U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL OCEAN SERVICE

Horizontal and Veritcal Control Report

Type of Survey	**Hydrographic**
Project	**OPR-Y390-KR-21**
Contract No	**1305M220DNCNJ0053**
Task Order No	**TO03**
Time Frame	**June 2021 - September 2021**

State	**Wisconsin**
General Locality	**Green Bay**

2021

CHIEF OF PARTY

David R. Neff, C.H.

LIBRARY & ARCHIVES

Date

NOAA FORM 77-28
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY No

H13467
H13468
H13469
H13470
H13471
H13472
H13473

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.

FIELD No

eTrac Inc.

State	Wisconsin		
General Locality	Green Bay		
Sub-Locality	Southern Green Bay		
Scale	1:10,000 (H13470: 1:20,000)	**Date of Survey**	June - September 2021
Instructions Dated	April 26, 2021	**Project No.**	OPR-Y390-KR-21
Vessel	R/V Endeavor, R/V Rapid, R/V Voxel		
Chief of Party	David Neff		
Surveyed by	eTrac Inc.		
Soundings by echo sounder	R2 Sonic 2024		
Graphic record scaled by			
Graphic record checked by	N/A	**Automated Plot**	N/A
Verification by	Atlantic Hydrographic Branch		
Soundings in	Meters at Low Water Datum - International Great Lakes Datum 1985		

REMARKS:

NAD 83 (2011), UTM Zone 16N

Times are in UTC

The purpose of this contract is to provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of the assigned area.

SUBCONSULTANTS:

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537

Contents

A. Vertical Control

Per the project instructions, survey data for OPR-Y390-KR-21 were vertically referenced to the ellipsoid. A time dependant, 7 parameter transformation from ITRF-2014 to NAD83_2011 was performed in QPS Qinsy. Using VDatum, a vertical separation model was created to transform the ellipsoidally referenced data from NAD83_2011 to LWD_IGLD85. The transformation and the separation model were applied in QPS Qinsy on the vessels in real-time to achieve LWD_IGLD85 in the field. Achieving LWD_IGLD85 in the field was extremely efficient for field operations as the NALL was easily identified in realtime. The separation model was carried through the processing pipeline maintaining LWD_IGLD85 throughout all processing efforts.

R/V Endeavor and R/V Voxel received GNSS satellite corrections on the Applanix POS MV 320 over the G2+ carrier signal from the Marinestar Global Correction System maintained by Fugro. R/V Rapid received GNSS satellite corrections on the R2Sonic I2NS over the G2+ carrier signal from the Marinestar Global Correction System maintained by Fugro. The Marinestar system is a global real-time GNSS broadcast system that delivers corrections from a network of base stations around the world via geo-stationary satellites. The Marinestar corrections system was utilized for both vertical and horizontal positioning. Accuracies in the 10-15cm range were observed throughout the project.

For OPR-Y390-KR-21, Applanix PosPac MMS was utilized for all survey data to post-process real-time positioning data utilizing Trimble's PP-RTX implementation of Trimble CenterPoint RTX. The Trimble CenterPoint RTX correction service is delivered via internet connection and integrated into Applanix PosPac MMS 8, to aid in post processed trajectories. A Smoothed Best Estimate of Trajectory (SBET) is provided by PosPac MMS and applied to survey data in Qimera 2.3.5.

B. Horizontal Control

Survey data for OPR-Y390-KR-21 were collected in NAD83_2011 UTM Zone 16N Projection.

Horizontal positioning was achieved using the same equipment and methods as described in the Vertical Control section of this document.

C. Approval Sheet

OPR-Y390-KR-21

Registry Nos.
H13467
H13468
H13469
H13470
H13471
H13472
H13473

Horizontal and Vertical Control Report

This report and the accompanying data are respectfully submitted.

Field operations contributing to the accomplishment of OPR-Y390-KR-21 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and associated data have been closely reviewed and are considered complete and adequate as per the Statement of Work.

David Neff
Digitally signed by David Neff
DN: C=US, E=david@etracinc.com, O=eTrac Inc., CN=David Neff
Date: 2021.09.21 13:36:11-07'00'

David R. Neff | eTrac Inc. | Lead Hydrographer | September 21, 2021

eTrac Inc.
September 2021