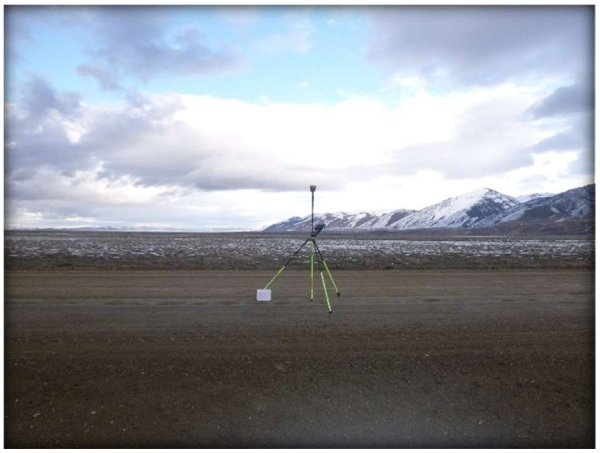
Check Point Survey Report

NV Northwest ELKO 2020 D20 LiDAR Project
Contract: G16PC00020
Task Order Number: 140g022f0313

Prepared for:
United States Geological Survey (USGS)



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1. INTRODUCTION

1.1 *Project Summary*

Dewberry Engineers Inc. is under contract to the United States Geological Survey to provide 131 Check Points in the State of Nevada. Under the above referenced USFWS Task Order, Dewberry is tasked to complete the quality assurance of LiDAR products. As part of this work Dewberry staff will complete Check Point surveys that will be used to evaluate vertical and horizontal accuracy. The ground survey was conducted January 30, 2023, thru April 29, 2023.

Existing NGS Control Points were located and surveyed to check the accuracy of the RTK/GPS survey equipment with the results shown in Section 2.4 of this Report.

As an internal QA/QC procedure and to verify that the Ground Control Points meet the 95% confidence level approximately 50% of the points were re-observed and are shown in Section 5 of this report.

Final horizontal coordinates are referenced to UTM 11 North, NAD83 (2011) in meters. Final Vertical elevations are referenced to NAVD88 in meters using Geoid model 2018B (Geoid18B).

1.2 *Points of Contact*

Questions regarding the technical aspects of this report should be addressed to:

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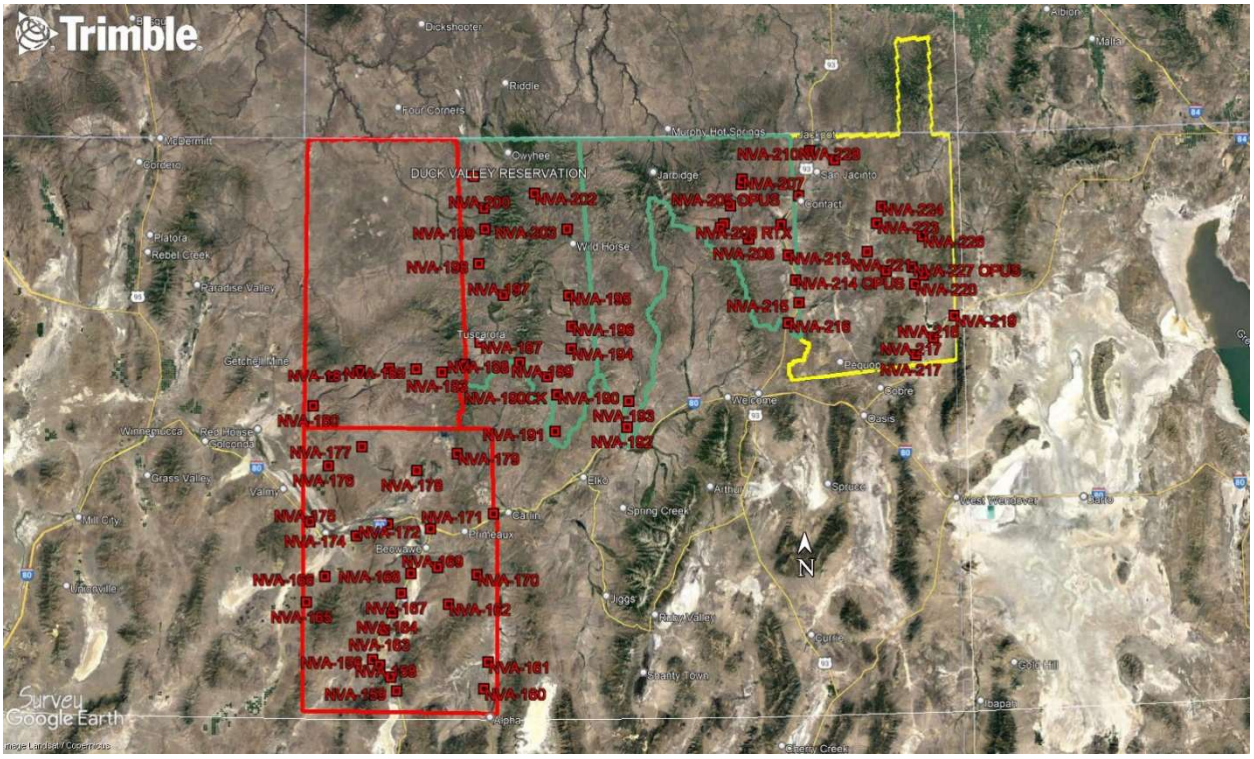
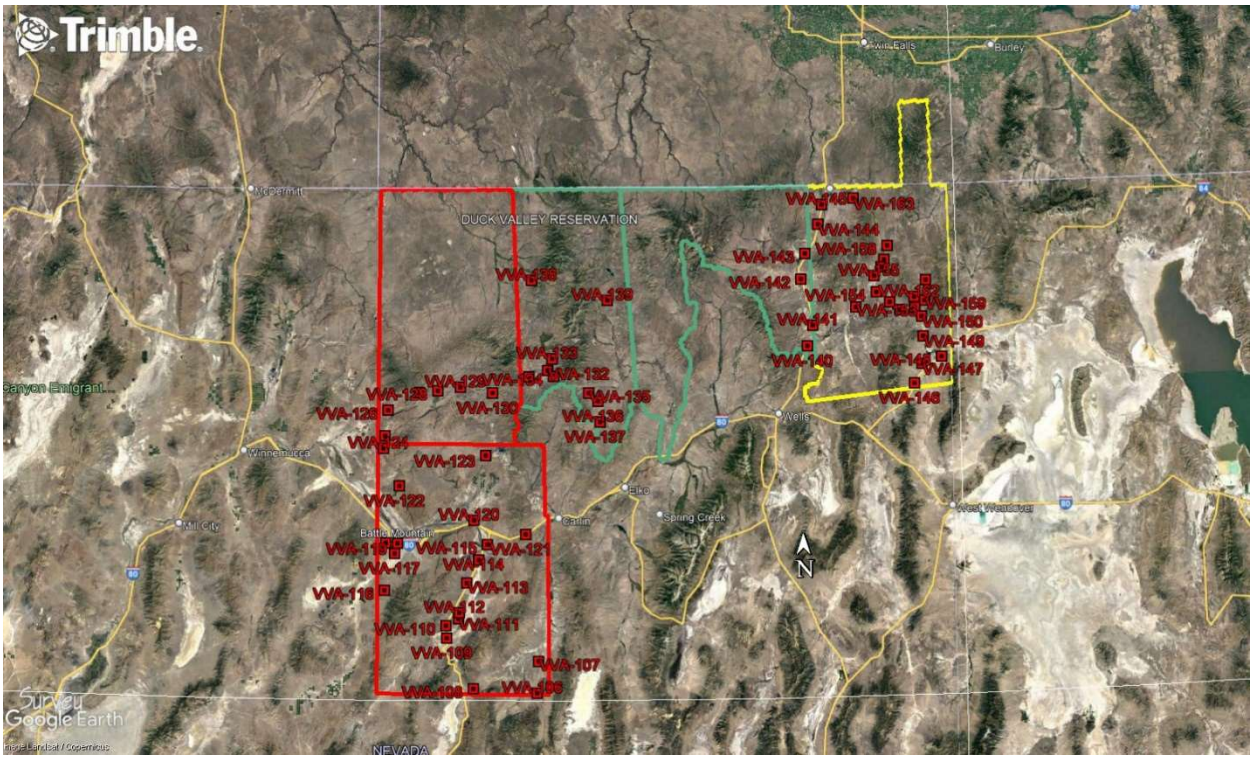
1.3 *Project Area*





PROJECT DETAILS

2.1 *Survey Equipment*

In performing the GPS observations a Trimble R-12i GNSS receiver/antenna attached to a two-meter fixed height pole with a Trimble TSC7 Data Collector to collect GPS raw data were used to perform the field surveys.

2.2 *Survey Point Detail*

The 131 Check Points were well distributed throughout the project area.

A sketch was made for each location and a nail was set at the point where possible or at an identifiable point. The Check Point locations are detailed on the "Control Point Documentation Report" sheets attached to this report.

2.3 *Network Design*

The GPS survey performed by Dewberry Engineers Inc. office located in Lanham, MD was tied to a Real Time Network operated by Trimble. The network is a series of "real-time" continuously operating, high precision GPS reference stations. All of the reference stations have been linked together using Trimble GPSNet software, creating a Virtual Reference Station System (VRS).

The Trimble NetR5 Reference Station is a multi-channel, multi-frequency GNSS (Global Navigation Satellite System) receiver designed for use as a stand-alone reference station or as part of a GNSS infrastructure solution. Trimble R-Track technology in the NetR5 receiver supports the modernized GPS L2C and L5 signals as well as GLONASS L1/L2 signals.

2.4 *Field Survey Procedures and Analysis*

Dewberry field surveyors used Trimble R-12i GNSS receivers, which is a geodetic quality dual frequency GPS receiver, to collect data at each surveyed location.

All locations were occupied once with approximately 50% of the locations being re-observed. All re-observations matched the initially derived station positions within the allowable tolerance of ± 5cm or within the 95% confidence level. Each occupation which utilized the VRS network was occupied for approximately three (3) minutes in duration and measured to 180 epochs.

Each occupation which utilized OPUS (if used) was occupied between 20 and 30 minutes.

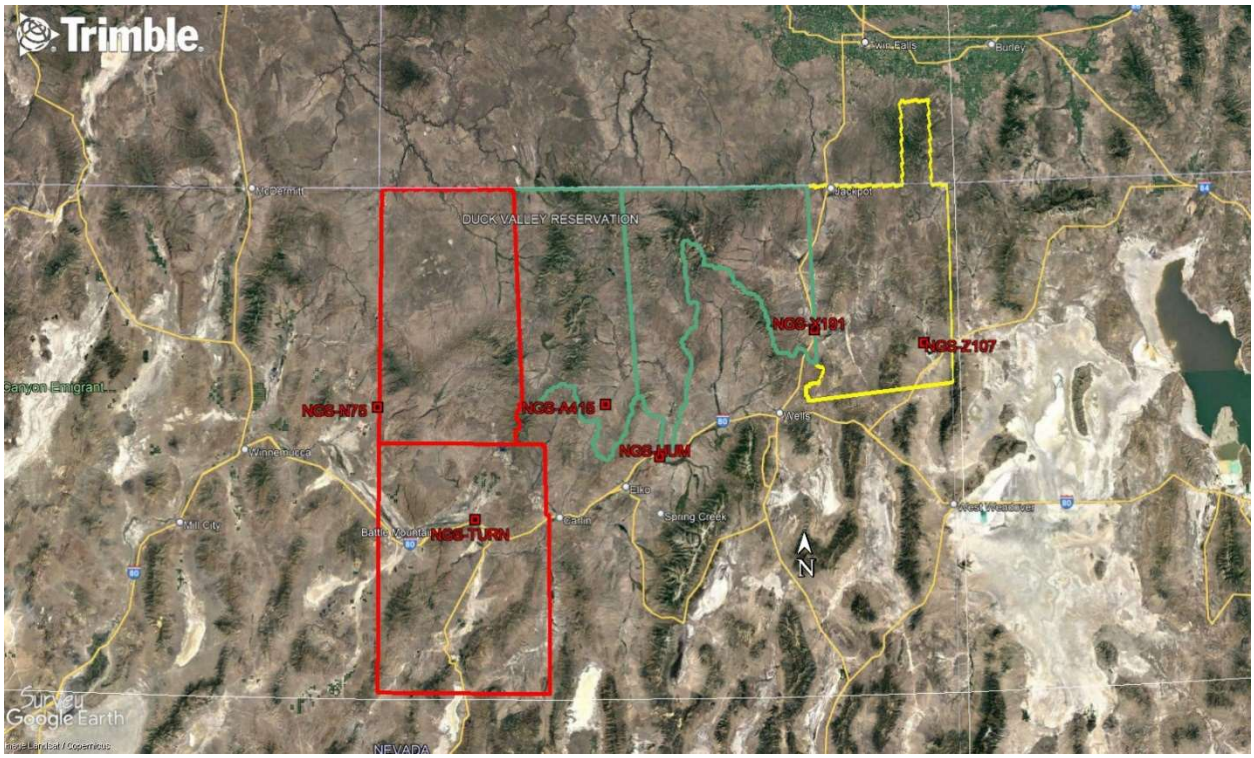
Field GPS observations are detailed on the "Control Point Documentation Reports" submitted as part of this report.

Six (6) existing NGS monument listed in the NSRS database were located for the Louisiana area as an additional QA/QC method to check the horizontal and vertical accuracy of the VRS network as well as being the primary project control monuments designated as MT0670, LQ0527, LR0258, MT0319, MT0160, and MU0211. The results are as follows:

	Observed Values			Data Sheet Values					
PT. #	NORTHING	EASTING	ELEVS.	NORTHING	EASTING	ELEVS.	Δ X	Δ Y	Δ Z
A415	4556755.586	597201.625	1792.374	N/A	N/A	1792.357	N/A	N/A	0.017
HUM	4534260.265	620848.225	1630.598	4534260.254	620848.359	1630.593	N/A	N/A	0.005
TURN	4506576.046	540732.422	1414.297	4506576.036	540732.436	1414.314	0.010	-0.014	-0.017
X191	4589595.128	687675.676	1742.741	N/A	N/A	1742.753	N/A	N/A	-0.012
Z107	4584253.088	735571.232	1501.691	N/A	N/A	1501.691	N/A	N/A	0.000
N75	4555041.009	498118.976	1420.896	4555041.019	498118.969	1420.889	-0.010	0.007	0.007

The above results indicate that the VRS network is providing positional values within the 5cm parameters for this survey.

NGS Monuments



2.5 *Adjustment*

The survey data was collected using Virtual Reference Stations (VRS) methodology within a Virtual Reference System (VRS).

The system is designed to provide a true Network RTK performance, the RTKNet software enables high-accuracy positioning in real time across a geographic region. The RTKNet software package uses real-time data streams from the Trimble network user and generates correction models for high-accuracy RTK GPS corrections throughout the network. Therefore, corrections were applied to the points as they were being collected, thus negating the need for a post process adjustment.

2.6 *Data Processing Procedures*

After field data is collected the information is downloaded from the data collectors into the office software. The Software program used is called Trimble Business Center.

Downloaded data is run through the TBC program to obtain the following reports; points report, point comparison report and a point detail report. The reports are reviewed for point accuracy and precision.

After review of the point data an "ASCII" or "txt" file which is the industry standard is created. Point files are loaded into our CADD program (Carlson Survey 2021) to make a visual check of the point data (Pt. #, Coordinates, Elev. and Description). The data can now be imported into the final product.

3. *FINAL COORDINATES/ELEVATIONS*

NEVADA - ADDITIONAL POINTS

POINT ID	NORTHING (m)	EASTING (m)	ELEV. (m)
UTM 11 NORTH, NAD83(2011), NAVD 88, Meters, Geoid 18			
NVA			
NVA-156	4451177.609	525426.275	1476.915
NVA-157	4449057.708	528128.475	1478.134
NVA-158	4444534.432	532446.427	1780.319
NVA-159	4439232.726	534750.687	1746.888
NVA-160	4440325.254	568184.925	1714.503
NVA-161	4450548.819	569739.775	1637.846
NVA-162	4472537.055	554533.821	1494.591
NVA-163	4462414.046	529880.571	1506.226
NVA-164	4469130.736	532932.488	1502.378
NVA-165	4472774.713	499880.278	1517.675
NVA-166	4482661.708	506969.091	1428.452
NVA-167	4476499.351	536379.366	1457.496
NVA-168	4484119.989	540047.802	1460.013
NVA-169	4486516.031	550281.185	1493.002
NVA-170	4483897.382	565429.635	1777.726
NVA-171	4507064.325	571611.706	1530.114
NVA-172	4501195.105	547518.725	1488.130
NVA-173	4502855.426	531165.747	1401.666
NVA-174	4498264.743	519070.449	1391.116
NVA-175	4503495.583	501166.526	1372.648
NVA-176	4524887.844	508210.405	1428.363
NVA-177	4532246.358	521114.488	1494.263
NVA-178	4523312.598	542189.392	1442.648
NVA-179	4529932.966	557662.269	1899.067
NVA-180	4547671.999	502240.246	1411.216
NVA-181	4561557.320	520236.232	1592.350
NVA-182	4562439.770	531501.393	1597.581
NVA-183	4561156.039	551697.063	1787.082
NVA-184	4558972.283	509369.983	1503.917
NVA-185	4562315.272	541755.417	1653.683
NVA-186	4564152.403	560462.759	1873.510
NVA-187	4572680.348	566169.608	1802.824
NVA-188	4564969.346	581328.274	1938.496
NVA-189	4559417.789	591903.434	1847.280

NVA-190	4552465.325	595709.561	1809.991
NVA-191	4538554.114	595003.836	1909.493
NVA-192	4540335.972	622438.058	1598.501
NVA-193	4550218.299	623007.314	1631.873
NVA-194	4570351.324	601016.323	1820.515
NVA-195	4590459.762	599958.287	1863.631
NVA-196	4578803.002	601215.753	1798.665
NVA-197	4590449.851	575021.835	1833.382
NVA-198	4602326.857	565506.388	1769.130
NVA-199	4615545.520	567774.814	1860.653
NVA-200	4623474.391	567389.283	1714.414
NVA-201	4635546.367	563229.741	1642.312
NVA-202	4629133.662	586606.454	1726.800
NVA-203	4615609.361	599167.494	1899.281
NVA-204	4616592.759	657692.655	1849.221
NVA-205	4624891.205	661519.413	1808.684
NVA-206	4633055.981	665592.960	1793.922
NVA-207	4635054.489	665894.023	1831.594
NVA-208	4612359.926	668457.483	1930.635
NVA-209	4618059.674	658976.097	1838.007
NVA-210	4646084.195	691658.579	1559.389
NVA-211	4628901.417	687562.784	1628.615
NVA-212	4617973.589	680882.743	1665.836
NVA-213	4606324.618	683701.896	1734.651
NVA-214	4596882.283	686500.621	1834.808
NVA-215	4588331.003	687882.464	1729.466
NVA-216	4580569.748	683771.829	1881.178
NVA-217	4568789.580	732831.541	1508.291
NVA-218	4575463.040	739569.917	1469.034
NVA-219	4583844.296	747538.172	1453.540
NVA-220	4595704.598	732331.291	1531.698
NVA-221	4600595.202	721262.458	1577.343
NVA-222	4607885.180	713934.921	1614.177
NVA-223	4618696.121	717506.897	1672.698
NVA-224	4625140.128	719389.555	1741.186
NVA-225	4599196.049	735502.920	1571.135
NVA-226	4613926.470	735136.247	1724.027
NVA-227	4602139.396	731251.390	1730.291
NVA-228	4642694.047	701238.720	1711.546
VVA			

VVA-106	4431829.684	568494.975	1783.187
VVA-107	4445606.804	569049.679	1670.237
VVA-108	4433597.438	540728.133	1817.876
VVA-109	4455454.854	528964.011	1466.008
VVA-110	4460869.912	528623.790	1507.794
VVA-111	4463862.772	534073.065	1467.030
VVA-112	4466486.440	534455.459	1467.196
VVA-113	4479433.225	537701.151	1452.660
VVA-114	4489433.008	542856.556	1442.803
VVA-115	4496113.924	546597.541	1438.711
VVA-116	4476014.618	501755.134	1502.969
VVA-117	4492006.620	506178.825	1382.979
VVA-118	4496585.419	502326.475	1380.793
VVA-119	4496442.115	507436.847	1379.540
VVA-120	4506590.962	540738.490	1414.181
VVA-121	4500660.639	563279.345	1807.812
VVA-122	4521311.369	508168.526	1424.768
VVA-123	4534642.776	545743.113	1546.739
VVA-124	4537472.898	501140.634	1412.693
VVA-125	4542910.627	501852.162	1421.203
VVA-126	4554037.394	503159.179	1403.048
VVA-127	4561723.080	516775.585	1628.216
VVA-128	4562523.759	524796.945	1578.341
VVA-129	4564105.236	534618.693	1611.738
VVA-130	4561667.705	548575.320	1792.948
VVA-131	4568752.406	564379.663	1798.739
VVA-132	4571517.540	572464.614	1765.144
VVA-133	4576534.351	574361.074	1748.335
VVA-134	4569035.777	575089.642	1882.561
VVA-135	4561859.992	590342.307	1847.398
VVA-136	4558401.662	594369.511	1859.222
VVA-137	4549434.967	595346.529	1818.994
VVA-138	4610360.834	565231.171	1723.543
VVA-139	4601906.707	598169.067	1952.139
VVA-140	4582754.264	685141.157	1811.898
VVA-141	4591683.314	687404.117	1788.912
VVA-142	4611605.056	682137.918	1715.851
VVA-143	4622651.329	683864.485	1655.829
VVA-144	4635404.521	689489.760	1620.915
VVA-145	4643935.887	691081.409	1582.310

VVA-146	**4567009.506**	**731964.379**	**1527.683**
VVA-147	**4575465.448**	**735247.360**	**1494.870**
VVA-148	**4578646.867**	**743839.932**	**1462.526**
VVA-149	**4587387.749**	**735634.429**	**1512.334**
VVA-150	**4595975.829**	**734920.990**	**1540.090**
VVA-151	**4598678.728**	**725305.116**	**1558.919**
VVA-152	**4601994.604**	**720920.649**	**1609.955**
VVA-153	**4599696.967**	**706161.600**	**1626.575**
VVA-154	**4606291.515**	**715077.660**	**1613.182**
VVA-155	**4613281.445**	**714030.251**	**1634.109**
VVA-156	**4617169.463**	**717023.445**	**1665.667**
VVA-157	**4620372.078**	**718330.879**	**1686.610**
VVA-158	**4626442.393**	**719723.969**	**1761.448**
VVA-159	**4602923.435**	**736175.743**	**1604.533**
VVA-160	**4611773.210**	**736498.675**	**1691.838**
VVA-161	**4599759.734**	**731815.415**	**1636.700**
VVA-162	**4604362.854**	**731571.660**	**1821.802**
VVA-163	**4646849.747**	**704744.534**	**1779.191**

4. *GPS OBSERVATIONS*

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY (AST)	RE-OBSERV. DATE	RE-OBSERV. TIME
NVA-156	2/5/2023	36	15:51	4/8/2023	12:35
NVA-157	2/5/2023	36	16:12	4/8/2023	12:50
NVA-158	4/8/2023	98	13:35	N/A	N/A
NVA-159	4/8/2023	98	13:58	N/A	N/A
NVA-160	2/2/2023	33	15:16	N/A	N/A
NVA-161	2/2/2023	33	14:29	N/A	N/A
NVA-162	4/8/2023	98	16:05	4/12/2023	17:19
NVA-163	2/5/2023	36	14:40	N/A	N/A
NVA-164	2/5/2023	36	12:44	4/12/2023	14:24
NVA-165	4/27/2023	117	17:15	N/A	N/A
NVA-166	4/27/2023	117	16:22	N/A	N/A
NVA-167	2/5/2023	36	12:17	4/12/2023	13:54
NVA-168	2/5/2023	36	11:40	4/12/2023	13:35
NVA-169	2/1/2023	32	12:14	N/A	N/A
NVA-170	4/8/2023	98	16:44	N/A	N/A
NVA-171	1/31/2023	31	10:55	2/1/2023	10:12
NVA-172	1/31/2023	31	12:38	2/1/2023	11:05
NVA-173	1/31/2023	31	15:48	2/1/2023	16:18
NVA-174	1/31/2023	31	16:16	2/1/2023	16:41
NVA-175	4/27/2023	117	14:36	N/A	N/A
NVA-176	4/27/2023	117	11:24	N/A	N/A
NVA-177	4/27/2023	117	12:21	N/A	N/A
NVA-178	1/31/2023	31	14:18	2/1/2023	15:02
NVA-179	4/12/2023	102	12:02	N/A	N/A
NVA-180	4/29/2023	119	13:04	N/A	N/A
NVA-181	4/28/2023	118	13:27	4/28/2023	19:26
NVA-182	4/28/2023	118	14:16	4/28/2023	18:52
NVA-183	4/28/2023	118	16:09	N/A	N/A
NVA-184	4/28/2023	118	12:37	4/29/2023	14:48
NVA-185	4/28/2023	118	15:11	N/A	N/A
NVA-186	4/15/2023	105	13:00	N/A	N/A
NVA-187	4/15/2023	105	12:03	N/A	N/A
NVA-188	4/11/2023	101	12:42	4/15/2023	11:15
NVA-189	4/11/2023	101	11:52	4/15/2023	10:40
NVA-190	1/30/2023	30	15:04	N/A	N/A

NVA-191	1/30/2023	30	13:05	N/A	N/A
NVA-192	1/30/2023	30	12:03	2/2/2023	12:07
NVA-193	1/30/2023	30	11:29	2/2/2023	11:41
NVA-194	4/9/2023	99	11:50	4/13/2023	11:52
NVA-195	4/9/2023	99	12:43	4/13/2023	12:38
NVA-196	4/9/2023	99	12:18	4/13/2023	12:20
NVA-197	4/11/2023	101	14:38	N/A	N/A
NVA-198	4/11/2023	101	16:33	N/A	N/A
NVA-199	4/11/2023	101	17:32	N/A	N/A
NVA-200	4/13/2023	103	15:19	N/A	N/A
NVA-201	4/9/2023	99	15:42	4/13/2023	14:46
NVA-202	4/9/2023	99	14:35	4/13/2023	14:06
NVA-203	4/9/2023	99	13:54	4/13/2023	13:26
NVA-204	4/24/2023	114	13:48	N/A	N/A
NVA-205	4/24/2023	114	14:26	N/A	N/A
NVA-206	4/24/2023	114	15:59	N/A	N/A
NVA-207	4/24/2023	114	16:24	N/A	N/A
NVA-208	4/17/2023	107	13:43	4/24/2023	12:58
NVA-209	4/18/2023	108	12:57	4/24/2023	13:27
NVA-210	4/17/2023	107	17:15	4/22/2023	14:24
NVA-211	4/17/2023	107	15:53	4/18/2023	15:50
NVA-212	4/17/2023	107	15:08	4/18/2023	15:29
NVA-213	4/17/2023	107	14:19	4/18/2023	12:07
NVA-214	4/17/2023	107	13:00	N/A	N/A
NVA-215	4/17/2023	107	11:46	4/18/2023	16:43
NVA-216	4/17/2023	107	10:54	4/18/2023	17:22
NVA-217	4/19/2023	109	11:38	4/20/2023	14:59
NVA-218	4/19/2023	109	12:07	N/A	N/A
NVA-219	4/19/2023	109	12:56	N/A	N/A
NVA-220	4/19/2023	109	15:14	4/20/2023	16:01
NVA-221	4/19/2023	109	17:08	4/20/2023	16:52
NVA-222	4/20/2023	110	17:59	4/21/2023	11:23
NVA-223	4/21/2023	111	13:57	N/A	N/A
NVA-224	4/21/2023	111	14:48	N/A	N/A
NVA-225	4/25/2023	115	12:12	N/A	N/A
NVA-226	4/25/2023	115	13:37	N/A	N/A
NVA-227	4/25/2023	115	15:24	N/A	N/A
NVA-228	4/22/2023	112	13:45	N/A	N/A

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY (AST)	RE-OBSERV. DATE	RE-OBSERV. TIME
VVA-106	2/2/2023	33	15:38	N/A	N/A
VVA-107	2/2/2023	33	14:52	N/A	N/A
VVA-108	4/8/2023	98	14:25	N/A	N/A
VVA-109	2/5/2023	36	15:23	N/A	N/A
VVA-110	2/5/2023	36	15:02	N/A	N/A
VVA-111	2/5/2023	36	13:09	4/12/2023	14:55
VVA-112	2/5/2023	36	13:33	4/12/2023	14:41
VVA-113	2/5/2023	36	11:59	N/A	N/A
VVA-114	2/5/2023	36	11:11	4/12/2023	13:10
VVA-115	2/1/2023	32	11:25	2/5/2023	10:50
VVA-116	4/27/2023	117	16:46	N/A	N/A
VVA-117	4/27/2023	117	15:50	4/29/2023	16:42
VVA-118	4/27/2023	117	15:03	4/29/2023	17:20
VVA-119	4/27/2023	117	15:26	4/29/2023	16:59
VVA-120	1/31/2023	31	13:38	2/1/2023	14:28
VVA-121	1/31/2023	31	11:47	2/1/2023	10:44
VVA-122	4/27/2023	117	10:53	N/A	N/A
VVA-123	1/31/2023	31	14:52	2/1/2023	15:30
VVA-124	4/29/2023	119	13:49	N/A	N/A
VVA-125	4/29/2023	119	13:25	N/A	N/A
VVA-126	4/29/2023	119	12:22	N/A	N/A
VVA-127	4/28/2023	118	13:03	4/29/2023	15:05
VVA-128	4/28/2023	118	13:48	4/28/2023	19:09
VVA-129	4/28/2023	118	14:37	4/28/2023	18:38
VVA-130	4/28/2023	118	15:39	N/A	N/A
VVA-131	4/15/2023	105	12:24	N/A	N/A
VVA-132	4/15/2023	105	11:36	N/A	N/A
VVA-133	4/11/2023	101	14:08	N/A	N/A
VVA-134	4/11/2023	101	13:21	N/A	N/A
VVA-135	4/11/2023	101	12:10	4/15/2023	10:55
VVA-136	4/11/2023	101	11:21	4/15/2023	10:22
VVA-137	1/30/2023	30	13:40	N/A	N/A
VVA-138	4/11/2023	101	16:59	N/A	N/A
VVA-139	4/9/2023	99	13:18	4/13/2023	13:01
VVA-140	4/17/2023	107	11:14	4/18/2023	17:02
VVA-141	4/17/2023	107	12:26	N/A	N/A
VVA-142	4/17/2023	107	14:37	4/18/2023	16:17

VVA-143	**4/17/2023**	**107**	**15:26**	**N/A**	**N/A**
VVA-144	**4/17/2023**	**107**	**16:16**	**N/A**	**N/A**
VVA-145	**4/17/2023**	**107**	**16:54**	**4/22/2023**	**14:42**
VVA-146	**4/19/2023**	**109**	**11:15**	**4/20/2023**	**14:44**
VVA-147	**4/19/2023**	**109**	**13:31**	**4/20/2023**	**15:19**
VVA-148	**4/19/2023**	**109**	**12:24**	**N/A**	**N/A**
VVA-149	**4/19/2023**	**109**	**14:15**	**4/20/2023**	**15:39**
VVA-150	**4/19/2023**	**109**	**14:46**	**4/25/2023**	**11:42**
VVA-151	**4/19/2023**	**109**	**16:36**	**4/20/2023**	**16:26**
VVA-152	**4/19/2023**	**109**	**17:23**	**4/20/2023**	**17:08**
VVA-153	**4/19/2023**	**109**	**18:11**	**4/20/2023**	**18:26**
VVA-154	**4/19/2023**	**109**	**17:44**	**4/20/2023**	**17:39**
VVA-155	**4/21/2023**	**111**	**11:46**	**4/21/2023**	**17:04**
VVA-156	**4/21/2023**	**111**	**12:18**	**4/21/2023**	**16:38**
VVA-157	**4/21/2023**	**111**	**14:14**	**N/A**	**N/A**
VVA-158	**4/21/2023**	**111**	**15:15**	**N/A**	**N/A**
VVA-159	**4/25/2023**	**115**	**12:42**	**N/A**	**N/A**
VVA-160	**4/25/2023**	**115**	**13:13**	**N/A**	**N/A**
VVA-161	**4/25/2023**	**115**	**14:58**	**N/A**	**N/A**
VVA-162	**4/25/2023**	**115**	**16:42**	**N/A**	**N/A**
VVA-163	**4/22/2023**	**112**	**13:11**	**N/A**	**N/A**

5. *POINT COMPARISON*

Point ID	Point CK	Delta North (M)	Delta East (M)	Vertical Difference (M)
NVA				
NVA-156	NVA-156 CK	-0.010	-0.003	-0.024
NVA-157	NVA-157 CK	0.000	0.014	-0.020
NVA-158	NVA-158 CK	N/A	N/A	N/A
NVA-159	NVA-159 CK	N/A	N/A	N/A
NVA-160	NVA-160 CK	N/A	N/A	N/A
NVA-161	NVA-161 CK	N/A	N/A	N/A
NVA-162	NVA-162 CK	-0.002	0.003	-0.015
NVA-163	NVA-163 CK	N/A	N/A	N/A
NVA-164	NVA-164 CK	0.001	-0.002	0.018
NVA-165	NVA-165 CK	N/A	N/A	N/A
NVA-166	NVA-166 CK	N/A	N/A	N/A
NVA-167	NVA-167 CK	0.009	-0.004	-0.001
NVA-168	NVA-168 CK	-0.002	0.020	-0.019
NVA-169	NVA-169 CK	N/A	N/A	N/A
NVA-170	NVA-170 CK	N/A	N/A	N/A
NVA-171	NVA-171 CK	0.010	0.009	0.009
NVA-172	NVA-172 CK	0.002	-0.007	0.004
NVA-173	NVA-173 CK	0.012	0.003	0.024
NVA-174	NVA-174 CK	0.000	0.005	0.017
NVA-175	NVA-175 CK	N/A	N/A	N/A
NVA-176	NVA-176 CK	N/A	N/A	N/A
NVA-177	NVA-177 CK	N/A	N/A	N/A
NVA-178	NVA-178 CK	0.007	0.033	0.024
NVA-179	NVA-179 CK	N/A	N/A	N/A
NVA-180	NVA-180 CK	N/A	N/A	N/A
NVA-181	NVA-181 CK	0.008	0.005	0.020
NVA-182	NVA-182 CK	0.002	-0.002	0.028
NVA-183	NVA-183 CK	N/A	N/A	N/A
NVA-184	NVA-184 CK	-0.020	0.005	0.019
NVA-185	NVA-185 CK	N/A	N/A	N/A
NVA-186	NVA-186 CK	N/A	N/A	N/A
NVA-187	NVA-187 CK	N/A	N/A	N/A
NVA-188	NVA-188 CK	0.008	-0.008	0.010
NVA-189	NVA-189 CK	-0.003	0.012	0.031
NVA-190	NVA-190 CK	N/A	N/A	N/A
NVA-191	NVA-191 CK	N/A	N/A	N/A

NVA-192	NVA-192 CK	0.001	0.002	0.028
NVA-193	NVA-193 CK	0.005	0.007	0.009
NVA-194	NVA-194 CK	-0.012	-0.005	-0.005
NVA-195	NVA-195 CK	0.010	0.010	-0.028
NVA-196	NVA-196 CK	-0.007	0.009	-0.039
NVA-197	NVA-197 CK	N/A	N/A	N/A
NVA-198	NVA-198 CK	N/A	N/A	N/A
NVA-199	NVA-199 CK	N/A	N/A	N/A
NVA-200	NVA-200 CK	N/A	N/A	N/A
NVA-201	NVA-201 CK	0.017	-0.001	0.036
NVA-202	NVA-202 CK	0.006	-0.008	0.025
NVA-203	NVA-203 CK	0.005	-0.017	0.008
NVA-204	NVA-204 CK	N/A	N/A	N/A
NVA-205	NVA-205 CK	N/A	N/A	N/A
NVA-206	NVA-206 CK	N/A	N/A	N/A
NVA-207	NVA-207 CK	N/A	N/A	N/A
NVA-208	NVA-208 CK	0.011	0.008	0.028
NVA-209	NVA-209 CK	0.009	0.008	0.019
NVA-210	NVA-210 CK	-0.004	-0.003	0.009
NVA-211	NVA-211 CK	0.001	0.002	0.001
NVA-212	NVA-212 CK	0.002	-0.030	-0.001
NVA-213	NVA-213 CK	-0.001	0.005	0.002
NVA-214	NVA-214 CK	N/A	N/A	N/A
NVA-215	NVA-215 CK	-0.002	0.004	-0.004
NVA-216	NVA-216 CK	0.007	-0.002	0.039
NVA-217	NVA-217 CK	-0.016	-0.024	-0.009
NVA-218	NVA-218 CK	N/A	N/A	N/A
NVA-219	NVA-219 CK	N/A	N/A	N/A
NVA-220	NVA-220 CK	-0.006	-0.021	-0.013
NVA-221	NVA-221 CK	-0.003	0.006	0.019
NVA-222	NVA-222 CK	-0.002	0.012	0.002
NVA-223	NVA-223 CK	N/A	N/A	N/A
NVA-224	NVA-224 CK	N/A	N/A	N/A
NVA-225	NVA-225 CK	N/A	N/A	N/A
NVA-226	NVA-226 CK	N/A	N/A	N/A
NVA-227	NVA-227 CK	N/A	N/A	N/A
NVA-228	NVA-228 CK	N/A	N/A	N/A
Point ID	**Point CK**	**Delta North (M)**	**Delta East (M)**	**Vertical Difference (M)**
VVA				
VVA-106	VVA-106 CK	N/A	N/A	N/A

VVA-107	VVA-107 CK	N/A	N/A	N/A
VVA-108	VVA-108 CK	N/A	N/A	N/A
VVA-109	VVA-109 CK	N/A	N/A	N/A
VVA-110	VVA-110 CK	N/A	N/A	N/A
VVA-111	VVA-111 CK	0.004	0.000	-0.005
VVA-112	VVA-112 CK	-0.012	-0.016	0.007
VVA-113	VVA-113 CK	N/A	N/A	N/A
VVA-114	VVA-114 CK	-0.009	0.001	-0.015
VVA-115	VVA-115 CK	-0.003	0.007	0.010
VVA-116	VVA-116 CK	N/A	N/A	N/A
VVA-117	VVA-117 CK	0.003	0.002	0.001
VVA-118	VVA-118 CK	0.011	0.011	-0.009
VVA-119	VVA-119 CK	0.011	-0.013	-0.002
VVA-120	VVA-120 CK	-0.007	-0.001	0.031
VVA-121	VVA-121 CK	0.002	0.016	0.015
VVA-122	VVA-122 CK	N/A	N/A	N/A
VVA-123	VVA-123 CK	0.009	0.012	0.015
VVA-124	VVA-124 CK	N/A	N/A	N/A
VVA-125	VVA-125 CK	N/A	N/A	N/A
VVA-126	VVA-126 CK	N/A	N/A	N/A
VVA-127	VVA-127 CK	-0.004	-0.012	0.038
VVA-128	VVA-128 CK	-0.014	-0.001	-0.010
VVA-129	VVA-129 CK	0.009	-0.008	0.018
VVA-130	VVA-130 CK	N/A	N/A	N/A
VVA-131	VVA-131 CK	N/A	N/A	N/A
VVA-132	VVA-132 CK	N/A	N/A	N/A
VVA-133	VVA-133 CK	N/A	N/A	N/A
VVA-134	VVA-134 CK	N/A	N/A	N/A
VVA-135	VVA-135 CK	0.007	0.004	0.016
VVA-136	VVA-136 CK	-0.006	-0.001	0.020
VVA-137	VVA-137 CK	N/A	N/A	N/A
VVA-138	VVA-138 CK	N/A	N/A	N/A
VVA-139	VVA-139 CK	0.014	-0.004	0.026
VVA-140	VVA-140 CK	0.000	-0.002	0.019
VVA-141	VVA-141 CK	N/A	N/A	N/A
VVA-142	VVA-142 CK	-0.003	-0.006	0.009
VVA-143	VVA-143 CK	N/A	N/A	N/A
VVA-144	VVA-144 CK	N/A	N/A	N/A
VVA-145	VVA-145 CK	0.009	-0.015	0.000
VVA-146	VVA-146 CK	-0.011	0.014	0.014
VVA-147	VVA-147 CK	-0.014	0.017	0.004
VVA-148	VVA-148 CK	N/A	N/A	N/A
VVA-149	VVA-149 CK	0.009	-0.001	0.008

VVA-150	VVA-150 CK	0.008	-0.002	0.005
VVA-151	VVA-151 CK	-0.014	0.003	0.022
VVA-152	VVA-152 CK	0.004	-0.012	0.043
VVA-153	VVA-153 CK	0.005	0.014	0.033
VVA-154	VVA-154 CK	0.001	0.010	-0.013
VVA-155	VVA-155 CK	-0.012	0.013	0.012
VVA-156	VVA-156 CK	0.017	0.000	-0.017
VVA-157	VVA-157 CK	N/A	N/A	N/A
VVA-158	VVA-158 CK	N/A	N/A	N/A
VVA-159	VVA-159 CK	N/A	N/A	N/A
VVA-160	VVA-160 CK	N/A	N/A	N/A
VVA-161	VVA-161 CK	N/A	N/A	N/A
VVA-162	VVA-162 CK	N/A	N/A	N/A
VVA-163	VVA-163 CK	N/A	N/A	N/A