

Town of Orleans

Scope of Services

for the

**Coastal Systems Program, School for Marine Science and Technology,
University of Massachusetts Dartmouth (CSP/SMAST)**

for

**Technical Support of the Orleans
Water Quality and Wastewater Planning Program**

[DRAFT]

December 2015

The Town of Orleans has been heavily engaged in water quality management planning for several decades. This engagement has involved substantial work by the town staff, town volunteers, engineering consultants, CSP/SMAST, State and Federal agencies, NGOs, universities and other parties. The programs, studies and other activities have been broad ranging and complex involving extensive water quality and benthic monitoring, groundwater monitoring, hydrographic studies, computer modeling, evaluation of traditional and non-traditional technologies and numerous other technical activities in support of the Town's restoration and management of its aquatic resources.

Over the next few years the Town will be revising and detailing its comprehensive plan for restoration and protection of the extensive and critically important salt and fresh water bodies of Town. This complex, expensive and essential program will require the continued support of the Coastal Systems Program from the School for Marine Science and Technology at UMass-Dartmouth, which has been integrally involved in and responsible for much of the extensive planning and analyses completed over the last two decades.

This purpose of this document, as part of the Town's Adaptive Management component of the program, is to provide a general scope of work to guide the continued technical support of CSP/SMAST over the next three years. The overall goals of this scope of work with respect to CSP/SMAST involvement are to provide specialized expertise and analytical tools to:

- A. Define criteria for and measure success in protecting and restoring the extensive water resources in the Town
- B. Ensure compliance with regulatory requirements including water quality standards, TMDLs and project performance requirements

- C. Provide technical and modeling support for the selection of the most cost-effective water quality, wastewater and septage management components to the overall program that meets the above goals, including optimization of sewer areas, monitoring and assessment of non-sewering approaches, by providing performance data on PRB's, shellfish deployments, enhanced natural attenuation, tidal flushing, etc (as the need arises).
- D. Implement the *Adaptive Management Planning* component of the program that involves continuous monitoring, assessment of progress and adaptation of program elements to ensure attainment of ultimate water resources management goals.

It is envisioned that the elements of the following tasks would be defined in more detail in scopes of services for work orders submitted by CSP/SMASST at the request of the Town. Work orders would be supported with agreed-upon cost estimates and timelines, scheduled and authorized by the Town according to the annual overall wastewater planning program or as unforeseen critical analytical needs arise. The annual budgets and three-year total budget would be reviewed and approved by the Town in its capital planning, appropriated on an annual basis and approved for spending on a work order basis.

Task 1 - Compliance and Water Quality Trend Monitoring

- 1.1 Initial comprehensive review of the overall Orleans water quality and compliance monitoring program, including:
 - Verify statistical and regulatory compliance adequacy of the Town's monitoring programs
 - Confirm QA/QC and staff/volunteer training adequacy
 - Review and confirm/modify data management protocols
 - Conduct data analyses, review, and reporting for unassessed data to allow use
 - Ensure consistency and integration of current and future monitoring activities with previous MEP protocols
 - Summarize trends, compliance adequacy, program modifications
 - Develop data access protocols
- 1.2 Annual program data collection, review and update
 - Oversee and conduct water quality monitoring for TMDL compliance, working with town
 - Provide laboratory analysis of all water quality samples collected for compliance monitoring and trend analysis, and reports to Town and MassDEP as required
 - Input all QA/QC accepted data into existing databases
 - Plan and conduct annual staff/volunteer training, as appropriate
 - Summarize compliance adequacy, including data analyses and review, update trends and develop recommendations for program modifications
 - Prepare technical memoranda, reports and other information and documentation as necessary.

- Other activities as needed and within budget limitations

Task 2 - Pilot/Demonstration Project Monitoring

- 2.1 Support engineering consulting tasks by advising on baseline and performance water quality monitoring requirements necessary to determine feasibility and effectiveness of demonstration projects for nutrient management (i.e. saline and fresh water bodies). Assist in development of project QAPPs, monitoring work plans, volunteer staff training and other activities as needed and within budget limitations.
- 2.2 Assist in development of demonstration project design and design criteria, including criteria for siting, field data collection to determine specific sites for quality and feasibility and options, to ensure suitability of the pilot site and transferability of the technology to other sites in Orleans watersheds and water bodies
- 2.3 Provide laboratory analytical services for all associated pilot/demonstration project water quality monitoring
- 2.3 Provide analytical assessment (e.g. modeling) to confirm adequacy of full scale applications of successful pilot technologies to meet water quality goals in Orleans water bodies
- 2.4 Prepare technical memoranda, reports and other information and documentation as necessary, including presentations to staff and public.
- 2.5 Assume the planning and design over the three-year period of:
 - Three PRB demonstration projects
 - Two FCW projects
 - Four aquaculture projects

Task 3 - MEP Monitoring and Modeling

- 3.1 Plan and conduct field studies and data collection necessary to revise and update the MEP models and other analytical tools to reflect current hydrographic, water quality and sediment conditions in the Orleans water bodies.
- 3.2 Use models and other tools to:
 - Confirm and/or update nutrient reduction requirements,
 - Test adequacy of watershed and in-situ projects to meet goals, both as part of siting, technology approach and scaling prior to implementation and also as part of compliance documentation
 - Conduct sensitivity analyses to define risk and inform decision making and
 - Other analytical needs as determined necessary

- 3.3 Prepare reports, technical memoranda, graphics and other documentation as needed for Town planning, regulatory and public involvement needs.

Task 4 – Watershed-Specific Studies

- 4.1 Plan and conduct monitoring and other analytical studies as required to resolve issues and satisfy requirements on specific watersheds. Tasks will be defined in the future but could include activities such as:
 - Namskaket Marsh – Additional vegetation studies, sanitary surveys, surface or ground water quality monitoring, ground water modeling
 - Rock Harbor – Further evaluation of nitrogen levels and impacts, evaluation of dredging requirements and impacts, water quality monitoring and evaluation of Cedar Pond, scope development for UAA studies, study of vertical mixing
 - Nauset Harbor – Evaluation of effects of sedimentation and potential dredging of Nauset Harbor or portions of the Harbor, determination and evaluation of effects of long-shore currents, further evaluation of boundary conditions and mass nitrogen balance for Town Cove, data analyses and documentation, hydrography and morphology of the Nauset inlet and impacts on flushing and nitrogen concentrations. Evaluation of consistency of Eastham and Orleans management plans
 - Pleasant Bay – data review and collection for update of the MEP model, coordination with the Pleasant Bay Alliance studies, evaluation of consistency of Harwich, Chatham, Brewster and Orleans management plans
 - Bakers Pond, Crystal Lake, Pilgrim Lake – development of management plans, including nutrient criteria

Task 5 - Miscellaneous Services

- 5.1 Meetings and presentations:
 - Project team and client meetings as requested
 - Planning, preparation for and attendance at workshops, training sessions, public forums and other presentations of public education activities
- 5.2 Studies, white papers, reviews and comments on documents by others and other tasks needed for resolution or explanation of unforeseen targeted technical issues to provide information in a rapid response mode to the Town and public as needs arise
- 5.3 Evaluation of regional nitrogen and water quality plans developed under the Watershed Management Agency (WMA) framework
- 5.4 Data analyses, QC reviews, coordination with and support of independent technical reviewers.