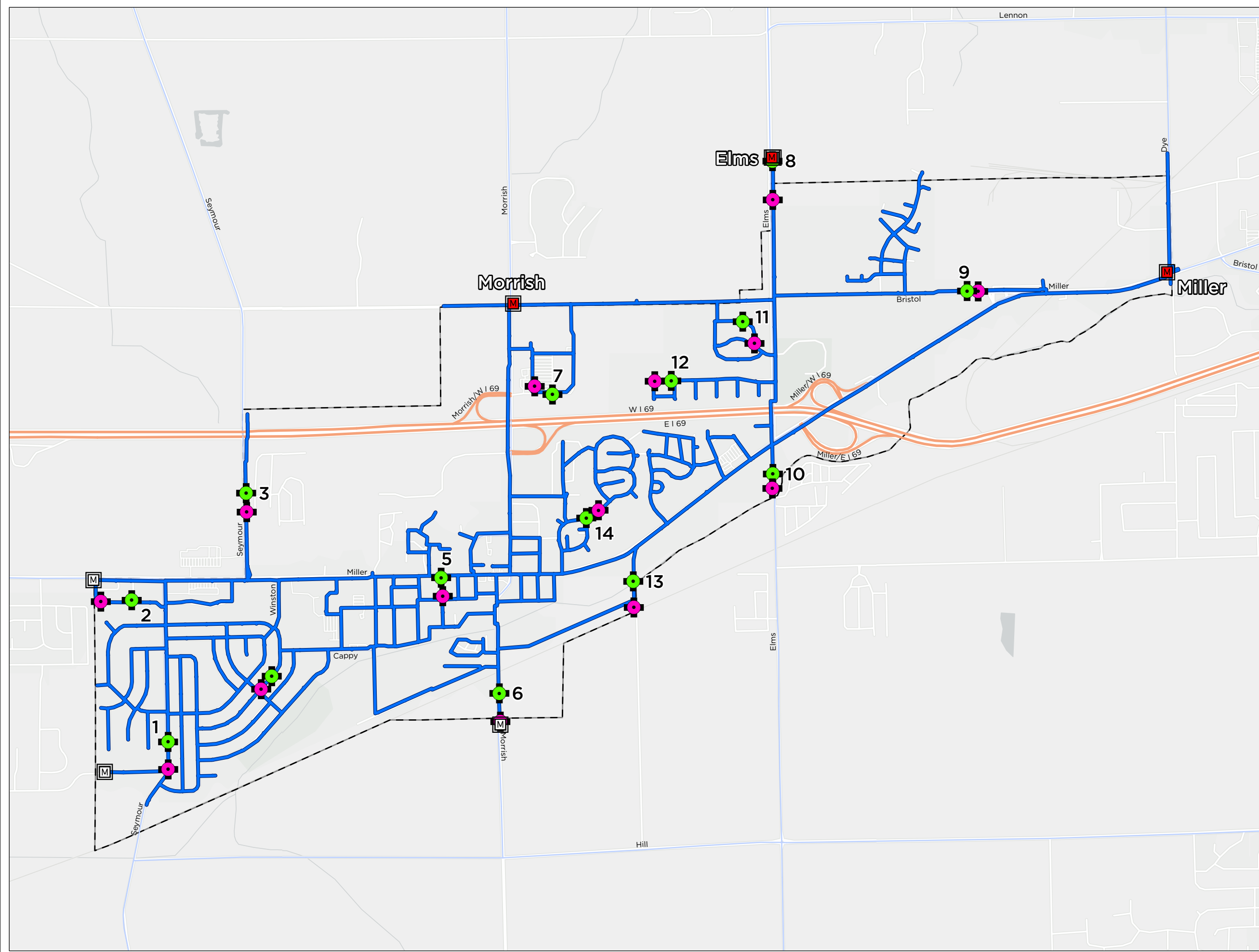
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Map Published: September 13, 2021

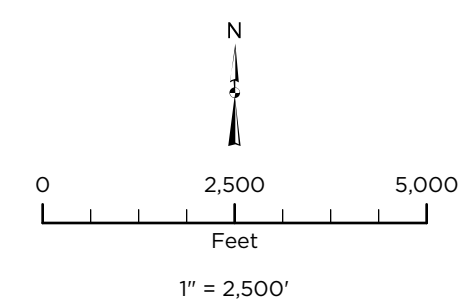




Water Master Plan Figure 2 Hydrant Testing Location



- Hydrant Flow Test Location
- Flow/Test Hydrant
 - Static Hydrant
 - Meter Vault
 - Deduct Meter Vault
 - Distribution Main
 - Municipal Boundary



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 13, 2021

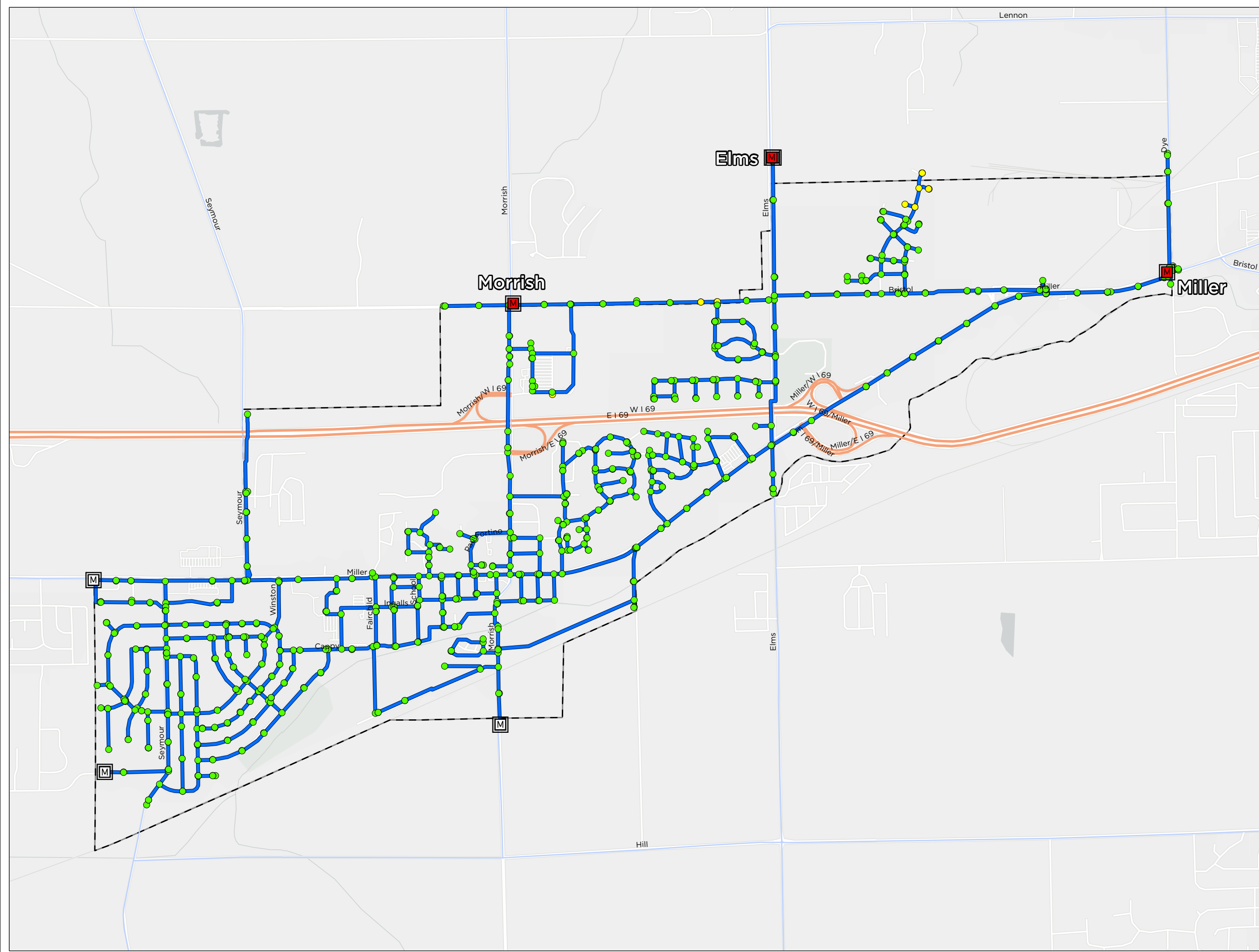




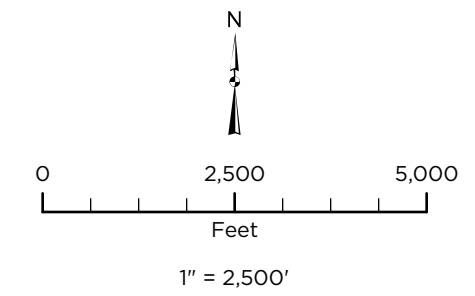
Water Master Plan

Figure 3

Average Day Pressure



- Existing Average Day Pressure (psi)
- 35 - 50 psi
 - 50 - 75 psi
- Meter Vault
- Deduct Meter Vault
- Distribution Main
- ▭ Municipal Boundary



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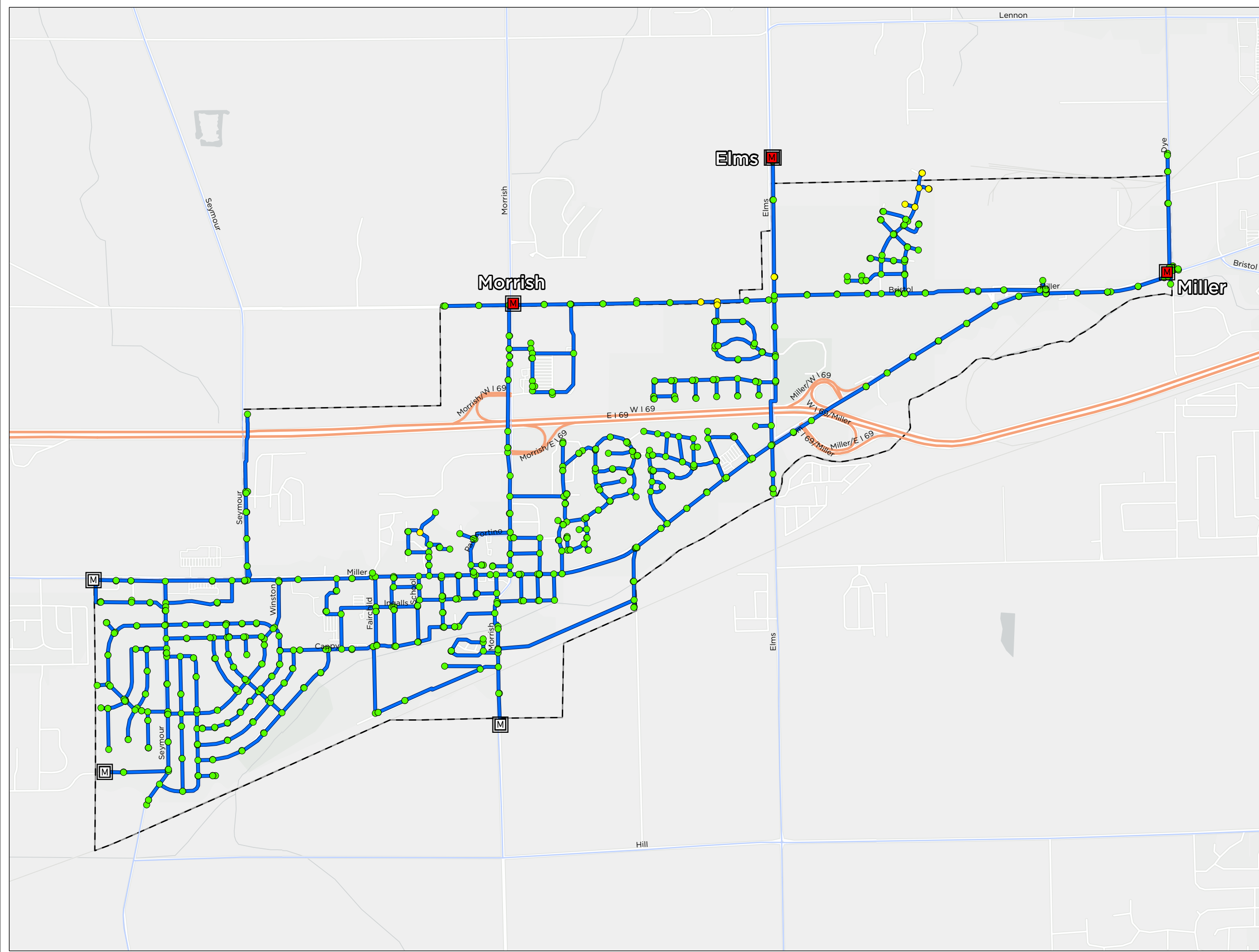
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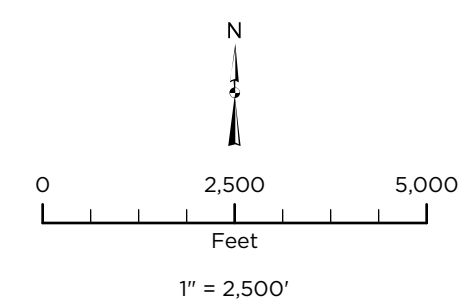




Water Master Plan Figure 4 Maximum Day Pressure



- Existing Maximum Day Pressure (psi)
- 35 - 50 psi
 - 50 - 75 psi
 - M Meter Vault
 - M Deduct Meter Vault
 - Distribution Main
 - Municipal Boundary



Source: Data provided by the City of Swartz Creek and Esri. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 14, 2021

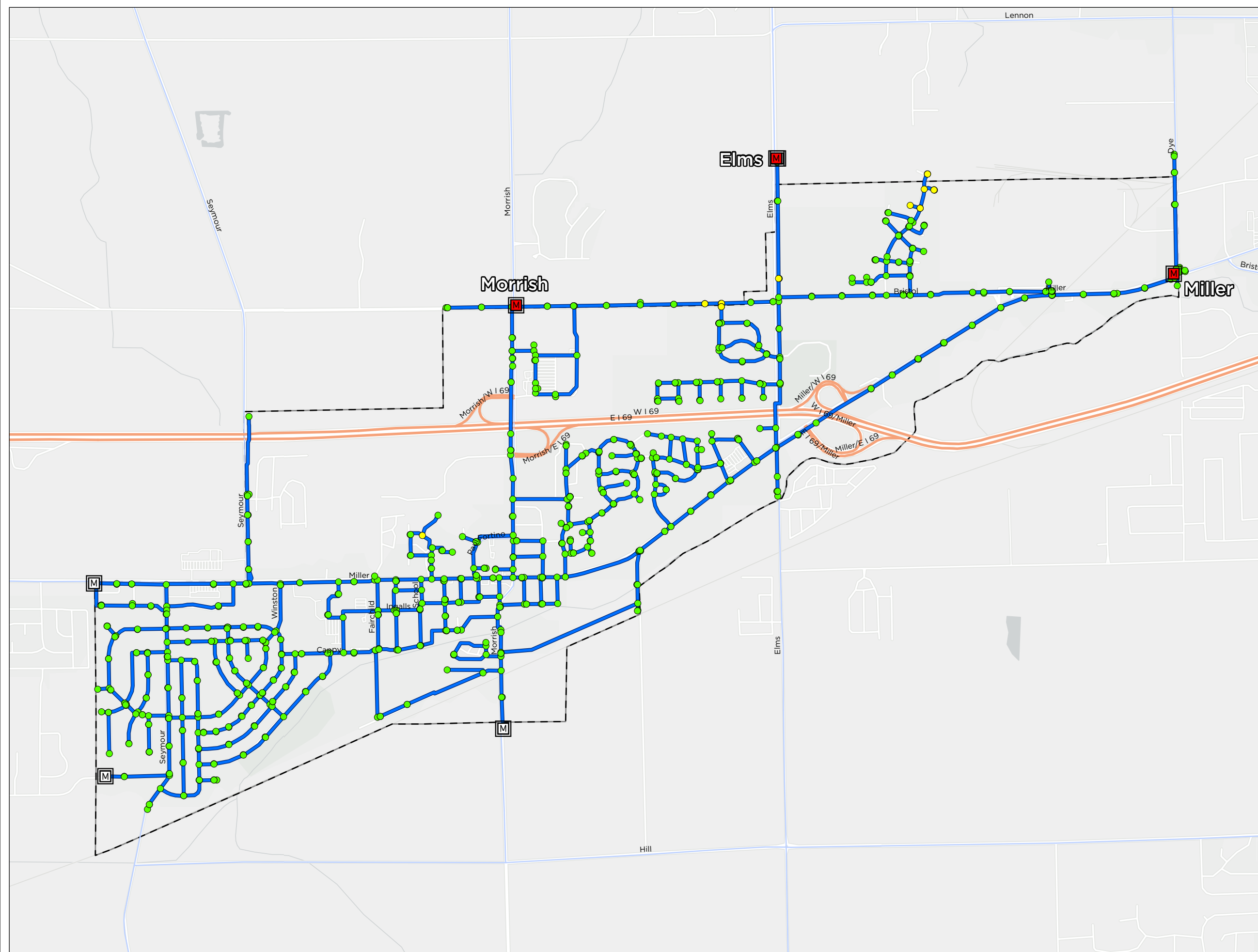




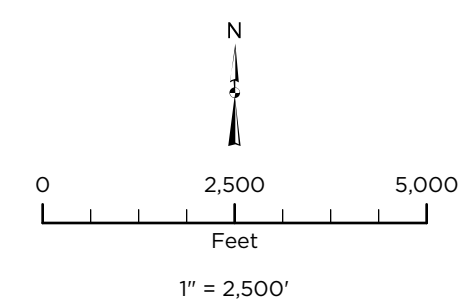
Water Master Plan

Figure 5

Peak Hour Pressure



- Existing Peak Hour Pressure (psi)
- 35 - 50 psi
 - 50 - 75 psi
- Meter Vault
- Deduct Meter Vault
- Distribution Main
- Municipal Boundary



Source: Data provided by the City of Swartz Creek and Esri. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

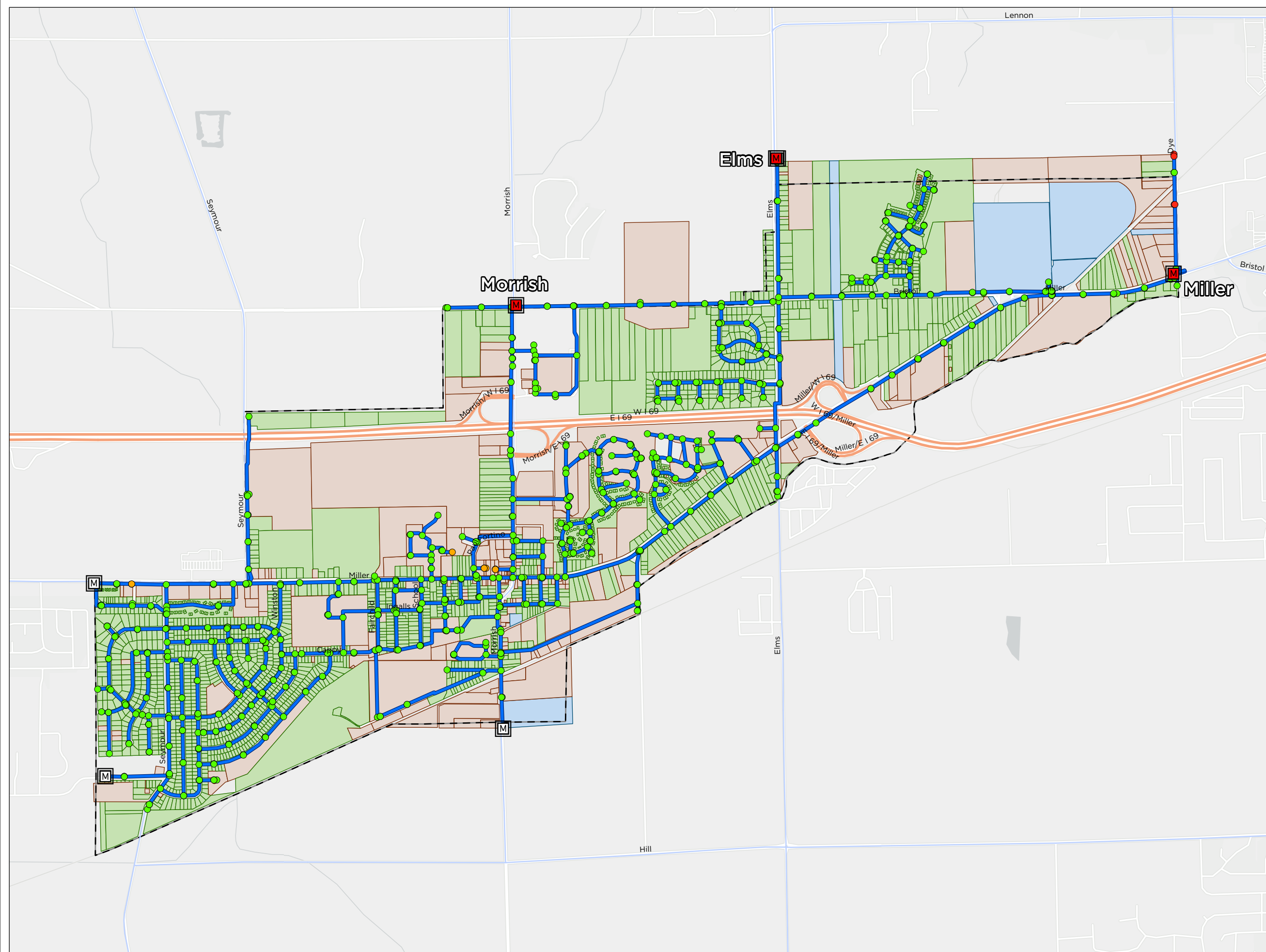
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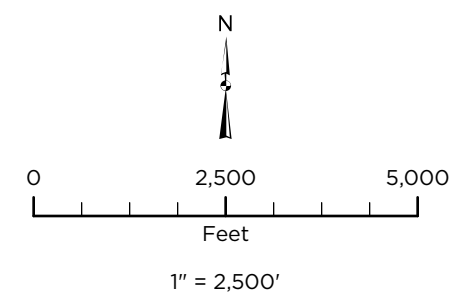


Water Master Plan Figure 6 Existing Fire Protection



- Existing Fire Protection
- < 50 % of Desired
 - 50 - 75 % of Desired
 - 75 - 100 % of Desired
 - M Meter Vault
 - M Deduct Meter Vault
 - Distribution Main

- Swartz Creek Zoning / Desired Fire Protection
- Single & Multi-Family Residential / 1,000 gpm
 - Commercial / 2,500 gpm
 - Industrial / 2,500 gpm
 - Municipal Boundary



Source: Data provided by the City of Swartz Creek and Esri. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 14, 2021



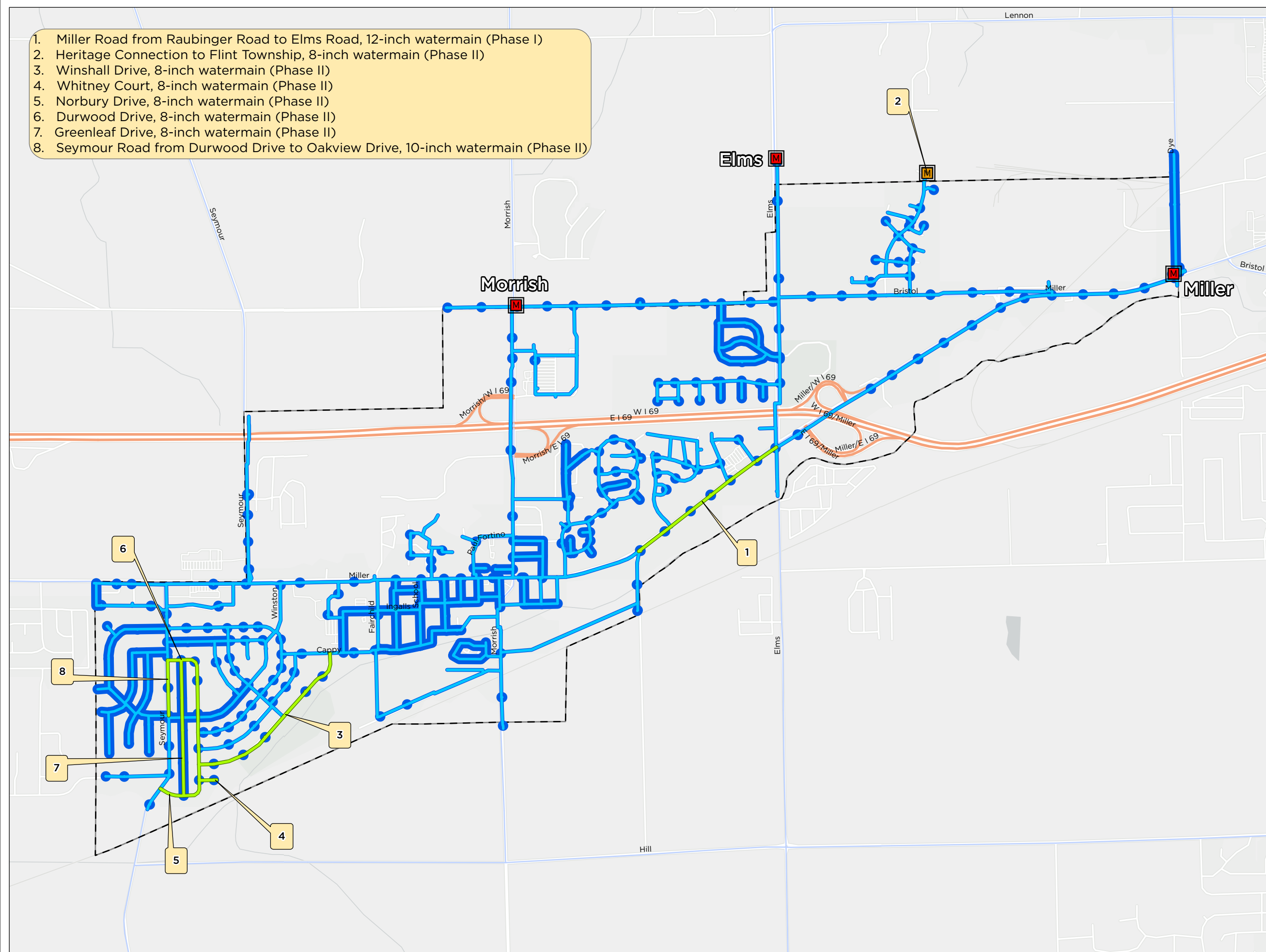


Water Master Plan

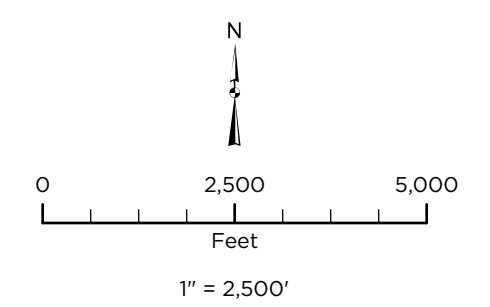
Figure 7

Future USDA Project Locations

1. Miller Road from Raubinger Road to Elms Road, 12-inch watermain (Phase I)
2. Heritage Connection to Flint Township, 8-inch watermain (Phase II)
3. Winshall Drive, 8-inch watermain (Phase II)
4. Whitney Court, 8-inch watermain (Phase II)
5. Norbury Drive, 8-inch watermain (Phase II)
6. Durwood Drive, 8-inch watermain (Phase II)
7. Greenleaf Drive, 8-inch watermain (Phase II)
8. Seymour Road from Durwood Drive to Oakview Drive, 10-inch watermain (Phase II)



- Future USDA Reservoir Project
- Meter Vault
- Future USDA Project
- Distribution Main
- To Be Upsized From 6" to 8"
- Municipal Boundary



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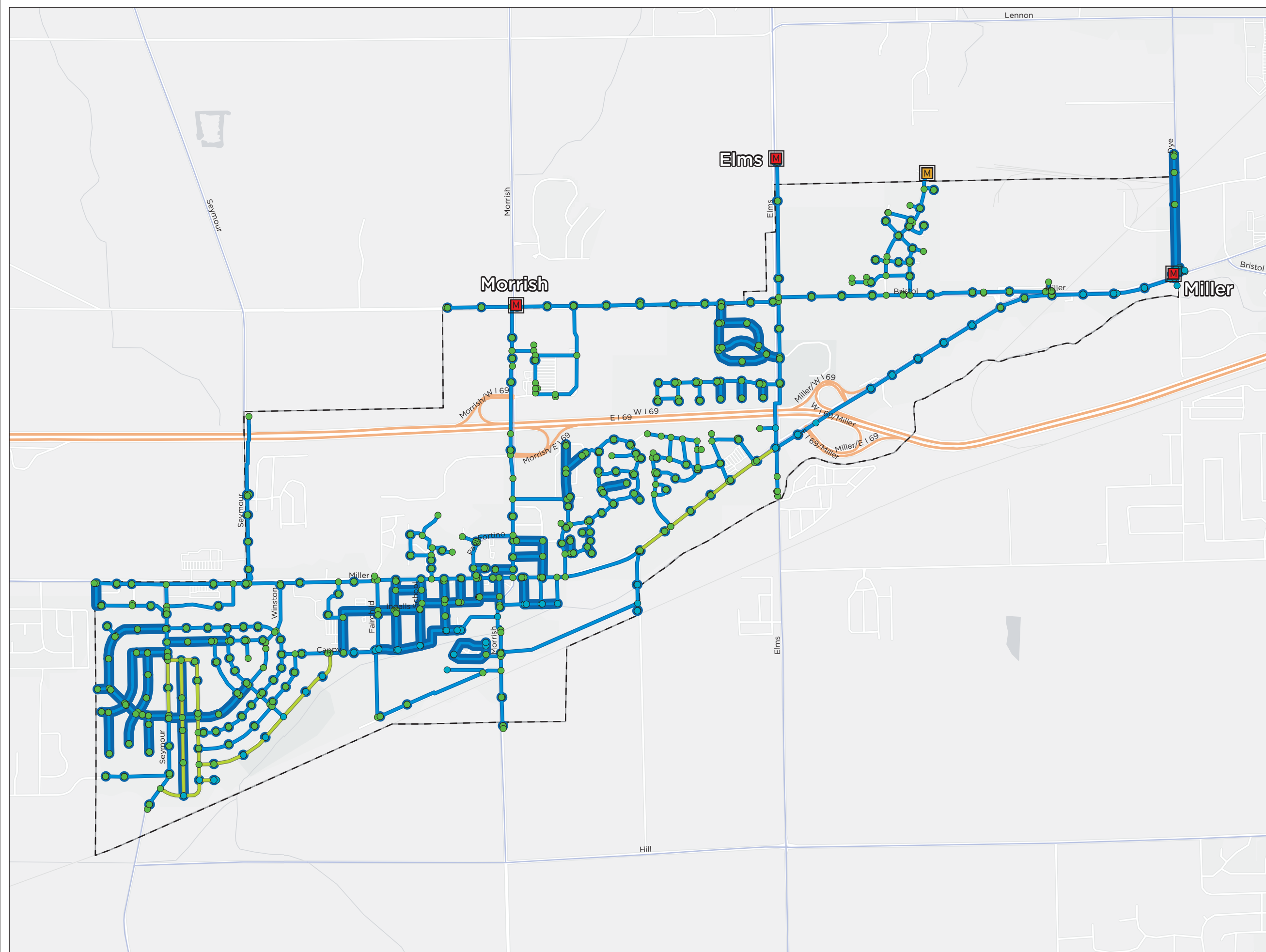
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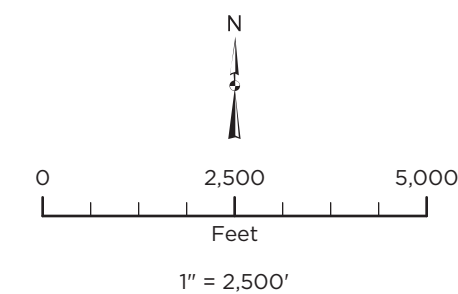




Water Master Plan Figure 8 Future Average Day Pressure



- Future Average Day Pressure (psi)
 - 50 - 75 psi
 - 75 - 100 psi
- Future USDA Reservoir Project
- Vault Meter
- Distribution Main
 - Future USDA Project
 - Distribution Main
 - To Be Upsized From 6" to 8"
- Municipal Boundary



Source: Data provided by the City of Swartz Creek and Esri. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

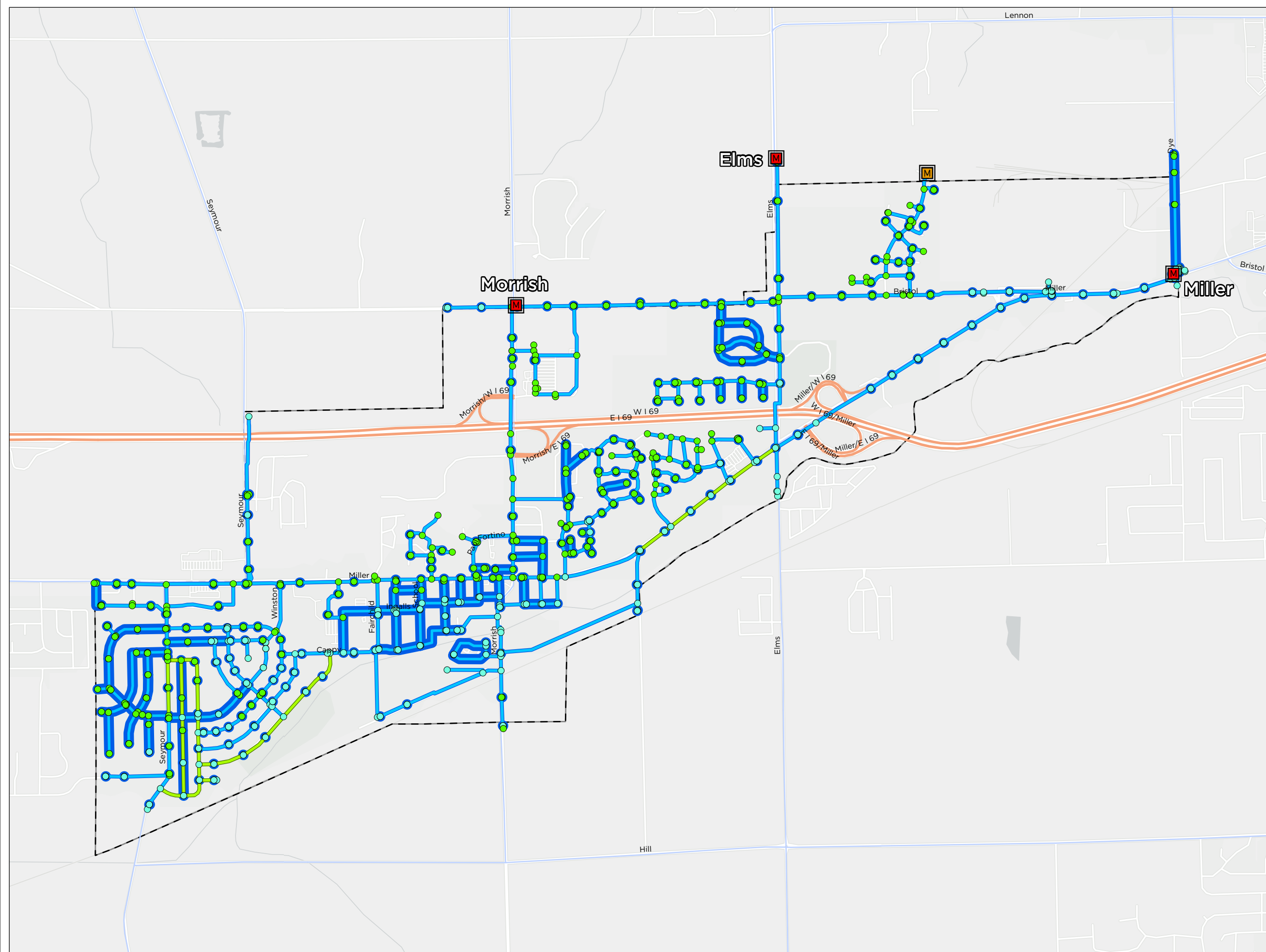
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 14, 2021





Water Master Plan Figure 9 Future Maximum Day Pressure



Future Max Day Pressure (psi)

- 50 - 75 psi
- 75 - 100 psi

■ Future USDA Reservoir Project

■ Meter Vault

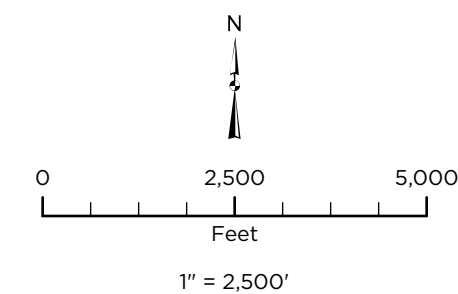
Distribution Main

— Future USDA Project

— Distribution Main

— To Be Upsized From 6" to 8"

□ Municipal Boundary



Source: Data provided by the City of Swartz Creek and Esri. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

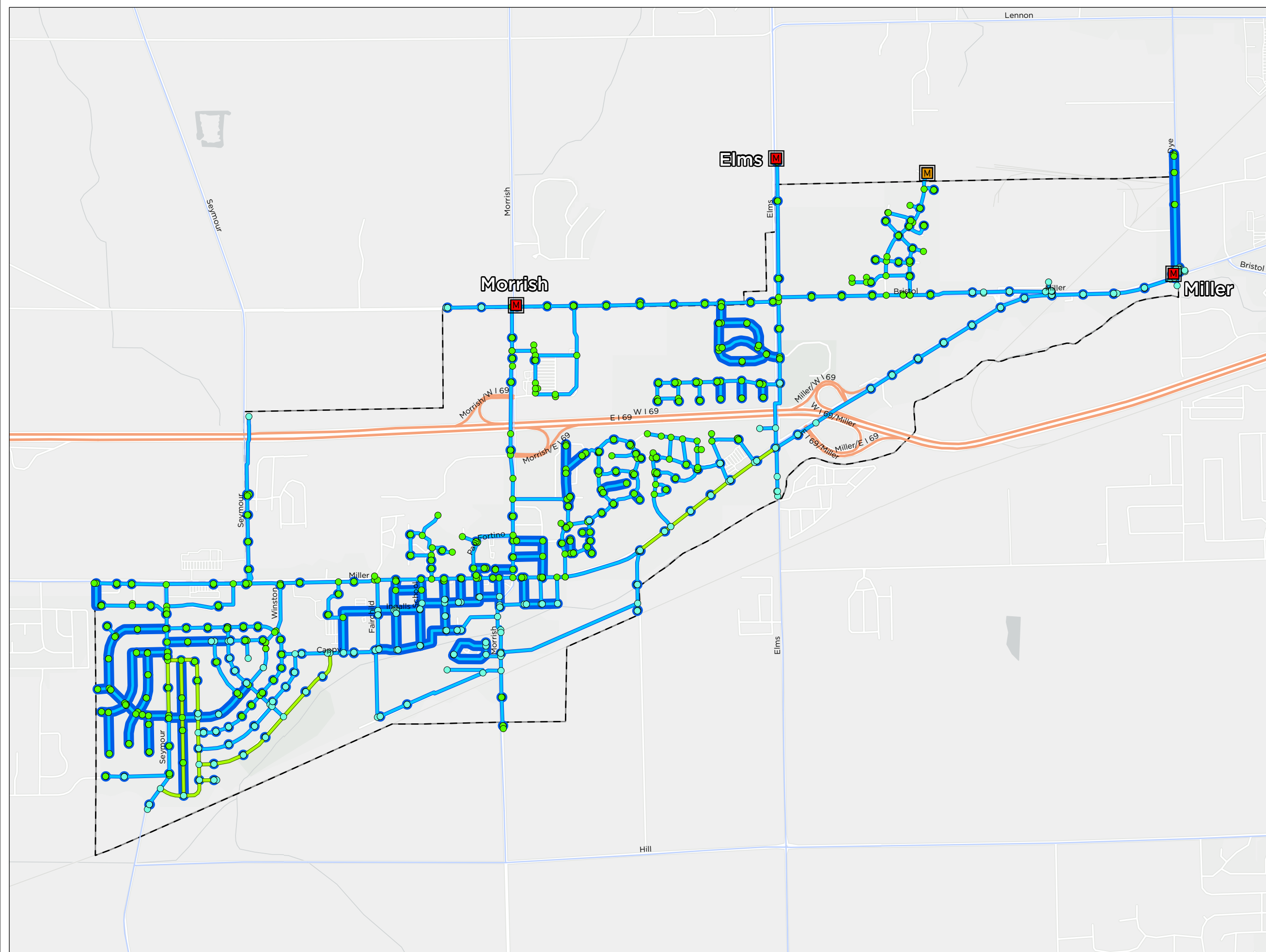
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 14, 2021





Water Master Plan Figure 10 Future Peak Hour Pressure



Future Peak Hour Pressure (psi)

- 50 - 75 psi
- 75 - 100 psi

■ Future USDA Reservoir Project

■ Meter Vault

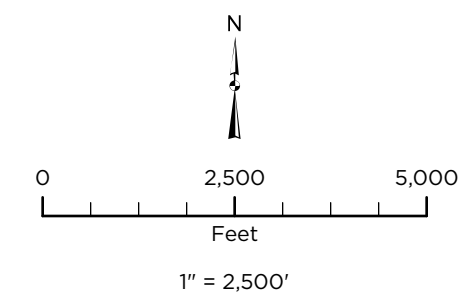
Distribution Main

— Future USDA Project

— Distribution Main

— To Be Upsized From 6" to 8"

□ Municipal Boundary



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 15, 2021

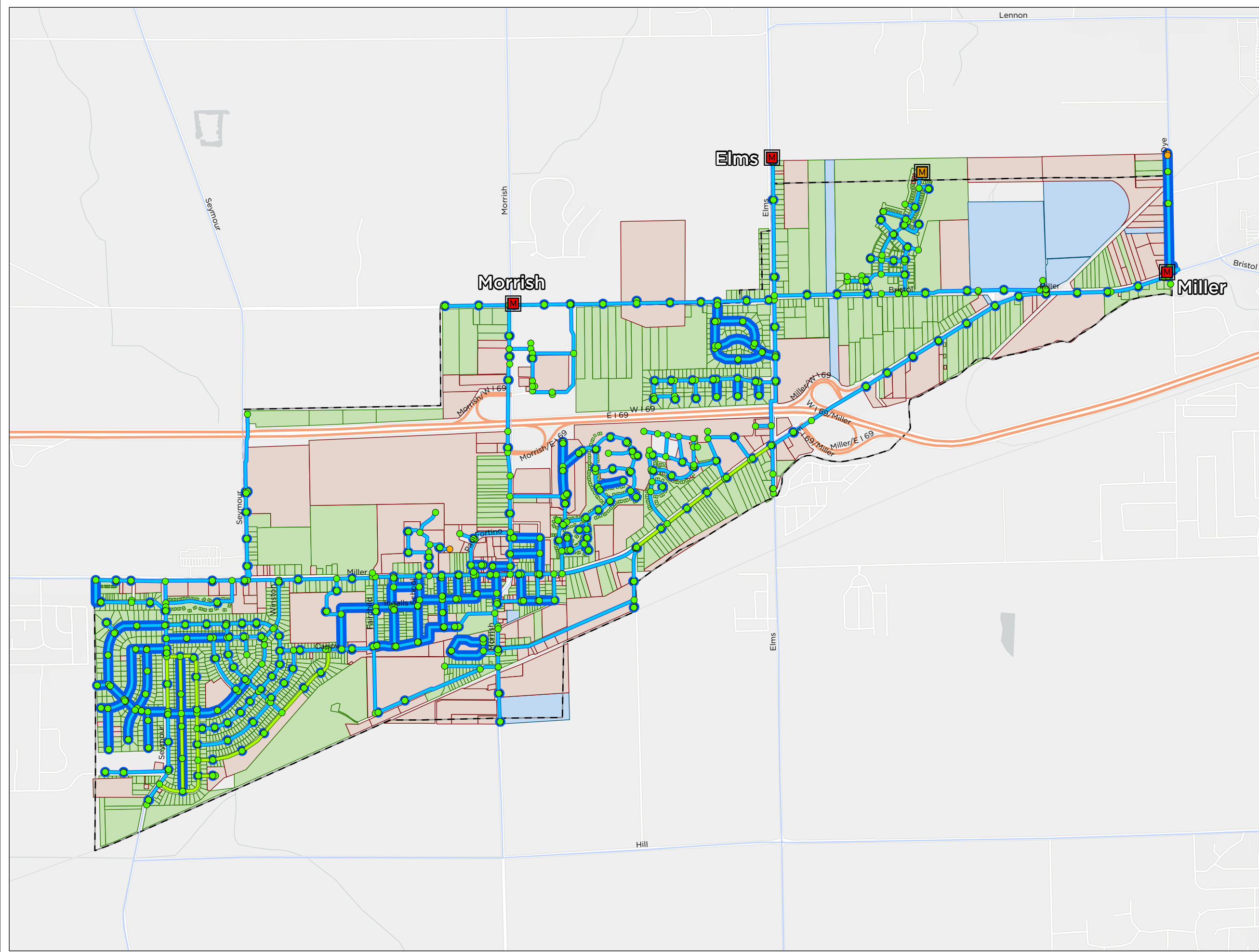




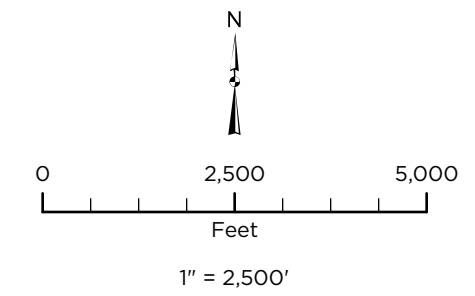
Water Master Plan

Figure 11

Future Fire Protection



- Future Fire Protection**
- < 50 % of Desired
 - 50 - 75 % of Desired
 - 75 - 100 % of Desired
 - Future USDA Reservoir Project
 - Meter Vault
- Distribution Main**
- Future USDA Project
 - Distribution Main
 - To Be Upsized From 6" to 8"
- Swartz Creek Zoning / Desired Fire Protection**
- Single & Multi-Family Residential / 1,000 gpm
 - Commercial / 2,500 gpm
 - Industrial / 2,500 gpm
 - Municipal Boundary



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Map Published: September 15, 2021



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I. INTRODUCTION

This report documents the City of Swartz Creek's Emergency Response Plan (ERP) as required by the America's Water Infrastructure Act of 2018 (AWIA). OHM facilitated meetings and coordinated the documentation of the decisions made by key Swartz Creek staff in order to develop the required EPA ERP components.

The ERP is required to describe strategies, resources, plans, and procedures utility owners can use to prepare for and respond to an incident, natural or man-made, that threatens life, property, or the environment. The ERP is suggested to include:

- ▶ Strategies and resources to improve the resiliency of the system, including the physical security and cybersecurity of the system.
- ▶ Plans and procedures that can be implemented and identification of equipment that can be utilized in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water.
- ▶ Actions, procedures, and equipment which can obviate or significantly lessen the impact of a malevolent act or natural hazard on the public health and the safety and supply of drinking water.
- ▶ Strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.

In order to meet EPA's ERP objectives, the Swartz Creek Project Team utilized the EPA ERP template to compile the following:

- ▶ Strategies – Resilience strategies that include assigned roles and responsibilities of both the utility and its response partners. It includes internal and external communications during an incident.
- ▶ Plans and Procedures – This report outlines and identifies plans, procedures, and equipment that can be used in the event of a malevolent act or natural hazard.
- ▶ Detection Strategies – Where applicable, it outlines strategies that could aid in the detection of malevolent acts or natural hazards for the assets outlined in Swartz Creek's 2021 Risk and Resilience Assessment (RRA).
- ▶ Mitigation Actions – Actions were documented based on assets and threats identified in the 2021 RRA.
- ▶ Outlines the flow and facilitation of interactions between the utility, and its emergency response partners.

This report is intended to be maintained internally by key Swartz Creek staff as a confidential document. While EPA requires official updates to this document and the ERP be submitted every five years, it is recommended that both documents are reviewed and updated annually or when key personnel or operational changes take place.

The only copies of this document have been provided to Swartz Creek management. It is recommended that a copy is kept off-site in a secure location. For security reasons, OHM Advisors will not maintain copies of this document.

II. SYSTEM OVERVIEW

A. COMMUNITY WATER SYSTEM

General information on the community water system is provided below.

PWSID	MI0006505
Street Address	5121 Morrish Rd.
City, State, Zip Code	Swartz Creek, MI 48473
Phone number	810-635-4464
Population Served	5,897
Prepared by	OHM Advisors
Reviewed by	Adam Zettel
Date Completed	December 22, 2021

B. PLAN DISTRIBUTION

As the Emergency Response Plan is shared, each recipient's name and title, the person who gave them the plan, and on what date is documented below.

Recipient/Title	Distributed By	Date

C. CHANGE HISTORY

Any changes made to this plan since its original development, who made the changes, and on what date the changes were incorporated into this plan are documented below.

Description of Change	Name/Title	Date

D. UTILITY INFORMATION

General information about the water utility is provided below.

Provide basic information about your utility.	
PWSID	MI0006505
Utility name and address	City of Swartz Creek Department of Public Services 5121 Morrish Rd. Swartz Creek, MI 48473
Owner	City of Swartz Creek
Directions to utility from major roadway, include lat./long. coordinates	Coordinates: 42.953891, -83.830664 From Eastbound I-69, take Exit 128 towards Morrish Rd. Turn left onto Morrish Rd. After approximately 0.7 miles, the DPW garage is on the left. From Northbound US 23, take Exit 90 for Hill Rd. Turn left onto Hill Rd. After approximately 5.5 miles, turn right onto Morrish Rd. In approximately 0.8 miles, the DPW garage is on the right.
Total population served and total service connections	Population: 5,897 Service Connections: 2,265
Name, title, phone number of primary contact (e.g., ERP Lead)	Adam Zettel, City Manager, 810-287-2147
Alternate contact	Robert Bincsik, Director of Community Services, 810-955-5978
Location of treatment, distribution, collection schematics and operation manuals	City Hall and the City's network (see Building and Zoning Department).

The checklist below lists utility information available at the City Hall in the event of an emergency. Most items have been scanned into the City's network and are available via the Building and Zoning Department

- Map of distribution systems
- Pressure boundary map
- Process flow diagram
- Site plans and "as built" drawings for the following components of your system (as applicable):
 - o Pumping and storage facilities
 - o Water Main
- Distribution system diagrams and instrumentation information
- Equipment specifications and operation instructions
- Emergency power and light generation operation specifications
- Supervisory Control and Data Acquisition (SCADA) system operation instructions
- Communications systems operation instructions

E. PERSONNEL INFORMATION

Key utility personnel information is provided below. In the event of an emergency in which cell service is not available, the DPW team has radios available for use.

Name and Title	Job Duties and Responsibilities	Contact Phone	Contact Email
Adam Zettel	City Manager	810.287.2147	azettel@cityofswartzcreek.org
Rob Bincsik	Director of Community Services	810.955.5978	rbincsik@cityofswartzcreek.org
Rebecca Bosas	DPW Employee	810.577.6943	rbosas@cityofswartzcreek.org
Jay Sandford	DPW Employee	810.577.6754	jsandford@cityofswartzcreek.org
Rodney Gardner	DPW Employee	810.625.7626	rgardner@cityofswartzcreek.org
David Wright	DPW Employee	810.577.4616	dwright@cityofswartzcreek.org

F. PRIMARY UTILITY COMPONENTS

The components necessary to maintain effective operation of the utility are listed below.

Source Wells:

Well Name	Depth/Location	Available Yield	Treatment Requirements/Associated Treatment Plant
N/A			

Treatment Plant:

Plant Name	Location	Capacity	Treatment Train
N/A			

Storage and Distribution System:

Location	Area Served	Comments
Moorish Rd and Bristol Rd	Swartz Creek	Genesee County Drain Commission (GCDC) Inflow Meter
Elms Rd between Lennon Rd and Bristol Rd	Swartz Creek	Genesee County Drain Commission (GCDC) Inflow Meter
Miller Rd and S Dye Rd	Swartz Creek	Genesee County Drain Commission (GCDC) Inflow Meter

Treatment Chemical Storage Facilities:

Location	Chemical(s)	Comments
N/A		

Other Key Facilities:

Location	Function	Comments
Miller Rd west of Seymour Rd	Part of GCDC network serving Flint Twp., Clayton Twp., and Gaines Twp.	Genesee County Drain Commission (GCDC) Deduct Meter
Hill Rd west of Seymour Rd	Part of GCDC network serving Flint Twp., Clayton Twp., and Gaines Twp.	Genesee County Drain Commission (GCDC) Deduct Meter
Morrish Rd south of Maple St	Part of GCDC network serving Flint Twp., Clayton Twp., and Gaines Twp.	Genesee County Drain Commission (GCDC) Deduct Meter

G. INDUSTRY CHEMICAL HANDLING AND STORAGE FACILITIES

The City of Swartz Creek does not handle or store any chemicals that are a threat to the water supply. There are no industrial businesses within the City that handle chemicals that pose a threat.

H. SAFETY MATERIALS AND INFORMATION

Important safety information to help protect utility personnel during an incident is provided below.

During extreme weather, cautionary measures for performing work will be taken as applicable based on the weather situation.

First aid supplies can be found at City Hall and the Department of Public Works garage.

I. RESPONSE RESOURCES

An inventory of available resources (e.g., equipment, supplies) maintained on site and/or readily available off-site (e.g., neighboring water system) are listed in the table below.

Kind	Type	Quantity	Location
Utility vehicles	½ ton / ¾ ton pickup trucks	5	DPW garage
Stationary Generators		2	DPW garage
Water main repair clamps	Size from 6" to 12" and varying lengths	Many	DPW garage

J. KEY LOCAL SERVICES

The closest locations of key logistical and medical services that the utility or mutual aid and assistance providers may need during an incident are provided below.

Facility	Location/Description
McLaren Flint Hospital	401 S Ballenger Hwy Flint, MI 48532
Grocery Store	Meijer 4141 Morrish Rd Swartz Creek, MI 48473
Grocery Store	Kroger 7084 Miller Rd Swartz Creek, MI 48473
Fuel	Admiral Petroleum 7561 Miller Rd Swartz Creek, MI 48473
Fuel	Mobil 4278 Morrish Rd Swartz Creek, MI 48473
Police Department	Metro Police Authority of Genesee County, Swartz Creek Post 8100 Civic Drive Swartz Creek, MI 48473 Ph: 810-635-4464
Sheriff Christopher Swanson	Genesee County Sheriff Department 1002 South Saginaw St Flint, MI 48502 Ph: 810-257-3406
Fire Department	Swartz Creek Area Fire Department 8100-B Civic Drive Swartz Creek, MI 48473 Ph: 810-635-2300

K. MITIGATION ACTIONS

Information on alternative source water options and interconnected utilities to mitigate impacts during incidents is provided below.

Alternative Source Water Options:

Type	Location	Comments
N/A		

Interconnected Utilities:

Utility Name	Location	Contact Information	Comments
N/A			

Sampling and Analysis:

Item	Description
Sampling Procedures	
Sampling Locations	
Sampling Containers	
Sample Transportation	
Laboratory Capabilities	
Interpreting Results	

Laboratory Contact List:

Name	Address	Analytes/Methods	Phone	Email or Website
Paragon Laboratories	12649 Richfield Ct, Livonia, MI 48150		734.462.3900	

III. COMMUNICATIONS

A. EMERGENCY RESPONSE ROLES

Name	Emergency Response Role	Responsibilities
City Manager	XX	Notification of health department, media, and public safety.
Assistant City Manager	NA	
Director of Public Works	XX	Staff coordination and coordination with GCDC-WWS and EGLE.
PIO	NA	
Fire Chief Emergency Incident Commander PIO	XX	Coordination with FEMA

B. INTERNAL AND EXTERNAL COMMUNICATION

Utility emergency response team members and external response partners, their response role and/or position, and contact information are provided below.

Internal Response Communication:

Name and Title	Job Duties and Responsibilities	Contact Phone	Contact Email
Adam Zettel	City Manager	810.287.2147	azettel@cityofswartzcreek.org
Rob Bincsik	Director of Community Services	810.955.5978	rbincsik@cityofswartzcreek.org
Rebecca Bosas	DPW Employee	810.577.6943	rbosas@cityofswartzcreek.org
Jay Sandford	DPW Employee	810.577.6754	jsandford@cityofswartzcreek.org
Rodney Gardner	DPW Employee	810.625.7626	rgardner@cityofswartzcreek.org
David Wright	DPW Employee	810.577.4616	dwright@cityofswartzcreek.org

External Response Partner Communication:

Name	Role/Title	Phone	Alternate Phone	Email or Website
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LOCAL				
Emergency Management Coordinator	Adam Zettel, City Manager	810-287-2147		
County Health Department	Mark Valacak, Sanitarian Supervisor for Genesee County	810-257-3588		
Local Police Department	Matt Bade, Police Chief	810-252-2082	911	
Local Fire Department	Dave Plumb, Fire Chief	810-965-4573	911	
Local Department of Transportation	Rob Bincsik, DPW Director	810-955-5978		
Genesee County Sheriff	Sheriff Christopher Swanson	810-257-3406	810-629-1112	
STATE				
Michigan State Police	Michigan State Flint Post 35	810-732-111		www.michigan.gov/msp
Michigan Department of Environment, Great Lakes, and Energy (EGLE)	Aaron Tytschkowski (Engineer)	517-282-3161		www.michigan.gov/egle
	Jason Berndt (Wellhead Protection)	517-241-4796		
	PEAS	800-292-4706		
	Water Safety/Public Health	800-866-4674		
	Pollution Emergency	800-292-4706		
	Environmental Response	800-662-927		
Michigan State Police, Emergency Management and Homeland Security Division (MSP/EMHSD)	Captain Keven Sweeny, Deputy State Director of Emergency Management, MSP	517-284-3966		sweeneyk@michigan.gov
State Emergency Response	Brenna Roos SASA Title III			RoosB@michigan.gov

Commented [AH1]: QUESTION FOR ADAM: Do we want to use Matt's cell phone or use a different number?

Commission (SERC)	Planner			
Department of Agriculture & Rural Development (MDARD)	Pesticide/ Fertilizer Spills	800-405-0101		www.michigan.gov/mdard/
	Oil/Chemical Spills (Federal Report Requirement)	800-424-8802		
	Chem Trac Hotline – Chemical Spills	800-424-9300		
Michigan Water / Wastewater Agency Response Network (WARN)	Tim Neumann	517-657-2417		www.miwarn.org Membership in process
Michigan Regional Laboratory System	Barbara Weberman (Laboratory Supervisor)	248-858-1310		www.michigan.gov/mdhhs/0,5885,7-339-71551_2945_5103_7168-14758--,00.html ; webermanb@oakgov.com
FEDERAL				
EPA Investigative Division				www.epa.gov/enforcement
FBI Regional Office		313-965-2323		www.fbi.gov/contact-us/field-offices/detroit
Center for Disease Control		800-232-4636		www.cdc.gov/
EPA National Response Center		800-424-8802		www.epa.gov/emergency-response/national-response-center
FEMA		1-800-621-3362	1-800-462-7585; 312-408-5500 (Regional Office)	www.fema.gov/; AskIA@fema.dhs.gov

Commented [AH2]: Does the City need to be a member to include this?

Commented [KM3R2]: Yes, or working toward membership. We can remove if Swartz Creek is not a member.

C. CRITICAL CUSTOMER COMMUNICATION

The Genesee County Health Department maintains a list of critical customers who should be given priority notification due to their reliance on the water supply either for medical reasons, based on usage, public health mission, or because they may serve customers considered to be sensitive sub-populations. In

the event of an emergency, the City of Swartz Creek advises the Health Department of the issue and shares key messaging. The Health Department then notifies the critical customers as appropriate.

Organization or Department	Point Person Name & Position	Contact Instructions	Phone /Alternate Phone	Email or Website
General Motors	James Harris		810.635.5573 248.830.8458	James.r.harris@gm.com
Swartz Creek Estates	Manager		810.207.1834	
North Atlas	Manager		810.442.8413	
Riverside Manor	Manager		810.635.3357	
Meijer	Manager		810.635.1400	
Mari-Dan Miller Farms	Manager		810.635.2922	
Springvale Assisted Living	Manager		810.230.6644	
Courtyard Manor of Swartz Creek	Manager		810.630.1063	
Swartz Creek Community Schools	Ben Mainka, Superintendent		810.591.2300	bmainka@swcrk.org

D. MEDIA OUTREACH

Contact information for all media outlets that the utility may coordinate with during notification efforts is provided below. **Communications Director** – City Manager

Organization or Department	Point Person Name & Position	Phone	Alternate Phone	Email or Website
WCRZ FM CARS 108		810-743-1080		www.wcrz.com
WFDF CBS 910		810-238-7300		www.radiolineup.com/stations/WFDF-AM
WJRT ABC 12		810-233-3130	After 5:30pm: 810-257-2800	www.abc12.com
WNEM 5 CBS		810-232-3900		www.wnem.com
WEYI TV 25		810-687-1000		nbc25news.com
Swartz Creek View	Lania	989-332-2055		www.swartzcreekview.mihomepaper.com

	Rocha			
Website Facebook Etc?	Adam Zettel	810.287.2147		https://cityofswartzcreek.org/index.php

E. PUBLIC NOTIFICATION TEMPLATE

Public notification information is provided below. (Please review, or if a template is available, please provide).

Types of information to include in a press release:

1. Type of emergency
2. All areas affected by the emergency
3. The public’s responsibility (e.g. conserve or boil water)
4. The utility’s responsibility
5. The action the utility is taking to correct the problem
6. Approximate time to resolve the problem

Commented [KM4]: If the City does not keep notification templates on hand, this information is what should be included and is sufficient on its own.

IV. FLOWCHARTS AND PROCEDURES

A. SYSTEM CONTAMINATION28

B. LOSS OF KEY SUPPLIERS32

C. PANDEMIC/DISEASE OUTBREAK, LOSS OF KEY EMPLOYEES.....35

D. PHYSICAL DESTRUCTION.....38

E. POWER OUTAGE.....41

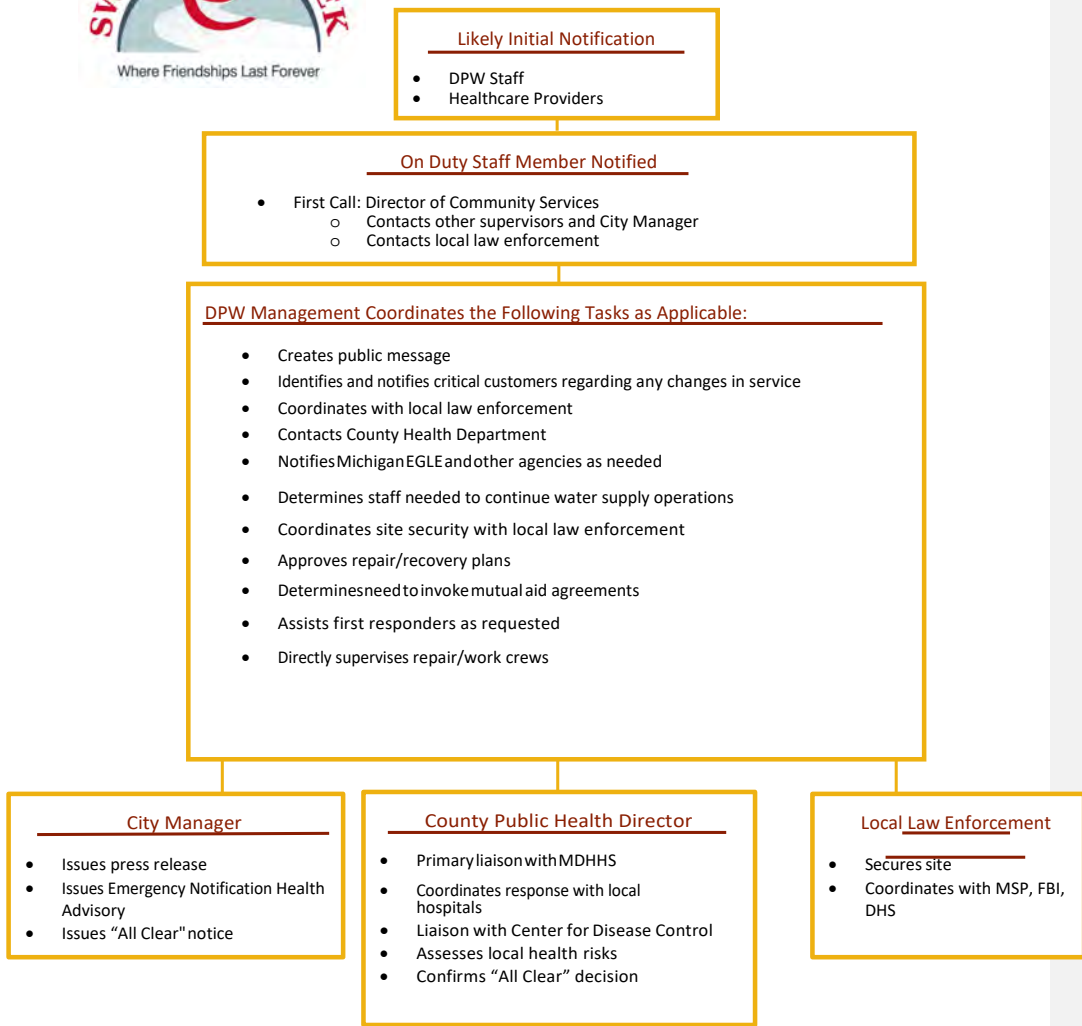
F. SCADA INTRUSION.....44

G. PROXIMITY INCIDENT.....47

Loss of Key Employees – Pandemic & Disease Outbreaks



Commented [KM5]: Does the order of notifications on this flow chart generally agree with what happens in an emergency? (This is an example that will be repeated and adjusted for other possible scenarios).



Pandemic and Disease Outbreak/Loss of Key Employees Procedure

A pandemic or disease outbreak could significantly impact City of Farmington’s staffing capabilities. A significantly reduced staff due to illness or other causes could impede City of Farmington’s ability to produce water. The procedures to address a loss of key staff are outlined below.

	1. Notify DPW Staff On Duty
	a. Robert Bincsik, Director of Community Services
	i. (810) 955-5978

Commented [KM6]: Is Robert the first notification? If not, who? (Some communities have an on-call number).

	2. Director of Community Services notifies City Manager
	a. Adam Zettel, City Manager
	i. (810) 287-2147

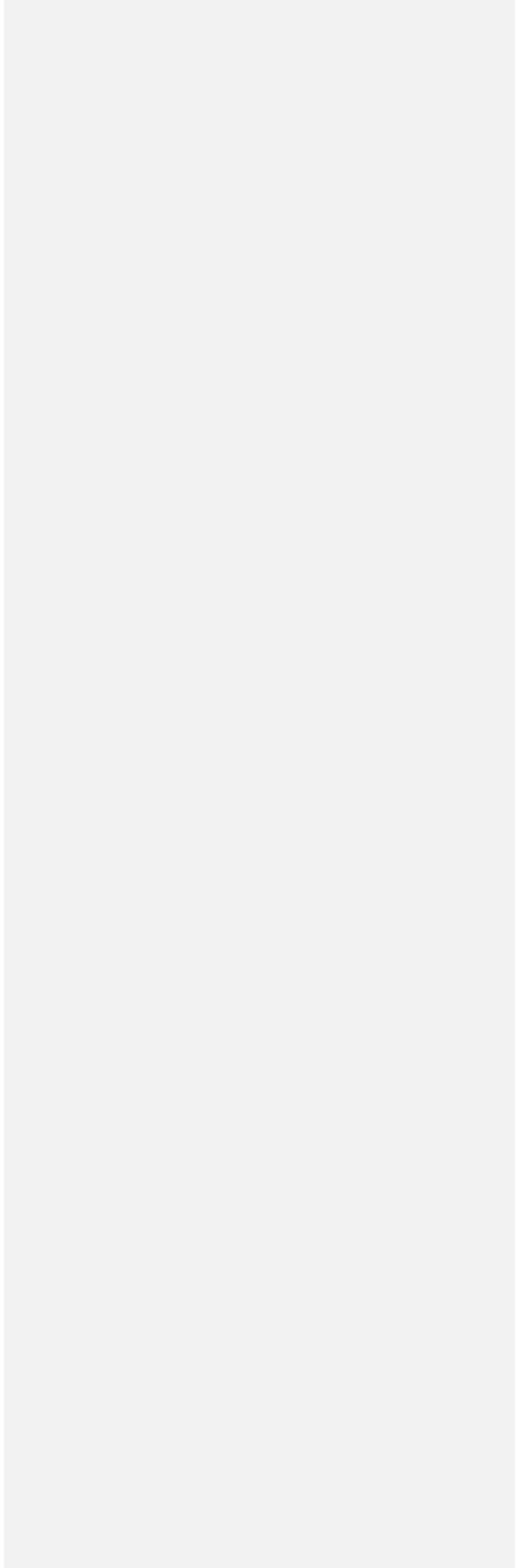
	3. City Manager notifies local law enforcement
	a. Local Law Enforcement
	i. 911
	ii. Matt Bade, Police Chief, Metro Police Authority of Genesee County
	1. (810) 252-2082

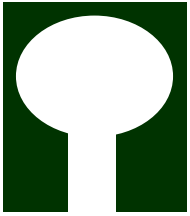
Commented [KM7]: Does the order of notifications here make sense for your community? Or does it happen another way?

	4. City Manager/Director of Community Services coordinates and assigns the following tasks, as applicable:
	a. Contact the Genesee County Health Department who will coordinate with the MDHHS, the CDC, and local hospitals to assess health risks
	1. (810) 257-3588
	b. Contact EGLE
	i. Aaron Tytschkowski (District Engineer)
	1. (517) 282-3161
	c. Create a joint message/press release/emergency notification to the public
	d. Determine the need to invoke mutual aid agreements (XXX)
	e. Notify critical customers of any changes in service – refer to critical customer list
	f. Coordinate with DPW staff to assist first responders, make repairs as necessary, and coordinate restoration efforts

Commented [KM8]: Who completes this type of coordination usually?

Commented [KM9]: Does Swartz Creek have any mutual aid agreements or connections to other utilities for emergency use? If so, which ones?





DIXON

**ENGINEERING & INSPECTION SERVICES
FOR THE COATING INDUSTRY**

1104 Third Avenue
Lake Odessa, MI 48849
Telephone: (616) 374-3221
Fax: (616) 374-7116

July 19, 2022

City of Swartz Creek
8083 Civic Dr.
Swartz Creek, MI 48473

Attn: Adam Zettel

Re: 300,000 Gallon Toroellipse Water Storage Tank
Roof Vent

Dear Mr. Zettel:

During our inspection on June 8, 2022 we discovered the roof vent dome top was open. The dome studs were severed allowing the dome to open during inclement weather. This did not present a health hazard since the tank is not used for storage anymore.

I was unsuccessful in getting a contractor over to repair for a reasonable cost since this is the peak of their painting season. I had our tank inspection crew stop by and reinstall the City repaired dome on their way through on June 23, 2022. One stud broke at the weld during installation.

The crew secured the remaining two and they were there about 2 hours.

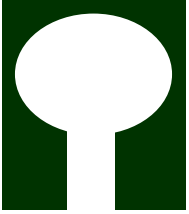
If you have any questions or concerns, please call me at (616) 374-3221 ext. 310.

Thank you for choosing DIXON for your inspection needs.

FOR DIXON ENGINEERING, INC.,

Thomas Rounds
Project Manager

Enclosures



DIXON

ENGINEERING & INSPECTION SERVICES
FOR THE COATING INDUSTRY

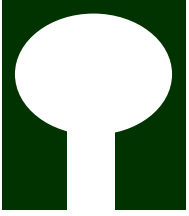
1104 Third Avenue
Lake Odessa, MI 48849
Telephone: (616) 374-3221
Fax: (616) 374-7116



PHOTO #1: As found on inspection



PHOTO #2: Reinstalled



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1104 Third Avenue
Lake Odessa, MI 48849
Telephone: (616) 374-3221
Fax: (616) 374-7116



PHOTO #3: Stud extension



PHOTO #4: Small Gap