2023 Oakland County Water Resources Commissioner's Office Water Quality Sampling Results

Background

The Oakland County Water Resources Commissioner's Office (WRC) is required to comply with the Michigan Department of Environment, Great Lakes and Energy's (EGLE) NPDES Municipal Separate Storm Sewer System (MS4) Phase II permit by implementing an Illicit Discharge Elimination Program (IDEP). WRC developed an alternative procedure for ongoing monitoring of all open and enclosed County drains for illicit discharges. This procedure covers all County drains in both MS4 and non-MS4 areas. All County drains and structures are currently inspected on a 4-year rotating cycle under WRC's Construction Drain Maintenance (CDM) Program. The Environmental team follows this same cycle for sampling the outfalls of each County drain to confirm current *E. coli* levels within the system.

A process for prioritizing the drains for illicit discharge investigation was previously developed and approved. The criteria used for evaluating and prioritizing County drains is as follows:

Priority 1 – Evidence of pollutants and/or *E. coli* values ≥ 10,000 cfu/100 ml

> Immediate follow-up to verify illicit discharge. Initiate upstream IDEP investigation to identify pollutant source(s) and coordinate additional activities as needed.

Priority 2 – No evidence of pollutants and *E. coli* values ≥ 5001 and < 10,000 cfu/100 ml

> Schedule additional dry weather sampling within one (1) year for further evaluation. Schedule upstream dry weather sampling or initiate IDEP investigation to identify pollutant source(s) as needed.

Priority 3 – No evidence of pollutants and *E. coli* values ≤ 5,000 cfu/100 ml

> Continue dry weather sampling of outfalls and discharge points per 4-year drain maintenance inspection cycle. Review results and re-prioritize as needed.

WRC contracts with Oakland University to perform Microbial Source Tracking (MST) sampling. With MST, human-associated pollution markers are detected by looking for *Bacteroides* HF183. Consecutive results over 10,000 cfu/100 ml will trigger a lab test for HF183 to be conducted. HF183 markers are measured in GC (Gene Copies)/100 ml with priority designation given to results of 1,000 GC/100ml in enclosed systems and 500 GC/100ml in open water courses or drains with regular flow.

Water quality samples for *E. coli* analysis were completed by either the Walled Lake-Novi Wastewater Treatment Plant (WWTP) or Paragon Laboratories, Inc. Samples for HF183 analysis were completed by Oakland University.

Projects and Results

Sample locations were proposed to support the following initiatives:

1. Priority 1 Drain Follow-up
2. Ongoing Outfall Sampling Program
3. Great Lakes Water Authority (GLWA) Regional Investigational Grab Sampling Program

A total of 315 samples were taken and analyzed for *E. coli* from these initiatives as follows:

- 10.16% (32 samples) were Priority 1
- 5.08% (16 samples) were Priority 2
- 84.76% (267 samples) were Priority 3

Priority 1 Follow-up

Austin Drain (Figure 1)

The Austin Drain, located in the City of Southfield, is a continued Priority 1 drain from previous years. After elevated *E. coli* results were narrowed down to a couple segments of pipe, the Construction Drain Maintenance (CDM) Unit walked the drain and sampled each tap throughout the identified pipe segments. An illicit discharge was identified from a building located on the 1800 block of W. 10 Mile Road. Follow-up dye testing of the building confirmed the illicit connection at a Road Commission for Oakland County catch basin along the north side of 10 Mile Road and ultimately into the Austin Drain. Work is currently being completed to fix the illicit connection.

Sample Results:

Structure Location	***E. coli* GEO MEAN cfu/100ml**	**Structure Location**	***E. coli* GEO MEAN cfu/100ml**
SOT105001	692	SOT092016B	340
SOT101001	10,998	SOT092020	284
SOT101005	915	SOT092026	353
SOT092014	72	10 Mile Local	35
SOT092016	78		

August 3rd CDM Walk (Sampling of Each Drain Tap)

Structure Location	*E. coli* GEO MEAN cfu/100ml	Structure Location	*E. coli* GEO MEAN cfu/100ml
SOT101001 – 66', 12" RCP	1,070	SOT101003 – 87', 12" RCP	221
SOT101001 – 141', 10" VCP	67	SOT101003 – 116', 10" VCP	4
SOT101001 - 369', 12" RCP	43	SOT101003 – 447', 10" VCP	26
SOT101001 - 468', 10" PCP	139	SOT101003 – 596', 10" VCP	87
SOT101001 – 669', 12" RCP	>1,209,800		
SOT101001 – 758', 10" VCP	239		

Costs: Labor: $4,513.74

Lab: $713.94

Total: $5,227.68

Next Steps: Follow-up in 2024 is required to confirm the illicit discharge has been resolved and if the drain can be removed from the Priority 1 list.

Owens Drain (Figure 2)

The Owens Drain, located in the City of Southfield, is a continued Priority 1 drain from the previous year. In 2022, an illicit discharge was discovered along 9 Mile Road. This work was still being completed in 2023 and the downstream manhole (SOT103060) still has elevated *E. coli* levels. Follow-up sampling results are as follows:

Sample Results (*single sample):

Structure Location	*E. coli* GEO MEAN cfu/100ml	Structure Location	*E. coli* GEO MEAN cfu/100ml
SOT103060	17,329*	SOT139005	2,934
SOT135005	3,448*	SOT139011	1,086*
SOT136026	21,328*	SOT139013	4,376*
SOT137014	3,315	SOT139050	1,027*
SOT137018	9,453		

Structure Location	HF183 Marker GC/100 ml	Structure Location	HF183 Marker GC/100 ml
SOT137018	944	SOT13060	1,102

Costs: Labor: $1,479.36

Lab: $219.03

Total: $1,698.39

Next Steps: The work to remove the illicit discharge along 9 Mile Rd. is still being resolved. Once complete, sampling downstream will confirm the fix. Continued high *E. coli* levels along other segments require further sampling investigation which will include HF183 sampling and possibly CCTV and/or dye testing.

Flannery Drain (Figure 3)

The Flannery Drain, located in the City of Southfield, is a continued Priority 1 drain from previous years. A sample of the Flannery Drain outfall to the Owens Drain showed continued elevated *E. coli* levels.

Results:

Structure Location	***E. coli* GEO MEAN cfu/100ml**
SOT139028	1,231

Costs: Labor: $213.12

Lab: $108.11

Total: $321.23

Next Steps: Follow-up sampling to confirm lower *E. coli* levels, possible HF183 sampling and wet weather nutrient sampling from multiple storage facilities in the area.

Fracassi Drain

The Fracassi Drain, located in the City of Southfield, has been a Priority 1 drain from previous years.

Sample Results (*single sample):

Structure Location	***E. coli* GEO MEAN cfu/100ml**	**Structure Location**	***E. coli* GEO MEAN cfu/100ml**
SOT123016*	35	SOT123057*	706
SOT123053	1,333	SOT123351*	2

Costs: Labor: $407.80

Lab: $138.40

Total: $546.20

Next Steps: Follow up sampling in 2024 to confirm *E. coli* levels are still low.

Clarenceville Drain

The Clarenceville Drain, located in the City of Farmington Hills, was removed from the Priority 1 list, but still required follow-up sampling.

Sample Results:

Structure Location	***E. coli* GEO MEAN cfu/100ml**
FAT144053	4,059

Structure Location	**HF183 Marker GC/100 ml**
FAT144053	800

Costs: Labor: $109.90

Lab: $219.93

Total: $329.83

Next Steps: Follow-up sampling in both the Clarenceville Drain and Hazel Drain, which outlet into the Clarenceville Drain. The outfall of the Clarenceville Drain needed repair so sampling wasn't completed in 2023; a sample will be taken at the outfall in 2024 and follow-up samples will be taken upstream as needed.

US-16 Drain

The US-16 Drain, located in the City of Farmington, was previously a Priority 1 drain. Multiple illicit connections were corrected throughout the year; however, elevated *E. coli* results persisted in 2023.

Cost: There is currently no cost estimate for the work.

Next Steps: Continue to coordinate with the City of Farmington to perform CCTV work and smoke test suspected properties and possibly faulty bulkheads throughout the rest of 2023 and 2024.

Outfall Sampling Program

A new outfall sampling program was initiated in 2023. Drain outfalls will be sampled in accordance with CDM's four-year inspection cycle. This program will ensure that any possible new pollutant sources are identified and investigated in a timely manner.

In 2023, the cost for this work was allocated to the GLWA Regional Investigational Grab Sampling Program.

GLWA Regional Investigational Grab Sampling Program

WRC began a long-term project with GLWA and its surrounding communities to sample and share IDEP investigation data throughout the GLWA operating area as part of a collaborative effort to regionally track and eliminate illicit discharges. Funding and sampling were completed by each Sanitary Disposal System (SDS).

Clinton-Oakland SDS

Sample Results (*single sample):

Drain Name	*E. coli* GEO MEAN cfu/100 ml	Drain Name	*E. coli* GEO MEAN cfu/100 ml
Augusta Drain (Osmun)*	18	Helaine Zack Drain	469
Augusta Drain (Lakes)	332	Ireland Drain	792
Augusta Drain (Norton)	559	Karas Drain	297
Brooklyn Drain	264	Ladd Drain	189
Clinton River Clarkston	222	McClure Drain	681
Clinton River Cooley	186	Nelson Drain (Dequindre)	1,034
Clinton River M59	194	Nelson Drain (Long Lk)	680
Clinton River Hamlin	144	Otter Drain	558
Dutton Drain	841	Paint Creek (Clarkston)	157
Ferry Drain	411	Paint Creek (Seymour Lk)	199
Galloway Drain	335	Paint Creek (Stanton)	166
Paint Creek (Rochester)	235	Sashabaw Creek (Orion)	67
Paint Creek (Gallagher)	182	Sturgis Drain (Hartland)	2,512
Rewold Drain	423	Sturgis Drain (Colebrook)	1,237
Sashabaw Creek (Ind Twp)	198	West End Drain	244

Drain Name	HF183 Marker GC/100 ml	Drain Name	HF183 Marker GC/100 ml
Nelson Drain (Dequindre)	371	Sturgis Drain (Hartland)	474

Cost: Labor: $8,762.04

Lab: $4,321.66

Total: $13,083.70

Next Steps: Follow-up samples on Nelson Drain and Sturgis Drain and continue investigation as needed. New locations will be selected for sampling which will correspond with the 2024 drain inspection cycle.

GWK SDS

Sample Results (* single sample):

Drain Name	***E. coli* GEO MEAN cfu/100 ml**	**Drain Name**	***E. coli* GEO MEAN cfu/100 ml**
Barnard Drain	3,982	Hazel Park Local (Elza)	>12,098,000
George W. Kuhn Dr North	486	Hazel Park Local (Maple Ln)	415
George W. Kuhn Dr South	307	Hazel Park Local (Vance)	744
Dunleavy (ROT093003)	7,955	Hazel Park Local (Tucker)	544
Dunleavy (ROT093015) *	9,060	Henry Graham (Executive)	1,109
Dunleavy (ROT093009) *	8,010	Henry Graham (14 Mile)	4,644
Dunleavy (ROT093025) *	8,200	Henry Graham (Whitcomb)	218
Dunleavy (ROT093035)	17,210	Henry Graham (ROT002016) *	200
Dunleavy (ROT093037)	4,061	Henry Graham (Groveland local) *	410
Dunleavy (ROT094004)	49,799	Henry Graham (Milverton)	1,384
Dunleavy (ROT094006)	72,013	Henry Graham (TRT143013)	11,484
Dunleavy (ROT094008)	127,018	Henry Graham (TRT143017) *	410
Dunleavy (ROT094010) *	2,688	Henry Graham (Taco Bell Tap) *	1,210
Dunleavy (ROT094018) *	133	Henry Graham (ROT002013) *	1,210
Dunleavy (ROT094022) *	100	Henry Graham (John R LS) *	2,090
Dunleavy (ROT094109) *	27,833	Henry Graham (ROT005014)	177,335
Dunleavy (ROT094135) *	31	Henry Graham (ROT005016) *	85
Henry Graham (ROT005019) *	10	Henry Graham (ROT005026) *	241,960
Henry Graham (ROT005021)	64,216	Henry Graham (ROT005027) *	109,350
Henry Graham (Brush Local)	200	Kaczmar Drain	2,686
Henry Graham (ROT005015) *	155,310	Kutchey Drain (Stephens)	1,581
Henry Graham (ROT005022) *	29	Kutchey Drain (Kathleen)	224
Henry Graham (ROT005023) *	166	Sharkey Drain (Lincoln)	1,287
Henry Graham (ROT005024) *	49	Sharkey Drain (Dequindre)	4,953

Drain Name	HF 183 Marker GC/100 ml	Drain Name	HF 183 Marker GC/100 ml
George W Kuhn North	95	Henry Graham (TRT143013)	13,120
George W Kuhn South	95	Henry Graham (John R LS)	629
Sharkey Drain (Dequindre)	99	Henry Graham (ROT005014)	2292
Henry Graham (Executive)	625	Dunleavy Drain (ROT093003)	10,667
Henry Graham (14 Mile)	8,674		

Cost: Labor: $10,313.28

Lab: $4,009.24

Total: $14,322.52

Next Steps: 2023 sampling results have shown elevated levels of *E. coli* on the Henry Graham Drain and Dunleavy Drain. On The Henry Graham Drain, elevated levels have been narrowed down to a tap at ROT005026. Investigation in the local system, which will include dye testing, in 2024. On the Dunleavy Drain, continued investigation of multiple intersections will continue. The Barnard Drain also had an elevated level of *E. coli* which will require resampling. The City of Hazel Park staff are investigating elevated levels of *E. coli* at the intersection of Elza and Dequindre; WRC staff will assist as needed in 2024.

Evergreen-Farmington SDS

WRC contracted with the Alliance of Rouge Communities staff to complete sampling within the Evergreen-Farmington SDS (see the attached report).

Figures

Figure 1 Austin Drain

Figure 2.1 Owens Drain

Figure 2.2 Owens Drain

Figure 3 Flannery Drain

Figure 4 Fracassi Drain

Figure 5 Clarenceville Drain

Figure 6.1 Clinton-Oakland SDS

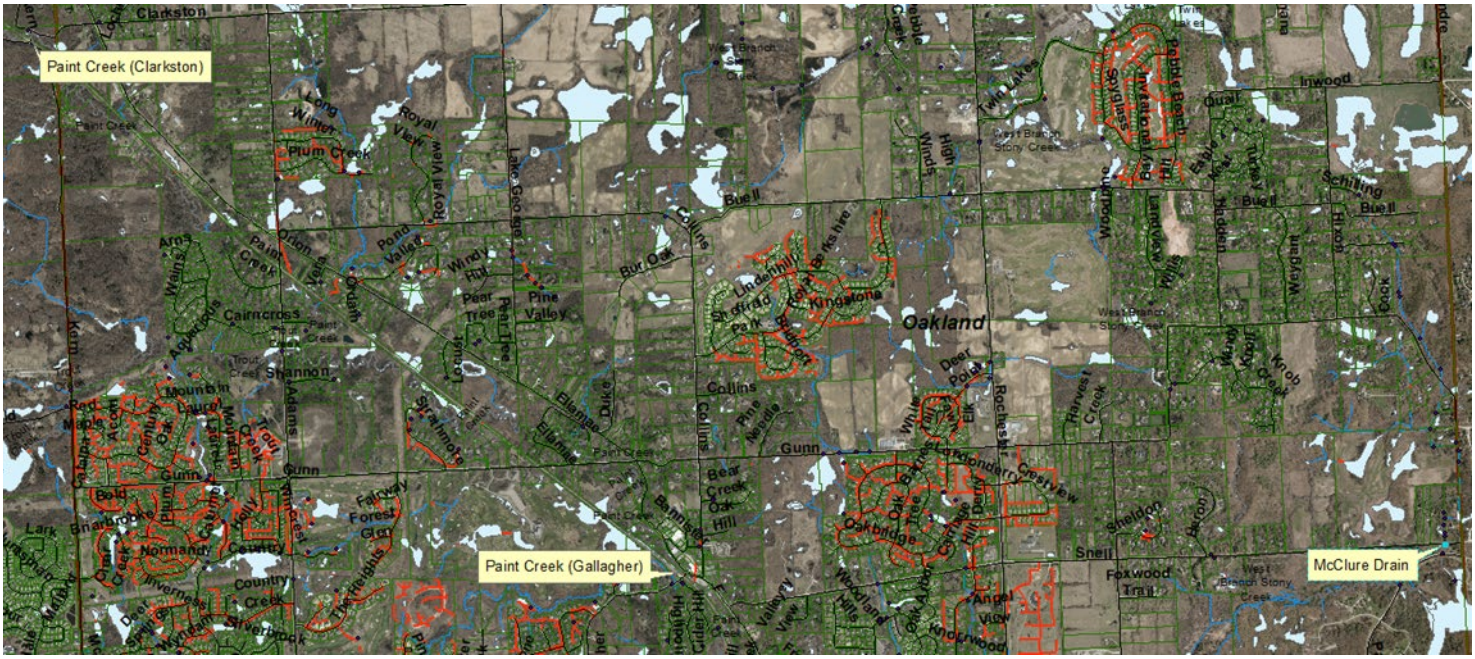

Figure 6.2 Clinton-Oakland SDS

Figure 6.3 Clinton Oakland SDS

Figure 6.4 Clinton Oakland SDS

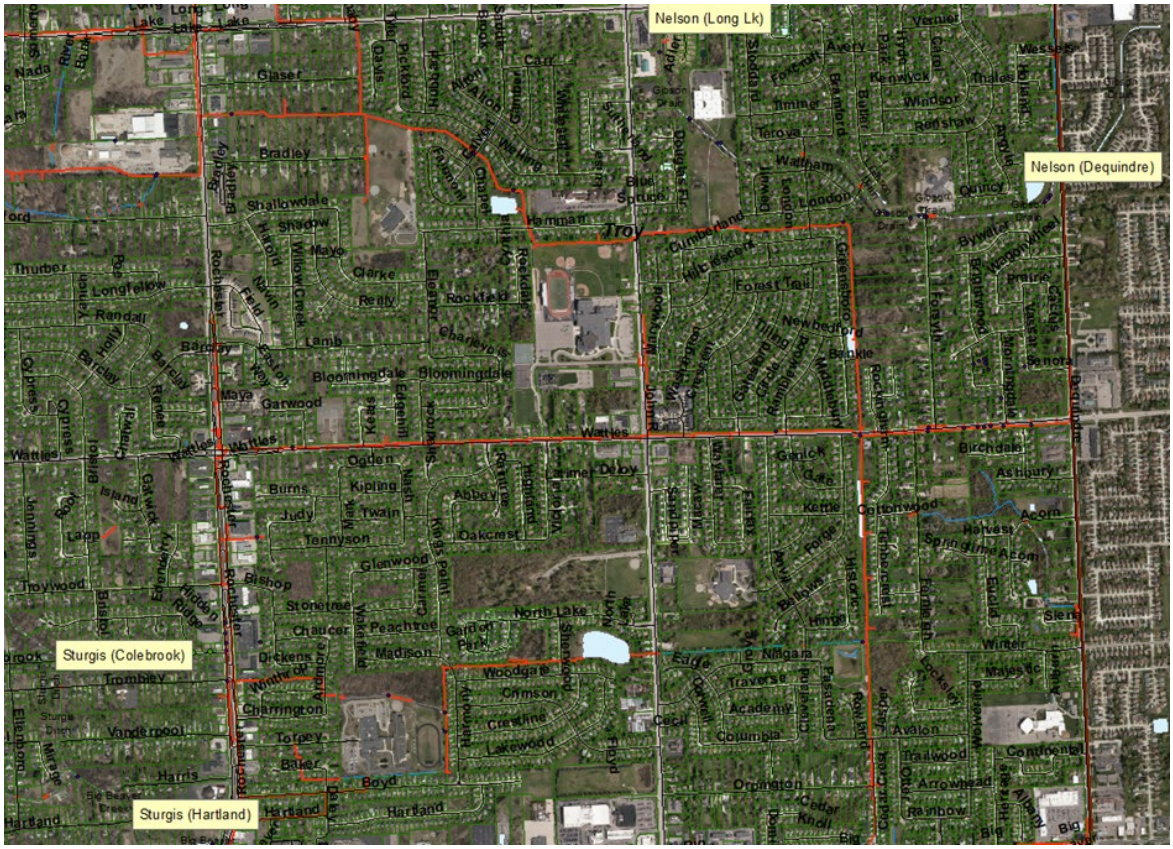

Figure 6.5 Clinton Oakland SDS

Figure 6.6 Clinton Oakland SDS

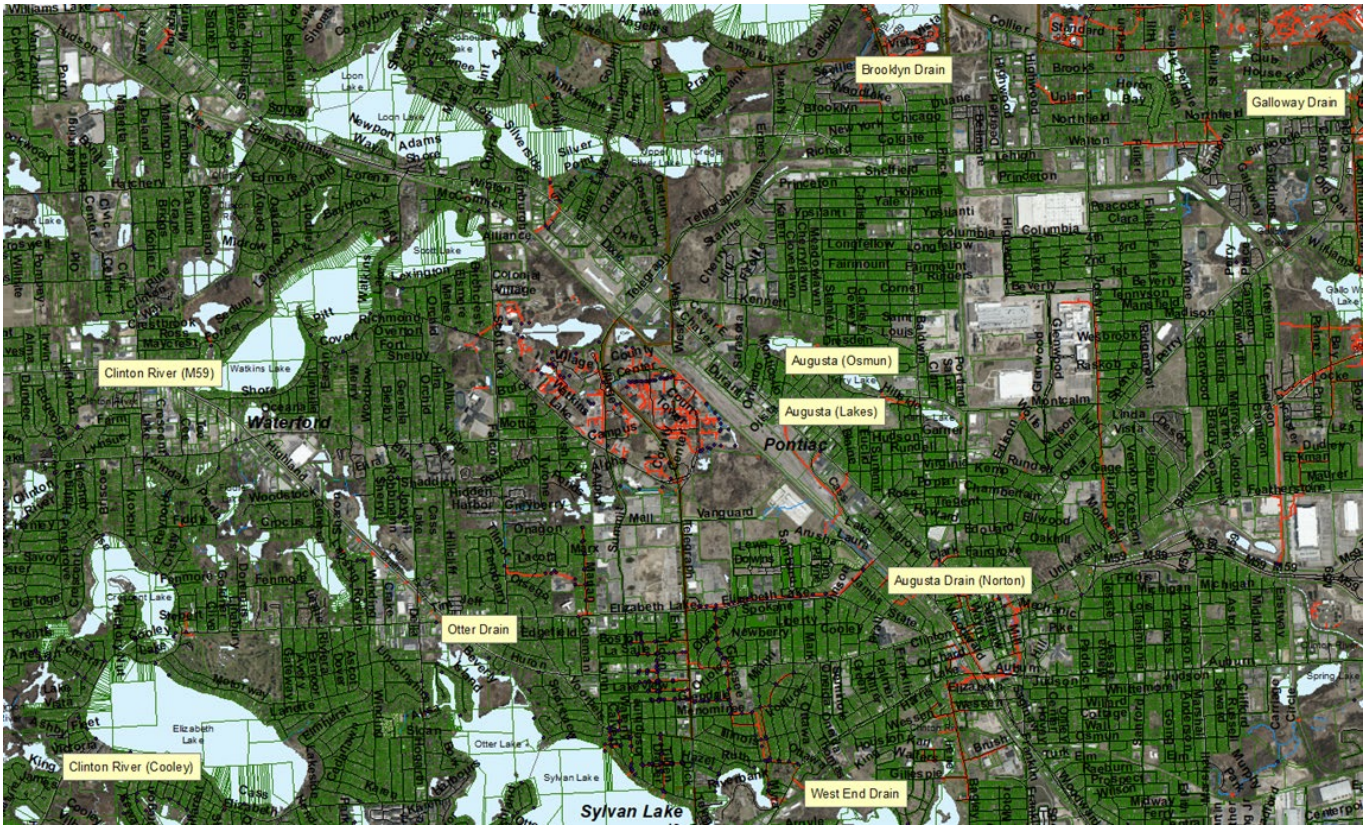

Figure 7.1 GWK SDS

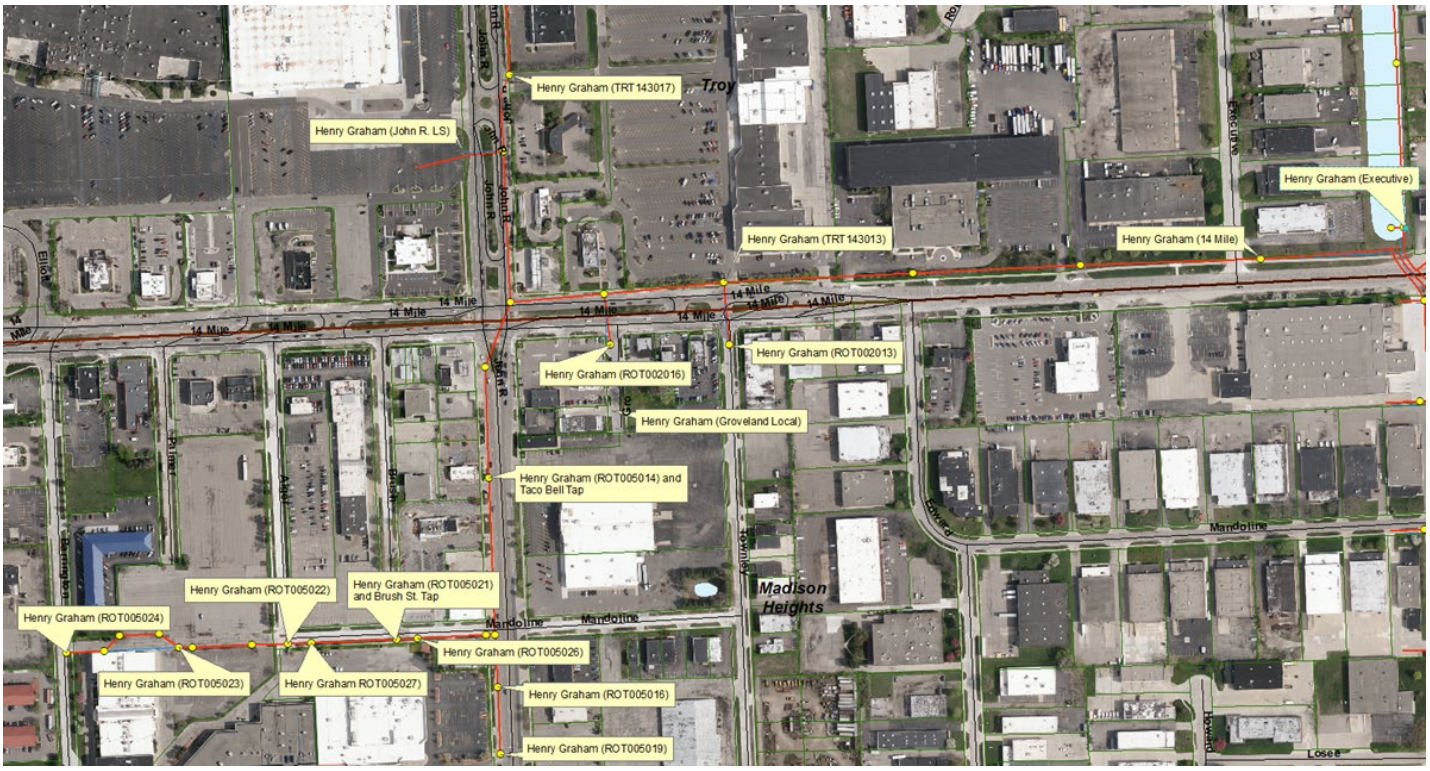

Figure 7.2 GWK SDS

Figure 7.3 GWK SDS