

**CHARTER TOWNSHIP OF VAN BUREN
ENVIRONMENTAL COMMISSION AGENDA**

**Wednesday, November 15, 2017 – 7:00 PM
Denton Room**

CALL TO ORDER

ROLL CALL

ENVIRONMENTAL COMMISSION

Chairman Brownlee	_____	Commissioner Merritt	_____
Commissioner Jahr	_____	Commissioner Emekpe	_____
Commissioner Debuck	_____	Board Representative White	_____
Commissioner Gibson	_____	Director Akers	_____
Deputy Director Best	_____	Recording Secretary Halstead	_____

APPROVAL OF AGENDA

ACCEPTANCE OF THE MINUTES OF THE PREVIOUS MEETING

1. October 18th, 2017 Minutes

COMMUNICATIONS

UNFINISHED BUSINESS

Open Discussion

NEW BUSINESS

1. Belleville Lake Drawdown
2. Open Discussion
 - a. MS4 Stormwater Permit Progress Report
 - b. WM Landfill Fifth Amendment Update

ANNOUNCEMENTS/COMMENT

ADJOURNMENT

***** If you are unable to attend, please contact Developmental Services at 699-8913 before noon on November 15, 2017*****

CHARTER TOWNSHIP OF VAN BUREN
Environmental Commission
Wednesday-October 18, 2017
DRAFT MINUTES

The meeting was called to order at 7:02 pm in the Denton Room by Chairperson Brownlee.

ROLL CALL:

Present: Brownlee, Jahr, Debuck, Gibson, Merritt, White

Absent Excused: Emekpe

Staff:, Best, Halstead

Audience: 1

APPROVAL OF AGENDA:

Motion Merritt, Seconded by Jahr to approve the October 18, 2017 agenda with the addition of item D. Election of Officers. Motion Carried.

APPROVAL OF MINUTES:

Motion Merritt, Seconded by Gibson to approve the July 19, 2017 Minutes with a correction on item D. Motion Carried.

COMMUNICATIONS: The process to find registered sealcoat contractors with the Township was brought up. Best will make sure staff know where to locate the registration book. He also mentioned he would be meeting with Rebecca Esselman and he will ask about the Coal Tar Pamphlets.

The Universities that were doing the algae study on Belleville Lake have picked up their test equipment.

The REAL Program is done, and it made an impact on the residents that were affected. The program will continue in 2018.

UNFINISHED BUSINESS: None

NEW BUSINESS:

- a. **Site Specific Variance Petition from US Ecology:** Strebor Inc. is asking for a variance to establish the different treatment standards for PCP, dioxin and furan concentrations that exceed the treatment standards for waste code 27. They are wanting to use a different treatment process that is not on their current permit. They need the variance to let them do the proper treatment process to make is safe to dispose of in the landfill.

- b. **Operating License Major Modification- US Ecology:** US Ecology Treatment Center, as part of their license renewal, are wanting to add new processes to their license to accommodate the new waste codes they will be taking in.

ANNOUNCEMENTS/COMMENTS:

- a. **Septic System Maintenance Workshop:** Van Buren Twp. held a septic system maintenance workshop put on by the Alliance of Rouge Communities on Sep. 14. It was well attended.
- b. **Tree Planting Workshop:** The Alliance of Downriver Watershed had gotten hundreds of trees for planting and 30 trees were given to Van Buren Twp.
A Tree Planting Workshop was set up with the citizen foresters of Detroit. There was VBT staff and resident volunteers that came out for the workshop.
The trees were planted along Tyler Rd. between Quirk and Beck Rd.
- c. **MS4 NPDES Stormwater Permit Progress Report:** Once every two years the Township is required to submit a progress report to the state. It covers the properties that the Township owns and the pipes that are within township facilities and drainage. The report is due Nov, 1st.
- d. **Election of Officers:** Brownlee was nominated for Chairman. Motion Gibson, Seconded by White to elect Brownlee for Chairman. Motion Carried.
Debuck was nominated for Vice-Chair. Motion Merritt, Seconded by White to elect Debuck for Vice-Chair. Motion Carried.

Motion Merritt, seconded by Debuck to adjourn at 8:21 pm.

MOTION CARRIED

Respectfully submitted,

Anna Halstead, Recording Secretary

General Storm Water Permit

2016 & 2017 Consolidated Report

Michigan General Permit Number: MIG610000

Certificate of Coverage Number: MIG610021



Charter Township of Van Buren
46425 Tyler Road
Van Buren Township, Michigan 48111
Matthew R. Best, M.S.
Director of Public Services
734.699.8913
10/9/2017

In order to assess our progress, Van Buren Township will document the following on an annual basis:

- Changes to goals and/or actions in the WMP prior to the required permit date for biannual review and revision
- Progress with respect to specific goals and/or actions
- Actions taken to eliminate illicit discharges
- Schedule for elimination of illicit connections identified but not eliminated.
- Documentation of the public education effort and an evaluation of its effectiveness
- Any additional actions taken to reduce the discharge of pollutants in storm water
- Modifications to approved IDEP and PEP, if applicable

Table 1: Watershed Management Plan Goals & Objectives for the Lower-1 Rouge River (L1) and Lower Huron River (LH) Watersheds
 Not Applicable to Van Buren Township: ~~Strikethrough~~

Goal #	Matching Goals in other WMP's	Lower-1 Rouge River WMP Goals	Lower-1 Rouge River WMP Objectives
1L1	4LH	Reduce flow variability	a. Develop water resource protection and management ordinances to manage peak flow rates.
			b. Study and implement BMPs for low impact development for undeveloped areas.
			c. Study and implement BMP programs for developed areas.
2L1	6LH	Reduce nutrient loading.	a. Develop ordinances for reducing nutrient loading
			b. Develop education, incentive, and public stewardship programs promoting source control and treatment of nutrients
			c. Study and implement BMP programs or projects for developed and undeveloped areas for source control and treatment of nutrients.
3L1	5LH	Reduce soil erosion and sedimentation.	a. Develop or revise ordinances to prevent, minimize and reduce soil erosion and sedimentation, especially from construction sites.
			b. Implement BMPs for effective soil erosion and sedimentation prevention and mitigation, addressing both upland sources as well as sources from streambank erosion
			c. Improve soil erosion and sedimentation control inspection and enforcement, as well as education, for parties responsible.
4L1	2LH	Protect and mitigate the loss of natural features.	a. Develop natural features inventories and/or assessments to determine plans for preservation and/or restoration of natural features
			b. Develop ordinances for managing natural features to benefit stormwater quality and quantity.

Goal #	Matching Goals in other WMP's	Lower-1 Rouge River WMP Goals	Lower-1 Rouge River WMP Objectives
5L1	10LH	Increase opportunities for passive and active recreational uses.	a. Eliminate/correct sources of bacteria that are harmful to public health and that limit river use, including illicit connections, failing septic systems and other sources.
			b. Identify key areas to protect and plan for recreational and interpretive opportunities in appropriate communities, especially along the river.
			c. Develop or restore recreational uses - such as fishing, canoeing, hiking, biking - where feasible, appropriate and desired, especially along the river and certain creeks.
6L1	9LH	Increase water quality, water quantity and biological monitoring in the subwatershed to measure progress.	a. Review existing and historical monitoring; identify and secure additional long-term monitoring resources.
7L1	1LH	Increase public understanding of their role in protecting water quality.	a. Develop and/or promote existing public involvement programs (workshops, events, etc.) to improve the public's understanding of their role in protecting water quality.
			b. Develop and/or continue Information and Education programs (brochures, newsletters, etc.) to disseminate water quality messages to the public.
8L1	8LH	Integrate stormwater management in planning and land use approval process.	a. Develop water resource ordinances, site plan review processes, education and incentive programs to encourage stormwater management in planning.
			b. Develop plans/programs for ongoing education about stormwater management tools for local officials, planning commissioners and others.
9L1	3LH	Establish financial and institutional arrangements for the fulfillment of the management plan.	a. Develop creative financing programs to support local stormwater management systems.
			b. Continue involvement with the Rouge River Advisory Council (RRAC) and the Rouge River Steering Committee as advisory and decision-making bodies to guide watershed-wide decisions so that standards, ideas, programs are shared.
10L1	3LH	Enforce action plans and increase accountability for stormwater management.	c. Develop and implement enforceable Storm Water Pollution Prevention Initiatives (SWPPIs), acceptable to regulatory agencies as well as local communities and agencies.
			d. Develop and adopt water resource protection ordinances that are enforceable.

Goal #	Matching Goals in other WMP's	Lower Huron River WMP Goals	Lower Huron River WMP Objectives
1LH	7L1	Establish information and education efforts to raise watershed awareness. <ul style="list-style-type: none"> ➤ Reduce pollution that impacts the lower Huron River Watershed by providing practical knowledge to key audiences 	a. Increase the general public's awareness and knowledge of the Watershed and the interconnectedness of the system
			b. Increase activities that result in preservation, restoration and protection of the system
			c. Increase participation in Watershed stewardship and recreation
2LH	4L1	Protect and mitigate loss of natural features <ul style="list-style-type: none"> ➤ Increase areas of natural features including wetlands, floodplains, woodlands, riparian buffers and open spaces ➤ Maintain or improve the aquatic community ➤ Preserve listed species and communities ➤ Prevent/regulate spread of non-native species 	a. Increase protections for natural features through policy and educational measures
			b. Improve mapping of natural features and distribution of such maps
			c. Conduct field work to refine natural features information and prioritize for protection
			d. Inventory the aquatic community
			e. Inventory listed species and communities
			f. Identify the type and extent of non-native species
3LH	9L1	Establish financial and institutional arrangements for WMP fulfillment	a. Develop long-term funding plans
			b. Create representative group to guide WMP implementation
			c. Prioritize specific projects for funding and establish estimated costs
			d. Identify options for institutions to guide WMP implementation
			e. Increase local community awareness about progress of plan implementation
4LH	1L1	Reduce flow variability/stabilize flows	a. Protect and increase storage in wetlands, floodplains, groundwater and other pervious areas with infiltration capacity
			b. Establish current stream flow dynamics through established monitoring strategy (see Goal 9)
			c. Increase the use of Low Impact Development design

Goal #	Matching Goals in other WMP's	Lower Huron River WMP Goals	Lower Huron River WMP Objectives
5LH	3L1	Reduce soil erosion and sedimentation ➤ Increase clarity in surface waters based on MDEQ Stream Crossing Watershed Survey	a. Establish baseline data for sediment fines in monitored streams through established monitoring strategy (see Goal 9)
			b. Increase education of BMPs among property owners and the building community
			c. Improve application and enforcement of Soil Erosion and Sedimentation Controls (SESC)
6LH	2L1	Reduce nutrient loading	a. Establish baseline data for nutrient concentrations and loading in surface waters through established monitoring strategy (see Goal 9)
			b. Reduce incidences of Separate Sewer Overflows
7LH	NA	Reduce pathogen (E. coli) loading	a. Decrease bacteria contributions to Wagner-Pink to meet MI WQS for E. coli (TMDL)
			b. Establish baseline data for bacteria through established monitoring strategy (see Goal 9)
			c. Implement and maintain Illicit Discharge Elimination Program investigations
			d. Reduce incidences of Separate Sewer Overflows
8LH	8L1	Increase adoption of BMPs for Low Impact Development (LID) design principles	a. Integrate stormwater management in the planning and land use approval process
			b. Educate land use decision makers on development impacts and LID tools
			c. Increase coordinated land use planning and development standards among the communities in the Watershed
9LH	6L1	Increase water quality, water quantity and biological monitoring	a. Develop a monitoring strategy
			b. Secure funding and develop partnerships to conduct short-term and long-term monitoring of key indicators
			c. Develop QAPPs for applicable parameters
			d. Increase coordination of monitoring through development of a monitoring strategy
10LH	5L1	Increase opportunities for recreational uses	a. Improve public access to land- and waterbased recreational opportunities
			b. Expand Greenways Trails Network

Table 2: Storm Water Pollution Prevention Initiative Evaluation

Illicit Discharge Detection and Elimination Plan (IDEP)		
Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
<p>Maintain 24-hour Environmental Complaint System</p> <p>2L1, 3L1, 7L1</p> <p>1LH, 5LH, 6LH,7LH</p>	<p>One water quality complaint was investigated/documentated by Township Staff during this reporting period in conjunction with the Township 24-hour Complaint system. (Algae bloom at Belleville Lake.)</p>	<p>Procedures are constantly being evaluated to assist staff to more efficiently track illegal dumping and water quality investigations.</p>
<p>County Based Illicit Discharge Investigation and Correction</p> <p>2LI, 5LI, 6LI</p> <p>6LH, 7LH. 9LH</p>	<p>No Illicit discharge complaints were sent for follow up to the Wayne County 24-Hour Environmental Hotline, Investigation and Coordinated Complaint Response Program during the reporting period.</p>	<p>Van Buren Township will continue to refer complaints to Wayne County for follow up.</p>
<p>IDEP Staff Training</p> <p>2LI, 6LI</p> <p>6I.Jf, 7LH</p>	<p>No IDEP training was attended by staff in the reporting period. Existing staff all previously received training from Wayne County.</p>	<p>Van Buren Township will have all <u>new</u> staff attend Wayne County sponsored IDEP Training in next reporting period.</p>
<p>Operation and Maintenance of Sanitary Sewers</p> <p>2L1</p> <p>6LH, 7LH</p>	<p>Significant effort was undertaken in both 2012 and 2013 in terms of sewer cleaning inspection through televising and lining. Similar efforts continued during the reporting period.</p>	<p>Maintenance effort continues through the annual work plan prepared by the Township. The Township is beginning the Asset Management process for its water and sewer system in 2018.</p>

Illicit Discharge Detection and Elimination Plan (IDEP)

Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
Sanitary Sewer Overflow (SSO) Control Implementation	The operation of the Equalization Basin continues to go well. The basin stabilizes sanitary sewer flows during wet-weather events. The operation and maintenance of the facility has reduced peak flows in the sanitary sewer systems tributary to the Rouge Valley and South Huron Valley systems.	This activity continues.
Minimize Infiltration of Seepage from OSDS 2LI 6LH, 7LH	Township continues to support the Wayne County On-Site Sewage Disposal Systems (OSDS) Evaluation & Maintenance Ordinance which requires inspections and necessary repair of OSDS at the time of property transfer.	This activity is primarily handled through the Wayne County Department of Health, with support, as needed, from the Township.
Method(s) to Evaluate Effectiveness - In-stream monitoring/ Environmental Indicator Monitoring 6L1, 9L1, 10L1 3LH, 9LH	Township contributes financially and works with our watershed partners through the Alliance of Rouge Communities (ARC) to implement water quality monitoring in the Lower-I Rouge Watershed and the Alliance of Downriver Watersheds (ADW) in the Lower Huron River Watershed. Monitoring is typically completed through an inter-agency agreement between the Huron River Watershed Council and the ADW.	Fees paid to Alliance of Rouge Communities (ARC) and Alliance of Downriver Watersheds (ADW) to assist in developing, implementing and reporting on the monitoring plan.
Illicit Discharge Investigation and Correction: Inspection of Community owned facilities 2L1, 6LH, 7LH	No illicit discharge investigations were conducted during this reporting period for Township-owned facilities.	Previous inspections were documented in prior reports.

Illicit Discharge Detection and Elimination Plan (IDEP)

Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
<p>Illicit Discharge Investigation and Correction: Visual Inspections During Routine Inspections</p> <p>2L1, 3L1</p> <p>5LH, 6LH, 7LH</p>	<p>No illicit discharges were reported during routine field operations conducted by Township personnel during this reporting period</p>	<p>Code Enforcement and Staff are the first responders for illicit discharge complaints. These issues are usually referred to Wayne County or MDEQ.</p>
<p>Storm Water BMP Tracking System</p> <p>1L1, 2L1, 3L1</p> <p>4LH, 5Lh, 6LH</p>	<p>No new township owned storm. BMPs (with outlets) have been completed during this reporting period. As such, the map currently on file with the State is current</p>	<p>Note: The Township does not own or operate any separate storm systems within the Township nor do we have authority or funding to do so. In some cases, the Township accepts limited responsibility for connections between private storm systems and the Wayne County drainage system. In turn, the Township requires an agreement from the private landowner to maintain the outlet. This is forced upon the Township by Wayne County.</p>
<p>Minimize Infiltration of Seepage from Sanitary Sewers</p> <p>2L1</p> <p>6LH, 7LH</p>	<p>Approximately 400 linear feet of Township owned sanitary sewer has been installed during this reporting period. The Township continues to maintain its current process for inspection whereby all new sanitary sewers is subjected to a deflection test, an exfiltration test or air test, an infiltration test in high water table areas and televising. All applicable testing procedures are conducted prior to Township acceptance of the new sanitary sewer systems.</p>	<p>The number of linear feet of new sanitary sewer inspected will continue to be provided in future reports.</p>
<p>Site Specific Surface and Ground Water Quality Monitoring</p> <p>6L1, 9L1, 10L1</p> <p>3LH, 9LH</p>	<p>No surface or groundwater sampling investigations were conducted during this reporting period for Township-owned facilities</p>	<p>Previous inspections were documented in prior reports.</p>

Illicit Discharge Detection and Elimination Plan (IDEP)

Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
<p>Belleville Lake Water Quality Monitoring</p>	<p>Township residents and members of the Environmental Commission participated in the MDEQ Harmful Algal Bloom Survey 2017, which looked at new predictive tools for monitoring harmful algal blooms (HABs), caused by toxin-producing cyanobacteria (See Appendix K.)</p>	<p>Team members submit geotagged photos of potential algal blooms, to field test a new computer program developed by Dr. Michael Waters. This program uses color analysis to assess the presence or absence of cyanobacteria in the water. Volunteers with iPhones can also install HAB-App to conduct the analysis themselves in real time. Volunteers who detect a potential HAB were asked to collect and preserve a water sample for later microscopic analysis.</p>
<p>Updated Map of known Storm Water Point Sources and Respective Receiving Waters or Drainage System</p> <p>6L1</p> <p>9LH</p>	<p>There are no updates to include this reporting period. The map on file with the State is considered current.</p>	<p>Note: The Township only owns a handful of properties that are held for a public purpose. Most of the Township properties are undeveloped with the exception of two fire stations, a small public works building and Township Hall. Therefore, the Township does not own or operate any separate storm systems within the Township <u>nor do not have authority or funding to do so</u>. In some cases, the Township accepts limited responsibility for connections between private storm systems and the Wayne County drainage system. In turn, the Township requires an agreement from the private landowner to maintain the outlet. This is forced upon the Township by Wayne County.</p>

Public Education and Participation Plan (PEP)		
Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
Van Buren Township Environmental Commission 7L1, 8L1 1LH, 8LH	The Environmental Commission met five (5) times in 2016 and seven (7) times in 2017. Copies of the Minutes and Agendas are on the Township web page through the link provided in Appendix F.	The Environmental Commission continued its efforts.
Location of Residential Separate Storm Water Drainage System Catch Basins and Waters of the State where the Separate Storm Water Drainage Systems Discharge 7L1 1LH	Maps have been provided during previous reporting periods. For the 2016 and 2017 reporting periods, there are no updates.	During the 2009 reporting period it was noted this Project, conducted by the University of Michigan, was nearing its conclusion and there was limited funding for continuation of this sampling work.
Storm Sewer System Labeling 7L1 1LH	No new storm sewer labels were placed during this period.	Inspection of previous storm drain labeling sites is needed to determine if replacement labels are necessary. Continuance of this effort is dependent upon the availability of volunteer effort
Maintain 24-Hour Environmental Complaint System 7L1	Van Buren Township continues to advertise its 24-hour Public Safety Dispatch Line at 734.699.8930 on its website. During the 2016 and 2017 reporting periods, there were no documented illegal dumping investigations conducted or tickets issued as a direct result of this process.	Van Buren Township continues to promote the Wayne County 24-hour Hotline through displays, brochures and its website.

Public Education and Participation Plan (PEP)

Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
Educating the Public Regarding Animal Wastes 2L1, 7L1 1LH, 6LH, 7LH	Van Buren continues to promote and make available the "Clean up after your Pet" tip card prepared in conjunction with the "Our Water. Our Future. Ours to Protect" series. The brochures are made available at Township facilities and a link to the SEMCOG website is maintained on the Township's website. The "Seven Simple Steps to Clean Water" continues to also be made available to the public. Copies of these brochures and publications have been provided in Appendix G.	As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.
Pesticides and Fertilizer Policy 2L1 1LH, 6LH, 7LH	The State of Michigan adopted a "Phosphorus Free Fertilizer Policy" during the reporting period.	The Township follows the lead of the State in this matter.
Host Household Hazardous Waste Day 7L1 1LH	The 2016 Household Hazardous Waste Day was held on October 15, 2016. The 2017 event occurred on October 14, 2017. Promotion of these events occurred through postings on the Township's website, posting of informational flyers within Township facilities and via mass distribution through the Township's Newsletter (samples of these postings are further provided in Appendix G.)	The Township further assists in the promotion of Electronic Waste Collection and Household Hazardous Waste Collection events sponsored by Wayne County. Promotion is through the display of brochures at Township facilities and via mass distribution through the Township's E-Newsletter. Through increased outreach efforts for HHW Day, the Township had 464 vehicles participating in 2016 and 250 in 2017. Copies of these posting are included in Appendix G.
Advertisements 2LI, 3LI, 4LI, 7LI 1LH, 2LH, 5LH, 6LH, 7LH	Advertisements continue to be placed through Wayne County Department of Environment, Alliance of Rouge Communities (ARC), Alliance of Downriver Watersheds (ADW) and the Lower Huron Watershed Advisory Group.	As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Regional survey conducted in 2004

Public Education and Participation Plan (PEP)

Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
Point of Sale Education 2L1, 7L1 1LH, 6LH	Point of sale educational material continues to be provided by Wayne County Department of Environment, Alliance of Rouge Communities (ARC), and Alliance of Downriver Watersheds (ADW). Links on the Township's website to both the Wayne County Website and the Huron River Watershed Website provides information in regard to "How to Order a Soil Test Kit". This program is part of a year-round soil testing program offered in conjunction with Michigan State University Extension (MSUE).	As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.
Belleville Lake Shoreline Management Workshops Deferred WMP Middle Huron	No workshops were held during this reporting period.	No data available for inclusion during this data period.
Host Household Hazardous Waste Day 7L1 1LH	The 2016 Household Hazardous Waste Day was held on October 15, 2016. The 2017 event occurred on October 14, 2017. Promotion of these events occurred through postings on the Township's website, posting of informational flyers within Township facilities and via mass distribution through the Township's Newsletter (samples of these postings are further provided in Appendix G.)	The Township further assists in the promotion of Electronic Waste Collection and Household Hazardous Waste Collection events sponsored by Wayne County. Promotion is through the display of brochures at Township facilities and via mass distribution through the Township's E-Newsletter. Through increased outreach efforts for HHW Day, the Township had 464 vehicles participating in 2016 and 250 in 2017. Copies of these posting are included in Appendix G.
Land Use Planning for the Healthy Watershed: The Role of the Local Citizen 1LI, 7LI, 8LI 1LH, 4LH, 8LH	Van Buren Township did not participate during the 2016 and 2017 reporting period.	No data available for inclusion during this reporting period. As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.

Public Education and Participation Plan (PEP)		
Activity in SWPPI	Action(s) Taken	Comments and Evaluation of Effectiveness
Conservation Planning 4L1 2LH	The Zoning Ordinance was updated in 2017. A copy of the plan is available at the website at www.vanburen-mi.org .	A map of the Natural Features Inventory has been included in Appendix I.
Learn How to Read a River Project 6L1, 7L1 1LH, 9LH	Van Buren Township continued to promote effort of the HRWC through provision of a link on the Township website. Van Buren did not specifically participate in this training workshop in the 2016 or 2017 reporting period.	As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.
Volunteer Monitoring: Bug Hunt, Adopt-A-Stream, River Roundup, Stonefly Search 6L1, 7L1 1LH, 9LH	A summary of effort is included in conjunction with the ARC, ADW and Friends of the Rouge annual reports. The specific events and the dates they were held are provided in the summary section of each of these reports. Copies of these reports are included in Appendices A, B, D and E.	The number of sites and participants are summarized in the provided ADW, ARC and Friends of the Rouge Annual Reports. As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.
Natural Features Ordinance Workshop 4L1, 7L1 1LH, 2LH	A Natural Features Ordinance Workshop was not held by the Township during this reporting period. A copy of the completed Natural Features Inventory map for the Township is provided in Appendix I.	No data available for inclusion during this reporting period. As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.
Distribute Pollution Prevention Literature and Messages 2L1, 3L1, 4L1, 7L1	Copies of literature are provided in Appendix G. These include... <ul style="list-style-type: none"> • 2016 and 2017 Water Quality Reports • Protecting Water Quality • Landscaping Near The Water's Edge • Household Hazardous Waste Disposal Guide • Recycling • Maintaining Septic Systems 	As indicated in the approved PEP, results of future public awareness surveys are anticipated to be evaluated against the SEMCOG Region survey conducted in 2004.

Appendix A

2016 -2017 Alliance of Downriver Watersheds (ADW) Bi-Annual Report

Please see the ADW website at:

<http://www.allianceofdownriverwatersheds.com/>

for a copy of the bi-annual report



Alliance of Downriver Watersheds Biennial Report 2016-2017



*American Lotus Beds, Brownstown Township
by Marc Akemann
2018 Alliance of Downriver Watersheds Community Calendar*

**ALLIANCE OF DOWNRIVER WATERSHEDS
BIENNIAL SUMMARY OF ACTIVITIES/ACCOMPLISHMENTS
2016-2017**

Meetings

The Full Alliance of Downriver Watersheds (ADW) and its respective subcommittees have continued to meet over the past two years (2016-2017) to coordinate activities toward improving the watershed as is summarized below:

- ***Full ADW***
The full ADW has met six (6) times since the last reporting period with an additional meeting scheduled for November 2017. Meeting dates have included:
March 9, 2016
June 1, 2016
October 12, 2016
January 25, 2017
May 17, 2017
November 2, 2017 (scheduled)

- ***Joint Public Involvement Committee and Technical Committee***
For a number of years, the Public Involvement Committee and Technical Committee have been holding their meetings together due to overlap of topics as well as committee members. The joint Public Involvement/Technical Committee has met thirteen (13) times since the last reporting period including:
February 3, 2016
March 4, 2016
March 9, 2016
May 12, 2016
June 16, 2016
August 10, 2016
November 3, 2016
January 11, 2017
February 28, 2017
April 11, 2017
June 20, 2017
August 1, 2017
October 10, 2017

- ***Executive Committee***
The Executive Committee meets when needed to discuss financial and other issues. The Executive Committee met two (2) times since the last reporting period primarily to discuss annual budgeting, work plans and contracts. Meeting dates included:
September 22, 2016
August 21, 2017

Website

The Alliance of Downriver Watersheds maintains a website to share information and make announcements. The website continues to be regularly maintained and updated. The website link/address is: www.allianceofdownriverwatersheds.com. The website includes a page for Committee documents and meeting dates, publications, educational resources and general information about the ADW.



Membership and Budget

In 2017, membership remained at 23 members.

- Final expenditures for 2015 were \$376,651
- Final expenditures for 2016 were \$187,998
- Expenditures to date for 2017 are \$107,505 (as of August 2017)

These funds were expended on efforts directly related to the betterment of the watersheds. The majority of the budget is a combination of dues, grants, and Wayne County funds. In both 2016 and 2017, the majority of expenditures were for conducting advanced IDEP investigations, public education, physical and biological monitoring, MS4 permit plans and template development as well as facilitation of ADW meetings.

Contracts

The ADW continued to be engaged in two (2) contracts during the 2016 and 2017 reporting year, including:

- *Watershed Facilitation Services w/ Orchard, Hiltz & McCliment, Inc. Team*

Inter-Agency Agreements

During the 2016-2017 reporting period, the ADW maintained (2) Inter-agency Agreements (IAA) with 2 entities for their assistance with ADW initiatives:

- *Fiduciary Services Agreement w/ Wayne County*
- *Huron River Watershed Council (Monitoring Evaluation Activities)*

New MS4 Permits Submitted

The ADW members new individual MS4 permits were due to the MDEQ April 3, 2017. The ADW worked together to develop several collaborative portions of the permit as well as templates for use by the various ADW members. This work was completed in our continued efforts to work together to address water quality issues, collaborate and share resources. The following collaborative sections of the permit were developed and attached to each ADW members MS4 permit:

- Public Participation Plan
- Public Education Plan
- Illicit Discharge Elimination Plan
- Total Maximum Daily Load Implementation Plan

In addition, the following templates were developed and distributed to ADW members for their modification and use in submitting their MS4 permit:

- Enforcement Response Procedure (ERP)
- Construction Runoff Control Program
- Post-Construction Runoff Control Program
- Pollution Prevention/Good Housekeeping

Current/Open Grant Projects

- **GLRI US Forest Service** grant application was submitted and was successful. The grant was for planting 430 trees in high-priority urban reforestation areas in the ADW to assist with the Emerald Ash Borer Restoration. The grant award was for approximately \$97,000 with a match (provided by Wayne County) of \$50,000. One hundred seventy-five, 2" – 2.5" trees were planted within Wayne County road right-of-ways throughout the ADW in October/November 2015. The remaining Wayne County trees (255) have been purchased and will be planted in October 2017. The grant deadline was extended and the ADW Facilitation's team scope modified to include a citizen volunteer tree planting effort. In September 2017, these funds were used to purchase 50 trees that were planted in Gibraltar and Van Buren Township. The Detroit Citizens Forester group assisted in the planting of the trees with the community DPW staff joining with equipment and placement. A summary report of the volunteer tree planting is being prepared and an overall grant final report will be prepared for grant closeout which is scheduled to be complete by December 31, 2017.
- The **GLRI Collaborative Invasive Species Control in the Rouge and Detroit River AOCs** – application was submitted by Wayne County in partnership with the ADW and the Alliance of Rouge Communities. The award was for \$634,756 to establish and begin implementing an effective, efficient and environmentally sound program of integrated pest management for invasive species. While a significant focus of the grant is outside of the ADW, the application did include funds to assist the ADW with Public Education and a training workshop for ADW members on invasive species identification and control methods. Six sites (approximately 10 acres) were treated for Phragmites in 2016 and 2017 by the contractor hired by Wayne County. The Friends of the Detroit River (FODR) helped identify, map and monitor 2 of the 6 sites. The FODR also coordinated and held two training and workday sessions with over 30 Student Conservation Association participants and other project partners including ADW staff. With the remainder of the funds available for use by the ADW staff, aerial photography and field work be used to map and prioritize areas for future removal of invasive species. A training session at the November 2017 ADW member meeting on invasive species identification is also planned.

- **MDEQ Stormwater, Asset Management, and Wastewater (SAW) Grant**
The ADW submitted a SAW application under the Stormwater Management Plan option in 2013 requesting \$999,900 in funds with a local match of \$111,100. The ADW was funded in the fourth round of SAW awards. SAW funded work began in 2017 with the initial focus on developing new MS4 permit collaborative plans and templates for use by the ADW as well as planning efforts related to the additional SAW work. The majority of SAW work will be completed in 2018 and 2019.

Progress Evaluation – Monitoring

Wayne County and the Huron River Watershed Council continued to execute long-term monitoring activities on behalf of the ADW. Following is a summary of monitoring efforts in 2016 and 2017, with brief summaries of monitoring efforts since the beginning of the ADW. The monitoring program is scheduled such that the majority of data is collected throughout Spring to Fall and the data is verified and compiled in early winter, with reporting in late winter. Details can be found in the annual monitoring report. Annual monitoring reports may be downloaded from the ADW website at <https://www.allianceofdownriverwatersheds.com/initiatives>. The monitoring reports also include the current five-year monitoring strategy.

2016-17 Monitoring

Stream Discharge: Eight water-level stations (1 USGS station in Ecorse Creek Watershed, 7 sensors owned by Wayne County, and one owned by HRWC) have now been established at sites throughout the ADW (2 in Ecorse Creek, 3 in Combined Downriver, and 2 in Lower Huron, with an additional sensor used to provide atmospheric pressure). The sensors were removed prior to freezing in November 2012. All stations have at least a 3-year record of continuous flow data generally covering the April-October time period. Stream discharge was measured numerous times at different water levels at all of the sites to allow translation from water level to discharge and calibrate annual changes in site characteristics. All of the data is quality checked and processed to produce a seasonal record and generate statistics to be included in the monitoring report. The USGS station at the North Branch of Ecorse Creek was monitored in 2016 and 2017 as the longitudinal flow sensor for the ADW and for the purpose of tracking storm data. Stream discharge is now measured at each site to pair with water chemistry data collected as described below.

Water Temperature: The water level sensors also recorded temperature data over the same intervals. Seasonal maximum temperatures can be determined over the sampling period, which can then be related to fish species tolerances in the annual reports. Temperature is also measured during the bi-monthly water chemistry site visits.

Water Chemistry: Eight stations were established for tracking long-term water chemistry trends at represented sites throughout the ADW. A ninth station was added in 2017 to include a large river location in the Lower Huron River watershed. Each site is visited twice per month from April through September by volunteer collectors. Water samples are collected and processed by the Ypsilanti Community Utility Authority (YCUA) laboratory. The lab analyzes the samples for total phosphorus, total suspended solids and *Escherichia coli* concentrations. Volunteers also directly measure conductivity, pH, and dissolved oxygen with handheld sensors. Additionally, each year, four investigative sites are selected and sampled in the same way. Results from investigative sites are compared to long-term sites to determine if pollutant sources can be narrowed down.

In total, 17 sites were sampled in 2016-17. Since the beginning of the water chemistry program, 25 sites have been sampled and 32 volunteers have been trained and involved in the program.

Stream Geomorphology: Wayne County staff completed rapid geomorphological surveys for 14 streams through 2011 to help determine stream reach stability. These surveys began in fall 2008 as part of the Grow Zone grant project and continued in 2010-11. No new sites were surveyed in 2016 or 2017.

Stream Biology: Biological monitoring efforts are carried out through two macroinvertebrate collection programs. The two organizations meet periodically to assure comparable methods and data.

The biological monitoring efforts of the Wayne County Department of Public Services, Water Quality Management Division and the Stream Teams continued with the following events:

- WCDPS/Stream Team Spring 2016 Bug Hunt; May/June 2016; 13 sites monitored.
- WCDPS/Stream Team Fall 2016 Bug Hunt; October 2016; 11 sites monitored.
- WCDPS 2017 Winter Stonefly Search; January 2017; 2 sites monitored.
- WCDPS/Stream Team Spring 2017 Bug Hunt; April/May 2015; 15 sites monitored.
- WCDPS/Stream Team Fall 2017 Bug Hunt; October 2017; 15 sites targeted for monitoring.
- Number of students participating in the WCDPS/Stream Team bug hunts in 2016: 369.
- Number of students participating in the WCDPS/Stream Team bug hunts in 2017: 233.

The biological monitoring efforts of the Huron River Watershed Council and volunteers included the following events across six sites in the Lower Huron River Watershed:

- Fall River Round-up, October 2015 -- 4 sites
- Winter Stonefly Search, January 2016 -- 2 sites
- Spring River Round-up, April 2016 -- 3 sites
- Winter Stonefly Search, January 2017 -- 1 site
- Spring River Round-up, April 2017 -- 2 sites

IDEP Activities and Training (2016 and 2017)

- Coordinated Complaint Response: WQMD has received and responded to 12 environmental concerns within the ADW member communities. Several of these came from an ADW community staff, WC SESC staff and WC Roads staff reporting environmental concerns to WQMD as a result of routine field operations. Two of the incidents also included the assistance of the Downriver Hazmat Team and/or US EPA response team.
- Advanced Investigations: Between January and December 2016, 24 facility dye-test inspections were performed at commercial and industrial facilities in the Ecorse Creek watershed. An environmental concern was identified at one of the facilities.
- In 2016, follow up inspections were performed at 10 facilities. Forty-five illicit connections and 3 illicit discharges were confirmed corrected at facilities in the Combined Downriver and Ecorse Creek watersheds.
- In 2015 (through September), 23 facility dye-test inspections were performed at commercial and industrial facilities in the Ecorse Creek watershed. No illicit connections, illicit discharges, or environmental concerns were identified.

- Since 2011, 328 facilities have been dye-tested. Forty-nine (49) illicit connections have been identified at eleven (11) facilities; twelve (12) illicit discharges have been identified at nine (9) facilities, and two (2) facilities with two environmental concerns. WQMD estimates that 815,720 gallons of polluted water will be removed from ADW waterways per year once all corrections are made.
- The ADW, in partnership with the Alliance of Rouge Communities (ARC) funded the half day IDEP training session hosted by Macomb County scheduled for October 18, 2017. Sixty-nine (69) people are scheduled to attend the training including 10 staff from five ADW member entities.

Household Hazardous Waste Collection Days

Wayne County continued to hold Household Hazardous Waste Day collections in 2016 and 2017 including the following:

2016 Events

In 2016, four Household Hazardous Waste Days were held for Wayne County residents including two in the ADW. These events were held in Huron Township at Huron High School on April 23, 2016 and in Taylor on October 8, 2017 at the Wayne County Community College Campus.

2017 Events

In 2017, four Household Hazardous Waste Days were held for Wayne County residents including one in the ADW. This event was held in Taylor on October 14, 2017 at the Wayne County Community College Campus.

Public Education/Involvement

Public education and involvement activities completed and discussed at ADW meetings included:

- *Crossing/Entering Signage*
Since 2014, the ADW has maintained a map of the locations of installed, existing creek crossing and entering watershed signs. The map allows the watershed a tool for keeping track of the signs installed as well as making recommendations for future signs. As of September 2017, the ADW and its' members have installed 17 entering the watershed signs and 63 creek crossing signs.

- *Pop-up Display for Key Venues and Events in Member Communities*

In 2016 the ADW designed and produced two pop-up outreach displays for use by members at key venues and events in their communities. The display’s messaging shows how ADW communities are working for clean water, and shares with residents how they can prevent stormwater pollution in their everyday actions. These are available for check out by members through the Wayne County Department of Public Services, Water Quality Management Division. In 2016 and



2017, both the existing ADW (7 Simple Steps) table top display and the newly created ADW Panel Displays were displayed in a number of ADW member communities including Allen Park, Brownstown Township, Flat Rock, Grosse Ile, Grosse Ile School District, Gibraltar, Riverview and Wyandotte. The complete list, including dates and locations is below.

7 Simple Steps Display

Event	Community	Dates
Riverview City Hall	Riverview	6/1/16 -7/1/16
Shiver on the River	Detroit-Belle Isle	2/6/16
Detroit River Water Festival	Detroit-Belle Isle	4/28/16
Allen Park City Hall	Allen Park	4/11/16 – 5/11/16
Shiver on the River	Detroit-Belle Isle	2/4/17

ADW Panel Display

Event	Community	Dates
Grosse Ile Township	Grosse Ile	10/13/16 – 12/16/16
GLRI Celebration	Dearborn	10/26/16
Brownstown Township	Brownstown	11/8/16 – 12/12/16
Flat Rock City Hall	Flat Rock	12/16/16 – 1/23/17
Woodhaven Brownstown School District	Woodhaven	1/23 /17 – 3/28/17
Romulus City Hall	Romulus	4/19/17- 5/19/17
Riverview City Hall	Riverview	5/12/17 – 7/10/17
Suds on the River	Ann Arbor	9/14/17
Suds on the River	Ann Arbor	9/14/17

- *Wall Graphics for Member Locations*
With the goal of connecting residents with ways to protect water quality in their everyday actions, in 2016 the ADW produced and provided to each member a set of six one-sided removable vinyl wall decals that are full sized posters featuring the ADW story, stormwater pollution prevention tips, clean water commitment, and nature photography. The decals' graphics and messaging leverage those already produced for the pop-up displays (above) by providing a smaller and efficient display format that can be installed longer term at community venues.



- *Public Survey and Outreach Strategy Research and Planning*
In 2016, the ADW conducted a mix of research efforts to help members thoroughly understand their residents' demographic makeup and the attitudes and behaviors that are relevant for stormwater outreach and education, collecting the information and insights needed to meet permit requirements going forward. Activities and work product included:
 - *ADW Communities Online Survey*, results and recommendations from an online panel survey of 400 Wayne County residents, an opt-in survey circulated by ADW members (158 responses) with comparison to a national survey conducted by Water Words That Work in 2014
 - *Target Audience Analysis*, demographics, lifestyle interest, business profiles for each of the 23 member communities (plus capture of regional online groups and forums in use)
 - *Communications Check Up*, an assessment of ADW strengths and weaknesses and recommended strategies for public communication and outreach
 - *Literature Review*, a literature review to determine if "off the shelf" social and market research can help the ADW achieve its goals (publicly available surveys, polls, focus group reports, campaign summary reports, and peer-reviewed academic papers)
 - *Survey Instrument*, A 25-question survey to measure resident water quality attitudes and awareness
- *5-Year Communications Plan*
In 2017, the ADW prepared a 5-year communications plan for the ADW that recommends a suite of public education activities based on the above research, including strategies, timelines, deliverables and milestones, projected costs and messaging. Activities in the plan include:
 - Biannual production of the watershed community calendar with an online photo contest
 - Three focused-issue digital pledge campaigns
 - Outreach activities for community venues and events

- *Collaborative Public Education Plan*

In 2016-17 the ADW prepared a Collaborative Public Education Plan and Table for use by ADW members in their 2017 Stormwater Discharge Permit Applications and to help meet on-going and future permit requirements for public education. Activities and schedules were drawn from the 5-Year Communications Plan (above). Projected costs for ADW implementation of collaborative efforts were provided to the ADW Executive Committee for 2018 budgeting purposes.

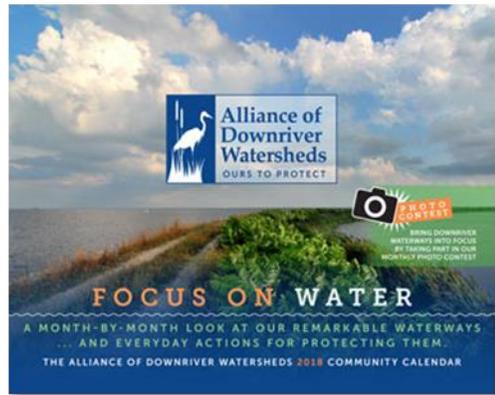
- *ADW Logo Update*

The ADW updated its logo in multiple formats for use in print and digital material as well as for social media applications and created a style guide for using the ADW brand assets. The logo update retained the original ADW logo elements that suggest nature, water, habitat, the beauty of animal species while making the logo more clear, simple and easy to read, and flexible enough for use in a variety of formats. The updated logo provides a hierarchy of elements and a consistent color, a modern typeface, combines pictorial and type-based graphics, and is easier for designers and staff to use correctly with direction from the style guide.



- *2018 Watershed Community Calendar*

In 2017, the ADW budgeted for the design, printing, delivery and distribution of 45,000 Watershed Community Calendars. The calendars feature water-related photos from local nature photographers and 12 months of tips for preventing stormwater runoff pollution and protecting the waters of the ADW. Additionally, recreation and volunteer stewardship opportunities in the ADW area are highlighted. The ADW members received delivery of the calendars in October 2017 for distribution to residents, businesses and constituents. Quantities for each ADW member were determined by the amount of dues paid (which is based on population). In addition to the ADW members, calendars were provided to the following organizations for further distribution:



- Dearborn Heights Watershed Council
- Huron River Watershed Council
- Downriver Linked Greenways
- Detroit River International Wildlife Refuge
- Friends of the Detroit River
- Downriver Chamber of Commerce
- Riverside Kayak (photo contest sponsor)
- Detroit River Water Festival
- H2E River Adventures (photo contest sponsor)

- Westcroft Gardens (photo contest sponsor)
- Willow and Lake Erie Metroparks
- Wayne County Green Schools in the ADW area
- Downriver Community Conference
- Michigan Sea Grant

- *2018 Photo Contest*

A companion online photo contest that supports and furthers the outreach goals of the 2018 Watershed Community Calendar will also run during 2018 starting in January. The contest seeks photos from the public that demonstrate their connection to the freshwater resources of Southeast Michigan and pollution prevention behaviors. Winning photos will earn prizes, provided by local ADW businesses, and can be incorporated into the next calendar (2020). Follow up emails will be used to track and measure participation and changes in attitudes and awareness among contestants. The contest will be promoted in the 2018 calendar and with social media, print advertising, a public relations campaign targeting local press and by ADW members. In 2017 the ADW designed and built out the digital infrastructure needed to run the contest, developed a marketing plan and produced contest publicity materials.

- *Green Schools River Residency Program*

Each year, the ADW gives hundreds of students an opportunity to learn about watersheds, water flows and erosion, flooding, and the consequences of human activities on water quality. Made possible by a partnership between the ADW, Wayne County Green Schools and the University of Michigan, Museum of Natural History, the River Residency program provides in-school workshops focused on a 12-foot traveling stream simulation table that cycles 40



gallons of water and holds 240 pounds of plastic sediment. In 2016 and through September 2017, the ADW provided vouchers to 5 schools for a 1-day River Residency Workshop:

- Barnes Elementary, Flat Rock (the school provided additional funding to extend the program to 1 week); 450, 3rd, 4th, and 5th grade students participated.
- Sietz Middle School, Riverview (the school provided additional funding to extend the program to 2 days); 120, 7th & 8th graders participated.
- Arno Elementary, Allen Park; 110 4th graders participated.
- Bates Elementary, Woodhaven-Brownstown; 80 5th grade students participated.
- Miller Elementary, Huron (the school provided additional funding to extend the program to 1; 165 4th & 5th graders participated.
- A total of 925 students have participated in the River Residency Program. Two additional schools have accepted the 2017 offer and the events are scheduled as follows:
 - St. Pius Catholic, City of Southgate, October 24 & 25, 2017
 - Chapman Elementary, City of Rockwood, November 30 – December 1, 2017

- See attached appendices for additional detail on public education efforts that have been performed by Alliance of Downriver Watershed partners or with the support of the Alliance of Downriver Watersheds. Attachments include summary tables of displays, signage map, listings of ADW 2016 and 2017 Green Schools, and summary tables of School Partners participating in the 2016 and 2017 macroinvertebrate (bug hunt) monitoring.

**Wayne County DPS
ADW Bug Hunts 2016
Partner Schools and Participation**

Reference Number	School	School Community Location	Bug Hunt Site	Location	Sample Site Community Location	Watershed	Number of Students Spring 2016	Number of Students Fall 2016
1	Barnes Elementary	Flat Rock	HR1	Flat Rock Community Park	Flat Rock	Lower Huron	27	28
2	Flat Rock HS	Flat Rock	HR1	Flat Rock Community Park	Flat Rock	Lower Huron	25	0
3	Riverview HS	Riverview	CD4	Valley View	Riverview	Combined Downriver	0	8
4	Southgate Creative Montessori	Southgate	EC4	Grams Drain at Brest and McCann	Southgate	Ecorse Creek	29	27
5	Seitz Middle School	Riverview	CD15	Frank and Poet at Homeister	Riverview	Combined Downriver	0	28
6	Pardee Elementary	Dearborn Heights	EC7	RA Young Rec Center	Dearborn Heights	Ecorse Creek	27	28
7	Southgate Anderson HS	Southgate	CD2	SAHS East	Southgate	Combined Downriver	7	7
8	Trenton HS	Trenton	CD5A	West Road/Frank and Poet	Trenton	Combined Downriver	27	28
9	Brown Elementary	Brownstown Township	HR2	Woods Creek	Huron Township	Combined Downriver	22	25
10	Brown Elementary	Brownstown Township	HR5	Reagan Drain	Huron Township	Lower Huron	26	0
Total							190	179
								369

**Wayne County DPS
ADW Bug Hunt - Spring 2017
Partner Schools and Participation**

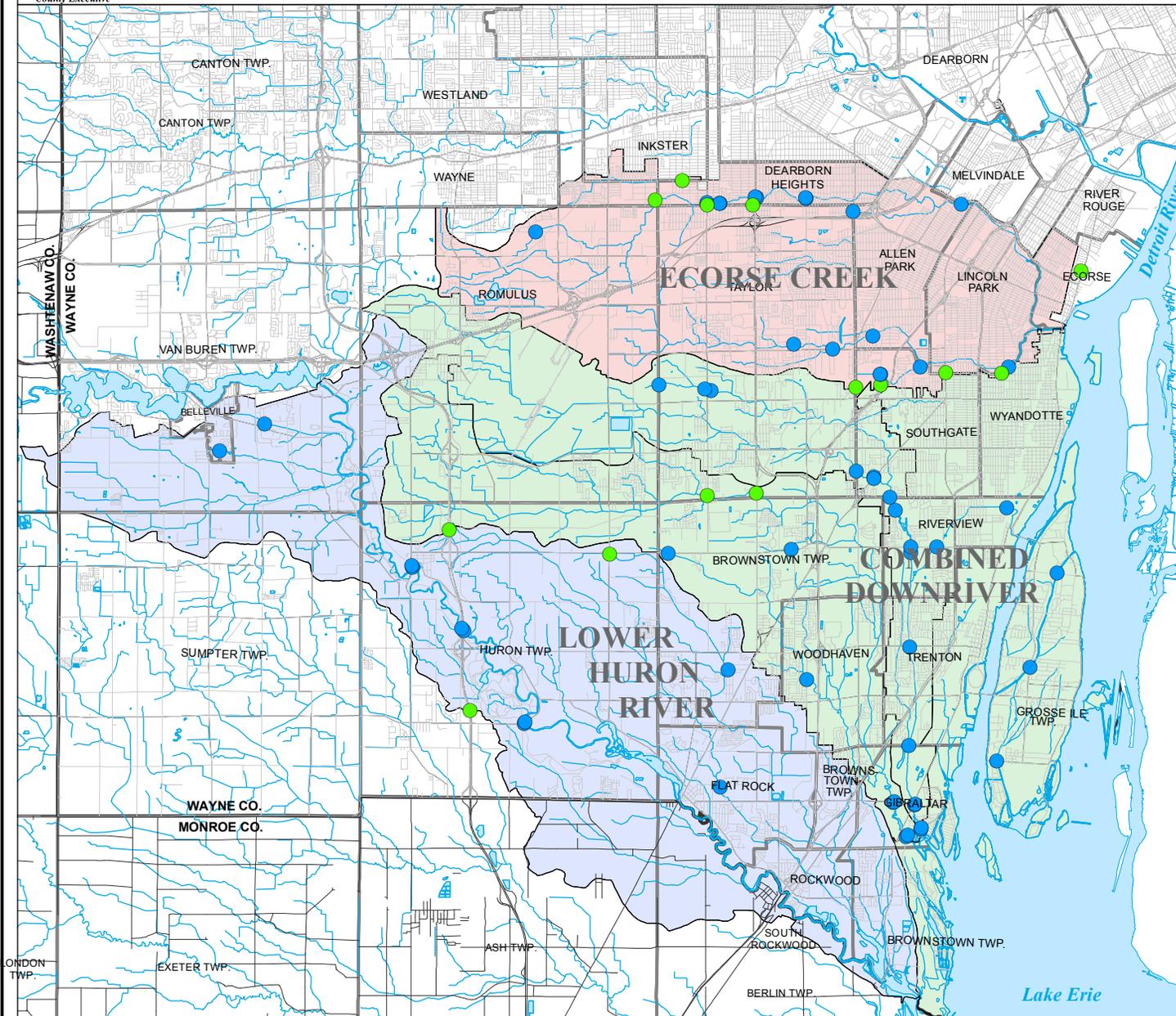
Reference Number	School	School Community Location	Bug Hunt Site	Location	Sample Site Community Location	Watershed	Number of Students Spring 2017
1	Barnes Elementary	Flat Rock	HR1	Flat Rock Community Park	Flat Rock	Lower Huron	30
2	Flat Rock HS	Flat Rock	HR1	Flat Rock Community Park	Flat Rock	Lower Huron	10
3	Southgate Creative Montessori	Southgate	EC4	Grams Drain at Brest and McCann	Southgate	Ecorse Creek	25
4	Seitz Middle School	Riverview	CD15	Frank and Poet at Homeister	Riverview	Combined Downriver	24
5	Pardee Elementary	Dearborn Heights	EC7	RA Young Rec Center	Dearborn Heights	Ecorse Creek	21
6	Southgate Anderson HS	Southgate	CD2	SAHS East	Southgate	Combined Downriver	9
7	Trenton HS	Trenton	CD5A	West Road/Frank and Poet	Trenton	Combined Downriver	29
8	Brown Elementary	Brownstown Township	HR2	Woods Creek	Huron Township	Combined Downriver	29
9	Brown Elementary	Brownstown Township	HR5	Reagan Drain	Huron Township	Lower Huron	29
10	Hedke Elementary	Trenton	CD8	Frank and Poet/Van Horn Rd	Trenton	Combined Downriver	27
Total							233



Robert A. Ficano
County Executive

ALLIANCE OF DOWNRIVER WATERSHEDS

Installed Watershed Sign Locations



LEGEND

- Rivers / streams
- Lakes
- Roads
- County boundary
- Community boundary
- Stream crossing sign (63)
- Watershed sign (17)



WAYNE COUNTY
DEPT. OF PUBLIC SERVICES
 Water Quality Management Division
 400 Monroe, Suite 400
 Detroit, Michigan 48226

File: \gis\map\mxd\asize\wayne\ADW wshed and crossing signs 2014.mxd
Date: 2.2014

2016 ADW Green Schools

	Certified School year	School	Grade level	School District	Score	Status	# of Years Recognized	City
1	2015-16	Allen Park High	High	Allen Park	20	Evergreen	4	Allen Park
2	2015-16	Allen Park Middle	Middle	Allen Park	15	Emerald	6	Allen Park
3	2015-16	Arno Elementary	Elementary	Allen Park	20	Evergreen	6	Allen Park
4	2015-16	Bennie Elementary	Elementary	Allen Park	15	Emerald	5	Allen Park
5	2015-16	Barnes Elementary	Elementary	Flat Rock	20	Evergreen	7	Flat Rock
6	2015-16	Flat Rock Community High	High	Flat Rock	20	Evergreen	6	Flat Rock
7	2015-16	Simpson Middle	Middle	Flat Rock	19	Emerald	3	Flat Rock
8	2015-16	Chapman Elementary	Elementary	Gibraltar	20	Evergreen	6	Rockwood
9	2015-16	Hunter Elementary	Elementary	Gibraltar	20	Evergreen	2	Trenton
10	2015-16	Shumate Middle	Middle	Gibraltar	17.5	Emerald	5	Gibraltar
11	2015-16	Weiss Elementary	Elementary	Gibraltar	12.5	Green	5	Woodhaven
12	2015-16	Miller Elementary	Elementary	Huron	11	Green	5	New Boston
13	2015-16	St Sebastian Catholic	K-8	Non-Public - Dearborn Hgts	16	Emerald	3	Dearborn Heights
14	2015-16	John Paul II Catholic	K-8	Non-Public - Lincoln Park	20	Evergreen	4	Lincoln Park
15	2015-16	St. Pius Catholic	K-12	Non-Public - Southgate	16	Emerald	4	Southgate
16	2015-16	Keystone Academy	Academy	PSA - Van Buren	11	Green	4	Belleville
17	2015-16	Seitz Middle	Middle	Riverview	11.5	Green	8	Riverview
18	2015-16	Bates Elementary	Elementary	Woodhaven-Brownstown	20.5	Evergreen	5	Woodhaven
19	2015-16	Wegienka Elementary	Elementary	Woodhaven-Brownstown	10	Green	1	Brownstown
20	2015-16	Yake Elementary	Elementary	Woodhaven-Brownstown	20	Evergreen	5	Woodhaven
21	2015-16	Lincoln Center, The		Wyandotte	16.5	Emerald	2	Wyandotte
22	2015-16	Madison School		Wyandotte	20	Evergreen	1	Wyandotte
23	2015-16	Roosevelt High	High	Wyandotte	18.5	Emerald	6	Wyandotte

2017 ADW Green Schools

	Certified School year	ADW School - 2017	Grade Level	School District	Score	Status	# of Years Recognized	City
1	2016-17	Allen Park High	High	Allen Park	22.5	Evergreen	5	Allen Park
2	2016-17	Arno Elementary	Elementary	Allen Park	21	Evergreen	7	Allen Park
3	2016-17	Lindemann Elementary	Elementary	Allen Park	15.5	Emerald	6	Allen Park
4	2016-17	Belleville High	High	VanBuren	20.5	Evergreen	3	Belleville
5	2016-17	Wegienka Elementary	Elementary	Woodhaven-Brownstown	15	Emerald	2	Brownstown
6	2016-17	St Sebastian Catholic	K-8	Non-Public - Dearborn Hgts	16.5	Emerald	4	Dearborn Heights
7	2016-17	Barnes Elementary	Elementary	Flat Rock	21.5	Evergreen	8	Flat Rock
8	2016-17	Flat Rock Community High	High	Flat Rock	17.5	Emerald	7	Flat Rock
9	2016-17	Shumate Middle	Middle	Gibraltar	17	Emerald	6	Gibraltar
10	2016-17	Parke Lane	Elementary	Grosse Ile	11	Green	1	Grosse Ile
11	2016-17	Seitz Middle	Middle	Riverview	25	Evergreen	9	Riverview
12	2016-17	Chapman Elementary	Elementary	Gibraltar	23.5	Evergreen	7	Rockwood
13	2016-17	St. Pius Catholic	K-12	Non-Public - Southgate	15	Emerald	6	Southgate
14	2016-17	Taylor Virtual Learning Academy	Academy	Taylor	15.5	Emerald	1	Taylor
15	2016-17	Bates Elementary	Elementary	Woodhaven-Brownstown	16.5	Emerald	6	Woodhaven
16	2016-17	Yake Elementary	Elementary	Woodhaven-Brownstown	21	Evergreen	6	Woodhaven
17	2016-17	Lincoln Center, The	Special Needs	Wyandotte	19	Emerald	3	Wyandotte
18	2016-17	Madison School		Wyandotte	15	Emerald	2	Wyandotte
19	2016-17	Roosevelt High	High	Wyandotte	15.5	Emerald	7	Wyandotte

Appendix B

2016 -2017 Alliance of Rouge Communities (ARC) Bi-Annual Report

Please see the ARC website at:

<http://www.allianceofrougecommunities.com/>

for a copy of the bi-annual report

Appendix C

Operations and Maintenance of Sanitary Sewers

2018 VBT Asset Management Program Summary



October 5, 2017

Mr. James Taylor
Director of Public Services
Charter Township of Van Buren
46425 Tyler Road
Van Buren, MI 48111

Re: Proposal for Professional Engineering Services
Stormwater, Asset Management, and Wastewater (SAW) Grant Program

Dear Mr. Taylor:

Fishbeck, Thompson, Carr & Huber, Inc. (FTCH) is pleased to submit the following proposal to assist the Charter Township of Van Buren (Township) in implementing a sanitary sewer Asset Management Program (AMP) through the Michigan Department of Environmental Quality (MDEQ) SAW Grant Program.

Scope of Services

The Township applied for a SAW Grant in 2013 to implement a sanitary AMP. The SAW Grant will be awarded to the Township in October 2017. The AMP total is \$777,777 with a Township match of \$77,777 for a grant of \$700,000. The Township will have three years from the date of the grant agreement to complete the project.

The SAW Grant Asset Management Plan is required to include the following:

- a) Asset Inventory and Condition Assessment
- b) Level of Service (LOS)
- c) Criticality of Assets
- d) Operation and Maintenance (O&M) Strategies/Revenue Structure
- e) Long-Term Funding/Capital Improvement Planning

The following tasks, listed in accordance with SAW Grant Application Appendix C, will comply with above grant requirements:

Task 1 – Asset Inventory

- Locate and survey the rim elevations of up to 2,816 sanitary manholes, and incorporate the data into the Township's geographic information system (GIS) database.
- Work with Township GIS staff to determine the gaps in the GIS and computerized maintenance management systems (CMMSs), and assist in updating them.

Task 2 – Condition Assessment

- Inspect up to 2,816 sanitary manholes using a Manhole Assessment Certification Program (MACP) form, and incorporate the inspection data into the GIS database. The manhole inspection will rate the manholes and identify manholes requiring rehabilitation.
- Inspect the sanitary pump stations. This will include developing a list of equipment at each station and identifying their age and major attribute information such as size, material, etc., as well as the condition of the equipment, structures, electrical, supervisory control and data acquisition (SCADA), and power systems.



- Inspect the Equalization Basin. This will include developing a list of equipment and identifying their age and major attribute information such as size, material, etc., as well as the condition of the equipment, structures, electrical, SCADA, and power systems.

Task 3 – Software/Hardware

- This task includes software and hardware the Township will purchase using the SAW Grant funds. FTCH will assist if needed.

Task 4 – Sewer Televising

- Sub-contract with a sewer televising contractor to inspect up to 100,000 feet of sanitary sewer in accordance with the Pipe Assessment Certification Program (PACP). The sewers chosen for this program will be based on location and age (constructed prior to 1997). The data from the inspections will be incorporated into the GIS database. The inspection will identify sewer reaches requiring rehabilitation.

Task 5 – Level of Service

LOS is a measure of the amount and/or quality of the public facility that must be provided to meet the community's basic needs and expectations.

- Assist the Township Board in developing a baseline for the existing LOS for the sanitary system based on minimum O&M activities and corrective action for critical failures in the system.
- Develop additional LOS criteria to represent increasing levels of annual spending requirements for O&M and capital/system renewal projects.
- Identify LOS components for inspection, preventative maintenance, corrective maintenance, and system renewal of each asset group (such as manholes, pipes, lift stations, etc.).

Task 6 – Revenue Structure

- Assist the Township in developing a long-term rate structure based on the capital improvement and O&M needs of the system.

Tasks 5 – Other

- Develop Asset Criticality:
 - Rate the probability of failure (POF) of the asset on a scale of 1 to 5 (low to high) using criteria such as maintenance history, failure history, and remaining percentage of useful life (or years remaining).
 - Review the collection system assets for their importance to the community, and develop a consequence of failure (COF) rating structure.
 - Compute the Business Risk Exposure (BRE) of the asset by multiplying the POF and COF.
 - Prioritize the improvements based on the BRE.
- Using the BRE, remaining useful life, and repair/replacement costs, develop 5-year and 20-year Capital Improvement Plans that include:
 - Grouping projects based on the type of work and asset classes.
 - A schedule for the repair/replacement projects through the year 2039.
 - Anticipated project costs and annual system costs through the year 2039.
- Develop a Preventative Maintenance Program:
 - Review current preventative maintenance history and system operations.
 - Identify gaps in the Preventative Maintenance Program and in system operations.



- Develop a revised Preventative Maintenance Program outlining tasks by asset, and incorporate the program into the Township’s CMMS database for scheduling and recording work orders.
- Review current staffing plan and update it based on the hours and staff needed to comply with the revised Preventative Maintenance Program.
- Incorporate all the analysis, findings, and recommendations into a final Asset Management Plan report.

Schedule

In accordance with the SAW Grant requirements, the AMP must be completed by October 30, 2020. Attached is a preliminary schedule for the implementation for the program.

Professional Services Fees

FTCH proposes to complete the services on a time and material basis based on the following table:

Detailed Breakdown	Twp	FTCH	Other	Total
1 Inventory				\$173,577
GPS Structures (2,816)	\$2,500	\$34,000		
GIS/CMMS Update	\$97,077	\$40,000		
2 Condition Assessment (excluding TV)				\$285,200
Manhole Inspection (2,816)	\$11,700	\$230,000		
Pump Station Inspection (16 PS)	\$1,000	\$ 10,000		
EQ Basin Inspection	\$500	\$2,000		
Sewer Televising Review		\$30,000		
3 Software/Hardware				\$15,000
Software			\$5,000	
Hardware			\$10,000	
4 Sewer Televising (Contractor)				\$187,000
Televising Sewers > 20 years old			\$187,000	
5 Level of Service				\$14,000
Level of Service Determination	\$4,000	\$10,000		
6 Rate Structure				\$21,000
Rate Methodology Development	\$3,000	\$3,000	\$15,000	
7 Other				\$82,000
Asset Criticality	\$2,000	\$25,000		
Develop CIP	\$2,000	\$12,000		
Develop Preventative Maint Program	\$2,000	\$12,000		
Final Report	\$2,000	\$25,000		
TOTAL	\$127,777	\$433,000	\$217,000	\$777,777



Authorization

If you concur with our scope of services, please sign in the space below as the Township representative authorized to give Notice-to-Proceed to FTCH for this project, and return to the attention of Maria E. Sedki, PE (mesedki@ftch.com). This proposal is subject to the Terms and Conditions for Professional Services of our existing contract with the Township for General Township Engineering Services, dated June 7, 2017. All federal, state, and local application/permit fees and costs are to be paid by the Township. Invoices will be submitted every four weeks and payment is due upon receipt.

If you have any questions or require additional information, please contact me at 248.324.1228 or mesedki@ftch.com. We look forward to working with you to develop a practical and effective Water Asset Management Program.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.

Handwritten signature of Maria E. Sedki in black ink.

Maria E. Sedki, PE

Handwritten signature of David L. Potter in black ink.

David L. Potter, PE, CSI-CCCA

nac
Attachments
By email

Authorization:

Charter Township of Van Buren, Michigan

_____ Date: _____
James T. Taylor
Director of Public Services



August 11, 2017

Mr. James Taylor
Director of Public Services
Charter Township of Van Buren
46425 Tyler Road
Van Buren, MI 48111

Re: Proposal for Professional Engineering Services
2018 Water Asset Management Plan (AMP)

Dear Mr. Taylor:

Fishbeck, Thompson, Carr & Huber, Inc. (FTCH) is pleased to submit the following proposal to assist the Charter Township of Van Buren (Township) in submitting the 2018 Water Asset Management Plan (AMP) to the Michigan Department of Environmental Quality (MDEQ) in accordance with the MDEQ's notice dated May 20, 2016.

Background

The Township owns and operates its own water distribution system, which includes approximately 110 miles of water main ranging in size from 4 to 20 inches in diameter, a 2 million gallon water storage tower, and four pressure reducing valve (PRV) structures. The Great Lakes Water Authority (GLWA) supplies the water to the Township through four master meters just upstream of the four PRVs. There are no booster stations or pressure districts in the Township.

In their May 20, 2016, notice, the MDEQ requested all community water systems that serve greater than 1,000 people submit a water AMP by January 1, 2018, in accordance with the 2009 revisions to the Michigan Safe Drinking Water Act, 1976 PA399. A memo titled *Asset Management Guidance for Submission to the Department of Environmental Quality* was issued in December 2016 by the MDEQ clarifying what should be included in the AMP. It stated that, at a minimum, the water AMP is to include:

- A. Asset Inventory and Condition Assessment
- B. Asset Criticality
- C. Level of Service (LOS) Goals
- D. 5 and 20 year Capital Improvement Plans (CIPs)
- E. Funding Structure and Rate Methodology

Scope of Services

Based on our meeting on July 19, 2017, and the MDEQ requirements, we have developed the following scope of services to develop the Township's water AMP which provides the road map to implementing an Asset Management Program for the water distribution system and submit it by the January 1, 2018, deadline. This proposal does not include the scope or fee to implement the program, which will be an ongoing process that will take several years. As such, FTCH proposes to:

1. Attend a Kickoff Meeting with the Township to further discuss the scope and schedule, and to review existing information regarding the water distribution system assets and their condition, and determine the gaps in the data.

2. Prepare a draft water AMP schedule and program implementation costs including components discussed with the Township.
3. Work with Township finance staff to determine the current operations, maintenance, and repair (OM&R) budget, and how it will be incorporated into the water AMP going forward. A detailed Rate Analysis Study will not be part of this AMP, but could be proposed as part of the long-term Asset Management Program.
4. Work with the Township's Geographic Information System (GIS) technician to create the necessary maps to include in the water AMP report, including:
 - a. Overall map of the water system, including location of all PRV Structures, master meters, and tower.
 - b. Map showing the water main system by diameter.
 - c. Map showing the water main system by age.
5. Work with Township Staff to create a spreadsheet of the Horizontal Assets including all hydrants, gate valves, and water main segments, and assign a unique ID to each of them.
6. Work with the Township staff to create a spreadsheet of the Vertical Assets located at the four PRV structures and at the storage tower, and assign a unique ID to each of them.
7. Prepare the draft water AMP report that will discuss which of the five core components of the water AMP the Township is currently working on, and what will be performed in the following years, including:
 - a. Determining the LOS.
 - b. Developing the CIPs.
 - c. Preparing a detailed Rate Analysis Study, if desired by the Township.The AMP report will include a schedule for completion of the listed work.
8. Meet with Township staff to review the draft report prior to finalizing and submitting to the MDEQ.
9. Prepare the Final AMP Report and submit to the MDEQ, subsequent to incorporating comments from Township staff.

Please note, the scope and fee do not include any field work or GIS work to implement the Asset Management Program.

Professional Services Fees and Schedule

FTCH proposes to complete the work and produce the final AMP report for a lump sum fee of Sixteen Thousand Two Hundred Dollars (\$16,200).

Assuming FTCH receives the Notice-to-Proceed by to September 1, 2017, FTCH will complete the work and submit the final AMP report to the MDEQ by December 29, 2017.

Authorization

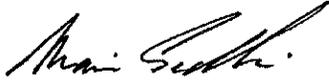
If you concur with our scope of services, please sign in the space below as the Township representative authorized to give Notice-to-Proceed to FTCH for this project. This proposal is subject to the Terms and Conditions for Professional Services of our existing contract with the Township for General Township Engineering Services, dated June 7, 2017. All federal, state, and local application/permit fees and costs are to be paid by the Township. Invoices will be submitted every four weeks and payment is due upon receipt.

Mr. James Taylor
Page 3
August 11, 2017

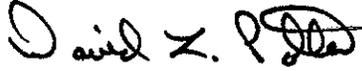
If you have any questions or require additional information, please contact me at 248.324.1228 or mesedki@ftch.com. We look forward to working with you to develop a practical and effective Water Asset Management Plan.

Sincerely,

FISHBECK, THOMPSON, CARR & HUBER, INC.



Maria E. Sedki, PE



David L. Potter, PE, CSI-CCCA

nac
By email

Authorization:

Charter Township of Van Buren, Michigan

_____ Date: _____
James T. Taylor
Director of Public Services

Appendix D

2016 and 2017 Monitoring Reports

Rouge River Benthic Monitoring Program Spring 2016 Report

Rouge River Benthic Macroinvertebrate Monitoring Program Fall 2016 Report

Rouge River Watershed 2016 Winter Stonefly Search

Reports for 2017 are available at Alliance of Rouge Communities (ARC) website at:

<http://www.allianceofrougecommunities.com/>



www.therouge.org
4901 Evergreen Rd., KM
Dearborn, MI
48128
(313) 792-9621

Rouge River Benthic Monitoring Program Spring 2016 Report

This report covers benthic macroinvertebrate monitoring at 53 sites on Rouge River tributaries and branches in the spring of 2016. Thirty-two sites were sampled by Friends of the Rouge (FOTR) volunteers and staff, fifteen were sampled by Wayne County Department of Public Services Water Quality Management Division, three were sampled by Susan Thompson, one was sampled by Schoolcraft College students and two were sampled by Wayne State University's Ecology Class.

FRIENDS OF THE ROUGE BENTHIC MONITORING PROGRAM

FOTR's benthic monitoring program was started in 2001 to involve a large number of volunteers in monitoring the health of the watershed by sampling the creeks of the Rouge River. The types and number of benthic macroinvertebrates found can be used to assess water quality. Each team of volunteers samples two sites under the direction of a trained team leader. Samples of each organism are collected and field identifications are verified in the lab. The program is funded by the Alliance of Rouge Communities and in cooperation with Wayne County Department of Public Services Water Quality Management Division.



Most of Friends of the Rouge's sites were sampled on April 16 during the Spring Bug Hunt in which 102 people participated. Groups participating in the event were Cub Scout Pack 247 (6 groups), Wayne State University (3 groups), Marygrove College, and the Antea Group.

Overall Scores

The majority of sites (30/53 or 57%) had FAIR Stream Quality Index scores (SQI) with an average score of 29 (Table 3). Three sites rated EXCELLENT and 12 rated GOOD. Eight sites had POOR SQI. The number of taxa at each site ranged from a low of five at three Upper branch sites (Bell1, Tar2, Up2) to a high of 26 at one Johnson Creek site (John2). The number of EPT (see sidebar) ranged from zero to seven. The seven were at one Johnson Creek site (MR-27) and one Middle Rouge site (MR-20). Seven sensitive families were found at eight sites (see Table 4) including three stonefly families, one mayfly family, one caddisfly family, dobsonflies and gomphid (clubtail) dragonfly nymphs.

Stream Quality Index, Taxa, EPT and Sensitive Families

Each site is given a **Stream Quality Index (SQI)** which is determined by weighting each type and number of organisms found by their sensitivity ratings. A higher proportion of sensitive organisms such as mayflies and caddisflies results in a higher score. A number of different organisms also results in a high score. The SQI is then given a rating:

>48 = EXCELLENT
34-48 = GOOD
19-33 = FAIR
<19 = POOR

Number of **taxa** represents the number of different families of organisms. A higher number of taxa indicate a healthier site.

EPT refers to the number of mayfly, caddisfly and stonefly families found; these three orders contain some of the most sensitive organisms.

Sensitive Families refers to insects that are rated 1 on the Hilsenhoff Sensitivity Index.

Trend Analysis

To determine whether the Rouge River is improving over time, SQI scores are averaged for each subwatershed and Johnson Creek (a cold water tributary) and the slope is plotted. A positive slope indicates an upward trend (scores increasing); a negative slope indicates a downward trend (scores decreasing). The trend is significant if the *p*-value is less than 0.05.

Data Trends

Table 1 contains the data trends by subwatershed/creek. The Johnson Creek, the Middle 1 and the Middle 3 subwatershed are showing significant positive trends. No other subwatersheds had significant trends.

Branch	slope	p-value	True trend	Subwatershed average score	Water Quality Rating
Main 1-2	0.4081	0.1219	no trend	27	Fair
Main3-4*	NA	NA	NA	25	Fair
Upper	-0.1824	0.2698	no trend	24	Fair
Johnson Creek	0.6414	0.0045	yes, positive	39	Good
Middle 1	0.7322	0.0017	yes, positive	29	Fair
Middle 3	0.8782	0.0242	yes, positive	20	Fair
Lower 1	0.0959	0.6126	no trend	30	Fair
Lower 2	0.1170	0.6690	no trend	26	Fair

*no sites sampled spring 2016

In addition to the trend analysis by subwatershed, a site-by-site analysis of all the sites was done (Table 2). The majority of the sites had no trend. Two sites had a statistically significant positive trend: John2 and Ton2. John2 is a Johnson Creek site that normally scores very high. Ton2 is a Tonquish Creek site impacted by urban development that suffers from poor macroinvertebrate diversity. One site had a statistically significant negative trend: Peb3. This site is located on Pebble Creek downstream of a recent dam removal.

Site	p-value	Slope	True trend	Site average score	Water Quality Rating
Peb3	0.0344	-4.0343	yes, negative	27	Fair
John2	0.0070	1.1996	yes, positive	46	Good
Ton2	0.0290	0.9974	yes, positive	19	Fair

Lower Branch

Thirteen sites were sampled on the Lower Branch of the Rouge (see Table 3). McClaugherty Creek was sampled at one location (LR-7), Fellows Creek was sampled at three locations (Fel1, Fel2 LR-5) and Fowler Creek at one (Fowl2). On the main branch of the Lower, eight sites were sampled.

While sampling Fel2, a team of WSU students were alarmed by a large amount of construction material dumped along the stream including concrete poured down the bank (see photo below). FOTR contacted Canton Township who sent out an inspector to meet with the homeowner and tell them to clean it up. This is a great example of how this program helps to unearth problems and get them addressed.



The Lower subwatershed did not have a significant trend and most sites scored FAIR (average 26). Three sites had GOOD scores (Fel2, LR-6 and Low3), all the rest scored FAIR. The number of taxa ranged from 8-16 and EPT: 0-3. One sensitive family was found: free-living (Rhyacophilidae) caddisflies at LR-8. This is the first time this species was found at LR-8 though it has been found upstream at Low2.

Eleven sites had past data for three years or more (Chart 1). Three sites were above a standard deviation of average (Fel2, LR-6 and LR-10) and two sites below (LR-8 and LR-12). No sites showed any trend when analyzed by site.

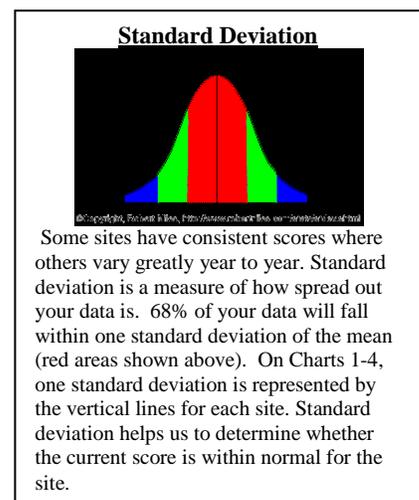
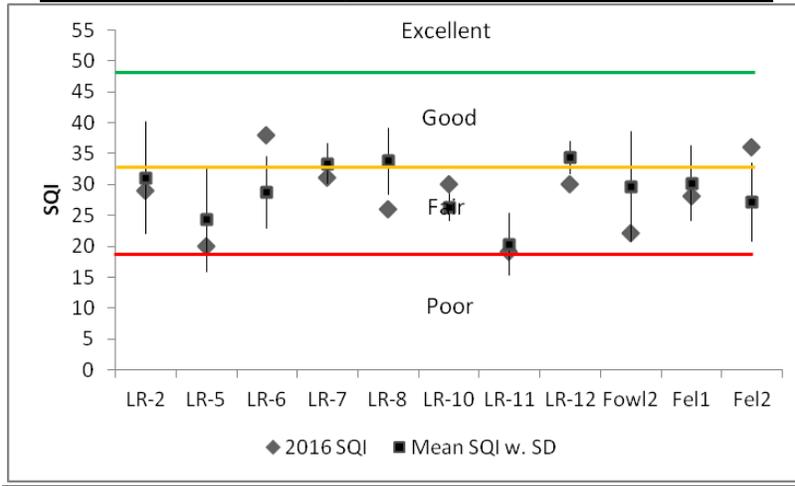


Chart 1: Lower Branch SQI and Mean with Standard Deviation



Main Branch

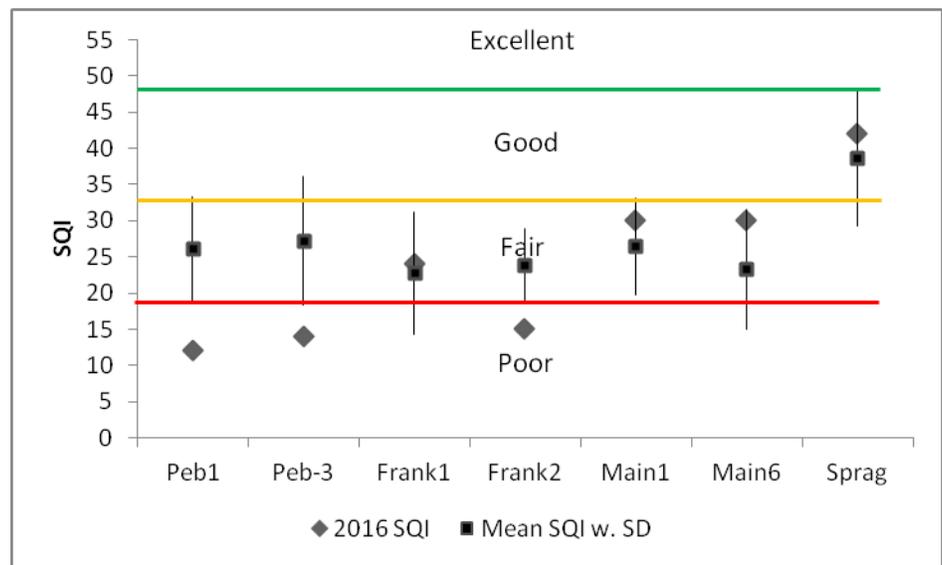
Ten sites on the Main Branch were sampled. Seven were on tributaries: Evans (Evan2), Franklin (Frank1, Frank2), Pebble (Peb1, Peb3), Sprague (Sprag) and Quarton Creeks (Main11). The Main1/2 subwatershed is not showing any trend (Table 1). The majority (8) of the scores were FAIR (average 25). There were two GOOD SQIs (MN-5, Sprag), three were POOR (Frank2, Peb1, Peb3). The number of taxa ranged from 6-19 and EPT 1-4. Sensitive clubtail dragonfly larvae (Gomphidae) and dobsonflies (Corydalidae) were found in Sprague Creek in Troy (Sprag).



Large native mussels including these white heelsplitters (*Lasnigona complanata*) were found at Firefighters Park in Troy (Main1). FOTR has identified four species of native mussels at this site and the Main branch has the highest diversity of native mussels in the watershed. There are only 11 species still found live in the Rouge River system.

For the seven sites with three years or more of past data (Chart 2), three sites were below a standard deviation of the mean (Peb1, Peb3 and Frank2). Peb3 also had a negative trend when analyzed by site (Table 2)

Chart 2: Main Branch & Tributary SQI and Mean with Standard Deviation



Middle Branch

Twenty sites were sampled on the Middle branch including four tributaries: Bishop (Bish2), Ingersoll (Ing1), Johnson (John2, MR-23, MR-26, John6, MR-22, MR-25, MR-27, John3) and Tonquish Creeks (Nton, Ton2, MR-16, Ton1).

The team that sampled John3 found a 15 inch brown trout (see photo below), part of a population once stocked by the Department of Natural Resources. Stocking was discontinued when surveys revealed a decline in the number of reddsidedace (an endangered minnow) in areas where large numbers of these non-native fish were found.



Average scores for the Johnson Creek, the Middle1 and the Middle3 subwatersheds are all showing positive trends (Table 1). The average score was GOOD (35) and the Middle Branch had three EXCELLENT SQIs (John2, MR-27, MR-20). The score for MR-20 was unusually high at 52. There were no POOR scores, 7 GOOD and ten FAIR. The number of taxa ranged from 9-26 and EPT 1-7. Sensitive families were found in most of the Johnson Creek sites. Sensitive families included slender winter (Capniidae) stoneflies (MR-22) Perlodid stoneflies (John2, MR-25 and MR-27), Perlid stoneflies (MR-20 and John2, pronggill (Leptophlebiidae) mayflies (John3, MR-22, MR-25 and MR-27).

For the seventeen sites with past data (Chart 3 and 4), three site SQIs were above a standard deviation (John2, Bish2 and MR-16) and two site SQIs were below (John3, MR-23). When analyzed site by site, two sites showed a trend and both were positive: John2 and Ton2 (Table 2).

Chart 3: Middle Branch Tributary SQI and Mean with Standard Deviation

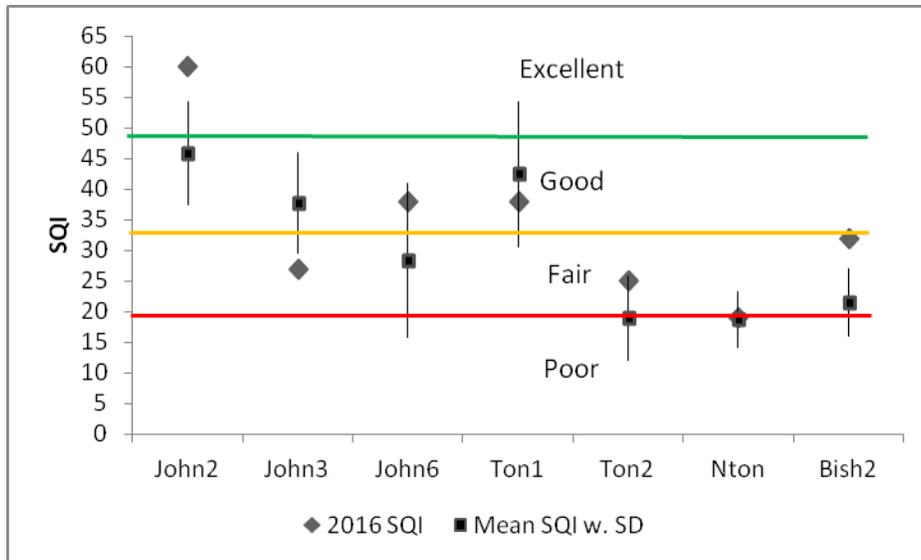
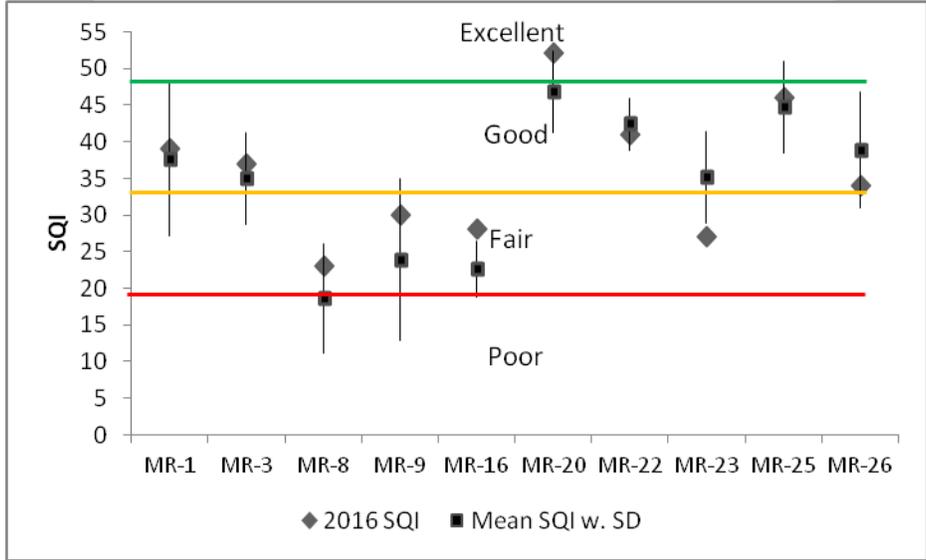


Chart 4: Middle Branch SQI and Mean with Standard Deviation



Upper Branch

Ten Upper branch sites were sampled this spring, including five tributaries: Beitz (UR-5), Bell (Bell1, Bell2, Bell3), Minnow Pond (Min1, Min3), Seeley (See2, See3) and Tarabusi Creeks (Tar2).

The Upper Subwatershed did not show any overall trend (Table1). The average score was POOR (19). Five sites scored POOR (Bell1, Bell2, Bell3, Tar2, Up2). All the rest of the sites scored FAIR. There were no GOOD or EXCELLENT scores. The number of taxa ranged from 5-11 and EPT 1-3. There were no sensitive families found.



Minnow Pond and Seeley Creek had the highest scores for the Upper subwatershed. An American toad came by to check on the action at Min3.

For the nine sites with past data (Chart 5), four sites were below a standard deviation of the mean (Bell1, Bell2, Tar2, Up2). In the trend analysis for sites, no Upper sites showed any trend.

Chart 5: Upper Branch SQI with Mean and Standard Deviation



Spring Bug Hunt 2016

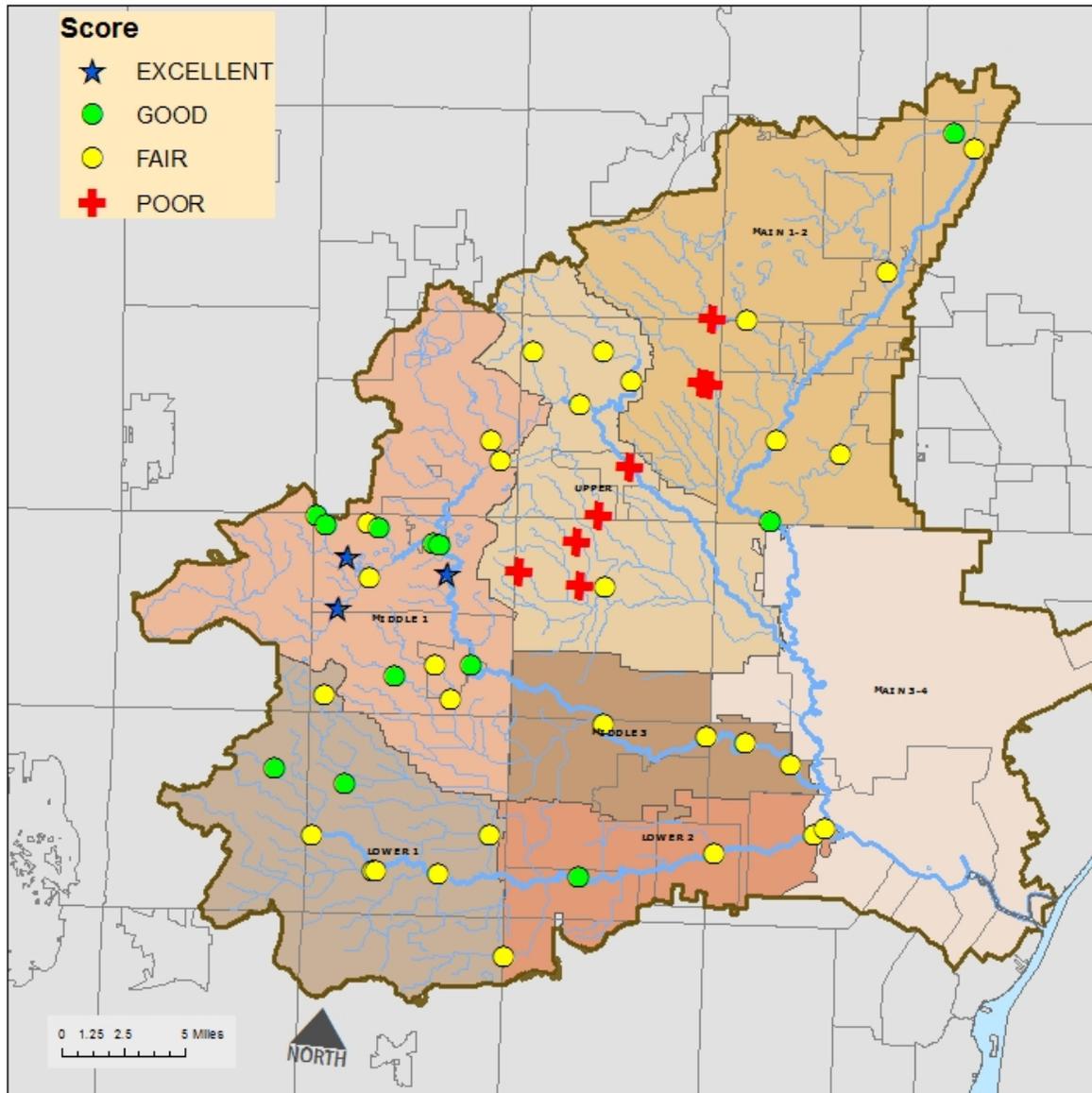


Table 3: Stream Quality Index, score, taxa, EPT (mayfly, stonefly and caddisfly families) and sensitive families found													
Branch	FIELDID	Stream Name	Site Name	Location	Latitude	Longitude	SQI	Score	Taxa	EPT	Sens	Collector	sensitive families
Lower	LR-7	McClougherty Creek	McClougherty	Ecorse & Hannan	42.2484	-83.4248	31	FAIR	15	1	0	WC	
Lower	LR-5	Fellows Creek	Fellows Lotz Finley Dr	Finley Drive	42.300561	-83.43748	20	FAIR	9	0	0	FOTR	
Lower	Fel1	Fellows Creek	Top of Hill Ct	Napier/Powell	42.35729	-83.53988	28	FAIR	8	1	0	FOTR	
Lower	Fel2	Fellows Creek	Vintage Valley	Ford/Ridge	42.31932	-83.5246	36	GOOD	14	3	0	FOTR	
Lower	Fowl2	Fowler Creek	Fowler Beck	Beck, N of Geddes	42.28226	-83.50515	22	FAIR	8	2	0	FOTR	
Lower	LR-11	Lower Rouge	Ford Field	Brady & Cherry Hill	42.309888	-83.24854	19	FAIR	10	1	0	WC	
Lower	LR-11A	Lower Rouge	Ford Field east	east of Ford Field	42.312568	-83.241523	23	FAIR	12	1	0	WC	
Lower	LR-8	Lower Rouge	Ridge Proctor	Ridge & Proctor	42.295976	-83.541846	26	FAIR	11	2	1	FOTR	Rhyacophilidae
Lower	LR-2	Lower Rouge	WTUA	Geddes/Beck	42.281962	-83.503009	29	FAIR	12	1	0	WC	
Lower	LR-12	Lower Rouge	Morton Taylor	east of Morton Taylor	42.282317	-83.466103	30	FAIR	12	2	0	WC	
Lower	LR-10	Lower Rouge	Inkster	John Daly north of Michigan	42.298506	-83.305839	30	FAIR	13	3	0	WC	
Lower	LR-6	Lower Rouge	Wayne WDM	Wayne Rd W	42.285	-83.383888	38	GOOD	16	2	0	WC	
Lower	Low3	Lower Rouge	Gotfredson		42.323651	-83.565967	43	GOOD	14	3	0	FOTR	
Main	Evan2	Evans Creek	LTU	10 Mile/Northwestern	42.474374	-83.246909	19	FAIR	9	1	0	FOTR	
Main	Frank2	Franklin Creek	Ink Pump Sta	Inkster & Farmington	42.529325	-83.325381	15	POOR	6	1	0	FOTR	
Main	Frank1	Franklin Creek	Franklin Cider Mill	14 Mile/Franklin Rd	42.53024	-83.30585	24	FAIR	10	1	0	FOTR	
Main	Main1	Main Rouge	FF Pk	Coolidge/I-75	42.60991	-83.17984	30	FAIR	12	2	0	FOTR	
Main	Main6	Main Rouge	Sfld Civic Ctr	Civic Center Dr/Telegraph	42.47886	-83.2845	30	FAIR	13	1	0	FOTR	
Main	MN-5	Main Rouge	Bridge St	Bridge w of Telegraph	42.443614	-83.284906	36	GOOD	14	2	0	WC	
Main	Peb1	Pebble Creek	Danvers Ct	28314 Danvers Ct	42.50133	-83.32912	12	POOR	7	1	0	FOTR	
Main	Peb3	Pebble Creek	Pebble d/s Dam	Danvers Drive	42.500849	-83.324474	14	POOR	7	1	0	FOTR	
Main	Main11	Quarton Branch	Quarton at Lakeside	Lakeside/Midland Dr	42.554445	-83.226312	27	FAIR	10	1	0	FOTR	
Main	Sprag	Sprague Creek	Main Lloyd Stage	6685 Coolidge	42.61623	-83.19174	42	GOOD	19	4	2	FOTR	Corydalidae, Gomphidae
Middle	Bish2	Bishop Creek	Bishop Scarborough	10 Mile/Meadowbrook	42.47131	-83.45151	32	FAIR	14	1	0	FOTR	
Middle	Ing1	Ingersoll Creek	Brookfarm Park	Willowbrook/10 Mile	42.46293	-83.44552	30	FAIR	14	1	0	FOTR	
Middle	John3	Johnson Creek	6M NV	6 Mile/Beck	42.40844	-83.51693	27	FAIR	12	3	1	FOTR	Leptophlebiidae
Middle	MR-23	Johnson Creek	Maybury north	8 Mile	42.432475	-83.520006	27	FAIR	10	1	0	WSU	
Middle	MR-26	Johnson Creek	Napier Rd	8 Mile/Napier	42.434306	-83.550725	34	GOOD	13	1	0	ST	
Middle	John6	Johnson Creek	Hines	Hines/Sheldon	42.42546	-83.48138	38	GOOD	13	3	0	FOTR	
Middle	MR-22	Johnson Creek	Maybury south	7 Mile N & Napier	42.43033	-83.544423	41	GOOD	18	6	2	ST	Leptophlebiidae, Capniidae
Middle	MR-25	Johnson Creek	Maybury East	Beck/Main St	42.43058	-83.5135	46	GOOD	19	5	2	WSU	Leptophlebiidae, Perlodidae
Middle	MR-27	Johnson Creek	Ridge	Ridge S of 7 Mile	42.41672	-83.531253	52	EXCELLENT	25	7	2	ST	Leptophlebiidae, Perlodidae
Middle	John2	Johnson Creek	5M NV	5 Mile/Ridge	42.39424	-83.534404	60	EXCELLENT	26	6	2	FOTR	Perlidae, Perlodidae
Middle	MR-8	Middle Rouge	Inkster Rd	W of Inkster, S of Hines	42.34893	-83.31455	23	FAIR	11	1	0	WC	
Middle	Mid5	Middle Rouge	Helms Haven	Hines/Outer Dr	42.33959	-83.26481	26	FAIR	11	2	0	FOTR	
Middle	MR-9	Middle Rouge	Wallaceville	E of Beech Daly	42.34732	-83.29135	30	FAIR	12	2	0	WC	
Middle	MR-3	Middle Rouge	Plym Riverside	S of Plymouth	42.37402	-83.45532	37	GOOD	16	2	0	WC	
Middle	MR-1	Middle Rouge	Northville Rec W	Hines/7 Mile	42.42487	-83.47712	39	GOOD	16	2	0	WC	
Middle	MR-20	Middle Rouge	Waterford Bd	Waterford Bend	42.411952	-83.471703	52	EXCELLENT	24	7	1	WC	Perlidae
Middle	Nton	Tonquish Creek	S Evergreen St	Harvey & Penniman	42.37312	-83.47572	19	FAIR	9	1	0	FOTR	
Middle	Ton2	Tonquish Creek	Ann Arbor Rd	Ann Arbor Rd/Lilley	42.35809	-83.46507	25	FAIR	11	1	0	FOTR	
Middle	MR-16	Tonquish Creek	Canoe Pk	W of Ann Arbor Trail/Hines	42.3519	-83.375	28	FAIR	12	1	0	WC	
Middle	Ton1	Tonquish Creek	Plym Twp Pk	Beck/Ann Arbor Tr	42.36701	-83.49895	38	GOOD	14	3	0	FOTR	
Upper	UR-5	Beitz Creek	Beitz Creek/6 Mile	6 Mile west of Farmington Rd	42.411266	-83.379288	23	FAIR	11	1	0	WC	
Upper	Bell1	Bell Branch	Bicentennial Park	7 Mile/Newburgh Rd	42.42924	-83.39666	9	POOR	5	0	0	FOTR	
Upper	Bell3	Bell Branch	Livonia 6 Mile	6 Mile/Farmington	42.41015	-83.39285	17	POOR	8	1	0	FOTR	
Upper	Bell2	Bell Branch	Schoolcraft College	6 Mile/Haggerty	42.415119	-83.429007	18	POOR	9	1	0	Sch	
Upper	Min3	Minnow Pond	Dunckel	12 Mile/OL	42.500565	-83.37127	23	FAIR	10	1	0	FOTR	
Upper	Min1	Minnow Pond	Minnow 13 M	13 Mile/Farmington	42.51274	-83.38905	29	FAIR	10	1	0	FOTR	
Upper	See2	Seeley Creek	Sleepy Hollow	Drake/11 Mile	42.48927	-83.40099	21	FAIR	7	3	0	FOTR	
Upper	See3	Seeley Creek	Kennedy Ct	Kennedy Court	42.51073	-83.4304	25	FAIR	10	2	0	FOTR	
Upper	Tar2	Tarabusi Creek	Tara 8 M	8 Mile/Gill	42.441084	-83.38423	14	POOR	5	1	0	FOTR	
Upper	Up2	Upper Rouge	Shiawasee Park	Shiawassee/Power	42.46323	-83.36811	15	POOR	5	1	0	FOTR	

Thank you to all the **volunteers** and **Team Leaders, Wayne County** for sampling and providing data for fifteen sites and doing the trend analysis, **Bruce McCulloch** for graphing data and advising us, **University of Michigan-Dearborn** for providing the meeting place for the Spring Bug Hunt and a lab for identification night, **Sue Thompson** for sampling additional sites, **Wayne State University** students for sampling two sites and **Diane O'Connell** and **Schoolcraft College** students for sampling one site.

Fall Bug Hunt - Oct. 15, 2016 9am-4pm Schoolcraft College VisTaTech Center

Sign up online today (deadline Sept. 30, 2016 at www.therouge.org)

Team Leader Training – Sat. Oct. 1, 2016 9am-2pm (must have participated in a previous event)

Rouge River Benthic Macroinvertebrate Monitoring Program Fall 2016 Report

This report contains benthic macroinvertebrate sampling results from 44 Rouge tributary and river sites. The Fall Bug Hunt on October 15 had 89 participants. There were 13 teams that sampled 25 sites. Groups participating included five teams from Wayne State University and one CSI Team (Critter Science Investigation). The Schoolcraft College Geography Department once again provided the meeting space and refreshments and volunteer Daisy Lovain ran the registration.

This report also includes data from additional FOTR sampling, one site sampled by Schoolcraft College students, three sites sampled by Sue Thompson and 14 sites sampled by Wayne County DPS.



Royal River Cruiser Nymph
photo credit: Nancy Gregor Wayne County DPS

New Dragonfly Species Found

Sue Thompson discovered a new dragonfly family and species for the watershed at two Middle Rouge sites above and below Newburgh Lake (MR-4 and MR-3). Its large size, long spidery legs and frontal horn led her to identify it in the Macromiidae family. Macromiidae naiads live in the muck and debris near the substrate surface in slow areas of streams where they wait to ambush prey (Hilsenhoff, 1995). The adult dragonflies “cruise” down the middle of streams and roads, thus the common family name Cruisers.

Because this was the first finding of this family in the Rouge River, the specimens from both sites were sent out for further identification. A late instar nymph from MR-4 was identified by Ethan Bright and Darrin O’Brien as a Royal River Cruiser, *Macromia taeniolata*.

According to Julie Craves, co-author of the Michigan Odonata Atlas, this species was not recorded in Wayne County until 2001, and despite extensive work in the watershed, was not found in the Rouge during fieldwork from 2001-2010 (Craves and O’Brien 2013, <http://bit.ly/2gRQgJ2>). An earlier instar nymph collected at MR-3 is also in the Macromiidae family, and most likely the same species.

Only three other members of this family have been found in Michigan. Stream Cruiser (*Didymops transversa*) and Swift River Cruiser (*Macromia illinoiensis*) are both fairly common and widespread, while *M. taeniolata* is much rarer and has only been documented in the southern Lower Peninsula. Alleghany River Cruiser (*M. alleghaniensis*) has only been recorded once in the state.



Adult Royal River Cruiser, Huron River, Wayne County
photo credit: Darrin O’Brien

Thank you to our long-term Volunteers!



From left: Chester Marvin, Susan Thompson, Ralph Williams (Sally Petrella), Bruce McCulloch, Diane O'Connell, Steve Weis

The benthic macroinvertebrate monitoring program would not be possible without volunteers who are willing to come back year after year, going through training and taking on leadership roles. At the Fall Bug Hunt, we recognized six volunteers who have participated for ten years or more (see photo at left). Volunteers were recognized with certificates and special pins.



From left: Stuart Steel, Lynn DeGrande, Lisa Agosta, Grant Faber, Daisy Lovain, (Sally Petrella), Dan Stowe, Alan Vankerckhove, Sandy & Doug Wallace

Additionally, nine volunteers who have participated for five years or more were recognized with certificates. Thank you to the Michigan Clean Water Corps for providing certificates and pins.

Overall Scores

Of the 44 sites sampled this fall, the average Stream Quality Index (SQI) was FAIR (28) (map p.6, Table 1 & 4). Sites averaged 12 taxa, two mayfly, stonefly and/or caddisfly families (EPT) and zero sensitive Families. One site had an EXCELLENT SQI: Sprag. Twelve sites were GOOD; 21 sites were FAIR and ten sites scored POOR. The number of taxa found at sites was highest at MR-20 and MR-27 (20) and lowest at Low3 and See 2(5).

Average SQI	Average # of taxa	Average # EPT	Average # Sensitive Families
28	12	2	0

Some mayfly, stonefly and caddis fly families (EPT) were found at all but five sites. Three Johnson Creek sites and Sprag had the highest number of these families (4 at MR-3, MR-20, MR-27 & Main1).

Understanding Benthic Scores

Each site is given a **Stream Quality Index (SQI)** which is determined by weighting each type and number of organisms found by their sensitivity ratings. A higher proportion of sensitive organisms such as mayflies and caddisflies results in a higher **SQI**. A greater number of different organisms also results in a high **SQI**. The **SQI** has four different levels: >48=**EXCELLENT**, 34-48=**GOOD**, 19-33=**FAIR**, <19=**POOR**.

Number of taxa represents the number of different families of organisms. Like SQI, a higher number of taxa indicate a healthier site.

Number of insect taxa – insects are more sensitive than the non-insect taxa.

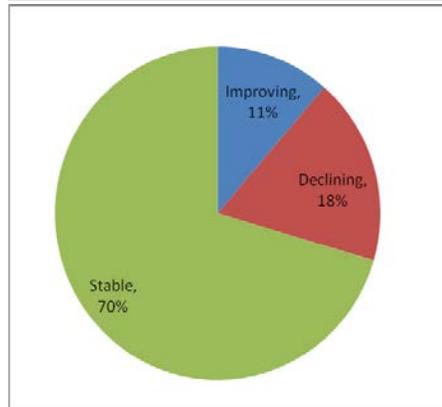
EPT refers to the number of mayfly, caddisfly and stonefly families found; these three orders contain some of the most sensitive organisms.

Number of sensitive families refers to the number of families of insects that rate very sensitive on the Hilsenhoff Biotic Index.

Four sites had sensitive families and all had been found at the sites in the past. MR-1 had net-tube caddisflies (Psychomyiidae). MR-27 had prongill mayflies (Leptophlebiidae). MN-5 and Sprag had dobsonflies (Corydalidae).

Data Trends

Chart 1: Trends for sites with past Data



For the forty-four sites that had three or more years of past data, 70% were stable, 11% were improving and 18% were declining (Chart 1). Compared to last fall, a lower percentage of sites are declining, more sites are improving and more are stable.

To compare change over time, we analyzed the trends (Table 2 and Figures 1-8). The Middle 3 subwatershed and Johnson Creek had significant positive slopes and both the Main 1-2 and the Upper Branch had significant negative slopes.

Individual sites were examined for long term trends (Table 3). Of the sites with sufficient data sampled in Fall 2016, three had significant trends. All three showed a declining trend.

Site	slope	p-value	True trend	Mean SQI	score
Peb3	-2.7714	0.0137	yes, negative	27	Fair
Main8	-2.0814	0.0028	yes, negative	20	Fair
Ing1	-1.6886	0.0371	yes, negative	29	Fair

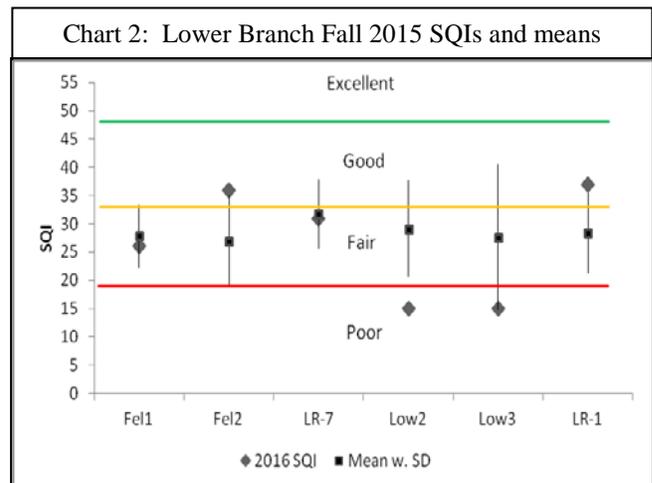
Subwatershed	slope	p-value	True trend	Mean SQI	score
Main 1-2	-0.4707	0.0164	yes, negative	30	Fair
Upper	-0.4366	0.0046	yes, negative	25	Fair
Johnson Creek	0.5672	0.0144	yes, positive	35	Good
Middle 1	0.0229	0.9091	No trend	32	Fair
Middle 3	0.5983	0.0013	yes, positive	22	Fair
Lower 1	-0.3044	0.1103	no trend	29	Fair
Lower 2	0.0731	0.7723	no trend	27	Fair
Main3-4	-0.7843	0.1687	no trend	28	Fair

Lower Branch

Seven sites were sampled on the Lower Branch of the Rouge (see Table 3). Two tributaries were sampled: Fellows (2) and McClaugherty. An additional four sites on the main branch of the Lower were sampled.

SQIs averaged FAIR (27). Two sites scored GOOD, three FAIR and two POOR. No sensitive families were found at any of the sites.

Seven sites had three or more years of data (Chart 2). Two sites were above a standard deviation of the average for the site (Fel2 and LR-1) and one was below (Low2).

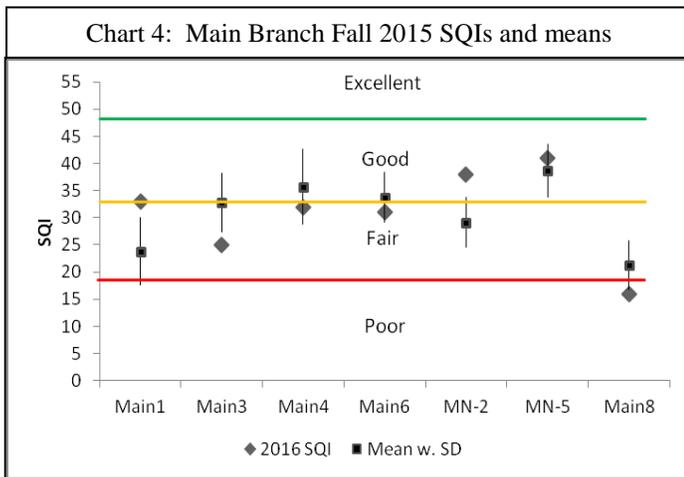
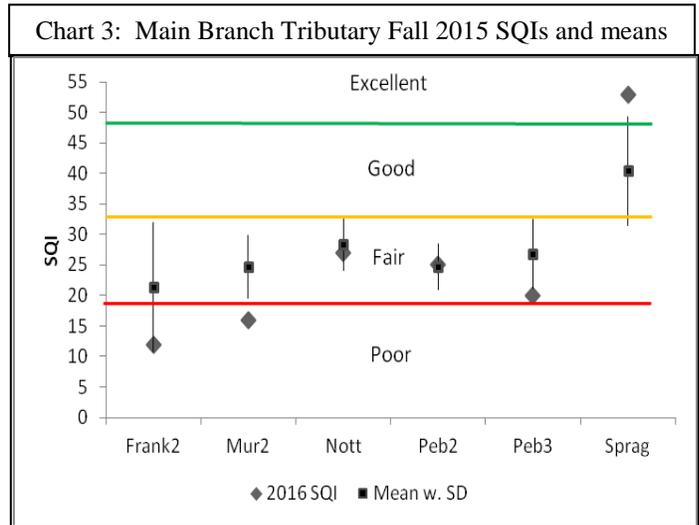


Long term trend analysis showed no significant change in the scores for the Lower Branch since 2001. No individual sites showed a significant trend.

Main Branch

Fourteen sites on the Main Branch were sampled. This included six tributaries: Evans, Franklin, Murphy, Nottingham, Pebble (2) and Sprague and seven sites on the Main. SQIs averaged FAIR (28). There was one EXCELLENT, two GOOD, seven FAIR, and four POOR SQIs. The EXCELLENT site was Sprag at the Stage Nature Center in Troy. GOOD sites were MN-2 and MN-5. Sensitive dobsonflies (*Corydalidae*) were found at both MN-5 and Sprag.

Thirteen sites on the Main had three or more years of data (Charts 3 & 4). Three sites (Sprag, Main1 and MN-2) were above a standard deviation of the mean and three were below (Mur2, Peb3, Main8).



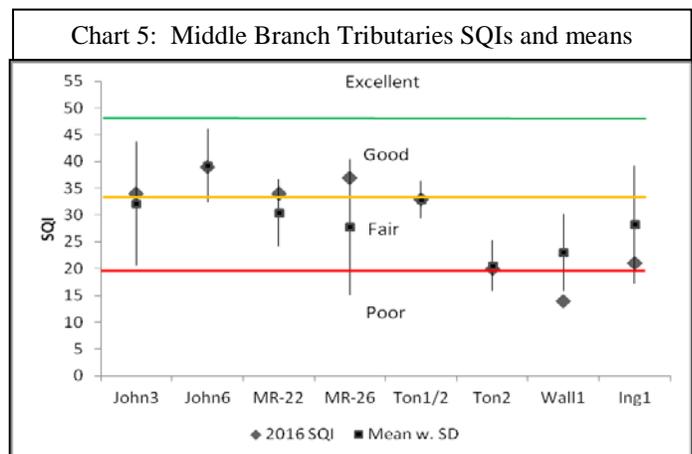
Long term trend analysis shows a significant negative trend for the Main 1/2 subwatershed (Table 2, Figures 1-8). Two Main Branch sites also showed a decline (Peb3 and Main8).

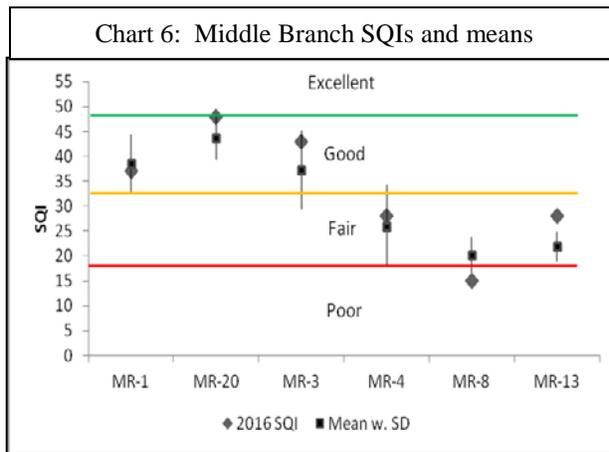
Middle Branch

Fifteen sites were sampled on the Middle Branch including Ingersoll, Johnson (5), Tonquish (2) and the Walled Lake drainage (Table 3). SQI scores averaged a high FAIR (32). There were 8 GOOD, 5 FAIR and one POOR (MR-8) SQIs. Sensitive families were found at MR-27 (*Leptophlebiidae*) & MR-1(*Psychomyiidae*).

Fourteen sites had three years or more of data (Charts 5 & 6). Of these, one was above a standard deviation of the mean (MR-13) and two were below (Wall1, MR-8).

In long term trend analysis, the Middle 3 and Johnson Creek had positive trends (Table 2, Figures 1-8). One Middle Branch site showed a negative trend (Ing1 – see Table 3)

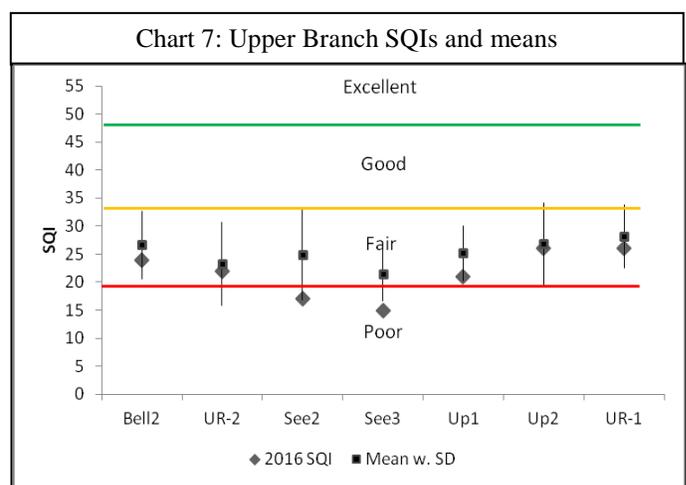




Upper Branch

Eight Upper branch sites were sampled this fall, including the Bell (2), Beitz and Seeley(2) (Table 3). SQIs averaged a low FAIR (22). Six sites were FAIR and two POOR (See2 & See3). No sensitive families were found in the Upper Branch.

Seven sites had three years or more of data (Chart 7). Two sites were below a standard deviation of the norm (See3 & UR-2). Long term trend analysis shows a significant decline in scores since 2001. No individual sites had significant trends.



THANK YOU!!!!!!

Thank you to all the **volunteers** and **Team Leaders, Schoolcraft College** for hosting the event, professor **Diane O'Connell** and **the Geography Department** for **providing refreshments**, **Daisy Lovain** for running registration, **Wayne County** for sampling and providing data for 14 sites, **Bill Eisenman** for assisting with Fordson Island sampling, **Sue Thompson** for sampling additional sites, helping with identification, trend analysis and reviewing the report, biologist **Bruce McCulloch** for identifying most of the specimens, SQI comparison graphs and reviewing the report, **Julie Craves**, **Darrin O'Brien** and **Ethan Bright** for identifying and info on the Royal River Cruiser and the **Alliance of Rouge Communities** for funding the program through a SAW Grant.

Join us for the Winter Stonefly Search

Sat. Jan. 21, 2017 9 am – 3 pm at UM-D

Register at www.therouge.org

(by Jan. 6, 2017)

Fall Bug Hunt 2016

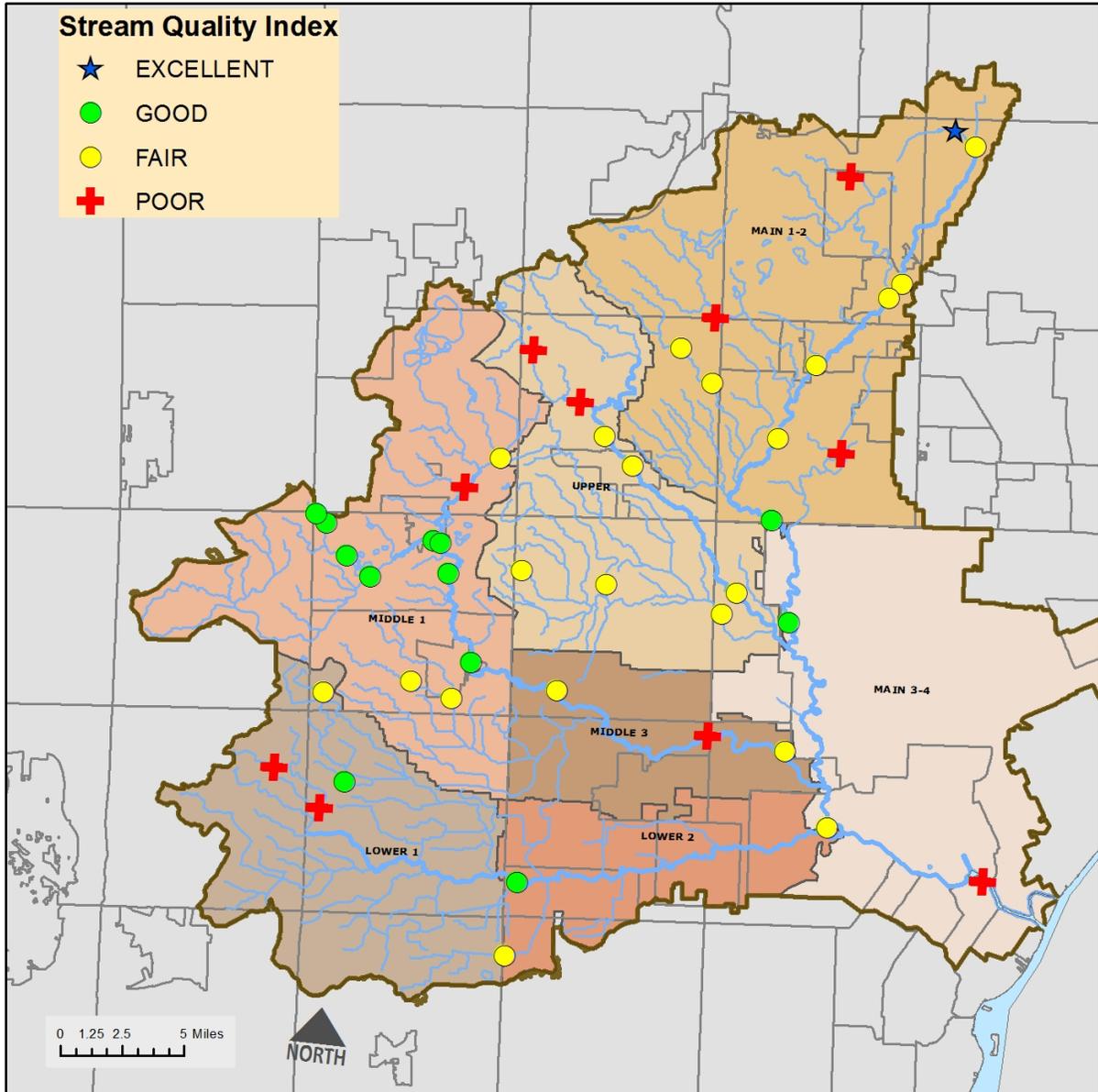


Table 4 - 2016 Fall Bug Hunt Results

FIELDID	Stream Name	Site Description	collector	SQI	score	taxa	EPT	Sensitive Family
Lower Branch								
Fel1	Fellows Creek	Top of Hill Ct	FOTR	26	FAIR	11	1	
Fel2	Fellows Creek	Vintage Valley	FOTR	36	GOOD	16	3	
LR-7	McClagherty Creek	Hannan and Ecorse	WC	31	FAIR	14	1	
Low2	Lower Rouge	Cherry Hill	FOTR	15	POOR	7	0	
Low3	Lower Rouge	Gotfredson	FOTR	15	POOR	5	1	
LR-1	Lower Rouge	Commerce Ct	WC	37	GOOD	16	3	
LR-11A	Lower Rouge	Ford Field east	WC	28	FAIR	13	2	
Main Branch								
Evan2	Evans Creek	LTU	FOTR	16	POOR	8	1	
Frank2	Franklin Creek	Ink Pump Sta	FOTR	12	POOR	6	0	
Mur2	Murphy Creek	Roeper School	FOTR	16	POOR	7	1	
Nott	Nottingham Creek	Country Day	FOTR	27	FAIR	9	2	
Peb2	Pebble Creek	Pebble 13 Mile	FOTR	25	FAIR	11	1	
Peb3	Pebble Creek	Pebble d/s Dam	FOTR	20	FAIR	8	1	
Sprag	Sprague Creek	Main Lloyd Stage	FOTR	53	EXCELLENT	18	3	Corydalidae
Main1	Main Rouge	FF Pk	FOTR	33	FAIR	17	4	
Main3	Main Rouge	Booth Pk	FOTR	25	FAIR	11	3	
Main4	Main Rouge	Linden Pk	FOTR	32	FAIR	13	3	
Main6	Main Rouge	Sfld Civic Ctr	FOTR	31	FAIR	15	3	
MN-2	Main Rouge	Eliza Howell	WC	38	GOOD	16	3	
MN-5	Main Rouge	Bridge St	WC	41	GOOD	17	3	Corydalidae
Main8	Main Rouge	Fordson Island	FOTR	16	POOR	8	0	
Middle Branch								
Ing1	Ingersoll Creek	Brookfarm Park	FOTR	21	FAIR	10	0	
John3	Johnson Creek	6M NV	FOTR	34	GOOD	15	2	
John6	Johnson Creek	Hines	FOTR	39	GOOD	15	3	
MR-22	Johnson Creek	Maybury south	ST	34	GOOD	17	2	
MR-26	Johnson Creek	Napier Rd	ST	37	GOOD	17	2	
MR-27	Johnson Creek	Ridge	ST	44	GOOD	20	4	Leptophlebiidae
Ton1/2	Tonquish Creek	Canton Ctr Rd	FOTR	33	FAIR	10	3	
Ton2	Tonquish Creek	Ann Arbor Rd	FOTR	20	FAIR	8	1	
Wall1	Walled Lk Drainage	Rotary Pk	FOTR	14	POOR	7	1	
MR-1	Middle Rouge	Northville Rec W	WC	37	GOOD	16	2	Psychomyiidae
MR-20	Middle Rouge	Waterford Bd	WC	48	GOOD	20	4	
MR-3	Middle Rouge	Plym Riverside	WC	43	GOOD	18	4	
MR-4	Middle Rouge	Levan Knoll	WC	28	FAIR	12	2	
MR-8	Middle Rouge	Inkster Rd	WC	15	POOR	7	1	
MR-13	Middle Rouge	Warrendale	WC	28	FAIR	10	2	
Upper Branch								
Bell2	Bell Branch	Schoolcraft College	SC	24	FAIR	11	1	
See2	Seeley Creek	Sleepy Hollow	FOTR	17	POOR	5	2	
See3	Seeley Creek	Kennedy Ct	FOTR	15	POOR	7	1	
Up1	Upper Rouge	Heritage Park	FOTR	21	FAIR	11	0	
Up2	Upper Rouge	Shiawasee Park	FOTR	26	FAIR	13	1	
UR-1	Upper Rouge	Lola Valley	WC	26	FAIR	10	2	
UR-2	Bell Branch	Bell Cr Pk	WC	22	FAIR	8	2	
UR-5	Beitz Creek	Beitz Creek/6 Mile	WC	32	FAIR	13	2	

Figure 1- Lower1 Subwatershed Mean SQIs

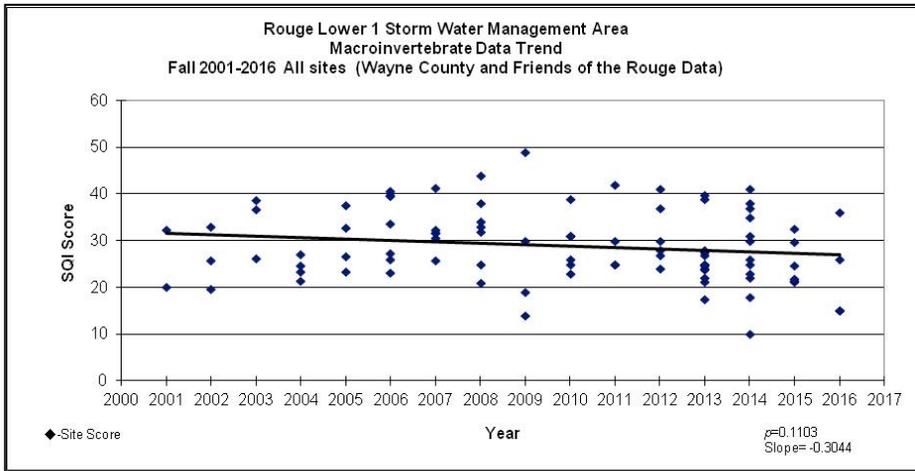


Figure 2- Lower2 Subwatershed Mean SQIs

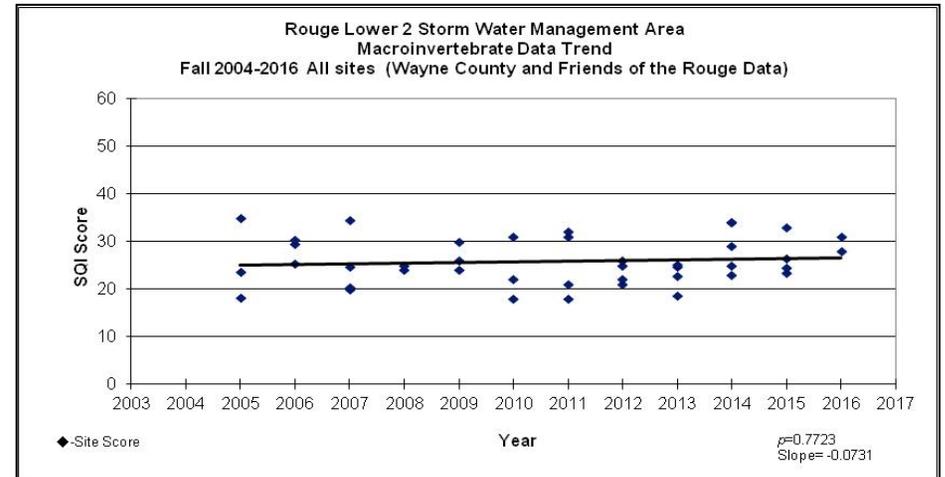


Figure 3- Main 1/2 Subwatershed Mean SQIs

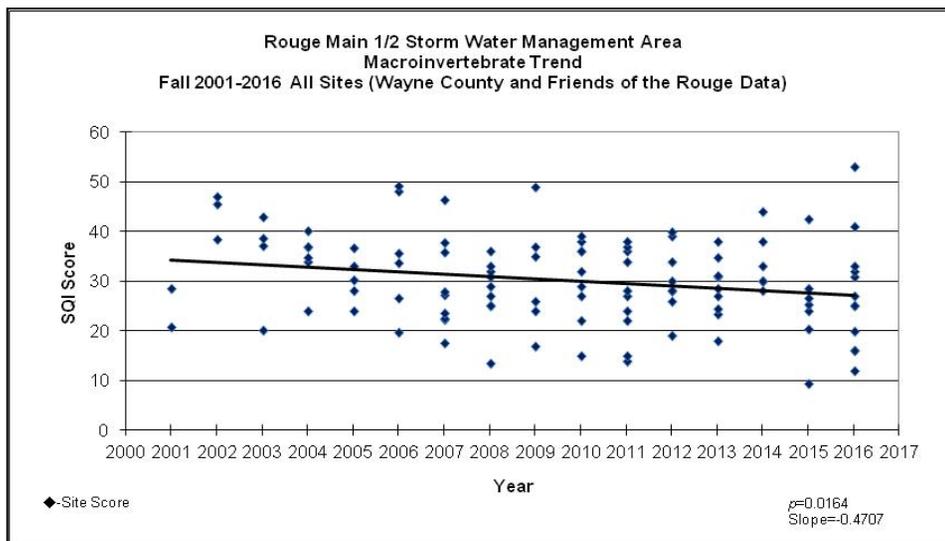


Figure 4- Main 3/4 Subwatershed Mean SQIs

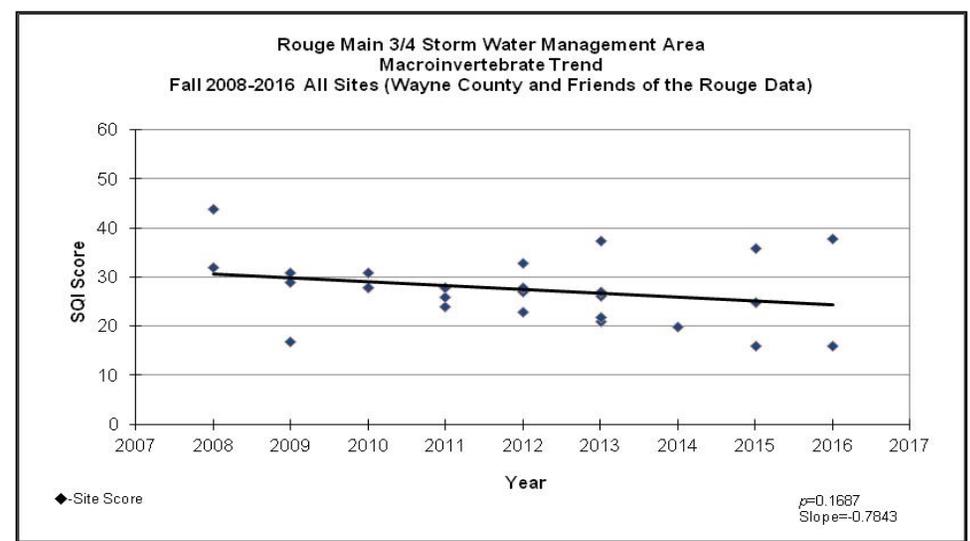


Figure 5 – Johnson Creek Mean SQIs

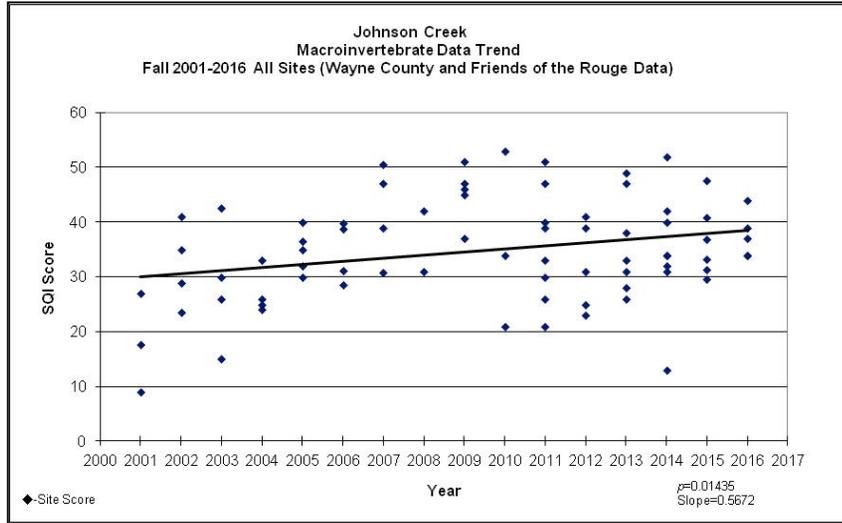


Figure 6 – Middle 1 Subwatershed Mean SQIs

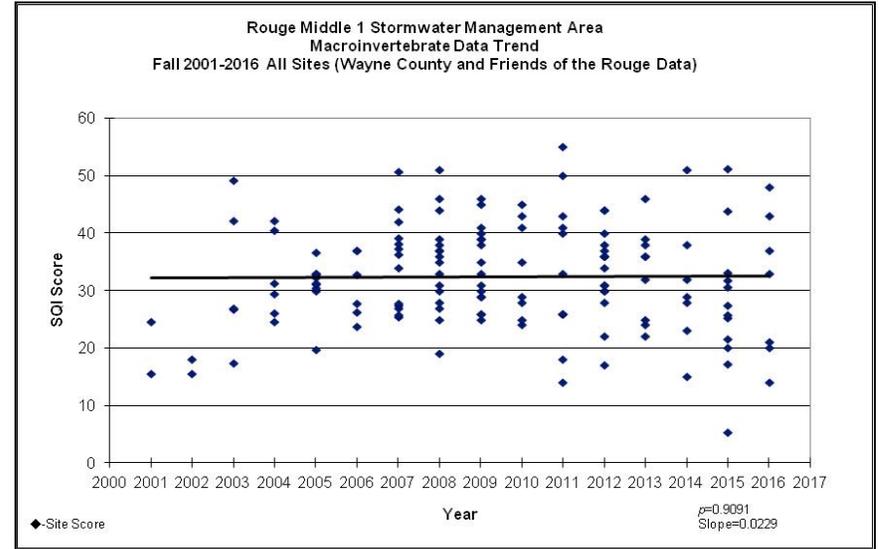


Figure 7 – Middle 3 Subwatershed Mean SQIs

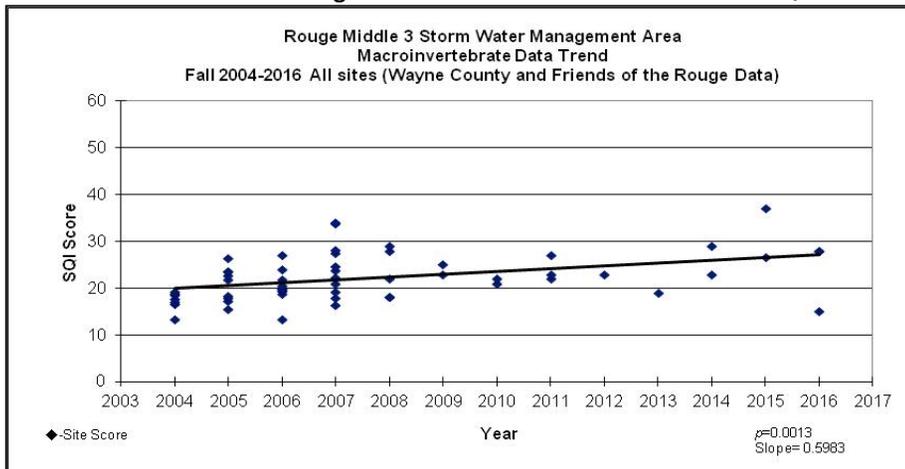
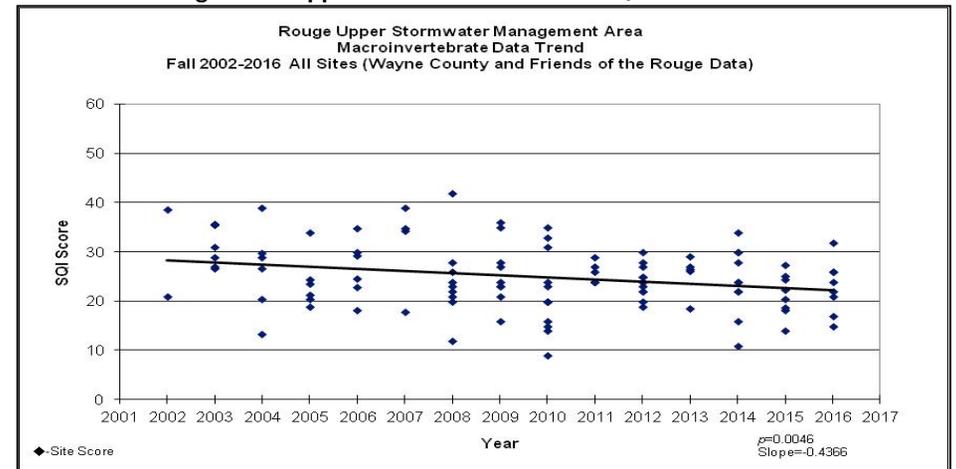


Figure 8 – Upper Subwatershed Mean SQIs



Rouge River Watershed 2016 Winter Stonefly Search

Stoneflies are sensitive indicators of healthy streams. Unlike other insects, winter stoneflies develop into adult flies in the winter. The Winter Stonefly Search is part of Friends of the Rouge volunteer benthic macroinvertebrate monitoring program.

Ninety-two volunteers participated in Friends of the Rouge's 2016 Winter Stonefly Search on February 13th on one of the only frigid days of this mild winter. The University of Michigan-Dearborn's Environmental Interpretive Center hosted the event. Participating were four teams from Wayne State University, two teams from Marygrove College, two teams from the 4H Critter Science Investigation Club, one group from Franklin High School and many other volunteers.



Lovebug refreshments!

Volunteers were able to sample 26 sites in 13 teams. A total of 38 sites were sampled. Wayne County Department of Public Services Water Quality Management Division sampled an additional six sites, Schoolcraft College students sampled one site and Sue Thompson sampled five sites.

Stoneflies were found at ten of the thirty-eight sites (26%) (see map and Table 1). This was higher than the past two years. Nine sites had slender winter stoneflies (Capniidae) and two sites had Perlodid stoneflies (one site had both).

All stoneflies were found on the Middle or Lower branches. Other branches that were sampled included one site on the Main branch and three sites on the Upper branch including Bell Creek.

All but three of the ten sites with stoneflies were in the Johnson Creek watershed. Four of these were on Sump Creek, a Johnson Creek tributary in and around Maybury State Park. The highest number of stoneflies at one site was at MR-22 with 22 stoneflies. Both sites with Perlodid stoneflies were on Sump Creek. Two other Johnson Creek sites had stoneflies – John1 at Five Mile and Salem Road and John7 in the Arcadia Ridge subdivision. Surprisingly, the Marygrove College team at John1 also found a Rhyacophilid caddisfly, a type of caddisfly first identified in Michigan through Friends of the Rouge's program. Usually found in April, this is the earliest in the year they have been found.



Marygrove College students look for stoneflies at Johnson Creek



Wayne State University students on the Lower Rouge

On the Lower Rouge, Fellows Creek had one site with stoneflies (LR-9) and Fowler Creek had two sites with them (Fowl1 & Fowl2). Fowl2 has not had stoneflies since 2011.

Thank you to all the volunteers! The Winter Stonefly Search is part of Friends of the Rouge's long term volunteer monitoring program.

**Spring Bug Hunt – Sat. April 16
9am-4 pm UM-D EIC**

Register by 4/1

Team Leader Training March 19 (must have previously attended an event)

www.therouge.org (register online)

(313) 792-9621

spetrella@therouge.org

Stonefly Search 2016

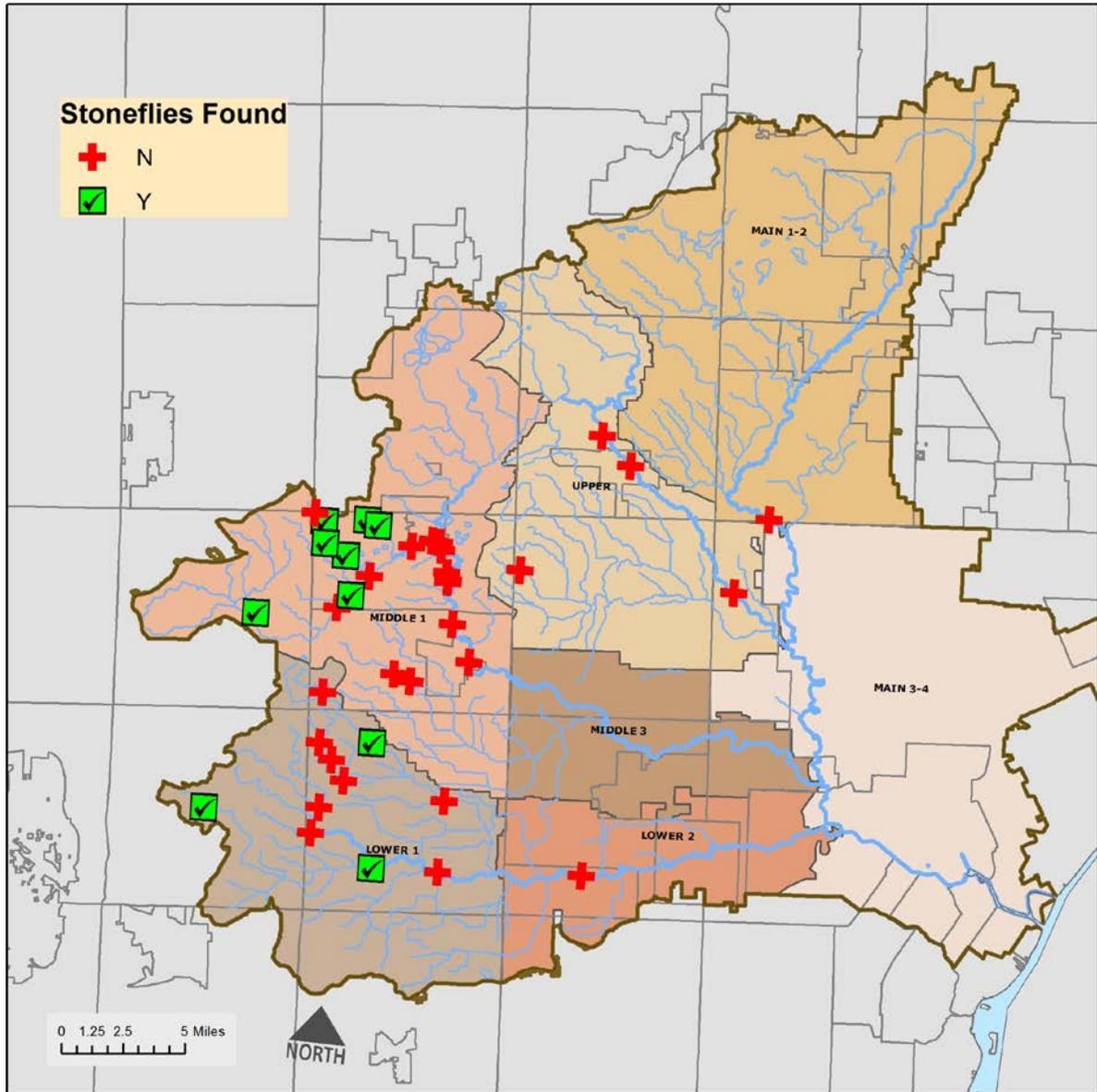


Table 1: 2016 Stonefly Search Results

Branch	FIELDID	Stream Name	Location	Collector*	ST16	Capnids	Perlodids
Lower	Fel1	Fellows Creek	Top of Hill Ct	FOTR	N		
Lower	Fel2	Fellows Creek	Vintage Valley	FOTR	N		
Lower	Fel4	Fellows Creek	Flodin Pk	FOTR	N		
Lower	Fel5	Fellows Creek	Warren Ridge	FOTR	N		
Lower	Fel6	Fellows Creek	Hanford Ridge	FOTR	N		
Lower	LR-9	Fellows Creek	Fellows Beck Warren	FOTR	Y	1	
Lower	Fowl1	Fowler Creek	Prospect	FOTR	Y	14	
Lower	Fowl2	Fowler Creek	Fowler Beck	FOTR	Y	2	
Lower	Low2	Lower Rouge	Cherry Hill	FOTR	N		
Lower	LR-12	Lower Rouge	Morton Taylor	WC	N		
Lower	LR-3	Lower Rouge	Goudy Park	WC	N		
Lower	LR-8	Lower Rouge	Ridge Proctor	FOTR	N		
Main	MN-5	Main Rouge	Bridge St	WC	N		
Middle	John1	Johnson Creek	5M Salem	FOTR	Y	10	
Middle	John2	Johnson Creek	5M NV	FOTR	N		
Middle	John3	Johnson Creek	6M NV	FOTR	N		
Middle	John5	Johnson Creek	Fish Hatchery Pk	FOTR	N		
Middle	John6	Johnson Creek	Hines	FOTR	N		
Middle	John7	Johnson Creek	Arcadia	FOTR	Y	3	
Middle	John8	Johnson Creek	Maybury Angell	FOTR	Y		3
Middle	MR-22	Johnson Creek	Maybury south	ST	Y	22	
Middle	MR-23	Johnson Creek	Maybury north	ST	Y	5	1
Middle	MR-25	Johnson Creek	Maybury East	ST	Y	8	
Middle	MR-26	Johnson Creek	Napier Rd	ST	N		
Middle	MR-27	Johnson Creek	Ridge	ST	Y	2	
Middle	Mid1	Middle Rouge	Northville Rec E	FOTR	N		
Middle	MR-1	Middle Rouge	Northville Rec W	FOTR	N		
Middle	MR-18	Middle Rouge	Springbrook Rec	FOTR	N		
Middle	MR-2	Middle Rouge	Reservoir Rd	WC	N		
Middle	MR-20	Middle Rouge	Waterford Bd	FOTR	N		
Middle	MR-2a	Middle Rouge	Reservoir Rd W	FOTR	N		
Middle	MR-3	Middle Rouge	Plym Riverside	WC	N		
Middle	Ton1	Tonquish Creek	Plym Twp Pk	FOTR	N		
Middle	Ton1/2	Tonquish Creek	Canton Ctr Rd	FOTR	N		
Upper	Bell2	Bell Branch	Schoolcraft College	Sch	N		
Upper	Up1	Upper Rouge	Heritage Park	FOTR	N		
Upper	Up2	Upper Rouge	Shiawasee Park	FOTR	N		
Upper	UR-1	Upper Rouge	Lola Valley	WC	N		

C*Collector - FOTR=Stonefly Search team, ST=Sue Thompson, WC=Wayne County

Appendix E

ADW Monitoring Results Presentation 2016

Please see the ADW website at:

<http://www.allianceofdownriverwatersheds.com/>

for a copy of the presentation.

Water Quality Monitoring Program

Collect water quality information from tributaries to the Huron River to evaluate sources of problems and measure the degree of management success



David Kraepel, Ron Fadoir, & Karen Kraepel at Silver Creek

Supported by:

- Middle Huron Partners and Stormwater Advisory Group
- Alliance of Downriver Watersheds – Lower Huron, Ecorse Creek, Combined Downriver
- Michigan Department of Environmental Quality

Outline

- What was measured
- Where
- Important results
- How are the results being used
- What's next



David Kraepel & Ron Fadoir at Silver Creek

What was measured in 2016?

- 29 volunteers; 319 hours – THANKS!
- 155 sample sets collected
 - Nutrients (Phosphorus)
 - Sediments (Total Suspended Solids)
 - Bacteria (*E. coli*)
 - Other (Dissolved Oxygen, pH, Temperature, Conductivity)
- 40 flow measures
- 48 investigative samples
- 1 storm sample



Huron
River
Watershed
Council

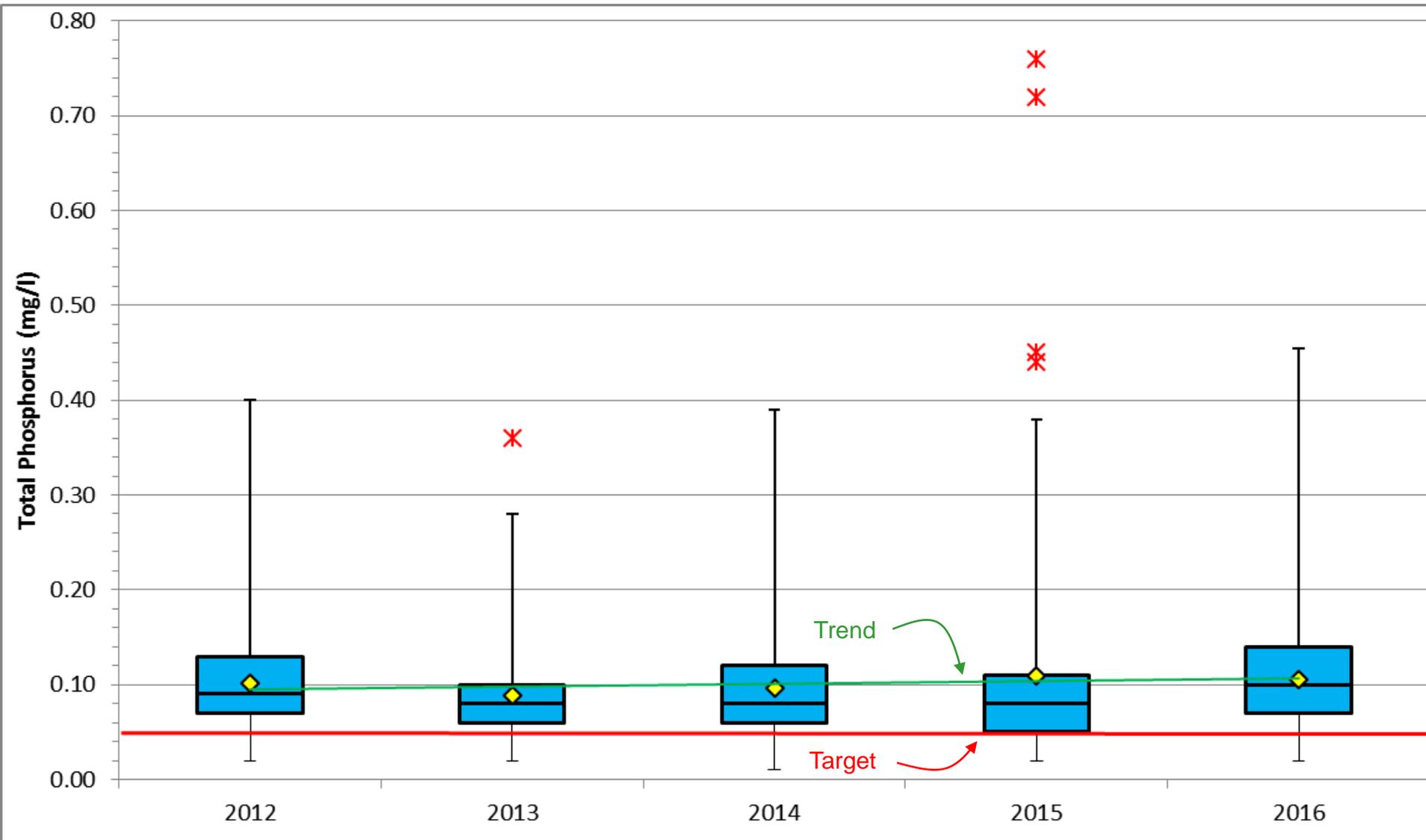
2016 ADW Monitoring

- Wayne County
- 12 sites
- 8 creeks, 1 river site
- 4 investigative sites

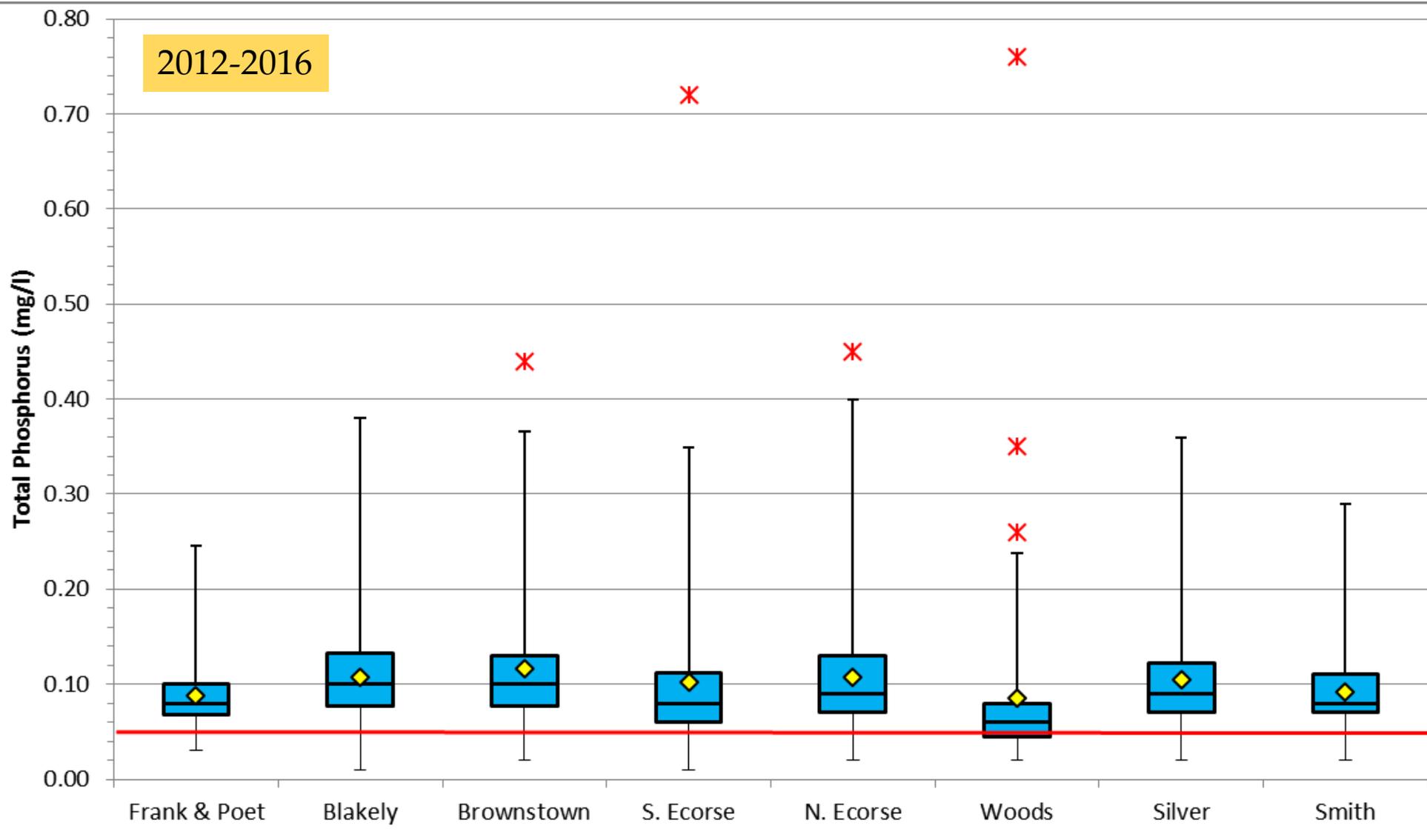
- Lon
Twp
- Investigative
 - Long-term
 - ~ Creeks
 - ~ ADW Watersheds
 - ~ Huron River



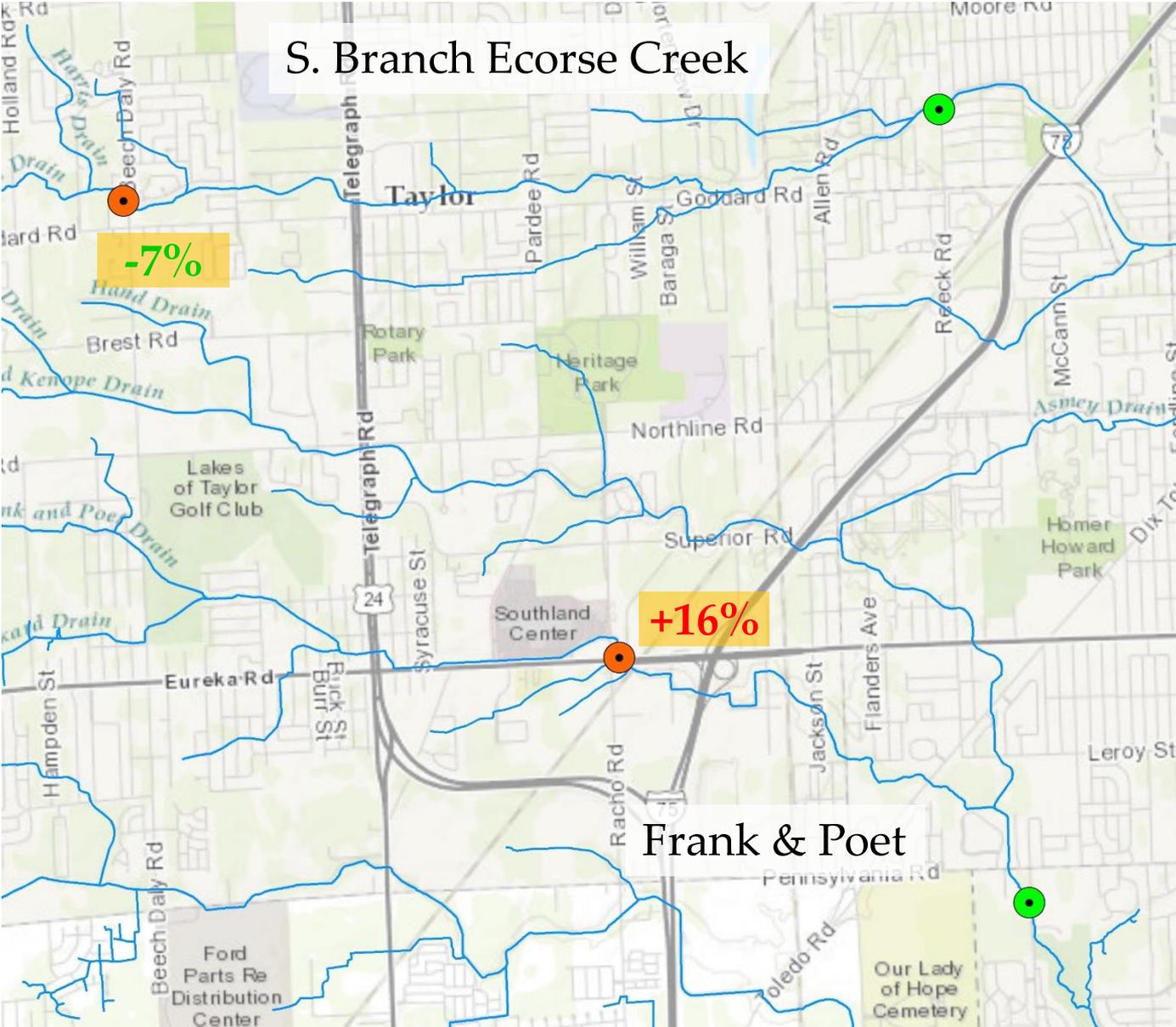
Phosphorus (TP) in Wayne County (by Year)



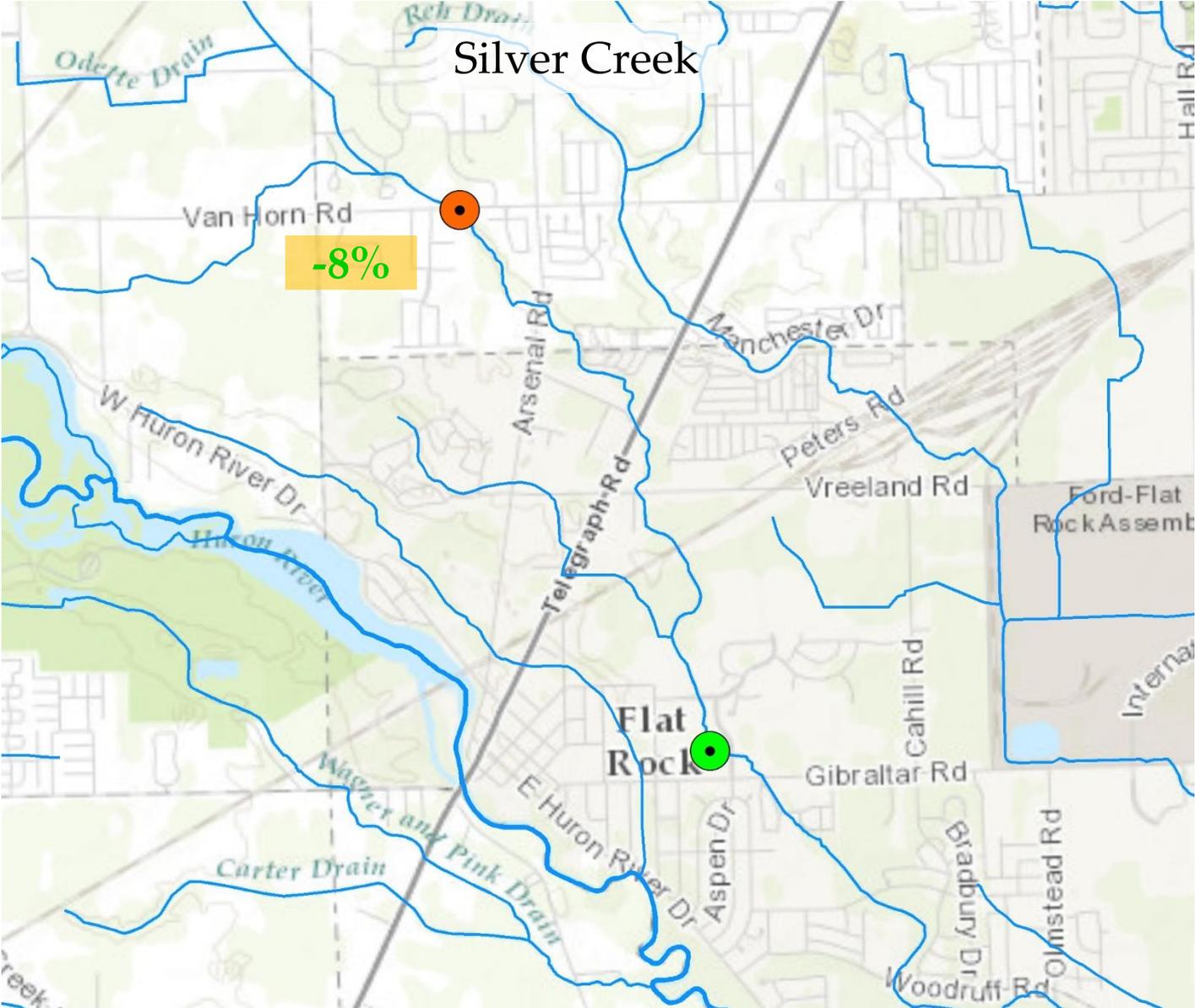
Phosphorus (TP) in Wayne County (by Site)



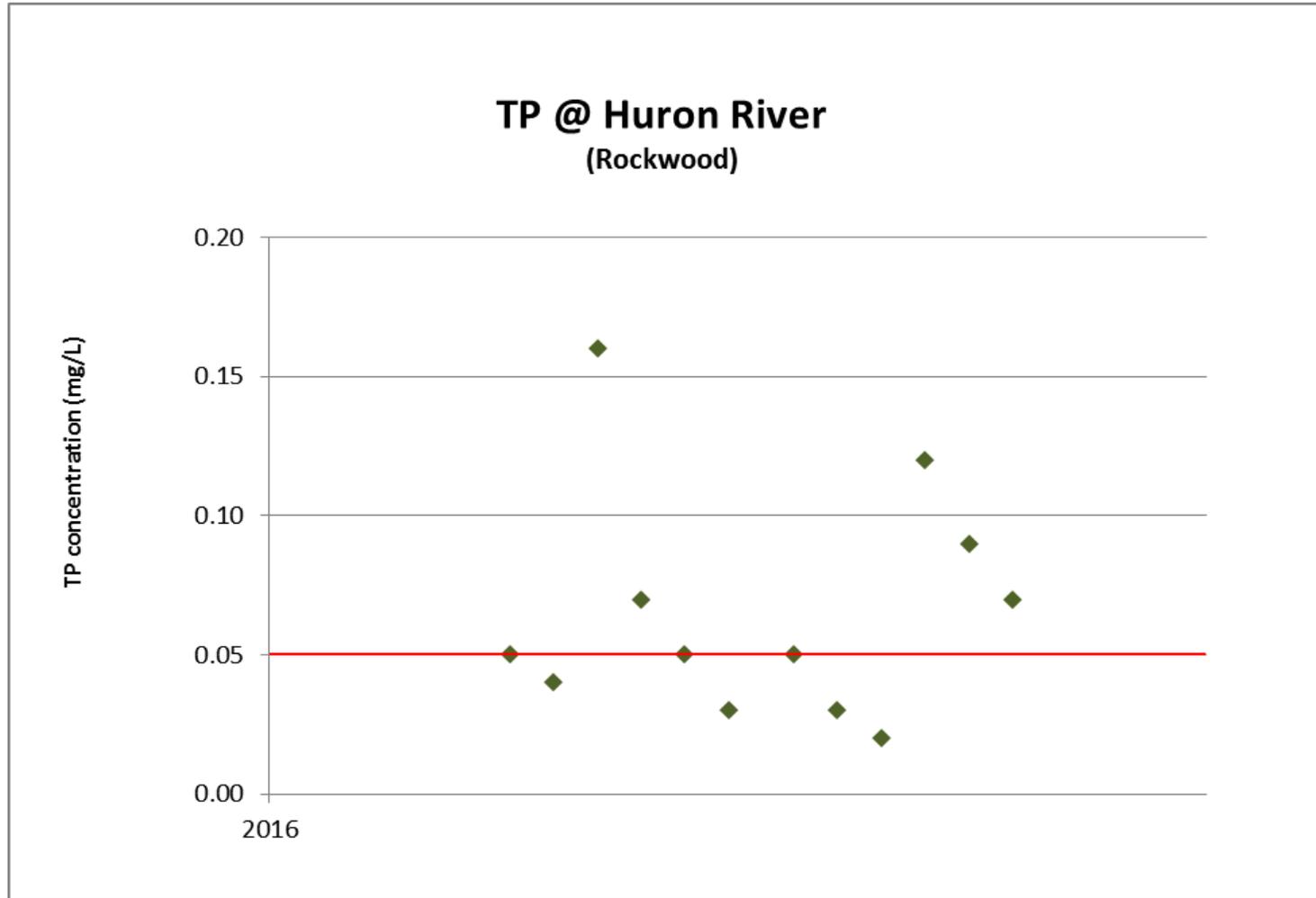
2016 Investigative Differences – TP



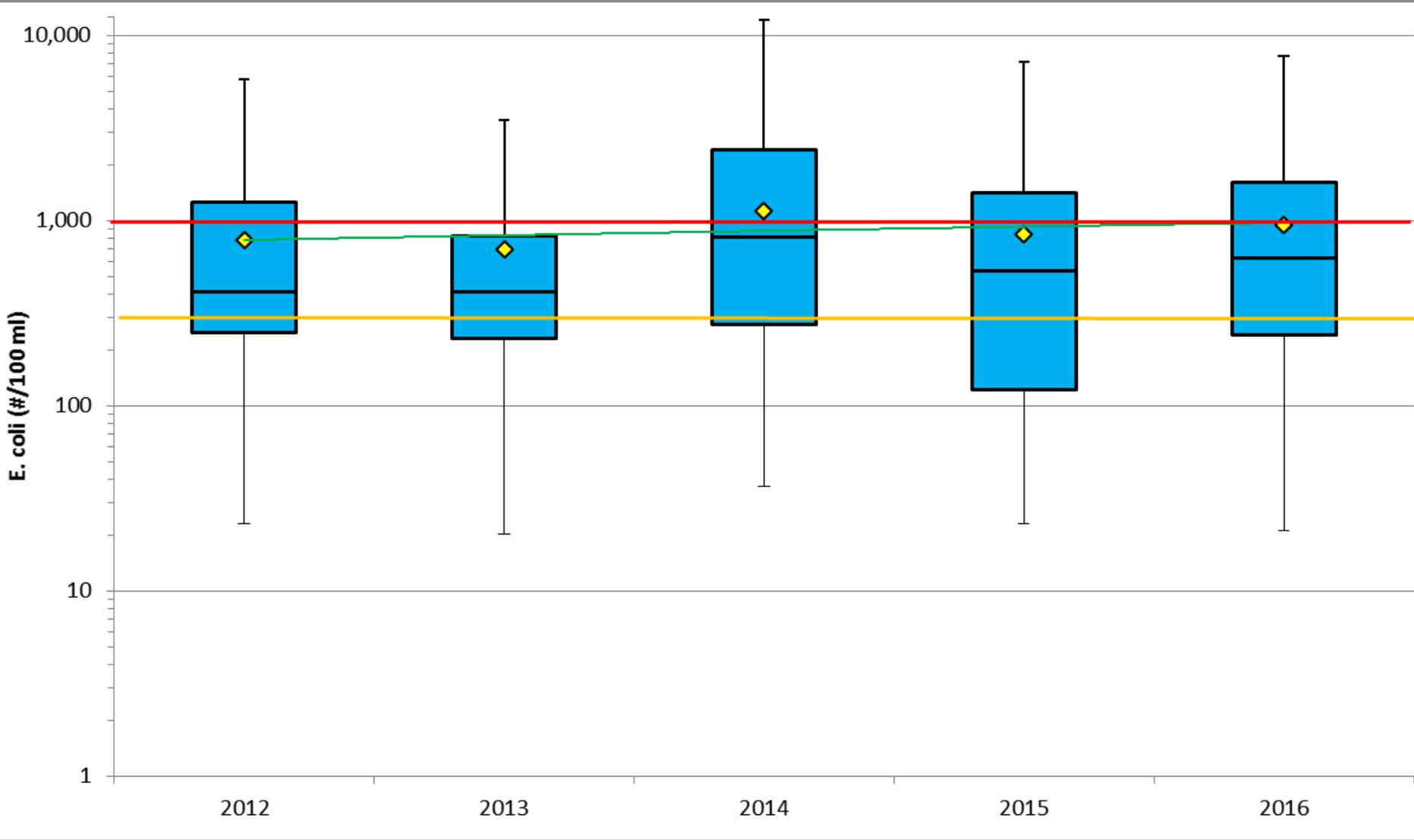
2016 Investigative Differences – TP



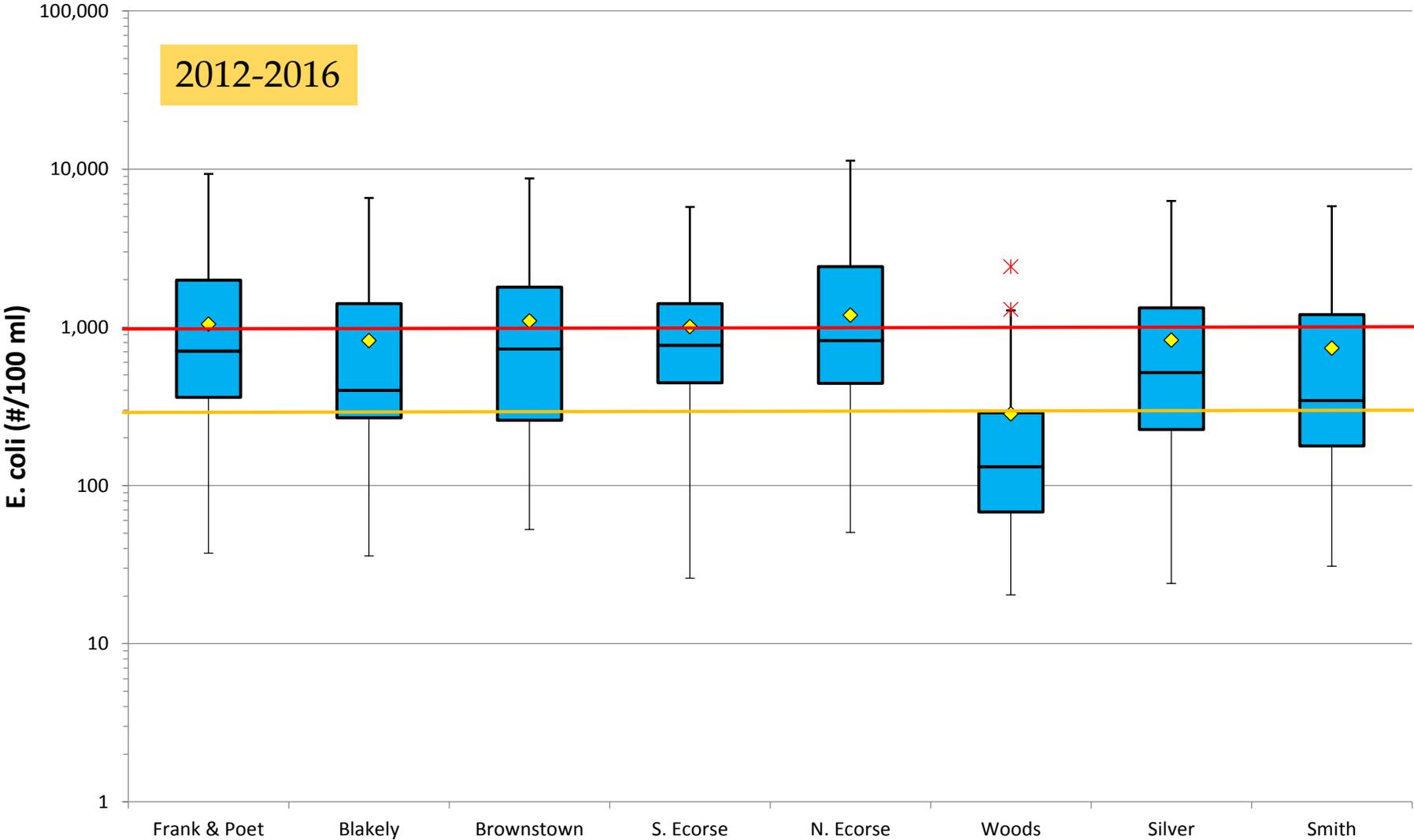
Huron River in Rockwood – TP



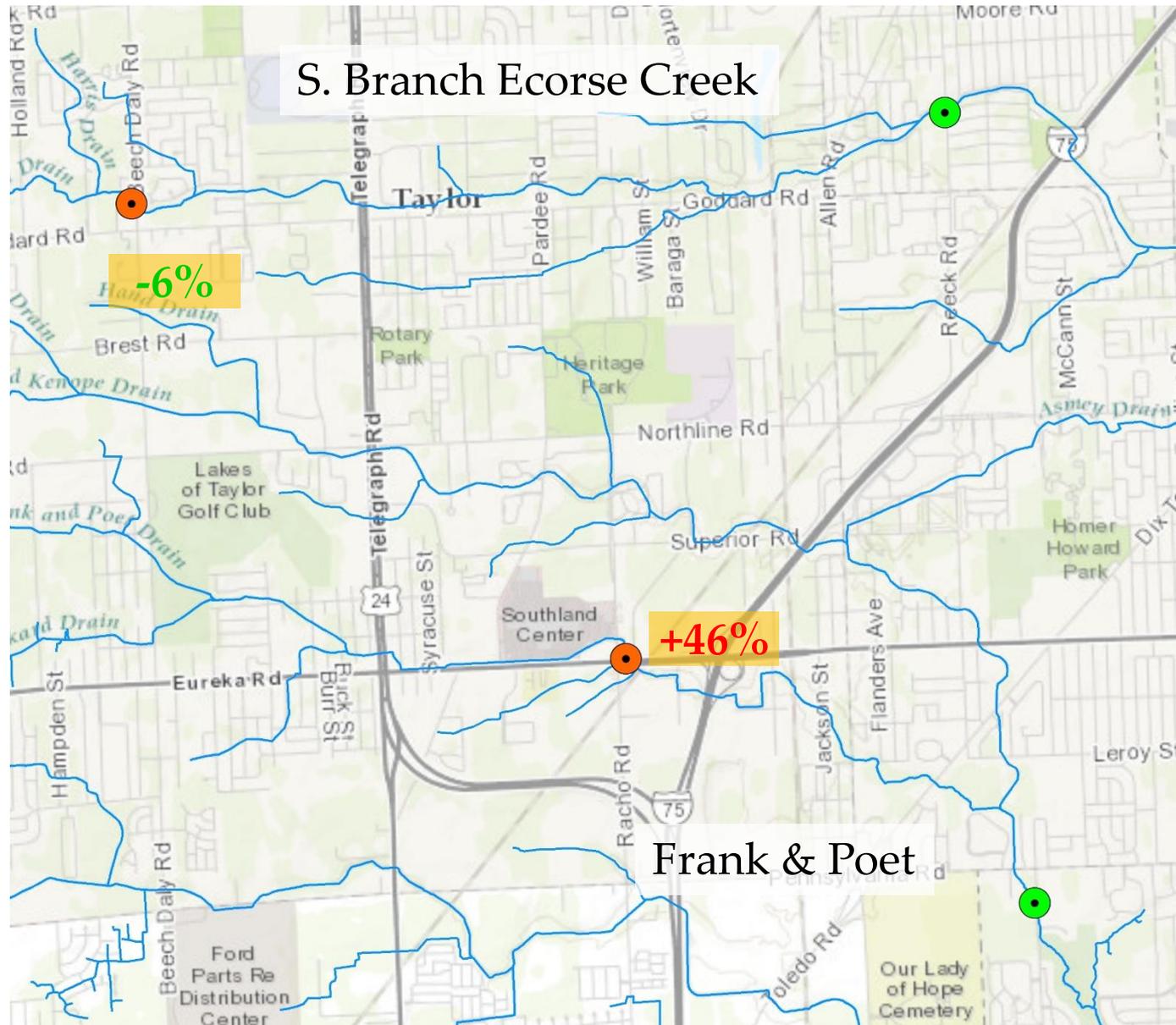
E. coli in Wayne County (by Year)



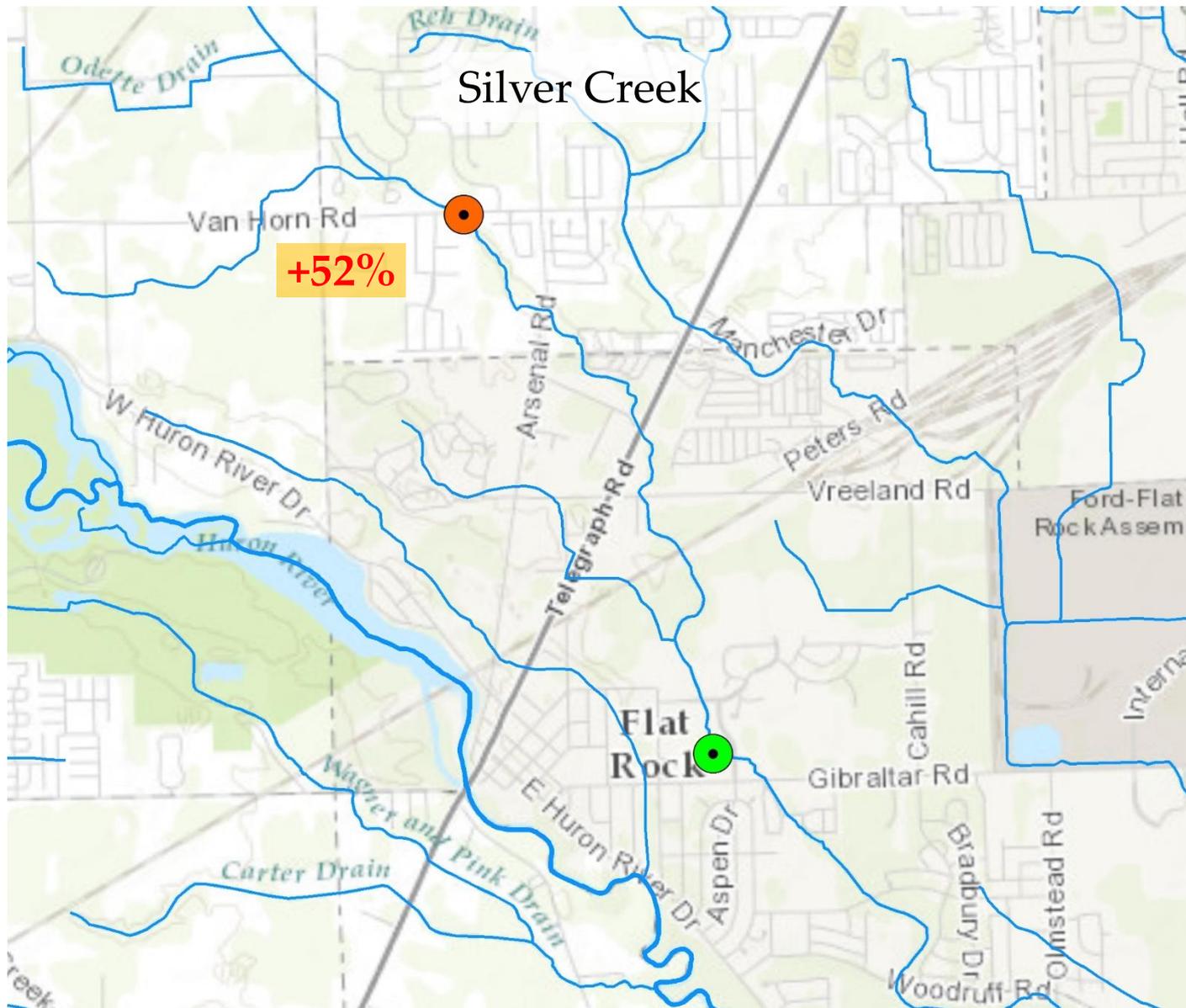
E. coli in Wayne County (by Site)



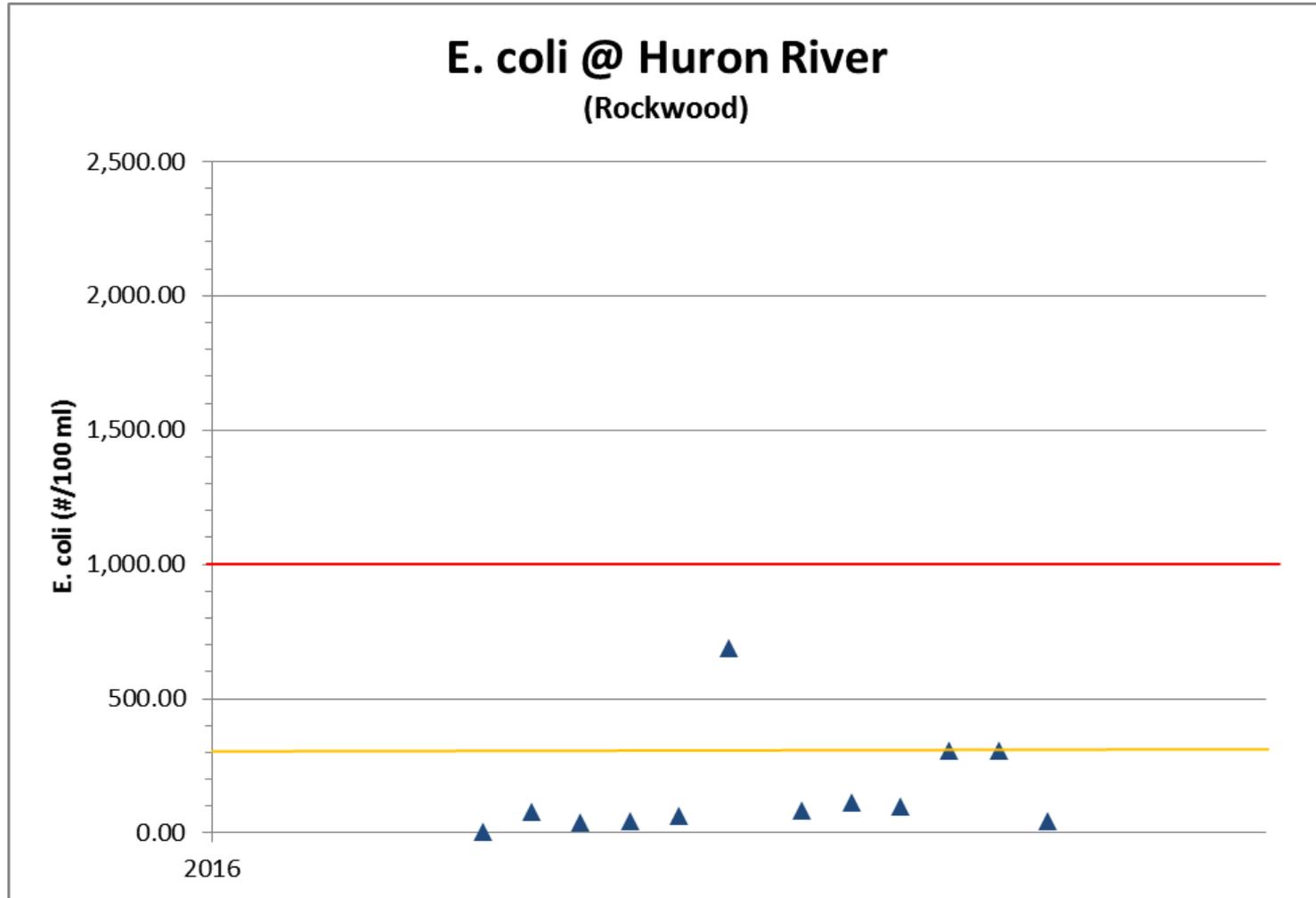
2016 Investigative Differences – E. coli



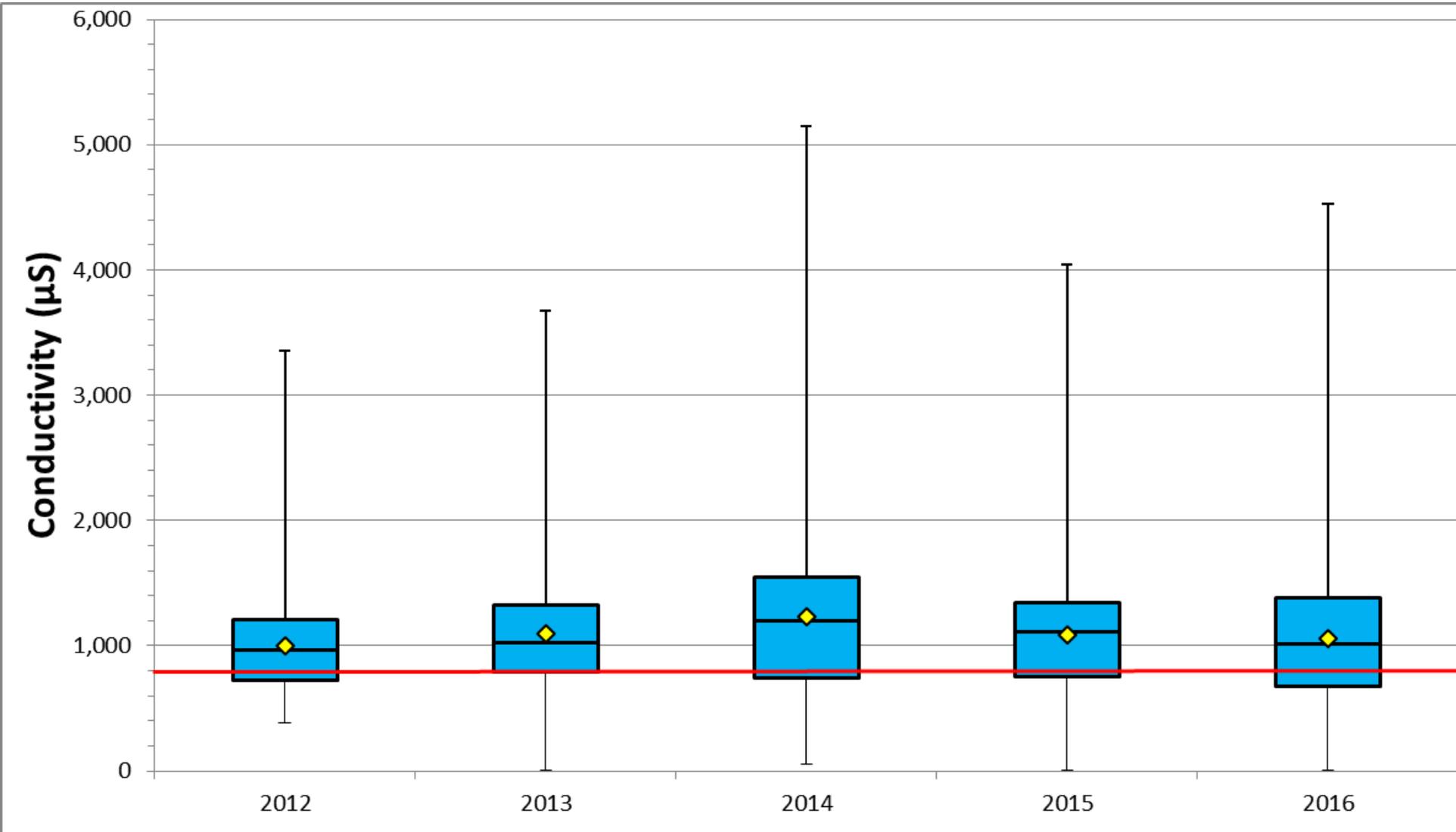
2016 Investigative Differences – E. coli



Huron River in Rockwood – E. coli

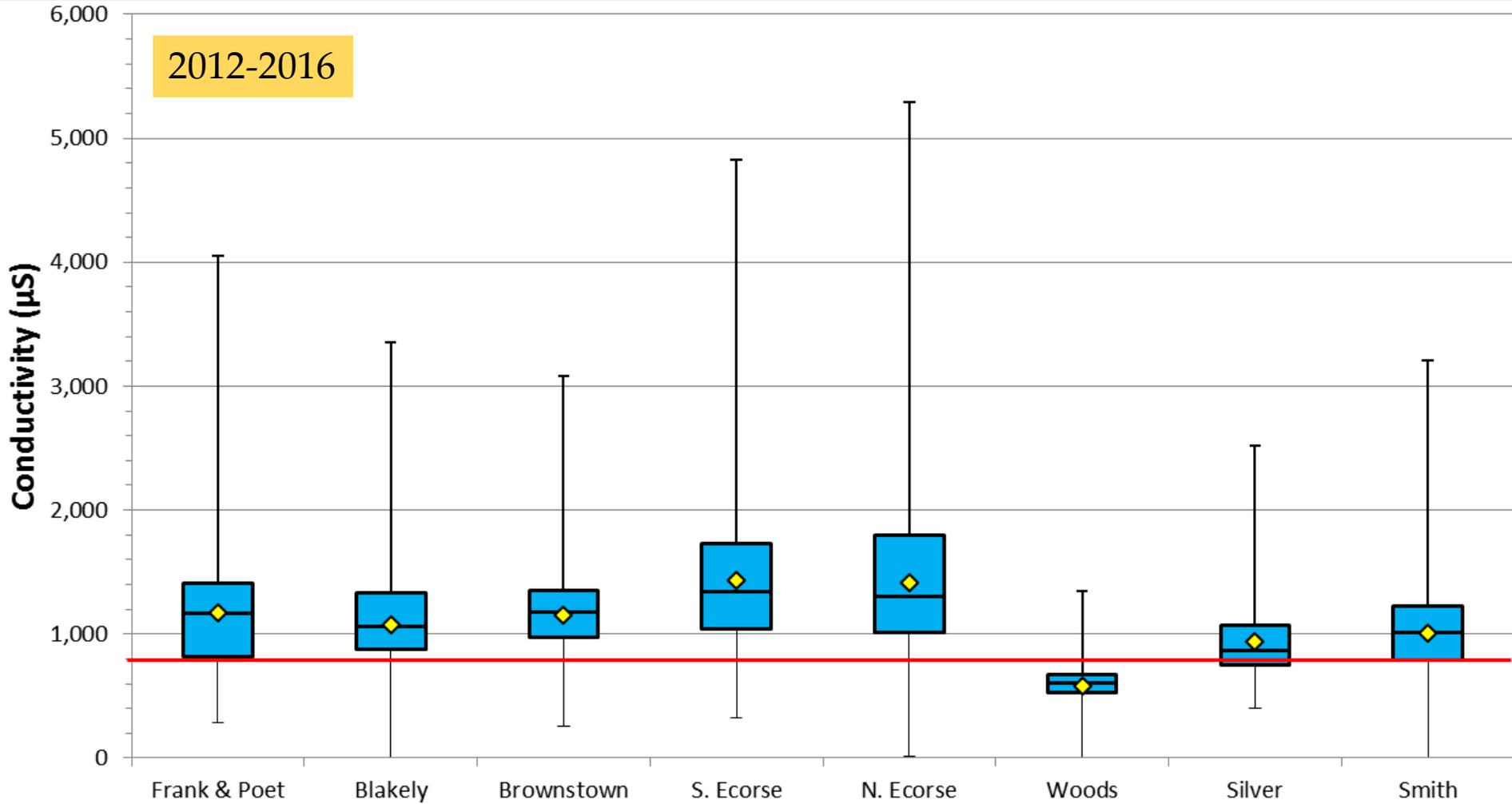


Conductivity in Wayne County (by Year)



Conductivity in Wayne County (by Site)

2012-2016



Other Parameters

- TSS: High (>80 mg/l) erosion events in Blakely, N. Ecorse, and Brownstown Creeks in 2016
- DO: Low (< 5 mg/l) events in Blakely (twice), N. Ecorse (5x), S. Ecorse (3x), Brownstown (5x), and Silver (5x) Creeks.
- Temperature: All sites within normal range for warm water streams (< 29°C / 84°F)

Summary of Results

- Nutrient runoff high (for P) and not improving. Some erosion issues.
- Bacteria high and not improving, except at Woods Creek
- Runoff from Southland Center and Silver Creek (upstream) in need of further investigation for source ID
- Conductivity also high, except for Woods Creek
- Low DO at 5 creek sites suggests the need for greater stormwater treatment and restoration. Consistent with insect results?

How does our sampling get used?

Raw sampling data analyzed and reported out

- Share results and analysis with municipalities
- Follow up on key findings, actions prioritized
- Implementation of ideas to address problems



Kimberly Lapworth, Selvan Thamilselvan & Viji Thamilselvan

Appendix F

Environmental Commission Meetings

Minutes and Agendas

Please see the Van Buren Township Website at:

<http://vanburen-mi.org/>

for the agendas and minutes of Commission meetings

Appendix G

Public Education Program:

Brochures

Publications

Advertisements

Water Quality Reports



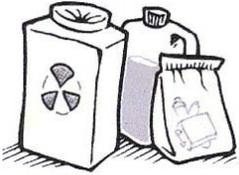
Household Hazardous Waste Collection Day

What: FREE one day drop-off for Van Buren Township residents

When: *Saturday, October 15, 2016 9:00 am - 2:00 pm*

Where: US Ecology East parking lot
49350 North I-94 Service Drive (see map on reverse)

Why: To dispose of household hazardous waste in a safe and environmentally friendly manner.



Below is a list of both acceptable and unacceptable items for collection. All products should be tightly sealed to prevent spillage while transporting to the facility and all containers brought to the collection must be left at the collection. **Products will not be accepted in milk jugs** because the plastic is thin and punctures easily.

Kitchen/Bathroom

- Bug Sprays
- Floor Care Products
- Furniture Polishes
- Metal Polish w/Solvent
- Medicines
- Nail Polish
- Cleaning Products

Miscellaneous

- Household Batteries
- Fluorescent Light Bulbs
- Artist Paints/Mediums
- Dry Cleaning Solvents
- Fiberglass Epoxy
- Solvents
- Lighter Fluids
- Pool Chemicals
- Computer Waste
- Pharmaceutical Waste
- Cameras
- Christmas Tree Lights

Acceptable Items

Garage

- Transmission Fluid
- Auto Batteries
- Battery Acid
- Brake Fluids
- Car Waxes
- Diesel Fuel
- Fuel Oil
- Antifreeze
- Gasoline
- Kerosene
- Motor Oil
- Propane Tanks

Garden

- Fungicides
- Herbicides
- Insecticides
- Pesticides
- Fertilizers
- Rat Poison

Workshop

- Paints (All)
- Paint Thinners
- Varnish & Stains
- Wood Preservatives
- Gun Cleaning
- Cutting Oils
- Turpentine
- Aerosol Cans
- Smoke Detectors
- Fire Extinguishers
- Carbon Monoxide Detectors

Unacceptable Items

- Explosives & Ammunition
- Industrial Waste
- Tires & Asbestos

Put household
HAZARDOUS WASTE
where it belongs!



See backside for more information and a map to the collection location.

What is Household Hazardous Waste?

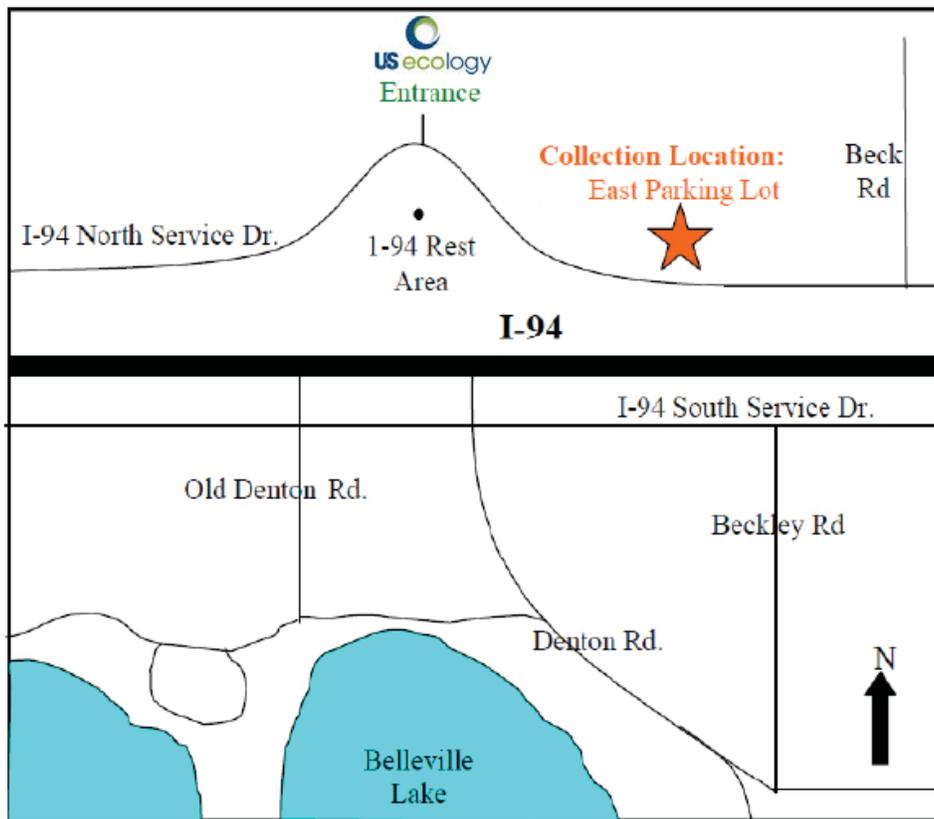
Many household products require special attention in their use, storage and disposal. A product is considered “**hazardous**” if it is:

- **Toxic or Poisonous**
- **Ignitable/Flammable**
- **Corrosive**
- **Reactive** (i.e., products that can explode if exposed to heat, air, water or shock)

Check the label to see if a product is hazardous. If it says **Warning, Caution, Danger, or Poison**, consider it hazardous.

Unwanted portions of hazardous products are considered to be hazardous wastes and should be treated in a careful manner to avoid accidents or polluting our environment.

Household Hazardous Waste Collection Day Drop-off Site



For more information, please call VBT Community Services at (734) 699-8926.



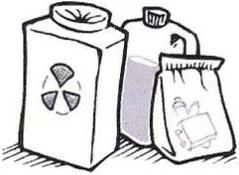
Household Hazardous Waste Collection Day

What: FREE one day drop-off for Van Buren Township residents

When: *Saturday, October 14, 2017 9:00 am - 2:00 pm*

Where: US Ecology East parking lot
49350 North I-94 Service Drive (see map on reverse)

Why: To dispose of household hazardous waste in a safe and environmentally friendly manner.



Below is a list of both acceptable and unacceptable items for collection. All products should be tightly sealed to prevent spillage while transporting to the facility and all containers brought to the collection must be left at the collection. **Products will not be accepted in milk jugs** because the plastic is thin and punctures easily.

Kitchen/Bathroom

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- Medicines
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- Cleaning Products

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- Fiberglass Epoxy
- Solvents
- Lighter Fluids
- Pool Chemicals
- Computer Waste
- Pharmaceutical Waste
- Cameras
- Christmas Tree Lights

Acceptable Items

Garage

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- Battery Acid
- Brake Fluids
- Car Waxes
- Diesel Fuel
- Fuel Oil
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- Smoke Detectors
- Fire Extinguishers
- Carbon Monoxide Detectors

Unacceptable Items

- Explosives & Ammunition
- Industrial Waste
- Tires & Asbestos

Put household
HAZARDOUS WASTE
where it belongs!



See backside for more information and a map to the collection location.

What is Household Hazardous Waste?

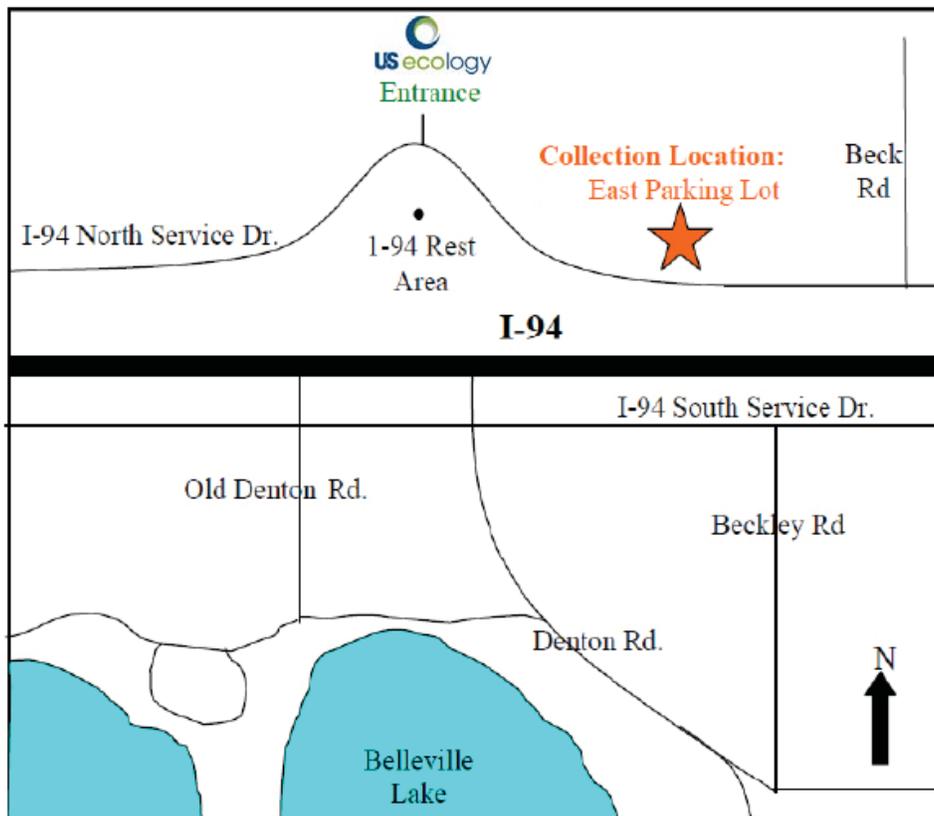
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Check the label to see if a product is hazardous. If it says **Warning, Caution, Danger, or Poison**, consider it hazardous.

Unwanted portions of hazardous products are considered to be hazardous wastes and should be treated in a careful manner to avoid accidents or polluting our environment.

Household Hazardous Waste Collection Day Drop-off Site



For more information, please call VBT Community Services at (734) 699-8926.

Residents of Wayne & Oakland County Attend Two FREE Workshops!

RSVP workshop title and date within one week of workshop to:
rsvp@allianceofrougecommunities.com or 734-272-0291

Sponsored by:



Alliance
of Rouge
Communities

OURS TO PROTECT

Working together, restoring the river



Septic System Maintenance Workshop

Learn about your septic system and how to maintain it.

Wayne County residents attend:
September 14, 2017, 6 pm - 8 pm
Otisville Sheldon Room, Van Buren Township Hall
46425 Tyler Road

Oakland County residents attend:
September 21, 2017, 6 pm - 8 pm
Wexford Hall, Farmington Hills Costick Center
28600 West Eleven Mile Road



Stewards of The Rouge River Workshop

Learn how you can protect water quality at home.



Wayne County residents attend:
October 11, 2017, 6 pm - 8 pm
Walnut Room, Summit on the Park, Canton
46000 Summit Parkway



Oakland County residents attend:
October 26, 2017, 6 pm - 8 pm
Public Library Meeting Room, West Bloomfield Twp.
4600 Walnut Lake Road



Help direct future activities - take our survey on Water Quality Changes in the Rouge River!

Completed surveys will be entered in a drawing for a \$100 Visa gift card to be distributed in December 2017.

Survey Link: <https://www.surveymonkey.com/r/PBKWV5H> or if you don't have internet access call 734-272-0291

For more information go to: www.allianceofrougecommunities.com



FALL TREE PLANTING W O R K S H O P

-September 30th, 2017 at 10:00 am-



Learn how to plant a tree the right way!

**Working with the Van Buren Township staff,
Alliance for Downriver Watersheds &
Citizen Foresters Detroit, volunteers will...**

- Help plant 30 trees at the VBT Water Tower
- Learn the right way to plant a tree
- Be part of an ongoing project to 'increase the green' in Metro Detroit

Park at Van Buren Township Hall and walk over to the Water Tower
46425 Tyler, Van Buren, MI 48111
To register or for more info, please call 734-699-8913



Alliance of Rouge Communities Trees for Green Schools

Wayne County & Oakland County Schools November 2016



Working together, restoring the river

As part of the Alliance of Rouge Communities (ARC) 2016 Green Infrastructure Education Campaign, Wayne County's Water Quality Management Division (WQMD) coordinated the purchase of 30 trees for recognized Michigan Green Schools in the ARC. The tree species offered were all native to Michigan and included eastern red bud, sugar maple, and tulip tree. The trees were bare root, 1.5 inch caliper and depending on the variety, 7'-10' in height. WQMD offered the trees to eight-one (81) schools that were new to the Green School program or held an Evergreen status during the 2016 program. These schools were located in the Oakland



*All of the volunteers had a great time and even said that they would do it again! Thanks again for this wonderful opportunity!
~Crestwood High School, Dearborn Heights*

and Wayne County portions of the Rouge River watershed. The thirty trees went to 19 Oakland County schools and 11 Wayne County schools.

Healthy trees in our communities improve our water quality. In addition to the visual impact of trees, tree canopies and root systems provide a natural filter to our water supply and reduce storm water runoff, flooding and erosion*.

Trees are natural air filters, too. Their foliage reduces particulate matter from the air, including dust, micro sized metals, and pollutants such as ozone, nitrogen oxides, ammonia and sulfur dioxides. Forty trees can remove 80lbs of air pollution annually*.

Trees cool the air naturally from the effects of water evaporating from leaves and from direct shade. Buildings shaded by trees need less energy for cooling, which in turn means lower monthly utility bills in the summer. Four trees planted around each home could save up to 30% on summer cooling costs*.

For more information on the ARC's Green Infrastructure Education Campaign please contact Ms Meaghan Price, ARC Senior Associate Scientist at (586) 296-1010 or email her at mprice@ectinc.com. For more information on the Green Schools Program please contact Ms. Nancy Gregor, Wayne County Water Quality Management Division at (734)326-4607 or email at ngregor@waynecounty.com.

* Information obtained from the *Value of Trees* flyer the Alliance for Community Trees www.actrees.org

Participating Schools

ARC School	School District
Derby Middle	Birmingham
Greenfeld Elem	Birmingham
Bingham Farms Elementary	Birmingham
Way Elementary	Bloomfield Hills
West Hills Middle	Bloomfield Hills
Grandview Elem	Clarenceville
Crestwood High	Crestwood
Beechview Elementary	Farmington
Hayes Elem	Livonia
Hayes Elem	Livonia
Our Shepherd Lutheran School	Non-Public - Birmingham
Our Shepherd Lutheran School	Non-Public - Birmingham
St Hugo of the Hills	Non-Public - Bloomfield
Dearborn Heights Montessori	Non-Public - Dbn Hgts
Our Lady of Sorrows	Non-Public - Farmington Hills
Acad of Sacred Heart	Non-Public -Bloomfield Hills
Mercy High	Non-Public Farm Hills
Our Lady of Victory	Non-Public Northville
St Valentine	Non-Public Redford
Winchester Elementary	Northville
Farrand Elem	Plymouth-Canton
South Canton Scholars	PSA - Canton
Plymouth Scholars	PSA - Plymouth
Rochester Adams HS	Rochester (Hills)
Rochester Adams HS	Rochester (Hills)
Hamlin Elementary School	Rochester (Hills)
University Hills	Rochester (Hills)
Smith Middle	Troy
Troy Union Elem	Troy
Walled Lake Central	Walled Lake

School feedback and Pictures

Hamlin Elementary is just thrilled to have our new Sugar Maple Tree! We planted it next to our brand new playground. We announced it in our weekly school newsletter with a picture (see link in below email) and also on the Hamlin Elementary Facebook page. <https://www.facebook.com/search/top/?q=hamlin%20elementary%20school>

Thank you again!

Sincerely,
Meggan Smith
Hamlin Elementary Green Schools Chair

NEW SUGAR MAPLE TREE AT HAMLIN

Hamlin Elementary is very excited to be one of the few schools to receive a Sugar Maple Tree with funds donated from the Trees for Green Schools campaign through the Alliance of Rouge Communities (ARC). Trees are only offered to schools who have earned Evergreen Green Schools status, and must be located within the Rouge River Watershed. Our new Sugar Maple Tree was planted next to the playground. It will have beautiful foliage and will grow very quickly in the years to come!



Hi Nancy,

Our Tulip Tree was planted after school yesterday by about 20 Green Club gals here at Mercy High School. They had a great time and we sincerely appreciate the opportunity for a total win-win event. Thanks for making this possible!

Thanks again for all you do!
Sherri Howard
Mercy High School
Math Teacher
Green Club Moderator



Thanks to you, Nancy, for the opportunity!
~Smith Middle School, Troy

Hi Nancy,

Here are a couple pictures from St Valentine's Tree Planting Ceremony on Friday with our entire school. Thank you again for the wonderful program and the tree which is replacing a birch that we lost last year. Our tree was planted with messages of future goals and positive memories of the students time at St Valentine.

Sincerely,
Jennifer Forbes



St Valentine School , Redford

Dear Nancy,

Thank YOU for coordinating the whole tree donation - we are so grateful!!

We were able to involve eco club and botany students from our school to plant our tree and the bonus tree! Great to get them involved and caring about their landscape at their school. I let them know who/how/why we received the tree. I also put the info and pics in our school newsletter and it was posted on our school's facebook page. I'll get the other info to you as soon as I hear back from the students.

Thanks again!

Deb Dunn

Rochester Adams High School

Rochester Adams Student: Scott Sidner-“It was my first time planting a tree.”

Rochester Adams Student: Mikaylia Yandura- “It was lots of fun [to plant the tree]”

Rochester Adams Teacher: Jerry Bondy- “We are very thankful for the tree donation.

Adam’s High School and Eco-Club are committed to making the world a better place for all living things and planting trees is a great way to accomplish that goal.”



Rochester Adams High School Eco Club



Farrand Elementary, Plymouth





The Charter Township of Van Buren

2016 Water Quality Report

The Charter Township of Van Buren is proud to present the 2016 Water Quality Report. In complying with Federal legislative requirements, this report has been developed to provide you with valuable information about your drinking water. State and Federal regulations require us to test our water on a regular basis to ensure its safety. We met all the monitoring and reporting requirements for 2016. You will see as you review this report that your drinking water meets or exceeds all government standards set for water quality and safety.

This report will explain where your water comes from, lists the results of testing conducted at the water treatment plant and in the water distribution system, and contains important information about water and health. The report also provides information on how you can minimize contaminants in our source water.

Please help us to preserve the quality of our drinking water supply. If at any time you notice a change in the look, smell or taste of your drinking water, please contact the Van Buren Township Department of Public Services—Water & Sewer Division at (734) 699-8925.

Drinking water quality is important to our community and the region. The Charter Township of Van Buren and the GreatLakes Water Authority (GLWA) are committed to meeting state and federal water quality standards including the Lead and Copper Rule. With the Great Lakes as our water source and proven treatment technologies, the GLWA consistently delivers safe drinking water to our community. The Charter Township of Van Buren operates the system of water mains that carry this water to your home's service line. This year's Water Quality Report highlights the performance of GLWA and the Charter Township of Van Buren water professionals in delivering some of the nation's best drinking water. Together, we remain committed to protecting public health and maintaining open communication with the public about our drinking water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

If the amount of a contaminant exceeds a predetermined safe level in your drinking water (MCL, Action Level, etc.) the Van Buren Township Department of Public Services will notify you via newspapers, radio, TV and other means within 24 hours. With the notification, you will be instructed on what appropriate actions you can take to protect you and your family's health.

Where Does My Water Come From?

Your source water comes from the Detroit River, situated within the Lake St. Clair, and several watersheds within U.S. and Canada. The Michigan Department of Environmental Quality in partnership the Detroit Water and Sewerage Department and several other governmental agencies performed a source water assessment in 2004 to determine the susceptibility or relative potential of contamination. The susceptibility rating is on a seven-tiered scale from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contamination sources. The susceptibility of our Detroit River source water intakes were determined to be highly susceptible to potential contamination. However, all four Detroit water treatment plants that use source water from Detroit River have historically provided satisfactory treatment of this source water to meet drinking water standards.

GLWA initiated source-water protection activities that include chemical containment, spill response, and a mercury reduction program. GLWA participates in a National Pollutant Discharge Elimination System permit discharge program and has an emergency response management plan. GLWA voluntarily developed and receive approval in 2016 for a source water protection program (SWIPP) for the Detroit River intakes. The programs includes seven elements that include the following: roles and duties of government units and water supply agencies, delineation of a source water protection area, identification of potential of source water protection area, management approaches for protection, contingency plans, siting of new sources and public participation and education. If you would like to know more information about the Source Water Assessment or SWIPP, contact the Van Buren Public Services Department (734)699-8925.

What's In My Water?

We are pleased to report that during the past year, the water delivered to your homes or businesses complied with, or did better than, all State and Federal drinking water requirements. For your information, we have compiled a list in the following tables showing what substances were detected in our drinking water and the last year in which the test was conducted. Although all of the substances listed are under the Maximum Contaminant Level (MCL) set by the U.S. EPA, and therefore not expected to cause any health risk, we feel it is important that you know exactly what was detected and how much of the substances were present in the water.

Lead

Information about lead: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Charter Township of Van Buren is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Health Considerations

Some people may be more vulnerable to contaminants in drinking water than is the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Southwest Water Treatment Plant 2016 Regulated Detected Contaminants Tables

Inorganic Chemicals – Monitoring at the Plant Finished Water Tap								
Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Fluoride	5-10-16	ppm	4	4	0.55	n/a	no	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	5-10-16	ppm	10	10	0.53	n/a	no	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.

Disinfection By-Products – Monitoring in Distribution System, Stage 2 Disinfection By-Products								
Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Allowed Level MCL	Highest LRAA	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Total Trihalomethanes (TTHM)	2016	ppb	n/a	80	43	16-43	NO	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	2016	ppb	n/a	60	48	10-48	NO	By-product of drinking water disinfection

Disinfectant Residuals – Monitoring in Distribution System by Treatment Plant								
Regulated Contaminant	Test Date	Unit	Health Goal MRDLG	Allowed Level MRDL	Highest RAA	Quarterly Range of Detection	Violation yes/no	Major Sources in Drinking Water
Total Chlorine Residual	Jan-Dec 2016	ppm	4	4	0.65	0.53-0.76	no	Water additive used to control microbes

2016 Turbidity – Monitored every 4 hours at Plant Finished Water				
Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)		Violation yes/no	Major Sources in Drinking Water
0.29 NTU	100 %		no	Soil Runoff

Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

January – March 2016 Microbiological Contaminants – Monthly Monitoring in Distribution System						
Regulated Contaminant	MCLG	MCL		Highest Number Detected	Violation yes/no	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples		0	NO	Naturally present in the environment
<i>E. coli</i> Bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or <i>E.coli</i> positive.		0	NO	Human waste and animal fecal waste.

2014 Lead and Copper Monitoring at Customers' Tap								
Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples over AL	Violation yes/no	Major Sources in Drinking Water
Lead	2014	ppb	0	15	0 ppb	0	NO	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2014	ppb	1300	1300	109 ppb	0	NO	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.

*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.

Southwest Water Treatment Plant 2016 Regulated Detected Contaminants Tables

Regulated Contaminant	Treatment Technique	Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each quarter and because the level was low, there is no TOC removal requirement	Erosion of natural deposits

Radionuclides 2014							
Regulated contaminant	Test date	Unit	Health Goal MCLG	Allowed Level	Level detected	Violation Yes/no	Major Sources in Drinking water
Combined Radium 226 and 228	5-13-14	pCi/L	0	5	0.65 + or - 0.54	no	Erosion of natural deposits

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	5.41	Erosion of natural deposits

The Great Lakes Water Authority monitored for Cryptosporidium in our source water (Detroit River) from our Southwest Water Treatment Plant during 2016. Cryptosporidium was detected twice in our source water samples. A follow-up water sample was collected from the treated water and Cryptosporidium was not found to be present. Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immunocompromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

For More Information

For more information about this report, to obtain extra copies of this report, or for any questions relating to your drinking water, please call the Van Buren Township Public Services Department at (734) 699-8925 or the U.S. EPA's Safe Drinking Water Hotline at 1-800-426-4791 or visit the EPA web site at www.usepa.gov/safewater/. You are also invited to attend the monthly meetings of the Water and Sewer Commission held at 7:00 pm on the 4th Tuesday of every month at the Van Buren Township Hall, 46425 Tyler Road. We are also on the web at www.vanburen-mi.org.

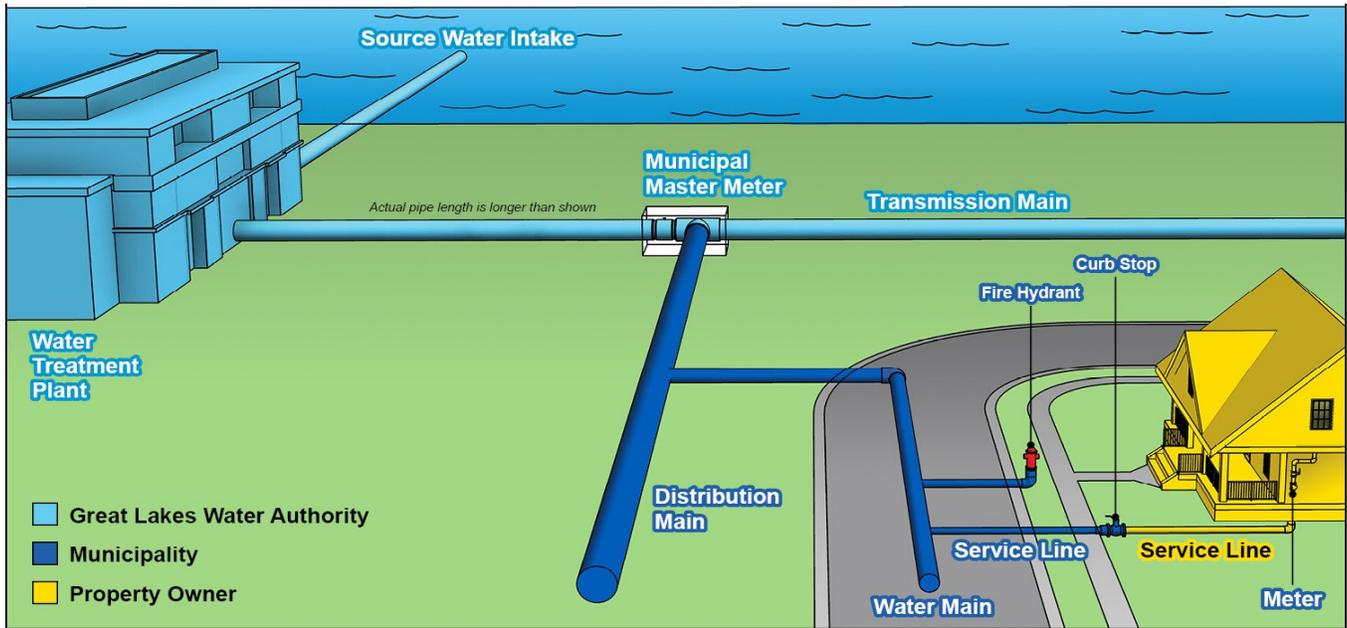
Irrigation

In order to keep our rates reasonably priced, please limit your outside watering to the hours of 5 p.m. to 7 a.m.

Key to the Detected Contaminants Table

Symbol	Abbreviation	Definition/Explanation
>	Greater than	
°C	Celsius	A scale of temperature in which water freezes at 0° and boils at 100° under standard conditions.
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic Acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total.
LRAA	Locational Running Annual Average	The average of analytical results for samples at a particular monitoring location during the previous four quarters.
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum Residual Disinfectant Level Goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
n/a	not applicable	
ND	Not Detected	
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
pCi/L	Picocuries Per Liter	A measure of radioactivity
ppb	Parts Per Billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts Per Million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
RAA	Running Annual Average	The average of analytical results for all samples during the previous four quarters.
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on the total.
µmhos	Micromhos	Measure of electrical conductance of water

Safe drinking water is a shared responsibility. The water that GLWA delivers to our community does not contain lead. Lead can leach into drinking water through home plumbing fixtures, and in some cases, customer service lines. Corrosion control reduces the risk of lead and copper from leaching into your water. Orthophosphates are added during the treatment process as a corrosion control method to create a protective coating in service pipes throughout the system, including in your home or business. The Charter Township of Van Buren performs required lead and copper sampling and testing in our community. Water consumers also have a responsibility to maintain the plumbing in their homes and businesses, and can take steps to limit their exposure to lead. Below is a diagram illustrating who owns and is responsible for each part of the system.



IMPORTANT INFORMATION REGARDING SEWER BACKUP OR BASEMENT FLOODING CLAIMS

Michigan statute, Act 222 Public Acts of 2001*, clarifies municipal liability for sewer backups. A key provision of the statute requires that a person seeking compensation for property damage or physical injury must file a written claim within 45 days of the event.

If you experience an overflow or backup of a sewage disposal system or storm water system, you must file a written claim with the Van Buren Township Water & Sewer Division within 45 days after the overflow or backup was discovered. Notice must be mailed to Van Buren Township Water & Sewer Division, 46425 Tyler Road, Belleville, MI 48111. Failure to provide the required notice will prevent recovery of damages.

Contact the Van Buren Department of Public Services at (734) 699-8925 immediately upon discovery of an overflow or backup. Like you, the Department of Public Services considers a sewer backup or basement flooding an emergency, and will respond to your call day or night, holidays and weekends.

*the full text of P.A. 222 of 2001 is available on our web site: www.vanburen-mi.org under Departments,

2016 Water Quality Report for Van Buren Township

Charter Township of Van Buren
46425 Tyler Road
Van Buren Twp, Mi 48111

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Van Buren Township Residents 2016 Water Quality Report

(note to Businesses: Please post in your Van Buren workplace)



Household

Recycling

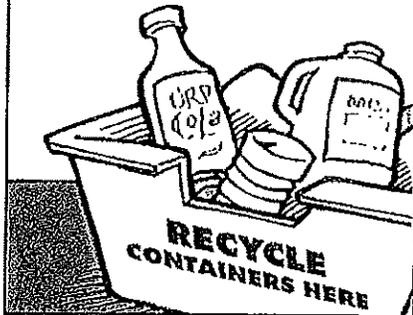


Why be concerned?

Each person in Van Buren Township produces approximately 3.5 pounds of solid waste (or trash) each day.

For most of us, as long as the garbage we place on the curb each week is taken away, there is no solid waste problem. However, we must plan for the future and reduce the amount of waste we produce. Landfills quickly fill up, and locating new ones is not an easy task.

One step in the right direction is to recycle as many containers, papers and compostable materials as possible.



What Goes in the Recycle Bin in Van Buren Township?

Place the following materials together in your home collection bin and put alongside your trash on your regular trash pickup day.

Glass: Clear, green and brown food and beverage containers. Rinse containers thoroughly, throw lids, neck rings, foil and styrofoam labels in the trash. Paper labels may remain.

Plastics: Milk and water jugs, laundry detergent bottles, or any rigid plastic container marked on the bottom with a 1 or 2. Rinse and flatten; throw lids and neck rings in the trash.

Cans: Steel, tin and aluminum food and beverage cans. Rinse cans thoroughly, remove labels. Lids may remain attached, but tucked inside. Smaller cans may be placed inside larger ones with lids tucked between. Clean aluminum foil is also accepted.

Paper: Newspapers and everything that comes with the newspaper is accepted. Bundle papers six inches thick and tie with twine, or place in a paper grocery bag. All types of white paper are accepted and so are paper grocery bags.

Corrugated Cardboard: Remove all packaging material. Bundle in 3 foot by 3 foot bundles. Pizza boxes, frozen food boxes, wet cardboard, or cereal type boxes are not accepted.

Recycling Opportunities for Homeowners

Curbside pick-up of recyclable materials is available to most homeowners in Van Buren Township.

Orange recycling bins are free for new homeowners. Replacement bins are available at the Township for \$7.50.

Drop-off opportunities are also available. The Waste Management Recycling Center is open from 8am to 5pm Monday through Friday and 9am to noon on Saturdays. It is located on Van Born road between Haggerty and Hannan roads.

A Few Recycling Tips:

Do not recycle miscellaneous items! Recycle only what is acceptable in our community recycling program.

When in doubt, throw it out! Do not risk contaminating other good recyclables.

Always rinse containers before recycling.

How Can Apartment and Condominium Dwellers Recycle?

If you do not have curbside collection, you may take your recyclables to the Waste Management Recycling Center located on Van Born Rd between Haggerty and Hannan roads. Hours of operation are 8am-4:30pm Monday through Friday and 7am-11am Saturdays. If you have questions, call (734) 326-0993



(Continued on other side)

Sources and Funding

- Prepared by Canton Township Engineering Services and JJR Incorporated (Fall 1997). Original Graphics by David Zinn and JJR.
- Guide preparation and distribution funded, in part, through a grant from the Rouge River National Wet Weather Demonstration Project (#X995743-02).

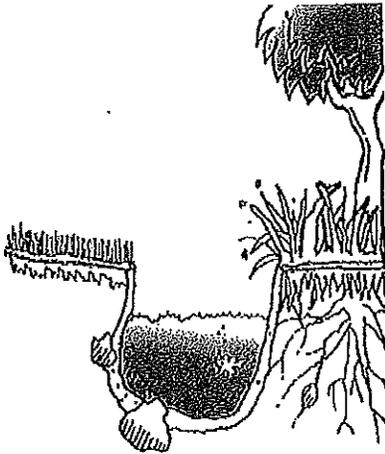


Landscaping Near the Water's Edge



Why be concerned?

Lands adjacent to streams, rivers and inland lakes are called riparian areas. Riparian vegetation serves many functions, such as providing shade which helps cool stream water (a survival requirement of some fish species, like trout). Riparian vegetation also traps sediment and nutrients collected by rain water as it flows across pavement and other impervious surfaces before it reaches a waterway.



Residents who live next to a stream, river or lake, often replace most of the existing vegetation between their house and the edge of water with lawn grasses and a few ornamental trees. The shallow root systems of lawn grasses are ineffective in preventing streambank erosion, which is a major problem within local streams and rivers. Eroded soil can cover fish habitat and degrade water quality.

Riparian Landscape Design Considerations

Residential developments next to waterways can be designed to protect riparian vegetation and benefit homeowners, wildlife and water quality.

Factors to consider in any landscape design project include: 1) use of the landscape; 2) views that should be protected or enhanced; and 3) desired maintenance level.

Typically, the most actively used outdoor areas are found in the "backyard." The backyard landscape may need to accommodate a variety of uses such as active play, outdoor dining, gardening, sunbathing, resting, or work space for hobbies. Often the total area available for these different uses is relatively small, and wise use of space is a necessity.

Views from the home and within the backyard are another factor to consider in landscape design. Many people value the views of an adjacent stream or lake and

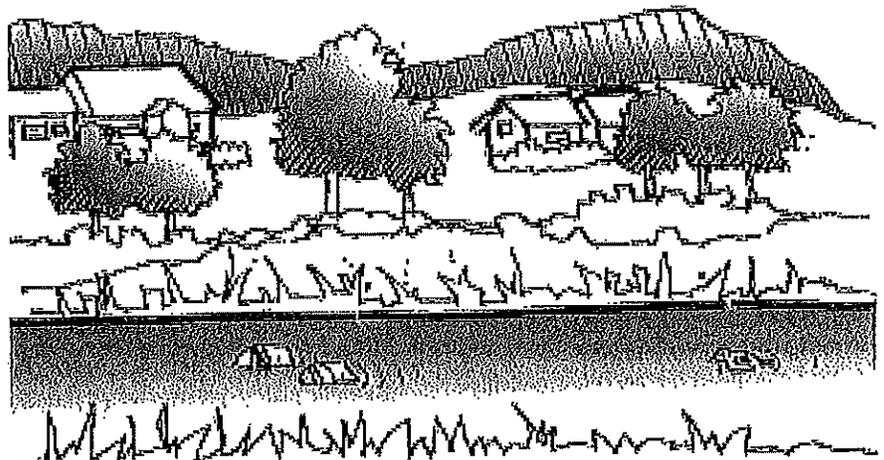
What Does "Native" Mean?

When a plant is termed "native," rather than "exotic," it means it is adapted to an area, including the local climate and soils, and provides habitat and food for local wildlife. Planting native plants in your yard adds to the scenic quality that is unique to Lower Michigan.

want access to the water's edge to experience the sound and sight of water. Views can be directed by sensitive placement of trees and shrubs in relationship to viewing points, such as windows, outdoor paths and patios. Existing vegetation can be selectively pruned to establish desired views.

Many people complain about mowing lawns, yet, they are desired by most and are even a requirement of many developments. Lawns do provide an ideal surface for many outdoor activities and permit open views which may be desired for safety or aesthetic reasons. Most of us, however, need much less lawn

(Continued on other side)



Sources and Funding

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Household

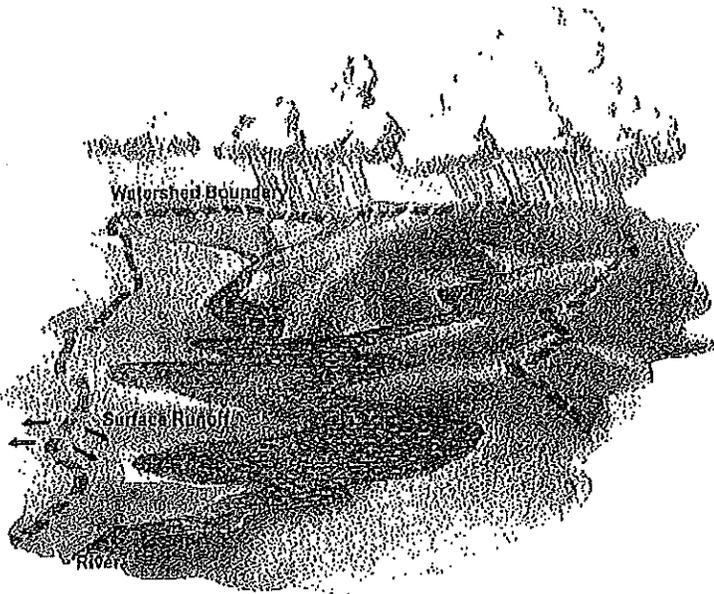
Protecting Water Quality



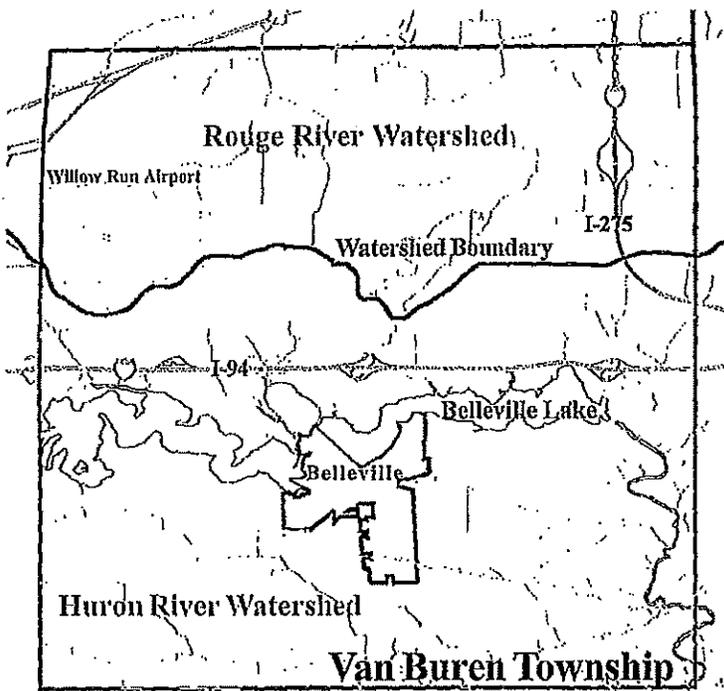
It's Your Watershed

Did you know that more than one-third of the pollution in our waterways come from stormwater runoff? As rain water flows over land it picks up a variety of pollutants, including eroded soil, trash, fertilizers and pesticides. Automobile fluids, including motor oil, antifreeze, gasoline, and brake fluid contain trace metals and poisons that often leak from vehicles onto streets and parking lots. These pollutants may make their way into storm sewers and ultimately into nearby streams and rivers.

Today, significant efforts are underway to improve our water quality because these waterways affect millions of residents and extend throughout hundreds of communities.



A watershed is all of the land area and waterways that drain into a river or a lake.



Van Buren Township is located in both the Rouge River Watershed and the Huron River Watershed. Although the Rouge River does not run through Van Buren, we are connected to the Rouge by our storm drain system. The majority of the Northern half of the Township is in the Rouge River Watershed. The rest of Van Buren, including Belleville Lake, is in the Huron River Watershed.

Van Buren Township is committed to protecting water quality and is working with other communities in both watersheds to develop proactive methods of controlling water pollution.

The information presented in this guide is intended to inform local residents and business owners of the role they can play in pollution prevention.

Despite advances in technology, environmental clean-up costs continue to increase every year. Preventing pollution is much easier and less costly to implement than trying to correct environmental damage after it has occurred.



Reducing Household Waste



Why be concerned?

Minimizing waste is one of the most important ways to protect water quality. Look for opportunities to reduce the volume of your waste and take advantage of them whenever possible. This will protect the environment and save landfill space.



Purchasing Power

- Buy the most durable products and parts available. Consider whether an item is easily repaired, reused and/or recycled.
- Avoid disposable products and excessive packaging. Buy products with recyclable packaging.
- Buy *only* what you need. For example, buy materials only in amounts that can be completely used in a timely manner.

- Keep stored materials dry and contained. Make sure they are properly labeled and dated so that the oldest materials can be used first.
- Separate wastes. Mixing wastes can prevent reuse and recycling.
- Find out if others can use your materials when you're done with them. If they can't be reused, recycle your wastes whenever possible.

Ideas for Using, Storing and Disposing of Products



- Recondition and reuse products, instead of buying new ones.
- Carefully read and follow label directions. Never use more product than the directions suggest.
- When possible, apply products to targeted areas *only*, versus excessive use over a larger area.
- Properly maintain equipment (including sprinklers) to prevent leaks, over-application and drift. Don't apply products outdoors when rain or winds are in the forecast.
- Use up materials *completely* and allow containers to air dry before disposing of them. Many plastic containers can be recycled.

Recycling Opportunities

Curbside pick-up of recyclable materials is available to most homeowners in Van Buren Township. Drop-off opportunities are also available. For more information refer to the Recycling fact sheet.

The Waste Management Recycling Center is open from 8am to 4:30pm Monday through Friday and 7am to 11am on Saturdays. It is located on Van Born road between Haggerty and Hannan roads. If you have questions, call (734) 326-0993

CONTACT INFO

Waste Management Recycling Center.....(734) 326-0993

Michigan Department of Environmental Quality ... (800) 662-9278

Wayne County Department of Environment 24-hour Hotline (888) 223-2363

Sources and Funding

- The Community Partners for Clean Streams program (Janis A. Bobrin, Washtenaw County Drain Commissioner). Original text by Florence Davis and graphics by David Zinn. Revisions by Canton Township Engineering Services and JJR Incorporated (Fall 1997).
- Guide preparation and distribution funded, in part, through a grant from the Rouge River National Wet Weather Demonstration Project (# X995743-02).

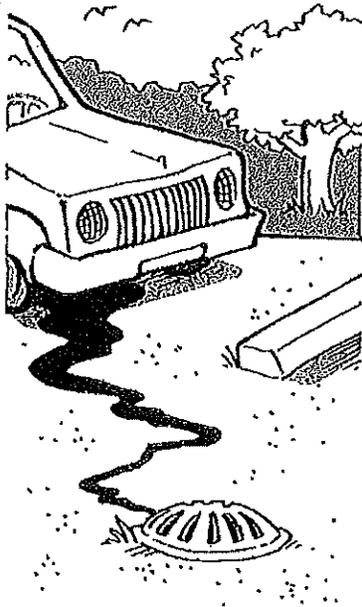


Car Care



Why be concerned?

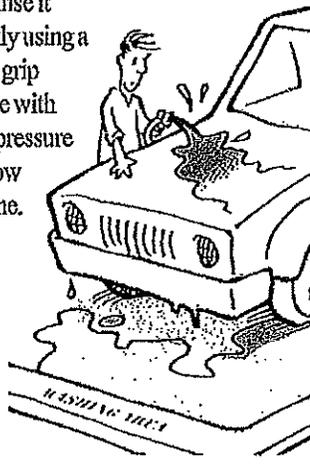
Washing cars in your driveway can add pollutants to Belleville Lake. Wash water that enters storm drains often contains detergents, oil, grease, heavy metals and dirt. Storm drains in Van Buren Township eventually discharge these substances into our rivers and lakes.



Vehicle fluids dumped down a storm drain or directly into a waterway can cause serious problems. Four quarts of oil, the amount it takes to fill your automobile's engine, can form an eight acre oil slick in a river. Other vehicle fluids such as antifreeze are poisonous to people, fish and wildlife. Many cats and dogs have died from drinking sweet-tasting puddles of antifreeze found on driveways, in ditches or near storm drains.

Washing Tips

- Wash your car at a commercial car wash that uses water efficiently and disposes of the wash water properly. If a commercial car wash isn't available near you, then wash your car on the lawn to prevent soapy runoff from entering storm drains or roadside ditches.
- Remove dirt around the wheels first with a wire brush. Collect the soil with a broom and dispose of it in a manner that will keep it out of storm drains.
- Use non-phosphate biodegradable detergents and mild soaps, such as vegetable oil-based soaps.
- Wash one section of the car at a time and rinse it quickly using a pistol grip nozzle with high pressure and low volume.



Car Maintenance Tips

- If you change vehicle fluids, such as motor oil or antifreeze, at home, take the waste fluids to an oil change facility.
- Always use a drip pan under your work and use funnels when transferring fluids.
- Never mix waste oil with gasoline, solvents or other liquids before recycling.



- Change vehicle fluids in the garage whenever possible. If a spill occurs, pour kitty litter, sawdust or cornmeal on the spill to absorb the liquid. Place the waste material in a strong plastic bag and dispose with your trash.
- Inspect vehicles regularly for leaking oil and fluids, and make repairs immediately after problems are detected.

Recreational Vehicle Tips

- Follow the guidelines listed above.
- Take recreational vehicle waste to: Walt Michal's RV Center 44700 N. I-94 Service Drive Van Buren Township, MI 48111
- See "Getting Help" for more information and for other regional drop-off locations

GETTING HELP

Van Buren Twp. Environmental & Planning Departments.....(734) 699-8913

Michigan Department of Environmental Quality.....(800) 662-9278

Sources and Funding

- Community Partners for Clean Streams program (Janis A. Bobrin, Washtenaw County Drain Commissioner) and the Rouge River Repair Kit. Original graphics by David Zinn and JJR Incorporated. Revisions by Canton Township Engineering Services and JJR Incorporated (Fall 1997).
- Guide preparation and distribution funded, in part, through a grant from the Rouge River National Wet Weather Demonstration Project (# X995743-02).



Maintaining Septic Systems



Why be concerned?

Septic systems are wastewater treatment systems designed to collect all wastewater from residences where sanitary sewer systems are not available. They are typically designed to be effective over a 20-year period if properly maintained.

Poorly maintained and failing septic systems can cause serious problems. Sewage from overloaded systems can pond on the ground near the drainfield or back up into buildings. Poorly treated septic liquids can contaminate ditches, creeks and shallow drinking water supplies. Animals and people may become ill from contact with these polluted waters.

In addition to public health concerns, it is costly to repair or replace a failing system.

How the Septic System Works

A septic system consists of a septic tank and a drainfield (Figure 1). Wastewater flows from the house to the septic tank where natural bacteria begin to break down the solid materials. This breakdown reduces solids in the wastewater, but leaves a sludge residue behind in the tank which builds up and must be removed to prevent it from entering the drainfield and clogging the system.

The center liquid layer flows slowly from the tank (Figure 2) into the drainfield. The drainfield is made up of perforated pipes that

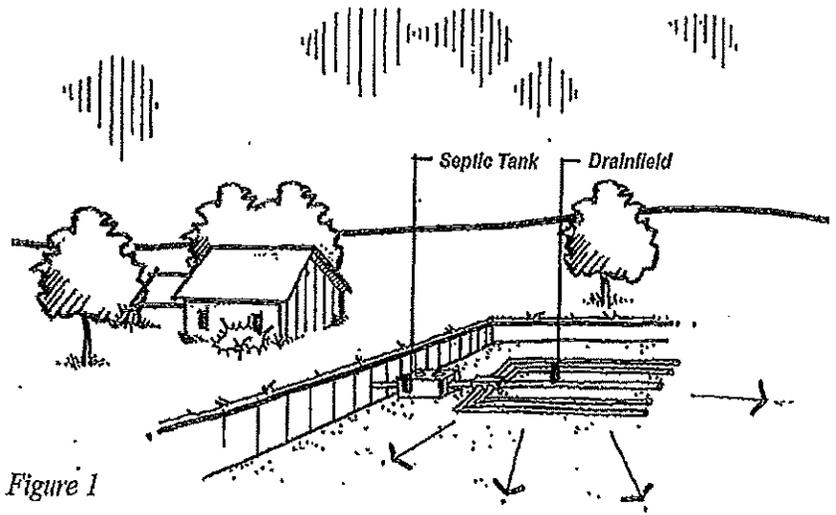


Figure 1

equally distribute the wastewater across the gravel-filled drainfield. The liquid then soaks into the soil, which acts as the final filter for treatment of wastewater received from the septic tank or from the house.

- Connect laundry and kitchen water to the septic tank.
- Divert other sources of water, like roof drains, house footing drains and sump pumps, to lawn areas away from the septic system. Excessive water keeps the soil in the drainfield saturated and prevents adequate treatment of the waste water.
- Have your septic tank pumped out by a licensed operator every 2-3 years.
- Have the operator make sure there is a tee or baffle on the outlet of the septic tank. The baffle stops the scum from floating into the drainfield.

Do's and Don'ts if You Are on a Septic System

Do's

- Learn the location of your septic tank and drainfield. Keep a sketch of it handy with your maintenance record for service visits. Obtain a copy of your septic permit from the Health Department, if possible.

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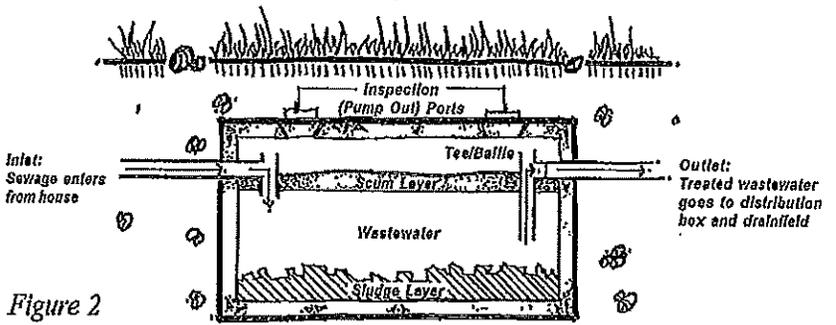


Figure 2

Sources and Funding

- Rouge RAP Advisory Council On-Site Septic Subcommittee and Rouge Repair Kit. Graphics by JJR Incorporated (Fall 1997).
- Guide preparation and distribution funded, in part, by a grant from the Rouge River National Wet Weather Demonstration Project (# X995743-02).



Home Composting



Through the natural process of composting, leaves and grass clippings from your yard can be transformed into a soil-enriching substance called compost. The steps for making compost outlined below reflect the experience of area master composters working in an urban setting.

MATERIALS FOR COMPOSTING

To avoid nuisances and odors, select the materials for your compost pile with care.

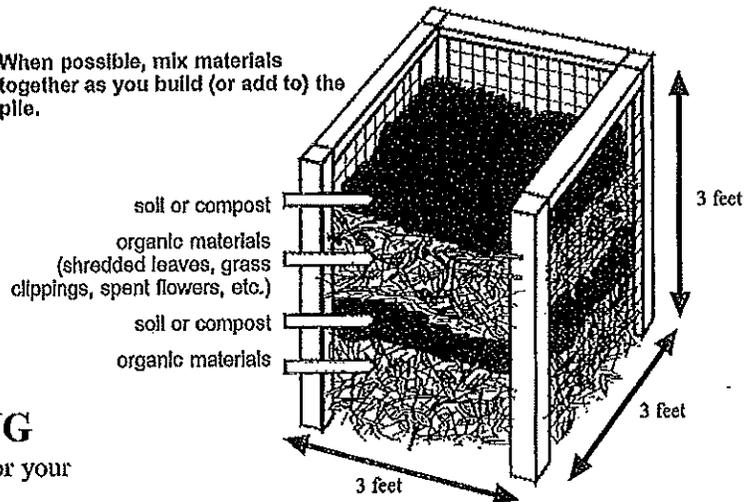
Yes:	No:
Grass clippings	Dairy products
Leaves — shredded, if possible	Oils and fats
Spent flowers & garden clippings	Meat, fish, bones
Young weeds (without seeds)	Pet manure; Cat litter
Hedge trimmings	Cooked food
Fruit & vegetable peelings	Diseased plants
Lettuce leaves	Black walnut leaves
Coffee grounds, filters, & tea bags	Bread
Fertilizer	Weeds with seeds
Soil or compost	Invasive weeds

For an *ideal* composting mix, combine shredded leaves (50% of total volume), green grass clippings, (25% of total volume) and soil or compost (25% of total volume). Start with available yard clippings and add other materials, as needed, to balance the pile.

The “green” materials have a high nitrogen content which typically causes the pile to heat up and decompose more quickly. To avoid odors, make sure that green materials are mixed thoroughly with brown materials and soil.

*Composting is nature's way with waste.
Why not be good to your garden?*

When possible, mix materials together as you build (or add to) the pile.



BUILDING THE COMPOST PILE

To build the pile, follow these steps:

1. Start with a layer of organic materials such as shredded leaves, grass, or other garden debris.
2. Water the layer until it is as *moist as a wrung-out sponge*.
3. Add 2"-3" of soil or compost — to provide microorganisms.
4. If possible, mix all materials together as you build the pile.
5. Continue the process of adding organic materials, soil, and water until the bin is filled. Add grass clippings in small amounts and mix in thoroughly.
6. Water each layer...and check moisture periodically.

Build the pile to a size of 3 feet x 3 feet x 3 feet or slightly larger — or fill the compost bin.

TURNING THE PILE

Turning and mixing the compost pile with a pitchfork or compost turner adds oxygen and accelerates the rate of decomposition. The pile may be turned once a week, once a month, several times a year, or not at all. If the pile is *turned over and mixed from time-to-time and kept moist*, finished compost is usually available in six to nine months.

Don't worry about the temperature of the pile — either hot or cold composting yields beneficial compost.

Appendix H

Zoning Ordinance

Please see the Van Buren Township Website at:

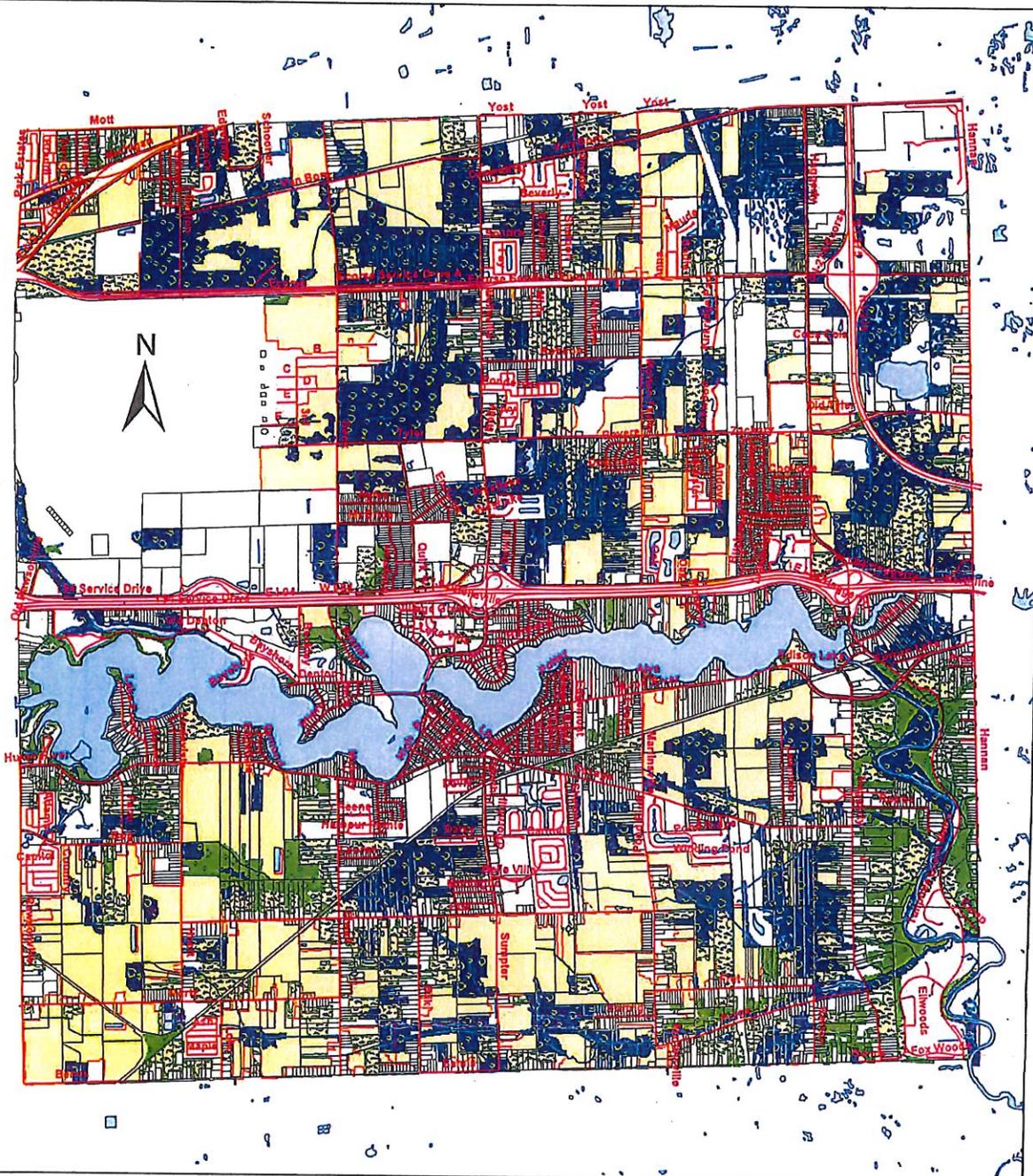
<http://vanburen-mi.org/>

for a copy of the updated zoning ordinance.

Appendix I

Natural Features Inventory

Van Buren Charter Township Natural Features



LEGEND		
Roads	Grassland & Shrubs	Woodlands
Hydroline	Agriculture	Wooded Wetlands
Parcels	Wetlands	Hypopoly



Appendix J

"Huron River Reports"

Please see the Huron River Watershed Council Website at:

<http://www.hrwc.org/publications/newsletters/>

for copies of the Huron River Reports Newsletter

Appendix K

MDEQ Harmful Algal Bloom Survey 2017

MDEQ Harmful Algal Bloom Survey 2017

Website: <https://sites.google.com/oakland.edu/ouhabsurvey>; Project Email: ouhabsurvey@gmail.com

Project Manager: Dr. David C Szlag, (Oakland University); szlag@oakland.edu; (248) 370-2321

Survey Coordinator: Dr. Thomas R Raffel, (Oakland University); raffel@oakland.edu; (248) 370-3551

Proposed Project

We are conducting a MI-DEQ supported project to develop stronger predictive tools for monitoring harmful algal blooms (HABs), caused by toxin-producing cyanobacteria. We will conduct a large-scale survey of Michigan lakes to determine why some lakes are at higher risk for HAB formation. This project will lead to more robust monitoring and risk assessment of HAB formation.

What can contribute to HAB formation?

- Natural ecosystem cycles
- Unusually high water temperature
- Eutrophication via nutrient runoff

2017 Research Aims

1. **Spatial Survey:** We will survey **approx. 30 lakes across Michigan** to test which variables best predict HAB formation. Our team will collect samples once every 4 weeks from July to Oct 2017. We are seeking at least one local volunteer to monitor our sampling apparatus (marker buoy and algae samplers).
2. **HAB-App Field Testing:** We are seeking a small number of dedicated volunteers (1-3 per lake) to **take and submit geotagged photos of potential algal blooms**, to field test a new computer program developed by our collaborator Dr. Michael Waters. This program uses color analysis to assess the presence or absence of cyanobacteria in the water. Volunteers with iPhones can also install HAB-App to conduct the analysis themselves in real time. **Volunteers who detect a potential HAB will be asked to collect and preserve a water sample for later microscopic analysis.**



Survey Methods

- Testing water (“grab”) and SPATT (Solid Phase Absorption Toxin Tracking) samples for the presence of harmful algae.
- qPCR (DNA detection), ELISA, and GC-MS (mass spectrometry) to quantify cyanobacteria and their toxins
- Collect water chemistry data at each sampling date (temperature, pH, conductivity, chlorophyll a, phycocyanin, turbidity, dissolved oxygen, oxidation-reduction potential)
- Collect continuous temperature/weather data using HOBO data loggers and climate databases
- Lake profiling (water chemistry and sample collections at varying depth)
- Track invasive zebra mussel abundance visually (quadrats) and accumulation over the survey period (PVC samplers)

How can your lake association get involved?

- Recruit at least one volunteer to monitor and report problems with our buoy, and to submit photos of possible HABs
- Talk with Dr. Raffel, Dr. Szlag, or one of their graduate students (Jason Sckrabulis jpsckrab@oakland.edu, Ryan McWhinnie rmmcwhin@oakland.edu, or Hamzah Ansari hdansar2@oakland.edu) about selecting a sampling site
- Obtain and sign Oakland University’s Liability Release Form from Dr. Raffel for each volunteer

Our Team:

This is a collaborative project between the Szlag Chemistry Lab and the Raffel Ecology Lab. Dr. Szlag is an expert on the chemistry of harmful algal blooms, and Dr. Raffel is an expert aquatic ecologist with experience organizing large-scale surveys. This work also includes collaborators at Wayne State University (Dr. Judy Westrick), Lake Superior State University (Benjamin Southwell), and Northern Kentucky University (Dr. Michael Waters & Dr. Miriam Steinitz-Kannan).