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LIDAR PROCESSING REPORT

FOR

**US GEOLOGICAL SURVEY
NGTOC III
ROLLA, MO**

SAGE GROUSE MONTANA LIDAR

December 29, 2010

AERO-METRIC PROJECT NO. 1-100804



LiDAR Processing Report

For

**US GEOLOGICAL SURVEY
NGTOC III**

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AERO-METRIC Project No. 1-100804

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US GEOLOGICAL SURVEY
SAGE GROUSE MONTANA LiDAR
AeroMetric Project No. 1100804

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1 INTRODUCTION

This report contains a summary of the LiDAR data acquisition and processing for the **USGS – SAGE GROUSE MONTANA LiDAR TASK ORDER**.

1.1 Contact Info

Questions regarding the technical aspects of this report should be addressed to:

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1.2 Purpose

Aerometric, Inc. acquired highly accurate Light Detection and Ranging (LiDAR) data for a project area that comprise approximately 290 square miles for the United State Geological Survey. Using Aerometric's Optech 3100 AG LiDAR system, data was collected at or below 1000 meters to support the project area's requirement.

1.3 Project Locations

The project area covers portions of Golden Valley and Musselshell Counties, Montana. The project area was defined and supplied by USGS.

1.4 Time Period

LiDAR data acquisition, control and QC surveys were completed between August 29th, 2010 and September 15th, 2010. A total of 5 flight missions were required to cover the project area. See Item 3.4 for a sketch of the acquisition missions and Section 7 of the report for each flight log. QC surveys were completed between August 29th and September 7th, 2010.

1.5 Project Scope

Aerometric, Inc. acquired highly accurate Light Detection and Ranging (LiDAR) data for an area that encompassed approximately 290 square miles in Montana. Using Aerometric's Optech 3100 AG LiDAR system, data was collected at or below an altitude of 1000 meters to support the project's requirements.

As documented in our proposal dated June 7, 2010 we were to achieve a TIN accuracy of 15cm for all areas. The accuracy as tested and published in this report in Section 8 has easily met both vertical accuracy requirements.

1.6 Conditions Affecting Progress

- None.

2 GEODETIC CONTROL

2.1 Network Scope

Base horizontal control for the entire project area consisted of one NGS Order B station: **Z 122**; one NGS Second Order station: **CARELESS**; and five NGS CORS stations: **BIL5**, **MTDT**, **MTEI**, **MTMS**, and **MTSU**.

Horizontal control is referenced to the Universal Transverse Mercator (UTM) Coordinate System – Zone 13, based on the North American Datum of 1983/2007 (NAD83/07). Final coordinates are published in meters.

Base vertical control for the entire project area consisted of two NGS Second Order Class 0 station: **CARELESS** and **Z 122**; one NGS Third Order station: **E 125 RESET**; and five NGS CORS stations: **BIL5**, **MTDT**, **MTEI**, **MTMS**, and **MTSU**. The NGS Geoid Model GEOID09 was applied to the derived ellipsoid heights that approximate the North American Vertical Datum of 1988.

Vertical control is based on the North American Vertical Datum of 1988 (NAVD88).

Base horizontal and vertical control for the Airborne GPS surveys consisted of two NGS CORS stations: **BIL5** and **MTEI**; and one temporary station: **101**.

NGS recovery sheets are located in Section 2 of the Control Survey Report.

2.2 Network Computations

GPS measurements were done in two stages. Initial computations were done with LEICA Geo Office (LGO), version 4.0. LGO permits the conversion of raw satellite data collected by the receivers to a meaningful coordinate difference between points (baseline solutions). Once the baseline solutions were determined, they were input into the GeoSurv-GeoLab2 series of programs (Geolab version 2.4d). Adjustments were performed for analysis and quality closure holding position and elevation of station **Z 122**.

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
BIL5	0.003	0.002	0.004	78891.7	1:21,880,000
CARELESS	0.001	0.074	0.074	49746.5	1:672,000
MTDT	0.021	0.019	0.028	239439.7	1:8,454,000
MTEI	0.003	0.010	0.010	65260.5	1:6,250,000
MTMS	0.006	0.006	0.008	256661.0	1:30,247,000
MTSU	0.000	0.000	0.000	179995.8	0

VERTICAL CLOSURES (in meters)

<u>STATION</u>	<u>ADJUSTED ELEVATION</u>	<u>PUBLISHED ELEVATION</u>	<u>DIFFERENCE</u>	<u>DISTANCE</u>	<u>ALLOWABLE 3rd ORDER CLOSURE</u>
BIL5	874.560*	874.573*	0.013	78891.7	0.107
CARELESS	1291.827	1291.970	0.043	49746.5	0.085
E 125 RESET	1090.607	1090.590	0.017	44860.7	0.080
MTDT	1217.718*	1217.756*	0.038	239439.7	0.186
MTEI	970.901*	970.877*	0.024	65260.5	0.097
MTMS	773.963*	773.923*	0.040	256661.0	0.192
MTSU	1495.515*	1495.512*	0.003	179995.8	0.161

Note: * - The published heights are ellipsoid.

The above control stations were held in the fully constrained scaled least squares base network adjustments to derive the ground control checkpoint values

3 LiDAR ACQUISITION & PROCEDURES

3.1 Acquisition Time Period

LiDAR data acquisition and Airborne GPS control surveys were completed between August 1st, 2010 and August 27th, 2010. A total of 5 flight missions were required to cover the project area.

3.2 LiDAR Planning

The LiDAR data for this project was collected with Aerometric's Optech 3100 AG Airborne LiDAR system (Serial Number 03SEN144). All flight planning and acquisition was completed using Optech's ALTM-Nav, version 2.1.25b (flight planning and LiDAR control software).

The following are the acquisition settings for the project:

- Flying Height (Above Ground): 1000 meters
- Laser Pulse Rate: 100 kHz
- Mirror Scan Frequency: 52 Hz
- Scan Angle (+/-): 19°
- Side Lap: 50 %
- Ground Speed: 155 kts
- Nominal Point Spacing: 0.7 meters

3.3 LiDAR Acquisition

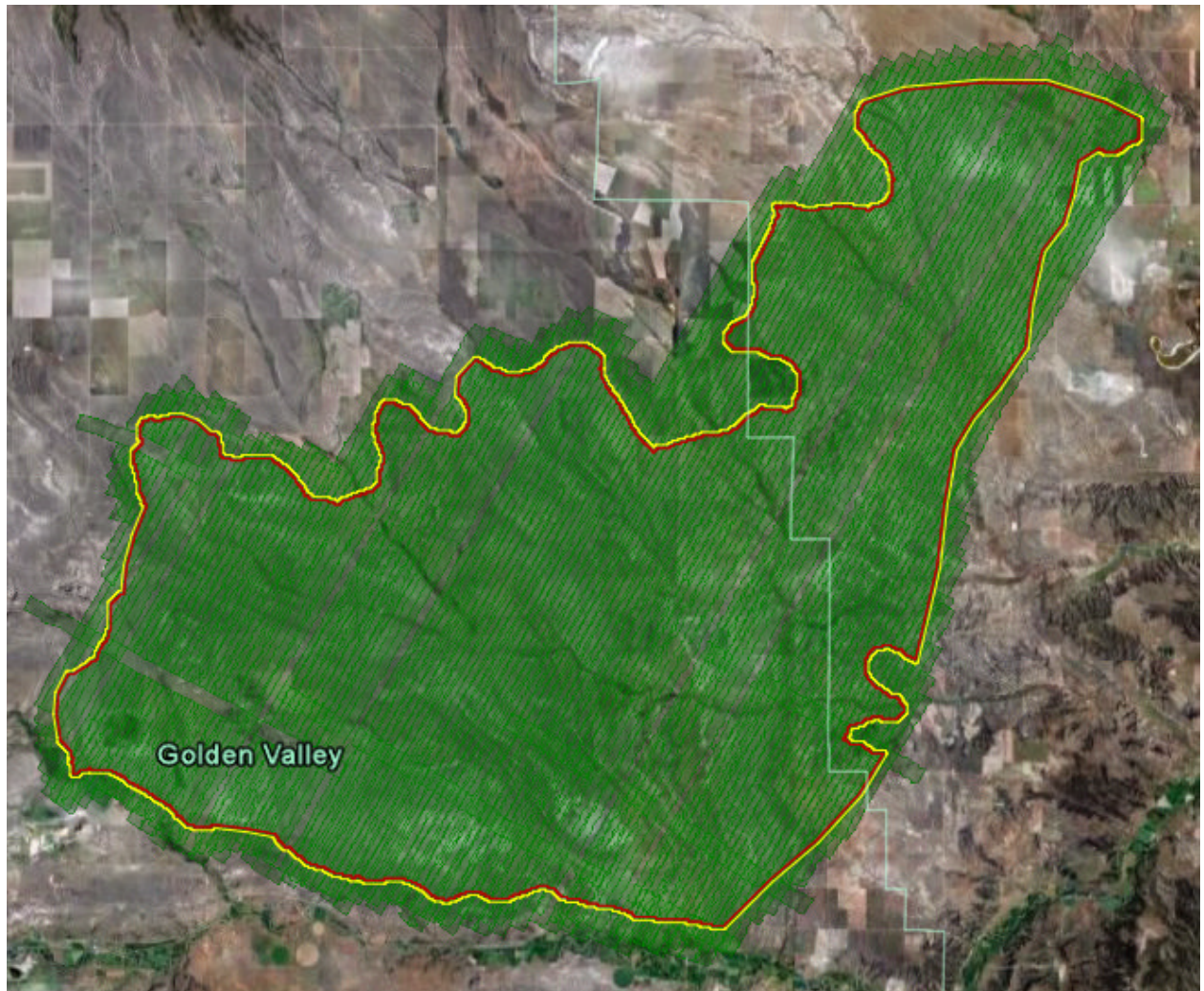
A total of 5 flight missions were required to cover the project area. The missions were flown using the above planned values. See below for a sketch of the acquisition missions and Section 6 of the report for each flight log.

Airborne GPS and IMU trajectories for the LiDAR sensor were also acquired during the time of flight.

Each mission was typically four to five hours long. Before take-off, the LiDAR system and the Airborne GPS and IMU systems were statically aligned for a period of five minutes and then again after landing for another five minutes. The missions acquired data according to the planned flight lines and included a minimum of one (usually two) cross flights. The cross flights were flown perpendicular to the planned flight lines and their data used in the in-situ calibration of the sensor.

3.4 LiDAR Trajectory Processing

The airborne positioning was based on the following control stations: 101, BIL5, and MTEI.



SAGE GROUSE MONTANA

4 QC SURVEYS

The check point survey was performed between August 29th and September 7th, 2010 using Rapid Static GPS techniques. A total of 42 check points were surveyed across the project area. These points were collected in open terrain to assess Fundamental Vertical Accuracy.

The control stations mentioned above to support the Airborne GPS acquisition were also used to complete the QC surveys.

See Section 5 of the control report for a complete listing.

5 FINAL LiDAR PROCESSING

5.1 ABGPS and IMU Processing

Airborne GPS

Applanix - POSGPS

Utilizing carrier phase ambiguity resolution on the fly (i.e., without initialization). The solution to sub-decimeter kinematic positioning without the operational constraint of static initialization as used in semi-kinematic or stop-and-go positioning was utilized for the airborne GPS post-processing.

The processing technique used by Applanix, Inc. for achieving the desired accuracy is Kinematic Ambiguity Resolution (KAR). KAR searches for ambiguities and uses a special method to evaluate the relative quality of each intersection (RMS). The quality indicator is used to evaluate the accuracy of the solution for each processing computation. In addition to the quality indicator, the software will compute separation plots between any two solutions, which will ultimately determine the acceptance of the airborne GPS post processing.

Inertial Data

The post-processing of inertial and aiding sensor data (i.e. airborne GPS post processed data) is to compute an optimally blended navigation solution. The Kalman filter-based aided inertial navigation algorithm generates an accurate (in the sense of least-square error) navigation solution that will retain the best characteristics of the processed input data. An example of inertial/GPS sensor blending is the following: inertial data is smooth in the short term. However, a free-inertial navigation solution has errors that grow without bound with time. A GPS navigation solution exhibits short-term noise but has errors that are bounded. This optimally blended navigation solution will retain the best features of both, i.e. the blended navigation solution has errors that are smooth and bounded.

The resultant processing generates the following data:

- Position: Latitude, Longitude, Altitude
- Velocity: North, East, and Down components
- 3-axis attitude: roll, pitch, true heading
- Acceleration: x, y, z components
- Angular rates: x, y, z components

The Applanix software, version 4.4, was used to determine both the ABGPS trajectory and the blending of inertial data.

The airborne GPS and blending of inertial and GPS post-processing were completed in multiple steps.

1. The collected data was transferred from the field data units to the main computer. Data was saved under the project number and separated between LiDAR mission dates. Inside each mission date, a sub-directory was created with the aircraft's tail number and an A or B suffix was attached to record which mission of the day the data is associated with. Inside the tail number sub-directory, five sub-directories were also created: EO, GPS, IMU, PROC, and RAW.
2. The aircraft raw data (IMU and GPS data combined) was run through a data extractor program. This separated the IMU and GPS data. In addition to the extraction of data, it provided the analyst the first statistics on the overall flight. The program was POSPac (POS post-processing PACKage).
3. Executing POSGPS program to derive accurate GPS positions for all flights:
Applanix POSGPS
The software utilized for the data collected was PosGPS, a kinematic on-the-fly (OTF) processing software package. Post processing of the data is computed from each base station (Note: only base stations within the flying area were used) in both a forward and backward direction. This provides the analyst the ability to Quality Check (QC) the post processing, since different ambiguities are determined from different base stations and also with the same data from different directions.

The trajectory separation program is designed to display the time of week that the airborne or roving antenna traveled, and compute the differences found between processing runs. Processed data can be compared between a forward/reverse solution from one base station, a reverse solution from one base station and a forward solution from the second base station, etc. For the Applanix POSGPS processing, this is considered the final QC check for the given mission. If wrong ambiguities were found with one or both runs, the analyst would see disagreements from the trajectory plot, and re-processing would continue until an agreement was determined.

Once the analyst accepts a forward and reverse processing solution, the trajectory plot is analyzed and the combined solution is stored in a file format acceptable for the IMU post processor.

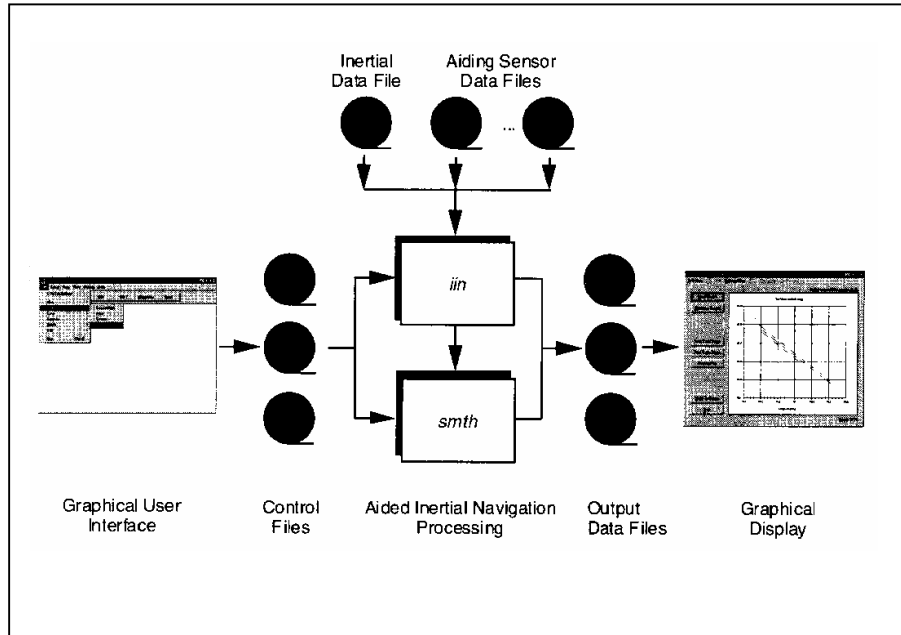
Please see Section 7 of the control report for the final accepted trajectory plots.

4. When the processed trajectory (either through POSGPS) data was accepted after quality control analysis, the combined solution is stored in a file format acceptable for the IMU post processor (i.e. POSProc).

5. Execute POSProc.

POSProc comprises a set of individual processing interface tools that execute and provide the following functions:

This diagram shows the organization of these tools, and is a function of the



POSProc processing components.

- Integrated Inertial Navigation (*iin*) Module.
 The name *iin* is a contraction of Integrated Inertial Navigation. *iin* reads inertial data and aiding data from data files specified in a processing environment file and computes the aided inertial navigation solution. The inertial data comes from a strapdown IMU. *iin* outputs the navigation data between start and end times at a data rate as specified in the environment file. *iin* also outputs Kalman filter data for analysis of estimation error statistics and smoother data that the smoothing program *smth* uses to improve the navigation solution accuracy.
iin implements a full strapdown inertial navigator that solves Newton's equation of motion on the earth using inertial data from a strapdown IMU. The inertial navigator implements coning and sculling compensation to handle potential problems caused by vibration of the IMU.

- Smoother Module (*smth*).
smth is a companion processing module to *iin*. *smth* is comprised of two individual functions that run in sequence. *smth* first runs the *smoother function* and then runs the *navigation correction function*.

The *smth* smoother function performs backwards-in-time processing of the forwards-in-time blended navigation solution and Kalman filter data generated by *iin* to compute smoothed error estimates. *smth* implements a modified Bryson-Frazier smoothing algorithm specifically designed for use with the *iin* Kalman filter. The resulting smoothed strapdown navigator error estimates at a given time point are the optimal estimates based on all input data before and after the given time point. In this sense, *smth* makes use of all available information in the input data. *smth* writes the smoothed error estimates and their RMS estimation errors to output data files.

The *smth* navigation correction function implements a feedforward error correction mechanism similar to that in the *iin* strapdown navigation solution using the smoothed strapdown navigation errors. *smth* reads in the smoothed error estimates and with these, corrects the strapdown navigation data. The resulting navigation solution is called a Best Estimate of Trajectory (BET), and is the best obtainable estimate of vehicle trajectory with the available inertial and aiding sensor data.

The above mentioned modules provide the analyst the following statistics to ensure that the most optimal solution was achieved: a log of the *iin* processing, the Kalman filter Measurement Residuals, Smoothed RMS Estimation Errors, and Smoothed Sensor Errors and RMS.

5.2 LiDAR “Point Cloud” Processing

The ABGPS/IMU post processed data along with the LiDAR raw measurements were processed using Optech Incorporated’s ASDA software. This software was used to match the raw LiDAR measurements with the computed ABGPS/IMU positions and attitudes of the LiDAR sensor. The result was a “point cloud” of LiDAR measured points referenced to the ground control system.

5.3 LIDAR CALIBRATION

Introduction

The purpose of the LiDAR system calibration is to refine the system parameters in order for the post-processing software to produce a “point cloud” that best fits the actual ground.

The following narrative outlines the calibration techniques employed for this project.

Calibration Procedures

Aerometric routinely performs two types of calibrations on its Optech 3100 LiDAR system. The first calibration, system calibration, is performed whenever the LiDAR system is installed in the aircraft. This calibration is performed to define the system parameters affected by the physical misalignment of the system versus aircraft. The second calibration, in-situ calibration, is performed for each mission using that mission’s data. This calibration is performed to refine the system parameters that are affected by the on site conditions as needed.

System Calibration and Correction Software

Optech has developed proprietary calibration software in December of 2009 that performs system calibration. The results from this new software achieved excellent results and an accuracy that meets the project requirements.

This new calibration tool incorporates Optech’s proprietary optical sensor models to compute laser point positions and provide laser point calibration improvements on a per flightline basis for the entire project area. It furthermore calculates planar surfaces at different angles from each flight line and then uses a robust least squares solution to compute the orientation parameters at the optical level instead of the traditional methods relating to the ground points. Determining and correcting at the optical level is critical when correcting the data especially when working in terrain and aggressive design parameters as found in this project. Each flight line was computed individually and output in LAS 1.2 format.

In-situ Calibration

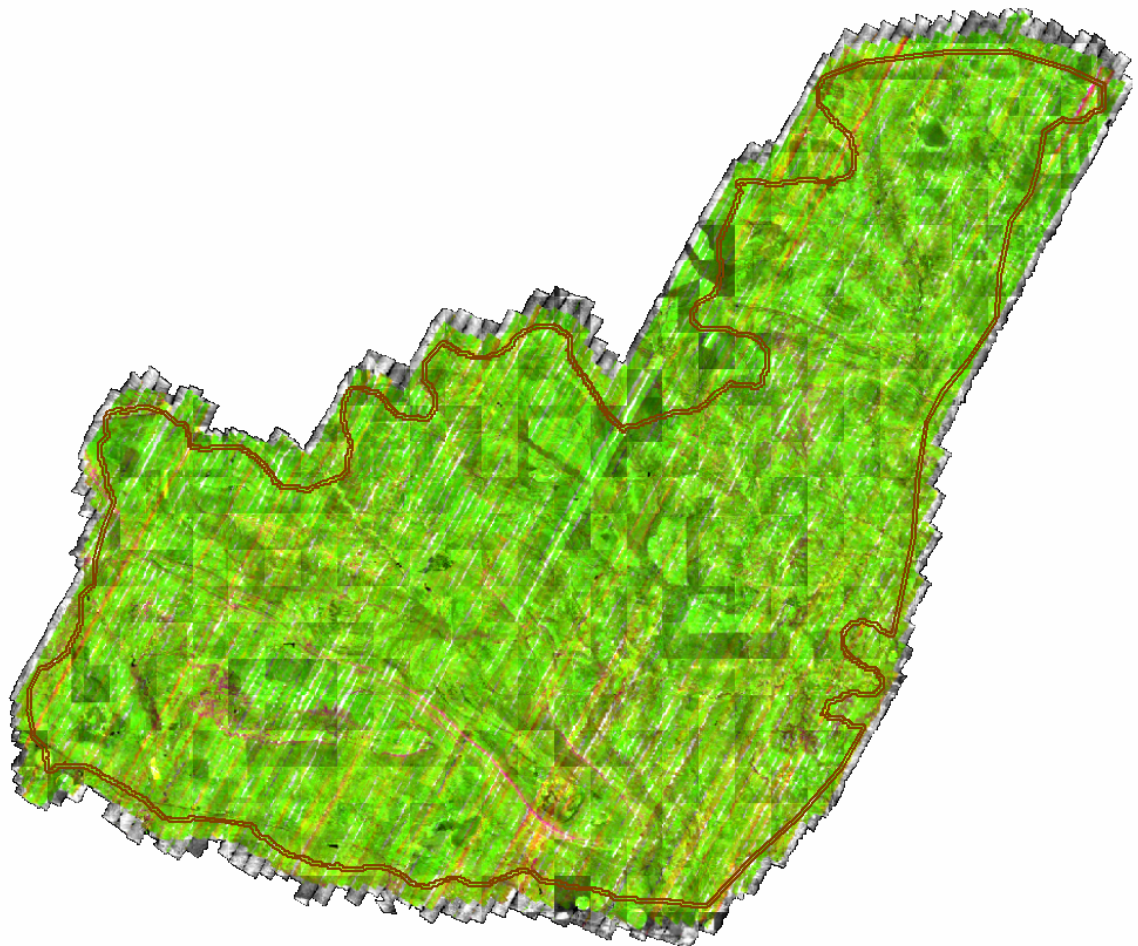
The in-situ calibration is performed, as needed using the mission’s data. This calibration is performed to refine the system parameters that are affected by the on site conditions.

For each mission, LiDAR data for at least one cross flight is acquired over the mission’s acquisition site. The processed data of the cross flight is compared to the perpendicular flight lines using either the Optech proprietary software or TerraSolid's TerraMatch software to determine if any systematic errors are present. In this calibration, the data of individual flight lines are compared against each other and their systematic errors are corrected in the final processed data.

5.4 LiDAR Processing

The LAS files were then imported, verified, and parsed into manageable, tiled grids using GeoCue version 7.0.34.0. GeoCue allows for ease of data management and process tracking.

The first step after the data has been processed and calibrated is to perform a relative accuracy assessment on the flightline to flightline comparisons and also a data density test prior to any further processing. To determine a proper accuracy assessment between flightlines, Aerometric uses GeoCue to create Orthos by elevation differences. The generated orthos have assigned elevation ranges that allow the technician to evaluate if the data passes the accuracy assessment and also determine if additional calibration efforts are needed based on the bias trends. Below is a screen capture of the elevation ortho where green indicates a flightline comparison of less than 0.05 meters; yellow is 0.050 – 0.100 meters; orange is 0.101 – 0.150 meters; red is 0.151 – 0.200 meters, and greater than 0.20 meters is magenta.



Sage Grouse Montana

In addition to the relative accuracy assessment, Aerometric also samples tiles to ensure that the required density has been met. Aerometric utilizes an in-house proprietary software to complete this task. Initially a grid was placed according to the version 12 specification that is based on the nominal post spacing. The results indicated that the density of the sampled tiles achieved only 89% of the grids meeting the specified data density criteria. However, using the latest USGS specification, version 13, which modifies the requirements to allow up to 2 times the nominal post spacing our data tests now easily meets the density requirements. Below are the statistics from the results of the inspected tiles as shown in the next image.

551435	12_642051435	12_643551435	12_645051435	12_646551435	12_648051435	12_649551435	12_651051435	12_652551435	12_654051435	12_655551435	12_6570
551420	12_642051420	12_643551420	12_645051420	12_646551420	12_648051420	12_649551420	12_651051420	12_652551420	12_654051420	12_655551420	12_6570
551405	12_642051405	12_643551405	12_645051405	12_646551405	12_648051405	12_649551405	12_651051405	12_652551405	12_654051405	12_655551405	12_6570
551390	12_642051390	12_643551390	12_645051390	12_646551390	12_648051390	12_649551390	12_651051390	12_652551390	12_654051390	12_655551390	12_6570

Sampled tiles: Sage Grouse Montana
 (2_642051405, 2_643551405, 2_645051405, 2_646551405, 2_648551405,
 2_649551405, 2_651051405, 2_652551405, 2_654051405, and 2_655551405)

Run 1 (Version 12 – 0.7m grid size)
 Total number of cells: 45,963,072
 Total number of cells with one point: 17,854,712
 Percentage of tiles with 1 point or more: 89.9%

Run 2 (Version 13 – 1.4m grid size)
 Total number of cells: 11,505,779
 Total number of cells with one point: 16,418
 Percentage of tiles with 1 point or more: 99.9%

Once both the accuracy between swaths and data density is accepted an automated classification algorithm is performed using TerraSolid’s TerraScan, version 10.017. This will produce the majority of the bare-earth datasets.

The remainder of the data was classified using manual classification techniques. The majority of the manual edit moved points misclassified as ground (class 2) to unclassified (class 1). Erroneous low points, high points, including clouds are classified to class 7.

5.4 Check Point Validation

The data was then verified using the ground control data collected by Aerometric. TerraScan computes the vertical differences between the surveyed elevation and the LiDAR derived elevation for each point.

A report listing the differences and common statistics was created and can be found in Section 8 of this report.

5.5 LiDAR Data Delivery

Raw point cloud data supplied is in the following format:

- LAS, version 1.2
- GPS times adjusted to GPS Absolute
- Full swaths and delivered as 1 file per swath not to exceed 2Gb.

Classified point cloud data is also being supplied using the following criteria:

- LAS, version 1.2
- GPS times adjusted to GPS Absolute
- Classification scheme:
 - Code 1 – Processed, but unclassified
 - Code 2 – Ground
 - Code 7 – Noise
 - Code 9 - Water
 - Code 10 – Ignored Ground (Breakline proximity)

The 1 meter bare-earth DEMs were created in the following manner: first, ArcGrids in ASCII format were created using TerraModeler version 10.005 (TerraSolid Ltd.). The ASCII grids were then imported into ARC and translated to raster format and placed in a geodatabase DEM feature dataset.

The first return 1 meter intensity images were created using GeoCue. These images are in GeoTiff format.



SAGE GROUSE Intensity Raster

Collected breaklines are first collected in a Microstation environment using the base specifications. Upon acceptance the breaklines, either polygons or lines, are translated into ARC and imported to the final geodatabase as separate features.

6 CONCLUSION

Because of the rigorous procedures and use of new technology, this project will serve the USGS and all users requiring the provided LiDAR derivative products for the Sage Grouse Montana project well into the future. Although this project tested the limits of both the equipment and personnel, the results are extremely accurate and reliable.

Retrieved from NGS DataBase on 12/21/06 at 18:02:44.

Antenna Reference Point(ARP): BILLINGS 5 CORS ARP

PID = DI3062

ITRF00 POSITION (EPOCH 1997.0)

Computed in Dec. 2006 using 57 day of data.

X = -1372156.638 m latitude = 45 58 16.26277 N
Y = -4223945.829 m longitude = 107 59 47.34270 W
Z = 4563650.379 m ellipsoid height = 873.935 m

ITRF00 VELOCITY

Computed in Oct. 2006 from 1758 days of data for bill.

VX = -0.0148 m/yr northward = -0.0095 m/yr
VY = 0.0026 m/yr eastward = -0.0149 m/yr
VZ = -0.0115 m/yr upward = -0.0068 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Dec. 2006.

X = -1372156.069 m latitude = 45 58 16.23777 N
Y = -4223947.064 m longitude = 107 59 47.29988 W
Z = 4563650.301 m ellipsoid height = 874.573 m

NAD_83 (CORS96) VELOCITY

Transformed from ITRF00 velocity in Dec. 2006.

VX = 0.0039 m/yr northward = -0.0004 m/yr
VY = 0.0038 m/yr eastward = 0.0025 m/yr
VZ = -0.0055 m/yr upward = -0.0073 m/yr

L1 Phase Center of the current GPS antenna: BILLINGS 5 CORS L1 PC C

The Zephyr Geodetic L1/L2 +RD w/ USCG mount antenna
(Antenna Code = TRM41249USCG SCIT) was installed on 10/18/06.
The L2 phase center is 0.012 m below the L1 phase center.
PID = DI3063

ITRF00 POSITION (EPOCH 1997.0)

Computed in Dec. 2006 using 57 day of data.

X = -1372156.658 m latitude = 45 58 16.26266 N
Y = -4223945.885 m longitude = 107 59 47.34279 W
Z = 4563650.435 m ellipso

The NGS Data Sheet

See file [dsdata.txt](#) for more information about the datasheet.

```

DATABASE = ,PROGRAM = datasheet, VERSION = 7.85
1      National Geodetic Survey,  Retrieval Date = DECEMBER 29, 2010
RV0246 *****
RV0246 DESIGNATION - CARELESS
RV0246 PID - RV0246
RV0246 STATE/COUNTY- MT/WHEATLAND
RV0246 USGS QUAD - HALBERT CREEK SOUTH (1986)
RV0246
RV0246 *CURRENT SURVEY CONTROL
RV0246
RV0246* NAD 83(1992)- 46 29 24.83428(N) 109 29 13.08757(W) ADJUSTED
RV0246* NAVD 88 - 1291.870 (meters) 4238.41 (feet) ADJUSTED
RV0246
RV0246 LAPLACE CORR- -0.89 (seconds) DEFLEC09
RV0246 GEOID HEIGHT- -12.02 (meters) GEOID09
RV0246 DYNAMIC HT - 1291.617 (meters) 4237.58 (feet) COMP
RV0246 MODELED GRAV- 980,373.0 (mgal) NAVD 88
RV0246
RV0246 HORZ ORDER - SECOND
RV0246 VERT ORDER - SECOND CLASS 0
RV0246
RV0246.The horizontal coordinates were established by classical geodetic methods
RV0246.and adjusted by the National Geodetic Survey in July 1992.
RV0246
RV0246.The orthometric height was determined by differential leveling and
RV0246.adjusted in June 1991.
RV0246
RV0246.The Laplace correction was computed from DEFLEC09 derived deflections.
RV0246
RV0246.The geoid height was determined by GEOID09.
RV0246
RV0246.The dynamic height is computed by dividing the NAVD 88
RV0246.geopotential number by the normal gravity value computed on the
RV0246.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
RV0246.degrees latitude (g = 980.6199 gals.).
RV0246
RV0246.The modeled gravity was interpolated from observed gravity values.
RV0246
RV0246; North East Units Scale Factor Converg.
RV0246;SPC MT - 248,942.282 600,999.924 MT 0.99943391 +0 00 34.3
RV0246;SPC MT - 816,739.77 1,971,784.53 iFT 0.99943391 +0 00 34.3
RV0246;UTM 12 - 5,149,630.026 616,117.850 MT 0.99976574 +1 05 50.9
RV0246
RV0246! - Elev Factor x Scale Factor = Combined Factor
RV0246!SPC MT - 0.99979941 x 0.99943391 = 0.99923344
RV0246!UTM 12 - 0.99979941 x 0.99976574 = 0.99956520
RV0246

```

RV0246: Primary Azimuth Mark Grid Az
 RV0246:SPC MT - HEDGES 221 54 38.2
 RV0246:UTM 12 - HEDGES 220 49 21.6

RV0246

PID	Reference Object	Distance	Geod. Az
			dddmmss.s
RV0247	CARELESS RM 1	16.968 METERS	14432
RV0755	HEDGES	APPROX. 6.8 KM	2215512.5
RV0245	CARELESS RM 2	11.473 METERS	25453

RV0246

RV0246

SUPERSEDED SURVEY CONTROL

RV0246

RV0246 NAD 83(1986)- 46 29 24.82772(N) 109 29 13.06651(W) AD() 2
 RV0246 NAD 27 - 46 29 24.97130(N) 109 29 10.42040(W) AD() 2
 RV0246 NGVD 29 (??/??/92) 1290.959 (m) 4235.42 (f) ADJ UNCH 2 0

RV0246

RV0246.Superseded values are not recommended for survey control.
 RV0246.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 RV0246.[See file dsdata.txt](#) to determine how the superseded data were derived.

RV0246

RV0246_U.S. NATIONAL GRID SPATIAL ADDRESS: 12TXS1611749630(NAD 83)

RV0246_MARKER: DS = TRIANGULATION STATION DISK

RV0246_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

RV0246_SP_SET: SET IN TOP OF CONCRETE MONUMENT

RV0246_STAMPING: CARELESS 1961

RV0246_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

RV0246+STABILITY: SURFACE MOTION

RV0246

HISTORY	Date	Condition	Report By
HISTORY	- 1961	MONUMENTED	CGS
HISTORY	- 1961	GOOD	CGS

RV0246

STATION DESCRIPTION

RV0246

RV0246'DESCRIBED BY COAST AND GEODETIC SURVEY 1961 (NES)
 RV0246'THE STATION IS LOCATED ON A ROAD RIGHT-OF-WAY ABOUT 4 MILES
 RV0246'NORTH AND 16-1/2 MILES EAST OF HARLOWTON, 10 MILES NORTH AND
 RV0246'2 MILES EAST OF SHAWMUT.
 RV0246'
 RV0246'TO REACH THE STATION FROM THE POST OFFICE IN SHAWMUT, GO SOUTH
 RV0246'ONE BLOCK, TURN RIGHT ON U.S. HIGHWAY 12 AND GO WEST FOR 0.2
 RV0246'MILE TO A ROAD RIGHT, TURN RIGHT AND FOLLOW THE GRAVELED
 RV0246'ROAD NORTH FOR 9.0 MILES TO A SIDE ROAD RIGHT, JUST BEFORE
 RV0246'REACHING THE OLD STORE BUILDINGS IN HEDGESVILLE. TURN RIGHT
 RV0246'AND GO EAST ON THE WINDING ROAD FOR 1.2 MILES TO A SIDE ROAD
 RV0246'LEFT, TURN LEFT AND GO NORTH ON THE GRAVELED ROAD FOR 1.2
 RV0246'MILES TO THE STATION ON THE LEFT, JUST SOUTH OF A RIGHT TURN
 RV0246'IN THE ROAD.
 RV0246'
 RV0246'THE STATION MARK IS A STANDARD DISK STAMPED CARELESS 1961, SET
 RV0246'IN A SQUARE CONCRETE MONUMENT THAT IS FLUSH. IT IS 65.5 FEET
 RV0246'SOUTH OF A FENCE AND 33 FEET WEST OF THE CENTER OF THE ROAD.
 RV0246'
 RV0246'R.M. 1 IS A STANDARD DISK STAMPED CARELESS NO 1 1961, SET
 RV0246'IN A SQUARE CONCRETE MONUMENT THAT IS FLUSH. IT IS 23 FEET

12/29/2010

DATASHEETS

RV0246'EAST OF THE CENTER OF THE ROAD AND 1.5 FEET WEST OF A FENCE.

RV0246'

RV0246'R.M. 2 IS A STANDARD DISK STAMPED CARELESS NO 2 1961, SET IN A

RV0246'SQUARE CONCRETE MONUMENT THAT IS FLUSH. IT IS 75 FEET SOUTH

RV0246'OF THE FENCE AND 53 FEET WEST OF THE CENTER OF THE ROAD.

RV0246

RV0246

STATION RECOVERY (1961)

RV0246

RV0246'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1961

RV0246'3.4 MI N FROM HEDGESVILLE.

RV0246'0.1 MILE NORTH ALONG A GRAVEL ROAD FROM THE CROSSING OF THE GREAT

RV0246'NORTHERN RAILWAY AT HEDGESVILLE, THENCE 1.2 MILES EAST ALONG A GRAVEL

RV0246'ROAD, THENCE 2.1 MILES NORTH ALONG A GRAVEL ROAD, AT THE SUMMIT OF A

RV0246'HILL, AT A FENCE CORNER, 31 1/2 FEET WEST OF THE CENTER LINE OF THE

RV0246'ROAD, 56 FEET NORTHWEST OF CARELESS R.M. 1, 38 FEET EAST-NORTHEAST OF

RV0246'CARELESS R.M. 2, 1.5 FEET WEST OF A WITNESS POST, ABOUT LEVEL WITH THE

RV0246'ROAD, AND SET IN THE TOP OF A CONCRETE POST FLUSH WITH THE GROUND.

*** retrieval complete.

Elapsed Time = 00:00:01

The NGS Data Sheet

See file [dsdata.txt](#) for more information about the datasheet.

```

DATABASE = ,PROGRAM = datasheet, VERSION = 7.85
1      National Geodetic Survey,  Retrieval Date = DECEMBER 29, 2010
AI9615 *****
AI9615 DESIGNATION - E 125 RESET
AI9615 PID - AI9615
AI9615 STATE/COUNTY- MT/MUSSELSHELL
AI9615 USGS QUAD - LAKE MASON NE (1986)
AI9615
AI9615 *CURRENT SURVEY CONTROL
AI9615
AI9615* NAD 83(1986)- 46 38 06. (N) 108 35 40. (W) SCALED
AI9615* NAVD 88 - 1090.59 (meters) 3578.0 (feet) RESET
AI9615
AI9615 GEOID HEIGHT- -13.24 (meters) GEOID09
AI9615 VERT ORDER - THIRD
AI9615
AI9615.The horizontal coordinates were scaled from a topographic map and have
AI9615.an estimated accuracy of +/- 6 seconds.
AI9615
AI9615.The orthometric height was computed from unverified reset data.
AI9615.No vertical observational check was made to the station.
AI9615
AI9615.The geoid height was determined by GEOID09.
AI9615
AI9615; North East Units Estimated Accuracy
AI9615;SPC MT - 265,430. 669,300. MT (+/- 180 meters Scaled)
AI9615
AI9615 SUPERSEDED SURVEY CONTROL
AI9615
AI9615.No superseded survey control is available for this station.
AI9615
AI9615_U.S. NATIONAL GRID SPATIAL ADDRESS: 12TXS841674(NAD 83)
AI9615_MARKER: DV = VERTICAL CONTROL DISK
AI9615_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AI9615_STAMPING: E 125 RESET 1999
AI9615_MARK LOGO: NGS
AI9615_MAGNETIC: N = NO MAGNETIC MATERIAL
AI9615_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AI9615+STABILITY: SURFACE MOTION
AI9615
AI9615 HISTORY - Date Condition Report By
AI9615 HISTORY - 1999 MONUMENTED MTDOT
AI9615
AI9615 STATION DESCRIPTION
AI9615
AI9615'DESCRIBED BY MONTANA DEPARTMENT OF TRANSPORTATION 1999 (LSC)
AI9615'22.95 KM (14.25 MI) NORTH ALONG US HIGHWAY 87 FROM THE ROUNDUP

```

12/29/2010

DATASHEETS

AI9615'COURTHOUSE, 27.5 M (90.2 FT) WEST OF THE CENTERLINE OF HIGHWAY 87, 0.5
AI9615'M (1.6 FT) EAST OF FENCE, AND 20 M (65.6 FT) SOUTH OF A CULVERT. A
AI9615'BRASS DISK SET IN A CONCRETE POST, 10 CM ABOVE THE GROUND.

*** retrieval complete.

Elapsed Time = 00:00:00

ITRF 00
ENGINC (MTEI), MONTANA

Retrieved from NGS DataBase on 04/15/05 at 20:52:40.

Antenna Reference Point(ARP): ENGINC CORS ARP

PID = DG9745

ITRF00 POSITION (EPOCH 1997.0)

Computed in April 2005 using 27 days of data.

X = -1422328.764 m latitude = 45 44 47.06025 N
Y = -4226311.557 m longitude = 108 36 00.77970 W
Z = 4546317.512 m ellipsoid height = 970.208 m

ITRF00 VELOCITY

Predicted with HTDP_2.7 April 2005.

VX = -0.0187 m/yr northward = -0.0094 m/yr
VY = -0.0012 m/yr eastward = -0.0173 m/yr
VZ = -0.0062 m/yr upward = 0.0005 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Apr. 2005.

X = -1422328.215 m latitude = 45 44 47.03558 N
Y = -4226312.810 m longitude = 108 36 00.73713 W
Z = 4546317.459 m ellipsoid height = 970.877 m

NAD_83 (CORS96) VELOCITY

Transformed from ITRF00 velocity in Apr. 2005.

VX = -0.0000 m/yr northward = 0.0000 m/yr
VY = -0.0000 m/yr eastward = 0.0000 m/yr
VZ = 0.0000 m/yr upward = 0.0000 m/yr

L1 Phase Center of the current GPS antenna: ENGINC CORS L1 PC C

The Trimble Zephyr Geodetic with GP/Radome antenna

(Antenna Code = TRM41249.00 TZGD) was installed on 12/23/04.

The L2 phase center is 0.004 m below the L1 phase center.

PID = DG9746

ITRF00 POSITION (EPOCH 1997.0)

Computed in April 2005 using 27 days of data.

X = -1422328.779 m latitude = 45 44 47.06026 N
Y = -4226311.604 m longitude = 108 36 00.77967 W
Z = 4546317.563 m ellipsoid height = 970.280 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Apr. 2005.

X = -1422328.230 m latitude = 45 44 47.03559 N
Y = -4226312.857 m longitude = 108 36 00.73710 W
Z = 4546317.511 m ellipsoid height = 970.948 m

The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP.

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the

GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

- * WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

- * For additional information about the interpretation and/or derivation of these positions and velocities, consult <http://www.ngs.noaa.gov/CORS/Derivation.html>. For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link <ftp://www.ngs.noaa.gov/cors/.html/mtei.log.txt>

ITRF 00
MONTANA STATE UNI (MTMS), MONTANA

Retrieved from NGS DataBase on 04/15/05 at 20:53:14.

Antenna Reference Point(ARP): MONTANA STATE UNI CORS ARP

PID = DG9749

ITRF00 POSITION (EPOCH 1997.0)

Computed in April 2005 using 58 days of data.

X = -1425435.270 m latitude = 48 32 27.45196 N
Y = -3984013.189 m longitude = 109 41 11.90457 W
Z = 4757493.973 m ellipsoid height = 773.344 m

ITRF00 VELOCITY

Predicted with HTDP_2.7 April 2005.

VX = -0.0194 m/yr northward = -0.0098 m/yr
VY = -0.0012 m/yr eastward = -0.0179 m/yr
VZ = -0.0061 m/yr upward = 0.0005 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Apr. 2005.

X = -1425434.717 m latitude = 48 32 27.42670 N
Y = -3984014.415 m longitude = 109 41 11.85904 W
Z = 4757493.890 m ellipsoid height = 773.923 m

NAD_83 (CORS96) VELOCITY

Transformed from ITRF00 velocity in Apr. 2005.

VX = 0.0000 m/yr northward = 0.0000 m/yr
VY = 0.0000 m/yr eastward = 0.0000 m/yr
VZ = 0.0000 m/yr upward = 0.0000 m/yr

L1 Phase Center of the current GPS antenna: MONTANA STATE UNI CORS L1 PC C

The Geodetic L1/L2 compact +groundplane antenna

(Antenna Code = TRM22020.00+GP) was installed on 11/02/04.

The L2 phase center is 0.004 m below the L1 phase center.

PID = DG9750

ITRF00 POSITION (EPOCH 1997.0)

Computed in April 2005 using 58 days of data.

X = -1425435.287 m latitude = 48 32 27.45195 N
Y = -3984013.235 m longitude = 109 41 11.90459 W
Z = 4757494.029 m ellipsoid height = 773.418 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Apr. 2005.

X = -1425434.734 m latitude = 48 32 27.42670 N
Y = -3984014.461 m longitude = 109 41 11.85907 W
Z = 4757493.946 m ellipsoid height = 773.997 m

The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP.

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the

GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

- * WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

- * For additional information about the interpretation and/or derivation of these positions and velocities, consult <http://www.ngs.noaa.gov/CORS/Derivation.html>. For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link <ftp://www.ngs.noaa.gov/cors/.html/mtms.log.txt>

ITRF 00
BOZEMAN (MTSU), MONTANA

Retrieved from NGS DataBase on 12/10/08 at 10:18:44.

Antenna Reference Point(ARP): BOZEMAN CORS ARP

PID = DK7547

ITRF00 POSITION (EPOCH 1997.0)

Computed in Dec. 2008 using 46 days of data.

X = -1603880.718 m latitude = 45 39 40.40046 N
Y = -4168460.285 m longitude = 111 02 42.05534 W
Z = 4540079.808 m ellipsoid height = 1494.895 m

ITRF00 VELOCITY

Predicted with HTDP_3.0 Dec. 2008.

VX = -0.0156 m/yr northward = -0.0101 m/yr
VY = -0.0011 m/yr eastward = -0.0142 m/yr
VZ = -0.0076 m/yr upward = -0.0008 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Dec. 2008.

X = -1603880.150 m latitude = 45 39 40.37669 N
Y = -4168461.527 m longitude = 111 02 42.01023 W
Z = 4540079.736 m ellipsoid height = 1495.512 m

NAD_83 (CORS96) VELOCITY

Transformed from ITRF00 velocity in Dec. 2008.

VX = 0.0031 m/yr northward = 0.0003 m/yr
VY = 0.0000 m/yr eastward = 0.0029 m/yr
VZ = -0.0007 m/yr upward = -0.0013 m/yr

L1 Phase Center of the current GPS antenna: BOZEMAN CORS L1 PC C

The Trimble Zephyr Geodetic with GP antenna

(Antenna Code = TRM41249.00) was installed on 06/04/07.

The L2 phase center is 0.003 m below the L1 phase center.

PID = DK7548

ITRF00 POSITION (EPOCH 1997.0)

Computed in Dec. 2008 using 46 days of data.

X = -1603880.735 m latitude = 45 39 40.40047 N
Y = -4168460.331 m longitude = 111 02 42.05532 W
Z = 4540079.860 m ellipsoid height = 1494.967 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Dec. 2008.

X = -1603880.167 m latitude = 45 39 40.37670 N
Y = -4168461.574 m longitude = 111 02 42.01021 W
Z = 4540079.788 m ellipsoid height = 1495.584 m

The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP.

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the

GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

- * WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

- * For additional information about the interpretation and/or derivation of these positions and velocities, consult <http://www.ngs.noaa.gov/CORS/Coords.html>
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link <http://www.ngs.noaa.gov/cors/Logfiles.html>

The NGS Data Sheet

See file [dsdata.txt](#) for more information about the datasheet.

DATABASE = , PROGRAM = datasheet, VERSION = 7.85

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1      National Geodetic Survey,   Retrieval Date = DECEMBER 29, 2010
RV0099 *****
RV0099 DESIGNATION - Z 122
RV0099 PID - RV0099
RV0099 STATE/COUNTY- MT/GOLDEN VALLEY
RV0099 USGS QUAD - LAVINA (1979)
RV0099
RV0099 *CURRENT SURVEY CONTROL
RV0099
RV0099* NAD 83(2007)- 46 17 36.85018(N) 108 54 21.13484(W) ADJUSTED
RV0099* NAVD 88 - 1043.329 (meters) 3422.99 (feet) ADJUSTED
RV0099
RV0099 EPOCH DATE - 2002.00
RV0099 X - -1,430,685.717 (meters) COMP
RV0099 Y - -4,177,294.278 (meters) COMP
RV0099 Z - 4,588,599.920 (meters) COMP
RV0099 LAPLACE CORR- -4.21 (seconds) DEFLEC09
RV0099 ELLIP HEIGHT- 1030.427 (meters) (04/30/08) ADJUSTED
RV0099 GEOID HEIGHT- -12.89 (meters) GEOID09
RV0099 DYNAMIC HT - 1043.156 (meters) 3422.42 (feet) COMP
RV0099 MODELED GRAV- 980,412.5 (mgal) NAVD 88
RV0099
RV0099 HORZ ORDER - B
RV0099 VERT ORDER - SECOND CLASS 0
RV0099 ELLP ORDER - FOURTH CLASS I
RV0099
RV0099.The horizontal coordinates were established by GPS observations
RV0099.and adjusted by the National Geodetic Survey in April 2008.
RV0099
RV0099.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
RV0099.See National Readjustment for more information.
RV0099.The horizontal coordinates are valid at the epoch date displayed above.
RV0099.The epoch date for horizontal control is a decimal equivalence
RV0099.of Year/Month/Day.
RV0099
RV0099.The orthometric height was determined by differential leveling and
RV0099.adjusted in June 1991.
RV0099
RV0099.The X, Y, and Z were computed from the position and the ellipsoidal ht.
RV0099
RV0099.The Laplace correction was computed from DEFLEC09 derived deflections.
RV0099
RV0099.The ellipsoidal height was determined by GPS observations
RV0099.and is referenced to NAD 83.
RV0099
RV0099.The geoid height was determined by GEOID09.

```

RV0099

RV0099.The dynamic height is computed by dividing the NAVD 88
RV0099.geopotential number by the normal gravity value computed on the
RV0099.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
RV0099.degrees latitude (g = 980.6199 gals.).

RV0099

RV0099.The modeled gravity was interpolated from observed gravity values.

RV0099

RV0099;	North	East	Units	Scale	Factor	Converg.
RV0099;SPC MT	- 227,266.951	645,754.535	MT	0.99947075		+0 26 04.6
RV0099;SPC MT	- 745,626.48	2,118,617.24	iFT	0.99947075		+0 26 04.6
RV0099;UTM 12	- 5,128,797.149	661,291.993	MT	0.99991980		+1 30 50.9
RV0099!	- Elev Factor	x Scale Factor	=	Combined Factor		
RV0099!SPC MT	- 0.99983849	x 0.99947075	=	0.99930933		
RV0099!UTM 12	- 0.99983849	x 0.99991980	=	0.99975831		

RV0099

RV0099 SUPERSEDED SURVEY CONTROL

RV0099

RV0099	NAVD 88 (04/30/08)	1043.33	(m)	3423.0	(f)	LEVELING	3
RV0099	NGVD 29 (??/??/92)	1042.480	(m)	3420.20	(f)	ADJ UNCH	2 0

RV0099

RV0099.Superseded values are not recommended for survey control.

RV0099.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

RV0099.[See file dsdata.txt](#) to determine how the superseded data were derived.

RV0099

RV0099_U.S. NATIONAL GRID SPATIAL ADDRESS: 12TXS6129128797(NAD 83)

RV0099_MARKER: DB = BENCH MARK DISK

RV0099_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

RV0099_SP_SET: SET IN TOP OF CONCRETE MONUMENT

RV0099_STAMPING: Z 122 1934

RV0099_MARK LOGO: CGS

RV0099_PROJECTION: PROJECTING 21 CENTIMETERS

RV0099_MAGNETIC: N = NO MAGNETIC MATERIAL

RV0099_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

RV0099+STABILITY: SURFACE MOTION

RV0099_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

RV0099+SATELLITE: SATELLITE OBSERVATIONS - May 16, 2007

RV0099

RV0099	HISTORY	- Date	Condition	Report By
RV0099	HISTORY	- 1934	MONUMENTED	CGS
RV0099	HISTORY	- 20070516	GOOD	INDIV
RV0099	HISTORY	- 20070516	GOOD	MDT

RV0099

RV0099 STATION DESCRIPTION

RV0099

RV0099'DESCRIBED BY COAST AND GEODETIC SURVEY 1934

RV0099'1.6 MI E FROM LAVINA.

RV0099'1.6 MILES EAST ALONG THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC

RV0099'RAILROAD FROM LAVINA, GOLDEN VALLEY COUNTY, 7-1/2 POLES EAST OF

RV0099'MILEPOST 1289, 12 FEET WEST OF THE CENTER OF A ROAD CROSSING, 40 FEET

RV0099'SOUTH OF THE TRACK, AND 5 FEET NORTH OF THE RIGHT-OF-WAY FENCE. A

RV0099'STANDARD DISK, STAMPED Z 122 1934 AND SET IN THE TOP OF A CONCRETE

RV0099'POST.

RV0099

RV0099 STATION RECOVERY (2007)

RV0099

12/29/2010

DATASHEETS

RV0099'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2007 (CLS)

RV0099'THE DESCRIBED RAILROAD IS NOW ABANDONDED. TO REACH THE STATION FROM
RV0099'THE INTERSECTION OF U.S. HIGHWAY 12 AND RAILWAY AVENUE EAST IN LAVINA,
RV0099'GO EAST ON RAILWAY AVENUE EAST FOR 1.0 MILES TO A BEND IN THE ROAD.
RV0099'BEAR NORTH THRU THE DOUBLE IRON GATE AND THEN GO EAST ON OLD RAILROAD
RV0099'GRADE FOR 0.65 MILES TO THE MARK ON THE RIGHT.

RV0099

RV0099

STATION RECOVERY (2007)

RV0099

RV0099'RECOVERY NOTE BY MONTANA DEPT OF TRANSPORTATION 2007 (WDW)

RV0099'RECOVERED AS DESCRIBED.

*** retrieval complete.

Elapsed Time = 00:00:00

ITRF 00
HELENA (MTDT), MONTANA

Retrieved from NGS DataBase on 04/30/10 at 09:40:30.

Antenna Reference Point(ARP): HELENA CORS ARP

PID = DL7335

ITRF00 POSITION (EPOCH 1997.0)

Computed in Apr. 2010 using 24 days of data.

X = -1644768.631 m latitude = 46 35 18.61478 N
Y = -4072251.917 m longitude = 111 59 37.01057 W
Z = 4611331.320 m ellipsoid height = 1217.181 m

ITRF00 VELOCITY

Predicted with HTDP_3.0 Apr. 2010.

VX = -0.0159 m/yr northward = -0.0097 m/yr
VY = -0.0006 m/yr eastward = -0.0145 m/yr
VZ = -0.0073 m/yr upward = -0.0008 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Apr. 2010.

X = -1644768.060 m latitude = 46 35 18.59112 N
Y = -4072253.147 m longitude = 111 59 36.96412 W
Z = 4611331.236 m ellipsoid height = 1217.756 m

NAD_83 (CORS96) VELOCITY

Transformed from ITRF00 velocity in Apr. 2010.

VX = 0.0030 m/yr northward = 0.0009 m/yr
VY = 0.0005 m/yr eastward = 0.0026 m/yr
VZ = -0.0003 m/yr upward = -0.0013 m/yr

L1 Phase Center of the current GPS antenna: HELENA CORS L1 PC C

The CONVERTED FROM ABSOLUTE igs05_1480.atx antenna

(Antenna Code = TRM57971.00 NONE) was installed on 06/24/09.

The L2 phase center is 0.020 m below the L1 phase center.

PID = DL7336

ITRF00 POSITION (EPOCH 1997.0)

Computed in Apr. 2010 using 24 days of data.

X = -1644768.652 m latitude = 46 35 18.61479 N
Y = -4072251.972 m longitude = 111 59 37.01057 W
Z = 4611331.383 m ellipsoid height = 1217.266 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)

Transformed from ITRF00 (epoch 1997.0) position in Apr. 2010.

X = -1644768.082 m latitude = 46 35 18.59114 N
Y = -4072253.201 m longitude = 111 59 36.96412 W
Z = 4611331.299 m ellipsoid height = 1217.842 m

The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP.

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the

GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

- * WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

- * For additional information about the interpretation and/or derivation of these positions and velocities, consult <http://www.ngs.noaa.gov/CORS/Coords.html>
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link <http://www.ngs.noaa.gov/cors/Logfiles.html>

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASO

PROJECT 1100804
 OPERATOR WJW
 DATE 3/29/10

SITE NUMBER 1
 SITE NAME 101

TRACKING TIMES (LOCAL) MEASURE MDT
 START 10:08
 STOP 16:12

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 11
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.201 _____

1.561

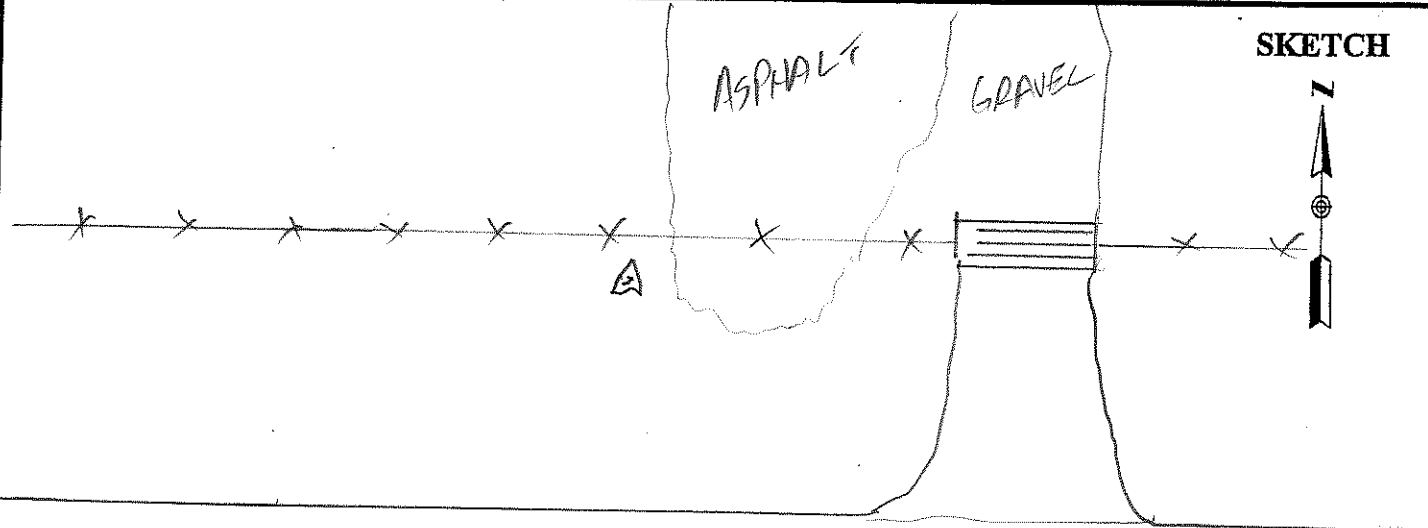
STATION DESCRIPTIONS Set Rebar
and CAP 3' S. OF
E-W FENCE, ± 65' W.
OF W. END CATTLE GUARD
EAST.

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
MC

TIME	GDOP	SATELLITES
16:08	2.0	8/3-8
22:12	1.8	7/9-9

APPROX COORDS
46-19-24.2
108-58-05.7



— US 12 LAVINA 1.5 m → —

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT 1100804
 OPERATOR WJN
 DATE 8/19/10

SITE NUMBER 1
 SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE MDT
 START 10:32
 STOP 15:29

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.228 _____

1.588

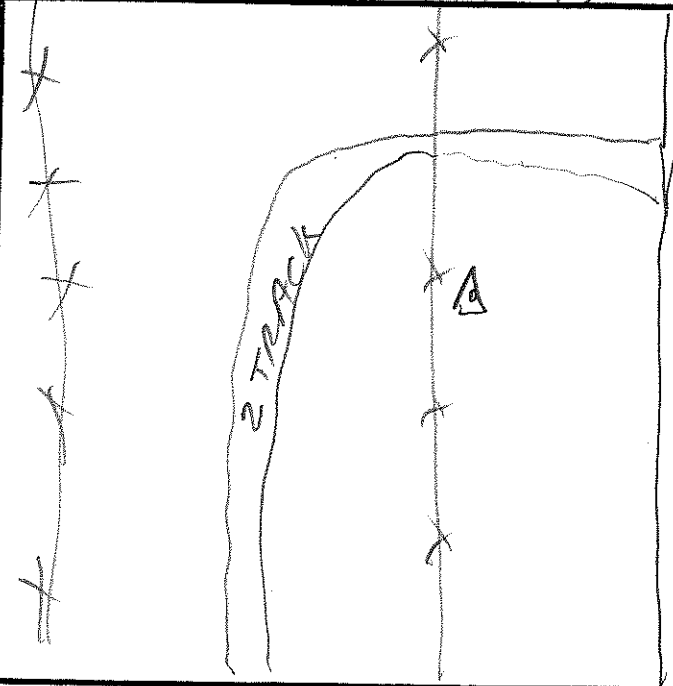
STATION DESCRIPTIONS Set Rebar
and CAP
3' E OF NS R/W Fence
± 30' S OF G TRAIL
ACCESS RD

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
MC

TIME	GDOP	SATELLITES
16:32	1.8	11/11-11
21:29	2.1	8/8-8

46-32-30.2
108-75-26.3



SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

Vent control

PROJECT 1100116
 OPERATOR WVN
 DATE 8/29/10

SITE NUMBER 1
 SITE NAME E 125 RESET

TRACKING TIMES (LOCAL) MEASURE MDT
 START 12:08
 STOP 12:55

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: No

HEIGHT READINGS MTS FT
1.168 _____

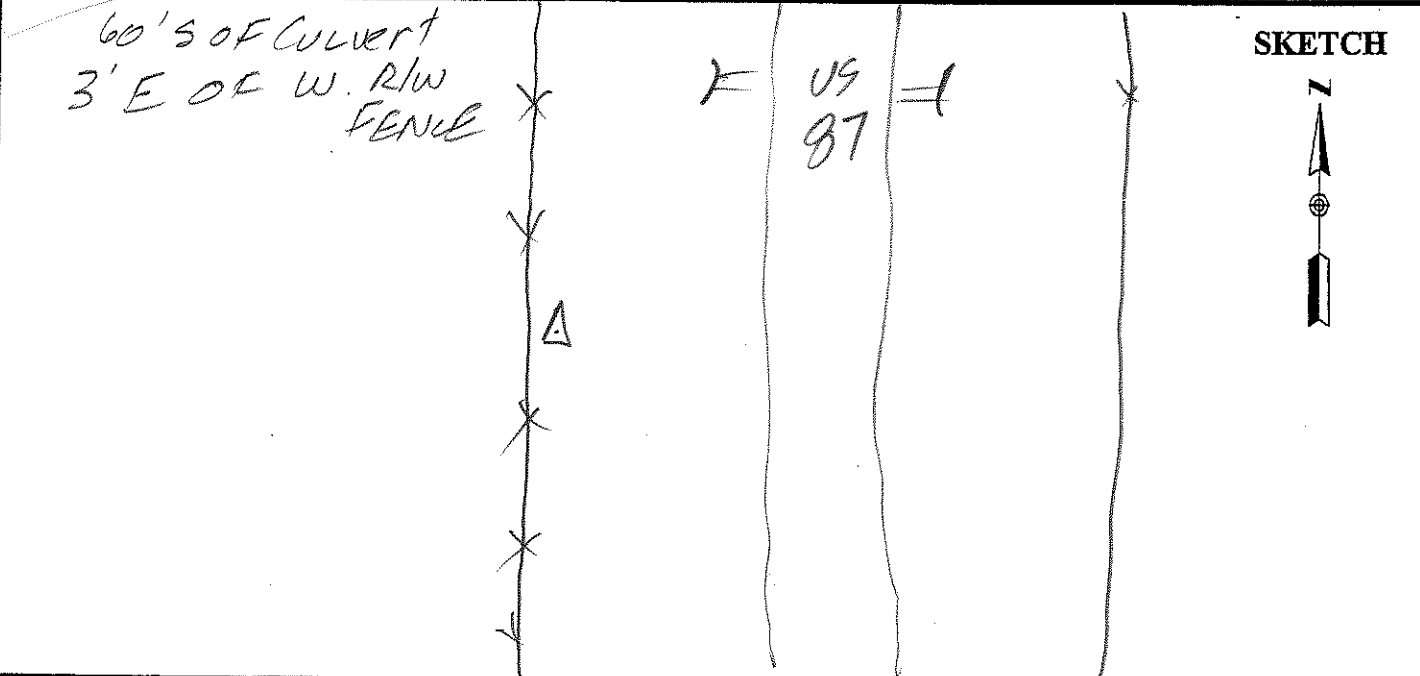
1.528

STATION DESCRIPTIONS BRASS
DISC IN CONC MKD
"E 125 RESET 1999"
MDT
As described by NGS

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
MC, becoming OVC

TIME	GDOP	SATELLITES
<u>19:08</u>	<u>1.8</u>	<u>11/11-11</u>
<u>19:55</u>	<u>1.9</u>	<u>10/10-10</u>



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 1100804
 OPERATOR W.J.N
 DATE 8/29/10

SITE NUMBER 2
 SITE NAME 103

TRACKING TIMES (LOCAL) MEASURE MDT
 START 14:30
 STOP 14:55

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: No

HEIGHT READINGS MTS FT
 1.269 _____

STATION DESCRIPTIONS Set Rebar and CAP

1.629

SATELLITE OBSERVATIONS

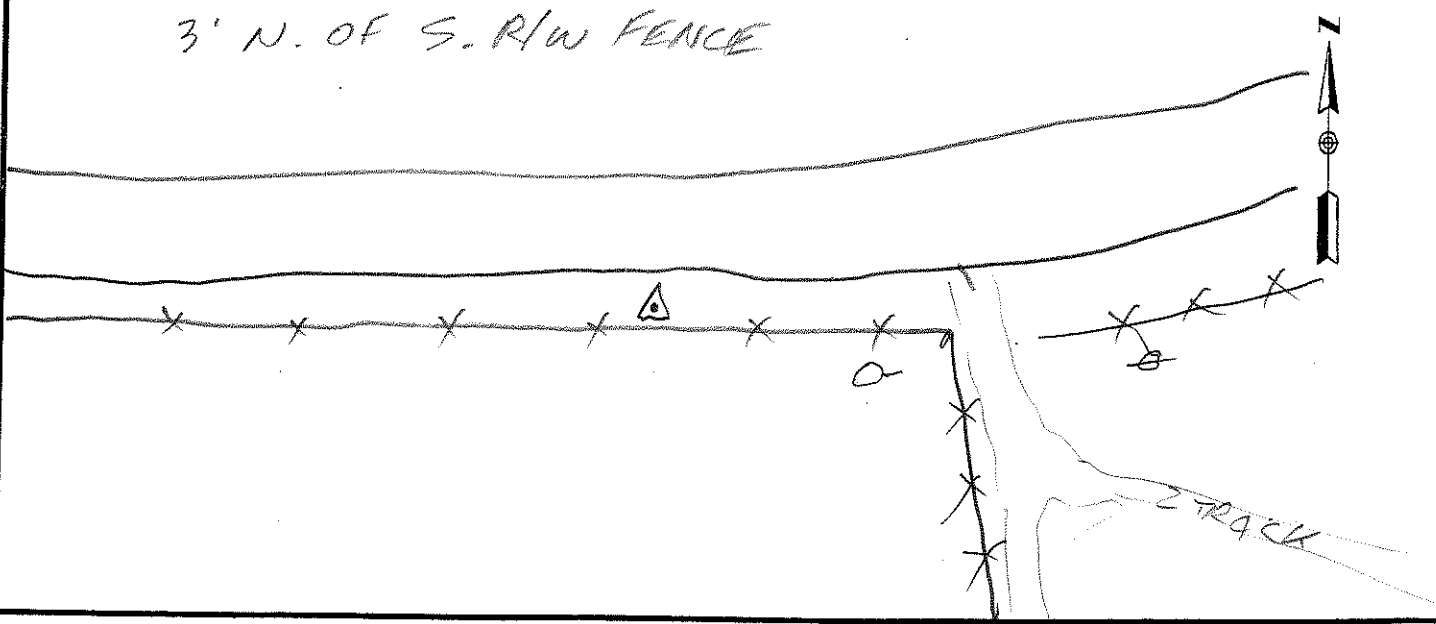
WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
<u>20:30</u>	<u>2.0</u>	<u>8/8-8</u>
<u>20:55</u>	<u>2.5</u>	<u>8/8-8</u>

RAIN
APPROX coords
46-27-04.6
109-46-36.9

45' W. OF FENCE INT
3' N. OF S. R/W FENCE

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT 1100904
 OPERATOR MWN
 DATE 8/30/10

SITE NUMBER 1
 SITE NAME 101

TRACKING TIMES (LOCAL) MEASURE MDT
 START 11:38
 STOP 16:54

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 11
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

HEIGHT READINGS MTS FT
 1.165 _____

1.525

OBSTRUCTIONS: NO

STATION DESCRIPTIONS Rebar
and CAP

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
<u>17:38</u>	<u>1.9</u>	<u>9/9-9</u>
<u>22:54</u>	<u>2.4</u>	<u>8/8-8</u>

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
HEAVY RAIN

set 8/29/10

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT 1100804
 OPERATOR WJN
 DATE 8/30/10

SITE NUMBER 1
 SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE MDT
 START 12:27
 STOP 17:34

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.188 _____

1.548

STATION DESCRIPTIONS Rebar and
CAP

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

HEAVY RAIN

TIME	GDOP	SATELLITES
<u>18:27</u>	<u>1.9</u>	<u>9/9-9</u>
<u>23:34</u>	<u>1.7</u>	<u>11/11-11</u>

Set 8/29/10

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

H+V
CONTROL

PROJECT 1100804
 OPERATOR W.M.
 DATE 08/30/10

SITE NUMBER 1
 SITE NAME Z122

TRACKING TIMES (LOCAL) MEASURE MDT
 START 13:18
 STOP 13:56

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: TREE SSE

HEIGHT READINGS MTS FT
 0.949 _____

1.309

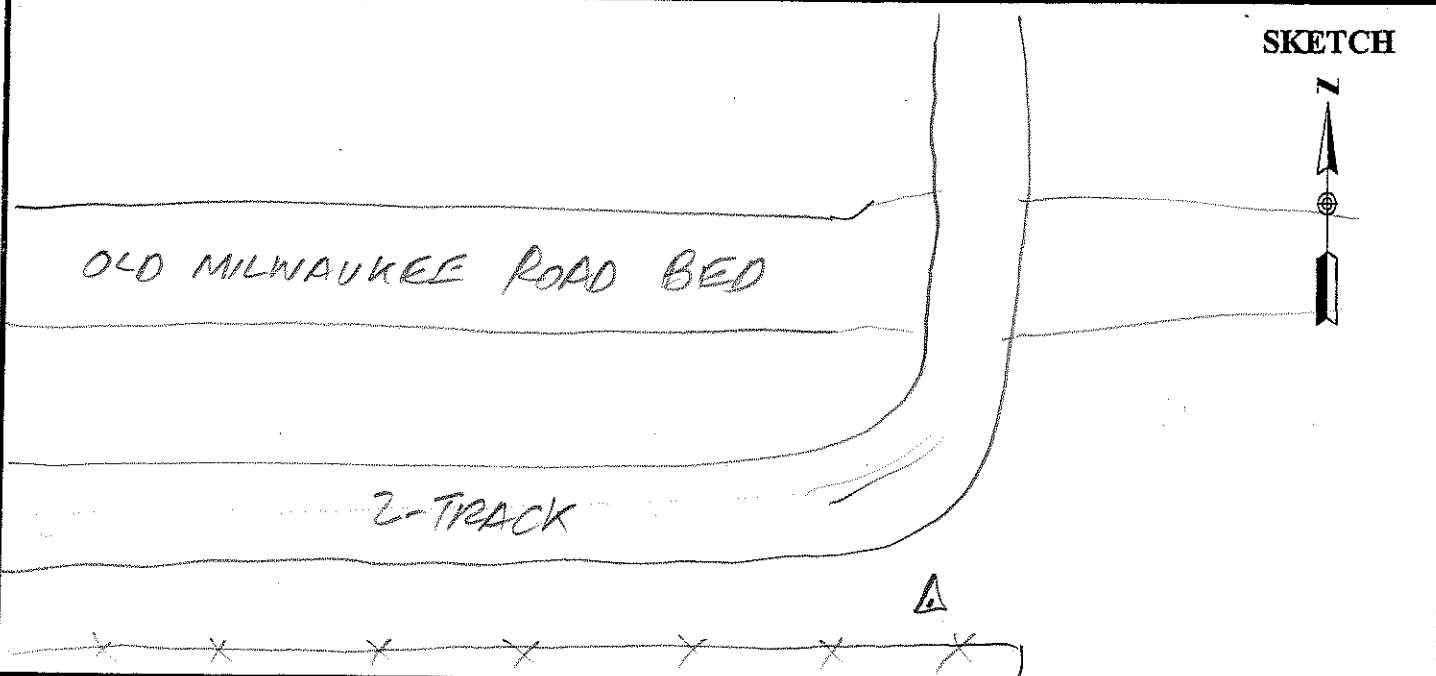
STATION DESCRIPTIONS BRASS
DISC IN CONC POST
"Z122 1984"
USC AND GS
AS DESCRIBED BY NGS

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
19:18	2.2	8/8-8
19:56	2.4	8/8-8

HEAVY RAIN



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

H+U
 CONTRA

PROJECT 1100904
 OPERATOR WJW
 DATE 3/30/10

SITE NUMBER 1
 SITE NAME CARELESS

TRACKING TIMES (LOCAL) MEASURE MDT
 START 15:07
 STOP 16:08

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.199 _____
 1.559

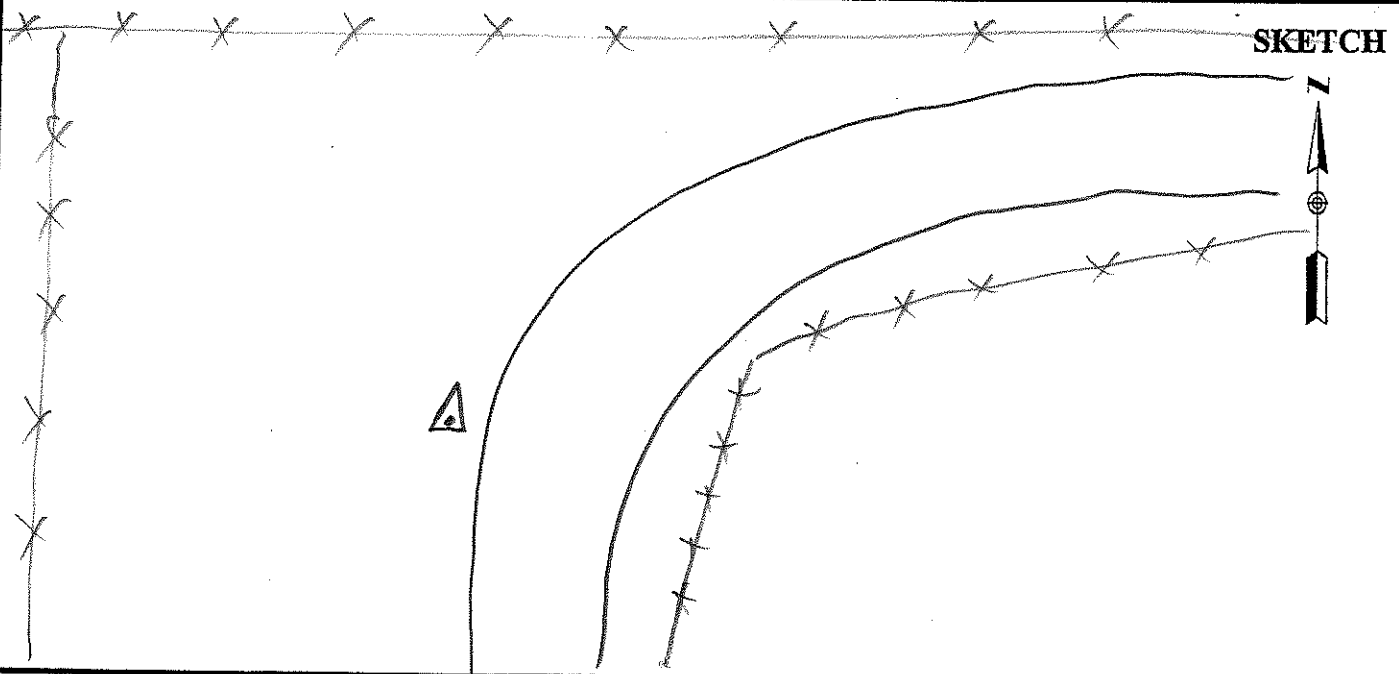
STATION DESCRIPTIONS FD BRASS
DISK IN CONC MKD
"CARELESS 1961"

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
21:07	2.2	8/8-8
22:08	2.4	8/8-8

RAIN
VERY WINDY



PUBL. 02THD 1291.870m

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT 1100804
 OPERATOR WJN
 DATE 8/31/10

SITE NUMBER 1
 SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:30
 STOP 16:34

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 11
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.161 _____

STATION DESCRIPTIONS REBAR AND CAP

1.521

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

PC VERY WINDY

TIME	GDOP	SATELLITES
<u>14:30</u>	<u>1.8</u>	<u>9/9-9</u>
<u>22:34</u>	<u>1.9</u>	<u>10/10-10</u>

AS BEFORE DESCRIBED

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

Base

PROJECT 1100804
 OPERATOR WJN
 DATE 9/31/10

SITE NUMBER 1
 SITE NAME 103

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:13
 STOP 16:00

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.196 _____

1.556

STATION DESCRIPTIONS REAR 4th CAP

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
PC VERY WINDY

TIME	GDOP	SATELLITES
<u>15:13</u>	<u>2.1</u>	<u>9/9-9</u>
<u>22:00</u>	<u>1.8</u>	<u>10/10-10</u>

AS BEFORE DESCRIBED

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR WJN
 DATE 8/31/10

SITE NUMBER 1
 SITE NAME 1

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:26
 STOP 9:49

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.251 _____

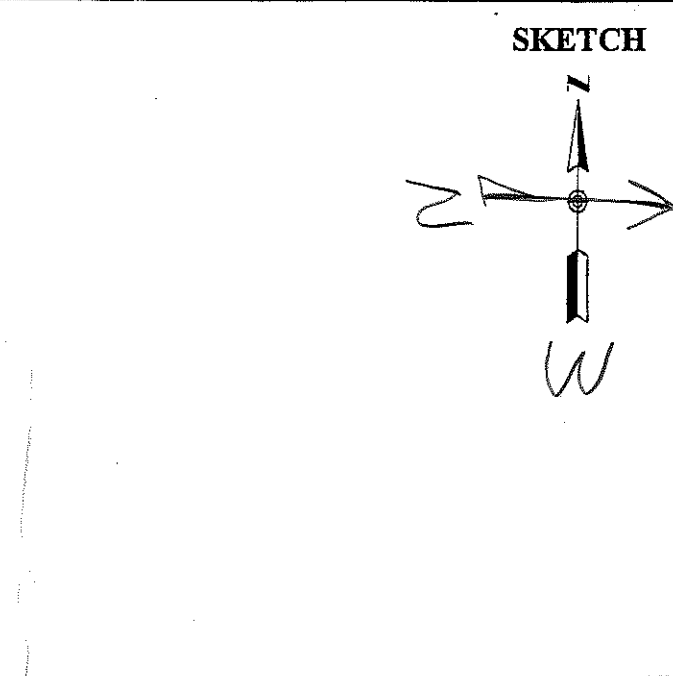
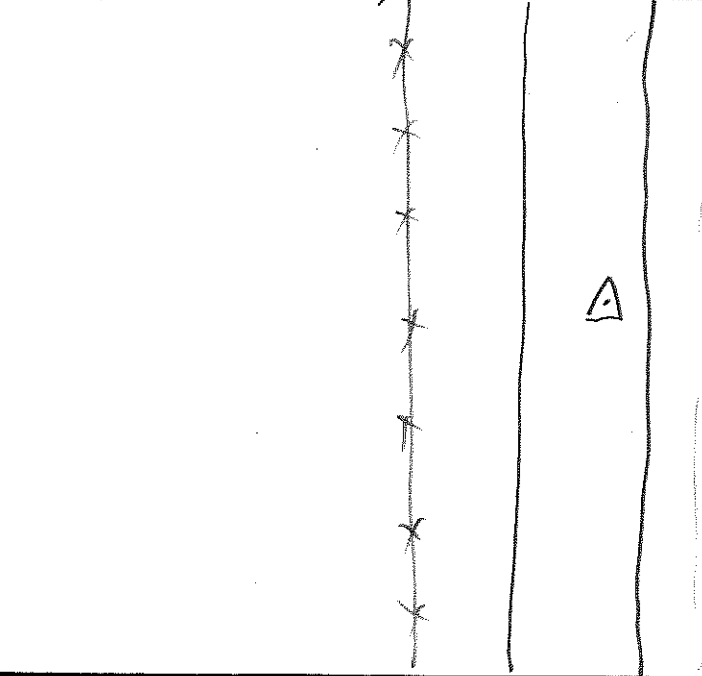
1.611

STATION DESCRIPTIONS POINT IN
E OF W AND LANE
DIRT RD TOP OF HILL

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
VERY WINDY

TIME	GDOP	SATELLITES
15:26	2.9	7/7-7
15:49	2.1	9/9-9



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR WJN
 DATE 8/31/10

SITE NUMBER 2
 SITE NAME 2

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:58
 STOP 10:25

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

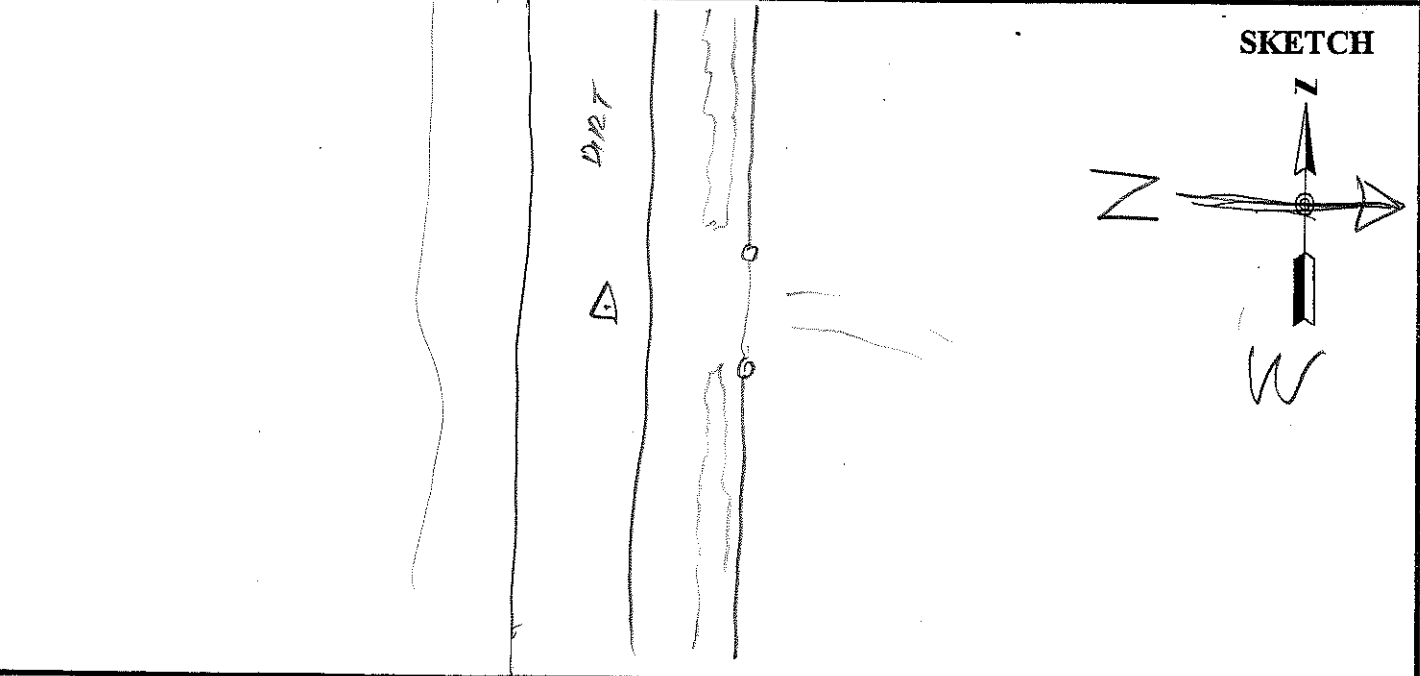
HEIGHT READINGS MTS FT
 1.270 _____

STATION DESCRIPTIONS POINT E
OF W BIRD LANE DIRT
RD OPP G FIELD ACC
N.

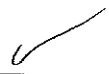
SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
VERY WINDY

TIME	GDOP	SATELLITES
15:58	2.1	9/9-9
16:25	2.4	9/9-9



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR WJN
 DATE 8/31/10

SITE NUMBER 3
 SITE NAME 3

TRACKING TIMES (LOCAL) MEASURE MDT
 START 10:37
 STOP 11:05

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.241 _____

1.601

STATION DESCRIPTIONS POINT N
END GRASSY TRIANGLE
5' S OF EE

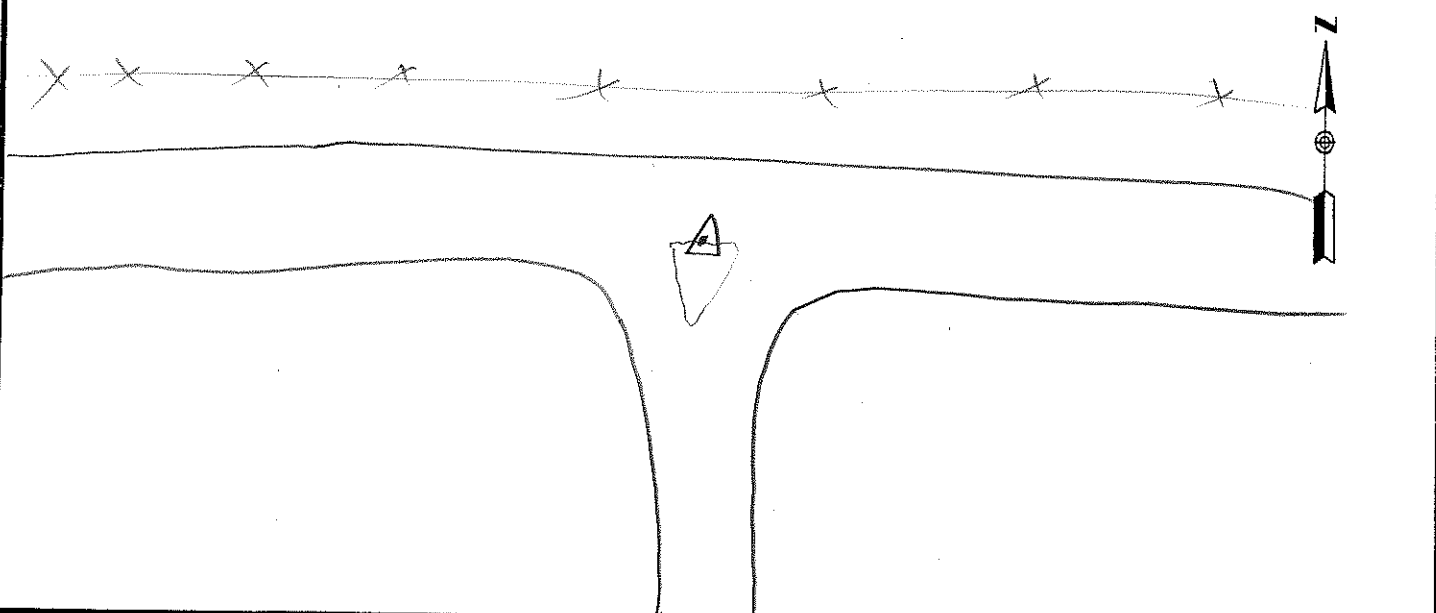
SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
16:36	2.1	10/10-10
17:05	2.2	9/9-9

VERY WINDY

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
OPERATOR UJN
DATE 8/31/10

SITE NUMBER 4
SITE NAME 4

TRACKING TIMES (LOCAL) MEASURE MDT

START 11:16
STOP 11:46

SENSOR TYPE 500 9500 399 299
MEMORY CARD 74
BATTERY NO. _____
CONTROLLER NO. _____
SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
1.248 _____

STATION DESCRIPTIONS E NW-SE
GRAVEL/DIRT RD

1.608

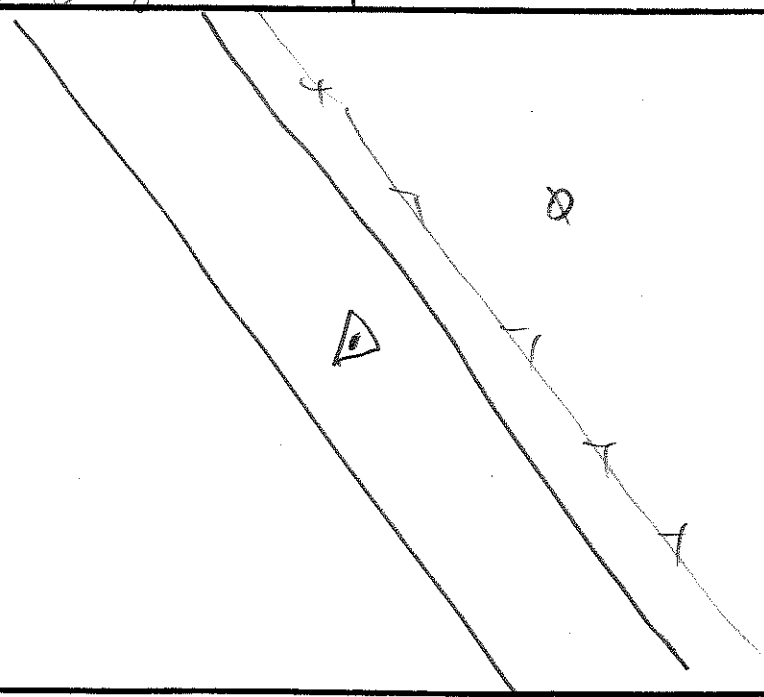
SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

VERY WINDY

TIME	GDOP	SATELLITES
17:16	2.2	8/8-10
17:46	2.7	8/8-8

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR WJN
 DATE 8/9/10

SITE NUMBER 5
 SITE NAME 5

TRACKING TIMES (LOCAL) MEASURE MDT
 START 11:56
 STOP 12:26

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.310 _____

1.670

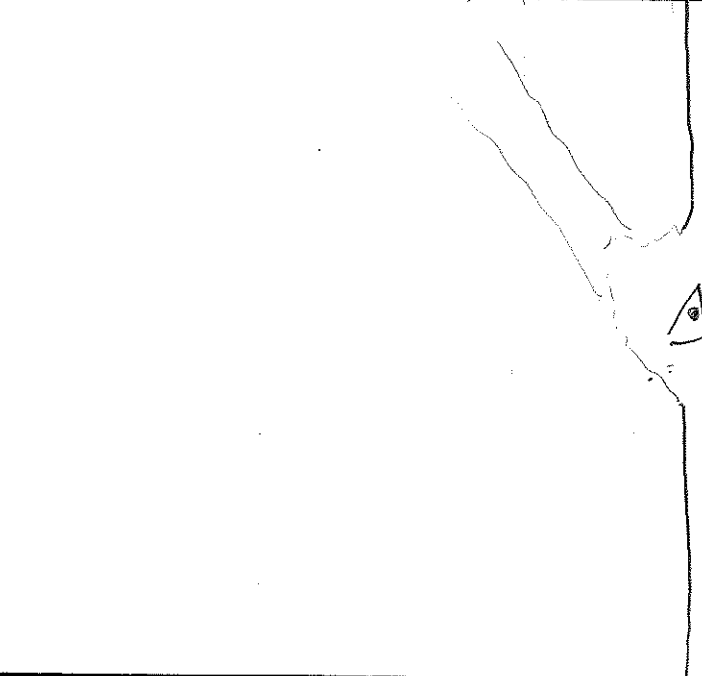
STATION DESCRIPTIONS W. EDGE
DIRT RD @ G RANGE
ACC NW

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
17:56	1.8	9/9-10
19:26	2.0	9/9-9

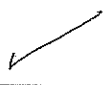
Very WINDY



SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR UWN
 DATE 3/31/10

SITE NUMBER 6
 SITE NAME 6

TRACKING TIMES (LOCAL) MEASURE MDT
 START 12:46
 STOP 13:14

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.275 _____

1.635

STATION DESCRIPTIONS E DIRT
RD @ PIPELINE

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
VERY WINDY

TIME	GDOP	SATELLITES
18:46	1.9	9/9-9
19:14	2.2	9/9-9

BELOW MAY BE VISIBLE

DIRT

▲

SKETCH

N

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 1100804
 OPERATOR WJN
 DATE 8/31/10

SITE NUMBER 7
 SITE NAME 7

TRACKING TIMES (LOCAL) MEASURE MDT
 START 13:32
 STOP 13:57

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.261 _____

1.621

STATION DESCRIPTIONS E N-S
DIRT RD OPP E DIRT
RD E

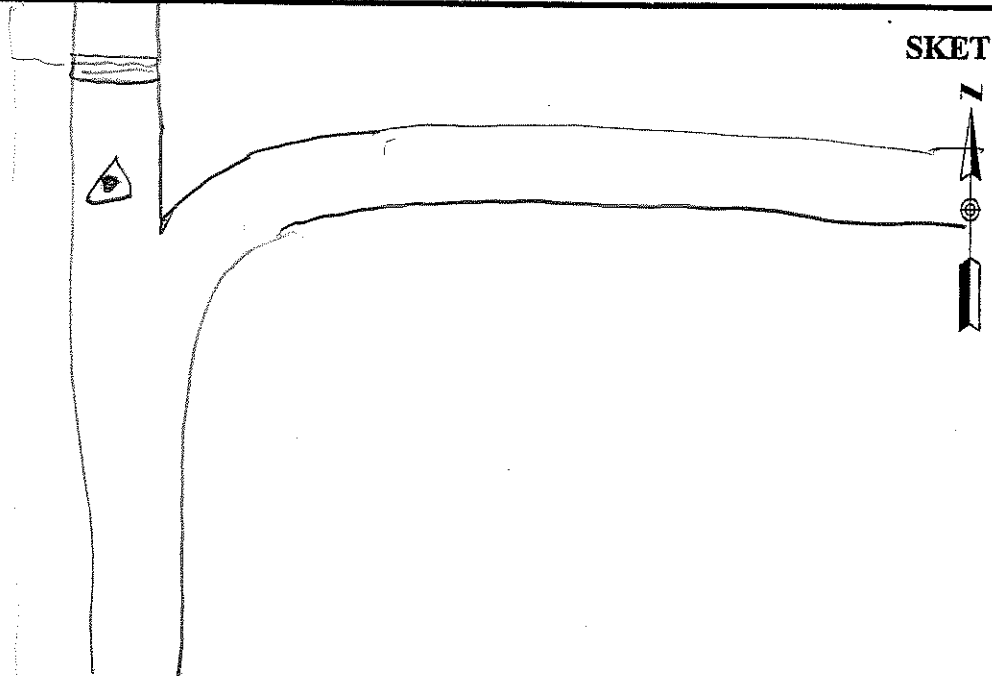
SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

VERY WINDY

TIME	GDOP	SATELLITES
19:32	2.2	8/8-8
19:57	2.3	8/8-8

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

✓

PROJECT 1100804
OPERATOR WJN
DATE 8/31/10

SITE NUMBER 8
SITE NAME 8

TRACKING TIMES (LOCAL) MEASURE MDT
START 14:06
STOP 14:26

SENSOR TYPE 500 9500 399 299
MEMORY CARD 14
BATTERY NO. _____
CONTROLLER NO. _____
SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
1.248 _____

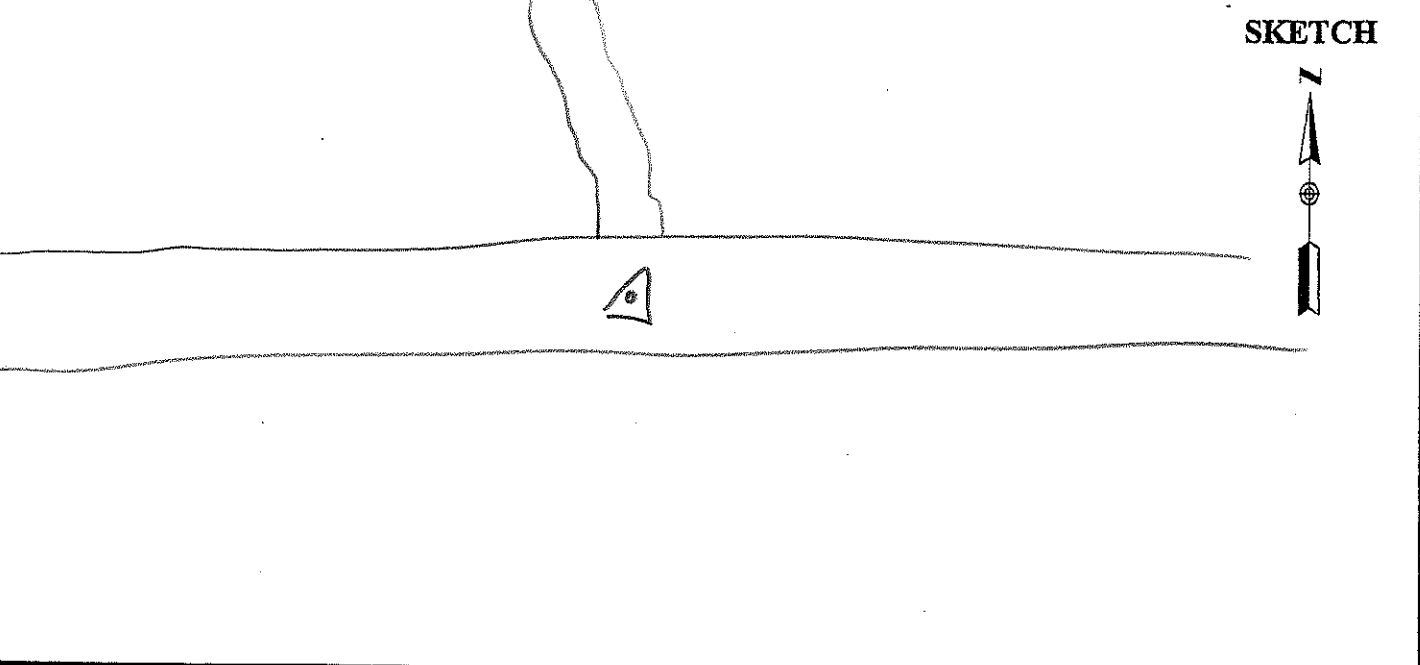
1.608

STATION DESCRIPTIONS E-W
DIRT RD OPP TRAIL &
ROAD N

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
20:06	2.2	8/8-8
20:26	2.4	8/8-8

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
VERY WINDY



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
OPERATOR WJN
DATE 8/31/10

SITE NUMBER 9
SITE NAME 9

TRACKING TIMES (LOCAL) MEASURE MDT
START 14:37
STOP 14:58

SENSOR TYPE 500 9500 399 299
MEMORY CARD 14
BATTERY NO. _____
CONTROLLER NO. _____
SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT

1.269 _____

1.629

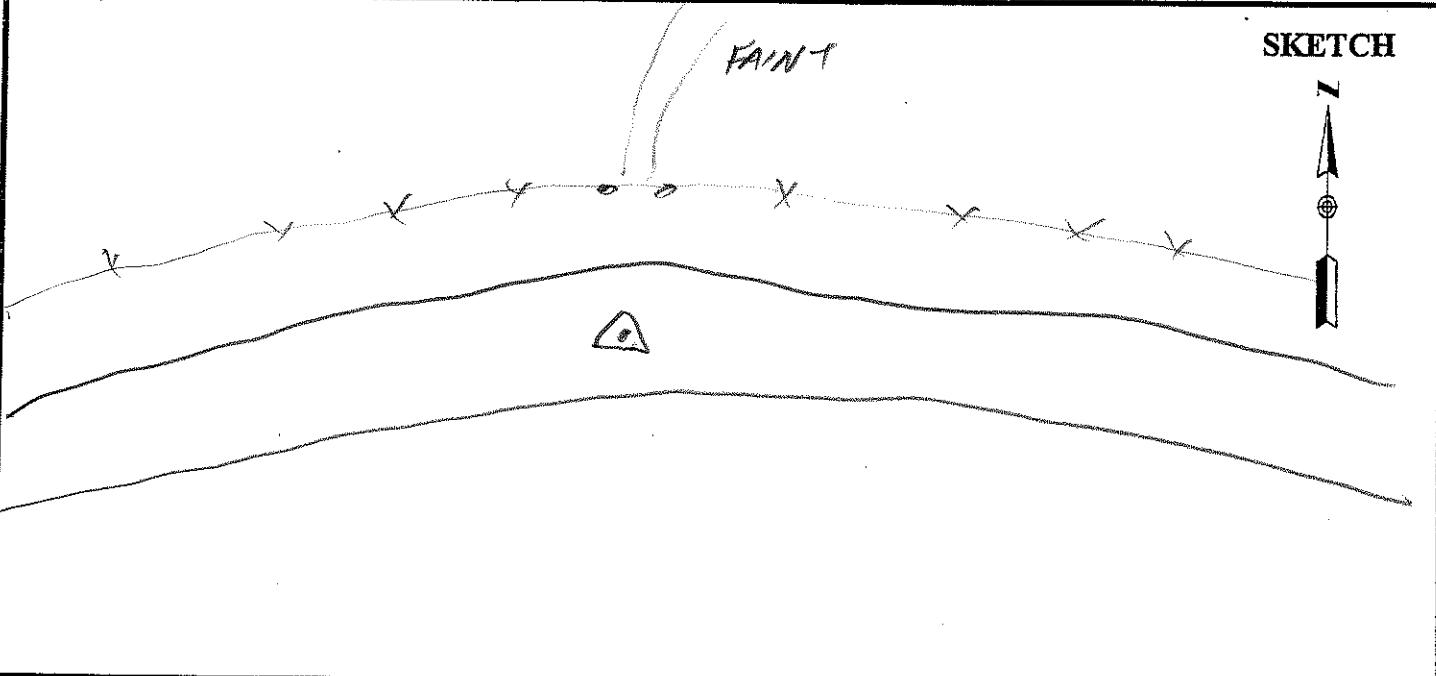
STATION DESCRIPTIONS & DIRT
RD OPP & TRAIL RD
N

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
20:37	2.6	8/8-8
20:58	2.2	8/8-8

VERY WINDY



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

TALL
GRASS
✓

PROJECT 1100804
 OPERATOR WJN
 DATE 8/31/10

SITE NUMBER 10
 SITE NAME 10

TRACKING TIMES (LOCAL) MEASURE MDT
 START 15:10
 STOP 15:39

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 14
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.246 _____

STATION DESCRIPTIONS POINT
@ APEX OF 2 TRACK
IN TALL GRASS

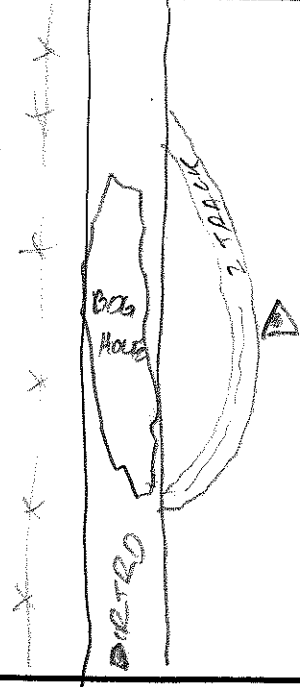
1-606

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
VERY WINDY

TIME	GDOP	SATELLITES
<u>21:10</u>	<u>2.2</u>	<u>9/9-9</u>
<u>21:39</u>	<u>2.2</u>	<u>9/9-9</u>

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT 1102804
 OPERATOR WJN
 DATE 9/10/10

SITE NUMBER 1
 SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:05
 STOP 15:34

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 11
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.166 _____

STATION DESCRIPTIONS REBAR
AND CAP

1.526

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
RAIN

TIME	GDOP	SATELLITES
<u>15:05</u>	<u>2.2</u>	<u>9/9-9</u>
<u>21:34</u>	<u>2.2</u>	<u>9/9-9</u>

AS BEFORE DESCRIBED

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/1/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>E125 RESET</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>9:57</u> STOP <u>15:22</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>14</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
---	---


SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.032</u> _____ <u>1.392</u>	STATION DESCRIPTIONS <u>BRASS DISK</u> <u>IN CONC</u> <u>"E 125 RESET 1999"</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>RAIN</u>
------------------------	--

TIME	GDOP	SATELLITES
<u>15:57</u>	<u>2.2</u>	<u>8/8-8</u>
<u>21:22</u>	<u>2.2</u>	<u>9/9-9</u>

AS BEFORE DESCRIBED

SKETCH



2

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100904
OPERATOR WIN
DATE _____

SITE NUMBER 1
SITE NAME 11

TRACKING TIMES (LOCAL) MEASURE MDT
START 10:19
STOP 10:38

SENSOR TYPE 500 9500 399 299
MEMORY CARD 601
BATTERY NO. _____
CONTROLLER NO. _____
SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
1.271 _____

STATION DESCRIPTIONS POINT IN
E N-S GRAVEL RD

1.631

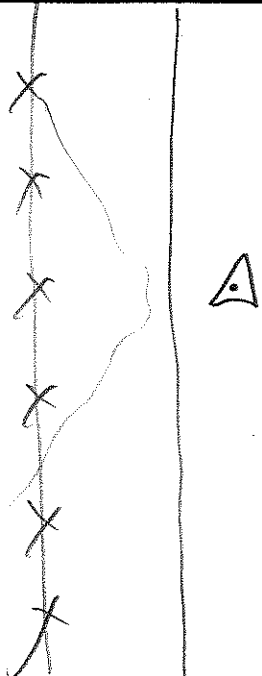
SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

RAIN

TIME	GDOP	SATELLITES
<u>15:19</u>	<u>2.2</u>	<u>8/9-8</u>
<u>15:38</u>	<u>1.8</u>	<u>10/10-10</u>

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100904
 OPERATOR WJN
 DATE 9/1/10

SITE NUMBER 2
 SITE NAME 12

TRACKING TIMES (LOCAL) MEASURE MDT
 START 10:46
 STOP 11:04

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: _____

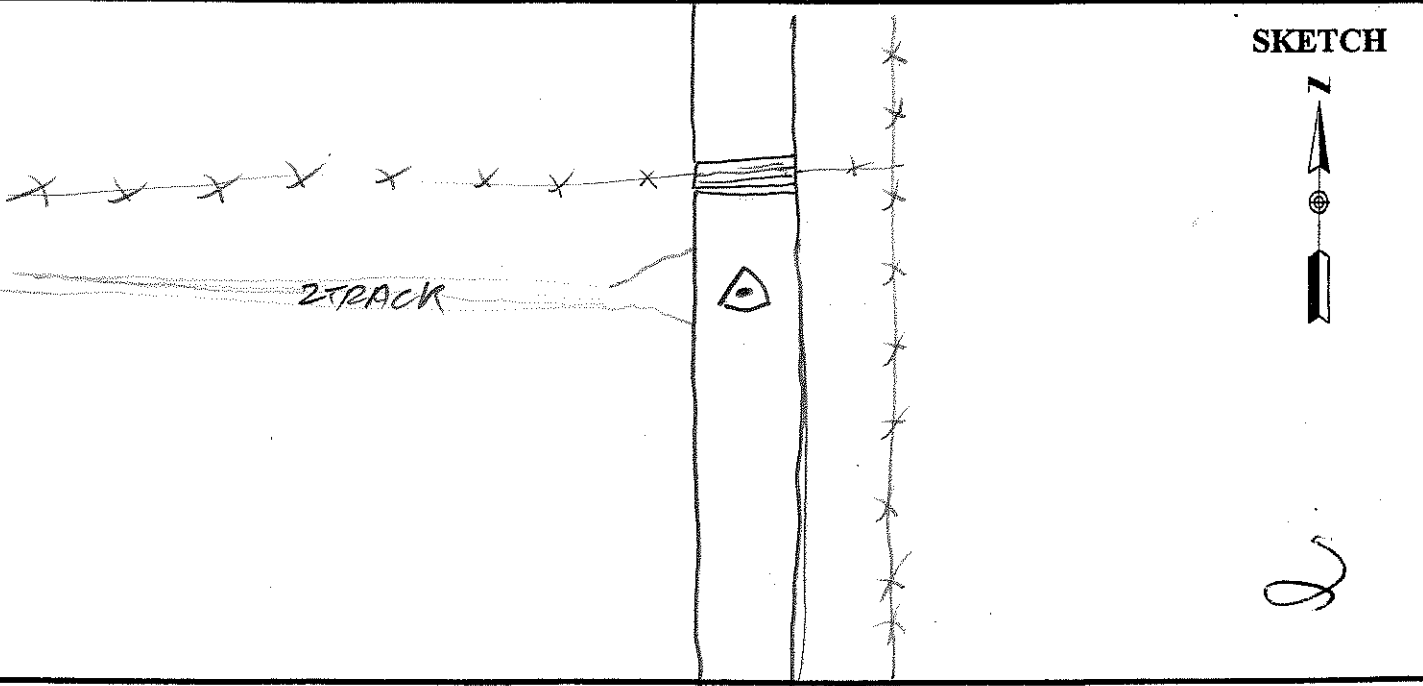
HEIGHT READINGS MTS FT
 1.253 _____

STATION DESCRIPTIONS E-N-S
DIRT RD @ E 2 TRACK
W.
+ 30 S OF S EDGE
CATTLE GUARD

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
RAIN

TIME	GDOP	SATELLITES
16:46	2.2	10/10-10
17:04	2.2	10/10-10



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SHEBOYGAN, WISCONSIN 53083



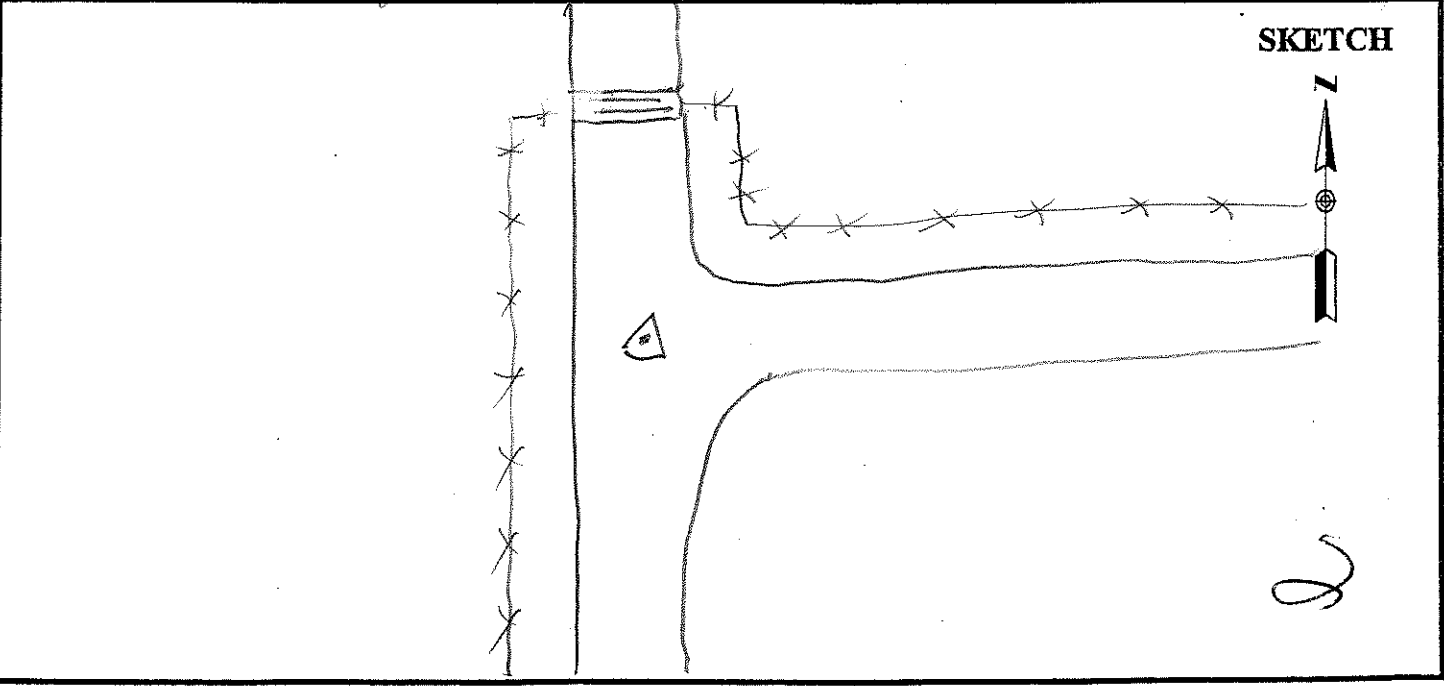
PROJECT <u>1100804</u>	SITE NUMBER <u>3</u>
OPERATOR <u>WJN</u>	SITE NAME <u>13</u>
DATE <u>9/1/10</u>	

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>11:12</u>	MEMORY CARD <u>601</u>
STOP <u>11:29</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.276</u> _____ <u>1.636</u>	STATION DESCRIPTIONS <u>Q Q INT</u> <u>GRAVEL ADS N-S-E</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>RAIN</u>
------------------------	--

TIME	GDOP	SATELLITES
17:12	1.9	10/10-10
17:29	2.0	10/10-10



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SHEBOYGAN, WISCONSIN 53083



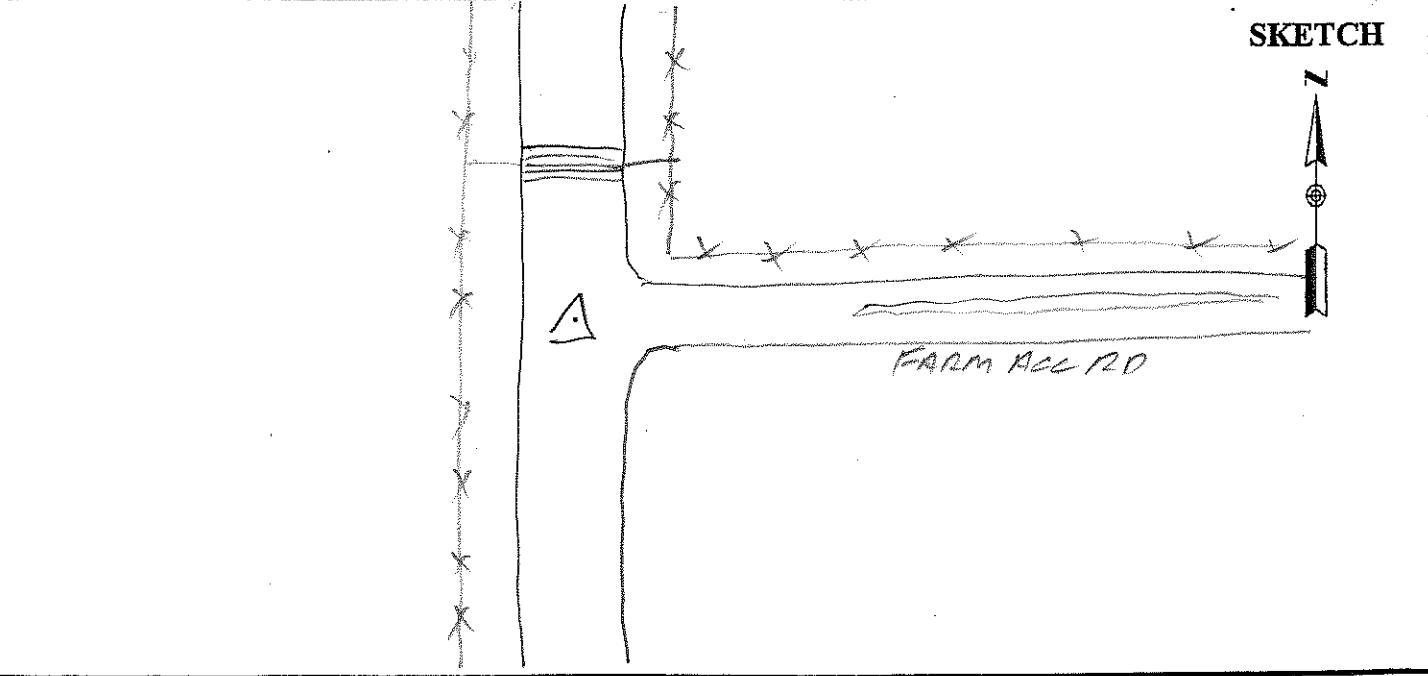
PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/1/10</u>	SITE NUMBER <u>4</u> SITE NAME <u>14</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>11:41</u> STOP <u>12:00</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: _____ _____ _____ _____
HEIGHT READINGS MTS FT <u>1.266</u> _____ 1.626	STATION DESCRIPTIONS <u>GC INT</u> <u>DIRT/GRAVEL PDS</u> <u>N-S-E</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>LIGHT RAIN</u>
------------------------	--

TIME	GDOP	SATELLITES
17:41	1.8	10/10-10
18:00	1.5	10/10-10



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PROJECT 1100804
 OPERATOR WJN
 DATE 9/1/10

SITE NUMBER 5
 SITE NAME 15

TRACKING TIMES (LOCAL) MEASURE MDT
 START 12:11
 STOP 12:34

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.233 _____

1.593

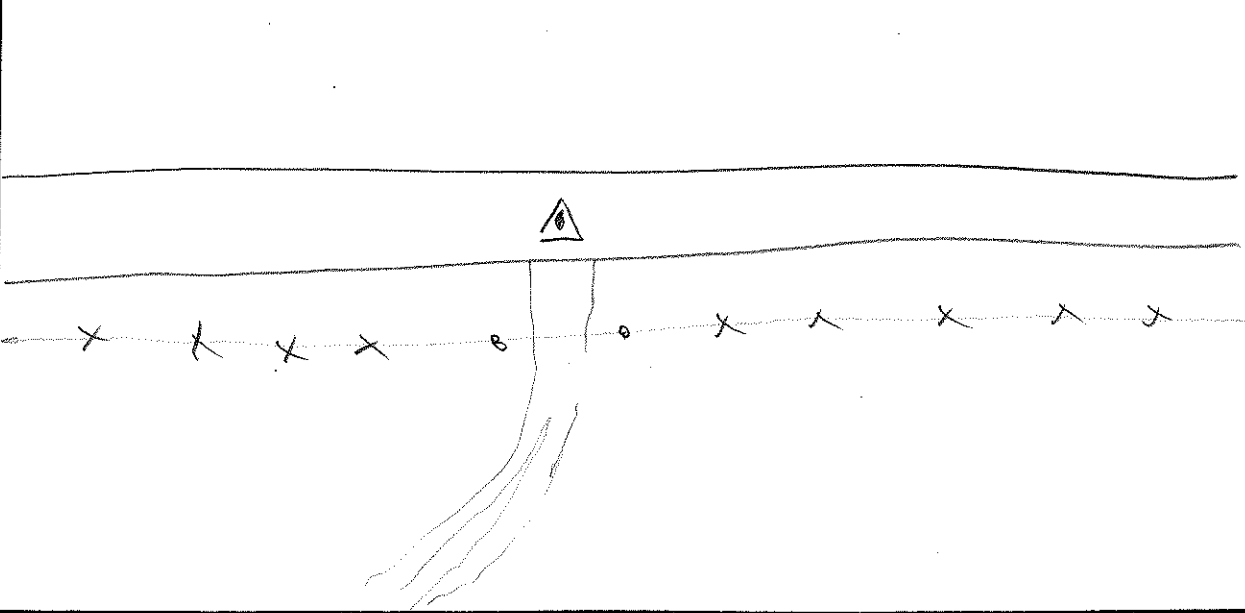
STATION DESCRIPTIONS E E-W
GRAVEL RD (POORLY GRAVELED)
@ E RANGE ACC S.

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
LIGHT RAIN, WINDY

TIME	GDOP	SATELLITES
17:11	1.9	9/9-9
17:34	1.8	9/9-9

SKETCH



AERO-METRIC, INC.
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SHEBOYGAN, WISCONSIN 53083

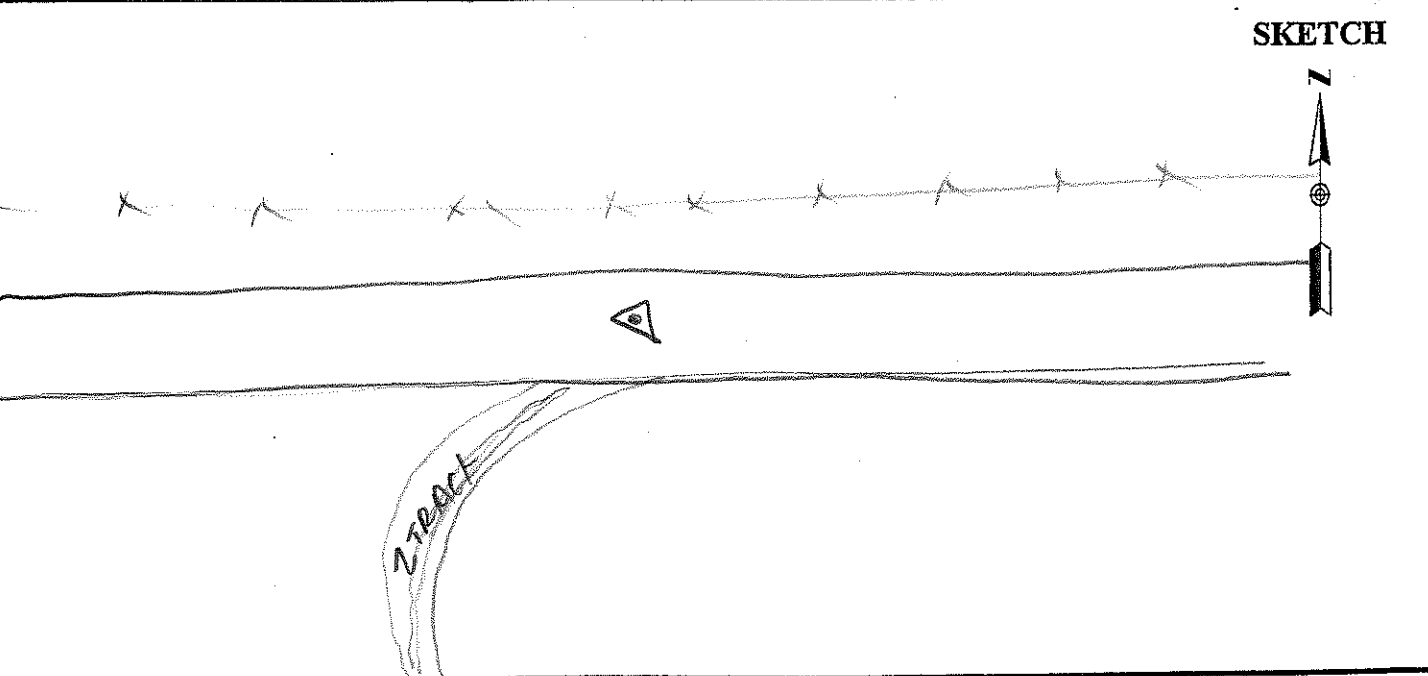
✓

PROJECT <u>1100804</u> OPERATOR <u>WVN</u> DATE <u>9/1/10</u>	SITE NUMBER <u>6</u> SITE NAME <u>16</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>12:42</u> STOP <u>13:04</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.241</u> _____ <u>1.601</u>	STATION DESCRIPTIONS <u>E-W</u> <u>GRAVEL RD</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>WINDY BECOMING</u> <u>EXTREMELY WINDY</u>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">TIME</th> <th style="width: 15%;">GDOP</th> <th style="width: 70%;">SATELLITES</th> </tr> </thead> <tbody> <tr> <td><u>18:42</u></td> <td><u>1.8</u></td> <td><u>9/9-9</u></td> </tr> <tr> <td><u>19:04</u></td> <td><u>1.9</u></td> <td><u>9/9-9</u></td> </tr> </tbody> </table>	TIME	GDOP	SATELLITES	<u>18:42</u>	<u>1.8</u>	<u>9/9-9</u>	<u>19:04</u>	<u>1.9</u>	<u>9/9-9</u>	
TIME	GDOP	SATELLITES								
<u>18:42</u>	<u>1.8</u>	<u>9/9-9</u>								
<u>19:04</u>	<u>1.9</u>	<u>9/9-9</u>								



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SHEBOYGAN, WISCONSIN 53083

✓

PROJECT <u>1100804</u>	SITE NUMBER <u>7</u>
OPERATOR <u>WJN</u>	SITE NAME <u>17</u>
DATE <u>9/1/10</u>	

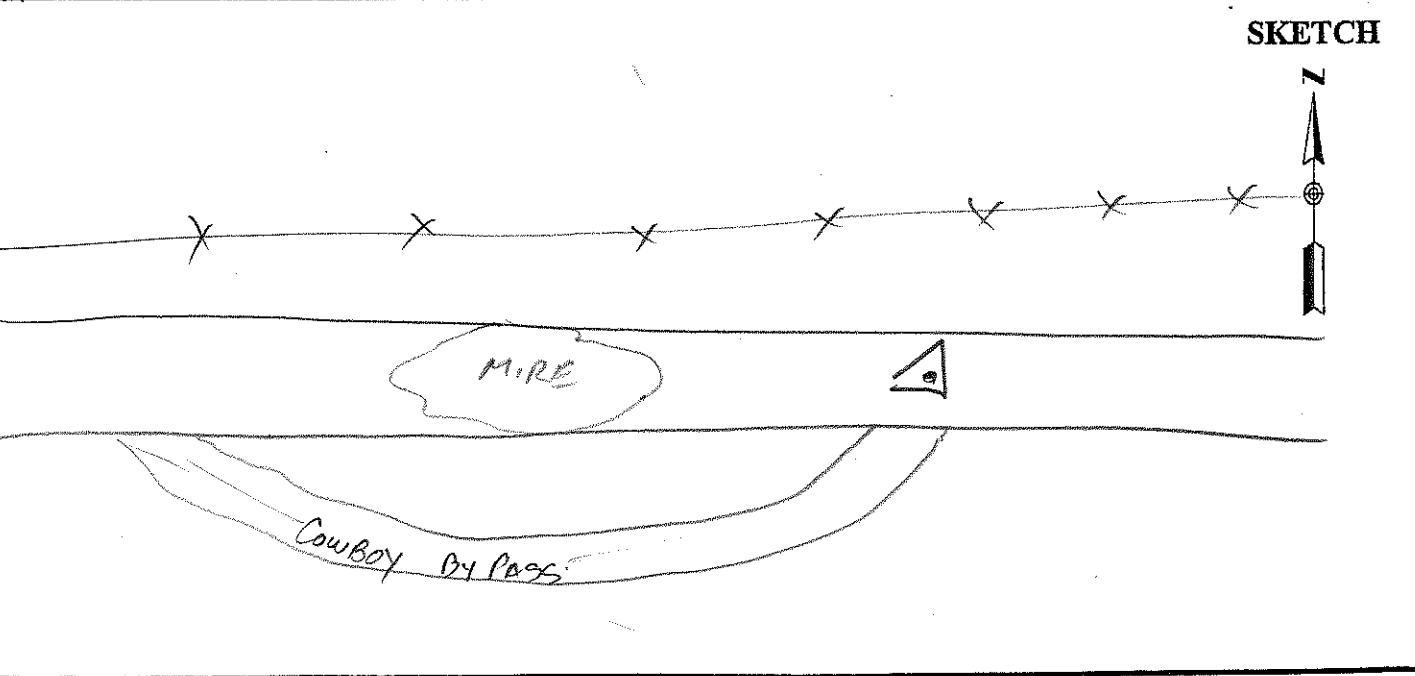
TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>13:13</u>	MEMORY CARD <u>601</u>
STOP <u>13:39</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
---	-------------------------

HEIGHT READINGS MTS FT <u>1-290</u> _____ <u>1.650</u>	STATION DESCRIPTIONS <u>G EW</u> <u>DIRT RD</u>
--	--

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>WINDY</u>
------------------------	---

TIME	GDOP	SATELLITES
19:13	1.9	9/9-9
19:39	2.0	8/8-8



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SHEBOYGAN, WISCONSIN 53083

✓

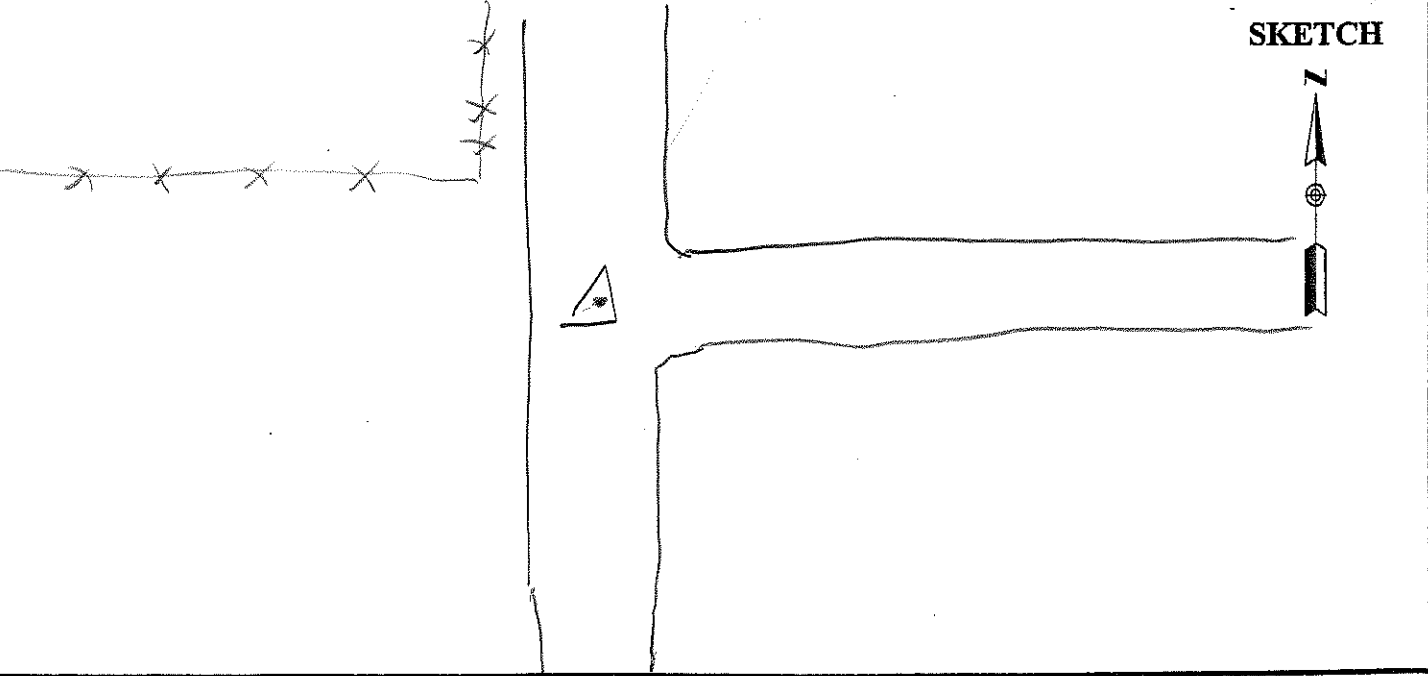
PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/1/10</u>	SITE NUMBER <u>8</u> SITE NAME <u>18</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>13:51</u> STOP <u>13:17</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.240</u> _____ <u>1.600</u>	STATION DESCRIPTIONS <u>GG INT</u> <u>DIRT RD S N-S-E</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>VERY WINDY</u>
------------------------	--

TIME	GDOP	SATELLITES
19:51	2.3	8/8-8
20:17	2.1	8/8-8



AERO-METRIC, INC.
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SHEBOYGAN, WISCONSIN 53083

TALL GRASS ✓

PROJECT 1100904
 OPERATOR WJN
 DATE 9/1/10

SITE NUMBER 9
 SITE NAME 19

TRACKING TIMES (LOCAL) MEASURE MDT
 START 14:44
 STOP 15:01

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

HEIGHT READINGS MTS FT
 1.309 _____

1.669

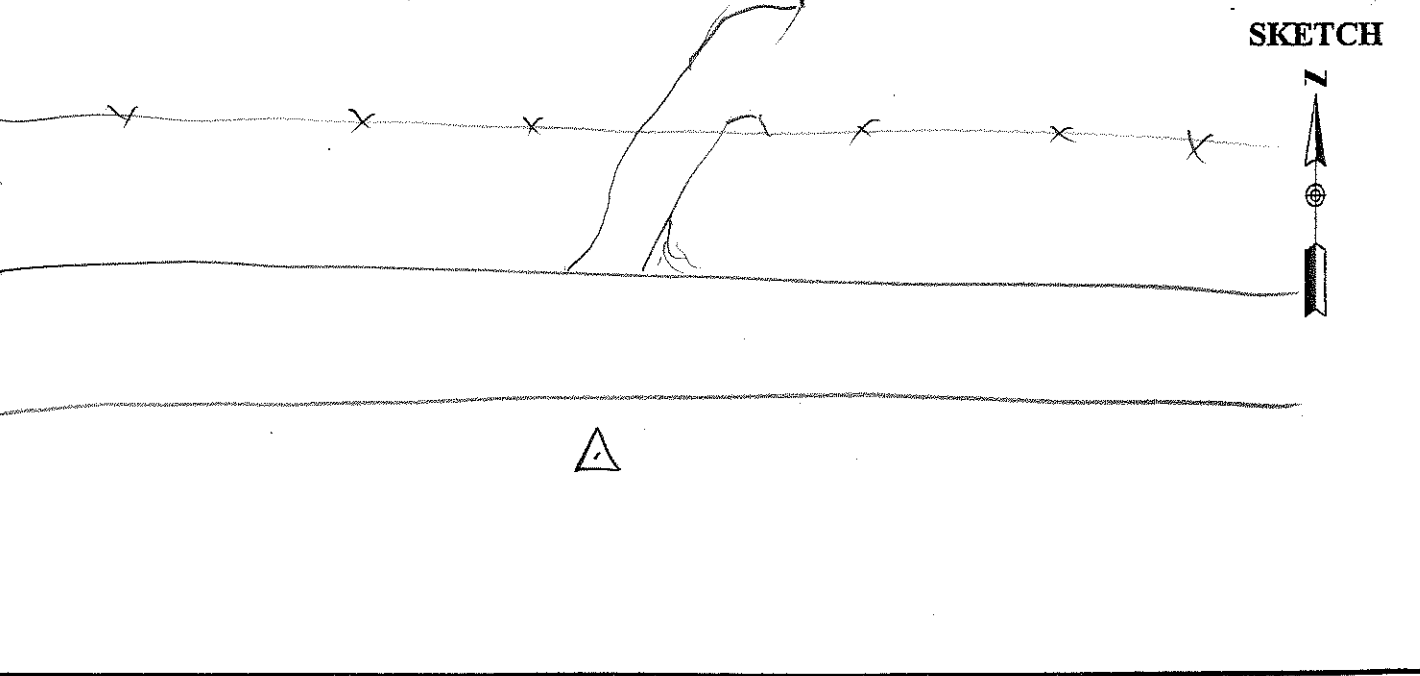
OBSTRUCTIONS: NO

STATION DESCRIPTIONS POINT IN
TALL GRASS

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
20:44	2.1	9/9-9
21:01	2.2	9/9-9



AERO-METRIC, INC.
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SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT <u>1100904</u> OPERATOR <u>WJN</u> DATE <u>9/2/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>103</u>
---	--

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>8:30</u> STOP <u>17:11</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>11</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
---	---

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>No</u>
HEIGHT READINGS MTS FT <u>1.238</u> _____ <u>1.598</u>	STATION DESCRIPTIONS <u>Rebar and</u> <u>CAP</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>WINDY</u>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">TIME</th> <th style="width: 15%;">GDOP</th> <th style="width: 70%;">SATELLITES</th> </tr> </thead> <tbody> <tr> <td><u>14:30</u></td> <td><u>2.0</u></td> <td><u>9/9-9</u></td> </tr> <tr> <td><u>23:11</u></td> <td><u>1.9</u></td> <td><u>9/9-9</u></td> </tr> </tbody> </table>	TIME	GDOP	SATELLITES	<u>14:30</u>	<u>2.0</u>	<u>9/9-9</u>	<u>23:11</u>	<u>1.9</u>	<u>9/9-9</u>	
TIME	GDOP	SATELLITES								
<u>14:30</u>	<u>2.0</u>	<u>9/9-9</u>								
<u>23:11</u>	<u>1.9</u>	<u>9/9-9</u>								

As Before described

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE


PROJECT <u>1100204</u> OPERATOR <u>WJN</u> DATE <u>9/2/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>101</u>
---	--

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>9:05</u> STOP <u>16:42</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>14</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
---	---

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>No</u>
HEIGHT READINGS MTS FT <u>1.134</u> _____ <u>1.494</u>	STATION DESCRIPTIONS <u>Rebar</u> <u>and CA</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>WINDY</u>
------------------------	---

TIME	GDOP	SATELLITES
<u>16:05</u>	<u>2.0</u>	<u>9/9-9</u>
<u>22:42</u>	<u>2.0</u>	<u>9/9-9</u>

<p align="center"><i>AS BEFORE DESCRIBED</i></p>	<p align="center">SKETCH</p> 
--	---

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

*CAN BE USED
 AS POINT
 FUTURE
 BASE*

PROJECT 1100304
 OPERATOR WJK
 DATE 9/2/10

SITE NUMBER 1
 SITE NAME 104

TRACKING TIMES (LOCAL) MEASURE MTS
 START 9:43
 STOP 10:23

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: No

HEIGHT READINGS MTS FT
 1.147 _____

1.507

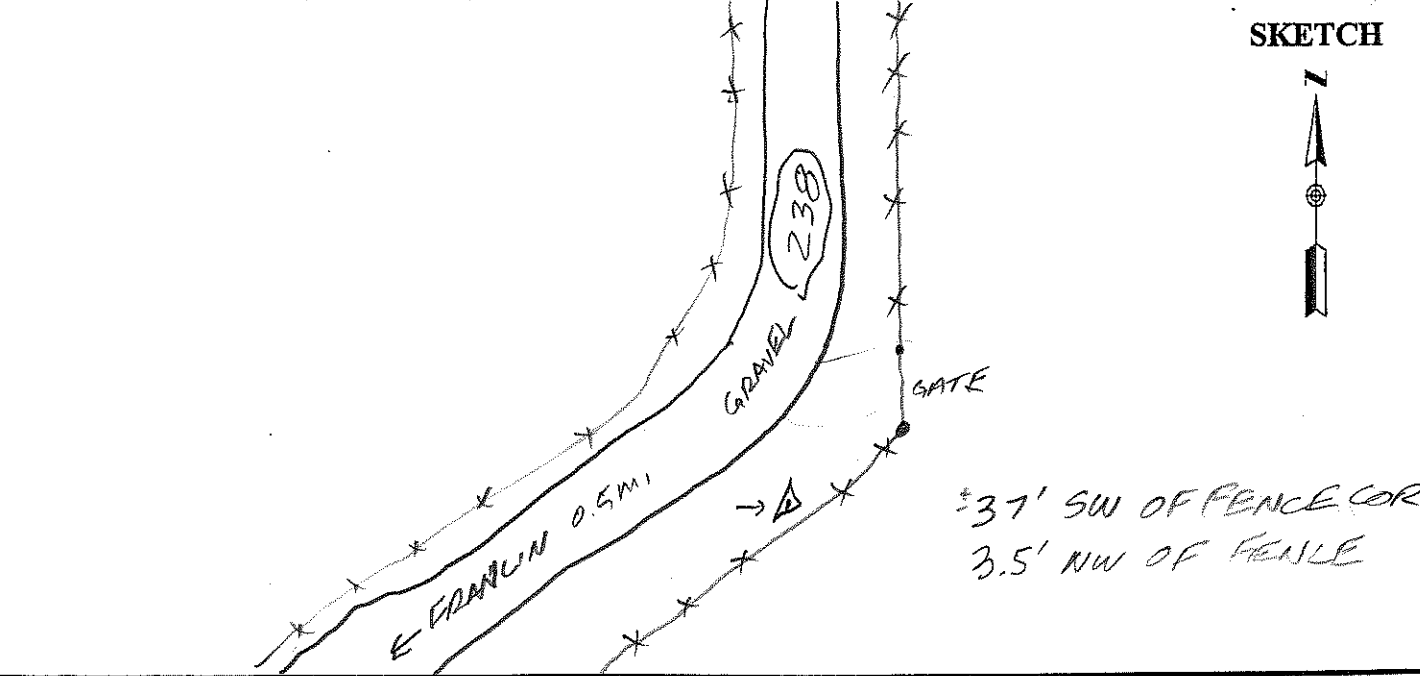
STATION DESCRIPTIONS Set Rebar
 and CAP

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
WINDY

TIME	GDOP	SATELLITES
15:43	2.2	8/8-8
16:23	2.0	8/8-8

APPROX COORDS
46-22-35.4
109-15-27.5



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SHEBOYGAN, WISCONSIN 53083

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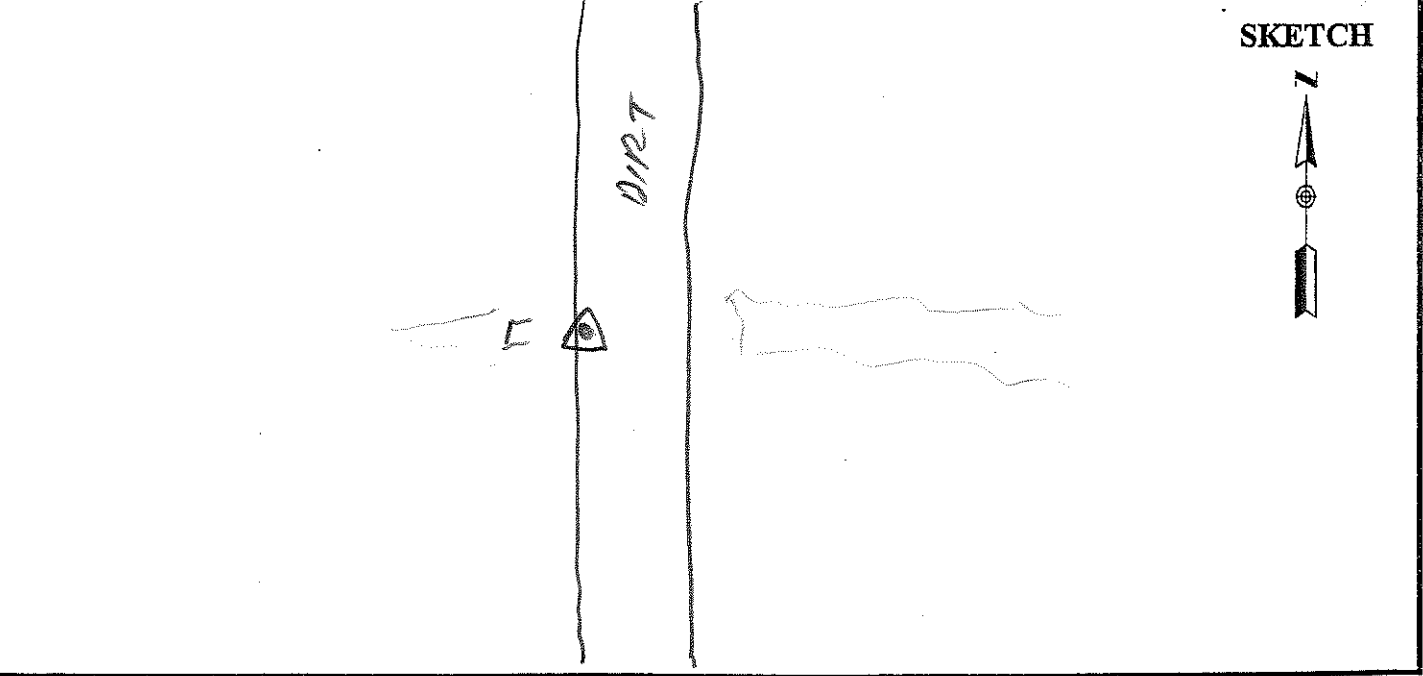
PROJECT <u>1100904</u> OPERATOR <u>WJA</u> DATE <u>9/2/10</u>	SITE NUMBER <u>2</u> SITE NAME <u>20</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>WJA</u> START <u>11:10</u> STOP <u>11:26</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 0.360	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.317</u> _____ <u>1.677</u>	STATION DESCRIPTIONS <u>WEST EDGE</u> <u>DIRT RD OPP DRAINAGE</u> <u>EAST</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>WINDY</u>

TIME	GDOP	SATELLITES
<u>17:10</u>	<u>1.9</u>	<u>10/10-10</u>
<u>17:26</u>	<u>1.8</u>	<u>10/10-10</u>



46-20-35
 1000514
 115000
 22222

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4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

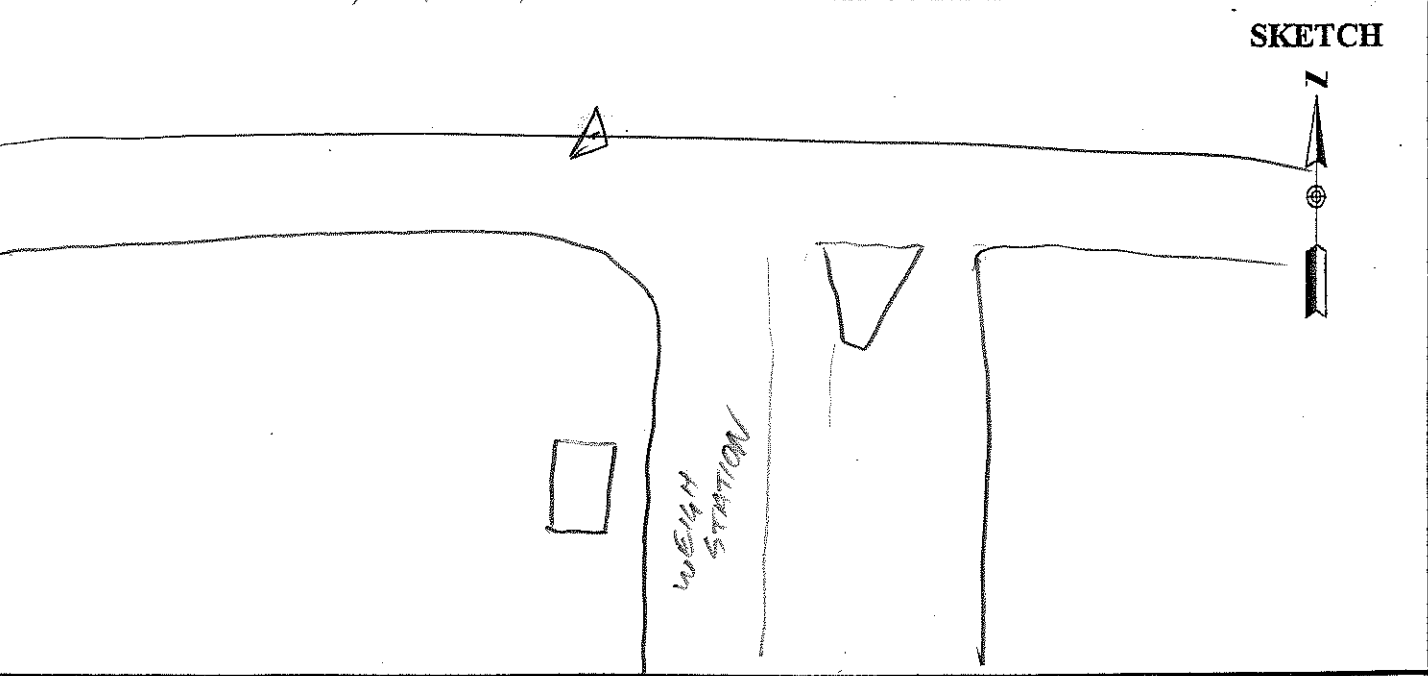


PROJECT <u>1100804</u> OPERATOR <u>WSN</u> DATE <u>9/2/10</u>	SITE NUMBER <u>3</u> SITE NAME <u>21</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>11:43</u> STOP <u>12:03</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>TRAFFIC S</u>
HEIGHT READINGS MTS FT <u>1.306</u> _____ <u>1.666</u>	STATION DESCRIPTIONS <u>N. EDGE</u> <u>PUMPT OPP SCALE HOUSE</u> <u>S.</u>

SATELLITE OBSERVATIONS			WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
			<u>WINDY</u>
TIME	GDOP	SATELLITES	
<u>17:43</u>	<u>1.8</u>	<u>9/9-9</u>	
<u>18:03</u>	<u>1.7</u>	<u>9/9-9</u>	



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

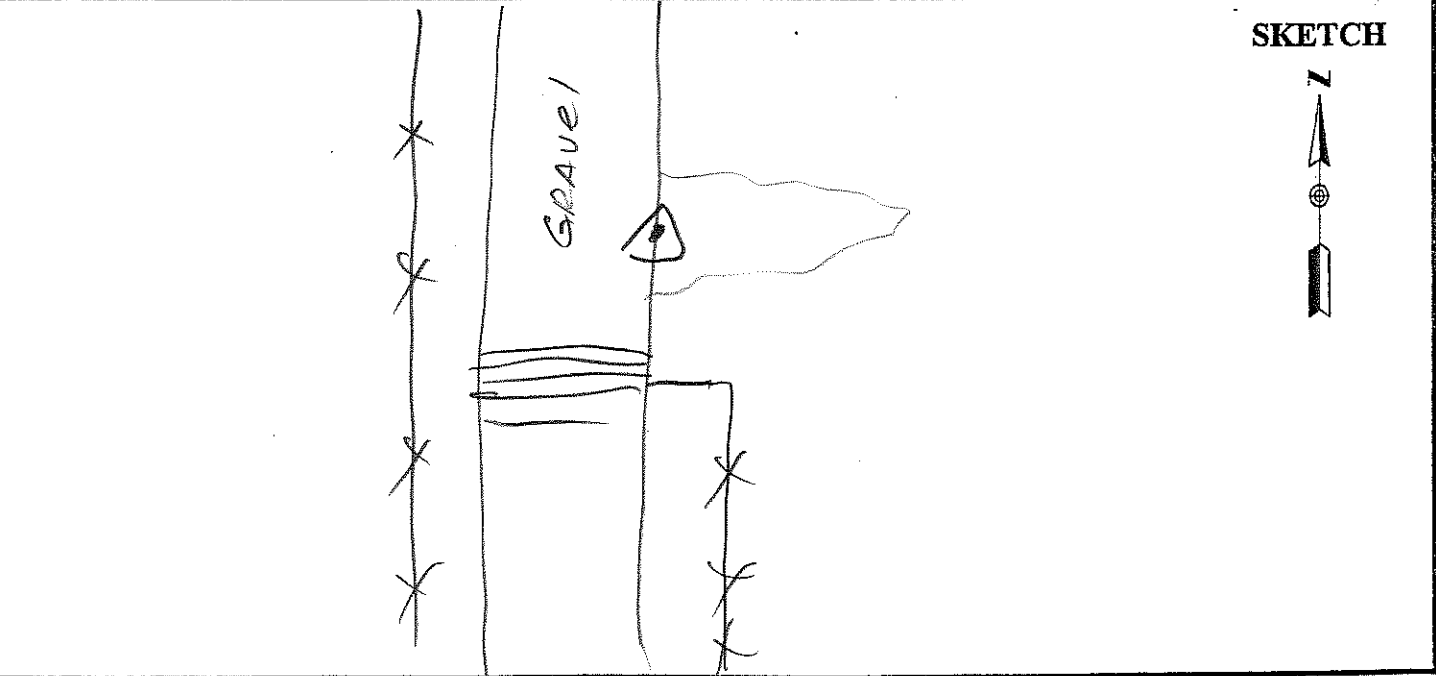
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PROJECT <u>1100804</u>	SITE NUMBER <u>4</u>
OPERATOR <u>WJN</u>	SITE NAME <u>22</u>
DATE <u>9/2/10</u>	

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>12:19</u>	MEMORY CARD <u>601</u>
STOP <u>12:42</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>No</u>
HEIGHT READINGS MTS FT <u>1.310</u> _____	STATION DESCRIPTIONS <u>E. EDGE</u>
<u>1-670</u>	<u>RD. @ FLAT TURNOUT</u>
	<u>E.</u>

SATELLITE OBSERVATIONS			WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
			<u>WINDY</u>
TIME	GDOP	SATELLITES	
18:19	1.9	10/10-10	
18:42	1.9	10/10-10	



AERO-METRIC, INC.
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SHEBOYGAN, WISCONSIN 53083

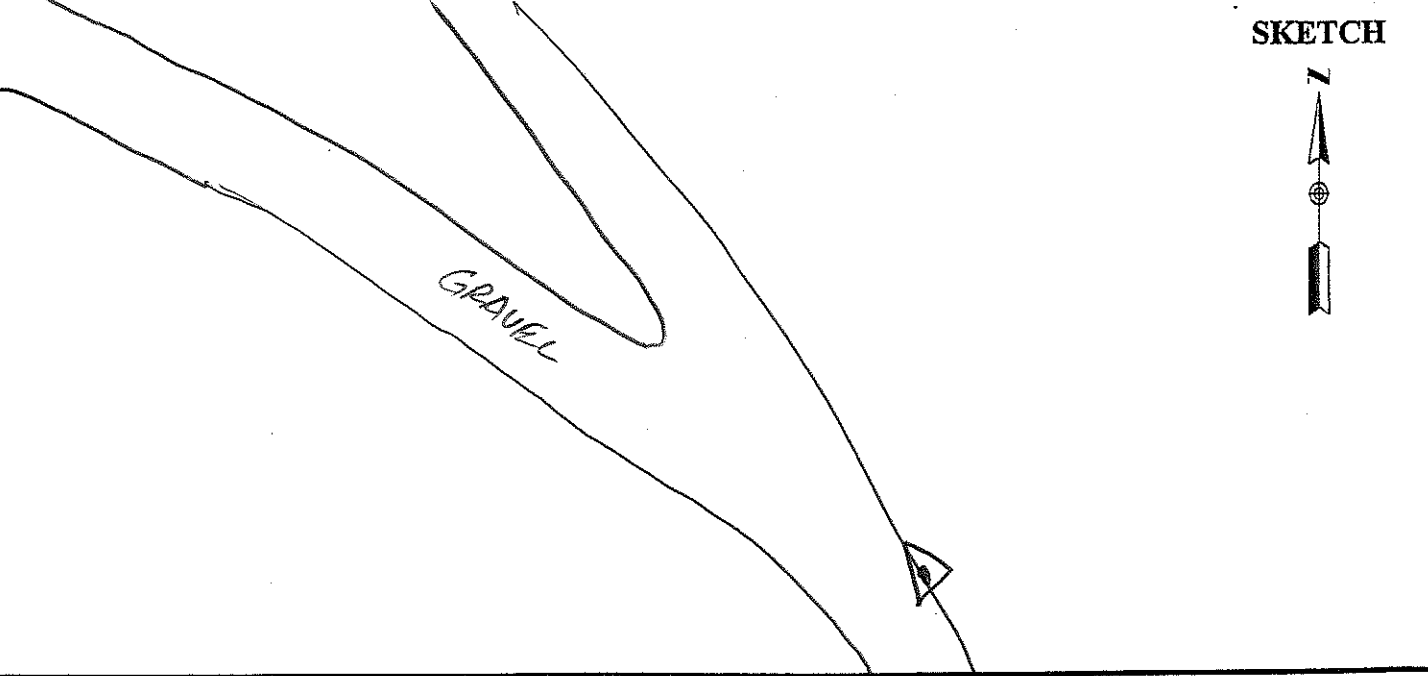
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PROJECT <u>1100904</u>	SITE NUMBER <u>5</u>
OPERATOR <u>WVN</u>	SITE NAME <u>23</u>
DATE <u>9/2/10</u>	

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>12:52</u>	MEMORY CARD <u>601</u>
STOP _____	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.314</u> _____ <u>1.674</u>	STATION DESCRIPTIONS <u>NE EDGE</u> <u>RD @ ext of G RD</u> <u>NW (south'y fork)</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS									
	<u>WINDY</u>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">TIME</th> <th style="width: 15%;">GDOP</th> <th style="width: 70%;">SATELLITES</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">18:52</td> <td style="text-align: center;">2.0</td> <td style="text-align: center;">9/9-9</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	TIME	GDOP	SATELLITES	18:52	2.0	9/9-9				
TIME	GDOP	SATELLITES								
18:52	2.0	9/9-9								



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR WJN
 DATE 9/2/10

SITE NUMBER 6
 SITE NAME 24

TRACKING TIMES (LOCAL) MEASURE MDT
 START 13:27
 STOP 13:53

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.282 _____

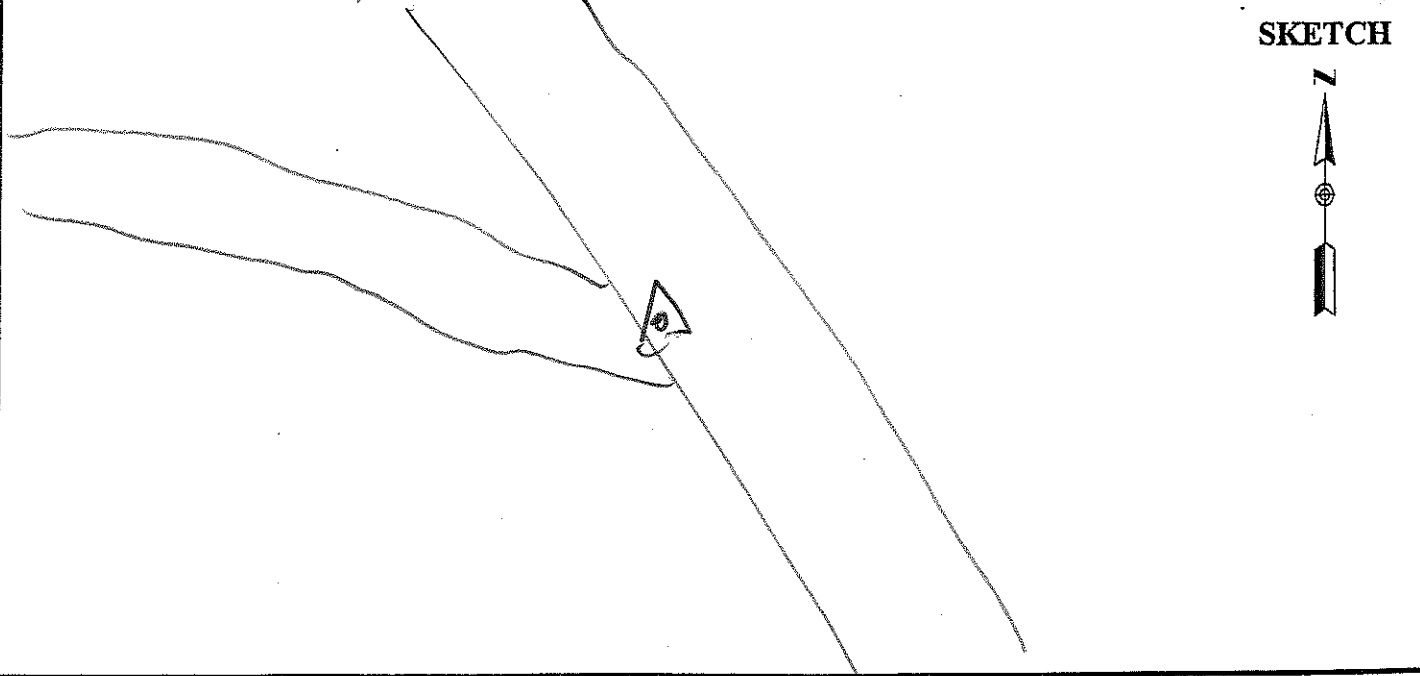
STATION DESCRIPTIONS SW EDGE
Pavement

1.642

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
WINDY

TIME	GDOP	SATELLITES
<u>19:27</u>	<u>2.0</u>	<u>9/9-9</u>
<u>19:53</u>	<u>2.0</u>	<u>9/9-9</u>



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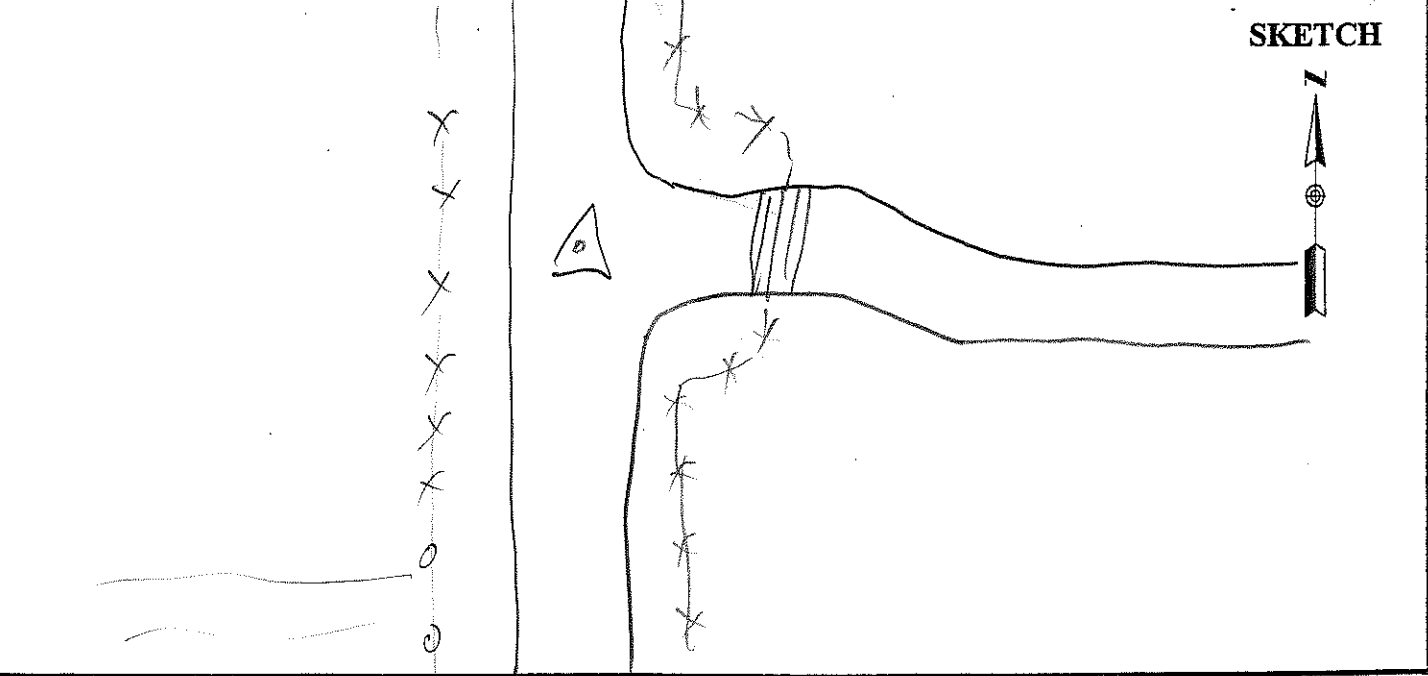
PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/2/10</u>	SITE NUMBER <u>7</u> SITE NAME <u>25</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>14:04</u> STOP <u>14:27</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>No</u>
HEIGHT READINGS MTS FT <u>1.276</u> _____ <u>1.636</u>	STATION DESCRIPTIONS <u>C N S</u> <u>GRAVEL RD @ C WINDING</u> <u>RD. E</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>WINDY</u>

TIME	GDOP	SATELLITES
16:04	2.0	8/8-8
16:27	2.7	8/8-8



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SHEBOYGAN, WISCONSIN 53083



PROJECT <u>1100804</u>	SITE NUMBER <u>8</u>
OPERATOR <u>WJN</u>	SITE NAME <u>26</u>
DATE <u>9/2/10</u>	

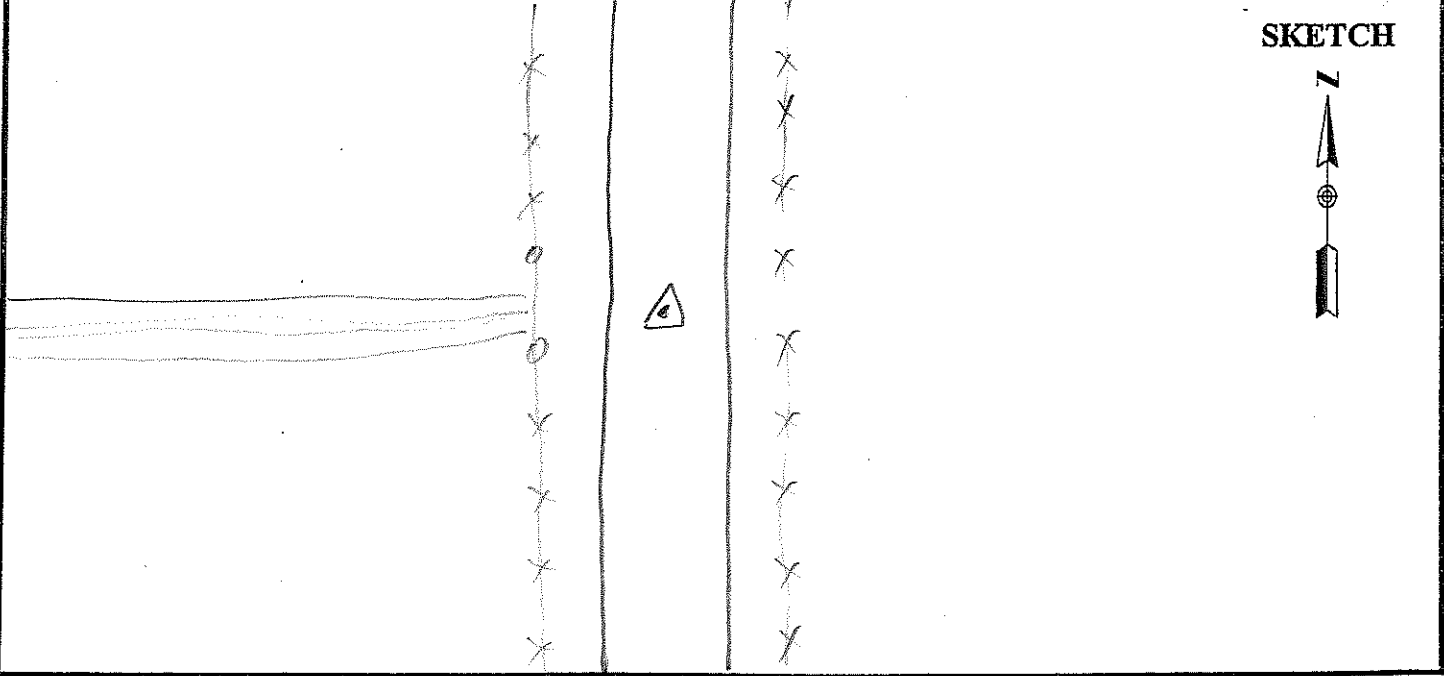
TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>14:38</u>	MEMORY CARD <u>601</u>
STOP <u>14:59</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>No</u>
---	-------------------------

HEIGHT READINGS MTS FT <u>1.314</u> _____ <u>1.664</u> _____	STATION DESCRIPTIONS <u>E N-S</u> <u>GRAVEL RD @ E 2 TRACK</u> <u>W</u>
--	---

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>WINDY</u>
------------------------	---

TIME	GDOP	SATELLITES
20:38	2.8	8/8-8
20:59	2.8	8/8-8



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✓

PROJECT 1100804
OPERATOR WJN
DATE 9/1/10

SITE NUMBER 9
SITE NAME 27

TRACKING TIMES (LOCAL) MEASURE MDT
START 15:10
STOP 15:31

SENSOR TYPE 500 9500 399 299
MEMORY CARD 601
BATTERY NO. _____
CONTROLLER NO. _____
SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: No

HEIGHT READINGS MTS FT
1.380 _____

STATION DESCRIPTIONS POINT IN
FLAT AREA NEAR NE
EDGE ROAD OPP &
2 TRACK E'LY

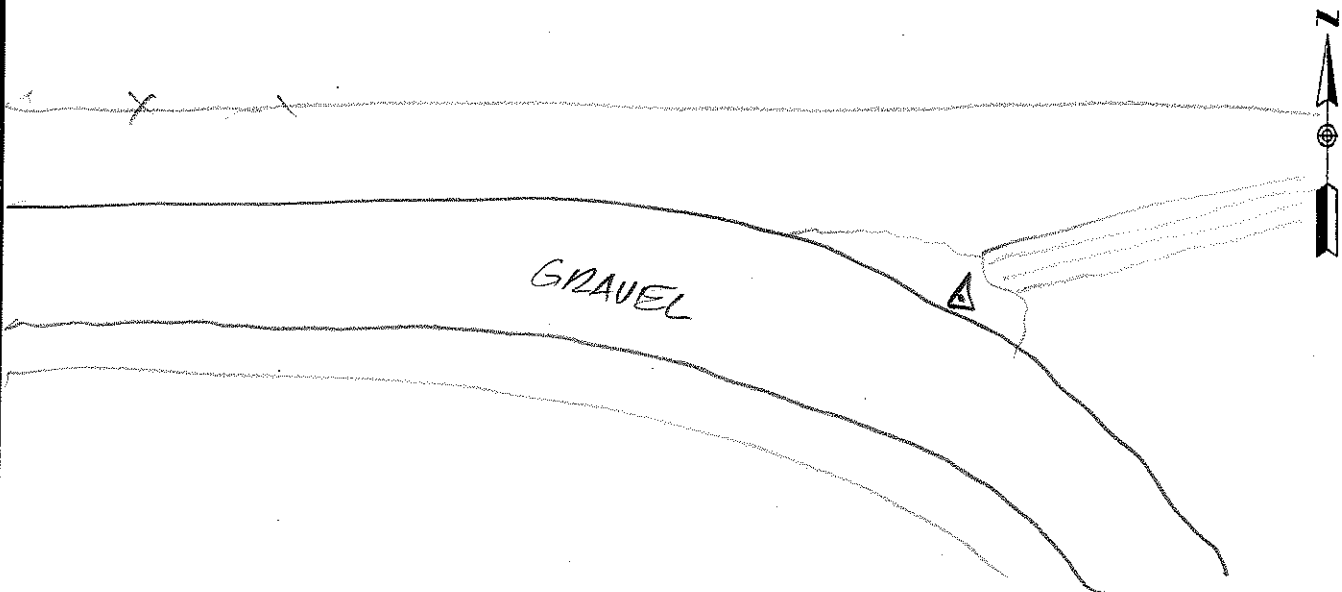
SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

TIME	GDOP	SATELLITES
21:10	2.2	8/8-9
21:31	2.8	7/7-7

WINDY - CALMING

SKETCH



AERO-METRIC, INC.
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 SHEBOYGAN, WISCONSIN 53083



PROJECT 1100804
 OPERATOR WJN
 DATE 9/2/10

SITE NUMBER 10
 SITE NAME 28

TRACKING TIMES (LOCAL) MEASURE NOT
 START 15:44
 STOP 16:10

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

HEIGHT READINGS MTS FT
 1.336 _____

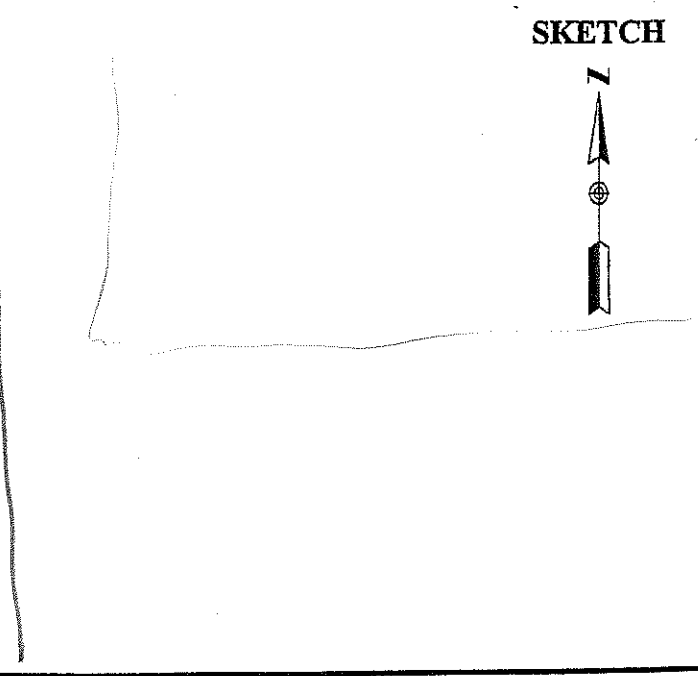
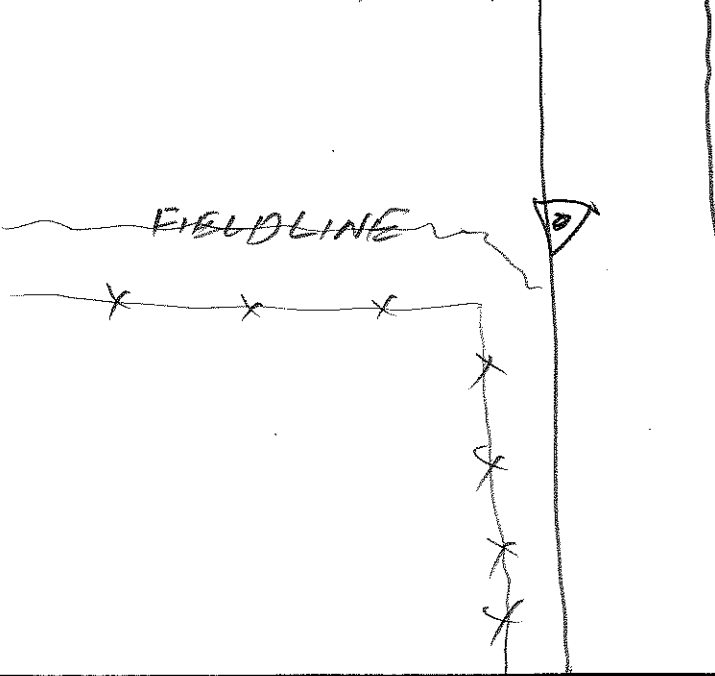
OBSTRUCTIONS: NO

STATION DESCRIPTIONS W. EDGE
GRAVEL

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
<u>21:44</u>	<u>2.0</u>	<u>8/8-9</u>
<u>22:10</u>	<u>2.1</u>	<u>9/9-9</u>

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
SKC



**AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083**

BASE

PROJECT 1100904
 OPERATOR WJN
 DATE 9/3/10

SITE NUMBER 1
 SITE NAME 101

TRACKING TIMES (LOCAL) MEASURE MDT
 START 8:56
 STOP 15:55

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 11
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
 1.167 _____

STATION DESCRIPTIONS Rebar and
CAP

1.527

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

PC

TIME	GDOP	SATELLITES
<u>14:56</u>	<u>2.0</u>	<u>9/9-9</u>
<u>21:55</u>	<u>1.7</u>	<u>11/11-11</u>

AS BEFORE DESCRIBED

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/3/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>104</u>
---	--

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>9:28</u> STOP <u>16:21</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>14</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
---	---


SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u> _____ _____ _____
HEIGHT READINGS MTS FT <u>1.202</u> _____ <u>1.562</u>	STATION DESCRIPTIONS <u>Rebar and</u> <u>CAP</u> _____ _____

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>PC</u>
------------------------	--

TIME	GDOP	SATELLITES	
<u>15:28</u>	<u>2.0</u>	<u>9/9-9</u>	
<u>22:21</u>	<u>2.2</u>	<u>8/8-8</u>	

set 9/2/10

SKETCH



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PROJECT 1100804
 OPERATOR WJN
 DATE 9/2/10

SITE NUMBER 1
 SITE NAME 29

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:39
 STOP 10:05

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

HEIGHT READINGS MTS FT
 1.295 _____

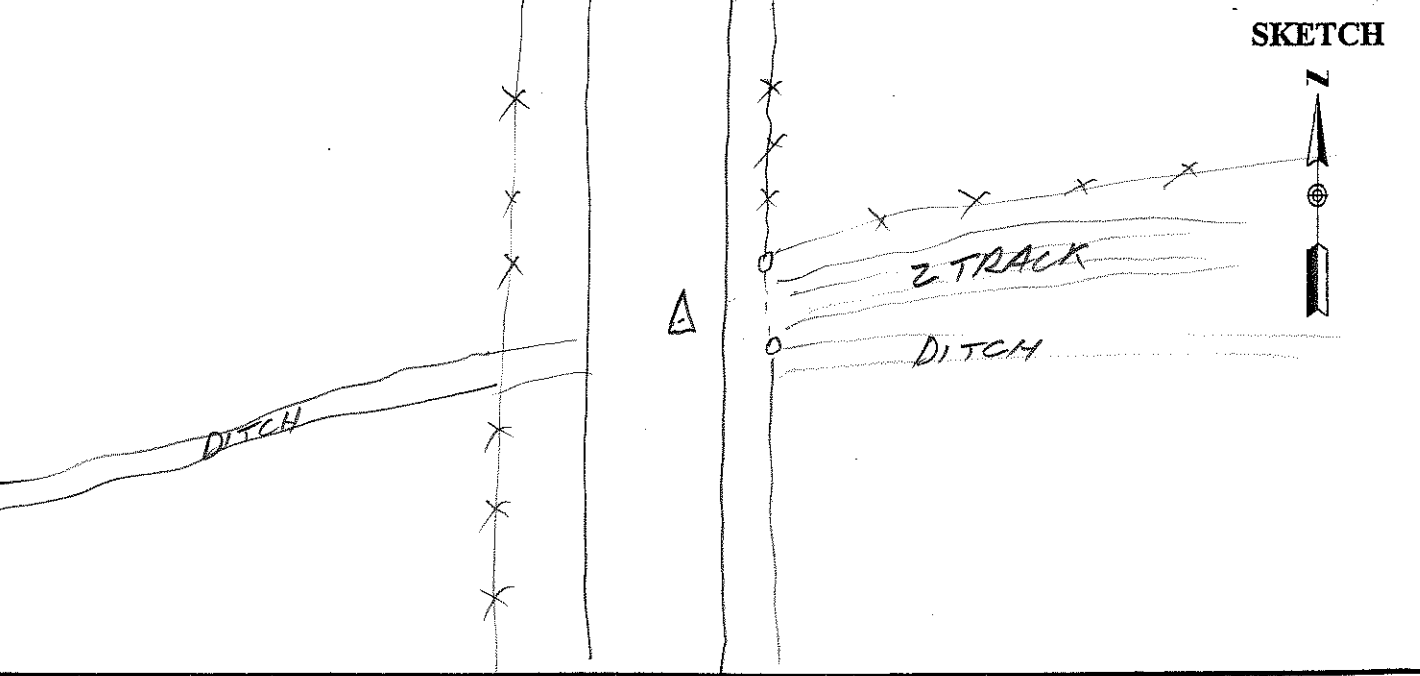
OBSTRUCTIONS: CROSSOVERS
E.

STATION DESCRIPTIONS Q. N. BND
LANE GRAVEL RD OFF
2 TRACK E.

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
<u>15:39</u>	<u>2.1</u>	<u>9/9-9</u>
<u>16:05</u>	<u>2.0</u>	<u>9/9-9</u>

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
PC



AERO-METRIC, INC.
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SHEBOYGAN, WISCONSIN 53083



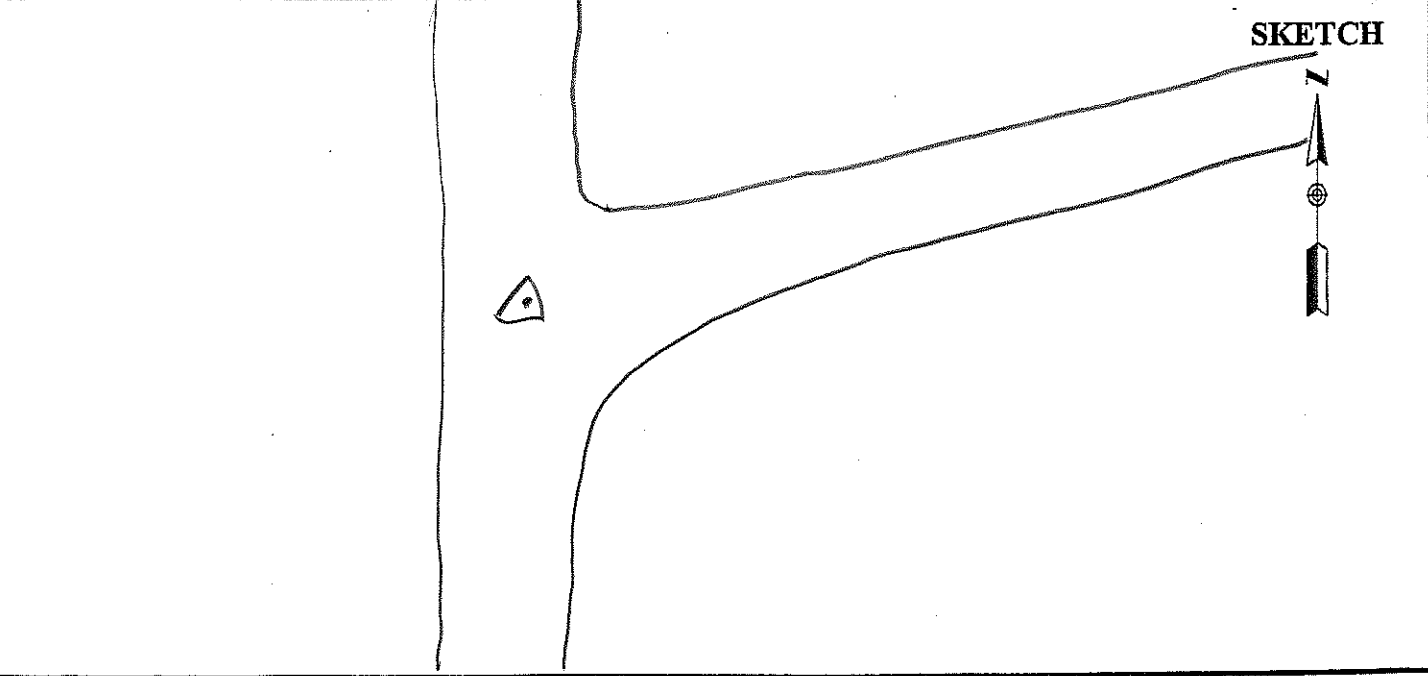
PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/3/10</u>	SITE NUMBER <u>2</u> SITE NAME <u>30</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>10:16</u> STOP <u>10:45</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.326</u> _____	STATION DESCRIPTIONS <u>CC</u> <u>INT RDS N-S-NE</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>PC</u>

TIME	GDOP	SATELLITES
16:16	1-8	11/11-11
16:45	1-8	10/10-10



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 SHEBOYGAN, WISCONSIN 53083

SPARSE
 GRASS
 ✓

PROJECT 1100804
 OPERATOR WJN
 DATE 9/3/10

SITE NUMBER 3
 SITE NAME 31

TRACKING TIMES (LOCAL) MEASURE MDT
 START 11:02
 STOP 11:30

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: N/O

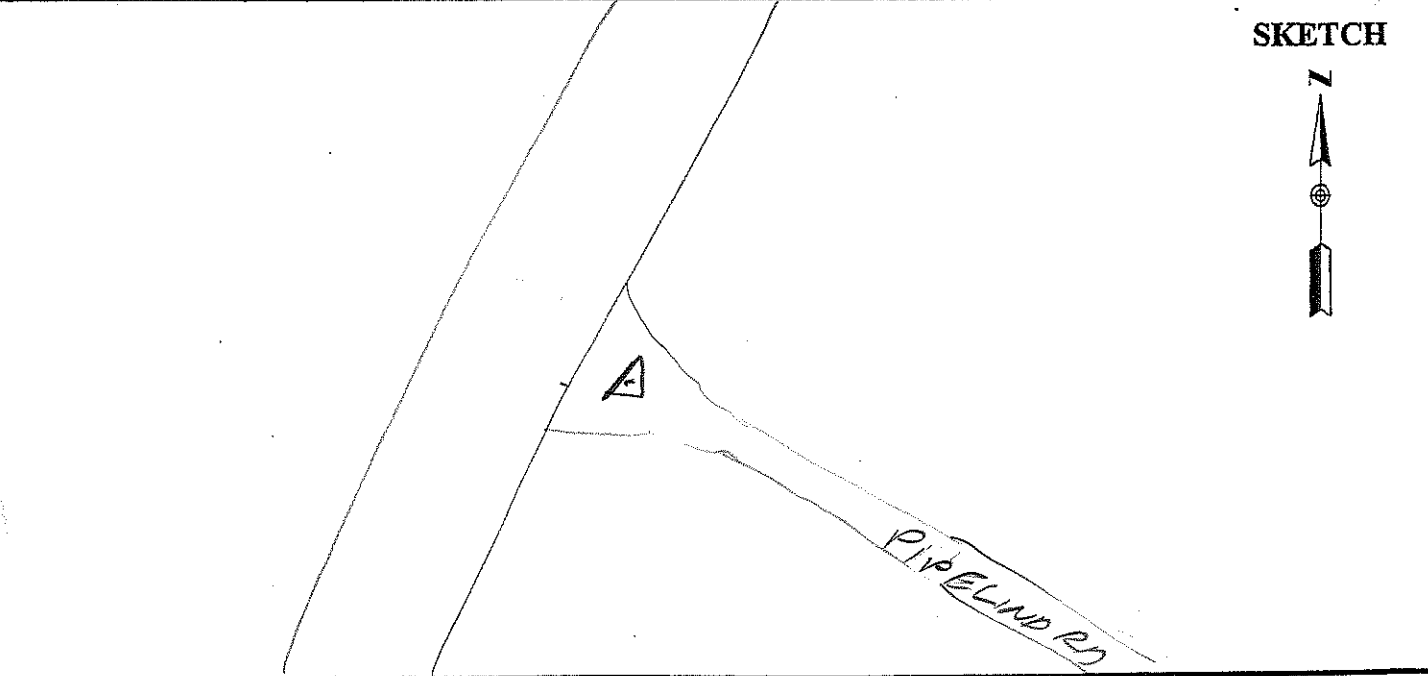
HEIGHT READINGS MTS FT
 1.260 _____

STATION DESCRIPTIONS PONTIAC
FLAT SPARSE GRASS
AREA ± 13' SE OF
Q GRAVEL RD AND
@ Q 2 TRACK SE

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
PC

TIME	GDOP	SATELLITES
17:02	1.9	10/10-10
17:30	1.9	10/10-10



SKETCH

AERO-METRIC, INC.
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SHEBOYGAN, WISCONSIN 53083



PROJECT <u>1100904</u>	SITE NUMBER <u>4</u>
OPERATOR <u>WJN</u>	SITE NAME <u>32</u>
DATE <u>9/3/10</u>	

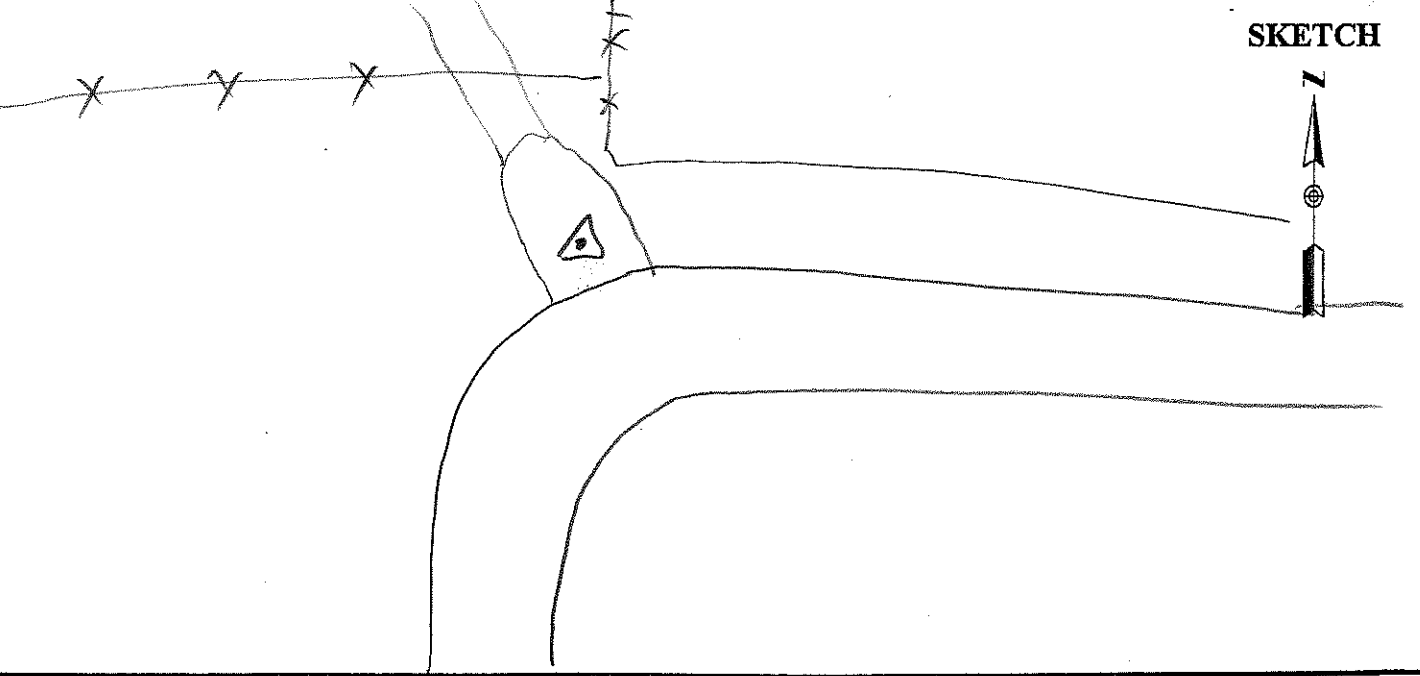
TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>11:42</u>	MEMORY CARD <u>601</u>
STOP <u>12:12</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
--	-------------------------

HEIGHT READINGS MTS FT <u>1.312</u> _____	STATION DESCRIPTIONS <u>Q GRAVEL</u> <u>ACCESS PAD TO FIELD</u> <u>@ FENCE / FIELD LINE</u> <u>N.</u>
--	--

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>PC</u>

TIME	GDOP	SATELLITES
<u>17:42</u>	<u>1.8</u>	<u>10/10-10</u>
<u>18:12</u>	<u>1.5</u>	<u>11/11-11</u>



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SHEBOYGAN, WISCONSIN 53083

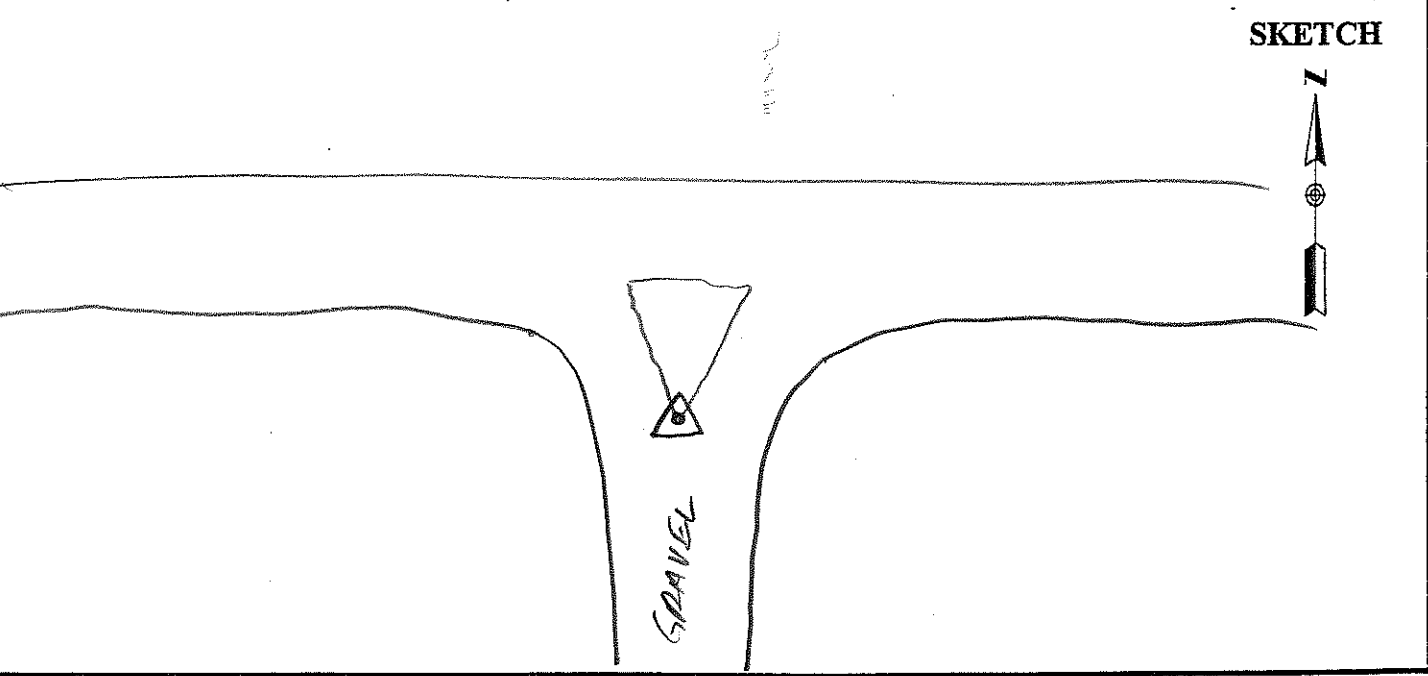
PROJECT <u>1100804</u> OPERATOR <u>WIN</u> DATE <u>9/3/10</u>	SITE NUMBER <u>5</u> SITE NAME <u>33</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>12:37</u> STOP <u>13:03</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.271</u> _____	STATION DESCRIPTIONS <u>4 RD S.</u> <u>@ S. TIP SHORT GRASS</u> <u>TRIANGLE</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>PC</u>

TIME	GDOP	SATELLITES
<u>18:37</u>	<u>2.1</u>	<u>7/7-9</u>
<u>19:03</u>	<u>2.0</u>	<u>9/9-9</u>



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SHEBOYGAN, WISCONSIN 53083



PROJECT 1100304
 OPERATOR WJN
 DATE 9/3/10

SITE NUMBER 6
 SITE NAME 34

TRACKING TIMES (LOCAL) MEASURE MDT
 START 13:15
 STOP 13:49

SENSOR TYPE 500 9500 399 299
 MEMORY CARD 601
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

OBSTRUCTIONS: NO

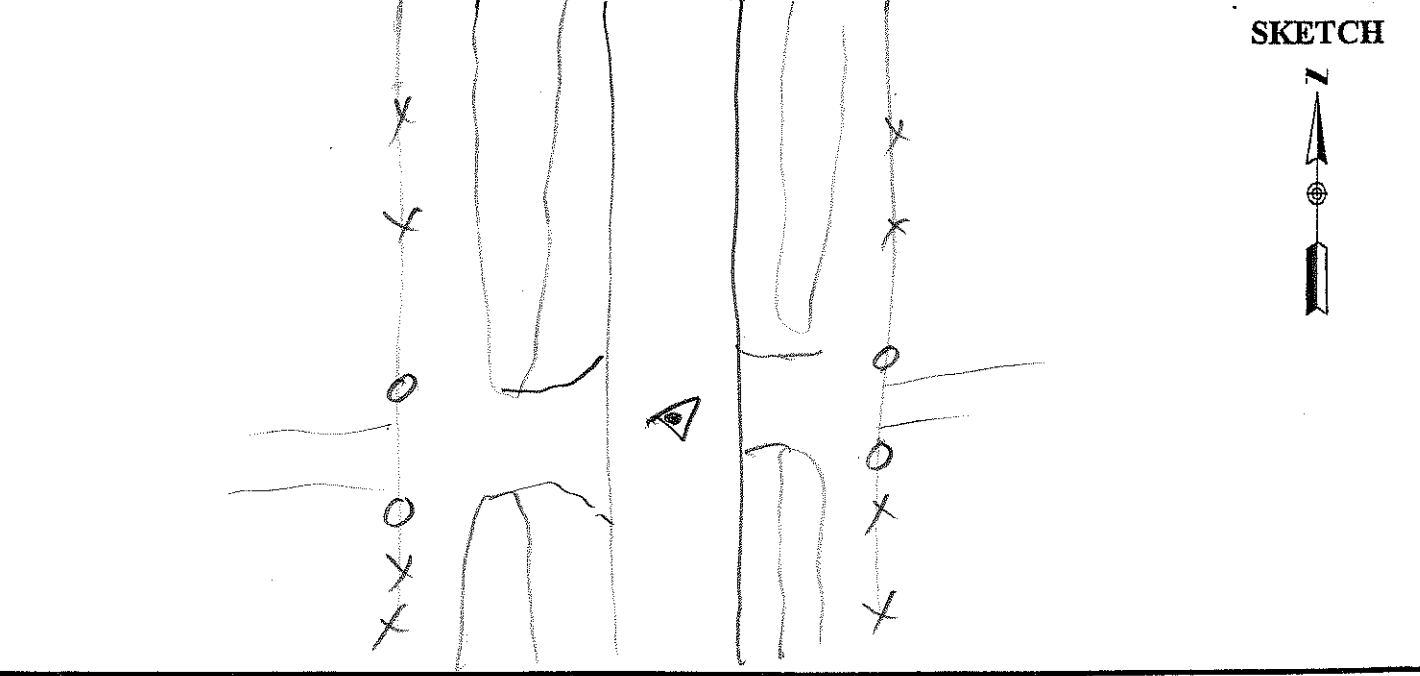
HEIGHT READINGS MTS FT
 1.299 _____

STATION DESCRIPTIONS C N-S
RD (GRAVEL) @ RANGE
ACCESS E-W

SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
FC

TIME	GDOP	SATELLITES
19:15	2.3	9/9-9
19:49	2.3	9/9-9



AERO-METRIC, INC.
 4020 TECHNOLOGY PARKWAY
 SHEBOYGAN, WISCONSIN 53083



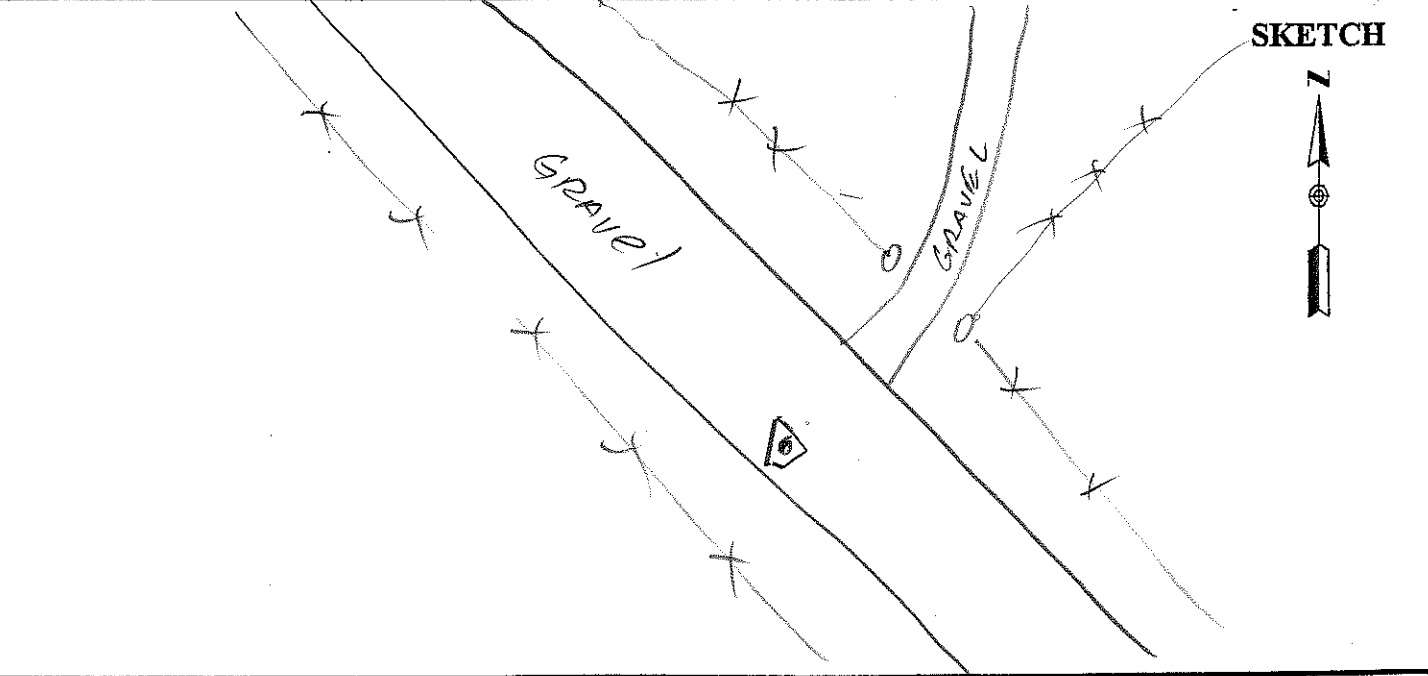
PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/2/10</u>	SITE NUMBER <u>7</u> SITE NAME <u>35</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>13:47</u> STOP <u>14:08</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.317</u> _____	STATION DESCRIPTIONS <u>E SE BND</u> <u>LANE OPP E RANCH</u> <u>ACC DR. NE</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>PC</u>
------------------------	--

TIME	GDOP	SATELLITES
19:47	2.3	8/8-8
20:08	2.1	8/8-8



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4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

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PROJECT <u>1100904</u>	SITE NUMBER <u>8</u>
OPERATOR <u>WJN</u>	SITE NAME <u>36</u>
DATE <u>9/3/10</u>	

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>14:19</u>	MEMORY CARD <u>601</u>
STOP <u>14:40</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
--	-------------------------

HEIGHT READINGS MTS FT <u>1.329</u> _____	STATION DESCRIPTIONS <u>G S BND</u> <u>LANG GRAVEL RD</u>
--	--

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>PC</u>
------------------------	--

TIME	GDOP	SATELLITES	
<u>20:19</u>	<u>1.9</u>	<u>8/8-8</u>	
<u>20:40</u>	<u>2.0</u>	<u>8/8-8</u>	

	<p style="text-align: right;">SKETCH</p> <div style="text-align: center;"> </div>
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AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

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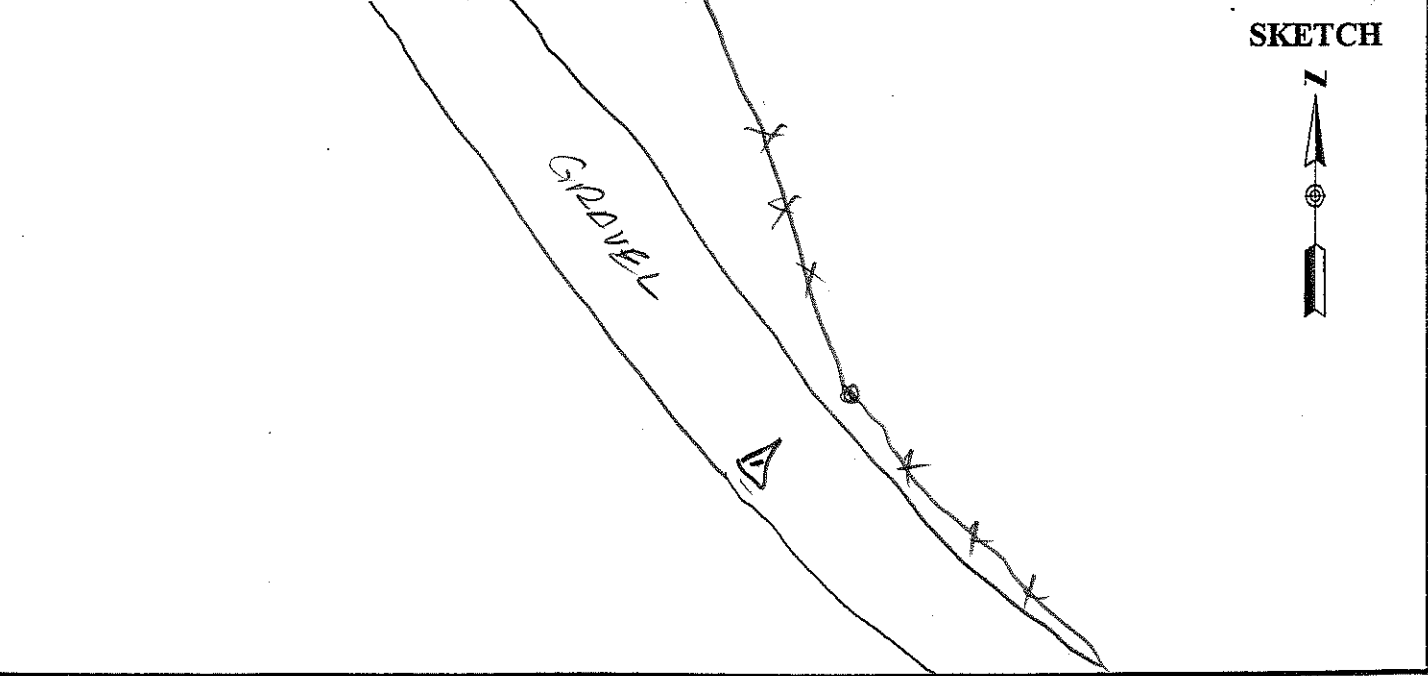
PROJECT <u>1100904</u> OPERATOR <u>WJN</u> DATE <u>9/3/10</u>	SITE NUMBER <u>9</u> SITE NAME <u>37</u>
---	---

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>14:49</u> STOP <u>15:11</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1315</u> _____	STATION DESCRIPTIONS <u>Q SW BND</u> <u>LANE</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>PC</u>
------------------------	--

TIME	GDOP	SATELLITES
20:49	2.2	9/9-9
21:11	2.1	9/9-9



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083



PROJECT <u>1100904</u> OPERATOR <u>WJN</u> DATE <u>9/3/10</u>	SITE NUMBER <u>10</u> SITE NAME <u>38</u>
---	--

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>15:19</u> STOP <u>15:40</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	--

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.236</u> _____	STATION DESCRIPTIONS <u>POINT IN</u> <u>LONG PATCHY GRASS</u> <u>10' SW OF SW EDGE</u> <u>GRAVEL RD</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>PC</u>

TIME	GDOP	SATELLITES
<u>21:19</u>	<u>2.0</u>	<u>9/9-9</u>
<u>21:40</u>	<u>2.0</u>	<u>9/9-9</u>



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT <u>1100804</u> OPERATOR <u>WJN</u> DATE <u>9/7/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>101</u>
---	--

TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>6:57</u> STOP _____	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>11</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
--	---

SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u> _____ _____ _____
HEIGHT READINGS MTS FT <u>1.173</u> _____	STATION DESCRIPTIONS <u>REBAR AND CAP</u> _____ _____ _____

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>SKC</u>
------------------------	---

TIME	GDOP	SATELLITES	
<u>12:57</u>	<u>3.5</u>	<u>7/7-7</u>	

AS BEFORE DESCRIBED

SKETCH



1.16

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT <u>1100904</u> OPERATOR <u>WJN</u> DATE <u>9/17/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>102</u>
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TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>7:37</u> STOP _____	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>14</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
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SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.191</u> _____	STATION DESCRIPTIONS <u>REPAIR AND CAD</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>PC</u>
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TIME	GDOP	SATELLITES
<u>13:37</u>	<u>2.0</u>	<u>8/8-8</u>

AS BEFORE DESCRIBED

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

SPARSE GRASS
✓

PROJECT <u>1100304</u>	SITE NUMBER <u>1</u>
OPERATOR <u>WVN</u>	SITE NAME <u>39</u>
DATE <u>9/7/10</u>	

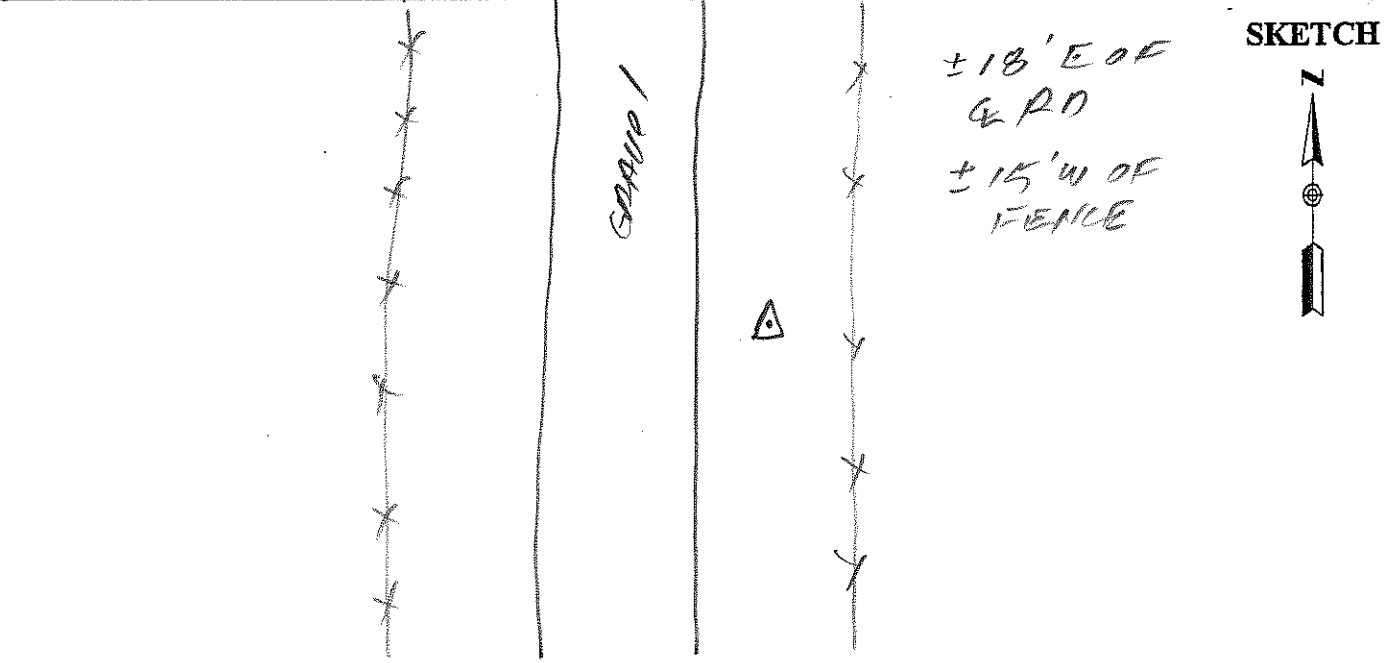
TRACKING TIMES (LOCAL) MEASURE <u>MDT</u>	SENSOR TYPE <u>500</u> 9500 399 299
START <u>9:25</u>	MEMORY CARD <u>601</u>
STOP <u>9:57</u>	BATTERY NO. _____
	CONTROLLER NO. _____
	SENSOR NO. _____

SENSOR CONSTANT	299/399	0.441	OBSTRUCTIONS: <u>NO</u>
	399E/9500	0.389	
	500	<u>0.360</u>	

HEIGHT READINGS	MTS	FT	STATION DESCRIPTIONS <u>POINT IN</u>
	<u>1.244</u>		<u>SPARSE GRASS FLAT</u>
			<u>AREA E OF NLS RD</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
	<u>PC</u>

TIME	GDOP	SATELLITES
<u>15:25</u>	<u>2.2</u>	<u>9/9-9</u>
<u>15:57</u>	<u>2.2</u>	<u>9/9-9</u>



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

✓

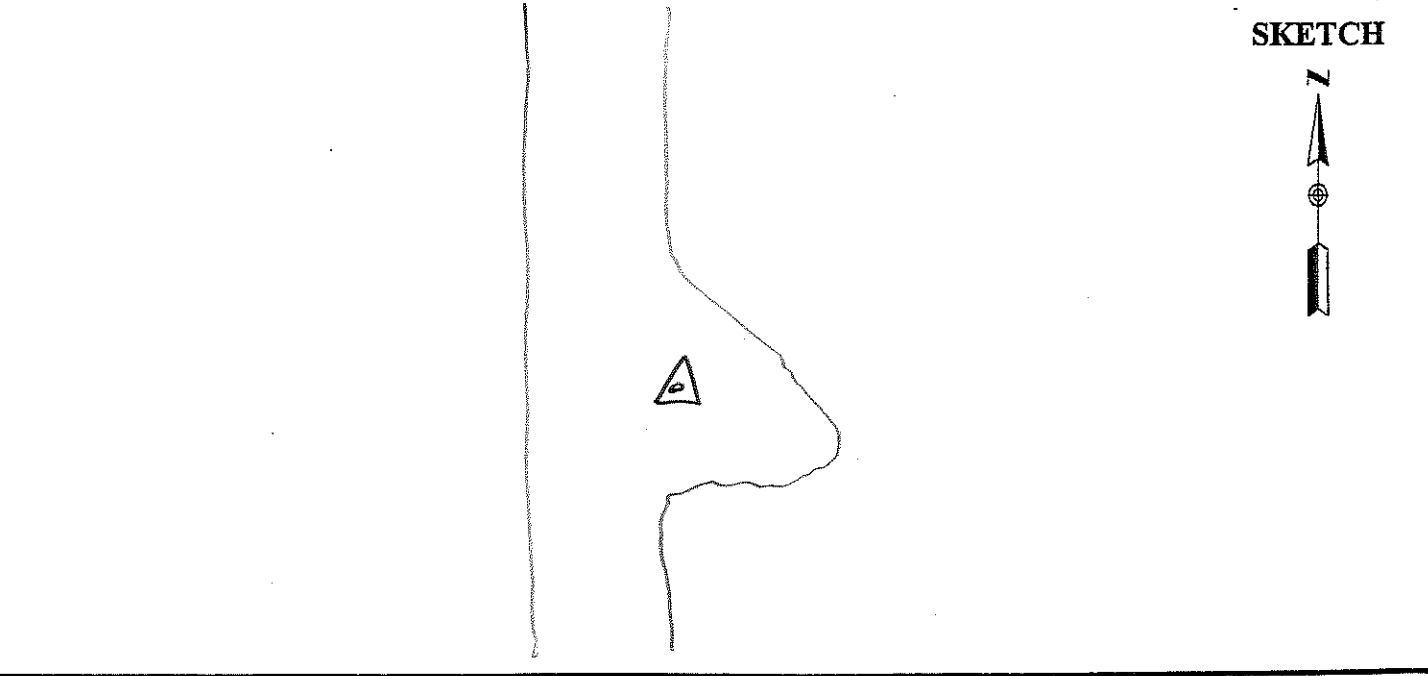
PROJECT <u>1100304</u> OPERATOR <u>WJN</u> DATE <u>9/7/10</u>	SITE NUMBER <u>2</u> SITE NAME <u>40</u>
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TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>10:10</u> STOP <u>10:36</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD <u>601</u> BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
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SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>N/A</u> _____ _____ _____
HEIGHT READINGS MTS FT <u>1.2600</u> _____	STATION DESCRIPTIONS <u>POINT IN</u> <u>FLAT GRAVEL FIELD</u> <u>ACC</u> _____ _____

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>PC becoming MC</u>
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TIME	GDOP	SATELLITES
16:10	1.9	11/11-11
10:36	1.4	11/11-11



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT <u>1100804</u> OPERATOR <u>WJW</u> DATE <u>9/6/10</u>	SITE NUMBER <u>1</u> SITE NAME <u>101</u>
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TRACKING TIMES (LOCAL) MEASURE <u>MDT</u> START <u>7:18</u> STOP <u>19:04</u>	SENSOR TYPE <u>500</u> 9500 399 299 MEMORY CARD _____ BATTERY NO. _____ CONTROLLER NO. _____ SENSOR NO. _____
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SENSOR CONSTANT 299/399 0.441 399E/9500 0.389 500 <u>0.360</u>	OBSTRUCTIONS: <u>NO</u>
HEIGHT READINGS MTS FT <u>1.154</u> _____ 1.514	STATION DESCRIPTIONS <u>12 BAR 400 CAP</u>

SATELLITE OBSERVATIONS	WEATHER CONDITIONS/IMPORTANT OBSERVATIONS <u>MC WINDY</u>
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TIME	GDOP	SATELLITES
13:18	2.7	7/7-7
01:04	2.2	8/8-8

AS BEFORE DESCRIBED

SKETCH


AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

BASE

PROJECT M00804
 OPERATOR WJN
 DATE 9/6/10

SITE NUMBER 1
 SITE NAME 102

TRACKING TIMES (LOCAL) MEASURE MDT
 START 9:00
 STOP 19:42

SENSOR TYPE 500 9500 399 299
 MEMORY CARD _____
 BATTERY NO. _____
 CONTROLLER NO. _____
 SENSOR NO. _____

SENSOR CONSTANT 299/399 0.441
 399E/9500 0.389
 500 0.360

HEIGHT READINGS MTS FT
 1.193 _____

1.543

OBSTRUCTIONS: NO

STATION DESCRIPTIONS REBAR ¹/₂ CAP


SATELLITE OBSERVATIONS

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
 MC WINDY

TIME	GDOP	SATELLITES
14:00	2.4	8/8-8
01:42	2.2	8/8-8

AS BEFORE DESCRIBED

SKETCH



14:48:43, Tue Sep 07, 2010

INI file: C:\WINNT\GEOLAB.INI
 Input file: Q:\1100804\G~GOQP#E\SURVEY\GEO\C.IOB
 Output file: Q:\1100804\G~GOQP#E\SURVEY\GEO\C.LST

Geoid File: C:\GEOLAB2\G2009U02.GEO

PARAMETERS		OBSERVATIONS	
Description	Number	Description	Number
No. of Stations	52	Directions	0
Coord Parameters	134	Distances	0
Free Latitudes	45	Azimuths	0
Free Longitudes	45	Vertical Angles	0
Free Heights	44	Zenithal Angles	0
Fixed Coordinates	22	Angles	0
Astro. Latitudes	0	Heights	0
Astro. Longitudes	0	Height Differences	0
Geoid Records	0	Auxiliary Params.	0
All Aux. Pars.	0	2-D Coords.	0
Direction Pars.	0	2-D Coord. Diffs.	0
Scale Parameters	0	3-D Coords.	0
Constant Pars.	0	3-D Coord. Diffs.	345
Rotation Pars.	0		
Translation Pars.	0		
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Total Parameters	134	Total Observations	345
Degrees of Freedom =		211	

SUMMARY OF SELECTED OPTIONS

OPTION	SELECTION
Computation Mode	Adjustment
Maximum Iterations	5
Convergence Criterion	0.00100
Confidence Level for Statistics	95.000
Covariance Matrix Computation	Connected Portion Only
Residual Rejection Criterion	Tau Max
Confidence Region Types	3D Station Relative
Relative Confidence Regions	Connected Only
Variance Factor (VF) Known	Yes
CMULT (Multiply Parm Cov With VF)	Yes
RMULT (Multiply Res Cov With VF)	No
Force Convergence in Max Iters	Yes
Distances Affect 3D	No
Full Inverse Computed	No
Normals Reordered	Yes
Coordinates Generated	No
Geoid Interpolation Method	Bi-Linear

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
NEO	000	1	5146579.098 0.005	668903.856 0.005	1100.114 0.004	UTM 12
SFMC		1	0.99995068	1 35 39.881081	UTM 12	
NEO	000	10	5151687.135 0.008	662368.666 0.008	1174.831 0.007	UTM 12
SFMC		10	0.99992407	1 32 6.854796	UTM 12	
NEO	000	101	5130133.854 0.003	656451.737 0.003	1068.946 0.003	UTM 12
SFMC		101	0.99990089	1 28 9.715934	UTM 12	
NEO	000	102	5157063.156 0.006	684729.307 0.006	1113.567 0.003	UTM 12
SFMC		102	1.00001947	1 44 57.764879	UTM 12	
NEO	000	103	5146589.993 0.005	670731.283 0.005	1052.424 0.004	UTM 12
SFMC		103	0.99995831	1 36 41.940722	UTM 12	
NEO	000	104	5137341.344 0.006	633997.365 0.006	1142.914 0.006	UTM 12
SFMC		104	0.99982071	1 15 41.288910	UTM 12	
NEO	000	11	5165151.485 0.009	673236.062 0.009	1155.584 0.006	UTM 12
SFMC		11	0.99996889	1 38 41.374194	UTM 12	
NEO	000	12	5162997.609 0.009	673291.037 0.009	1130.152 0.006	UTM 12
SFMC		12	0.99996913	1 38 39.247368	UTM 12	
NEO	000	13	5160554.440 0.009	673373.146 0.009	1106.685 0.006	UTM 12
SFMC		13	0.99996948	1 38 37.508697	UTM 12	
NEO	000	14	5157497.586 0.009	673447.456 0.009	1113.878 0.007	UTM 12
SFMC		14	0.99996980	1 38 34.364175	UTM 12	
NEO	000	15	5158886.408 0.010	671002.233 0.010	1158.118 0.008	UTM 12
SFMC		15	0.99995944	1 37 13.612307	UTM 12	
NEO	000	16	5158885.814 0.010	668967.949 0.010	1146.006 0.008	UTM 12
SFMC		16	0.99995094	1 36 4.281932	UTM 12	
NEO	000	17	5158782.897 0.011	665992.791 0.011	1136.074 0.010	UTM 12
SFMC		17	0.99993869	1 34 22.699889	UTM 12	
NEO	000	18	5158729.300 0.013	662206.388 0.013	1159.863 0.012	UTM 12
SFMC		18	0.99992341	1 32 13.555592	UTM 12	
NEO	000	19	5160582.441 0.008	674983.718 0.008	1105.178 0.006	UTM 12
SFMC		19	0.99997638	1 39 32.474780	UTM 12	
NEO	000	2	5146507.433 0.006	666391.355 0.006	1079.545 0.005	UTM 12
SFMC		2	0.99994033	1 34 14.453107	UTM 12	
NEO	000	20	5137832.909 0.007	665063.035 0.007	1113.946 0.006	UTM 12
SFMC		20	0.99993492	1 33 14.104279	UTM 12	
NEO	000	21	5130189.702	658756.875	1064.039	UTM 12

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
			0.004	0.004	0.003	
SFMC		21	0.99990982	1 29 27.681271	UTM 12	
NEO	000	22	5132061.865	658068.321	1088.248	UTM 12
			0.004	0.004	0.004	
SFMC		22	0.99990714	1 29 7.561666	UTM 12	
NEO	000	23	5134845.435	657040.185	1128.985	UTM 12
			0.005	0.005	0.004	
SFMC		23	0.99990316	1 28 37.451771	UTM 12	
NEO	000	24	5137219.396	654763.648	1191.552	UTM 12
			0.006	0.006	0.006	
SFMC		24	0.99989443	1 27 24.336851	UTM 12	
NEO	000	25	5140909.671	654727.883	1113.492	UTM 12
			0.007	0.007	0.007	
SFMC		25	0.99989429	1 27 29.202264	UTM 12	
NEO	000	26	5143823.122	654657.926	1161.026	UTM 12
			0.008	0.008	0.008	
SFMC		26	0.99989402	1 27 31.631187	UTM 12	
NEO	000	27	5147846.223	654428.187	1143.864	UTM 12
			0.009	0.009	0.009	
SFMC		27	0.99989315	1 27 30.462711	UTM 12	
NEO	000	28	5150421.970	652914.380	1169.360	UTM 12
			0.010	0.010	0.010	
SFMC		28	0.99988743	1 26 43.241224	UTM 12	
NEO	000	29	5138204.457	633982.114	1150.919	UTM 12
			0.006	0.006	0.006	
SFMC		29	0.99982066	1 15 42.002735	UTM 12	
NEO	000	3	5146396.922	662120.380	1110.316	UTM 12
			0.008	0.008	0.007	
SFMC		3	0.99992308	1 31 49.254938	UTM 12	
NEO	000	30	5141817.548	634101.785	1202.555	UTM 12
			0.006	0.006	0.006	
SFMC		30	0.99982106	1 15 51.215947	UTM 12	
NEO	000	31	5144319.804	636494.295	1223.035	UTM 12
			0.007	0.007	0.007	
SFMC		31	0.99982901	1 17 16.002817	UTM 12	
NEO	000	32	5148323.066	637023.352	1208.028	UTM 12
			0.009	0.009	0.009	
SFMC		32	0.99983079	1 17 39.813032	UTM 12	
NEO	000	33	5150263.122	646340.651	1257.396	UTM 12
			0.011	0.011	0.011	
SFMC		33	0.99986324	1 22 59.476231	UTM 12	
NEO	000	34	5146966.581	646490.476	1223.483	UTM 12
			0.010	0.010	0.010	
SFMC		34	0.99986378	1 22 59.414855	UTM 12	
NEO	000	35	5144461.836	647283.792	1164.460	UTM 12
			0.009	0.009	0.009	
SFMC		35	0.99986665	1 23 22.425991	UTM 12	
NEO	000	36	5142160.112	649755.257	1141.394	UTM 12
			0.008	0.008	0.008	
SFMC		36	0.99987568	1 24 42.630517	UTM 12	
NEO	000	37	5139324.182	651440.234	1148.314	UTM 12
			0.007	0.007	0.007	

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
SFMC		37	0.99988192	1 25 35.200086	UTM 12	
NEO	000	38	5136760.832 0.006	653682.797 0.006	1101.910 0.006	UTM 12
SFMC		38	0.99989033	1 26 46.991321	UTM 12	
NEO	000	39	5134286.432 0.005	659658.893 0.005	1119.106 0.005	UTM 12
SFMC		39	0.99991335	1 30 5.097330	UTM 12	
NEO	000	4	5148410.551 0.009	659060.150 0.009	1168.465 0.008	UTM 12
SFMC		4	0.99991100	1 30 8.769610	UTM 12	
NEO	000	40	5142969.258 0.009	659510.071 0.009	1101.113 0.009	UTM 12
SFMC		40	0.99991276	1 30 14.799514	UTM 12	
NEO	000	5	5150304.959 0.010	657535.249 0.010	1173.350 0.009	UTM 12
SFMC		5	0.99990506	1 29 20.147022	UTM 12	
NEO	000	6	5148633.026 0.007	662659.694 0.007	1136.601 0.007	UTM 12
SFMC		6	0.99992523	1 32 11.446600	UTM 12	
NEO	000	7	5152265.592 0.008	662345.346 0.008	1180.478 0.007	UTM 12
SFMC		7	0.99992397	1 32 7.065246	UTM 12	
NEO	000	8	5152302.216 0.007	664692.147 0.007	1158.093 0.007	UTM 12
SFMC		8	0.99993341	1 33 26.952704	UTM 12	
NEO	000	9	5152505.633 0.007	667212.155 0.007	1103.235 0.006	UTM 12
SFMC		9	0.99994369	1 34 53.028050	UTM 12	
NEO	111	BIL5	5095232.124 0.000	732687.348 0.000	888.860 0.000	UTM 12
SFMC		BIL5	1.00026566	2 9 37.700502	UTM 12	
NEO	111	CARELESS	5149630.026 0.000	616117.850 0.000	1291.870 0.000	UTM 12
SFMC		CARELESS	0.99976574	1 5 50.850860	UTM 12	
NEO	001	E 125 RESET	5167441.185 0.007	684076.142 0.007	1090.590 0.000	UTM 12
SFMC		E 125 RESET	1.00001650	1 44 56.001232	UTM 12	
NEO	111	MTDT	5159916.453 0.000	423883.103 0.000	1230.837 0.000	UTM 12
SFMC		MTDT	0.99967121	0-43 18.562282	UTM 12	
NEO	111	MTEI	5068672.108 0.000	686667.455 0.000	984.037 0.000	UTM 12
SFMC		MTEI	1.00002840	1 43 9.721654	UTM 12	
NEO	111	MTMS	5377260.369 0.000	596942.045 0.000	790.120 0.000	UTM 12
SFMC		MTMS	0.99971546	0 59 3.681064	UTM 12	
NEO	111	MTSU	5056408.344 0.000	496494.120 0.000	1506.357 0.000	UTM 12
SFMC		MTSU	0.99960015	0 -1 55.872937	UTM 12	
NEO	111	Z 122	5128797.149 0.000	661291.993 0.000	1043.329 0.000	UTM 12
SFMC		Z 122	0.99991980	1 30 50.937158	UTM 12	

Adjusted PLH Coordinates:

CODE	FFF	STATION		LATITUDE STD DEV	LONGITUDE STD DEV	ELIP-HEIGHT STD DEV
PLH	000	1	N 46 27	5.87794 0.005	W108 48 2.52561 0.005	1087.029 0.004
PLH	000	10	N 46 29	57.03335 0.008	W108 53 2.23952 0.008	1161.896 0.007
PLH	000	101	N 46 18	24.21197 0.003	W108 58 5.62256 0.003	1056.146 0.003
PLH	000	102	N 46 32	30.31691 0.006	W108 35 26.35102 0.006	1100.261 0.003
PLH	000	103	N 46 27	4.57498 0.005	W108 46 36.91474 0.005	1039.308 0.004
PLH	000	104	N 46 22	34.93460 0.006	W109 15 27.45508 0.006	1130.657 0.006
PLH	000	11	N 46 37	3.16754 0.009	W108 44 14.66418 0.009	1142.509 0.006
PLH	000	12	N 46 35	53.39014 0.009	W108 44 14.98659 0.009	1117.060 0.006
PLH	000	13	N 46 34	34.22211 0.009	W108 44 14.42368 0.009	1093.575 0.006
PLH	000	14	N 46 32	55.19435 0.009	W108 44 15.05205 0.009	1100.757 0.007
PLH	000	15	N 46 33	42.40978 0.010	W108 46 7.94498 0.010	1145.049 0.008
PLH	000	16	N 46 33	44.24254 0.010	W108 47 43.42454 0.010	1132.975 0.008
PLH	000	17	N 46 33	43.57936 0.011	W108 50 3.20035 0.011	1123.104 0.010
PLH	000	18	N 46 33	45.17200 0.013	W108 53 0.99281 0.013	1146.981 0.012
PLH	000	19	N 46 34	33.62543 0.008	W108 42 58.77725 0.008	1092.042 0.006
PLH	000	2	N 46 27	5.80507 0.006	W108 50 0.30637 0.006	1066.506 0.005
PLH	000	20	N 46 22	26.13239 0.007	W108 51 13.55746 0.007	1100.948 0.006
PLH	000	21	N 46 18	24.09164 0.004	W108 56 17.85601 0.004	1051.189 0.003
PLH	000	22	N 46 19	25.28875 0.004	W108 56 47.75808 0.004	1075.407 0.004
PLH	000	23	N 46 20	56.27768 0.005	W108 57 32.45513 0.005	1116.161 0.004
PLH	000	24	N 46 22	15.03154 0.006	W108 59 16.07937 0.006	1178.776 0.006
PLH	000	25	N 46 24	14.54849 0.007	W108 59 13.35963 0.007	1100.717 0.007
PLH	000	26	N 46 25	48.94033 0.008	W108 59 13.16203 0.008	1148.259 0.008
PLH	000	27	N 46 27	59.39244 0.009	W108 59 19.12510 0.009	1131.112 0.009
PLH	000	28	N 46 29	24.03415 0.010	W109 00 27.01626 0.010	1156.665 0.010
PLH	000	29	N 46 23	2.89660 0.006	W109 15 27.27930 0.006	1138.663 0.006

Adjusted PLH Coordinates:

CODE	FFF	STATION		LATITUDE STD DEV	LONGITUDE STD DEV	ELIP-HEIGHT STD DEV
PLH	000	3	N 46 27	5.97010 0.008	W108 53 20.50902 0.008	1097.362 0.007
PLH	000	30	N 46 24	59.81726 0.006	W109 15 17.94900 0.006	1190.310 0.006
PLH	000	31	N 46 26	19.12327 0.007	W109 13 23.29198 0.007	1210.766 0.007
PLH	000	32	N 46 28	28.37466 0.009	W109 12 54.27454 0.009	1195.784 0.009
PLH	000	33	N 46 29	24.14581 0.011	W109 05 35.38199 0.011	1244.927 0.011
PLH	000	34	N 46 27	37.28482 0.010	W109 05 32.09050 0.010	1210.988 0.010
PLH	000	35	N 46 26	15.55796 0.009	W109 04 57.76604 0.009	1151.918 0.009
PLH	000	36	N 46 24	59.07054 0.008	W109 03 4.66960 0.008	1128.765 0.008
PLH	000	37	N 46 23	25.89156 0.007	W109 01 49.09043 0.007	1135.625 0.007
PLH	000	38	N 46 22	1.07043 0.006	W109 00 7.18027 0.006	1089.159 0.006
PLH	000	39	N 46 20	35.97374 0.005	W108 55 30.69797 0.005	1106.226 0.005
PLH	000	4	N 46 28	13.78826 0.009	W108 55 41.38912 0.009	1155.591 0.008
PLH	000	40	N 46 25	17.23078 0.009	W108 55 27.00360 0.009	1088.217 0.009
PLH	000	5	N 46 29	16.41360 0.010	W108 56 50.54039 0.010	1160.522 0.009
PLH	000	6	N 46 28	17.89992 0.007	W108 52 52.43673 0.007	1123.644 0.007
PLH	000	7	N 46 30	15.78187 0.008	W108 53 2.60601 0.008	1167.547 0.007
PLH	000	8	N 46 30	14.91642 0.007	W108 51 12.52339 0.007	1145.113 0.007
PLH	000	9	N 46 30	19.26676 0.007	W108 49 14.10589 0.007	1090.200 0.006
PLH	111	BIL5	N 45 58	16.23777 0.000	W107 59 47.29988 0.000	874.573 0.000
PLH	111	CARELESS	N 46 29	24.83428 0.000	W109 29 13.08757 0.000	1279.846 0.000
PLH	001	E 125 RESET	N 46 38	6.89169 0.007	W108 35 42.13815 0.007	1077.354 0.000
PLH	111	MTDT	N 46 35	18.59112 0.000	W111 59 36.96412 0.000	1217.756 0.000
PLH	111	MTEI	N 45 44	47.03558 0.000	W108 36 0.73713 0.000	970.877 0.000
PLH	111	MTMS	N 48 32	27.42670 0.000	W109 41 11.85904 0.000	773.923 0.000
PLH	111	MTSU	N 45 39	40.37669 0.000	W111 02 42.01023 0.000	1495.512 0.000
PLH	111	Z 122	N 46 17	36.85018 0.000	W108 54 21.13484 0.000	1030.433 0.000

Geoid Values:

CODE	NAME	N/S DEFLECTION			E/W DEFLECTION			UNDULATION		
GEOI	1	-	0	0	0.4	+	0	0	2.4	-13.084
GEOI	10	-	0	0	1.4	+	0	0	3.0	-12.936
GEOI	101	+	0	0	0.6	+	0	0	3.2	-12.800
GEOI	102	-	0	0	1.2	+	0	0	2.0	-13.306
GEOI	103	-	0	0	0.6	+	0	0	2.3	-13.115
GEOI	104	-	0	0	0.6	+	0	0	3.0	-12.258
GEOI	11	-	0	0	2.0	+	0	0	2.4	-13.075
GEOI	12	-	0	0	1.6	+	0	0	2.5	-13.093
GEOI	13	-	0	0	1.4	+	0	0	2.4	-13.109
GEOI	14	-	0	0	0.9	+	0	0	2.5	-13.121
GEOI	15	-	0	0	0.9	+	0	0	2.8	-13.069
GEOI	16	-	0	0	1.3	+	0	0	2.8	-13.031
GEOI	17	-	0	0	1.7	+	0	0	3.0	-12.970
GEOI	18	-	0	0	2.1	+	0	0	3.4	-12.882
GEOI	19	-	0	0	1.3	+	0	0	2.4	-13.136
GEOI	2	-	0	0	0.7	+	0	0	2.8	-13.039
GEOI	20	+	0	0	1.1	+	0	0	2.6	-12.998
GEOI	21	+	0	0	0.8	+	0	0	2.9	-12.851
GEOI	22	+	0	0	0.2	+	0	0	3.2	-12.841
GEOI	23	+	0	0	0.3	+	0	0	3.1	-12.823
GEOI	24	-	0	0	0.1	+	0	0	3.3	-12.776
GEOI	25	-	0	0	0.4	+	0	0	3.6	-12.775
GEOI	26	-	0	0	0.6	+	0	0	3.9	-12.768
GEOI	27	-	0	0	0.9	+	0	0	4.1	-12.752
GEOI	28	-	0	0	0.9	+	0	0	4.3	-12.695
GEOI	29	-	0	0	0.6	+	0	0	2.9	-12.256
GEOI	3	-	0	0	0.7	+	0	0	2.9	-12.954
GEOI	30	-	0	0	1.2	+	0	0	2.5	-12.245
GEOI	31	-	0	0	1.7	+	0	0	2.7	-12.269
GEOI	32	-	0	0	2.4	+	0	0	2.7	-12.243
GEOI	33	-	0	0	1.4	+	0	0	4.6	-12.469
GEOI	34	-	0	0	1.5	+	0	0	4.3	-12.495
GEOI	35	-	0	0	1.8	+	0	0	4.2	-12.542
GEOI	36	-	0	0	1.4	+	0	0	4.2	-12.630
GEOI	37	-	0	0	0.6	+	0	0	3.8	-12.689
GEOI	38	-	0	0	0.3	+	0	0	3.3	-12.751
GEOI	39	+	0	0	0.5	+	0	0	3.0	-12.880
GEOI	4	-	0	0	0.8	+	0	0	3.5	-12.874
GEOI	40	-	0	0	0.1	+	0	0	3.2	-12.895
GEOI	5	-	0	0	1.1	+	0	0	3.6	-12.829
GEOI	6	-	0	0	1.0	+	0	0	3.0	-12.958
GEOI	7	-	0	0	1.4	+	0	0	3.0	-12.931
GEOI	8	-	0	0	1.1	+	0	0	3.1	-12.981
GEOI	9	-	0	0	1.3	+	0	0	2.5	-13.034
GEOI	BIL5	-	0	0	0.1	+	0	0	2.7	-14.287
GEOI	CARELESS	-	0	0	1.2	+	0	0	0.6	-12.024
GEOI	E 125 RESET	-	0	0	1.2	+	0	0	2.3	-13.236
GEOI	MTDT	+	0	0	6.2	+	0	0	0.8	-13.081
GEOI	MTEI	+	0	0	1.4	+	0	0	3.5	-13.161
GEOI	MTMS	+	0	0	5.2	-	0	0	0.0	-16.197
GEOI	MTSU	+	0	0	7.0	-	0	0	3.6	-10.845
GEOI	Z 122	+	0	0	0.8	+	0	0	2.6	-12.896

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
GROUP:	082910.ASC	,obs#:	1			
DXCT		101	102	33567.69190 0.027	-0.008 0.026	-0.315 0.21
DYCT		101	102	8548.59990 0.027	0.008 0.027	0.314 0.21
DZCT		101	102	18043.79140 0.027	0.024 0.027	0.900 0.61
GROUP:	082910.ASC	,obs#:	2			
DXCT		101	103	17695.61060 0.015	0.014 0.015	0.969 0.65
DYCT		101	103	6257.66270 0.015	-0.109 0.015	-7.436 5.00
DZCT		101	103	11074.25050 0.015	0.086 0.015	5.822 3.93
GROUP:	082910.ASC	,obs#:	3			
DXCT		102	103	-15872.07280 0.012	0.014 0.011	1.224 0.80
DYCT		102	103	-2291.05870 0.012	0.004 0.011	0.375 0.25
DZCT		102	103	-6969.46320 0.012	-0.016 0.012	-1.390 0.92
GROUP:	082910.ASC	,obs#:	4			
DXCT		101	E 125 RESET	35661.71900 0.032	-0.009 0.031	-0.286 0.19
DYCT		101	E 125 RESET	15827.68070 0.032	0.024 0.032	0.749 0.51
DZCT		101	E 125 RESET	25170.69970 0.032	0.073 0.032	2.300 1.57
GROUP:	082910.ASC	,obs#:	5			
DXCT		102	E 125 RESET	2094.02840 0.007	-0.002 0.006	-0.311 0.19
DYCT		102	E 125 RESET	7279.08900 0.007	0.007 0.006	1.111 0.69
DZCT		102	E 125 RESET	7126.98360 0.007	-0.026 0.006	-4.076 2.53
GROUP:	083010R.ASC	,obs#:	6			
DXCT		101	102	33567.69010 0.027	-0.007 0.026	-0.247 0.17
DYCT		101	102	8548.58570 0.027	0.023 0.027	0.849 0.58
DZCT		101	102	18043.81950 0.027	-0.004 0.027	-0.157 0.11
GROUP:	083010R.ASC	,obs#:	7			
DXCT		101	BIL5	62737.21060 0.058	-0.002 0.058	-0.031 0.02
DYCT		101	BIL5	-49195.54780 0.058	-0.007 0.058	-0.118 0.08
DZCT		101	BIL5	-25978.72660 0.058	0.012 0.058	0.201 0.14

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
GROUP: 083010R.ASC ,obs#: 8						
DXCT		102	BIL5	29169.52920 0.054	-0.004 0.054	-0.074 0.05
DYCT		102	BIL5	-57744.13410 0.054	-0.029 0.054	-0.535 0.37
DZCT		102	BIL5	-44022.55160 0.054	0.021 0.054	0.396 0.27
GROUP: 083010R.ASC ,obs#: 9						
DXCT		Z 122	BIL5	58529.64930 0.054	-0.000 0.054	-0.001 0.00
DYCT		Z 122	BIL5	-46652.77560 0.054	-0.007 0.054	-0.127 0.09
DZCT		Z 122	BIL5	-24949.62610 0.054	0.003 0.054	0.056 0.04
GROUP: 083010R.ASC ,obs#: 10						
DXCT		CARELESS	BIL5	95597.77950 0.089	0.041 0.089	0.459 0.32
DYCT		CARELESS	BIL5	-76140.12760 0.089	-0.002 0.089	-0.025 0.02
DZCT		CARELESS	BIL5	-40210.76890 0.089	-0.029 0.089	-0.331 0.23
GROUP: 083010R.ASC ,obs#: 11						
DXCT		101	CARELESS	-32860.52160 0.031	-0.090 0.031	-2.925 2.00
DYCT		101	CARELESS	26944.57580 0.031	-0.001 0.031	-0.020 0.01
DZCT		101	CARELESS	14232.04750 0.031	0.036 0.031	1.164 0.80
GROUP: 083010R.ASC ,obs#: 12						
DXCT		102	CARELESS	-66428.21520 0.048	-0.080 0.047	-1.690 1.16
DYCT		102	CARELESS	18395.98920 0.048	-0.022 0.047	-0.470 0.32
DZCT		102	CARELESS	-3811.76820 0.048	0.036 0.047	0.763 0.52
GROUP: 083010R.ASC ,obs#: 13						
DXCT		101	MTDT	-209874.76530 0.162	-0.017 0.162	-0.106 0.07
DYCT		101	MTDT	102498.37430 0.162	-0.011 0.162	-0.070 0.05
DZCT		101	MTDT	21702.22470 0.162	-0.005 0.162	-0.034 0.02
GROUP: 083010R.ASC ,obs#: 14						
DXCT		102	MTDT	-243442.43050 0.180	-0.035 0.180	-0.197 0.14
DYCT		102	MTDT	93949.79010 0.180	-0.035 0.180	-0.197 0.14
DZCT		102	MTDT	3658.39970 0.180	0.004 0.180	0.024 0.02
GROUP: 083010R.ASC ,obs#: 15						
DXCT		Z 122	MTDT	-214082.35160 0.165	0.010 0.165	0.058 0.04

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DYCT		Z 122	MTDT	105041.15140 0.165	-0.016 0.165	-0.099 0.07
DZCT		Z 122	MTDT	22731.29950 0.165	0.012 0.165	0.071 0.05
GROUP: 083010R.ASC ,obs#: 16						
DXCT		CARELESS	MTDT	-177014.28140 0.133	0.110 0.133	0.832 0.57
DYCT		CARELESS	MTDT	75553.88550 0.133	-0.098 0.133	-0.736 0.51
DZCT		CARELESS	MTDT	7470.12860 0.133	0.007 0.133	0.056 0.04
GROUP: 083010R.ASC ,obs#: 17						
DXCT		101	MTEI	12565.05400 0.047	0.009 0.047	0.197 0.14
DYCT		101	MTEI	-51561.31560 0.047	0.016 0.047	0.331 0.23
DZCT		101	MTEI	-43311.54650 0.047	-0.011 0.047	-0.223 0.15
GROUP: 083010R.ASC ,obs#: 18						
DXCT		102	MTEI	-21002.59460 0.061	-0.026 0.061	-0.424 0.29
DYCT		102	MTEI	-60109.92750 0.061	0.019 0.061	0.317 0.22
DZCT		102	MTEI	-61355.36300 0.061	-0.009 0.061	-0.154 0.11
GROUP: 083010R.ASC ,obs#: 19						
DXCT		Z 122	MTEI	8357.49150 0.045	0.012 0.045	0.271 0.19
DYCT		Z 122	MTEI	-49018.53300 0.045	0.005 0.045	0.113 0.08
DZCT		Z 122	MTEI	-42282.44150 0.045	-0.024 0.045	-0.523 0.36
GROUP: 083010R.ASC ,obs#: 20						
DXCT		CARELESS	MTEI	45425.65070 0.074	0.024 0.074	0.324 0.22
DYCT		CARELESS	MTEI	-78505.91490 0.074	0.040 0.074	0.536 0.37
DZCT		CARELESS	MTEI	-57543.58620 0.074	-0.054 0.074	-0.731 0.50
GROUP: 083010R.ASC ,obs#: 21						
DXCT		101	MTMS	9458.54460 0.175	0.016 0.175	0.093 0.06
DYCT		101	MTMS	190737.07520 0.175	0.019 0.175	0.111 0.08
DZCT		101	MTMS	167864.90960 0.175	-0.036 0.175	-0.205 0.14
GROUP: 083010R.ASC ,obs#: 22						
DXCT		102	MTMS	-24109.12850 0.163	0.006 0.163	0.036 0.02
DYCT		102	MTMS	182188.48540 0.163	0.001 0.163	0.006 0.00
DZCT		102	MTMS	149821.08770 0.163	-0.029 0.163	-0.179 0.00

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.163	0.163	0.12
GROUP:	083010R.ASC	,obs#:	23			
DXCT		Z 122	MTMS	5250.98420	0.017	0.097
				0.177	0.177	0.07
DYCT		Z 122	MTMS	193279.84130	0.025	0.143
				0.177	0.177	0.10
DZCT		Z 122	MTMS	168893.99110	-0.025	-0.144
				0.177	0.177	0.10
GROUP:	083010R.ASC	,obs#:	24			
DXCT		101	MTSU	-168986.86050	-0.011	-0.090
				0.121	0.121	0.06
DYCT		101	MTSU	6289.98920	-0.007	-0.059
				0.121	0.121	0.04
DZCT		101	MTSU	-49549.27450	-0.006	-0.045
				0.121	0.121	0.03
GROUP:	083010R.ASC	,obs#:	25			
DXCT		102	MTSU	-202554.52420	-0.031	-0.210
				0.147	0.147	0.14
DYCT		102	MTSU	-2258.59290	-0.033	-0.226
				0.147	0.147	0.16
DZCT		102	MTSU	-67593.10910	0.014	0.094
				0.147	0.147	0.06
GROUP:	083010R.ASC	,obs#:	26			
DXCT		Z 122	MTSU	-173194.46510	0.034	0.274
				0.124	0.124	0.19
DYCT		Z 122	MTSU	8832.72640	0.028	0.223
				0.124	0.124	0.15
DZCT		Z 122	MTSU	-48520.18790	-0.000	-0.001
				0.124	0.124	0.00
GROUP:	083010R.ASC	,obs#:	27			
DXCT		101	Z 122	4207.55880	0.001	0.930
				0.003	0.001	0.16
DYCT		101	Z 122	-2542.76990	-0.002	-1.690
				0.003	0.001	0.44
DZCT		101	Z 122	-1029.09410	0.002	1.529
				0.003	0.001	0.42
GROUP:	083010R.ASC	,obs#:	28			
DXCT		102	Z 122	-29360.11560	-0.008	-0.340
				0.025	0.025	0.23
DYCT		102	Z 122	-11091.34610	-0.034	-1.377
				0.025	0.025	0.93
DZCT		102	Z 122	-19072.93670	0.029	1.181
				0.025	0.025	0.80
GROUP:	083110.ASC	,obs#:	29			
DXCT		102	1	-17603.28690	0.007	0.538
				0.013	0.012	0.35
DYCT		102	1	-1705.97720	-0.021	-1.662
				0.013	0.013	1.09
DZCT		102	1	-6907.19570	0.028	2.207
				0.013	0.013	1.46
GROUP:	083110.ASC	,obs#:	30			
DXCT		103	1	-1731.22130	-0.000	-0.529

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.001	0.000	0.03
DYCT		103	1	585.05620	0.000	1.782
				0.001	0.000	0.12
DZCT		103	1	62.31160	-0.000	-2.298
				0.001	0.000	0.18
GROUP: 083110.ASC ,obs#: 31						
DXCT		102	10	-22434.20870	-0.004	-0.254
				0.016	0.014	0.16
DYCT		102	10	3937.75630	0.018	1.286
				0.016	0.014	0.80
DZCT		102	10	-3212.71470	0.022	1.574
				0.016	0.014	0.98
GROUP: 083110.ASC ,obs#: 32						
DXCT		103	10	-6562.15410	0.001	0.253
				0.007	0.003	0.07
DYCT		103	10	6228.83240	-0.003	-1.283
				0.007	0.003	0.34
DZCT		103	10	3756.79110	-0.004	-1.572
				0.007	0.003	0.42
GROUP: 083110.ASC ,obs#: 33						
DXCT		102	103	-15872.05980	0.001	0.083
				0.012	0.011	0.05
DYCT		102	103	-2291.04120	-0.013	-1.156
				0.012	0.011	0.75
DZCT		102	103	-6969.47850	-0.001	-0.063
				0.012	0.011	0.04
GROUP: 083110.ASC ,obs#: 34						
DXCT		102	2	-19978.96340	0.005	0.344
				0.015	0.014	0.22
DYCT		102	2	-883.24680	0.000	0.020
				0.015	0.014	0.01
DZCT		102	2	-6923.57670	-0.017	-1.209
				0.015	0.014	0.79
GROUP: 083110.ASC ,obs#: 35						
DXCT		103	2	-4106.89960	-0.000	-0.344
				0.003	0.001	0.05
DYCT		103	2	1407.80790	-0.000	-0.040
				0.003	0.001	0.01
DZCT		103	2	45.88500	0.001	1.209
				0.003	0.001	0.17
GROUP: 083110.ASC ,obs#: 36						
DXCT		102	3	-24028.59080	0.001	0.075
				0.017	0.016	0.05
DYCT		102	3	481.62190	0.007	0.468
				0.017	0.016	0.30
DZCT		102	3	-6897.70610	-0.012	-0.748
				0.017	0.016	0.48
GROUP: 083110.ASC ,obs#: 37						
DXCT		103	3	-8156.53060	-0.000	-0.080
				0.006	0.002	0.02
DYCT		103	3	2772.68470	-0.001	-0.476
				0.006	0.002	0.11

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DZCT		103	3	71.75970 0.006	0.001 0.002	0.753 0.17
GROUP: 083110.ASC ,obs#: 38						
DXCT		102	4	-26393.98360 0.019	0.006 0.017	0.381 0.24
DYCT		102	4	2854.33870 0.019	0.027 0.017	1.608 1.00
DZCT		102	4	-5412.71690 0.019	-0.034 0.017	-2.028 1.26
GROUP: 083110.ASC ,obs#: 39						
DXCT		103	4	-10521.91710 0.008	-0.001 0.003	-0.388 0.11
DYCT		103	4	5145.42550 0.008	-0.005 0.003	-1.618 0.44
DZCT		103	4	1556.72150 0.008	0.007 0.003	2.036 0.56
GROUP: 083110.ASC ,obs#: 40						
DXCT		102	5	-27335.39110 0.019	-0.013 0.017	-0.769 0.47
DYCT		102	5	4656.50250 0.019	0.006 0.017	0.334 0.20
DZCT		102	5	-4077.32130 0.019	-0.002 0.017	-0.114 0.07
GROUP: 083110.ASC ,obs#: 41						
DXCT		103	5	-11463.34850 0.009	0.003 0.004	0.769 0.23
DYCT		103	5	6947.56400 0.009	-0.001 0.004	-0.334 0.10
DZCT		103	5	2892.15550 0.010	0.000 0.004	0.114 0.03
GROUP: 083110.ASC ,obs#: 42						
DXCT		102	6	-22946.35770 0.016	-0.011 0.015	-0.728 0.46
DYCT		102	6	1794.24170 0.016	0.000 0.015	0.018 0.01
DZCT		102	6	-5348.46160 0.016	0.003 0.015	0.200 0.13
GROUP: 083110.ASC ,obs#: 43						
DXCT		103	6	-7074.31110 0.006	0.001 0.002	0.728 0.16
DYCT		103	6	4085.29640 0.006	-0.000 0.002	-0.017 0.00
DZCT		103	6	1621.02100 0.006	-0.000 0.002	-0.200 0.05
GROUP: 083110.ASC ,obs#: 44						
DXCT		102	7	-22306.90660 0.016	-0.018 0.014	-1.311 0.81
DYCT		102	7	4334.03150 0.016	0.007 0.014	0.461 0.28
DZCT		102	7	-2810.03350 0.016	0.002 0.014	0.141 0.09
GROUP: 083110.ASC ,obs#: 45						

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DXCT		103	7	-6434.86980 0.007	0.004 0.003	1.310 0.36
DYCT		103	7	6625.09370 0.007	-0.001 0.003	-0.457 0.13
DZCT		103	7	4159.44810 0.007	-0.000 0.003	-0.140 0.04
GROUP: 083110.ASC ,obs#: 46						
DXCT		102	8	-20086.82020 0.014	-0.007 0.013	-0.530 0.33
DYCT		102	8	3571.11150 0.014	-0.003 0.013	-0.227 0.14
DZCT		102	8	-2844.70660 0.014	0.003 0.013	0.251 0.16
GROUP: 083110.ASC ,obs#: 47						
DXCT		103	8	-4214.76920 0.006	0.001 0.002	0.534 0.13
DYCT		103	8	5862.16250 0.006	0.001 0.002	0.235 0.06
DZCT		103	8	4124.77640 0.006	-0.001 0.002	-0.260 0.07
GROUP: 083110.ASC ,obs#: 48						
DXCT		102	9	-17653.16600 0.013	-0.007 0.011	-0.583 0.36
DYCT		102	9	2883.79240 0.013	-0.008 0.011	-0.722 0.45
DZCT		102	9	-2792.09150 0.013	0.028 0.011	2.463 1.54
GROUP: 083110.ASC ,obs#: 49						
DXCT		103	9	-1781.11460 0.005	0.001 0.002	0.582 0.14
DYCT		103	9	5174.83750 0.005	0.001 0.002	0.720 0.17
DZCT		103	9	4177.41960 0.005	-0.004 0.002	-2.462 0.58
GROUP: 090110.ASC ,obs#: 50						
DXCT		102	11	-8709.63980 0.010	0.001 0.007	0.094 0.05
DYCT		102	11	9371.60660 0.010	0.006 0.007	0.865 0.45
DZCT		102	11	5822.74140 0.010	0.002 0.007	0.233 0.12
GROUP: 090110.ASC ,obs#: 51						
DXCT		E 125 RESET	11	-10803.66510 0.008	-0.000 0.005	-0.095 0.04
DYCT		E 125 RESET	11	2092.52080 0.008	-0.004 0.005	-0.864 0.36
DZCT		E 125 RESET	11	-1304.21310 0.008	-0.001 0.005	-0.230 0.10
GROUP: 090110.ASC ,obs#: 52						
DXCT		102	12	-9213.56500 0.009	-0.001 0.006	-0.093 0.05
DYCT		102	12	7907.39000	-0.002	-0.347

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.009	0.006	0.17
DZCT		102	12	4323.77690	0.004	0.623
				0.009	0.006	0.31
GROUP: 090110.ASC ,obs#: 53						
DXCT		E 125 RESET	12	-11307.59250	0.000	0.093
				0.008	0.005	0.04
DYCT		E 125 RESET	12	628.28980	0.002	0.348
				0.008	0.005	0.16
DZCT		E 125 RESET	12	-2803.17310	-0.003	-0.624
				0.008	0.005	0.28
GROUP: 090110.ASC ,obs#: 54						
DXCT		102	13	-9767.57030	-0.003	-0.623
				0.008	0.005	0.28
DYCT		102	13	6236.84540	-0.003	-0.550
				0.008	0.005	0.25
DZCT		102	13	2626.37450	0.007	1.344
				0.008	0.005	0.62
GROUP: 090110.ASC ,obs#: 55						
DXCT		E 125 RESET	13	-11861.60390	0.004	0.618
				0.009	0.006	0.30
DYCT		E 125 RESET	13	-1042.25710	0.003	0.539
				0.009	0.006	0.26
DZCT		E 125 RESET	13	-4500.56710	-0.008	-1.339
				0.009	0.006	0.65
GROUP: 090110.ASC ,obs#: 56						
DXCT		102	14	-10495.20510	-0.003	-0.568
				0.008	0.005	0.23
DYCT		102	14	4133.42490	-0.000	-0.037
				0.008	0.005	0.02
DZCT		102	14	528.78850	-0.001	-0.155
				0.008	0.005	0.06
GROUP: 090110.ASC ,obs#: 57						
DXCT		E 125 RESET	14	-12589.23850	0.004	0.568
				0.010	0.008	0.30
DYCT		E 125 RESET	14	-3145.67170	0.000	0.037
				0.010	0.008	0.02
DZCT		E 125 RESET	14	-6598.17070	0.001	0.155
				0.010	0.008	0.08
GROUP: 090110.ASC ,obs#: 58						
DXCT		102	15	-12442.15080	0.009	1.420
				0.010	0.006	0.63
DYCT		102	15	5880.34260	-0.008	-1.360
				0.010	0.006	0.61
DZCT		102	15	1563.67440	0.005	0.757
				0.010	0.006	0.34
GROUP: 090110.ASC ,obs#: 59						
DXCT		E 125 RESET	15	-14536.15730	-0.011	-1.419
				0.011	0.008	0.71
DYCT		E 125 RESET	15	-1398.77280	0.011	1.360
				0.011	0.008	0.69
DZCT		E 125 RESET	15	-5563.27210	-0.006	-0.759
				0.011	0.008	0.39

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
GROUP:	090110.ASC	,obs#:	60			
DXCT		102	16	-14351.87910 0.011	0.001 0.007	0.070 0.03
DYCT		102	16	6581.98380 0.011	-0.006 0.007	-0.829 0.38
DZCT		102	16	1593.82400 0.011	0.006 0.007	0.854 0.39
GROUP:	090110.ASC	,obs#:	61			
DXCT		E 125 RESET	16	-16445.90440 0.012	-0.001 0.009	-0.071 0.04
DYCT		E 125 RESET	16	-697.12560 0.012	0.007 0.009	0.825 0.41
DZCT		E 125 RESET	16	-5533.11960 0.012	-0.007 0.009	-0.851 0.43
GROUP:	090110.ASC	,obs#:	62			
DXCT		102	17	-17172.94960 0.013	0.009 0.009	1.077 0.50
DYCT		102	17	7534.60220 0.013	0.015 0.009	1.713 0.81
DZCT		102	17	1572.58400 0.013	-0.003 0.009	-0.381 0.18
GROUP:	090110.ASC	,obs#:	63			
DXCT		E 125 RESET	17	-19266.95590 0.014	-0.011 0.010	-1.073 0.53
DYCT		E 125 RESET	17	255.53830 0.014	-0.017 0.010	-1.710 0.85
DZCT		E 125 RESET	17	-5554.38040 0.014	0.004 0.010	0.375 0.19
GROUP:	090110.ASC	,obs#:	64			
DXCT		102	18	-20750.78370 0.016	0.002 0.011	0.219 0.10
DYCT		102	18	8777.10770 0.016	0.007 0.011	0.604 0.29
DZCT		102	18	1623.72160 0.016	0.016 0.011	1.452 0.70
GROUP:	090110.ASC	,obs#:	65			
DXCT		E 125 RESET	18	-22844.80520 0.016	-0.003 0.012	-0.222 0.11
DYCT		E 125 RESET	18	1498.02520 0.016	-0.007 0.012	-0.612 0.30
DZCT		E 125 RESET	18	-5503.20290 0.016	-0.017 0.012	-1.456 0.72
GROUP:	090110.ASC	,obs#:	66			
DXCT		102	19	-8245.79170 0.007	0.000 0.005	0.044 0.02
DYCT		102	19	5707.93340 0.007	0.001 0.005	0.173 0.08
DZCT		102	19	2612.60260 0.007	-0.002 0.005	-0.334 0.15
GROUP:	090110.ASC	,obs#:	67			
DXCT		E 125 RESET	19	-10339.81770 0.008	-0.000 0.006	-0.040 0.02

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DYCT		E 125 RESET	19	-1571.16100 0.008	-0.001 0.006	-0.169 0.08
DZCT		E 125 RESET	19	-4514.35810 0.008	0.002 0.006	0.331 0.16
GROUP: 090110.ASC ,obs#: 68						
DXCT		102	E 125 RESET	2094.02370 0.007	0.003 0.006	0.430 0.26
DYCT		102	E 125 RESET	7279.09100 0.007	0.005 0.006	0.802 0.49
DZCT		102	E 125 RESET	7126.96320 0.007	-0.006 0.006	-0.919 0.57
GROUP: 090210.ASC ,obs#: 69						
DXCT		103	101	-17695.62620 0.015	0.001 0.015	0.103 0.07
DYCT		103	101	-6257.54470 0.015	-0.009 0.015	-0.627 0.42
DZCT		103	101	-11074.33780 0.015	0.002 0.015	0.117 0.08
GROUP: 090210.ASC ,obs#: 70						
DXCT		103	104	-36933.08700 0.026	-0.001 0.025	-0.030 0.02
DYCT		103	104	6283.01280 0.026	-0.009 0.025	-0.345 0.23
DZCT		103	104	-5675.04700 0.026	0.022 0.025	0.847 0.57
GROUP: 090210.ASC ,obs#: 71						
DXCT		101	104	-19237.45790 0.016	-0.005 0.016	-0.330 0.22
DYCT		101	104	12540.56170 0.016	-0.004 0.016	-0.248 0.16
DZCT		101	104	5399.28940 0.016	0.021 0.016	1.363 0.90
GROUP: 090210.ASC ,obs#: 72						
DXCT		103	20	-7616.01540 0.007	-0.003 0.005	-0.701 0.30
DYCT		103	20	-4030.05270 0.007	-0.005 0.005	-1.074 0.47
DZCT		103	20	-5884.08260 0.007	0.002 0.005	0.497 0.22
GROUP: 090210.ASC ,obs#: 73						
DXCT		101	20	10079.60230 0.008	0.004 0.006	0.699 0.33
DYCT		101	20	2227.49030 0.008	0.006 0.006	1.071 0.51
DZCT		101	20	5190.25850 0.008	-0.003 0.006	-0.492 0.24
GROUP: 090210.ASC ,obs#: 74						
DXCT		103	21	-15514.01580 0.014	-0.004 0.013	-0.310 0.20
DYCT		103	21	-7005.94230 0.014	-0.028 0.013	-2.107 1.40
DZCT		103	21	-11080.50620 0.019	0.019	1.371

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.014	0.014	0.91
GROUP:	090210.ASC	,obs#:	75			
DXCT		101	21	2181.60470 0.002	0.000 0.000	0.357 0.03
DYCT		101	21	-748.41730 0.002	0.000 0.000	2.156 0.17
DZCT		101	21	-6.15130 0.002	-0.000 0.000	-1.445 0.12
GROUP:	090210.ASC	,obs#:	76			
DXCT		103	22	-15681.01200 0.013	0.001 0.013	0.077 0.05
DYCT		103	22	-5521.40080 0.013	-0.008 0.013	-0.650 0.43
DZCT		103	22	-9757.64190 0.013	0.006 0.013	0.477 0.32
GROUP:	090210.ASC	,obs#:	77			
DXCT		101	22	2014.61370 0.002	-0.000 0.000	-0.065 0.01
DYCT		101	22	736.14460 0.002	0.000 0.000	0.665 0.06
DZCT		101	22	1316.70040 0.002	-0.000 0.000	-0.499 0.05
GROUP:	090210.ASC	,obs#:	78			
DXCT		103	23	-15934.19980 0.012	0.004 0.011	0.333 0.21
DYCT		103	23	-3314.95210 0.012	0.000 0.012	0.022 0.01
DZCT		103	23	-7788.08770 0.012	0.002 0.012	0.145 0.09
GROUP:	090210.ASC	,obs#:	79			
DXCT		101	23	1761.42900 0.003	-0.000 0.001	-0.333 0.06
DYCT		101	23	2942.60200 0.003	-0.000 0.001	-0.022 0.00
DZCT		101	23	3286.25020 0.003	-0.000 0.001	-0.145 0.02
GROUP:	090210.ASC	,obs#:	80			
DXCT		103	24	-17471.24940 0.013	0.006 0.011	0.568 0.35
DYCT		103	24	-970.95440 0.013	-0.003 0.011	-0.236 0.15
DZCT		103	24	-6064.29120 0.013	0.007 0.011	0.581 0.36
GROUP:	090210.ASC	,obs#:	81			
DXCT		101	24	224.38280 0.005	-0.001 0.002	-0.568 0.14
DYCT		101	24	5286.59630 0.005	0.000 0.002	0.236 0.06
DZCT		101	24	5010.05260 0.005	-0.001 0.002	-0.581 0.14
GROUP:	090210.ASC	,obs#:	82			
DXCT		103	25	-16529.27140	-0.002	-0.242

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.012	0.009	0.14
DYCT		103	25	1588.04190	-0.010	-1.081
				0.012	0.010	0.61
DZCT		103	25	-3574.82320	0.022	2.270
				0.012	0.010	1.28
GROUP: 090210.ASC ,obs#: 83						
DXCT		101	25	1166.35010	0.001	0.234
				0.008	0.004	0.08
DYCT		101	25	7845.58120	0.004	1.073
				0.008	0.004	0.39
DZCT		101	25	7499.54360	-0.009	-2.266
				0.008	0.004	0.82
GROUP: 090210.ASC ,obs#: 84						
DXCT		103	26	-15848.91930	0.004	0.496
				0.011	0.008	0.25
DYCT		103	26	3552.42090	-0.001	-0.163
				0.011	0.008	0.08
DZCT		103	26	-1530.68280	0.005	0.620
				0.011	0.008	0.32
GROUP: 090210.ASC ,obs#: 85						
DXCT		101	26	1846.71250	-0.003	-0.499
				0.010	0.006	0.21
DYCT		101	26	9809.97240	0.001	0.162
				0.010	0.006	0.07
DZCT		101	26	9543.66220	-0.004	-0.620
				0.010	0.006	0.27
GROUP: 090210.ASC ,obs#: 86						
DXCT		103	27	-15015.40110	-0.002	-0.326
				0.011	0.007	0.15
DYCT		103	27	6366.02200	-0.007	-0.892
				0.011	0.008	0.41
DZCT		103	27	1232.76320	0.003	0.421
				0.011	0.007	0.19
GROUP: 090210.ASC ,obs#: 87						
DXCT		101	27	2680.21830	0.003	0.326
				0.012	0.009	0.16
DYCT		101	27	12623.56120	0.008	0.891
				0.012	0.009	0.45
DZCT		101	27	12307.10620	-0.004	-0.420
				0.012	0.009	0.21
GROUP: 090210.ASC ,obs#: 88						
DXCT		103	28	-15773.66730	0.003	0.397
				0.013	0.008	0.18
DYCT		103	28	8613.13370	-0.003	-0.324
				0.013	0.008	0.15
DZCT		103	28	3051.39380	0.002	0.260
				0.013	0.008	0.12
GROUP: 090210.ASC ,obs#: 89						
DXCT		101	28	1921.96480	-0.004	-0.396
				0.014	0.010	0.20
DYCT		101	28	14870.68140	0.003	0.324
				0.014	0.011	0.17

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DZCT		101	28	14125.73480 0.014	-0.003 0.011	-0.261 0.13
GROUP: 090310.ASC ,obs#: 90						
DXCT		101	104	-19237.46280 0.016	-0.000 0.016	-0.016 0.01
DYCT		101	104	12540.55940 0.016	-0.002 0.016	-0.100 0.07
DZCT		101	104	5399.31170 0.016	-0.001 0.016	-0.066 0.04
GROUP: 090310.ASC ,obs#: 91						
DXCT		101	29	-19029.55140 0.016	-0.002 0.016	-0.098 0.06
DYCT		101	29	13124.27920 0.016	-0.003 0.016	-0.194 0.13
DZCT		101	29	6000.83870 0.017	0.004 0.016	0.244 0.16
GROUP: 090310.ASC ,obs#: 92						
DXCT		104	29	207.91010 0.001	0.000 0.000	0.000* 0.00
DYCT		104	29	583.71830 0.001	0.000 0.000	0.000* 0.01
DZCT		104	29	601.53190 0.001	-0.000 0.000	0.000* 0.01
GROUP: 090310.ASC ,obs#: 93						
DXCT		101	30	-17990.72000 0.017	0.001 0.017	0.044 0.03
DYCT		101	30	15493.52950 0.017	-0.002 0.017	-0.150 0.10
DZCT		101	30	8528.35240 0.017	0.009 0.017	0.567 0.37
GROUP: 090310.ASC ,obs#: 94						
DXCT		104	30	1246.74380 0.003	-0.000 0.001	-0.042 0.00
DYCT		104	30	2952.96910 0.003	0.000 0.001	0.155 0.02
DZCT		104	30	3129.05140 0.003	-0.000 0.001	-0.568 0.07
GROUP: 090310.ASC ,obs#: 95						
DXCT		101	31	-15098.86920 0.017	-0.002 0.016	-0.108 0.07
DYCT		101	31	16348.78660 0.017	0.002 0.016	0.114 0.07
DZCT		101	31	10231.36860 0.017	0.007 0.016	0.432 0.28
GROUP: 090310.ASC ,obs#: 96						
DXCT		104	31	4138.59200 0.005	0.000 0.001	0.108 0.02
DYCT		104	31	3808.23070 0.005	-0.000 0.001	-0.113 0.02
DZCT		104	31	4832.06530 0.005	-0.001 0.001	-0.432 0.08
GROUP: 090310.ASC ,obs#: 97						

Residuals (critical value = 3.909):

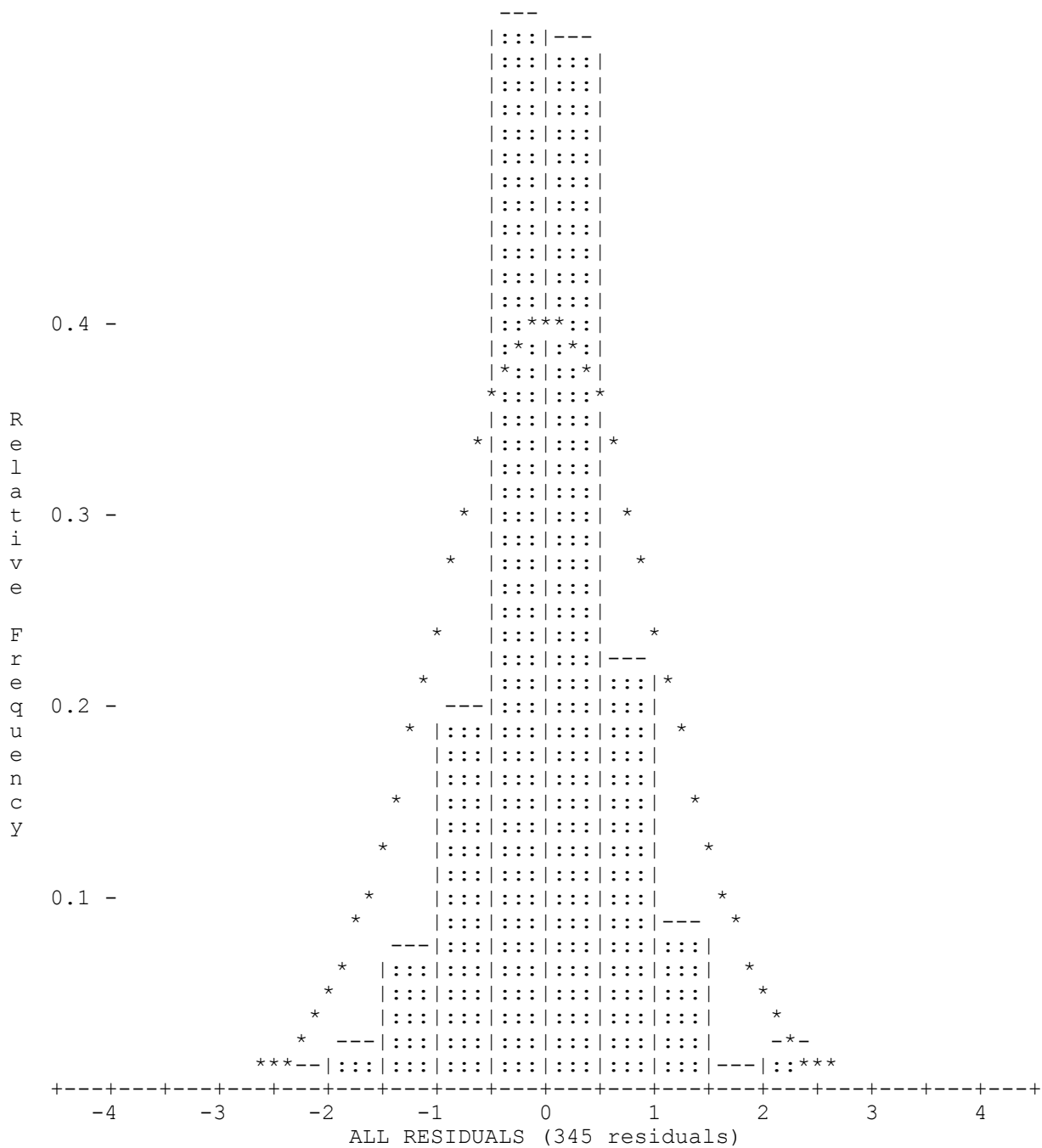
TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DXCT		101	32	-13558.18850 0.018	0.009 0.016	0.533 0.33
DYCT		101	32	18886.82410 0.018	0.009 0.016	0.521 0.32
DZCT		101	32	12970.45340 0.018	0.000 0.016	0.003 0.00
GROUP: 090310.ASC ,obs#: 98						
DXCT		104	32	5679.28490 0.008	-0.002 0.003	-0.533 0.14
DYCT		104	32	6346.27640 0.008	-0.002 0.003	-0.521 0.14
DZCT		104	32	7571.14280 0.008	-0.000 0.003	-0.004 0.00
GROUP: 090310.ASC ,obs#: 99						
DXCT		101	33	-4314.51840 0.016	0.005 0.012	0.418 0.22
DYCT		101	33	16962.56290 0.016	0.000 0.012	0.038 0.02
DZCT		101	33	14192.12290 0.016	-0.004 0.012	-0.358 0.19
GROUP: 090310.ASC ,obs#: 100						
DXCT		104	33	14922.95270 0.012	-0.003 0.007	-0.418 0.17
DYCT		104	33	4422.00580 0.012	-0.000 0.007	-0.038 0.02
DZCT		104	33	8792.80530 0.012	0.003 0.007	0.358 0.15
GROUP: 090310.ASC ,obs#: 101						
DXCT		101	34	-5023.23490 0.014	0.002 0.010	0.242 0.13
DYCT		101	34	14700.35420 0.014	0.002 0.010	0.156 0.08
DZCT		101	34	11894.71670 0.014	-0.008 0.010	-0.777 0.40
GROUP: 090310.ASC ,obs#: 102						
DXCT		104	34	14214.23220 0.011	-0.002 0.007	-0.243 0.10
DYCT		104	34	2159.79900 0.011	-0.001 0.007	-0.159 0.07
DZCT		104	34	6495.39300 0.011	0.005 0.007	0.778 0.33
GROUP: 090310.ASC ,obs#: 103						
DXCT		101	35	-4915.69410 0.012	-0.001 0.008	-0.062 0.03
DYCT		101	35	12770.47400 0.012	0.003 0.008	0.342 0.17
DZCT		101	35	10112.86130 0.012	-0.009 0.008	-1.106 0.55
GROUP: 090310.ASC ,obs#: 104						
DXCT		104	35	14321.76800 0.010	0.000 0.007	0.064 0.03
DYCT		104	35	229.92130	-0.002	-0.340

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.010	0.007	0.15
DZCT		104	35	4713.53390	0.007	1.105
				0.010	0.007	0.49
GROUP: 090310.ASC ,obs#: 105						
DXCT		101	36	-3186.84660	-0.002	-0.338
				0.009	0.006	0.14
DYCT		101	36	10379.07840	-0.000	-0.062
				0.010	0.006	0.03
DZCT		101	36	8467.88340	-0.002	-0.399
				0.010	0.006	0.17
GROUP: 090310.ASC ,obs#: 106						
DXCT		104	36	16050.61170	0.003	0.336
				0.011	0.008	0.17
DYCT		104	36	-2161.48030	0.001	0.060
				0.011	0.008	0.03
DZCT		104	36	3068.56710	0.003	0.396
				0.012	0.008	0.20
GROUP: 090310.ASC ,obs#: 107						
DXCT		101	37	-2341.92820	-0.002	-0.496
				0.007	0.003	0.17
DYCT		101	37	7877.81620	-0.003	-0.871
				0.007	0.003	0.29
DZCT		101	37	6488.49140	0.000	0.085
				0.007	0.003	0.03
GROUP: 090310.ASC ,obs#: 108						
DXCT		104	37	16895.52820	0.005	0.499
				0.012	0.010	0.28
DYCT		104	37	-4662.75330	0.009	0.873
				0.012	0.010	0.49
DZCT		104	37	1089.18190	-0.001	-0.088
				0.012	0.010	0.05
GROUP: 090310.ASC ,obs#: 109						
DXCT		101	38	-890.01240	0.001	0.467
				0.005	0.002	0.10
DYCT		101	38	5405.55520	0.001	0.824
				0.005	0.002	0.19
DZCT		101	38	4647.68230	-0.001	-0.472
				0.005	0.002	0.11
GROUP: 090310.ASC ,obs#: 110						
DXCT		104	38	18347.45700	-0.006	-0.463
				0.014	0.012	0.28
DYCT		104	38	-7134.99130	-0.010	-0.819
				0.014	0.012	0.51
DZCT		104	38	-751.63480	0.006	0.466
				0.014	0.012	0.29
GROUP: 090710.ASC ,obs#: 111						
DXCT		101	102	33567.67820	0.005	0.203
				0.027	0.026	0.14
DYCT		101	102	8548.59850	0.010	0.367
				0.027	0.027	0.25
DZCT		101	102	18043.81750	-0.002	-0.082
				0.027	0.027	0.06

Residuals (critical value = 3.909):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
GROUP: 090710.ASC ,obs#: 112						
DXCT		101	39	4079.35950 0.004	-0.000 0.001	-0.100 0.01
DYCT		101	39	1674.69190 0.004	0.000 0.001	0.732 0.08
DZCT		101	39	2846.21770 0.004	-0.001 0.001	-1.759 0.18
GROUP: 090710.ASC ,obs#: 113						
DXCT		102	39	-29488.32640 0.023	0.002 0.023	0.101 0.07
DYCT		102	39	-6873.89950 0.023	-0.016 0.023	-0.725 0.48
DZCT		102	39	-15197.63850 0.023	0.040 0.023	1.756 1.18
GROUP: 090710.ASC ,obs#: 114						
DXCT		101	40	6197.53460 0.009	-0.000 0.004	-0.068 0.02
DYCT		101	40	7609.23310 0.009	0.003 0.004	0.867 0.24
DZCT		101	40	8825.15170 0.009	-0.009 0.004	-2.398 0.67
GROUP: 090710.ASC ,obs#: 115						
DXCT		102	40	-27370.15040 0.020	0.001 0.018	0.067 0.04
DYCT		102	40	-939.35650 0.020	-0.015 0.018	-0.868 0.53
DZCT		102	40	-9218.71520 0.020	0.043 0.018	2.398 1.48



S T A T I S T I C S S U M M A R Y

Residual Critical Value Type	Tau Max
Residual Critical Value	3.9085
Number of Flagged Residuals	3
Convergence Criterion	0.0010
Final Iteration Counter Value	2
Confidence Level Used	95.0000
Estimated Variance Factor	1.0182
Number of Degrees of Freedom	211

Chi-Square Test on the Variance Factor:

8.4871e-01 < 1.0000 < 1.2442e+00 ?

THE TEST PASSES

NOTE: All confidence regions were computed using the following factors:

Variance factor used	=	1.0182
3-D expansion factor	=	2.7955

Note that, for relative confidence regions, precisions are computed from the ratio of the major semi-axis and the spatial distance between the two stations.

3D Station Confidence Regions (95.000 percent):

STATION	MAJ-SEMI (AZ, VANG)	MED-SEMI (AZ, VANG)	MIN-SEMI (AZ, VANG)
1	0.015 (0, 0)	0.015 (90, 0)	0.012 (0, 90)
10	0.023 (0, 0)	0.023 (90, 0)	0.020 (0, 90)
101	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)
102	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)
103	0.014 (0, 0)	0.014 (90, 0)	0.011 (0, 90)
104	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)
11	0.025 (0, 0)	0.025 (90, 0)	0.017 (0, 90)
12	0.024 (0, 0)	0.024 (90, 0)	0.018 (0, 90)
13	0.024 (0, 0)	0.024 (90, 0)	0.018 (0, 90)
14	0.024 (0, 0)	0.024 (90, 0)	0.018 (0, 90)
15	0.027 (0, 0)	0.027 (90, 0)	0.021 (0, 90)
16	0.029 (0, 0)	0.029 (90, 0)	0.024 (0, 90)
17	0.032 (0, 0)	0.032 (90, 0)	0.027 (0, 90)
18	0.036 (0, 0)	0.036 (90, 0)	0.033 (0, 90)
19	0.023 (0, 0)	0.023 (90, 0)	0.016 (0, 90)
2	0.017 (0, 0)	0.016 (90, 0)	0.014 (0, 90)
20	0.019 (0, 0)	0.019 (90, 0)	0.017 (0, 90)
21	0.011 (0, 0)	0.011 (90, 0)	0.010 (0, 90)
22	0.011 (0, 0)	0.011 (90, 0)	0.010 (0, 90)
23	0.013 (0, 0)	0.013 (90, 0)	0.012 (0, 90)
24	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)
25	0.020 (0, 0)	0.020 (90, 0)	0.020 (0, 90)
26	0.023 (0, 0)	0.023 (90, 0)	0.022 (0, 90)
27	0.026 (0, 0)	0.026 (90, 0)	0.025 (0, 90)
28	0.029 (0, 0)	0.029 (90, 0)	0.029 (0, 90)
29	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)
3	0.021 (0, 0)	0.021 (90, 0)	0.019 (0, 90)
30	0.018 (0, 0)	0.018 (90, 0)	0.018 (0, 90)
31	0.021 (0, 0)	0.021 (90, 0)	0.020 (0, 90)
32	0.025 (0, 0)	0.025 (90, 0)	0.025 (0, 90)
33	0.030 (0, 0)	0.030 (90, 0)	0.030 (0, 90)
34	0.027 (0, 0)	0.027 (90, 0)	0.027 (0, 90)
35	0.025 (0, 0)	0.025 (90, 0)	0.025 (0, 90)
36	0.023 (0, 0)	0.023 (90, 0)	0.023 (0, 90)
37	0.020 (0, 0)	0.020 (90, 0)	0.020 (0, 90)
38	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)
39	0.014 (0, 0)	0.014 (90, 0)	0.013 (0, 90)
4	0.025 (0, 0)	0.025 (90, 0)	0.024 (0, 90)
40	0.025 (0, 0)	0.025 (90, 0)	0.025 (0, 90)
5	0.028 (0, 0)	0.028 (90, 0)	0.026 (0, 90)
6	0.021 (0, 0)	0.021 (90, 0)	0.019 (0, 90)
7	0.023 (0, 0)	0.023 (90, 0)	0.021 (0, 90)
8	0.021 (0, 0)	0.021 (90, 0)	0.018 (0, 90)
9	0.019 (0, 0)	0.019 (90, 0)	0.016 (0, 90)
E 125 RESET	0.019 (0, 0)	0.019 (90, 0)	0.000 (0, 90)

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ, VANG)	MED-SEMI (AZ, VANG)	MIN-SEMI (AZ, VANG)	DISTANCE	PPM
1	102	0.012 (0, 0)	0.012 (90, 0)	0.011 (0, 90)	18986.703	0.63
1	103	0.004 (0, 90)	0.004 (0, 0)	0.004 (90, 0)	1828.470	2.15
10	102	0.020 (0, 0)	0.020 (90, 0)	0.020 (0, 90)	23002.638	0.87
10	103	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	9796.613	1.81
101	102	0.014 (0, 0)	0.014 (90, 0)	0.010 (0, 90)	39056.976	0.37
101	103	0.011 (0, 0)	0.011 (90, 0)	0.010 (0, 90)	21792.958	0.50
101	104	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	23590.213	0.56
101	20	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)	11554.175	1.41
101	21	0.005 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2306.418	2.06
101	22	0.005 (0, 90)	0.005 (0, 0)	0.005 (90, 0)	2516.799	2.05
101	23	0.009 (0, 90)	0.009 (0, 0)	0.009 (90, 0)	4749.840	1.91
101	24	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	7286.911	1.83
101	25	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	10915.888	1.67
101	26	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	13810.407	1.52
101	27	0.024 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	17832.635	1.37
101	28	0.028 (0, 90)	0.027 (0, 0)	0.027 (90, 0)	20600.182	1.35
101	29	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	23882.643	0.56
101	30	0.016 (0, 90)	0.015 (0, 0)	0.015 (90, 0)	25227.927	0.61
101	31	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	24493.669	0.75
101	32	0.023 (0, 90)	0.023 (0, 0)	0.023 (90, 0)	26622.722	0.87
101	33	0.029 (0, 90)	0.028 (0, 0)	0.028 (90, 0)	22533.526	1.27
101	34	0.025 (0, 90)	0.025 (0, 0)	0.025 (90, 0)	19565.721	1.30
101	35	0.023 (0, 90)	0.023 (0, 0)	0.023 (90, 0)	17015.255	1.38
101	36	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	13769.033	1.55
101	37	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	10471.156	1.71
101	38	0.014 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	7184.226	1.88

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ, VANG)	MED-SEMI (AZ, VANG)	MIN-SEMI (AZ, VANG)	DISTANCE	PPM
101	39	0.010 (0, 90)	0.010 (0, 0)	0.010 (90, 0)	5248.497	1.94
101	40	0.023 (0, 90)	0.023 (0, 0)	0.023 (90, 0)	13198.222	1.78
101	BIL5	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	83851.378	0.11
101	CARELESS	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	44814.976	0.21
101	E 125 RESET	0.017 (0, 0)	0.017 (90, 0)	0.009 (0, 90)	46431.041	0.37
101	MTDT	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	234572.643	0.04
101	MTEI	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	68500.653	0.14
101	MTMS	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	254261.125	0.04
101	MTSU	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	176213.671	0.05
101	Z 122	0.010 (0, 0)	0.010 (90, 0)	0.009 (0, 90)	5022.776	1.90
102	103	0.011 (0, 0)	0.011 (90, 0)	0.010 (0, 90)	17485.560	0.65
102	11	0.018 (0, 0)	0.018 (90, 0)	0.018 (0, 90)	14056.645	1.28
102	12	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	12888.431	1.37
102	13	0.018 (0, 90)	0.018 (0, 0)	0.017 (90, 0)	11882.827	1.48
102	14	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	11292.219	1.58
102	15	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	13850.282	1.50
102	16	0.023 (0, 90)	0.023 (0, 0)	0.023 (90, 0)	15869.441	1.47
102	17	0.027 (0, 90)	0.027 (0, 0)	0.027 (90, 0)	18818.962	1.45
102	18	0.032 (0, 90)	0.032 (0, 0)	0.032 (90, 0)	22589.139	1.44
102	19	0.016 (0, 90)	0.016 (0, 0)	0.016 (90, 0)	10363.362	1.52
102	2	0.014 (0, 0)	0.014 (90, 0)	0.013 (0, 90)	21163.059	0.65
102	3	0.019 (0, 0)	0.019 (90, 0)	0.019 (0, 90)	25003.672	0.76
102	39	0.017 (0, 0)	0.017 (90, 0)	0.014 (0, 90)	33878.887	0.51
102	4	0.023 (0, 0)	0.023 (90, 0)	0.023 (0, 90)	27094.046	0.86
102	40	0.026 (0, 0)	0.026 (90, 0)	0.025 (0, 90)	28896.218	0.91
102	5	0.026 (0, 0)	0.026 (90, 0)	0.025 (0, 90)	28027.343	0.92

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ, VANG)	MED-SEMI (AZ, VANG)	MIN-SEMI (AZ, VANG)	DISTANCE	PPM
102	6	0.018 (0, 0)	0.018 (90, 0)	0.018 (0, 90)	23629.667	0.78
102	7	0.020 (0, 0)	0.020 (90, 0)	0.020 (0, 90)	22897.141	0.89
102	8	0.018 (0, 0)	0.018 (90, 0)	0.018 (0, 90)	20599.169	0.87
102	9	0.016 (0, 0)	0.016 (90, 0)	0.015 (0, 90)	18103.766	0.89
102	BIL5	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	78251.088	0.22
102	CARELESS	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	69033.755	0.24
102	E 125 RESET	0.009 (0, 0)	0.009 (90, 0)	0.008 (0, 90)	10400.178	0.91
102	MTDT	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	260967.765	0.06
102	MTEI	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	88423.938	0.19
102	MTMS	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	237108.085	0.07
102	MTSU	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	213546.893	0.08
102	Z 122	0.017 (0, 0)	0.017 (90, 0)	0.008 (0, 90)	36726.168	0.46
103	104	0.017 (0, 0)	0.017 (90, 0)	0.016 (0, 90)	37891.094	0.45
103	2	0.009 (0, 90)	0.008 (0, 0)	0.008 (90, 0)	4341.734	1.96
103	20	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)	10433.959	1.52
103	21	0.012 (0, 0)	0.012 (90, 0)	0.011 (0, 90)	20311.220	0.58
103	22	0.012 (0, 0)	0.012 (90, 0)	0.011 (0, 90)	19276.709	0.61
103	23	0.014 (0, 0)	0.014 (90, 0)	0.013 (0, 90)	18042.777	0.75
103	24	0.016 (0, 0)	0.016 (90, 0)	0.016 (0, 90)	18519.250	0.88
103	25	0.019 (0, 0)	0.019 (90, 0)	0.019 (0, 90)	16985.816	1.15
103	26	0.022 (0, 0)	0.021 (90, 0)	0.021 (0, 90)	16314.128	1.32
103	27	0.024 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	16355.678	1.48
103	28	0.028 (0, 90)	0.027 (0, 0)	0.027 (90, 0)	18229.249	1.51
103	3	0.016 (0, 90)	0.016 (0, 0)	0.016 (90, 0)	8615.214	1.88
103	4	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	11815.647	1.81
103	5	0.024 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	13712.822	1.77

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
103	6	0.015 (0, 90)	0.015 (0, 0)	0.015 (90, 0)	8328.458	1.86
103	7	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	10129.183	1.81
103	8	0.016 (0, 90)	0.015 (0, 0)	0.015 (90, 0)	8315.227	1.87
103	9	0.013 (0, 90)	0.013 (0, 0)	0.013 (90, 0)	6884.920	1.85
104	29	0.002 (0, 90)	0.002 (0, 0)	0.002 (90, 0)	863.594	2.40
104	30	0.009 (0, 90)	0.009 (0, 0)	0.009 (90, 0)	4479.437	1.95
104	31	0.014 (0, 90)	0.014 (0, 0)	0.014 (90, 0)	7414.810	1.88
104	32	0.021 (0, 90)	0.020 (0, 0)	0.020 (90, 0)	11395.248	1.80
104	33	0.028 (0, 90)	0.028 (0, 0)	0.028 (90, 0)	17876.298	1.56
104	34	0.025 (0, 90)	0.024 (0, 0)	0.024 (90, 0)	15776.542	1.56
104	35	0.023 (0, 90)	0.023 (0, 0)	0.023 (90, 0)	15079.237	1.53
104	36	0.022 (0, 90)	0.022 (0, 0)	0.022 (90, 0)	16483.639	1.35
104	37	0.020 (0, 90)	0.020 (0, 0)	0.020 (90, 0)	17560.938	1.15
104	38	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	19700.309	0.90
11	E 125 RESET	0.017 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	11081.462	1.57
12	E 125 RESET	0.018 (0, 90)	0.017 (0, 0)	0.017 (90, 0)	11666.798	1.50
13	E 125 RESET	0.018 (0, 90)	0.018 (0, 0)	0.018 (90, 0)	12729.455	1.39
14	E 125 RESET	0.018 (0, 0)	0.018 (90, 0)	0.018 (0, 90)	14557.469	1.26
15	E 125 RESET	0.021 (0, 90)	0.021 (0, 0)	0.021 (90, 0)	15627.117	1.34
16	E 125 RESET	0.024 (0, 90)	0.023 (0, 0)	0.023 (90, 0)	17365.750	1.35
17	E 125 RESET	0.027 (0, 90)	0.027 (0, 0)	0.027 (90, 0)	20053.239	1.37
18	E 125 RESET	0.033 (0, 90)	0.032 (0, 0)	0.032 (90, 0)	23546.013	1.38
19	E 125 RESET	0.016 (0, 90)	0.016 (0, 0)	0.016 (90, 0)	11391.216	1.39

1100804 USGS-SAGE GROUSE *** GROUND SURVEY FILE ***
 HORIZONTAL - NAD 83/07 UTM ZONE 13
 VERTICAL - NAVD88 METERS

STATION	EASTING	NORTHING	ELEVATION
1	668903.856	5146579.098	1100.114
2	666391.355	5146507.433	1079.545
3	662120.380	5146396.922	1110.316
4	659060.150	5148410.551	1168.465
5	657535.249	5150304.959	1173.350
6	662659.694	5148633.026	1136.601
7	662345.346	5152265.592	1180.478
8	664692.147	5152302.216	1158.093
9	667212.155	5152505.633	1103.235
10	662368.666	5151687.135	1174.831
11	673236.062	5165151.485	1155.584
12	673291.037	5162997.609	1130.152
13	673373.146	5160554.440	1106.685
14	673447.456	5157497.586	1113.878
15	671002.233	5158886.408	1158.118
16	668967.949	5158885.814	1146.006
17	665992.791	5158782.897	1136.074
18	662206.388	5158729.300	1159.863
19	674983.718	5160582.441	1105.178
20	665063.035	5137832.909	1113.946
21	658756.875	5130189.702	1064.039
22	658068.321	5132061.865	1088.248
23	657040.185	5134845.435	1128.985
24	654763.648	5137219.396	1191.552
25	654727.883	5140909.671	1113.492
26	654657.926	5143823.122	1161.026
27	654428.187	5147846.223	1143.864
28	652914.380	5150421.970	1169.360
29	633982.114	5138204.457	1150.919
30	634101.785	5141817.548	1202.555
31	636494.295	5144319.804	1223.035
32	637023.352	5148323.066	1208.028
33	646340.651	5150263.122	1257.396
34	646490.476	5146966.581	1223.483
35	647283.792	5144461.836	1164.460
36	649755.257	5142160.112	1141.394
37	651440.234	5139324.182	1148.314
38	653682.797	5136760.832	1101.910
39	659658.893	5134286.432	1119.106
40	659510.071	5142969.258	1101.113
101	656451.737	5130133.854	1068.946
102	684729.307	5157063.156	1113.567
103	670731.283	5146589.993	1052.424
104	633997.365	5137341.344	1142.914
BIL5	732687.348	5095232.124	888.860
CARELESS	616117.850	5149630.026	1291.870
E 125RESET	684076.142	5167441.185	1090.590
MTDT	423883.103	5159916.453	1230.837
MTEI	686667.455	5068672.108	984.037
MTMS	596942.045	5377260.369	790.120
MTSU	496494.120	5056408.344	1506.357
Z 122	661291.993	5128797.149	1043.329

LIDAR FLIGHT LOG

Happy LABOR DAY!



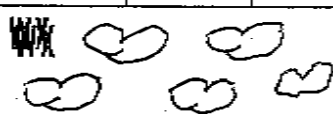
DCI

MISSION: **Q090610A** DATE: **9-6-10**

PILOT: **JOSEY B.** OPERATOR: **DOUG C.** AIRCRAFT: **NZ80MB**

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
1100804							8:18	9:00		BIL → SITE .7
SAGE Grouse		2 TEST Fires					1448	1450		2 TEST Fires
	1	30	155	52.6	19	100	1000	1501	1502	
	2	210						1505	1506	
	3	30						1510	1511	
	4	210						1514	1515	
	5	30						1519	1520	
	6	210						1523	1525	
	7	30						1528	1530	
	8	210						1534	—	EYE Safety Cut-off
	8	210						1537	1539	
	9	30						—	—	Cued OUT West End
	X	CF						1545	1546	CROSS FLIGHT
	112	30						1551	1553	Chop
	111	210						1556	1558	
	110	30						1600	1603	
	109	210						1605	1608	
	108	30						1611	1615	
	107	210						1617	1620	
	106	30	✓	✓	✓	✓	✓	1623	1627	✓

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES:
				SITE	FERRY				
1100804	112	29	83	3.8	1.1				Initial flight over LAVINA Southern BASE ST.
									PA LOG 1 of 2



PAGE 01/04
 HAMPTON INN & SUITES
 40665581124066558112
 09/06/2010 19:20

LIDAR FLIGHT LOG



DCL

Happy LABOR DAY!

MISSION: Q090610A

DATE: 9-6-10

PILOT: JOSEY B

OPERATOR: DOUG C.

AIRCRAFT: N280MB

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
1100804	105 210	155	52.6	19	100	1000	1630	1634	 	chop
SageGrouse	104 30						1636	1641	/	
	103 210						1644	1648	/	
	102 30						1651	1656	/	
	101 210						1701	1709	/	
	100 30						1712	1721	/	
	99 210						1723	1732	/	
	98 30						1735	1743	/	
	97 210						1746	1754	/	+ chop
	96 30						1757	1805	/	
	95 210						1708	1816	/	
	94 30						1819	1827	/	
	93 210						1830	1839	/	
	X CF	✓	✓	✓	✓	✓	1843	1845	/	Cross flight
							12:48	13:12	/	SITE → BIL 04

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES:
				SITE	FERRY				
1100804	112	29	83	3.8	1.1				
									LOG 2 of 2



PAGE 02/04
HAMPDEN INN & SUITES
40666681124066668112
07:51 0107/90/50

Flight Log

 Project Number: 0
 S/N : 0
 Operator : ???
 Pilot(s) : ???
 Aircraft : ???
 Airport : ???
 Mission : ???
 Wheels Up : ???
 Flight Length :
 HOBBS Start :
 HOBBS End :

Weather

 Date : September 06, 2010
 Julian Day : 249
 Temperature : ???
 Visibility : ???
 Clouds : ???
 Precipitation : ???
 Wind Dir : ???
 Wind Speed : ???
 Pressure : ???

Statistics

 Laser Time : 02:03:52

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
14:48:02.52	14:48:29.419	1	2307	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
14:49:56.518	14:50:24.917	1	2207	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:01:55.705	15:02:39.404	1	2207	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:05:41.301	15:06:40.8	2	2216	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:10:19.296	15:11:22.694	3	2195	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:14:46.291	15:15:53.689	4	2189	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:19:15.586	15:20:37.584	5	2206	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:23:53.78	15:25:07.679	6	2194	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:28:41.875	15:30:21.673	7	2190	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:34:05.369	15:34:24.368	8	2196	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:37:55.664	15:39:30.662	8	2176	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:45:26.755	15:46:26.654	1	2160	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:51:47.748	15:53:13.346	112	2124	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl

15:56:17.242	15:58:02.04	111	2100	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:00:54.837	16:03:15.534	110	2081	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
16:05:54.031	16:08:33.227	109	2078	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:11:54.823	16:14:58.919	108	2062	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
16:17:29.316	16:20:51.612	107	2055	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:23:39.909	16:27:33.604	106	2051	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
16:30:07.2	16:34:06.395	105	2062	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:36:51.492	16:41:26.486	104	2068	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
16:44:02.183	16:48:36.277	103	2057	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:51:25.173	16:56:10.067	102	2069	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:01:26.36	17:09:40.349	101	2100	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
17:12:39.545	17:21:02.534	100	2095	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:23:50.731	17:32:17.719	99	2080	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
17:35:12.515	17:43:38.404	98	2093	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:46:22.1	17:54:31.889	97	2148	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
17:57:09.186	18:05:32.375	96	2127	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
18:08:23.371	18:16:39.46	95	2094	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
18:19:38.056	18:27:57.545	94	2123	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
18:30:46.241	18:39:12.63	93	2109	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
18:43:26.124	18:45:24.422	112	2133	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl

LIDAR FLIGHT LOG

Happy LABOR DAY



DC 2

MISSION: **Q090610B**

DATE: **9-6-10**

PILOT: **JOSEY B.**

OPERATOR: **DOUG C.**

AIRCRAFT: **N280MB**

PAGE 03/04

HAMPTON INN & SUITES

40665581124066558112

09/06/2010 19:20

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
1100 804							13:42	1418	 	BIL → SITE
Sage Grouse	2	TEST FIRES					2006	2007	 	2 TEST Fires
	92 30	155	52.6	19	100	1000	2016	2024	 	chop
	91 210	155	52.6	19	100	1000	2027	2035	 	
	90 30						2038	2046	 	
	89 210						2049	2058	 	
	88 30						2101	2109	 	
	87 210						2112	2120	 	
	86 30						2123	2131	 	
	85 210						2134	2143	 	
	84 30						2145	2154	 	
	83 210						2157	2205	 	
	82 30						2208	2217	 	
	81 210						2219	2228	 	
	80 30						2231	2239	 	
	79 210						2242	2251	 	
	78 30						2254	2302	 	
	77 210						2305	2314	 	
	76 30						2217	2325	 	
	75 210						2228	2336	 	

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES
				SITE	FERRY				
✓ 1100 804	112	20	63	3.8	1.0				LOG 1 of 2

LIDAR FLIGHT LOG



DC 2

MISSION: Q090610 B DATE: 9-6-10

PILOT: JOSEY B. OPERATOR: Doug C.

AIRCRAFT: N280MB

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
100804	74 30	155	52.6	19	100	1000	2339	2348	 	+ Chap
SAGE Grouse	73 210	↓	↓	↓	↓	↓	2351	2359	 	
	X CF	↓	↓	↓	↓	↓	0003	0006	 	cross flight
							1806	18:30	 	SITE → BIL
									 	
									 	
									 	
									 	
									 	
									 	
									 	
									 	
									 	
									 	
									 	
									 	
									 	

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES:
				SITE	FERRY				
1100804	112	20	63	3.8	1.0				LOG 2 of 2
						WX			

PAGE 04/04
HAMPTON INN & SUITES
40665581124066558112
09/06/2010 19:20

Flight Log

 Project Number: 0
 S/N : 0
 Operator : ???
 Pilot(s) : ???
 Aircraft : ???
 Airport : ???
 Mission : ???
 Wheels Up : ???
 Flight Length :
 HOBBS Start :
 HOBBS End :

Weather

 Date : September 06, 2010
 Julian Day : 249
 Temperature : ???
 Visibility : ???
 Clouds : ???
 Precipitation : ???
 Wind Dir : ???
 Wind Speed : ???
 Pressure : ???

Statistics

 Laser Time : 02:50:51

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
20:06:45.233	20:07:02.233	92	1984	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:07:16.133	20:07:38.632	92	1992	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:16:17.021	20:24:39.211	92	2096	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:27:18.708	20:35:45.597	91	2074	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:38:25.094	20:46:46.383	90	2082	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:49:35.979	20:58:10.868	89	2080	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
21:00:59.464	21:09:15.954	88	2132	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:12:00.35	21:20:30.839	87	2057	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
21:23:30.435	21:31:46.324	86	2109	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:34:34.22	21:42:59.609	85	2087	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
21:45:54.405	21:54:28.393	84	2110	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:57:10.69	22:05:53.578	83	2129	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:08:53.274	22:17:03.863	82	2159	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl

22:19:56.159	22:28:23.748	81	2085	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:31:19.444	22:39:34.432	80	2149	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
22:42:36.328	22:51:16.117	79	2152	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:54:27.412	23:02:33.901	78	2135	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:05:22.197	23:14:07.786	77	2144	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:17:02.782	23:25:09.871	76	2159	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:28:08.067	23:36:50.855	75	2126	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:39:43.551	23:48:04.839	74	2131	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:51:05.735	23:59:48.923	73	2081	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
00:03:31.818	00:06:00.515	73	2139	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl

LIDAR FLIGHT LOG



Dc1

01/04
 PAGE
 HAMPDEN INN & SUITES
 218999991124066666112
 406666661124066666112
 09/01/08 01:02 // 01/08

MISSION: **Q 090710 A** DATE: **9-7-10**

PILOT: **JOSEY B.** OPERATOR: **DOUG C.** AIRCRAFT: **N280MB**

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
100804							8:00	8:36	2.	BIL → SITE
Sage Grouse	2 Test						1426	1427		2 TEST FIRES
	72 30	155	52.6	19	100	1000	1436	1444		
	71 210						1448	1457		
	70 30						1500	1508		
	69 210						1511	1520		
	68 30						1523	1532		
	67 210						1535	1544		
	66 30						1547	1555		
	65 210						1559	1608		
	64 30						1611	1619		
	63 210						1623	1631		
	62 30						1634	1641		
	61 210						1644	1652		
	60 30						1655	1701		
	59 210						1705	1711		
	58 30						1714	1718		
	57 210						1722	1727		
	56 30						1730	1735		
	55 210						1738	1744		

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES
				SITE	FERRY				
<input checked="" type="checkbox"/>	1100804	112	28	35	4.7	1.0			Initial flight over LAWIWA BASE station
<input type="checkbox"/>									LOG 1 of 2
<input type="checkbox"/>									

Flight Log

 Project Number: 0
 S/N : 0
 Operator : ???
 Pilot(s) : ???
 Aircraft : ???
 Airport : ???
 Mission : ???
 Wheels Up : ???
 Flight Length :
 HOBBS Start :
 HOBBS End :

Weather

 Date : September 07, 2010
 Julian Day : 250
 Temperature : ???
 Visibility : ???
 Clouds : ???
 Precipitation : ???
 Wind Dir : ???
 Wind Speed : ???
 Pressure : ???

Statistics

 Laser Time : 03:14:10

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
14:26:14.813	14:26:37.012	72	2304	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
14:26:45.812	14:27:03.612	72	2305	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
14:36:01.602	14:44:19.893	72	2121	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
14:48:00.089	14:57:22.478	71	2084	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:00:34.775	15:08:41.565	70	2143	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:11:38.562	15:20:53.451	69	2125	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:23:49.147	15:32:01.237	68	2136	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:35:33.233	15:44:44.321	67	2138	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
15:47:41.117	15:55:46.707	66	2135	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
15:59:14.803	16:08:15.491	65	2136	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:11:24.587	16:19:22.676	64	2124	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
16:23:21.171	16:31:16.46	63	2106	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:34:03.156	16:41:02.547	62	2121	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl

16:44:08.242	16:52:01.332	61	2149	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
16:54:58.728	17:01:49.118	60	2123	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:05:38.913	17:11:13.605	59	2093	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
17:13:59.601	17:18:53.794	58	2106	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:22:04.09	17:27:43.882	57	2135	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
17:30:48.378	17:35:45.771	56	2122	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:38:46.967	17:44:40.959	55	2180	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
17:47:59.254	17:52:56.847	54	2130	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
17:56:10.443	18:02:06.934	53	2162	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
18:05:14.73	18:10:29.823	52	2111	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
18:13:54.218	18:20:01.109	51	2112	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
18:22:55.805	18:28:18.198	50	2098	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
18:31:31.393	18:37:34.585	49	2139	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
18:40:45.68	18:46:10.573	48	2125	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
18:49:40.468	18:55:35.06	47	2123	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
18:58:05.656	19:03:25.349	46	2122	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
19:06:22.845	19:12:05.936	45	2181	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
19:15:22.632	19:20:06.325	45	2156	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl

LIDAR FLIGHT LOG



Dec

MISSION: **Q090710B** DATE: **9-7-10**

LOT: **JOSEY B** OPERATOR: **DOUG C.** AIRCRAFT: **N280MB**

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
1100804							14:18	14:54		BIL → SITE
AGE Grouse	✓ 2	TEST	Fires				2042	2044		2 TEST FIRES
	44 30	155	52.6	19	100	1000	2054	2100		+ chop min
	43 210						2103	2108		
	42 30						2111	2116		
	41 210						2119	2125		
	40 30						2128	2133		
	39 210						2136	2141		
	38 30						2144	2149		
	37 210						2152	2157		
	36 30						2200	2206		
	35 210						2209	2214		
	34 30						2217	2222		
	33 210						2225	2229		
	32 30						2232	2237		
	31 210						2240	2244		
	30 30						2248	2252		
	29 210						2255	2300		
	28 30						2303	2307		
	27 210						2311	2314		

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES
				SITE	FERRY				
✗ 1100804	112	36/112	0	4.2	1.1				Initial flight over SE BASE station
○									
○									LOG 1 of 2



03/04
 PAGE
 HAMPDEN INN & SUITES
 40666681124066668112
 09/01/2012 17:00

LIDAR FLIGHT LOG



DC2

MISSION: **Q090910B**

DATE: **9-7-10**

LOT: **JOSEY B**

OPERATOR: **DOUG C**

AIRCRAFT: **N280MB**

PROJECT NUMBER	LINE NO. & Hdg		GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
				FREQ	ANGLE			START	STOP		
1100804	22	30	155	52.6	19	100	1000	2217	2321	 	+ Chop
Sage Grouse	26	210						2323	2327	/	
	21	30						2329	2333	/	
	25	210						2335	2339	/	
	20	30						2341	2345	/	
	24	210						2347	2351	/	
	19	30						2354	2357	/	
	23	210						0000	0003	/	
	18	30						0006	0009	/	
	13	210						0012	0015	/	
	17	30						0018	0021	/	
	12	210						0024	0027	/	
	16	30						0029	0033	/	
	11	210						0036	0039	/	
	15	30						0041	0045	/	
	10	210						0047	0051	/	
	14	30						0053	0056	/	
	9	210						0059	0102	/	
	X	CF	✓	✓	✓	✓	✓	0105	0108	/	Cross flight
								19:06	19:36		SITE → BIL

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES:
				SITE	FERRY				
<input checked="" type="checkbox"/>	1100804	112	36/112	0	4.2	1.1			LOG 2 of 2
<input type="checkbox"/>									
<input type="checkbox"/>									



PAGE 04/04
 HAMPDEN INN & SUITES
 40666681124066668112
 40666681124066668112
 09/07/10 01:02 // 0/0/00

Flight Log

 Project Number: 0
 S/N : 0
 Operator : ???
 Pilot(s) : ???
 Aircraft : ???
 Airport : ???
 Mission : ???
 Wheels Up : ???
 Flight Length :
 HOBBS Start :
 HOBBS End :

Weather

 Date : September 07, 2010
 Julian Day : 250
 Temperature : ???
 Visibility : ???
 Clouds : ???
 Precipitation : ???
 Wind Dir : ???
 Wind Speed : ???
 Pressure : ???

Statistics

 Laser Time : 02:32:17

START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
20:42:53.69	20:43:21.189	44	2314	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:43:44.288	20:44:09.888	44	2309	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:54:26.474	20:59:54.867	44	2168	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:03:16.062	21:08:40.055	43	2133	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
21:11:47.651	21:16:55.644	42	2222	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:19:51.64	21:25:10.633	41	2180	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
21:28:03.229	21:33:03.822	40	2162	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:36:12.717	21:41:23.81	39	2174	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
21:44:15.406	21:49:29.999	38	2203	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
21:52:22.195	21:57:44.188	37	2162	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:00:53.083	22:06:05.676	36	2209	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
22:09:12.172	22:14:27.264	35	2180	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:17:37.36	22:22:01.254	34	2227	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl

22:24:57.15	22:29:39.344	33	2217	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:32:54.439	22:37:23.833	32	2190	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
22:40:22.429	22:44:56.923	31	2191	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
22:48:13.718	22:52:43.812	30	2240	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
22:55:33.308	23:00:04.102	29	2183	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:03:18.598	23:07:44.392	28	2169	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:11:15.387	23:14:42.382	27	2218	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:17:26.478	23:20:58.674	22	2216	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:23:33.07	23:27:01.865	26	2208	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:29:30.362	23:32:58.457	21	2157	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:35:32.053	23:39:02.149	25	2160	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:41:45.545	23:45:19.74	20	2159	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:47:52.436	23:51:18.631	24	2175	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
23:53:59.128	23:57:40.223	19	2190	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
23:59:59.619	00:03:29.614	23	2205	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
00:05:59.011	00:09:39.206	18	2148	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
00:12:05.402	00:15:33.497	13	2171	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
00:17:58.694	00:21:36.989	17	2141	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
00:24:05.885	00:27:26.58	12	2166	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
00:29:55.977	00:33:29.872	16	2180	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
00:36:09.868	00:39:24.463	11	2167	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
00:41:50.46	00:45:20.855	15	2167	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
00:47:55.951	00:51:10.246	10	2198	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
00:53:35.243	00:56:56.438	14	2170	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
00:59:21.434	01:02:26.93	9	2181	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
01:05:10.926	01:08:35.021	9	2115	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl

LIDAR FLIGHT LOG



Dc1

MISSION: Q091510A DATE: 9-15-10

PILOT: JOSEY B. OPERATOR: DOUG C.

AIRCRAFT: N280MB

PROJECT NUMBER	LINE NO. & Hdg	GND SPEED (KTS)	SCAN		PRF	ALT (m)	TIME		Tranzpak Drive	REMARKS
			FREQ	ANGLE			START	STOP		
Hillcrest, CA							7:00	8:30	XXXX	SMN → BIL
							12:48	13:18		BIL → SITE .5
1100804	2	TEST	Fires				1918	1919		2 TEST
SAGE GROUSE	69 30	155	52.6	19	100	1/800	1924	1930		
(Reflights)	68 210						1935	1935		
	↓ 210						1940	1941		
	66 30						1944	1945		
	65 30						1948	1949		
	↓ 210						1953	1953		
	63 210						1958	2004		
	62 30						2007	2009		
	59 210						2012	2017		
	58 30						2023	2024		
	57 210						2028	2032		
	56 30						2034	2039		
	55 210						2042	2042		
	44 210						2044	2046		
	69 30	✓	✓	✓	✓	✓	2050	2055		
							14:54	15:30		SITE → BIL .6

STATUS	TOTAL LINES	FLOWN	LEFT	AIRCRAFT		STATIC	START:	STOP:	NOTES:
				SITE	FERRY				
✓ Hillcrest	112	112	8	1.6	1.1				
✓ 1100904	112	112	8	1.6	1.1				

P.001/001

TOTAL P.001

SEP-15-2010 15:54

Flight Log

 Project Number: 0
 S/N : 0
 Operator : ???
 Pilot(s) : ???
 Aircraft : ???
 Airport : ???
 Mission : ???
 Wheels Up : ???
 Flight Length :
 HOBBS Start :
 HOBBS End :

Weather

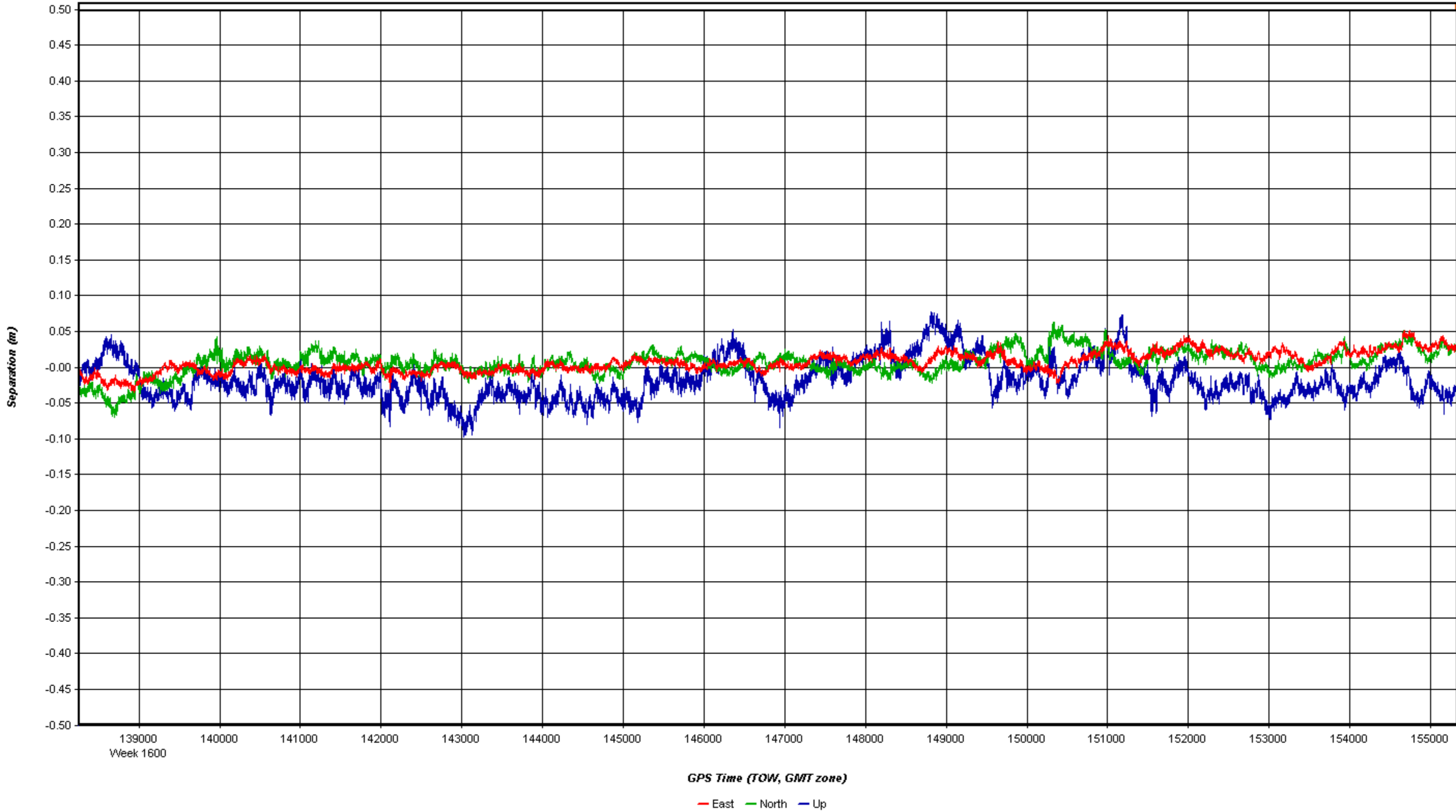
 Date : September 15, 2010
 Julian Day : 258
 Temperature : ???
 Visibility : ???
 Clouds : ???
 Precipitation : ???
 Wind Dir : ???
 Wind Speed : ???
 Pressure : ???

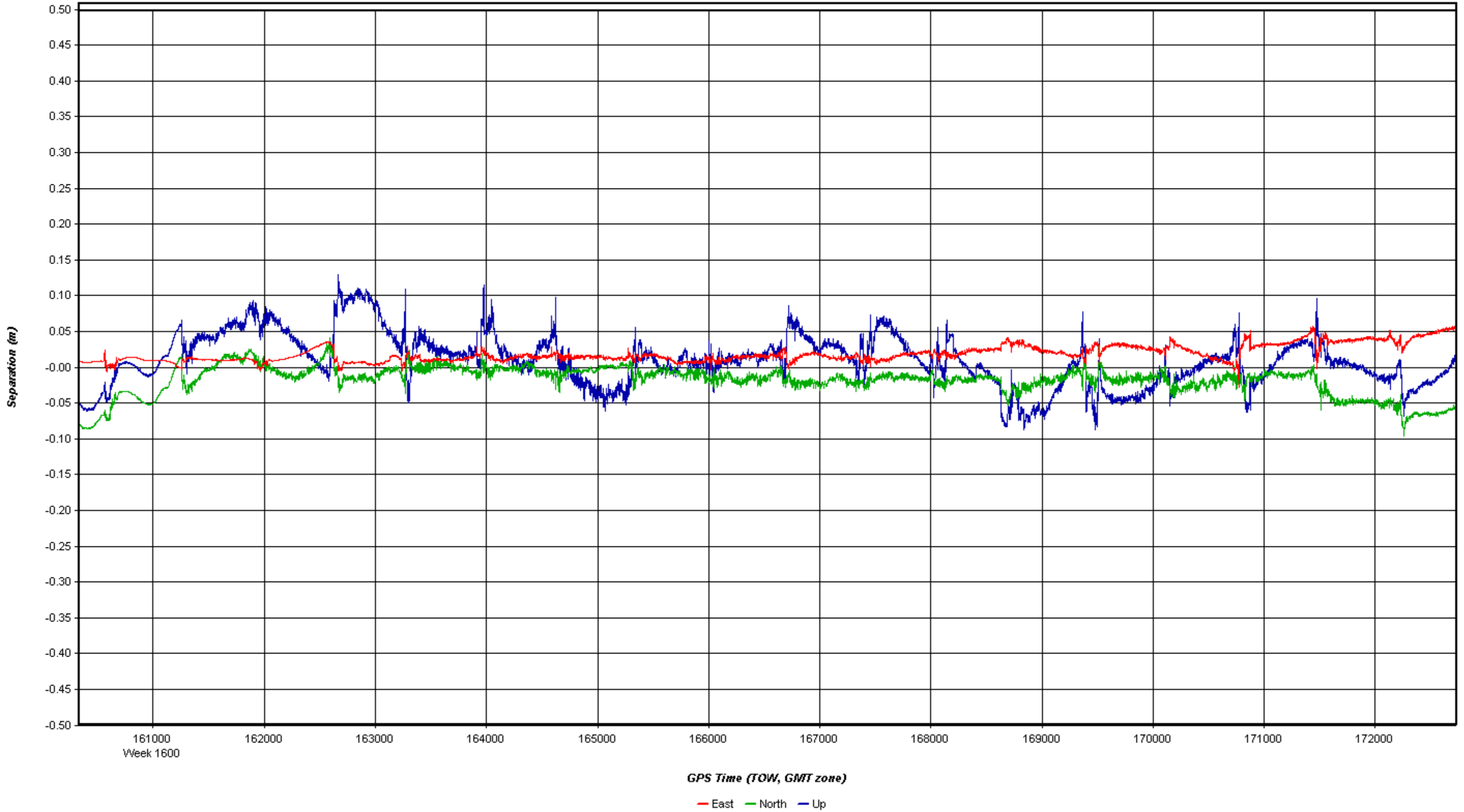
Statistics

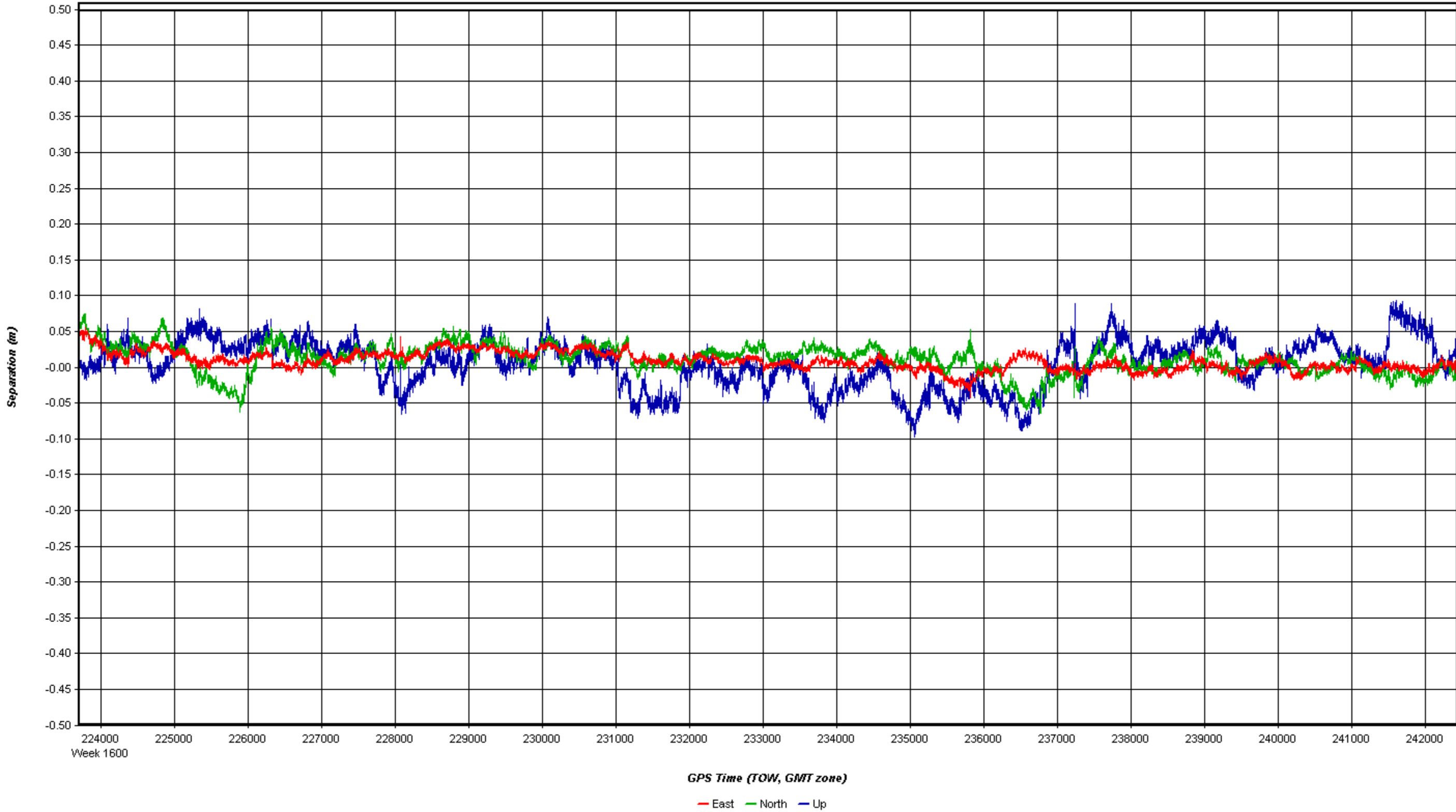
 Laser Time : 00:37:01

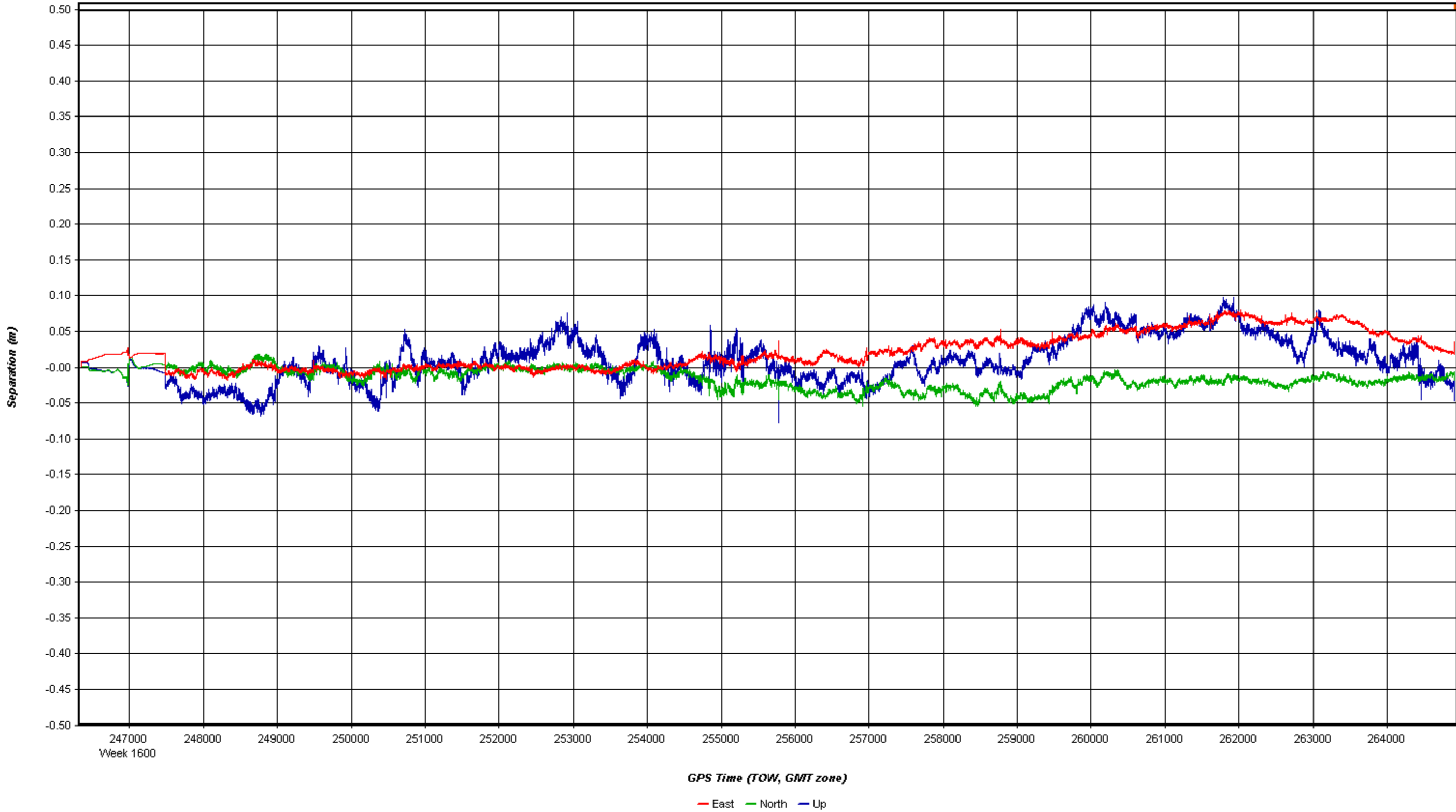
START	STOP	LINE#	ALT	PRF	FREQ	ANGLE	MP	DIV	RC	HDG	Plan File
19:18:07.25	19:18:31.35	69	1991	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
19:18:42.25	19:18:59.549	69	1974	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
19:24:28.343	19:30:01.837	69	1852	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
19:34:59.532	19:35:57.731	68	1915	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
19:40:21.426	19:41:28.824	68	2095	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
19:44:41.421	19:45:04.82	66	2065	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
19:48:47.616	19:49:21.715	65	2121	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
19:53:02.211	19:53:40.71	65	2088	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
19:58:50.304	20:03:59.898	63	2119	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:07:12.594	20:09:54.291	62	2037	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:12:45.888	20:14:18.886	59	2070	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:14:47.385	20:16:59.683	59	2118	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:23:23.775	20:24:48.373	58	2143	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl

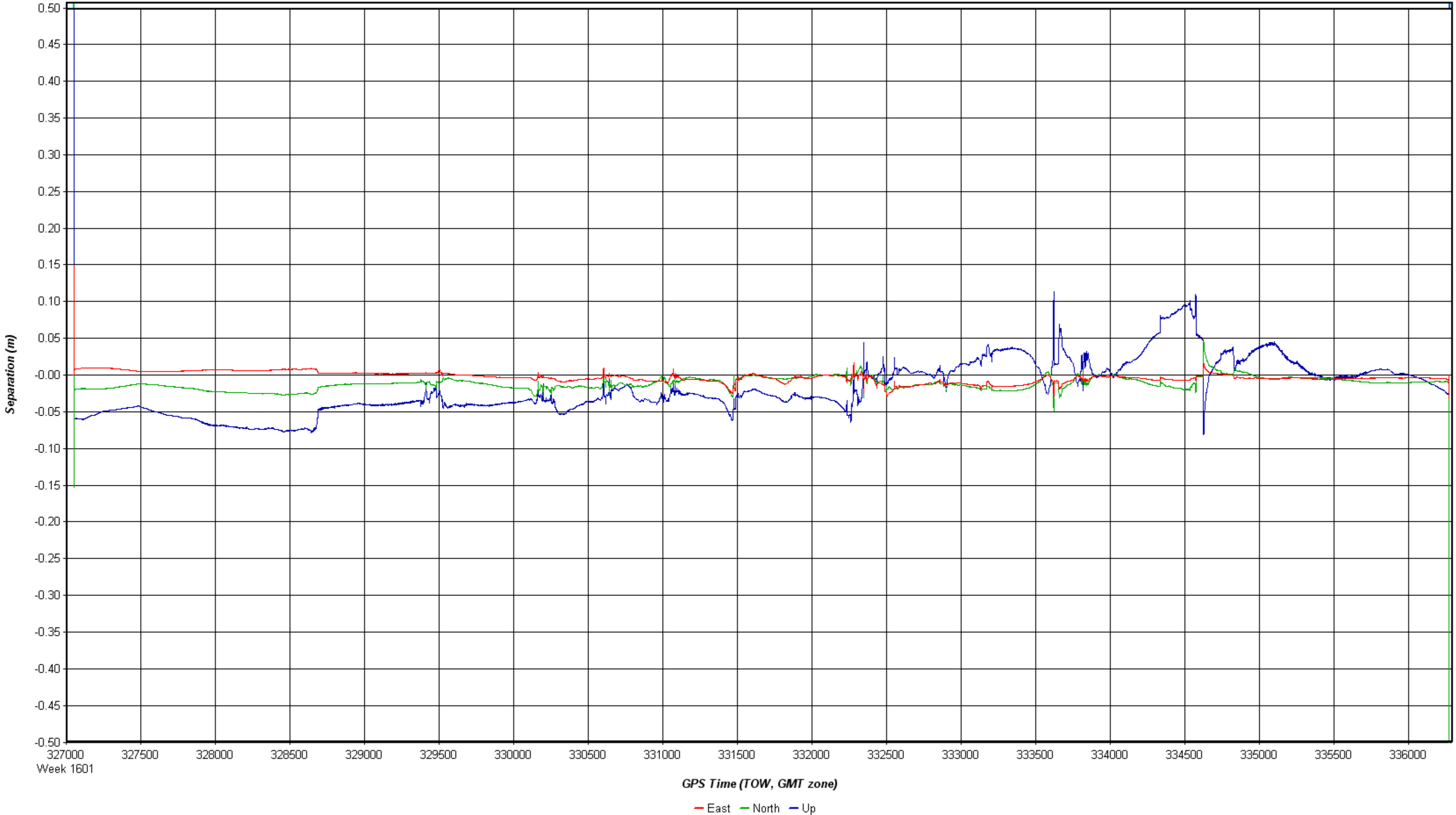
20:28:39.468	20:32:11.264	57	2096	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:34:54.161	20:38:46.956	56	2134	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:38:53.356	20:39:12.155	56	2128	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl
20:42:12.152	20:42:41.551	55	2133	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:44:42.549	20:45:58.647	44	2169	100	52.60	19.00	NAR	OFF	UNKNOWN	210.00	Sage_Grouse_MT_LiDAR_Fl
20:50:01.842	20:55:32.435	69	2136	100	52.60	19.00	NAR	OFF	UNKNOWN	30.00	Sage_Grouse_MT_LiDAR_Fl











Q:\1100804\Lidar\QAQC\1100804_checkpoints.txt

Number	Easting	Northing	Known Z	Laser Z	Dz
1	668903.856	5146579.098	1100.114	1100.080	-0.034
2	666391.355	5146507.433	1079.545	removed	*
3	662120.380	5146396.922	1110.316	1110.350	+0.034
4	659060.150	5148410.551	1168.465	1168.530	+0.065
5	657535.249	5150304.959	1173.350	removed	*
6	662659.694	5148633.026	1136.601	removed	*
7	662345.346	5152265.592	1180.478	1180.440	-0.038
8	664692.147	5152302.216	1158.093	removed	*
9	667212.155	5152505.633	1103.235	1103.190	-0.045
10	662368.666	5151687.135	1174.831	removed	*
11	673236.062	5165151.485	1155.584	1155.710	+0.126
12	673291.037	5162997.609	1130.152	removed	*
13	673373.146	5160554.440	1106.685	1106.750	+0.065
14	673447.456	5157497.586	1113.878	removed	*
15	671002.233	5158886.408	1158.118	removed	*
16	668967.949	5158885.814	1146.006	1145.960	-0.046
17	665992.791	5158782.897	1136.074	removed	*
18	662206.388	5158729.300	1159.863	1160.000	+0.137
19	674983.718	5160582.441	1105.178	removed	*
20	665063.035	5137832.909	1113.946	1113.880	-0.066
21	658756.875	5130189.702	1064.039	removed	*
22	658068.321	5132061.865	1088.248	1088.180	-0.068
23	657040.185	5134845.435	1128.985	1129.000	+0.015
24	654763.648	5137219.396	1191.552	removed	*
25	654727.883	5140909.671	1113.492	1113.550	+0.058
26	654657.926	5143823.122	1161.026	1161.050	+0.024
27	654428.187	5147846.223	1143.864	removed	*
28	652914.380	5150421.970	1169.360	1169.270	-0.090
29	633982.114	5138204.457	1150.919	1150.930	+0.011
30	634101.785	5141817.548	1202.555	1202.550	-0.005
31	636494.295	5144319.804	1223.035	1223.040	+0.005
32	637023.352	5148323.066	1208.028	removed	*
33	646340.651	5150263.122	1257.396	removed	*
34	646490.476	5146966.581	1223.483	1223.440	-0.043
35	647283.792	5144461.836	1164.460	removed	*
36	649755.257	5142160.112	1141.394	1141.390	-0.004
37	651440.234	5139324.182	1148.314	removed	*
38	653682.797	5136760.832	1101.910	1101.920	+0.010
39	659658.893	5134286.432	1119.106	removed	*
40	659510.071	5142969.258	1101.113	removed	*
101	656451.737	5130133.854	1068.946	1069.030	+0.084
102	684729.307	5157063.156	1113.567	outside	*
103	670731.283	5146589.993	1052.424	outside	*
104	633997.365	5137341.344	1142.914	removed	*
BIL5	732687.348	5095232.124	888.860	outside	*
CARELESS	616117.850	5149630.026	1291.870	outside	*
E_125RESET	684076.142	5167441.185	1090.590	outside	*
MTDT	423883.103	5159916.453	1230.837	outside	*
MTEI	686667.455	5068672.108	984.037	outside	*
MTMS	596942.045	5377260.369	790.120	outside	*
MTSU	496494.120	5056408.344	1506.357	outside	*
Average dz	+0.009				
Minimum dz	-0.090				
Maximum dz	+0.137				
Average magnitude	0.049				
Root mean square	0.061				
Std deviation	0.062				