



OPUS SOLUTION REPORT

TEXAS BRINE COMPANY, LLC

BAYOU CORNE, LOUISIANA

July 2013

FENSTERMAKER, LLC JOB NO. 2139115.00C

As part of the Bayou Corne Subsidence Survey, Trimble GPS Receivers were placed on three existing NGS Style Monuments titled GPS 1, GPS 3 and GPS 4. The Trimble GPS Receivers logged satellite data for at least 4 hours. The raw data from these static logging sessions were sent to National Geodetic Survey web site "OPUS" for processing.

Monument GPS 1

NGS OPUS Solution Report

File: TR7001220726570

Page: 3 of 8

NAD 83(2011)(EPOCH:2010.0)	NAD 83(2011) LA SOUTH 1702	NAD 27 LA SOUTH 1702
Lat.= 30°00'46.46577"	Northing=550,261.19	Northing=489,556.19
Long.= 91°06'01.24763"	Easting=3,354571.48	Easting=2,073771.98
Ellipsoidal Hgt. = -81.913 ft.		
Orthometric Hgt. = 4.852 ft. (Geoid 12A)		

File: TR7001559947491

Page: 4 of 8

NAD 83(2011)(EPOCH:2010.0)	NAD 83(2011) LA SOUTH 1702	NAD 27 LA SOUTH 1702
Lat.= 30°00'46.46572"	Northing=550,261.19	Northing=489,556.19
Long.= 90°06'01.24777"	Easting=3,354,571.47	Easting=2,073,771.97
Ellipsoidal Hgt. = -81.840 ft.		
Orthometric Hgt. = 4.925 ft. (Geoid 12A)		



Monument GPS 3

File: TR7003047619077

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NAD 83(2011)(EPOCH:2010.0)	NAD 83(2011) LA SOUTH 1702	NAD 27 LA SOUTH 1702
Lat.= 30°01'00.90798"	Northing= 551,698.43	Northing=490,993.43
Long.= 91°08'12.84667"	Easting=3,342,999.59	Easting=2,062,200.16
Ellipsoidal Hgt. = -84.668 ft.		
Orthometric Hgt. = 2.175 ft. (Geoid 12A)		

File: TR7003659970665

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NAD 83(2011)(EPOCH:2010.0)	NAD 83(2011) LA SOUTH 1702	NAD 27 LA SOUTH 1702
Lat.= 30°01'00.90816"	Northing=551,698.44	Northing=490,993.45
Long.= 91°08'12.84614"	Easting=3,342,999.63	Easting=2,062,200.21
Ellipsoidal Hgt. = -84.997 ft.		
Orthometric Hgt. = 1.847 ft. (Geoid 12A)		

Monument GPS 4

File: TR7005605767401

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NAD 83(2011)(EPOCH:2010.0)	NAD 83(2011) LA SOUTH 1702	NAD 27 LA SOUTH 1702
Lat.= 30°00'23.53165"	Northing=547,921.55	Northing=487,216.60
Long.= 91°08'21.07803"	Easting=3,342,282.36	Easting=2,061,482.91
Ellipsoidal Hgt. = -85.190 ft.		
Orthometric Hgt. = 1.555 ft. (Geoid 12A)		

File: TR7006370147293

Page 8 of 8

NAD 83(2011)(EPOCH:2010.0)	NAD 83(2011) LA SOUTH 1702	NAD 27 LA SOUTH 1702
Lat.= 30°00'23.53154"	Northing=547,921.53	Northing=487,216.59
Long.= 91°08'21.07825"	Easting=3,342,282.34	Easting=2,061,482.89
Ellipsoidal Hgt.=-85.203 ft.		
Orthometric Hgt. = 1.542 ft. (Geoid 12A)		



From: opus [opus@ngs.noaa.gov]
Sent: Monday, July 29, 2013 8:10 AM
To: Adam Judice
Subject: OPUS solution : INPU TR7001220726570
Attachments: inpu203q.13o.xml

FILE: INPU TR7001220726570

NGS OPUS SOLUTION REPORT

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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: adam@fenstermaker.com
RINEX FILE: inpu203q.13o

DATE: July 29, 2013
TIME: 13:09:18 UTC

SOFTWARE: page5 1209.04 master92.pl 072313 START: 2013/07/22 16:16:00
EPHEMERIS: igr17501.eph [rapid] STOP: 2013/07/22 22:27:00
NAV FILE: brdc2030.13n OBS USED: 17344 / 19243 : 90%
ANT NAME: TRM55971.00 NONE # FIXED AMB: 147 / 169 : 87%
ARP HEIGHT: 2 OVERALL RMS: 0.022(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2013.5556)

X:	-106147.665(m)	0.011(m)	-106148.425(m)	0.011(m)
Y:	-5526500.188(m)	0.010(m)	-5526498.694(m)	0.010(m)
Z:	3171600.268(m)	0.013(m)	3171600.089(m)	0.013(m)

LAT:	30 0 46.46577	0.011(m)	30 0 46.48476	0.011(m)
E LON:	268 53 58.75237	0.012(m)	268 53 58.72294	0.012(m)
W LON:	91 6 1.24763	0.012(m)	91 6 1.27706	0.012(m)
EL HGT:	-24.967(m)	0.015(m)	-26.337(m)	0.015(m)
ORTHO HGT:	1.479(m)	0.027(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)

Northing (Y) [meters]	3321735.110	167719.947
Easting (X) [meters]	683210.358	1022475.433
Convergence [degrees]	0.95046241	0.11649634
Point Scale	1.00001414	0.99992577
Combined Factor	1.00001806	0.99992969

US NATIONAL GRID DESIGNATOR: 15RXP8321021735(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL9074	FSHS FRANKLIN HIGH SCH CORS ARP	N294819.103	W0913008.051	45121.4
DF8160	SJB1 SJB GROUP COOP CORS ARP	N302345.831	W0910625.854	42480.2
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	38419.3

NEAREST NGS PUBLISHED CONTROL POINT

BJ5089	KESSLER RESET	N300208.512	W0910421.723	3679.2
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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.



From: opus [opus@ngs.noaa.gov]
 Sent: Monday, July 29, 2013 8:10 AM
 To: Adam Judice
 Subject: OPUS solution : INPU TR7001559947491
 Attachments: inpu204n.13o.xml

FILE: INPU TR7001559947491

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
 For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: adam@fenstermaker.com	DATE: July 29, 2013
RINEX FILE: inpu204n.13o	TIME: 13:10:15 UTC
SOFTWARE: page5 1209.04 master72.pl 072313	START: 2013/07/23 13:01:00
EPHEMERIS: igr17502.eph [rapid]	STOP: 2013/07/23 21:34:00
NAV FILE: brdc2040.13n	OBS USED: 23147 / 26743 : 87%
ANT NAME: TRM55971.00 NONE	# FIXED AMB: 190 / 250 : 76%
ARP HEIGHT: 2	OVERALL RMS: 0.022(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2013.5581)

X:	-106147.669(m)	0.011(m)	-106148.429(m)	0.011(m)
Y:	-5526500.208(m)	0.007(m)	-5526498.714(m)	0.007(m)
Z:	3171600.278(m)	0.006(m)	3171600.099(m)	0.006(m)

LAT:	30 0 46.46572	0.007(m)	30 0 46.48472	0.007(m)
E LON:	268 53 58.75223	0.011(m)	268 53 58.72281	0.011(m)
W LON:	91 6 1.24777	0.011(m)	91 6 1.27719	0.011(m)
EL HGT:	-24.945(m)	0.006(m)	-26.315(m)	0.006(m)
ORTHO HGT:	1.501(m)	0.015(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)
Northing (Y) [meters]	3321735.109	167719.945
Easting (X) [meters]	683210.354	1022475.429
Convergence [degrees]	0.95046239	0.11649632
Point Scale	1.00001414	0.99992577
Combined Factor	1.00001806	0.99992969

US NATIONAL GRID DESIGNATOR: 15RXP8321021735(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DF8160	SJB1 SJB GROUP COOP CORS ARP	N302345.831	W0910625.854	42480.2
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	14897.4
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	38419.3

NEAREST NGS PUBLISHED CONTROL POINT

BJ5089	KESSLER RESET	N300208.512	W0910421.723	3679.2
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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.



From: opus [opus@ngs.noaa.gov]
Sent: Monday, July 29, 2013 8:13 AM
To: Adam Judice
Subject: OPUS solution : INPU TR7003047619077
Attachments: inpu205n.13o.xml

FILE: INPU TR7003047619077

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: adam@fenstermaker.com
RINEX FILE: inpu205n.13o

DATE: July 29, 2013
TIME: 13:12:42 UTC

SOFTWARE: page5 1209.04 master63.pl 072313 START: 2013/07/24 13:34:00
EPHEMERIS: igr17503.eph [rapid] STOP: 2013/07/24 20:58:30
NAV FILE: brdc2050.13n OBS USED: 21808 / 23804 : 92%
ANT NAME: TRM55971.00 # FIXED AMB: 127 / 163 : 78%
ARP HEIGHT: 2 OVERALL RMS: 0.020(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2013.5609)

X: -109669.178(m) 0.004(m) -109669.938(m) 0.004(m)
Y: -5526208.202(m) 0.009(m) -5526206.708(m) 0.009(m)
Z: 3171984.919(m) 0.003(m) 3171984.739(m) 0.003(m)

LAT: 30 1 0.90798 0.006(m) 30 1 0.92694 0.006(m)
E LON: 268 51 47.15333 0.004(m) 268 51 47.12387 0.004(m)
W LON: 91 8 12.84667 0.004(m) 91 8 12.87613 0.004(m)
EL HGT: -25.807(m) 0.007(m) -27.177(m) 0.007(m)
ORTHO HGT: 0.663(m) 0.016(m) [NAVD88 (Computed using GEOID12A)]

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)
Northing (Y) [meters]	3322121.824	168158.016
Easting (X) [meters]	679676.950	1018948.312
Convergence [degrees]	0.93227558	0.09821823
Point Scale	0.99999832	0.99992578
Combined Factor	1.00000237	0.99992983

US NATIONAL GRID DESIGNATOR: 15RXP7967622121(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	17485.5
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	39904.3
DL9074	FSHS FRANKLIN HIGH SCH CORS ARP	N294819.103	W0913008.051	42367.3

NEAREST NGS PUBLISHED CONTROL POINT

BJ5095	MABILE	N300005.000	W0911134.865	5679.0
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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.



From: opus [opus@ngs.noaa.gov]
Sent: Monday, July 29, 2013 8:14 AM
To: Adam Judice
Subject: OPUS solution : INPU TR7003659970665
Attachments: inpu206n.13o.xml

FILE: INPU TR7003659970665

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: adam@fenstermaker.com DATE: July 29, 2013
RINEX FILE: inpu206n.13o TIME: 13:13:51 UTC

SOFTWARE: page5 1209.04 master73.pl 072313 START: 2013/07/25 13:05:00
EPHEMERIS: igr17504.eph [rapid] STOP: 2013/07/25 21:43:30
NAV FILE: brdc2060.13n OBS USED: 25992 / 27355 : 95%
ANT NAME: TRM55971.00 # FIXED AMB: 108 / 132 : 82%
ARP HEIGHT: 2 OVERALL RMS: 0.018(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2013.5636)

X:	-109669.162(m)	0.011(m)	-109669.922(m)	0.011(m)
Y:	-5526208.113(m)	0.010(m)	-5526206.619(m)	0.010(m)
Z:	3171984.874(m)	0.008(m)	3171984.694(m)	0.008(m)

LAT:	30 1 0.90816	0.008(m)	30 1 0.92712	0.008(m)
E LON:	268 51 47.15386	0.010(m)	268 51 47.12440	0.010(m)
W LON:	91 8 12.84614	0.010(m)	91 8 12.87560	0.010(m)
EL HGT:	-25.907(m)	0.011(m)	-27.277(m)	0.011(m)
ORTHO HGT:	0.563(m)	0.022(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)
Northing (Y) [meters]	3322121.830	168158.022
Easting (X) [meters]	679676.964	1018948.326
Convergence [degrees]	0.93227566	0.09821831
Point Scale	0.99999832	0.99992578
Combined Factor	1.00000239	0.99992985

US NATIONAL GRID DESIGNATOR: 15RXP7967622121(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL9074	FSHS FRANKLIN HIGH SCH CORS ARP	N294819.103	W0913008.051	42367.3
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	17485.5
DF8160	SJB1 SJB GROUP COOP CORS ARP	N302345.831	W0910625.854	42127.6

NEAREST NGS PUBLISHED CONTROL POINT

BJ5095	MABILE	N300005.000	W0911134.865	5679.0
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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.



From: opus [opus@ngs.noaa.gov]
Sent: Monday, July 29, 2013 8:17 AM
To: Adam Judice
Subject: OPUS solution : INPU TR7005605767401
Attachments: inpu206m.13o.xml

FILE: INPU TR7005605767401

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: adam@fenstermaker.com
RINEX FILE: inpu206m.13o

DATE: July 29, 2013
TIME: 13:17:08 UTC

SOFTWARE: page5 1209.04 master91.pl 072313 START: 2013/07/25 12:22:00
EPHEMERIS: igr17504.eph [rapid] STOP: 2013/07/25 21:27:00
NAV FILE: brdc2060.13n OBS USED: 23278 / 26260 : 89%
ANT NAME: TRM55971.00 NONE # FIXED AMB: 122 / 139 : 88%
ARP HEIGHT: 2 OVERALL RMS: 0.017(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2013.5636)

X: -109901.153(m) 0.003(m) -109901.913(m) 0.003(m)
Y: -5526779.225(m) 0.011(m) -5526777.731(m) 0.011(m)
Z: 3170988.247(m) 0.012(m) 3170988.067(m) 0.012(m)

LAT: 30 0 23.53165 0.007(m) 30 0 23.55060 0.007(m)
E LON: 268 51 38.92197 0.003(m) 268 51 38.89251 0.003(m)
W LON: 91 8 21.07803 0.003(m) 91 8 21.10749 0.003(m)
EL HGT: -25.966(m) 0.015(m) -27.336(m) 0.015(m)
ORTHO HGT: 0.474(m) 0.028(m) [NAVD88 (Computed using GEOID12A)]

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)
Northing (Y) [meters]	3320967.486	167006.821
Easting (X) [meters]	679475.102	1018729.701
Convergence [degrees]	0.93083883	0.09707496
Point Scale	0.99999742	0.99992575
Combined Factor	1.00000150	0.99992983

US NATIONAL GRID DESIGNATOR: 15RXP7947520967(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL8635	GVMS GALVEZ MIDDLE SCH CORS ARP	N301851.796	W0905413.029	40982.6
DF8160	SJB1 SJB GROUP COOP CORS ARP	N302345.831	W0910625.854	43291.1
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	18301.7

NEAREST NGS PUBLISHED CONTROL POINT

BJ5095 MABILE N300005.000 W0911134.865 5220.8

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.



From: opus [opus@ngs.noaa.gov]
Sent: Monday, July 29, 2013 8:18 AM
To: Adam Judice
Subject: OPUS solution : INPU TR7006370147293
Attachments: inpu207m.13o.xml

FILE: INPU TR7006370147293

NGS OPUS SOLUTION REPORT
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All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: adam@fenstermaker.com DATE: July 29, 2013
RINEX FILE: inpu207m.13o TIME: 13:18:10 UTC

SOFTWARE: page5 1209.04 master72.pl 072313 START: 2013/07/26 12:18:00
EPHEMERIS: igr17505.eph [rapid] STOP: 2013/07/26 16:57:00
NAV FILE: brdc2070.13n OBS USED: 11794 / 13362 : 88%
ANT NAME: TRM55971.00 NONE # FIXED AMB: 76 / 86 : 88%
ARP HEIGHT: 2 OVERALL RMS: 0.016(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2013.5661)

X: -109901.159(m) 0.010(m) -109901.919(m) 0.010(m)
Y: -5526779.223(m) 0.013(m) -5526777.729(m) 0.013(m)
Z: 3170988.242(m) 0.013(m) 3170988.062(m) 0.013(m)

LAT: 30 0 23.53154 0.009(m) 30 0 23.55049 0.009(m)
E LON: 268 51 38.92175 0.009(m) 268 51 38.89229 0.009(m)
W LON: 91 8 21.07825 0.009(m) 91 8 21.10771 0.009(m)
EL HGT: -25.970(m) 0.014(m) -27.340(m) 0.014(m)
ORTHO HGT: 0.470(m) 0.027(m) [NAVD88 (Computed using GEOID12A)]

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)
Northing (Y) [meters]	3320967.482	167006.817
Easting (X) [meters]	679475.096	1018729.695
Convergence [degrees]	0.93083880	0.09707493
Point Scale	0.99999742	0.99992575
Combined Factor	1.00000150	0.99992983

US NATIONAL GRID DESIGNATOR: 15RXP7947520967(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL9074	FSHS FRANKLIN HIGH SCH CORS ARP	N294819.103	W0913008.051	41556.2
DF8160	SJB1 SJB GROUP COOP CORS ARP	N302345.831	W0910625.854	43291.1
DL8631	AWES AWES 147 BC ALWES CORS ARP	N300600.962	W0905858.634	18301.8

NEAREST NGS PUBLISHED CONTROL POINT

BJ5095	MABILE	N300005.000	W0911134.865	5220.8
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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.