



January 3, 2013

Ms. Christine Buckley
Harford County Department of Public Works
212 South Bond Street
Bel Air, Maryland 21014

**Subject: Environmental Assessment Contract No. 10-133
Task Order Proposal - Revised
Small Watershed Action Plan for Declaration Run and Riverside Watersheds**

Dear Ms. Buckley:

URS Corporation is pleased to submit this revised proposal to develop a small watershed action plan to improve watershed conditions in Declaration Run and Riverside Watersheds to meet the Harford County's National Pollutant Discharge Elimination (NPDES) Municipal Separate Storm Sewer System (MS4) permit requirements and the Environmental Protection Agency (EPA) Clean Water Act, Section 319 criteria. The proposal was revised based on your December 13, 2012 telephone conference with Mary Roman and Manasa Damera and December 20, 2012 follow up message from Michele Dobson. Our lump sum fee for this work is \$89,472. Attached with this letter are:

- Scope of work
- Labor-hours and cost to perform the work

URS looks forward to working with you on this project. Please contact me at 301.820.3000 or our proposed project manager for this project, Mary Roman, PE at 443.737.1290 if you have any questions regarding this proposal.

Sincerely,
URS Corporation

Lynn M. Mayo, PE, CFM
Vice President

Attachments

Harford County
Declaration Run and Riverside Watersheds-Small Watershed Action Plan
Scope of Work, January 3, 2013

Project Understanding

Harford County requires that a Small Watershed Action Plan (SWAP) be developed for the Declaration Run and Riverside Watersheds to meet the Harford County's National Pollutant Discharge Elimination (NPDES) Municipal Separate Storm Sewer System (MS4) permit requirements and the EPA section 319 criteria. The primary goal of the Small Watershed Action Plan is to prioritize water quality restoration projects that would meet the County's urban stormwater waste load allocation goals for the Chesapeake Bay TMDLs and to treat runoff from 20% of currently unmanaged impervious areas.

Watershed Background

The Declaration Run and Riverside watersheds are approximately 420 acres and 320 acres respectively and are located in the lower portion on the Bush River Basin, north of US Route 40 and south of MD Route 7. These are developed urban watersheds with medium- and high-density residential areas as their major land cover with pockets of forested, industrial, commercial and institutional areas. Approximately 20% of the land cover is impervious. A large amount of development has occurred in this area over the past 30 years and the County expects that growth in this area will continue to increase.

Scope of Services

The scope of services includes project components that meet the Environmental Protection Agency's Small Watershed Action Plan criteria a. through i. The scope consists of three main phases:

- The initial phase of the study will include data collection, review, and evaluation of current watershed conditions.
- The second phase includes identifying and assessing watershed improvement opportunities, including development of structural and non-structural improvement projects.
- The final phase of the study includes developing an implementation plan that includes prioritization of the improvement projects, estimating the load reductions that can be achieved with implementation of the proposed projects; developing outreach recommendations; and recommending a monitoring plan to track the County's progress.

1. Data Collection and Review

URS will identify, compile and review information pertaining to the watersheds. These data include previous studies, and other data collected by public and private organizations. URS will review the available data including drainage studies, general development plans and updates, and other studies pertinent to the watersheds. URS will also perform a literature search and prepare a summary of the relevant regulatory or municipal watershed management and protection guidance.

GIS Data Management: It is assumed that the County will provide all the available existing data pertinent to the watersheds to URS in Geographic Information System (GIS) format. Data to be provided by the County include the following:

- Streams
- Soils
- Land use/land cover
- Topographic data
- Aerial photographs
- Parcel data
- Utility data (water, sewer, storm drain, electric)
- Stormwater management facilities (public and private)
- National Wetland Inventory Maps
- Roads
- Impervious cover
- addition available relevant data

As a part of this GIS effort, our GIS staff will use the County's base data and layers and attribute tables specific to watersheds or sub-watersheds to include:

- Land use coverage
- Percent impervious coverage
- Public lands
- Natural resources
- Existing stormwater management (SWM) facility drainage areas, broken down by water quality and quantity treatment

2. Evaluation of Current Watershed Conditions (Identification of Causes and Sources)

URS will evaluate watershed conditions by assessing several factors, including the land use coverage; percent impervious cover, development and redevelopment patterns; assessment of the natural resources of the watershed, such as trees, wetlands, parklands, riparian buffers, and stream valleys; pollutant loading analyses; and stream assessments.

Watershed Overview. URS will conduct a one-day field reconnaissance of the overall Declaration Run and Riverside Watersheds. A comprehensive understanding of the available information and thorough understanding of the GIS data for the watershed will enable us to target areas for field review. For the purpose of this assignment, we propose that a two-person team will conduct 1 day of field reconnaissance. Field sheets will be developed to ensure that accurate, complete, and consistent information is collected. Data acquired during the field assessment will be recorded on the field sheets and entered into the GIS to assist in the assessment of the watershed. Digital photographs will be taken.

Impervious Cover Analysis. As part of the MS4 permit requirements, the County must quantify the amount of existing impervious area, identify those areas that have adequate stormwater control, and those where the runoff is currently uncontrolled.. URS will utilize the County's 2000 impervious area coverage and update the information to reflect current conditions.

Pollutant Load Estimation Modeling. URS develop a baseline water quality model that estimates the pollutant loads from various point and non-point sources in the watershed. The model input will include updated existing land use, existing BMPs and watershed data layers. The existing land use data will be obtained by integrating MD Office of Planning and Harford County data to reflect current conditions. Based on County GIS data, there are approximately seven BMPs in the study area and these will be input to the model. Further this model will be used as a base model to develop the proposed conditions water quality model for estimating the pollutant load reductions that would be achieved due to the proposed BMP implementation. The Center for Watershed Protection's Watershed Treatment Model (WTM) will be used to estimate the pollutant loads in the watersheds for the following constituents:

- Sediment
- Nutrients (nitrogen, phosphorus)
- Bacteria

Stream Assessments. URS will assess the stability, habitat, and riparian habitat conditions of the streams in the Declaration Run and Riverside watersheds using a combination of stream assessment tools. Based on a review of available data, URS anticipates conducting assessments for up to 10 reaches including one cross section for each reach within the watersheds. We propose using the following forms to document existing stream conditions and restoration potential, all of which are attached with this proposal:

- Maryland Biological Stream Survey (MBSS) Summer Physical Habitat Sheet
- Bank Erosion Hazard Index Worksheet (BEHI) and Bank Erosion Hazard Rating Guide
- A restoration potential rating form

We propose using the MBSS Physical Habitat Sheet, rather than other methodologies such as the Rapid Stream Assessment Technique (RSAT) or the Stream Visual Assessment Protocol (SVAP), both of which we have used on previous projects, because the MBSS protocol is consistent with data being collected statewide using by the Maryland Department of Natural Resources.

For streams with high eroding banks we propose to also use the Bank Erosion Hazard Index (BEHI) methodology to assess the stability of the banks. The BEHI produces an adjective rating for bank stability from limited field data, including bank height, bankfull depth, bank slope, approximate root density, root depth, and bank protection.

With regard to the restoration potential rating form, we are currently using a form that was developed by others for a watershed study for the City of Gaithersburg. The form provides a score on the degree of stream impairment as well as the stream's potential for restoration. We propose modifying the form to adapt to Harford County preferences, which we will discuss with the County.

URS proposes to supplement the habitat assessment data with data obtained by measuring one cross section within each stream reach at a riffle. We will use a laser level and rod to measure the cross sections. We will also measure the water surface slope at each transect and note the nature of the bed material. We will place a 2-foot long rebar and plastic cap at each end of the cross section for future reference. The cross section data (stations and relative elevations) and slope will be entered into a

spreadsheet model that will calculate stream hydraulic geometry and discharge using Manning's Equation. From the cross section measurements we will generate the following additional data:

- Bankfull width
- Bankfull depth
- Bankfull width to depth ratio
- Entrenchment ratio (ratio of the width of the floodprone area to the bankfull width)
- Degree of incision (ratio of the low bank height to the bankfull depth)
- Rosgen stream type

This data, along with the habitat evaluation, will result in a reproducible assessment of the habitat and physical condition of the streams. The cross section measurements will not appreciably add to the field effort but will significantly enhance the quality of the study results.

While walking the streams for the stream condition assessments, URS will also assess all storm drain outfalls that we encounter. We will note and photographically document significant bank erosion, stream downcutting, and damaged infrastructure (broken pipes, oxidation of corrugated metal pipes, broken endwall sections and concrete pads, and loss of riprap, for example). We will also note recommended corrective action where needed.

3. Watershed Improvement Assessment

URS will recommend improvement measures to improve, restore and enhance the natural resources of the Declaration Run and Riverside watersheds. Improvement measures to be identified and evaluated include new water quality measures/BMPs; retrofit of existing stormwater management opportunities; stream restoration measures; and nonstructural and ESD recommendations.

Stormwater Management Practices and Stream Restoration Improvements

Potential stormwater and stream restoration measures will be evaluated for consideration. A cursory assessment of each measure to include an evaluation of the following factors: relative effectiveness, environmental impacts, cost considerations, constructability, and relative level of improvement will be provided. URS will provide a summary table of identified potential measures. This task does not include conceptual design of the alternatives, hydrologic or hydraulic modeling, site plan development or site grading.

URS will recommend site specific structural stormwater management alternatives and retrofit of existing facilities that would improve the water quality conditions in the watershed. This effort will consist of the following:

- **Desktop Analysis:** A desktop analysis will be conducted to identify suitable areas for implementation of new or retrofit SWM or ESD/LID measures. URS will review County's data, existing GIS mapping data, aerial photos, existing BMPs and current MDE criteria for this desktop analysis.
- **Field Assessment:** A field assessment of potential opportunities identified as a part of the desktop analysis will be conducted to assess the environmental and physical opportunities and constraints of

the potential project. Potential site factors include forest cover, sedimentation, wetlands, drainage paths/streams, proximity to houses, other structures, active parks, utilities and access to the site etc.

- **Summary of Identified Stormwater Management Projects:** URS will summarize field-identified structural stormwater management opportunities. The summary will include
 - Type of measure
 - Location
 - Drainage area
 - Percent impervious of drainage area
 - Approximate channel protection volume (Cpv) provided by the measure, as applicable
 - General description of benefits and constraints

URS will also identify high-priority stream reaches in need of restoration/ stabilization. We will focus on projects that achieve water quality improvements, more stable receiving streams, and aquatic habitat enhancements. Examples include stabilization of eroding stream banks; streambed grade control to stop and/or reverse bed degradation; providing bankfull benches or bank grading to increase the floodprone area thereby reducing shear stress on the bed and banks; improving in-stream habitat through the installation of structures such as rock or wood wing deflectors, cross vanes, J-hook vanes, and cover logs; and riparian plantings.

For the highest priority stormwater and stream improvements, URS will provide the following information:

- a) The potential improvement measures will be shown on GIS-based mapping. The map will include existing known utilities, topography, streams, property lines, etc. that are available in GIS format. For stream projects, the map will show the upper and lower limits of stabilization and typical method (rock stream stabilization, regenerative stream conveyance, storm drain pipe extension, etc.). For stormwater projects location, size and orientation will be shown.
- b) A narrative description of proposed project will be provided that will include any data or computations used for sizing the project or determining its impact (contributing drainage area; land use; water quality volume estimate; stream reach length for stabilization projects, etc.).
- c) Rough order of magnitude costs based will be developed for structural water quality restoration projects. The cost estimates will be developed based on available unit cost data and engineering judgment and experience using the County's unit costs and design specifications. Detailed cost estimates are not proposed.
- d) An opportunities and constraints review will be provided that will address logistical, constructability, and cost issues.

Non-Structural Programmatic Measures and Environmental Site Design Techniques

In addition to the structural water quality restoration projects, URS will evaluate and identify potential non-structural opportunities and Environmental Site Design (ESD) techniques that are applicable for implementation in the watersheds. Some of the potential measures that could be proposed include:

- **Non Structural Measures:** pollution prevention, good housekeeping, trash reduction recommendations.
- **ESD Techniques :** Rain gardens, rain barrels and cisterns, dry wells, green roofs, permeable pavers; conservation landscaping; tree canopy

URS will create a table of nonstructural management measures and applicability for locations within the study area.

4. Development of Small Watershed Action Plan

URS will prepare a draft small watershed action plan that summarizes the analyses conducted. The report will include figures of the overall watershed and specific locations of interest, tables of summary data and documentation of analyses conducted. In addition, the report will include the following

- **Pollutant Load Reduction Estimation:** URS will use the existing conditions baseline model developed for the watersheds and incorporate the proposed structural projects to estimate the pollutant load reduction achieved due to the implementation of the BMPs at the watershed level. Expected pollutant load reductions per proposed project will also be estimated as a part of this task. In addition, for nonstructural recommendations, URS will summarize potential pollutant reductions based on the MDE' Accounting for Waste Load Allocations (Draft 2011).
- **Prioritization of Proposed Projects:** The proposed structural projects (i.e. stream restoration and BMP/LID projects) will be evaluated and prioritized based on their effectiveness. Some of the factors that will be used for prioritization include:
 - Estimated pollutant load reductions
 - Landowner constraints
 - Utility constraints
 - Access to the project site
 - Environmental impacts
 - Cost
- **Implementation Schedule:** Based on the prioritization of projects, URS will develop a timeline for the implementation of each watershed restoration project. The highest implementation priority will be given to the projects that provide the maximum pollutant load reductions in a most cost effective way. The schedule will consider the County's CIP budget constraints. Additional factors for prioritization will be discussed with the County and incorporated into the prioritization.
- **Public Outreach:** URS will identify key outreach goals specific to the restoration objective. We will work with the County to recommend specific outreach activities and materials that would be necessary to obtain the public's acceptance off the proposed watershed restoration measures.
- **Monitoring:** URS will analyze the County's existing monitoring programs with in the watershed and provide recommendations for monitoring the SWAP implementation activities on a subwatershed level.

URS will submit two hard copies and one digital copy of the draft small watershed action plan to Harford County for review. Based on comments from the County, URS will make revisions and provide 3 hard copies and one digital copy of the final plan.

After Harford County provides review comments on the draft plan, URS will prepare an “executive summary” or “fact sheet” of the technical report for distribution to the public. This 10-20 page document will synthesize information contained in the technical report and incorporate relevant data and recommendations. The document will not contain elaborate graphics.

5. Meetings

Meetings envisioned for this project include a kickoff teleconference at the project initiation, and a meeting at 75% completion of the project to track progress. In addition, conference calls will be held to discuss the project progress.

Project Schedule

URS plans to complete this project with in County’s 9-month timeframe (i.e. by September 2013) assuming that Notice to Proceed is provided in early January. URS will develop a detailed project schedule after the kick-off meeting.

Fee Proposal

URS’ fee estimate to provide the above services is provided on the attached sheets.

URS Corporation
LABOR HOUR BREAKDOWN / FEE ESTIMATE
Declaration Run and Riverside Watersheds - Small Watershed Action Plan

Task Description	Sr WR Eng/PM	Sr. Scientist	Senior Engineer	WR Engineer	Environ. Scientist	GIS Analyst	Cadd/GIS Technician	Tech Edit Graphics	Total Hours	Total Labor
Rate:	\$141.50	\$133.58	\$91.10	\$79.15	\$79.15	\$56.64	\$56.64	\$56.64		
Task 1 Data Collection and Review										
Project start up-obtain data	4			4						
Review data	1			10	4					
Compile GIS data	1			12						
Subtotal - Task 1	6	0	0	26	4	0	0	0	36	\$3,223.50
Task 2 Evaluation of Current Watershed Conditions										
Watershed Overview	10			20						
Impervious Cover Analyses	2		4	32						
Pollutant Load Estimates	2		4	32						
Stream Assessment (field work, data analysis, forms)	2	48		4	48					
Subtotal - Task 2	16	48	8	88	48	0	0	0	208	\$20,169.04
Task 3 Watershed Improvement Assessment										
Stormwater Management - Desktop analysis	2			12						
Stormwater Management - Field Assessment	6		16	20						
Stormwater Management - Recommendations	4		20	90			24			
Stream Restoration Projects - Recommendations	4	16		4	40		24			
Non-Structural Programmatic and ESD Measures	8			32						
Subtotal - Task 3	20	16	36	158	40	0	48	0	318	\$26,637.30
Task 4 Develop Small Watershed Action Plan										
Watershed Plan Development	16	6	8	40	10					
Pollutant Load Reduction Estimates	4			16						
Prioritization of Proposed Projects	8	2		24	6					
Implementation Schedule	4	2		24						
Public outreach and monitoring recommendations	2			16						
Submit draft Plan (TR, Tech edit, submit)	4	2	8	16				8		
Address Comments Submit Final Plan	6	2	4	24	6		8	2		
Executive Summary Document (Draft)	12	6		40	4			4		
Executive Summary Document (Final)	4	2		8						
Subtotal - Task 4	60	22	20	208	26	0	8	14	358	\$33,017.94
Task 5 Meetings and Project Management										
Conference calls (kickoff and throughout project)	10	4		8						
Meeting at 75% completion of project minutes	8	8		10						
Subtotal - Task 5	18	12	0	18	0	0	0	0	48	\$5,574.66
Total Hours	120	98	64	498	118	0	56	14	968	\$88,622

Total Labor Costs: \$88,622
Direct Costs \$850
TOTAL Amount \$89,472

URS Corporation
DIRECT COSTS

Declaration Run and Riverside Watersheds - Small Watershed Action Plan

Direct Costs

Item Description	Amount	Unit	Unit Cost	Total Cost
Travel/Mileage	900	Mile	\$0.500	\$450
Phone, postage, photos, graphics printing	1	LS	\$200.00	\$200
Prints	100	Sheet	\$1.00	\$100
misc	100	LS	\$1.00	\$100

Total Direct Costs:

\$850