It is noted that detailed design of the Southern Embankment has not yet been conducted and that all values reported in this document are subject to change during the detailed design phase. In particular, a primary design criterion for the Southern Embankment is the maximum pool elevation. The maximum pool elevation along the Western Tieback will be limited to 924.0 feet (if necessary the gated structures and/or the operation plan will be modified to keep the maximum pool elevation at or below 924.0 feet). However, the detailed design phase of this Project will attempt to achieve a maximum pool of 923.5 feet, which appears achievable based on preliminary modeling results.

3.1 Wind-Wave Analysis

An updated wind-wave analysis was performed due to the modification of the alignment of the Southern Embankment, particularly the shift of the alignment between the DIS and the WRRS, which increases the longest fetch length. The updated analysis involves a coupled two-dimensional modeling approach for capturing both wind setup and wave growth across areas inundated upstream of the Southern Embankment. Two wind speeds of 40 mph and 50 mph were considered, which roughly bound the 50% Annual Chance Exceedance (ACE) and 1% ACE wind speeds, adjusted to a 1-hour fetch-limited duration for over-water winds. These winds were considered for wind directions ranging from southeast to northwest (SE, SSE, S, SSW, SW, WSW, W, WNW, and NW) in order to capture the influence of wind from any hazardous direction across the pool. A maximum pool elevation of 924.0 feet was assumed for the analysis based on an early estimate of the PMF pool elevation. The pool's sloping water surface is also incorporated so that wind fetch lengths are accurately captured in the model. The results of this modeling indicate that 5 feet of freeboard is sufficient to keep wave overtopping associated with 40 mph and 50 mph winds well below allowable rates of wave overtopping flow. The 50 mph wind model runs indicate a few areas along the northern-most portion of the embankment have 2% wave runup values exceeding 5 feet of freeboard; however, the estimated coincident probability of this event occurring is approximately 1.97×10^{-5} ACE (or 1 in 50,800). In the event that this rare combination of pool and wind occurs, wave overtopping is still not expected to lead to damage on the downstream slope of the embankment and initiation of dam failure is extremely remote. For additional information on the wind-wave analysis, please see *Southern Embankment Wind-Wave Analysis* (Attachment 2).

3.2 Crest Profile

The maximum pool elevation profile plus the required freeboard, which is controlled by the results of the wind-wave analysis, determine the required crest elevation of the dam, except in the tieback reaches where overtopping will be accounted for in the design. The design elevations of the Southern Embankment crest profile are provided in Figure 2 (non-tieback reaches), Figure 3 (Western Tieback), and Figure 4 (Eastern Tieback). Between the DIS and the RRS, the dam crest will have an elevation of 929.0 feet. The gated structures and a short reach of the embankment on either side of these structures will have a crest elevation of 931.0 feet. While the wind-wave analysis indicates that a crest elevation of 929.0 feet is sufficient, the portion of the Southern Embankment between the RRS and the Eastern Tieback will transition from a crest elevation of 929.0 feet just east of the RRS to a crest elevation of 931.0 feet at its southern end just prior to transitioning to the Eastern Tieback. This transition is necessary to maintain five (5) feet of freeboard above the sloping maximum pool elevation, which is produced by the PMF event.