

OPUS-RS solution : 018506_14_242_A0.14O OP1409698346254

opus <opus@ngs.noaa.gov>

Tue 9/2/2014 4:57 PM

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

FILE: 018506_14_242_A0.14O OP1409698346254

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: 0185242b.14oDATE: September 02, 2014
TIME: 22:57:30 UTCSOFTWARE: rsgps 1.37 RS94.prl 1.99.2 START: 2014/08/30 01:16:45
EPHEMERIS: igr18076.eph [rapid] STOP: 2014/08/30 02:51:15
NAV FILE: brdc2420.14n OBS USED: 6433 / 7063 : 91%
ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 10.65/ 80.81
ARP HEIGHT: 1.8000 NORMALIZED RMS: 0.256

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.66051)

X: -1325258.957(m) 0.004(m) -1325259.819(m) 0.004(m)
Y: -4254668.426(m) 0.009(m) -4254667.176(m) 0.009(m)
Z: 4549139.196(m) 0.013(m) 4549139.159(m) 0.013(m)LAT: 45 46 59.02982 0.009(m) 45 46 59.05074 0.009(m)
E LON: 252 41 56.58343 0.004(m) 252 41 56.52813 0.004(m)
W LON: 107 18 3.41657 0.004(m) 107 18 3.47187 0.004(m)
EL HGT: 940.762(m) 0.013(m) 940.082(m) 0.013(m)
ORTHO HGT: 955.528(m) 0.016(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 13) SPC (2500 MT)

Northing (Y) [meters] 5072519.561 172775.356
Easting (X) [meters] 321138.437 770922.850
Convergence [degrees] -1.64953600 1.60861502
Point Scale 0.99999332 0.99962034
Combined Factor 0.99984586 0.99947293

US NATIONAL GRID DESIGNATOR: 13TCL2113872519(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DI3062	BIL5 BILLINGS 5 CORS ARP	N455816.237	W1075947.298	57911.2
DG9745	MTEI ENGINC CORS ARP	N454447.035	W1083600.736	101165.4
DM7161	WYSH SHERIDAN CORS ARP	N444801.769	W1070035.715	111579.2
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	178270.9
DL7758	P722 YNPBASSRCHMT2005 CORS ARP	N452725.985	W1093415.586	180732.7
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	216977.6
DI2260	P054 TEREKALAKAMT2006 CORS ARP	N455046.833	W1042629.062	222371.5

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)

bil5	-1372156.892	-4223945.790	4563650.235
mtei	-1422329.057	-4226311.555	4546317.418
wysh	-1326396.425	-4335757.882	4472504.191
p052	-1266648.341	-4138194.581	4670709.512
p722	-1501537.049	-4223566.592	4524171.111
mtlw	-1449333.482	-4105829.825	4646773.502
p054	-1110122.547	-4310701.945	4554151.774
0185	-1325259.819	-4254667.176	4549139.159

Covariance matrix of the stations:

1	1.4260E-07	3.0400E-07	-3.1240E-07	1.8200E-10	-5.2990E-08	5.4960E-08	1.0810E-10	-4.9140E-08	5.3640E-08
4.8980E-10	-4.8100E-08	4.6180E-08	-3.6750E-10	-5.6620E-08	5.8980E-08	1.7590E-10	-5.5030E-08	5.3990E-08	-2.7980E-10
-4.2220E-08	4.4720E-08	1.9660E-08	2.8640E-10	1.1090E-09	2	3.0400E-07	1.0800E-06	-1.0290E-06	-5.1070E-08
-1.5390E-07	1.6890E-07	-5.3610E-08	-1.6770E-07	1.8110E-07	-4.8350E-08	-1.4960E-07	1.6650E-07	-5.1170E-08	-1.5150E-07
1.6610E-07	-4.7840E-08	-1.4220E-07	1.5790E-07	-5.1740E-08	-1.7250E-07	1.8830E-07	-1.0730E-10	2.8800E-08	-5.3400E-09
3	-3.1240E-07	-1.0290E-06	1.1710E-06	5.2360E-08	1.6730E-07	-1.6600E-07	5.1680E-08	1.7260E-07	-1.6800E-07
5.2330E-08	1.7550E-07	-1.8080E-07	5.2110E-08	1.6240E-07	-1.6010E-07	5.2720E-08	1.6490E-07	-1.6810E-07	5.0960E-08
1.8590E-07	-1.8540E-07	-3.5570E-10	-8.0230E-09	2.8690E-08	4	1.8200E-10	-5.1070E-08	5.2360E-08	1.5190E-07
3.1380E-07	-3.1730E-07	-1.1200E-09	-4.6190E-08	5.7020E-08	-3.0730E-09	-5.3180E-08	4.3870E-08	1.9100E-09	-5.8800E-08
6.3030E-08	6.6440E-10	-6.1880E-08	5.4410E-08	-7.4500E-09	-4.3040E-08	4.6980E-08	1.6090E-08	-6.5080E-09	9.0780E-09
5	-5.2990E-08	-1.5390E-07	1.6730E-07	3.1380E-07	1.0730E-06	-1.0120E-06	-5.5460E-08	-1.6910E-07	1.7710E-07
-4.9200E-08	-1.4740E-07	1.6630E-07	-5.4140E-08	-1.4810E-07	1.5950E-07	-5.0190E-08	-1.3710E-07	1.5400E-07	-5.1090E-08
-1.7480E-07	1.8770E-07	-4.5620E-09	1.8650E-08	1.0010E-09	6	5.4960E-08	1.6890E-07	-1.6600E-07	-3.1730E-07
-1.0120E-06	1.1450E-06	5.3040E-08	1.7690E-07	-1.6010E-07	5.0510E-08	1.6870E-07	-1.8250E-07	5.7760E-08	1.5630E-07
-1.4840E-07	5.6130E-08	1.5290E-07	-1.6280E-07						

4.4280E-08 1.8820E-07 -1.8280E-07 2.5700E-09 -1.7950E-09 2.5190E-08
 7 1.0810E-10 -5.3610E-08 5.1680E-08 -1.1200E-09 -5.5460E-08 5.3040E-08 1.3910E-07 3.1080E-07 -3.0310E-07
 2.9760E-09 -4.7250E-08 4.8330E-08 -2.9610E-09 -5.7680E-08 5.4630E-08 -1.0750E-09 -5.2720E-08 5.3790E-08
 5.7680E-09 -4.3960E-08 4.1480E-08 2.0250E-08 -3.3340E-09 -1.3520E-12
 8 -4.9140E-08 -1.6770E-07 1.7260E-07 -4.6190E-08 -1.6910E-07 1.7690E-07 3.1080E-07 1.1900E-06 -1.0510E-06
 -5.7550E-08 -1.7830E-07 1.6120E-07 -4.2240E-08 -1.7360E-07 1.8470E-07 -4.5190E-08 -1.8120E-07 1.6630E-07
 -7.0930E-08 -1.7810E-07 1.8950E-07 -8.9730E-09 -5.7230E-09 2.2140E-08
 9 5.3640E-08 1.8110E-07 -1.6800E-07 5.7020E-08 1.7710E-07 -1.6010E-07 -3.0310E-07 -1.0510E-06 1.1490E-06
 4.3940E-08 1.7360E-07 -1.8880E-07 6.1220E-08 1.6740E-07 -1.4590E-07 5.7170E-08 1.5820E-07 -1.6810E-07
 3.0340E-08 1.9280E-07 -1.7450E-07 -2.2180E-09 5.9400E-09 2.9960E-08
 10 4.8980E-10 -4.8350E-08 5.2330E-08 -3.0730E-09 -4.9200E-08 5.0510E-08 2.9760E-09 -5.7550E-08 4.3940E-08
 1.3110E-07 2.7450E-07 -2.8420E-07 -7.9300E-09 -4.7680E-08 4.5840E-08 -1.7800E-09 -3.1390E-08 5.1810E-08
 2.0840E-08 -3.9880E-08 3.9460E-08 2.5340E-08 7.9330E-09 -8.3860E-09
 11 -4.8100E-08 -1.4960E-07 1.7550E-07 -5.3180E-08 -1.4740E-07 1.6870E-07 -4.7250E-08 -1.7830E-07 1.7360E-07
 2.7450E-07 1.0300E-06 -1.0160E-06 -5.9580E-08 -1.3880E-07 1.5470E-07 -4.7730E-08 -1.0680E-07 1.5950E-07
 -1.9330E-08 -1.6510E-07 1.8380E-07 8.2950E-09 3.2890E-08 -5.9840E-09
 12 4.6180E-08 1.6650E-07 -1.8080E-07 4.3870E-08 1.6630E-07 -1.8250E-07 4.8330E-08 1.6120E-07 -1.8880E-07
 -2.8420E-07 -1.0160E-06 1.2560E-06 4.0730E-08 1.6780E-07 -1.8600E-07 4.4490E-08 1.7800E-07 -1.7990E-07
 6.1440E-08 1.7670E-07 -1.9530E-07 2.6670E-09 7.1670E-09 -6.7160E-09
 13 -3.6750E-10 -5.1170E-08 5.2110E-08 1.9100E-09 -5.4140E-08 5.7760E-08 -2.9610E-09 -4.2240E-08 6.1220E-08
 -7.9300E-09 -5.9580E-08 4.0730E-08 1.6840E-07 3.2090E-07 -3.1570E-07 1.1090E-09 -7.0340E-08 5.4570E-08
 -1.7020E-08 -4.4210E-08 5.0010E-08 1.2640E-08 -1.0600E-08 1.4630E-08
 14 -5.6620E-08 -1.5150E-07 1.6240E-07 -5.8800E-08 -1.4810E-07 1.5630E-07 -5.7680E-08 -1.7360E-07 1.6740E-07
 -4.7680E-08 -1.3880E-07 1.6780E-07 3.2090E-07 1.0540E-06 -9.8560E-07 -5.4640E-08 -1.2190E-07 1.4690E-07
 -4.4010E-08 -1.7750E-07 1.8500E-07 -4.5040E-09 2.5540E-08 -1.0860E-08
 15 5.8980E-08 1.6610E-07 -1.6010E-07 6.3030E-08 1.5950E-07 -1.4840E-07 5.4630E-08 1.8470E-07 -1.4590E-07
 4.5840E-08 1.5470E-07 -1.8600E-07 -3.1570E-07 -9.8560E-07 1.1150E-06 6.1720E-08 1.2980E-07 -1.5400E-07
 3.0180E-08 1.9090E-07 -1.7760E-07 5.8800E-10 -1.2000E-08 4.2380E-08
 16 1.7590E-10 -4.7840E-08 5.2720E-08 6.6440E-10 -5.0190E-08 5.6130E-08 -1.0750E-09 -4.5190E-08 5.7170E-08
 -1.7800E-09 -4.7730E-08 4.4490E-08 1.1090E-09 -5.4640E-08 6.1720E-08 1.4930E-07 2.8600E-07 -3.1950E-07
 -5.3130E-09 -4.0940E-08 4.7790E-08 1.6740E-08 -2.6660E-09 8.3780E-09
 17 -5.5030E-08 -1.4220E-07 1.6490E-07 -6.1880E-08 -1.3710E-07 1.5290E-07 -5.2720E-08 -1.8120E-07 1.5820E-07
 -3.1390E-08 -1.0680E-07 1.7800E-07 -7.0340E-08 -1.2190E-07 1.2980E-07 2.8600E-07 1.0010E-06 -9.6410E-07
 -1.3420E-08 -1.6860E-07 1.8020E-07 6.2450E-09 4.6510E-08 -2.5900E-08
 18 5.3990E-08 1.5790E-07 -1.6810E-07 5.4410E-08 1.5400E-07 -1.6280E-07 5.3790E-08 1.6630E-07 -1.6810E-07
 5.1810E-08 1.5950E-07 -1.7990E-07 5.4570E-08 1.4690E-07 -1.5400E-07 -3.1950E-07 -9.6410E-07 1.1640E-06
 4.9930E-08 1.8020E-07 -1.8920E-07 3.5900E-09 -9.9730E-09 1.8970E-08
 19 -2.7980E-10 -5.1740E-08 5.0960E-08 -7.4500E-09 -5.1090E-08 4.4280E-08 5.7680E-09 -7.0930E-08 3.0340E-08
 2.0840E-08 -1.9330E-08 6.1440E-08 -1.7020E-08 -4.4010E-08 3.0180E-08 -5.3130E-09 -1.3420E-08 4.9930E-08
 1.4590E-07 2.5170E-07 -2.6830E-07 3.2040E-08 1.4550E-08 -2.4530E-08
 20 -4.2220E-08 -1.7250E-07 1.8590E-07 -4.3040E-08 -1.7480E-07 1.8820E-07 -4.3960E-08 -1.7810E-07 1.9280E-07
 -3.9880E-08 -1.6510E-07 1.7670E-07 -4.4210E-08 -1.7750E-07 1.9090E-07 -4.0940E-08 -1.6860E-07 1.8020E-07
 2.5170E-07 1.1800E-06 -1.1150E-06 3.8080E-09 -3.6320E-09 2.4490E-08
 21 4.4720E-08 1.8830E-07 -1.8540E-07 4.6980E-08 1.8770E-07 -1.8280E-07 4.1480E-08 1.8950E-07 -1.7450E-07
 3.9460E-08 1.8380E-07 -1.9530E-07 5.0010E-08 1.8500E-07 -1.7760E-07 4.7790E-08 1.8020E-07 -1.8920E-07
 -2.6830E-07 -1.1150E-06 1.2480E-06 -6.9870E-09 1.8660E-08 4.5560E-09
 22 1.9660E-08 -1.0730E-10 -3.5570E-10 1.6090E-08 -4.5620E-09 2.5700E-09 2.0250E-08 -8.9730E-09 -2.2180E-09
 2.5340E-08 8.2950E-09 2.6670E-09 1.2640E-08 -4.5040E-09 5.8800E-10 1.6740E-08 6.2450E-09 3.5900E-09
 3.2040E-08 3.8080E-09 -6.9870E-09 1.4630E-06 3.8110E-06 -3.8850E-06
 23 2.8640E-10 2.8800E-08 -8.0230E-09 -6.5080E-09 1.8650E-08 -1.7950E-09 -3.3340E-09 -5.7230E-09 5.9400E-09
 7.9330E-09 3.2890E-08 7.1670E-09 -1.0600E-08 2.5540E-08 -1.2000E-08 -2.6660E-09 4.6510E-08 -9.9730E-09

1.4550E-08 -3.6320E-09 1.8660E-08 3.8110E-06 1.3830E-05 -1.3400E-05
 24 1.1090E-09 -5.3400E-09 2.8690E-08 9.0780E-09 1.0010E-09 2.5190E-08 -1.3520E-12 2.2140E-08 2.9960E-08
 -8.3860E-09 -5.9840E-09 -6.7160E-09 1.4630E-08 -1.0860E-08 4.2380E-08 8.3780E-09 -2.5900E-08 1.8970E-08
 -2.4530E-08 2.4490E-08 4.5560E-09 -3.8850E-06 -1.3400E-05 1.4700E-05

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

```
0.0000014630  0.0000038110  -0.0000038850
0.0000038110  0.0000138300  -0.0000134000
-0.0000038850 -0.0000134000  0.0000147000
```

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

```
0.0000003926  -0.0000000745  0.0000004591
-0.0000000745  0.0000008561  -0.0000003878
0.0000004591  -0.0000003878  0.0000287443
```

Horizontal network accuracy = 0.00198 meters.

Vertical network accuracy = 0.01051 meters.

		Vectors		
To	From	X	Y	Z
bil5	0185	-46897.072	30721.386	14511.077
mtei	0185	-97069.237	28355.621	-2821.740
wysh	0185	-1136.606	-81090.706	-76634.967
p052	0185	58611.478	116472.595	121570.353
p722	0185	-176277.229	31100.583	-24968.047
mtlw	0185	-124073.663	148837.350	97634.343
p054	0185	215137.273	-56034.769	5012.615

Covariance matrix of the 7 vectors

```
1 1.5663E-06 4.1148E-06 -4.1982E-06 1.4274E-06 3.7623E-06 -3.8337E-06 1.4232E-06 3.7705E-06 -3.8303E-06
1.4185E-06 3.7543E-06 -3.8426E-06 1.4303E-06 3.7586E-06 -3.8277E-06 1.4268E-06 3.7494E-06 -3.8357E-06
1.4110E-06 3.7647E-06 -3.8344E-06
2 4.1148E-06 1.4852E-05 -1.4416E-05 3.7665E-06 1.3629E-05 -1.3224E-05 3.7608E-06 1.3639E-05 -1.3220E-05
3.7548E-06 1.3619E-05 -1.3235E-05 3.7705E-06 1.3624E-05 -1.3217E-05 3.7659E-06 1.3612E-05 -1.3227E-05
3.7448E-06 1.3632E-05 -1.3225E-05
3 -4.1982E-06 -1.4416E-05 1.5814E-05 -3.8414E-06 -1.3226E-05 1.4480E-05 -3.8330E-06 -1.3242E-05 1.4473E-05
-3.8239E-06 -1.3210E-05 1.4497E-05 -3.8472E-06 -1.3219E-05 1.4469E-05 -3.8403E-06 -1.3201E-05 1.4484E-05
-3.8092E-06 -1.3231E-05 1.4481E-05
4 1.4274E-06 3.7665E-06 -3.8414E-06 1.5827E-06 4.1359E-06 -4.2139E-06 1.4255E-06 3.7803E-06 -3.8348E-06
1.4185E-06 3.7560E-06 -3.8529E-06 1.4362E-06 3.7632E-06 -3.8316E-06 1.4308E-06 3.7494E-06 -3.8433E-06
1.4074E-06 3.7707E-06 -3.8401E-06
5 3.7623E-06 1.3629E-05 -1.3226E-05 4.1359E-06 1.4866E-05 -1.4411E-05 3.7634E-06 1.3648E-05 -1.3230E-05
3.7584E-06 1.3631E-05 -1.3242E-05 3.7720E-06 1.3638E-05 -1.3230E-05 3.7680E-06 1.3628E-05 -1.3237E-05
3.7499E-06 1.3640E-05 -1.3232E-05
6 -3.8337E-06 -1.3224E-05 1.4480E-05 -4.2139E-06 -1.4411E-05 1.5795E-05 -3.8345E-06 -1.3243E-05 1.4485E-05
-3.8287E-06 -1.3224E-05 1.4499E-05 -3.8444E-06 -1.3231E-05 1.4484E-05 -3.8398E-06 -1.3219E-05 1.4493E-05
-3.8188E-06 -1.3234E-05 1.4487E-05
7 1.4232E-06 3.7608E-06 -3.8330E-06 1.4255E-06 3.7634E-06 -3.8345E-06 1.5616E-06 4.1341E-06 -4.1859E-06
1.4204E-06 3.7588E-06 -3.8393E-06 1.4271E-06 3.7612E-06 -3.8310E-06 1.4249E-06 3.7554E-06 -3.8348E-06
1.4165E-06 3.7666E-06 -3.8365E-06
```

8 3.7705E-06 1.3639E-05 -1.3242E-05 3.7803E-06 1.3648E-05 -1.3243E-05 4.1341E-06 1.5031E-05 -1.4479E-05
 3.7545E-06 1.3625E-05 -1.3268E-05 3.7883E-06 1.3637E-05 -1.3225E-05 3.7774E-06 1.3608E-05 -1.3246E-05
 3.7345E-06 1.3661E-05 -1.3251E-05

9 -3.8303E-06 -1.3220E-05 1.4473E-05 -3.8348E-06 -1.3230E-05 1.4485E-05 -4.1859E-06 -1.4479E-05 1.5789E-05
 -3.8305E-06 -1.3226E-05 1.4488E-05 -3.8362E-06 -1.3228E-05 1.4482E-05 -3.8340E-06 -1.3222E-05 1.4483E-05
 -3.8279E-06 -1.3238E-05 1.4491E-05

10 1.4185E-06 3.7548E-06 -3.8239E-06 1.4185E-06 3.7584E-06 -3.8287E-06 1.4204E-06 3.7545E-06 -3.8305E-06
 1.5434E-06 4.0693E-06 -4.1635E-06 1.4171E-06 3.7599E-06 -3.8314E-06 1.4191E-06 3.7654E-06 -3.8284E-06
 1.4265E-06 3.7594E-06 -3.8302E-06

11 3.7543E-06 1.3619E-05 -1.3210E-05 3.7560E-06 1.3631E-05 -1.3224E-05 3.7588E-06 1.3625E-05 -1.3226E-05
 4.0693E-06 1.4794E-05 -1.4417E-05 3.7537E-06 1.3633E-05 -1.3227E-05 3.7576E-06 1.3644E-05 -1.3225E-05
 3.7688E-06 1.3636E-05 -1.3229E-05

12 -3.8426E-06 -1.3235E-05 1.4497E-05 -3.8529E-06 -1.3242E-05 1.4499E-05 -3.8393E-06 -1.3268E-05 1.4488E-05
 -4.1635E-06 -1.4417E-05 1.5969E-05 -3.8616E-06 -1.3229E-05 1.4478E-05 -3.8516E-06 -1.3203E-05 1.4508E-05
 -3.8017E-06 -1.3255E-05 1.4507E-05

13 1.4303E-06 3.7705E-06 -3.8472E-06 1.4362E-06 3.7720E-06 -3.8444E-06 1.4271E-06 3.7883E-06 -3.8362E-06
 1.4171E-06 3.7537E-06 -3.8616E-06 1.6061E-06 4.1470E-06 -4.2159E-06 1.4347E-06 3.7450E-06 -3.8486E-06
 1.4013E-06 3.7736E-06 -3.8426E-06

14 3.7586E-06 1.3624E-05 -1.3219E-05 3.7632E-06 1.3638E-05 -1.3231E-05 3.7612E-06 1.3637E-05 -1.3228E-05
 3.7599E-06 1.3633E-05 -1.3229E-05 4.1470E-06 1.4833E-05 -1.4363E-05 3.7635E-06 1.3636E-05 -1.3232E-05
 3.7569E-06 1.3631E-05 -1.3223E-05

15 -3.8277E-06 -1.3217E-05 1.4469E-05 -3.8316E-06 -1.3230E-05 1.4484E-05 -3.8310E-06 -1.3225E-05 1.4482E-05
 -3.8314E-06 -1.3227E-05 1.4478E-05 -4.2159E-06 -1.4363E-05 1.5730E-05 -3.8322E-06 -1.3232E-05 1.4485E-05
 -3.8309E-06 -1.3222E-05 1.4475E-05

16 1.4268E-06 3.7659E-06 -3.8403E-06 1.4308E-06 3.7680E-06 -3.8398E-06 1.4249E-06 3.7774E-06 -3.8340E-06
 1.4191E-06 3.7576E-06 -3.8516E-06 1.4347E-06 3.7635E-06 -3.8322E-06 1.5788E-06 4.0934E-06 -4.2165E-06
 1.4089E-06 3.7689E-06 -3.8386E-06

17 3.7494E-06 1.3612E-05 -1.3201E-05 3.7494E-06 1.3628E-05 -1.3219E-05 3.7554E-06 1.3608E-05 -1.3222E-05
 3.7654E-06 1.3644E-05 -1.3203E-05 3.7450E-06 1.3636E-05 -1.3232E-05 4.0934E-06 1.4738E-05 -1.4328E-05
 3.7768E-06 1.3619E-05 -1.3213E-05

18 -3.8357E-06 -1.3227E-05 1.4484E-05 -3.8433E-06 -1.3237E-05 1.4493E-05 -3.8348E-06 -1.3246E-05 1.4483E-05
 -3.8284E-06 -1.3225E-05 1.4508E-05 -3.8486E-06 -1.3232E-05 1.4485E-05 -4.2165E-06 -1.4328E-05 1.5826E-05
 -3.8141E-06 -1.3234E-05 1.4487E-05

19 1.4110E-06 3.7448E-06 -3.8092E-06 1.4074E-06 3.7499E-06 -3.8188E-06 1.4165E-06 3.7345E-06 -3.8279E-06
 1.4265E-06 3.7688E-06 -3.8017E-06 1.4013E-06 3.7569E-06 -3.8309E-06 1.4089E-06 3.7768E-06 -3.8141E-06
 1.5448E-06 4.0443E-06 -4.1218E-06

20 3.7647E-06 1.3632E-05 -1.3231E-05 3.7707E-06 1.3640E-05 -1.3234E-05 3.7666E-06 1.3661E-05 -1.3238E-05
 3.7594E-06 1.3636E-05 -1.3255E-05 3.7736E-06 1.3631E-05 -1.3222E-05 3.7689E-06 1.3619E-05 -1.3234E-05
 4.0443E-06 1.5017E-05 -1.4558E-05

21 -3.8344E-06 -1.3225E-05 1.4481E-05 -3.8401E-06 -1.3232E-05 1.4487E-05 -3.8365E-06 -1.3251E-05 1.4491E-05
 -3.8302E-06 -1.3229E-05 1.4507E-05 -3.8426E-06 -1.3223E-05 1.4475E-05 -3.8386E-06 -1.3213E-05 1.4487E-05
 -4.1218E-06 -1.4558E-05 1.5939E-05

Correlation matrix of the 7 vectors

1 1.0000E+00 8.5314E-01 -8.4354E-01 9.0661E-01 7.7969E-01 -7.7078E-01 9.1001E-01 7.7709E-01 -7.7022E-01
 9.1232E-01 7.7992E-01 -7.6833E-01 9.0181E-01 7.7979E-01 -7.7115E-01 9.0731E-01 7.8039E-01 -7.7041E-01 9.0711E-01
 01 7.7624E-01 -7.6742E-01

2 8.5314E-01 1.0000E+00 -9.4063E-01 7.7686E-01 9.1720E-01 -8.6339E-01 7.8091E-01 9.1283E-01 -8.6325E-01
 7.8424E-01 9.1874E-01 -8.5939E-01 7.7200E-01 9.1791E-01 -8.6467E-01 7.7769E-01 9.2007E-01 -8.6272E-01 7.8180E-01
 01 9.1280E-01 -8.5955E-01

3 -8.4354E-01 -9.4063E-01 1.0000E+00 -7.6783E-01 -8.6260E-01 9.1622E-01 -7.7132E-01 -8.5886E-01 9.1596E-01

-7.7402E-01 -8.6369E-01 9.1227E-01 -7.6337E-01 -8.6310E-01 9.1738E-01 -7.6857E-01 -8.6473E-01 9.1557E-01
 -7.7068E-01 -8.5855E-01 9.1215E-01
 4 9.0661E-01 7.7686E-01 -7.6783E-01 1.0000E+00 8.5265E-01 -8.4282E-01 9.0676E-01 7.7504E-01 -7.6713E-01
 9.0758E-01 7.7621E-01 -7.6637E-01 9.0078E-01 7.7668E-01 -7.6792E-01 9.0515E-01 7.7632E-01 -7.6791E-01 9.0008E-
 01 7.7343E-01 -7.6456E-01
 5 7.7969E-01 9.1720E-01 -8.6260E-01 8.5265E-01 1.0000E+00 -9.4049E-01 7.8110E-01 9.1301E-01 -8.6354E-01
 7.8464E-01 9.1916E-01 -8.5943E-01 7.7196E-01 9.1841E-01 -8.6513E-01 7.7778E-01 9.2069E-01 -8.6300E-01 7.8251E-
 01 9.1292E-01 -8.5961E-01
 6 -7.7078E-01 -8.6339E-01 9.1622E-01 -8.4282E-01 -9.4049E-01 1.0000E+00 -7.7210E-01 -8.5950E-01 9.1723E-01
 -7.7545E-01 -8.6506E-01 9.1293E-01 -7.6329E-01 -8.6442E-01 9.1890E-01 -7.6894E-01 -8.6644E-01 9.1668E-01
 -7.7309E-01 -8.5932E-01 9.1308E-01
 7 9.1001E-01 7.8091E-01 -7.7132E-01 9.0676E-01 7.8110E-01 -7.7210E-01 1.0000E+00 8.5329E-01 -8.4299E-01
 9.1491E-01 7.8202E-01 -7.6882E-01 9.0115E-01 7.8149E-01 -7.7296E-01 9.0749E-01 7.8280E-01 -7.7139E-01 9.1198E-
 01 7.7780E-01 -7.6900E-01
 8 7.7709E-01 9.1283E-01 -8.5886E-01 7.7504E-01 9.1301E-01 -8.5950E-01 8.5329E-01 1.0000E+00 -9.3986E-01
 7.7949E-01 9.1364E-01 -8.5637E-01 7.7101E-01 9.1325E-01 -8.6009E-01 7.7541E-01 9.1427E-01 -8.5880E-01 7.7498E-
 01 9.0927E-01 -8.5611E-01
 9 -7.7022E-01 -8.6325E-01 9.1596E-01 -7.6713E-01 -8.6354E-01 9.1723E-01 -8.4299E-01 -9.3986E-01 1.0000E+00
 -7.7594E-01 -8.6540E-01 9.1240E-01 -7.6179E-01 -8.6435E-01 9.1891E-01 -7.6790E-01 -8.6675E-01 9.1621E-01
 -7.7508E-01 -8.5968E-01 9.1346E-01
 10 9.1232E-01 7.8424E-01 -7.7402E-01 9.0758E-01 7.8464E-01 -7.7545E-01 9.1491E-01 7.7949E-01 -7.7594E-01
 1.0000E+00 8.5159E-01 -8.3863E-01 9.0005E-01 7.8581E-01 -7.7758E-01 9.0911E-01 7.8950E-01 -7.7462E-01
 9.2380E-01 7.8087E-01 -7.7223E-01
 11 7.7992E-01 9.1874E-01 -8.6369E-01 7.7621E-01 9.1916E-01 -8.6506E-01 7.8202E-01 9.1364E-01 -8.6540E-01
 8.5159E-01 1.0000E+00 -9.3797E-01 7.7007E-01 9.2029E-01 -8.6708E-01 7.7750E-01 9.2400E-01 -8.6427E-01
 7.8835E-01 9.1482E-01 -8.6149E-01
 12 -7.6833E-01 -8.5939E-01 9.1227E-01 -7.6637E-01 -8.5943E-01 9.1293E-01 -7.6882E-01 -8.5637E-01 9.1240E-01
 -8.3863E-01 -9.3797E-01 1.0000E+00 -7.6248E-01 -8.5951E-01 9.1350E-01 -7.6705E-01 -8.6063E-01 9.1258E-01
 -7.6541E-01 -8.5593E-01 9.0928E-01
 13 9.0181E-01 7.7200E-01 -7.6337E-01 9.0078E-01 7.7196E-01 -7.6329E-01 9.0115E-01 7.7101E-01 -7.6179E-01
 9.0005E-01 7.7007E-01 -7.6248E-01 1.0000E+00 8.4963E-01 -8.3876E-01 9.0098E-01 7.6974E-01 -7.6337E-01
 8.8962E-01 7.6837E-01 -7.5947E-01
 14 7.7979E-01 9.1791E-01 -8.6310E-01 7.7668E-01 9.1841E-01 -8.6442E-01 7.8149E-01 9.1325E-01 -8.6435E-01
 7.8581E-01 9.2029E-01 -8.5951E-01 8.4963E-01 1.0000E+00 -9.4028E-01 7.7771E-01 9.2227E-01 -8.6364E-01
 7.8484E-01 9.1328E-01 -8.5997E-01
 15 -7.7115E-01 -8.6467E-01 9.1738E-01 -7.6792E-01 -8.6513E-01 9.1890E-01 -7.7296E-01 -8.6009E-01 9.1891E-01
 -7.7758E-01 -8.6708E-01 9.1350E-01 -8.3876E-01 -9.4028E-01 1.0000E+00 -7.6899E-01 -8.6906E-01 9.1802E-01
 -7.7713E-01 -8.6024E-01 9.1419E-01
 16 9.0731E-01 7.7769E-01 -7.6857E-01 9.0515E-01 7.7778E-01 -7.6894E-01 9.0749E-01 7.7541E-01 -7.6790E-01
 9.0911E-01 7.7750E-01 -7.6705E-01 9.0098E-01 7.7771E-01 -7.6899E-01 1.0000E+00 8.4860E-01 -8.4352E-01
 9.0215E-01 7.7402E-01 -7.6520E-01
 17 7.8039E-01 9.2007E-01 -8.6473E-01 7.7632E-01 9.2069E-01 -8.6644E-01 7.8280E-01 9.1427E-01 -8.6675E-01
 7.8950E-01 9.2400E-01 -8.6063E-01 7.6974E-01 9.2227E-01 -8.6906E-01 8.4860E-01 1.0000E+00 -9.3818E-01
 7.9152E-01 9.1541E-01 -8.6206E-01
 18 -7.7041E-01 -8.6272E-01 9.1557E-01 -7.6791E-01 -8.6300E-01 9.1668E-01 -7.7139E-01 -8.5880E-01 9.1621E-01
 -7.7462E-01 -8.6427E-01 9.1258E-01 -7.6337E-01 -8.6364E-01 9.1802E-01 -8.4352E-01 -9.3818E-01 1.0000E+00
 -7.7138E-01 -8.5846E-01 9.1216E-01
 19 9.0711E-01 7.8180E-01 -7.7068E-01 9.0008E-01 7.8251E-01 -7.7309E-01 9.1198E-01 7.7498E-01 -7.7508E-01
 9.2380E-01 7.8835E-01 -7.6541E-01 8.8962E-01 7.8484E-01 -7.7713E-01 9.0215E-01 7.9152E-01 -7.7138E-01
 1.0000E+00 8.3968E-01 -8.3065E-01
 20 7.7624E-01 9.1280E-01 -8.5855E-01 7.7343E-01 9.1292E-01 -8.5932E-01 7.7780E-01 9.0927E-01 -8.5968E-01

7.8087E-01 9.1482E-01 -8.5593E-01 7.6837E-01 9.1328E-01 -8.6024E-01 7.7402E-01 9.1541E-01 -8.5846E-01 8.3968E-01 1.0000E+00 -9.4098E-01
21 -7.6742E-01 -8.5955E-01 9.1215E-01 -7.6456E-01 -8.5961E-01 9.1308E-01 -7.6900E-01 -8.5611E-01 9.1346E-01
-7.7223E-01 -8.6149E-01 9.0928E-01 -7.5947E-01 -8.5997E-01 9.1419E-01 -7.6520E-01 -8.6206E-01 9.1216E-01
-8.3065E-01 -9.4098E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8302014 830
B201408300100201408300200 7 rsgps 1.37IGS
lant_info.003 NGS
C00080001 -468970723 12 307213856 38 145110766 39
C00080002 -970692373 12 283556207 38 -28217404 39
C00080003 -11366056 12 -810907061 38 -766349674 39
C00080004 586114777 12 1164725950 38 1215703531 39
C00080005 -1762772293 12 311005834 38 -249680474 39
C00080006 -1240736625 12 1488373504 38 976343432 39
C00080007 -2143594571 12 -560347690 38 50126152 39
D 1 2 8531353 1 3 -8435443 1 4 9066061 1 5 7796943 1 6 -7707809
D 1 7 9100091 1 8 7770862 1 9 -7702188 1 10 9123247 1 11 7799205
D 1 12 -7683255 1 13 9018063 1 14 7797902 1 15 -7711474 1 16 9073080
D 1 17 7803915 1 18 -7704146 1 19 9071092 1 20 7762446 1 21 -7674214
D 2 3 -9406322 2 4 7768601 2 5 9171953 2 6 -8633935 2 7 7809093
D 2 8 9128321 2 9 -8632534 2 10 7842404 2 11 9187378 2 12 -8593926
D 2 13 7719975 2 14 9179057 2 15 -8646740 2 16 7776926 2 17 9200687
D 2 18 -8627195 2 19 7817958 2 20 9128016 2 21 -8595457 3 4 -7678344
D 3 5 -8626003 3 6 9162245 3 7 -7713190 3 8 -8588586 3 9 9159568
D 3 10 -7740197 3 11 -8636889 3 12 9122723 3 13 -7633717 3 14 -8630984
D 3 15 9173817 3 16 -7685700 3 17 -8647250 3 18 9155744 3 19 -7706797
D 3 20 -8585535 3 21 9121463 4 5 8526526 4 6 -8428155 4 7 9067602
D 4 8 7750376 4 9 -7671261 4 10 9075787 4 11 7762137 4 12 -7663693
D 4 13 9007781 4 14 7766821 4 15 -7679174 4 16 9051509 4 17 7763164
D 4 18 -7679113 4 19 9000833 4 20 7734280 4 21 -7645620 5 6 -9404875
D 5 7 7811005 5 8 9130090 5 9 -8635421 5 10 7846421 5 11 9191595
D 5 12 -8594326 5 13 7719559 5 14 9184075 5 15 -8651334 5 16 7777791
D 5 17 9206873 5 18 -8630012 5 19 7825112 5 20 9129186 5 21 -8596121
D 6 7 -7720981 6 8 -8595002 6 9 9172294 6 10 -7754463 6 11 -8650605
D 6 12 9129342 6 13 -7632898 6 14 -8644228 6 15 9188976 6 16 -7689351
D 6 17 -8664396 6 18 9166815 6 19 -7730878 6 20 -8593248 6 21 9130792
D 7 8 8532895 7 9 -8429921 7 10 9149122 7 11 7820184 7 12 -7688231
D 7 13 9011465 7 14 7814898 7 15 -7729558 7 16 9074941 7 17 7827962
D 7 18 -7713851 7 19 9119814 7 20 7777952 7 21 -7689974 8 9 -9398578
D 8 10 7794863 8 11 9136402 8 12 -8563747 8 13 7710077 8 14 9132545
D 8 15 -8600863 8 16 7754109 8 17 9142718 8 18 -8588031 8 19 7749832
D 8 20 9092740 8 21 -8561090 9 10 -7759433 9 11 -8653977 9 12 9123972
D 9 13 -7617858 9 14 -8643545 9 15 9189148 9 16 -7679028 9 17 -8667513
D 9 18 9162053 9 19 -7750765 9 20 -8596791 9 21 9134619 10 11 8515862
D 10 12 -8386288 10 13 9000494 10 14 7858141 10 15 -7775770 10 16 9091109
D 10 17 7895029 10 18 -7746190 10 19 9238013 10 20 7808698 10 21 -7722299
D 11 12 -9379714 11 13 7700650 11 14 9202900 11 15 -8670777 11 16 7775045

D 11 17 9239965 11 18 -8642676 11 19 7883534 11 20 9148168 11 21 -8614853
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 D 14 18 -8636435 14 19 7848423 14 20 9132842 14 21 -8599656 15 16 -7689877
 D 15 17 -8690578 15 18 9180237 15 19 -7771264 15 20 -8602419 15 21 9141886
 D 16 17 8485962 16 18 -8435213 16 19 9021465 16 20 7740249 16 21 -7652047
 D 17 18 -9381819 17 19 7915244 17 20 9154098 17 21 -8620629 18 19 -7713831
 D 18 20 -8584593 18 21 9121604 19 20 8396794 19 21 -8306482 20 21 -9409829

ITRF position of 0185 as determined by individual baselines

	X	Y	Z
bil5	-1325259.819	-4254667.185	4549139.164
mtei	-1325259.817	-4254667.191	4549139.154
wysh	-1325259.825	-4254667.174	4549139.177
p052	-1325259.821	-4254667.176	4549139.152
p722	-1325259.827	-4254667.184	4549139.182
mtlw	-1325259.819	-4254667.179	4549139.168
p054	-1325259.816	-4254667.168	4549139.155

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
bil5	0.000	-0.009	0.005	0.003	-0.003	0.010
mtei	0.002	-0.015	-0.004	0.006	-0.013	0.006
wysh	-0.006	0.002	0.018	-0.006	0.013	0.013
p052	-0.002	-0.000	-0.006	-0.002	-0.005	-0.004
p722	-0.008	-0.008	0.024	-0.005	0.009	0.024
mtlw	0.000	-0.003	0.009	0.001	0.004	0.009
p054	0.003	0.008	-0.004	0.000	0.003	-0.009

STATE PLANE COORDINATES - International Foot
 SPC (2500 MT)

Northing (Y) [feet] 566848.281
 Easting (X) [feet] 2529274.442
 Convergence [degrees] 1.60861502
 Point Scale 0.99962034
 Combined Factor 0.99947293

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

dop from interpolation is 0.406
scatter (mean square distance from rover) is 26709.643
average edop for rover is 0.750
average ndop for rover is 1.180
average hdop for rover is 1.398
average vdop for rover is 1.980
average gdop for rover is 2.850

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.