March 13th, 2023

Mr. Beau Breeden
President
Cape St. Clair Improvement Association
1223 River Bay Road
Annapolis, Maryland 21409

Re: Main Beach Shoreline Monitoring Study Results
Cape St. Clair Community
Anne Arundel County, Maryland

Dear Mr. Breeden,

Sustainable Science, LLC (SSLLC) is pleased to provide a summary of the shoreline monitoring results for the community main beach. The project design involved the layout of headland rock control structures to form a stable beach shoreline as defined by wind driven waves. The design effort also included evaluating the shoreline positions since 1844. The results of the historical evaluation are provided in ***Figure 1; Historical Shoreline Evolution***.

The main beach monitoring program was executed immediately following initial rock structure construction in April of 2021 and continued monthly on five (5) transects until the dredging and cobble beach construction in February of 2022. The transects were reestablished and the monitoring executed immediately following the second construction phase and throughout the 2022 hurricane season. An additional transect (Transect 6) was also added at the constructed cobble beach. During this time period, a transect survey was executed immediately and 2 weeks after Hurricane Ian. The last monitoring survey was performed after the hurricane season on December 27th, 2022.

The results of the monitoring study are provided in ***Figure 2; Transect Monitoring Plots***. It is pointed out that the shown plots horizontal scale is 20 times larger than the vertical scale for presentation ease. Several study findings are noted:

- ✓ The predicted versus the end of study shoreline position reveal shoreline trend response lines up with the design layout. As seen in the transect location figure, additional accretion is to be expected up to the predicted stable beach embayment line.
- ✓ Immediately after Hurricane Ian, the shoreline gained materials most notably in Transects 4 & 5.
- ✓ The cobble beach response in Transect 6 shows a stable beach profile throughout the monitoring period.

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Referring to ***Figure 3; Stable Beach Embayment***, the final fill depths are depicted. This graphic reveals that additional sand is needed from Transects 3 through 5 to achieve the final stable beach grades.

We very much thank you for engaging us to execute the shoreline monitoring to compare the design predictions with the observed shoreline response. We judge that the shoreline response is trending in the correct trajectory. If you have any questions or need additional information, please feel free to contact me.

Sincerely,

F. Albert McCullough III, PE, PWS
Principal Coastal Engineer

Cc: Mr. Joe Berg

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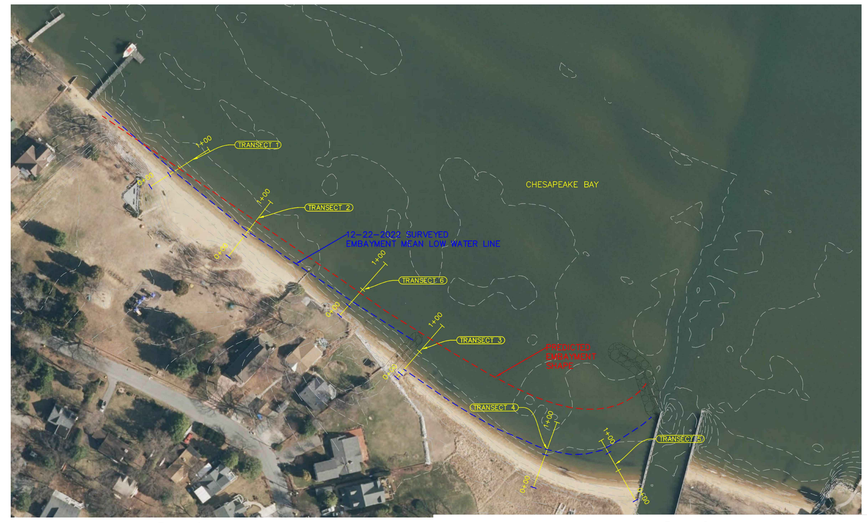
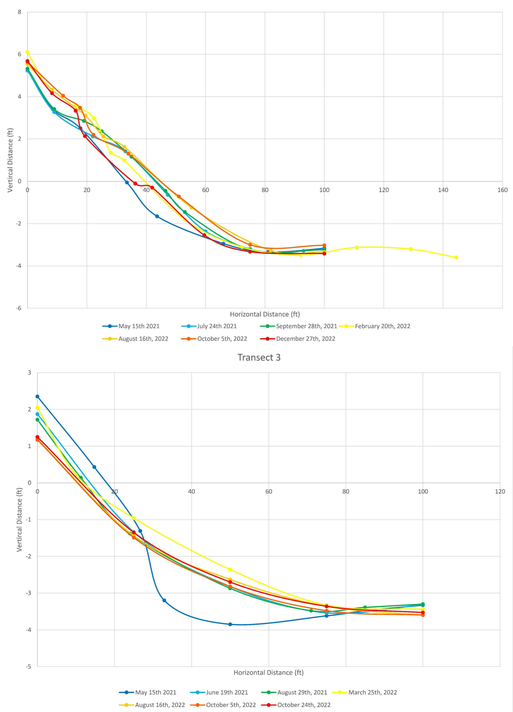
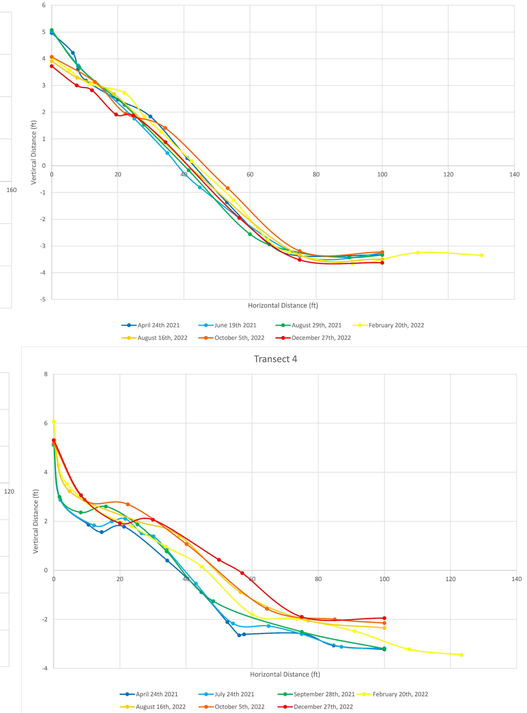
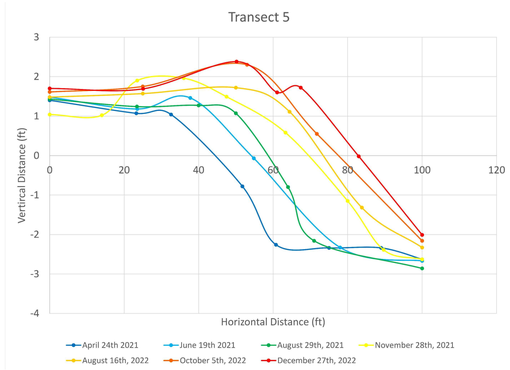
FIGURE 1. HISTORICAL SHORELINE EVOLUTION

FIGURE 3. FINAL STABLE EMBAYMENT BEACH FILL GRAPHIC









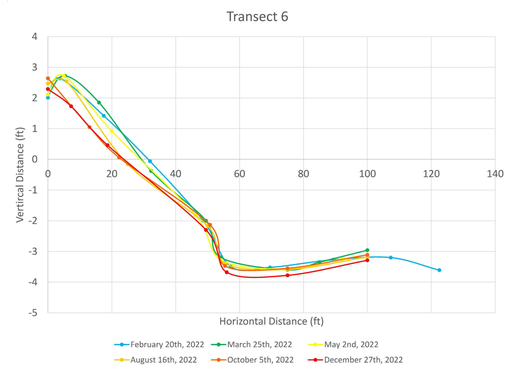


FIGURE 2. TRANSECT MONITORING PLOTS