

## C. HORIZONTAL AND VERTICAL CONTROL

Please refer to the Horizontal and Vertical Control Report (HVCR) for detailed descriptions of the procedures and systems used to attain hydrographic positioning. The HVCR will be delivered with the Descriptive Report for the last sheet of this task order. Specifics pertaining to H12094 are discussed below.

### C.1 VERTICAL CONTROL

The vertical datum for H12094 is Mean Lower-Low Water (MLLW). NOAA tide station 8651370 Duck, NC ( $36^{\circ} 11'N$   $075^{\circ} 44.8'W$ ) was the source of all verified water level heights for determining tidal correctors to the soundings. All data for H12094 were contained within tide zones SA55A and SA46A which were provided by NOAA and summarized in Table C-1.

The adequacy of the preliminary zoning provided by NOAA was accomplished through a number of means. The primary means for analyzing the adequacy of zoning was a comparative analysis of correctors across the zone boundary between SA55A and SA46A. This comparative zone-to-zone analysis (summarized in Table C-2) compared the difference in observed verified water level correctors at 6-minute intervals from 18 August 2010 to 17 October 2010. The results supported the adequacy of the NOAA provided preliminary zone boundaries and zoning parameters based on Duck, NC (8651370). Adequacy of zoning was also carried out by analyzing zone boundary crossings in the navigated swath editor, SAIC's **Multi View Editor (MVE)**, reviewing differences between overlapping swath data as well as cross line versus main scheme data. In addition, sun illuminated coverage grids were viewed within **SABER** and examined for any vertical offsets which may be a result of tidal zoning impacts. SAIC did not revise the delivered tide zones for H12094. The water level zoning parameters provided by NOS, Table C-1, were adequate for application of the observed verified water levels. As a result, they were accepted as final and applied to all H12094 multibeam data.

**Table C-1. Water Level Zoning Parameters Applied on Sheet H12094**

Zone	Time Corrector (minutes)	Range Ratio	Reference Station
SA46A	00:00	1.08	8651370
SA55A	00:00	1.11	8651370

**Table C-2. Comparison of Verified 6 Minute Water Level Data Across Tide Zones SA55A and SA46A for Dates Inclusive of H12094**

Zone Boundary	SA55A – SA46A
Minimum Difference	-0.050
Maximum Difference	0.006
Average Difference	-0.022
Standard Deviation	0.011

Data are in Meters above MLLW

No final tide note was provided by NOAA Center for Operational Oceanographic Products and Services (CO-OPS). SAIC is not required to have a final tide note from CO-OPS. SAIC has provided a final tide note in Appendix IV.

## C.2 HORIZONTAL CONTROL

The survey data for sheet H12094 were collected in horizontal datum North American Datum of 1983 (NAD-83), using geodetic coordinates, while data display and products used the UTM Zone 18, North projection. The following equipment was used for positioning on the *M/V Atlantic Surveyor*:

- POS/MV Model 320 Version 4, Serial Number 2575 with a Trimble Probeacon Differential Receiver (primary sensor)
- Trimble 7400 Rsi GPS Receiver with a Trimble Probeacon Differential Receiver (secondary sensor)

Differential correctors used for online data were from the U.S. Coast Guard Stations at Driver, VA, Annapolis, MD, Reedy Point, DE, and New Bern, NC. The differential receivers were programmed to only receive differential corrector data from these four stations.

Daily position confidence checks were conducted using an independent Trimble DGPS system. A real-time **ISS-2000** survey monitor also raised an alarm to alert the survey watchstander if the position differences exceeded the maximum allowable distance. All positioning confidence checks were within the 10 meter limit specified in section 5.1.4.2 of the *NOS Hydrographic Surveys Specifications and Deliverables*, April 2009. A summary report, “H12094\_Daily\_Positioning\_Confidence\_Checks”, is located in Separates I.