# PERFORMANCE WORK STATEMENT (PWS)

**for**

**EPA Region 1 Blanket Purchase Agreement, BPA-68HE0118A0001-0003**

**Period of Performance: June 11, 2018 – May 31, 2023**

# TITLE: An Integrated Stormwater Management Approach for Promoting Urban Community Sustainability and Resilience


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## I. PURPOSE

In broad and simple terms, this project is about disconnection of impervious cover (**IC**) within a geographically-constrained urbanized New England community located near the southern New England coastline. The community has requested EPA provide direct assistance to address chronic (even acute) flooding and the general poor transmission of stormwater runoff related to and resulting from impervious cover. The project is equally about building municipal understanding and capacity for integrating green infrastructure (**GI**) and other stormwater control measures (**SCM**) into municipal land use decision making to achieve innovative and cost-effective management of stormwater for a broad range of management objectives (e.g., volumetric control (flooding); reuse, resilience and sustainability; control of pollutants and protection of sensitive surface waters).

The project seeks to provide simple yet meaningful ways to estimate and convey the impact of innovative stormwater management (incl. GI SCM implementation) so that municipalities may more effectively communicate benefits and needs to gain public trust and support. A related objective is to seek opportunities for resource management including practical approaches for reuse and sustainability as well as opportunities for attaining climate resilience into the future. Although the project work scope describes a robust technical level of effort involving Geographic Information System (GIS) data and stormwater modeling, the project is largely intended to provide, by way of a meaningful collaborative partnership with the municipality, simple, cost-effective and transferrable solutions to stormwater related problems.

This brief summary of Purpose is consistent with the Vision, Purpose, Mission and Long-Term Goals of the Southern New England Program (**SNEP**),[1] the purpose of this project is to (a) build capacity of municipalities and of SNEP partners to support restoration activities (Goals 4 and 5), (b) expand the use of nature-based approaches to treat pollution at the source and offer associated benefits for habitat, wildlife, and outdoor recreation (Goals 1, 2 and 4) and (c) identify opportunities to restore water quality and physical processes that support critical habitat and ecosystem function (Goals 1, 2 and 4).

## II. ANTICIPATED OUTCOME OF THE PROJECT

Enhancing the capabilities of a municipality to directly manage stormwater runoff and address multiple local water resource issues through incorporation of Green Infrastructure (**GI**) Stormwater Control Measures (**SCM**) and other stormwater related approaches. Through close collaboration with the community, support the community in developing simple but effective strategies to incorporate innovative approaches for effectively disconnecting excessive runoff from impervious cover (i.e., IC disconnection) to minimize negative impacts (flooding and excessive pollutant loading) and support more beneficial uses (e.g., groundwater recharge and greening local environment).

## III. PROJECT BACKGROUND

Disconnection of impervious cover (**IC disconnection (ICD)**) is a fundamental policy objective underlying design and implementation of stormwater controls.[2] This is particularly so for geographically constrained urban centers where land use planning typically results in expansion of IC as a percentage of the total available land cover. When impervious surfaces reach 10–20% of local watershed area, surface runoff doubles and continues to increase until, at 100% impervious surface coverage, runoff is five times that of a forested watershed. As impervious surfaces increase, stormwater runoff increases in quantity, speed, temperature, and pollutant load. IC also contributes to excessive ambient urban temperatures (the "heat island effect") and poor air quality. An important policy objective for stormwater practitioners and municipalities is to try to mitigate and even reverse the prevalence and effects of IC by disconnecting IC and/or providing incentives and strategies to control it (e.g., municipal ordinance moratorium on new or redevelopment that does not capture and control all or a significant portion of stormwater runoff volume on site).

In theory, ICD establishes the magnitude and extent of stormwater flow control, both physically and chemically. The type of structural or non-structural ICD will depend on a number of factors but will typically involve interception and temporary storage of IC runoff through passive and/or engineered surface and subsurface infiltration practices. Characteristics of the physical setting for accomplishing ICD largely determines the range of best management options available for runoff control (e.g., rain garden; infiltration swale, sub-surface trenches, etc.).

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[1] Refer to https://www.epa.gov/snecwrp/vision-and-purpose-southeast-new-england-coastal-watershed-restoration-program

[2] Refer generally to Roy, Allison H. and Shuster, William D., Assessing Impervious Surface Connectivity and Applications for Watershed Management, Journal of the American Water Resources Association (JAWRA) 45(1):198-209 (Feb 2009).

Developing and sustaining successful approaches for stormwater management (incl. ICD and GI SCM implementation) is, however, an emerging science. Although municipal decision making aimed at moderating negative impacts from stormwater runoff should be informed by and make use of effective innovations in water resource management science, in practice, mere dissemination of scientifically-robust information about the effectiveness of new strategies is unlikely to result in the desired adoption of these strategies by decision makers (Clark, 2010). Studies suggest that cultural and social transmission processes are much more important to understanding the diffusion of innovations than is often assumed by most theorists (Damanpour and Schneider 2009) and thus more emphasis needs to be placed on linking scientific research to decision-making (Weisberg et al., 2007).

EPA Region 1 believes the referenced problem of technology dissemination is related to the ability to effectively transfer oftentimes complex innovations of stormwater management to practitioners. Accordingly, although this project focuses on flood risk, pollutant load and runoff volume reduction objectives through state-of-the-art hierarchical and modeling approaches, it will employ process objectives to ensure meaningful transfer to the municipality. Indeed, a similar innovative approach emerged from a recently completed ten-year study implementing a watershed management plan in the Berry Brook watershed in Dover, NH: the partnership between New Hampshire Department of Environmental Protection (NHDES), the University of New Hampshire Stormwater Center (UNHSC) and the City of Dover, NH, reduced the amount of uncontrolled impervious area in the 185-acre urban watershed from 30% to 10%. This unique partnership reduced best management practice implementation costs, optimized the effectiveness of implementation actions, and has led to more maintainable stormwater management systems.

Stormwater is a multifaceted problem increasingly exacerbated by more frequent larger storm events and increasing demands on existing infrastructure. Perhaps now more than ever, municipal officials require a comprehensive approach to the problem where innovations can be implemented in a best and most cost-effective manner and where municipal officials are able to provide clear and convincing information to their constituencies to garner the needed public support for municipal decision making.

## IV. TECHNICAL BACKGROUND: TISBURY, MA

Tisbury recently completed a Drainage Master Plan, entitled "Drainage Master Plan – Final Report", dated January 2018 (hereafter, **DMP**) (DMP, incl. Appendices A and B, **available as a separate attachment** (**Appendix 1**) **to this PWS**). The DMP included a Mapping and Assessment Program and a Prioritization Plan for addressing multiple drainage problems that cause or contribute to flooding in and around Tisbury, including:

- **Five Corners**, where "[f]requent flooding in intersection and on commercial properties especially in high intensity storms and high tides" attributable in part to "[l]arge areas of impervious cover, including commercial buildings and parking lots";

- **Union St./Main St.**, where "[o]verland flow [occurs] in Union Street" in part due to "[r]unoff [that] misses catch basins in [the] downtown area" and "[l]arge impervious areas [that] cause severe peak flow" such that there is "[p]otential risk from flowing water in Union Street"; and
- **Delano Road / Causeway Road**, where in part because "[n]o drainage infrastructure [exists] upstream of Delano Rd and Villa Dr intersection," the runoff "overtops structures" eventually discharging into Lagoon Pond which is nitrogen limited.

The areas described refer generally to the Village of Tisbury (i.e., Vineyard Haven) which is denoted as R-10 on the Zoning Map.[3] R-10 is a high density residential area comprised of lots having minimum areas of about 10,000 ft2, although the corresponding minimum dimensions for frontage (80 ft) and lot depth (80 ft) would equate to lot sizes of about 6,400 ft2.[4] The R-10 area slopes fairly steeply to the northeast down towards the business district denoted as B-1 on the Zoning Map and Lagoon Pond, an estuary listed as impaired (nitrogen). The area generally described here is more specifically described in the 'base map' provided in DMP Appendices A and B as the approximate 'rectangle' formed by Assessors Maps 15, 16, 19, 20, 21, 22, 23, 24 and 36.[5] The rectangular area formed by these maps would appear to be approximately 4,800 ft x 3,200 ft; 15.4 million ft2.

The soils of Tisbury are generally characterized as "outwash sand and gravel over sandy glacial till" [6] and the soils of Martha's Vineyard more generally characterized as "outwash plain (Qmvo) and [] eastern moraine (Qmvo/Qmv)".[7] More generally,

> Primary aquifer units in New England consist of Pleistocene age glacial and post-glacial sediment packages that are thickest in north-south trending valleys following the gran of the underlying low-porosity (mostly crystalline and metamorphic) fractured bedrock . . . In upland areas surficial and unconsolidated materials are dominantly thin till composed . . . of poorly sorted silt-sand-gravel. Tills cover a majority of the region and are in direct contact with bedrock. . . . The sole source aquifers in the Cape Cod region of southeast Massachusetts . . . reside in large, unbounded outwash plains, and pro-glacial lakes developed ahead of the retreating Laurentide ice sheet. In this area, the outwash plain sediments lie in direct contact with moraine deposits of the ice sheet. The water table throughout New England is predominantly within the glacially derived sediment packages. [8]

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[3] Refer to https://www.tisburyma.gov/sites/tisburyma/files/uploads/tisbury_zoning_map-pdf.pdf.

[4] Refer to Section 13.00 (Appendices) of the Tisbury, MA Zoning By-laws, available at https://www.tisburyma.gov/planning-board/pages/zoning-laws-index.

[5] The Assessors maps are reproduced for use in the DMP and may also be located here: https://www.tisburyma.gov/assessors/pages/assessors-maps. However, the Assessors maps in the DMP do not correspond with the Assessors maps. For purposes of this work scope, refer to the maps provided in the DMP Attachment B.

[6] William M. Wilcox, Martha's Vineyard Commission, WATER TABLE LEVEL DATA UPDATE & DISCUSSION (February 2009) at p. 16 (hereafter "Feb 2009 Water Table Level Data Report"). Available at https://www.mvcommission.org/sites/default/files/docs/welldat_2008web.pdf.

[7] Ibid. at p. 3, referring to Figure 1 (Locus and Geology).

[8] Boutt, David F., Assessing hydrogeologic controls on dynamic groundwater storage using long-term instrumental records of water table levels, *Hydrological Processes*, 2017; 1-19; pp. 2-3; John Wiley & Sons, Ltd.

Precipitation falling on impervious or semi-impervious cover in the Village causes or contributes to the flooding. Because the Village slopes quite severely (actual slope unknown) to the northeast and district B-1, it is likely that runoff from upgradient areas of the Village lack time and area to infiltrate, and run downhill and oversaturate the B-1 district (located adjacent to coastal estuaries), where hydrologically, discharge of flood waters lacks the hydraulic head and perhaps also the permeability for ready transmission (likely also tidally influenced) to the sea. [9] In general, the capacity for the more inland / upgradient R-10 soils to infiltrate depends on the capacity (static depth and infiltration rate) of the R-10 soils to infiltrate runoff. [10]

Promoting infiltration by ICD must consider the impact of infiltration on water quality, perhaps particularly for Martha's Vineyard where drinking water supplies are uniquely constrained. [11] The Figure entitled "Key Development Constraints" (otherwise, Figure 2) of the Executive Summary for the Jan 13, 2017 Tisbury Housing Production Plan FY2018-2022 identifies Lagoon Pond as "Impaired – TMDL Required". The Figure entitled, "Water Resources" (otherwise, Figure 3) of same, identifies Water Supply Protection Zones, including Interim Wellhead Protection Areas and MassDEP-Approved Zones upgradient and to the southwest and south – i.e., not within the vicinity of Vineyard Haven.[12] Consequently, it appears disconnection of IC to promote infiltration and recharge of the groundwater table in the Vineyard Haven R-10 and B-1 areas would not pose a risk to drinking water supplies and would help to offset discharge of nitrogen to Lagoon Pond.

EPA's Region 1 GIS Center developed **GIS data and maps** containing the extent and location of IC in the target area, along with overlay of same with topography indicating the direction and relative magnitude of the slope of the area. The Impervious Surface Cover was determined using two initial datasets: National Land Cover Dataset Percent Developed Imperviousness (https://www.mrlc.gov/nlcd11_data.php) and Mass GIS Impervious Surface (https://docs.digital.mass.gov/dataset/massgis-data-impervious-surface-2005). The following steps were taken accordingly for each dataset and the background data for these datasets is as follows:

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[9] The Feb 2009 Water Table Level Data Report at pp. 5-6. The report postulated the range of water level data exhibited by more inland wells (5 to 7 ft) vis-à-vis wells located along the shore (2 ft or less) may in part be "the result of the groundwater flow in the elevated part of the aquifer having a larger vertical component than is found nearer to the shore. The hydraulic gradient in these areas is lower than it is nearer to the shorelines where the aquifer is constantly discharging water. The result is that the recharging water piles up[,] and when there is no recharge, the continuing discharge drops the water table by a greater amount."

[10] It may be sufficient to estimate the infiltration rate of R-10 soils using surface infiltrometer measurements, or by employing conservative assumptions. To precisely determine the static depth of unsaturated zone soils, it would be best to advance some statistically significant number of soil borings or piezometers. If this is not possible, it may be possible to estimate depth using secondary (existing) data (e.g., test pit data, if available), leaving more precise measurements to be collected during a later preliminary phase of an implementation / feasibility project.

[11] The Feb 2009 Water Table Level Data Report emphasizes "[t]he collection of this data is vital to gaining a thorough understanding of the hydrology of the various water bearing formations on which we depend for our drinking water supplies and into which various contaminants are released in the disposal of wastewater, infiltration of road runoff, past disposal of solid waste and spills of various chemicals. To plan for a sustainable future source of drinking water that does not compromise either the quality of the supply or the complex interaction between ground and surface waters in our coastal ponds, we need to know as much as possible about [the water table and its elevations]". Ibid at p. 3.

[12] Martha's Vineyard Commission and Commonwealth of Massachusetts, Tisbury Housing Production Plan FY2018-2022, Executive Summary (Jan 13, 2017). Available at https://www.mvcommission.org/sites/default/files/docs/Tisbury%20HPP%20Draft%20Consolidated.pdf.

NLCD Percent Impervious Surface
Date: 2011
Spatial Resolution: 30m x 30m
Relative Measure: Percent for each pixel
NLCD Percent Impervious Surface Methods: Zonal statistics as table: This tool can derive an array of statistical measures for a given value in a given location (or zone). EPA's R1 GIS Center ran this tool on the NLCD Impervious Surface raster and gave the input zone as the respective Map LOC ID, which is distinct for each parcel. As each pixel is 30m x 30m, the mean value for each tax parcel was utilized to determine the mean percent impervious cover.

Mass GIS Impervious Surface
Date: 2005
Spatial Resolution: 1m x 1m
Relative Measure: Binary, 1 = impervious, 0 = not impervious

Mass GIS Impervious Surface Methods: Zonal statistics as table: Similar to the NLCD raster layer, EPA's R1 GIS Center ran the zonal statistics with respect to the LOC ID for each parcel. From the total sum, EPA's R1 GIS Center could determine the total area of the impervious cover for each parcel. This relays from the fact that each 1m pixel was either 1 or 0 for impervious cover; or not. If it is assumed each pixel is 100% impervious if given the value of 1, then the total sum indicates the area. Using this as a percent of the total area for each parcel, the number reflects accordingly.

The EPA R1 GIS Center's recommendation is to prioritize the Mass GIS data. Although it is more outdated (2005 vs. 2011), the spatial resolution is considerably better (1m vs 30m pixels). **The GIS data and maps are provided as three (3) files as a separate attachment to this PWS (Appendix 2)**.

## V. SCOPE OF WORK

This following scope of work is predicated on developing a volumetric approach for controlling stormwater runoff in Tisbury, MA, using GI and other SCM. Although the primary objective is volumetric control, the project will estimate pollutant load reductions. The design approach will be dependent on the existing land use character (e.g., type, extent and location) including municipal infrastructure (i.e., stormwater sewer system) within the target R-10/B-1 area.

From the nature and distribution of land use within the target area, the design approach would follow a hierarchical order, considering first the disconnection of residential roof runoff, leaving the remainder of runoff to be offset by other means, including the Town's storm sewer system, infiltration techniques, and perhaps also storage techniques; many of these approaches will depend in part on *location* (i.e., infiltration availability and capacity as a function of spatial variability) within the target R-10/B-1 area (e.g., storm sewer system).

With respect to the Town's storm sewer system, the system is not a regulated MS4. The system consists of a patchwork of storm sewers, catch basins and outfalls, the locations and conditions of which vary depending on location within the Town. The locations and conditions of the Town's

storm sewer system is provided as part of the DMP (Appendix 1). The DMP acknowledges existing deficiencies that limit the effectiveness of the system (e.g., condition of outfalls), but under an assumption that these deficiencies will be addressed, the volumetric component of Village runoff potentially managed by the storm system would be considered.

The design approach is will rely heavily on GIS information and EPA's Opti-Tool. Opti-Tool is:

> a spreadsheet-based optimization tool designed to assist stormwater (SW) managers and consulting engineers in preparing technically sound and cost-effective watershed SW management plans to achieve needed pollutant and volume reductions more affordably from developed landscapes throughout the New England Region. The user-friendly tool is highly flexible with options to conduct both watershed-wide planning level analyses as well as detailed site-specific analyses. Output from the Opti-Tool allows users to evaluate costs of various treatment options including the optimized best mix of structural Green Infrastructure (GI), Low Impact Development (LID) and other common categories of SW controls in a targeted geographic area. Opti-Tool is based on extensive research and modelling, makes use of EPA's SUSTAIN decision support system and incorporates best available information for estimating regional long-term cumulative pollutant load and runoff volume reduction performances for 11 categories of structural SW controls.[13]

For the reasons cited above, it will be particularly important to estimate the benefits from SCM implementation so that the municipality can meaningfully convey to its constituency what is likely to be a cost, time and priority-dependent implementation approach. As the project unfolds, specific opportunities for implementation will be considered; process and approach adjustments will also likely arise for technical direction.

## Task 0: Work Plan, Budget and Schedule

The Contractor shall prepare a detailed work plan and budget response to the following work scope describing its proposed approach to completing all of the tasks in this PWS. Its response shall include a description of all assumptions and contingencies made by the Contractor, a proposed scheduled including a list of deliverables with due dates and schedule for deliverables, an estimated budget, and special reporting requirements (if any). The Contractor's response will include a description of proposed staff and the number of hours and labor classifications proposed for each task.

Task 0 Deliverables

The Work Plan, Budget and Schedule is due within two (2) weeks of Task Order (**TO**) award.

## Task 1: Prepare Quality Assurance Project Plan (QAPP)

EPA policy requires that an approved Quality Assurance Project Plan be developed in advance for work that involves the collection, generation, evaluation, analysis or use of secondary environmental data for environmental decision making. The QAPP defines and documents how specific data generation and collection activities shall be planned, implemented, and assessed. To accomplish some of the work assignment objectives, it will be necessary for the Contractor to use existing environmental information/data and to develop modelled stormwater

[13] https://www.epa.gov/tmdl/opti-tool-epa-region-1s-stormwater-management-optimization-tool#fn1

runoff flow and pollutant load estimates for various land source areas within the Town of Tisbury using EPA Region 1's Opti-Tool. Additionally, Opti-Tool shall be applied to help inform the development of SCM retrofit management strategies. Therefore, the Contractor shall develop a QAPP for all activities that involve assembling, reviewing and using existing environmental information and data, as well as for applying Opti-Tool.

As a template, the Contractor may use an existing QAPP for a related EPA project, entitled "Quality Assurance Project Plan for Phase 2 Mystic River Watershed Eutrophication Analysis" dated September 7, 2017, prepared for EPA by Eastern Research Group under Contract EP-C-16-033, Work Assignment No. 1-35. This QAPP is provided as a separate attachment to this PWS (**Appendix 3**).

Task 1 Deliverables

The Contractor shall provide a draft QAPP to the TOCORs in electronic format **at the time of submitting the Work Plan.** The Contractor shall submit a final QAPP within 5 business days after receiving comments on the draft QAPP from the EPA TOCORs.

## Task 2: Project Management and Administration

This task includes subtasks related to administration, management and coordination of the project.

**Mark Voorhees** (Stormwater Permitting)**, Newt Tedder** (Stormwater Permitting)**, Karen Simpson** (SNEP Coordinator) **and Ray Cody** (Surface Water Branch) will serve as the core Project Team (**Project Team**) and/or Project Technical Leads (**PTL**) for this project (**hereinafter, "the Project"**). **Ray Cody** will serve as the Task Order (TO) Contracting Officer Representative (**TOCOR**) and **Mark Voorhees** will serve as the Alternate TOCOR (**Alt. TOCOR**). Except as provided (e.g., invoicing, contract-related correspondence), the Contractor shall direct all draft and final deliverables to the Project Team and copy (i.e., cc) the TOCOR and Alt. TOCOR.

Provisions for Deliverables are generally set forth in the GSA Contract and/or the BPA. To the extent the following is not inconsistent with either, EPA intends to provide any and all formal reports produced under this contract for public dissemination, in whole or in derivative documents, as appropriate. The Contractor shall always provide draft versions of any spreadsheets, calculations or reports. EPA and its stakeholders may review and comment on draft deliverables / submittals. If so, then the Contractor shall incorporate any such comments into a final version(s). For communiques and reports, the Contractor shall use standard computer software (e.g., Adobe Acrobat, MS Word, MS Excel, MS PowerPoint). All other software (e.g., computer models) must utilize publicly-available non-proprietary code. In addition, software application files, if delivered to the Government, must conform with Section 508 of the

Rehabilitation Act of 1973, as amended (29 U.S.C. § 794(d)).[14] Refer to http://www.section508.gov/.

Provisions for invoicing are also generally set forth in the GSA Contract and/or the BPA. To the extent the following is not inconsistent with either, then to ensure timely administration, invoices shall be submitted promptly within the first week of each calendar month. Invoices shall be directed to the COR. The COR will distribute as appropriate to the Project Team Leader and/or the Project Team for review and consideration, as appropriate. Invoices shall, among other things, summarize the Contractor's work for the billing month, project anticipated work for the next billing period(s), identify and anticipate any problems that may impact the project or its schedule, and specify and identify the billable hours and other direct costs on a Task and Subtask basis. In its response to this PWS, the Contractor may add one or more specific Subtasks or line items under this Task for its general administration of the project.

### Subtask 2A. Kickoff Meeting

The Contractor shall initiate a project kick-off meeting with the project team at EPA's Region 1 Boston office located at 5 Post Office Square, Suite 100, Boston, MA 02109-3912. For this meeting, the Contractor shall assume travel, lodging (if applicable), logistics and coordination for managerial and technical personnel for a half day meeting with EPA. For this meeting, EPA will make available any additional technical references not already provided herein, or other supplemental data or information that may assist the Contractor.

A week following this meeting, the Contractor shall summarize its understanding of the project kick-off meeting (e.g., action items; scheduling adjustments) and transmit these by email to the COR.

Subtask 2A Deliverables

- Kickoff meeting within one (1) month of Task Order Award.
- Kickoff meeting summary (incl. action items, scheduling adjustments, etc.) within one (1) week of kickoff meeting.

### Subtask 2B. Conference Calls, Meetings, Project Team Support and Post-Project Webinar

Following the Kickoff Meeting, the Contractor shall provide for monthly conference calls (as needed) to keep the project team updated as to the status of the project. These calls may utilize EPA's teleconferencing facilities and EPA can provide teleconferencing details in advance of each call.

The Contractor shall briefly summarize its understanding of each conference call (e.g., action items; scheduling adjustments) and/or meeting and transmit these by email to the COR.

[14] In 1998, Congress amended the Rehabilitation Act of 1973 to require Federal agencies to make their electronic and information technology (EIT) accessible to people with disabilities. The law applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology. Under Section 508, agencies must give disabled employees and members of the public access to information that is comparable to access available to others.

The Contractor will budget for presenting the results of its work (post-project) in an approximate one (1) hour webinar for interested participants from State agency, non-governmental organizations and/or the private sector. For budgetary purposes, EPA has a license for conducting webinars which the Contractor may utilize, but the Contractor will coordinate all outreach, scheduling and technical aspects of the webinar materials itself.

It is possible that drafts of any given deliverable may require time and level of effort (**LOE**) for EPA review and/or same for facilitating such review of the drafts by others. The Contractor shall include reasonable provisions for incorporating such review into the development of final deliverables.

Subtask 2B Deliverables

- Monthly Conference Calls
- Monthly Conference Call Summaries
- Development and presentation of a 1-hour webinar
- Reasonable provisions for incorporating EPA and/or stakeholder review and input, if any.

## Task 3: Municipal Coordination Meeting

The purpose of this Task is to meet with key representatives of the municipality that are or will be engaged with SW management opportunities within the community. The purpose of this meeting is for the various project partners to become acquainted, share general information, and to begin a dialogue that covers the following key topics:

- local SW management issues and concerns (flooding, water quality, etc.);
- identify local data and information sources;
- long-term community goals related to GI and built environment;
- general information on SCM retrofit strategies for IC disconnection;
- lessons learned elsewhere (e.g., Berry Brook watershed Dover, NH);
- develop "go to" Project Team that includes key municipal representatives (Municipal Partners), EPA and the Contractor; and
- review and refine project tasks going forward.

The Contractor shall work with TOCORs and Project Team to schedule a Municipal Coordination Meeting to be held with Tisbury municipal officials and representatives on Martha's Vineyard. EPA expects the municipality shall provide a meeting space. The Contractor shall be responsible for running the meeting and developing meeting materials (e.g., presentation) as needed to address the above topics. The Contractor shall prepare for the meeting by reviewing readily available background information pertaining to SW runoff issues within the Municipality including the recently completed Drainage Master Plan (DMP) provided as a separate attachment to this PWS. EPA estimates that preparation for the meeting shall require approximately 40 hours LOE. The TOCORs shall investigate obtaining a SharePoint site accessible to the Project Team to be used as a depository for materials related to the project.

Task 3 Deliverable:

- Schedule, prepare for and participate in Municipal Coordination Meeting within one month of Kickoff Meeting (Task 1);
- Prepare and submit Meeting Notes to TOCORs within 1 week of meeting; and
- Provide TOCORs with electronic copies of all materials prepared for the meeting by scheduled meeting date.

## Task 4: Stormwater Management Assessment for the Town of Tisbury, MA

This Task consist of several subtasks that are designed to assemble necessary information for informing municipal decision makers on SCM opportunities within their built landscape and for developing wise and feasible implementation strategies to address local water resource issues over short and long-term timeframes. The Project Team will work side by side with municipal officials to identify SW-related problem areas within the municipality, as well as identifying other specific SW management opportunities that may exist. Using information to be developed under this Task (e.g., drainage area characterization and SW management analyses) and with input from the municipality, efforts will be made to identify and prioritize typical types of SW management opportunities that may arise over the long term of conducting municipal business (e.g., roof top disconnection/rain barrel and rain garden programs; redevelopment, roadway projects, urban renewal, etc.).

### Subtask 4A. Watershed Characterizations through Geographic Information System (GIS) Spatial Data Analyses

The Contractor shall compile all readily available data (local and state) to conduct GIS spatial analyses that will support use of the EPA Region 1 Opti-Tool for quantifying SW runoff volume, high flow rates and pollutant loads according to IC and pervious cover from various land uses within the municipality. The GIS analyses shall also identify broad-based SCM management categories based on drainage area characteristics such as IC, soils, land use, depths to groundwater, surface elevations and slopes, and exclusion areas (e.g., hazardous waste locations). For planning purposes, the Contractor shall assume using an approach that will be generally consistent with the approach used to quantify SW runoff volume and pollutant loadings and to identify broad-based potential SCM categories in the Opti-Tool Buzzards Bay Watershed Case Study (https://www3.epa.gov/region1/npdes/stormwater/ma/opti-tool-case-study-demo-buzzards-bay-watershed.pdf).

However, it is likely that additional steps to isolate runoff contributions from public/private roadways, IC on private properties and IC from municipal properties will be needed to better inform the development of management strategies.

Discussions with the TOCORs and Project Team will identify whether the GIS analysis should be conducted according to sub-drainage areas. Sub-drainage areas may become important for consideration of runoff source contributions to high flow rates and pollutant loads to sensitive surface waters. Consideration shall be given to whether IC source area should be

subdivided according to surface slopes to better evaluate contributions to high runoff flow rates in the Opti-Tool analysis (Sub-task 4B).

The contractor shall develop a **technical memorandum** (**TM**) that describes the proposed approach for conducting the GIS analyses to characterize watershed conditions and identify potential SCM management categories that align with identified water resource goals. The TM shall identify the data to be used and proposed outputs for subsequent Opti-Tool analyses. The TOCORs shall be responsible for obtaining input on the TM from the Project Team. Upon finalization of the TM, the Contractor shall conduct the GIS analysis and summarize the results in in a spreadsheet.

Subtask 4A Deliverables

- Submit to TOCORs in electronic format a Draft Technical Memorandum by November 1, 2018. Finalize and submit TM to TOCORs within one week of receiving comments from the TOCORs.
- Submit to TOCORs in electronic format results of the GIS analysis in an Excel compatible spreadsheet.

### Subtask 4B. Opti-Tool Analyses for Quantifying Stormwater Runoff Volume, High-Flow Rates and Pollutant Loadings from Watershed Source Areas

The Contractor shall use the results of Subtask 4A to conduct the GIS analyses in accordance with Subtask 4A and apply the EPA Region 1 Opti-Tool for conducting a planning level analysis to cumulatively quantify SW runoff volume, high runoff flow rates and pollutant loads for nitrogen according to IC and pervious cover from various land uses within the municipality. Opti-Tool shall be applied using a regionally applicable long-term hourly precipitation record for a up to a 20-year period to be determined in coordination with the Project Team. Average annual cumulative runoff volumes and pollutant loads shall be determined using the implementation mode of the Opti-Tool, which involves conducting long-term simulations using the Hydrologic Response Unit (HRU) SWMM models (included in the Opti-Tool package) for each of the identified IC and pervious cover source areas within the sub-drainage areas as identified in the GIS analysis.

The Contractor shall coordinate with the Project Team to develop an IC runoff high flow rate metric(s) to assist in evaluating contributions of high runoff rates that contribute to flooding and eventually for evaluating SCM reduction benefits. This work may involve additional analysis of the HRU SWMM model hourly timeseries outputs. To evaluate contributions to local flooding, the contractor shall assess whether additional IC HRU SWMM models are needed to more fully evaluate high runoff flow rate contributions from steeper surface slopes within the municipal drainage areas. If it is determined that additional HRU models for steeper surface slopes are warranted, then the Contractor shall develop the HRU SWMM models (by adjusting surface slope of the existing HRU models) and conduct long-term simulations for the analysis period.

The Contractor shall prepare a **TM** that presents the results of Opti-Tool runoff flow, volume and pollutant source analysis for the Town of Tisbury. The results shall be represented in a manner to facilitate the municipality's understanding of the relative contributions of runoff source areas within the Town / Village that specifically contribute to flooding, excessive pollutant loading and depletion of groundwater recharge. The TM shall describe the proposed high runoff flow rate metric(s) to be used to evaluate both source contributions and reduction benefits associated with SCM categories.

Subtask 4B Deliverables

- Submit to TOCORs in electronic format a Draft Technical Memorandum by December 15, 2018. Finalize and submit TM to TOCORs within one week of receiving comments from the TOCORs.
- Submit to TOCORs in electronic format results of the Opti-Tool analysis in an Excel compatible spreadsheet.

### Subtask 4C. Develop High Runoff Flow Rate Metric(s) to Evaluate Source Area Contributions and SCM Reduction Benefits

The Contractor shall develop a high runoff flow rate metric(s) (identified in Subtask 4B) that is designed to provide a straightforward means for evaluating source area contributions and reduction benefits associated with SCM with varying design capacities. EPA envisions that the cumulative performance curve concept may be applicable for evaluating SCM reduction benefits. The Contractor shall develop a **TM** that describes the methodology used to develop the metric(s) and high runoff flow rate reduction estimates for the major categories of SCMs for which performance curves have already been developed. The TM shall provide the results of the reduction estimates in a readily useable format for practitioners to evaluate high flow rate reduction benefits of SCMs.

Subtask 4C Deliverables

- Submit to TOCORs in electronic format a Draft Technical Memorandum by February 1, 2019. Finalize and submit TM to TOCORs within one week of receiving comments from the TOCORs.

### Subtask 4D. Develop Planning Level SCM Performance Curves for Estimating Cumulative Reductions in SW-Related Indicator Bacteria

The Contractor shall develop a methodology to provide planning level estimates of long-term cumulative reductions in SW-related indicator bacteria by SCMs with varying design capacities. These estimates shall be developed for SCMs that include infiltration and filtering processes and for which cumulative **performance curves** (**PC**) have already been developed. The estimates will be based on following a similar methodology used to develop the existing PCs for runoff volume, nitrogen, phosphorus, solids and zinc with the exception that bacteria reduction performance of SCMs will be based on readily available performance information (e.g., International BMP Database) rather than detailed calibrations to specific performance data as was done for the other pollutants. The

contractor shall consider readily available information related to the build-up and wash-off of indicator bacteria from impervious surfaces in developing the runoff bacteria time series using the SWMM IC HRU models included with the Opti-Tool package. EPA envisions that the SUSTAIN model or an equivalent model capable of simulating water quality performance in SCMs shall be used to simulate long-term cumulative performances for bacteria removal.

The Contractor shall prepare a draft **TM** that describes the proposed methodology. Once the TM describing the methodology is finalized and approved by EPA, the Contractor shall apply the methodology to develop the planning level SCM PCs for estimating cumulative reductions in SW-related indicator bacteria.

Subtask 4D Deliverables

- Submit to TOCORs in electronic format a Draft Technical Memorandum by December 15, 2018. Finalize and submit TM to TOCORs within one week of receiving comments from the TOCORs.
- Submit to TOCORs in electronic format the SCM performance curves of cumulative reductions estimates for indicator bacteria by February 15, 2019.

### Subtask 4E. Identify Green Infrastructure Stormwater Control Opportunities and Potential Management Strategies for Tisbury

The Contractor shall coordinate with the Project Team to identify broad processed-based SCM categories (e.g., infiltration, filtration, IC removal, etc.) suitable for addressing the Town's water resource needs/objectives and interpreting them with municipal end-users into localized system approaches. The results of Subtasks 4A and 4B shall serve as a starting point for work under this Subtask by quantifying runoff source areas and identifying potential SCM management categories.

Work under this Subtask shall include the Contractor's participation in a **meeting with Tisbury municipal officials** to discuss potential strategies and to introduce numerous real examples of relatively "low-tech" SCM retrofits that would partially, or in tandem with other SCMs (based on a hierarchical approach for disconnection), effectively disconnect IC runoff. The concept of outright removal of IC shall be explored with the Town. Emphasis will be on straightforward transferrable SCM concepts that achieve the overall planning goals noted above, minimize maintenance requirements, and can be most cost-effectively implemented by local municipal departments with minimal outside support. The Project Team will work with the Town to understand local operation and maintenance capacity to ensure that SCM retrofits are compatible with end user maintenance culture.

The Contractor shall be prepared to address the technical and economic feasibility of potential SCM retrofit categories and strategies being discussed, as well as provide ranges of estimates of associated cumulative runoff reduction benefits that could potentially be achieved. The Contractor shall estimate the cumulative reduction benefits for runoff

volume and pollutant loads using EPA Region 1's performance curves (https://www.unh.edu/unhsc/sites/default/files/media/ms4_permit_nomographs_sheet_final.pdf). Reduction to high runoff rates using the metric(s) to be identified/developed in Subtask 4D shall not be accomplished as part of this Subtask but shall be estimated in a later Subtask during the Opti-Tool SW management analysis (Subtask 4G).

In coordination with the TOCORs, the Contractor shall schedule a meeting to take place within the municipality (Contractor shall not be responsible for securing a meeting space). The Contractor shall prepare a **presentation** and provide **written materials** to facilitate the discussions with the municipality. Written material shall likely include a series of brief information sheets on potential SCM categories and strategies for consideration that cite real-world examples when available. Through this process, the Project Team shall identify SCM categories and potential strategies that the municipality considers to be acceptable for further evaluation for the Town. Following the meeting, the Contractor shall prepare a **list of the recommended SCM categories and potential strategies** identified for further evaluation.

Subtask 4E Deliverable:

- Develop meeting materials (e.g., presentation and brief information sheets) and provide to TOCORs in electronic format within one week prior to the scheduled date for the Subtask 4E Project Team Meeting;
- Attend and participate in Subtask 4E meeting; and
- Submit to the TOCORs in electronic format within one week of the meeting date a list of the SCM opportunities and strategies identified at the meeting for further evaluation.

### Subtask 4F. Conduct Field Investigations to Further Evaluate Community SCM Opportunities and Strategies

The Contractor shall coordinate with the Project Team and Town of Tisbury to conduct **field investigations** to further explore SCM retrofit project opportunities and prioritize opportunities for further evaluation. The purpose of the investigations would be to evaluate specific project opportunities and to further evaluate the general feasibility of applying typical generic types of SCMs identified in Subtask 4C (e.g., rooftop disconnection, rain garden programs, IC removal, infiltration/filtration systems public right of ways, etc.) as part of a long term municipal SCM strategy.

Information collected during the field investigations shall be used to develop conceptual designs of specific potential projects and conceptual designs of generic SCMs that may be adapted at suitable locations within the municipality. The feasibility of implementing the SCMs identified for conceptual designs, or a variation thereof, shall be determined based on field investigations and other readily available information (e.g., maps of topography and utilities, etc.). To the extent practicable, efforts will be made to evaluate opportunities that include the most promising SCM types (applied in varying and typical settings) determined to be acceptable to the municipality and that also serve as examples/templates

for future municipal work. EPA estimates that that up to a total **10 days** of field investigations will be adequate to accomplish the objectives of this subtask.

During the field investigations, the Contractor and Project Team shall engage in opportunities to raise awareness within the community and solicit community participation. The Contractor shall prepare a streamlined **informational brochure/flyer** (maximum 1 page) that outlines key elements of the project designed to inform the public. The brochure shall be distributed as opportunities arise during and after field investigations. The brochure shall require review and approval by the Town.

The Contractor shall prepare a **TM** that describes the field investigations undertaken, presents results and summarizes overall findings including input from the Town on potential SCM opportunities and programmatic SCM retrofit strategies. EPA expects that the list of potential SCM conceptual designs shall include low tech and adaptable SCMs that will partially or wholly (e.g., IC removal) disconnect IC runoff; and will be technically feasible, readily implementable (pending final design) and acceptable to the community. The TM shall recommend a prioritized list of potential conceptual designs for specific SCM projects and generic SCMs that are generally suitable for implementation within the municipality on a longer term programmatic basis. The Contractor shall prioritize SCMs for conceptual design consideration based on the Town's preferences and on SCMs that would contribute to addressing flooding problem areas, reducing SW pollutant loads to sensitive surface waters, increasing groundwater recharge and increasing capacity for beneficial reuse of captured SW runoff. The TOCORs shall coordinate the review of the draft TM with the Municipal Partners.

Subtask 4F Deliverables

- Submit a draft informational brochure to TOCORs in electronic format within 2 weeks of the first scheduled date for conducting field investigations. The TOCORs will be responsible for seeking Town review and approval of the brochure. Submit finalized informational brochure to TOCORs prior to conducting field investigations. The Contractor shall distribute the informational brochure during interactions with the public during and after the field investigations as opportunities arise.
- Conduct and complete field investigations as needed to support development of project specific and generic SCM conceptual designs (Subtask 4G) by June 1, 2019.
- Submit to TOCORs in electronic format a Draft Technical Memorandum by June 15, 2019. Finalize and submit the TM to TOCORs within one week of receiving comments from the TOCORs.

### Subtask 4G. Develop SCM Conceptual Designs

The Contractor shall work closely with the municipality to develop up to **6 conceptual designs** of project specific and generic SCMs as directed by the TOCORs. The SCMs selected for conceptual design development shall be based on input from the municipality and the recommendations in the finalized prioritized list from Subtask 4D. EPA expects a high level

of confidence that the conceptual designs can be readily implemented in suitable locations. A primary objective of this subtask is to provide realistic designs that highlight the range of opportunities and locations (actual and typical) for installing feasible SCM retrofits that could be applied singularly or more widely as dispersed SCMs. Each conceptual design shall include a summary sheet that provides details of the conceptual design including design capacity, drainage area characteristics, quantified cumulative reduction benefits for high runoff flow rates, pollutant loads, and runoff volume, estimated cost, and estimated operation and maintenance requirements (hours per year and brief description).

Subtask 4G Deliverables

- Submit draft conceptual designs in electronic format for up to 6 SCMs (combination of project specific and generic SCMs) to the TOCORs by July 15, 2019. Submit finalized conceptual designs to TOCORs within 1 week of receiving comments from the TOCORs.

### Subtask 4H. Quantify Benefits for Municipal Long-Term SCMs Implementation Strategies

Based on the work of previous Subtasks, the Contractor shall work closely with the TOCORs, Project Team and the Town to develop 'big-picture' long-term SCM management strategies to accomplish IC disconnection and to achieve water resource objectives (flooding, water quality, urban community farming and affordable foods, urban aesthetics and safety, green jobs, smart growth land use planning, greening community, etc.). The Contractor shall use the Opti-Tool and the conceptual designs developed under Subtask 4G to assist in informing this process and identify the most potentially cost-effective opportunities that could be accomplished going forward. EPA envisions that the Contractor shall employ a hierarchical conceptual approach for accomplishing IC disconnection through SCMs and quantify the pollutant and runoff volumetric reductions for each major source category 'type' (e.g., urbanized residential, municipal (streets, buildings, lots). Opti-Tool shall be used to quantify the cumulative reduction benefits that could be achieved at various levels of implementation of potential SCM retrofit strategies over the long term.

The Contractor shall prepare a **TM** that presents the presents recommended long-term SCM retrofit strategies and the expected SW runoff-related reduction benefits associated with the strategies.

Subtask 4H Deliverables

- Submit TM in electronic format to the TOCORs by August 15, 2019

### Subtask 4I. Develop Streamlined Technical Support Document to Quantify Benefits of SCMs for IC Disconnection

The Contractor shall prepare a streamlined Technical Support Document (**TSD**) designed for municipal practitioners that provides clear steps for quantifying reduction SW runoff-related reduction benefits of SCMs using the existing EPA Region 1 PCs and new performance information related to high runoff flow rate reduction and indicator bacteria that shall be developed under this work assignment. EPA expects that existing resources

such as the UNH SC's fact sheets that include curves (https://www.unh.edu/unhsc/news/ms4-tools) shall be incorporated into this TSD.

Subtask 4I Deliverables

- Submit to TOCORs in electronic format a draft TSD by August 15, 2019. Finalize guidance document by September 30, 2019.

### Subtask 4J. Final Project Meeting and Final Project Report

The contractor shall participate in a **final working meeting with the Town of Tisbury** to present results of the analyses conducted under previous subtasks and to discuss project findings. The Contractor shall also present the draft TSD for quantifying SCM benefits developed under subtask 4I.

The Contractor shall provide a draft **final report** that describes the process undertaken to achieve project objectives, project work, findings and recommendations. The draft final reports shall consider discussions and input received during the final project meeting. EPA envisions that final TMs developed under the work assignment can be readily consolidated into this final report.

Subtask 4J Deliverables

- Participate in the final project meeting to be held in the municipality and to be scheduled by the TOCORs.
- Submit to TOCORs in electronic format a draft final report technical guidance document by September 15, 2019. Finalize report by September 30, 2019.

### Task 5. Develop Streamlined Technical Support Document for Developing Long- Term Community SCM IC Disconnection Strategies

The Contractor shall consider the lessons learned from this project and develop a Technical Support Document (**TSD**) designed to provide municipal officials with information on conducting projects with similar water resource objectives to identify SCM retrofit opportunities within the municipality and to develop long-term SCM implementation strategies for IC disconnection.

Subtask 5 Deliverables

- Submit to TOCORs in electronic format a draft TSD by September 15, 2019. Finalize report by September 30, 2019.

## VI. SCHEDULE

The following table provides an estimate of the project schedule. EPA understands that this schedule may change as a result of discussions with the Contractor or with the natural course of the project. In addition, the Contractor may propose modifications or an alteration of this schedule in its response to this PWS**. However, the schedule must presume completion within one year of Task Order (TO) award.**

| **Deliverables** | **Delivery Dates** |
|---|---|
| Task 0. Workplan, Budget and Schedule | Within two (2) weeks of TO award |
| Task 1. Prepare QAPP | |
| • Draft | Same as Task 0: within two (2) weeks of TO award |
| • Final | Within five (5) business days of receipt of EPA comments |
| Task 2. Project Management and Administration | |
| • Subtask 2A Kickoff Mtg | Within one (1) month of TO award |
| • Subtask 2B Monthly Conference Calls and Summaries | As Needed |
| • Subtask 2B Post-project Webinar | Within one year of TO award |
| Task 3. Municipal Coordination Meeting | |
| • Meeting | Within two (2) months of TO award |
| • Meeting Notes | Within one week of Meeting |
| Task 4. Stormwater Mngt Assessment for Tisbury, MA | |
| • Subtask 4A. Watershed Characterizations through Geographic Information System (GIS) Spatial Data Analyses | |
| o Draft Technical Memorandum (TM) | November 1, 2018 |
| o GIS Results in Excel | Same |
| o Final TM | Within one (1) week of receipt of EPA comments |

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| • Subtask 4B. Opti-Tool Analyses for Quantifying Stormwater Runoff Volume, High-Flow Rates and Pollutant Loadings from Watershed Source Areas | |
| ○ Draft Technical Memorandum | December 15, 2018 |
| ○ Opti-Tool Results in Excel | Same |
| ○ Final TM | Within one (1) week of receipt of EPA comments |
| • Subtask 4C. Develop High Runoff Flow Rate Metric(s) to Evaluate Source Area Contributions and SCM Reduction Benefits | |
| ○ Draft Technical Memorandum | February 1, 2019 |
| ○ Final TM | Within one (1) week of receipt of EPA comments |
| • Subtask 4D. Develop Planning Level SCM Performance Curves for Estimating Cumulative Reductions in SW-Related Indicator Bacteria | |
| ○ Draft Technical Memorandum | December 15, 2018 |
| ○ Final TM | Within one (1) week of receipt of EPA comments |
| ○ PCs for Indicator Bacteria | February 15, 2019 |
| • Subtask 4E. Identify Green Infrastructure Stormwater Control Opportunities and Potential Management Strategies for the Community | |
| ○ Meeting Materials | March 1, 2019 |
| ○ Meeting | TBD: March 2019 |
| ○ SCM Opportunities / Strategies List | Within one (1) week of Meeting |

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|---|---|
| • Subtask 4F. Conduct Field Investigations to Further Evaluate Community SCM Opportunities and Strategies | |
| ○ Draft Brochure / Flyer | Within two (2) weeks of FI. |
| ○ Final Brochure / Flyer | Prior to FI |
| ○ Field Investigations (**FI**) | TBD: April / May 2019; complete by June 1, 2019 |
| ○ Draft Technical Memorandum | After completion of FI but by June 15, 2019 |
| ○ Final TM | Within one (1) week of EPA comments |
| • Subtask 4G. Develop SCM Conceptual Designs | |
| ○ Draft Concept Designs (CD) | By July 15, 2019 |
| ○ Final CDs | Within one (1) week of EPA comments |
| • Subtask 4H. Quantify Benefits for Municipal Long-Term SCMs Implementation Strategies | |
| ○ Draft Technical Memorandum | By August 15, 2019 |
| ○ Final TM | Within one (1) week of EPA comments |
| • Subtask 4I. Develop Streamlined Technical Support Document to Quantify Benefits of SCMs for IC Disconnection | |
| ○ Draft TSD | By August 15, 2019 |
| ○ Final TM | Within one (1) week of EPA comments |

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|---|---|
| • Subtask 4J. Final Project Meeting and Final Project Report<br>○ Final Meeting<br>○ Draft Final Report<br>○ Final Report | <br>TBD: Late August 2019<br>By Sept 15, 2019 or before TO expiration (whichever is sooner)<br>By Sept 30, 2019, or before TO expiration (whichever is sooner) |
| Task 5. Develop Streamlined Technical Support Document for Developing Long- Term Community SCM IC Disconnection Strategies<br>○ Draft Final Report<br>○ Final Report | <br>By Sept 15, 2019 or before TO expiration (whichever is sooner)<br>By Sept 30, 2019, or before TO expiration (whichever is sooner) |

## VII. REFERENCES

**Appendix 1**. "Drainage Master Plan – Final Report", dated January 2018 (incl. DMP Appendices A and B. Available as separate attachments to this PWS.

**Appendix 2**. EPA GIS Data and Maps. Three (3) separate files.

**Appendix 3**. QAPP: "Quality Assurance Project Plan for Phase 2 Mystic River Watershed Eutrophication Analysis" dated September 7, 2017, prepared for EPA by Eastern Research Group under Contract EP-C-16-033, Work Assignment No. 1-35. Provided as a separate attachment to this PWS