Fiscal Year 2014
Strategic 20-Year Plan
Pump Station Capital Rehabilitation Program

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Pump Station Capital Rehabilitation Program

Pump Stations play an integral role in maintaining highway operations for the Michigan Department of Transportation's (MDOT) 9,700 miles of road network. They work to expel surface water runoff from depressed sections of roadway in prevention of flooding and roadway closures. Unfortunately, pump stations are seldom recognized as key components of the highway system infrastructure, that is, until a major flood event occurs.

The Pump Station Capital Rehabilitation Program was established in 2006. It was developed as a statewide capital outlay program responsible for the rehabilitation and replacement of electro-mechanical systems (pumps, wells, intake and discharge pipes, and electrical components) and other peripheral components such as the station structure and site.

Prior to the program's inception, pump stations received rehabilitation work through road and bridge preservation projects. This became a problematic approach as station rehabilitations were not always included in road scoping. It also didn't ensure the most critical stations were being targeted.

To help target critical stations, the Pump Station Capital Rehabilitation Program was created. This dedicated source of funding was directed toward standalone rehabilitation projects that sought to bring the system condition up to a manageable level. The now established pump station rehab program in conjunction with road and bridge programs work jointly to improve and sustain the overall condition.

Strategic Direction

The Pump Station Program has a performance goal of achieving an overall good/fair condition rating of 90 percent. According to the current condition assessments, 96 stations are in poor condition. Taking into account the rate of deterioration, in the next 20 years pump stations that are currently rated in the fair conditions will most likely drop into the poor condition category, adding 33 more stations in need of rehabilitation. These aging pump stations demand more maintenance visits to keep them operational. The pumps themselves, along with electrical components, are operating well beyond the recommended service life of 20-30 years.

Goal 1: Rehabilitate

Rehabilitate pump stations to achieve an overall good/fair condition rating of 90% (149 stations).

Objectives:

Identify pump station rehabilitations according to the following:

- Emergency pump failures. A complete failure or series of failures that poses a safety concern.
- Stations in known "Poor" condition. Conditions are derived from a weighted point scoring system collected from an on-site inspection. The inspection includes rating the mechanical, electrical, structural, and site conditions for each station. See Att 2-A for further information on "poor" rated station conditions.
- Age of the pump station, beyond normal service life. Identify stations beyond 45 years of age. These stations will be inspected on an annual basis (until programmed) to ensure the pumps do not fail.

Prioritize pump station rehabilitations according to the following:

- By historical records, identifying stations with known problems.
- Proximity to major flood zones/areas prone to flooding.
- Proximity to other pump stations in need of repair and/or proximity to other road and bridge projects. This ensures the program takes maximum advantage of lower mobilization costs and economies of scale.
- Location on corridors of high significance. The more significant, the higher the priority.

Goal 2: Maintain

Maintain 149 MDOT owned pump stations with a site inspected rating of four and above (Good-Fair).

Objectives:

In addition to inspections associated with preventive maintenance cycles, a condition inspection will be performed as follows:

- Stations that are rated > 7: Inspect, and Validate/Update rating every 5 years
- Stations that are rated >=4 and < 7: Inspect, and Validate/Update rating every 2 years
- Stations that are rated <4: Inspect annually, and consider for rehabilitation as noted above

Stations will receive minor rehabilitation work in conjunction with scheduled maintenance to help sustain a good/fair condition rating.

Program Condition Inventory & Analysis

As of fiscal year 2014 the program is responsible for maintaining 165 pump stations. Each MDOT region contains at least one station with Metro region having 139 or 84% (119 in Wayne County) of the total inventory. Please reference Figure 1.0 and attachment 1-A for further details.

Routine maintenance is performed on all pump stations; however, there are several stations that are well beyond their service life. Replacing individual electrical and mechanical components on a regular schedule would not be cost effective because there would be no way of knowing which component is the weakest link in the system. The maintenance on stations in poor condition is more of a run-fail approach. Maintenance crews check the operation of the pumps on their routine visit and make sure they are operational and repair those items that fail and respond to emergency calls as needed. In fiscal year 2013, $2.8M was spent on maintenance related work and $389k was spent on operational costs.

The success of the program is dependent on completing recurring condition inspections throughout the life of a station. Condition inspections allow the program to strategically target and prioritize the most critical stations first. At the same time, it also provides the program a glimpse of future conditions so that minor maintenance or rehabilitation efforts can be targeted on fair rated stations. The key is to extend the life of a station as much as possible without sacrificing safety or operations.

Pump Station Regional Distribution

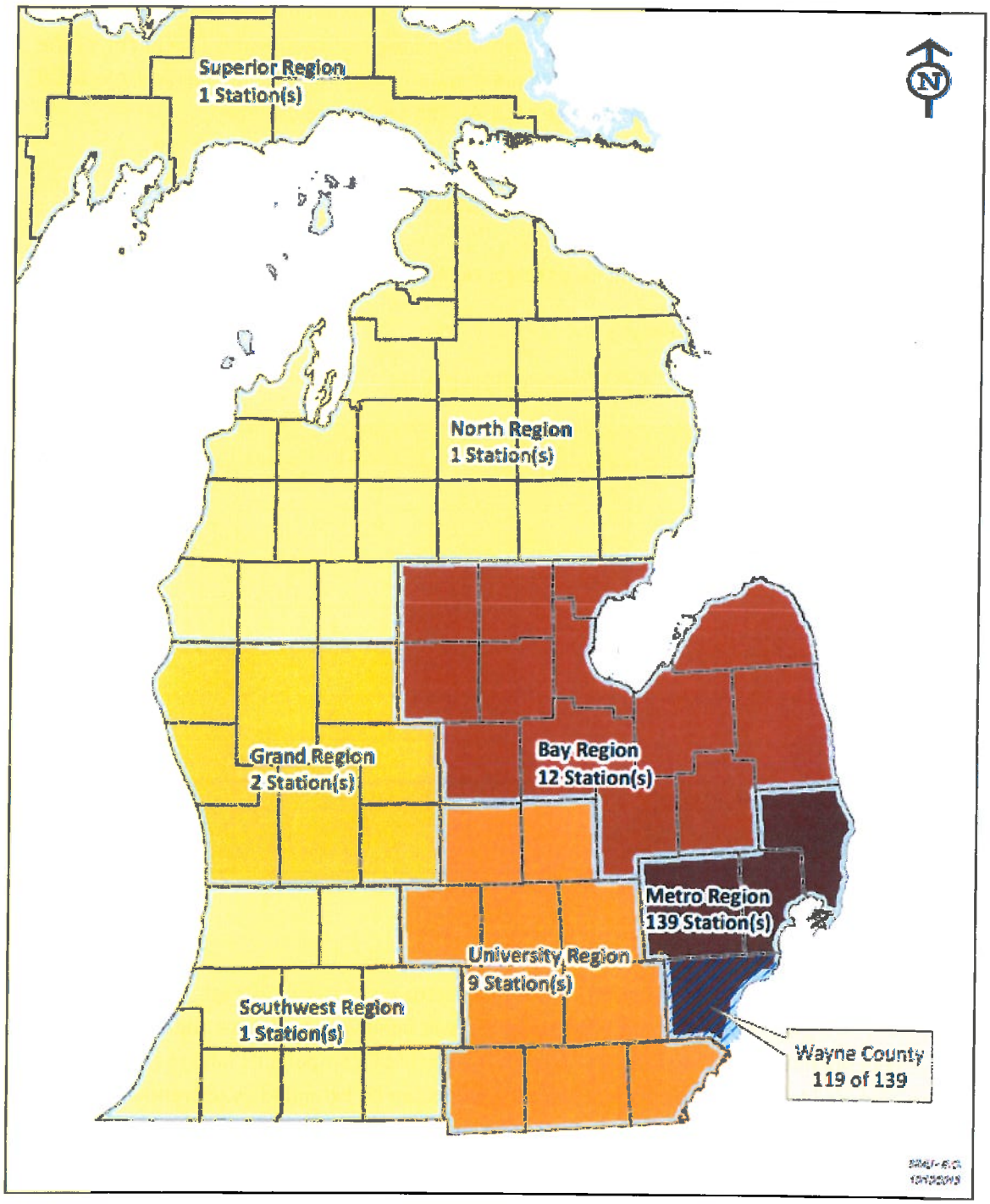


Figure 1.0

Ratings

The first step in guiding the strategic direction of the program is to know what the current system condition is. In fiscal years 2012 and 2013 a statewide pump station condition assessment was performed. The assessment inventoried 165 pump stations and their current health. The health of the station, or rating, was determined using a weighted point system examining the mechanical, electrical, structural, and site conditions of each station (See Att 2-A). The ratings are used for:

- Determining an average rate of deterioration
- Identifying stations and/or groups of stations most critical
- Predicting future conditions
- Help determine the appropriate minor or major rehabilitation fix.

The results of the inventory are as follows:

FY14 Pump Station Ratings

	Good	Fair	Poor	Total
Superior	1			1
North		1		1
Grand		2		2
Bay	2	5	5	12
Southwest	1			1
University	2	3	4	9
Metro	*30	22	87	139
Statewide	36	33	96	165
Statewide %	22%	20%	58%	100%

* Includes six (2) stations currently under construction

The most critical components of a pump station are the electro-mechanical systems. When these fail, water ceases to be expelled from the roadway; the end result being a road closure and/or safety hazard. On average, a pump has a 25-30 year service life with the electrical components having anywhere from 15-25 years. Service life of these electro-mechanical systems can be extended by preventive maintenance measures as Figure 2.0 demonstrates the impact they have on the current system and its deterioration.

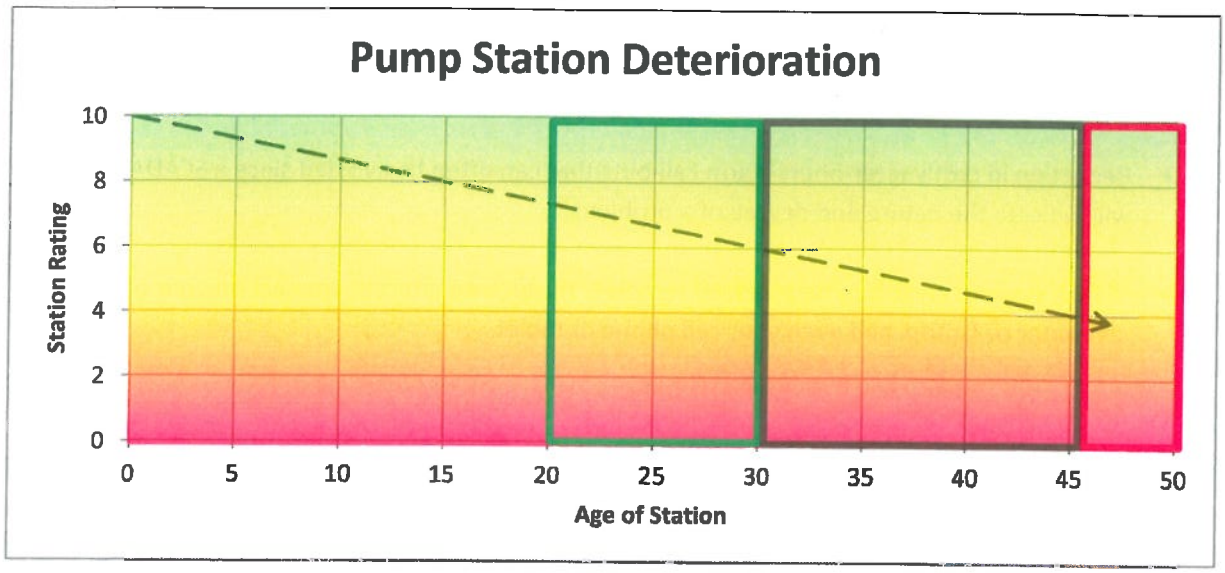


Figure 2.0

With the current maintenance efforts performed on these stations, notice how the rating doesn't fall into the fair category (<7) until it reaches 20 years of age. Furthermore, stations do not fall into the poor category until 45 years. This is at least 15 years past the recommended service life for these systems. With this dramatic increase in life expectancy it is important to continue with current maintenance schedules while working to enhance them with the Supervisory Control and Data Acquisition (SCADA) system (discussed further on in this section).

In Figure 2.0 there are three boxes ranging from 20-50+ years of age. The green box represents the rating and age of a station that should be receiving minor electrical rehabilitations, the brown box for minor mechanical rehabilitations, and the red box for major rehabilitation in both categories (as well as other items like the pump structure and site). These checkpoints are derived from the current conditions reviewed from the 2012 and 2013 inspections while also factoring in the recommended service life of each component.

To summarize, stations rated 7-10 and less than 20 years of age should receive routine maintenance and an inspections every five years. Stations with a rating of 4-7 between 20-45 years of age will receive an inspection every 2 years, with possible minor rehabilitations. Stations with a rating of 4 or less and beyond 45 years of age will be monitored on an annual basis and are candidates for major pump station rehabilitations.

Starting in 2009, MDOT began installing remote sensing SCADA control systems for 16 pump stations that have been rehabilitated in Macomb, Wayne, Lenawee and Genesee Counties and in the city of Kalamazoo (see Figure 3.0 on next page). The term SCADA systems can be used to describe a multitude of computer-based control systems that allow operators and maintenance personnel to monitor and control pump station equipment. The system monitors the incoming voltage, hours of operation, water level, pump flow and various condition alarms of key components that may need attention. This is a

Web based system with graphical display screens indicating status of pump stations and can be accessed anytime, anywhere, with the various alarms sent to designated personnel 24 hours, including the STOC and SEMTOC. Some of the benefits of the SCADA system include:

- Reduction in costly after-hours alarm call-outs that can often be avoided since a SCADA system will indicate the nature and degree of a problem.

- SCADA systems can often be accessed remotely through an internet connect on your office computer or laptop, and even your cell phone or tablet.

- Allows MDOT earlier notification when pump station problems occur, providing valuable response time prior to impacting public safety and mobility.

Figure 3.0 – Supervisory Control and Data Acquisition

These systems, once installed, will have "real-time" impact on the way stations are monitored and maintained. However, since they are installed on only 10% of the system, regular site inspections will continue.

Financial Projections

Throughout the programs 7 year history it has averaged an annual funding allocation of $4 million dollars (Reference "Historical Pump Station Targets" chart). In the past two fiscal years (17 & 18) the program has been reduced to $2 million for the I-94 and I-75 modernization projects. Since the condition is directly impacted by the monetary investment, three funding scenarios have been identified to better understand what the future condition of the system will be like based on each funding limitation.

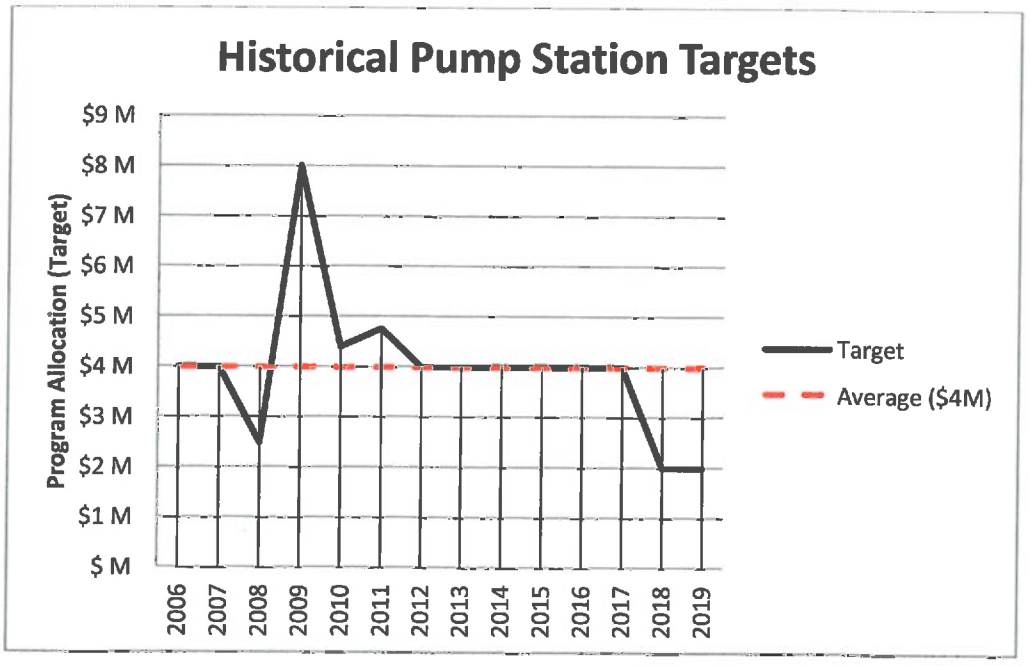
The following funding scenarios will be applied starting in fiscal year 2020.

1) Will assume the program is able to utilize the average annual funding allocation of $4M (average).

2) Will assume a reduced budget totaling $2M dollars for the I94/I75 modernization projects and any "Mega" projects thereafter. (It is possible for pump stations to be included in "Mega" projects, but is not a certainty.)

3) Will assume a recommended annual investment of $8M.

Please reference the "20 Year Outlook" section to see how these funding scenarios impact the systems condition.



Twenty Year Outlook

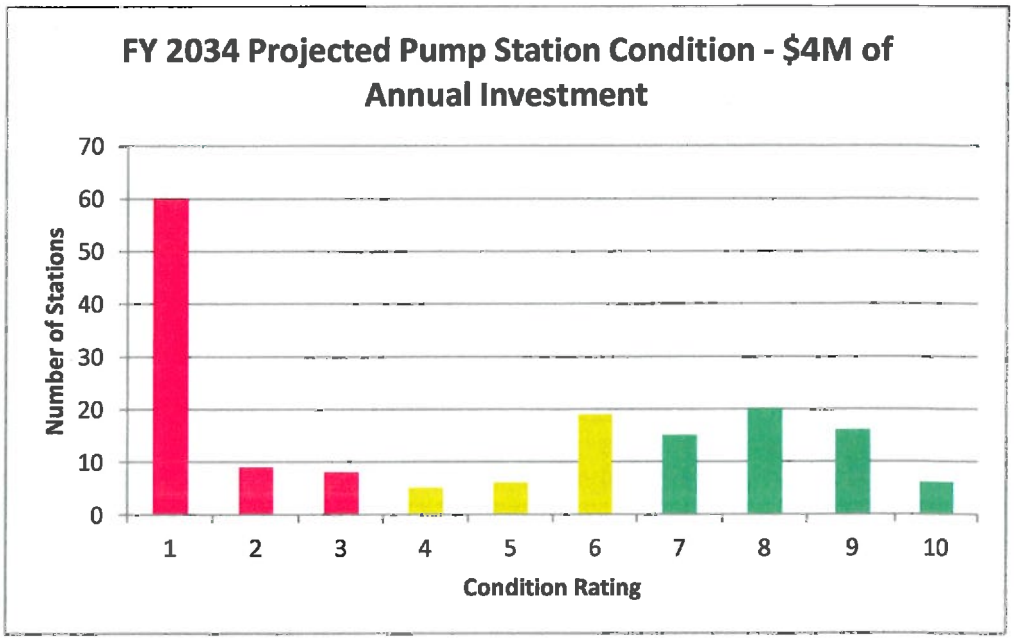
The twenty year outlook works to synthesize current pump station conditions and future capital investment to come up with a pump station condition forecast. The forecast is projected using each of the three funding scenarios as discussed in the Financial Projections section to see how this limiting factor affects future station conditions. The outlook does not account for projects involved in road or bridge preservation projects and will assume the cost of pump construction at $1.5M with preliminary engineering estimated at $120k. The program seeks to target the most critical stations (poorly rated) first.

In the current five year program (fiscal year 14-18) there are 17 pump stations scheduled for construction (See attachment 3-A). There are also 2 stations currently under construction from previous years. In the following projections it will be assumed the 2 stations under construction will be completed in FY14. The remaining 17 stations are calculated using their scheduled end construction date.

Because of recent increases in design and construction costs, FY19 fiscal target will be used to fund delayed projects from previous years. Therefore, FY19 will be calculated without any new rehabilitation projects.

Funding Scenario 1: $4M Annual Investment (Average Target)

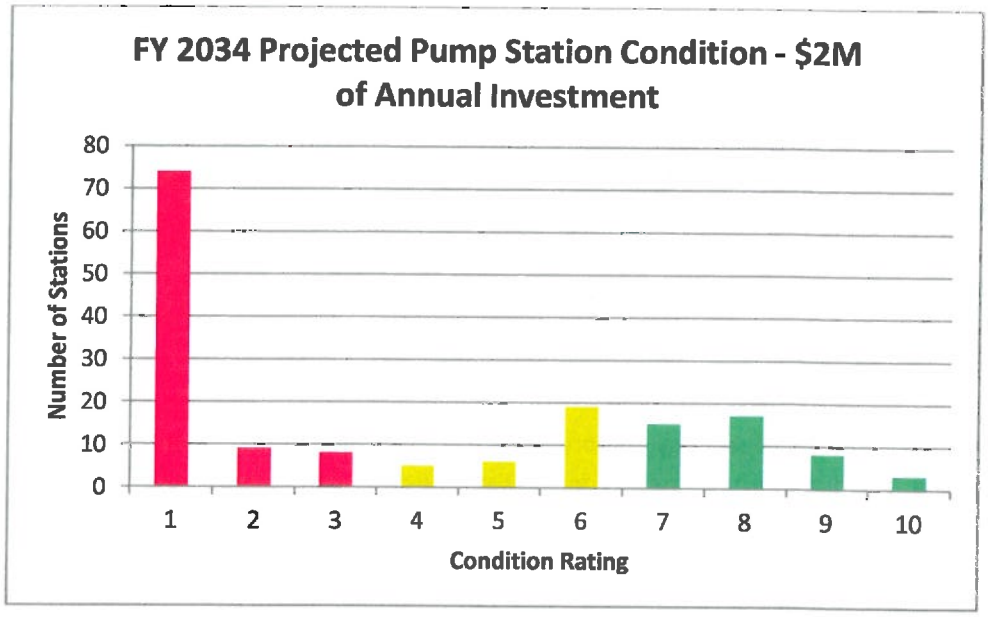
This projection conservatively allows two construction jobs per year (though it may be possible to perform up to 3); it is being utilized because of the recent increase in pump engineering and construction costs.



If the program invested $4M in station rehabilitations starting in fiscal year 2020, 47% of the system would be in "poor" condition, 18% in "fair" and 35% in "good". This assumes the program is targeting stations with the poorest ratings.

Funding Scenario 2: $2M Annual Investment

This projection conservatively allows one construction job per year; it is being utilized because of the recent increase in pump engineering and construction costs.

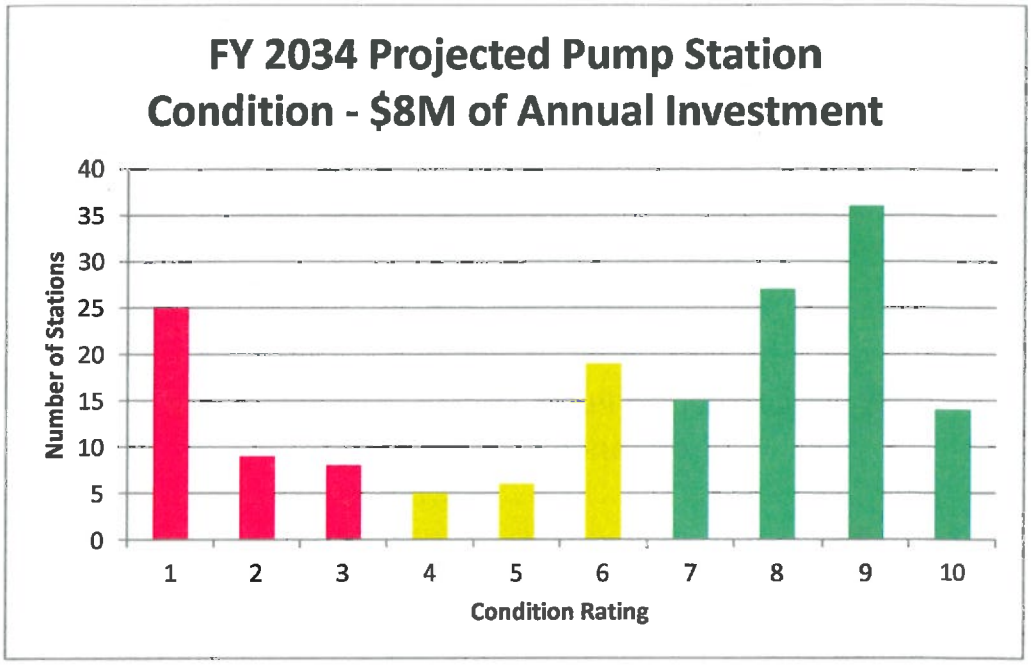


If the program invested $2M in station rehabilitations starting in fiscal year 2020, 56% of the system would be in "poor" condition, 18% in "fair" and 26% in "good". Using the current rate of deterioration, there are six stations that would be in critical condition. This would dramatically increase maintenance costs as well as the risk of failure during a catastrophic event. This scenario assumes the program is targeting stations with the poorest ratings.

Funding Scenario 3: Recommended Investment Strategy

The recommended investment strategy uses an annual allocation of $8M over 14 years starting in fiscal year 2020. The $8M in annual investment will cover 4-5 rehabilitations and 4-5 engineering projects per year.

If the program invested $8M in station rehabilitations starting in fiscal year 2020, 26% of the system would be in "poor" condition, 27% in "fair" and 47% in "good". This scenario assumes the program is targeting stations with the poorest ratings. See chart on following page.



Closing

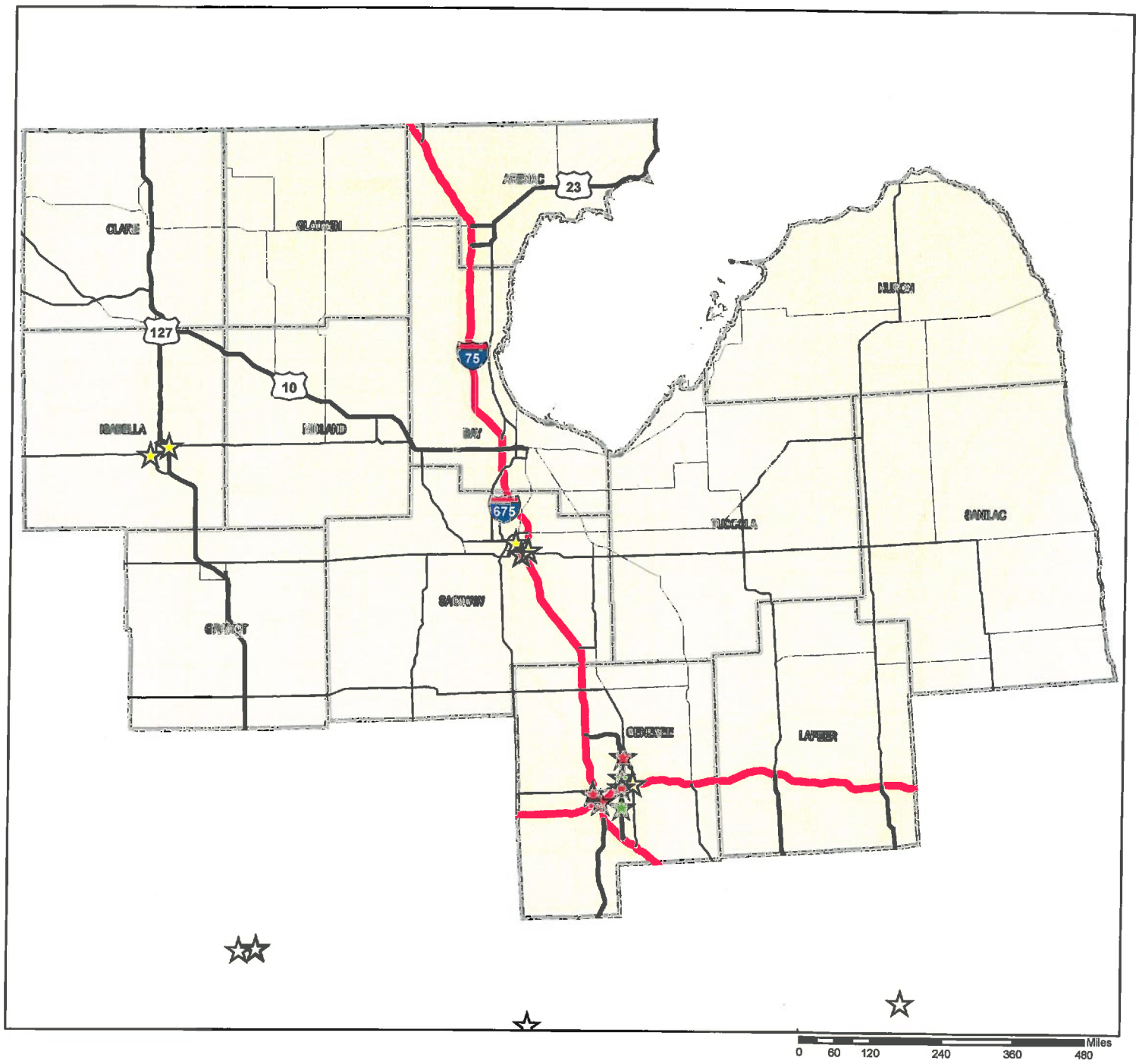
The recommended investment strategy demonstrates a realistic financial investment over 14 years (starting in 2020). The dramatic increase in good/fair stations is apparent and will further aid the program in achieving its overarching condition goal (90% in good/fair condition). If the State Highway Program were able to invest this amount of capital in pump stations over that 14 year period, the program could then begin to look at allocating money toward minor rehabilitation efforts, representing more of a preventative type program. This would emulate how MDOTs road program currently operates, utilizing a "mix of fixes". This upfront financial investment will save MDOT time and money in the long run.

To actually achieve the overarching goal of having 90% of the system in a good/fair state, the financial investment needed would be approximately $41 M. This is on top of the recommended financial investment and would rehab an additional 27 stations. The grand total of this investment over 20 years would be $173 M. Unless the State Highway program receives an infusion of capital; this option may not be viable given the current financial situation the department is in.

Pump stations play an integral role in supporting the highway system. It is MDOTs responsibility to ensure they are kept in a state of good repair, allowing highway operations to continue through extreme weather events in prevention of roadway closures and traffic incidents.

Att 1-A

Pump Station Regional Distribution



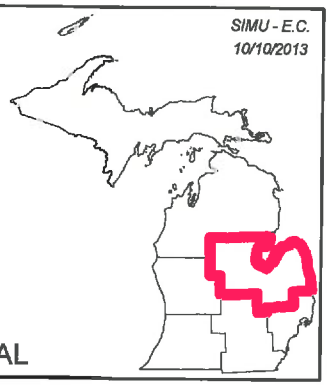
Legend

FY13 Station Rating

- Poor (0-4)
- Fair (4-7)
- Good (7-10)

Bay

Count 12



COHS TYPE

NATIONAL — STATEWIDE — REGIONAL — LOCAL

Pump Station Regional Distribution

Legend

FY13 Station Rating

- Poor (0-4)
- Fair (4-7)
- Good (7-10)

Grand

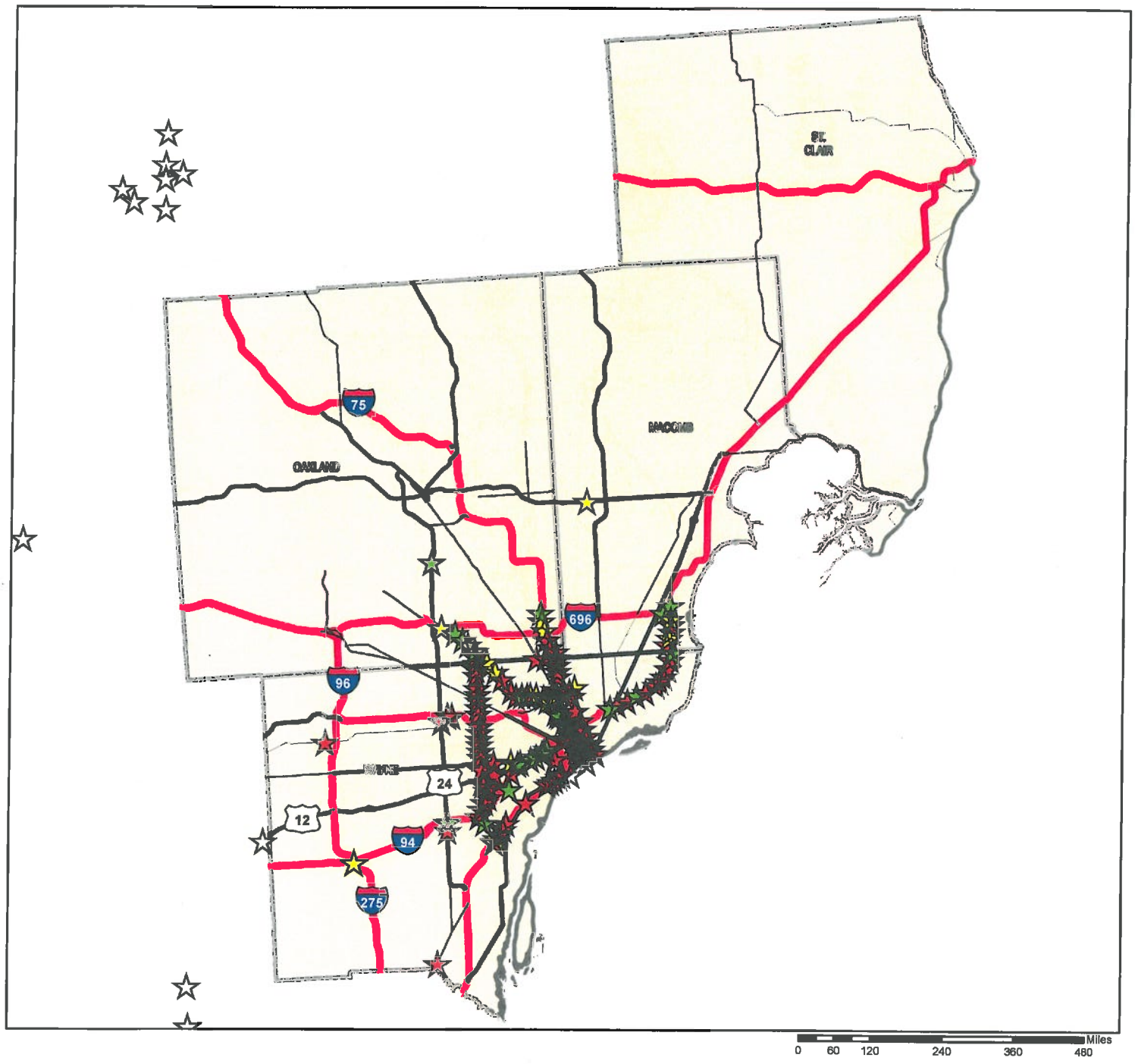
Count 2

SIMU - E.C.
10/10/2013

COHS TYPE

NATIONAL — STATEWIDE — REGIONAL — LOCAL

Pump Station Regional Distribution



Legend

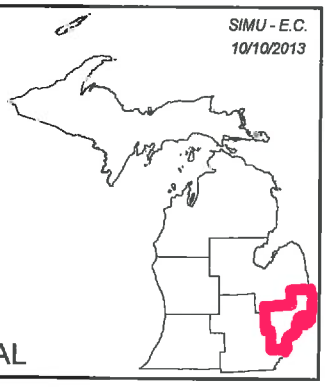
FY13 Station Rating

- Poor (0-4)
- Fair (4-7)
- Good (7-10)

Metro

Count 139

SIMU - E.C.
10/10/2013



COHS TYPE

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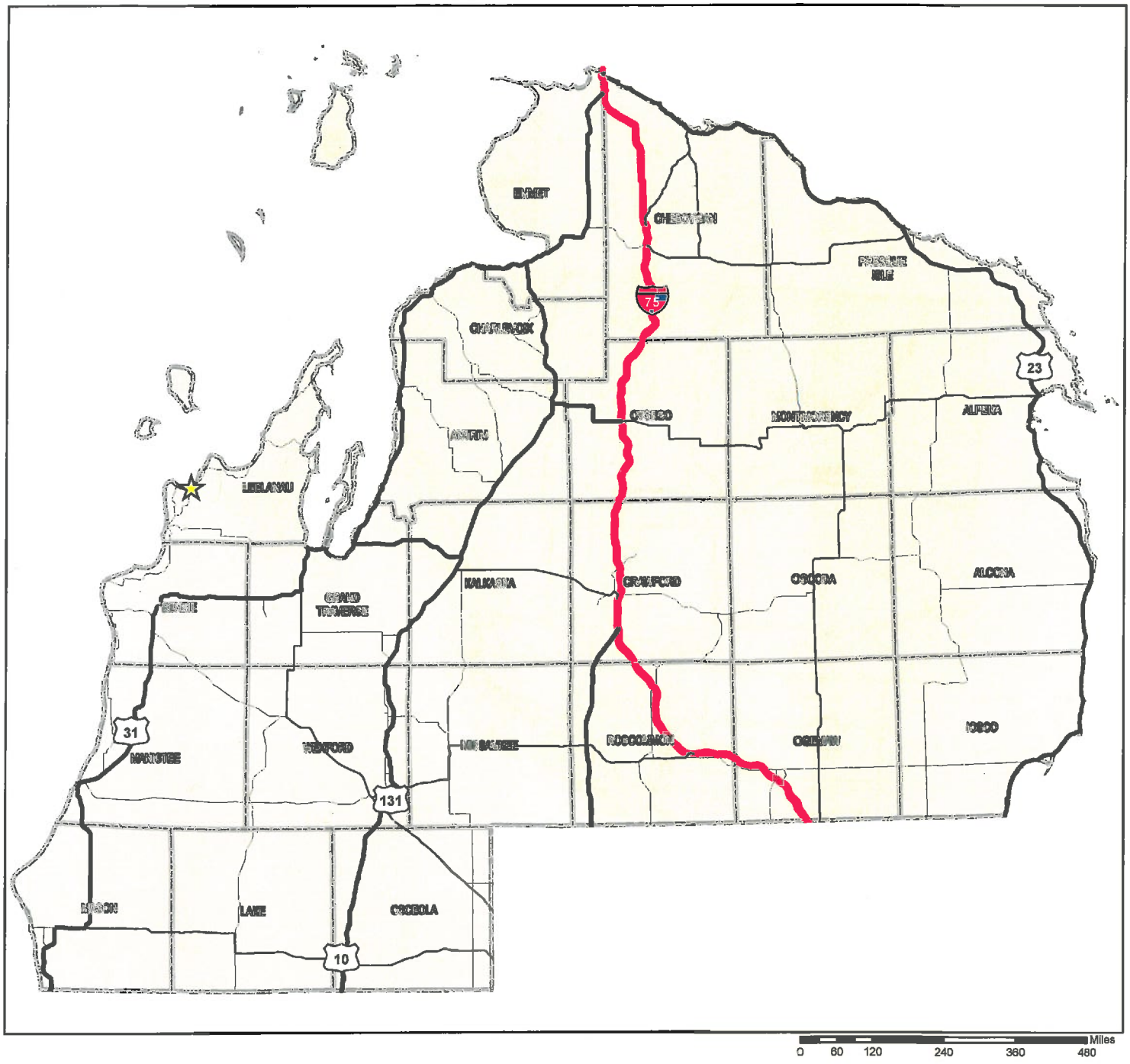
Pump Station Regional Distribution



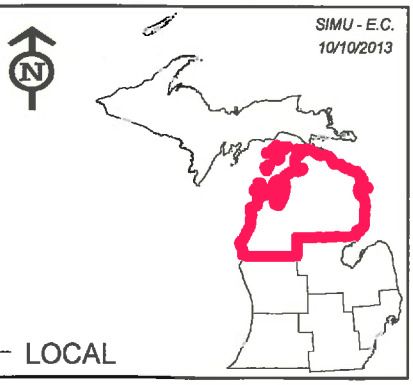
Legend

FY13 Station Rating

- Poor (0-4)
- Fair (4-7)
- Good (7-10)

North

Count 1



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COHS TYPE

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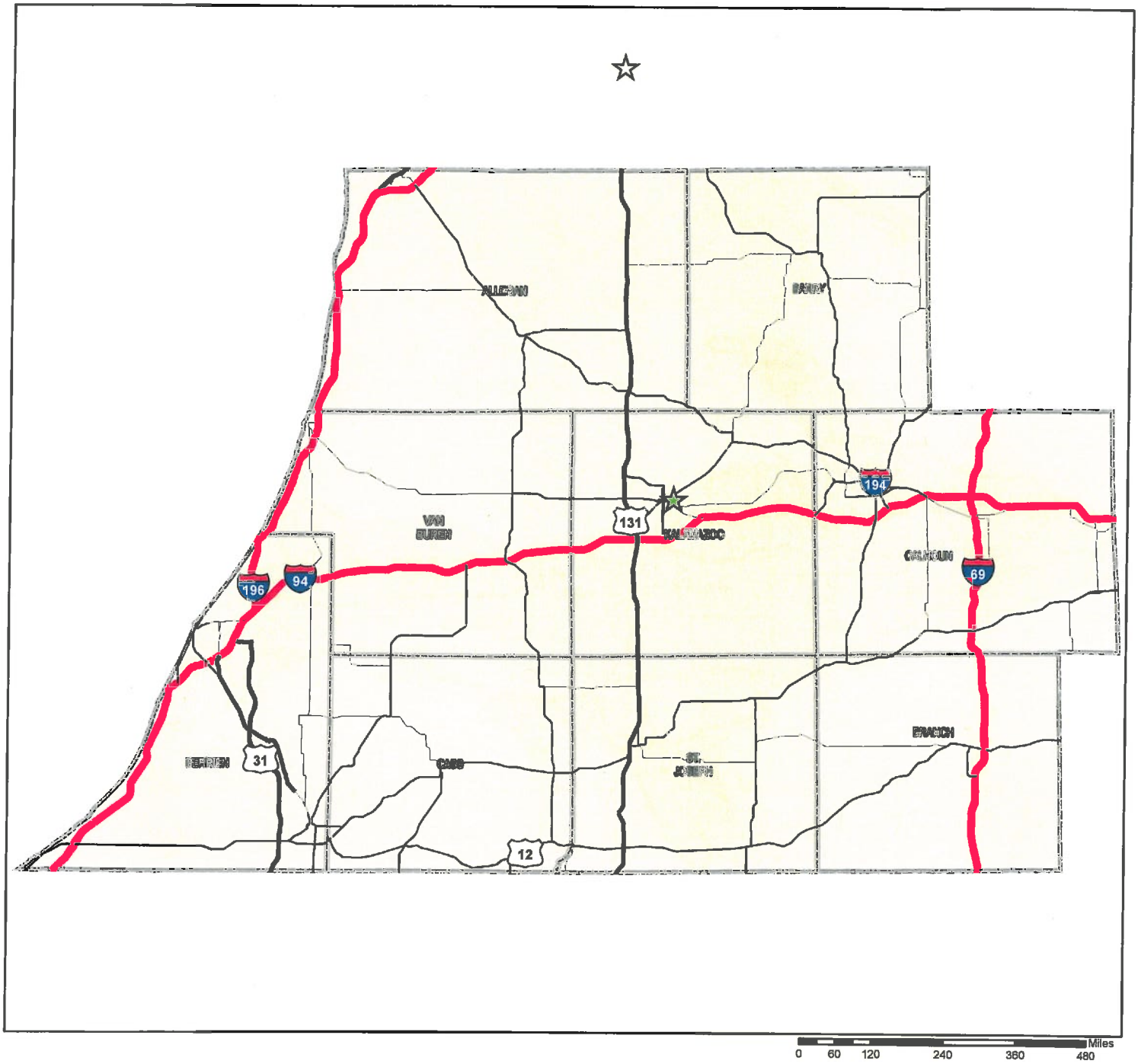
Pump Station Regional Distribution



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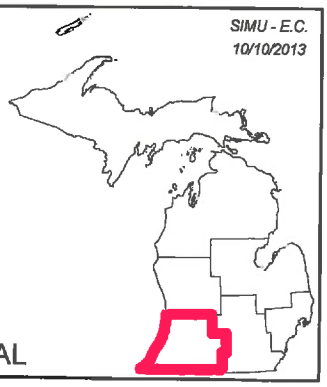
FY13 Station Rating

- Poor (0-4)
- Fair (4-7)
- Good (7-10)

Southwest

Count 1



COHS TYPE

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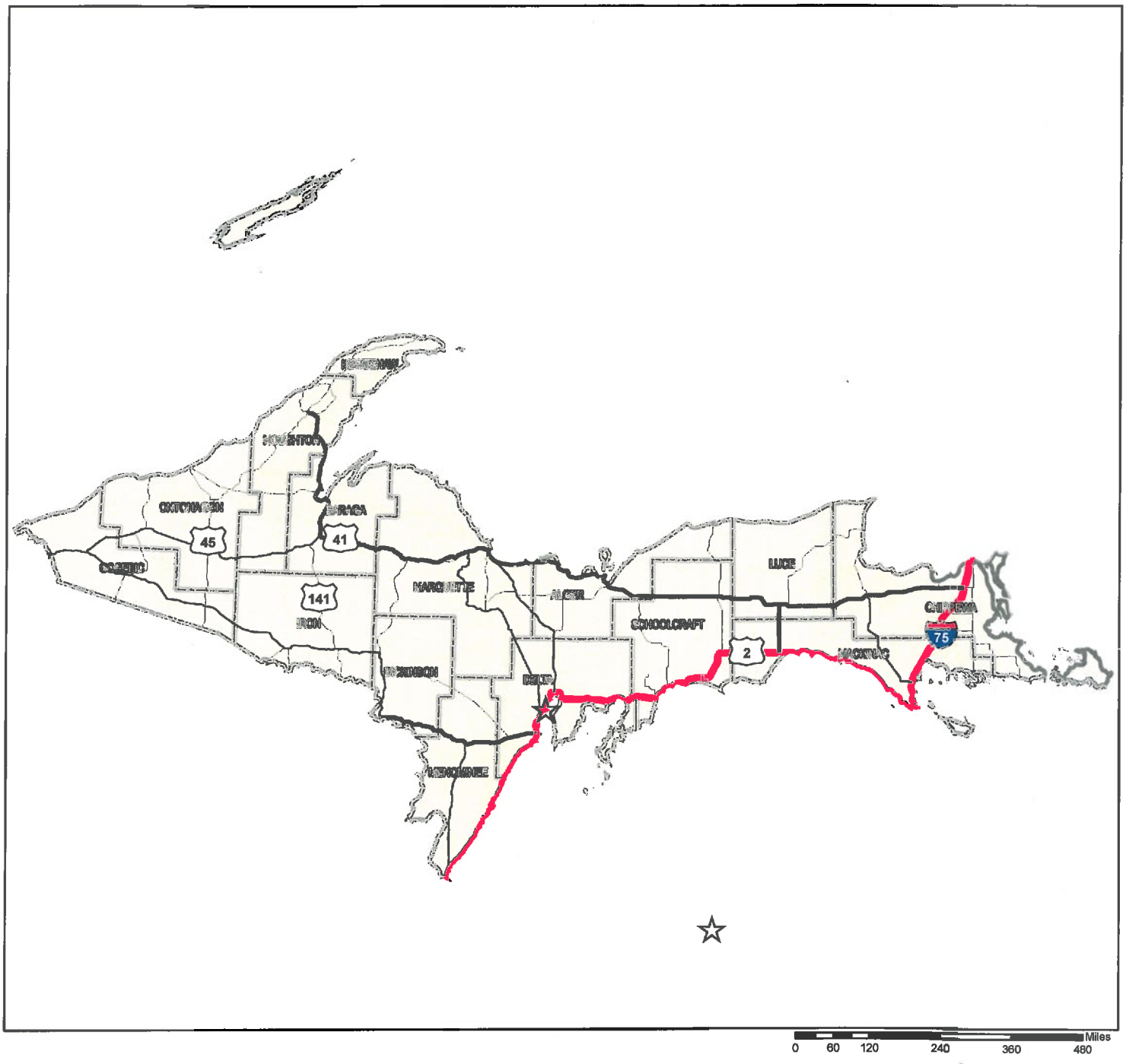
Pump Station Regional Distribution



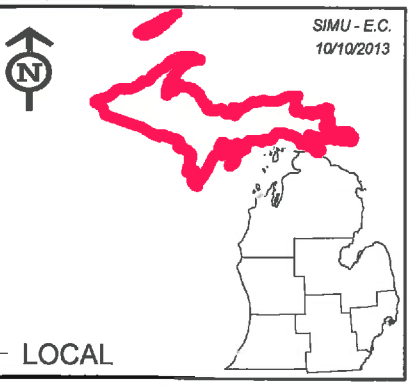
Legend

FY13 Station Rating

- Poor (0-4)
- Fair (4-7)
- Good (7-10)

Superior

Count 1



COHS TYPE

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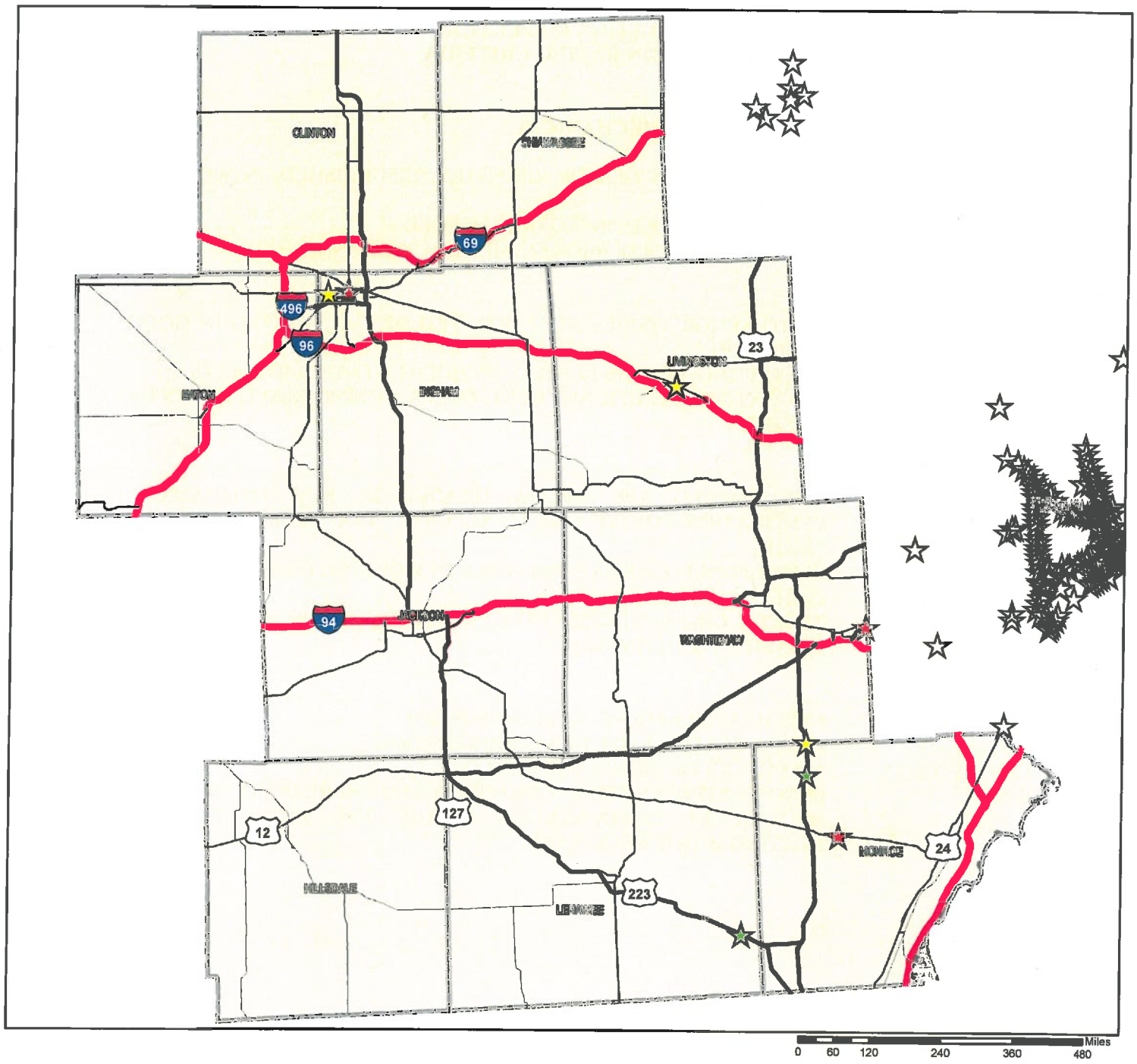
Pump Station Regional Distribution



Legend

FY13 Station Rating

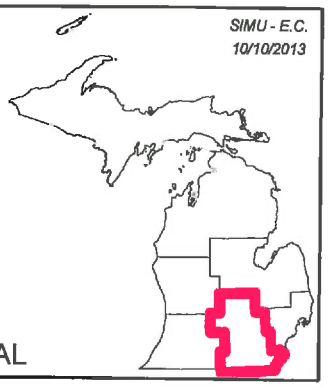
- Poor (0-4)
- Fair (4-7)
- Good (7-10)

University

Count 9

N

SIMU - E.C.
10/10/2013



COHS TYPE

NATIONAL — STATEWIDE — REGIONAL — LOCAL

Att 2-A

PUMP STATION INSPECTION
CONDITION RATING CRITERIA

MECHANICAL

PUMP	
7 TO 10 (GOOD)	UNDER 20 YEARS OLD OR RECENTLY REFURBISHED, IN WORKING ORDER
4 TO 6 (FAIR)	20 TO 30 YEARS OLD, IN WORKING ORDER
0 TO 3 (POOR)	OVER 30 YEARS OLD, BROKEN, MISSING, DISCONNECTED
DISCHARGE TUBE	
7 TO 10 (GOOD)	NO TO MINOR VISIBLE RUST, PAINTED OR GALVANIZED IN GOOD CONDITION
4 TO 6 (FAIR)	NO COATING, MAY BE RUSTED, NO HOLES WITH SOLID JOINTS
0 TO 3 (POOR)	NO COATING, SIGNIFICANT RUST, HOLES, COMPROMISED JOINTS OR MISSING
VENTILATION	
7 TO 10 (GOOD)	NEW FORCED AIR (BELOW GRADE) OR NON MECHANICAL VENTILATION (ABOVE GRADE) SECURE TO OUTSIDE & WEATHER TIGHT
4 TO 6 (FAIR)	OLDER FORCED AIR SYSTEM, STILL IN WORKING ORDER, WEATHER TIGHT
0 TO 3 (POOR)	BROKEN OR NO VENTILATION PROVIDED, NOT WEATHER TIGHT, POSSIBLE SECURITY ISSUE
HEATER	
7 TO 10 (GOOD)	NEW HEATER IN GOOD WORKING ORDER
4 TO 6 (FAIR)	OLDER HEATER, STILL IN WORKING ORDER
0 TO 3 (POOR)	NO HEATER OR BROKEN HEATER.
N/A	IF NO HEATING SYSTEM IS PROVIDED AND THERE IS NO EVIDENCE/ HISTORY OF CONDENSATION WITHIN THE MACHINE ROOM, HEATING IS NOT NECESSARY

ELECTRICAL

SERVICE

7 TO 10 (GOOD)	NEW SERVICE, 480 VOLT (MIN)
4 TO 6 (FAIR)	480 VOLT (MIN), HISTORY OF PHASE LOSS
0 TO 3 (POOR)	LESS THAN 480 VOLT OR HISTORY OF NUMEROUS PHASE / POWER OUTAGE

CT CABINET

7 TO 10 (GOOD)	NEW CABINET, NO RUST, LOCK MECHANISM IN GOOD ORDER, MT SWITCH, GENERATOR LUGS
4 TO 6 (FAIR)	OLDER CABINET, SOME RUST, SECURE AND WEATHER TIGHT, NO MT SWITCH OR GENERATOR LUGS
0 TO 3 (POOR)	NOT WEATHER TIGHT, LOCKING MECHANISM COMPROMISED, RUSTY

METER

7 TO 10 (GOOD)	NEW METER, WORKING, SECURE ENLOSURE
4 TO 6 (FAIR)	WORKING METER, NO ENCLOSURE
0 TO 3 (POOR)	BROKEN OR NO METER

CONTROL PANEL

7 TO 10 (GOOD)	NEW PANEL, NO RUST, CONTROLS IN GOOD ORDER
4 TO 6 (FAIR)	OLDER PANEL, CONTROLS IN GOOD ORDER, REPLACEMENT PARTS AVAILABLE IF NEEDED
0 TO 3 (POOR)	OLD PANEL, REPLACEMENT PARTS NOT AVAILABLE

LEVEL CONTROL

7 TO 10 (GOOD)	PIEZO CONTROL UNIT WITH MULTITRODE SYSTEM IN WORKING CONDITION
4 TO 6 (FAIR)	PIEZO CONTROL IN WORKING CONDITION, NO MULTITRODE
0 TO 3 (POOR)	MECHANICAL FLOAT SYSTEM OR PIEZO SYSTEM NOT WORKING

LIGHTING

7 TO 10 (GOOD)	IN WORKING CONDITION, PROVIDES ADEQUATE ILLUMINATION FOR MAINTENANCE ACTIVITIES
4 TO 6 (FAIR)	IN WORKING CONDITION, ILLUMINATION LESS THAN NEEDED
0 TO 3 (POOR)	NOT WORKING, ILLUMINATION INADEQUATE FOR MAINTENANCE

STRUCTURAL

ROOF

HATCHES

7 TO 10 (GOOD)	NO RUST, WEATHER TIGHT, LOCKING MECHANISM IN GOOD WORKING ORDER
4 TO 6 (FAIR)	RUSTY, SOME LEAKS, LOCKING MECHANISM IN GOOD WORKING ORDER
0 TO 3 (POOR)	NOT WEATHER TIGHT, CONCRETE WITH BITUMEN SEAL, NOT SECURE

DRAIANAGE

7 TO 10 (GOOD)	POSITIVE DRAINAGE
4 TO 6 (FAIR)	MINIMAL DRAINAGE, SOME PONDING
0 TO 3 (POOR)	NOT WEATHER TIGHT

RAILS

7 TO 10 (GOOD)	RAILS SOLID IN PROPER LOCATIONS
4 TO 6 (FAIR)	RAILS LOOSE.
0 TO 3 (POOR)	RAILS MISSING

MACHINE ROOM

7 TO 10	ISOLATED FROM WET WELL
4 TO 6	NOT ISOLATED, NO HISTORY OF CONFINED SPACE ATMOSHPHERE ISSUES
0 TO 3 (POOR)	NOT ISOLATED, HISTORY OF CONFINED SPACE ATMOSPHERE ISSUES

WET WELL

7 TO 10 (GOOD)	TRASH RACKS WITH NO GAPS, INSTALLED CORRECTLY NO RUST
4 TO 6 (FAIR)	TRASH RACKS SOME RUST, SOME BROKEN SLATS
0 TO 3 (POOR)	TRASH RACKS LARGE GAPS, MISSING SECTIONS

CONC SURF COAT

7 TO 10 (GOOD)	SURFACE COATING ON EXTERIOR & INTERIOR SURFACES WITH NO TO MINIMAL SPALLING
4 TO 6 (FAIR)	SURFACE COATING IN WET WELL ONLY OR WITH LARGE AREAS (>10%) PEELING
0 TO 3 (POOR)	NO SURFACE COATING OR PEELING >25%

DOORS

7 TO 10 (GOOD)	NO RUST, SOLID FRAME, WEATHER TIGHT, LOCKING MECHANISM IN GOOD WORKING ORDER
4 TO 6 (FAIR)	RUSTY, SOLID FRAME, SOME LEAKS, LOCKING MECHANISM IN GOOD WORKING ORDER
0 TO 3 (POOR)	NOT WEATHER TIGHT, RUSTY, NOT SECURE, HARD TO OPERATE

LADDERS & STAIRS

7 TO 10 (GOOD)	NO RUST, SOLID FRAME, GALVINIZED OR PAINTED
4 TO 6 (FAIR)	RUSTY, SOLID FRAME
0 TO 3 (POOR)	RUSTED, NOT SECURE. MISSING RUNGS OR HAND RAILS

SITE

FENCE

7 TO 10 (GOOD)	SECURE, NO GAPS, NO RUST, GATE WORKING
4 TO 6 (FAIR)	SECURE, RUSTY, GATE WORKING
0 TO 3 (POOR)	GAPS, MISSING, RUSTED, NOT SECURE, GATE MISSING

SLOPES

7 TO 10 (GOOD)	VEGETATED, NO EROSION
4 TO 6 (FAIR)	< 10% BARE, NO TO MINIMAL EROSION
0 TO 3 (POOR)	> 10% BARE, MINIMAL TO SIGNIFICANT EROSION, SEEPAGE

PARKING

7 TO 10 (GOOD)	ADEQUATE, PAVED, IN GOOD CONDITION
4 TO 6 (FAIR)	ADEQUATE, UNPAVED OR PAVEMENT DETERIORATED
0 TO 3 (POOR)	MINIMAL, DETERIORATED OR NO PAVEMENT / CURB CUT

Att 2-B

2013

Rating	Region/Cnty Program YR	County ID	Route	Road Name	Address	Cross Road	Pwr Co & volts	yr built/ rehabed	# of pumps Total HP
7.8	Superior		M-35	12th St		RR	UPPCO	1986	???
	North		M-22	Pine St		Pine St	CMS	1992	???
5.6	Grand		M-11	Division	2707 S. Division	Division	CMS	1994	3 @
5.8			US-31		2469 Harvey St	Pennsylvania RR	CMS	1984	3 @
5.5	Bay		M-54		1402 S. Dort Hwy	X01 of 25072	CMS	1988	3@????
2.6	2018		I-75		G-3425 Arlene	Arlene Dr	CMS	1957	4@ ???
5.4			I-675		312 N. 13th St	13th St	CMS	???	4@ 75
3.9	2016		I-75		G-3161 US-23	I-69	CMS	1968	3@ 30
8.0			I-475		3517 S. Grand Traverse	Bristol Road	CMS 480	1968 / 2006	4 @ ???
3.4	2015		I-475		1460 Harrison	8th Street	CMS	1968	4 @ 300
8.6			I-475		1221 RT Longway	RT Longway	CMS 480	1968 / 2009	4 @ 125
3.9	2015		I-475		1400 E. Pierson	Pierson Road	CMS	1976	4 @ 250
3.9			M-46		2900 Holland St	X01 of 73063	CMS	1982	2 @ 35
5.5			I-75		990 N I-75	Former Central Michigan RR	CMS	1984	3 @ 35
4.9			M-20		502 W. High St	X01 of 37021	CMS	1984	2 @ 35
4.7			M-20		5605 E. Pickard	US-127	CMS	1984	3 @ 70
	Southwest		M-43		918 E. Michigan	Mills St	CMS 480	2009	3 @ ???
3.6	University		M-43	E Saginaw	E Saginaw at Larch	X01 of 33042	BWL	1965 / 1984	3 @ 35
3.7			M-43	Oakland		X02 of 33042	BWL 480	1956	2 @ 10
4.1			M-43	W. Saginaw		X01 of 33061	BWL 480	1956	3 @ 15
8.3			US-223		13201 E. US-223	Lipp Hwy	CMS 480	1923 / 1983 / 2011	3 @ 7.5 hp
5.4			I-96 BL	Grand River Ave		University Dr	DE 480	1967 / 1991	???
	2015		M-50	Custer Rd		Meanwell Road	???	1925 / 1982	???
7.4			US-23			Cone Road	DTE 480	1948 / 2004	3 @ 60 hp
6.6			US-23			Milan-Oakville Road	DTE 480	1965 / 1999	3 @ 84 hp
	2016		US-12			Willow Run Entrance	???	1942 / 1985	3 at 60 = 180
3.4	Metro	121	M-102	8 Mile Rd.	1265 8 Mile	at GTWRR (E of M-1)	DE 240	1970	3 @ 10 = 30
3.3	Oakland	976	M-102	8 Mile Rd.	101 Bennett	At Woodward	DE 240	1955	2 @ 30=60
2.4		103	Old M-14	Ann Arbor Rd.	41787 Ann Arbor	At CSX RR (E of General)	DE 240	1936	2 @
6.5		280	M-8	Davison Fwy.	255 Davison	Hamilton	DE 480	1997	2 @ 35 = 70
4.1		1066	M-8	Davision Fwy	13400 Joseph Campau	Jos. Campau	DE 480	1997	3 @ 40 = 120
6.5		286	M-8	Davison Fwy.	262 Davison	Oakland	DE 480	1997	2 @ 35 = 70
6.5		282	M-8	Davison Fwy.	101 Davison	Second	DE 480	1997	3 @ 35 = 105
3.4		1012	I-75	Fisher Fwy.		Chrysler Fwy	PLD 480	1963	5 @ 60 = 300
3.1		1628	M-153	Ford Rd.	15525 Ford	Greenfield Rd	DE 240	1962	3 @ 20
4.1		129	M-153	Ford Rd.	12930 Ford	Oakman Rd	DE 480	1971	3 @ 40
4.2		283	M-1	Woodward Ave.		M-8 (Davison)	DE 480	1997	3 @ 35 = 105
3.3	Oakland	1064B	I-75	Chrysler Fwy.	20741 Chrysler Fwy	N. of 8 Mile	DE 240	1966	3 @ 40
3.7		1064A	I-75	Chrysler Fwy.	20250 Chrysler Fwy	S. of 8 Mile	DE 240	1967	3 @ 30
3.7		1060	I-75	Chrysler Fwy.	18970 Chrysler Fwy	7 Mile Rd	DE 480	1967	4 @ 40
3.3		1020	I-75	Chrysler Fwy.	4400 Chrysler Fwy	Canfield	DE 480	1962	5 @ 75 = 375
3.7		1050	I-75	Chrysler Fwy.	12000 Chrysler Fwy	Carpenter	DE 240	1965	3 @ 80

2013

Rating	Region/Cnty Program YR	County ID	Route	Road Name	Address	Cross Road	Pwr Co & volts	yr built/ rehabed	# of pumps Total HP
4.0	2017	1311	I-75	Fisher Fwy.	1650 Champaign	Champaign	DE 480	1965	4 @ 30
3.4	2013	1313	I-75	Fisher Fwy.	16600 Cicotte	Cicotte	DE 480	1965	5 at 50 = 250
3.6		1323	I-75	Fisher Fwy.	4413 Lafayette	Clark	DE 480	1967	3 @ 60
3.0		1052	I-75	Chrysler Fwy.	13200 Chrylser Fwy	Davison	DE 480	1968	4 @ 150 = 600
4.0		1310	I-75	Fisher Fwy.	2765 Dix	Dix-Toledo	DE 240	1966	4 at 40 =160
3.8		1350	I-75	Fisher Fwy.	6255 Fisher Fwy	Dragoon	DE 480	1966	4 @ 30
3.5		1040	I-75	Chrysler Fwy.	7321 Chrysler Fwy	E. Grand Blvd	DE 480	1965	5 @ 75
3.2	2016	1027	I-75	Chrysler Fwy.		Ferry	PLD 480	1962	5 @ 50 = 250
2.9		1339	I-75	Fisher Fwy.	2080 Grand River	Grand River	DE 480	1966	5 @ 60 =300
3.5		1044	I-75	Chrysler Fwy.	8825 Chrysler Fwy	Holbrook	DE 480	1967	4 @ 30
3.2		1341	I-75	Fisher Fwy.	3395 Jefferson	Jefferson Outlet	DE 4800	1967	4 @ 450
3.5		1322	I-75	Fisher Fwy.		Junction	PLD 480	1967	3 @ 40
3.7		1309	I-75	Fisher Fwy.	2082 London	London-Moore	DE 240	1966	4 @ 40
3.8		1058	I-75	Chrysler Fwy.	18200 Chrysler Fwy	Nevada	PLD 480	1967	4 @ 50
		1481	I-75	Chrysler Fwy.	12261 Pleasant	Pleasant	DE 480	1965	???
3.8		1312	I-75	Chrysler Fwy.	1600 Southfield	Southfield	DE 240	1965	3 @ 15
3.7		1063	I-75	Chrysler Fwy.	19842 Chrysler Fwy	State Fair	DE 480	1966	4 @ 30
3.7		1320	I-75	Chrysler Fwy.		Waterman	PLD 480	1966	3 @ 30
3.2		1017	I-75	Chrysler Fwy.	3081 Chrysler Fwy	Wilkins	DE 480	1961	5 @ 60 = 300
3.4		1319	I-75	Chrysler Fwy.	750 Wheelock	Wheelock	DE 480	1965	4 @ 40
3.6		579	I-94	Ford Fwy	1042 Hecla	Hecla	PLD 240	1953	3 @ 30 = 90
8.5		744	I-94	Ford Fwy	5205 28th St	28th	PLD 480	1952 / 2009	???
2.8		789	I-94	Ford Fwy		Cadillac	PLD 480	1959	4 @ 30 = 120
3.6	2017	1714	I-94	Ford Fwy		Cadieux	PLD 240	1956	4 @ 50 = 200
8.6		737	I-94	Ford Fwy	5052 Casper	Central	DE 480	1949 / 2008	3@45=135
3.2		793	I-94	Ford Fwy		Conner	PLD 480	1958	5 @ 75 = 375
3.1		1807	I-94	Ford Fwy	20710 Country Club	Country Club	DE 240	1958	3 @ 25 = 75
8.9		797	I-94	Ford Fwy		Dickerson	PLD 480	1958 / 2009	3@45=135
UC		1704	I-94	Ford Fwy		E. Outer Dr	PLD 480	1959 / 2011	5 at 75 = 375
8.4		1810	I-94	Ford Fwy	20670 Hollywood	Hollywood	DE 480	1960 / 2009	3 @ 45 = 135
4.0		2211	I-94	Ford Fwy	38483 Ex-Way	@ I-275	DE 480	1976	4 @ 60 hp
3.6		1007	I-94	Ford Fwy	5820 Brush	@ I-75/Brush	DE 220	1961	4 @ 40 = 160
8.2		743	I-94	Ford Fwy	5101 Junction	Junction	PLD 480	1952 / 2007	3@40=120
3.9		760	I-94	Ford Fwy	1002 W. Ferry	@ M-10	PLD 480	1952	???
3.6	2017	1716	I-94	Ford Fwy	17801 E. Ford Fwy	Marseilles	DE 480	1949	4 @ 60 = 240
8.7		740	I-94	Ford Fwy	6820 Linzee	Martin	PLD 480	1949 / 2007	4@40=160
UC		727	I-94	Ford Fwy	10310 Michigan Ave	Michigan	DE 480	1944 / 2010	???
3.8	2014	704	I-94	Ford Fwy	3801 Irving	Irving / Rotunda	DE 240	1944	3 @ 50 =150
8.8		785	I-94	Ford Fwy		Seneca	PLD 480	1956 / 2008	3 @ 45 = 135
3.5	2014	710	I-94	Ford Fwy	5900 Southfield Fwy	Southfield	DE 480	1943	5 @ Varies
7.4		714	I-94	Ford Fwy	6345 Telegraph	US-24 (Telegraph)	DE 240	1943 / 2004	4 @ 40
8.6		742	I-94	Ford Fwy	5042 Howell	Wesson	PLD 480	1949 / 2008	4@45=180
UC		1711	I-94	Ford Fwy	16455 Harper	Whittier	DE 480	1959 / 2011	5 at 50 = 250
3.2		1803	I-94	Ford Fwy	20710 Woodcrest	Woodcrest	DE 240	1958	5 @ 25 = 125
7.8		731	I-94	Ford Fwy	9340 Michigan Ave	Wyoming	DE 480	1949 / 2006	3@60=180
3.3		754	I-94	Ford Fwy	5405 14th St	14th	PLD 240	1953	2@30 = 60
UC		1994	I-96	Jeffries Fwy	13571 Dolphin	Seminary- W. of Rouge Riv	DE 4800	1970	???
UC		1995	I-96	Jeffries Fwy	13571 Dolphin	Dolphin- W. of Rouge Riv	DE 4800	1970	???

2013

Rating	Region/Cnty Program YR	County ID	Route	Road Name	Address	Cross Road	Pwr Co & volts	yr built/ rehabed	# of pumps Total HP
8.9		877	M-10	Lodge Fwy	968 Tuscola	Selden	PLD 480	1954 / 1986 / 2011	2 @ 47
3.7		852	M-10	Lodge Fwy	14356 12th St	12th (Oakman)	PLD 480	1954 / 1986	5@40 = 200
3.2		867	M-10	Lodge Fwy	915 Bethune	Bethune	PLD 480	1954 / 1986	3@30=90
UC		859	M-10	Lodge Fwy	1453 Calvert	Calvert	PLD 480	1954 / 1986 / 2010	3@30=90
4.0		853	M-10	Lodge Fwy		Davison (Clements)	PLD 480	1954 / 1986	5@40 = 200
3.8		861	M-10	Lodge Fwy	1137 Edison	Edison	PLD 480	1954 / 1986	3@ 40 =120
3.3		864	M-10	Lodge Fwy	915 Euclid	Euclid	PLD 480	1954 / 1986	4@30= 120
3.4		875	M-10	Lodge Fwy	4722 Hamilton	Forest	PLD 480	1954 / 1986	3@30=90
3.6		879	M-10	Lodge Fwy	3109 Grand River	Grand River	PLD 480	1954 / 1986	3@30=90
4.5	2013	847	M-10	Lodge Fwy	15458 Holmur	Holmur	PLD 480	1954 / 1986	3@30=90
4.4		834	M-10	Lodge Fwy	19345 Hubbell	Hubbell	DE 480	1963 / 1986	4@100 = 400
3.6	2017	842	M-10	Lodge Fwy	15420 Wyoming	Kentucky	DE 480	1954 / 1986	3@30=90
6.0		885	M-10	Lodge Fwy	501 2nd St	Larned	PLD 480	1954 / 1988	3@60=180
4.5		849	M-10	Lodge Fwy	15505 Linwood	Linwood	PLD 480	1954 / 1986	4@40 = 160
3.7	2013	881	M-10	Lodge Fwy	1023 Jones	Michigan (Plaza)	PLD 480	1954 / 1986	4@30= 120
8.9		869	M-10	Lodge Fwy	924 Milwaukee	Milwaukee	PLD 480	1954 / 1986 / 2011	2 @ 47
5.2	Oakland	830	M-10	Lodge Fwy	20710 Northwestern	8 Mile Road	DE 480	1963 / 1986	4@60=240
3.8		841	M-10	Lodge Fwy		Puritan	PLD 480	1963 / 1986	3 @60 = 180
3.9		846	M-10	Lodge Fwy	15458 Santa Rosa	Santa Rosa	PLD 480	1954 / 1986	3@30=90
3.7		837	M-10	Lodge Fwy		Schaefer	PLD 480	1963 / 1986	4@75=300
3.5		880	M-10	Lodge Fwy	880 Cherry	Vernor	PLD 480	1954 / 1986	3@30=90
8.9		860	M-10	Lodge Fwy	1225 W. Chicago	W. Chicago	PLD 480	1954 / 1986 / 2011	2 @ 47
9.8		844	M-10	Lodge Fwy	15463 Woodingham	Woodingham	PLD 480	1954 / 1986 / 2010	3 @ 45
3.2		916	M-39	Southfield Fwy.	19125 Southfield Fwy	7 Mile	DE 240	1963	3 @ 20
2.8		924	M-39	Southfield Fwy.	20580 Southfield Fwy	8 Mile	DE 240	1963	2 @ 30
3.4	2018	925	M-39	Southfierld Fwy.	21549 Southfield Fwy	Cornell	DE 240	1963	3 @ 20=60
3.2		918	M-39	Southfield Fwy.	15150 Southfield Fwy	Fenkell	DE 240	1962	3 @ 40
3.2		987	M-39	Southfield Fwy.	1864 Southfield Fwy	Fern	DE 240	???	3 @ 25
8.5		124	M-39	Southfield Rd.	16105 Southfield Fwy	GTW RR	DE 480	1929 / 2010	3 @ 30
3.2		923	M-39	Southfield Fwy.	4900 Southfield Fwy	Hubbard	DE 240	1963	3 @ 25
2.6		910	M-39	Southfield Fwy.	8961 Southfield Fwy	Joy	DE 240	1961	2 @ 20
2.4		990	M-39	Southfield Fwy.	14441 Southfield Fwy	Lyndon	DE 240	1961	3 @ 20
3.3		914	M-39	Southfield Fwy.	16891 Southfield Fwy	McNichols	DE 240	1962	5@30=150
3.8		905	M-39	Southfield Fwy.	12951 Southfield Fwy	Oakwood	DE 240	1962	4 @ 25
3.8		904	M-39	Southfield Fwy.	4615 Southfield Fwy	Outer Dr	DE 240	1963	3 @ 40
2.7		920	M-39	Southfield Fwy.	6300 Southfield Fwy	Paul	DE 240	1961	3 @ 20
3.0		993	M-39	Southfield Fwy.	19895 Southfield Fwy	Pembroke	DE 240	1962	3 @ 20
3.7		911	M-39	Southfield Fwy.	11434 Southfield Fwy	Plymouth	DE 240	1961	3 @ 20
3.2		991	M-39	Southfield.	16100 Southfield Fwy	Puritan	DE 240	1962	3 @ 25
3.4		906	M-39	Southfield Fwy.	3351 Southfield Fwy	Rotunda	DE 240	1962	3 @ 25
3.1		315	M-39	Southfield Fwy.	3800 Southfield Fwy	Rouge River	DE 480	1961	5 @ 20
2.8		912	M-39	Southfield Fwy.	13625 Southfield Fwy	Schoolcraft	DE 240	1961	3 @ 20
2.9		909	M-39	Southfield Fwy.	8005 Southfield Fwy	Tireman	DE 240	1961	3 @ 20
3.2		988	M-39	Southfirld Fwy.	3650 Southfield Fwy	Village	DE 240	1962	4 @ 30
3.4		921	M-39	Southfield Fwy.	9400 Southfield Fwy	W. Chicago	DE 240	1963	3 @ 20
		908	M-39	Southfield Fwy.	7230 Southfield Fwy	Warren	DE 240	1961	???
		1629	US-12	Michigan Ave. US-12	15445 Michigan Ave	Michigan @ Greenfield	DE 240	1960	???
		978	US-12	Michigan Ave,	4210 Michigan Ave	Michigan @ Scotten	DE 480	1941	???

2013

Rating	Region/Cnty Program YR	County ID	Route	Road Name	Address	Cross Road	Pwr Co & volts	yr built/ rehabed	# of pumps Total HP
3.5		928	M-39		17500 Rotunda	Outlet sewer (N. of Rotunda)	DE 480	1963	1@350=350
	2014	162	US-24	Telegraph Rd.	12400 Telegraph	CSX R.R. (Plymouth Rd)	DE 480	1960	4@50=200
	2015	158	US-24	Telegraph Rd.	27858 Detroit	GTW R.R. (Flat Rock)	DE 240	1926	???
	2014	160	US-24	Telegraph Rd.	7325 Telegraph	N. & S. R.R. (Ecorse Rd)	DE 480	1965	???
3.1		1005	I-375		1231 Chrysler Fwy	Monroe	DE 480	1959	5 @ 100 = 500
2.8	2013	524	M-1	Woodward Ave.	15385 Woodward Ave	@ Conrail	DE 240	1959	2 @ 15 = 30
8.9		726	I-94	Ford Fwy	2714 Schaefer	I-94/Schaefer @ FoMoCo #10	DE 480	1944 / 2009	3@140=420
7.9			M-10	Lodge Fwy	22925 Northwestern	9 Mile Road	DE 480	1962	4 @ 60=240
8.0			M-10	Lodge Fwy	23935 Northwestern	Mt Vernon	DE 480	1962	3 @ 85=255
8.2			M-10	Lodge Fwy	24761 Northwestern	Evergreen	DE 480	1962	4 @ 85=340
8.2			M-10	Lodge Fwy	25955 Northwestern	Civic Center Dr	DE 480	1962	3 @ 70=210
4.0			I-696	Reuther Fwy		Lahser	DE 480	1986	4 @ 300 = 1200
8.5			US-24	Telegraph	5385 Telegraph	Gilbert Lake (N Quarton)	DE 480	??? / 2007	2 @40=80
4.3			I-696		1400 Stephenson	Barrett	DE	1970	3 @ 300
4.6			I-75		110 Stephenson	11 Mile	DE	1971	3 @ 25
3.9			I-75		23839 Chrysler	Woodward Heights	DE	1971	3 @ 40=120
3.9			I-75		22689 Chrysler	Otis (9 Mile)	DE	1965	4 @ 40
3.8			I-75		21759 Chrysler	Meyers	DE 480	1965	4 @ 30=120
8.8			I-75		1030 Stephenson	Gardenia	DE 480	1965 / 2008	4 @ 45
			I-696	Reuther Fwy		Elm St	DE 4800	??? / 2010	???
6.8			M-59			Utica Road	DE 480	1995	4 @ 100 = 400
3.4			I-94		21650 Beaconsfield	Shady Lane	DE 480	1960	5 @ 100 = 500
4.3			I-94		19650 Frazho	9 Mile Road	DE 480	1960	3 @ 135 = 405
4.0			I-94			Stephens Road	DE 480	1960	3 @ 100 = 300
3.7			I-94			10 Mile Road	DE 480	1960	3 @ 100 = 300
4.1			I-94			Frazho Road	DE 480	1960	4 @ 50 = 200
8.4			I-94		19711 Martin	Martin	DE 480	???/2006	4 @ 215 = 860

Red=Poor, Blue=Fair, Green=Good, Yellow=data needed

Transferred to Monroe County Drain Commissioner Agreement # 06-5147

			US-223			500' East of Creque Rd	???	1975	???
			US-223			700' East of Stone Quarry Rd	???		
			US-223			600' West of Lake Rd	???		
			US-223			Turk Road, .25 Mi s of 223	???		
			US-223			600' East of Turk Rd	???		

Att 3-A

MDOT
Michigan Department of Transportation

Program Detail (Obligations) - STATEWIDE REPORT

FEDERAL/ STATE AMOUNTS ONLY

FISCAL Year(s): 2014,2015,2016,2017,2018

Region	County	TSC	Job	CS	Route	Location	Work Description	Const. Let Date	Finance System	Miles	Phase	Schd. Start	Actual Start	FHWA Oversight	Estimated Amount	Authorized Amount	Cost To Date	Unsubmitted Est. Amount
Template : Pump Station Rehabilitation																		
Year : 2014																		
Bay	GENESEE	Davison	119434	25032	I-75	at Arlene (D01 of 25032) Genessee Co.	Pump Station Rehabilitation	04/06/2018	ST	0.022	PE-C	10/28/2013			$121,275	$0		$121,275
Metro	WAYNE	Taylor	106663	82053	US-24	D01 of 82052, D01 of 82053, and D13 of 82022	Pump Station Rehabilitation	12/06/2013	ST	0.768	CON	10/28/2013	10/18/2013		$3,310,000	$3,333,253	$0	$0
Subtotal for: Pump Station Rehabilitation 2014										**0.790**					**$3,431,275**	**$3,333,253**	**$0**	**$121,275**
Template : Pump Station Rehabilitation																		
Year : 2015																		
Bay	GENESEE	Davison	103739	25132	I-475	at 8th St, & Pierson (D02 & D04), city of Flint	Pump Station Rehabilitation	12/05/2014	ST	0.247	CON	10/01/2014			$1,760,000	$0		$1,760,000
Metro	WAYNE	Taylor	111439	82051	Telegraph Rd	GTW R.R. at Flat Rock (D01) of 82051, Wayne C	Pump Station Rehabilitation	12/05/2014	ST	0.000	CON	10/20/2014			$1,030,000	$0		$1,030,000
Metro	WAYNE	Taylor	113476	82022	I-94	at Southfield Freeway (D06 of 82022), Allen Park	Pump Station Rehabilitation	12/05/2014	ST	0.002	CON	11/05/2014			$1,456,000	$0		$1,456,000
University	MONROE	Brighton	111438	58032	M-50	at GTW Railroad (D01 of 58032), Monroe County	Pump Station Reconstruction	03/06/2015	ST	0.102	CON	01/29/2015			$1,210,000	$0		$1,210,000
Subtotal for: Pump Station Rehabilitation 2015										**0.351**					**$5,456,000**	**$0**	**$0**	**$5,456,000**
Template : Pump Station Rehabilitation																		
Year : 2016																		
Bay	GENESEE	Davison	111441	25031	I-75	at I-69 (D02 of 25031), Genessee County	Pump Station Rehabilitation	12/04/2015	ST	0.056	CON	10/02/2015			$1,000,000	$0		$1,000,000
Metro	WAYNE	Detroit	108165	82251	I-75	at Ferry Street (D04 of 82251), city of Detroit	Pump Station Rehabilitation	12/04/2015	ST	0.026	CON	10/29/2015			$1,210,000	$0		$1,210,000
University	WASHTENA	Brighton	111437	81063	US-12 WB	at Willow Run Plant Entrance (D01 of 81063)	Reconstruct pump station	03/04/2016	ST	0.000	CON	01/28/2016			$1,790,000	$0		$1,790,000
Subtotal for: Pump Station Rehabilitation 2016										**0.082**					**$4,000,000**	**$0**	**$0**	**$4,000,000**
Template : Pump Station Rehabilitation																		
Year : 2017																		
Metro	WAYNE	Detroit	111464	82025	I-94	at Cadieux (D06 of 82025), city of Detroit	Pump Station Rehabilitation	12/02/2016	ST	0.018	CON	10/21/2016			$1,000,000	$0		$1,000,000
Metro	WAYNE	Detroit	111465	82025	I-94	at Marseilles (D07 of 82025), Wayne County	Pump Station Rehabilitation	12/02/2016	ST	0.087	CON	10/28/2016			$1,000,000	$0		$1,000,000
Metro	WAYNE	Taylor	113471	82191	I-75	at Champaign (D04 of 82191), Lincoln Park	Pump Station Rehabilitation	12/02/2016	ST	0.010	CON	10/21/2016			$1,000,000	$0		$1,000,000
Metro	WAYNE	Detroit	113475	82112	M-10	at Kentucky Street (D13 of 82112), Detroit	Pump Station Rehabilitation	12/02/2016	ST	0.010	CON	10/21/2016			$1,000,000	$0		$1,000,000
Subtotal for: Pump Station Rehabilitation 2017										**0.125**					**$4,000,000**	**$0**	**$0**	**$4,000,000**
Template : Pump Station Rehabilitation																		
Year : 2018																		
Bay	GENESEE	Davison	119434	25032	I-75	at Arlene (D01 of 25032) Genessee Co.	Pump Station Rehabilitation	04/06/2018	ST	0.022	CON	03/06/2018			$1,334,025	$0		$1,334,025

MDOT
Michigan Department of Transportation

Program Detail (Obligations) - STATEWIDE REPORT

FEDERAL/ STATE AMOUNTS ONLY

FISCAL Year(s): 2014,2015,2016,2017,2018

Region	County	TSC	Job	CS	Route	Location	Work Description	Const. Let Date	Finance System	Miles	Phase	Schd. Start	Actual Start	FHWA Oversight	Estimated Amount	Authorized Amount	Cost To Date	Unsubmitted Est. Amount
Template : Pump Station Rehabilitation																		
Year : 2018																		
Metro	OAKLAND	Oakland	111775	63171	M-39	at Cornell, (D01 of 63171), City of Southfield	Pump Station Rehabilitation	04/06/2018	ST	0.017	CON	03/06/2018			$990,000	$0		$990,000
Subtotal for: Pump Station Rehabilitation 2018										**0.039**					**$2,324,025**	**$0**	**$0**	**$2,324,025**
Subtotal for: Pump Station Rehabilitation										**1.387**					**$19,211,300**	**$3,333,253**	**$0**	**$15,901,300**
Grand Total :										**1.387**					$19,211,300	$3,333,253	$0	$15,901,300

Total Jobs Reported : 14

Preferences :

- **Report Style** Statewide
- **Years** 2014,2015,2016,2017,2018
- **Job Type** Trunkline
- **Job Indicator** All
- **Phase Type** All
- **Phase Status** Active,Programmed,Completed
- **Finance System** All
- **Templates** Trunkline - Pump Station Rehabilitation
- **FHWA Oversight Indicator** All