

## Memorandum

To George Meservey, Director of Planning & Community Development  
Michael Domenica, P.E., Program Manager

CC Betsy Shreve, AICP, AECOM Project Director  
Mark Owen, AECOM  
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Subject **Town of Orleans, MA  
Water Quality and Wastewater Planning  
Task Number 1.a. – Disposal Site Evaluations  
Technical Memorandum Outline Summarizing Hydrogeologic Evaluation for  
Downtown Area, Route 6 Cloverleaf Site**

Project Number 60476644

From Thomas Parece, P.E., AECOM Project Manager

Date 12/24/15

### 1. Introduction

- a. Provide a brief overview of the project background including status of CWMP, 208 Plan Update, sources of nitrate to groundwater, WQAP process, Final Consensus Plan and selection of a combination of traditional wastewater and non-traditional wastewater treatment technologies. Appendix to include Consensus Plan documentation.
- b. Provide a brief overview of the rationale for sewerage the Downtown Area.
- c. Provide a general description of wastewater sources, collection area, and potential treatment options.
- d. Summarize existing information and status of Tri-Town facility.
- e. Describe the process of obtaining a MassDEP Groundwater Discharge Permit (GWDP) and required Hydrogeologic Evaluation.
- f. Describe proposed Route 6 Cloverleaf discharge area including ground elevation; site topography; site acreage; area available for discharge; access points; land ownership; land use, zoning, and potential sensitive receptors.
- g. Description of proposed primary and reserve discharge areas.

### 2. Previous Subsurface Investigations

- a. Summarize results of previous subsurface investigations.

**3. Hydrogeologic Investigation**

- a. Summarize field investigations and methodologies including test pit excavations, soil boring and monitoring well installation, slug testing, etc.

**4. Hydrogeologic Conditions and Data Analysis**

- a. Summarize hydrogeologic conditions including depth to groundwater, soil classifications from soil borings, groundwater flow direction, hydraulic conductivity, hydraulic gradient, groundwater velocity, groundwater quality, etc.

**5. Groundwater Mounding Evaluation**

- a. Summarize groundwater mounding analysis including a conceptual model of the aquifer, model design, input parameters, model simulations, model sensitivity analysis, and model simulation outputs.

**6. Potential Impacts**

- a. Summarize nutrient loading analysis including the existing nutrient load to watershed(s) and estimated additional nutrient load from the groundwater discharge. Summarize potential impacts to sensitive receptors from groundwater mounding and nutrient loading.

**7. Groundwater Discharge Cost Estimate**

- a. Summarize estimated costs to obtain site access, design, construct, operate and maintain the proposed groundwater discharge.

**8. Conclusions**

- a. Recommend groundwater discharge location and method(s).
- b. Estimate site's capacity for groundwater discharge.