

OPUS-RS solution : 018772_14_248_A0.14O OP1410469468959

opus <opus@ngs.noaa.gov>

Thu 9/11/2014 3:08 PM

Inbox

To:Chad Mozol <Chad.Mozol@neciusa.com>;

FILE: 018772_14_248_A0.14O OP1410469468959

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: cmozol@neciusa.com DATE: September 11, 2014
RINEX FILE: 0187248u.14o TIME: 21:07:46 UTC

SOFTWARE: rsgps 1.37 RS90.prl 1.99.2 START: 2014/09/05 20:13:45
EPHEMERIS: igr18085.eph [rapid] STOP: 2014/09/05 21:11:45
NAV FILE: brdc2480.14n OBS USED: 3165 / 3305 : 96%
ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 24.58/ 50.91
ARP HEIGHT: 1.8000 NORMALIZED RMS: 0.250

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.67908)

X: -1363466.549(m) 0.003(m) -1363467.407(m) 0.003(m)
Y: -4300924.582(m) 0.008(m) -4300923.327(m) 0.008(m)
Z: 4495170.932(m) 0.017(m) 4495170.889(m) 0.017(m)

LAT: 45 5 10.09328 0.011(m) 45 5 10.11378 0.011(m)
E LON: 252 24 37.78454 0.005(m) 252 24 37.72981 0.005(m)
W LON: 107 35 22.21546 0.005(m) 107 35 22.27019 0.005(m)
EL HGT: 1495.039(m) 0.015(m) 1494.347(m) 0.015(m)
ORTHO HGT: 1507.374(m) 0.018(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 13) SPC (2500 MT)

Northing (Y) [meters] 4995781.510 94770.964
Easting (X) [meters] 296213.595 750388.141
Convergence [degrees] -1.83443557 1.39753564
Point Scale 1.00011067 0.99994939
Combined Factor 0.99987630 0.99971506

US NATIONAL GRID DESIGNATOR: 13TBK9621395781(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DM7161	WYSH SHERIDAN CORS ARP	N444801.769	W1070035.715	55690.9
DI3062	BIL5 BILLINGS 5 CORS ARP	N455816.237	W1075947.298	103394.7
DG9745	MTEI ENGINC CORS ARP	N454447.035	W1083600.736	107923.9
DJ8992	P033 TENSLEEPTRWY2005 CORS ARP	N435710.415	W1072315.121	126974.8
DL7758	P722 YNPBASSRCHMT2005 CORS ARP	N452725.985	W1093415.586	160898.4

NEAREST NGS PUBLISHED CONTROL POINT

QV0348	T8S R34E SEC 31 1/4 COR SOUTH	N450510.073	W1073522.205	0.7
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OPUS-RS Extended Output, Level 2

FINAL COORDINATES (ITRF at epoch of observations)

wysh	-1326396.430	-4335757.881	4472504.194
bil5	-1372156.891	-4223945.784	4563650.210
mtei	-1422329.055	-4226311.552	4546317.405
p033	-1374663.812	-4389900.535	4405280.430
p722	-1501537.056	-4223566.610	4524171.134
0187	-1363467.407	-4300923.327	4495170.889

Covariance matrix of the stations:

1	2.2210E-07	4.3480E-07	-4.9010E-07	1.2960E-08	-7.8430E-08	1.2140E-07	-9.5820E-09	-1.0460E-07	1.4650E-07
2	0.0490E-08	-1.1040E-07	3.7360E-08	-4.6190E-08	-1.4090E-07	1.8430E-07	8.3760E-08	1.0590E-07	-1.3160E-07
3	4.3480E-07	1.7740E-06	-1.8020E-06	-9.5640E-08	-3.6750E-07	4.4220E-07	-1.1090E-07	-3.8780E-07	4.6260E-07
4	-9.3530E-08	-4.0210E-07	4.0380E-07	-1.3590E-07	-4.1670E-07	4.9380E-07	3.0540E-08	1.0560E-07	-8.8820E-08
5	-4.9010E-07	-1.8020E-06	2.1130E-06	9.3190E-08	4.0710E-07	-4.8840E-07	1.3150E-07	4.4840E-07	-5.2740E-07
6	7.2690E-08	4.4050E-07	-3.1170E-07	1.9350E-07	5.0480E-07	-5.8620E-07	-7.8710E-08	-1.8660E-07	2.8090E-07
7	1.2960E-08	-9.5640E-08	9.3190E-08	2.0870E-07	4.5100E-07	-4.8560E-07	-5.8930E-09	-1.1170E-07	1.3760E-07
8	5.7890E-09	-1.1080E-07	9.4420E-08	-2.1720E-08	-1.3270E-07	1.6030E-07	5.1950E-08	2.9330E-08	-3.2010E-08
9	-7.8430E-08	-3.6750E-07	4.0710E-07	4.5100E-07	1.7520E-06	-1.8240E-06	-1.1980E-07	-3.7170E-07	4.8630E-07
10	-9.7010E-08	-4.0640E-07	4.0690E-07	-1.5560E-07	-4.0660E-07	5.2340E-07	2.8930E-08	1.1120E-07	-7.2180E-08
11	1.2140E-07	4.4220E-07	-4.8840E-07	-4.8560E-07	-1.8240E-06	2.2080E-06	1.2250E-07	4.6590E-07	-5.0730E-07
12	1.1930E-07	4.4080E-07	-4.9250E-07	1.2220E-07	4.7620E-07	-5.2010E-07	2.0340E-08	5.4490E-08	-4.3850E-08
13	-9.5820E-09	-1.1090E-07	1.3150E-07	-5.8930E-09	-1.1980E-07	1.2250E-07	2.2270E-07	4.7180E-07	-5.3170E-07
14	-7.7540E-09	-1.1190E-07	1.4260E-07	6.3040E-10	-1.2930E-07	1.3520E-07	2.4220E-08	-3.7470E-08	4.9170E-08
15	-1.0460E-07	-3.8780E-07	4.4840E-07	-1.1170E-07	-3.7170E-07	4.6590E-07	4.7180E-07	1.7810E-06	-1.8770E-06
16	-1.1490E-07	-4.1340E-07	4.5710E-07	-1.4000E-07	-4.0790E-07	5.0480E-07	-1.5670E-09	4.5280E-08	6.7830E-09
17	1.4650E-07	4.6260E-07	-5.2740E-07	1.3760E-07	4.8630E-07	-5.0730E-07	-5.3170E-07	-1.8770E-06	2.2790E-06
18	1.3690E-07	4.4940E-07	-5.3910E-07	1.1020E-07	4.7930E-07	-5.0560E-07	4.9020E-08	1.1450E-07	-1.1530E-07
19	2.0490E-08	-9.3530E-08	7.2690E-08	5.7890E-09	-9.7010E-08	1.1930E-07	-7.7540E-09	-1.1490E-07	1.3690E-07
20	2.1150E-07	4.4660E-07	-4.9360E-07	-3.0100E-08	-1.4090E-07	1.6460E-07	6.0470E-08	4.5660E-08	-6.4050E-08
21	-1.1040E-07	-4.0210E-07	4.4050E-07	-1.1080E-07	-4.0640E-07	4.4080E-07	-1.1190E-07	-4.1340E-07	4.4940E-07
22	4.4660E-07	1.8480E-06	-1.7940E-06	-1.1460E-07	-4.2610E-07	4.6440E-07	-1.4650E-08	-2.2560E-08	4.4920E-08
23	3.7360E-08	4.0380E-07	-3.1170E-07	9.4420E-08	4.0690E-07	-4.9250E-07	1.4260E-07	4.5710E-07	-5.3910E-07
24	-4.9360E-07	-1.7940E-06	2.1510E-06	2.2020E-07	5.2430E-07	-6.0850E-07	-8.2810E-08	-1.8280E-07	2.9710E-07
25	-4.6190E-08	-1.3590E-07	1.9350E-07	-2.1720E-08	-1.5560E-07	1.2220E-07	6.3040E-10	-1.4000E-07	1.1020E-07

```

-3.0100E-08 -1.1460E-07 2.2020E-07 2.9770E-07 5.4540E-07 -6.4550E-07 -2.0570E-08 -1.4400E-07 1.7900E-07
 14 -1.4090E-07 -4.1670E-07 5.0480E-07 -1.3270E-07 -4.0660E-07 4.7620E-07 -1.2930E-07 -4.0790E-07 4.7930E-07
-1.4090E-07 -4.2610E-07 5.2430E-07 5.4540E-07 1.8570E-06 -1.9850E-06 -4.2990E-08 -3.9150E-08 1.0870E-07
 15 1.8430E-07 4.9380E-07 -5.8620E-07 1.6030E-07 5.2340E-07 -5.2010E-07 1.3520E-07 5.0480E-07 -5.0560E-07
1.6460E-07 4.6440E-07 -6.0850E-07 -6.4550E-07 -1.9850E-06 2.4210E-06 9.1810E-08 2.0020E-07 -2.1850E-07
 16 8.3760E-08 3.0540E-08 -7.8710E-08 5.1950E-08 2.8930E-08 2.0340E-08 2.4220E-08 -1.5670E-09 4.9020E-08
6.0470E-08 -1.4650E-08 -8.2810E-08 -2.0570E-08 -4.2990E-08 9.1810E-08 2.0290E-06 5.3950E-06 -5.7410E-06
 17 1.0590E-07 1.0560E-07 -1.8660E-07 2.9330E-08 1.1120E-07 5.4490E-08 -3.7470E-08 4.5280E-08 1.1450E-07
4.5660E-08 -2.2560E-08 -1.8280E-07 -1.4400E-07 -3.9150E-08 2.0020E-07 5.3950E-06 2.1230E-05 -2.2130E-05
 18 -1.3160E-07 -8.8820E-08 2.8090E-07 -3.2010E-08 -7.2180E-08 -4.3850E-08 4.9170E-08 6.7830E-09 -1.1530E-07
-6.4050E-08 4.4920E-08 2.9710E-07 1.7900E-07 1.0870E-07 -2.1850E-07 -5.7410E-06 -2.2130E-05 2.5140E-05

```

Covariance Matrix for the xyz OPUS Rover Position (meters²).

```

0.0000020290 0.0000053950 -0.0000057410
0.0000053950 0.0000212300 -0.0000221300
-0.0000057410 -0.0000221300 0.0000251400

```

Covariance Matrix for the enu OPUS Position (meters²).

```

0.0000006742 0.0000000692 0.0000016521
0.0000000692 0.0000010370 0.0000013623
0.0000016521 0.0000013623 0.0000466877

```

Horizontal network accuracy = 0.00228 meters.

Vertical network accuracy = 0.01340 meters.

		Vectors		
To	From	X	Y	Z
wysh	0187	37070.977	-34834.554	-22666.696
bil5	0187	-8689.484	76977.543	68479.321
mtei	0187	-58861.649	74611.775	51146.516
p033	0187	-11196.405	-88977.208	-89890.459
p722	0187	-138069.649	77356.717	29000.245

Covariance matrix of the 5 vectors

```

1 2.0836E-06 5.6934E-06 -6.0208E-06 1.9062E-06 5.1817E-06 -5.5083E-06 1.9114E-06 5.1861E-06 -5.5119E-06
1.9053E-06 5.1934E-06 -5.4892E-06 1.9196E-06 5.1912E-06 -5.5169E-06
2 5.6934E-06 2.2793E-05 -2.3657E-05 5.2395E-06 2.0646E-05 -2.1653E-05 5.2910E-06 2.0691E-05 -2.1693E-05
5.2253E-06 2.0745E-05 -2.1455E-05 5.3726E-06 2.0747E-05 -2.1748E-05
3 -6.0208E-06 -2.3657E-05 2.6691E-05 -5.5371E-06 -2.1464E-05 2.4415E-05 -5.5800E-06 -2.1502E-05 2.4447E-05
-5.5255E-06 -2.1548E-05 2.4250E-05 -5.6478E-06 -2.1547E-05 2.4491E-05
4 1.9062E-06 5.2395E-06 -5.5371E-06 2.1338E-06 5.7877E-06 -6.2149E-06 1.9469E-06 5.2555E-06 -5.6204E-06
1.9224E-06 5.2695E-06 -5.5318E-06 1.9759E-06 5.2760E-06 -5.6405E-06
5 5.1817E-06 2.0646E-05 -2.1464E-05 5.7877E-06 2.2760E-05 -2.3936E-05 5.2837E-06 2.0702E-05 -2.1686E-05
5.2234E-06 2.0735E-05 -2.1468E-05 5.3545E-06 2.0751E-05 -2.1735E-05
6 -5.5083E-06 -2.1653E-05 2.4415E-05 -6.2149E-06 -2.3936E-05 2.7436E-05 -5.6880E-06 -2.1725E-05 2.4792E-05
-5.5780E-06 -2.1789E-05 2.4394E-05 -5.8181E-06 -2.1817E-05 2.4882E-05
7 1.9114E-06 5.2910E-06 -5.5800E-06 1.9469E-06 5.2837E-06 -5.6880E-06 2.2033E-06 5.9058E-06 -6.3709E-06
1.9366E-06 5.3352E-06 -5.5648E-06 2.0260E-06 5.3462E-06 -5.7468E-06
8 5.1861E-06 2.0691E-05 -2.1502E-05 5.2555E-06 2.0702E-05 -2.1725E-05 5.9058E-06 2.2920E-05 -2.4128E-05
5.2360E-06 2.0794E-05 -2.1497E-05 5.4006E-06 2.0816E-05 -2.1832E-05
9 -5.5119E-06 -2.1693E-05 2.4447E-05 -5.6204E-06 -2.1686E-05 2.4792E-05 -6.3709E-06 -2.4128E-05 2.7650E-05
-5.5891E-06 -2.1840E-05 2.4419E-05 -5.8588E-06 -2.1874E-05 2.4968E-05

```

10 1.9053E-06 5.2253E-06 -5.5255E-06 1.9224E-06 5.2234E-06 -5.5780E-06 1.9366E-06 5.2360E-06 -5.5891E-06
2.1196E-06 5.8106E-06 -6.0877E-06 1.9590E-06 5.2514E-06 -5.6042E-06
11 5.1934E-06 2.0745E-05 -2.1548E-05 5.2695E-06 2.0735E-05 -2.1789E-05 5.3352E-06 2.0794E-05 -2.1840E-05
5.8106E-06 2.3123E-05 -2.3786E-05 5.4391E-06 2.0866E-05 -2.1911E-05
12 -5.4892E-06 -2.1455E-05 2.4250E-05 -5.5318E-06 -2.1468E-05 2.4394E-05 -5.5648E-06 -2.1497E-05 2.4419E-05
-6.0877E-06 -2.3786E-05 2.6697E-05 -5.6170E-06 -2.1532E-05 2.4453E-05
13 1.9196E-06 5.3726E-06 -5.6478E-06 1.9759E-06 5.3545E-06 -5.8181E-06 2.0260E-06 5.4006E-06 -5.8588E-06
1.9590E-06 5.4391E-06 -5.6170E-06 2.3678E-06 6.1274E-06 -6.6573E-06
14 5.1912E-06 2.0747E-05 -2.1547E-05 5.2760E-06 2.0751E-05 -2.1817E-05 5.3462E-06 2.0816E-05 -2.1874E-05
5.2514E-06 2.0866E-05 -2.1532E-05 6.1274E-06 2.3165E-05 -2.4424E-05
15 -5.5169E-06 -2.1748E-05 2.4491E-05 -5.6405E-06 -2.1735E-05 2.4882E-05 -5.7468E-06 -2.1832E-05 2.4968E-05
-5.6042E-06 -2.1911E-05 2.4453E-05 -6.6573E-06 -2.4424E-05 2.7998E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 8.2616E-01 -8.0735E-01 9.0406E-01 7.5247E-01 -7.2855E-01 8.9212E-01 7.5045E-01 -7.2620E-01
9.0662E-01 7.4820E-01 -7.3600E-01 8.6424E-01 7.4721E-01 -7.2232E-01
2 8.2616E-01 1.0000E+00 -9.5911E-01 7.5130E-01 9.0646E-01 -8.6591E-01 7.4664E-01 9.0527E-01 -8.6413E-01
7.5177E-01 9.0363E-01 -8.6974E-01 7.3132E-01 9.0289E-01 -8.6089E-01
3 -8.0735E-01 -9.5911E-01 1.0000E+00 -7.3370E-01 -8.7086E-01 9.0221E-01 -7.2764E-01 -8.6932E-01 8.9991E-01
-7.3463E-01 -8.6735E-01 9.0846E-01 -7.1043E-01 -8.6654E-01 8.9591E-01
4 9.0406E-01 7.5130E-01 -7.3370E-01 1.0000E+00 8.3052E-01 -8.1227E-01 8.9793E-01 7.5150E-01 -7.3172E-01
9.0393E-01 7.5019E-01 -7.3292E-01 8.7905E-01 7.5042E-01 -7.2976E-01
5 7.5247E-01 9.0646E-01 -8.7086E-01 8.3052E-01 1.0000E+00 -9.5789E-01 7.4615E-01 9.0639E-01 -8.6448E-01
7.5205E-01 9.0385E-01 -8.7093E-01 7.2939E-01 9.0374E-01 -8.6101E-01
6 -7.2855E-01 -8.6591E-01 9.0221E-01 -8.1227E-01 -9.5789E-01 1.0000E+00 -7.3159E-01 -8.6636E-01 9.0013E-01
-7.3147E-01 -8.6506E-01 9.0136E-01 -7.2185E-01 -8.6540E-01 8.9778E-01
7 8.9212E-01 7.4664E-01 -7.2764E-01 8.9793E-01 7.4615E-01 -7.3159E-01 1.0000E+00 8.3107E-01 -8.1625E-01
8.9614E-01 7.4747E-01 -7.2558E-01 8.8701E-01 7.4832E-01 -7.3169E-01
8 7.5045E-01 9.0527E-01 -8.6932E-01 7.5150E-01 9.0639E-01 -8.6636E-01 8.3107E-01 1.0000E+00 -9.5845E-01
7.5122E-01 9.0324E-01 -8.6903E-01 7.3308E-01 9.0337E-01 -8.6183E-01
9 -7.2620E-01 -8.6413E-01 8.9991E-01 -7.3172E-01 -8.6448E-01 9.0013E-01 -8.1625E-01 -9.5845E-01 1.0000E+00
-7.3008E-01 -8.6374E-01 8.9878E-01 -7.2409E-01 -8.6430E-01 8.9739E-01
10 9.0662E-01 7.5177E-01 -7.3463E-01 9.0393E-01 7.5205E-01 -7.3147E-01 8.9614E-01 7.5122E-01 -7.3008E-01
1.0000E+00 8.2999E-01 -8.0929E-01 8.7445E-01 7.4944E-01 -7.2749E-01
11 7.4820E-01 9.0363E-01 -8.6735E-01 7.5019E-01 9.0385E-01 -8.6506E-01 7.4747E-01 9.0324E-01 -8.6374E-01
8.2999E-01 1.0000E+00 -9.5735E-01 7.3506E-01 9.0155E-01 -8.6113E-01
12 -7.3600E-01 -8.6974E-01 9.0846E-01 -7.3292E-01 -8.7093E-01 9.0136E-01 -7.2558E-01 -8.6903E-01 8.9878E-01
-8.0929E-01 -9.5735E-01 1.0000E+00 -7.0648E-01 -8.6582E-01 8.9441E-01
13 8.6424E-01 7.3132E-01 -7.1043E-01 8.7905E-01 7.2939E-01 -7.2185E-01 8.8701E-01 7.3308E-01 -7.2409E-01
8.7445E-01 7.3506E-01 -7.0648E-01 1.0000E+00 8.2733E-01 -8.1763E-01
14 7.4721E-01 9.0289E-01 -8.6654E-01 7.5042E-01 9.0374E-01 -8.6540E-01 7.4832E-01 9.0337E-01 -8.6430E-01
7.4944E-01 9.0155E-01 -8.6582E-01 8.2733E-01 1.0000E+00 -9.5903E-01
15 -7.2232E-01 -8.6089E-01 8.9591E-01 -7.2976E-01 -8.6101E-01 8.9778E-01 -7.3169E-01 -8.6183E-01 8.9739E-01
-7.2749E-01 -8.6113E-01 8.9441E-01 -8.1763E-01 -9.5903E-01 1.0000E+00

G-FILE for the vectors

Axx2014 9 52014 9 5
B201409052000201409052100 5 rsgps 1.37IGS
Iant_info.003 NGS
C00060001 370709769 14 -348345535 47 -226666958 51
C00060002 -86894844 14 769775432 47 684793205 52

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C00060003 -588616487 14 746117751 47 511465158 52
C00060004 -111964054 14 -889772081 48 -898904593 51
C00060005 -1380696492 15 773567170 48 290002449 52
D 1 2 8261610 1 3 -8073546 1 4 9040613 1 5 7524683 1 6 -7285470
D 1 7 8921178 1 8 7504496 1 9 -7261952 1 10 9066221 1 11 7482027
D 1 12 -7359981 1 13 8642392 1 14 7472103 1 15 -7223161 2 3 -9591114
D 2 4 7512998 2 5 9064596 2 6 -8659057 2 7 7466352 2 8 9052694
D 2 9 -8641277 2 10 7517735 2 11 9036254 2 12 -8697442 2 13 7313179
D 2 14 9028890 2 15 -8608918 3 4 -7337036 3 5 -8708567 3 6 9022079
D 3 7 -7276359 3 8 -8693185 3 9 8999058 3 10 -7346299 3 11 -8673533
D 3 12 9084550 3 13 -7104251 3 14 -8665424 3 15 8959134 4 5 8305195
D 4 6 -8122717 4 7 8979293 4 8 7514996 4 9 -7317230 4 10 9039346
D 4 11 7501895 4 12 -7329205 4 13 8790466 4 14 7504222 4 15 -7297552
D 5 6 -9578927 5 7 7461501 5 8 9063892 5 9 -8644763 5 10 7520524
D 5 11 9038527 5 12 -8709276 5 13 7293869 5 14 9037432 5 15 -8610061
D 6 7 -7315928 6 8 -8663587 6 9 9001325 6 10 -7314705 6 11 -8650640
D 6 12 9013632 6 13 -7218549 6 14 -8654019 6 15 8977762 7 8 8310690
D 7 9 -8162492 7 10 8961368 7 11 7474742 7 12 -7255777 7 13 8870052
D 7 14 7483247 7 15 -7316918 8 9 -9584523 8 10 7512178 8 11 9032351
D 8 12 -8690292 8 13 7330805 8 14 9033711 8 15 -8618311 9 10 -7300830
D 9 11 -8637446 9 12 8987846 9 13 -7240850 9 14 -8642966 9 15 8973860
D 10 11 8299924 10 12 -8092889 10 13 8744508 10 14 7494380 10 15 -7274852
D 11 12 -9573500 11 13 7350614 11 14 9015481 11 15 -8611323 12 13 -7064767
D 12 14 -8658202 12 15 8944112 13 14 8273330 13 15 -8176342 14 15 -9590307
    
```

ITRF position of 0187 as determined by individual baselines

	X	Y	Z
wysh	-1363467.410	-4300923.331	4495170.907
bil5	-1363467.403	-4300923.333	4495170.910
mtei	-1363467.406	-4300923.342	4495170.896
p033	-1363467.411	-4300923.328	4495170.870
p722	-1363467.408	-4300923.324	4495170.889

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
wysh	-0.004	-0.004	0.017	-0.002	0.009	0.015
bil5	0.003	-0.006	0.021	0.005	0.011	0.018
mtei	0.001	-0.015	0.007	0.006	-0.005	0.014
p033	-0.005	-0.001	-0.019	-0.004	-0.015	-0.012
p722	-0.002	0.003	-0.001	-0.002	0.001	-0.002

STATE PLANE COORDINATES - International Foot

SPC (2500 MT)

Northing (Y) [feet]	310928.360
Easting (X) [feet]	2461903.350
Convergence [degrees]	1.39753564
Point Scale	0.99994939
Combined Factor	0.99971506

** 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: 1506.523 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.525
scatter (mean square distance from rover) is 13487.671
average edop for rover is 0.790
average ndop for rover is 1.040
average hdop for rover is 1.306
average vdop for rover is 2.160
average gdop for rover is 3.010

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.

8002 The Opus solution for your submitted RINEX file appears to be
8002 quite close to an NGS published control point. This suggests that
8002 you may have set your GPS receiver up over an NGS control point.
8002 Furthermore, our files indicate that this control point has not
8002 been recovered in the last five years.
8002 If you did indeed recover an NGS control point, we would
8002 appreciate receiving this information through our web based
8002 Mark Recovery Form at
8002 http://www.ngs.noaa.gov/products_services.shtml#MarkRecoveryForm.
8002