

## OPUS-RS solution : 018506\_14\_239\_A2.14O OP1409695603580

opus &lt;opus@ngs.noaa.gov&gt;

Tue 9/2/2014 4:11 PM

To:John Freetly &lt;John.Freetly@neciusa.com&gt;;

FILE: 018506\_14\_239\_A2.14O OP1409695603580

## 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  
RINEX FILE: 0185239r.14oDATE: September 02, 2014  
TIME: 22:10:36 UTCSOFTWARE: rsgps 1.37 RS52.prl 1.99.2      START: 2014/08/27 17:50:00  
EPHEMERIS: igr18073.eph [rapid]      STOP: 2014/08/27 19:22:45  
NAV FILE: brdc2390.14n      OBS USED: 4030 / 5205 : 77%  
ANT NAME: CHCX90D-OPUS    NONE      QUALITY IND. 28.44/ 72.05  
ARP HEIGHT: 1.8000      NORMALIZED RMS:    0.316

REF FRAME: NAD\_83(2011)(EPOCH:2010.0000)      IGS08 (EPOCH:2014.65418)

X: -1335498.523(m) 0.004(m)      -1335499.383(m) 0.004(m)  
Y: -4280581.329(m) 0.008(m)      -4280580.076(m) 0.008(m)  
Z: 4522091.566(m) 0.012(m)      4522091.526(m) 0.012(m)LAT: 45 26 3.22792 0.006(m)      45 26 3.24869 0.006(m)  
E LON: 252 40 21.36329 0.005(m)      252 40 21.30836 0.005(m)  
W LON: 107 19 38.63671 0.005(m)      107 19 38.69164 0.005(m)  
EL HGT: 1051.050(m) 0.012(m)      1050.362(m) 0.012(m)  
ORTHO HGT: 1065.545(m) 0.015(m) [NAVD88 (Computed using GEOID12A)]

## UTM COORDINATES    STATE PLANE COORDINATES

UTM (Zone 13)      SPC (2500 MT )

Northing (Y) [meters]    5033824.583      133974.208  
Easting (X) [meters]    317956.866      769942.480  
Convergence [degrees]    -1.65859842      1.58926670  
Point Scale      1.00000747      0.99976711  
Combined Factor      0.99984271      0.99960239

US NATIONAL GRID DESIGNATOR: 13TCL1795633824(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DM7161	WYSH SHERIDAN CORS ARP	N444801.769	W1070035.715	74741.9
DI3062	BIL5 BILLINGS 5 CORS ARP	N455816.237	W1075947.298	79236.0
DG9745	MTEI ENGINC CORS ARP	N454447.035	W1083600.736	105220.5
DL7758	P722 YNPBASSRCHMT2005 CORS ARP	N452725.985	W1093415.586	175565.9
DI2260	P054 TEREKALAKAMT2006 CORS ARP	N455046.833	W1042629.062	229629.9

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)

wysh	-1326396.427	-4335757.880	4472504.195
bil5	-1372156.892	-4223945.791	4563650.235
mtei	-1422329.054	-4226311.550	4546317.408
p722	-1501537.050	-4223566.607	4524171.128
p054	-1110122.547	-4310701.940	4554151.771
0185	-1335499.383	-4280580.076	4522091.526

Covariance matrix of the stations:

1	2.0840E-07	4.0570E-07	-4.3440E-07	-1.4290E-09	-1.0330E-07	1.0940E-07	-1.5270E-09	-1.0710E-07	1.1430E-07	-2.2830E-09	-1.1410E-07	1.2290E-07	-3.2350E-09	-8.1070E-08	8.7680E-08	4.0440E-08	-1.9220E-09	5.8520E-10
2	4.0570E-07	1.3460E-06	-1.3090E-06	-9.4570E-08	-2.9150E-07	3.2020E-07	-8.0610E-08	-2.9010E-07	3.2560E-07	-6.2270E-08	-2.9870E-07	3.4310E-07	-1.6880E-07	-2.6550E-07	3.2080E-07	-1.5560E-08	-2.3970E-10	4.5720E-08
3	-4.3440E-07	-1.3090E-06	1.4760E-06	1.0660E-07	3.2910E-07	-3.1750E-07	1.0220E-07	3.2880E-07	-3.1930E-07	9.6560E-08	3.3220E-07	-3.2550E-07	1.2920E-07	3.1810E-07	-3.1440E-07	1.6450E-09	7.8770E-09	3.7850E-08
4	-1.4290E-09	-9.4570E-08	1.0660E-07	2.0620E-07	3.7290E-07	-4.2160E-07	-3.2070E-09	-9.8180E-08	1.1110E-07	-6.2160E-09	-1.0490E-07	1.1840E-07	4.6710E-09	-7.5430E-08	8.5670E-08	3.7620E-08	-4.2080E-09	6.8270E-09
5	-1.0330E-07	-2.9150E-07	3.2910E-07	3.7290E-07	1.1670E-06	-1.1940E-06	-1.0550E-07	-2.1710E-07	2.8660E-07	-1.2130E-07	-2.1690E-07	2.8070E-07	-4.2320E-08	-2.4190E-07	2.9720E-07	6.4460E-09	6.2200E-08	-2.3150E-08
6	1.0940E-07	3.2020E-07	-3.1750E-07	-4.2160E-07	-1.1940E-06	1.4230E-06	1.1210E-07	2.8830E-07	-3.0220E-07	1.2020E-07	2.8880E-07	-2.9990E-07	7.9650E-08	2.9720E-07	-3.0360E-07	1.8560E-09	-3.0170E-09	3.7740E-08
7	-1.5270E-09	-8.0610E-08	1.0220E-07	-3.2070E-09	-1.0550E-07	1.1210E-07	2.2140E-07	3.8110E-07	-4.3320E-07	2.3070E-09	-1.1660E-07	1.2860E-07	-1.8830E-08	-7.8630E-08	9.0850E-08	2.9900E-08	-1.9920E-08	2.5860E-08
8	-1.0710E-07	-2.9010E-07	3.2880E-07	-9.8180E-08	-2.1710E-07	2.8830E-07	3.8110E-07	1.1750E-06	-1.2020E-06	-1.2270E-07	-2.2050E-07	2.8280E-07	-5.2080E-08	-2.4700E-07	3.0190E-07	8.1720E-10	5.6310E-08	-1.7610E-08
9	1.1430E-07	3.2560E-07	-3.1930E-07	1.1110E-07	2.8660E-07	-3.0220E-07	-4.3320E-07	-1.2020E-06	1.4260E-06	1.2630E-07	2.8780E-07	-2.9730E-07	8.0770E-08	3.0260E-07	-3.0740E-07	5.4560E-09	-2.9240E-09	3.9870E-08
10	-2.2830E-09	-6.2270E-08	9.6560E-08	-6.2160E-09	-1.2130E-07	1.2020E-07	2.3070E-09	-1.2270E-07	1.2630E-07	2.5730E-07	3.8910E-07	-4.4020E-07	-5.0740E-08	-8.3340E-08	9.8270E-08	1.8960E-08	-4.1180E-08	5.1580E-08
11	-1.1410E-07	-2.9870E-07	3.3220E-07	-1.0490E-07	-2.1690E-07	2.8880E-07	-1.1660E-07	-2.2050E-07	2.8780E-07									

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3.8910E-07 1.1890E-06 -1.2160E-06 -5.1460E-08 -2.5350E-07 3.0660E-07 -3.6640E-09 5.7840E-08 -2.1840E-08
 12 1.2290E-07 3.4310E-07 -3.2550E-07 1.1840E-07 2.8070E-07 -2.9990E-07 1.2860E-07 2.8280E-07 -2.9730E-07
-4.4020E-07 -1.2160E-06 1.4340E-06 6.8690E-08 3.0940E-07 -3.1090E-07 7.3060E-09 -1.2110E-08 5.4190E-08
 13 -3.2350E-09 -1.6880E-07 1.2920E-07 4.6710E-09 -4.2320E-08 7.9650E-08 -1.8830E-08 -5.2080E-08 8.0770E-08
-5.0740E-08 -5.1460E-08 6.8690E-08 2.6750E-07 3.1540E-07 -3.6010E-07 7.3060E-08 6.7170E-08 -8.4910E-08
 14 -8.1070E-08 -2.6550E-07 3.1810E-07 -7.5430E-08 -2.4190E-07 2.9720E-07 -7.8630E-08 -2.4700E-07 3.0260E-07
-8.3340E-08 -2.5350E-07 3.0940E-07 3.1540E-07 1.2080E-06 -1.2270E-06 1.1960E-08 2.3760E-08 1.6890E-08
 15 8.7680E-08 3.2080E-07 -3.1440E-07 8.5670E-08 2.9720E-07 -3.0360E-07 9.0850E-08 3.0190E-07 -3.0740E-
07 9.8270E-08 3.0660E-07 -3.1090E-07 -3.6010E-07 -1.2270E-06 1.4360E-06 -1.6490E-08 9.8760E-09 3.0810E-08
 16 4.0440E-08 -1.5560E-08 1.6450E-09 3.7620E-08 6.4460E-09 1.8560E-09 2.9900E-08 8.1720E-10 5.4560E-09
1.8960E-08 -3.6640E-09 7.3060E-09 7.3060E-08 1.1960E-08 -1.6490E-08 2.2860E-06 5.3380E-06 -5.9300E-06
 17 -1.9220E-09 -2.3970E-10 7.8770E-09 -4.2080E-09 6.2200E-08 -3.0170E-09 -1.9920E-08 5.6310E-08 -2.9240E-09
-4.1180E-08 5.7840E-08 -1.2110E-08 6.7170E-08 2.3760E-08 9.8760E-09 5.3380E-06 1.6370E-05 -1.7320E-05
 18 5.8520E-10 4.5720E-08 3.7850E-08 6.8270E-09 -2.3150E-08 3.7740E-08 2.5860E-08 -1.7610E-08 3.9870E-08
5.1580E-08 -2.1840E-08 5.4190E-08 -8.4910E-08 1.6890E-08 3.0810E-08 -5.9300E-06 -1.7320E-05 1.9730E-05
    
```

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

```

0.0000022860 0.0000053380 -0.0000059300
0.0000053380 0.0000163700 -0.0000173200
-0.0000059300 -0.0000173200 0.0000197300
    
```

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

```

0.0000004999 -0.0000000792 -0.0000006291
-0.0000000792 0.0000006369 0.0000006325
-0.0000006291 0.0000006325 0.0000372491
    
```

Horizontal network accuracy = 0.00185 meters.

Vertical network accuracy = 0.01197 meters.

		Vectors		
To	From	X	Y	Z
wysh	0185	9102.956	-55177.804	-49587.331
bil5	0185	-36657.509	56634.285	41558.709
mtei	0185	-86829.671	54268.526	24225.882
p722	0185	-166037.666	57013.469	2079.602
p054	0185	225376.836	-30121.864	32060.245

Covariance matrix of the 5 vectors

```

 1 2.4135E-06 5.7612E-06 -6.3666E-06 2.2065E-06 5.2302E-06 -5.8230E-06 2.2141E-06 5.2320E-06 -5.8217E-06
2.2243E-06 5.2295E-06 -5.8150E-06 2.1693E-06 5.2469E-06 -5.8264E-06
 2 5.7612E-06 1.7716E-05 -1.8683E-05 5.2632E-06 1.6017E-05 -1.7043E-05 5.2929E-06 1.6024E-05 -1.7037E-05
5.3325E-06 1.6014E-05 -1.7011E-05 5.1176E-06 1.6081E-05 -1.7055E-05
 3 -6.3666E-06 -1.8683E-05 2.1130E-05 -5.8319E-06 -1.6976E-05 1.9337E-05 -5.8553E-06 -1.6981E-05 1.9333E-05
-5.8867E-06 -1.6974E-05 1.9312E-05 -5.7175E-06 -1.7027E-05 1.9347E-05
 4 2.2065E-06 5.2632E-06 -5.8319E-06 2.4170E-06 5.7087E-06 -6.3603E-06 2.2153E-06 5.2432E-06 -5.8312E-06
2.2232E-06 5.2410E-06 -5.8257E-06 2.1800E-06 5.2548E-06 -5.8347E-06
 5 5.2302E-06 1.6017E-05 -1.6976E-05 5.7087E-06 1.7413E-05 -1.8488E-05 5.2460E-06 1.6034E-05 -1.7007E-05
5.2514E-06 1.6033E-05 -1.7004E-05 5.2221E-06 1.6042E-05 -1.7010E-05
 6 -5.8230E-06 -1.7043E-05 1.9337E-05 -6.3603E-06 -1.8488E-05 2.1078E-05 -5.8456E-06 -1.7011E-05 1.9350E-05
-5.8632E-06 -1.7006E-05 1.9338E-05 -5.7673E-06 -1.7037E-05 1.9358E-05
    
```

7 2.2141E-06 5.2929E-06 -5.8553E-06 2.2153E-06 5.2460E-06 -5.8456E-06 2.4476E-06 5.7382E-06 -6.3945E-06  
 2.2394E-06 5.2450E-06 -5.8346E-06 2.1642E-06 5.2673E-06 -5.8485E-06  
 8 5.2320E-06 1.6024E-05 -1.6981E-05 5.2432E-06 1.6034E-05 -1.7011E-05 5.7382E-06 1.7432E-05 -1.8501E-05  
 5.2557E-06 1.6035E-05 -1.7007E-05 5.2179E-06 1.6043E-05 -1.7010E-05  
 9 -5.8217E-06 -1.7037E-05 1.9333E-05 -5.8312E-06 -1.7007E-05 1.9350E-05 -6.3945E-06 -1.8501E-05 2.1076E-05  
 -5.8607E-06 -1.7007E-05 1.9339E-05 -5.7698E-06 -1.7031E-05 1.9352E-05  
 10 2.2243E-06 5.3325E-06 -5.8867E-06 2.2232E-06 5.2514E-06 -5.8632E-06 2.2394E-06 5.2557E-06 -5.8607E-06  
 2.5054E-06 5.7719E-06 -6.4291E-06 2.1432E-06 5.2839E-06 -5.8668E-06  
 11 5.2295E-06 1.6014E-05 -1.6974E-05 5.2410E-06 1.6033E-05 -1.7006E-05 5.2450E-06 1.6035E-05 -1.7007E-05  
 5.7719E-06 1.7443E-05 -1.8502E-05 5.2230E-06 1.6035E-05 -1.7001E-05  
 12 -5.8150E-06 -1.7011E-05 1.9312E-05 -5.8257E-06 -1.7004E-05 1.9338E-05 -5.8346E-06 -1.7007E-05 1.9339E-05  
 -6.4291E-06 -1.8502E-05 2.1056E-05 -5.7837E-06 -1.7015E-05 1.9334E-05  
 13 2.1693E-06 5.1176E-06 -5.7175E-06 2.1800E-06 5.2221E-06 -5.7673E-06 2.1642E-06 5.2179E-06 -5.7698E-06  
 2.1432E-06 5.2230E-06 -5.7837E-06 2.4074E-06 5.5743E-06 -6.1887E-06  
 14 5.2469E-06 1.6081E-05 -1.7027E-05 5.2548E-06 1.6042E-05 -1.7037E-05 5.2673E-06 1.6043E-05 -1.7031E-05  
 5.2839E-06 1.6035E-05 -1.7015E-05 5.5743E-06 1.7530E-05 -1.8574E-05  
 15 -5.8264E-06 -1.7055E-05 1.9347E-05 -5.8347E-06 -1.7010E-05 1.9358E-05 -5.8485E-06 -1.7010E-05 1.9352E-05  
 -5.8668E-06 -1.7001E-05 1.9334E-05 -6.1887E-06 -1.8574E-05 2.1104E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 8.8104E-01 -8.9152E-01 9.1358E-01 8.0679E-01 -8.1642E-01 9.1098E-01 8.0661E-01 -8.1626E-01  
 9.0455E-01 8.0597E-01 -8.1572E-01 8.9994E-01 8.0664E-01 -8.1637E-01  
 2 8.8104E-01 1.0000E+00 -9.6560E-01 8.0432E-01 9.1190E-01 -8.8193E-01 8.0377E-01 9.1180E-01 -8.8168E-01  
 8.0039E-01 9.1094E-01 -8.8073E-01 7.8362E-01 9.1249E-01 -8.8201E-01  
 3 -8.9152E-01 -9.6560E-01 1.0000E+00 -8.1606E-01 -8.8500E-01 9.1627E-01 -8.1419E-01 -8.8480E-01 9.1611E-01  
 -8.0906E-01 -8.8412E-01 9.1559E-01 -8.0165E-01 -8.8467E-01 9.1616E-01  
 4 9.1358E-01 8.0432E-01 -8.1606E-01 1.0000E+00 8.7997E-01 -8.9111E-01 9.1080E-01 8.0776E-01 -8.1701E-01  
 9.0346E-01 8.0717E-01 -8.1664E-01 9.0375E-01 8.0728E-01 -8.1695E-01  
 5 8.0679E-01 9.1190E-01 -8.8500E-01 8.7997E-01 1.0000E+00 -9.6504E-01 8.0357E-01 9.2033E-01 -8.8778E-01  
 7.9508E-01 9.1996E-01 -8.8805E-01 8.0656E-01 9.1819E-01 -8.8731E-01  
 6 -8.1642E-01 -8.8193E-01 9.1627E-01 -8.9111E-01 -9.6504E-01 1.0000E+00 -8.1386E-01 -8.8745E-01 9.1808E-01  
 -8.0685E-01 -8.8692E-01 9.1796E-01 -8.0964E-01 -8.8629E-01 9.1783E-01  
 7 9.1098E-01 8.0377E-01 -8.1419E-01 9.1080E-01 8.0357E-01 -8.1386E-01 1.0000E+00 8.7847E-01 -8.9031E-01  
 9.0434E-01 8.0271E-01 -8.1275E-01 8.9157E-01 8.0412E-01 -8.1375E-01  
 8 8.0661E-01 9.1180E-01 -8.8480E-01 8.0776E-01 9.2033E-01 -8.8745E-01 8.7847E-01 1.0000E+00 -9.6523E-01  
 7.9527E-01 9.1957E-01 -8.8772E-01 8.0547E-01 9.1772E-01 -8.8685E-01  
 9 -8.1626E-01 -8.8168E-01 9.1611E-01 -8.1701E-01 -8.8778E-01 9.1808E-01 -8.9031E-01 -9.6523E-01 1.0000E+00  
 -8.0653E-01 -8.8701E-01 9.1801E-01 -8.1001E-01 -8.8605E-01 9.1757E-01  
 10 9.0455E-01 8.0039E-01 -8.0906E-01 9.0346E-01 7.9508E-01 -8.0685E-01 9.0434E-01 7.9527E-01 -8.0653E-01  
 1.0000E+00 8.7311E-01 -8.8517E-01 8.7269E-01 7.9730E-01 -8.0683E-01  
 11 8.0597E-01 9.1094E-01 -8.8412E-01 8.0717E-01 9.1996E-01 -8.8692E-01 8.0271E-01 9.1957E-01 -8.8701E-01  
 8.7311E-01 1.0000E+00 -9.6543E-01 8.0600E-01 9.1697E-01 -8.8610E-01  
 12 -8.1572E-01 -8.8073E-01 9.1559E-01 -8.1664E-01 -8.8805E-01 9.1796E-01 -8.1275E-01 -8.8772E-01 9.1801E-01  
 -8.8517E-01 -9.6543E-01 1.0000E+00 -8.1236E-01 -8.8565E-01 9.1718E-01  
 13 8.9994E-01 7.8362E-01 -8.0165E-01 9.0375E-01 8.0656E-01 -8.0964E-01 8.9157E-01 8.0547E-01 -8.1001E-01  
 8.7269E-01 8.0600E-01 -8.1236E-01 1.0000E+00 8.5806E-01 -8.6824E-01  
 14 8.0664E-01 9.1249E-01 -8.8467E-01 8.0728E-01 9.1819E-01 -8.8629E-01 8.0412E-01 9.1772E-01 -8.8605E-01  
 7.9730E-01 9.1697E-01 -8.8565E-01 8.5806E-01 1.0000E+00 -9.6564E-01  
 15 -8.1637E-01 -8.8201E-01 9.1616E-01 -8.1695E-01 -8.8731E-01 9.1783E-01 -8.1375E-01 -8.8685E-01 9.1757E-01  
 -8.0683E-01 -8.8610E-01 9.1718E-01 -8.6824E-01 -9.6564E-01 1.0000E+00

G-FILE for the vectors

```

Axx2014 8272014 827
B201408271700201408271900 5 rsgps 1.37IGS
lant_info.003 NGS
C00060001 91029560 15 -551778040 42 -495873306 45
C00060002 -366575086 15 566342853 41 415587086 45
C00060003 -868296707 15 542685261 41 242258823 45
C00060004 -1660376664 15 570134688 41 20796018 45
C00060005 -2041198933 15 -301218636 41 320602445 45
D 1 2 8810436 1 3 -8915205 1 4 9135785 1 5 8067872 1 6 -8164219
D 1 7 9109782 1 8 8066113 1 9 -8162640 1 10 9045538 1 11 8059701
D 1 12 -8157171 1 13 8999426 1 14 8066400 1 15 -8163749 2 3 -9655965
D 2 4 8043151 2 5 9119020 2 6 -8819316 2 7 8037709 2 8 9117993
D 2 9 -8816833 2 10 8003923 2 11 9109371 2 12 -8807336 2 13 7836180
D 2 14 9124874 2 15 -8820059 3 4 -8160568 3 5 -8849957 3 6 9162721
D 3 7 -8141913 3 8 -8847977 3 9 9161133 3 10 -8090580 3 11 -8841228
D 3 12 9155893 3 13 -8016479 3 14 -8846671 3 15 9161638 4 5 8799698
D 4 6 -8911113 4 7 9107984 4 8 8077635 4 9 -8170058 4 10 9034576
D 4 11 8071653 4 12 -8166422 4 13 9037486 4 14 8072834 4 15 -8169491
D 5 6 -9650380 5 7 8035707 5 8 9203272 5 9 -8877842 5 10 7950771
D 5 11 9199623 5 12 -8880476 5 13 8065625 5 14 9181921 5 15 -8873073
D 6 7 -8138611 6 8 -8874494 6 9 9180761 6 10 -8068463 6 11 -8869244
D 6 12 9179554 6 13 -8096366 6 14 -8862946 6 15 9178275 7 8 8784707
D 7 9 -8903088 7 10 9043442 7 11 8027112 7 12 -8127450 7 13 8915728
D 7 14 8041246 7 15 -8137471 8 9 -9652304 8 10 7952658 8 11 9195715
D 8 12 -8877232 8 13 8054671 8 14 9177162 8 15 -8868476 9 10 -8065263
D 9 11 -8870079 9 12 9180051 9 13 -8100090 9 14 -8860450 9 15 9175737
D 10 11 8731135 10 12 -8851735 10 13 8726933 10 14 7972953 10 15 -8068255
D 11 12 -9654310 11 13 8060016 11 14 9169692 11 15 -8861040 12 13 -8123625
D 12 14 -8856471 12 15 9171780 13 14 8580622 13 15 -8682420 14 15 -9656433
    
```

ITRF position of 0185 as determined by individual baselines

	X	Y	Z
wysh	-1335499.389	-4280580.080	4522091.542
bil5	-1335499.381	-4280580.078	4522091.528
mtei	-1335499.378	-4280580.077	4522091.513
p722	-1335499.386	-4280580.063	4522091.516
p054	-1335499.381	-4280580.081	4522091.529

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
wysh	-0.005	-0.004	0.016	-0.004	0.007	0.015
bil5	0.002	-0.002	0.001	0.003	0.000	0.002
mtei	0.005	-0.000	-0.014	0.005	-0.009	-0.010
p722	-0.003	0.014	-0.010	-0.007	0.002	-0.016
p054	0.002	-0.005	0.003	0.003	-0.000	0.005

STATE PLANE COORDINATES - International Foot

SPC (2500 MT )

Northing (Y) [feet] 439547.927  
Easting (X) [feet] 2526058.005  
Convergence [degrees] 1.58926670  
Point Scale 0.99976711  
Combined Factor 0.99960239

\*\* 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: 1064.687 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.477  
scatter (mean square distance from rover) is 21293.050  
average edop for rover is 0.710  
average ndop for rover is 0.820  
average hdop for rover is 1.085  
average vdop for rover is 2.090  
average gdop for rover is 2.720

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.