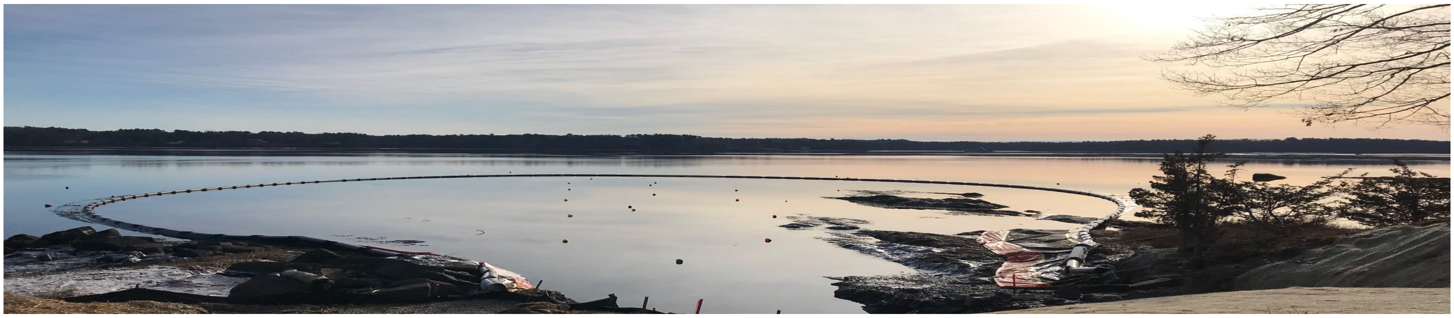
Seacoast Reliability Project

Durham, NH



Project Background

Mackworth-Enviro designed, installed, and maintained operations on two bottom- sealing filter barrier turbidity systems as part of the Eversource Energy Seacoast Reliability Project (SRP). The project consisted of a 12.9-mile, 115 kV transmission project to improve the electrical reliability in the Seacoast region of New Hampshire. Three cables were buried approximately 1 mile across Little Bay north of Adams Point. The cables were installed using a jet plow along most of the route across Little Bay. Hand jetting was used to install cables close to shore where water depths were too shallow for the use of the jet plow.

The Bottom-sealing turbidity barriers were deployed on the eastern and western tidal flats during the hand- jetting process. Each barrier consisted of a surface float, a microfabric skirt that filtered out particulates, an impervious weighted bottom foot, and a series of anchors and lines for securing the float, skirt, and foot. The barriers were utilized to contain and minimize turbidity associated with the resuspension of suspended sediments from hand jetting.

Design Considerations

There were several elements and challenges considered in the design process including currents, tidal range, and operations. The barriers needed to function through an 8-foot tidal range, with the bottom of the barrier staying in contact with the mudflat while the top was held to the top of the water column.

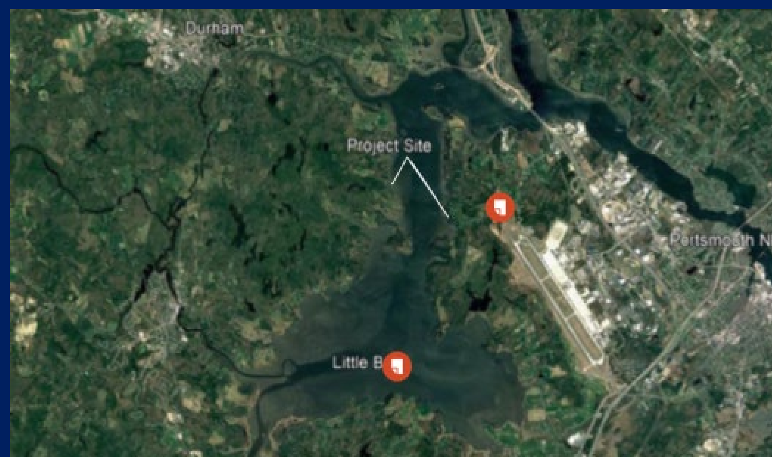


Figure 1. Aerial picture of site

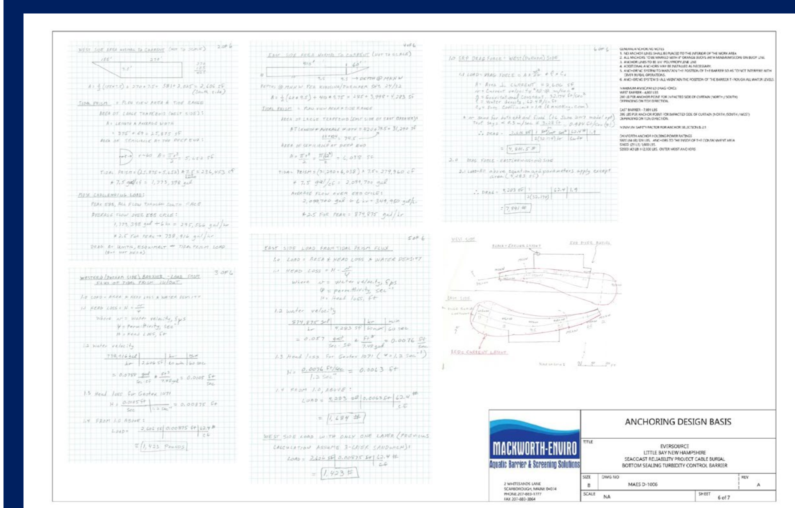


Figure 2. Anchoring design basis with engineering calculations

The majority of the expected loading on the barriers was from drag forces, as the barriers extended out from the shore perpendicular to current vectors. Based on the available information Mackworth concluded probable maximum loads to be sustained by the barriers, with a total maximum load at max tidal flow of 7,891 pounds caused by drag forces on the eastern barrier, and 4,802 pounds caused by drag forces on the western barrier.

The barriers also featured barge gates on the bay ends of each system to allow for diver operation access and the diver support spud barge.

Performance vs Requirements

Normandeau Associates, an environmental consulting company, conducted 28 days of hourly water quality monitoring during hand jetting. The data was typically collected: before construction activity started for the day, during the activity, and after construction stopped for the day.

There were over 17,500 in-situ water quality measurements collected over the course of the cable installation. These measurements included turbidity, dissolved oxygen, temperature, salinity, and pH. NO exceedances of the State turbidity standards were observed over the 28-day monitoring period for hand jetting.

Paired profile samples were taken inside and outside the turbidity barrier to examine barrier effectiveness. Samples outside the barrier were right around background levels for turbidity, typically between 2 and 5 NTU. Samples inside the barrier reported much higher turbidity, ranging up to 30 NTU. Results of the paired profile sampling demonstrate the effectiveness of the turbidity barrier in this application.

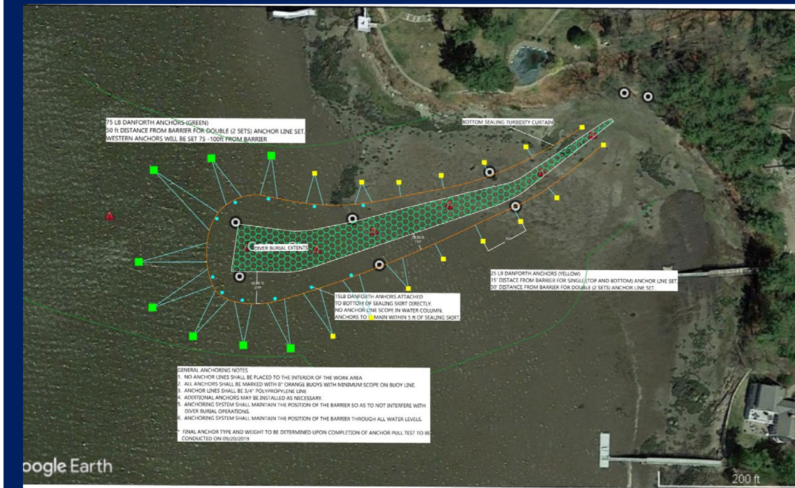


Figure 3. Eastern barrier overlay with anchor placement

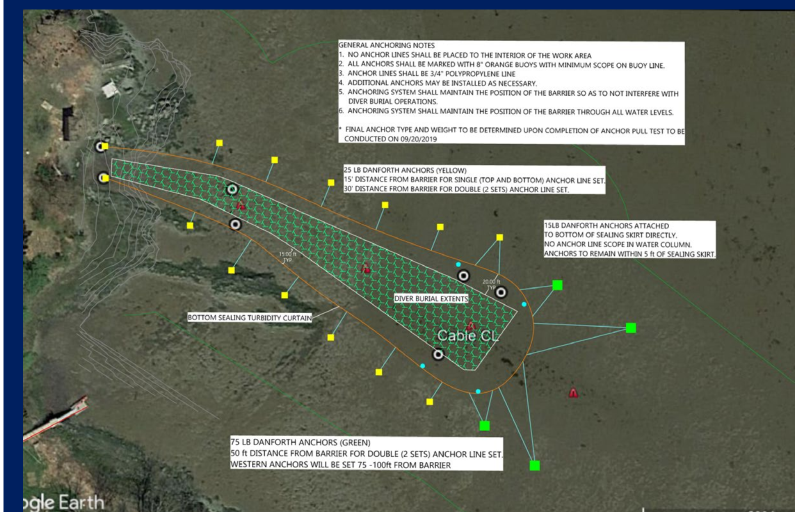


Figure 4. Western barrier overlay with anchor placement

Figure 5. Drone footage of barrier during hand jetting operations

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