



TMDLs and Watershed Improvement Plan (WIP)

Talbot County
November 1, 2011

Schedule

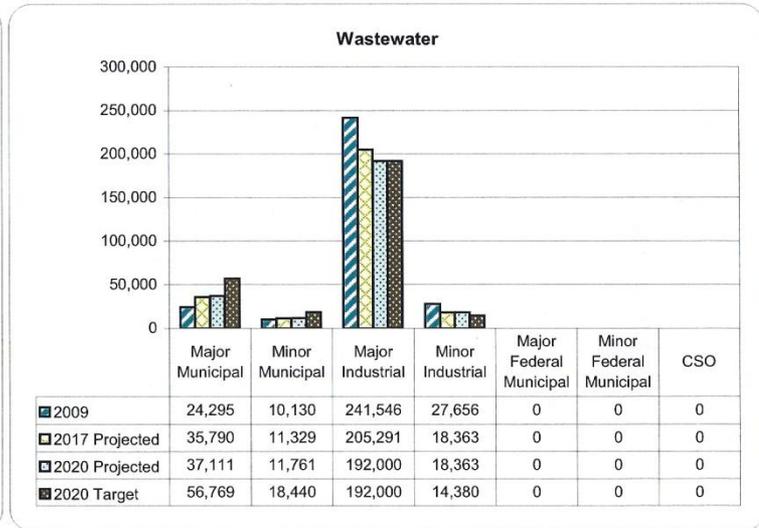
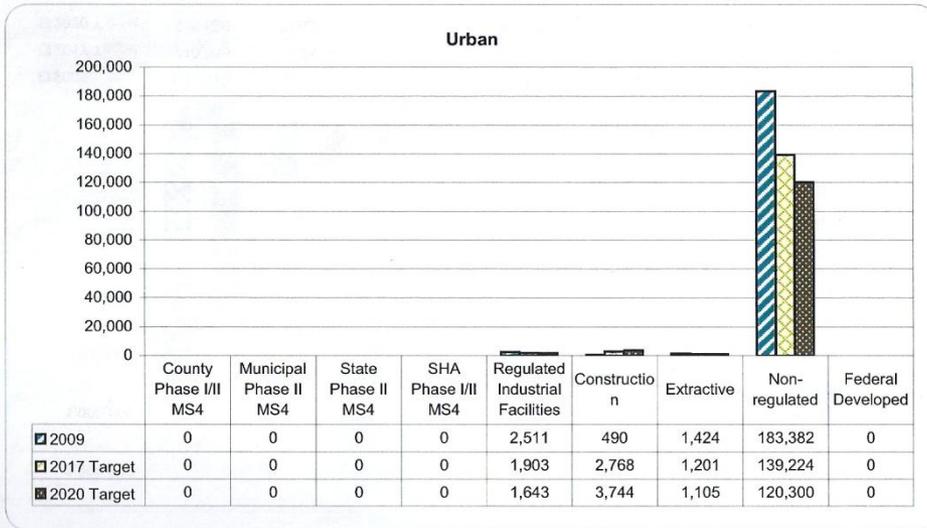
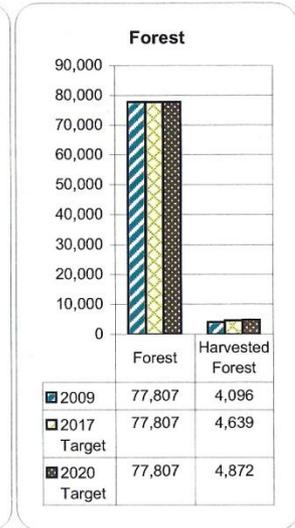
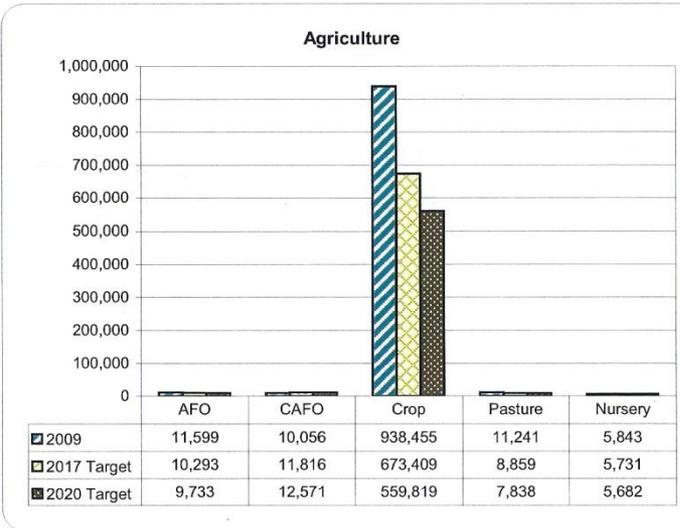
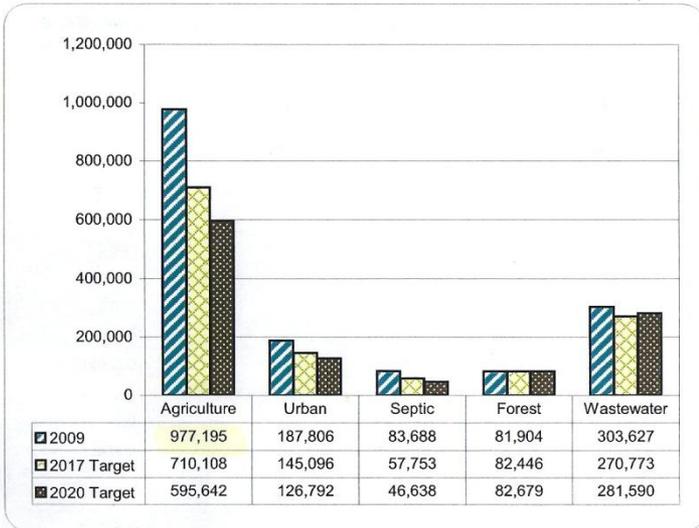
- Final approved local implementation plans due July 2, 2012
- MD will submit draft WIP in mid-December and a final plan in March 2012
- Local jurisdictions are asked to submit draft strategies and funding proposals for state submissions
- State submission will be designed to meet basin-specific allocations assigned to Maryland
- Local WIPs will be used to modify state's WIP

Local Role

- Urban and agricultural efforts
- Work group
- Straw man plan
- Milestones
- Public input
- Final plan
 - Work group
 - Jurisdictions review
 - Public review
- Implementation



Phase 2 - Talbot (Non-Federal & Federal) Total Nitrogen Loads, Delivered*



*Delivered loads calculated using delivery factors provided by EPA.

Talbot County

TMDL Nitrogen Loads

Total Nitrogen Delivered

| <u>Sector</u> | <u>2009</u> | <u>2017</u> | <u>2020</u> |
|---------------|----------------|----------------|----------------|
| Agriculture | 977,195 | 710,108 | 595,642 |
| Urban | 187,806 | 145,096 | 126,792 |
| Septic | 83,688 | 57,753 | 46,638 |
| Forest | 81,904 | 82,446 | 82,679 |
| Wastewater | <u>303,627</u> | <u>270,773</u> | <u>281,590</u> |
| Total | 1,634,220 | 1,266,176 | 1,133,341 |

Loads as Percent of Total by Sector

| <u>Sector</u> | <u>2009</u> | <u>Percent of Total</u> | <u>2017</u> | <u>Percent of Total</u> | <u>2020</u> | <u>Percent of Total</u> |
|---------------|----------------|-------------------------|----------------|-------------------------|----------------|-------------------------|
| Agriculture | 977,195 | 59.8% | 710,108 | 56.1% | 595,642 | 52.6% |
| Urban | 187,806 | 11.5% | 145,096 | 11.5% | 126,792 | 11.2% |
| Septic | 83,688 | 5.1% | 57,753 | 4.6% | 46,638 | 4.1% |
| Forest | 81,904 | 5.0% | 82,446 | 6.5% | 82,679 | 7.3% |
| Wastewater | <u>303,627</u> | 18.6% | <u>270,773</u> | 21.4% | <u>281,590</u> | 24.8% |
| Total | 1,634,220 | 100% | 1,266,176 | 100% | 1,133,341 | 100% |

Maryland Assessment Scenario Tool (MAST)



Scenario List Scenario Details Urban Septic Processed Water Forest Agriculture Animals Manure Transport Summary Log Out

Coyman 10-14-11 Summary Results

Description: Initial scenario to determine BMP strategy to meet TMDL 2010 landuse and loads
 Source Year: 2010
 Date Created: 10/14/2011 3:10:01 PM

Landuse Acres

| Landuse | Pre-BMP Acres | Post-BMP Acres |
|---------------------|------------------|------------------|
| Sector: Agriculture | 89,284.9 | 87,101.9 |
| Sector: Forest | 55,878.0 | 60,261.5 |
| Sector: Urban | 25,399.3 | 23,199.0 |
| Sector: Water | 1,802.9 | 1,802.9 |
| Total Acres: | 172,365.1 | 172,365.3 |

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Landuse Loads

| Landuse | Lbs Nitrogen Edge of Stream | Lbs Nitrogen Delivered | Lbs Phosphorus Edge of Stream | Lbs Phosphorus Delivered | Lbs Sediment Edge of Stream | Lbs Sediment Delivered |
|---------------------|-----------------------------|------------------------|-------------------------------|--------------------------|-----------------------------|------------------------|
| Sector: Agriculture | 717,230.1 | 717,230.1 | 54,964.5 | 54,964.5 | 8,579,295.4 | 8,579,295.4 |
| Sector: Forest | 86,473.5 | 86,473.5 | 2,767.2 | 2,767.2 | 990,988.8 | 990,988.8 |
| Sector: Urban | 126,731.9 | 126,731.9 | 7,396.3 | 7,396.3 | 2,579,699.1 | 2,579,699.1 |
| Sector: Water | 16,854.3 | 16,854.3 | 1,108.8 | 1,108.8 | 0.0 | 0.0 |
| Total Lbs: | 947,289.8 | 947,289.8 | 66,236.8 | 66,236.8 | 12,149,983.3 | 12,149,983.3 |

Download

Septic Systems

| Septic Zone | Pre-BMP Systems | Post-BMP Systems |
|--|-----------------|------------------|
| Critical Area | 3,861.4 | 3,629.7 |
| Within 1000 ft of a perennial stream | 1,289.3 | 1,289.3 |
| Outside of the Critical Area, not within 1000 ft of a perennial stream | 2,237.3 | 2,237.3 |
| Total Systems: | 7,388.0 | 7,156.3 |

Download

Septic Loads

| Septic Zone | Lbs Nitrogen Edge of Stream | Lbs Nitrogen Delivered |
|--------------------------------------|-----------------------------|------------------------|
| Critical Area | 53,580.5 | 53,580.5 |
| Within 1000 ft of a perennial stream | 12,145.6 | 12,145.6 |
| Total Lbs: | 78,372.5 | 78,372.5 |



Maryland Assessment Scenario Tool

- Scenario List
- Scenario Details
- Urban
- Septic
- Processed Water
- Forest
- Agriculture
- Animals
- Manure Transport
- Summary
- Log Out

Coyman 10-14-11 Urban BMPs

| Pre-BMP Landuse Acres | Non-Federal | Federal |
|--|-------------|---------|
| County Phase I/II MS4 Impervious | 0 | 0 |
| County Phase I/II MS4 Pervious | 0 | 0 |
| CSS construction | 0 | 0 |
| CSS extractive | 0 | 0 |
| CSS impervious developed | 0 | 0 |
| CSS pervious developed | 0 | 0 |
| Federal Impervious | 0 | 0 |
| Federal Pervious | 0 | 0 |
| Municipal Phase II MS4 Impervious | 0 | 0 |
| Municipal Phase II MS4 Pervious | 0 | 0 |
| nonregulated extractive | 155.5 | 0 |
| nonregulated impervious developed | 4582.6 | 1.3 |
| nonregulated pervious developed | 20048.6 | 9 |
| regulated construction | 267.3 | 0 |
| regulated extractive | 0 | 0 |
| Regulated Industrial Facility Impervious | 88.8 | 0 |
| Regulated Industrial Facility Pervious | 246.2 | 0 |
| SHA Phase I/II MS4 Impervious | 0 | 0 |
| SHA Phase I/II MS4 Pervious | 0 | 0 |
| State Phase II MS4 Impervious | 0 | 0 |
| State Phase II MS4 Pervious | 0 | 0 |

Select the BMP you would like to add:
- Please Select a BMP -

Select the land use you would like to apply the BMP to:

Select the geographic scale you would like to use to determine the area for the BMP:
- Please Select a Geographic Scale -

Specify which geographic area you would like the BMP applied to:

Enter the percent of acres to apply the BMP to:
percent

Notes:

Pre Bmp Landuse Raw Data

| Multi Edit Mode | | | | | | | |
|---|--|------------|---------|--------|-------------------------|------|--------|
| BMP | Landuse | Geography | Unit | Amount | Notes | | |
| Bioretention/raingardens | nonregulated pervious developed | Talbot, MD | percent | 0.5 | About 200 acres treated | Edit | Delete |
| Dry Detention Ponds and Hydrodynamic Structures | nonregulated impervious developed | Talbot, MD | percent | 0.058 | | Edit | Delete |
| Dry Detention Ponds and Hydrodynamic Structures | nonregulated pervious developed | Talbot, MD | percent | 0.058 | | Edit | Delete |
| Dry Detention Ponds and Hydrodynamic Structures | Regulated Industrial Facility Impervious | Talbot, MD | percent | 0.058 | | Edit | Delete |
| Dry Detention Ponds and Hydrodynamic Structures | Regulated Industrial Facility Pervious | Talbot, MD | percent | 0.058 | | Edit | Delete |
| Dry Extended Detention Ponds | nonregulated impervious developed | Talbot, MD | percent | 0.06 | | Edit | Delete |
| Dry Extended Detention Ponds | nonregulated pervious developed | Talbot, MD | percent | 0.06 | | Edit | Delete |

Multi Edit Mode

BMP Scenario Development

Septic Scenario

TMDL target = 46,638

| | <u>Load</u> | <u>Incremental lbs Reduced</u> | <u>Total lbs Reduced(3)</u> | <u>Lbs to Reach 2020TMDL</u> |
|--|-------------|--|-------------------------------------|--------------------------------------|
| 1 2009 Load (1) | 83,688 | | - | 37,050 |
| 2 2009 Progress Load | 85,152 | (1,464) | (1,464) | 38,514 |
| 3 BMP effect: (2) | | | | |
| 4 232 Connect to ENR + | 81,569 | 3,583 | 2,119 | 34,931 |
| 5 150 Denite systems + | 80,434 | 1,135 | 3,254 | 33,796 |
| 6 50% pump out CA + 50% pump out non CA | 79,015 | 1,419 | 4,673 | 32,377 |
| 7 + | 78,372 | 643 | 5,316 | 31,734 |

8 Notes:

(1) Source: Phase 2 Talbot (Non-federal 7 federal) Total nitrogen Loads, Delivered MDE

9 TMDL

10 website

11 (2) Results from MAST model applying BMPs one at a time

12 (3) Total reduction calculated from 2009 Load number from MDE on line 1

13 Notes:

14 (4) MAST model #s have errors so progress load is questionable as it is listed as +/- 2k lbs higher than base load from TMDLs from MDE. Check and rectify as needed

15 TMDL Accomplishment Scenarios

16 1. Add 2,287 more connections of existing septics to ENR plant or \$20,000 per connection (Bill W.)

17 2. Add 3,354 denite systems @ \$10,000 (per Bill W). Installing 36 per year under current funding

Septic System BMPs

Urban Stormwater and Other BMPs

October 26, 2011

Urban Scenario

| | Target Load = | 126,792 | | | |
|----|---|------------------------------|--------------------------|--------------------|--------|
| | <u>Load (1)</u> | <u>Increment lbs Reduced</u> | <u>Total lbs Reduced</u> | <u>Lbs to TMDL</u> | |
| 1 | 2009 Load (TMDL load Summary) | 187,806 | | | |
| 2 | 2009 Progress Load | 161,521 | 26,285 | 26,285 | 34,729 |
| 3 | Installed BMP effect: (2) | | | | |
| 4 | 10% Tree Cover all land uses | 149,108 | 12,413 | 12,413 | 22,316 |
| 5 | 1,000 acres bioretention treated? | 148,647 | 461 | 12,874 | 21,855 |
| 6 | 20 miles street sweeping | 148,647 | - | 12,874 | 21,855 |
| 7 | 100 acres monthly street sweeping | 148,628 | 20 | 12,894 | 21,836 |
| 8 | 200 acres urban forested buffer | 148,614 | 14 | 12,908 | 21,822 |
| 9 | Urban nutrient management 100% | 129,936 | 18,678 | 31,586 | 3,144 |
| 10 | 45 acres of impervious surface removed | 129,814 | 122 | 31,707 | 3,022 |
| 11 | 1 % substitute pervious pavers for impervious | 129,624 | 190 | 31,898 | 2,832 |
| 12 | 1,000 lf shore erosion control | 129,584 | 40 | 31,938 | 2,792 |
| 13 | 2,463 acres treated? w/urban filters | 129,031 | 552 | 32,490 | 2,239 |
| 14 | 2,463 acres treated? w/open veg channels | 128,410 | 622 | 33,112 | 1,618 |
| 15 | 2,463 acres treated? w/recent strm wtr mgt | 127,719 | 691 | 33,802 | 927 |
| 16 | 9,000 lf additional shore erosion control | 127,539 | 180 | 33,982 | 747 |
| 17 | 2,291.3 additional acres treated with open channels | 126,732 | 807 | 34,790 | (60) |

Notes:

- (1) Calculated by MAST model unless otherwise specified
- (2) BMP effect deducted from MAST 2009 Progress load

Draft Two-year Milestones

- 1. Explore the efficacy of improving management of roadside ditches**
 - 1. Determine the opportunity for converting roadside ditches to bioswales**
 - 2. Determine the opportunity for converting roadside ditches to wetlands**
- 2. Propose and seek adoption of a surface water utility to develop a sustainable funding mechanism**
- 3. Review MAST data for land cover. Make corrections as appropriate.**
- 4. Review MAST TMDL strategy as new best management practices (BMPs) are added. Amend as appropriate**
- 5. Gain detailed understanding of the MAST BMPs and their installation requirements.**
- 6. Determine locations and funding for installation of proposed BMPs.**
- 7. Explore the efficacy of a septic utility for inspection and pump out of on-site septic systems.**
- 8. Establish a water and sewer plan policy giving priority to the connection of existing on-site septic systems with an order of location precedence for connection. This policy would set priorities for achieving the maximum pollution reduction.**
- 9. Connect the Hyde Park Community to the Easton Utilities Sewer System.**
- 10. Work with the municipalities to increase tree canopy cover requirements in urban and rural areas.**
- 11. Coordinate with the state, Talbot County Departments, municipalities and private landowners the development of inventory potential sites for BMP installation. Produce a list of such sites and assess their availability and viability.**
- 12. Continue to seek funding for and facilitate the installation of denitrification on-site septic systems.**
- 13. Develop an implementation mechanism for urban nutrient management planning and implementation. Implement plans and policies for the municipalities and sewer villages.**
- 14. Develop tracking mechanism for installed BMPs including municipal and private individual efforts and track assumed nutrient reductions**
- 15. Devise interim strategy to achieve 2017 TMDL goals**
- 16. Determine state and federal funding for BMP installation**
- 17. Determine local funding requirements and develop method for obtaining funds**
- 18. Develop and implement institutional arrangements to achieve local TMDL through coordination with local stakeholders and especially with municipalities and the state**

Next Steps

- 1. Review MAST model assumptions and basic data**
- 2. Refine MAST scenarios**
- 3. Implement milestones**
- 4. Gain understanding of best management practices**
 - a. Potential locations**
 - b. Costs**
 - c. Implementation procedures**
- 5. Work with stakeholders, municipalities, Planning Commission and County Council to develop final WIP plan**
- 6. Develop system to monitor progress and adjust resources and actions accordingly**

