

## Municipal Vulnerability Preparedness Program Action Grant Case Study

**Municipality:** Town of Oak Bluffs

**Project Title:** Conceptual Design of Dukes County Avenue Pump Station Resiliency Improvements – Town of Oak Bluffs, MA

**Award Year (FY):** FY2023

**Grant Award:** \$ 69,712.50

**Match:** \$ 23,237.50

**Match Source:** Cash and in-kind services

**One or Two Year Project:** One year project

**Municipal Department Leading Project:** Oak Bluffs Wastewater Department

**Project Website URL:** Oak Bluffs Wastewater Department Website - [Wastewater Department | Oak Bluffs, MA \(oakbluffsma.gov\)](https://www.oakbluffsma.gov/wastewater)

**Community Overview:** The Town of Oak Bluffs is located on the northeast corner of Martha’s Vineyard. The community has a year-round population of approximately 4,700 people. The Dukes County Avenue pump station conveys about 90% of sewered flow to the wastewater treatment facility (WWTF) and serves residential and commercial areas. The Dukes County Ave PS is located within the 100-year flood plain. The station also serves Environmental Justice (EJ) Communities and Climate Vulnerable communities. The Town of Oak Bluffs has historical value and is a world-renowned tourist destination.

**Project Description and Goals:** The Dukes County Avenue pump station, a vital part of the Town’s sewer infrastructure, is located in the 100-year flood plan and Category 1 Surge Inundation Zone. This area is vulnerable to storm events under both current and projected future conditions. This project assessed the impacts of flooding on vulnerable sewer infrastructure, specifically focusing on the Dukes County Avenue Pump Station, including the electrical equipment, wet well, and critical manholes. The table below identifies the proposed design elevations for the Dukes County Avenue Pump Station.

Parameter	Dukes County Avenue Pump Station
2050 Design Flood Elevation (Mechanical) (ft)	15.8
2080 Design Flood Elevation (Structural) (ft)	17.3

The goal of this project was to evaluate nature-based and hard infrastructure alternatives to allow the Dukes County Avenue Pump Station to withstand a design storm event.

As part of this project, public meetings were held to discuss the project and alternatives considered. Areas surrounding and served by the pump station focused on in this project are home to Environmental Justice communities and elderly climate vulnerable populations. The project was completed on time and materials developed in this effort are on the Town of Oak Bluffs’ website for public review.

### Results and Deliverables:

Design flood elevations were established for critical sewer infrastructure using projected sea level rise and flood-related freeboard elevations. Vulnerable aspects of the pump station were identified. An upgrade was proposed for each identified vulnerability to reduce or eliminate the risk of damage from coastal flooding. Conceptual designs and cost estimates were developed to increase the flood resiliency of the pump station and critical manholes. Recommended flood resiliency measures incorporated into the conceptual designs for pump stations include constructing an elevated building to house pump station electrical equipment and raising the generator platform to the design flood elevation (DFE).

### Lessons Learned:

Multiple flood resiliency strategies were assessed for the pump station and critical infrastructure. The criticality of infrastructure served by the pump station was used to evaluate options to maintain operation

during a design storm versus shutting down the station during the design storm and providing the capability to restart equipment shortly after flood waters recede.

The proposed flood resiliency strategies (such as construction of an elevated electrical building) are anticipated to increase the flood resilience of the evaluated infrastructure while the Town continues its planning effort to adapt to climate change. The alternatives evaluated in this project will provide a valuable example of potential adaptation options to neighboring low-lying coastal communities in Southeastern Massachusetts.

**Partners and Other Support:**

- Massachusetts Office of Coastal Zone Management
- Owner – Town of Oak Bluffs, MA – Patrick Hickey, Facilities Manager
- Engineer – GHD Inc.

**Project Photos:**



**FIGURE 1 FLOODING AT LAKE AVENUE PUMP STATION (THIS IS ONE OF THE TWO PUMPSTATIONS THAT WILL BE SERVED BY THE PROPOSED ELEVATED GENERATOR).**



**FIGURE 2 FLOODING AT LAKE AVENUE PUMP STATION**