

SECTION 7 - WATERSHED PLANNING PROCESS

Under County Public Improvement Act (PA 342, 1939) in Section 10, the communities of Genesee County have signed a contract to supply time and money to Developing the Watershed plan and implementation. Phase II communities within the Lower Flint Watershed but outside Genesee have made other arrangements for implementation to satisfy their Certificate of Coverage.



Figure 7-1 Organizational Chart

Besides the watershed workgroup there are several other committees that are responsible for various aspects of the planning and implementation. The Lower Flint River Watershed is one of five watersheds within Genesee County under this committee. Because of this many of the decisions and timelines are county wide.

The **Advisory Committee** is the decision making body made up of those communities that have signed a contract. This group is responsible for voting on the proposed implementations developed by the subcommittees and workgroups. The members of the Advisory Committee were split into one of three groups to serve on one of the subcommittees. The **Public Education and Participation Subcommittee** is responsible for the development of the Public Education Plan. The **Construction**

Standards and Practices Subcommittee is responsible for establishing a unified review process and adopting a standard for best management practices. The **Monitoring and Mapping Subcommittee** is responsible for the methods that are going to be used to monitor the water for improvement or degradation. Each of these groups have workgroups made up of stakeholders, the public, and the municipal officials.

Public Education Plan

Required Elements

- Encourage Public to report Illicit Discharges or improper disposal into storm sewer
- Education of public on the availability, location and requirements of facilities for disposal or drop off of:
 - Household Hazardous Waste
 - Grass Clippings
 - Leaf Litter
 - Motor Vehicle Fluids
- Public education concerning application and disposal of pesticides and fertilizers
- Public education concerning materials and procedures for residential car washing
- Public education concerning the ultimate discharge point & potential impacts from the separate storm water drainage system serving their place of residence
- Public education for citizen responsibility and stewardship
- Public education concerning management of riparian lands to protect water quality

PUBLIC EDUCATION PLAN

The Public Education Subcommittee is responsible for the complete storm water education plan. The committee works with the Genesee County drain office and U of M's Center for Applied Environmental Research (CAER) Department to draft the Education Plan. Using the Michigan Department of Environmental Quality's (MDEQ) required elements as a starting point the committee has been working on the following items:

- Identify existing programs and organizations that are already educating on required elements
- Identify gaps in existing programs
- Develop baseline survey of
 - General publics knowledge
 - Focus groups knowledge
 - Quantify behaviors that need to be changed
 - Marketing preferences and influences
 - Demographics
- Identify target audiences and the behaviors that need to be changed.
- Draft Media Campaign
- Implementing the Website and resources for the educational campaign

The Public Education Workgroup developed a table of existing education programs that could possibly meet some or all our education requirements. More importantly the table can identify those requirements that are not being met at all. It is the intent of the Advisory Committee and the Public Education Workgroup to partner with existing programs whenever possible.

- 8) On a scale of 1 to 5, with 1 being Very Concerned (VC) and 5 being Not Concerned At All (NCAA), how concerned would you be if you saw your neighbor do each of the following...

	VC					NCAA				
	1	2	3	4	5	1	2	3	4	5
Dumping liquid chemical waste to the dirt/lawn?	87.9%	6.8%	2%	<1%	2.6%					
Dumping liquid chemical waste into a storm drain on the street?	89.3%	4.6%	3.6%	<1%	2%					
Dumping liquid chemical waste onto his driveway?	79.7%	11.4%	4.2%	<1%	3.9%					
Dumping used oil from vehicles on his driveway?	80.1%	9.2%	5.9%	1.6%	3.3%					
Dumping used oil from vehicles on his lawn?	83.7%	6.8%	3.9%	2%	3.6%					
Dumping used oil from vehicles into a storm drain?	90.2%	4.9%	1.3%	1%	2.6%					
Pushing grass clippings into a pile at the curb?	25.5%	7.5%	19.3%	8.2%	39.7%					
Raking leaves into a pile on the street?	24.3%	6.2%	17.4%	9.5%	42.6%					
Raking leaves into a ditch?	33.1%	11.9%	12.3%	5.6%	37.1%					
Burn leaves	47.9%	8.9%	13.8%	3%	26.6%					
Dumping travel trailer waste into drain sewers?	86.8%	4%	3.3%	1.3%	4.6%					
Dumping travel trailer waste onto a roadside?	85.4%	5.3%	2.6%	2%	4.6%					
Dumping household cleaning products into a storm drain in the street	84.4%	6.3%	3.6%	1.3%	4.3%					
Dumping household cleaning products into a sink or toilet	43.9%	6%	15.6%	9%	25.6%					
Dumping household cleaning products onto the dirt/grass.	62.8%	9.6%	11%	6.3%	10.3%					
Disposing of animal manure by burying	24.8%	6.7%	13.4%	7.7%	47.3%					
Disposing of animal manure by throwing in ditch	49.5%	11.5%	11.2%	4.7%	23.1%					
Disposing of animal manure by throwing in garbage	24.7%	6.8%	10.8%	8.1%	49.5%					
Don't dispose of animal waste (leave where it falls)	56.1%	10.8%	9.8%	7.1%	16.2%					

- 9) Which of the following possible methods of disposal is recommended for each of the following materials?

Unused garden pesticides? _____
 Unused garden fertilizers? _____
 Antifreeze? _____
 Used engine oil? _____
 Animal manure/pet waste? _____
 Latex paint? _____
 Oil based paint? _____
 Household cleaning products? _____

- 10) If you discovered that your current method of disposal of these products was different than what is recommended, which of the following is most accurate? (check one)

- a) 35.1% I would comply with the recommendations, regardless of cost (e.g. disposal fees)
 b) 49.8% I would comply with the recommendations if there were little or no cost associated
 c) 12.7% I would comply with the recommendations only if there was no cost associated
 d) 2.4% I would not comply with the recommendations.

- 11) If you discovered that your current method of disposal of these products was different that what is recommended, which of the following is most accurate? (check one)

- a) 52.2% I would comply with the recommendations regardless of inconvenience
 b) 36.1% I would comply with the recommendations as long as there is little inconvenience
 c) 10.0% I would comply with the recommendations only if it is convenient
 d) 1.7% I would not comply with the recommendations.

- 12) On a scale of 1 to 5, 1=*Very Convenient* and 5=*Not convenient at all*, how convenient do you think each of the following would be for you to use as a drop off site for your hazardous household waste?

	VC					NC				
	1	2	3	4	5	1	2	3	4	5
Local township/city hall	66%	10.3%	9%	1.7%	12.4%					
Local water treatment plant	34.3%	8.1%	12.7%	7.4%	37.5%					
County extension office (MSUE)	21.0%	9.8%	12%	9.4%	47.8%					
Local Business	70.7%	13.4%	3.8%	0.7%	11.4%					
Local University	42.8%	13.1%	16.6%	5.9%	21.7%					
County Health Department	38.9%	10.9%	15.8%	6.7%	27.7%					
Local fire station	78.3%	12.1%	1.7%	1%	6.9%					

- a. If you have a question about how to dispose of a product you suspect is hazardous, how likely are you to find out the recommended method of disposal? (circle one)

Very likely Not likely at all

1 2 3 4 5

67% 11.7% 8.9% 4.1% 8.2%

- 13) Who would you contact to find out a recommended method of disposal for a product?
-

- 14) On a scale of 1 to 5, 1=*Very Convenient* and 5=*Not convenient at all*, how convenient do you think each of the following would be as a place or method to find out this information?

	VC					NCAA				
	1	2	3	4	5	1	2	3	4	5
Internet	58.3%	7.6%	6.9%	1%	26.2%					
Telephone Hotline	77.2%	11%	3.4%	1.4%	6.9%					
Educational flyers/mailers	49.1%	15.7%	17.8%	6.3%	11.1%					
Radio	43.3%	14.9%	16.3%	7.6%	18%					
Local Paper	47.1%	15.6%	14.9%	4.5%	18%					
Place of purchase	62.1%	11.9%	9.8%	5.3%	10.9%					
As part of local news broadcasting	49.8%	14.5%	19.7%	6.2%	9.7%					
Product label	79.6%	9%	5.5%	0%	5.9%					
Community/school newsletter	41.9%	16.3%	13.5%	10%	18.3%					
Billboard	39.1%	13.5%	17%	10.4%	20.1%					

- 15) Are fertilizers, pesticides, herbicides used on your home's landscape?

46.5% yes 44.1% no 8.3% Don't know 1.0% N/A

If yes

→16 a) How many times per year do you estimate these products are applied to your yard?
_____ times per year

0=1.5% 1=19.8% 2=32.1% 3=19.1% 4=10.7% >4=16.8%

→16 b) Who applies these products?

34.8% you 21.2% A member of your household 43.9% A lawn care professional

→16 c) How do you determine things like **what** needs to be applied, when the products should be applied and how much to apply to your yard?

- 16) Does your community have an ordinance regarding fertilizer application?

7.7% yes 92.3% no 0% Don't Know

- 17) What two bodies of water are located closest to your home?

Approximately how far away is each of these from your home?

Name of body of water:	Distance from home:
1) _____	_____
2) _____	_____

18) On a scale of 1 to 5, with 1 being *A great deal* and 5 being *None at all*, in your opinion, how much responsibility do each of the following have in maintaining a community's water quality?

	A Great Deal					None				
	1	2	3	4	5					
Area Businesses	69.3%	12.0%	8.1%	6.0%	4.6%					
Residents whose homes are located directly on a body of water	80.9%	7.4%	4.2%	3.9%	3.5%					
Residents who live in a home located within 1Mile of a body of water	59.2%	21.3%	11.3%	4.3%	3.9%					
Residents who live in a home located more than 1Mile from a body of water	44.3%	16.8%	22.1%	7.5%	9.3%					
Elected officials in a community	82%	9.2%	5.6%	1.1%	2.1%					
The Environmental Protection Agency (EPA)	89.8%	4.6%	1.8%	1.1%	2.8%					
The Department of Environmental Quality (DEQ)	89.3%	4.3%	2.9%	.7%	2.9%					
Local law enforcement	51.4%	16.5%	18%	5.6%	8.5%					
The Department of Natural Resources (DNR)	82.1%	10%	3.2%	2.1%	2.5%					
Local Conservation/Environmental groups	75.6%	11.8%	7.2%	2.5%	2.9%					
County Drain Commissioner	89.2%	6.8%	2.2%	0%	1.8%					
County Health Department	84.4%	7.8%	4.3%	1.4%	2.1%					

20) On a scale of 1 to 5, 1 being *Very Confident* and 5 being *Not Confident At All*, how confident are you that you understand the concept of a "watershed"? Very Confident

1	2	3	4	5
18.9%	11.1%	20.7%	7.8%	41.5%

21) Is your residence located in a watershed? 12.0% yes 23.9% no 64.1% Don't know

If yes,

21a)→Which one? _____

21b)→How do you know this? _____

22) If hazardous chemicals are dumped into the street, where does that material ultimately end up?

23) Can you think of any other places they may end up? _____

24) On a scale of 1 to 5, with 1 being *Very Much* and 5 being *Not at all*, please indicate how much you would trust information about stormwater pollution from each of the following sources:

	Very Much					Not at all				
	1	2	3	4	5					
Michigan Department of Environmental Quality	67.4%	13.6%	13.6%	0.7%	4.8%					
Drain Commissioner's Office	48.7%	18.6%	22.6%	4.3%	5.7%					
UM-Flint	60.5%	18.1%	13.4%	2.9%	5.1%					
Local Government	27.2%	16.8%	31.9%	10%	14%					
Conservation District	46.8%	26.8%	16.4%	2.2%	7.8%					
Private Companies	8.9%	8.9%	27.5%	21.8%	32.9%					
County Extension Service	40.6%	23.0%	20.3%	6.5%	9.6%					
Flint River Watershed Coalition	44.5%	19.1%	17.2%	6.6%	12.5%					
County Health Department	58.6%	20.5%	12.6%	4.3%	4.0%					

25) In your opinion, which of the following age groups MOST needs to learn more about protecting local waterways?

37.4% Elementary age children (0 to 11) 18.1% Young adults 19 – 25

32.4% Middle and high school age children (11 to 18) 10.3% Adults 26-55

1.8% Adults > 55

26) Have you spent leisure time on a water body in Genesee County in the past 12 months?

27.1% yes 72.9% no 0% Don't Know

→*If yes,* What water bodies? _____

	Yes	No
Do you canoe or kayak in Genesee County?	15.6%	84.4%
Do you fish in Genesee County?	48.1%	51.9%
Do you boat, water ski, or use personal watercraft in Genesee County?	54.5%	45.5%
Do you hike along shorelines or stream banks in Genesee County?	48.1%	51.9%
Do you swim in Genesee County lakes or streams?	48.1%	51.9%

- 27) Regarding the quality of the water in the lakes, rivers, and streams in your community...is it...(please select one)
- | | |
|--------------------------------------|-------------------------------------|
| <u>2.9%</u> Getting much better | <u>25.0%</u> Getting somewhat worse |
| <u>22.1%</u> Getting somewhat better | <u>12.7%</u> Getting much worse |
| <u>37.3%</u> Staying the same | <u>0.0%</u> Don't know |

- 28) Which ONE of the following do you think contributes the **most** pollution to lakes, rivers and streams in the community where you live?
- | |
|---|
| <u>9.4%</u> Wastewater treatment plant discharges |
| <u>36.7%</u> Factories / industrial discharges |
| <u>17.6%</u> Stormwater (rainwater) runoff into storm drains and roadside ditches |
| <u>30.3%</u> Sewage overflows |
| <u>6.0%</u> Dirt eroded from stream banks and surrounding areas |

- 29) Where does stormwater (rainwater) go after it enters a storm drain or roadside ditch in your community? _____

- 30) On a scale of 1 to 5, with 1 being Strongly Agree and 5 being Strongly Disagree, please indicate your level of agreement with the following statement:

	Strongly Agree		Strongly Disagree		
	1	2	3	4	5
“The quality of local streams where I live affects Saginaw Bay.”	47.0%	11.6%	15.3%	6.0%	20.1%
“The quality of local streams where I live affects the Great Lakes.”	55.8%	8.8%	14.2%	6.5%	14.6%

- 31) Is your residence located directly on a...
- | | Yes | No | Don't Know |
|-------------|-------|-------|------------|
| Lake? | 1.4% | 98.6% | 0 |
| Wetland? | 4.6% | 95.4% | 0 |
| Swamp? | 3.9% | 96.1% | 0 |
| Marsh? | 1.4% | 98.6% | 0 |
| River? | 2.5% | 97.5% | 0 |
| Stream? | 5.0% | 95.0% | 0 |
| Road Ditch? | 27.0% | 73.0% | 0 |

- 32) How many people live in your household? _____ # of people
- | | | | | | |
|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|
| 1= <u>17.4%</u> | 2= <u>31.7%</u> | 3= <u>20.3%</u> | 4= <u>14.6%</u> | 5= <u>8.5%</u> | >5= <u>7.5%</u> |
|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|

- 33) Are there any children under the age of 18 living in your household? 45.2% yes 54.8% no
 →If yes, What are their ages? _____

- 34) What is the highest level of education you have completed? (check one)
- | | | |
|-----------------------------------|-----------------------------------|-----------------------------------|
| <u>2.2%</u> Less than high school | <u>35.8%</u> Some college | <u>2.2%</u> Some Graduate courses |
| <u>30.1%</u> High School | <u>21.9%</u> Undergraduate degree | <u>7.9%</u> Graduate degree |

- 35) Do you own or rent your home? 74.6% own 25.4% rent

- 36) Do you live in a single-family residence or a multiple family dwelling (e.g. an apartment building)? (check one) 87.5% single family 12.5% multiple family

Currently the Public Education Committee is in the implementation phase. Target audiences are identified for the required elements. The survey results provide a baseline for knowledge about the watershed and also help direct the development of the media campaign. In chapter 8 there are several action items that came out of the public/stakeholder goals and concerns. These action items will be integrated into the overall media campaign. The media campaign is being developed on a countywide basis and will be implemented on behalf of those Phase II Communities that have signed an Act 342 contract.

MONITORING AND MAPPING

The Monitoring and Mapping Committee evaluated a list of possible monitoring activities. Example activities that were discussed include:

- Aesthetic monitoring via canoe trip
- Biomonitoring
- Benthic monitoring
- Frog and toad monitoring (MDNR)
- Stream crossing watershed survey with photograph
- Water quality monitoring
- Photographic survey
- Meta/toxin/hydrocarbon constituents monitoring
- Streamwalk observation and education.

After reviewing their various options with their costs, advantages and disadvantages the Monitoring and Mapping Committee had decided on the following 5 options to monitor the water quality within the Lower Flint River Watershed.

Benthic Macroinvertebrate Monitoring

- Since the Flint River Watershed Coalition (FRWC) is already doing this at approximately 30 sites (some of them outside the areas we're looking at) we should look at promoting, enhancing and expanding the current activity through:
 - Advertising
 - Purchasing equipment
 - Providing volunteers
 - Providing a place to summarize information
 - Expanding to more parts of the watershed
 - Providing funding for administrative costs (current coordinator is a volunteer)
 - Updating volunteer training
 - Adding sampling sites
 - Correlate all information (from all 5 monitoring activities) onto one centralized mapping site
- Have a joint meeting between the FRWC board members and members of this committee to assess the limitations of the current program and see where we could improve the quality of the program. This falls in line with the philosophy of partnering with existing community programs to comply with the NPDES Phase II Permit.
- Get public involved in collecting data.
- Brent Nickola explained how benthic macroinvertebrates are good indicators of the quality of water in a stream.

- Set the timeframe of Spring 2005 to determine what enhancements are most needed by FRWC and how they may be implemented.
- Deciding what percentage of the available funds should be allocated for this.

Basic Water Quality Monitoring

- “Snapshot” of the water quality
- Great for public involvement
 - School classes
 - Scouting groups
 - Senior citizens
 - Project GREEN (Global Rivers Environmental Education Network)
- Use same sights as for macroinvertebrate testing

Frog and Toad Survey

- DNR (Department of Natural Resources) program already in place
- Enhance program or fill gaps
- Use available data

Stream Crossing Watershed Survey with Photographs

- DEQ (Department of Environmental Quality) has procedure that they recommend
- Can be built into already existing municipal efforts
 - Mostly GCRC and GDC
- 1,100 crossings in Genesee County
 - DEQ suggests 30% of crossings
- Drain office will handle the data base
- Results must be measurable
- Includes IDEP (Illicit Discharge Elimination Program)

Hot Spot Water Quality Monitoring

- Done by professionals

DESIGN REVIEW PROCESS & BMP'S

Standards and Practices Subcommittee is responsible for establishing a unified review process and adopting a standard for best management practices. This group did much of their work in 2003. The below proposed review process was developed to allow environmental concerns to be addressed prior to the design phase. Currently many environmental concerns are treated as an afterthought if they are even considered in the design.

PROPOSED FUNCTIONAL FLOW OF PROJECT REVIEW FOR STORMWATER COMPLIANCE

INTRODUCTION

A county-wide ordinance will be developed to specify the general guidelines for stormwater management in new developments. The following document outlines the major events and their sequence constituting the project review process.

STEP 1: Pre Development

For each project, developers, their designated design representatives (engineers or architects), representatives from the County Road Commission, Health Department, municipal officials (zoning, planner, engineer, DPW, building official), and Drain Commissioner's office (Water and Waste Services and Surface Water) will attend a pre-planning conference. The purpose will be to provide design standards, development guidelines, and to identify the type of information developers and their representatives must furnish to comply with the new development procedures. Communication between the project designer and developer, as well as the relevant local officials and developer are two key components of this framework.

Note: different scheduling scenarios will be required for each development type (e.g., PUD, plat, mobile home park, site plans). Each development type has been provided a specific flow chart.

Inputs

- Location map
- Development description. Verbal with supporting maps (conceptual)
- 2 ft contour map
- Federal Wetland map -NWI (National Wetland Inventory)
- Drainage district ID
- Aerials - Genesee County Planning Commission - 1" = 200' w/ ¼ mile buffer around site
- Zoning Map
- Soils Map (from County soil survey)
- Floodplain maps - FEMA & Available plats
- Traffic & utility information, including: sanitary, storm, water supply, gas, electric, road width, existing capacity

Outputs

Design Standards & Specifications, including:

- BMP Specifications
- Construction Standards and Methods
- Current fee & meeting schedules
- Permit Applications

STEP 2: Conceptual Site Plan

Review of the conceptual site plan for approval at County level by the appropriate personnel in Water & Waste Services, soil erosion, surface water, and the Road Commission and Health Department. Comments are returned to the owner/client and designer.

STEP 3: Coordination Review

- Designer
- Owner/Client
- Reviewers from agencies

NOTE: Review of BMP compliance will occur at the same time as the review of the construction prints.

STEP 4: Municipal Review

Guided by Zoning and general ordinances (design standards)
Local planning commission members will be educated about the new construction standards, and will be given a checklist for reference during site plan review.

STEP 5: Site Plan Approval

- Submit construction plans and documents for approval
- Obtain Permits: Federal, State, and County
- Obtain Building Permit from municipality

General Flowchart of Process

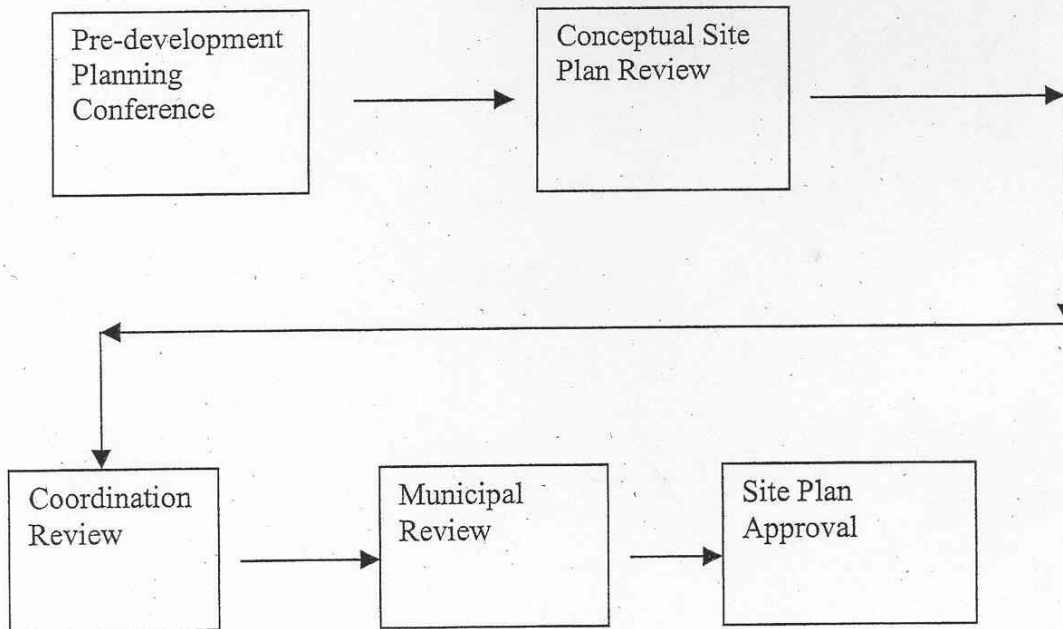


Figure 7-2 Flowchart for new development

Another responsibility of the BMP committee was to review available BMP's for both new construction and good housekeeping of existing sites. Currently once a private storm system is installed there is mechanism to ensure that it is properly maintained.

The BMP sub-committee has adopted the Soil Erosion & Sedimentation Control Guidebook from the Michigan Department of Management and Budget as the basis for the BMP requirements. Below are amendments to individual BMP's to bring those best management practices into line with existing County requirements.

- E4: If the back slope of the Terrace is to be used as an access point the minimum width for the back slope will be 15' not 6'.
- E7: Temporary seeding should be applied to any areas that have earth changes that have been initiated but will not be completed within 2 weeks or disturbed areas on a site that have been cleared but are not worked for more than a week.
- E8: If preferable vegetation is proposed such as indigenous planting will be reviewed & approved on an individual site basis.
- E12: Filter fabric is required for riprap areas. If riprap smaller than that specified in the Guidebook is to be used then the riprap must be mortared together in place.
- E14: In addition to the Energy Dissipater choices provided, a spillway or drop structure may be used as an acceptable energy dissipater either in combination with the other methods outlined in the Guidebook or as a stand-alone measure.
- E15 & E16: Slope drains will be designed to have a non-erosive velocity at the discharge point.
- ES31: The distance between check dams will be such that the bottom of the upstream check dam will be at the same elevation as the top of the downstream check dam as Referenced in CD-exhibit 1 of the MDEQ guidebook for BMP's.
- ES32: the upstream sump for the Stone filter berm will be sized to accommodate the sediment for the contributing area by using The Universal Soil Loss Equation in Developing Areas. Reference Appendix 2D of the MDEQ guidebook for BMP's.
- ES35: For dewatering, an acceptable alternative to the gravel inlet protection could be a floated inlet with a filter bag.
- S55: The minimum requirements considered acceptable for permanent and temporary sediment basin design include:
 - Capacity of basin must be designed to be equal or greater to the volume of the sediment expected to be trapped at the site plus the volume of the 10-year rain event. The Oakland County Surface Area Method or The MDEQ BMP Guidebook: SB-5 Basin Capacity can be modified to meet this requirement. Other methods may be submitted with supporting documentation for consideration. Permanent basins will be designed to be dry. Temporary basins will be filled and stabilized once the construction site is stabilized, and prior to release of soil erosion permit.
- S56: The Sediment Trap length to width ratio shall be 5:1 not 2:1.
- S57: Grass Buffer/Filter Strip shall be a minimum of 30' from top of bank or edge of critical resource area.

Below are additional BMP Guidelines that are not addressed in the Soil Erosion & Sedimentation Control Guidebook.

- Stand Pipe: Should be designed to filter sediment. This structure should not to be designed as the outlet restrictor. Rim should be set at the elevation of the 10-year storage. The overflow cover will have to be designed to pass the design flow.

- Excavated drop inlet sediment trap The MDEQ BMP Guidebook: Fil-6. An acceptable alternative to weep holes is edge drain set within a sand or stone bedding.
- Equipment Maintenance & Storage The MDEQ BMP Guidebook: EMS
- Stockpile Location: Must be set away from any critical areas or steep grades. Appropriate Filter and or Seeding BMP's to be applied.
- Vortex Separator: To separate debris from discharge.
- Oil & Grit Separator: This BMP is not to be used as a sediment basin during construction. Specific systems with supporting documentation may be submitted for approval. General Criteria:
 - o Planning considerations: Should serve impervious areas of less than 1 acre or per manufacturers recommendation.
 - o Design: supporting documentation will need to show method & capacity of suspended solids removed and buoyant contaminants removed. Low flow capacity of system and method used to bypass the high flow.
- Outlet: From the MDEQ BMP Guidebook; There should be no overfall from the end of the pipe/outlet to the outlet structure (i.e. the pipe/outlet should not be suspended above the outlet structure)
- Detention Basins: The MDEQ BMP Guidebook: EDB
- Underground detention basins: Specific systems with supporting documentation may be submitted for approval. General Criteria
 - o Cleanout is needed for maintenance.
- Infiltration Basins with underdrain: The MDEQ BMP Guidebook: IB.
- Construction Access Roads:
- Street Sweeping:
- Parking Lot Storage in Recessed Landscape

A Maintenance Schedule for the following permanent BMP's should be developed and included in the site plan or construction drawings to implement once the construction is complete.

- ES31 Check Dams: Should be checked annually. Accumulated upflow sediment removed and any noted problems repaired.
- ES32 Stone Filter Berm: Should be checked annually. Accumulated upflow sediment removed and any noted problems repaired.
- ES37 Diversion Ditch: Sediment removed and any noted problems repaired.
- ES39 Streambank biostabilization: Should be checked annually. Check for additional eroding or deteriorating of the anchors or trees. Replace trees or anchors as needed.
- ES41 Wattles: Should be checked annually. Periodic pruning and replanting of live stake may be required.
- S55 Sediment Basin: Annual inspection. Keep outlet clear of debris and excess vegetation. Remove sediment when the design volume exceeds 50% of the sediment expected to be trapped.
- S57 Buffer Strip: Should be checked annually. Clip unwanted and invasive vegetation.
- Stand Pipe: Annual inspection. Keep outlet clear of debris and excess vegetation and any noted problems repaired.
- Excavated drop inlet sediment trap Annual inspection. Keep outlet clear of debris and excess vegetation and any noted problems repaired.

- Vortex Separator: Clean out bi-annually or as recommended by manufacturer.
- Oil & Grit Separator: Clean out bi-annually or as recommended by manufacturer.
- Detention basin: Annual inspection. Keep outlet clear of debris and excess vegetation and any noted problems repaired. Proper disposal of contaminants
- Underground detention basins: Annual inspection. Jet and vacuum any excess debris or sediment and any noted problems repaired.
- Catchbasins: Annual inspection. Keep outlet clear of debris and excess vegetation. Clean sumps and any noted problems repaired.



STATE OF MICHIGAN

DMB Infrastructure Services, Design and Construction Division
Soil Erosion and Sedimentation Control Program

SOIL EROSION AND SEDIMENTATION CONTROL GUIDEBOOK











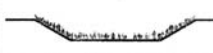





DETAILS AND SPECIFICATIONS

February 2002





MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
EROSION CONTROLS			
E1	SELECTIVE GRADING AND SHAPING		To reduce steep slopes and erosive velocities.
E2	GRUBBING OMITTED		For use on steep slopes to prevent rilling, gullying, and reduce sheet flow velocity or where clear vision corridors are necessary.
E3	SLOPE ROUGHENING AND SCARIFICATION		Where created grades cause increased erosive velocities. Promotes infiltration and reduces runoff velocity.
E4	TERRACES		On relatively long slopes up to 8% grades with fairly stable soils.
E5	DUST CONTROL		For use on construction sites, unpaved roads, etc. to reduce dust and sedimentation from wind and construction activities.
E6	MULCH		For use in areas subject to erosive surface flows or severe wind or on newly seeded areas.
E7	TEMPORARY SEEDING		Stabilization method utilized on construction sites where earth change has been initiated but not completed within a 2 week period.
E8	PERMANENT SEEDING		Stabilization method utilized on sites where earth change has been completed (final grading attained).
E9	MULCH BLANKETS		On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
E10	SODDING		On areas and slopes where immediate stabilization is required.
E11	VEGETATED CHANNELS		For use in created stormwater channels. Vegetation is used to slow water velocity and reduce erosion within the channel.
E12	RIPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
E13	GABION WALLS		On newly created or denuded stream banks to reduce velocity until permanent stabilization is achieved or on existing banks to retard erosive velocities.
E14	ENERGY DISSIPATOR		Where the energy transmitted from a concentrated flow of surface runoff is sufficient to erode receiving area or watercourse.
E15	TEMPORARY SLOPE DRAIN		Where surface runoff temporarily accumulates or sheet flows over the top of a slope and must be conveyed down a slope in order to prevent erosion.
E16	SLOPE DRAIN		Where concentrated flow of surface runoff must be permanently conveyed down a slope in order to prevent erosion.

B = BIOENGINEERING








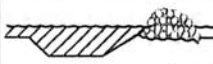




MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E17	CELLULAR CONFINEMENT SYSTEMS		Used on steep slopes and high velocity channels.
E18	PLASTIC SHEETS		Used on exposed slopes, seeded areas, new ditch bottoms, and areas subject to surface runoff and erosion. Used as a liner in temporary channels and to stabilize stockpiles.
E19	TEMPORARY DRAINAGEWAY/ STREAM CROSSING		Use on construction sites where stream/drainageway crossings are required.
E20	TEMPORARY BYPASS CHANNEL		Use within existing stream corridors when existing flow cannot be interrupted, and at culvert and bridge repair sites
E21	LIVE STAKING	 B	In areas requiring protection of slopes against surface erosion and shallow mass wasting.
EROSION / SEDIMENT CONTROLS			
ES31	CHECK DAM		Used to reduce surface flow velocities within constructed and existing flow corridors.
ES32	STONE FILTER BERM		Use primarily in areas where sheet or rill flow occurs and to accommodate dewatering flow.
ES33	FILTER ROLLS	 B	In areas requiring immediate protection of slopes against surface erosion and gully formation and for perimeter sediment control.
ES34	SAND FENCE		For use in areas susceptible to wind erosion, especially where the ground has not yet been stabilized by other means.
ES35	DEWATERING		Use where construction activities are limited by the presence of water and dry work is required.
ES36	DIVERSION DIKE/BERM		Within existing flow corridors to address or prevent erosion and sedimentation, or on disturbed or unstable slopes subject to erosive surface water velocities.
ES37	DIVERSION DITCH		In conjunction with a diversion dike, or where diversion of upslope runoff is necessary to prevent damage to unstabilized or disturbed construction areas.
ES38	COFFERDAM/SHEET PILING		Constructed along or within water corridor or waterbody to provide dry construction area.
ES39	STREAMBANK BIOSTABILIZATION	 B	For use along banks where stream and riparian zones may have difficulty recovering from the long-term effects of erosion.
ES40	POLYMERS		To minimize soil erosion and reduce sedimentation in water bodies by increasing soil particle size.
ES41	WATTLES	 B	In areas requiring protection of slopes against surface erosion and gully formation.

B = BIOENGINEERING



MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
SEDIMENT CONTROLS			
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S52	CATCH BASIN SEDIMENT GUARD		Use in or at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS		Used at every point where construction traffic enters or leaves a construction site.
S54	TIRE WASH		For use on construction sites where vehicular traffic requires sediment removed from its tires in highly erosive areas.
S55	SEDIMENT BASIN		At the outlet of disturbed areas and at the location of a permanent detention basin.
S56	SEDIMENT TRAP		In small drainage areas, along construction site perimeters, and above check dams or drain inlets.
S57	VEGETATED BUFFER/FILTER STRIP		Use along shorelines, waterways, or other sensitive areas. Slows velocity, reduces sediment load, and reduces erosion in areas of sheet flow.
S58	INLET PROTECTION FABRIC DROP		Use at stormwater inlets, especially at construction sites.
S59	INLET PROTECTION FABRIC FENCE		Use at stormwater inlets, especially at construction sites.
S60	INLET PROTECTION STONE		Use around urban stormwater inlets.

B = BIOENGINEERING

SECTION 8 - ACTION PLAN

The Broad Goals were refined by the Shiawassee River Watershed workgroup. They were then ranked reviewed by stakeholders and the public. Throughout the process, specific actions or concerns were proposed. Also available to the workgroup are several planning handbooks that helped in the development of goals, objectives and actions

Several tools are available to assist watershed groups in watershed protection. These tools summarized from the Center for Watershed Protection's Rapid Watershed Planning Handbook are discussed in detail below and are meant to be used to protect and restore water resources within the watershed. Different subwatersheds may require different combinations of these watershed tools.

Watershed Planning

Watershed planning is an overall tool which critically looks at the characteristics of a watershed, its geology, hydrology, land use, development, demographics and water quality. This data is typically broken down into smaller subwatershed units for effective and efficient planning and actions.

Land Conservation

This tool focuses on the conservation of land of five critical types:

- Critical Habitats
- Aquatic Corridors
- Hydrologic Reserve Areas
- Water Hazards
- Cultural/Historical Areas

Conservation of these land types helps protect the existing water quality from degradation from development and encroachment of important critical land types.

Aquatic Buffers

The area where land and water meet is an aquatic buffer. Aquatic buffers may be used along streams and rivers, lakes, ponds, and wetlands. It functions to reduce the amount of pollutants enter water bodies through filtering and uptake of pollutants and also to protect the water body from encroachment. Aquatic buffers can also provide habitat corridors and protection of floodplains from impervious development.

Better Site Design

Better site design incorporates a number of best management practices in conjunction with sustainable development when designing a subdivision or portion of a community. The key to this type of design is that it can reduce the amount of impervious cover by 10% to 50% (CWP, Rapid Watershed Planning Handbook, 1998).

Erosion and Sediment Control

Erosion and sediment control is a critical tool that the watershed group holds to protect waters from sedimentation. The potential impacts to waterways are enhanced by removal of trees and topsoil, exposed soils, alteration of drainage patterns, and

disturbing sensitive areas. Many Michigan communities have existing programs, but they are understaffed and under enforced. Things such as ensuring the use of buffer strips, reducing sediment loads, and maintaining the boundary of conservation areas and buffers are important steps. Conducting a good erosion and sediment control program is a critical component of effective watershed protection.

Storm Water Best Management Practices

As described by the USEPA, stormwater nonpoint source pollution has a significant impact on water quality in the United States. To reduce this impact, it is important that watershed protection measures include examining best management practices used to reduce the amount of pollution that is entering receiving water bodies. Since development causes hydrological changes in the watershed, BMPs must also be chosen to mitigate this effect.

Non-Storm Water Discharges

Non-storm water discharges include discharges from septic systems, sanitary sewers, and others such as industrial NPDES discharges, and manure runoff to name a few. This tool is used to evaluate the need for septic system inspections, failing septic system repairs, ordinance changes, spill prevention, and identifying and removing illicit connections.

Watershed Management Plans that are being conducted through the Michigan Watershed Permit are already developing and implementing an illicit discharge elimination plan, or IDEP, which is examining the storm sewer systems and other waterways for illicit discharges and connections.

Watershed Stewardship Programs

Watershed stewardship is the community investment of time and resources to promote public understanding and awareness of watersheds issues. A number of programs are available to consider when selecting a method to promote watershed stewardship including:

- Watershed Advocacy
- Watershed Education
- Pollution Prevention
- Watershed Maintenance
- Indicator Monitoring
- Restoration

These programs provide different ways to promote watershed stewardship, depending on the size, education level, and watershed savvy education of the community members, the community may choose a number of these programs to use as a tool in implementing the watershed management plan.

GOAL #1 – PROTECT PUBLIC HEALTH

Objective	Action	Commitment	Timeframe	Evaluation Method
Develop 'Time of Sale Septic Ordinance'	Draft ordinance	Health Dept/Water &Waste and Ad Hoc Committee	Short Term	If completed
	Develop cost analysis	Health Dept/Water & Waste and Ad Hoc Committee	Short Term	If completed
	Adopt ordinance	County with local community support	Short Term	If completed
	Training on ordinance	Health Dept	Short Term	Attendance to training
	Enforcement	Health Dept	Short Term	# of inspections Long term failure rate trend
	Develop tracking septic systems	Health Dept and SWM	Short Term	If completed
	Implement septic system tracking	Health Dept and SWM	Short Term	# of Inspections Long term failure rate trend
	Connect septic to available sanitary sewer system	Develop ordinance language to work with Time of Sale Ordinance	Health Dept/Water & Waste/Ad Hoc Committee made up of local community	Short Term
Develop cost analysis			Short Term	If completed
Adopt ordinance			Short Term	If completed
Develop training program to coincide with Time of Sale Inspection		Health Dept/Water & Waste/Ad Hoc Committee made up of local community	Short Term	Attendance to training
Enforcement		Enforcing Agent	Short Term	# of inspections # of connections
Develop sewer connection tracking system		Health Dept/Water & Waste/Ad Hoc Committee	Short Term	If completed
Implement Sewer Connection Tracking System		Health Dept/Water & Waste/Ad Hoc Committee	Short Term	# of inspections # of connections
Education at time of sale of property (septic, lawn, leaves, grass, carwash, etc)		Develop informational packets	SW Public Ed Committee	Short Term
	Identify distribution method	SW Public Ed Committee	Short Term	If completed
	Develop cost analysis		Short Term	If completed

Objective	Action	Commitment	Timeframe	Evaluation Method
	Implement	TBD from PE Committee	Short Term	Count # packets distributed Return postcard with packet General public survey
Disconnecting of footing drains from sanitary sewer	Baseline draft ordinance	Communities & WWS (Ad Hoc Comm)	Short Term	If completed
	Develop cost analysis	Communities & WWS (Ad Hoc Comm)	Short Term	If completed
	Adopt ordinance	Communities & WWS (Ad Hoc Comm)	Short Term	If completed
	Training on ordinance	WWS	Short Term	Attendance to training
	Enforcement	WWS/ Community	Short Term	Long term SSO trend
	Develop and implement tracking system	WWS/ Community	Short Term	No. of disconnects
Examine source of pollutants resulting in fish advisory	Identify Fish advisory pollutants and thresholds	MDEQ/ Monitoring and Mapping Comm	Short Term	Pollutant document
	Identify source of pollutants	MDEQ/ Monitoring and Mapping Comm	Short Term	Pollutant source document
	Examine sources individually to determine if specific actions can be taken to reduce pollutant.	SWM and Monitoring and Mapping Comm	Short Term	Existing or new action items may be developed for each source
	Include new actions into watershed plan with dates to be done	SWM and Monitoring and Mapping Comm	Short Term	Updated Lower Flint River Watershed Plan
Identify existing Wellhead Protection Programs	Identify any existing wellhead protection programs within watershed	MDEQ/ Monitoring and Mapping Committee/participating communities	Short Term	Done
	Identify responsible parties that would benefit from a Wellhead protection program	MDEQ/ Monitoring and Mapping Comm/ Ad Hoc Committee/ participating communities	Short Term	List of potential Wellhead protection programs
	Examine potential to participate in the development of new wellhead protection	SWM and Ad Hoc Committee/ participating communities	Wish List	New wellhead protection program adoption

Objective	Action	Commitment	Timeframe	Evaluation Method
	program			
Drinking water well test at time of sale ordinance	Draft Ordinance	Health Dept/Ad Hoc Committee	Short Term	If completed
	Develop Cost Analysis	Health Dept/Water & Waste and Ad Hoc Committee	Short Term	If completed
	Adopt Ordinance	County with local community support	Short Term	If completed
	Training on Ordinance	Health Dept	Short Term	Attendance to training
	Enforcement	Health Dept	Short Term	# of Inspections Long term failure rate trend
Map Arsenic Levels for drinking wells	Identify existing arsenic levels that have been tested in the watershed	Health Dept/Ad Hoc Committee made up of local community	Short Term	If completed
	Make information available to decision makers and general public	To be Determined	Short Term Perpetual	# of hits on website

GOAL #2 – ESTABLISH A WATERSHED STEWARDSHIP ETHIC AMONG THE PUBLIC

Objective	Action	Commitment	Timeframe	Evaluation Method
Promote existing water quality programs that public can participate in	Promote stewardship programs such as River Cleanup/ Benthic monitoring/ Etc	Public Ed Committee	Short Term Perpetual	Increased attendance to activity
	Determine if there is room to improve existing programs or a need for new programs	Public Ed Committee	Short Term	List of existing/ proposed programs
Improve communication to the public about water quality and threat(s) to public	Provide information on web site	Public Ed Committee	Short Term	# Of hits on website
	Make public aware through media campaign that information is available	Public Ed Committee	Short Term	# of ad's, print, Etc
Direct Mailing of literature to riparian land owners (Rivers/Lakes)	Acquire articles for newsletter to riparian land owners	SW Public Ed Committee	Short Term	
	Identify Distribution Method	To be determined from PE Committee	Short Term	
	Implement	To be determined from PE Committee	Short Term	Count # newsletters distributed Return postcard from newsletter
Expand existing Household Hazardous Waste program	Meeting with existing organizers	Program Organizers, PE Committee	Short Term	If completed
	Determine what improvements can be made	Program Organizers/ Ad Hoc Committee	Short Term	List of potential improvements
	Receive proposal for needs assessment	Organizer	Short Term	If completed
	Sign Contract	SWM/ Organizer	Short Term	If complete
Enhance existing Benthic Monitoring Program	Meet with FRWC to develop a partnership	FRWC and MM Committee	Current	Meeting held to discuss how partnership can expand/ improve existing FRWC program

Objective	Action	Commitment	Timeframe	Evaluation Method
	Identify additional stream segments that would be desirable to gather macroinvertebrate sampling data on.	MM Committee/ FRWC	Current	Data compiled from existing and additional sites.
	Determine what additional resources are needed to expand the monitoring program.	MM Committee/ FRWC	Current	Data compiled from existing and additional sites.
	Agree on monitoring enhancements and expansion; i.e. responsibility, schedule and cost.	MM Committee/ FRWC	Current	Consistent monitoring and data of identified sites.
	Correlate all of the various monitoring information onto one centralized map and database.	SWM	Current	All monitoring activities should be related together (e.g. frog/toad, WQ)
	Sign Contract	FRWC/SWM	Current	Complete
Conduct basic water quality monitoring	Identify volunteer programs and public school projects to work with.	MM Committee / FRWC	Current	Data compiled from existing and additional sites.
	Meet with representatives to layout the framework for a monitoring program. Identify responsibilities, schedule and costs.	MM Committee / FRWC	Current	Data compiled from existing and additional sites.
	Correlate all of the various monitoring information onto one centralized map and database.	SWM	Current	All monitoring activities should be related together (e.g. frog/toad, benthic)
	Identify training requirements and additional resources needed.	FRWC	Current	Consistent sampling and data of identified sites.
	Sign Contract	FRWC/SWM	Current	If Complete

Objective	Action	Commitment	Timeframe	Evaluation Method
Enhance existing frog and toad survey	Prepare a map of where the existing frog and toad survey information is being collected.	Monitoring and Mapping Committee	Long Term	Completed map with existing data
	Map additional sites identified by MDNR as being desirable to collect the data.	Monitoring and Mapping Committee	Long Term	Completed revised map
	Correlate all of the various monitoring information onto one centralized map and database.	Monitoring and Mapping Committee	Long Term	All monitoring activities should be related together (e.g. WQ, benthic)
	Determine what, if any, advertisement or program support should be provided.	Monitoring and Mapping Committee	Long Term	# of volunteers & data collected
	Determine who will coordinate with the MDNR to review the data collected.	Volunteer Network	Long Term	Assign a volunteer to coordinate and review data
	Determine implementation schedule.	Volunteer Network	Long Term	If Complete

GOAL #3 – REDUCE IMPACT FROM PEAK FLOWS

Objective	Action	Commitment	Timeframe	Evaluation Method
Develop a comprehensive stormwater management program for new development and redevelopment	Adopt a BMP specifications manual.	BMP Committee	Short Term	If Done
	Develop new County site plan review process:	BMP Committee	Short Term	If Done
	Prepare Draft Ordinance	BMP Committee	Short Term	Ordinance adopted & enforced
	Review current permit fee structure to see if they cover the cost of processing and enforcement.	BMP Committee	Short Term	If Done
	Facilitate Community Acceptance	SWM/ Communities	Short Term	If Community supports county ordinance
	Communities to Adopt Ordinance	Villages, Cities, Townships, County	Short Term	If Community adopts additional ordinances
	Training on Ordinance	BMP Committee	Short Term	# of training
	Enforcement	To be determined	Short Term	# of sites reviewed
Maintain drainage system & restore watercourses to minimize flooding	Inventory/inspect drains /Watercourses	SWM/IDEP Road Commission MDOT	Current	
	Develop list of necessary work for Natural Watercourses	SWM/IDEP	Short Term	If Done
	Determine mechanism under which maintenance/repair can be done to Natural Watercourses	SWM/MDEQ/Ad Hock Committee	Wish List	
	Develop a schedule of routine maintenance for County Drains	SWM	Current	Reduce complaint calls
Protect existing floodplains and wetlands from being filled or developed	Identify existing floodplains and wetlands	SWM	Short Term	If list is done
	Prioritize existing floodplains and wetlands as to value	SWM	Short Term	Prioritization list is developed

Objective	Action	Commitment	Timeframe	Evaluation Method
	Determine mechanism under which floodplains & wetlands can be protected through easement or land purchase	Ad Hock Committee	Long Term	Once mechanism is developed, area protected can be quantified
Reduce storm water runoff quantity, peak flows, & peak velocity	Review and update existing storm water requirement for new developments.	SWM	Short Term	New storm water requirements adopted
	Training/enforcement	BMP Committee	Short Term	# of people trained # of sites reviewed can quantify change from old policy and new policy
Monitor water quantity to measure change	Gather data from existing water gauges and corresponding rain gauges	Monitoring and Mapping	Short Term	Establish baseline measure and make data available
	Track water flows as they relate to rain events	WWS	Short Term	Use baseline measure to gauge future flows against current flows and rain events
	Add water/precipitation gauges as needed in key locations.	Monitoring and Mapping/WWS	Wish List	Additional data available from new gauges
Produce demonstration projects for each of the following categories (Bio-retention, Low Impact Development) for new and retrofit sites	Pick existing sites for retrofit with bio-retention	BMP Committee	Wish List	Sites picked
	Work with developers for new sites for bio-retention or low impact development	BMP Committee	Wish List	Partnerships made
	Develop mechanism for funding	BMP Committee	Wish List	If done
	Track reduction of flow/pollutants	SWM	Wish List	flow meters or other measurement devices
	Use as educational tool for more sites	PEP Committee	Wish List	

GOAL #4 - CREATE, RESTORE & ENHANCE RECREATIONAL USE

Objective	Action	Commitment	Timeframe	Evaluation Method
Increase and educate opportunities for passive and active recreational uses	Promote recreational programs through website, brochures	Gen. Co. Parks & Rec/ Public Ed Committee	Short Term	Increased use of river, lakes, streams
	Disseminate Information	Gen. Co. Parks & Rec/ Public Ed Committee	Perpetual	# of hits on website # of flyers distributed
Encourage investment in land (along water) for recreation/ Wildlife protection	Enhance existing Greenways program by meeting with organization	Greenways Program	Wish List	Meeting being held
	Receive proposal for needs assessment	To be determined	Wish List	To be Determined
Expand park, trails, and river walk system	Compile list of existing, proposed programs from various organizations	Public Ed committee	Short Term	If done, make list of existing efforts available
	prioritize list of existing efforts	Public Ed committee	Wish List	If done, Make list of prioritized existing efforts available for review
	Enhance existing programs	Public Ed committee	Wish List	Quantify additional efforts that resulted from this effort
	Receive proposal for needs assessment	Public Ed committee	Wish List	TBD
	Sign contract if needed	SWM/	Wish List	TBD
Develop additional access sites and river trails	Develop list of proposed programs	Ad hoc Committee/ SWM	Short Term	If done, make list of existing programs available
	Examine the river and stream corridors to identify additional opportunities	Ad hoc Committee/ SWM	Short Term	
	Identify gaps that are not addressed under existing proposed programs	Ad hoc Committee/ SWM	Short Term	If done, Make list of gaps in existing efforts available for review
	Provide information to interested parties	Ad hoc Committee/ SWM	Short Term	If done, feedback from results

GOAL #5 - RESTORE & PROTECT AQUATIC LIFE, WILDLIFE & HABITAT

Objective	Action	Commitment	Timeframe	Evaluation Method
Re-establish stream buffers	Draft Buffer Strip Ordinance	BMP Committee	Short Term	If completed
	Develop Cost Analysis	BMP Committee	Short Term	If completed
	Adopt Ordinance	County	Short Term	If adopted
	Training on Ordinance	To be determined	Short Term	Attendance to training
	Enforcement & Tracking	To be determined	Short Term	Tracking of enforcement
Adopt a priority ranking process to protect areas with greatest need	Identify existing floodplains and wetlands	To be determined	Short Term	If list is done
	Prioritize existing floodplains and wetlands as to value	To be determined	Short Term	If list is done
	Determine mechanism under which floodplains & wetlands can be protected through easement or land purchase	To be determined	Wish List	Prioritization list is developed
Protect key locations of threatened and endangered species and habitat	Locate key locations of threatened and endangered species and habitat	Ad hoc Committee	Short Term	If list is done
	Develop a plan to protect areas, or stabilize and enhance the habitat	Ad hoc Committee	Long Term	If plan is done & area protected/ stabilized due to program
Identify key soil erosion issues/ locations	Work with soil conservation agency or NRCS to identify key soil erosion problems.	BMP Committee	Short Term	Problem identified
	Coordinate needs/ efforts to correct identified problems	NRCS	Short Term	Corrective measures proposed. # of corrections/ estimated lbs of pollutants reduced due to correction

GOAL #6 – MDEQ REQUIREMENT – GOOD HOUSEKEEPING ACTIVITIES

Objective	Action	Commitment	Timeframe	Evaluation Method
Reduce pollutants through maintenance activities, schedules, and inspection procedures for storm water structural controls	Cleaning, clearing, restoring streams/ channels.	Local Communities	To be filled out by each municipality	Record of these activities.
	Tail ditch work; installation /maintenance of Rip Rap; other open channels erosion control measures & maintenance functions.	Local Communities	To be filled out by each municipality	New structures, maintenance schedules, Record of activities.
	Storm and combined sewer maintenance and construction projects.	Local Communities	To be filled out by each municipality	Maintenance schedules, Record of activities.
	Infrastructure failures (sink hole repairs).	Local Communities	To be filled out by each municipality	Structure restored.
	Tie-in inspections/permits; other maintenance functions related to the storm water infrastructure.	Local Communities	To be filled out by each municipality	Inspection schedule, Inspection schedule, maintenance schedule.
Controls for reducing or eliminating the discharges of pollutants from streets, roads, highways, parking lots, and maintenance	Catch basin top replacements, cleaning, repair, and construction	Local Communities	To be filled out by each municipality	Maintenance schedule.
	Spill/hazard responses	Local Communities	To be filled out by each municipality	Maintenance schedule.
	Street sweeping	Local Communities	To be filled out by each municipality	Maintenance schedule.
	Liter pickup	Local Communities	To be filled out by each municipality	Maintenance schedule.
Procedures for the proper disposal of operation and maintenance waste from the separate storm water drainage system	Option 1: County facility (which is due to come on line in late 2005 or 2006)	GCDC or County	To be filled out by each municipality	Waste material is disposed of in an appropriate manner.
	Option 2: A local facility that specifically accepts and processes maintenance waste.	O& M Department	To be filled out by each municipality	Waste material is disposed of in an appropriate manner.

Objective	Action	Commitment	Timeframe	Evaluation Method
Ensure that flood management projects assess the impacts on the water quality of the receiving waters and, examine existing water quantity structures for incorporation of additional water quality protection devices or practices	Assess site plan review process for municipal projects to determine the current level of protection.	Local Communities	To be filled out by each municipality	Assessment is completed.
	Where appropriate, adopt additional measures to ensure water quality.	Local Communities	To be filled out by each municipality	Additional measures or processes are adopted (if necessary).
	Seek opportunities to implement additional measures to existing structures.	Local Communities	To be filled out by each municipality	Certain existing BMPs receive enhancements (where appropriate).
Municipal Good Housekeeping Activities	Use low phosphorous fertilizer and apply according to manufacture specifications.	Local Communities	To be filled out by each municipality	O&M specifications are reviewed and if need be adjusted.
	Employ Practice Integrated Pest Management techniques.	Local Communities	To be filled out by each municipality	O&M procedures are reviewed and if need be adjusted.
	Apply pesticides sparingly.	Local Communities	To be filled out by each municipality	O&M specifications are reviewed and if need be adjusted.
	Avoid the use of herbicides and apply them at least 300 ft from watercourses.	Local Communities	To be filled out by each municipality	O&M procedures are reviewed and if need be adjusted.
	Keep stocks of pesticides, herbicides and fertilizers in dry, self contained areas that are not connected to the drainage system.	Local Communities	To be filled out by each municipality	O&M specifications are reviewed and if need be adjusted.

GOAL #7 – MDEQ REQUIREMENT – POST CONSTRUCTION CONTROLS

Objective	Action	Commitment	Timeframe	Evaluation Method
Evaluate and implement site appropriate, cost-effective structural and nonstructural best management practices (BMP's)	Assess site plan review process to determine the current level of requirements.	Local Communities	To be filled out by each municipality	Assessment is completed.
	Where appropriate, adopt additional measures to ensure water quality.	Local Communities	To be filled out by each municipality	Additional measures or processes are adopted (if necessary).
	Seek opportunities to implement additional measures to existing structures.	Local Communities	To be filled out by each municipality	Existing BMP's may be enhanced.
Establish long-term operation and maintenance practices for storm water BMPs	Review of existing O&M practices for the maintenance of current BMPs.	Local Communities	To be filled out by each municipality	Completion of review. Ability to determine needed O&M procedures.
	Adopt procedure for instituting needed O&M practices for new BMPs.	Local Communities	To be filled out by each municipality	O&M manual/procedures reflect new requirements

