

## **C. VERTICAL AND HORIZONTAL CONTROL**

No vertical or horizontal controls were established, recovered, or occupied during data acquisition for OPR-D302-KR-12, which includes H12394. Therefore a Horizontal and Vertical Control Report is not required.

## C.1 VERTICAL CONTROL

The vertical datum for H12394 is Mean Lower Low Water (MLLW). The Project Instructions specified NOAA tide station 8651370 Duck, NC as the source for water level correctors. A full explanation of the tide zone assessment is detailed in Section C.4 of the DAPR. For H12394, 8651370 Duck, NC was the source of all final verified water level heights for determining correctors to soundings. All data for H12394 were contained within three tide zones which were provided from NOAA and are summarized in Figure 16.

Zone	Time Corrector (minutes)	Range Ratio	Reference Station
SA53	+12	1.18	8651370
SA54	+12	1.11	8651370
SA55	+6	1.11	8651370

**Figure 16. Water Level Zoning Parameters Applied on Sheet H12394**

SAIC did not revise the delivered tide zones for tide station 8651370 Duck, NC as the water level zoning parameters in Figure 16, provided by National Ocean Service (NOS), were deemed adequate for the application of observed verified water levels. As a result, they were accepted as final and applied to all H12394 multibeam data.

No final tide note was provided by the NOAA Center for Operational Oceanographic Products and Services (CO-OPS). SAIC is not required to have a final tide note from CO-OPS for H12394.

## C.2 HORIZONTAL CONTROL

The survey data for sheet H12394 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.

Please refer to the DAPR for details regarding all antenna and transducer offsets.

Differential correctors used for online data were from the U.S. Coast Guard Stations at Driver, VA (289 kHz), Annapolis, MD (301 kHz), and New Bern, NC (294 kHz). The differential receivers were programmed manually to only receive differential corrector data from these three stations.

Horizontal positioning of the multibeam transducer by the POS/MV was verified by frequent comparison checks against an independent Trimble DGPS system. During survey data acquisition, the **ISS-2000** real-time system provided a continuous view of the positioning comparison between the POS/MV and the Trimble DGPS. An alarm was triggered within **ISS-2000** if the comparisons were not within an acceptable range. Any soundings with total horizontal uncertainties exceeding the maximum allowable IHO S-44 5<sup>th</sup> edition Order 1a specifications were flagged as invalid and therefore not used in