

Kotlik LiDAR

Survey Report Mining, Land and Water- Survey Section

October 16, 2019

Project Summary

The Division of Mining, Land and Water Survey Section performed a LiDAR Ground Control Survey for the Division of Geological and Geophysical Surveys (DGGS) from August 20-22, 2019. Kimra Widmer and Sean Naramore were the on-site field crew. The area of the LiDAR survey was centered on Kotlik, Alaska, within an approximate 2 mile radius around town and extending easterly along the shoreline approximately 1 mile wide and 15 miles long. A total of 94 check points were collected consisting of 42 bare earth, 18 forested, 33 shrubbery, and 1 urban area points. Photos were taken of each point to show the vegetation and ground conditions except for point 1084.

Control Summary

The field crew recovered DNR DGGS Bench Mark with the designation “2A9 A 2015” with PID “BBFB57” with published coordinates from the NGS OPUS shared solutions website:

UTM Zone 3 North NAD83(2011):

Northing: 22934191.586' / 6990355.576 meters

Easting: 1884711.296' / 574461.152 meters

Geoid 12B Orthometric Elevation: 12.861' / 3.920 meters



The GPS base station was set on “2A9-A 2015” and was used throughout the entire RTK survey. The coordinates for the base were calculated from OPUS, see the observed OPUS Datasheet for “2A9-A 2015”.

The following coordinates for “2A9-A 2015” (point number “100”) were calculated by OPUS:

UTM Zone 3 North NAD83(2011):

Northing: 22934191.612' / 6990355.584 meters

Easting: 1884711.255' / 574461.140 meters

Geoid 12B Orthometric Elevation: 12.863' / 3.921 meters

The differences between the published OPUS solution and the field observed solution is:

Northing: -0.026' / -0.008 meters

Easting: 0.041' / 0.012 meters

Geoid 12B Orthometric Elevation: -0.002' / -0.001 meters

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Visual representation of the RTK collected points on August 20-22, 2019.

All field work was performed with Trimble R10-2 GNSS receivers and a Trimble R3 controller for the RTK Survey. GNSS observations were processed and adjusted using Trimble Business Center and compared with OPUS solutions for the recovered benchmark “2A9-A 2015” and set spike (point number “101”) observed on August 20-22, 2019. Point 101 was a 10-inch spike set in the western corner of the runway apron and served as an RTK check point for daily surveys. This point was statically observed for 4 hours and 50 minutes and processed with OPUS. Five check shots were taken throughout the RTK survey period. These comparisons are shown in the table below.

2019 KOTLIK RTK GNSS Position Check- UTM Zone 3 NAD83(2011) meters					
OPUS computed Final Coordinates					
Point Name	Point 101				
Northing	6990404.865				
Easting	574421.214				
Elevation (Ortho)	3.518				
Observed Points	Point 1011	Point 1043	Point 1080	Point 1081	Point 1101
Code	check in	check	check out	check in	check out
Northing	6990404.874	6990404.872	6990404.877	6990404.871	6990404.861
Easting	574421.204	574421.205	574421.210	574421.202	574421.203
Elevation (Ortho)	3.537	3.533	3.538	3.535	3.534
Deltas					
Northing	-0.009	-0.007	-0.012	-0.006	0.004
Easting	0.010	0.009	0.004	0.012	0.011
Elevation (Ortho)	-0.019	-0.015	-0.020	-0.017	-0.016

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Check Points Summary

Ground GPS points were collected throughout the project area and are intended to provide adequate control to adjust LiDAR data in all areas of the project. Only one of the points was able to be taken on concrete due to the remote nature of the village. Check points were collected using one of the following codes; bare earth “BE”, forested “FO”, shrubbery “SH”, or urban area “UB”.

- 42 Bare earth points were taken on gravel or flat areas with little vegetation.
- 18 Forested points were taken in areas of with small to medium size trees.
- 33 Shrubbery points were taken in areas with shrubs or long grass.
- 1 Urban area point was taken on concrete.

There is standing water all around the village, which made finding dry land a bit of a search for the collection of GPS ground points.



Pictured above is the general village terrain.



Pictured above is the typical standing water found surrounding the village.