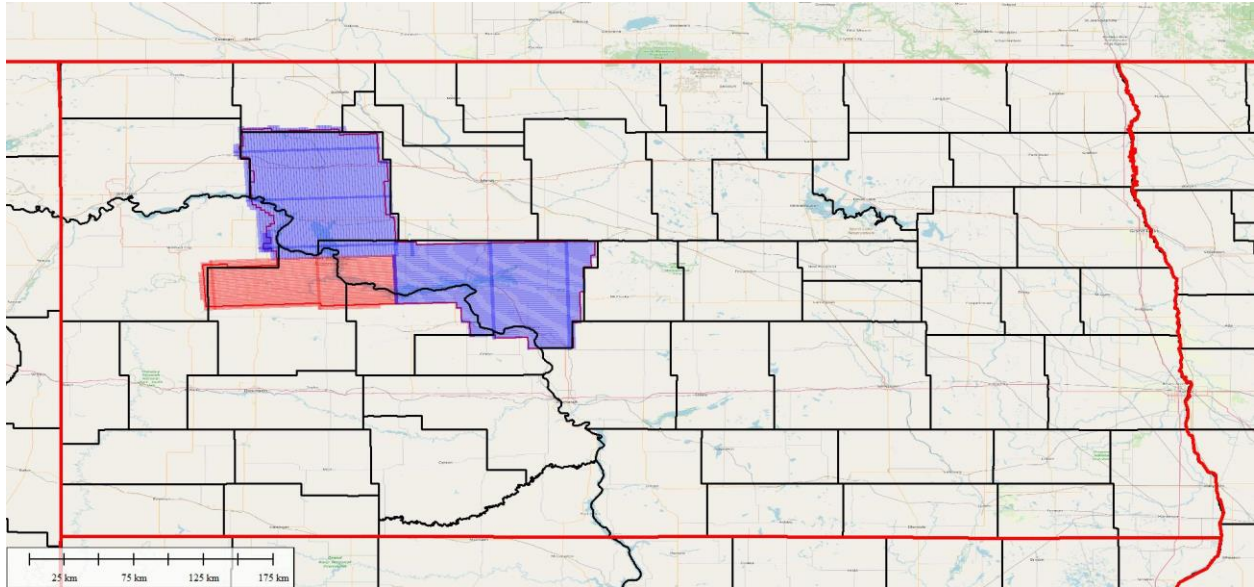


**REPORT OF LIDAR SURVEY**  
**Ground Control Report**  
**North Dakota**  
**Phase 10-Blocks B C D**



**Performed by:**

**TerraSurv**

**For:**

**Fugro Geospatial**

**Terrasurv Project Number: 21050**

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# REPORT OF SURVEY

## NORTH DAKOTA PHASE 10

### INTRODUCTION

Terrasurv, Inc of Pittsburgh, PA was tasked by Fugro Geospatial with performing a control survey in support of LiDAR data collection covering a portion of central North Dakota including the counties of McLean, Mountrail, and the northern half of Dunn. The phase 10 project consists of four blocks: A, B, C, and D. The current project does not include Block A, located along the Canadian border in Renville and a portion of Bottineau counties. The project consisted of two parts: 46 ground control (calibration) points (GCP) and 193 quality control (QC: NVA/VVA/VVA-F), for a total of 239 new stations. The map in figure 1 shows the location of the Ground Control (GCP) and figure 2 shows the location of the QC points. The control symbology for figures 1 and 2 are listed in table 1. Also shown are the Continuously Operating Reference Stations used in the project via the Trimble VRSNow VRS/RTN Network.

Table 1 - Map Symbology and Control Quantity

Type	Symbol	VA Quantity
Ground Control (GCP)	Green Dot	46
Non-Vegetated (NVA)	Red Dot	115
Vegetated (VVA)	Red X	70
Woods (VVA-F)	Yellow X	8
CORS	White square with red "+"	15

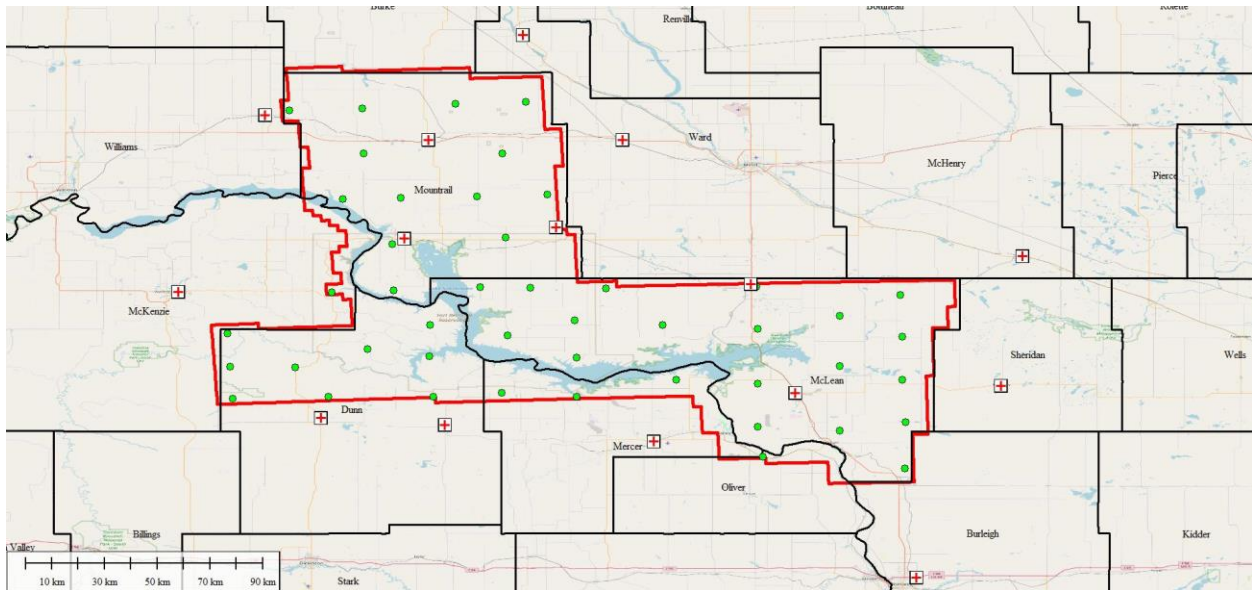


Figure 1 – GCP stations and CORS

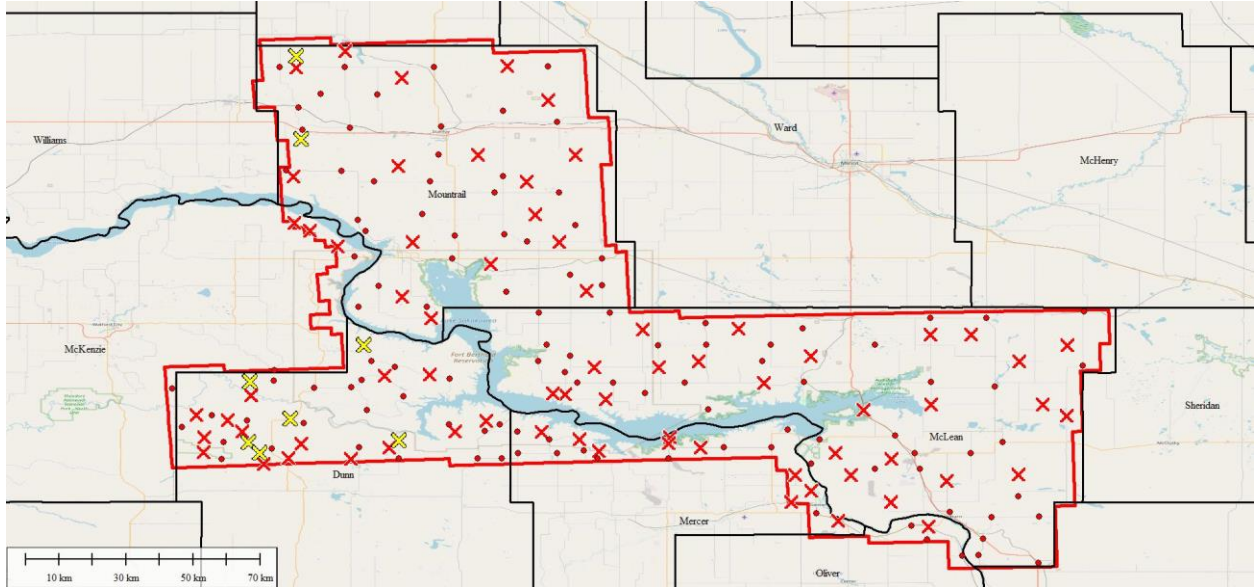


Figure 2 – Checkpoints

## CONTROL

The National Spatial Reference System (NSRS) was used to provide control for the network. The Trimble [VRSNow](#) real time network (RTN) was utilized. The horizontal datum for processing was the North American Datum of 1983 – NAD83 (2011), epoch 2010.0. These results were transformed to the NAD83 (NSRS2007) datum realization using the NGS NCAT utility. The vertical datum was the North American Vertical Datum of 1988 (NAVD88), realized with the GEOID12B geoid model from the National Geodetic Survey (NGS). This superseded geoid model was used at the request of the client.

## STATIONS

Table 2 lists the GCP and CP stations established in this survey, including the GCP, NVA, VVA, and VVA-F, as well as the CORS and the temporary bases established to survey some of the VVA-F points.

Table 2 - Station List

Station Name	GPSID	USGS Quadrangle	Description
	PRS726993621	KILLDEER	Trimble VRSNow CORS
	PRS578413396	SCHAFFER	Trimble VRSNow CORS
	PRS564310971	NEW TOWN	Trimble VRSNow CORS
	PRS146395842	HALLIDAY	Trimble VRSNow CORS
	PRS710450365	HAZEN WEST	Trimble VRSNow CORS
	PRS293847152	UNDERWOOD	Trimble VRSNow CORS
	PRS219240856	STANLEY	Trimble VRSNow CORS
	PRS384356447	KENMARE	Trimble VRSNow CORS
	PRS590151022	TIOGA	Trimble VRSNow CORS
	PRS976698893	BERTHOLD	Trimble VRSNow CORS
	PRS336468086	PLAZA	Trimble VRSNow CORS
	PRS626464516	MENOKEN SW	Trimble VRSNow CORS
	PRS709014801	MCCLUSKY	Trimble VRSNow CORS
	PRS416318893	MAX	Trimble VRSNow CORS
	PRS130830704	DRAKE	Trimble VRSNow CORS

Station Name	GPSID	USGS Quadrangle	Description
GCP001	21050AA	LONE BUTTE NE	dirt center of an intersection of 3 access roads.
GCP002	21050AB	ROSS	bare dirt on 92nd Avenue on north side of 59th Street
GCP003	21050AC	PETES CREEK	dirt centerline of a road to the south and the south side of 116th Avenue
GCP004	21050AD	SANISH	north edge of 38th Street at center of 90th Avenue extended
GCP005	21050AE	HALLIDAY NW	dirt edge of the intersection of 2nd Street NW and 86th Avenue NW.
GCP006	21050AF	BLACKWATER LAKE SW	bare dirt on field entrance on east side of 63rd Avenue
GCP007	21050AG	SANISH SE	bare ground at NE edge of 90th Avenue at field road to the NE
GCP008	21050AH	BEULAH NW	asphalt centerline of CR15 and on the south side of 2nd Street NW.
GCP009	21050AI	MANDAREE SE	dirt centerline of an access road to the east od BIA 17W.
GCP010	21050AJ	SADDLE BUTTE SW	dirt centerline of Mossett Road and the north side of BIA 22.
GCP011	21050AK	LONE BUTTE SE	north side of 9B Street NW and just west of a cattle guard.
GCP012	21050AL	ROSEGLLEN	dirt centerline of 27 1/2 Street NW and on the west side of 56th Avenue NW.
GCP013	21050AM	EMMET SE	dirt centerline of a field road to the south side of 6th Street NW.
GCP015	21050AO	MAX	dirt centerline of a field access on the north side of 28th Street NW.
GCP016	21050AP	GARRISON NE	dirt centerline of 34th Avenue NW and on the north side of 18th Street NW.
GCP017	21050AQ	RIVERDALE SOUTH	dirt centerline of 5th Street NW and on the west side of 34th Avenue NW.
GCP018	21050AR	KONGSBERG	dirt centerline of a drive to the north of 26th Street NW.
GCP019	21050AS	LONG LAKE	dirt centerline of a track road to the south of 16th Street NW and opposite 11th Avenue NW.
GCP020	21050AT	PETERSON LAKE	dirt centerline of 11th Avenue NW and on the south side of 6th Street NW.
GCP021	21050AU	HANNOVER NE	hard ground in center of field road on north side of Hwy 200 ALT
GCP022	21050AV	TURTLE CREEK SE	dirt centerline of 10 1/2 Avenue SW and on the south side of 4th Street SW.
GCP023	21050AW	WILTON	bare road surface on turn radius from 357 Avenue WB to 12th Avenue NB
GCP024	21050AX	SANISH SW	dirt center of a road to the north of SD22N and just south from a cattle guard.
GCP025	21050AY	STRING BUTTES	dirt centerline of BIA 21 and the west side of BIA 13.
GCP026	21050AZ	PARSHALL	dirt/gravel on field entrance on east side of 72nd Avenue opposite driveway west
GCP027	21050BA	BLACKWATER LAKE NW	bare road surface of 20th Street at west edge of 61st Avenue
GCP028	21050BB	RAT LAKE SW	bare dirt road surface at road intersection in oil well area
GCP029	21050BC	BELDEN SW	bare road surface in intersection of well access roads (49th Street)
GCP030	21050BD	EPWORTH	bare ground on entrance to pumps on north side of 49th Street and west side of 74th Avenue
GCP031	21050BE	PLAZA NW	bare road surface on NB lane of 63rd Avenue opposite north edge of drive west
GCP032	21050BF	WHITE EARTH	bare road surface on turn radius from 69th Street EB to 101st Avenue SB
GCP033	21050BG	COTTONWOOD LAKE	bare road surface of EB lane of 69th Lane east of drive north
GCP034	21050BH	CLEARWATER LAKE	bare ground in field entrance to sand quarry on east side of 75th Avenue



Station Name	GPSID	USGS Quadrangle	Description
GCP035	21050BI	PALERMO NE	dirt road surface in northbound lane of 64th avenue at C/L 71st Street
GCP047	21050BU	HORSESHOE VALLEY	dirt centerline of 19th Avenue NW and on the south side of 21st Street NW.
GCP049	21050BW	GOLDEN VALLEY NW	asphalt centerline of 75th Avenue NW and the south side of SD 1806.
GCP050	21050BX	EMMET NE	dirt centerline of 19th Street NW and on the west side of 47th Avenue NW.
GCP051	21050BY	STANTON SE	dirt centerline of 5th Street SW and on the east side of 34th Avenue SW.
GCP052	21050BZ	PARSHALL SW	bare ground on east side of 76th Avenue at C/L access road east to oil well
GCP053	21050CA	PARSHALL SE	road surface in NB lane of 68th Avenue opposite driveway west
GCP054	21050CB	PALERMO	bare dirt road surface in WB lane of 59th Street just west of 70th Avenue
GCP055	21050CC	RAUB	eastbound lane of BIA 9 at west side of Hwy 1804
GCP058	21050CF	LOST BRIDGE	asphalt centerline of 9th Street NW and the west side of 108th Avenue NW.
GCP059	21050CG	TURTLE CREEK SW	bare road surface in northbound travel lane of 21st Avenue north of 6th Street
GCP060	21050CH	TURTLE LAKE	dirt centerline of the southern levee road and on the east side of 21st Avenue NW.
GCP061	21050CI	DUNN CENTER NW	dirt centerline of an access to a well site on the north side of 2nd Street NW.
NVA046	21050EC	WHITE EARTH	dirt road surface on turn radius from 74th Street EB to 99th Avenue SB
NVA047	21050ED	ROSS NW	dirt road surface on turn radius from 91st Avenue (CR 7) NB to 74th Street EB
NVA048	21050EE	LOSTWOOD	bare dirt road surface on turn radius from 74th Street eastbound to Hwy 8 southbound
NVA049	21050EF	ROSS NW	bare road surface on turn radius from 94th Avenue NB to 69th Street EB
NVA050	21050EG	MANITOU	center of dirt driveway to RTC building on east side of 93rd Avenue
NVA051	21050EH	STANLEY	asphalt pavement in southeast bound lane of Prairie Drive just SE of Old Highway 2
NVA052	21050EI	RAT LAKE	pavement on turn radius from Hwy 1804 (paved) WB to 94th Avenue (dirt) NB
NVA053	21050EJ	RAT LAKE SE	bare ground on field entrance on west side of Hwy 1804 south of 46th Street
NVA054	21050EK	BELDEN SE	pavement on turn radius from 43rd Street WB to Hwy 8 NB
NVA055	21050EL	EPWORTH	bare ground on south side of 42nd Street opposite 71st Avenue
NVA056	21050EM	PALERMO NE	bare ground at west edge of grass triangle at C/L extended of 74th Street and about 100 feet west of 66th Avenue
NVA057	21050EN	BLAISDELL	sparse ground on field entrance on north side of old highway 2 just west of pavement and 67th Avenue
NVA058	21050EO	PALERMO	bare road surface in northbound lane of 74th Avenue just south of 66th Street
NVA059	21050EP	COTTONWOOD LAKE	bare road surface on turn radius from 87th Avenue SB to 69th Street WB
NVA060	21050EQ	STANLEY	bare ground in middle of 82nd Avenue on south edge of 58th Street
NVA061	21050ER	EPWORTH NW	bare ground in center of 54th Street (field road) on east side of 74th Avenue
NVA062	21050ES	SHELL LAKE	bare road surface on turn radius from 67th Avenue NB to 51st Street EB
NVA063	21050ET	SIKES DAM	bare ground on entrance to well pad on east side of 87th Avenue north of 53rd Street
NVA064	21050EU	EPWORTH NW	center of 75th Avenue (field road) on north side of 51st Street

Station Name	GPSID	USGS Quadrangle	Description
NVA065	21050EV	RAT LAKE SE	bare dirt on entrance to water depot on east side of Hwy 1804
NVA066	21050EW	SANISH	bare road surface on SB lane of 95th Avenue south of Hwy 23
NVA067	21050EX	SANISH	bare dirt in middle of drive into pipeline access on west side of 92nd Avenue
NVA068	21050EY	SANISH SE	bare road surface on turn radius from unnamed road NB to 30th Street EB
NVA069	21050EZ	PARSHALL	center of gravel drive to missile silo H-8 on west side of 76th Avenue
NVA070	21050FA	WABEK	sparse grass on field entrance in SW quadrant of intersection of 34th Street and 64th Avenue
NVA071	21050FB	MAKOTI SW	bare road surface in WB lane of 29th Street just west of 63rd Avenue
NVA072	21050FC	BLACKWATER LAKE	asphalt centerline of 57th Avenue NW and on the north side of 23rd Street NW.
NVA073	21050FD	RAUB	gravel entrance to substation on north side of Hwy 37 opposite Hwy 1804 from the south
NVA074	21050FE	EMMET NE	dirt centerline of 23rd Street NW and on the east side of 43rd Avenue NW.
NVA075	21050FF	BLUE HILL	asphalt centerline of 27th Street NW and on the west side of 51st Avenue NW.
NVA076	21050FG	EMMET	gravel centerline of 23rd Street NW and the west side of SD 28.
NVA077	21050FH	EMMET	asphalt centerline of 56th Avenue NW and on the north side of 16th Street NW.
NVA078	21050FI	GARRISON	asphalt centerline of 3rd Avenue SW and on the west side of 1st Street SW.
NVA079	21050FJ	COLEHARBOR NE	asphalt centerline of 16th Street NW and on the east side of 25th Avenue NW.
NVA080	21050FK	RUSO	SPARSE= centerline of a pasture access on the east side of SD41 and opposite 28th Street NW.
NVA081	21050FL	BUTTE	dirt centerline of a drive on the south side of the intersection of Coteau Street and Railroad Avenue.
NVA082	21050FM	TURTLE CREEK NW	asphalt centerline of 16th Avenue NW and on the south side of 5th Street NW.
NVA083	21050FN	WASHBURN NE	asphalt centerline of a dead-end road to the strip mine on the north side of 3rd Street NW.
NVA084	21050FO	SANGER	bare road surface of 13th Street east of 20/21 Street and US 83
NVA085	21050FP	STANTON	center of dirt road on SW side of Hwy 200 ALT
NVA086	21050FQ	HAZEN NW	gravel centerline of a field access on the west side of 51st Avenue NW and just south from SD1806.
NVA087	21050FR	HAY FLAT	asphalt centerline of 81C Avenue NW and the north side of BIA 22.
NVA088	21050FS	LONE BUTTE NE	dirt centerline of 120th Avenue NW and the north side of 15th Street NW.
NVA089	21050FT	MANDAREE	asphalt centerline of a well access on the south side of BIA Route 14.
NVA090	21050FU	OAKDALE	dirt centerline of a field access on the east side of 108th Avenue NW and opposite 4th Street NW.
NVA091	21050FV	LONE BUTTE SE	dirt centerline of 115M Avenue NW and on the south side of 10th Street NW.
NVA092	21050FW	KILLDEER MOUNTAINS	dirt centerline of a pasture access on the east side of 114th Avenue NW and just south of the intersection with 5th Street NW.
NVA093	21050FX	DUNN CENTER NE	dirt centerline of 4th Street NW and the west edge of 97th Avenue NW.
NVA094	21050FY	MANDAREE NE	asphalt centerline of a road to the south of BIA Route 12.
NVA095	21050FZ	MANDAREE NE	asphalt centerline of a drive to the north of BIA Route 12 and opposite BIA Route 14.

Station Name	GPSID	USGS Quadrangle	Description
NVA096	21050GA	MANDAREE NE	dirt centerline of the northern most of 2 roads to the west of BIA 14.
NVA097	21050GB	DUNN CENTER NE	asphalt centerline of 2nd Street NW and the west side of 92nd Avenue NW.
NVA098	21050GC	GOLDEN VALLEY NE	asphalt centerline of 6th Street NW and the east side of 73rd Avenue NW.
NVA099	21050GD	RAUB	sparse grass on field entrance in NE quadrant of intersection of 68th Avenue and 21st Street
NVA100	21050GE	BLACKWATER LAKE NW	bare road surface of 65th Avenue NB just north of Hwy 1804
NVA101	21050GF	RAUB NW	bare ground on field entrance on east side of Hwy 1804 opposite 20th Street
NVA102	21050GG	RAUB	bare road surface in intersection of 71st Avenue and 18th Street
NVA103	21050GH	RAUB	bare ground on turn radius from Hwy 1804 WB to driveway north
NVA104	21050GI	TWIN BUTTES	asphalt centerline of 77th Avenue NW and the southeast edge of BIA22.
NVA105	21050GJ	HALLIDAY NE	asphalt centerline of a pasture access on the south side of SD1806 and east of the intersection with SD 8N.
NVA106	21050GK	BEULAH NE	gravel centerline of 2nd Street NW and on the east side of SD 1806
NVA107	21050GL	HAZEN NE	gravel centerline of a field access on the east side of 45th Avenue NW and opposite the intersection with SD 1806.
NVA108	21050GM	GARRISON DAM SOUTH	dirt centerline of a dirt road to the east of 40th Avenue NW.
NVA109	21050GN	TURTLE CREEK SE	asphalt/gravel in middle of field entrance on south side of 9th Street
NVA110	21050GO	TURTLE CREEK SE	dirt centerline of 5th Street SW and on the west side of 14th Avenue SW.
NVA111	21050GP	TURTLE CREEK SW	center of gravel field entrance on north side of 9th Street east of 20th Avenue
NVA112	21050GQ	WILTON	pavement in middle of cul-de-sac
NVA113	21050GR	SANGER	sparse grass/bare dirt in middle of field entrance on east side of Hwy 1804 opposite 16th Street
NVA114	21050GS	SANGER	pavement on apron on east side of Hwy 1806 between RR and highway and south of 16th Street
NVA115	21050GT	WASHBURN SW	bare ground in middle of field road on south side of Hwy 200 ALT opposite 30th Avenue
NVA116	21050GU	FORT CLARK NE	bare road surface in WB lane of 13th Street just west of 8th Avenue
NVA117	21050GV	WASHBURN	center of gravel parking pad for RV in RV park
NVA118	21050GW	WASHBURN NE	bare ground on old field entrance on north side of Main Street
NVA119	21050GX	COLEHARBOR	asphalt centerline of a drive to the east of US83.
NVA120	21050GY	UNDERWOOD	dirt centerline of Main Street and on the west side of 32nd Avenue NW.
NVA121	21050GZ	GARRISON DAM SOUTH	asphalt centerline of Colorado Street and on the west side of Dakota Street.
NVA122	21050HA	GARRISON DAM NORTH	dirt centerline of a private road to the south of Sakakawea Estates Road.
NVA123	21050HB	EMMET SW	dirt centerline of 53rd Avenue NW and 11th Street NW.
NVA124	21050HC	BENEDICT	dirt centerline of a track road to the south of the intersection of 28th Street NW and 23rd Avenue NW.
NVA125	21050HD	HORSESHOE VALLEY	dirt centerline of a field access on the east side of SD 41.
NVA126	21050HE	TURTLE CREEK NW	asphalt centerline of 20th Avenue NW and on the south side of 3rd Street NW.



Station Name	GPSID	USGS Quadrangle	Description
NVA127	21050HF	DOUGLAS EAST	dirt centerline of 26th Street NW and on the west side of 39th Avenue NW.
NVA128	21050HG	COLEHARBOR NW	dirt centerline of 23rd Street NW and on the east side of 30th Avenue NW.
NVA129	21050HH	ALKALI LAKE	east side of CR 33 and west side of 4th Avenue NW.
NVA130	21050HI	EMMET NE	dirt centerline of 20th Street NW and on the west side of 44th Avenue NW.
NVA131	21050HJ	PARSHALL SW	bare ground on field entrance on north side of 29th Street
NVA132	21050HK	SHELL CREEK BAY	gravel parking area on south side of Hwy 1804
NVA133	21050HL	BELDEN SW	bare road surface on turn radius from 84th Avenue NB to 47th Street EB
NVA134	21050HM	WHITE EARTH	bare road surface on turn radius from Front Street SE bound to McTavish Avenue SW bound
NVA135	21050HN	TIOGA SE	bare dirt in NW corner of intersection of US 2 and 99th Drive
NVA136	21050HO	CHARLSON NE	paved apron to field entrance on Hwy 1804 east of 101st Avenue
NVA137	21050HP	WABEK	gravel parking lot for plaza sub-station on west side of 64th Avenue and south of Hwy 23
NVA138	21050HQ	EPWORTH SE	bare road surface on turn radius from 65th Avenue SB to 45th Street WB
NVA139	21050HR	ROBINSON LAKE	bare road surface in NB lane of 90th Avenue just north of 53rd Street
NVA140	21050HS	EPWORTH	bare ground on field entrance on north side of 43rd Street opposite 74th Avenue
NVA141	21050HT	MANDAREE SE	dirt centerline of an access road to the southwest of BIA 17W.
NVA142	21050HU	SADDLE BUTTE SW	dirt centerline of 12th Street NW and the east side of BIA 17.
NVA143	21050HV	HAY FLAT	dirt centerline of Mossett Road and the north side of BIA 22.
NVA144	21050HW	TWIN BUTTES	asphalt centerline of BIA 20 and the east side of SD 8N.
NVA145	21050HX	GOLDEN VALLEY NE	asphalt centerline of 3rd Street NW and the northeast side of SD1806.
NVA146	21050HY	GOLDEN VALLEY NE	dirt centerline of a drive to the north of CR 11.
NVA147	21050HZ	BEULAH NW	dirt centerline of 2nd Street NW and east side of CR13.
NVA148	21050IA	GOLDEN VALLEY NW	dirt centerline of 2nd Street NW and the west side of 79th Avenue NW.
NVA149	21050IB	GOLDEN VALLEY NW	asphalt centerline of CR 1 and the north side of SD 1806.
NVA150	21050IC	LOST BRIDGE	dirt centerline of a private road to the east of 104th Avenue NW.
NVA151	21050ID	KILLDEER MOUNTAINS	dirt centerline of a drive to Olson Ranch on the west side of 114th Avenue NW.
NVA152	21050IE	FIGURE 4 RANCH	asphalt centerline of a road to the west of Bear Den Road.
NVA153	21050IF	FIGURE 4 RANCH	dirt centerline of a road to the south of another road.
NVA154	21050IG	NORTH KILLDEER MOUNTAIN	dirt centerline of a road to the north side of 111th Avenue NW.
NVA155	21050IH	LONE BUTTE SE	dirt centerline of a trail and the west edge of an access road.
NVA156	21050II	MANDAREE	dirt centerline of a pasture access on the west side of BIA 17W and just south from BIA 14.
NVA157	21050IJ	SADDLE BUTTE	gravel centerline of BIA 12S and the east side of BIA 15.
NVA158	21050IK	PARSHALL NE	bare dirt in middle of field entrance on east side of 68th Avenue opposite 36th Street
NVA159	21050IL	BLACKWATER LAKE SE	asphalt centerline of 14th Street NW and on the west side of 61st Avenue NW.

Station Name	GPSID	USGS Quadrangle	Description
NVA160	21050IM	NEW TOWN SW	pavement on turn radius from 86th Avenue NE bound to 30th Street SE bound
VVA036	21050JW	WHITE EARTH	high brush on south side of 74th Street west of intersection
VVA037	21050JX	POWERS LAKE	brush on south side of 77th Street east of 91st Avenue at fiber optic vault
VVA038	21050JY	LOSTWOOD	high brush in SW quadrant of intersection of 84th Avenue and 72nd Street
VVA039	21050JZ	PALERMO NW	high weeds at NE corner of field on west side of 71st Avenue
VVA040	21050KA	PALERMO NE	high weeds in SE quadrant of intersection of 68th Street and 66th Avenue
VVA041	21050KB	BLAISDELL	high brush on west side of 65th Avenue south of 58th Street between road and field
VVA042	21050KC	STANLEY SE	high brush on south side of 58th Street west of 77th avenue at low spot
VVA043	21050KD	ROBINSON LAKE	brush in SE quadrant of intersection of 56th Street and 87th Avenue
VVA044	21050KE	SHELL CREEK BAY	high brush on north side of 38th Street east of 78th Avenue
VVA045	21050KF	CHARLSON NE	brush on south side of 54th Street and east side of entrance to well opposite 100th Avenue
VVA046	21050KG	CHARLSON	brush on north side of trail west of 100th Avenue
VVA047	21050KH	RAT LAKE SW	brush in SW quadrant of intersection of 44th street and 98th Avenue
VVA048	21050KI	RAT LAKE SW	brush on east side of 41st Street just south of 97th Avenue
VVA049	21050KJ	BELDEN SW	brush on east side of 41st Street just south of 42nd Street
VVA050	21050KK	NEW TOWN	high brush on north side of 32nd Street and east side of 89th Avenue (field road)
VVA051	21050KL	NEW TOWN SW	brush on west side of unnamed road just south of 28th Street at NE corner of fallow field
VVA052	21050KM	PARSHALL NE	brush on east side of 66th avenue opposite 33rd Street at SW corner of field
VVA053	21050KN	EPWORTH SE	high brush on south side of 42nd Street east of 67th Avenue at NE corner of field
VVA054	21050KO	EPWORTH	brush on north side of 47th Street on west side of 70th Avenue extended
VVA055	21050KP	EPWORTH NW	brush in NW quadrant of intersection of 71st Avenue and 53rd Street
VVA056	21050KQ	LONE BUTTE SE	GRASS= field on the south side of 10th Street NW.
VVA057	21050KR	NORTH KILLDEER MOUNTAIN	GRASS= field on the east side of 113th Avenue NW and north side of an access road to a well site.
VVA058	21050KS	NORTH KILLDEER MOUNTAIN	GRASS= south shoulder of 7th Street NW and north side of 2 well sites.
VVA059	21050KT	LONE BUTTE SE	GRASS= top of hill between two well sites at the end of 6th Street NW.
VVA060	21050KU	PETES CREEK	GRASS= south side of a track road to the west of a main access road.
VVA061	21050KV	OAKDALE	GRASS= east side of a well site access road.
VVA062	21050KW	OAKDALE	GRASS= north shoulder of 2nd Street NW and the east side of a road to the north.
VVA063	21050KX	OAKDALE	GRASS= west shoulder of 109th Avenue SW and just south of 1st Street SW.
VVA064	21050KY	NORTH KILLDEER MOUNTAIN	GRASS= south side of a dirt road.
VVA065	21050KZ	MANDAREE NE	GRASS= north shoulder of BIA 14 and opposite the intersection with BIA 17E.
VVA066	21050LA	STRING BUTTES	GRASS= north shoulder of BIA Route 12.
VVA067	21050LB	HAY FLAT	GRASS= north side of BIA 20 and to the east of a drive.

Station Name	GPSID	USGS Quadrangle	Description
VVA068	21050LC	HAY FLAT	GRASS= south side of BIA 22 and west from a cell tower access road to the south.
VVA069	21050LD	DUNN CENTER NW	GRASS= east shoulder of 98th Avenue NW.
VVA070	21050LE	DUNN CENTER NE	GRASS= south side of 4th Street NW and on the east side of a well access road.
VVA071	21050LF	RAUB SE	GRASS= north shoulder of 7th Street NW and west of a drive to the north.
VVA072	21050LG	BLACKWATER LAKE NW	corn field on east side of 65th Avenue south of 19th Street
VVA073	21050LH	BLACKWATER LAKE SW	brush on south side of 13th Street and east side of 66th Avenue at NW corner of field
VVA074	21050LI	RAUB SE	corn field on west side of 71st Avenue
VVA075	21050LJ	RAUB SE	brush on north side of 14th Street
VVA076	21050LK	GOLDEN VALLEY NE	GRASS= field on the northeast of the intersection of 6th Street NW, 69th Avenue NW and BIA 222.
VVA077	21050LL	BEULAH NW	GRASS= north shoulder of 67th Avenue NW and west of a pasture access.
VVA078	21050LM	BLACKWATER LAKE SE	GRASS= north side of 58th Avenue NW and east from a dirt road to the lake shore.
VVA079	21050LN	BEULAH NE	GRASS= vacant lot on the east side of Lake Shore Estates and opposite storage buildings.
VVA080	21050LO	HAZEN NW	GRASS= southwest quadrant of the intersection of 54th Avenue NW and 4th Street NW.
VVA081	21050LP	GARRISON DAM SOUTH	fallow field on SW side of CR 37 opposite 42nd Avenue
VVA082	21050LQ	STANTON	brush on NW side of CR18 and SW side of CR 37 in SE corner of field
VVA083	21050LR	STANTON	high weeds on north side of 6th Street
VVA084	21050LS	STANTON SE	high weeds on SW side of Hwy 200 ALT and north side of road to substation
VVA085	21050LT	WASHBURN	brush on south side of CR 4 where road turns south across RR tracks
VVA086	21050LU	WASHBURN SW	GRASS= center of an island at the intersection of 6th Street SW and 30th Avenue SW.
VVA087	21050LV	RIVERDALE SOUTH	GRASS= north shoulder of 1st Street SW and west from 35th Avenue SW.
VVA088	21050LW	RIVERDALE SOUTH	GRASS= east shoulder of 37th Avenue NW and north from 3rd Street NW.
VVA089	21050LX	ALKALI LAKE	GRASS= northeast from the intersection of 23rd Street NW and 6th Avenue NW.
VVA090	21050LY	PETERSON LAKE	GRASS= southwest from the intersection of 11th Avenue NW and 12th Street NW.
VVA091	21050LZ	PELICAN LAKE	GRASS= southwest from the intersection of SD 33 and 10th Street NW.
VVA092	21050MA	TURTLE CREEK NE	GRASS= southeast from the intersection of 1st Street SW and 14th Avenue SW.
VVA093	21050MB	WASHBURN NE	high weeds on east side of Hwy 200 ALT south of 2nd Street
VVA094	21050MC	UNDERWOOD	GRASS= northeast from the intersection of 2nd Street NW and 30th Avenue NW.
VVA095	21050MD	RIVERDALE NORTH	GRASS= northeast from the intersection of 11th Street NW and US 83.
VVA096	21050ME	EMMET NE	GRASS= west shoulder of 46th Avenue NW and north from SD 1804.
VVA097	21050MF	EMMET	GRASS= north shoulder of 20th Street NW and east from 52nd Avenue NW.
VVA098	21050MG	BLACKWATER LAKE	GRASS= southeast shoulder from the intersection of 19th Street NW and 57th Avenue NW.
VVA099	21050MH	ROSEGLEN	GRASS= northwest shoulder from the intersection of 26th Street NW and 59th Avenue NW.
VVA100	21050MI	DOUGLAS WEST	GRASS= northwest from the intersection of 26th Street NW and 47th Avenue NW.

Station Name	GPSID	USGS Quadrangle	Description
VVA101	21050MJ	GARRISON	GRASS= southwest from the intersection of 21st Street NW and 38th Avenue NW.
VVA102	21050MK	BENEDICT	GRASS= southwest from the intersection of 25th Street NW and 23rd Avenue NW.
VVA103	21050ML	LAKE NETTIE	GRASS= east shoulder of 25th Avenue NW and on the north side of a drive to Eveson Ranch.
VVA104	21050MM	LONG LAKE	GRASS= southwest from the intersection of 12th Avenue NW and 20th Street NW.
VVA105	21050MN	RUSO	GRASS= southwest of the intersection of 18th Avenue NW and a road to the west.
VVAF03	21050MQ	MANDAREE NE	trees on the north side of an intersection of 2 roads.
VVAF03BASE	21050WC	MANDAREE NE	Temporary base for VVA-F woods point
VVAF04	21050MR	CROFF	TREES= south side of 11th Avenue NW.
VVAF04BASE	21050WB	CROFF	Temporary base for VVA-F woods point
VVAF05	21050MS	BATTLEVIEW	line of pine trees on north side of 76th Street opposite driveway south
VVAF06	21050MT	TIOGA SE	woods on SE side of 99th Drive
VVAF07	21050MU	KILLDEER MOUNTAINS	TREES= north side of Gap Road and west from 11th Avenue NW.
VVAF07BASE	21050WA	KILLDEER MOUNTAINS	Temporary base for VVA-F woods point
VVAF08	21050MV	DUNN CENTER NE	TREES= east side of 92nd Avenue NW and beside a pull off.
VVAF08BASE	21050WE	DUNN CENTER NE	Temporary base for VVA-F woods point
VVAF09	21050MW	LOST BRIDGE	TREES= along the east side of SD22.
VVAF09BASE	21050WD	LOST BRIDGE	Temporary base for VVA-F woods point
VVAF10	21050MX	KILLDEER MOUNTAINS	TREES= south side of 3rd Street NW and north of Bridger/Bonneville CTB.

The stations were not permanently marked.

## METHODOLOGY

The field survey was done by using Trimble R10 and R10-2 multi-frequency, multi-constellation GNSS receivers in a real time (RTK/VRS) mode. Corrections were obtained from the VRSNow network with corrections delivered over the cellular network. These corrections are applied in real time and used by the rover receiver to converge to a cm level solution. Each station was occupied once for a minimum of 2 minutes (120 epochs), then re-initialized and occupied a second time immediately after the first occupation. Additional observations were made if necessary to ensure agreement at the 0.03 m level. The solutions are stored as vectors from the nearest physical CORS. Three of the eight woods checkpoints were done using the VRS, and the other five were done by establishing a temporary base nearby using the VRS network and then using a second receiver as a rover with corrections delivered over a radio link. One station, GCP28, was in an area with no cell service. This station was surveyed using the Trimble Centerpoint RTX service, which functions somewhat similar to the VRS service but corrections from a worldwide network of reference stations are delivered over a satellite communications link in real-time. Table 3 summarizes the VRS/RTK occupations (precisions in meters).

Table 3 – VRS/RTK Occupation Summary

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRSS78413396853	21050AA	11/02/2021 18:34:58	18:36:57	0.009	0.012	18	1.3
PRSS78413396853	21050AA	11/02/2021 18:37:44	18:39:43	0.009	0.012	20	1.2

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS219240856098	21050AB	11/08/2021 17:16:32	17:18:31	0.008	0.010	19	1.2
PRS219240856098	21050AB	11/08/2021 17:18:57	17:20:56	0.009	0.010	19	1.2
PRS726993621058	21050AC	11/01/2021 21:48:35	21:50:36	0.008	0.015	16	1.5
PRS726993621058	21050AC	11/01/2021 21:51:20	21:53:19	0.009	0.019	15	1.6
PRS564310971284	21050AD	11/10/2021 14:59:31	15:01:30	0.006	0.009	20	1.2
PRS564310971284	21050AD	11/10/2021 15:01:51	15:03:50	0.006	0.009	15	1.3
PRS146395842822	21050AE	11/03/2021 15:57:53	15:59:52	0.008	0.013	16	1.6
PRS146395842822	21050AE	11/03/2021 16:01:02	16:03:01	0.008	0.013	16	1.6
PRS710450365219	21050AF	11/09/2021 18:52:49	18:54:48	0.009	0.015	21	1.4
PRS710450365219	21050AF	11/09/2021 18:56:49	18:58:48	0.009	0.013	21	1.3
PRS564310971284	21050AG	11/10/2021 14:10:23	14:12:39	0.009	0.012	18	1.3
PRS564310971284	21050AG	11/10/2021 14:13:06	14:15:05	0.009	0.013	13	1.5
PRS710450365219	21050AH	11/03/2021 21:55:57	21:57:56	0.009	0.020	13	2.2
PRS710450365219	21050AH	11/03/2021 21:58:50	22:00:49	0.009	0.016	14	1.6
PRS726993621058	21050AI	11/02/2021 21:45:07	21:47:06	0.010	0.015	14	1.5
PRS726993621058	21050AI	11/02/2021 21:47:32	21:49:31	0.010	0.014	13	1.7
PRS146395842822	21050AJ	11/03/2021 17:34:32	17:36:34	0.011	0.014	16	1.4
PRS146395842822	21050AJ	11/03/2021 17:36:58	17:38:57	0.011	0.014	15	1.4
PRS726993621058	21050AK	11/01/2021 23:18:02	23:20:01	0.010	0.015	15	1.4
PRS726993621058	21050AK	11/01/2021 23:20:23	23:22:22	0.010	0.015	10	1.6
PRS336468086984	21050AL	12/04/2021 16:25:39	16:27:39	0.009	0.012	16	1.4
PRS336468086984	21050AL	12/04/2021 16:28:15	16:30:14	0.010	0.013	16	1.5
PRS710450365219	21050AM	11/04/2021 13:38:36	13:40:35	0.012	0.016	19	1.2
PRS710450365219	21050AM	11/04/2021 13:41:18	13:43:17	0.012	0.015	17	1.3
PRS41631889358	21050AO	12/03/2021 21:15:16	21:17:15	0.005	0.007	16	1.4
PRS41631889358	21050AO	12/03/2021 21:18:24	21:20:23	0.005	0.006	18	1.2
PRS41631889358	21050AP	12/03/2021 21:50:42	21:52:41	0.008	0.011	19	1.1
PRS41631889358	21050AP	12/03/2021 21:53:35	21:55:34	0.008	0.011	18	1.2
PRS293847152424	21050AQ	12/03/2021 15:54:03	15:56:03	0.008	0.011	19	1.2
PRS293847152424	21050AQ	12/03/2021 15:57:59	16:00:00	0.008	0.009	19	1.2
PRS130830704922	21050AR	12/03/2021 19:49:11	19:51:10	0.009	0.017	17	1.2
PRS130830704922	21050AR	12/03/2021 19:53:03	19:55:03	0.009	0.015	16	1.3
PRS709014801347	21050AS	12/02/2021 21:45:50	21:47:49	0.009	0.013	18	1.1
PRS709014801347	21050AS	12/02/2021 21:48:19	21:50:20	0.009	0.012	15	1.3
PRS709014801347	21050AT	12/02/2021 20:57:21	20:59:21	0.010	0.015	14	1.6
PRS709014801347	21050AT	12/02/2021 20:59:59	21:01:58	0.010	0.017	12	1.6
PRS293847152424	21050AU	11/12/2021 19:45:54	19:47:53	0.009	0.014	21	1.1
PRS293847152424	21050AU	11/12/2021 19:48:29	19:50:28	0.009	0.013	21	1.1
PRS709014801347	21050AV	12/02/2021 20:17:39	20:19:39	0.012	0.017	16	1.2
PRS709014801347	21050AV	12/02/2021 20:20:09	20:22:08	0.011	0.016	12	1.5
PRS626464516455	21050AW	11/12/2021 21:48:30	21:50:32	0.012	0.018	15	1.7
PRS626464516455	21050AW	11/12/2021 21:51:29	21:53:28	0.012	0.018	15	1.7
PRS564310971284	21050AX	11/02/2021 22:59:35	23:01:34	0.010	0.015	14	1.4
PRS564310971284	21050AX	11/02/2021 23:02:40	23:04:39	0.010	0.013	14	1.4
PRS564310971284	21050AY	11/02/2021 20:25:39	20:27:40	0.010	0.013	17	1.3
PRS564310971284	21050AY	11/02/2021 20:28:17	20:30:16	0.011	0.014	17	1.3
PRS336468086984	21050AZ	11/09/2021 16:36:42	16:38:41	0.009	0.012	19	1.4
PRS336468086984	21050AZ	11/09/2021 16:39:00	16:40:59	0.011	0.014	16	1.4
PRS336468086984	21050BA	11/09/2021 18:15:30	18:17:29	0.010	0.015	17	1.5
PRS336468086984	21050BA	11/09/2021 18:18:04	18:18:22	0.013	0.021	17	1.5
PRS336468086984	21050BA	11/09/2021 18:19:55	18:21:54	0.010	0.016	18	1.4
PRS564310971284	21050BC	11/08/2021 21:57:51	21:59:50	0.009	0.013	16	1.3
PRS564310971284	21050BC	11/08/2021 22:00:48	22:02:47	0.009	0.014	16	1.4
PRS219240856098	21050BD	11/09/2021 14:55:55	14:57:54	0.009	0.012	18	1.3
PRS336468086984	21050BD	11/09/2021 14:58:31	15:00:30	0.009	0.013	18	1.3
PRS336468086984	21050BE	11/09/2021 15:50:33	15:52:32	0.006	0.011	20	1.3
PRS336468086984	21050BE	11/09/2021 15:52:53	15:54:52	0.007	0.010	13	1.6
PRS59015102271	21050BF	11/08/2021 16:07:46	16:09:45	0.006	0.009	20	1.4
PRS59015102271	21050BF	11/08/2021 16:11:45	16:13:44	0.005	0.008	20	1.4
PRS219240856098	21050BG	11/08/2021 14:00:25	14:02:37	0.008	0.010	20	1.3
PRS219240856098	21050BG	11/08/2021 14:03:02	14:05:01	0.008	0.011	19	1.3
PRS219240856098	21050BH	11/07/2021 22:44:53	22:46:52	0.009	0.014	16	1.4
PRS219240856098	21050BH	11/07/2021 22:47:19	22:49:18	0.009	0.015	14	1.6
PRS38435644749	21050BI	11/07/2021 21:58:10	22:00:09	0.010	0.016	18	1.3

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS38435644749	21050BI	11/07/2021 22:00:49	22:02:48	0.010	0.018	18	1.2
PRS41631889358	21050BU	12/03/2021 18:19:12	18:21:11	0.010	0.012	19	1.3
PRS41631889358	21050BU	12/03/2021 18:21:34	18:23:33	0.010	0.013	18	1.3
PRS146395842822	21050BW	11/03/2021 20:04:16	20:06:16	0.010	0.013	18	1.4
PRS146395842822	21050BW	11/03/2021 20:07:05	20:09:04	0.012	0.014	16	1.5
PRS41631889358	21050BX	12/04/2021 14:33:24	14:35:24	0.009	0.014	18	1.2
PRS41631889358	21050BX	12/04/2021 14:36:15	14:38:14	0.008	0.013	18	1.2
PRS293847152424	21050BY	12/03/2021 14:03:25	14:05:24	0.008	0.013	18	1.4
PRS293847152424	21050BY	12/03/2021 14:06:09	14:08:08	0.007	0.012	18	1.4
PRS564310971284	21050BZ	11/09/2021 21:44:08	21:46:07	0.009	0.015	18	1.2
PRS564310971284	21050BZ	11/09/2021 21:47:02	21:49:01	0.008	0.015	18	1.2
PRS336468086984	21050CA	11/09/2021 21:20:14	21:22:15	0.009	0.015	15	1.6
PRS336468086984	21050CA	11/09/2021 21:22:41	21:24:14	0.010	0.016	15	1.6
PRS219240856098	21050CB	11/09/2021 13:27:20	13:29:19	0.007	0.011	20	1.2
PRS219240856098	21050CB	11/09/2021 13:29:57	13:31:56	0.007	0.010	21	1.1
PRS146395842822	21050CC	11/09/2021 20:43:06	20:45:05	0.010	0.014	16	1.5
PRS146395842822	21050CC	11/09/2021 20:45:29	20:47:28	0.009	0.013	12	1.7
PRS726993621058	21050CF	11/02/2021 15:28:44	15:29:54	0.009	0.012	18	1.2
PRS726993621058	21050CF	11/02/2021 15:31:30	15:33:29	0.009	0.011	18	1.2
PRS293847152424	21050CG	11/12/2021 22:35:23	22:37:22	0.011	0.013	17	1.1
PRS293847152424	21050CG	11/12/2021 22:37:48	22:39:47	0.011	0.016	16	1.3
PRS293847152424	21050CH	12/02/2021 23:00:32	23:02:32	0.008	0.012	19	1.3
PRS293847152424	21050CH	12/02/2021 23:04:20	23:06:19	0.008	0.013	19	1.3
PRS726993621058	21050CI	11/02/2021 13:33:55	13:35:54	0.006	0.013	17	1.7
PRS726993621058	21050CI	11/02/2021 13:37:06	13:39:05	0.007	0.012	14	1.8
PRS59015102271	21050EC	11/08/2021 15:37:41	15:39:40	0.012	0.018	19	1.4
PRS59015102271	21050EC	11/08/2021 15:40:08	15:42:07	0.012	0.019	15	1.4
PRS59015102271	21050ED	11/08/2021 14:46:44	14:48:46	0.009	0.012	20	1.2
PRS59015102271	21050ED	11/08/2021 14:49:09	14:51:10	0.010	0.013	16	1.4
PRS219240856098	21050EE	11/07/2021 23:04:13	23:06:25	0.010	0.016	16	1.4
PRS219240856098	21050EE	11/07/2021 23:06:42	23:08:41	0.012	0.016	15	1.4
PRS59015102271	21050EF	11/08/2021 13:45:08	13:47:07	0.009	0.012	21	1.3
PRS59015102271	21050EF	11/08/2021 13:47:31	13:49:30	0.010	0.012	17	1.5
PRS219240856098	21050EG	11/08/2021 13:24:12	13:26:11	0.009	0.013	16	1.4
PRS219240856098	21050EG	11/08/2021 13:26:34	13:28:33	0.008	0.013	18	1.5
PRS219240856098	21050EH	11/07/2021 23:21:30	23:23:29	0.004	0.005	17	1.2
PRS219240856098	21050EH	11/07/2021 23:23:59	23:25:58	0.004	0.005	16	1.2
PRS219240856098	21050EI	11/08/2021 17:32:40	17:34:43	0.010	0.011	19	1.3
PRS219240856098	21050EI	11/08/2021 17:35:14	17:37:13	0.011	0.012	15	1.4
PRS564310971284	21050EJ	11/08/2021 19:14:47	19:16:44	0.009	0.016	21	1.5
PRS564310971284	21050EJ	11/08/2021 19:18:25	19:20:24	0.008	0.017	21	1.5
PRS564310971284	21050EK	11/09/2021 23:02:45	23:04:49	0.008	0.011	15	1.5
PRS564310971284	21050EK	11/09/2021 23:05:11	23:07:10	0.008	0.010	15	1.3
PRS336468086984	21050EL	11/09/2021 22:37:49	22:39:48	0.011	0.017	14	1.6
PRS336468086984	21050EL	11/09/2021 22:40:16	22:42:15	0.011	0.017	14	1.6
PRS38435644749	21050EM	11/07/2021 22:11:00	22:13:41	0.009	0.014	17	1.5
PRS38435644749	21050EM	11/07/2021 22:15:06	22:17:05	0.008	0.014	17	1.4
PRS219240856098	21050EN	11/07/2021 21:26:51	21:28:51	0.012	0.018	13	1.4
PRS219240856098	21050EN	11/07/2021 21:29:33	21:31:32	0.012	0.018	13	1.4
PRS219240856098	21050EO	11/07/2021 21:13:07	21:15:06	0.010	0.014	14	1.3
PRS219240856098	21050EO	11/07/2021 21:09:39	21:12:28	0.010	0.012	15	1.2
PRS219240856098	21050EP	11/08/2021 14:11:49	14:13:48	0.008	0.011	22	1.2
PRS219240856098	21050EP	11/08/2021 14:14:10	14:16:09	0.008	0.011	16	1.4
PRS219240856098	21050EQ	11/08/2021 22:54:26	22:55:47	0.008	0.010	17	1.2
PRS219240856098	21050EQ	11/08/2021 22:58:40	23:00:39	0.008	0.009	17	1.2
PRS219240856098	21050EQ	11/08/2021 23:01:05	23:02:10	0.008	0.010	12	1.4
PRS219240856098	21050ER	11/09/2021 14:34:58	14:36:57	0.009	0.014	18	1.3
PRS219240856098	21050ER	11/09/2021 14:37:21	14:39:20	0.008	0.013	16	1.4
PRS336468086984	21050ES	11/09/2021 15:28:20	15:30:19	0.007	0.010	19	1.2
PRS336468086984	21050ES	11/09/2021 15:32:11	15:34:10	0.006	0.010	18	1.3
PRS219240856098	21050ET	11/08/2021 22:19:05	22:21:04	0.009	0.013	15	1.6
PRS219240856098	21050ET	11/08/2021 22:21:38	22:23:37	0.009	0.013	15	1.5
PRS219240856098	21050EU	11/09/2021 14:46:20	14:48:20	0.009	0.014	18	1.3
PRS219240856098	21050EU	11/09/2021 14:48:44	14:50:43	0.009	0.013	15	1.5



GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS564310971284	21050EV	11/08/2021 19:25:12	19:27:11	0.007	0.015	20	1.6
PRS564310971284	21050EV	11/08/2021 19:27:35	19:29:34	0.008	0.014	19	1.4
PRS564310971284	21050EW	11/08/2021 20:02:00	20:03:59	0.008	0.011	20	1.3
PRS564310971284	21050EW	11/08/2021 20:04:25	20:06:24	0.008	0.011	20	1.2
PRS564310971284	21050EX	11/10/2021 14:44:47	14:46:46	0.007	0.012	17	1.4
PRS564310971284	21050EX	11/10/2021 14:47:08	14:48:00	0.008	0.013	14	1.5
PRS564310971284	21050EY	11/10/2021 14:28:07	14:30:06	0.008	0.012	19	1.1
PRS564310971284	21050EY	11/10/2021 14:30:30	14:32:29	0.009	0.012	17	1.2
PRS564310971284	21050EZ	11/09/2021 22:02:24	22:04:23	0.008	0.015	17	1.3
PRS564310971284	21050EZ	11/09/2021 22:04:53	22:06:52	0.007	0.015	16	1.3
PRS336468086984	21050FA	11/09/2021 17:40:08	17:42:07	0.009	0.012	21	1.2
PRS336468086984	21050FA	11/09/2021 17:42:31	17:44:30	0.010	0.012	17	1.3
PRS336468086984	21050FB	11/09/2021 17:54:40	17:56:39	0.009	0.011	17	1.4
PRS336468086984	21050FB	11/09/2021 17:57:29	17:59:28	0.008	0.011	17	1.4
PRS336468086984	21050FC	12/04/2021 15:55:52	15:57:51	0.012	0.015	16	1.3
PRS336468086984	21050FC	12/04/2021 15:59:34	16:01:33	0.011	0.013	16	1.3
PRS336468086984	21050FD	11/09/2021 21:05:02	21:07:01	0.009	0.015	17	1.3
PRS336468086984	21050FD	11/09/2021 21:07:25	21:09:24	0.009	0.016	14	1.4
PRS41631889358	21050FE	12/04/2021 14:04:04	14:06:03	0.009	0.012	17	1.4
PRS41631889358	21050FE	12/04/2021 14:06:51	14:08:51	0.008	0.012	18	1.3
PRS41631889358	21050FF	12/04/2021 16:47:46	16:49:45	0.014	0.018	18	1.5
PRS41631889358	21050FF	12/04/2021 16:50:37	16:52:37	0.011	0.017	18	1.5
PRS41631889358	21050FG	12/04/2021 17:01:53	17:03:54	0.013	0.019	18	1.5
PRS41631889358	21050FG	12/04/2021 17:04:33	17:06:32	0.013	0.017	18	1.5
PRS41631889358	21050FH	12/04/2021 15:11:16	15:13:17	0.011	0.015	18	1.2
PRS41631889358	21050FH	12/04/2021 15:14:05	15:16:04	0.012	0.015	18	1.2
PRS41631889358	21050FI	12/03/2021 22:09:49	22:11:48	0.010	0.016	16	1.5
PRS41631889358	21050FI	12/03/2021 22:12:26	22:14:26	0.011	0.018	13	1.5
PRS293847152424	21050FJ	12/03/2021 17:39:19	17:41:18	0.010	0.011	19	1.4
PRS293847152424	21050FJ	12/03/2021 17:42:44	17:44:47	0.012	0.013	18	1.6
PRS41631889358	21050FK	12/03/2021 20:09:21	20:11:20	0.009	0.015	18	1.2
PRS41631889358	21050FK	12/03/2021 20:12:25	20:14:24	0.009	0.016	17	1.2
PRS130830704922	21050FL	12/03/2021 19:28:52	19:30:51	0.009	0.015	19	1.1
PRS130830704922	21050FL	12/03/2021 19:32:00	19:34:00	0.009	0.013	18	1.2
PRS293847152424	21050FM	12/02/2021 22:23:48	22:25:47	0.010	0.015	16	1.5
PRS293847152424	21050FM	12/02/2021 22:26:23	22:28:22	0.009	0.015	11	1.8
PRS293847152424	21050FN	12/03/2021 16:38:20	16:40:19	0.004	0.006	20	1.2
PRS293847152424	21050FN	12/03/2021 16:40:51	16:42:50	0.004	0.006	19	1.2
PRS293847152424	21050FO	11/12/2021 21:07:07	21:09:06	0.012	0.017	18	1.2
PRS293847152424	21050FO	11/12/2021 21:09:37	21:11:36	0.012	0.017	18	1.2
PRS710450365219	21050FP	11/12/2021 19:21:09	19:23:22	0.009	0.013	22	1.2
PRS710450365219	21050FP	11/12/2021 19:23:46	19:25:45	0.008	0.011	22	1.2
PRS710450365219	21050FQ	11/04/2021 13:22:59	13:24:58	0.010	0.015	19	1.3
PRS710450365219	21050FQ	11/04/2021 13:26:09	13:28:10	0.010	0.015	19	1.3
PRS146395842822	21050FR	11/03/2021 16:48:42	16:50:41	0.010	0.015	16	1.5
PRS146395842822	21050FR	11/03/2021 16:51:24	16:53:23	0.010	0.013	12	1.6
PRS578413396853	21050FS	11/02/2021 18:20:28	18:22:27	0.009	0.011	22	1.1
PRS578413396853	21050FS	11/02/2021 18:22:54	18:24:55	0.008	0.011	21	1.2
PRS726993621058	21050FT	11/02/2021 16:08:52	16:10:53	0.008	0.012	19	1.4
PRS726993621058	21050FT	11/02/2021 16:12:49	16:14:48	0.009	0.013	19	1.4
PRS726993621058	21050FU	11/02/2021 14:11:28	14:13:27	0.007	0.011	17	1.6
PRS726993621058	21050FU	11/02/2021 14:13:56	14:15:55	0.007	0.012	17	1.6
PRS726993621058	21050FV	11/01/2021 23:06:12	23:08:11	0.010	0.014	15	1.5
PRS726993621058	21050FV	11/01/2021 23:08:41	23:10:40	0.011	0.017	12	1.6
PRS726993621058	21050FW	11/01/2021 20:48:57	20:50:57	0.009	0.012	16	1.4
PRS726993621058	21050FW	11/01/2021 20:51:57	20:53:56	0.009	0.012	16	1.4
PRS726993621058	21050FX	11/03/2021 14:02:58	14:04:57	0.008	0.013	18	1.3
PRS726993621058	21050FX	11/03/2021 14:06:35	14:08:34	0.008	0.013	15	1.5
PRS564310971284	21050FY	11/02/2021 19:49:00	19:50:59	0.007	0.012	20	1.3
PRS564310971284	21050FY	11/02/2021 19:52:03	19:54:02	0.009	0.014	20	1.3
PRS564310971284	21050FZ	11/02/2021 20:00:20	20:01:15	0.011	0.017	19	1.3
PRS564310971284	21050FZ	11/02/2021 20:02:35	20:04:00	0.011	0.016	19	1.3
PRS726993621058	21050GA	11/02/2021 22:04:28	22:06:27	0.009	0.016	13	1.8
PRS726993621058	21050GA	11/02/2021 22:07:55	22:09:55	0.011	0.019	13	1.8

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS146395842822	21050GB	11/03/2021 15:01:32	15:03:31	0.009	0.011	18	1.2
PRS146395842822	21050GB	11/03/2021 15:04:46	15:06:45	0.008	0.011	17	1.3
PRS146395842822	21050GC	11/03/2021 20:18:11	20:20:12	0.010	0.010	17	1.4
PRS146395842822	21050GC	11/03/2021 20:20:46	20:22:45	0.012	0.013	14	1.5
PRS336468086984	21050GD	11/09/2021 20:19:03	20:21:02	0.011	0.017	15	1.5
PRS336468086984	21050GD	11/09/2021 20:21:26	20:23:25	0.010	0.015	10	1.7
PRS336468086984	21050GE	11/09/2021 18:36:58	18:38:57	0.011	0.020	18	1.5
PRS336468086984	21050GE	11/09/2021 18:39:30	18:41:29	0.012	0.022	15	1.7
PRS336468086984	21050GF	11/09/2021 20:54:43	20:56:42	0.010	0.016	17	1.3
PRS336468086984	21050GF	11/09/2021 20:57:34	20:59:33	0.010	0.016	16	1.4
PRS336468086984	21050GG	11/09/2021 20:30:04	20:32:30	0.010	0.016	15	1.6
PRS336468086984	21050GG	11/09/2021 20:32:53	20:34:52	0.011	0.016	15	1.6
PRS146395842822	21050GH	11/09/2021 19:48:57	19:50:56	0.011	0.015	20	1.1
PRS146395842822	21050GH	11/09/2021 19:51:24	19:53:23	0.011	0.015	14	1.3
PRS146395842822	21050GI	11/03/2021 18:24:43	18:26:42	0.009	0.011	18	1.2
PRS146395842822	21050GI	11/03/2021 18:27:37	18:29:37	0.009	0.012	13	1.4
PRS146395842822	21050GJ	11/03/2021 16:25:08	16:27:07	0.009	0.016	16	1.6
PRS146395842822	21050GJ	11/03/2021 16:27:45	16:29:44	0.009	0.016	14	1.6
PRS710450365219	21050GK	11/03/2021 22:07:45	22:08:52	0.011	0.017	15	1.4
PRS710450365219	21050GK	11/03/2021 22:12:17	22:14:18	0.009	0.015	14	1.5
PRS710450365219	21050GL	11/04/2021 13:51:03	13:53:02	0.011	0.016	17	1.3
PRS710450365219	21050GL	11/04/2021 13:53:44	13:55:47	0.012	0.018	17	1.2
PRS293847152424	21050GM	12/03/2021 14:54:40	14:56:40	0.010	0.013	19	1.3
PRS293847152424	21050GM	12/03/2021 14:57:33	14:59:32	0.010	0.013	19	1.3
PRS293847152424	21050GN	11/12/2021 22:08:21	22:10:20	0.012	0.020	15	1.6
PRS293847152424	21050GN	11/12/2021 22:10:45	22:12:44	0.013	0.018	11	2.1
PRS293847152424	21050GO	12/02/2021 20:02:35	20:04:34	0.012	0.018	15	1.3
PRS293847152424	21050GO	12/02/2021 20:05:11	20:07:11	0.013	0.020	15	1.3
PRS293847152424	21050GP	11/12/2021 22:20:31	22:22:32	0.012	0.018	17	1.2
PRS293847152424	21050GP	11/12/2021 22:22:56	22:24:55	0.011	0.017	16	1.2
PRS626464516455	21050GQ	11/12/2021 21:35:27	21:37:26	0.011	0.017	17	1.3
PRS626464516455	21050GQ	11/12/2021 21:37:44	21:39:46	0.011	0.017	12	1.5
PRS293847152424	21050GR	11/12/2021 21:17:07	21:19:06	0.011	0.017	17	1.3
PRS293847152424	21050GR	11/12/2021 21:19:27	21:21:26	0.011	0.016	12	1.7
PRS293847152424	21050GS	11/12/2021 20:31:45	20:33:44	0.012	0.017	18	1.3
PRS293847152424	21050GS	11/12/2021 20:34:11	20:36:10	0.011	0.017	19	1.2
PRS293847152424	21050GT	11/12/2021 19:58:59	20:00:58	0.009	0.012	21	1.1
PRS293847152424	21050GT	11/12/2021 20:01:21	20:03:20	0.008	0.012	15	1.3
PRS293847152424	21050GU	11/12/2021 20:18:04	20:20:03	0.010	0.014	19	1.2
PRS293847152424	21050GU	11/12/2021 20:20:27	20:22:26	0.010	0.013	17	1.3
PRS293847152424	21050GV	11/12/2021 20:53:54	20:55:53	0.010	0.014	18	1.2
PRS293847152424	21050GV	11/12/2021 20:56:20	20:58:19	0.010	0.014	18	1.2
PRS293847152424	21050GW	11/12/2021 23:02:57	23:04:56	0.007	0.009	17	1.3
PRS293847152424	21050GW	11/12/2021 23:05:15	23:07:14	0.007	0.010	12	1.6
PRS293847152424	21050GX	12/03/2021 16:57:55	16:59:54	0.007	0.010	18	1.4
PRS293847152424	21050GX	12/03/2021 17:00:43	17:02:42	0.007	0.009	13	1.7
PRS293847152424	21050GY	12/03/2021 14:21:53	14:23:52	0.008	0.011	19	1.2
PRS293847152424	21050GY	12/03/2021 14:24:34	14:26:35	0.007	0.011	18	1.3
PRS293847152424	21050GZ	12/03/2021 15:34:32	15:36:31	0.010	0.013	19	1.2
PRS293847152424	21050GZ	12/03/2021 15:38:15	15:40:14	0.010	0.013	18	1.3
PRS293847152424	21050HA	11/04/2021 14:05:23	14:07:22	0.013	0.019	16	1.3
PRS293847152424	21050HA	11/04/2021 14:08:00	14:09:59	0.011	0.017	17	1.2
PRS710450365219	21050HB	12/04/2021 14:54:17	14:56:16	0.011	0.015	15	1.6
PRS710450365219	21050HB	12/04/2021 14:56:41	14:58:40	0.012	0.016	7	2.3
PRS41631889358	21050HC	12/03/2021 20:41:11	20:43:12	0.009	0.013	16	1.5
PRS41631889358	21050HC	12/03/2021 20:44:51	20:46:50	0.008	0.011	16	1.5
PRS293847152424	21050HD	12/02/2021 22:02:53	22:04:54	0.012	0.015	17	1.2
PRS293847152424	21050HD	12/02/2021 22:06:06	22:08:05	0.011	0.014	17	1.2
PRS293847152424	21050HE	12/02/2021 22:38:41	22:40:42	0.008	0.010	17	1.5
PRS293847152424	21050HE	12/02/2021 22:42:06	22:44:05	0.009	0.013	14	1.8
PRS41631889358	21050HF	12/03/2021 23:00:44	23:02:44	0.008	0.012	18	1.5
PRS41631889358	21050HF	12/03/2021 23:03:12	23:05:11	0.008	0.011	16	1.5
PRS41631889358	21050HG	12/03/2021 21:32:59	21:34:58	0.008	0.009	18	1.2
PRS41631889358	21050HG	12/03/2021 21:35:22	21:37:21	0.008	0.009	13	1.4

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS709014801347	21050HH	12/03/2021 18:54:45	18:56:44	0.010	0.014	19	1.2
PRS709014801347	21050HH	12/03/2021 18:57:56	18:59:57	0.009	0.014	16	1.4
PRS41631889358	21050HI	12/04/2021 14:20:21	14:22:22	0.009	0.014	16	1.4
PRS41631889358	21050HI	12/04/2021 14:22:55	14:24:54	0.008	0.014	14	1.6
PRS336468086984	21050HJ	11/09/2021 21:31:47	21:33:46	0.008	0.014	15	1.7
PRS336468086984	21050HJ	11/09/2021 21:34:08	21:36:09	0.008	0.014	12	2.0
PRS564310971284	21050HK	11/09/2021 23:15:49	23:17:48	0.010	0.011	16	1.3
PRS564310971284	21050HK	11/09/2021 23:18:09	23:20:08	0.008	0.009	16	1.3
PRS564310971284	21050HL	11/08/2021 21:43:53	21:45:53	0.008	0.015	16	1.3
PRS564310971284	21050HL	11/08/2021 21:46:18	21:48:20	0.009	0.015	12	1.5
PRS59015102271	21050HM	11/08/2021 16:23:46	16:25:45	0.008	0.011	20	1.3
PRS59015102271	21050HM	11/08/2021 16:26:11	16:28:10	0.007	0.011	16	1.5
PRS59015102271	21050HN	11/08/2021 16:37:44	16:39:43	0.008	0.010	17	1.5
PRS59015102271	21050HN	11/08/2021 16:40:51	16:42:50	0.007	0.010	19	1.3
PRS59015102271	21050HO	11/08/2021 17:46:50	17:48:59	0.009	0.013	21	1.1
PRS59015102271	21050HO	11/08/2021 17:49:26	17:51:25	0.009	0.012	20	1.1
PRS336468086984	21050HP	11/09/2021 16:59:33	17:01:32	0.006	0.007	21	1.2
PRS336468086984	21050HP	11/09/2021 17:02:04	17:04:03	0.007	0.008	19	1.2
PRS336468086984	21050HQ	11/09/2021 16:07:25	16:09:24	0.007	0.009	21	1.2
PRS336468086984	21050HQ	11/09/2021 16:09:51	16:11:50	0.007	0.010	13	1.6
PRS219240856098	21050HR	11/08/2021 18:19:58	18:22:06	0.008	0.013	19	1.3
PRS219240856098	21050HR	11/08/2021 18:22:33	18:24:32	0.007	0.012	20	1.3
PRS336468086984	21050HS	11/09/2021 22:48:29	22:50:28	0.011	0.015	15	1.4
PRS336468086984	21050HS	11/09/2021 22:50:55	22:52:54	0.011	0.016	15	1.4
PRS726993621058	21050HT	11/02/2021 21:31:44	21:33:43	0.011	0.014	14	1.5
PRS726993621058	21050HT	11/02/2021 21:34:12	21:36:11	0.010	0.015	14	1.5
PRS146395842822	21050HU	11/02/2021 21:10:08	21:12:07	0.010	0.015	15	1.6
PRS146395842822	21050HU	11/02/2021 21:13:42	21:15:41	0.011	0.016	14	1.7
PRS146395842822	21050HV	11/03/2021 17:19:44	17:21:43	0.010	0.012	16	1.3
PRS146395842822	21050HV	11/03/2021 17:22:35	17:24:34	0.010	0.011	15	1.3
PRS146395842822	21050HW	11/03/2021 18:10:25	18:12:24	0.009	0.014	18	1.2
PRS146395842822	21050HW	11/03/2021 18:12:47	18:14:47	0.010	0.013	17	1.3
PRS146395842822	21050HX	11/03/2021 21:12:21	21:14:20	0.010	0.012	18	1.2
PRS146395842822	21050HX	11/03/2021 21:15:28	21:17:27	0.009	0.011	18	1.2
PRS146395842822	21050HY	11/03/2021 20:57:25	20:59:24	0.009	0.012	19	1.2
PRS146395842822	21050HY	11/03/2021 21:00:12	21:02:12	0.009	0.013	19	1.2
PRS146395842822	21050HZ	11/03/2021 21:29:29	21:31:29	0.009	0.014	17	1.2
PRS146395842822	21050HZ	11/03/2021 21:32:12	21:34:11	0.008	0.013	17	1.2
PRS146395842822	21050IA	11/03/2021 19:25:19	19:27:18	0.008	0.011	18	1.4
PRS146395842822	21050IA	11/03/2021 19:28:04	19:30:03	0.008	0.011	18	1.4
PRS146395842822	21050IB	11/03/2021 19:53:14	19:55:13	0.009	0.012	17	1.6
PRS146395842822	21050IB	11/03/2021 19:56:12	19:58:11	0.011	0.013	17	1.5
PRS726993621058	21050IC	11/02/2021 15:43:59	15:45:58	0.009	0.011	18	1.2
PRS726993621058	21050IC	11/02/2021 15:46:52	15:48:54	0.008	0.011	18	1.2
PRS726993621058	21050ID	11/01/2021 21:24:09	21:26:09	0.009	0.015	17	1.3
PRS726993621058	21050ID	11/01/2021 21:26:53	21:28:52	0.009	0.015	17	1.3
PRS578413396853	21050IE	11/02/2021 16:44:20	16:46:20	0.009	0.013	22	1.2
PRS578413396853	21050IE	11/02/2021 16:47:20	16:49:19	0.008	0.012	21	1.2
PRS726993621058	21050IF	11/02/2021 16:28:34	16:30:33	0.010	0.015	18	1.6
PRS726993621058	21050IF	11/02/2021 16:31:33	16:33:32	0.009	0.015	18	1.6
PRS726993621058	21050IG	11/02/2021 14:29:28	14:31:29	0.010	0.014	17	1.3
PRS726993621058	21050IG	11/02/2021 14:32:23	14:34:22	0.010	0.013	16	1.4
PRS726993621058	21050IH	11/01/2021 23:27:23	23:29:22	0.013	0.018	15	1.3
PRS726993621058	21050IH	11/01/2021 23:29:52	23:31:51	0.015	0.020	15	1.3
PRS726993621058	21050II	11/02/2021 21:54:41	21:56:42	0.012	0.018	13	1.8
PRS726993621058	21050II	11/02/2021 21:57:55	21:59:54	0.010	0.021	13	1.8
PRS564310971284	21050IJ	11/02/2021 20:37:42	20:39:41	0.012	0.015	17	1.3
PRS564310971284	21050IJ	11/02/2021 20:40:32	20:42:31	0.012	0.015	18	1.2
PRS336468086984	21050IK	11/09/2021 17:15:24	17:17:23	0.010	0.011	20	1.3
PRS336468086984	21050IK	11/09/2021 17:18:09	17:20:08	0.012	0.013	16	1.5
PRS710450365219	21050IL	12/04/2021 15:26:18	15:28:17	0.013	0.014	17	1.3
PRS710450365219	21050IL	12/04/2021 15:28:40	15:30:40	0.012	0.014	15	1.5
PRS564310971284	21050IM	11/10/2021 13:44:44	13:46:43	0.008	0.010	19	1.2
PRS564310971284	21050IM	11/10/2021 13:47:07	13:49:06	0.007	0.009	14	1.3

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS59015102271	21050JW	11/08/2021 15:48:03	15:50:02	0.011	0.016	20	1.3
PRS59015102271	21050JW	11/08/2021 15:50:29	15:52:28	0.011	0.018	17	1.5
PRS59015102271	21050JX	11/08/2021 14:57:02	14:59:14	0.010	0.014	20	1.3
PRS59015102271	21050JX	11/08/2021 14:59:38	15:01:37	0.010	0.015	18	1.4
PRS219240856098	21050JY	11/08/2021 14:27:21	14:29:20	0.008	0.010	21	1.2
PRS219240856098	21050JY	11/08/2021 14:29:59	14:31:58	0.007	0.009	23	1.0
PRS38435644749	21050JZ	11/07/2021 22:26:55	22:29:21	0.009	0.015	16	1.5
PRS38435644749	21050JZ	11/07/2021 22:30:07	22:32:06	0.010	0.017	16	1.5
PRS219240856098	21050KA	11/07/2021 21:44:11	21:46:10	0.010	0.016	18	1.2
PRS219240856098	21050KA	11/07/2021 21:47:19	21:49:18	0.008	0.014	18	1.3
PRS976698893895	21050KB	11/09/2021 13:50:42	13:52:41	0.007	0.010	18	1.2
PRS976698893895	21050KB	11/09/2021 13:53:03	13:55:02	0.008	0.011	15	1.3
PRS219240856098	21050KC	11/08/2021 23:11:23	23:13:22	0.007	0.010	16	1.4
PRS219240856098	21050KC	11/08/2021 23:13:48	23:15:47	0.009	0.011	13	1.4
PRS219240856098	21050KD	11/08/2021 22:34:31	22:36:30	0.008	0.011	15	1.5
PRS219240856098	21050KD	11/08/2021 22:36:50	22:38:51	0.008	0.012	11	1.7
PRS564310971284	21050KE	11/09/2021 22:19:39	22:21:38	0.009	0.020	15	1.5
PRS564310971284	21050KE	11/09/2021 22:22:16	22:24:15	0.009	0.018	15	1.5
PRS59015102271	21050KF	11/08/2021 17:56:51	17:58:50	0.009	0.014	17	1.3
PRS59015102271	21050KF	11/08/2021 17:59:25	18:01:24	0.009	0.014	17	1.3
PRS564310971284	21050KG	11/08/2021 20:43:14	20:45:13	0.010	0.013	20	1.1
PRS564310971284	21050KG	11/08/2021 20:45:27	20:47:26	0.008	0.012	19	1.2
PRS564310971284	21050KG	11/08/2021 20:47:48	20:49:48	0.009	0.013	12	1.5
PRS564310971284	21050KH	11/08/2021 20:29:50	20:31:53	0.008	0.012	19	1.3
PRS564310971284	21050KH	11/08/2021 20:33:06	20:35:05	0.008	0.010	19	1.2
PRS564310971284	21050KI	11/08/2021 20:15:41	20:17:40	0.008	0.011	20	1.2
PRS564310971284	21050KI	11/08/2021 20:18:05	20:20:04	0.007	0.012	15	1.5
PRS564310971284	21050KJ	11/08/2021 21:28:07	21:30:06	0.007	0.010	14	1.5
PRS564310971284	21050KJ	11/08/2021 21:30:41	21:32:43	0.007	0.010	11	1.9
PRS564310971284	21050KK	11/10/2021 13:30:30	13:32:31	0.006	0.008	21	1.1
PRS564310971284	21050KK	11/10/2021 13:32:56	13:34:55	0.007	0.009	15	1.3
PRS564310971284	21050KL	11/10/2021 13:56:16	13:58:36	0.008	0.011	19	1.2
PRS564310971284	21050KL	11/10/2021 13:59:27	14:01:26	0.008	0.011	19	1.2
PRS336468086984	21050KM	11/09/2021 17:29:48	17:31:47	0.010	0.013	19	1.4
PRS336468086984	21050KM	11/09/2021 17:32:13	17:34:12	0.010	0.012	15	1.4
PRS336468086984	21050KN	11/09/2021 16:22:56	16:24:55	0.008	0.011	18	1.4
PRS336468086984	21050KN	11/09/2021 16:25:29	16:27:28	0.008	0.012	17	1.7
PRS336468086984	21050KO	11/09/2021 15:12:16	15:14:15	0.007	0.011	19	1.2
PRS336468086984	21050KO	11/09/2021 15:15:26	15:17:25	0.008	0.011	18	1.3
PRS219240856098	21050KP	11/09/2021 14:17:51	14:19:50	0.011	0.015	18	1.3
PRS219240856098	21050KP	11/09/2021 14:20:14	14:22:13	0.010	0.014	17	1.3
PRS726993621058	21050KQ	11/01/2021 23:40:51	23:42:52	0.012	0.018	14	1.8
PRS726993621058	21050KQ	11/01/2021 23:43:17	23:45:16	0.013	0.018	13	1.9
PRS726993621058	21050KR	11/01/2021 22:56:01	22:58:00	0.009	0.016	15	1.5
PRS726993621058	21050KR	11/01/2021 22:58:33	23:00:32	0.009	0.014	15	1.5
PRS726993621058	21050KS	11/01/2021 22:43:57	22:45:57	0.008	0.016	14	1.9
PRS726993621058	21050KS	11/01/2021 22:46:46	22:48:45	0.008	0.015	14	1.8
PRS726993621058	21050KT	11/01/2021 22:19:49	22:21:48	0.010	0.024	14	2.0
PRS726993621058	21050KT	11/01/2021 22:25:43	22:27:42	0.008	0.025	13	2.2
PRS726993621058	21050KU	11/01/2021 21:07:50	21:09:49	0.009	0.012	16	1.5
PRS726993621058	21050KU	11/01/2021 21:11:18	21:13:19	0.009	0.014	15	1.6
PRS726993621058	21050KV	11/02/2021 13:47:35	13:49:34	0.006	0.011	17	1.8
PRS726993621058	21050KV	11/02/2021 13:49:56	13:51:56	0.006	0.011	15	1.6
PRS726993621058	21050KW	11/02/2021 13:15:19	13:17:18	0.008	0.016	17	1.8
PRS726993621058	21050KW	11/02/2021 13:20:13	13:22:12	0.006	0.012	16	2.1
PRS726993621058	21050KX	11/01/2021 19:41:41	19:43:42	0.008	0.011	16	1.7
PRS726993621058	21050KX	11/01/2021 19:49:37	19:51:37	0.008	0.011	17	1.5
PRS726993621058	21050KY	11/02/2021 14:51:20	14:53:19	0.010	0.017	14	1.4
PRS726993621058	21050KY	11/02/2021 14:54:37	14:56:36	0.011	0.017	13	1.5
PRS564310971284	21050KZ	11/02/2021 20:55:56	20:57:55	0.011	0.014	18	1.2
PRS564310971284	21050KZ	11/02/2021 20:58:23	21:00:24	0.010	0.013	17	1.3
PRS564310971284	21050LA	11/02/2021 20:11:52	20:13:52	0.010	0.013	18	1.3
PRS564310971284	21050LA	11/02/2021 20:16:10	20:18:10	0.009	0.012	18	1.3
PRS146395842822	21050LB	11/03/2021 17:59:58	18:01:57	0.010	0.014	16	1.4

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS146395842822	21050LB	11/03/2021 18:03:04	18:05:03	0.010	0.012	16	1.4
PRS146395842822	21050LC	11/03/2021 17:02:55	17:04:54	0.011	0.014	14	1.6
PRS146395842822	21050LC	11/03/2021 17:08:10	17:10:09	0.010	0.011	15	1.5
PRS726993621058	21050LD	11/03/2021 13:49:40	13:51:39	0.007	0.012	18	1.4
PRS726993621058	21050LD	11/03/2021 13:54:07	13:56:07	0.006	0.011	18	1.4
PRS146395842822	21050LE	11/03/2021 14:19:26	14:21:25	0.008	0.010	18	1.2
PRS146395842822	21050LE	11/03/2021 14:23:02	14:25:01	0.008	0.011	18	1.2
PRS146395842822	21050LF	11/03/2021 20:29:48	20:31:47	0.009	0.010	18	1.2
PRS146395842822	21050LF	11/03/2021 20:32:33	20:34:34	0.010	0.012	18	1.2
PRS336468086984	21050LG	11/09/2021 20:06:22	20:08:21	0.011	0.015	16	1.4
PRS336468086984	21050LG	11/09/2021 20:08:52	20:10:51	0.013	0.018	14	1.5
PRS146395842822	21050LH	11/09/2021 19:08:57	19:11:11	0.011	0.016	19	1.4
PRS146395842822	21050LH	11/09/2021 19:11:38	19:13:37	0.011	0.017	14	1.6
PRS146395842822	21050LI	11/09/2021 19:21:15	19:23:14	0.010	0.015	18	1.4
PRS146395842822	21050LI	11/09/2021 19:23:38	19:25:37	0.010	0.016	13	1.7
PRS146395842822	21050LJ	11/09/2021 19:35:21	19:37:20	0.009	0.014	19	1.2
PRS146395842822	21050LJ	11/09/2021 19:37:46	19:39:45	0.010	0.014	15	1.4
PRS146395842822	21050LK	11/03/2021 20:44:54	20:46:53	0.010	0.012	19	1.2
PRS146395842822	21050LK	11/03/2021 20:49:03	20:51:03	0.009	0.011	19	1.2
PRS146395842822	21050LL	11/03/2021 21:39:54	21:41:53	0.009	0.015	16	1.3
PRS146395842822	21050LL	11/03/2021 21:43:06	21:45:06	0.010	0.018	16	1.3
PRS710450365219	21050LM	11/03/2021 22:34:04	22:36:07	0.010	0.015	14	1.7
PRS710450365219	21050LM	11/03/2021 22:36:54	22:38:53	0.009	0.014	14	1.7
PRS710450365219	21050LN	11/03/2021 22:24:15	22:26:14	0.008	0.014	16	1.3
PRS710450365219	21050LN	11/03/2021 22:27:12	22:29:13	0.009	0.015	16	1.2
PRS710450365219	21050LO	11/04/2021 13:09:53	13:11:52	0.009	0.012	20	1.2
PRS710450365219	21050LO	11/04/2021 13:13:08	13:15:07	0.010	0.015	19	1.3
PRS710450365219	21050LP	11/12/2021 18:37:58	18:39:57	0.009	0.013	20	1.5
PRS710450365219	21050LP	11/12/2021 18:40:27	18:42:26	0.008	0.012	20	1.5
PRS710450365219	21050LQ	11/12/2021 18:51:51	18:53:50	0.010	0.013	20	1.5
PRS710450365219	21050LQ	11/12/2021 18:54:13	18:56:12	0.010	0.014	16	1.8
PRS710450365219	21050LR	11/12/2021 19:06:52	19:08:51	0.009	0.011	22	1.3
PRS710450365219	21050LR	11/12/2021 19:09:16	19:11:15	0.008	0.011	21	1.3
PRS710450365219	21050LS	11/12/2021 19:31:42	19:33:41	0.010	0.013	22	1.1
PRS710450365219	21050LS	11/12/2021 19:34:04	19:36:03	0.010	0.013	20	1.1
PRS293847152424	21050LT	11/12/2021 20:08:07	20:10:06	0.011	0.014	19	1.2
PRS293847152424	21050LT	11/12/2021 20:10:40	20:12:39	0.011	0.015	20	1.1
PRS293847152424	21050LU	12/03/2021 13:41:48	13:43:48	0.007	0.011	20	1.1
PRS293847152424	21050LU	12/03/2021 13:44:14	13:46:13	0.008	0.013	19	1.2
PRS293847152424	21050LV	12/03/2021 14:36:08	14:38:07	0.009	0.012	17	1.3
PRS293847152424	21050LV	12/03/2021 14:40:29	14:42:28	0.008	0.010	19	1.2
PRS293847152424	21050LW	12/03/2021 15:13:57	15:15:56	0.008	0.010	18	1.2
PRS293847152424	21050LW	12/03/2021 15:16:33	15:18:32	0.008	0.010	16	1.3
PRS130830704922	21050LX	12/03/2021 19:11:22	19:13:21	0.008	0.012	19	1.2
PRS130830704922	21050LX	12/03/2021 19:13:57	19:15:56	0.010	0.015	15	1.4
PRS709014801347	21050LY	12/02/2021 21:30:54	21:32:53	0.010	0.014	17	1.2
PRS709014801347	21050LY	12/02/2021 21:33:27	21:35:26	0.011	0.014	17	1.2
PRS709014801347	21050LZ	12/02/2021 21:16:10	21:18:09	0.013	0.018	14	1.6
PRS709014801347	21050LZ	12/02/2021 21:18:39	21:20:38	0.011	0.016	12	1.6
PRS293847152424	21050MA	12/02/2021 20:36:48	20:38:47	0.011	0.018	14	1.7
PRS293847152424	21050MA	12/02/2021 20:40:02	20:42:03	0.010	0.018	14	1.7
PRS293847152424	21050MB	11/12/2021 22:48:51	22:50:50	0.009	0.011	17	1.3
PRS293847152424	21050MB	11/12/2021 22:51:13	22:53:12	0.008	0.012	12	1.6
PRS293847152424	21050MC	12/03/2021 16:16:31	16:18:30	0.005	0.007	21	1.2
PRS293847152424	21050MC	12/03/2021 16:21:19	16:23:18	0.005	0.006	20	1.2
PRS293847152424	21050MD	12/03/2021 17:12:46	17:14:46	0.009	0.013	20	1.3
PRS293847152424	21050MD	12/03/2021 17:15:24	17:17:23	0.009	0.012	18	1.4
PRS41631889358	21050ME	12/03/2021 22:23:30	22:25:29	0.012	0.021	16	1.6
PRS41631889358	21050ME	12/03/2021 22:26:28	22:28:28	0.010	0.019	16	1.6
PRS41631889358	21050MF	12/04/2021 17:15:27	17:17:28	0.012	0.019	19	1.4
PRS41631889358	21050MF	12/04/2021 17:17:52	17:19:51	0.012	0.017	18	1.4
PRS336468086984	21050MG	12/04/2021 15:42:39	15:44:38	0.014	0.017	15	1.4
PRS336468086984	21050MG	12/04/2021 15:45:28	15:47:27	0.015	0.017	16	1.4
PRS336468086984	21050MH	12/04/2021 16:10:34	16:12:33	0.011	0.014	16	1.4



GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS336468086984	21050MH	12/04/2021 16:13:53	16:15:52	0.010	0.011	16	1.4
PRS41631889358	21050MI	12/04/2021 13:39:48	13:41:47	0.011	0.014	18	1.3
PRS41631889358	21050MI	12/04/2021 13:42:49	13:44:49	0.010	0.014	14	1.4
PRS41631889358	21050MJ	12/03/2021 22:45:49	22:47:48	0.010	0.015	19	1.3
PRS41631889358	21050MJ	12/03/2021 22:48:18	22:50:17	0.008	0.011	16	1.5
PRS41631889358	21050MK	12/03/2021 20:54:24	20:56:23	0.008	0.013	16	1.5
PRS41631889358	21050MK	12/03/2021 20:57:19	20:59:19	0.008	0.012	16	1.5
PRS293847152424	21050ML	12/03/2021 17:52:32	17:54:31	0.010	0.012	19	1.4
PRS293847152424	21050ML	12/03/2021 17:56:35	17:58:34	0.009	0.011	19	1.3
PRS293847152424	21050MM	12/03/2021 18:36:29	18:38:33	0.011	0.015	20	1.2
PRS293847152424	21050MM	12/03/2021 18:39:33	18:41:32	0.010	0.014	20	1.2
PRS41631889358	21050MN	12/03/2021 20:23:54	20:25:53	0.010	0.015	16	1.4
PRS41631889358	21050MN	12/03/2021 20:26:24	20:28:23	0.011	0.017	16	1.4
21050WC	21050MQ	11/02/2021 22:33:31	22:36:31	0.006	0.009	18	1.5
21050WC	21050MQ	11/02/2021 22:37:07	22:40:07	0.008	0.011	18	1.5
21050WB	21050MR	11/02/2021 17:16:09	17:19:10	0.006	0.009	18	1.5
21050WB	21050MR	11/02/2021 17:19:43	17:21:42	0.009	0.011	20	1.4
PRS59015102271	21050MS	11/08/2021 15:25:10	15:27:09	0.012	0.018	20	1.2
PRS59015102271	21050MS	11/08/2021 15:28:02	15:30:01	0.016	0.023	19	1.3
PRS59015102271	21050MT	11/08/2021 16:49:49	16:51:48	0.015	0.020	18	1.3
PRS59015102271	21050MT	11/08/2021 16:54:04	16:56:03	0.009	0.012	18	1.3
21050WA	21050MU	11/01/2021 20:30:05	20:33:05	0.006	0.010	24	1.1
21050WA	21050MU	11/01/2021 20:33:28	20:36:27	0.005	0.008	20	1.2
21050WE	21050MV	11/03/2021 14:47:29	14:49:29	0.003	0.005	22	1.1
21050WE	21050MV	11/03/2021 14:49:55	14:51:54	0.003	0.005	21	1.1
21050WD	21050MW	11/02/2021 23:35:58	23:37:57	0.007	0.008	20	1.1
21050WD	21050MW	11/02/2021 23:38:24	23:40:23	0.007	0.010	18	1.4
PRS726993621058	21050MX	11/01/2021 20:00:42	20:02:05	0.012	0.016	16	1.6
PRS726993621058	21050MX	11/01/2021 20:03:01	20:05:00	0.012	0.014	16	1.5
PRS726993621058	21050WA	11/01/2021 20:21:05	20:23:04	0.009	0.012	15	1.6
PRS726993621058	21050WA	11/01/2021 20:24:41	20:26:42	0.008	0.011	17	1.4
PRS578413396853	21050WB	11/02/2021 17:08:44	17:10:44	0.009	0.014	19	1.4
PRS578413396853	21050WB	11/02/2021 17:11:24	17:12:59	0.010	0.014	20	1.3
PRS564310971284	21050WC	11/02/2021 22:24:36	22:26:37	0.009	0.018	15	1.5
PRS564310971284	21050WC	11/02/2021 22:28:00	22:30:00	0.009	0.015	15	1.5
PRS726993621058	21050WD	11/02/2021 23:27:28	23:29:27	0.010	0.013	13	1.5
PRS726993621058	21050WD	11/02/2021 23:29:59	23:31:58	0.012	0.015	14	1.3
PRS146395842822	21050WE	11/03/2021 14:36:01	14:38:00	0.009	0.012	18	1.3
PRS146395842822	21050WE	11/03/2021 14:39:49	14:41:48	0.008	0.010	18	1.3

As mentioned, each station was occupied twice (or more if needed) in succession. The Earth Centered Earth Fixed (ECEF) vector differences were rotated into a local horizon system (N, E, Up) for analysis. Stations which had observations that differed by more than 0.03 m in the vertical component were re-observed until agreement was achieved. Figure 3 summarizes the repeat baseline analysis.



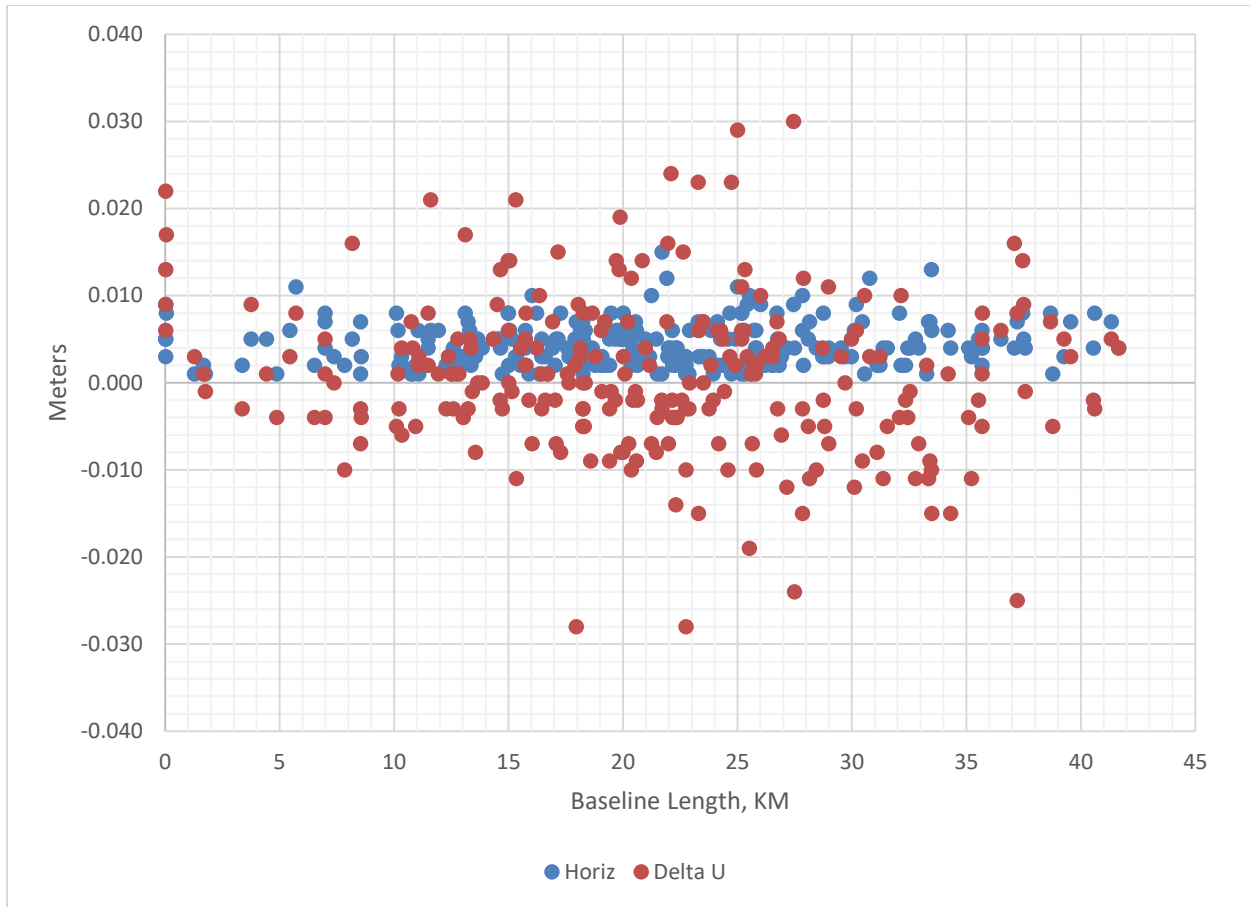


Figure 3 - Repeat Baseline Analysis

Table 4 lists the RTX occupations.

Table 4 - RTX Occupations Summary

GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	# of Epochs	PDOP
21050BB	11/08/2021 18:46:39	18:50:32	0.009	0.038	31	234	1.0
21050BB	11/08/2021 18:50:53	18:54:05	0.009	0.039	29	180	1.1
21050BB	11/08/2021 18:54:39	18:57:38	0.009	0.040	29	180	1.1
21050BB	11/08/2021 18:58:11	19:01:10	0.009	0.037	29	180	1.1

The RTX observations were stored as ITRF2014 positions at the current epoch (2021.84). The NGS utility HTDP was used to transform the ITRF2014 positions to NAD83 (2011) epoch 2010.0 prior to the least squares adjustment.

## LEAST SQUARES ADJUSTMENTS

Geolab was used to adjust the VRS/RTK vectors and the RTX positions. No scaling of the a priori GPS statistics was done. Station errors (centering, HI and HT) of 0.005 m were input. The GEOID18 model was used.

The adjustment constrained the VRS CORS positions (as computed and broadcast by the network) in all three dimensions (NAD83 (2011) latitude, longitude, and ellipsoidal height). The error factor was 0.10. This adjustment provided the adjusted positions (NAD83 (2011) epoch 2010.0) and GPS derived orthometric heights (NAVD88) for the stations in the network. The adjusted latitude/longitudes were transformed to UTM Zone 14 grid coordinates. At the request of the client, the positions were also transformed to NAD83 (NSRS2007) using the NGS Coordinate Conversion and Transformation (NCAT) tool, and NAVD88 GPS derived orthometric heights were also computed for this datum realization using GEOID12B. Table 5 lists the error ellipses at the 95% level.

**Table 5 - Station Error Ellipses - 95% meters**

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
21050AA	0.006	3	0.005	0.006
21050AB	0.006	169	0.005	0.005
21050AC	0.005	23	0.005	0.008
21050AD	0.005	16	0.004	0.005
21050AE	0.005	8	0.005	0.006
21050AF	0.006	180	0.005	0.007
21050AG	0.005	0	0.005	0.006
21050AH	0.006	28	0.005	0.008
21050AI	0.006	144	0.005	0.007
21050AJ	0.007	162	0.005	0.007
21050AK	0.006	25	0.005	0.007
21050AL	0.006	1	0.005	0.006
21050AM	0.007	13	0.005	0.007
21050AO	0.004	12	0.004	0.004
21050AP	0.005	8	0.005	0.006
21050AQ	0.005	174	0.005	0.005
21050AR	0.006	29	0.005	0.008
21050AS	0.005	157	0.005	0.006
21050AT	0.006	107	0.005	0.008
21050AU	0.006	12	0.005	0.007
21050AV	0.006	21	0.005	0.008
21050AW	0.006	137	0.006	0.009
21050AX	0.006	59	0.005	0.007
21050AY	0.006	174	0.005	0.007
21050AZ	0.006	163	0.005	0.006
21050BA	0.005	13	0.004	0.007
21050BB	0.003	10	0.002	0.014
21050BC	0.005	159	0.005	0.007
21050BD	0.005	3	0.005	0.006
21050BE	0.005	155	0.004	0.006
21050BF	0.005	178	0.004	0.005
21050BG	0.005	177	0.005	0.006
21050BH	0.006	42	0.005	0.007
21050BI	0.006	21	0.005	0.008
21050BU	0.006	11	0.005	0.006
21050BW	0.007	180	0.005	0.007
21050BX	0.005	10	0.005	0.007
21050BY	0.005	6	0.005	0.006
21050BZ	0.005	31	0.005	0.007
21050CA	0.005	36	0.005	0.007
21050CB	0.005	2	0.005	0.006
21050CC	0.006	8	0.005	0.007
21050CF	0.005	177	0.005	0.006
21050CG	0.006	81	0.006	0.007
21050CH	0.005	12	0.005	0.006
21050CI	0.005	22	0.004	0.006
21050EC	0.006	9	0.006	0.009
21050ED	0.006	7	0.005	0.006

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
21050EE	0.006	169	0.005	0.008
21050EF	0.006	11	0.005	0.006
21050EG	0.006	24	0.005	0.006
21050EH	0.004	178	0.004	0.004
21050EI	0.006	164	0.005	0.006
21050EJ	0.006	2	0.005	0.008
21050EK	0.005	162	0.005	0.006
21050EL	0.006	43	0.006	0.008
21050EM	0.005	29	0.005	0.007
21050EN	0.006	39	0.006	0.009
21050EO	0.006	30	0.005	0.006
21050EP	0.005	11	0.005	0.006
21050EQ	0.004	160	0.004	0.004
21050ER	0.005	1	0.005	0.007
21050ES	0.005	166	0.005	0.005
21050ET	0.005	49	0.005	0.007
21050EU	0.005	4	0.005	0.007
21050EV	0.005	177	0.004	0.007
21050EW	0.005	0	0.004	0.006
21050EX	0.005	9	0.005	0.006
21050EY	0.005	172	0.005	0.006
21050EZ	0.005	34	0.005	0.007
21050FA	0.006	176	0.005	0.006
21050FB	0.006	180	0.005	0.006
21050FC	0.006	31	0.006	0.007
21050FD	0.006	12	0.005	0.008
21050FE	0.005	22	0.005	0.006
21050FF	0.007	16	0.005	0.008
21050FG	0.008	179	0.005	0.009
21050FH	0.006	10	0.006	0.007
21050FI	0.006	15	0.005	0.008
21050FJ	0.006	15	0.005	0.006
21050FK	0.005	4	0.005	0.008
21050FL	0.006	15	0.005	0.007
21050FM	0.006	10	0.005	0.007
21050FN	0.004	22	0.004	0.004
21050FO	0.006	24	0.006	0.008
21050FP	0.006	6	0.005	0.006
21050FQ	0.006	7	0.005	0.007
21050FR	0.006	165	0.005	0.007
21050FS	0.005	3	0.005	0.006
21050FT	0.005	164	0.005	0.006
21050FU	0.005	104	0.005	0.006
21050FV	0.006	179	0.005	0.007
21050FW	0.006	178	0.005	0.006
21050FX	0.005	22	0.005	0.006
21050FY	0.005	176	0.005	0.006
21050FZ	0.006	177	0.005	0.008
21050GA	0.006	106	0.005	0.008
21050GB	0.005	20	0.005	0.006
21050GC	0.007	178	0.005	0.006
21050GD	0.006	170	0.005	0.008
21050GE	0.007	21	0.005	0.010
21050GF	0.006	12	0.005	0.008
21050GG	0.006	6	0.005	0.008
21050GH	0.006	178	0.005	0.007
21050GI	0.005	22	0.005	0.006
21050GJ	0.005	168	0.005	0.008
21050GK	0.006	28	0.005	0.008
21050GL	0.007	7	0.005	0.008
21050GM	0.006	164	0.005	0.007
21050GN	0.007	133	0.006	0.009
21050GO	0.007	23	0.006	0.009
21050GP	0.006	113	0.006	0.008

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
21050GQ	0.006	157	0.006	0.008
21050GR	0.006	21	0.005	0.008
21050GS	0.007	14	0.005	0.008
21050GT	0.006	11	0.005	0.006
21050GU	0.006	14	0.005	0.007
21050GV	0.006	4	0.005	0.007
21050GW	0.005	155	0.005	0.005
21050GX	0.005	11	0.004	0.005
21050GY	0.005	168	0.005	0.006
21050GZ	0.006	161	0.005	0.007
21050HA	0.007	13	0.006	0.009
21050HB	0.006	173	0.005	0.007
21050HC	0.005	27	0.005	0.006
21050HD	0.006	175	0.005	0.007
21050HE	0.005	6	0.005	0.006
21050HF	0.005	35	0.005	0.006
21050HG	0.005	42	0.005	0.005
21050HH	0.006	14	0.005	0.007
21050HI	0.005	171	0.005	0.007
21050HJ	0.005	149	0.005	0.007
21050HK	0.006	173	0.005	0.005
21050HL	0.005	102	0.005	0.007
21050HM	0.005	170	0.005	0.006
21050HN	0.005	171	0.005	0.005
21050HO	0.006	168	0.005	0.007
21050HP	0.005	158	0.004	0.005
21050HQ	0.005	160	0.004	0.005
21050HR	0.005	11	0.005	0.006
21050HS	0.006	161	0.005	0.007
21050HT	0.006	8	0.005	0.007
21050HU	0.006	176	0.005	0.007
21050HV	0.006	161	0.005	0.006
21050HW	0.006	1	0.005	0.007
21050HX	0.006	7	0.005	0.006
21050HY	0.006	6	0.005	0.006
21050HZ	0.005	15	0.005	0.007
21050IA	0.005	5	0.004	0.006
21050IB	0.006	179	0.005	0.006
21050IC	0.005	1	0.005	0.006
21050ID	0.005	7	0.005	0.007
21050IE	0.005	172	0.005	0.006
21050IF	0.006	17	0.005	0.007
21050IG	0.006	142	0.005	0.007
21050IH	0.007	4	0.006	0.009
21050II	0.006	16	0.006	0.009
21050IJ	0.007	175	0.005	0.007
21050IK	0.006	163	0.005	0.006
21050IL	0.006	14	0.006	0.007
21050IM	0.005	20	0.005	0.005
21050JW	0.006	2	0.005	0.008
21050JX	0.006	5	0.005	0.007
21050JY	0.005	162	0.005	0.005
21050JZ	0.005	50	0.005	0.008
21050KA	0.005	36	0.005	0.007
21050KB	0.005	150	0.005	0.006
21050KC	0.005	161	0.005	0.006
21050KD	0.005	178	0.005	0.006
21050KE	0.005	38	0.005	0.009
21050KF	0.006	179	0.005	0.007
21050KG	0.005	9	0.004	0.005
21050KH	0.005	11	0.005	0.006
21050KI	0.005	1	0.005	0.006
21050KJ	0.005	44	0.005	0.006
21050KK	0.005	28	0.004	0.005

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
2105OKL	0.005	0	0.005	0.006
2105OKM	0.006	174	0.005	0.006
2105OKN	0.005	152	0.005	0.006
2105OKO	0.005	42	0.005	0.006
2105OKP	0.006	163	0.005	0.007
2105OKQ	0.007	173	0.005	0.009
2105OKR	0.005	28	0.005	0.007
2105OKS	0.005	31	0.005	0.008
2105OKT	0.005	144	0.005	0.011
2105OKU	0.006	178	0.005	0.007
2105OKV	0.005	24	0.005	0.006
2105OKW	0.005	10	0.004	0.007
2105OKX	0.005	8	0.005	0.006
2105OKY	0.006	152	0.005	0.008
2105OKZ	0.006	177	0.005	0.007
2105OLA	0.006	176	0.005	0.006
2105OLB	0.006	165	0.005	0.006
2105OLC	0.006	159	0.005	0.006
2105OLD	0.005	30	0.004	0.006
2105OLE	0.005	22	0.005	0.006
2105OLF	0.006	3	0.005	0.006
2105OLG	0.007	166	0.005	0.008
2105OLH	0.007	179	0.005	0.008
2105OLI	0.006	7	0.005	0.008
2105OLJ	0.006	7	0.005	0.007
2105OLK	0.006	4	0.005	0.006
2105OLL	0.006	25	0.005	0.008
2105OLM	0.006	33	0.005	0.007
2105OLN	0.005	31	0.005	0.007
2105OLO	0.006	10	0.005	0.007
2105OLP	0.006	179	0.005	0.006
2105OLQ	0.006	179	0.005	0.007
2105OLR	0.005	4	0.005	0.006
2105OLS	0.006	180	0.005	0.007
2105OLT	0.007	15	0.005	0.007
2105OLU	0.005	176	0.005	0.006
2105OLV	0.005	155	0.005	0.006
2105OLW	0.005	2	0.005	0.005
2105OLX	0.006	9	0.005	0.007
2105OLY	0.006	42	0.005	0.007
2105OLZ	0.007	126	0.005	0.008
2105OMA	0.006	166	0.005	0.008
2105OMB	0.005	78	0.005	0.006
2105OMC	0.004	11	0.004	0.004
2105OMD	0.006	15	0.005	0.006
2105OME	0.006	55	0.006	0.009
2105OMF	0.007	178	0.005	0.009
2105OMG	0.007	8	0.007	0.008
2105OMH	0.006	22	0.005	0.006
2105OMI	0.006	38	0.005	0.007
2105OMJ	0.006	22	0.005	0.006
2105OMK	0.005	14	0.005	0.006
2105OML	0.006	8	0.005	0.006
2105OMM	0.006	6	0.005	0.007
2105OMN	0.006	32	0.005	0.008
2105OMQ	0.007	109	0.007	0.009
2105OMR	0.008	161	0.006	0.009
2105OMS	0.007	169	0.006	0.009
2105OMT	0.007	161	0.005	0.007
2105OMU	0.007	176	0.006	0.008
2105OMV	0.007	23	0.006	0.007
2105OMW	0.008	24	0.007	0.008
2105OMX	0.007	10	0.005	0.007
2105OWA	0.006	175	0.005	0.006

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
21050WB	0.006	162	0.005	0.007
21050WC	0.005	85	0.005	0.008
21050WD	0.006	25	0.005	0.007
21050WE	0.005	24	0.005	0.006

## SUMMARY

A LiDAR ground control network was established in central North Dakota. The estimated accuracy of the control network is  $\pm 0.03$  m with respect to the NAD83 (2011) epoch 2010.0 reference frame and the NAVD88 vertical datum (using GEOID18). Table 6 lists the adjusted NAD83(2011) epoch 2010.0 UTM Zone 14 coordinates, the transformed NAD83 (NSRS2007) UTM Zone 14 coordinates and the NAVD88 GPS derived orthometric heights based on the NAD83(NSRS2007 ellipsoidal heights and the GEOID12B model.



Horizontal Datum: NAD83 (2011) epoch 2010.0 and transformed NAD83(NSRS2007)

Vertical Datum: NAVD88=NAD83(NSRS2007) Ellipsoidal Heights-GEOID12B

UTM Zone: 14

Units: meters

**Table 6– Adjusted Coordinates and Elevations (meters)**

Station Name	GPSID	NAD83 (2011) epoch 2010.0		NAD83 (NSRS2007)			Geoid12B
		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
GCP001	21050AA	5286366.690	194114.747	5286366.686	194114.725	722.084	739.654
GCP002	21050AB	5352560.302	231955.312	5352560.298	231955.292	730.215	748.343
GCP003	21050AC	5261820.296	194132.788	5261820.293	194132.767	764.560	781.907
GCP004	21050AD	5318213.051	237686.770	5318213.047	237686.750	574.532	592.558
GCP005	21050AE	5260007.376	245527.895	5260007.373	245527.872	662.601	680.581
GCP006	21050AF	5273435.104	282950.692	5273435.103	282950.670	593.250	612.109
GCP007	21050AG	5300694.165	237251.157	5300694.162	237251.135	660.215	678.128
GCP008	21050AH	5258513.570	282378.836	5258513.569	282378.814	547.663	566.610
GCP009	21050AI	5278717.846	229566.056	5278717.843	229566.034	656.142	673.891
GCP010	21050AJ	5275405.896	245231.418	5275405.893	245231.395	554.632	572.640
GCP011	21050AK	5273828.507	194056.456	5273828.505	194056.435	595.146	612.622
GCP012	21050AL	5299214.059	291411.287	5299214.057	291411.265	645.823	664.704
GCP013	21050AM	5264085.496	308143.192	5264085.495	308143.172	589.879	609.591
GCP015	21050AO	5298723.095	329626.132	5298723.093	329626.109	622.692	642.807
GCP016	21050AP	5282595.268	329535.687	5282595.266	329535.665	563.170	583.420
GCP017	21050AQ	5261828.511	328971.283	5261828.509	328971.265	587.561	607.828
GCP018	21050AR	5294525.306	366275.517	5294525.306	366275.497	603.715	624.854
GCP019	21050AS	5278570.857	366321.413	5278570.856	366321.393	579.988	600.981
GCP020	21050AT	5262455.056	365965.376	5262455.055	365965.357	552.226	573.257
GCP021	21050AU	5234433.348	329533.889	5234433.346	329533.875	501.298	521.695
GCP022	21050AV	5246327.259	366394.585	5246327.257	366394.565	554.562	575.788
GCP023	21050AW	5228988.147	365908.706	5228988.145	365908.683	631.557	652.962
GCP024	21050AX	5300705.965	221492.903	5300705.962	221492.884	651.884	669.689
GCP025	21050AY	5287176.239	245924.516	5287176.235	245924.493	650.612	668.586
GCP026	21050AZ	5319306.861	266559.707	5319306.858	266559.682	626.142	644.462
GCP027	21050BA	5287330.558	282933.711	5287330.556	282933.689	591.602	610.360
GCP028	21050BB	5335582.645	225964.460	5335582.641	225964.443	584.719	602.810
GCP029	21050BC	5335427.772	240573.154	5335427.768	240573.133	621.501	639.593
GCP030	21050BD	5335170.327	260014.000	5335170.324	260013.975	660.481	678.770
GCP031	21050BE	5335251.834	277758.257	5335251.833	277758.232	625.285	643.910
GCP032	21050BF	5369753.426	214093.575	5369753.424	214093.554	674.315	692.611
GCP033	21050BG	5369666.170	232454.148	5369666.167	232454.124	682.473	700.705

Station Name	GPSID	NAD83 (2011) epoch 2010.0		NAD83 (NSRS2007)			Geoid12B
		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
GCP034	21050BH	5370206.367	255996.625	5370206.364	255996.600	673.315	691.855
GCP035	21050BI	5370263.758	273690.542	5370263.756	273690.518	668.412	687.374
GCP047	21050BU	5286848.403	350528.807	5286848.401	350528.785	583.342	604.047
GCP049	21050BW	5260865.177	263189.252	5260865.174	263189.229	651.255	669.647
GCP050	21050BX	5284933.786	305381.473	5284933.785	305381.452	607.330	626.774
GCP051	21050BY	5245725.478	328511.929	5245725.476	328511.915	592.086	612.353
GCP052	21050BZ	5300920.766	259394.263	5300920.763	259394.239	607.357	625.521
GCP053	21050CA	5300012.681	272163.518	5300012.679	272163.494	589.630	608.050
GCP054	21050CB	5350994.118	267101.611	5350994.115	267101.586	635.044	653.607
GCP055	21050CC	5282423.706	265650.343	5282423.704	265650.319	624.540	642.900
GCP058	21050CF	5272783.242	210804.345	5272783.239	210804.324	756.992	774.490
GCP059	21050CG	5243565.853	349410.644	5243565.851	349410.627	557.733	578.506
GCP060	21050CH	5268099.395	350032.983	5268099.393	350032.963	544.767	565.440
GCP061	21050CI	5261316.046	218751.369	5261316.042	218751.346	679.425	696.961
NVA046	21050EC	5377636.652	217702.635	5377636.650	217702.612	681.591	699.908
NVA047	21050ED	5377006.359	230567.847	5377006.357	230567.824	686.849	705.136
NVA048	21050EE	5376190.315	248189.491	5376190.312	248189.467	696.608	715.059
NVA049	21050EF	5369200.209	225349.770	5369200.207	225349.748	670.050	688.278
NVA050	21050EG	5358998.107	230662.092	5358998.104	230662.072	685.036	703.204
NVA051	21050EH	5358410.784	248775.361	5358410.781	248775.336	671.096	689.402
NVA052	21050EI	5346291.820	228431.877	5346291.816	228431.858	707.926	726.028
NVA053	21050EJ	5331576.047	230945.898	5331576.044	230945.880	611.889	629.961
NVA054	21050EK	5325929.010	250047.600	5325929.006	250047.574	630.716	648.848
NVA055	21050EL	5323685.927	264429.396	5323685.924	264429.371	584.102	602.414
NVA056	21050EM	5375323.951	270681.843	5375323.950	270681.818	685.847	704.820
NVA057	21050EN	5358863.549	271839.463	5358863.547	271839.438	673.030	691.776
NVA058	21050EO	5362629.686	261337.281	5362629.683	261337.256	676.609	695.181
NVA059	21050EP	5368600.639	236591.414	5368600.636	236591.391	657.921	676.167
NVA060	21050EQ	5350191.623	247878.293	5350191.620	247878.270	681.190	699.420
NVA061	21050ER	5343210.353	260424.651	5343210.351	260424.626	672.980	691.331
NVA062	21050ES	5337915.955	271439.829	5337915.953	271439.803	608.874	627.403
NVA063	21050ET	5342328.241	245933.017	5342328.238	245932.993	687.743	705.898
NVA064	21050EU	5338467.913	258590.389	5338467.910	258590.364	674.286	692.570
NVA065	21050EV	5328176.293	232307.125	5328176.289	232307.107	657.486	675.542
NVA066	21050EW	5320631.235	229770.473	5320631.231	229770.456	557.251	575.270
NVA067	21050EX	5311834.593	234166.844	5311834.589	234166.824	626.000	643.961
NVA068	21050EY	5305666.289	229876.070	5305666.285	229876.051	642.335	660.227
NVA069	21050EZ	5308958.569	259668.008	5308958.565	259667.982	641.253	659.426

Station Name	GPSID	NAD83 (2011) epoch 2010.0		NAD83 (NSRS2007)			Geoid12B
		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
NVA070	21050FA	5310025.762	278936.771	5310025.760	278936.747	627.969	646.508
NVA071	21050FB	5301884.006	280221.538	5301884.003	280221.515	615.393	633.988
NVA072	21050FC	5291916.603	289538.593	5291916.602	289538.570	622.303	641.191
NVA073	21050FD	5292821.814	267072.513	5292821.811	267072.489	578.644	596.989
NVA074	21050FE	5291172.577	312039.071	5291172.575	312039.050	599.488	619.104
NVA075	21050FF	5298040.526	299269.129	5298040.525	299269.107	630.528	649.650
NVA076	21050FG	5291590.003	299205.334	5291590.002	299205.312	629.334	648.501
NVA077	21050FH	5280639.035	294413.666	5280639.034	294413.645	580.256	599.390
NVA078	21050FI	5279991.534	318366.518	5279991.532	318366.497	557.803	577.749
NVA079	21050FJ	5279146.361	343941.813	5279146.360	343941.792	546.647	567.232
NVA080	21050FK	5298006.944	355617.649	5298006.943	355617.628	610.914	631.783
NVA081	21050FL	5299410.569	375136.715	5299410.568	375136.696	510.254	531.682
NVA082	21050FM	5261039.136	357877.708	5261039.135	357877.689	572.275	593.112
NVA083	21050FN	5258298.726	340131.209	5258298.724	340131.192	598.027	618.494
NVA084	21050FO	5232473.854	353265.162	5232473.851	353265.143	499.864	520.966
NVA085	21050FP	5240859.802	319659.027	5240859.801	319659.013	498.836	518.959
NVA086	21050FQ	5261044.435	301692.507	5261044.433	301692.487	607.761	627.273
NVA087	21050FR	5267712.340	253598.024	5267712.337	253598.001	683.257	701.399
NVA088	21050FS	5283494.330	191246.284	5283494.328	191246.262	743.031	760.569
NVA089	21050FT	5282098.907	219917.045	5282098.903	219917.024	738.834	756.466
NVA090	21050FU	5264563.280	210387.471	5264563.277	210387.450	720.020	737.455
NVA091	21050FV	5275117.958	198838.862	5275117.955	198838.841	748.122	765.584
NVA092	21050FW	5266952.396	200862.484	5266952.394	200862.463	776.171	793.548
NVA093	21050FX	5264108.707	228020.012	5264108.704	228019.990	681.261	698.930
NVA094	21050FY	5289514.109	231716.597	5289514.105	231716.576	652.340	670.153
NVA095	21050FZ	5287664.832	236330.136	5287664.828	236330.114	609.914	627.769
NVA096	21050GA	5284059.326	229536.705	5284059.322	229536.683	658.566	676.325
NVA097	21050GB	5260487.934	235884.454	5260487.930	235884.432	673.827	691.617
NVA098	21050GC	5264815.037	266571.203	5264815.035	266571.181	648.241	666.708
NVA099	21050GD	5289381.892	271764.224	5289381.889	271764.201	576.881	595.348
NVA100	21050GE	5281180.881	280011.260	5281180.878	280011.238	621.374	640.085
NVA101	21050GF	5288022.847	265267.725	5288022.845	265267.701	577.991	596.322
NVA102	21050GG	5284592.049	270510.380	5284592.046	270510.356	602.648	621.109
NVA103	21050GH	5281409.373	272894.923	5281409.371	272894.900	630.386	648.917
NVA104	21050GI	5267263.174	260204.843	5267263.172	260204.820	603.687	621.994
NVA105	21050GJ	5259724.883	251868.755	5259724.880	251868.731	587.632	605.763
NVA106	21050GK	5258247.453	290416.250	5258247.453	290416.228	591.578	610.764
NVA107	21050GL	5260803.842	311276.484	5260803.840	311276.467	598.784	618.608

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		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
NVA108	21050GM	5255696.399	319125.058	5255696.397	319125.043	505.585	525.672
NVA109	21050GN	5238686.172	364724.946	5238686.170	364724.926	546.824	568.120
NVA110	21050GO	5244848.155	360714.412	5244848.152	360714.392	544.918	566.017
NVA111	21050GP	5238906.186	355109.100	5238906.184	355109.082	533.680	554.712
NVA112	21050GQ	5224995.559	364307.497	5224995.557	364307.474	647.078	668.482
NVA113	21050GR	5227675.816	352200.023	5227675.813	352200.004	494.334	515.484
NVA114	21050GS	5227585.508	348875.488	5227585.505	348875.469	496.333	517.372
NVA115	21050GT	5236674.512	338840.907	5236674.509	338840.891	503.614	524.210
NVA116	21050GU	5232620.634	341955.282	5232620.632	341955.266	562.449	583.166
NVA117	21050GV	5240670.978	346794.921	5240670.976	346794.905	555.262	576.005
NVA118	21050GW	5253429.607	341070.138	5253429.604	341070.123	572.398	592.895
NVA119	21050GX	5263464.176	336238.921	5263464.174	336238.901	590.242	610.646
NVA120	21050GY	5253684.145	331954.025	5253684.143	331954.010	564.383	584.705
NVA121	21050GZ	5262768.276	321082.227	5262768.273	321082.212	580.919	601.027
NVA122	21050HA	5266003.852	314635.493	5266003.850	314635.474	558.232	578.153
NVA123	21050HB	5272430.103	298854.495	5272430.102	298854.474	589.454	608.806
NVA124	21050HC	5298292.366	344377.806	5298292.365	344377.784	601.941	622.501
NVA125	21050HD	5277608.134	356710.291	5277608.132	356710.271	569.724	590.526
NVA126	21050HE	5257981.748	351399.623	5257981.746	351399.605	576.377	597.067
NVA127	21050HF	5295814.747	318602.417	5295814.746	318602.396	603.108	622.903
NVA128	21050HG	5290555.189	332939.819	5290555.187	332939.797	604.522	624.804
NVA129	21050HH	5283300.747	374604.951	5283300.747	374604.931	579.129	600.365
NVA130	21050HI	5286392.486	310264.722	5286392.485	310264.701	584.869	604.473
NVA131	21050HJ	5302503.125	265971.731	5302503.122	265971.707	654.016	672.282
NVA132	21050HK	5319279.771	249299.211	5319279.767	249299.184	586.071	604.183
NVA133	21050HL	5332641.160	243899.554	5332641.157	243899.531	702.203	720.291
NVA134	21050HM	5365423.113	220781.532	5365423.111	220781.511	618.335	636.563
NVA135	21050HN	5358804.838	221175.115	5358804.835	221175.095	622.472	640.669
NVA136	21050HO	5346858.440	217404.239	5346858.437	217404.221	610.079	628.221
NVA137	21050HP	5317964.075	279236.126	5317964.073	279236.101	615.799	634.347
NVA138	21050HQ	5328149.117	274262.912	5328149.115	274262.887	628.433	646.927
NVA139	21050HR	5342759.903	234712.277	5342759.899	234712.257	698.732	716.822
NVA140	21050HS	5325929.997	259962.867	5325929.993	259962.841	624.959	643.211
NVA141	21050HT	5275129.642	230184.584	5275129.639	230184.563	660.513	678.265
NVA142	21050HU	5278836.629	237714.545	5278836.626	237714.523	602.644	620.521
NVA143	21050HV	5270132.510	246511.560	5270132.507	246511.537	689.852	707.860
NVA144	21050HW	5269705.452	256748.049	5269705.449	256748.026	665.905	684.121
NVA145	21050HX	5260570.755	267922.083	5260570.753	267922.060	637.322	655.843

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		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
NVA146	21050HY	5261265.528	273429.885	5261265.526	273429.862	567.066	585.742
NVA147	21050HZ	5258765.243	275969.474	5258765.241	275969.451	625.695	644.448
NVA148	21050IA	5259527.565	256716.937	5259527.563	256716.914	627.138	645.379
NVA149	21050IB	5260884.704	260054.604	5260884.702	260054.581	637.987	656.302
NVA150	21050IC	5271828.618	217202.175	5271828.616	217202.154	716.132	733.696
NVA151	21050ID	5261874.462	200185.123	5261874.459	200185.102	826.356	843.681
NVA152	21050IE	5287745.266	212182.008	5287745.263	212181.988	735.147	752.750
NVA153	21050IF	5284723.656	211894.400	5284723.653	211894.380	721.986	739.573
NVA154	21050IG	5273195.246	205918.908	5273195.244	205918.887	767.953	785.410
NVA155	21050IH	5271920.149	192726.056	5271920.147	192726.035	618.074	635.532
NVA156	21050II	5281921.198	227367.483	5281921.195	227367.462	668.654	686.377
NVA157	21050IJ	5283598.783	247176.203	5283598.780	247176.180	625.616	643.618
NVA158	21050IK	5313502.261	272702.313	5313502.259	272702.288	618.321	636.725
NVA159	21050IL	5277700.328	286319.242	5277700.326	286319.219	607.524	626.441
NVA160	21050IM	5305177.781	243578.418	5305177.778	243578.395	567.924	585.918
VVA036	21050JW	5377466.915	220884.910	5377466.913	220884.888	711.492	729.786
VVA037	21050JX	5381838.996	230814.643	5381838.994	230814.620	676.449	694.791
VVA038	21050JY	5373274.695	241646.492	5373274.693	241646.468	718.399	736.717
VVA039	21050JZ	5375954.865	262635.399	5375954.864	262635.374	674.379	693.151
VVA040	21050KA	5365575.826	270341.371	5365575.825	270341.346	669.125	687.927
VVA041	21050KB	5348962.653	275056.507	5348962.651	275056.483	628.268	646.981
VVA042	21050KC	5349845.492	255703.863	5349845.489	255703.839	666.473	684.807
VVA043	21050KD	5347321.411	239744.280	5347321.407	239744.258	679.039	697.176
VVA044	21050KE	5317372.612	256909.387	5317372.609	256909.361	551.222	569.415
VVA045	21050KF	5345188.714	218753.332	5345188.710	218753.315	597.138	615.273
VVA046	21050KG	5331406.210	218208.090	5331406.207	218208.073	644.193	662.240
VVA047	21050KH	5328899.008	221154.927	5328899.004	221154.911	644.765	662.802
VVA048	21050KI	5323880.525	226630.335	5323880.521	226630.319	579.420	597.448
VVA049	21050KJ	5324647.008	241566.814	5324647.003	241566.792	676.159	694.217
VVA050	21050KK	5308504.359	238823.318	5308504.356	238823.297	564.107	582.080
VVA051	21050KL	5301769.947	244156.880	5301769.943	244156.857	579.248	597.233
VVA052	21050KM	5308563.282	275737.910	5308563.279	275737.885	627.501	645.970
VVA053	21050KN	5323422.469	270845.731	5323422.466	270845.706	628.678	647.082
VVA054	21050KO	5331691.270	266346.557	5331691.267	266346.531	623.137	641.519
VVA055	21050KP	5341455.273	265109.739	5341455.270	265109.714	627.507	645.936
VVA056	21050KQ	5275484.171	195698.025	5275484.168	195698.004	755.382	772.858
VVA057	21050KR	5273420.265	201973.875	5273420.263	201973.853	767.870	785.313
VVA058	21050KS	5270035.520	204708.695	5270035.517	204708.675	792.212	809.621

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		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
VVA059	21050KT	5268809.394	196949.933	5268809.391	196949.912	741.086	758.494
VVA060	21050KU	5264315.775	196583.756	5264315.773	196583.735	804.679	822.039
VVA061	21050KV	5265759.951	216425.367	5265759.947	216425.346	674.407	691.933
VVA062	21050KW	5261574.226	213649.626	5261574.223	213649.605	688.914	706.384
VVA063	21050KX	5260184.227	208530.869	5260184.224	208530.848	719.488	736.881
VVA064	21050KY	5280686.776	207025.142	5280686.774	207025.121	725.553	743.108
VVA065	21050KZ	5285202.869	234124.827	5285202.866	234124.806	586.395	604.220
VVA066	21050LA	5285131.227	243219.174	5285131.223	243219.151	679.913	697.843
VVA067	21050LB	5270890.100	254001.499	5270890.097	254001.476	685.834	703.989
VVA068	21050LC	5268006.516	247605.064	5268006.513	247605.040	680.168	698.193
VVA069	21050LD	5260951.276	226279.703	5260951.273	226279.681	691.135	708.765
VVA070	21050LE	5263799.776	234124.498	5263799.772	234124.475	715.094	732.860
VVA071	21050LF	5267099.386	265104.826	5267099.383	265104.803	570.048	588.482
VVA072	21050LG	5285858.856	276456.274	5285858.853	276456.251	599.968	618.564
VVA073	21050LH	5276338.130	278254.970	5276338.127	278254.947	612.032	630.732
VVA074	21050LI	5278287.121	270250.177	5278287.119	270250.154	591.537	610.038
VVA075	21050LJ	5278391.680	267677.458	5278391.678	267677.435	612.749	631.190
VVA076	21050LK	5264685.027	272565.927	5264685.025	272565.904	613.643	632.275
VVA077	21050LL	5261164.730	276406.083	5261164.728	276406.061	593.664	612.421
VVA078	21050LM	5264675.959	290910.889	5264675.957	290910.866	562.230	581.403
VVA079	21050LN	5262833.905	290575.565	5262833.905	290575.542	549.916	569.090
VVA080	21050LO	5261238.235	296917.541	5261238.233	296917.520	590.703	610.069
VVA081	21050LP	5252464.564	315705.490	5252464.562	315705.475	549.859	569.858
VVA082	21050LQ	5247777.105	318901.454	5247777.103	318901.439	496.538	516.634
VVA083	21050LR	5244554.836	314656.929	5244554.835	314656.916	515.234	535.243
VVA084	21050LS	5238627.999	324009.165	5238627.997	324009.151	501.410	521.641
VVA085	21050LT	5236367.774	342328.815	5236367.773	342328.798	499.683	520.374
VVA086	21050LU	5243939.452	334896.155	5243939.450	334896.140	560.294	580.711
VVA087	21050LV	5252228.456	327057.852	5252228.454	327057.837	560.413	580.650
VVA088	21050LW	5258807.127	324060.228	5258807.124	324060.213	580.398	600.573
VVA089	21050LX	5289566.743	371527.403	5289566.742	371527.382	601.552	622.761
VVA090	21050LY	5272131.224	366150.411	5272131.223	366150.392	572.151	593.146
VVA091	21050LZ	5268770.334	370910.265	5268770.332	370910.246	559.253	580.354
VVA092	21050MA	5251482.541	360894.400	5251482.539	360894.381	545.276	566.288
VVA093	21050MB	5249929.144	346375.003	5249929.142	346374.988	562.066	582.696
VVA094	21050MC	5256831.591	335294.961	5256831.588	335294.944	599.655	620.031
VVA095	21050MD	5271519.276	330052.127	5271519.274	330052.104	548.089	568.393
VVA096	21050ME	5280098.451	310225.081	5280098.449	310225.061	592.021	611.689



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		UTM14 North	UTM14 East	UTM14 North	UTM14 East	Ellip Hgt	NAVD88
VVA097	2105OMF	5286825.002	297426.476	5286825.001	297426.455	631.596	650.749
VVA098	2105OMG	5285464.868	289321.498	5285464.866	289321.475	597.492	616.435
VVA099	2105OMH	5296876.223	286498.882	5296876.221	286498.859	634.089	652.858
VVA100	2105OMI	5296215.827	305727.452	5296215.825	305727.430	623.840	643.186
VVA101	2105OMJ	5287702.915	319954.409	5287702.913	319954.388	591.279	611.205
VVA102	2105OMK	5293451.598	344236.197	5293451.597	344236.175	588.398	608.962
VVA103	2105OML	5272722.614	343763.216	5272722.612	343763.194	556.086	576.665
VVA104	2105OMM	5284951.034	361723.127	5284951.033	361723.107	603.940	624.864
VVA105	2105OMN	5293239.509	352291.639	5293239.507	352291.618	614.077	634.833
VVAF03	2105OMQ	5294436.872	230381.018	5294436.869	230380.997	697.047	714.878
VVAF04	2105OMR	5284732.856	206984.537	5284732.853	206984.517	688.233	705.813
VVAF05	2105OMS	5380730.709	221090.389	5380730.707	221090.366	712.291	730.610
VVAF06	2105OMT	5356008.793	220837.031	5356008.789	220837.011	644.078	662.259
VVAF07	2105OMU	5266697.475	205754.212	5266697.473	205754.191	820.336	837.711
VVAF08	2105OMV	5265890.627	236137.390	5265890.624	236137.367	585.416	603.239
VVAF09	2105OMW	5273221.216	214533.215	5273221.213	214533.194	738.373	755.918
VVAF10	2105OMX	5263428.720	207847.453	5263428.717	207847.432	755.030	772.417