

OPUS-RS solution : 018697_14_226_A2.14O OP1408202060023

opus <opus@ngs.noaa.gov>

Sat 8/16/2014 9:17 AM

To: John Freetly <John.Freetly@neciusa.com>;

FILE: 018697_14_226_A2.14O OP1408202060023

NGS OPUS-RS SOLUTION REPORT

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All computed coordinate accuracies are listed as 1-sigma RMS values.

For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: john.freetly@neciusa.com DATE: August 16, 2014
 RINEX FILE: 0186226v.14o TIME: 15:16:53 UTC

SOFTWARE: rsgps 1.37 RS50.prl 1.99.2 START: 2014/08/14 21:49:30
 EPHEMERIS: igr18054.eph [rapid] STOP: 2014/08/14 22:47:45
 NAV FILE: brdc2260.14n OBS USED: 3320 / 3320 : 100%
 ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 11.57/ 41.35
 ARP HEIGHT: 1.80000 NORMALIZED RMS: 0.377

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.61898)

X: -1373729.677(m) 0.009(m) -1373730.553(m) 0.009(m)
 Y: -4030478.401(m) 0.013(m) -4030477.178(m) 0.013(m)
 Z: 4733863.659(m) 0.009(m) 4733863.651(m) 0.009(m)

LAT: 48 13 10.45164 0.011(m) 48 13 10.47259 0.011(m)
 E LON: 251 10 44.66338 0.005(m) 251 10 44.60410 0.005(m)
 W LON: 108 49 15.33662 0.005(m) 108 49 15.39590 0.005(m)
 EL HGT: 919.445(m) 0.014(m) 918.856(m) 0.014(m)
 ORTHO HGT: 935.098(m) 0.017(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 12) SPC (2500 MT)

Northing (Y) [meters] 5343000.636 441318.762
 Easting (X) [meters] 661853.780 650440.628
 Convergence [degrees] 1.62529369 0.49674487
 Point Scale 0.99992189 0.99961543
 Combined Factor 0.99977782 0.99947140

US NATIONAL GRID DESIGNATOR: 12UXU6185343000(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9749	MTMS MONTANA STATE UNI CORS ARP	N483227.426	W1094111.858	73421.4
DL7731	P053 WHITEWATERMT2007 CORS ARP	N484333.865	W1074331.456	98671.5
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	137762.5
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	164493.4
DI2257	P049 ARMINGTON_MT2006 CORS ARP	N472059.850	W1105422.382	183770.7

NEAREST NGS PUBLISHED CONTROL POINT

Information on nearest mark is not available due to database connectivity issues or has restrictions on when or how it can be published.

OPUS-RS Extended Output, Level 2

FINAL COORDINATES (ITRF at epoch of observations)

mtms	-1425435.575	-3984013.202	4757493.880
p053	-1283559.264	-4015770.341	4771131.615
mtlw	-1449333.490	-4105829.832	4646773.499
p052	-1266648.327	-4138194.553	4670709.489
p049	-1545099.839	-4044895.874	4669084.578
0186	-1373730.553	-4030477.178	4733863.651

Covariance matrix of the stations:

1	2.1270E-07	4.1700E-07	-5.1830E-07	-1.1810E-08	-1.0800E-07	1.1950E-07	3.0530E-09	-9.8950E-08	1.3050E-07
	-1.6300E-08	-1.0340E-07	1.4090E-07	1.2410E-08	-1.0680E-07	1.2750E-07	2.8570E-08	-2.9900E-08	3.2780E-08
2	4.1700E-07	1.4840E-06	-1.6790E-06	-8.4150E-08	-2.8220E-07	3.8870E-07	-1.1540E-07	-3.4450E-07	4.3920E-07
	-8.1140E-08	-2.9590E-07	3.7580E-07	-1.3550E-07	-3.6110E-07	4.7480E-07	5.4990E-09	7.6760E-08	-2.6820E-08
3	-5.1830E-07	-1.6790E-06	2.2560E-06	1.6240E-07	4.5620E-07	-5.1600E-07	1.0810E-07	3.9150E-07	-5.0130E-07
	1.7350E-07	4.3950E-07	-5.6930E-07	7.3720E-08	3.9310E-07	-4.6890E-07	3.6560E-08	8.3260E-08	-5.3690E-08
4	-1.1810E-08	-8.4150E-08	1.6240E-07	2.2410E-07	4.0840E-07	-4.4510E-07	-1.7580E-08	-1.3380E-07	1.1340E-07
	8.4050E-08	-1.1300E-08	-4.6470E-08	-7.9060E-08	-1.7850E-07	2.1500E-07	7.9500E-08	1.0970E-07	-1.0780E-07
5	-1.0800E-07	-2.8220E-07	4.5620E-07	4.0840E-07	1.4590E-06	-1.5870E-06	-1.1890E-07	-3.6100E-07	4.0410E-07
	1.6980E-08	-2.0260E-07	1.9470E-07	-1.9920E-07	-4.1240E-07	5.3140E-07	5.4070E-08	1.7630E-07	-1.2950E-07
6	1.1950E-07	3.8870E-07	-5.1600E-07	-4.4510E-07	-1.5870E-06	2.0240E-06	1.2060E-07	4.2300E-07	-4.5320E-07
	2.2860E-08	2.9650E-07	-2.8810E-07	1.8270E-07	4.7880E-07	-5.6660E-07	-3.8560E-08	-8.5520E-08	1.1660E-07
7	3.0530E-09	-1.1540E-07	1.0810E-07	-1.7580E-08	-1.1890E-07	1.2060E-07	2.1890E-07	4.5040E-07	-4.9300E-07
	-2.3210E-08	-1.1120E-07	1.4770E-07	1.8950E-08	-1.0520E-07	1.1710E-07	2.1430E-08	-5.4010E-08	5.1210E-08
8	-9.8950E-08	-3.4450E-07	3.9150E-07	-1.3380E-07	-3.6100E-07	4.2300E-07	4.5040E-07	1.5920E-06	-1.6940E-06
	-1.4460E-07	-3.6050E-07	4.7660E-07	-7.2970E-08	-3.2590E-07	4.0280E-07	-3.7860E-08	-6.8020E-08	9.9990E-08
9	1.3050E-07	4.3920E-07	-5.0130E-07	1.1340E-07	4.0410E-07	-4.5320E-07	-4.9300E-07	-1.6940E-06	2.0940E-06
	1.0600E-07	3.8670E-07	-4.1890E-07	1.4290E-07	4.6290E-07	-5.2080E-07	1.4200E-08	3.8350E-08	1.1300E-08
10	-1.6300E-08	-8.1140E-08	1.7350E-07	8.4050E-08	1.6980E-08	2.2860E-08	-2.3210E-08	-1.4460E-07	1.0600E-07
	2.5830E-07	4.0930E-07	-5.3860E-07	-1.0310E-07	-1.9970E-07	2.3550E-07	9.2620E-08	1.4490E-07	-1.4830E-07
11	-1.0340E-07	-2.9590E-07	4.3950E-07	-1.1300E-08	-2.0260E-07	2.9650E-07	-1.1120E-07	-3.6050E-07	3.8670E-07

```

4.0930E-07 1.4730E-06 -1.6300E-06 -1.8500E-07 -4.1320E-07 5.0820E-07 5.1170E-08 1.4940E-07 -1.2450E-07
 12 1.4090E-07 3.7580E-07 -5.6930E-07 -4.6470E-08 1.9470E-07 -2.8810E-07 1.4770E-07 4.7660E-07 -4.1890E-07
-5.3860E-07 -1.6300E-06 2.1410E-06 2.9760E-07 5.8160E-07 -6.6530E-07 -1.0110E-07 -2.5170E-07 3.0950E-07
 13 1.2410E-08 -1.3550E-07 7.3720E-08 -7.9060E-08 -1.9920E-07 1.8270E-07 1.8950E-08 -7.2970E-08 1.4290E-07
-1.0310E-07 -1.8500E-07 2.9760E-07 3.5120E-07 5.9160E-07 -6.9600E-07 -2.2200E-08 -1.7060E-07 1.7200E-07
 14 -1.0680E-07 -3.6110E-07 3.9310E-07 -1.7850E-07 -4.1240E-07 4.7880E-07 -1.0520E-07 -3.2590E-07 4.6290E-07
-1.9970E-07 -4.1320E-07 5.8160E-07 5.9160E-07 1.7120E-06 -1.9170E-06 -7.2650E-08 -1.3390E-07 1.8080E-07
 15 1.2750E-07 4.7480E-07 -4.6890E-07 2.1500E-07 5.3140E-07 -5.6660E-07 1.1710E-07 4.0280E-07 -5.2080E-07
2.3550E-07 5.0820E-07 -6.6530E-07 -6.9600E-07 -1.9170E-06 2.4220E-06 8.8730E-08 2.1520E-07 -1.8350E-07
 16 2.8570E-08 5.4990E-09 3.6560E-08 7.9500E-08 5.4070E-08 -3.8560E-08 2.1430E-08 -3.7860E-08 1.4200E-08
08 9.2620E-08 5.1170E-08 -1.0110E-07 -2.2200E-08 -7.2650E-08 8.8730E-08 1.9080E-06 4.7950E-06 -5.6180E-06
 17 -2.9900E-08 7.6760E-08 8.3260E-08 1.0970E-07 1.7630E-07 -8.5520E-08 -5.4010E-08 -6.8020E-08 3.8350E-08
1.4490E-07 1.4940E-07 -2.5170E-07 -1.7060E-07 -1.3390E-07 2.1520E-07 4.7950E-06 1.7480E-05 -1.9960E-05
 18 3.2780E-08 -2.6820E-08 -5.3690E-08 -1.0780E-07 -1.2950E-07 1.1660E-07 5.1210E-08 9.9990E-08 1.1300E-08
-1.4830E-07 -1.2450E-07 3.0950E-07 1.7200E-07 1.8080E-07 -1.8350E-07 -5.6180E-06 -1.9960E-05 2.5170E-05

```

Covariance Matrix for the xyz OPUS Rover Position (meters^2).

```

0.0000019080 0.0000047950 -0.0000056180
0.0000047950 0.0000174800 -0.0000199600
-0.0000056180 -0.0000199600 0.0000251700

```

Covariance Matrix for the enu OPUS Position (meters^2).

```

0.0000006003 0.0000000378 0.0000014748
0.0000000378 0.0000010525 0.0000009887
0.0000014748 0.0000009887 0.0000429052

```

Horizontal network accuracy = 0.00225 meters.

Vertical network accuracy = 0.01284 meters.

		Vectors		
To	From	X	Y	Z
mtms	0186	-51705.022	46463.975	23630.229
p053	0186	90171.289	14706.836	37267.963
mtlw	0186	-75602.937	-75352.655	-87090.152
p052	0186	107082.226	-107717.375	-63154.162
p049	0186	-171369.286	-14418.696	-64779.073

Covariance matrix of the 5 vectors

```

 1 2.0636E-06 5.2364E-06 -6.2056E-06 1.7881E-06 4.6628E-06 -5.4927E-06 1.8611E-06 4.7638E-06 -5.5345E-06
1.7705E-06 4.6703E-06 -5.4088E-06 1.9140E-06 4.7907E-06 -5.6120E-06
 2 5.2364E-06 1.8810E-05 -2.1695E-05 4.5957E-06 1.6945E-05 -1.9459E-05 4.7281E-06 1.7127E-05 -1.9532E-05
4.5635E-06 1.6958E-05 -1.9306E-05 4.8246E-06 1.7176E-05 -1.9674E-05
 3 -6.2056E-06 -2.1695E-05 2.7533E-05 -5.3844E-06 -1.9458E-05 2.4591E-05 -5.5977E-06 -1.9752E-05 2.4711E-05
-5.3328E-06 -1.9479E-05 2.4345E-05 -5.7528E-06 -1.9831E-05 2.4938E-05
 4 1.7881E-06 4.5957E-06 -5.3844E-06 1.9731E-06 5.0396E-06 -5.9167E-06 1.7895E-06 4.5894E-06 -5.4110E-06
1.8199E-06 4.6228E-06 -5.4556E-06 1.7716E-06 4.5794E-06 -5.3839E-06
 5 4.6628E-06 1.6945E-05 -1.9458E-05 5.0396E-06 1.8586E-05 -2.1332E-05 4.6760E-06 1.7011E-05 -1.9465E-05
4.6130E-06 1.6952E-05 -1.9384E-05 4.7123E-06 1.7025E-05 -1.9514E-05
 6 -5.4927E-06 -1.9459E-05 2.4591E-05 -5.9167E-06 -2.1332E-05 2.6961E-05 -5.5100E-06 -1.9551E-05 2.4589E-05
-5.4083E-06 -1.9453E-05 2.4456E-05 -5.5687E-06 -1.9576E-05 2.4670E-05

```

7 1.8611E-06 4.7281E-06 -5.5977E-06 1.7895E-06 4.6760E-06 -5.5100E-06 2.0840E-06 5.3373E-06 -6.1764E-06
 1.7707E-06 4.6866E-06 -5.4204E-06 1.9277E-06 4.8165E-06 -5.6408E-06
 8 4.7638E-06 1.7127E-05 -1.9752E-05 4.5894E-06 1.7011E-05 -1.9551E-05 5.3373E-06 1.9208E-05 -2.1792E-05
 4.5434E-06 1.7038E-05 -1.9332E-05 4.9305E-06 1.7356E-05 -1.9872E-05
 9 -5.5345E-06 -1.9532E-05 2.4711E-05 -5.4110E-06 -1.9465E-05 2.4589E-05 -6.1764E-06 -2.1792E-05 2.7241E-05
 -5.3779E-06 -1.9487E-05 2.4430E-05 -5.6613E-06 -1.9716E-05 2.4821E-05
 10 1.7705E-06 4.5635E-06 -5.3328E-06 1.8199E-06 4.6130E-06 -5.4083E-06 1.7707E-06 4.5434E-06 -5.3779E-06
 1.9811E-06 5.0082E-06 -5.9072E-06 1.7345E-06 4.5230E-06 -5.3229E-06
 11 4.6703E-06 1.6958E-05 -1.9479E-05 4.6228E-06 1.6952E-05 -1.9453E-05 4.6866E-06 1.7038E-05 -1.9487E-05
 5.0082E-06 1.8654E-05 -2.1214E-05 4.7294E-06 1.7051E-05 -1.9542E-05
 12 -5.4088E-06 -1.9306E-05 2.4345E-05 -5.4556E-06 -1.9384E-05 2.4456E-05 -5.4204E-06 -1.9332E-05 2.4430E-05
 -5.9072E-06 -2.1214E-05 2.6692E-05 -5.3913E-06 -1.9307E-05 2.4379E-05
 13 1.9140E-06 4.8246E-06 -5.7528E-06 1.7716E-06 4.7123E-06 -5.5687E-06 1.9277E-06 4.9305E-06 -5.6613E-06
 1.7345E-06 4.7294E-06 -5.3913E-06 2.3036E-06 5.6298E-06 -6.5747E-06
 14 4.7907E-06 1.7176E-05 -1.9831E-05 4.5794E-06 1.7025E-05 -1.9576E-05 4.8165E-06 1.7356E-05 -1.9716E-05
 4.5230E-06 1.7051E-05 -1.9307E-05 5.6298E-06 1.9460E-05 -2.2273E-05
 15 -5.6120E-06 -1.9674E-05 2.4938E-05 -5.3839E-06 -1.9514E-05 2.4670E-05 -5.6408E-06 -1.9872E-05 2.4821E-05
 -5.3229E-06 -1.9542E-05 2.4379E-05 -6.5747E-06 -2.2273E-05 2.7959E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 8.4047E-01 -8.2328E-01 8.8616E-01 7.5291E-01 -7.3640E-01 8.9742E-01 7.5667E-01 -7.3817E-01
 8.7567E-01 7.5275E-01 -7.2879E-01 8.7789E-01 7.5601E-01 -7.3884E-01
 2 8.4047E-01 1.0000E+00 -9.5332E-01 7.5435E-01 9.0623E-01 -8.6408E-01 7.5515E-01 9.0102E-01 -8.6286E-01
 7.4756E-01 9.0528E-01 -8.6158E-01 7.3292E-01 8.9775E-01 -8.5787E-01
 3 -8.2328E-01 -9.5332E-01 1.0000E+00 -7.3052E-01 -8.6012E-01 9.0257E-01 -7.3897E-01 -8.5888E-01 9.0229E-01
 -7.2206E-01 -8.5952E-01 8.9802E-01 -7.2235E-01 -8.5673E-01 8.9883E-01
 4 8.8616E-01 7.5435E-01 -7.3052E-01 1.0000E+00 8.3220E-01 -8.1123E-01 8.8247E-01 7.4548E-01 -7.3805E-01
 9.2052E-01 7.6198E-01 -7.5175E-01 8.3099E-01 7.3904E-01 -7.2488E-01
 5 7.5291E-01 9.0623E-01 -8.6012E-01 8.3220E-01 1.0000E+00 -9.5294E-01 7.5132E-01 9.0029E-01 -8.6504E-01
 7.6022E-01 9.1039E-01 -8.7028E-01 7.2017E-01 8.9521E-01 -8.5604E-01
 6 -7.3640E-01 -8.6408E-01 9.0257E-01 -8.1123E-01 -9.5294E-01 1.0000E+00 -7.3508E-01 -8.5915E-01 9.0731E-01
 -7.4002E-01 -8.6745E-01 9.1164E-01 -7.0662E-01 -8.5467E-01 8.9856E-01
 7 8.9742E-01 7.5515E-01 -7.3897E-01 8.8247E-01 7.5132E-01 -7.3508E-01 1.0000E+00 8.4358E-01 -8.1973E-01
 8.7147E-01 7.5166E-01 -7.2676E-01 8.7981E-01 7.5632E-01 -7.3898E-01
 8 7.5667E-01 9.0102E-01 -8.5888E-01 7.4548E-01 9.0029E-01 -8.5915E-01 8.4358E-01 1.0000E+00 -9.5268E-01
 7.3652E-01 9.0010E-01 -8.5376E-01 7.4122E-01 8.9772E-01 -8.5753E-01
 9 -7.3817E-01 -8.6286E-01 9.0229E-01 -7.3805E-01 -8.6504E-01 9.0731E-01 -8.1973E-01 -9.5268E-01 1.0000E+00
 -7.3206E-01 -8.6446E-01 9.0599E-01 -7.1466E-01 -8.5633E-01 8.9940E-01
 10 8.7567E-01 7.4756E-01 -7.2206E-01 9.2052E-01 7.6022E-01 -7.4002E-01 8.7147E-01 7.3652E-01 -7.3206E-01
 1.0000E+00 8.2385E-01 -8.1235E-01 8.1193E-01 7.2847E-01 -7.1522E-01
 11 7.5275E-01 9.0528E-01 -8.5952E-01 7.6198E-01 9.1039E-01 -8.6745E-01 7.5166E-01 9.0010E-01 -8.6446E-01
 8.2385E-01 1.0000E+00 -9.5069E-01 7.2147E-01 8.9495E-01 -8.5572E-01
 12 -7.2879E-01 -8.6158E-01 8.9802E-01 -7.5175E-01 -8.7028E-01 9.1164E-01 -7.2676E-01 -8.5376E-01 9.0599E-01
 -8.1235E-01 -9.5069E-01 1.0000E+00 -6.8754E-01 -8.4716E-01 8.9240E-01
 13 8.7789E-01 7.3292E-01 -7.2235E-01 8.3099E-01 7.2017E-01 -7.0662E-01 8.7981E-01 7.4122E-01 -7.1466E-01
 8.1193E-01 7.2147E-01 -6.8754E-01 1.0000E+00 8.4086E-01 -8.1924E-01
 14 7.5601E-01 8.9775E-01 -8.5673E-01 7.3904E-01 8.9521E-01 -8.5467E-01 7.5632E-01 8.9772E-01 -8.5633E-01
 7.2847E-01 8.9495E-01 -8.4716E-01 8.4086E-01 1.0000E+00 -9.5488E-01
 15 -7.3884E-01 -8.5787E-01 8.9883E-01 -7.2488E-01 -8.5604E-01 8.9856E-01 -7.3898E-01 -8.5753E-01 8.9940E-01
 -7.1522E-01 -8.5572E-01 8.9240E-01 -8.1924E-01 -9.5488E-01 1.0000E+00

G-FILE for the vectors

```

Axx2014 8142014 814
B201408142100201408142200 5 rsgps 1.37IGS
lant_info.003 NGS
C00060001 -517050218 14 464639751 43 236302287 52
C00060002 901712891 14 147068363 43 372679632 51
C00060003 -756029372 14 -753526548 43 -870901519 52
C00060004 1070822260 14 -1077173753 43 -631541620 51
C00060005 -1713692855 15 -144186962 44 -647790727 52
D 1 2 8404742 1 3 -8232813 1 4 8861628 1 5 7529105 1 6 -7363978
D 1 7 8974229 1 8 7566662 1 9 -7381651 1 10 8756711 1 11 7527498
D 1 12 -7287863 1 13 8778876 1 14 7560069 1 15 -7388377 2 3 -9533201
D 2 4 7543494 2 5 9062276 2 6 -8640786 2 7 7551525 2 8 9010185
D 2 9 -8628581 2 10 7475591 2 11 9052839 2 12 -8615780 2 13 7329222
D 2 14 8977469 2 15 -8578722 3 4 -7305160 3 5 -8601238 3 6 9025715
D 3 7 -7389660 3 8 -8588835 3 9 9022926 3 10 -7220602 3 11 -8595168
D 3 12 8980230 3 13 -7223521 3 14 -8567316 3 15 8988269 4 5 8321976
D 4 6 -8112254 4 7 8824735 4 8 7454800 4 9 -7380542 4 10 9205159
D 4 11 7619826 4 12 -7517527 4 13 8309930 4 14 7390427 4 15 -7248765
D 5 6 -9529434 5 7 7513245 5 8 9002922 5 9 -8650405 5 10 7602176
D 5 11 9103896 5 12 -8702768 5 13 7201691 5 14 8952109 5 15 -8560409
D 6 7 -7350825 6 8 -8591549 6 9 9073148 6 10 -7400208 6 11 -8674463
D 6 12 9116432 6 13 -7066217 6 14 -8546711 6 15 8985602 7 8 8435767
D 7 9 -8197253 7 10 8714710 7 11 7516579 7 12 -7267558 7 13 8798069
D 7 14 7563202 7 15 -7389753 8 9 -9526812 8 10 7365238 8 11 9001022
D 8 12 -8537638 8 13 7412164 8 14 8977169 8 15 -8575269 9 10 -7320642
D 9 11 -8644607 9 12 9059902 9 13 -7146574 9 14 -8563285 9 15 8993955
D 10 11 8238480 10 12 -8123483 10 13 8119269 10 14 7284728 10 15 -7152224
D 11 12 -9506914 11 13 7214677 11 14 8949525 11 15 -8557186 12 13 -6875422
D 12 14 -8471616 12 15 8923991 13 14 8408607 13 15 -8192445 14 15 -9548798
    
```

ITRF position of 0186 as determined by individual baselines

	X	Y	Z
mtms	-1373730.557	-4030477.179	4733863.640
p053	-1373730.547	-4030477.165	4733863.651
mtlw	-1373730.543	-4030477.172	4733863.660
p052	-1373730.567	-4030477.199	4733863.663
p049	-1373730.553	-4030477.179	4733863.651

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
mtms	-0.004	-0.001	-0.011	-0.003	-0.009	-0.007
p053	0.006	0.013	-0.000	0.002	0.010	-0.010
mtlw	0.010	0.005	0.009	0.008	0.012	0.001
p052	-0.014	-0.022	0.012	-0.006	-0.011	0.026
p049	-0.000	-0.001	-0.000	0.000	-0.001	0.001

STATE PLANE COORDINATES - International Foot

SPC (2500 MT)

Northing (Y) [feet] 1447896.201
Easting (X) [feet] 2133991.562
Convergence [degrees] 0.49674487
Point Scale 0.99961543
Combined Factor 0.99947140

** Orthometric Heights Above Future Geopotential Datum.

Prototype orthometric heights are now being made available as a precursor to the completion of GRAV-D and the replacement of NAVD 88 with a new geopotential reference system. The following height reflects the current best estimate of the true orthometric height, based on the existing gravimetric geoid model. This height is subject to change as data and modeling for the gravimetric geoid change throughout the lifetime of the GRAV-D project, or as new realizations of the ITRF are adopted. However, at the completion of GRAV-D, these heights will supersede the NAVD 88 heights

APPROX ORTHO HGT: 934.097 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.519
scatter (mean square distance from rover) is 18985.016
average edop for rover is 0.760
average ndop for rover is 1.050
average hdop for rover is 1.296
average vdop for rover is 2.140
average gdop for rover is 2.980

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.