

EXHIBIT C

CHANGE ORDER FORM

In accordance with the Purchase Order, dated October 20, 2015, and the Design Engineering Services Agreement dated October 15, 2015, between Town of Orleans, Massachusetts ("Client"), and AECOM Technical Services, Inc. a California corporation, ("AECOM"), this Change Order, with an effective date of _____, 2016, modifies that Agreement as follows:

1. Changes to the Services:

1.1 Attachment 1 – Scope of Services, EXHIBIT A – SERVICES, Page 14, add the following new Article:

"10. FY 17 Planning and Implementation (November 2016 through June 2017)

Task 10.1 - Continued Planning and Engineering

10.1.A Effluent Disposal

Activities to support performing detailed Hydrogeologic Evaluation for two potential WWTF groundwater discharge sites for the proposed Downtown Area WWTF.

10.1.A.1 Overland Way – Site 1/1A

- ❖ Review of Existing Town Reports; Collect Town Site Data (BOH, DPW, etc.); Review of USGS and Other Hydrogeologic Data; Meetings with Town; Conduct Site Visits; and Prepare Health and Safety Plan.
- ❖ Confirm with MassDEP the field investigation requirements for both traditional subsurface groundwater discharge and wick discharge
- ❖ Prepare a Hydrogeologic Evaluation Proposal for both Subsurface and Wick Discharge; Prepare and Submit to MassDEP; Prepare Specifications and Subcontract Agreements; Prepare and Meet with MassDEP to discuss proposed Hydrogeologic Evaluation; Conduct a Site Visit with MassDEP; Conduct Field Investigations (Oversee Drilling and Test Pit Excavation); Collect and Analysis Groundwater and Soil Samples; Perform Soils Conductivity Testing; and Analyze Field Data and Summary.
- ❖ Conduct Groundwater Modeling: Modify the existing USGS Monomoy Lens Groundwater Model for site specific conditions (ie. reduce the grid size to 50 feet by 50 feet, adjust drain nodes, and adjust for geological/aquifer conditions) and Perform Groundwater Modeling Scenarios; Evaluate Groundwater Modeling Results; Evaluate Potential Impacts to Sensitive Receptors; Evaluate Nitrate Loading and Estuary Impacts; and Evaluate for Freshwater Loading.
- ❖ Update Cost Estimate for Groundwater Discharge Infrastructure.
- ❖ Submittal of a Groundwater Discharge Permit Application to MassDEP for review and approval.
- ❖ Assumptions
 - Two Trips to Town Hall and Site and One Meeting with Town.

- Hydrogeologic Evaluation - Ten trips to Town Hall/Site; One meeting with MassDEP; Installation of Three to Four Monitoring Wells (Number of Wells Dependent on Depth to Groundwater); One Day of Test Pits; One Day Certified Soil Evaluator; and Use of USGS Monomoy Lens Groundwater Model with noted modifications without having to create a sub-model and no extensive redesign of model.
- No fee and/or user charge for using the existing USGS Monomoy Lens Groundwater Model.
- Town provides a backhoe and operator for test pits (2 days).
- No Permitting Fees.

10.1.A.2 Downtown Area– Site to be selected

- ❖ Identify with the Town up to seven sites and perform an effluent disposal site evaluation based on site suitability, permitting, previous reports, impacts to the environmental, etc. to identify the preferred site for further consideration.
- ❖ Prepare a Siting Study including Review of Existing Town Reports; Collect Town Site Data (BOH, DPW, etc.); Review of USGS and Other Hydrogeologic Data; Meetings with Town; Conduct Site Visits; and Prepare Health and Safety Plan.
- ❖ Prepare a Hydrogeologic Evaluation Proposal for Subsurface Discharge; Prepare and Submit to MassDEP; Prepare Specifications and Subcontract Agreements; Prepare and Meet with MassDEP to discuss proposed Hydrogeologic Evaluation; Conduct a Site Visit with MassDEP; Conduct Field Investigations (Oversee Drilling and Test Pit Excavation); Collect and Analysis Groundwater and Soil Samples; Perform Soils Conductivity Testing; and Analyze Field Data and Summary. Based on the siting study, If the conditions at the chosen site indicate that it may be suitable for a wick discharge, additional field work, data analysis, groundwater modeling and analysis and report tasks may subsequently be necessary and are not included in this scope of work.
- ❖ Conduct Groundwater Modeling: Modify the existing USGS Monomoy Lens Groundwater Model for site specific conditions (ie. reduce the grid size to 50 feet by 50 feet, adjust drain nodes, and adjust for geological/aquifer conditions) and Perform Groundwater Modeling Scenarios; Evaluate Groundwater Modeling Results; Evaluate Potential Impacts to Sensitive Receptors; Evaluate Nitrate Loading and Estuary Impacts; and Evaluate for Freshwater Loading.
- ❖ Update Cost Estimate for Groundwater Discharge Infrastructure.
- ❖ Submittal of a Groundwater Discharge Permit Application to MassDEP for review and approval.
- ❖ Assumptions
 - Site Study - Two Trips to Town Hall and Site and One Meeting with Town; and Location determined by December 15, 2016.

- Hydrogeologic Evaluation - Ten trips to Town Hall/Site; One meeting with MassDEP; Installation of Three to Four Monitoring Wells (Number of Wells Dependent on Depth to Groundwater); One Day of Test Pits; One Day Certified Soil Evaluator; and Use of USGS Monomoy Lens Groundwater Model without having to create a sub-model and no extensive redesign of model.
- No fee and/or user charge for using the existing USGS Monomoy Lens Groundwater Model.
- Town provides a backhoe and operator for test pits (2 days).
- No Permitting Fees.

10.1.B Demonstration Projects-Design and Implementation

10.1.B.1 Shellfish/Aquaculture

- ❖ Activities to support four different shellfish/aquaculture projects:
- ❖ Lonnie's Pond - Continuation of water quality monitoring (cost is only for review of data collected by SMAST); acquisition and installation of up to 500,000 additional oysters to achieve goal of at least 260 kg of N removed.
 - Phase 1 - 2016 Season
 - Design system for overwintering oysters grown during 2016 season.
 - Prepare preliminary designs.
 - All gear for overwintering oysters must be purchased, assembled and installed in November 2016.
 - Finalize design and install system for overwintering oysters grown during 2016 season.
 - Build system that will keep the oysters off the bottom, submerged at a depth to prevent freezing prevent entry of drill and allow proper water flow.
 - Mobilize and install system.
 - Make field adjustments as needed.
 - Management and oversight of overwintering system.
 - Maintain gear twice a week.
 - Prepare a 2016 Final Report regarding the oysters grown during the 2016 season.
 - Phase 2 - 2017 Season – Subject to review and approval of the 2016 Final Report.
 - Order gear and seed.
 - Identify sources of larger seed (3/4-inch and 2-inch).
 - Solicit bids from seed sources and prepare ordering information.
 - Gear for 2017 planting of oysters purchased and assembled in the February 2017.

- Single oysters ordered by March 2017 for installation in June 2017.
- Build additional bags.
- Pickup and install seed.
- Operation and maintenance June only.
- Project Management/Coordination of Water Quality Monitoring from November 2016 - June 2017 conducted by SMAST.
- Organize and Conduct Shellfish Working Group Meetings.
- Develop a preliminary long term Aquaculture operation program outline (potential market, Town management, etc.) with the Shellfish Working Group.
- ❖ Kent's Point - Design and installation of 500 bags of remote set (oyster spat on clam shell) oysters.
 - Identify and confirm location with Shellfish Working Group.
 - Order gear and remote set oysters.
 - Gear for 2017 planting of remote sets purchased and assembled in the winter of 2017.
 - Remote set ordered by February 2017 for installation in June 2017.
 - Build remote set bags.
 - Pickup and install remote set bags.
 - Operation and maintenance June (one month only).
 - Project Management/Coordination of Water Quality Monitoring from November 2016 - June 2017 conducted by SMAST.
- ❖ Existing Grant Expansion - Evaluation of existing and planned grants and discussions with existing grower.
 - Conduct Site Visits and Meetings with Growers.
 - Prepare Draft Needs and Options Assessment.
 - Review with Growers/Revise.
 - Develop Final Needs and Options Assessment with budget.
 - Evaluate Town Cove lease sites.
 - Conduct initial discussion with Board of Selectmen.
 - Project Management/Coordination of development of scope of specific grants areas prepared by SMAST.
- ❖ Town Cove Quahog Inventory.
 - Project Management/Coordination of quahog population survey conducted by SMAST.
 - Identify areas for additional planting.

10.1.B.2 Permeable Reactive Barriers (PRB)

- ❖ Continued monitoring of PRB at Eldredge park to confirm performance and nitrogen removal achieved; Field investigation and analysis at Landfill to allow for subsequent consideration of alternatives to remove nitrogen, but also treat for 1,4-dioxane, which was discovered in recent testing by DEP and the Town.
- ❖ Eldredge Park PRB Demonstration Test.
 - Continue groundwater monitoring of installed demonstration project.
 - Assumptions
 - Access to be provided by Town of Orleans and Nauset Regional Schools.
 - The monitoring well network installed as of November 16, 2016 will be sufficient to monitor PRB performance
- ❖ Town Landfill 1,4-Dioxane and Nitrogen Assessment.
 - Develop a Phase I field investigation plan for town review and comment.
 - Revise Phase I field investigation plan and submit to MassDEP for comment if necessary.
 - Conduct Phase I field investigation including data review and evaluation of sources, mapping and survey of landfill cap and wells, installation of 5 monitoring wells with a total of 26 well screens, and Initial Groundwater Assessment
 - Analyze data and provide Phase 1 Report.
 - Additional groundwater assessment to fill data gaps
 - Prepare Phase 2 Report with risk evaluation, feasibility, with conceptual design and recommendations for source management.
 - Assumptions
 - Sampling and monitoring data previously collected at Landfill will be provided.
 - Regulatory review if necessary to be completed without long delay (less than 1 month).
 - Updated information available regarding private wells downgradient of the landfill will be provided.
 - Updated information regarding landfill DPW Facility Plans will be provided along with available Landfill and Transfer Station stormwater drainage system drawings.
 - This task does not include work associated with providing public water to properties downstream of the landfill.

10.1.B.3 Nitrogen Removing Barriers (NRB)

- ❖ Plan, design, and implement NRB Demonstration Projects
 - Identify with the Town up to ten sites to perform a site analysis and perform a site evaluation based on site suitability, permitting, property owner acceptability, to identify four demonstration sites
 - Develop Preliminary design for siting of the demonstration projects.
 - Coordinate with Barnstable County Department of Health and Environment during the design development and design.
 - Coordinate with Barnstable County Department of Health and Environment to identify potential funding sources.
 - Conduct topographic survey of the proposed sites to supplement documents produced by Surveying & Mapping Consultants and the Town's existing aerial topographic survey.
 - Prepare soil evaluations at the proposed sites.
 - Install two monitor wells at each proposed site for water quality testing and to determine groundwater flow direction. Perform baseline sampling and monitoring.
 - Prepare Contract Documents (plans and specifications).
 - Prepare applications and file for required local and state permits.
 - Conducting bidding phase and construction phase services.
- ❖ Assumptions
 - Number of sites for design and installation limited to four.
 - Suitable soils exist in area of the proposed systems.
 - No wetland permitting will be required for any of the sites.
 - NRB systems will be constructed by private installation contractor after solicitation and award of a contract for construction of the systems.

10.1.C Facilities Engineering – Preliminary Design Report (25% Design) – Downtown Area

Prepare a Preliminary Design Report (25%) for the Downtown Area that includes the following items: (a) Topographic Survey; (b) Subsurface investigation; (c) Cultural Resource Evaluation; (d) Update Collection System Type Evaluation and Preliminary System Configuration; (e) Update WWTF Process Selection; (f) Prepare Design Data; and (g) Program Cost Estimate Update.

10.1.C.1 Topographic Survey

- ❖ Description: Conduct research, data accumulation using a combination of on the ground survey and aerial mapping, office computations, CAD drafting services, professional oversight and coordination, and preparation of data accumulation plans showing the roadways in the Downtown Area and the adjacent areas pertinent to the design and permitting of the proposed wastewater collection system.

❖ Subtasks

- Utilize the documents produced by Surveying & Mapping Consultants to produce a topographic survey of approximately 30,000 linear feet of roadway.
- Update the documents produced by Surveying & Mapping Consultants to include significant changes since the survey was completed, building sills, bench marks and additional survey to encompass the entire Downtown Area.
 - Establish survey baselines to commence the conventional on the ground survey.
 - Conduct research of Town Assessor's records, Barnstable Registry of Deeds records, and Town GIS data necessary for compilation of the roadways.
 - Conduct a Real Time Kinetic (RTK) GPS survey to locate and establish elevations of the 20 photo identifiable points needed to provide control for the aerial topographic survey.
 - Conduct the aerial mapping of the subject area.
 - Conduct on the ground data accumulation survey to supplement the aerial mapping data, obtain utility information, and set project bench marks.
- Office computations and CAD drafting services for plotting of field data and merging the aerial mapping data with the field survey and prepare electronic files and data accumulation plans.

❖ Assumptions

- Documents produced by Surveying & Mapping Consultants for the Town will be utilized.
- A utility locating subcontractor may be required if the record utility plans are not available from the utility companies and/or are not reflective of the actual field conditions. No budget has been included for this item as this requirement will not be known until after other activities have been completed. If required, a funding request would be included at a future Town Meeting.
- The Topographic Survey does not include a metes and bounds survey and/or development of land takings/easement documents.

10.1.C.2 Subsurface Investigation

- ❖ Description: Conduct a Subsurface Investigation that will consist of performing Drilling and Sampling of subsurface materials along approximately 30,000 linear feet of roadway in the Downtown Area.

❖ Subtasks

- Review of preliminary plans and determination of boring locations.
- Premark drilling sites and contact Dig Safe for utility marking prior to drilling.
- Prepare permits required for conducting subsurface investigations (Town and MassDOT).
- Conduct Drilling and Sampling via Hollow Stem Auger.

- Installation of up to 10 Monitoring Wells

- ❖ Assumptions

- Record plans exist for the streets and the information on the plans is usable for the field survey.
- Boundary monumentation exists in the areas of the survey and the monumentation is suitable for the purposes of the survey.

10.1.C.3 Cultural Resource Evaluation

- ❖ Description: Conduct a Cultural Resource Evaluation within the proposed Downtown Area. The Cultural Resource Evaluation shall be conducted in two phases: (1) Research; and (2) Field Survey. The Cultural Resource Evaluation shall be performed under the direction of a Principal Investigator meeting the qualifications set by the National Park Service (36 CFR Part 66, Appendix C) for direction of archaeological projects.

- ❖ Subtasks

- Research will encompass a review of local geography, ecology, soils, and Native American Groups to develop cultural contexts and predictive statements for historic and archaeological resources that may be present within the project area.
- Prepare a technical proposal for an archaeological survey for submission to the Massachusetts Historical Commission with a State Archaeologist's permit application.

- ❖ Assumptions

- The requirement to conduct an Archaeological Field Survey will not be known until the completion of Task 01 Research and therefore no budget has been included for this item. If required, a funding request would be included at a future Town Meeting.

10.1.C.4 Update Collection System Type Evaluation and Preliminary System Configuration

- ❖ Description: Update the evaluation of the Collection System type to be utilized in the Preliminary System Configuration Update and Program Cost Estimate Update for the Downtown Area using information obtained including the Topographic Survey and Subsurface Investigations.

- ❖ Subtasks

- The collection system evaluation update will include the following: (a) gravity sewer, (b) low pressure sewer, (c) septic tank effluent gravity; (d) septic tank effluent pump; (e) vacuum sewer; and (f) hybrid (combination of the collection system types).
- Prepare for and meet with the Town to review, modify and confirm previous selection inputs, process, etc.
- Summarize the age of existing on-site systems from existing Board of Health records and seasonal use of the on-site system based on water usage.
- Prepare and incorporate a phasing (implementation) plan.

- Update the Downtown Area collection system conceptual layout (plan and profiles) using information obtained including the collection system evaluation update, the topographic survey, and subsurface investigations.

- ❖ Assumptions

- Updating of the Collection System Type Evaluation and Preliminary System Configuration upon completion of the Topographic Survey, Subsurface investigation, and Cultural Resource Evaluation.
- Utilize existing documents prepared by AECOM to Update Collection System Type Evaluation and Preliminary System Configuration.
- Assumes data on age of systems is available from the Board of Health

10.1.C.5 Update WWTF Process Selection

- ❖ Description: Update the WWTF Process Selection based on currently available information and sites, and information from the collection system evaluation.

- ❖ Subtasks

- Based on the previously completed tasks, and updated design data, update the WWTF process selection using the requirements of TR-16: Guides for the Design of Wastewater Treatment Works, prepared by the New England Interstate Water Pollution Control Commission and MassDEP requirements as a basis.

- ❖ Assumptions

- Utilize existing documents prepared by AECOM to update the WWTF Process Selection.

10.1.C.6 Prepare Design Data

- ❖ Description: Based on the previously completed tasks and capacity projections for the recommended re-zoning, prepare design data documents that will summarize the Collection System and WWTF design components (sizes, materials of construction, etc.) using the requirements of TR-16: Guides for the Design of Wastewater Treatment Works, prepared by the New England Interstate Water Pollution Control Commission and MassDEP requirements as a basis.

- ❖ Subtasks

- Conduct one build-out evaluation based on recommended re-zoning.
- Update capacity projections based on recommended re-zoning and build-out evaluation.
- Review data from completed tasks.
- Prepare a Design Data Report that will summarize the Collection System and WWTF design components.

10.1.C.7 Program Cost Estimate Update

- ❖ Description: Update the existing Program Cost Estimate for the Downtown Area.
- ❖ Subtasks
 - Update the existing Program Cost Estimate for the Downtown Area and WWTF that includes a construction cost contingency, as well as Town administration costs (Town Administration, Legal, and Design, Bid and Construction Engineering Services).
- ❖ Assumptions
 - Utilize existing documents prepared by AECOM to update the Program Cost Estimate.

10.1.D WWTF/Septage Facility Construction - For Reference Only

- ❖ Description: Design, Bidding and Construction of a new Wastewater Treatment Facility for the Downtown Area. The facility will incorporate septage receiving and process capability. The design of the facility would utilize modular components with the construction phased as the required to address the phase construction of the collection system.
- ❖ No Budget Allocated. To be Funded at a Future Town Meeting

10.1.E Tri-Town Transition Requirements - For Reference Only

- ❖ Description: Demolition of the Tri-Town Septage Treatment Facility and Compost Shelter located on Overland Way.
- ❖ No Budget Allocated. Funding request delayed until FY18 Town Meeting following Bidding Phase Services at which time the three member Towns will request Construction Phase Services.

10.1.F Regulatory Coordination

- ❖ Description: Continued consultation and meetings with regulators to gain approval of aspects of the traditional and non-traditional projects and activities. While preparation of technical material and initial permit application forms are scoped and budgeted to a limited extent under the individual project tasks (such as the MassDEP Groundwater Permit for the Hydrogeologic Investigation at the Effluent Disposal sites and the Request for Determination of Applicability to the Orleans ConCom for the aquaculture demonstration project), other necessary tasks including pre-application meetings, meetings to discuss comments, site visits, are included under this task. Agencies requiring follow-up coordination include MassDEP, Massachusetts Historic Commission, Cape Cod Commission, and NHESP and others.
- ❖ Subtasks
 - Continued coordination and review with variety of state and local agencies regarding proposed project activities and anticipated jurisdictional impacts.
 - Up to 8 meetings with the agencies are assumed across all NT and traditional projects.
 - Coordination of planned monitoring activities and review of initial results of the monitoring of demonstration projects (shellfish, PRB and NRB) with SMAST.

- Coordination with Cape Cod Commission regarding planned activities associated with demonstration projects, studies as they relate to the Orleans Downtown Engineering work.

10.1.G Meetinghouse Pond Utility Survey - For Reference Only

- ❖ Description: Consultation with the Town and utility companies who have infrastructure located within the Meetinghouse Pond Area in order to obtain utility information, including record information, materials of construction, utility repair/relocation requirements and planned utility upgrades and/or expansions.
- ❖ No Budget Allocated. Funding request delayed until future Town Meeting.

10.1.H Update of Amended CWMP

- ❖ Description: The Town of Orleans is continuing to build on efforts to improve water quality in coastal embayments and estuaries as well as freshwater ponds by amending the previous Comprehensive Wastewater Management Plan (CWMP) based on additional wastewater engineering and planning developments that have occurred since publication of the CWMP/SEIR in 2010. The Town has worked closely with stakeholders and has further developed a draft plan that combines both traditional and non-traditional wastewater management technologies to provide a cost effective solution to reduce nitrogen loading to the town's sensitive water bodies. Much progress has been made since 2011, including substantial work in FY16 and the initial months of FY17. Initial phases of aquaculture and permeable reactive barrier demonstration projects are in process. Additional work on the non-traditional technologies and traditional technologies is proposed for the balance of FY17. The progress achieved through completion of the work in FY17 and the proposed implementation plan for the entire program will be summarized in the Amended CWMP.
- ❖ Subtasks
 - Review comments provided on the Initial Draft Update of the Amended CWMP submitted in May 2016 and additional comments on draft Amended CWMP submitted at the end of November 2016, and address outstanding issues as part of ongoing work for FY17 tasks.
 - Compile summaries of all work completed in each task of the Water Quality and Wastewater Management Plan
 - Provide concise summary of key progress, decisions made, regulatory issues and proposed schedule for remaining planning activities and implementation program.
 - Compile summary into Draft Update of Amended CWMP.
 - Develop Draft Updated Executive Summary.
 - Provide the Draft Updated Amended CWMP and Executive Summary to the Town for review and comment.
 - Address comments and prepare Final Amended CWMP and Executive Summary and provide to Town for submittal to MassDEP and Cape Cod Commission.

❖ Assumptions

- Approval by Town in December 2016 for informal submittal to the MassDEP and Cape Cod Commission for their review to verify that the the Town is on the right path in order to obtain concurrence of regulatory compliance. Estimated that in July the official ACWMP will be provided to the Cape Cod Commission and MassDEP for approval.

Task 10.2 – Adaptive Management Implementation

10.2.A Water Quality Monitoring: MEP Compliance

❖ Description

- Continuation of the SMAST review of water quality data relevant to Orleans; SMAST monitoring of the Aquaculture/Shellfish Propagation in Lonnie's Pond and Kent's Point Demonstration Projects and coordination with other local WQ monitoring programs.

❖ Subtasks

- Review and comment on the results of the data collection and analysis completed by SMAST.
- Attend two meetings to discuss the data collection, analysis and review comments.

10.2.B Water Quality Monitoring: Project Baselines

❖ Description

- Continuation of coordination with the SMAST limited monitoring program to collect baseline data and post installation operational data for the Aquaculture/Shellfish Propagation Lonnie's Pond and Kent's Point Demonstration Projects.

❖ Subtasks

- Review and comment on the baseline data and initial post-construction data compiled by SMAST.
- Attend two meetings to discuss the baseline data, initial operational data and review comments.

10.2.C MEP Study and Report Updates

❖ Description: Update and rerun the Nauset Harbor MEP Linked Model.

❖ Subtasks

- Review and comment on the Nauset Harbor MEP model update and model results prepared by SMAST.
- Attend two meetings to discuss the model update, model results and review comments.

10.2.D Namskaket and Little Namskaket Adaptive Plans

❖ Description: Develop information, preliminary assessment of issues and approach with Brewster for development of integrated adaptive management plans for protection of the Namskaket and Little Namskaket watersheds and tidal marshes.

❖ Subtasks

- Review and comment on the Namskaket and Little Namskaket Adaptive Plans prepared by SMAST.

- Attend to two meetings to discuss the Namskaket and Little Namskaket Adaptive Plans and review comments.

10.2.E Stormwater and Fertilizer Management - For Reference Only

- ❖ Description: Coordination with the Orleans Town Engineer regarding findings and recommendations of Fertilizer and Stormwater related programs in the various sub-watersheds. The Town is proceeding on a comprehensive assessment of contributions of nitrogen to the various water bodies in Town from fertilizer and nitrogen, and is developing a plan to reduce those contributions. The work being done to reduce nitrogen contributions from Stormwater and Fertilizer will be taken into account when confirming the remaining Nitrogen from wastewater that must be removed to meet MEP requirements.
- ❖ Scope of Services Provided By Others.

10.2.F Revise Comprehensive Plan for Cedar Pond and Rock Harbor Creek Watershed - For Reference Only

- ❖ Description: Coordinate the resolution of saline status of Cedar Pond with MassDEP and MEPA and develop an Amended CWMP for Rock Harbor Creek watershed based on Cedar Pond resolution, employing traditional and non-traditional technologies, as appropriate, and considering the attainability of water quality standards with respect to MEP nitrogen reduction requirements and human uses (e.g. marina) of the lower segment of the Creek.
- ❖ Scope of Services Provided By Others.

10.2.G Water Quality Remediation and Protection Plans for Priority Freshwater Ponds

- ❖ Description: Update the 2010 CWMP evaluation of freshwater ponds using most recent water quality data and define priority ponds for remediation and protection. Integrate the stormwater and fertilizer data bases into the evaluation. Refine the Draft Work Plan Development document to direct the development of management plans for the priority ponds. Define and characterize technologies and management strategies that will be evaluated for management plans.
- ❖ Subtasks
 - Review and comment on the Water Quality Remediation and Protection Plans for Priority Freshwater Ponds prepared by others.
 - Attend two meetings to discuss the review comments of the Water Quality Remediation and Protection Plans for Priority Freshwater Ponds prepared by others.

Task 10.3 Program Management

10.3.A Technical Oversight and Program Management - For Reference Only

- ❖ Description: Provide overall program management for water quality and wastewater management programs for the Town of Orleans.
- ❖ Scope of Services Provided By Others.

10.3.B Public Engagement Coordination

- ❖ Description: Continuation of public engagement in order to keep stakeholders apprised of overall status of the Project, increase the understanding of the technical approach and assumptions, obtain stakeholder feedback.

- ❖ Subtasks
 - Prepare for and attend OWQAP Meetings to keep members apprised of overall status of the Project.
 - Prepare for and attend OWQAP Sub-committee Workshops regarding Aquaculture/Shellfish Propagation, Permeable Reactive Barriers/Nitrogen Removing Biofilters, Collection System, Freshwater Ponds, and Namskaket and Little Namskaket Watersheds.
 - Prepare for and attend Other Public Meetings.
 - Prepare and submit brief Status Reports that incorporate/discuss the status of the non-traditional technologies demonstration projects (Aquaculture/Shellfish Propagation, Permeable Reactive Barriers, and Nitrogen Removing Biofilters).
- ❖ Assumptions
 - Up to 7 OWQAP Meetings.
 - Up to 8 OWQAP Sub-committee Workshops.
 - Up to 3 Other Public Meetings.
 - Status Reports as applicable.

10.3.C P3 Development and Financial Analysis

- ❖ Description
 - Continued coordination with the Downtown Area property owners to review costs of the proposed sewerage program and potential ways to allocate those costs across users, parcels or property owners. Evaluate cost impacts to different types of users in the Downtown Area (both residential and non-residential) based on different cost allocations. Compare potential costs to properties associated with the sewerage program to costs of continuing to use on-site systems.
 - Continued development of financial model and additional model runs to determine costs associated with various scenarios, including new scenarios based on potential zoning changes. Additional model development includes a user interface, ability to determine costs by parcel to determine each property's user rates and property tax impact, and refined affordability evaluations.
- ❖ Subtasks
 - Continue to hold periodic meetings with the Downtown area property owners (up to 4 meetings).
 - Prepare a cost comparison table that shows costs to properties associated with the sewerage program compared to costs of continuing to use on-site systems.
 - Provide the Town with additional information on potential for Design/Build as a procurement method including potential cost savings and a schedule for development of a RFP for possible Design/Build contractors.
 - Phase One Model Update
 - Enhance financial model to determine costs by parcel/unit/owner, which would include all costs already identified in the model, such as taxes, user charges, management fees, and the like, but would show costs specific to each parcel/unit/owner, as opposed to an averaged one available in the current version of the model.

- Estimate property tax burdened to properties for up to seven scenarios assuming sewerage is implemented in the Downtown area.
- Estimate special assessment tax burdened to properties for up to seven scenarios assuming sewerage is implemented in the Downtown area.
- Prepare up to seven different scenarios for cost allocation to individual properties, presented as outputs from financial model runs.
- Enhance financial model to include 50-year borrowings and special assessments so the model can support current Massachusetts General Laws and project costs can be spread over a longer time period resulting in lower per-year costs.
- Phase Two Model Update - Enhance model for greater efficiency and smaller file size so users can run cases more quickly than the current model allows and the file size is more manageable.
- Phase Three Model Update - Add a user input interface to the model to allow users to determine the cases to run, as opposed to running pre-determined cases as the model currently operates.
- Updated Financial Model Technical Memorandum.
- Provide documentation and conduct a training session with the Town on the updated model.
- ❖ Assumptions
 - To integrate costs by parcel/unit/owner into the model, certain data is needed as inputs, including, but not limited to, parcel ID, number of units per parcel, unit owner, unit valuation, parcel class, and flow per unit.
 - The Town is able to secure 50-year borrowings and its residents can apportion special assessments over 50 years.
 - The Town provides guidance on which properties could have updated zoning so the model can account for additional development in the cost allocation.
 - The Town provides guidance on what additional tax revenue and future growth should be included in the analysis so the model can determine additional revenue that may be available to the Town.
 - Any new file inputs to the model are in a format that does not change across iterations.
 - Up to seven cases will be allowed for each model run instead of the higher amount available in the current model.

10.3.D Regulatory Coordination

- ❖ Description: Continued consultation with regulators for discussing numerous issues that cross multiple projects. These issues are the topic at periodic meetings and discussions with the regulators including MassDEP, Cape Cod Commission, USEPA and MEPA. Issues include monitoring (requirements and data base management), water quality standards, adaptive management, funding, and watershed permitting.
- ❖ Subtasks
 - Prepare for and attend meetings with various regulators including MassDEP, Cape Cod Commission, USEPA and MEPA. Prepare presentation materials or handouts as required. Prepare meeting summary.

- Prepare technical memorandum summarizing the issues discussed with each of the regulators, findings of the discussion, and/or guidance provided.
- Coordinate with Cape Cod Commission regarding information needed for continued compliance with the 208 Water Quality Plan.
- ❖ Assumptions
 - Attendance at up to six meetings.
 - Discussions will be based on the work as currently scoped by the Town. Any requests by the agencies to conduct additional work or analysis would require the discussion and approval by the Town.

2. Change to Deliverables:

2.1 Attachment 1 – Scope of Services, List of Deliverables, add the following new Articles:

Number	Deliverable	Draft	Final
Task No. 10 - FY 17 Planning and Implementation (November 2016 through June 2017)			
Task 10.1 - Continued Planning and Engineering			
10.1.A - Effluent Disposal			
10.1.A.1.- Overland Way – Site 1/1A			
	○ Hydrogeologic Evaluation	75%	25%
	○ Hydrogeologic Evaluation Technical Memorandum	75%	25%
	○ Groundwater Discharge Permit Application	---	100%
10.1.A.2 - Downtown Area			
	○ Site Evaluation and Screening and Study Technical Memorandum	75%	25%
	○ Hydrogeologic Evaluation	75%	25%
	○ Hydrogeologic Evaluation Technical Memorandum	75%	25%
	○ Groundwater Discharge Permit Application	---	100%
10.1.B - Demonstration Projects-Design and Implementation			
10.1.B.1 - Shellfish/Aquaculture			
Lonnie's Pond			
	○ Build and Install Overwintering System (2016 Oysters)	---	100%
	○ 2016 Project Report and BOS Meeting	---	100%
	○ Assemble bags	75%	25%
	○ Install oysters (June 2017)	---	100%
	○ Monthly Operation and Maintenance (November 2016 through June 2017)	---	100%

Number	Deliverable	Draft	Final
Kent's Point			
o	Plan and Permitting Technical Memorandum	75%	25%
o	Assembled bags	75%	25%
o	Install oyster remote sets (June 2017)	---	100%
o	Operation and Maintenance (June 2017)	---	100%
Existing Grant Expansion			
o	Needs and Options Assessment Technical Memorandum	75%	25%
o	Preliminary list and map of Town Cove lease sites	---	100%
o	Meeting to discuss Town Cove lease sites	---	100%
o	Summary Report	75%	25%
Town Cove Quahog Inventory			
o	Current population numbers and recommendations for additional quahog propagation numbers Technical Memorandum	75%	25%
o	Review Meeting	---	100%
10.1.B.2 - Permeable Reactive Barriers (PRB)			
Eldredge Park PRB Demonstration Test			
o	Overview of baseline sampling, injection activities, and preliminary post-injection groundwater monitoring Technical Memorandum	75%	25%
o	Quarterly groundwater monitoring Technical Memorandum	75%	25%
Town Landfill 1,4-Dioxane and Nitrogen Assessment			
o	Phase 1 Landfill Field Investigation Plan Technical Memorandum	75%	25%
o	BOS Meeting	---	100%
o	Phase 1 Landfill Field Investigation Summary Technical Memorandum	75%	25%
o	BOS Meeting	---	100%
o	Phase 2 Landfill Field Investigation and Risk Evaluation Technical Memorandum	75%	25%

Number	Deliverable	Draft	Final
10.1.B.3 - Nitrogen Removing Barriers (NRB)			
	o Site Identification and Selection Technical Memorandum	75%	25%
	o Site Selection Meeting	---	100%
	o Prepare Contract Documents (plans and specifications)	75%	25%
	o Prepare and file permit documents	75%	25%
	o Prepare and administer construction bid documents	---	100%
	o Installation	---	100%
10.1.C Facilities Engineering – Preliminary Design Report (25% Design) – Downtown Area			
10.1.C.1 - Topographic Survey			
	o Hard copy and pdf file of the certified set of plans stamped by a Massachusetts Professional Land Surveyor	50%	50%
	o Electronic file in AutoCAD 2014 Civil 3D format accompanied by XML and DTM files	---	100%
	o Aerial Survey Documents	---	100%
10.1.C.2 - Subsurface Investigation			
	o Boring logs/locations and summary of the findings Technical Memorandum	75%	25%
10.1.C.3 - Cultural Resource Evaluation			
	o Phase 1 research, letter report, a Massachusetts Historical Commission permit application	75%	25%
10.1.C.4. - Update Collection System Type Evaluation and Preliminary System Configuration			
	o BOS Meeting	0%	100%
	o Updated collection system evaluation report	75%	25%
	o Updated preliminary system configuration showing the conceptual collection system layout for the Downtown Area	---	100%
10.1.C.5 - Update WWTF Process Selection			
	o Finalize WWTF Flows	---	100%
	o Updated WWTF process selection Technical Memorandum	75%	25%

Number	Deliverable	Draft	Final
10.1.C.6 - Design Data			
o	Design Data Technical Memorandum	75%	25%
10.1.C.7 - Program Cost Estimate Update			
o	Updated Program Cost Estimate	75%	25%
10.1.D - WWTF/Septage Facility Construction - For Reference Only			
10.1.E - Tri-Town Transition Requirements - For Reference Only			
10.1.F - Regulatory Coordination			
o	Draft and Final Meeting Minutes	75%	25%
10.1.G - Meetinghouse Pond Utility Survey - For Reference Only			
10.1.H Update of Amended CWMP			
o	Updated of Amended CWMP and Executive Summary	75%	25%
o	BOS Meeting	---	100%
Task 10.2 – Adaptive Management Implementation			
10.2.A - Water Quality Monitoring: MEP Compliance			
o	Review of the data collection and analysis completed by Others Technical Memorandum	75%	25%
o	Coordination Meetings	---	100%
10.2.B - Water Quality Monitoring: Project Baselines			
o	Review of the baseline data and initial operational data compiled by Others Technical Memorandum	75%	25%
o	Coordination Meetings	---	100%
10.2.C - MEP Study and Report Updates			
o	Technical Memorandum on the review of the Nauset Harbor MEP model update and model results by Others	75%	25%
o	Coordination Meetings	---	100%

Number	Deliverable	Draft	Final
10.2.D - Namskaket and Little Namskaket Adaptive Plans			
	○ Review of the Namskaket and Little Namskaket Adaptive Plans prepared by Others Technical Memorandum	75%	25%
	○ Coordination Meetings	---	100%
10.2.E - Stormwater and Fertilizer Management – For Reference Only			
10.2.F - Revise Comprehensive Plan for Cedar Pond and Rock Harbor Creek Watershed – For Reference Only			
10.2.G - Water Quality Remediation and Protection Plans for Priority Freshwater Ponds			
	○ Review of the Water Quality Remediation and Protection Plans prepared by Others Technical Memorandum	75%	25%
	○ Coordination Meetings	---	100%
Task 10.3 - Program Management			
10.3.A - Technical Oversight and Program Management - For Reference Only			
10.3.B - Public Engagement Coordination			
	○ OWQAP Meetings	---	100%
	○ OWQAP Sub-committee Workshop Minutes - Draft and Final	75%	25%
	○ Other Public Meeting Minutes - Draft and Final	75%	25%
	○ E-mail Status Reports on the non-traditional technologies demonstration projects	---	100%
10.3.C - P3 Development and Financial Analysis			
	○ Downtown Area property Owners Meetings	---	100%
	○ Cost Allocations by Lot and Comparison to costs to maintain current on-site systems Technical Memorandum	75%	25%
	○ Updated Design/Build and key schedule considerations and deadlines Technical Memorandum	75%	25%
	○ Phase One Model Update. Enhancement to accept per-property water usage and property valuation as inputs and determine costs on a per-property basis.	75%	25%
	○ Phase Two Model Update. Improved efficiencies within the model so it runs more quickly and is a more manageable file size.	75%	25%
	○ Phase Three Model Update. User interface in the model that allows the user to determine the cases to run.	75%	25%

Number	Deliverable	Draft	Final
	o Updated Financial Model Technical Memorandum	75%	25%
	o Training Session	---	100%
10.3.D - Regulatory Coordination			
	o Meeting Minutes	---	100%
	o Regulatory findings or guidance Technical Memorandum	75%	25%

3. **Change in Project Schedule (attach schedule if appropriate):**

Modify the time for completion from November 1, 2016 to June 30, 2017.

4. **Change in Consultant's Compensation:**

The Services set forth in this Change Order will be performed on the following basis:

- No change to Compensation
- Time & Material (See Exhibit B for the Hourly Labor Rate Schedule)
- Time and Materials with a Not- to-Exceed amount of (\$ *Numerical Amount*). The Hourly Labor Rate Schedule is set forth in EXHIBIT B (if applicable). Reimbursable expenses are included in the overall Not to Exceed cap.
- Lump Sum [\$2,734,900]

Number	Deliverable	Payment Amount
Task No. 10 - FY 17 Planning and Implementation (November 2016 through June 2017)		
Task 10.1 - Continued Planning and Engineering		
10.1.A - Effluent Disposal		
10.1.A.1 - Overland Way – Site 1/1A		
	o Hydrogeologic Evaluation	\$233,500
	o Hydrogeologic Evaluation Technical Memorandum	\$35,000
	o Groundwater Discharge Permit Application	\$20,000
10.1.A.2 - Downtown Area		
	o Site Evaluation and Screening and Study Technical Memorandum	\$10,000
	o Hydrogeologic Evaluation	\$85,000
	o Hydrogeologic Evaluation Technical Memorandum	\$25,000
	o Groundwater Discharge Permit Application	\$15,000

Number	Deliverable	Payment Amount
10.1.B - Demonstration Projects-Design and Implementation		
10.1.B.1 - Shellfish/Aquaculture		
	Lonnie's Pond	
	o Build and Install Overwintering System (2016 Oysters)	\$80,000
	o 2016 Project Report and BOS Meeting	\$17,000
	o Assemble bags	\$115,000
	o Install oysters (June 2017)	\$135,000
	o Monthly Operation and Maintenance (November 2016 through June 2017)	\$15,000
	Kent's Point	
	o Plan and Permitting Technical Memorandum	\$12,500
	o Assembled bags	\$91,000
	o Install oyster remote set (June 2017)	\$30,000
	o Operation and Maintenance (June 2017)	\$15,000
	Existing Grant Expansion	
	o Needs and Options Assessment Technical Memorandum	\$35,000
	o Preliminary list and map of Town Cove lease sites	\$15,000
	o Meeting with to discuss Town Cove lease sites	\$6,000
	o Summary Report	\$10,000
	Town Cove Quahog Inventory	
	o Current population numbers and recommendations for additional quahog propagation numbers Technical Memorandum	\$20,000
	o Review Meeting	\$6,000
10.1.B.2 - Permeable Reactive Barriers (PRB)		
	Eldredge Park PRB Demonstration Test.	
	o Overview of baseline sampling, injection activities, and preliminary post-injection groundwater monitoring Technical Memorandum	\$95,000
	o Quarterly groundwater monitoring Technical Memorandum	\$15,000
	Town Landfill 1,4-Dioxane and Nitrogen Assessment.	
	o Phase 1 Landfill Field Investigation Plan	\$260,000
	o BOS Meeting	\$6,000
	o Phase 1 Landfill Field Investigation Summary Report	\$25,000
	o BOS Meeting	\$6,000
	o Phase 2 Landfill Field Investigation and Risk Evaluation Report	\$25,000

Number	Deliverable	Payment Amount
10.1.B.3 - Nitrogen Removing Barriers (NRB)		
	o Site Identification and Selection Technical Memorandum	\$10,000
	o Site Selection Meeting	\$4,000
	o Prepare Contract Documents (plans and specifications)	\$20,000
	o Prepare and file permit documents	\$10,000
	o Prepare and administer construction bid documents	\$15,000
	o Installation	\$80,000
10.1.C Facilities Engineering – Preliminary Design Report (25% Design) – Downtown Area		
10.1.C.1 - Topographic Survey		
	o Hard copy and pdf file of the certified set of plans stamped by a Massachusetts Professional Land Surveyor	\$85,000
	o Electronic file in AutoCAD 2014 Civil 3D format accompanied by XML and DTM files	\$5,000
	o Aerial Survey Documents	\$15,000
10.1.C.2 - Subsurface Investigation		
	o Boring logs/locations and summary of the findings Technical Memorandum	\$390,000
10.1.C.3 - Cultural Resource Evaluation		
	o Phase 1 research, letter report, a Massachusetts Historical Commission permit application	\$25,000
10.1.C.4 - Update Collection System Type Evaluation and Preliminary System Configuration		
	o BOS Meeting	\$4,000
	o Updated collection system evaluation report	\$20,000
	o Updated preliminary system configuration showing the conceptual collection system layout for the Downtown Area	\$50,000
10.1.C.5 - Update WWTF Process Selection		
	o Finalize WWTF Flows	\$20,000
	o Updated WWTF process selection Technical Memorandum	\$15,000
10.1.C.6 - Design Data		
	o Design Data Technical Memorandum	\$20,000

Number	Deliverable	Payment Amount
10.1.C.7 - Program Cost Estimate Update		
	o Updated Program Cost Estimate	\$40,000
10.1.D - WWTF/Septage Facility Construction - For Reference Only		
10.1.E - Tri-Town Transition Requirements - For Reference Only		
10.1.F - Regulatory Coordination		
	o Draft and Final Meeting Minutes	\$32,000
10.1.G - Meetinghouse Pond Utility Survey - For Reference Only		
10.1.H Update of Amended CWMP		
	o Update of Amended CWMP and Executive Summary	\$55,000
	o Meeting	\$5,000
Task 10.2 – Adaptive Management Implementation		
10.2.A - Water Quality Monitoring: MEP Compliance		
	o Review of the data collection and analysis completed by Others Technical Memorandum	\$15,000
	o Coordination Meetings	\$8,000
10.2.B - Water Quality Monitoring: Project Baselines		
	o Review of the baseline data and initial operational data compiled by Others Technical Memorandum	\$15,000
	o Coordination Meetings	\$8,000
10.2.C - MEP Study and Report Updates		
	o Technical Memorandum on the review of the Nauset Harbor MEP model update and model results by Others	\$7,500
	o Coordination Meetings	\$8,000
10.2.D - Namskaket and Little Namskaket Adaptive Plans		
	o Review of the Namskaket and Little Namskaket Adaptive Plans prepared by Others Technical Memorandum	\$7,500
	o Coordination Meetings	\$8,000

Number	Deliverable	Payment Amount
10.2.E - Stormwater and Fertilizer Management – For Reference Only		
10.2.F - Revise Comprehensive Plan for Cedar Pond and Rock Harbor Creek Watershed – For Reference Only		
10.2.G - Water Quality Remediation and Protection Plans for Priority Freshwater Ponds		
	o Review of the Water Quality Remediation and Protection Plans prepared by Others Technical Memorandum	\$15,000
	o Coordination Meetings	\$8,000
Task 10.3 - Program Management		
10.3.A - Technical Oversight and Program Management - For Reference Only		
10.3.B - Public Engagement Coordination		
	o OWQAP Meetings	\$45,000
	o OWQAP Sub-committee Workshop Minutes - Draft and Final	\$36,000
	o Other Public Meeting Minutes - Draft and Final	\$15,000
	o E-mail Status Reports on the non-traditional technologies demonstration projects	\$16,000
10.3.C - P3 Development and Financial Analysis		
	o Downtown Area property Owners Meetings	\$16,000
	o Cost Allocations by Lot and Comparison to costs to maintain current on-site systems Technical Memorandum	\$12,000
	o Updated Design/Build and key schedule considerations and deadlines Technical Memorandum	\$20,000
	o Phase One Model Update. Enhancement to accept per-property water usage and property valuation as inputs and determine costs on a per-property basis.	\$17,500
	o Phase Two Model Update. Improved efficiencies within the model so it runs more quickly and is a more manageable file size.	\$7,500
	o Phase Three Model Update. User interface in the model that allows the user to determine the cases to run.	\$12,000
	o Updated Financial Model Technical Memorandum	\$15,000
	o Training Session	\$10,000

Number	Deliverable	Payment Amount
10.3.D - Regulatory Coordination		
	o Meeting Minutes	\$24,000
	o Regulatory findings or guidance Technical Memorandum	\$10,000

[] Cost Plus Fixed Fee: [Cost \$ Numerical Amount and Fee \$ Numerical Amount]

Therefore, the total authorized Compensation, inclusive of the Change Order is \$4,295,560.

AECOM Total Funding Allocation Summary

Description	Value
FY16 Town Meeting – FY16 Water Quality and Wastewater Planning	\$990,000
FY17 Town Meeting – FY17 Interim Planning and Implementation (June 2016 through October 2016)	\$551,560
Compost Shelter Demolition – Design Phase	\$5,000
Cape Cod Commission Aquaculture/Shellfish Propagation Grant	\$15,000
FY17 Special Town Meeting – FY17 Planning and Implementation (November 2016 through June 2017)	\$2,734,000
Total Funding Allocation	\$4,295,560

AECOM Engineering Agreement Summary


Description	Value
Original Agreement - FY16 Water Quality and Wastewater Planning	\$990,000
Change Order No. 1 - FY17 Interim Planning and Implementation (June 2016 through October 2016)	\$571,560
Change Order No. 2 - FY17 Planning and Implementation (November 2016 through June 2017)	\$2,734,000
Total Authorized Compensation	\$4,295,560

5. **Project Impact:** None
6. **Other Changes** (including terms and conditions): None
7. All other terms and conditions of the Agreement remain unchanged.

8. Each Party represents that the person executing this Change Order has the necessary legal authority to do so on behalf of the respective Party.

AECOM Technical Services, Inc.

CLIENT: Town of Orleans, MA



Signature

Signature

Betsy Shreve-Gibb

Printed Name

John Kelly

Printed Name

Vice President

Title

Orleans Town Administrator

Title

Address
9 Jonathan Bourne Road
Pocasset, MA 02559

Address
19 School Road
Orleans, MA 02653

Town Accountant's Certificate

I hereby certify that an appropriation in the amount of this contract is available therefore and that the undersigned official of the Town has been authorized to execute said contract and approve all requisitions and change orders.

Signature

Cathy Doane

Printed Name

Finance Director/Town Accountant

Title

Date

[End of Agreement]

