



ACQUISITION REPORT – USGS LIDAR ACQUISITION

Lower NC McIntosh - OK

19 January 2012

Prepared for

United States Geological Survey
1400 Independence Road
Rolla, MO 65401
573.308.3612

Prepared by

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Fugro EarthData was tasked with acquiring lidar data over an Area of Interest (AOI) covering or portions of the Lower North Canadian Region of McIntosh County in East Central Oklahoma. The project plan called for lidar to be collected with a nominal point spacing of 2 meters and a side lap of 10% or greater between flight lines. The AOI covers 350 square miles. A 100 meter buffer shall be used for each AOI as part of the flight planning and processing.

All acquisition was to be done during leaf off conditions in December 2011.

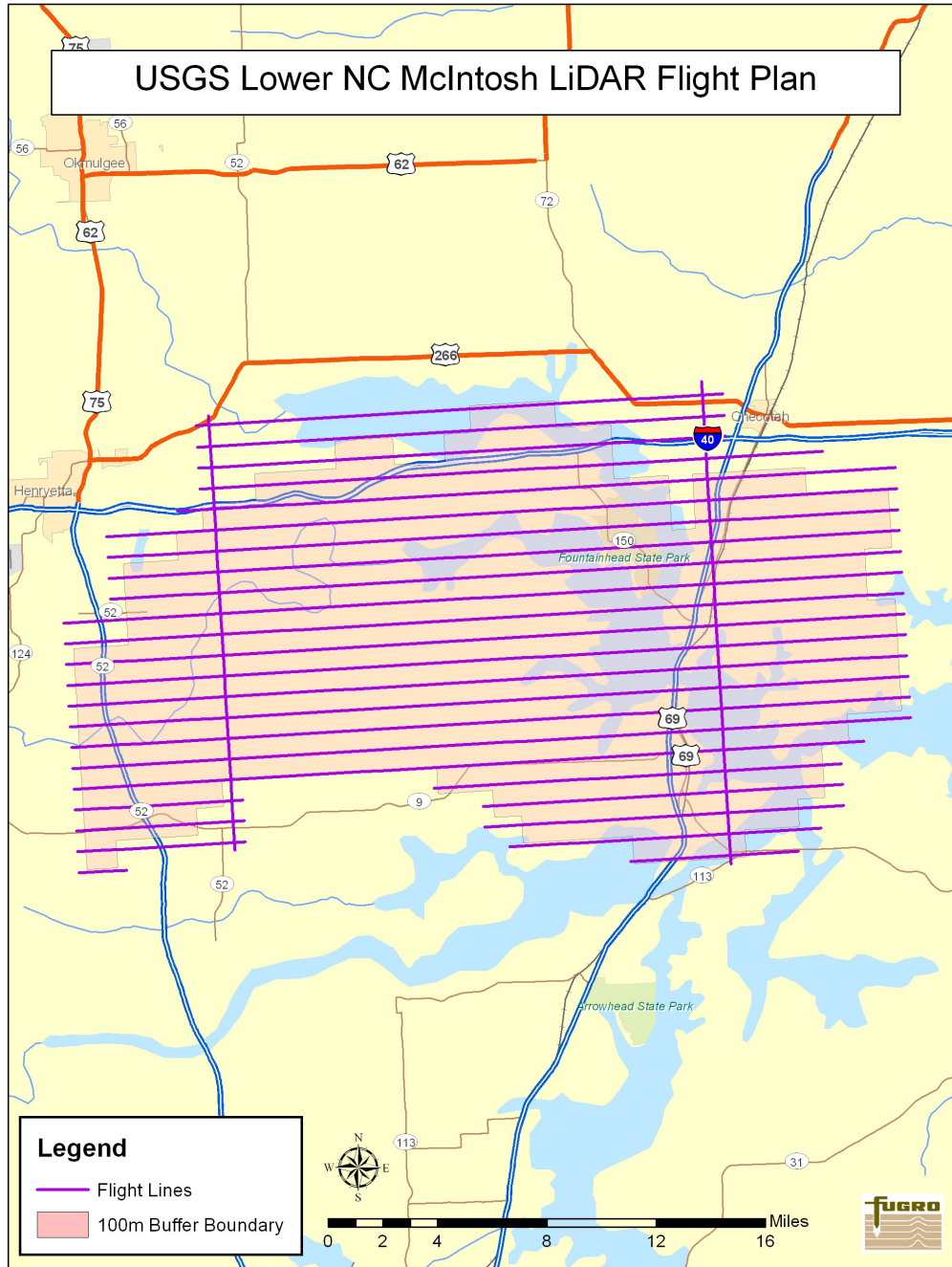


Fig. 1 Flight plan

The following is detail on the lidar acquisition covering the Lower NC McIntosh OK AOI.

Collections: 02
Collection Dates: December 09th, 2011
Field of View (FOV): 38 degrees
Average Point Density (planned): 2 pts/m²
Flight Level(s): 2350 / 7710 m/ft
Sensor Type: Leica ALS60
Sensor Serial Number(s): 113

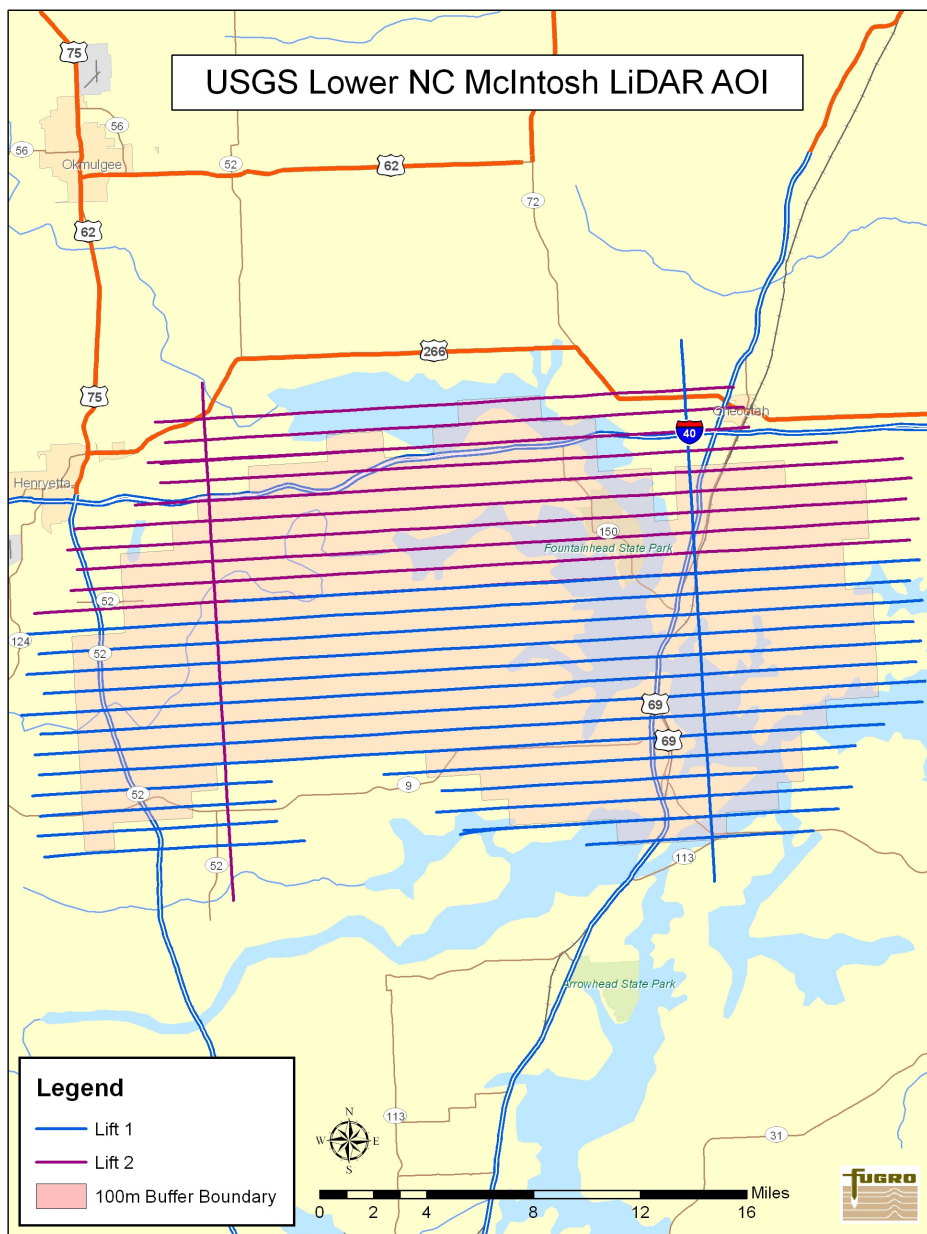


Fig. 2 AOI Executed Flight Trajectories



All acquired LiDAR data was QC'd in Frederick, MD and accepted for processing.
 Below are the flight logs, base stations information and GPS plot from all lifts covering the Lower NC McIntosh OK AOI.

Flight Log/Base Station/GPS Processing – 12.09.2011 (sensor 113)

Horizons Job #		Project Name		Lift Begin			Lift End			Fit		Fit		Hobbs	Activity
				Airport	Chocks	Hobbs	Airport	Chocks	Hobbs	Duration	Hrs	Hrs			
E11-0041-00		McIntosh Coutny		1	KSNL	16:05	5365.9	KOKM	16:35	5366.5	0:30	0.5	0.6	Transit	
				2	KOKM	17:05	5366.5	KOKM	21:25	5370.6	4:20	4.4	4.1	Production	
				3											

Horizons Job #		Project Name		Operator		Unit	IMU	PIA	Min Range'	Max Range'	Ground Temp°C		Shipping Track	Base 1 ID	Base 2 ID		
E11-0041-00		McIntosh Coutny		Rachel Adam		113		2	6122	8346	5.0	7.0		H318			
Flight Date		GPS Day	Lift	System	Pilot		Sun*	Solar Times (urc)	Laser Power	Pulse Rate	Flying Temp °C		Data Logger	Ant Ht	Ant Ht		
9-Dec-11		11-343	1	ALS60	Nathan Hayden				74%	89,500	-4.0	-4.0	3L1	1.80			
Mission ID (DaySensorJobLift)		FMS	Aircraft	Airport ID	UTC	FOV	Altitude	Speed	Scan Hz	AR	SW1	SW2	mi/MPT	Altm Setting	Download Drive	Rec ID	Rec ID
343_113_11004100_01		CCNS 4	N76JN	KOKM	-6	38	7,710	170	34.5	15	4		0.878	30.37	30.38	ZX-011	

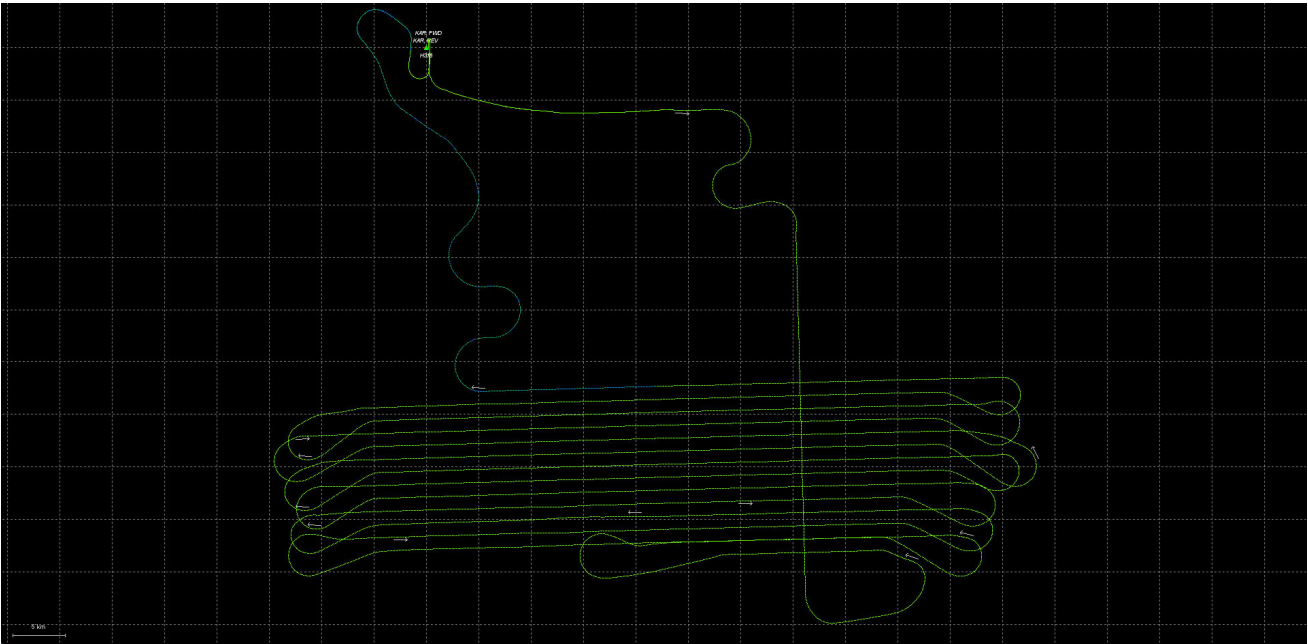
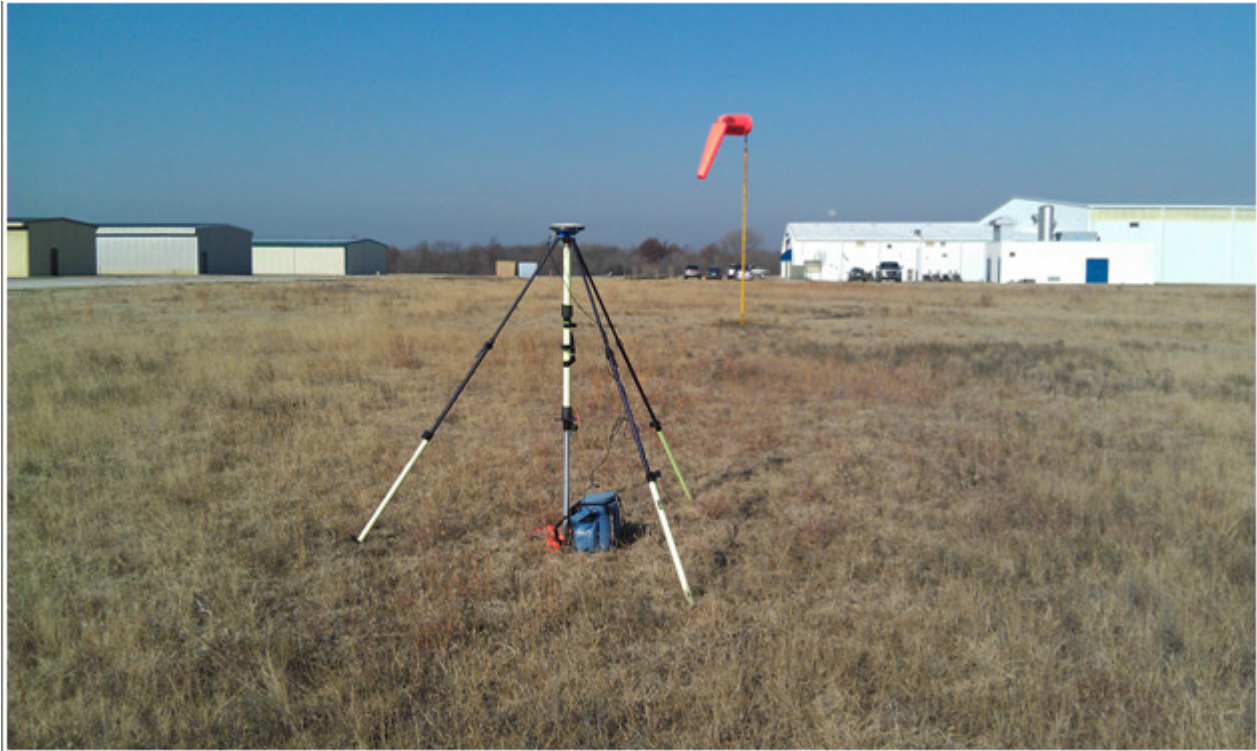
Area	Flight #	HZN	Client's	From	To	Begin	End	UTC		Fit	Altitude	Speed	Scan	Rate	Comments and Conditions	SVs	PDOP
								Start	End								
						17:18:00	17:23:00								ground static		
						17:33:00	17:36:00								s-turn		
LMC_2M	29			22	1	18.4	0	17:37:55	17:44:00	179	8310	162	34.5	CROSSING LINE	16	1.3	
	1			8	1	6.1	0	17:49:03	17:51:00	268	8275	165	34.5		16	1.3	
	3			1	14	0	11.4	17:56:21	18:00:00	088	8265	169	34.5	CALIBRATION LINE	16	1.2	
	3			14	1	11.4	0	18:05:04	18:09:00	268	8290	167	34.5		15	1.3	
	2			3	1	1.8	0	18:11:21	18:14:00	269	8410	167	34.5		15	1.4	
	4			1	8	0	6.1	18:18:25	18:21:00	088	8455	168	34.5		15	1.4	
	5			1	16	0	13.2	18:23:06	18:28:00	088	8430	169	34.5		16	1.2	
	7			16	1	13.2	0	18:32:26	18:37:00	269	8345	166	34.5		15	1.2	
	6			8	1	6.1	0	18:39:05	18:41:00	268	8370	167	34.5		15	1.2	
	8			1	8	0	6.1	18:45:37	18:48:00	088	8350	167	34.5		15	1.4	
	9			1	18	0	14.9	18:49:43	18:55:00	088	8350	168	34.5		17	1	
	10			34	1	29	0	18:59:05	19:08:00	269	8355	168	34.5		15	1.2	
	11			1	36	0	30.7	19:12:37	19:23:00	088	8335	166	34.5		15	1.2	
	12			36	1	30.7	0	19:26:27	19:36:00	268	8380	164	34.5		15	1.4	
	13			1	36	0	30.7	19:40:59	19:51:00	088	8300	171	34.5		15	1.4	
	14			36	1	30.7	0	19:55:45	20:06:00	268	8300	167	34.5		15	1.3	
	15			1	36	0	30.7	20:10:31	20:20:00	088	8300	164	34.5		15	1.2	
	16			36	1	30.7	0	20:24:33	20:34:00	268	8280	170	34.5		14	1.4	
	17			1	36	0	30.7	20:38:51	20:49:00	088	8330	170	34.5		15	1.1	
	18			36	1	30.7	0	20:52:41	21:01:00	268	8350	169	34.5		13	1.4	
						21:01:00	21:04:00							S-TURN			
						21:17:00	21:22:00							GROUND STATIC			

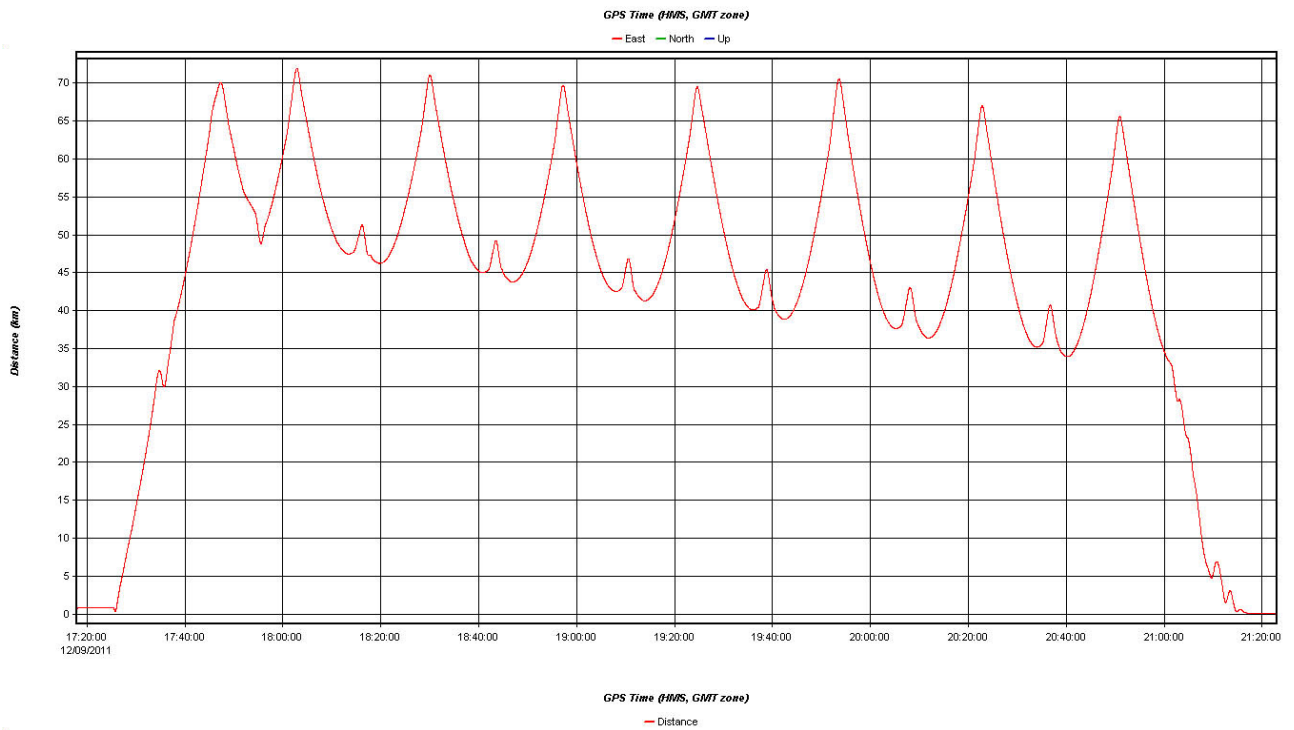
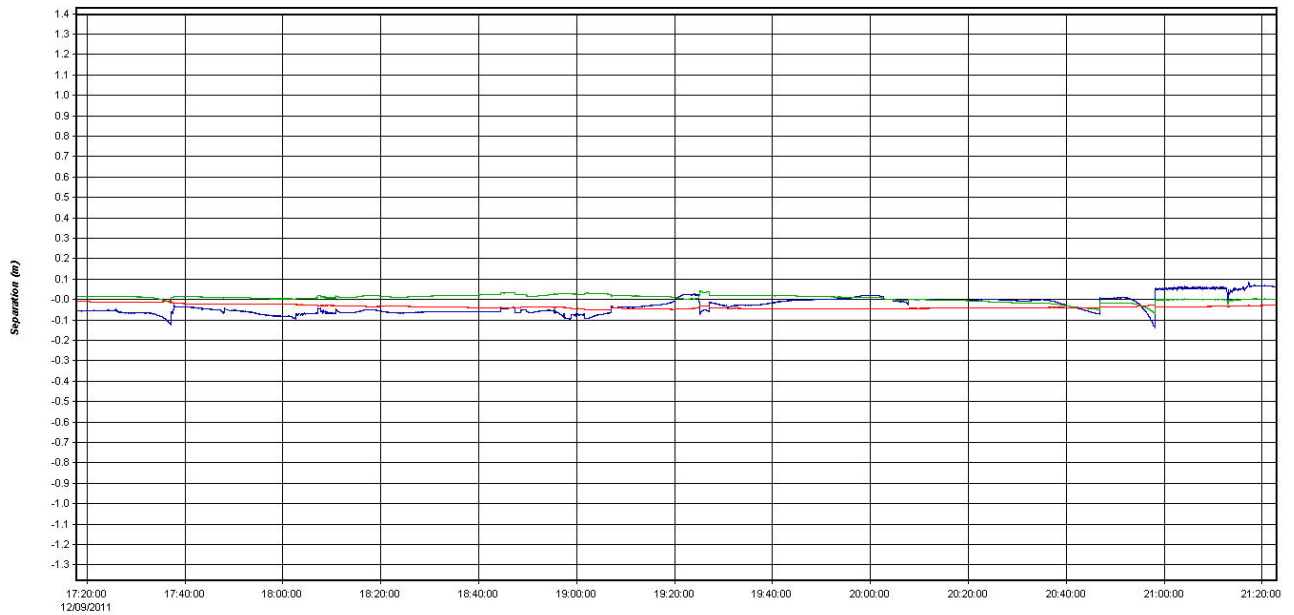
ALS
Flight Log

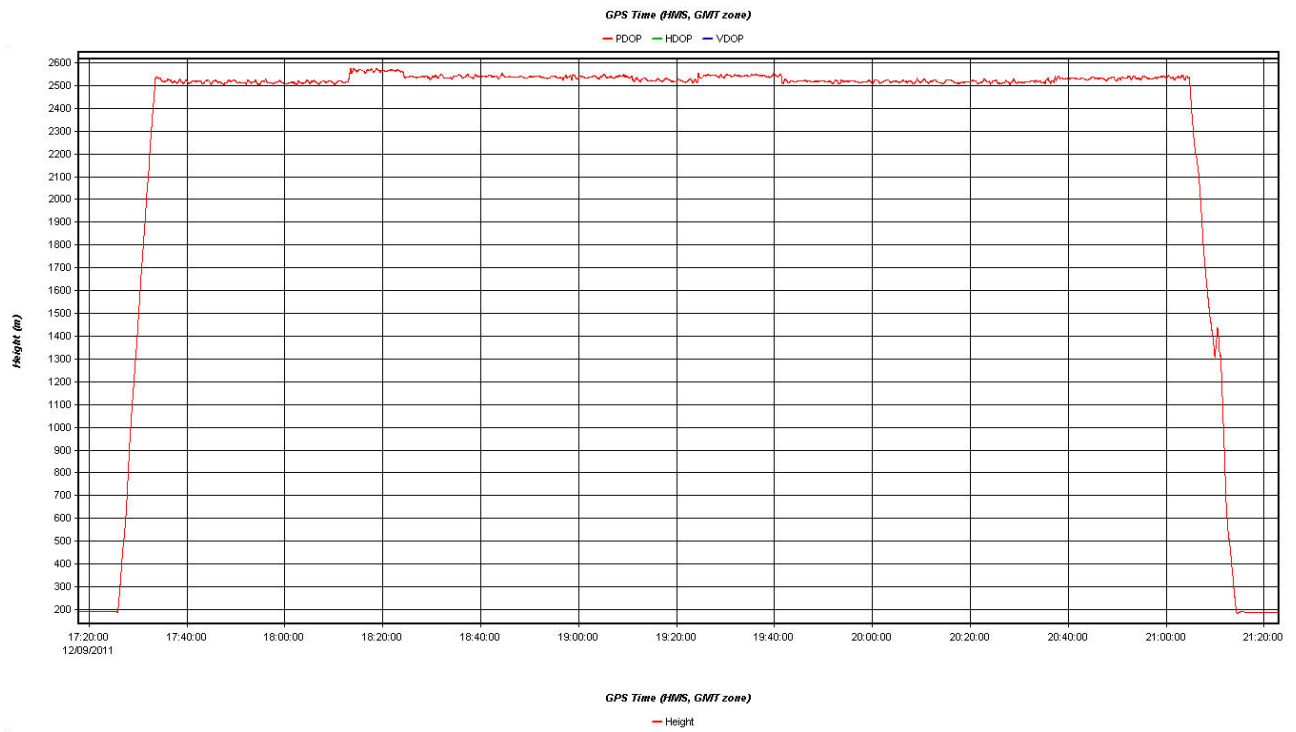
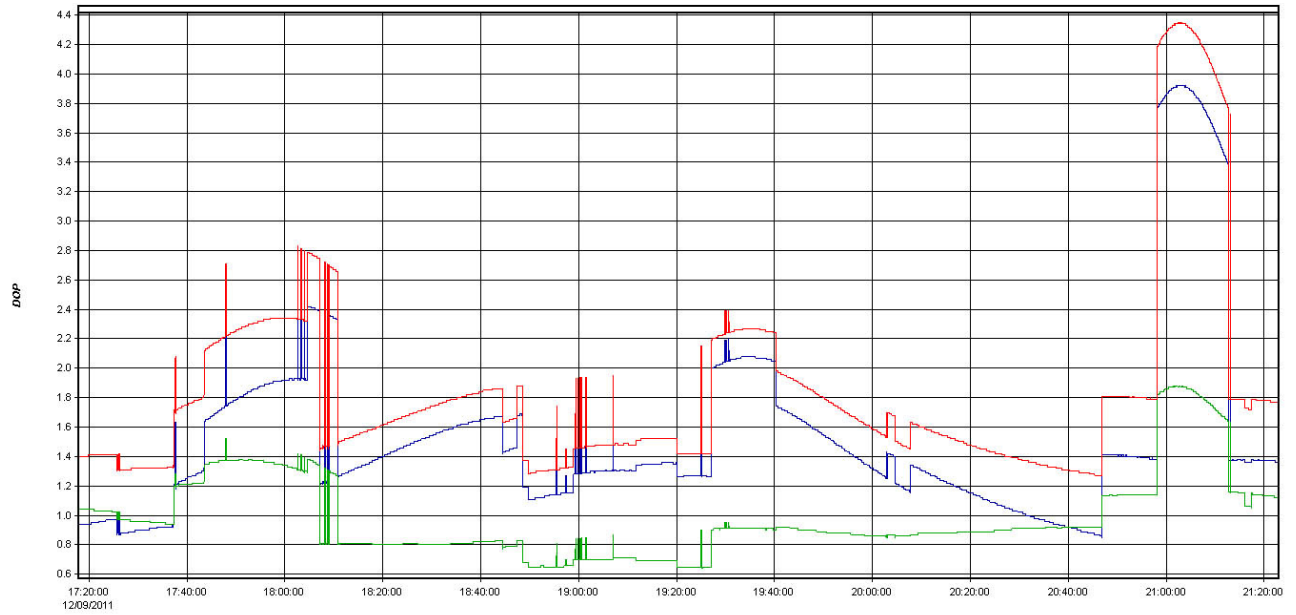


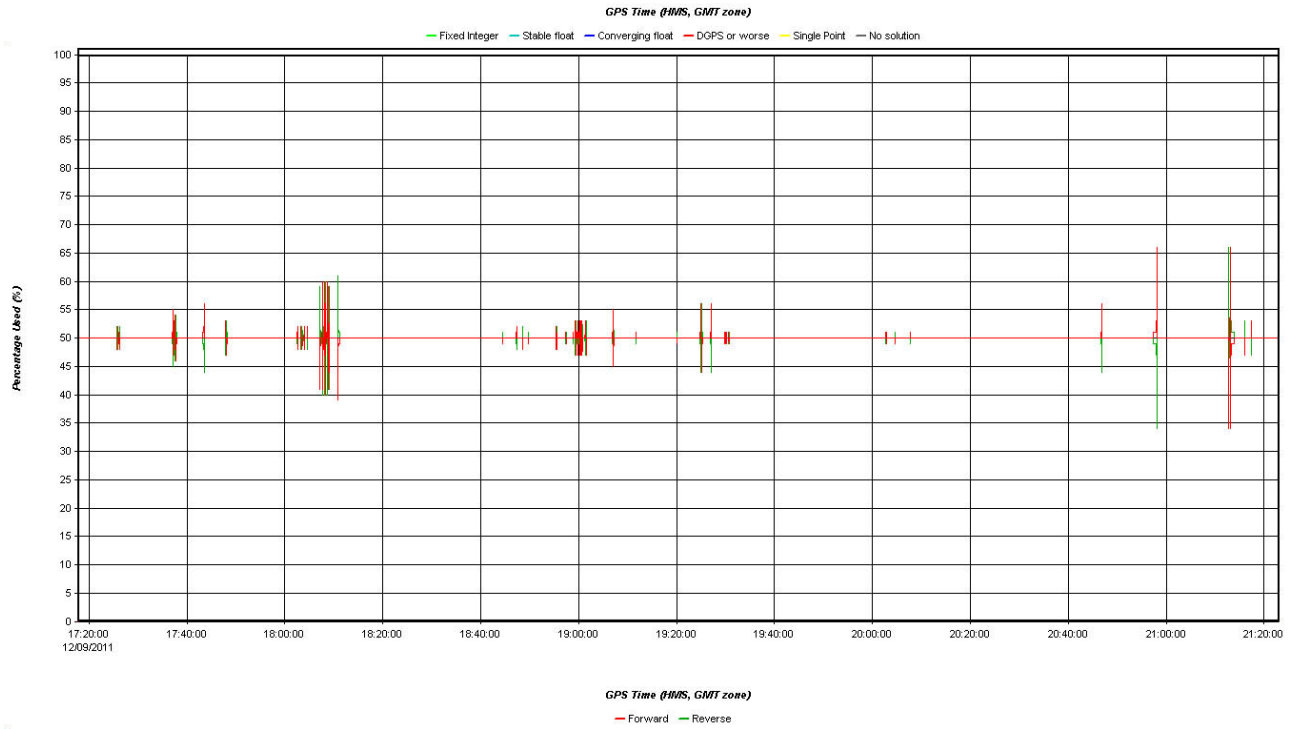
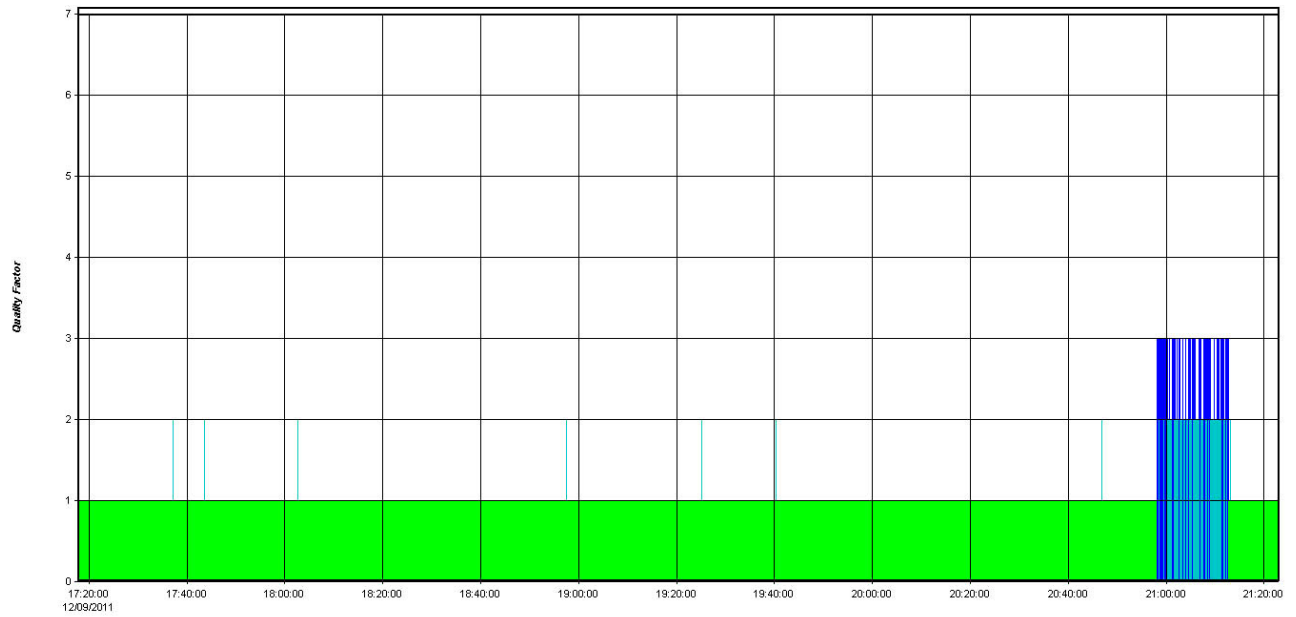
Fugro Horizons, Inc.		Survey Control Data Sheet			
Project Name: McIntosh County		Project # / Lift: E11-0041-00 / LIFT 1		Operator: Rachel Adam	
Date / Julian 12/9/11 11-343		Aircraft: N76NJ		Mission #: 343 113 11004100 01	
Base Operator: Rachel Adam		State/County: Oklahoma, McIntosh County		USGS Quad:	
PID #: 0318		Designation: H318		Session: A	
		Ashtech S/N: ZX-11		Ant.S/N: ZX-11	
Tripod Desc:		Seco Precise Tripod:		Station Information:	
Fixed Height:	<input checked="" type="checkbox"/> High:	<input checked="" type="checkbox"/> Steel Point:	<input type="checkbox"/> Pub. Bench Mark:	<input type="checkbox"/> New Control (tmp):	<input type="checkbox"/> Base Station:
Non-Seco:	<input type="checkbox"/> Low:	<input type="checkbox"/> Collar:	<input type="checkbox"/> Pub. Control:	<input type="checkbox"/> Aerial Target:	<input type="checkbox"/> Photo I.D.:
Antenna Height: **		Description:			
Vertical (m): 1.8		<p>The temporary point, H318, at the Okmulgee Regional Airport, KOKM, is located in a grass area that is directly NE of the FBO building. It is 100' directly SE of the airport wind sock. The point is a seven inch steel spike with a brass washer labeled "Fugro Horizons Inc Point 0318". It has 2 ribbons of orange tape rapped around it. See attached Google Earth photo. Point set by Rachel Adam on 12/9/2011.</p>			
Vertical (ft):					
** Measured to "Antenna Ref.Pt."					
Slant (m):					
Slant (ft):					
START Time: 16:52					
STOP Time: 02:10					
Local Time:					
UTC: <input checked="" type="checkbox"/>					
Latitude: N 35 40 04.15					
Longitude: W 95 57 06.25					
Height (m):					

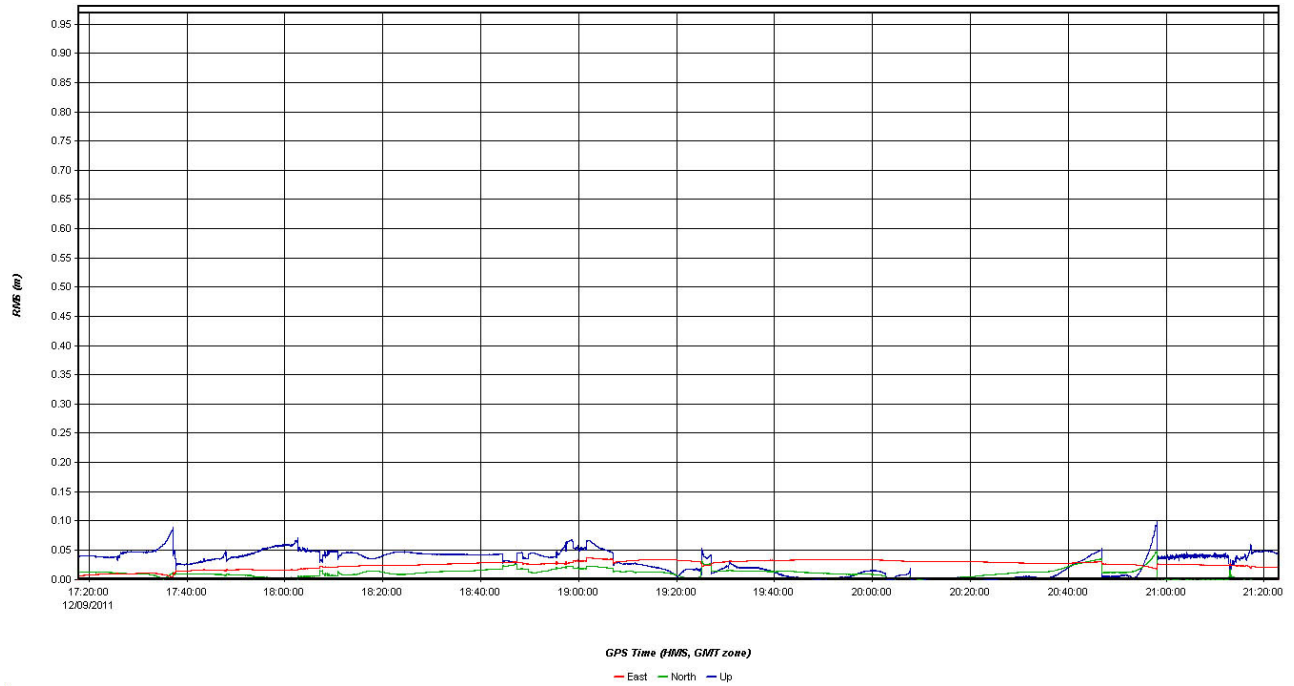














Flight Log/Base Station/GPS Processing – 12.09.2010 (sensor 113)

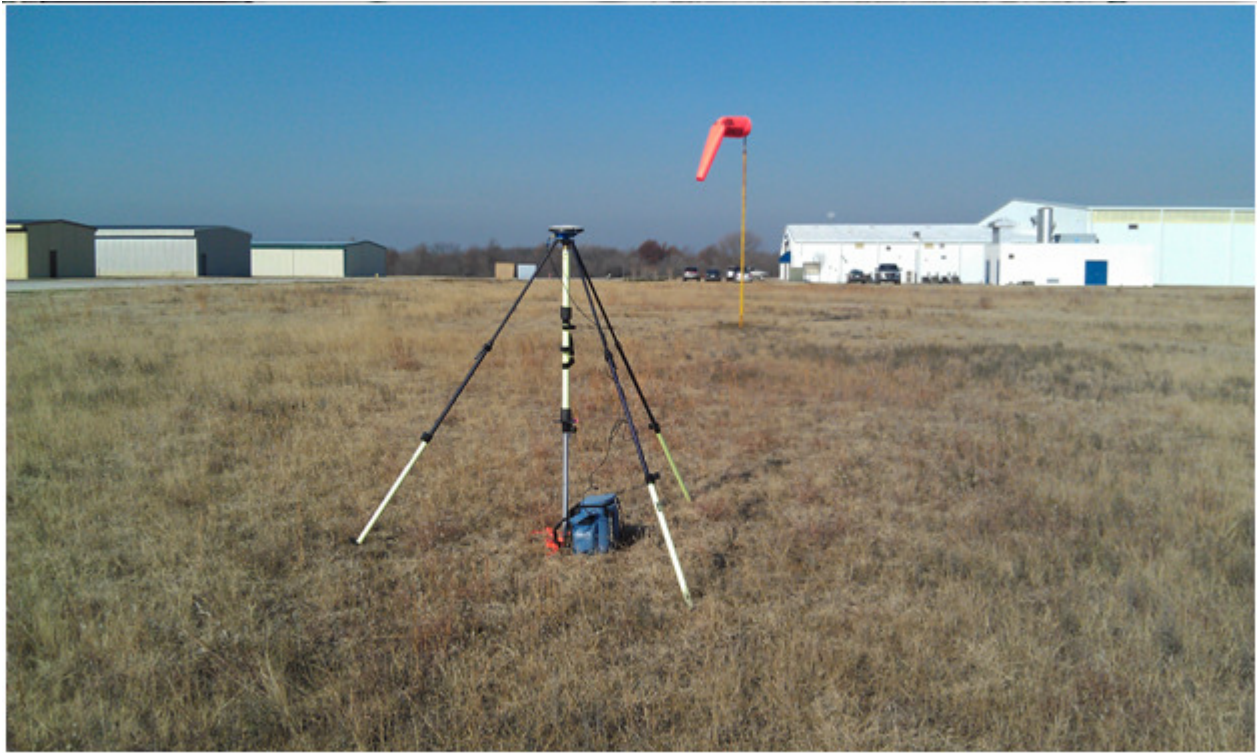
FUGRO		10.5										ALS Flight Log	
		Lift Begin			Lift End			Fit		Fit			
		Airport	Chocks	Hobbs	Airport	Chocks	Hobbs	Duration	Hrs	Hrs			
		1	KOKM	22:48	5370.6	KOKM	2:10	5373.9	3:22	3.4	3.3	Production	
		2	KOKM	2:10	5373.9	KSNL	2:50	5374.7	0:40	0.7	0.8	Transit	
		3											

Horizons Job # E11-0041-00		Project Name McIntosh Countny			Operator Rachel Adam		Unit 113	IMU	PIA 2	Min Range' 6122	Max Range' 8346	Ground Temp °C 3.0 -1.0		Shipping Track	Base 1 ID H318	Base 2 ID		
Flight Date 9-Dec-11		GPS Day 11-343	Lift 2	System ALS60	Pilot Nathan Hayden			Sun*	Solar Times (urc)	Laser Power 74%	Pulse Rate 89,500	Flying Temp °C -4.0 -4.0		Data Logger 3L1	Ant Ht 1.80	Ant Ht		
Mission ID (DaySensorJobLift) 343_113_11004100_02		FMS CCNS 4	Aircraft N76JN	Airport ID KOKM	UTC -6	FOV 38	Altitude 7,710	Speed 170	Scan Hz 34.5	AR 15	SW1 4	SW2	mi/WPT 0.878	AltM Setting 30.42 30.48	Download Drive	Rec ID ZX-011	Rec ID	
Area		Flight # HZN	Client's	Vvbt From	Distance To	UTC Begin End		Start	End	Fit Dir	Altitude (feet)	Speed (knots)	Scan Rate	Comments and Conditions			SVs	PDOF
							22:54:00	22:59:00						GROUND STATIC				
							23:15:00	23:19:00						S-TURN				
LMC_2M	28		1	20	0	26.8	23:22:27	23:28:00	359	8310	157	34.5	CROSSING LINE			17	1.4	
	25		8	1	9.9	0	23:34:17	23:36:00	268	8320	167	34.5	CALIBRATION LINE			17	1.4	
	27		1	23	0	31.1	23:39:49	23:46:00	088	8300	166	34.5				17	1.4	
	26		23	1	31.1	0	23:51:14	23:57:00	268	8275	168	34.5				17	1.3	
	25		1	23	0	31.1	0:04:02	0:11:00	088	8280	167	34.5				16	1.5	
	24		27	1	36.7	0	0:15:17	0:23:00	268	8300	162	34.5				17	1.3	
	23		1	31	0	42.4	0:28:09	0:37:00	088	8300	164	34.5				17	1.2	
	22		34	1	46.6	0	0:41:26	0:51:00	268	8280	165	34.5				18	1.1	
	21		1	34	0	46.6	0:55:52	1:05:00	088	8290	170	34.5				20	1.1	
	20		34	1	46.6	0	1:10:15	1:20:00	268	8310	167	34.5				18	1.1	
	19		1	34	0	46.6	1:24:15	1:33:00	088	8325	169	34.5				17	1.2	
	18		36	1	49.5	0	1:38:16	1:48:00	269	8300	165	34.5				19	1.1	
							1:48:00	1:51:00					S-TURN					
							2:02:00	2:07:00					GROUND STATIC					

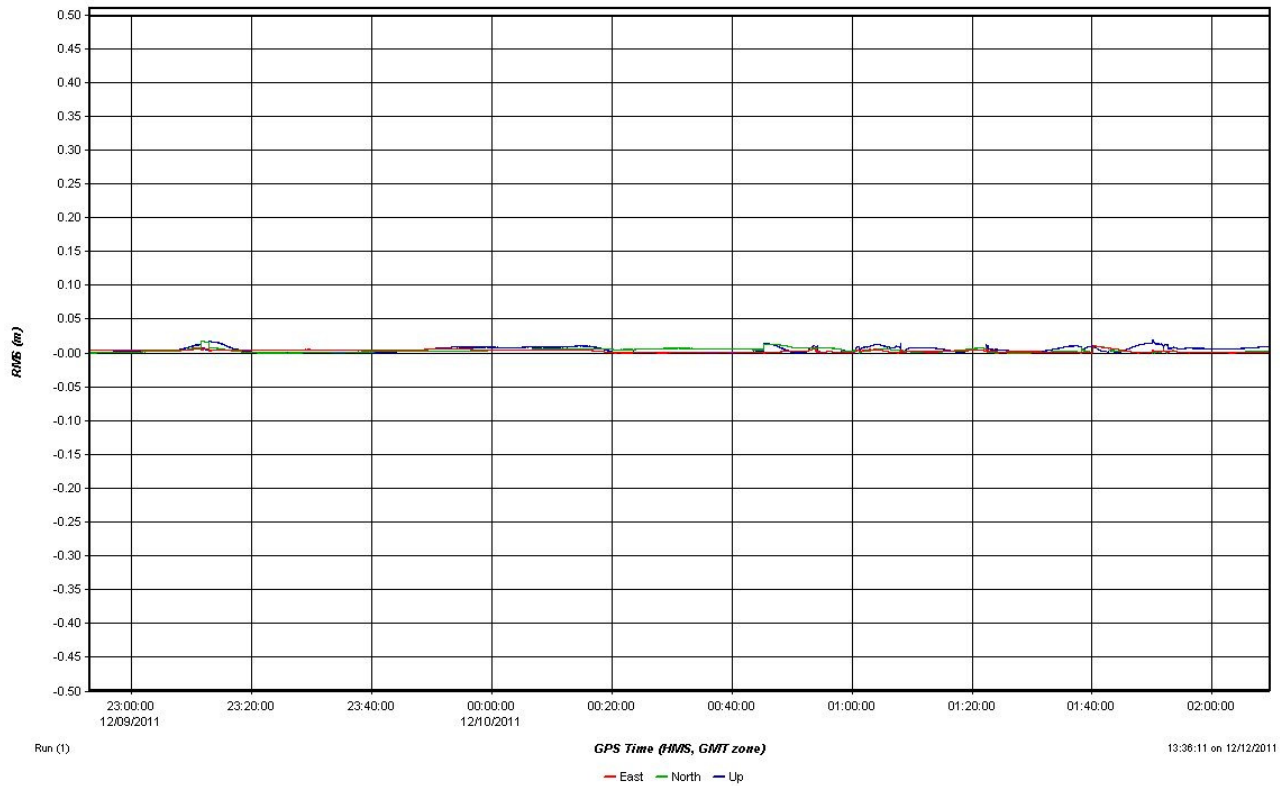


Fugro Horizons, Inc.		Survey Control Data Sheet			
Project Name: McIntosh County		Project # / Lift: E11-0041-00 / LIFT 2		Operator: Rachel Adam	
Date / Julian 12/9/11 11-343		Aircraft: N76NJ		Mission #: 343 113 11004100 02	
Base Operator: Rachel Adam		State/County: Oklahoma, McIntosh County		USGS Quad: Session: A	
PID #: 0318		Designation: H318		Ashtech S/N: ZX-11 Ant.S/N: ZX-11	
Tripod Desc:		Seco Precise Tripod:		Station Information:	
Fixed Height:	<input checked="" type="checkbox"/> High:	<input checked="" type="checkbox"/> Steel Point:	<input type="checkbox"/> Pub. Bench Mark:	<input type="checkbox"/> New Control (tmp):	<input type="checkbox"/> Base Station:
<input type="checkbox"/> Non-Seco:	<input type="checkbox"/> Low:	<input type="checkbox"/> Collar:	<input type="checkbox"/> Pub. Control:	<input type="checkbox"/> Aerial Target:	<input type="checkbox"/> Photo I.D.:
Antenna Height: **		Description:			
Vertical (m): 1.8		<p>The temporary point, H318, at the Okmulgee Regional Airport, KOKM, is located in a grass area that is directly NE of the FBO building. It is 100' directly SE of the airport wind sock. The point is a seven inch steel spike with a brass washer labeled "Fugro Horizons Inc Point 0318". It has 2 ribbons of orange tape rapped around it. See attached Google Earth photo. Point set by Rachel Adam on 12/9/2011.</p>			
Vertical (ft):					
** Measured to "Antenna Ref.Pt."					
Slant (m):					
Slant (ft):					
START Time: 16:52					
STOP Time: 02:10					
Local Time:					
UTC: <input checked="" type="checkbox"/>					
Latitude: N 35 40 04.15					
Longitude: W 95 57 06.25					
Height (m):					



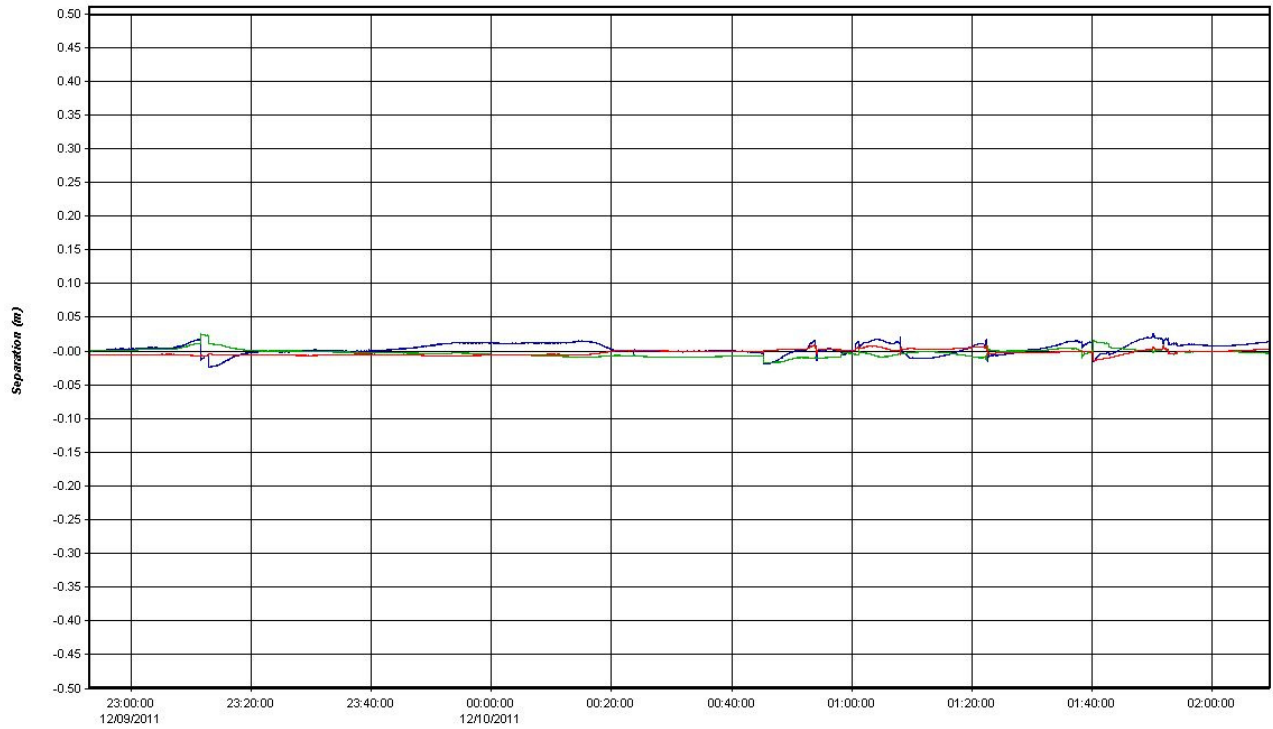


343_113_02 [Combined] - Forward/Reverse or Combined RMS Plot





343_113_02 [Combined] - Forward/Reverse or Combined Separation Plot



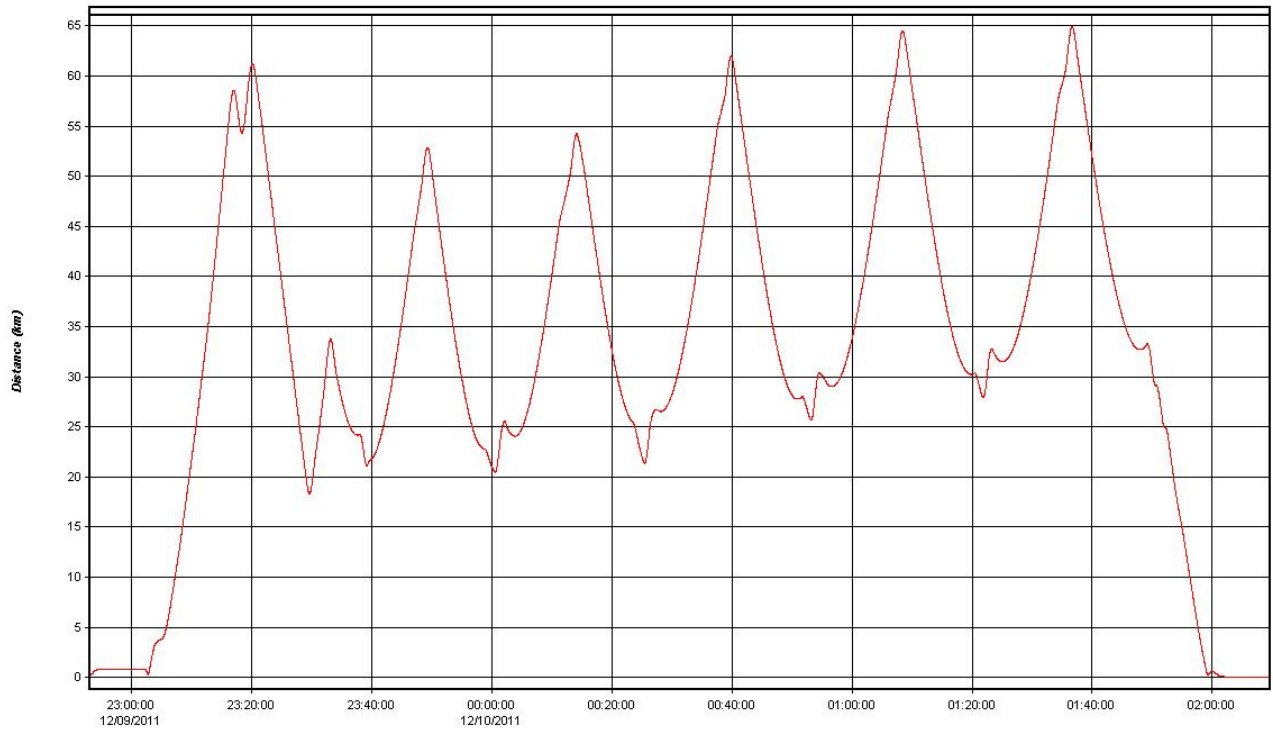
Run (1)

GPS Time (HRS, GMT zone)

13:36:11 on 12/12/2011

— East — North — Up

343_113_02 [Combined] - Horizontal Distance Separation (km)



Run (1)

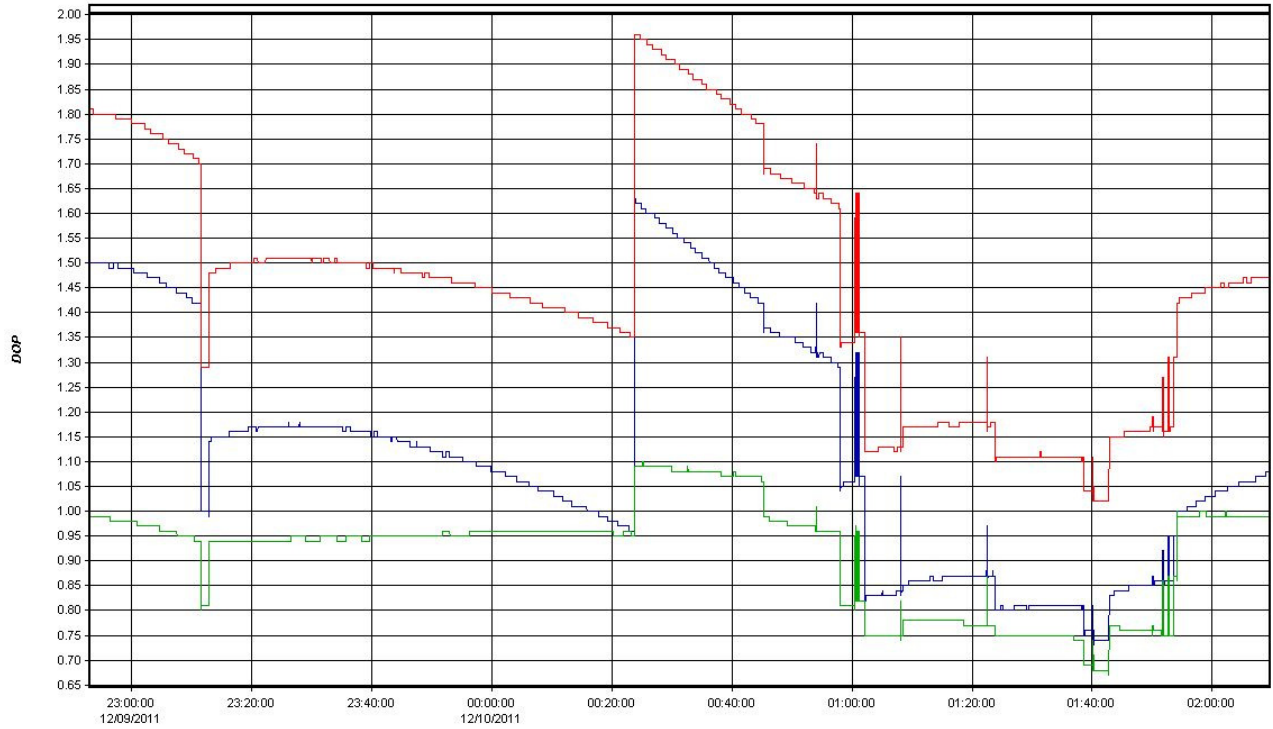
GPS Time (HRS, GMT zone)

13:36:11 on 12/12/2011

— Distance



343_113_02 [Combined] - PDOP, HDOP, VDOP Plots



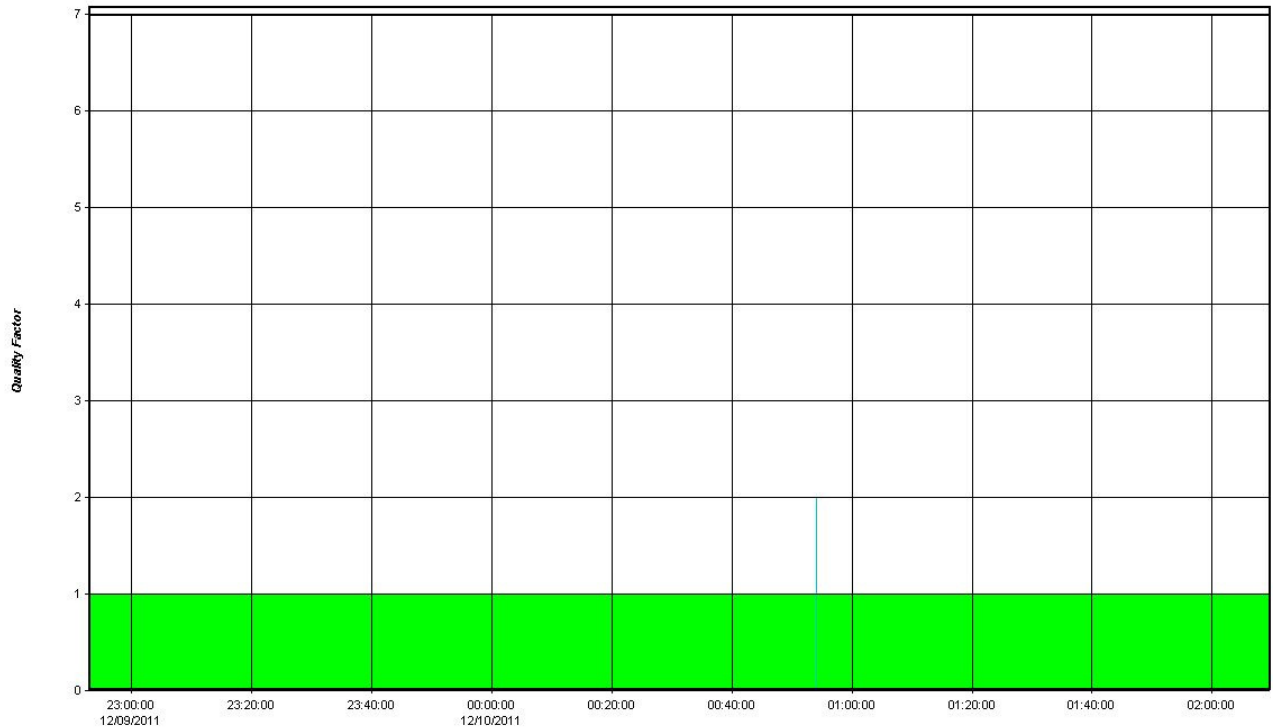
Run (1)

GPS Time (HMS, GMT zone)

13:36:11 on 12/12/2011

— PDOP — HDOP — VDOP

343_113_02 [Combined] - Quality Factor Plot



Run (1)

GPS Time (HMS, GMT zone)

13:36:11 on 12/12/2011

— Fixed Integer — Stable float — Converging float — DGPS or worse — Single Point — No solution

