



down to earth

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MBSS Survey By: Tracy Eberhard, Water Resource Specialist

Each spring staff from the Bureau of Resource Management, in accordance with the Maryland Biological Stream Survey (MBSS) protocols, performs biological stream sampling at various sites within the County. The MBSS survey was originally developed in the 1990's to provide information for ensuring the protection and restoration of Maryland's stream ecological resources. Biological sampling, or "bug shuffle", involves collecting benthic macroinvertebrates to aid in assessing the overall health of the stream by accounting for the presence or absence of species and species diversity.

Biological indicators such as benthic invertebrates are used to study watershed health. Metrics such as species diversity, percent abundance of pollution-sensitive or pollution-indicative organisms, and total organism abundance are used to determine if the benthic community shows signs of stress. Signs of stress in the watershed include poor species diversity, large abundances of a few organisms, and presence of pollution-tolerant organisms.

The goal of the MBSS survey is to provide an inventory of biodiversity in our streams, assess the current condition and identify the impacts of stressors on ecological resources in Maryland's streams and rivers, assess the efficacy of stream restoration and conservation efforts, and build a long-term database to document changes over time of the ecological condition and biodiversity status in Maryland's streams.

Carroll County has been macroinvertebrate sampling in various locations throughout the County since 2003. Most of the sites sampled are targeted locations selected to monitor changes in habitats over time. Since stream ecosystems are

complex and variable, there is a need to know how they are responding to management efforts over time.

One of the benefits of a stormwater retrofit is to improve the physical, chemical, and biological features of the receiving stream. Beneficial changes to the physical functions of a stream improve the chemical and biological functions, which take the longest to recover. Receiving waters of stormwater management retrofits are a primary focus of the County. Ideally several years of data should be collected as a baseline for pre-retrofit conditions; and monitoring for several years post-retrofit to monitor for impacts in the stream ecosystem. The pre-retrofit and post-retrofit sampling will document changes to indices values to understand how the health of the biological community has changed as a result of the stormwater retrofit.

The County also has a few sentinel sites as well as National Pollutant Discharge Elimination System (NPDES) locations that are required by the County's permit. The sentinel sites are locations the County is monitoring for changes due to natural impacts over time. These locations can provide static information on changes to the County's streams over time.

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Langdon Stormwater Management Facility—Train Innovation

By Christopher Heyn, P.E., Bureau Chief

The Bureau of Resource Management in partnership with the City of Westminster is constructing a regional stormwater management pond located inside the City limits. With a drainage area of over 200 acres, the new stormwater facility will treat almost 100 acres of impervious roadways and buildings that impact the Double Pipe Creek watershed.

The primary challenge of the project is its location. Situated in a valley surrounded by a residential community, access to the site is via a one lane, two-way alley. The new facility requires over 70,000 cubic yards of dirt to be removed. This equates to roughly 7,000 dump trucks trying to negotiate small City streets with significant hills. The damage to City streets and the unquantifiable impacts to the safety and convenience of residents were serious considerations when looking at the project.

The interesting, and it turns out fortuitous feature of the site, is its proximity to the Maryland Midland Railway, Inc. (MMD). By coincidence, the Town of New Windsor has a wastewater lagoon that is no longer needed due to the upgrade of their wastewater treatment plant. The lagoon is also conveniently located next to the railroad and the Town was looking for an inexpensive way to fill it and reclaim the land.

Working with MMD, the Bureau developed the process to transport the material by train and greatly reduce the impacts to the local community.

Every morning at 7:30 a.m., MMD supplies a train consisting of 10 rail cars and two locomotives. Two excavators sitting on dirt platforms synchronize their loading of cars from stockpiles of material that have been placed adjacent to them. As cars fill up, the train pulls forward to make the next cars available for loading. Each car holds approximately 65 cubic yards of material, or the equivalent of approximately 6 dump trucks. It takes the excavators, run by Highland Turf, Inc. (HTI), less than an hour to load the train. With nine of the ten cars filled, the train transports approximately 585 cubic yards of material with one run.

The trip from Westminster to New Windsor takes approximately 20 minutes. There, a specialized excavator that rides in the 10th rail car lifts itself up and traverses across the top of the full rail cars to offload the material to an unloading zone. Herzog, a company from Missouri, is subcontracted by MMD to perform this service. At the unloading zone, Stambaugh's Inc. is contracted to load the material into off road dump trucks that make the short trip from the unloading zone to the lagoon, where the material is deposited and compacted. Unloading takes a little less than 3 hours due to the single small excavator. With the train unloaded, it returns to Westminster for the second trip of the day.

As the project has progressed, the team members have worked successfully to optimize operations. Due to 12-hour

time limitations on the train crew, there is not time to fully unload two – nine car train loads everyday. We have optimized to 16 cars per day, which equates to 1,040 cubic yards of material per day, or, roughly 100 dump truck trips. This is a typical haul out rate from a stormwater management facility project using conventional truck transport.

Hauling costs of eight miles by truck for this amount of material would typically cost around half a million dollars. This is approximately the same cost being expended for hauling by train. The unquantified savings related to local roadway impacts and to citizens make this an extremely cost-effective option that the Bureau was able to take advantage of due to the site locations.

Construction of the facility began mid-April and hauling operations are estimated to continue until August. Special thanks need to be expressed to the Maryland Department of Natural Resources Chesapeake and Coastal Service for partially funding the project with a \$900,000 grant as well as the State Highway Administration - Transportation Alternatives Program which is partially funding the project with a grant for \$979,941. Total cost of the project, which includes design, property acquisition, and construction is budgeted at \$3.1 million. Average cost per impervious acre treated is approximately \$32,000.



Langdon stormwater facility site, Westminster



Loading material into train cars at Langdon site, Westminster



Unloading material from train cars in New Windsor

Partial grant funding provided by:



MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

Stormwater Update

By: Janet O'Meara, Watershed Management Coordinator

Construction at the **Elderwood SWM Basin #2/Oklahoma Phase IV Stormwater Management Facility** is complete! The contractor completed sidewalk repairs and seeded the bottom of the facilities this Spring. The County will continue to monitor the facilities for a 2" stand of grass. This project received partial grant funding from the Maryland State Highway Administration's Transportation Alternatives Program.

Construction is wrapping up at the **Central MD 2 Stormwater Management Facility**. This retrofit was possible through a partnership with the businesses in the Industrial Park. Stambaugh's Inc. was the contractor on this project. Construction of the facility is complete and the disturbed areas have been stabilized. We are awaiting re-paving of the use-in-common access to the facility.

Construction is underway on the **Roberts Mill Stormwater Management Facility** in Taneytown. The contractor just completed several weeks of blasting rock and continues hauling offsite of excess material. We anticipate the construction of the facility wrapping up in early August. A portion of the construction costs for this project are being paid for by a grant received by the County from Maryland Department of Natural Resources, Chesapeake and Atlantic Coastal Bays Trust Fund.

Construction is well underway on the **Whispering Valley Stormwater Management Facility** located off of Michelle Road and MD Route 30 in Manchester. White Pine Construction has the lower facility completed, and is continuing to work on the upper facility and the installation of storm drain pipe to convey stormwater to the facility in a non-erosive manner. A portion of the construction costs for this project are being paid for by a grant received by the County from Maryland Department of Natural Resources, Chesapeake and Atlantic Coastal Bays Trust Fund.

Construction is underway on the **Shiloh Middle School Stormwater Facility** in Hampstead. Grading continues on the upper facility as well and installation of drainage pipe.

Construction continues on the **Eden Farms - Willow Pond Stormwater Facility Retrofit**. Kibler Construction is wrapping up the installation of storm drain pipe in Sullivan Road to convey drainage from the Devlin Square

facilities. Work continues on the embankment with the pouring of the weir wall and continued grading to build the new embankment. A portion of the construction costs for this project are being paid for by a grant received by the County from Maryland Department of Natural Resources, Chesapeake and Atlantic Coastal Bays Trust Fund.



Whispering Valley SWM Facility



Roberts Mill SWM Facility



Partial grant funding for Roberts Mill, Whispering Valley, Willow Pond, and Langdon provided by:



MBSS Survey

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The two NPDES locations' indices values are part of collection of data from each of the required monitoring stations. The NPDES, and pre/post retrofit sites are sampled annually. The several sentinel sites are sampled in rotating years, once every couple years.

Staff from the Bureau of Resource Management attended the annual certification training by the Maryland Department of Natural Resources in late February. Specialized training in protocols and sampling technique are required for all persons who perform MBSS sampling throughout the state.

Annual renewal of training and a field audit every 3 years ensures consistency and accuracy for all persons who wish to do macroinvertebrate sampling across Maryland. This year County staff have sampled 15 sites within the County including sites being monitored for retrofits and long-term trends.