2. STUDY PURPOSE

The purpose of this study is to evaluate the Port of Searsport to support the floating OSW industry in Maine and beyond. When fully assembled, OSW components are too large to be transported by road or rail. Ports are, therefore, an essential part of the supply chain. Each component must be manufactured and/or assembled at a waterfront fabrication facility, transited via vessel or barge to a marshalling facility where they are assembled, and then brought to the installation site.

The ongoing east coast port buildout has also demonstrated that the development of ports for the OSW market can be a significant economic driver for a region.

M&N created required criteria for a marine terminal to serve as a floating OSW port. The existing marine infrastructure and other physical attributes of each of the four sites were examined, compared to these established criteria, and a gap analysis performed to determine the necessary retrofits or upgrades required by each facility. A Class 4 cost estimate for the required work was created along with a construction schedule for required work activities.

The port characteristics and capabilities were examined using a phased approach. This approach would allow the terminal to begin operations with the minimum requirements and then grow over time to support a full commercial scale wind farm project. It also allows for a smaller capital expenditure to start the development process, followed by a larger investment as the industry continues to develop. The time between the initial port installation and full build out should be driven by prevailing market conditions. The parameters of the phases are identified below:

- **Phase 1**: Capable of supporting a research type project of approximately 150 MW to 200 MW.
- **Phase 2**: Capable of supporting a full-scale commercial wind farm installation (over 1000 MW).

Currently, the largest commercially available turbine on the market is the 12 MW GE Haliade X unit. The specifications for this unit are proprietary information and are not publicly available. M&N has had discussions with various WTG component manufacturers regarding the existing and proposed size and weight of WTG components. A generalization of components in the 15 to 20 MW range is provided in Table 2-1. It should be noted that the recent linear relationship between the increase in turbine MW output and the size and weight of the components may not continue. Manufacturers may instead begin to look for optimization of internal components, which may allow for a leveling off of component size.

Table 2-1: Approximate Weight and Dimensions of Considered Turbine Components

Component	Length (ft)	Width (ft)	Height (ft)	Diameter (ft)	Weight (T)
Blade	404	N/A	N/A	21	77
Nacelle	80	36	43	NA	917
Tower 1 (T1)	101	N/A	N/A	30	315
Tower 2 (T2)	155	N/A	N/A	26	324
Tower 3 (T3)	164	N/A	N/A	23	272