

Appendices

Contents

1	Appendix A FGDC Metadata	2
1.1	East Block	2
1.2	West Block	13
2	Appendix B Static GPS Validation	22
2.1	East Block	22
2.2	West Block	24
3	Appendix C Aircraft Trajectory Plot.....	25
3.1	East Block	25
3.2	West Block	26
4	Appendix D Geodetic Control Survey Report.....	26
4.1	Published Control Stations: CORS Stations	28
4.2	New Control Stations:	29
4.3	Fully Constrained GPS Network.....	30
4.4	Minimally Constrained GPS Network.....	64
4.5	Published Control Stations:	96
4.5.1	CORS STATIONS.....	96
4.5.2	New Control Stations.....	179

1 Appendix A FGDC Metadata

1.1 East Block

Metadata:

Identification_Information:

Citation:

Citation_Information:

Originator: Terrapoint USA

Publication_Date: 20090817

Title: San Gabriel LiDAR Survey (East Block)

Geospatial_Data_Presentation_Form: Map

Online_Linkage: none

Larger_Work_Citation:

Citation_Information:

Originator: Terrapoint USA

Publication_Date: 20090817

Title: San Gabriel LiDAR Survey

Publication_Information:

Publication_Place: Houston, Texas

Publisher: Terrapoint USA

Online_Linkage: none

Description:

Abstract:

LIDAR data is remotely sensed high-resolution elevation data collected by an airborne collection platform. By positioning laser range finding with the use of 1 second GPS with 100hz inertial measurement unit corrections; Terrapoint LIDAR instruments are able to make highly detailed geospatial elevation products of the ground, man-made structures and vegetation. The LiDAR flightlines for this project was planned for a 60% acquisition overlap. The nominal resolution of this project without overlap is 6 points per square meter. Up to four returns were recorded for Intensity, Flightline and echo number attributes were provided for each LiDAR point.

Purpose:

This LiDAR project will support USGS science for the Multi-Hazards Southern California (SoCal) project by providing high accuracy, classified multiple return LiDAR and derivative products, for two areas totaling approximately 81 square miles, of the San Gabriel Area within Los Angeles County, California. The LiDAR data were acquired and processed by Terrapoint USA to support USGS's effort to collect pre-earthquake imagery of three perpendicular profiles along the Sierra Madre fault system to help characterize the geomorphic expression of compressional structures (faults and folds). At a later date Imagery could also be combined with a post-earthquake LiDAR acquisition to fully map surface rupture and possible image coseismic fold growth.

Supplemental_Information:

LiDAR Collection Specific Supplemental Information:

- General Overview:

The Airborne LiDAR survey was conducted using one OPTECH 3100EA systems flying at a nominal height of 800 meters AGL with lines were flown in multiple orientation blocks to best optimize flying time considering the layout for the project. The Optech 3100EA system was configured in two scanner configurations for the acquisition of the San Gabriel LiDAR project. Terrapoint modified the scanner configuration during the acquisition stage of this project in order to maintain the planned efficiency while reducing the visual effects of the corn rows and maintaining the scanner field view limitations set out in the contract.

All missions acquired between June 2nd and June 15th, were acquired with Configuration 1 and all missions acquired between June 16th and June 22nd, were acquired with Configuration 2.

CONFIGURATION_1
Aircraft Speed = 130 Knots
Data Acquisition Height = 800 meters AGL
Swath Width = 285 m Nominal
Distance Between Flight Lines = 114m
Overlap = 60%
Scanner Field Of View = +/-12.1 degrees
Scan Cutoff = 2 Degrees on either side of scan
Pulse Repetition Rate = 71 Kilohertz
Scan Frequency = 58.9 Hertz
Number of Returns Per Pulse = 4
Beam Divergence: Narrow
Resultant Raw Point Density = 6 pts/m2 without overlap

CONFIGURATION_2
Aircraft Speed = 130 Knots
Data Acquisition Height = 800 meters AGL
Swath Width = 340 m Nominal
Distance Between Flight Lines = 85m
Overlap = 75%
Scanner Field Of View = +/-18 degrees
Scan Cutoff = 6 Degrees on either side of scan
Pulse Repetition Rate = 71 Kilohertz
Scan Frequency = 47.8 Hertz
Number of Returns Per Pulse = 4
Beam Divergence: Narrow
Resultant Raw Point Density = 6 pts/m2 without overlap

The aircraft used for the survey was a Piper PA-31 Navajo, registration C-FVTL. This aircraft has a flight range of approximately 7 hours or 1025 nautical miles under optimal conditions. The aircraft was staged from the El Monte Airport (KEMT), and ferried to the project site for flight operations.

The total site size is 51.7 square miles

- GPS Receivers

A combination of Sokkia GSR 2600 and NovAtel DL-4+ dual frequency GPS receivers were used to support the airborne operations of this survey and to establish the GPS control network.

- Number of Flights and Flight Lines

A total of 8 missions were flown for this site with a flight time ranging approximately 15.3 online production hours and 205 production flight lines under good meteorological and GPS conditions to provide complete coverage.

- Reference Coordinate System Used:

Seven National Geodetic Survey (NGS) and two Southern California Integrated GPS Network (SCIGN) Continuously Operating Reference Stations were incorporated in a GPS control network to establish four new temporary control monuments for this project, to maintain base line distance requirements. The newly established temporary control points were used to control all flight missions, kinematic and static ground surveys.

The published horizontal datum of the control points is NAD83NSRS and the vertical datum NAVD88.

The following are the final coordinates of the newly established control points used in this project:

Station Id	Latitude	Longitude	Ellipsoidal Height	Orthometric Height
914301;34 05	22.05520;	-117 47 05.06989;	268.0278;	301.5868
914302;34 04	51.19350;	-118 02 16.26505;	51.7520;	86.1686
914303;34 10	47.78100;	-118 10 52.20514;	437.6259;	471.3486
914304;34 05	04.66812;	-118 01 56.81072;	56.5790;	90.9522

The following are the CORS stations observed to establish the new control points used in this project:

CORS-NGS_AZU1; CORS-NGS_CIT1; CORS-NGS_CVHS; CORS-SCIGN_GVRS; CORS-SCIGN_LEEP; CORS-NGS_LORS; CORS-NGS_PKRD; CORS-NGS_PSDM; CORS-NGS_SPMS

For further details concerning the control used in this project including the network adjustment, please see the Geodetic Control Survey Report in Appendix D.

- Geoid Model Used

The Geoid03 geoid model, published by the NGS, was used to transform all ellipsoidal heights to orthometric.

-General LiDAR notes

-Intensity

Please note that Terrapoint standard procedure is to not calibrate or normalize LiDAR intensity; but due to lower intensity returns for mission o109170a in comparison to the adjoining missions, Terrapoint used the normalize function in Dashmap for this particular mission.

-Waterbodies

Water is not included in the bare earth ground points for rivers (>10m wide), lakes or ponds (With an axis >100m), rather it is classified as water on Class 9; all remaining points within the water body were classified to class 1.

Water body delineation was collected using hillshades and intensity images generated from ground DEM and LiDAR

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20090530

Ending_Date: 20090618

Currentness_Reference: Ground Condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -117.983757

East_Bounding_Coordinate: -117.790423

North_Bounding_Coordinate: 34.174634

South_Bounding_Coordinate: 34.072945

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: ASPRS standards

Theme_Keyword: DEM

Theme_Keyword: digital elevation model

Theme_Keyword: elevation

Theme_Keyword: LAS_v1.2

Theme_Keyword: laser

Theme_Keyword: LiDAR

Theme_Keyword: ArcInfo Binary

Theme_Keyword: Intensity

Theme_Keyword: RawData

Theme_Keyword: RINEX

Theme_Keyword: ABGPS_IMU

Theme_Keyword: OPTECH_3100EA

Theme_Keyword: surface model

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: San Gabriel Mountains

Place_Keyword: San Dimas, California

Place_Keyword: Glendora, California

Place_Keyword: Azusa, California

Place_Keyword: Kincaid, California

Place_Keyword: Duarte, California

Place_Keyword: Kincaid, California
Place_Keyword: Bradbury, California
Place_Keyword: Butler, California
Place_Keyword: Irwindale, California
Place_Keyword: Los Angeles, California
Place_Keyword: Los Angeles County, California
Place_Keyword: California
Place_Keyword: United States of America
Place_Keyword: SouthWest

Access_Constraints:
All deliverable data and documentation shall be free from restrictions regarding use and distribution. Data and documentation provided under this task order shall be freely distributable by government agencies.

Use_Constraints:
Any conclusions from results of the analysis of this LiDAR are not the responsibility of Terrapoint. The LiDAR data was thoroughly visually verified to represent the true ground conditions at time of collection. Users should be aware of this limitations of this dataset if using for critical applications.

Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 25216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Raw elevation measurements have been tested to 0.073 meters vertical accuracy at 95 percent confidence level against Terrapoint acquired static GPS points

Logical_Consistency_Report:
All files delivered were verified and tested to ensure they open and are positioned properly.

Completeness_Report:
According to Terrapoint standards; the following aspects of the LiDAR data was verified during the course of the project processing:
-Data completeness and integrity
-Data accuracy and errors
-Anomaly checks through full-feature hillshades
-Post automated classification Bare-earth verification
-RMSE inspection of final bare-earth model using kinematic GPS
-Final quality control of deliverable products; ensuring integrity; graphical quality; conformance to Terrapoint standards are met for all delivered products.
-On a project level, a coverage check is carried out to ensure no slivers are present

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
Compiled to meet 0.98 meter horizontal accuracy at the 95 percent confidence level

Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:
Raw elevation measurements have been tested to 0.073 meters vertical accuracy at 95 percent confidence level against Terrapoint acquired static GPS points

Lineage:
Source_Information:

Source_Citation:
Citation_Information:
Originator: Terrapoint USA
Publication_Date: 20090817
Title: San Gabriel LiDAR Survey
Edition: One
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Houston, Texas
Publisher: Terrapoint USA
Online_Linkage: www.terrapoint.com
Larger_Work_Citation:
Citation_Information:
Originator: Terrapoint USA
Publication_Date: 20090817
Title: San Gabriel LiDAR Survey
Publication_Information:
Publication_Place: Houston, Texas
Publisher: Terrapoint USA
Online_Linkage: www.terrapoint.com
Type_of_Source_Media: Hard Drive
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20090817
Ending_Date: 20090817
Source_Currentness_Reference: Ground Condition
Source_Citation_Abbreviation: none
Source_Contribution:
LiDAR data representing the San Gabriel Mountain Area to help characterize the geomorphic expression of compressional structures (faults and folds) mapping in Los Angeles County, California
Process_Step:
Process_Description:
- Airborne GPS Kinematic
Airborne GPS kinematic data was processed on-site using GrafNav kinematic On-The-Fly (OTF) software. Flights were flown with a minimum of 6 satellites in view (130 above the horizon) and with a PDOP of better than 4.5. Distances from base station to aircraft were kept to a maximum of 30 km, to ensure a strong OTF (On-The-Fly) solution. For all flights, the GPS data can be classified as excellent, with GPS residuals of 5cm average but no larger than 12 cm being recorded.
Source_Used_Citation_Abbreviation: GPS Processing
Process_Date: 200811
Source_Produced_Citation_Abbreviation: GPS
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Process_Step:
Process_Description:
- Generation and Calibration of laser points (raw data)
Laser data points are generated using Terrapoint's proprietary laser post-processing software. This software combines the raw

laser range and angle data file with the finalized GPS/IMU information. The resulting point cloud has been projected into the desired coordinate system in TerraSolid's TerraScan in LAS format. All missions are validated against the adjoining missions for relative vertical biases and collected GPS kinematic ground truthing points for absolute vertical accuracy purposes. On a project level, a coverage check is carried out to ensure no slivers are present.

Source_Used_Citation_Abbreviation: Calibration

Process_Date: 200905_200907

Source_Produced_Citation_Abbreviation: CAL

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Organization: Terrapoint USA

Contact_Person: Claude Vickers

Contact_Position: Client Program Manager

Contact_Address:

Address_Type: mailing and physical address

Address: 251216 Grogan's Park Drive

City: The Woodlands

State_or_Province: Texas

Postal_Code: 77380

Country: USA

Contact_Voice_Telephone: 1-877-80-TERRA

Contact_Facsimile_Telephone: 1-281-296-0869

Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com

Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Process_Step:

Process_Description:

- System Calibration Results

The following are the post calibration results for the San Gabriel data outlined by mission:

Mission Name;Roll Correction(Deg);Pitch Correction (Deg);Scale Correction;Droop Correction;Normalized Intensity;Resulting Calibration Vertical Bias

o109150a;0.0214;-0.0593;1.00792;21R,16L;No;0cm

o109151a;0.0144;-0.0616;1.007721;21R,16L;No;0cm

o109152a;0.013259;-0.0587;1.007509;21R,16L;No;0cm

o109155a;0.009643;-0.06817;1.007518;21R,16L;No;+10cm

o109158a;0.0114;-0.06506;1.007612;21R,16L;No;line 15844 (+0.05cm), Line 15845 (-0.05cm)

o109167a;0.016712;-0.06161;1.00768;21R,16L;No;0cm

o109168a;0.016712;-0.06161;1.00768;21R,16L;No;Lines 16808 and 16809 (-0.05cm)

o109169a;0.0207;-0.0561;1.0079;21R,16L;No;-10cm

-Post Production Vertical Bias Resolution

The following biases were observed when verified with the GPS validation data post ground

classification and review. The elevations of the LiDAR data were adjusted accordingly: +13.4 cm

The following shift was applied to resolve a GPS Antenna Profile Error in the final LiDAR LAS deliverable and DEM: +10.8cm

Source_Used_Citation_Abbreviation: Vertical Bias Resolution

Process_Date: 200906_200908

Source_Produced_Citation_Abbreviation: Cal_Dz

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Organization: Terrapoint USA

Contact_Person: Claude Vickers

Contact_Position: Client Program Manager

Contact_Address:

Address_Type: mailing and physical address

Address: 251216 Grogan's Park Drive

City: The Woodlands

State_or_Province: Texas

Postal_Code: 77380

Country: USA

Contact_Voice_Telephone: 1-877-80-TERRA

Contact_Facsimile_Telephone: 1-281-296-0869

Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com

Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Process_Step:

Process_Description:

- Data Classification and Editing

The data was processed using the software TerraScan, and following the methodology described herein. The initial step is the setup of the TerraScan project, which is done by importing client provided tile boundary index encompassing the entire project areas. The 3D laser point clouds, in binary format, were imported into the TerraScan project and divided in 962 file size optimized tiles (2.5 million Raw LiDAR Points). Once tiled, the laser points were classified using a proprietary routine in TerraScan. This routine removes any obvious outliers from the dataset following which the ground layer is extracted from the point cloud. The ground extraction process encompassed in this routine takes place by building an iterative surface model. This surface model is generated using three main parameters: building size, iteration angle and iteration distance. The initial model is based on low points being selected by a "roaming window" with the assumption is that these are the ground points. The size of this roaming window is determined by the building size parameter. The low points are triangulated and the remaining points are evaluated and subsequently added to the model if they meet the iteration angle and distance constraints. This process is repeated until no additional points are added within an iteration. A second critical parameter is the maximum terrain angle constraint, which determines the maximum terrain angle allowed within the classification model. The data is then manually quality controlled with the use of hillshading, cross-sections and profiles. Any points found to be of class vegetation, building or error during the quality control process, are removed from the ground model and placed on the appropriate layer. An integrity check is also performed simultaneously to verify that ground features such as rock cuts, elevated roads and crests are present. Once data has been cleaned and complete, it is then reviewed by a supervisor via manual inspection and through the use of a hillshade mosaic of the entire project area.

Source_Used_Citation_Abbreviation: Processing

Process_Date: 200907_200908

Source_Produced_Citation_Abbreviation: PRD

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Organization: Terrapoint USA

Contact_Person: Claude Vickers

Contact_Position: Client Program Manager

Contact_Address:

Address_Type: mailing and physical address

Address: 251216 Grogan's Park Drive

City: The Woodlands

State_or_Province: Texas

Postal_Code: 77380

Country: USA

Contact_Voice_Telephone: 1-877-80-TERRA

Contact_Facsimile_Telephone: 1-281-296-0869

Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com

Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Process_Step:

Process_Description:

-Deliverable Product Generation

>Deliverable Tiling Scheme

All acquired LiDAR points were retiled in the provided USNG (United States National Grid) tiling scheme with a total of

142 tiles for the East Block being populated; the DEM and Intensity images were clipped to the project boundary and as

result of the clipping were delivered in a total of 84 tiles for the East Block.

>LiDAR Point Data

-The LiDAR point data was delivered in LAS 1.2; POINTDATA RECORD FORMAT 1; adhering to the following ASPRS classification scheme:

Class 1 - Unclassified; Class 2 - Ground; Class 7 - Noise; Class 9 - Water; Class 12 - Overlap

-The LAS files contain the following fields of information (Precision reported in brackets):

Class (Integer); GPS Absolute (0.0001 seconds); Easting (0.01 meter); Northing (0.01 meter);

Elevation (0.01 meter); Echo Number (Integer 1 to 4); Echo (Integer 1 to 4);

Intensity (8 Bit Integer);

Flightline (Integer); Scan Angle (Integer Degree)

-Water is not included in the bare earth ground points for lakes or ponds, rather it is classified as water on Class 9; all remaining points within the water body were classified to class 1. Water body delineation was collected using hillshades and intensity images generated from ground DEM and LiDAR.

-All points outside project area were assigned to Class 1 - Unclassified.

>Bare Earth DEM

-The bare earth DEM was generated from the bare earth LiDAR points and was gridded to 0.5 meter.

-Areas corresponding to the Lakes and ponds have been flattened to the mean water elevation derived from LiDAR points at time of collection.

-No underwater features were included in the DEM

-Terrapoint has provided the DEM based on two lowest point algorithms (please note that the interpolation method for pixels with no values is not provided in the software vendor documentation) based within Terrasolid's Terrascan Software. The grids were generated in ASCII XYZ in the processing tiles; then they were subsequently merged into the USNG tiles and converted to ArcInfo Binary Raster using Terrapoint's proprietary PreTOPS software and ArcView 3.1.

>Intensity Image

- The first return full feature Intensity products were generated from the first return full feature LiDAR points and generated to a 0.5 meter intensity gridded product.

- The grids were generated using lowest intensity values within the grid cell area and delivered in the provided USNG tiles

- The intensity grids were generated in Terrascan then they were subsequently merged into the USNG tiles and converted to ArcInfo Binary Raster using Global Mapper 9.0 and ArcView 3.1.

- Please note that the intensity used to produce the imagery is not calibrated, hence variations acquisition altitude will produce different intensity return values.

>GPS RINEX

GPS RINEX Files of the airborne GPS were provided in softcopy

>ABGPS/IMU Positions

ABGPS/IMU combined files containing x,y,z,pitch,roll,heading,GPS_Time were provided in a comma delimited ASCII format. All positions were provided in NAD83 UTM11, NAVD83(Geoid03), GPS seconds (reported to a 10th of a millisecond), meters (reported to a centimeter) for the XYZ and degrees for the pitch,roll,heading (reported to 6 decimals of a degree).

>RAW Data

- Main Folder

- 0109XXXy.txt => Laser operational log
- mgps_0109XXXy.gps => Aircraft GPS/IMU
- 9143-01-0026-XXXy.epp => Graftnav Ephemeris - Base Station
- 9143-01-0026-XXXy.gpb => Graftnav format RAW GPS - Base Station
- 9143-01-0026-XXXy.sta => Graftnav by-product file
- mgps_0109XXXy.epp => Graftnav Ephemeris - Airborne
- mgps_0109XXXy.gpb => Graftnav format RAW GPS - Airborne
- 0109XXXy.pos => Backup of aircraft GPS/IMU
- 0109XXXy.range => RAW laser data
- 9143-01-0026-XXXy.pdc => RAW GPS base station
- 0109XXXy.tree => Processing file from Dashmap
- 0109XXXy.html => processing file from Dashmap
- 109XXXy.dat => By-Product from NAV system
- 0109XXXy.dxf => DXF of trajectory

- POSAV Subfolder

- 0109XXXy.* => Primary GPS IMU data from Aircraft (logged in 12MB segments)

- Intensity_correction_table Subfolder

- optech1_dashmapv3_5141.res => Configuration file for system hardware

```
-- 100kHz_5141.txt => Intensity Correction Table for system when operating at 100KHz
-- 70kHz_5141.txt => Intensity Correction Table for system when operating at 70KHz
-- 50kHz_5141.txt => Intensity Correction Table for system when operating at 50KHz
-- 33kHz_5141.txt => Intensity Correction Table for system when operating at 33KHz
Source_Used_Citation_Abbreviation: Processing_Deliverables
Process_Date: 200908
Source_Produced_Citation_Abbreviation: PRD_DEL
Process_Contact:
  Contact_Information:
    Contact_Person_Primary:
      Contact_Organization: Terrapoint USA
      Contact_Person: Claude Vickers
      Contact_Position: Client Program Manager
    Contact_Address:
      Address_Type: mailing and physical address
      Address: 251216 Grogan's Park Drive
      City: The Woodlands
      State_or_Province: Texas
      Postal_Code: 77380
      Country: USA
    Contact_Voice_Telephone: 1-877-80-TERRA
    Contact_Facsimile_Telephone: 1-281-296-0869
    Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
    Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Planar:
      Grid_Coordinate_System:
        Grid_Coordinate_System_Name: Universal Transverse Mercator
        Universal_Transverse_Mercator:
          UTM_Zone_Number: 11
          Transverse_Mercator:
            Scale_Factor_at_Central_Meridian: 0.999600
            Longitude_of_Central_Meridian: -117.000000
            Latitude_of_Projection-Origin: 0.000000
            False_Easting: 500000.000000
            False_Northing: 0.000000
      Planar_Coordinate_Information:
        Planar_Coordinate_Encoding_Method: Coordinate pair
        Coordinate_Representation:
          Abscissa_Resolution: 0.01
          Ordinate_Resolution: 0.01
        Planar_Distance_Units: meter
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name: GRS 80
      Semi-major_Axis: 6378137.0000000
      Denominator_of_Flattening_Ratio: 298.26
  Vertical_Coordinate_System_Definition:
    Altitude_System_Definition:
      Altitude_Datum_Name: North American Vertical Datum of 1988
      Altitude_Resolution: 0.01
      Altitude_Distance_Units: meter
      Altitude_Encoding_Method: Explicit elevation coordinate included with horizontal
coordinates
  Entity_and_Attribute_Information:
    Overview_Description:
      Entity_and_Attribute_Overview:
        >LiDAR point data in LAS 1.2 (Class 1 - Unclassified; Class 2 - Ground; Class 7 -
Noise; Class 9 - Water; Class 12 - Overlap)
        The LAS files contain the following fields of information (Precision reported in
brackets):
          Class (Integer); GPS Week Time (0.0001 seconds); Easting (0.01 meter); Northing (0.01
meter); Elevation (0.01 meter); Echo Number (Integer 1 to 4); Echo (Integer 1 to 4); Intensity
(8 Bit Integer); Flightline (Integer); Scan Angle (Integer Degree)

        >Bare Earth DEM - ArcInfo ASCII Grid - 0.5m
        >First Return Full Feature Intensity - ArcInfo ASCII Grid - 0.5m
        >RAW Data - All raw data and values used to produce calibrated point cloud
```

>RINEX - Airborne GPS data in RINEX format
>ABGPS_IMU - Airborne GPS_IMU data in ASCII format (X,Y,Z,Pitch,Roll,Heading,GPS_Time)
Entity_and_Attribute_Detail_Citation: none
Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Resource_Description:
The LiDAR data was captured for Dewberry & Davis for
fire debris flow mapping purposes
Distribution_Liability:
Users must assume responsibility to determine the
appropriate use of this LiDAR dataset.

The LiDAR has been compiled to 1 meter vertical accuracy;

Data is representative of ground conditions at time of
acquisition only.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: LAS 1.2; ArcInfo ASCII; ASCII; RINEX; Proprietary formats pertaining to
RAW data data vendors
Digital_Transfer_Option:
Offline_Option:
Offline_Media: Harddrive
Recording_Format: Windows Compatible
Compatibility_Information: Windows Compatible
Fees: Current Handling and Processing Terrapoint Fees
Ordering_Instructions:
Proper release required from Dewberry & Davis LLC for
orders outside of Dewberry & Davis LLC. Please contact Terrapoint
sales for general Terrapoint LiDAR library sales.

Metadata_Reference_Information:
Metadata_Date: 20090817
Metadata_Review_Date: 20090817
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: Mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Metadata_Standard_Name: FGDC CSDGM
Metadata_Standard_Version: FGDC-STD-001-19988



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

1.2 West Block

Metadata:

Identification_Information:

Citation:

Citation_Information:

Originator: Terrapoint USA
Publication_Date: 20090817
Title: San Gabriel LiDAR Survey (West Block)
Geospatial_Data_Presentation_Form: Map
Online_Linkage: none
Larger_Work_Citation:

Citation_Information:

Originator: Terrapoint USA
Publication_Date: 20090817
Title: San Gabriel LiDAR Survey
Publication_Information:
Publication_Place: Houston, Texas
Publisher: Terrapoint USA
Online_Linkage: none

Description:

Abstract:

LIDAR data is remotely sensed high-resolution elevation data collected by an airborne collection platform. By positioning laser range finding with the use of 1 second GPS with 100hz inertial measurement unit corrections; Terrapoint LIDAR instruments are able to make highly detailed geospatial elevation products of the ground, man-made structures and vegetation. The LiDAR flightlines for this project was planned for a 60% acquisition overlap. The nominal resolution of this project without overlap is 6 points per square meter. Up to four returns were recorded for Intensity, Flightline and echo number attributes were provided for each LiDAR point.

Purpose:

This LiDAR project will support USGS science for the Multi-Hazards Southern California (SoCal) project by providing high accuracy, classified multiple return LiDAR and derivative products, for two areas totaling approximately 81 square miles, of the San Gabriel Area within Los Angeles County, California. The LiDAR data were acquired and processed by Terrapoint USA to support USGS's effort to collect pre-earthquake imagery of three perpendicular profiles along the Sierra Madre fault system to help characterize the geomorphic expression of compressional structures (faults and folds). At a later date Imagery could also be combined with a post-earthquake LiDAR acquisition to fully map surface rupture and possible image coseismic fold growth.

Supplemental_Information:

LiDAR Collection Specific Supplemental Information:

- General Overview:

The Airborne LiDAR survey was conducted using one OPTECH 3100EA systems flying at a nominal height of 800 meters AGL with lines were flown in multiple orientation blocks to best optimize flying time considering the layout for the project. The Optech 3100EA system was configured in two scanner configurations for the acquisition of the San Gabriel LiDAR project. Terrapoint modified the scanner configuration during the acquisition stage of this project in order to maintain the planned efficiency while reducing the visual effects of the corn rows and maintaining the scanner field view limitations set out in the contract.

All missions acquired between June 2nd and June 15th, were acquired with Configuration 1 and all missions acquired between June 16th and June 22nd, were acquired with Configuration 2.

CONFIGURATION_1

Aircraft Speed = 130 Knots

Data Acquisition Height = 800 meters AGL
Swath Width = 285 m Nominal
Distance Between Flight Lines = 114m
Overlap = 60%
Scanner Field Of View = +/-12.1 degrees
Scan Cutoff = 2 Degrees on either side of scan
Pulse Repetition Rate = 71 Kilohertz
Scan Frequency = 58.9 Hertz
Number of Returns Per Pulse = 4
Beam Divergence: Narrow
Resultant Raw Point Density = 6 pts/m2 without overlap

CONFIGURATION_2
Aircraft Speed = 130 Knots
Data Acquisition Height = 800 meters AGL
Swath Width = 340 m Nominal
Distance Between Flight Lines = 85m
Overlap = 75%
Scanner Field Of View = +/-18 degrees
Scan Cutoff = 6 Degrees on either side of scan
Pulse Repetition Rate = 71 Kilohertz
Scan Frequency = 47.8 Hertz
Number of Returns Per Pulse = 4
Beam Divergence: Narrow
Resultant Raw Point Density = 6 pts/m2 without overlap

The aircraft used for the survey was a Piper PA-31 Navajo, registration C-FVTL. This aircraft has a flight range of approximately 7 hours or 1025 nautical miles under optimal conditions. The aircraft was staged from the El Monte Airport (KEMT), and ferried to the project site for flight operations.

The total site size is 28.61 square miles

- GPS Receivers

A combination of Sokkia GSR 2600 and NovAtel DL-4+ dual frequency GPS receivers were used to support the airborne operations of this survey and to establish the GPS control network.

- Number of Flights and Flight Lines

A total of 6 missions were flown for this site with a flight time ranging approximately 13.5 online production hours and 160 production flight lines under good meteorological and GPS conditions to provide complete coverage.

- Reference Coordinate System Used:

Seven National Geodetic Survey (NGS) and two Southern California Integrated GPS Network (SCIGN) Continuously Operating Reference Stations were incorporated in a GPS control network to establish four new temporary control monuments for this project, to maintain base line distance requirements. The newly established temporary control points were used to control all flight missions, kinematic and static ground surveys.

The published horizontal datum of the control points is NAD83NSRS and the vertical datum NAVD88.

The following are the final coordinates of the newly established control points used in this project:

Station Id	Latitude	Longitude	Ellipsoidal Height	Orthometric Height
914301	34 05 22.05520	-117 47 05.06989	268.0278	301.5868
914302	34 04 51.19350	-118 02 16.26505	51.7520	86.1686
914303	34 10 47.78100	-118 10 52.20514	437.6259	471.3486
914304	34 05 04.66812	-118 01 56.81072	56.5790	90.9522

The following are the CORS stations observed to establish the new control points used in this project:

CORS-NGS_AZU1; CORS-NGS_CIT1; CORS-NGS_CVHS; CORS-SCIGN_GVRS; CORS-SCIGN_LEEP; CORS-NGS_LORS; CORS-NGS_PKRD; CORS-NGS_PSDM; CORS-NGS_SPMS

For further details concerning the control used in this project including the network adjustment, please see the Geodetic Control Survey Report in Appendix D.

- Geoid Model Used

The Geoid03 geoid model, published by the NGS, was used to transform all ellipsoidal heights to orthometric.

-General LiDAR notes

-Intensity

Please note that Terrapoint standard procedure is to not calibrate or normalize LiDAR intensity; but due to

lower intensity returns for mission o109170a in comparison to the adjoining missions, Terrapoint used the normalize function in Dashmap for this particular mission.

-Waterbodies

Water is not included in the bare earth ground points for rivers (>10m wide), lakes or ponds (With an axis >100m), rather it is classified as water on Class 9; all remaining points within the water body were classified to class 1.

Water body delineation was collected using hillshades and intensity images generated from ground DEM and LiDAR

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20090602

Ending_Date: 20090622

Currentness_Reference: Ground Condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -118.258739

East_Bounding_Coordinate: -118.124291

North_Bounding_Coordinate: 34.236533

South_Bounding_Coordinate: 34.061766

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: ASPRS standards

Theme_Keyword: DEM

Theme_Keyword: digital elevation model

Theme_Keyword: elevation

Theme_Keyword: LAS_v1.2

Theme_Keyword: laser

Theme_Keyword: LiDAR

Theme_Keyword: ArcInfo Binary

Theme_Keyword: Intensity

Theme_Keyword: RawData

Theme_Keyword: RINEX

Theme_Keyword: ABGPS_IMU

Theme_Keyword: OPTECH_3100EA

Theme_Keyword: surface model

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: San Gabriel Mountains

Place_Keyword: Altadena, California

Place_Keyword: Pasadena, California

Place_Keyword: South Pasadena, California

Place_Keyword: Los Angeles, California

Place_Keyword: Los Angeles County, California

Place_Keyword: California

Place_Keyword: United States of America

Place_Keyword: SouthWest

Access_Constraints:
All deliverable data and documentation shall be free from restrictions regarding use and distribution. Data and documentation provided under this task order shall be freely distributable by government agencies.

Use_Constraints:
Any conclusions from results of the analysis of this LiDAR are not the responsibility of Terrapoint. The LiDAR data was thoroughly visually verified to represent the true ground conditions at time of collection. Users should be aware of this limitations of this dataset if using for critical applications.

Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 25216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Raw elevation measurements have been tested to 0.076 meters vertical accuracy at 95 percent confidence level against Terrapoint acquired static GPS points

Logical_Consistency_Report:
All files delivered were verified and tested to ensure they open and are positioned properly.

Completeness_Report:
According to Terrapoint standards; the following aspects of the LiDAR data was verified during the course of the project processing:
-Data completeness and integrity
-Data accuracy and errors
-Anomaly checks through full-feature hillshades
-Post automated classification Bare-earth verification
-RMSE inspection of final bare-earth model using kinematic GPS
-Final quality control of deliverable products; ensuring integrity; graphical quality; conformance to Terrapoint standards are met for all delivered products.
-On a project level, a coverage check is carried out to ensure no slivers are present

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
Compiled to meet 0.98 meter horizontal accuracy at the 95 percent confidence level

Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:
Raw elevation measurements have been tested to 0.076 meters vertical accuracy at 95 percent confidence level against Terrapoint acquired static GPS points

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: Terrapoint USA
Publication_Date: 20090817
Title: San Gabriel LiDAR Survey
Edition: One
Geospatial_Data_Presentation_Form: map
Publication_Information:

Publication_Place: Houston, Texas
Publisher: Terrapoint USA
Online_Linkage: www.terrapoint.com
Larger_Work_Citation:
Citation_Information:
Originator: Terrapoint USA
Publication_Date: 20090817
Title: San Gabriel LiDAR Survey
Publication_Information:
Publication_Place: Houston, Texas
Publisher: Terrapoint USA
Online_Linkage: www.terrapoint.com
Type_of_Source_Media: Hard Drive
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20090817
Ending_Date: 20090817
Source_Currentness_Reference: Ground Condition
Source_Citation_Abbreviation: none
Source_Contribution:
LiDAR data representing the San Gabriel Mountain Area to help characterize the geomorphic expression of compressional structures (faults and folds) mapping in Los Angeles County, California
Process_Step:
Process_Description:
- Airborne GPS Kinematic
Airborne GPS kinematic data was processed on-site using GrafNav kinematic On-The-Fly (OTF) software. Flights were flown with a minimum of 6 satellites in view (130 above the horizon) and with a PDOP of better than 4.5. Distances from base station to aircraft were kept to a maximum of 30 km, to ensure a strong OTF (On-The-Fly) solution. For all flights, the GPS data can be classified as excellent, with GPS residuals of 5cm average but no larger than 12 cm being recorded.
Source_Used_Citation_Abbreviation: GPS Processing
Process_Date: 200811
Source_Produced_Citation_Abbreviation: GPS
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Process_Step:
Process_Description:
- Generation and Calibration of laser points (raw data)
Laser data points are generated using Terrapoint's proprietary laser post-processing software. This software combines the raw laser range and angle data file with the finalized GPS/IMU information. The resulting point cloud has been projected into the desired coordinate system in TerraSolid's TerraScan in LAS format. All missions are validated against the adjoining missions for relative vertical biases and collected GPS kinematic ground truthing points for absolute vertical accuracy purposes. On a project level, a coverage check is carried out to ensure no slivers are present.

Source_Used_Citation_Abbreviation: Calibration
Process_Date: 200905_200907
Source_Produced_Citation_Abbreviation: CAL
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Process_Step:
Process_Description:
- System Calibration Results
The following are the post calibration results for the San Gabriel data outlined by mission:

Mission Name;Roll Correction(Deg);Pitch Correction (Deg);Scale Correction;Droop Correction;Normalized Intensity;Resulting Calibration Vertical Bias
o109153a;-0.0104;-0.0629;1.00564;21R, 7L;No;-5cm
o109166a;-0.0055;-0.0651;1.00711;21R, 7L;No;-8cm
o109170a;-0.0051;-0.0594;1.00648;21R, 7L;Yes;0cm
o109172a;-0.0017;-0.0657;1.00714;21R, 7L;No;+8cm
o109172b;-0.0070;-0.0655;1.00727;21R, 7L;No;+8cm
o109173a;0.00290;-0.0600;1.00631;21R, 7L;No;+5cm
-Post Production Vertical Bias Resolution
The following biases were observed when verified with the GPS validation data post ground classification and review. The elevations of the LiDAR data were adjusted accordingly: +5.9 cm
The following shift was applied to resolve a GPS Antenna Profile Error in the final LiDAR LAS deliverable and DEM: +10.8cm

Source_Used_Citation_Abbreviation: Vertical Bias Resolution
Process_Date: 200906_200908
Source_Produced_Citation_Abbreviation: Cal_Dz
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Process_Step:
Process_Description:
- Data Classification and Editing
The data was processed using the software TerraScan, and following the methodology described herein. The initial step is the setup of the TerraScan project, which is done by importing client provided tile boundary index encompassing the entire project areas. The 3D laser point clouds, in binary format, were imported into the TerraScan

project and divided in 700 file size optimized tiles (2.5 million Raw LiDAR Points). Once tiled, the laser points were classified using a proprietary routine in TerraScan. This routine removes any obvious outliers from the dataset following which the ground layer is extracted from the point cloud. The ground extraction process encompassed in this routine takes place by building an iterative surface model. This surface model is generated using three main parameters: building size, iteration angle and iteration distance. The initial model is based on low points being selected by a "roaming window" with the assumption is that these are the ground points. The size of this roaming window is determined by the building size parameter. The low points are triangulated and the remaining points are evaluated and subsequently added to the model if they meet the iteration angle and distance constraints. This process is repeated until no additional points are added within an iteration. A second critical parameter is the maximum terrain angle constraint, which determines the maximum terrain angle allowed within the classification model. The data is then manually quality controlled with the use of hillshading, cross-sections and profiles. Any points found to be of class vegetation, building or error during the quality control process, are removed from the ground model and placed on the appropriate layer. An integrity check is also performed simultaneously to verify that ground features such as rock cuts, elevated roads and crests are present. Once data has been cleaned and complete, it is then reviewed by a supervisor via manual inspection and through the use of a hillshade mosaic of the entire project area.

Source_Used_Citation_Abbreviation: Processing

Process_Date: 200907_200908

Source_Produced_Citation_Abbreviation: PRD

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Organization: Terrapoint USA

Contact_Person: Claude Vickers

Contact_Position: Client Program Manager

Contact_Address:

Address_Type: mailing and physical address

Address: 251216 Grogan's Park Drive

City: The Woodlands

State_or_Province: Texas

Postal_Code: 77380

Country: USA

Contact_Voice_Telephone: 1-877-80-TERRA

Contact_Facsimile_Telephone: 1-281-296-0869

Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com

Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Process_Step:

Process_Description:

-Deliverable Product Generation

>Deliverable Tiling Scheme

All acquired LiDAR points were retiled in the provided USNG (United States National Grid) tiling scheme with a total of

114 tiles for the West Block being populated; the DEM and Intensity images were clipped to the project boundary and as

result of the clipping were delivered in a total of 47 tiles for the West Block.

>LiDAR Point Data

-The LiDAR point data was delivered in LAS 1.2; POINTDATA RECORD FORMAT 1; adhering to the following ASPRS classification scheme:

Class 1 - Unclassified; Class 2 - Ground; Class 7 - Noise; Class 9 - Water; Class 12

- Overlap

-The LAS files contain the following fields of information (Precision reported in brackets):

Class (Integer); GPS Absolute (0.0001 seconds); Easting (0.01 meter); Northing (0.01 meter);

Elevation (0.01 meter); Echo Number (Integer 1 to 4); Echo (Integer 1 to 4);
Intensity (8 Bit Integer);
Flightline (Integer); Scan Angle (Integer Degree)
-Water is not included in the bare earth ground points for lakes or ponds, rather it is classified as water on Class 9; all remaining points within the water body were classified to class 1. Water body delineation was collected using hillshades and intensity images generated from ground DEM and LiDAR.
-All points outside project area were assigned to Class 1 - Unclassified.
>Bare Earth DEM
-The bare earth DEM was generated from the bare earth LiDAR points and was gridded to 0.5 meter.
-Areas corresponding to the Lakes and ponds have been flattened to the mean water elevation derived from LiDAR points at time of collection.
-No underwater features were included in the DEM
-Terrapoint has provided the DEM based on two lowest point algorithms (please note that the interpolation method for pixels with no values is not provided in the software vendor documentation) based within Terrasolid's Terrascan Software. The grids were generated in ASCII XYZ in the processing tiles; then they were subsequently merged into the USNG tiles and converted to ArcInfo Binary Raster using Terrapoint's proprietary PreTOPS software and ArcView 3.1.
>Intensity Image
- The first return full feature Intensity products were generated from the first return full feature LiDAR points and generated to a 0.5 meter intensity gridded product.
- The grids were generated using lowest intensity values within the grid cell area and delivered in the provided USNG tiles
- The intensity grids were generated in Terrascan then they were subsequently merged into the USNG tiles and converted to ArcInfo Binary Raster using Global Mapper 9.0 and ArcView 3.1.
- Please note that the intensity used to produce the imagery is not calibrated, hence variations acquisition altitude will produce different intensity return values.
>GPS RINEX
GPS RINEX Files of the airborne GPS were provided in softcopy
>ABGPS/IMU Positions
ABGPS/IMU combined files containing x,y,z,pitch,roll,heading,GPS_Time were provided in a comma delimited ASCII format. All positions were provided in NAD83 UTM11, NAVD88(Geoid03), GPS seconds (reported to a 10th of a millisecond), meters (reported to a centimeter) for the XYZ and degrees for the pitch,roll,heading (reported to 6 decimals of a degree).
>RAW Data
- Main Folder
-- o109XXXy.txt => Laser operational log
-- mgps_o109XXXy.gps => Aircraft GPS/IMU
-- 9143-01-0026-XXXy.epp => Graftnav Ephemeris - Base Station
-- 9143-01-0026-XXXy.gpb => Graftnav format RAW GPS - Base Station
-- 9143-01-0026-XXXy.sta => Graftnav by-product file
-- mgps_o109XXXy.epp => Graftnav Ephemeris - Airborne
-- mgps_o109XXXy.gpb => Graftnav format RAW GPS - Airborne
-- o109XXXy.pos => Backup of aircraft GPS/IMU
-- o109XXXy.range => RAW laser data
-- 9143-01-0026-XXXy.pdc => RAW GPS base station
-- o109XXXy.tree => Processing file from Dashmap
-- o109XXXy.html => processing file from Dashmap
-- 109XXXy.dat => By-Product from NAV system
-- o109XXXy.dxf => DXF of trajectory
- POSAV Subfolder
-- o109XXXy.* => Primary GPS IMU data from Aircraft (logged in 12MB segments)
- Intensity_correction_table Subfolder
-- optechl_dashmapv3_5141.res => Configuration file for system hardware
-- 100kHz_5141.txt => Intensity Correction Table for system when operating at 100KHz
-- 70kHz_5141.txt => Intensity Correction Table for system when operating at 70KHz
-- 50kHz_5141.txt => Intensity Correction Table for system when operating at 50KHz
-- 33kHz_5141.txt => Intensity Correction Table for system when operating at 33KHz
Source_Used_Citation_Abbreviation: Processing_Deliverables
Process_Date: 200908
Source_Produced_Citation_Abbreviation: PRD_DEL
Process_Contact:
Contact_Information:
Contact_Person_Primary:

```
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
  Address_Type: mailing and physical address
  Address: 251216 Grogan's Park Drive
  City: The Woodlands
  State_or_Province: Texas
  Postal_Code: 77380
  Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Planar:
      Grid_Coordinate_System:
        Grid_Coordinate_System_Name: Universal Transverse Mercator
        Universal_Transverse_Mercator:
          UTM_Zone_Number: 11
          Transverse_Mercator:
            Scale_Factor_at_Central_Meridian: 0.999600
            Longitude_of_Central_Meridian: -117.000000
            Latitude_of_Projection_Origin: 0.000000
            False_Easting: 500000.000000
            False_Northing: 0.000000
        Planar_Coordinate_Information:
          Planar_Coordinate_Encoding_Method: Coordinate pair
          Coordinate_Representation:
            Abscissa_Resolution: 0.01
            Ordinate_Resolution: 0.01
          Planar_Distance_Units: meter
      Geodetic_Model:
        Horizontal_Datum_Name: North American Datum of 1983
        Ellipsoid_Name: GRS 80
        Semi-major_Axis: 6378137.00000000
        Denominator_of_Flattening_Ratio: 298.26
    Vertical_Coordinate_System_Definition:
      Altitude_System_Definition:
        Altitude_Datum_Name: North American Vertical Datum of 1988
        Altitude_Resolution: 0.01
        Altitude_Distance_Units: meter
        Altitude_Encoding_Method: Explicit elevation coordinate included with horizontal
coordinates
      Entity_and_Attribute_Information:
        Overview_Description:
          Entity_and_Attribute_Overview:
            >LiDAR point data in LAS 1.2 (Class 1 - Unclassified; Class 2 - Ground; Class 7 -
Noise; Class 9 - Water; Class 12 - Overlap)
            The LAS files contain the following fields of information (Precision reported in
brackets):
              Class (Integer); GPS Week Time (0.0001 seconds); Easting (0.01 meter); Northing (0.01
meter); Elevation (0.01 meter); Echo Number (Integer 1 to 4); Echo (Integer 1 to 4); Intensity
(8 Bit Integer); Flightline (Integer); Scan Angle (Integer Degree)

              >Bare Earth DEM - ArcInfo ASCII Grid - 0.5m
              >First Return Full Feature Intensity - ArcInfo ASCII Grid - 0.5m
              >RAW Data - All raw data and values used to produce calibrated point cloud
              >RINEX - Airborne GPS data in RINEX format
              >ABGPS_IMU - Airborne GPS_IMU data in ASCII format (X,Y,Z,Pitch,Roll,Heading,GPS_Time)
          Entity_and_Attribute_Detail_Citation: none
      Distribution_Information:
        Distributor:
          Contact_Information:
            Contact_Organization_Primary:
              Contact_Organization: Terrapoint USA
              Contact_Person: Claude Vickers
              Contact_Position: Client Program Manager
```

Contact_Address:
Address_Type: mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time

Resource_Description:
The LiDAR data was captured for Dewberry & Davis for fire debris flow mapping purposes

Distribution_Liability:
Users must assume responsibility to determine the appropriate use of this LiDAR dataset.

The LiDAR has been compiled to 1 meter vertical accuracy;

Data is representative of ground conditions at time of acquisition only.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: LAS 1.2; ArcInfo ASCII; ASCII; RINEX; Proprietary formats pertaining to RAW data data vendors
Digital_Transfer_Option:
Offline_Option:
Offline_Media: Harddrive
Recording_Format: Windows Compatible
Compatibility_Information: Windows Compatible
Fees: Current Handling and Processing Terrapoint Fees
Ordering_Instructions:
Proper release required from Dewberry & Davis LLC for orders outside of Dewberry & Davis LLC. Please contact Terrapoint sales for general Terrapoint LiDAR library sales.

Metadata_Reference_Information:
Metadata_Date: 20090817
Metadata_Review_Date: 20090817
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Terrapoint USA
Contact_Person: Claude Vickers
Contact_Position: Client Program Manager
Contact_Address:
Address_Type: Mailing and physical address
Address: 251216 Grogan's Park Drive
City: The Woodlands
State_or_Province: Texas
Postal_Code: 77380
Country: USA
Contact_Voice_Telephone: 1-877-80-TERRA
Contact_Facsimile_Telephone: 1-281-296-0869
Contact_Electronic_Mail_Address: claud.vickers@terrapoint.com
Hours_of_Service: Monday to Friday, 8:30 - 4:30, Eastern Time
Metadata_Standard_Name: FGDC CSDGM
Metadata_Standard_Version: FGDC-STD-001-1998

2 Appendix B Static GPS Validation

2.1 East Block

Number	Easting	Northing	Known Z	Laser Z	Dz
--------	---------	----------	---------	---------	----

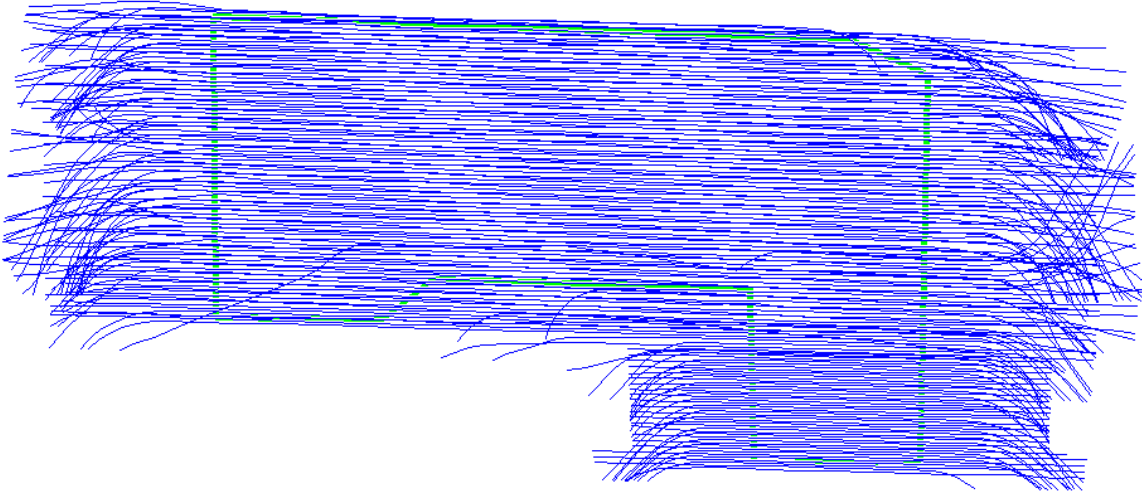
estaticA	410826.400	3777394.060	149.620	149.620	+0.000
estaticB	412671.760	3777965.070	176.530	176.520	-0.010
estaticC	413339.960	3775174.990	150.360	150.400	+0.040
estaticD	416179.290	3780187.380	227.960	227.910	-0.050
estaticE	420020.950	3775671.050	210.280	210.280	+0.000
estaticF	422130.050	3778497.690	286.780	286.750	-0.030
estaticG	424398.840	3776354.300	293.940	293.930	-0.010
estaticH	423543.940	3770739.200	250.020	250.020	+0.000
estaticI	417046.250	3777388.700	185.030	185.050	+0.020
estaticJ	423851.770	3773442.890	251.910	251.910	+0.000
eStaticK	425130.490	3773542.270	277.810	277.800	-0.010
eStaticL	424916.110	3774255.340	282.140	282.210	+0.070
eStaticM	424425.580	3775515.140	284.230	284.200	-0.030
eStaticN	423302.620	3776806.510	262.860	262.860	+0.000
eStaticO	422782.660	3777179.950	260.220	260.190	-0.030
eStaticP	422681.580	3777609.900	270.330	270.340	+0.010
estaticQ	410792.400	3774667.580	128.290	128.340	+0.050
estaticR	409416.630	3777989.430	156.950	156.850	-0.100
estaticS	417843.120	3776787.990	187.660	187.660	+0.000
estaticT	419452.380	3778729.950	247.820	247.780	-0.040
estaticU	420203.800	3776828.050	226.080	226.120	+0.040
estaticV	420571.060	3777759.730	245.130	245.120	-0.010
estaticW	421880.660	3778963.520	294.590	294.540	-0.050
estaticX	423645.360	3772089.540	249.420	249.460	+0.040
estaticY	422821.460	3779910.730	368.530	368.470	-0.060
estaticZ	422325.310	3778541.030	293.190	293.210	+0.020
Average dz	-0.005				
Minimum dz	-0.100				
Maximum dz	+0.070				
Average magnitude	0.028				
Root mean square	0.037				
Std deviation	0.038				

2.2 West Block

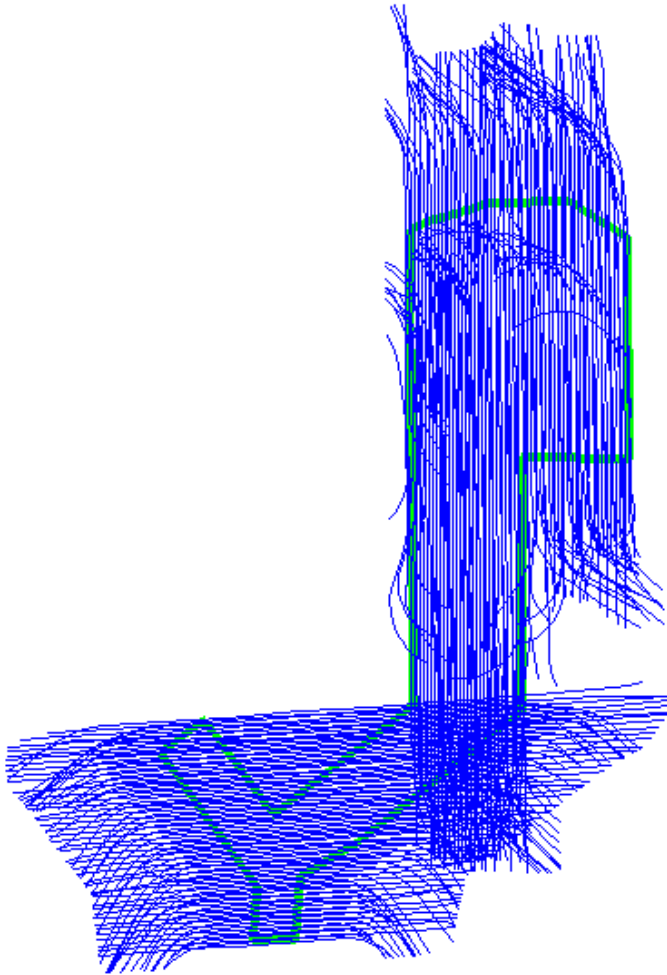
Number	Easting	Northing	Known Z	Laser Z	Dz
wstaticA	384819.410	3774544.960	111.760	111.730	-0.030
wstaticB	385321.990	3773635.970	106.060	106.040	-0.020
wstaticC	386033.100	3772841.270	105.030	105.020	-0.010
wstaticD	387086.490	3771154.880	99.360	99.350	-0.010
wstaticE	387266.150	3772655.630	114.600	114.540	-0.060
wstaticF	388581.050	3773635.270	136.790	136.760	-0.030
wstaticG	390007.250	3775079.690	166.910	166.900	-0.010
wstaticH	391303.460	3776057.150	192.280	192.320	+0.040
wstaticI	392381.570	3776320.170	185.980	185.910	-0.070
wstaticJ	392550.540	3776645.930	206.820	206.810	-0.010
wstaticK	392501.700	3779673.890	235.610	235.610	+0.000
wstaticL	391077.440	3779524.210	352.080	352.090	+0.010
wstaticM	393150.270	3781284.400	287.240	287.240	+0.000
wstaticO	391165.980	3782734.860	470.910	470.970	+0.060
wstaticP	390498.520	3787673.240	603.810	outside	*
wstaticQ	391051.480	3788141.970	650.970	651.060	+0.090
wstaticR	391488.210	3785639.660	465.070	465.070	+0.000
wstaticS	391408.700	3784125.640	334.130	334.110	-0.020
wstaticT	392558.690	3783093.030	331.990	331.930	-0.060
wstaticU	392306.530	3784180.050	353.910	353.870	-0.040
wstaticV	393146.020	3784434.840	374.710	374.700	-0.010
wstaticW	394544.020	3783201.280	352.800	352.780	-0.020
wstaticX	395780.860	3784846.670	503.920	503.970	+0.050
wstaticY	394391.260	3786728.560	551.760	551.810	+0.050
wstaticZ	394185.140	3785362.860	451.740	451.750	+0.010
Average dz	-0.004				
Minimum dz	-0.070				
Maximum dz	+0.090				
Average magnitude	0.030				
Root mean square	0.039				
Std deviation	0.039				

3 Appendix C Aircraft Trajectory Plot

3.1 East Block



3.2 West Block



4 Appendix D Geodetic Control Survey Report

Project Number: 2009-143U
Project: San Gabriel Mountain LiDAR
Client: Dewberry and Davis LLC

Prepared by: Adrian Salazar Camungol
Date: August 19 2009

Control Source: National Geodetic Survey
Horizontal Datum: NAD83



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

Vertical Datum: NAVD88
Units: Metres
Geoid: Geoid 03

4.1 Published Control Stations: CORS Stations

AZU1

LATITUDE 34 07 33.65306 LONGITUDE -117 53 47.30380
ELLHGT: 145.459 ORTHOHGT: 179.1403

CIT1

LATITUDE 34 08 12.13762 LONGITUDE -118 07 38.17666
ELLHGT 216.056 ORTHOHGT: 250.0759

CVHS

LATITUDE 34 04 55.22616 LONGITUDE -117 54 06.13191
ELLHGT 119.808 ORTHOHGT: 153.8123

GVR5

LATITUDE 34 02 50.79454 LONGITUDE -118 06 46.36714
ELLHGT 155.226 ORTHOHGT: 190.0475

LEEP

LATITUDE 34 08 04.54995 LONGITUDE -118 19 18.26664
ELLHGT 485.747 ORTHOHGT: 520.4171

LORS

LATITUDE 34 07 59.96318 LONGITUDE -117 45 14.60181
ELLHGT 449.607 ORTHOHGT: 482.6602

PKRD

LATITUDE 34 04 17.60222 LONGITUDE -118 13 58.40284
ELLHGT 131.552 ORTHOHGT: 166.4400

PSDM

LATITUDE 34 05 30.33981 LONGITUDE -117 48 25.47827
ELLHGT 279.091 ORTHOHGT: 312.6961

SPMS

LATITUDE 33 59 33.54095 LONGITUDE -117 50 55.54017
ELLHGT 207.753 ORTHOHGT: 242.0579

4.2 New Control Stations:

STA_ID: 914301

LATITUDE: 34 05 22.05520 LONGITUDE: -117 47 05.06989

ELLHGT: 268.0278m ORTHOHGT: 301.5868m

STA_ID: 914302

LATITUDE: 34 04 51.19350 LONGITUDE: -118 02 16.26505

ELLHGT: 51.7520m ORTHOHGT: 86.1686m

STA_ID: 914303

LATITUDE: 34 10 47.78100 LONGITUDE: -118 10 52.20514

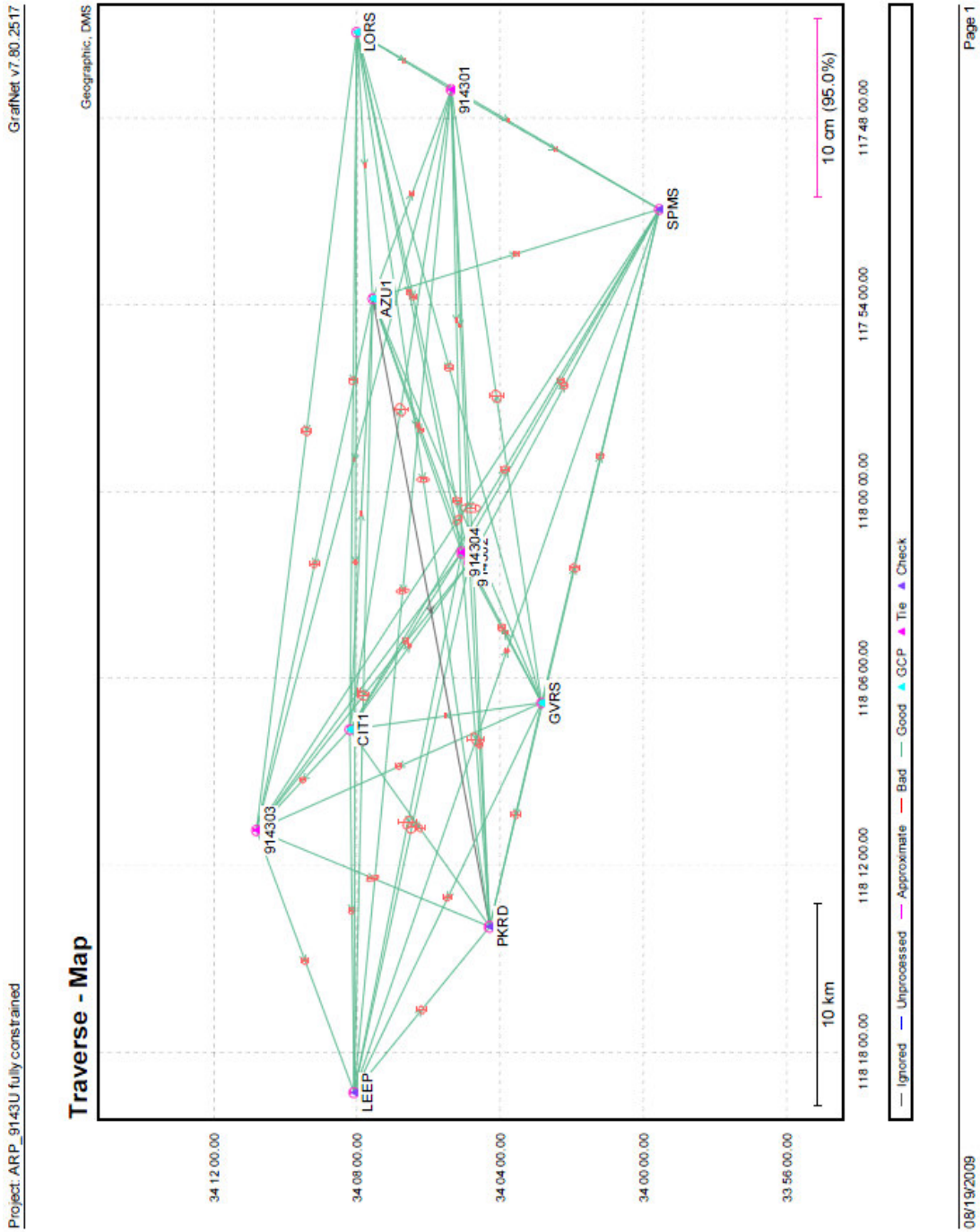
ELLHGT: 437.6259 m ORTHOHGT: 471.3486m

STA_ID: 914304

LATITUDE: 34 05 04.66812 LONGITUDE: -118 01 56.81072

ELLHGT: 56.5790m ORTHOHGT: 90.9522m

4.3 Fully Constrained GPS Network



GrafNet - GRAPHIC GPS NETWORK PROCESSING
SOFTWARE PACKAGE

TRAVERSE SOLUTION:

DATUM: NAD83
GRID: UTM, Zone 11
UNITS: metres (see preferences to change)
GEOID: C:\Operations_DVD\Software\Geoids\USA\GEOID03 (CONTUS) CURRENT.wpg

STATIONS (STATUS):

Station	Type	HgtStatus	Result	Coordinates derived from...
914301	Loop Tie	OK	Good	AZU1
914302	Loop Tie	OK	Good	AZU1
914303	Loop Tie	OK	Good	AZU1
914304	Loop Tie	OK	Good	AZU1
AZU1	Control-3D	OK	Pub(3D)	(-)
CIT1	Control-3D	OK	Pub(3D)	(-)
GVR5	Control-3D	OK	Pub(3D)	(-)
LEEP	Check-3D	OK	Good	AZU1
LORS	Control-3D	OK	Pub(3D)	(-)
PKRD	Check-3D	OK	Good	CIT1
PSDM	Control-3D	OK	Pub(3D)	(-)
SPMS	Check-3D	OK	Good	AZU1

STATIONS (COORDINATES):

Station	Latitude	Longitude	Grid-E	Grid-N
EllHgt	OrthoHgt			
(m)	(m)	(D M S)	(m)	(m)
914301	34 05 22.05563	-117 47 05.07024	427606.012	3772353.066
267.965	301.524			
914302	34 04 51.19399	-118 02 16.26504	404245.649	3771610.654
51.662	86.079			
914303	34 10 47.78082	-118 10 52.20533	391149.350	3782737.945
437.578	471.300			
914304	34 05 04.66793	-118 01 56.81061	404748.446	3772020.626
56.524	90.897			
AZU1	34 07 33.65306	-117 53 47.30380	417333.825	3776491.220
145.459	179.081			
CIT1	34 08 12.13762	-118 07 38.17666	396063.495	3777887.529
216.057	250.095			
GVR5	34 02 50.79454	-118 06 46.36714	397282.707	3767974.931
155.226	190.076			
LEEP	34 08 04.54999	-118 19 18.26699	378128.917	3777868.894
485.822	520.361			

LORS	34 07 59.96318	-117 45 14.60181	430472.788	3777195.470
449.607	482.674			
PKRD	34 04 17.60237	-118 13 58.40295	386237.569	3770775.800
131.555	166.468			
PSDM	34 05 30.33981	-117 48 25.47827	425547.476	3772624.272
279.091	312.710			
SPMS	33 59 33.54130	-117 50 55.54019	421610.913	3761665.693
207.672	241.997			

LOOP, CHECK & DUPLICATE TIES:

Name/Session	Type	Result	DEast (m)	DNorth (m)	DHeight (m)
AZU1 to 914301 (4)	Duplicate	Good	-0.0018	0.0028	-0.0118
AZU1 to 914301 (3)	Duplicate	Good	-0.0209	0.0296	-0.0018
AZU1 to 914301 (2)	Duplicate	Good	-0.0095	0.0158	0.0228
CIT1 to 914301	LoopTie	Good	0.0001	0.0103	-0.1082
CIT1 to 914301 (4)	Duplicate	Good	-0.0020	0.0180	-0.0923
CIT1 to 914301 (3)	Duplicate	Good	-0.0176	0.0276	-0.0620
CIT1 to 914301 (1)	Duplicate	Good	-0.0063	0.0225	-0.0760
GVRs to 914301	LoopTie	Good	-0.0066	0.0097	-0.1201
GVRs to 914301 (3)	Duplicate	Good	-0.0224	0.0299	-0.0594
GVRs to 914301 (4)	Duplicate	Good	-0.0078	0.0229	-0.1042
GVRs to 914301 (1)	Duplicate	Good	-0.0122	0.0301	-0.1026
LORS to 914301	LoopTie	Good	-0.0007	0.0023	-0.0677
LORS to 914301 (1)	Duplicate	Good	-0.0084	0.0257	-0.0413
LORS to 914301 (3)	Duplicate	Good	-0.0219	0.0283	-0.0739
LORS to 914301 (4)	Duplicate	Good	-0.0021	0.0063	-0.0768
PSDM to 914301	LoopTie	Good	-0.0034	0.0026	-0.0839
PSDM to 914301 (3)	Duplicate	Good	-0.0178	0.0296	-0.0814
PSDM to 914301 (4)	Duplicate	Good	-0.0066	0.0077	-0.0851
PSDM to 914301 (1)	Duplicate	Good	-0.0101	0.0254	-0.0666
AZU1 to 914302 (2)	Duplicate	Good	-0.0057	0.0072	-0.0422
AZU1 to 914302 (1)	Duplicate	Good	-0.0050	0.0176	-0.0136
CIT1 to 914302	LoopTie	Good	0.0015	0.0086	-0.0966
CIT1 to 914302 (2)	Duplicate	Good	0.0002	0.0025	-0.0839
CIT1 to 914302 (1)	Duplicate	Good	0.0032	0.0166	-0.1050
GVRs to 914302	LoopTie	Good	-0.0045	0.0105	-0.1081
GVRs to 914302 (2)	Duplicate	Good	-0.0050	0.0096	-0.1082
GVRs to 914302 (1)	Duplicate	Good	-0.0018	0.0213	-0.1082
LORS to 914302	LoopTie	Good	-0.0029	0.0113	-0.1080
LORS to 914302 (1)	Duplicate	Good	0.0004	0.0202	-0.1163
PSDM to 914302	LoopTie	Good	-0.0055	0.0105	-0.1016
PSDM to 914302 (2)	Duplicate	Good	-0.0013	0.0049	-0.0709
PSDM to 914302 (1)	Duplicate	Good	-0.0034	0.0198	-0.1214
914301 to 914302	LoopTie	Good	0.0150	-0.0115	-0.0415
AZU1 to 914303 (2)	Duplicate	Good	-0.0102	-0.0213	0.0339
AZU1 to 914303 (1)	Duplicate	Good	-0.0035	-0.0173	-0.0396
AZU1 to 914303 (4)	Duplicate	Good	-0.0013	0.0079	-0.0434
CIT1 to 914303	LoopTie	Good	-0.0059	-0.0162	-0.1016
CIT1 to 914303 (4)	Duplicate	Good	0.0036	0.0156	-0.0983
CIT1 to 914303 (3)	Duplicate	Good	-0.0037	-0.0175	-0.0491

CIT1 to 914303 (2)	Duplicate Good	-0.0035	-0.0183	-0.0356
CIT1 to 914303 (6)	Duplicate Good	0.0005	0.0125	-0.0925
GVRs to 914303	LoopTie Good	-0.0024	0.0202	-0.1038
GVRs to 914303 (3)	Duplicate Good	-0.0096	-0.0153	-0.0595
GVRs to 914303 (2)	Duplicate Good	-0.0110	-0.0108	-0.0650
GVRs to 914303 (1)	Duplicate Good	-0.0105	-0.0135	-0.1061
GVRs to 914303 (6)	Duplicate Good	-0.0103	0.0087	-0.1172
LORS to 914303	LoopTie Good	0.0046	-0.0012	-0.0505
LORS to 914303 (4)	Duplicate Good	0.0003	0.0159	-0.0928
LORS to 914303 (3)	Duplicate Good	-0.0121	-0.0149	-0.0306
LORS to 914303 (2)	Duplicate Good	-0.0007	-0.0185	-0.0098
LORS to 914303 (1)	Duplicate Good	-0.0095	-0.0189	-0.1111
PSDM to 914303 (6)	Duplicate Good	-0.0032	0.0055	-0.0764
PSDM to 914303	LoopTie Good	-0.0042	-0.0134	-0.0364
PSDM to 914303 (1)	Duplicate Good	-0.0061	-0.0161	-0.1189
914301 to 914303	LoopTie Good	0.0039	-0.0016	0.0042
914302 to 914303	LoopTie Good	-0.0050	-0.0246	0.0440
AZU1 to 914304 (2)	Duplicate Good	0.0088	-0.0139	0.0241
AZU1 to 914304 (1)	Duplicate Good	0.0045	-0.0090	0.0043
CIT1 to 914304	LoopTie Good	-0.0047	0.0019	-0.0797
CIT1 to 914304 (2)	Duplicate Good	0.0144	-0.0055	-0.0849
CIT1 to 914304 (1)	Duplicate Good	0.0078	-0.0055	-0.0743
GVRs to 914304	LoopTie Good	-0.0068	0.0061	-0.0919
GVRs to 914304 (2)	Duplicate Good	0.0035	-0.0069	-0.1059
GVRs to 914304 (1)	Duplicate Good	0.0020	-0.0004	-0.0844
LORS to 914304	LoopTie Good	0.0069	0.0009	-0.0844
LORS to 914304 (2)	Duplicate Good	0.0138	-0.0177	-0.0424
LORS to 914304 (1)	Duplicate Good	0.0051	-0.0054	-0.0655
PSDM to 914304	LoopTie Good	0.0103	-0.0110	-0.0772
PSDM to 914304 (1)	Duplicate Good	0.0047	-0.0034	-0.0772
914301 to 914304	LoopTie Good	0.0060	-0.0099	0.0175
914303 to 914304	LoopTie Good	0.0089	-0.0155	0.0068
POINT LEEP	CheckPnt Good	-0.0090	0.0012	0.0750
AZU1 to LEEP (2)	Duplicate Good	-0.0026	-0.0015	0.0078
AZU1 to LEEP (3)	Duplicate Good	-0.0042	-0.0034	-0.0049
AZU1 to LEEP (4)	Duplicate Good	-0.0020	-0.0003	-0.0185
CIT1 to LEEP	LoopTie Good	-0.0015	0.0045	-0.0880
CIT1 to LEEP (2)	Duplicate Good	-0.0031	0.0042	-0.0822
CIT1 to LEEP (3)	Duplicate Good	-0.0002	0.0036	-0.0849
CIT1 to LEEP (4)	Duplicate Good	-0.0004	0.0005	-0.0861
GVRs to LEEP	LoopTie Good	-0.0057	0.0052	-0.0835
GVRs to LEEP (2)	Duplicate Good	-0.0067	0.0070	-0.0861
GVRs to LEEP (3)	Duplicate Good	-0.0068	0.0068	-0.0811
GVRs to LEEP (4)	Duplicate Good	-0.0039	0.0059	-0.0790
LORS to LEEP (4)	Duplicate Good	-0.0147	-0.0029	-0.0382
LORS to LEEP (3)	Duplicate Good	-0.0074	-0.0021	-0.0813
LORS to LEEP (1)	Duplicate Good	-0.0083	-0.0006	-0.0843
LORS to LEEP	LoopTie Good	-0.0077	-0.0027	-0.0764
PSDM to LEEP (4)	Duplicate Good	-0.0162	-0.0023	-0.0495
PSDM to LEEP	LoopTie Good	-0.0111	-0.0023	-0.0792
PSDM to LEEP (2)	Duplicate Good	-0.0099	-0.0017	-0.0746
PSDM to LEEP (1)	Duplicate Good	-0.0105	-0.0005	-0.0803
914301 to LEEP	LoopTie Good	0.0283	-0.0315	-0.0303
914301 to LEEP (2)	Duplicate Good	-0.0199	-0.0244	0.0305
914301 to LEEP (4)	Duplicate Good	0.0012	-0.0030	0.0400

914301 to LEEP (5)	Duplicate	Good	0.0065	-0.0053	0.0037
914302 to LEEP	LoopTie	Good	-0.0003	-0.0143	0.0097
914302 to LEEP (2)	Duplicate	Good	0.0027	-0.0086	0.0251
914302 to LEEP (3)	Duplicate	Good	-0.0012	-0.0056	0.0158
914303 to LEEP	LoopTie	Good	0.0056	0.0210	0.0034
914303 to LEEP (4)	Duplicate	Good	-0.0003	-0.0100	0.0190
914303 to LEEP (2)	Duplicate	Good	0.0024	0.0195	-0.0448
914303 to LEEP (3)	Duplicate	Good	0.0048	0.0155	-0.0256
914303 to LEEP (5)	Duplicate	Good	-0.0038	-0.0076	0.0141
914304 to LEEP	LoopTie	Good	-0.0108	-0.0019	0.0294
914304 to LEEP (2)	Duplicate	Good	-0.0046	0.0074	-0.0161
914304 to LEEP (3)	Duplicate	Good	-0.0088	-0.0163	0.0392
POINT PKRD	CheckPnt	Good	-0.0029	0.0044	0.0025
CIT1 to PKRD (1)	Duplicate	Good	-0.0003	-0.0011	-0.0040
CIT1 to PKRD (2)	Duplicate	Good	0.0019	-0.0030	0.0163
CIT1 to PKRD (4)	Duplicate	Good	0.0013	0.0035	0.0175
GVRs to PKRD	LoopTie	Good	-0.0057	0.0020	0.0098
GVRs to PKRD (1)	Duplicate	Good	-0.0045	0.0019	0.0078
GVRs to PKRD (2)	Duplicate	Good	-0.0063	-0.0013	0.0065
GVRs to PKRD (4)	Duplicate	Good	-0.0048	0.0064	0.0219
LORS to PKRD (1)	Duplicate	Good	-0.0051	0.0020	-0.0246
LORS to PKRD (2)	Duplicate	Good	0.0046	0.0005	-0.0095
LORS to PKRD	LoopTie	Good	-0.0005	-0.0016	0.0128
LORS to PKRD (4)	Duplicate	Good	-0.0023	-0.0023	0.0059
PSDM to PKRD	LoopTie	Good	-0.0023	0.0007	0.0325
PSDM to PKRD (2)	Duplicate	Good	-0.0021	-0.0048	0.0202
PSDM to PKRD (1)	Duplicate	Good	-0.0015	0.0020	0.0048
PSDM to PKRD (3)	Duplicate	Good	-0.0054	0.0014	0.0210
914301 to PKRD (3)	Duplicate	Good	0.0502	-0.0225	-0.0072
914301 to PKRD	LoopTie	Good	0.0082	-0.0134	0.0776
914302 to PKRD	LoopTie	Good	-0.0007	-0.0223	0.0815
914302 to PKRD (2)	Duplicate	Good	0.0096	-0.0040	0.1175
914302 to PKRD (3)	Duplicate	Good	0.0038	-0.0039	0.1197
914303 to PKRD (4)	Duplicate	Good	-0.0002	-0.0107	0.1075
914303 to PKRD	LoopTie	Good	0.0005	0.0191	0.0589
914303 to PKRD (2)	Duplicate	Good	0.0036	0.0153	0.0535
914303 to PKRD (1)	Duplicate	Good	0.0018	0.0096	0.1024
914303 to PKRD (6)	Duplicate	Good	-0.0071	0.0068	0.0661
914304 to PKRD	LoopTie	Good	-0.0134	0.0095	0.0908
914304 to PKRD (1)	Duplicate	Good	-0.0118	-0.0026	0.1382
914304 to PKRD (3)	Duplicate	Good	0.0003	-0.0052	0.1104
LEEP to PKRD	LoopTie	Good	0.0031	0.0056	0.0891
LEEP to PKRD (2)	Duplicate	Good	0.0017	0.0050	0.0743
LEEP to PKRD (3)	Duplicate	Good	0.0066	0.0021	0.0831
LEEP to PKRD (4)	Duplicate	Good	0.0019	0.0032	0.0847
POINT SPMS	CheckPnt	Good	-0.0004	0.0106	-0.0813
AZU1 to SPMS (2)	Duplicate	Good	0.0002	0.0026	0.0052
AZU1 to SPMS (1)	Duplicate	Good	0.0015	0.0027	-0.0043
AZU1 to SPMS (4)	Duplicate	Good	0.0011	0.0032	-0.0009
CIT1 to SPMS	LoopTie	Good	0.0017	0.0081	-0.0834
CIT1 to SPMS (2)	Duplicate	Good	0.0000	0.0092	-0.0958
CIT1 to SPMS (1)	Duplicate	Good	0.0019	0.0094	-0.0794
CIT1 to SPMS (4)	Duplicate	Good	0.0030	0.0114	-0.0965
GVRs to SPMS	LoopTie	Good	-0.0049	0.0113	-0.0795
GVRs to SPMS (2)	Duplicate	Good	-0.0036	0.0119	-0.0998



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

GVR5 to SPMS (1)	Duplicate	Good	-0.0021	0.0102	-0.0726
GVR5 to SPMS (4)	Duplicate	Good	0.0009	0.0105	-0.1004
LORS to SPMS	LoopTie	Good	0.0028	0.0059	-0.0729
LORS to SPMS (1)	Duplicate	Good	0.0013	0.0058	-0.0802
LORS to SPMS (2)	Duplicate	Good	0.0014	0.0063	-0.0633
LORS to SPMS (4)	Duplicate	Good	0.0018	0.0065	-0.0816
PSDM to SPMS	LoopTie	Good	0.0012	0.0060	-0.0789
PSDM to SPMS (2)	Duplicate	Good	0.0007	0.0073	-0.0693
PSDM to SPMS (3)	Duplicate	Good	0.0009	0.0068	-0.0716
PSDM to SPMS (4)	Duplicate	Good	0.0025	0.0084	-0.0826
914301 to SPMS	LoopTie	Good	0.0226	-0.0231	-0.0157
914301 to SPMS (2)	Duplicate	Good	0.0241	-0.0129	-0.0795
914301 to SPMS (1)	Duplicate	Good	0.0126	-0.0235	0.0049
914301 to SPMS (4)	Duplicate	Good	0.0020	0.0007	0.0123
914301 to SPMS (5)	Duplicate	Good	-0.0008	0.0009	0.0267
914302 to SPMS	LoopTie	Good	0.0023	-0.0073	0.0555
914302 to SPMS (2)	Duplicate	Good	0.0047	-0.0026	0.0063
914302 to SPMS (3)	Duplicate	Good	0.0076	-0.0084	0.0196
914303 to SPMS	LoopTie	Good	0.0033	0.0050	0.0287
914303 to SPMS (3)	Duplicate	Good	0.0091	0.0140	-0.0488
914303 to SPMS (2)	Duplicate	Good	0.0035	0.0217	-0.0419
914303 to SPMS (6)	Duplicate	Good	-0.0040	0.0031	0.0076
914304 to SPMS	LoopTie	Good	-0.0131	0.0195	-0.0005
914304 to SPMS (1)	Duplicate	Good	-0.0050	0.0113	0.0040
914304 to SPMS (3)	Duplicate	Good	-0.0028	0.0030	0.0170
LEEP to SPMS (3)	Duplicate	Good	0.0088	0.0087	-0.0036
LEEP to SPMS (1)	Duplicate	Good	0.0091	0.0077	0.0051
LEEP to SPMS	LoopTie	Good	0.0112	0.0100	-0.0084
LEEP to SPMS (4)	Duplicate	Good	0.0182	0.0097	-0.0280
PKRD to SPMS	LoopTie	Good	0.0006	0.0084	-0.0835
PKRD to SPMS (2)	Duplicate	Good	0.0015	0.0138	-0.0958
PKRD to SPMS (3)	Duplicate	Good	0.0023	0.0081	-0.0965
PKRD to SPMS (4)	Duplicate	Good	0.0014	0.0052	-0.1199

RMS (tie points)			0.0087	0.0125	0.0691
RMS (check points)			0.0054	0.0067	0.0639
			=====		

Fully Constrained NETWORK - WEIGHTED GPS NETWORK ADJUSTMENT

DATUM: 'NAD83'
GRID: UTM, Zone 11
SCALE_FACTOR: 40.2965
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	--	LATITUDE	--	--	LONGITUDE	--	ELLHGT	--	HZ-SD	V-SD
--------	------	----	----------	----	----	-----------	----	--------	----	-------	------

AZU1	GCP-3D	34 07 33.65306 -117 53 47.30380	145.459 0.00500
0.00500			
CIT1	GCP-3D	34 08 12.13762 -118 07 38.17666	216.056 0.00500
0.00500			
GVR5	GCP-3D	34 02 50.79454 -118 06 46.36714	155.226 0.00500
0.00500			
LEEP	CHK-3D	34 08 04.54995 -118 19 18.26664	485.747
LORS	GCP-3D	34 07 59.96318 -117 45 14.60181	449.607 0.00500
0.00500			
PKRD	CHK-3D	34 04 17.60222 -118 13 58.40284	131.552
SPMS	CHK-3D	33 59 33.54095 -117 50 55.54017	207.753

INPUT VECTORS

SESSION NAME	VECTOR(m)	----- Covariance (m) [unscaled] -----
	DX/DY/DZ	standard deviations in brackets
914301 to 914302 (2)	-20808.8487	5.3914e-007 (0.0007)
	10622.5820	2.9886e-007 5.1403e-007 (0.0007)
	-908.7612	-2.5721e-007 -3.7457e-007 6.8103e-007
(0.0008)		
914301 to 914303 (4)	-29715.7947	5.4552e-007 (0.0007)
	22007.6005	6.7518e-007 1.7490e-006 (0.0013)
	8402.9641	-3.3951e-007 -6.7129e-007 6.1301e-007
(0.0008)		
914301 to 914304 (1)	-20261.1182	3.7504e-007 (0.0006)
	10589.9932	3.0988e-007 5.0847e-007 (0.0007)
	-562.2194	-2.0379e-007 -2.0617e-007 2.7106e-007
(0.0005)		
914301 to LEEP (2)	-42490.9070	1.5513e-004 (0.0125)
	25621.0123	6.5500e-005 7.9864e-005 (0.0089)
	4267.7948	-1.8944e-005 -1.3471e-005 1.3462e-005
(0.0037)		
914301 to LEEP (3)	-42490.9715	1.7038e-005 (0.0041)
	25620.9944	9.7746e-007 5.3217e-006 (0.0023)
	4267.8348	-3.4957e-006 -1.9978e-006 3.1284e-006
(0.0018)		
914301 to LEEP (4)	-42490.9276	2.6892e-005 (0.0052)
	25621.0187	4.4238e-006 3.6207e-005 (0.0060)
	4267.7718	-3.8564e-006 -9.2723e-006 6.8121e-006
(0.0026)		
914301 to LEEP (5)	-42490.9459	1.8969e-005 (0.0044)
	25620.9959	1.9317e-006 5.7336e-006 (0.0024)
	4267.7941	-3.9433e-006 -2.3180e-006 3.1095e-006
(0.0018)		

914301 to PKRD (3)	-36988.9766	3.6157e-004	(0.0190)
	18542.1646	4.1186e-005	5.1085e-005 (0.0071)
	-1721.3287	-5.0102e-005	-9.3237e-006 2.5820e-005
(0.0051)			
914301 to PKRD (4)	-36988.9087	3.7516e-005	(0.0061)
	18542.2021	-5.4646e-007	2.3472e-005 (0.0048)
	-1721.3838	-8.7887e-006	-6.8350e-006 9.4542e-006
(0.0031)			
914301 to SPMS (1)	-8010.5547	1.4275e-006	(0.0012)
	-2513.8731	1.3622e-006	3.4518e-006 (0.0019)
	-8932.3123	-7.1350e-007	-1.6016e-006 2.0638e-006
(0.0014)			
914301 to SPMS (2)	-8010.6004	1.4092e-005	(0.0038)
	-2513.9349	1.2868e-005	3.2478e-005 (0.0057)
	-8932.2739	-1.0264e-005	-1.9123e-005 3.0023e-005
(0.0055)			
914301 to SPMS (3)	-8010.5717	8.3702e-007	(0.0009)
	-2513.8837	9.5899e-007	2.0843e-006 (0.0014)
	-8932.3011	-4.7226e-007	-8.4644e-007 1.0592e-006
(0.0010)			
914301 to SPMS (4)	-8010.5488	6.4020e-007	(0.0008)
	-2513.8846	7.2242e-007	1.6575e-006 (0.0013)
	-8932.3364	-3.2166e-007	-6.2555e-007 8.6086e-007
(0.0009)			
914301 to SPMS (5)	-8010.5408	9.6341e-007	(0.0010)
	-2513.8754	8.5206e-007	2.2206e-006 (0.0015)
	-8932.3447	-3.9713e-007	-1.0726e-006 1.5265e-006
(0.0012)			
914302 to 914303 (2)	-8906.9429	4.5075e-008	(0.0002)
	11385.0371	4.7379e-008	1.1928e-007 (0.0003)
	9311.7546	-2.2176e-008	-4.6352e-008 5.8178e-008
(0.0002)			
914302 to LEEP (1)	-21682.1128	1.6988e-005	(0.0041)
	14998.4019	9.0835e-006	1.5155e-005 (0.0039)
	5176.5921	-6.9898e-006	-9.9642e-006 1.9312e-005
(0.0044)			
914302 to LEEP (2)	-21682.1109	1.2320e-005	(0.0035)
	14998.4117	1.0092e-005	1.6722e-005 (0.0041)
	5176.5787	-6.6394e-006	-6.7719e-006 8.9729e-006
(0.0030)			
914302 to LEEP (3)	-21682.1119	5.7662e-006	(0.0024)
	14998.4016	5.6982e-006	1.3949e-005 (0.0037)
	5176.5814	-3.1818e-006	-6.2370e-006 7.7773e-006
(0.0028)			

914302 to PKRD (1)	-16180.0747	6.5399e-006	(0.0026)
	7919.6055	5.3997e-006	8.5928e-006 (0.0029)
	-812.5847	-4.2845e-006	-4.3233e-006 7.4915e-006
(0.0027)			
914302 to PKRD (2)	-16180.0745	1.8333e-005	(0.0043)
	7919.6277	1.6871e-005	2.1465e-005 (0.0046)
	-812.6200	-9.7157e-006	-1.2656e-005 1.3142e-005
(0.0036)			
914302 to PKRD (3)	-16180.0685	3.5038e-005	(0.0059)
	7919.6264	1.8246e-005	1.3555e-005 (0.0037)
	-812.6213	-1.3977e-005	-9.6334e-006 9.4640e-006
(0.0031)			
914302 to SPMS (1)	12798.2921	7.7175e-006	(0.0028)
	-13136.4484	3.9329e-006	6.0769e-006 (0.0025)
	-8023.5601	-3.9491e-006	-4.3225e-006 8.8870e-006
(0.0030)			
914302 to SPMS (2)	12798.2696	2.2349e-006	(0.0015)
	-13136.4857	2.2009e-006	5.5838e-006 (0.0024)
	-8023.5365	-1.2559e-006	-2.5121e-006 3.1501e-006
(0.0018)			
914302 to SPMS (3)	12798.2738	5.5432e-006	(0.0024)
	-13136.4717	3.7165e-006	6.3289e-006 (0.0025)
	-8023.5391	-3.0615e-006	-3.7809e-006 3.7935e-006
(0.0019)			
914303 to LEEP (1)	-12775.1589	5.5415e-006	(0.0024)
	3613.3875	5.0797e-006	9.0266e-006 (0.0030)
	-4135.1926	-3.1344e-006	-4.0425e-006 5.5185e-006
(0.0023)			
914303 to 914304 (2)	9454.6698	2.5994e-007	(0.0005)
	-11417.6053	3.1176e-007	8.2200e-007 (0.0009)
	-8965.1739	-1.5596e-007	-3.1245e-007 2.9263e-007
(0.0005)			
914303 to LEEP (2)	-12775.1746	1.4626e-006	(0.0012)
	3613.3516	1.5814e-006	3.5355e-006 (0.0019)
	-4135.1643	-6.2300e-007	-1.2549e-006 1.6667e-006
(0.0013)			
914303 to LEEP (3)	-12775.1681	4.6185e-006	(0.0021)
	3613.3687	4.7604e-006	1.1438e-005 (0.0034)
	-4135.1718	-2.6775e-006	-5.1591e-006 6.2768e-006
(0.0025)			
914303 to LEEP (4)	-12775.1393	3.3300e-006	(0.0018)
	3613.4113	4.0597e-006	1.0082e-005 (0.0032)
	-4135.1757	-1.2591e-006	-3.3799e-006 3.4406e-006
(0.0019)			

914303 to LEEP (5)	-12775.1388	3.1832e-006	(0.0018)
	3613.4049	3.0440e-006	7.6706e-006 (0.0028)
	-4135.1749	-1.4974e-006	-3.4824e-006 4.4640e-006
(0.0021)			
914303 to PKRD (1)	-7273.1061	3.5036e-006	(0.0019)
	-3465.3890	3.4122e-006	6.2979e-006 (0.0025)
	-10124.3818	-2.0928e-006	-2.7023e-006 3.3387e-006
(0.0018)			
914303 to PKRD (2)	-7273.1284	8.0105e-006	(0.0028)
	-3465.4266	1.1784e-005	2.7142e-005 (0.0052)
	-10124.3591	-5.6980e-006	-1.5900e-005 1.4725e-005
(0.0038)			
914303 to PKRD (3)	-7273.1245	2.8754e-005	(0.0054)
	-3465.4260	1.4974e-005	1.1124e-005 (0.0033)
	-10124.3653	-1.1470e-005	-7.9057e-006 7.7667e-006
(0.0028)			
914303 to PKRD (4)	-7273.0970	2.6753e-005	(0.0052)
	-3465.3762	2.8221e-005	3.6932e-005 (0.0061)
	-10124.3678	-5.3395e-007	-2.7258e-006 4.1634e-006
(0.0020)			
914303 to PKRD (6)	-7273.1117	1.2521e-005	(0.0035)
	-3465.4183	2.6790e-005	8.1828e-005 (0.0090)
	-10124.3591	-6.5970e-006	-2.0923e-005 7.2072e-006
(0.0027)			
914303 to SPMS (2)	21705.2167	9.5449e-006	(0.0031)
	-24521.5288	1.2276e-005	3.2259e-005 (0.0057)
	-17335.2886	-6.3927e-006	-1.2809e-005 1.1514e-005
(0.0034)			
914303 to SPMS (3)	21705.2111	4.6079e-006	(0.0021)
	-24521.5274	2.3967e-006	9.2928e-006 (0.0030)
	-17335.2784	1.9286e-006	-1.6764e-006 8.6560e-006
(0.0029)			
914303 to SPMS (4)	21705.2486	5.8585e-006	(0.0024)
	-24521.4689	2.3904e-006	1.3723e-005 (0.0037)
	-17335.3143	1.8030e-006	-7.2979e-006 1.1663e-005
(0.0034)			
914303 to SPMS (6)	21705.2474	8.1021e-006	(0.0028)
	-24521.4869	9.6919e-006	2.7472e-005 (0.0052)
	-17335.3009	-5.0091e-006	-1.0688e-005 1.0228e-005
(0.0032)			
914304 to LEEP (1)	-22229.7991	3.1185e-005	(0.0056)
	15031.0320	4.1749e-005	8.2362e-005 (0.0091)
	4829.9947	-1.5974e-005	-3.6091e-005 2.2459e-005
(0.0047)			

914304 to LEEP (2)	-22229.8249	1.2494e-005	(0.0035)
	15030.9972	1.0239e-005	1.6975e-005 (0.0041)
	4830.0125	-6.7422e-006	-6.8705e-006 9.1218e-006
(0.0030)			
914304 to LEEP (3)	-22229.7932	3.6053e-005	(0.0060)
	15031.0472	3.1616e-005	3.8415e-005 (0.0062)
	4830.0011	-2.4259e-006	-8.7312e-006 9.9679e-006
(0.0032)			
914304 to PKRD (1)	-16727.7478	2.3762e-005	(0.0049)
	7952.2588	1.6457e-005	1.5672e-005 (0.0040)
	-1159.2089	-4.6897e-006	-4.7431e-006 8.1001e-006
(0.0028)			
914304 to PKRD (2)	-16727.7682	1.9139e-005	(0.0044)
	7952.2175	3.5804e-005	1.0120e-004 (0.0101)
	-1159.1923	-1.1306e-005	-2.9269e-005 1.1221e-005
(0.0033)			
914304 to PKRD (3)	-16727.7687	2.9702e-006	(0.0017)
	7952.2455	2.8118e-006	5.8115e-006 (0.0024)
	-1159.1911	-9.6795e-007	-1.8590e-006 2.5107e-006
(0.0016)			
914304 to SPMS (1)	12250.5737	9.9656e-007	(0.0010)
	-13103.8719	1.1225e-006	2.7149e-006 (0.0016)
	-8370.1228	-4.8385e-007	-9.8458e-007 1.2664e-006
(0.0011)			
914304 to SPMS (2)	12250.5770	4.7083e-006	(0.0022)
	-13103.8830	5.6210e-006	1.5948e-005 (0.0040)
	-8370.1270	-2.9038e-006	-6.2010e-006 5.9418e-006
(0.0024)			
914304 to SPMS (3)	12250.5790	1.6920e-006	(0.0013)
	-13103.8573	1.8962e-006	5.0823e-006 (0.0023)
	-8370.1232	-6.5212e-007	-1.7445e-006 2.3971e-006
(0.0015)			
AZU1 to 914301 (3)	8006.9814	1.0223e-006	(0.0010)
	-6915.0520	1.2032e-006	2.5377e-006 (0.0016)
	-3288.7674	-5.6442e-007	-9.3097e-007 1.1183e-006
(0.0011)			
AZU1 to 914301 (2)	8006.9844	1.6495e-006	(0.0013)
	-6915.0218	1.9491e-006	5.7903e-006 (0.0024)
	-3288.7697	-8.3403e-007	-2.1323e-006 2.1436e-006
(0.0015)			
AZU1 to 914301 (4)	8006.9676	6.9008e-007	(0.0008)
	-6915.0372	8.1650e-007	1.9042e-006 (0.0014)
	-3288.7396	-3.4652e-007	-6.7721e-007 8.6182e-007
(0.0009)			

AZU1 to 914301 (5)	8006.9713	1.0373e-006 (0.0010)	
	-6915.0263	1.0756e-006	3.4797e-006 (0.0019)
	-3288.7439	-4.4188e-007	-1.3408e-006 1.5719e-006
(0.0013)			
AZU1 to 914302 (1)	-12801.8565	1.5108e-005 (0.0039)	
	3707.5523	9.3629e-006	1.0847e-005 (0.0033)
	-4197.5447	-1.2118e-005	-1.0551e-005 1.7779e-005
(0.0042)			
AZU1 to 914302 (2)	-12801.8643	5.7368e-006 (0.0024)	
	3707.5362	4.7408e-006	9.0908e-006 (0.0030)
	-4197.5201	-3.5879e-006	-5.4078e-006 4.5146e-006
(0.0021)			
AZU1 to 914302 (3)	-12801.8510	2.5049e-006 (0.0016)	
	3707.5733	2.7823e-006	7.0346e-006 (0.0027)
	-4197.5378	-1.4598e-006	-2.8844e-006 2.9900e-006
(0.0017)			
AZU1 to 914303 (1)	-21708.8298	5.5188e-006 (0.0023)	
	15092.5465	5.7665e-006	1.0070e-005 (0.0032)
	5114.2577	-3.3836e-006	-4.3855e-006 5.1837e-006
(0.0023)			
AZU1 to 914303 (2)	-21708.7941	1.1607e-006 (0.0011)	
	15092.5989	1.3846e-006	3.3440e-006 (0.0018)
	5114.2198	-5.6730e-007	-1.1744e-006 1.4983e-006
(0.0012)			
AZU1 to 914303 (4)	-21708.8399	7.6910e-006 (0.0028)	
	15092.5323	6.4534e-006	1.1288e-005 (0.0034)
	5114.2391	-4.4103e-006	-4.7015e-006 6.6056e-006
(0.0026)			
AZU1 to 914303 (6)	-21708.8220	5.9824e-006 (0.0024)	
	15092.5685	8.4210e-006	2.3531e-005 (0.0049)
	5114.2212	-3.4568e-006	-1.2103e-005 9.8996e-006
(0.0031)			
AZU1 to 914304 (1)	-12254.1509	9.3333e-007 (0.0010)	
	3674.9561	1.0857e-006	2.5403e-006 (0.0016)
	-3850.9567	-4.4394e-007	-8.8989e-007 1.0750e-006
(0.0010)			
AZU1 to 914304 (2)	-12254.1458	1.5573e-006 (0.0012)	
	3674.9750	1.7899e-006	5.8266e-006 (0.0024)
	-3850.9637	-7.2943e-007	-2.1179e-006 2.1727e-006
(0.0015)			
AZU1 to 914304 (3)	-12254.1510	1.4983e-006 (0.0012)	
	3674.9464	1.8312e-006	5.0856e-006 (0.0023)
	-3850.9617	-5.8832e-007	-1.6262e-006 2.0211e-006
(0.0014)			

AZU1 to LEEP (1)	-34483.9717	1.1965e-005	(0.0035)
	18705.9612	1.1024e-005	3.3653e-005 (0.0058)
	979.0479	-6.7491e-006	-1.4637e-005 1.3319e-005
(0.0036)			
AZU1 to LEEP (2)	-34483.9659	1.1833e-005	(0.0034)
	18705.9664	1.0779e-005	3.2956e-005 (0.0057)
	979.0447	-6.5803e-006	-1.4228e-005 1.3019e-005
(0.0036)			
AZU1 to LEEP (3)	-34483.9690	1.1824e-005	(0.0034)
	18705.9573	1.0737e-005	3.2902e-005 (0.0057)
	979.0535	-6.5458e-006	-1.4178e-005 1.2970e-005
(0.0036)			
AZU1 to LEEP (4)	-34483.9771	1.1842e-005	(0.0034)
	18705.9469	1.0822e-005	3.3011e-005 (0.0057)
	979.0585	-6.6154e-006	-1.4278e-005 1.3069e-005
(0.0036)			
AZU1 to SPMS (1)	-3.5840	2.0814e-007	(0.0005)
	-9428.9243	2.3335e-007	5.8084e-007 (0.0008)
	-12221.0727	-1.1716e-007	-2.2516e-007 2.6562e-007
(0.0005)			
AZU1 to SPMS (2)	-3.5791	2.0845e-007	(0.0005)
	-9428.9179	2.3418e-007	5.8167e-007 (0.0008)
	-12221.0779	-1.1693e-007	-2.2325e-007 2.6404e-007
(0.0005)			
AZU1 to SPMS (3)	-3.5803	2.7181e-006	(0.0016)
	-9428.9205	2.4511e-006	7.4954e-006 (0.0027)
	-12221.0729	-1.4923e-006	-3.2133e-006 2.9479e-006
(0.0017)			
AZU1 to SPMS (4)	-3.5825	2.2208e-007	(0.0005)
	-9428.9222	2.4919e-007	6.0210e-007 (0.0008)
	-12221.0751	-1.2144e-007	-2.3040e-007 2.6877e-007
(0.0005)			
CIT1 to 914303 (1)	-3198.0706	4.3077e-006	(0.0021)
	4557.7607	3.9232e-006	6.9390e-006 (0.0026)
	4093.0997	-2.4396e-006	-3.1330e-006 4.3271e-006
(0.0021)			
CIT1 to 914301 (1)	26517.7233	5.2086e-006	(0.0023)
	-17449.8349	4.9989e-006	1.2475e-005 (0.0035)
	-4309.9118	-2.5923e-006	-5.7566e-006 7.3748e-006
(0.0027)			
CIT1 to 914301 (3)	26517.7374	2.8363e-005	(0.0053)
	-17449.8325	2.1984e-005	2.8766e-005 (0.0054)
	-4309.9239	-1.0243e-005	-1.5851e-005 1.4617e-005
(0.0038)			

CIT1 to 914301 (4)	26517.7144	1.1238e-005	(0.0034)
	-17449.8426	6.7502e-006	1.7105e-005 (0.0041)
	-4309.8990	2.7089e-006	-3.4067e-006 1.3530e-005
(0.0037)			
CIT1 to 914301 (5)	26517.7083	1.5893e-005	(0.0040)
	-17449.8495	1.9834e-005	5.5298e-005 (0.0074)
	-4309.8837	-1.0361e-005	-2.1824e-005 2.0324e-005
(0.0045)			
CIT1 to 914302 (1)	5708.8825	9.1897e-006	(0.0030)
	-6827.2490	4.9029e-006	8.1592e-006 (0.0029)
	-5218.6846	-3.7557e-006	-5.3375e-006 1.0395e-005
(0.0032)			
CIT1 to 914302 (2)	5708.8971	3.4069e-006	(0.0018)
	-6827.2280	3.3756e-006	8.3870e-006 (0.0029)
	-5218.6848	-1.9016e-006	-3.7574e-006 4.6931e-006
(0.0022)			
CIT1 to 914302 (3)	5708.8894	1.5203e-006	(0.0012)
	-6827.2397	1.5668e-006	3.7575e-006 (0.0019)
	-5218.6827	-6.7325e-007	-1.3965e-006 1.8670e-006
(0.0014)			
CIT1 to 914303 (2)	-3198.0464	3.5481e-006	(0.0019)
	4557.8111	3.8595e-006	1.0880e-005 (0.0033)
	4093.0644	-2.1578e-006	-4.8210e-006 5.2341e-006
(0.0023)			
CIT1 to 914303 (3)	-3198.0517	1.0581e-006	(0.0010)
	4557.8007	1.1435e-006	2.6676e-006 (0.0016)
	4093.0713	-4.6344e-007	-9.5906e-007 1.3023e-006
(0.0011)			
CIT1 to 914303 (4)	-3198.0861	2.2594e-006	(0.0015)
	4557.7519	2.7783e-006	7.4380e-006 (0.0027)
	4093.0716	-8.9352e-007	-2.5477e-006 2.6776e-006
(0.0016)			
CIT1 to 914303 (6)	-3198.0803	2.4866e-006	(0.0016)
	4557.7562	2.3788e-006	6.0525e-006 (0.0025)
	4093.0709	-1.1789e-006	-2.7524e-006 3.5256e-006
(0.0019)			
CIT1 to 914304 (1)	6256.5962	1.4070e-006	(0.0012)
	-6859.8404	1.4630e-006	3.4135e-006 (0.0018)
	-4872.1074	-6.2170e-007	-1.2625e-006 1.6447e-006
(0.0013)			
CIT1 to 914304 (2)	6256.5863	2.5395e-006	(0.0016)
	-6859.8450	2.3935e-006	6.1097e-006 (0.0025)
	-4872.1015	-1.2450e-006	-2.9043e-006 4.0742e-006
(0.0020)			

CIT1 to 914304 (3)	6256.6032	2.4206e-006 (0.0016)	
	-6859.8539	2.6736e-006	7.3014e-006 (0.0027)
	-4872.1105	-9.5345e-007	-2.5411e-006 3.5589e-006
(0.0019)			
CIT1 to AZU1 (1)	18510.7405	5.0481e-007 (0.0007)	
	-10534.8058	5.6652e-007	1.4056e-006 (0.0012)
	-1021.1447	-2.8490e-007	-5.4486e-007 6.4177e-007
(0.0008)			
CIT1 to AZU1 (2)	18510.7446	6.8842e-006 (0.0026)	
	-10534.8061	6.2675e-006	1.9109e-005 (0.0044)
	-1021.1464	-3.8312e-006	-8.2585e-006 7.5617e-006
(0.0027)			
CIT1 to AZU1 (3)	18510.7450	6.9068e-006 (0.0026)	
	-10534.8017	6.2657e-006	1.9171e-005 (0.0044)
	-1021.1521	-3.8203e-006	-8.2591e-006 7.5510e-006
(0.0027)			
CIT1 to AZU1 (4)	18510.7496	5.1227e-007 (0.0007)	
	-10534.7994	5.7335e-007	1.4095e-006 (0.0012)
	-1021.1498	-2.9026e-007	-5.4506e-007 6.4378e-007
(0.0008)			
CIT1 to LEEP (1)	-15973.2245	5.3759e-006 (0.0023)	
	8171.1553	3.5841e-006	7.2044e-006 (0.0027)
	-42.0984	-2.2805e-006	-4.1038e-006 5.3384e-006
(0.0023)			
CIT1 to LEEP (2)	-15973.2208	5.8778e-006 (0.0024)	
	8171.1589	4.9348e-006	8.8190e-006 (0.0030)
	-42.1014	-3.1541e-006	-4.9152e-006 5.9799e-006
(0.0024)			
CIT1 to LEEP (3)	-15973.2242	5.8988e-006 (0.0024)	
	8171.1586	4.9473e-006	8.8533e-006 (0.0030)
	-42.0994	-3.1493e-006	-4.9161e-006 5.9725e-006
(0.0024)			
CIT1 to LEEP (4)	-15973.2237	4.1031e-007 (0.0006)	
	8171.1592	4.0069e-007	8.8093e-007 (0.0009)
	-42.0961	-2.2289e-007	-4.0332e-007 5.3182e-007
(0.0007)			
CIT1 to PKRD (1)	-10471.1835	9.4130e-006 (0.0031)	
	1092.3673	1.1275e-005	2.2916e-005 (0.0048)
	-6031.2841	-7.5211e-006	-1.0548e-005 1.0893e-005
(0.0033)			
CIT1 to PKRD (2)	-10471.1770	6.2187e-007 (0.0008)	
	1092.3841	5.5772e-007	1.0389e-006 (0.0010)
	-6031.2939	-3.2657e-007	-4.7753e-007 5.7721e-007
(0.0008)			

CIT1 to PKRD (3)	-10471.1825	9.1523e-006	(0.0030)
	1092.3698	1.1134e-005	2.2784e-005 (0.0048)
	-6031.2872	-7.4716e-006	-1.0604e-005 1.0863e-005
(0.0033)			
CIT1 to PKRD (4)	-10471.1777	4.3918e-006	(0.0021)
	1092.3814	4.9629e-006	1.0978e-005 (0.0033)
	-6031.2999	-3.3803e-006	-5.2544e-006 7.0794e-006
(0.0027)			
CIT1 to SPMS (1)	18507.1664	8.9311e-006	(0.0030)
	-19963.7213	7.5162e-006	1.3413e-005 (0.0037)
	-13242.2282	-4.8381e-006	-7.5259e-006 9.1389e-006
(0.0030)			
CIT1 to SPMS (2)	18507.1618	8.9276e-006	(0.0030)
	-19963.7341	7.5062e-006	1.3405e-005 (0.0037)
	-13242.2189	-4.8188e-006	-7.5047e-006 9.1079e-006
(0.0030)			
CIT1 to SPMS (3)	18507.1654	8.9099e-006	(0.0030)
	-19963.7237	7.4594e-006	1.3325e-005 (0.0037)
	-13242.2249	-4.7620e-006	-7.4121e-006 9.0120e-006
(0.0030)			
CIT1 to SPMS (4)	18507.1583	7.9954e-006	(0.0028)
	-19963.7343	5.2999e-006	1.0647e-005 (0.0033)
	-13242.2203	-3.3646e-006	-6.0355e-006 7.8759e-006
(0.0028)			
GVRs to AZU1 (3)	19931.4902	6.9918e-006	(0.0026)
	-5058.2819	6.3451e-006	1.9390e-005 (0.0044)
	7212.8194	-3.8735e-006	-8.3645e-006 7.6567e-006
(0.0028)			
GVRs to 914301 (1)	27938.4555	5.0434e-006	(0.0022)
	-11973.3412	4.8437e-006	1.2067e-005 (0.0035)
	3924.0735	-2.5073e-006	-5.5619e-006 7.1101e-006
(0.0027)			
GVRs to 914301 (3)	27938.4813	2.7220e-005	(0.0052)
	-11973.3142	2.1098e-005	2.7607e-005 (0.0053)
	3924.0494	-9.8298e-006	-1.5212e-005 1.4028e-005
(0.0037)			
GVRs to 914301 (4)	27938.4529	1.0814e-005	(0.0033)
	-11973.3368	6.4603e-006	1.6454e-005 (0.0041)
	3924.0803	2.6128e-006	-3.3248e-006 1.3135e-005
(0.0036)			
GVRs to 914301 (5)	27938.4491	1.5253e-005	(0.0039)
	-11973.3413	1.9034e-005	5.3069e-005 (0.0073)
	3924.1001	-9.9430e-006	-2.0944e-005 1.9505e-005
(0.0044)			

GVRs to 914302 (1)	7129.6237	8.2419e-006 (0.0029)
	-1350.7363	4.3973e-006 7.3177e-006 (0.0027)
	3015.2900	-3.3683e-006 -4.7870e-006 9.3231e-006
(0.0031)		
GVRs to 914302 (2)	7129.6296	3.1362e-006 (0.0018)
	-1350.7320	3.1099e-006 7.7110e-006 (0.0028)
	3015.2996	-1.7478e-006 -3.4492e-006 4.2984e-006
(0.0021)		
GVRs to 914302 (3)	7129.6290	1.3993e-006 (0.0012)
	-1350.7322	1.4431e-006 3.4489e-006 (0.0019)
	3015.2988	-6.1777e-007 -1.2787e-006 1.7064e-006
(0.0013)		
GVRs to 914303 (1)	-1777.3297	5.8937e-006 (0.0024)
	10034.2737	5.3988e-006 9.6011e-006 (0.0031)
	12327.0767	-3.3352e-006 -4.3007e-006 5.8804e-006
(0.0024)		
GVRs to 914303 (2)	-1777.3140	4.7917e-006 (0.0022)
	10034.3021	4.9340e-006 1.2085e-005 (0.0035)
	12327.0514	-2.8088e-006 -5.4656e-006 6.6639e-006
(0.0026)		
GVRs to 914303 (3)	-1777.3119	1.4401e-006 (0.0012)
	10034.3090	1.5575e-006 3.6255e-006 (0.0019)
	12327.0520	-6.3002e-007 -1.3013e-006 1.7649e-006
(0.0013)		
GVRs to 914303 (4)	-1777.3449	3.0666e-006 (0.0018)
	10034.2625	3.7710e-006 1.0095e-005 (0.0032)
	12327.0476	-1.2128e-006 -3.4579e-006 3.6343e-006
(0.0019)		
GVRs to 914303 (6)	-1777.3402	3.3757e-006 (0.0018)
	10034.2547	3.2324e-006 8.2378e-006 (0.0029)
	12327.0646	-1.6007e-006 -3.7389e-006 4.7857e-006
(0.0022)		
GVRs to 914304 (1)	7677.3353	1.3253e-006 (0.0012)
	-1383.3333	1.3815e-006 3.2106e-006 (0.0018)
	3361.8707	-5.8297e-007 -1.1836e-006 1.5360e-006
(0.0012)		
GVRs to 914304 (2)	7677.3274	2.3467e-006 (0.0015)
	-1383.3451	2.2158e-006 5.6855e-006 (0.0024)
	3361.8881	-1.0739e-006 -2.6443e-006 3.4680e-006
(0.0019)		
GVRs to 914304 (3)	7677.3385	6.7319e-006 (0.0026)
	-1383.3462	5.7542e-006 1.0131e-005 (0.0032)
	3361.8695	-1.0721e-006 -4.0887e-006 4.6500e-006
(0.0022)		

GVRs to AZU1 (1)	19931.4828	5.2157e-007 (0.0007)
	-5058.2926	5.8203e-007 1.4406e-006 (0.0012)
	7212.8315	-2.9050e-007 -5.5248e-007 6.6197e-007
(0.0008)		
GVRs to AZU1 (2)	19931.4849	6.9783e-006 (0.0026)
	-5058.2931	6.3425e-006 1.9419e-005 (0.0044)
	7212.8304	-3.8614e-006 -8.3543e-006 7.6194e-006
(0.0028)		
GVRs to AZU1 (4)	19931.4976	6.9554e-006 (0.0026)
	-5058.2738	6.3495e-006 1.9382e-005 (0.0044)
	7212.8171	-3.8753e-006 -8.3691e-006 7.6364e-006
(0.0028)		
GVRs to CIT1 (1)	1420.7460	3.9117e-006 (0.0020)
	5476.5240	2.6069e-006 5.2377e-006 (0.0023)
	8233.9704	-1.6602e-006 -2.9838e-006 3.8819e-006
(0.0020)		
GVRs to CIT1 (2)	1420.7380	3.0265e-007 (0.0006)
	5476.5073	2.9799e-007 6.7163e-007 (0.0008)
	8233.9782	-1.6540e-007 -3.0601e-007 4.0688e-007
(0.0006)		
GVRs to CIT1 (3)	1420.7399	3.0436e-007 (0.0006)
	5476.5084	2.9893e-007 6.7451e-007 (0.0008)
	8233.9782	-1.6854e-007 -3.1015e-007 4.1536e-007
(0.0006)		
GVRs to CIT1 (4)	1420.7418	3.0609e-007 (0.0006)
	5476.5125	3.0104e-007 6.7977e-007 (0.0008)
	8233.9766	-1.6617e-007 -3.0710e-007 4.1517e-007
(0.0006)		
GVRs to LEEP (1)	-14552.4800	6.6952e-006 (0.0026)
	13647.6760	5.6263e-006 1.0047e-005 (0.0032)
	8191.8752	-3.6057e-006 -5.6124e-006 6.8321e-006
(0.0026)		
GVRs to LEEP (2)	-14552.4806	6.7195e-006 (0.0026)
	13647.6727	5.6375e-006 1.0077e-005 (0.0032)
	8191.8752	-3.5982e-006 -5.6071e-006 6.8214e-006
(0.0026)		
GVRs to LEEP (3)	-14552.4785	6.7356e-006 (0.0026)
	13647.6764	5.6488e-006 1.0085e-005 (0.0032)
	8191.8725	-3.6130e-006 -5.6272e-006 6.8608e-006
(0.0026)		
GVRs to LEEP (4)	-14552.4800	6.1094e-006 (0.0025)
	13647.6797	4.0660e-006 8.1754e-006 (0.0029)
	8191.8721	-2.5825e-006 -4.6495e-006 6.0609e-006
(0.0025)		

GVRs to PKRD (1)	-9050.4367	9.1282e-006	(0.0030)
	6568.8921	1.0934e-005	2.2222e-005 (0.0047)
	2202.6835	-7.2935e-006	-1.0229e-005 1.0564e-005
(0.0033)			
GVRs to PKRD (2)	-9050.4348	8.9455e-006	(0.0030)
	6568.8919	1.0803e-005	2.2068e-005 (0.0047)
	2202.6869	-7.2374e-006	-1.0217e-005 1.0520e-005
(0.0032)			
GVRs to PKRD (3)	-9050.4349	8.8754e-006	(0.0030)
	6568.8930	1.0798e-005	2.2094e-005 (0.0047)
	2202.6823	-7.2455e-006	-1.0283e-005 1.0534e-005
(0.0032)			
GVRs to PKRD (4)	-9050.4321	4.2589e-006	(0.0021)
	6568.9001	4.8127e-006	1.0646e-005 (0.0033)
	2202.6719	-3.2780e-006	-5.0954e-006 6.8652e-006
(0.0026)			
GVRs to SPMS (1)	19927.9116	7.5523e-006	(0.0027)
	-14487.1989	6.3571e-006	1.1364e-005 (0.0034)
	-5008.2560	-4.0781e-006	-6.3548e-006 7.6952e-006
(0.0028)			
GVRs to SPMS (2)	19927.9020	7.5794e-006	(0.0028)
	-14487.2204	6.3695e-006	1.1398e-005 (0.0034)
	-5008.2422	-4.0695e-006	-6.3487e-006 7.6831e-006
(0.0028)			
GVRs to SPMS (3)	19927.9111	7.6069e-006	(0.0028)
	-14487.2058	6.3680e-006	1.1349e-005 (0.0034)
	-5008.2531	-4.0848e-006	-6.3435e-006 7.7404e-006
(0.0028)			
GVRs to SPMS (4)	19927.8981	4.9495e-007	(0.0007)
	-14487.2180	4.9629e-007	1.1431e-006 (0.0011)
	-5008.2407	-2.7846e-007	-5.1572e-007 6.9218e-007
(0.0008)			
LEEP to PKRD (1)	5502.0383	8.6467e-006	(0.0029)
	-7078.7888	1.0519e-005	2.1525e-005 (0.0046)
	-5989.1977	-7.0589e-006	-1.0018e-005 1.0263e-005
(0.0032)			
LEEP to PKRD (2)	5502.0339	9.0715e-006	(0.0030)
	-7078.8000	1.0775e-005	2.1794e-005 (0.0047)
	-5989.1889	-7.1549e-006	-9.9679e-006 1.0328e-005
(0.0032)			
LEEP to PKRD (3)	5502.0338	6.2101e-007	(0.0008)
	-7078.7898	5.3731e-007	1.0563e-006 (0.0010)
	-5989.1915	-3.3733e-007	-4.8887e-007 5.9860e-007
(0.0008)			

LEEP to PKRD (4)	5502.0383	8.7150e-006 (0.0030)
	-7078.7914	1.0525e-005 2.1500e-005 (0.0046)
	-5989.1933	-7.0509e-006 -9.9541e-006 1.0249e-005
(0.0032)		
LEEP to SPMS (1)	34480.3833	1.8141e-006 (0.0013)
	-28134.8775	-2.1540e-007 1.8026e-006 (0.0013)
	-13200.1300	-3.1132e-007 -6.1763e-007 6.2279e-007
(0.0008)		
LEEP to SPMS (2)	34480.3756	1.8099e-006 (0.0013)
	-28134.8875	-1.9876e-007 1.7836e-006 (0.0013)
	-13200.1244	-3.1493e-007 -6.1687e-007 6.2311e-007
(0.0008)		
LEEP to SPMS (3)	34480.3800	1.8114e-006 (0.0013)
	-28134.8845	-2.0559e-007 1.7919e-006 (0.0013)
	-13200.1260	-3.1487e-007 -6.1644e-007 6.2284e-007
(0.0008)		
LEEP to SPMS (4)	34480.3619	2.1241e-006 (0.0015)
	-28134.8985	-3.0092e-007 1.9454e-006 (0.0014)
	-13200.1132	-3.6179e-007 -6.6529e-007 7.0965e-007
(0.0008)		
LORS to AZU1 (3)	-11713.5600	2.4907e-006 (0.0016)
	5952.7130	2.2519e-006 6.8950e-006 (0.0026)
	-841.6878	-1.3702e-006 -2.9582e-006 2.7072e-006
(0.0016)		
LORS to 914301 (1)	-3706.5634	1.1255e-006 (0.0011)
	-962.2889	1.0721e-006 2.7288e-006 (0.0017)
	-4130.4763	-5.6349e-007 -1.2683e-006 1.6370e-006
(0.0013)		
LORS to 914301 (3)	-3706.5647	7.8289e-007 (0.0009)
	-962.3204	8.6298e-007 1.7330e-006 (0.0013)
	-4130.4601	-4.9745e-007 -7.7039e-007 9.6590e-007
(0.0010)		
LORS to 914301 (4)	-3706.5777	5.0607e-007 (0.0007)
	-962.3024	5.7074e-007 1.3105e-006 (0.0011)
	-4130.4403	-2.5434e-007 -4.9520e-007 6.8246e-007
(0.0008)		
LORS to 914301 (5)	-3706.5744	7.6319e-007 (0.0009)
	-962.2931	6.7829e-007 2.2969e-006 (0.0015)
	-4130.4421	-3.1299e-007 -1.0207e-006 1.2784e-006
(0.0011)		
LORS to 914302 (1)	-24515.4215	9.7368e-006 (0.0031)
	9660.2628	4.9733e-006 7.6866e-006 (0.0028)
	-5039.2236	-5.0072e-006 -5.4918e-006 1.1258e-005
(0.0034)		

LORS to 914302 (3)	-24515.4130	7.0018e-006	(0.0026)
	9660.2717	4.7191e-006	8.0574e-006 (0.0028)
	-5039.2209	-3.8774e-006	-4.8141e-006 4.8075e-006
(0.0022)			
LORS to 914303 (1)	-33422.3716	6.3396e-006	(0.0025)
	21045.2766	6.6008e-006	1.2412e-005 (0.0035)
	4272.5650	-4.0772e-006	-5.4270e-006 6.8687e-006
(0.0026)			
LORS to 914303 (2)	-33422.3399	1.0238e-005	(0.0032)
	21045.3545	1.3189e-005	3.4743e-005 (0.0059)
	4272.5077	-6.8516e-006	-1.3766e-005 1.2360e-005
(0.0035)			
LORS to 914303 (3)	-33422.3389	4.9536e-006	(0.0022)
	21045.3321	2.5774e-006	9.9929e-006 (0.0032)
	4272.5164	2.0752e-006	-1.7919e-006 9.2931e-006
(0.0030)			
LORS to 914303 (4)	-33422.3823	2.8817e-006	(0.0017)
	21045.2774	3.5696e-006	9.7112e-006 (0.0031)
	4272.5259	-1.1203e-006	-3.1456e-006 3.7931e-006
(0.0019)			
LORS to 914303 (6)	-33422.3650	8.6907e-006	(0.0029)
	21045.3187	1.0411e-005	2.9590e-005 (0.0054)
	4272.5163	-5.3679e-006	-1.1489e-005 1.0983e-005
(0.0033)			
LORS to 914304 (1)	-23967.6991	1.1929e-006	(0.0011)
	9627.6879	1.3438e-006	3.2567e-006 (0.0018)
	-4692.6548	-5.7861e-007	-1.1840e-006 1.5229e-006
(0.0012)			
LORS to 914304 (2)	-23967.6946	5.8536e-006	(0.0024)
	9627.7149	6.9940e-006	1.9873e-005 (0.0045)
	-4692.6576	-3.6087e-006	-7.7195e-006 7.3924e-006
(0.0027)			
LORS to 914304 (3)	-23967.7097	1.9372e-006	(0.0014)
	9627.6718	2.1453e-006	5.9102e-006 (0.0024)
	-4692.6494	-7.6158e-007	-2.0669e-006 2.8708e-006
(0.0017)			
LORS to AZU1 (1)	-11713.5510	1.9501e-007	(0.0004)
	5952.7269	2.1923e-007	5.4670e-007 (0.0007)
	-841.6941	-1.1005e-007	-2.1114e-007 2.4806e-007
(0.0005)			
LORS to AZU1 (2)	-11713.5485	1.9344e-007	(0.0004)
	5952.7327	2.1749e-007	5.4145e-007 (0.0007)
	-841.6987	-1.0819e-007	-2.0744e-007 2.4497e-007
(0.0005)			

LORS to AZU1 (4)	-11713.5500	1.9825e-007	(0.0004)
	5952.7255	2.2206e-007	5.4763e-007 (0.0007)
	-841.6923	-1.1263e-007	-2.1191e-007 2.4977e-007
(0.0005)			
LORS to CIT1 (1)	-30224.3052	9.1598e-006	(0.0030)
	16487.5151	6.1044e-006	1.2265e-005 (0.0035)
	179.4620	-3.8876e-006	-6.9869e-006 9.0900e-006
(0.0030)			
LORS to CIT1 (2)	-30224.2919	9.2113e-006	(0.0030)
	16487.5438	6.1487e-006	1.2352e-005 (0.0035)
	179.4460	-3.9196e-006	-7.0384e-006 9.1302e-006
(0.0030)			
LORS to CIT1 (3)	-30224.3048	1.0110e-005	(0.0032)
	16487.5186	8.5018e-006	1.5220e-005 (0.0039)
	179.4628	-5.4244e-006	-8.4772e-006 1.0267e-005
(0.0032)			
LORS to CIT1 (4)	-30224.2970	9.0261e-006	(0.0030)
	16487.5267	5.9895e-006	1.2039e-005 (0.0035)
	179.4573	-3.7938e-006	-6.8170e-006 8.8920e-006
(0.0030)			
LORS to GVRs (1)	-31645.0511	9.0837e-006	(0.0030)
	11010.9912	6.0350e-006	1.2129e-005 (0.0035)
	-8054.5083	-3.8292e-006	-6.8739e-006 8.9423e-006
(0.0030)			
LORS to GVRs (2)	-31645.0318	9.2130e-006	(0.0030)
	11011.0313	6.1461e-006	1.2348e-005 (0.0035)
	-8054.5316	-3.9126e-006	-7.0112e-006 9.0749e-006
(0.0030)			
LORS to GVRs (3)	-31645.0506	1.0146e-005	(0.0032)
	11011.0006	8.5297e-006	1.5233e-005 (0.0039)
	-8054.5090	-5.4721e-006	-8.5311e-006 1.0372e-005
(0.0032)			
LORS to GVRs (4)	-31645.0408	9.0331e-006	(0.0030)
	11011.0100	5.9921e-006	1.2045e-005 (0.0035)
	-8054.5176	-3.7981e-006	-6.8244e-006 8.9030e-006
(0.0030)			
LORS to LEEP (1)	-46197.5169	1.8758e-006	(0.0014)
	24658.6804	-2.2353e-007	1.8656e-006 (0.0014)
	137.3614	-3.2089e-007	-6.3982e-007 6.4484e-007
(0.0008)			
LORS to LEEP (2)	-46197.5138	1.8727e-006	(0.0014)
	24658.6875	-2.0735e-007	1.8435e-006 (0.0014)
	137.3587	-3.2545e-007	-6.3766e-007 6.4530e-007
(0.0008)			

LORS to LEEP (3)	-46197.5161	1.8703e-006	(0.0014)
	24658.6838	-2.1415e-007	1.8541e-006 (0.0014)
	137.3610	-3.2378e-007	-6.3833e-007 6.4458e-007
(0.0008)			
LORS to LEEP (4)	-46197.4925	1.8859e-006	(0.0014)
	24658.7121	-2.3394e-007	1.8751e-006 (0.0014)
	137.3374	-3.2160e-007	-6.3910e-007 6.4560e-007
(0.0008)			
LORS to PKRD (1)	-40695.4893	3.0627e-005	(0.0055)
	17579.8716	7.6218e-007	1.4221e-005 (0.0038)
	-5851.8174	-6.1150e-006	-3.8527e-006 5.5265e-006
(0.0024)			
LORS to PKRD (2)	-40695.4916	2.8353e-005	(0.0053)
	17579.8880	6.7323e-007	1.3906e-005 (0.0037)
	-5851.8246	-5.7636e-006	-3.7607e-006 5.2973e-006
(0.0023)			
LORS to PKRD (3)	-40695.4778	1.5610e-005	(0.0040)
	17579.9029	8.6754e-007	7.6624e-006 (0.0028)
	-5851.8354	-4.0636e-006	-1.9063e-006 2.8822e-006
(0.0017)			
LORS to PKRD (4)	-40695.4787	1.8199e-005	(0.0043)
	17579.8973	7.0700e-007	8.6201e-006 (0.0029)
	-5851.8310	-4.6555e-006	-2.1434e-006 3.3196e-006
(0.0018)			
LORS to SPMS (1)	-11717.1336	1.9432e-007	(0.0004)
	-3476.1972	1.9522e-007	4.5329e-007 (0.0007)
	-13062.7671	-1.1018e-007	-2.0617e-007 2.7288e-007
(0.0005)			
LORS to SPMS (2)	-11717.1273	1.9453e-007	(0.0004)
	-3476.1851	1.9541e-007	4.5355e-007 (0.0007)
	-13062.7770	-1.1011e-007	-2.0625e-007 2.7250e-007
(0.0005)			
LORS to SPMS (3)	-11717.1321	1.9491e-007	(0.0004)
	-3476.1912	1.9522e-007	4.5116e-007 (0.0007)
	-13062.7713	-1.1131e-007	-2.0628e-007 2.7590e-007
(0.0005)			
LORS to SPMS (4)	-11717.1347	1.9433e-007	(0.0004)
	-3476.1984	1.9514e-007	4.5232e-007 (0.0007)
	-13062.7669	-1.0991e-007	-2.0605e-007 2.7272e-007
(0.0005)			
PKRD to SPMS (1)	28978.3487	1.0424e-005	(0.0032)
	-21056.0943	1.2415e-005	2.5264e-005 (0.0050)
	-7210.9379	-8.3024e-006	-1.1591e-005 1.2059e-005
(0.0035)			

```

PKRD to SPMS (2)      28978.3418  1.0282e-005 (0.0032)
                      -21056.1055  1.2342e-005 2.5197e-005 (0.0050)
                      -7210.9355  -8.2784e-006 -1.1626e-005 1.2045e-005
(0.0035)

PKRD to SPMS (3)      28978.3423  1.0093e-005 (0.0032)
                      -21056.1028  1.2185e-005 2.4955e-005 (0.0050)
                      -7210.9304  -8.1911e-006 -1.1556e-005 1.1942e-005
(0.0035)

PKRD to SPMS (4)      28978.3348  4.8972e-006 (0.0022)
                      -21056.1190  5.5201e-006 1.2205e-005 (0.0035)
                      -7210.9149  -3.7440e-006 -5.8054e-006 7.8276e-006
(0.0028)

```

```

*****
      OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)
*****

```

SESSION NAME	-- RE --	-- RN --	-- RH --	- PPM -
DIST - STD -	(m)	(m)	(m)	
(km) (m)				
914301 to 914302 (2)	0.0055	-0.0138	-0.0147	0.894
23.4 0.0084				
914301 to 914303 (4)	-0.0004	0.0169	-0.0103	0.522
37.9 0.0108				
914301 to 914304 (1)	-0.0059	0.0091	0.0097	0.633
22.9 0.0068				
914301 to LEEP (2)	-0.0243	-0.0101	0.0247	0.726
49.8 0.1001				
914301 to LEEP (3)	0.0242	-0.0173	-0.0359	0.936
49.8 0.0320				
914301 to LEEP (4)	-0.0031	0.0112	0.0343	0.727
49.8 0.0531				
914301 to LEEP (5)	0.0023	0.0089	-0.0020	0.189
49.8 0.0335				
914301 to PKRD (3)	0.0422	-0.0097	-0.0991	2.611
41.4 0.1329				
914301 to PKRD (4)	-0.0001	-0.0005	-0.0144	0.347
41.4 0.0533				
914301 to SPMS (1)	0.0023	-0.0168	0.0017	1.394
12.3 0.0167				
914301 to SPMS (2)	0.0139	-0.0061	-0.0828	6.865
12.3 0.0556				
914301 to SPMS (3)	0.0124	-0.0164	-0.0189	2.282
12.3 0.0127				
914301 to SPMS (4)	-0.0082	0.0073	0.0090	1.161
12.3 0.0113				
914301 to SPMS (5)	-0.0110	0.0075	0.0235	2.205
12.3 0.0138				

914302 to 914303 (2) 17.2 0.0030	0.0001	-0.0036	0.0028	0.264
914302 to LEEP (1) 26.9 0.0455	0.0049	0.0023	-0.0228	0.871
914302 to LEEP (2) 26.9 0.0391	0.0078	0.0080	-0.0074	0.499
914302 to LEEP (3) 26.9 0.0333	0.0039	0.0110	-0.0166	0.757
914302 to PKRD (1) 18.0 0.0302	0.0004	-0.0070	-0.0373	2.104
914302 to PKRD (2) 18.0 0.0462	0.0107	0.0112	-0.0012	0.862
914302 to PKRD (3) 18.0 0.0484	0.0048	0.0113	0.0009	0.684
914302 to SPMS (1) 20.0 0.0302	0.0017	0.0016	0.0256	1.283
914302 to SPMS (2) 20.0 0.0210	0.0041	0.0064	-0.0237	1.242
914302 to SPMS (3) 20.0 0.0251	0.0069	0.0005	-0.0103	0.622
914303 to LEEP (1) 13.9 0.0285	0.0057	0.0166	0.0122	1.542
914303 to 914304 (2) 17.3 0.0074	0.0014	-0.0150	0.0135	1.168
914303 to LEEP (2) 13.9 0.0164	0.0026	0.0152	-0.0360	2.813
914303 to LEEP (3) 13.9 0.0300	0.0050	0.0112	-0.0168	1.491
914303 to LEEP (4) 13.9 0.0261	-0.0003	-0.0143	0.0278	2.247
914303 to LEEP (5) 13.9 0.0248	-0.0037	-0.0120	0.0228	1.874
914303 to PKRD (1) 12.9 0.0230	-0.0023	0.0039	0.0249	1.958
914303 to PKRD (2) 12.9 0.0448	-0.0004	0.0096	-0.0240	1.996
914303 to PKRD (3) 12.9 0.0438	-0.0036	0.0134	-0.0185	1.789
914303 to PKRD (4) 12.9 0.0523	-0.0042	-0.0164	0.0300	2.661
914303 to PKRD (6) 12.9 0.0640	-0.0112	0.0011	-0.0114	1.236
914303 to SPMS (2) 37.1 0.0464	-0.0026	0.0098	-0.0306	0.870
914303 to SPMS (3) 37.1 0.0301	0.0030	0.0021	-0.0375	1.016
914303 to SPMS (4) 37.1 0.0355	-0.0026	-0.0069	0.0400	1.099
914303 to SPMS (6) 37.1 0.0430	-0.0100	-0.0088	0.0189	0.624
914304 to LEEP (1) 27.3 0.0740	-0.0032	-0.0066	0.0314	1.184
914304 to LEEP (2) 27.3 0.0394	0.0031	0.0027	-0.0140	0.536

914304 to LEEP (3) 27.3 0.0583	-0.0013	-0.0210	0.0412	1.698
914304 to PKRD (1) 18.6 0.0438	-0.0084	-0.0086	0.0540	2.983
914304 to PKRD (2) 18.6 0.0728	-0.0099	0.0034	0.0066	0.667
914304 to PKRD (3) 18.6 0.0213	0.0037	-0.0113	0.0262	1.549
914304 to SPMS (1) 19.8 0.0142	-0.0034	-0.0010	0.0086	0.471
914304 to SPMS (2) 19.8 0.0327	-0.0115	0.0071	0.0041	0.714
914304 to SPMS (3) 19.8 0.0192	-0.0012	-0.0093	0.0216	1.190
AZU1 to 914301 (3) 11.1 0.0137	-0.0114	0.0193	0.0069	2.117
AZU1 to 914301 (2) 11.1 0.0197	0.0000	0.0054	0.0315	2.886
AZU1 to 914301 (4) 11.1 0.0118	0.0077	-0.0075	-0.0031	1.008
AZU1 to 914301 (5) 11.1 0.0157	0.0095	-0.0103	0.0087	1.487
AZU1 to 914302 (1) 14.0 0.0420	-0.0050	0.0049	0.0218	1.639
AZU1 to 914302 (2) 14.0 0.0279	-0.0057	-0.0054	-0.0068	0.744
AZU1 to 914302 (3) 14.0 0.0225	-0.0000	-0.0126	0.0354	2.691
AZU1 to 914303 (1) 26.9 0.0289	0.0018	-0.0090	-0.0454	1.721
AZU1 to 914303 (2) 26.9 0.0156	-0.0051	-0.0130	0.0280	1.162
AZU1 to 914303 (4) 26.9 0.0321	0.0040	0.0161	-0.0493	1.932
AZU1 to 914303 (6) 26.9 0.0399	0.0053	0.0083	-0.0058	0.424
AZU1 to 914304 (1) 13.4 0.0135	0.0021	-0.0003	0.0052	0.419
AZU1 to 914304 (2) 13.4 0.0196	0.0065	-0.0052	0.0249	1.965
AZU1 to 914304 (3) 13.4 0.0186	-0.0023	0.0087	0.0008	0.676
AZU1 to LEEP (1) 39.2 0.0487	0.0053	0.0039	0.0029	0.184
AZU1 to LEEP (2) 39.2 0.0483	0.0027	0.0025	0.0108	0.290
AZU1 to LEEP (3) 39.2 0.0482	0.0011	0.0005	-0.0020	0.060
AZU1 to LEEP (4) 39.2 0.0483	0.0034	0.0037	-0.0156	0.416
AZU1 to SPMS (1) 15.4 0.0065	0.0008	-0.0010	0.0011	0.108
AZU1 to SPMS (2) 15.4 0.0065	-0.0006	-0.0011	0.0106	0.694

AZU1 to SPMS (3) 15.4 0.0230	-0.0007	-0.0037	0.0055	0.429
AZU1 to SPMS (4) 15.4 0.0066	0.0004	-0.0004	0.0046	0.300
CIT1 to 914303 (1) 6.9 0.0251	-0.0035	-0.0104	-0.0361	5.466
CIT1 to 914301 (1) 32.0 0.0318	-0.0000	0.0097	0.0040	0.328
CIT1 to 914301 (3) 32.0 0.0538	-0.0114	0.0148	0.0180	0.811
CIT1 to 914301 (4) 32.0 0.0411	0.0042	0.0053	-0.0122	0.436
CIT1 to 914301 (5) 32.0 0.0607	0.0064	-0.0024	-0.0282	0.906
CIT1 to 914302 (1) 10.3 0.0334	0.0003	0.0015	0.0017	0.226
CIT1 to 914302 (2) 10.3 0.0258	-0.0027	-0.0126	0.0229	2.544
CIT1 to 914302 (3) 10.3 0.0170	-0.0014	-0.0065	0.0102	1.176
CIT1 to 914303 (2) 6.9 0.0281	-0.0010	-0.0126	0.0299	4.694
CIT1 to 914303 (3) 6.9 0.0142	-0.0013	-0.0117	0.0164	2.917
CIT1 to 914303 (4) 6.9 0.0223	0.0060	0.0213	-0.0328	5.733
CIT1 to 914303 (6) 6.9 0.0220	0.0030	0.0182	-0.0270	4.739
CIT1 to 914304 (1) 10.5 0.0161	0.0026	0.0007	-0.0022	0.327
CIT1 to 914304 (2) 10.5 0.0226	0.0091	0.0007	-0.0127	1.492
CIT1 to 914304 (3) 10.5 0.0231	-0.0100	0.0081	-0.0076	1.423
CIT1 to AZU1 (1) 21.3 0.0101	0.0019	0.0024	-0.0201	0.952
CIT1 to AZU1 (2) 21.3 0.0368	-0.0019	0.0029	-0.0177	0.847
CIT1 to AZU1 (3) 21.3 0.0368	-0.0002	0.0053	-0.0112	0.580
CIT1 to AZU1 (4) 21.3 0.0102	-0.0031	0.0011	-0.0090	0.449
CIT1 to LEEP (1) 17.9 0.0269	0.0012	0.0059	-0.0137	0.834
CIT1 to LEEP (2) 17.9 0.0289	-0.0004	0.0057	-0.0079	0.544
CIT1 to LEEP (3) 17.9 0.0289	0.0025	0.0051	-0.0106	0.669
CIT1 to LEEP (4) 17.9 0.0086	0.0023	0.0019	-0.0118	0.680
CIT1 to PKRD (1) 12.1 0.0417	-0.0019	-0.0009	-0.0160	1.326
CIT1 to PKRD (2) 12.1 0.0095	0.0004	-0.0028	0.0043	0.426

CIT1 to PKRD (3) 12.1 0.0415	-0.0016	0.0002	-0.0120	0.998
CIT1 to PKRD (4) 12.1 0.0301	-0.0003	0.0037	0.0055	0.543
CIT1 to SPMS (1) 30.3 0.0356	-0.0020	0.0034	-0.0026	0.156
CIT1 to SPMS (2) 30.3 0.0356	-0.0039	0.0032	-0.0190	0.648
CIT1 to SPMS (3) 30.3 0.0355	-0.0022	0.0021	-0.0066	0.240
CIT1 to SPMS (4) 30.3 0.0327	-0.0009	0.0054	-0.0197	0.675
GVRs to AZU1 (3) 21.8 0.0370	-0.0002	0.0045	-0.0002	0.207
GVRs to 914301 (1) 30.6 0.0312	-0.0008	0.0138	-0.0169	0.713
GVRs to 914301 (3) 30.6 0.0527	-0.0110	0.0136	0.0264	1.032
GVRs to 914301 (4) 30.6 0.0403	0.0035	0.0067	-0.0185	0.653
GVRs to 914301 (5) 30.6 0.0595	0.0048	-0.0065	-0.0344	1.152
GVRs to 914302 (1) 7.9 0.0317	0.0005	0.0027	0.0042	0.638
GVRs to 914302 (2) 7.9 0.0247	-0.0027	-0.0089	0.0043	1.304
GVRs to 914302 (3) 7.9 0.0163	-0.0023	-0.0080	0.0043	1.193
GVRs to 914303 (1) 16.0 0.0293	-0.0029	-0.0113	-0.0349	2.303
GVRs to 914303 (2) 16.0 0.0308	-0.0033	-0.0085	0.0061	0.689
GVRs to 914303 (3) 16.0 0.0166	-0.0019	-0.0130	0.0116	1.098
GVRs to 914303 (4) 16.0 0.0260	0.0052	0.0224	-0.0327	2.500
GVRs to 914303 (6) 16.0 0.0257	-0.0026	0.0109	-0.0461	2.968
GVRs to 914304 (1) 8.5 0.0156	0.0019	0.0024	-0.0066	0.855
GVRs to 914304 (2) 8.5 0.0215	0.0034	-0.0041	-0.0280	3.360
GVRs to 914304 (3) 8.5 0.0294	-0.0069	0.0089	-0.0141	2.126
GVRs to AZU1 (1) 21.8 0.0103	0.0013	0.0017	-0.0177	0.819
GVRs to AZU1 (2) 21.8 0.0370	-0.0008	0.0023	-0.0167	0.773
GVRs to AZU1 (4) 21.8 0.0370	-0.0029	0.0005	0.0099	0.472
GVRs to CIT1 (1) 10.0 0.0229	0.0013	-0.0022	0.0149	1.515
GVRs to CIT1 (2) 10.0 0.0075	0.0004	0.0017	-0.0048	0.510

GVRs to CIT1 (3)	-0.0007	0.0007	-0.0032	0.337
10.0 0.0075				
GVRs to CIT1 (4)	-0.0005	-0.0005	0.0014	0.157
10.0 0.0075				
GVRs to LEEP (1)	0.0022	0.0031	-0.0036	0.243
21.6 0.0308				
GVRs to LEEP (2)	0.0012	0.0049	-0.0062	0.371
21.6 0.0309				
GVRs to LEEP (3)	0.0011	0.0048	-0.0012	0.233
21.6 0.0309				
GVRs to LEEP (4)	0.0040	0.0039	0.0009	0.261
21.6 0.0286				
GVRs to PKRD (1)	-0.0009	-0.0014	0.0014	0.190
11.4 0.0411				
GVRs to PKRD (2)	-0.0027	-0.0046	0.0001	0.465
11.4 0.0409				
GVRs to PKRD (3)	-0.0021	-0.0013	0.0035	0.371
11.4 0.0409				
GVRs to PKRD (4)	-0.0012	0.0031	0.0156	1.396
11.4 0.0296				
GVRs to SPMS (1)	-0.0008	0.0008	0.0098	0.394
25.1 0.0327				
GVRs to SPMS (2)	-0.0024	0.0025	-0.0173	0.703
25.1 0.0328				
GVRs to SPMS (3)	-0.0036	0.0019	0.0030	0.200
25.1 0.0328				
GVRs to SPMS (4)	0.0022	0.0011	-0.0179	0.720
25.1 0.0097				
LEEP to PKRD (1)	-0.0011	0.0042	0.0028	0.481
10.8 0.0404				
LEEP to PKRD (2)	-0.0025	0.0036	-0.0120	1.186
10.8 0.0407				
LEEP to PKRD (3)	0.0024	0.0008	-0.0031	0.376
10.8 0.0096				
LEEP to PKRD (4)	-0.0023	0.0019	-0.0015	0.309
10.8 0.0404				
LEEP to SPMS (1)	0.0031	0.0001	0.0076	0.177
46.4 0.0131				
LEEP to SPMS (2)	0.0052	0.0024	-0.0058	0.176
46.4 0.0130				
LEEP to SPMS (3)	0.0027	0.0011	-0.0010	0.067
46.4 0.0130				
LEEP to SPMS (4)	0.0121	0.0022	-0.0255	0.610
46.4 0.0139				
LORS to AZU1 (3)	0.0015	0.0049	-0.0251	1.950
13.2 0.0221				
LORS to 914301 (1)	0.0000	0.0128	0.0362	6.819
5.6 0.0149				
LORS to 914301 (3)	-0.0135	0.0154	0.0035	3.688
5.6 0.0118				
LORS to 914301 (4)	0.0064	-0.0065	0.0006	1.627
5.6 0.0100				
LORS to 914301 (5)	0.0078	-0.0105	0.0097	2.894
5.6 0.0132				

LORS to 914302 (1) 26.8 0.0340	-0.0003	0.0050	-0.0121	0.489
LORS to 914302 (3) 26.8 0.0283	-0.0036	-0.0038	-0.0038	0.243
LORS to 914303 (1) 39.7 0.0321	-0.0047	-0.0132	-0.0483	1.266
LORS to 914303 (2) 39.7 0.0481	0.0038	-0.0128	0.0531	1.379
LORS to 914303 (3) 39.7 0.0313	-0.0076	-0.0092	0.0323	0.866
LORS to 914303 (4) 39.7 0.0257	0.0051	0.0215	-0.0299	0.936
LORS to 914303 (6) 39.7 0.0446	0.0092	0.0044	0.0124	0.404
LORS to 914304 (1) 26.3 0.0155	0.0020	0.0008	0.0041	0.178
LORS to 914304 (2) 26.3 0.0365	0.0107	-0.0115	0.0272	1.196
LORS to 914304 (3) 26.3 0.0208	0.0038	0.0070	-0.0148	0.641
LORS to AZU1 (1) 13.2 0.0063	0.0001	0.0009	-0.0080	0.608
LORS to AZU1 (2) 13.2 0.0063	0.0006	0.0012	-0.0002	0.100
LORS to AZU1 (4) 13.2 0.0063	-0.0015	-0.0002	-0.0096	0.738
LORS to CIT1 (1) 34.4 0.0351	0.0020	0.0014	-0.0125	0.369
LORS to CIT1 (2) 34.4 0.0352	0.0037	-0.0031	0.0226	0.673
LORS to CIT1 (3) 34.4 0.0379	0.0033	-0.0011	-0.0102	0.313
LORS to CIT1 (4) 34.4 0.0347	0.0002	-0.0026	0.0018	0.093
LORS to GVR5 (1) 34.5 0.0349	0.0007	0.0034	-0.0273	0.800
LORS to GVR5 (2) 34.5 0.0351	0.0025	-0.0022	0.0225	0.661
LORS to GVR5 (3) 34.5 0.0380	0.0047	-0.0008	-0.0199	0.593
LORS to GVR5 (4) 34.5 0.0348	0.0005	-0.0009	-0.0044	0.131
LORS to LEEP (1) 52.4 0.0133	-0.0034	0.0008	-0.0126	0.250
LORS to LEEP (2) 52.4 0.0133	-0.0028	-0.0013	-0.0047	0.108
LORS to LEEP (3) 52.4 0.0133	-0.0025	-0.0007	-0.0096	0.190
LORS to LEEP (4) 52.4 0.0133	-0.0100	-0.0015	0.0335	0.668
LORS to PKRD (1) 44.7 0.0451	-0.0044	0.0021	-0.0392	0.884
LORS to PKRD (2) 44.7 0.0438	0.0054	0.0006	-0.0241	0.552

LORS to PKRD (3)	0.0002	-0.0015	-0.0018	0.052
44.7 0.0325				
LORS to PKRD (4)	-0.0016	-0.0021	-0.0087	0.203
44.7 0.0348				
LORS to SPMS (1)	-0.0003	-0.0003	-0.0060	0.334
17.9 0.0061				
LORS to SPMS (2)	-0.0002	0.0003	0.0109	0.609
17.9 0.0061				
LORS to SPMS (3)	0.0012	-0.0002	0.0014	0.101
17.9 0.0061				
LORS to SPMS (4)	0.0001	0.0004	-0.0074	0.413
17.9 0.0061				
PKRD to SPMS (1)	-0.0018	0.0023	0.0053	0.165
36.5 0.0439				
PKRD to SPMS (2)	-0.0009	0.0077	-0.0070	0.284
36.5 0.0438				
PKRD to SPMS (3)	-0.0001	0.0020	-0.0076	0.216
36.5 0.0435				
PKRD to SPMS (4)	-0.0011	-0.0009	-0.0311	0.852
36.5 0.0317				
<hr/>				
RMS	0.0062	0.0082	0.0219	

\$ - This session is flagged as a 3-sigma outlier

CHECK POINT RESIDUALS (East, North, Height - Local Level)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
LEEP	-0.0038	0.0024	0.1322
PKRD	-0.0020	0.0043	-0.0265
SPMS	-0.0017	0.0044	-0.0215
<hr/>			
RMS	0.0026	0.0038	0.0788

CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
AZU1	-0.0005	-0.0027	0.0543
CIT1	0.0026	-0.0003	-0.0171
GVR5	-0.0026	0.0032	-0.0227
LORS	0.0004	-0.0002	-0.0145
<hr/>			
RMS	0.0019	0.0021	0.0315

OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	--	LATITUDE	--	--	LONGITUDE	--	-	ELLHGT	-	ORTHOHGT
914301	34	05	22.05520	-117	47	05.06989		268.0278		301.5868
914302	34	04	51.19350	-118	02	16.26505		51.7520		86.1686
914303	34	10	47.78100	-118	10	52.20514		437.6259		471.3486
914304	34	05	04.66812	-118	01	56.81072		56.5790		90.9522
AZU1	34	07	33.65297	-117	53	47.30382		145.5134		179.1348
CIT1	34	08	12.13762	-118	07	38.17656		216.0394		250.0778
GVR5	34	02	50.79464	-118	06	46.36725		155.2029		190.0534
LEEP	34	08	04.55003	-118	19	18.26679		485.8795		520.4184
LORS	34	07	59.96318	-117	45	14.60179		449.5924		482.6593
PKRD	34	04	17.60236	-118	13	58.40291		131.5256		166.4394
SPMS	33	59	33.54110	-117	50	55.54024		207.7312		242.0565

OUTPUT STATION COORDINATES (GRID)

STA_ID	-	EASTING	-	-	NORTHING	-	-	ELLHGT	-	ORTHOHGT
		(m)			(m)			(m)		(m)
914301		427606.0204			3772353.0533			268.0278		301.5868
914302		404245.6486			3771610.6387			51.7520		86.1686
914303		391149.3551			3782737.9500			437.6259		471.3486
914304		404748.4432			3772020.6324			56.5790		90.9522
AZU1		417333.8243			3776491.2169			145.5134		179.1348
CIT1		396063.4976			3777887.5282			216.0394		250.0778
GVR5		397282.7046			3767974.9342			155.2029		190.0534
LEEP		378128.9223			3777868.8950			485.8795		520.4184
LORS		430472.7885			3777195.4699			449.5924		482.6593
PKRD		386237.5697			3770775.7997			131.5256		166.4394
SPMS		421610.9116			3761665.6869			207.7312		242.0565

OUTPUT VARIANCE/COVARIANCE

STA_ID	SE/SN/SUP	-----	CX matrix (m)-----
	(95.00 %)	(not scaled by confidence level)	
	(m)	(ECEF, XYZ cartesian)	
914301	0.0066	8.3992e-006	
	0.0068	2.0270e-006 1.0832e-005	
	0.0088	-1.0675e-006 -1.9108e-006 8.7675e-006	
914302	0.0067	8.9653e-006	
	0.0069	2.4084e-006 1.1724e-005	
	0.0094	-1.3575e-006 -2.4806e-006 9.4949e-006	

914303	0.0066	8.4381e-006		
	0.0068	2.1690e-006	1.1394e-005	
	0.0090	-1.0826e-006	-2.0991e-006	8.8077e-006
914304	0.0067	9.0628e-006		
	0.0070	2.9050e-006	1.2964e-005	
	0.0096	-1.3579e-006	-2.5224e-006	9.3074e-006
AZU1	0.0063	6.9525e-006		
	0.0064	6.7302e-007	7.9512e-006	
	0.0072	-3.4524e-007	-6.5840e-007	7.1070e-006
CIT1	0.0064	7.1858e-006		
	0.0064	8.0340e-007	8.2049e-006	
	0.0074	-4.4043e-007	-8.1606e-007	7.3809e-006
GVR5	0.0064	7.3093e-006		
	0.0065	9.2056e-007	8.4597e-006	
	0.0075	-4.9774e-007	-9.3309e-007	7.5732e-006
LEEP	0.0070	9.1528e-006		
	0.0067	1.5967e-006	1.0853e-005	
	0.0088	-1.1606e-006	-2.0088e-006	8.5539e-006
LORS	0.0063	7.0519e-006		
	0.0064	6.7408e-007	7.9487e-006	
	0.0072	-3.7199e-007	-6.9557e-007	7.1902e-006
PKRD	0.0072	1.1964e-005		
	0.0073	5.0468e-006	1.6331e-005	
	0.0114	-3.0222e-006	-4.3798e-006	1.1301e-005
SPMS	0.0064	7.3387e-006		
	0.0065	1.0123e-006	8.6975e-006	
	0.0077	-5.6261e-007	-1.0537e-006	7.5871e-006

VARIANCE FACTOR = 1.0480

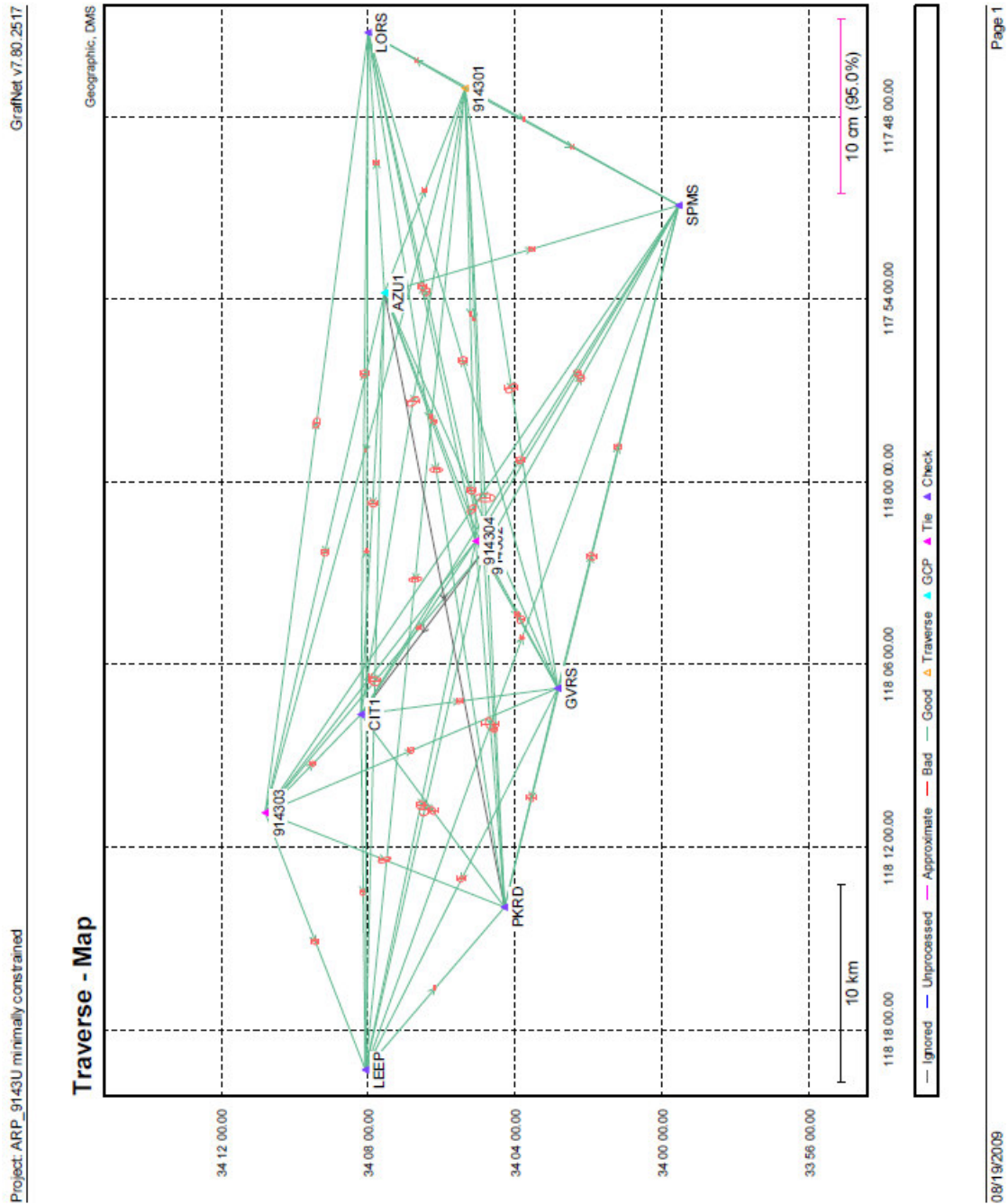
Note: Values < 1.0 indicate statistics are pessimistic, while
values > 1.0 indicate optimistic statistics. Entering this
value as the network adjustment scale factor will bring
variance factor to one.



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

4.4 Minimally Constrained GPS Network



GrafNet - GRAPHIC GPS NETWORK PROCESSING
SOFTWARE PACKAGE

TRAVERSE SOLUTION:

DATUM: NAD83
GRID: UTM, Zone 11
UNITS: metres (see preferences to change)
GEOID: C:\Operations_DVD\Software\Geoids\USA\GEOID03 (CONTUS) CURRENT.wpg

STATIONS (STATUS):

Station	Type	HgtStatus	Result	Coordinates derived from...
914301	Traverse	OK	Good	AZU1
914302	Loop Tie	OK	Good	AZU1
914303	Loop Tie	OK	Good	AZU1
914304	Loop Tie	OK	Good	AZU1
AZU1	Control-3D	OK	Pub(3D)	(-)
CIT1	Check-3D	OK	Good	AZU1
GVRs	Check-3D	OK	Good	AZU1
LEEP	Check-3D	OK	Good	AZU1
LORS	Check-3D	OK	Good	AZU1
PKRD	Check-3D	OK	Good	914301 AZU1
SPMS	Check-3D	OK	Good	AZU1

STATIONS (COORDINATES):

Station	Latitude	Longitude	Grid-E	Grid-N
EllHgt OrthoHgt	(D M S)	(D M S)	(m)	(m)
(m)	(m)			
914301	34 05 22.05563	-117 47 05.07024	427606.012	3772353.066
267.965	301.524			
914302	34 04 51.19399	-118 02 16.26504	404245.649	3771610.654
51.662	86.079			
914303	34 10 47.78057	-118 10 52.20528	391149.351	3782737.937
437.621	471.344			
914304	34 05 04.66793	-118 01 56.81061	404748.446	3772020.626
56.524	90.897			
AZU1	34 07 33.65306	-117 53 47.30380	417333.825	3776491.220
145.459	179.081			
CIT1	34 08 12.13788	-118 07 38.17656	396063.498	3777887.536
215.974	250.013			
GVRs	34 02 50.79487	-118 06 46.36724	397282.705	3767974.941
155.149	189.999			
LEEP	34 08 04.55010	-118 19 18.26682	378128.921	3777868.897
485.827	520.366			

LORS	34 07 59.96343	-117 45 14.60171	430472.791	3777195.478
449.513	482.580			
PKRD	34 04 17.60280	-118 13 58.40327	386237.561	3770775.813
131.477	166.391			
SPMS	33 59 33.54130	-117 50 55.54019	421610.913	3761665.693
207.672	241.997			

LOOP, CHECK & DUPLICATE TIES:

Name/Session	Type	Result	DEast (m)	DNorth (m)	DHeight (m)
AZU1 to 914301 (2)	Duplicate	Good	-0.0095	0.0158	0.0228
AZU1 to 914301 (3)	Duplicate	Good	-0.0209	0.0296	-0.0018
AZU1 to 914301 (4)	Duplicate	Good	-0.0018	0.0028	-0.0118
AZU1 to 914302 (2)	Duplicate	Good	-0.0057	0.0072	-0.0422
AZU1 to 914302 (1)	Duplicate	Good	-0.0050	0.0176	-0.0136
914301 to 914302	LoopTie	Good	0.0150	-0.0115	-0.0415
AZU1 to 914303 (2)	Duplicate	Good	-0.0089	-0.0292	0.0773
AZU1 to 914303 (1)	Duplicate	Good	-0.0022	-0.0252	0.0038
AZU1 to 914303 (6)	Duplicate	Good	0.0013	-0.0079	0.0434
914301 to 914303	LoopTie	Good	0.0052	-0.0095	0.0476
914302 to 914303	LoopTie	Good	-0.0037	-0.0325	0.0874
AZU1 to 914304 (2)	Duplicate	Good	0.0088	-0.0139	0.0241
AZU1 to 914304 (1)	Duplicate	Good	0.0045	-0.0090	0.0043
914301 to 914304	LoopTie	Good	0.0060	-0.0099	0.0175
914303 to 914304	LoopTie	Good	0.0077	-0.0077	-0.0367
POINT CIT1	CheckPnt	Good	0.0026	0.0078	-0.0824
AZU1 to CIT1 (4)	Duplicate	Good	0.0029	0.0044	-0.0023
914301 to CIT1	LoopTie	Good	0.0208	-0.0188	-0.1310
914301 to CIT1 (1)	Duplicate	Good	0.0163	-0.0062	-0.0702
914301 to CIT1 (4)	Duplicate	Good	0.0050	-0.0105	0.0087
914301 to CIT1 (5)	Duplicate	Good	0.0031	-0.0025	0.0245
914303 to CIT1	LoopTie	Good	-0.0024	0.0002	-0.0291
914303 to CIT1 (6)	Duplicate	Good	0.0007	0.0034	-0.0351
914304 to CIT1	LoopTie	Good	-0.0052	0.0134	-0.0099
914304 to CIT1 (2)	Duplicate	Good	-0.0117	0.0135	0.0005
914304 to CIT1 (3)	Duplicate	Good	0.0073	0.0061	-0.0045
POINT GVRS	CheckPnt	Good	-0.0025	0.0103	-0.0770
AZU1 to GVRS (1)	Duplicate	Good	-0.0014	0.0027	0.0175
AZU1 to GVRS (2)	Duplicate	Good	0.0006	0.0022	0.0165
AZU1 to GVRS (4)	Duplicate	Good	0.0027	0.0041	-0.0101
914301 to GVRS	LoopTie	Good	0.0204	-0.0194	-0.0190
914301 to GVRS (1)	Duplicate	Good	0.0102	-0.0196	0.0237
914301 to GVRS (4)	Duplicate	Good	0.0059	-0.0129	0.0261
914301 to GVRS (5)	Duplicate	Good	0.0048	0.0008	0.0417
914302 to GVRS	LoopTie	Good	-0.0006	-0.0108	0.0299
914302 to GVRS (2)	Duplicate	Good	0.0024	0.0008	0.0291
914302 to GVRS (3)	Duplicate	Good	0.0021	-0.0001	0.0292
914303 to GVRS	LoopTie	Good	-0.0015	-0.0018	-0.0182
914303 to GVRS (3)	Duplicate	Good	0.0058	0.0336	-0.0626
914303 to GVRS (2)	Duplicate	Good	0.0070	0.0292	-0.0574
914303 to GVRS (1)	Duplicate	Good	0.0066	0.0319	-0.0159

914303 to GVRs (6)	Duplicate	Good	0.0062	0.0097	-0.0051
914304 to GVRs	LoopTie	Good	-0.0060	0.0173	0.0269
914304 to GVRs (1)	Duplicate	Good	-0.0045	0.0108	0.0056
914304 to GVRs (3)	Duplicate	Good	0.0045	0.0046	0.0136
CIT1 to GVRs	LoopTie	Good	-0.0012	0.0012	-0.0040
CIT1 to GVRs (2)	Duplicate	Good	-0.0004	-0.0026	0.0156
CIT1 to GVRs (3)	Duplicate	Good	0.0008	-0.0016	0.0140
CIT1 to GVRs (4)	Duplicate	Good	0.0005	-0.0003	0.0094
POINT LEEP	CheckPnt	Good	-0.0047	0.0046	0.0799
AZU1 to LEEP (2)	Duplicate	Good	0.0016	0.0020	0.0128
AZU1 to LEEP (1)	Duplicate	Good	0.0042	0.0034	0.0049
AZU1 to LEEP (4)	Duplicate	Good	0.0022	0.0032	-0.0135
914301 to LEEP	LoopTie	Good	0.0325	-0.0281	-0.0254
914301 to LEEP (2)	Duplicate	Good	-0.0157	-0.0209	0.0355
914301 to LEEP (4)	Duplicate	Good	0.0055	0.0005	0.0450
914301 to LEEP (5)	Duplicate	Good	0.0107	-0.0019	0.0086
914302 to LEEP	LoopTie	Good	0.0039	-0.0109	0.0146
914302 to LEEP (2)	Duplicate	Good	0.0069	-0.0052	0.0301
914302 to LEEP (3)	Duplicate	Good	0.0030	-0.0021	0.0208
914303 to LEEP	LoopTie	Good	0.0025	0.0013	-0.0195
914303 to LEEP (3)	Duplicate	Good	0.0076	0.0268	-0.0641
914303 to LEEP (2)	Duplicate	Good	0.0052	0.0308	-0.0833
914303 to LEEP (1)	Duplicate	Good	0.0084	0.0323	-0.0351
914303 to LEEP (5)	Duplicate	Good	-0.0010	0.0037	-0.0244
914304 to LEEP	LoopTie	Good	-0.0004	0.0109	-0.0112
914304 to LEEP (1)	Duplicate	Good	-0.0066	0.0015	0.0343
914304 to LEEP (3)	Duplicate	Good	-0.0046	-0.0129	0.0441
CIT1 to LEEP	LoopTie	Good	0.0017	-0.0008	0.0025
CIT1 to LEEP (1)	Duplicate	Good	0.0004	0.0001	-0.0006
CIT1 to LEEP (2)	Duplicate	Good	-0.0012	-0.0002	0.0052
CIT1 to LEEP (4)	Duplicate	Good	0.0015	-0.0040	0.0013
GVRs to LEEP	LoopTie	Good	0.0013	-0.0018	-0.0016
GVRs to LEEP (2)	Duplicate	Good	0.0003	-0.0000	-0.0042
GVRs to LEEP (3)	Duplicate	Good	0.0002	-0.0002	0.0009
GVRs to LEEP (4)	Duplicate	Good	0.0031	-0.0011	0.0029
POINT LORS	CheckPnt	Good	0.0025	0.0075	-0.0938
AZU1 to LORS (2)	Duplicate	Good	0.0009	0.0037	-0.0249
AZU1 to LORS (1)	Duplicate	Good	0.0015	0.0040	-0.0172
AZU1 to LORS (4)	Duplicate	Good	0.0030	0.0052	-0.0156
914301 to LORS	LoopTie	Good	0.0245	-0.0209	-0.0215
914301 to LORS (1)	Duplicate	Good	0.0109	-0.0182	-0.0544
914301 to LORS (4)	Duplicate	Good	0.0046	0.0011	-0.0186
914301 to LORS (5)	Duplicate	Good	0.0032	0.0052	-0.0278
914302 to LORS	LoopTie	Good	0.0014	-0.0128	0.0213
914302 to LORS (3)	Duplicate	Good	0.0049	-0.0039	0.0129
914303 to LORS (4)	Duplicate	Good	0.0006	-0.0006	-0.0461
914303 to LORS	LoopTie	Good	0.0135	0.0301	-0.1078
914303 to LORS (2)	Duplicate	Good	0.0022	0.0339	-0.1288
914303 to LORS (1)	Duplicate	Good	0.0103	0.0343	-0.0276
914303 to LORS (6)	Duplicate	Good	-0.0034	0.0167	-0.0882
914304 to LORS	LoopTie	Good	-0.0114	0.0253	-0.0530
914304 to LORS (1)	Duplicate	Good	-0.0028	0.0129	-0.0301
914304 to LORS (3)	Duplicate	Good	-0.0047	0.0067	-0.0110
CIT1 to LORS	LoopTie	Good	-0.0016	0.0007	-0.0038
CIT1 to LORS (2)	Duplicate	Good	-0.0019	0.0027	-0.0367

CIT1 to LORS (1)	Duplicate	Good	-0.0003	-0.0018	-0.0017
CIT1 to LORS (4)	Duplicate	Good	0.0016	0.0022	-0.0159
GVRs to LORS	LoopTie	Good	-0.0031	0.0013	-0.0053
GVRs to LORS (1)	Duplicate	Good	0.0008	-0.0029	0.0022
GVRs to LORS (2)	Duplicate	Good	-0.0008	0.0028	-0.0477
GVRs to LORS (4)	Duplicate	Good	0.0011	0.0014	-0.0208
LEEP to LORS (1)	Duplicate	Good	0.0058	0.0047	-0.0142
LEEP to LORS	LoopTie	Good	0.0052	0.0068	-0.0221
LEEP to LORS (3)	Duplicate	Good	0.0049	0.0063	-0.0173
LEEP to LORS (4)	Duplicate	Good	0.0127	0.0069	-0.0603
POINT PKRD	CheckPnt	Good	-0.0112	0.0178	-0.0751
914301 to PKRD (3)	Duplicate	Good	0.0420	-0.0092	-0.0848
914302 to PKRD	LoopTie	Good	-0.0089	-0.0089	0.0039
914302 to PKRD (2)	Duplicate	Good	0.0014	0.0094	0.0399
914302 to PKRD (3)	Duplicate	Good	-0.0045	0.0095	0.0421
914303 to PKRD (4)	Duplicate	Good	-0.0097	0.0104	-0.0136
914303 to PKRD	LoopTie	Good	-0.0091	0.0403	-0.0621
914303 to PKRD (2)	Duplicate	Good	-0.0059	0.0365	-0.0676
914303 to PKRD (1)	Duplicate	Good	-0.0078	0.0308	-0.0187
914303 to PKRD (6)	Duplicate	Good	-0.0167	0.0280	-0.0550
914304 to PKRD	LoopTie	Good	-0.0216	0.0229	0.0132
914304 to PKRD (1)	Duplicate	Good	-0.0201	0.0108	0.0606
914304 to PKRD (3)	Duplicate	Good	-0.0080	0.0082	0.0327
CIT1 to PKRD	LoopTie	Good	-0.0106	0.0056	0.0048
CIT1 to PKRD (2)	Duplicate	Good	-0.0087	0.0026	0.0211
CIT1 to PKRD (1)	Duplicate	Good	-0.0109	0.0045	0.0008
CIT1 to PKRD (4)	Duplicate	Good	-0.0094	0.0091	0.0222
GVRs to PKRD	LoopTie	Good	-0.0112	0.0050	0.0092
GVRs to PKRD (2)	Duplicate	Good	-0.0119	0.0017	0.0058
GVRs to PKRD (1)	Duplicate	Good	-0.0101	0.0050	0.0072
GVRs to PKRD (4)	Duplicate	Good	-0.0104	0.0094	0.0213
LEEP to PKRD	LoopTie	Good	-0.0059	0.0121	0.0006
LEEP to PKRD (1)	Duplicate	Good	-0.0093	0.0155	0.0065
LEEP to PKRD (2)	Duplicate	Good	-0.0108	0.0149	-0.0083
LEEP to PKRD (4)	Duplicate	Good	-0.0106	0.0132	0.0022
LORS to PKRD (1)	Duplicate	Good	-0.0152	0.0079	-0.0085
LORS to PKRD (2)	Duplicate	Good	-0.0054	0.0064	0.0066
LORS to PKRD	LoopTie	Good	-0.0105	0.0043	0.0289
LORS to PKRD (4)	Duplicate	Good	-0.0124	0.0037	0.0220
POINT SPMS	CheckPnt	Good	-0.0004	0.0106	-0.0813
AZU1 to SPMS (2)	Duplicate	Good	0.0002	0.0026	0.0052
AZU1 to SPMS (1)	Duplicate	Good	0.0015	0.0027	-0.0043
AZU1 to SPMS (4)	Duplicate	Good	0.0011	0.0032	-0.0009
914301 to SPMS	LoopTie	Good	0.0226	-0.0231	-0.0157
914301 to SPMS (2)	Duplicate	Good	0.0241	-0.0129	-0.0795
914301 to SPMS (1)	Duplicate	Good	0.0126	-0.0235	0.0049
914301 to SPMS (4)	Duplicate	Good	0.0020	0.0007	0.0123
914301 to SPMS (5)	Duplicate	Good	-0.0008	0.0009	0.0267
914302 to SPMS	LoopTie	Good	0.0023	-0.0073	0.0555
914302 to SPMS (2)	Duplicate	Good	0.0047	-0.0026	0.0063
914302 to SPMS (3)	Duplicate	Good	0.0076	-0.0084	0.0196
914303 to SPMS	LoopTie	Good	0.0022	0.0128	-0.0148
914303 to SPMS (3)	Duplicate	Good	0.0080	0.0217	-0.0923
914303 to SPMS (2)	Duplicate	Good	0.0024	0.0294	-0.0854
914303 to SPMS (6)	Duplicate	Good	-0.0051	0.0109	-0.0359

914304 to SPMS	LoopTie	Good	-0.0131	0.0195	-0.0005
914304 to SPMS (1)	Duplicate	Good	-0.0050	0.0113	0.0040
914304 to SPMS (3)	Duplicate	Good	-0.0028	0.0030	0.0170
CIT1 to SPMS	LoopTie	Good	-0.0012	0.0004	-0.0010
CIT1 to SPMS (2)	Duplicate	Good	-0.0029	0.0015	-0.0134
CIT1 to SPMS (1)	Duplicate	Good	-0.0010	0.0017	0.0030
CIT1 to SPMS (4)	Duplicate	Good	0.0001	0.0037	-0.0141
GVR5 to SPMS	LoopTie	Good	-0.0026	0.0011	-0.0025
GVR5 to SPMS (2)	Duplicate	Good	-0.0014	0.0016	-0.0228
GVR5 to SPMS (1)	Duplicate	Good	0.0001	-0.0001	0.0044
GVR5 to SPMS (4)	Duplicate	Good	0.0031	0.0002	-0.0234
LEEP to SPMS (3)	Duplicate	Good	0.0046	0.0053	-0.0085
LEEP to SPMS	LoopTie	Good	0.0070	0.0066	-0.0133
LEEP to SPMS (1)	Duplicate	Good	0.0049	0.0043	0.0001
LEEP to SPMS (4)	Duplicate	Good	0.0140	0.0063	-0.0329
LORS to SPMS	LoopTie	Good	0.0004	-0.0014	0.0209
LORS to SPMS (1)	Duplicate	Good	-0.0011	-0.0015	0.0135
LORS to SPMS (2)	Duplicate	Good	-0.0010	-0.0010	0.0304
LORS to SPMS (4)	Duplicate	Good	-0.0007	-0.0008	0.0121
PKRD to SPMS	LoopTie	Good	0.0083	-0.0049	-0.0059
PKRD to SPMS (2)	Duplicate	Good	0.0092	0.0005	-0.0181
PKRD to SPMS (3)	Duplicate	Good	0.0100	-0.0052	-0.0188
PKRD to SPMS (4)	Duplicate	Good	0.0091	-0.0081	-0.0422

RMS (tie points)			0.0090	0.0136	0.0355
RMS (check points)			0.0053	0.0106	0.0818
			=====		

DATUM: 'NAD83'
GRID: UTM, Zone 11
SCALE_FACTOR: 41.1940
CONFIDENCE LEVEL: 95.00 % (Scale factor is 2.4479)

INPUT CONTROL/CHECK POINTS

STA_ID	TYPE	--	LATITUDE	--	--	LONGITUDE	--	ELLHGT	--	HZ-SD	V-SD
AZU1	GCP-3D	34	07	33.65306	-117	53	47.30380	145.459	0.00500		
CIT1	CHK-3D	34	08	12.13762	-118	07	38.17666	216.056			
GVR5	CHK-3D	34	02	50.79454	-118	06	46.36714	155.226			
LEEP	CHK-3D	34	08	04.54995	-118	19	18.26664	485.747			
LORS	CHK-3D	34	07	59.96318	-117	45	14.60181	449.607			
PKRD	CHK-3D	34	04	17.60222	-118	13	58.40284	131.552			
SPMS	CHK-3D	33	59	33.54095	-117	50	55.54017	207.753			

INPUT VECTORS

SESSION NAME	VECTOR(m)	-----	Covariance (m) [unscaled]	-----
	DX/DY/DZ		standard deviations in brackets	
914301 to 914302 (2)	-20808.8487	5.3914e-007	(0.0007)	
	10622.5820	2.9886e-007	5.1403e-007	(0.0007)
	-908.7612	-2.5721e-007	-3.7457e-007	6.8103e-007
(0.0008)				
914301 to 914303 (4)	-29715.7947	5.4552e-007	(0.0007)	
	22007.6005	6.7518e-007	1.7490e-006	(0.0013)
	8402.9641	-3.3951e-007	-6.7129e-007	6.1301e-007
(0.0008)				
914301 to 914304 (1)	-20261.1182	3.7504e-007	(0.0006)	
	10589.9932	3.0988e-007	5.0847e-007	(0.0007)
	-562.2194	-2.0379e-007	-2.0617e-007	2.7106e-007
(0.0005)				
914301 to CIT1 (1)	-26517.7566	5.6723e-005	(0.0075)	
	17449.7875	5.7781e-005	1.9782e-004	(0.0141)
	4309.9406	-4.2850e-005	-9.6732e-005	1.2591e-004
(0.0112)				
914301 to CIT1 (3)	-26517.7809	2.8314e-005	(0.0053)	
	17449.7515	2.1976e-005	2.8803e-005	(0.0054)
	4309.9851	-1.0219e-005	-1.5854e-005	1.4610e-005
(0.0038)				
914301 to CIT1 (4)	-26517.7147	1.1376e-005	(0.0034)	

	17449.8419	6.8809e-006	1.7276e-005	(0.0042)
	4309.8999	2.7851e-006	-3.3339e-006	1.3605e-005
(0.0037)				
914301 to CIT1 (5)	-26517.7089	1.5867e-005	(0.0040)	
	17449.8486	1.9831e-005	5.5442e-005	(0.0074)
	4309.8844	-1.0347e-005	-2.1867e-005	2.0339e-005
(0.0045)				
914301 to GVR5 (1)	-27938.4562	5.0380e-006	(0.0022)	
	11973.3398	4.8385e-006	1.2072e-005	(0.0035)
	-3924.0725	-2.5031e-006	-5.5655e-006	7.1135e-006
(0.0027)				
914301 to GVR5 (3)	-27938.4819	2.7167e-005	(0.0052)	
	11973.3133	2.1080e-005	2.7626e-005	(0.0053)
	-3924.0487	-9.8126e-006	-1.5218e-005	1.4030e-005
(0.0037)				
914301 to GVR5 (4)	-27938.4532	1.0947e-005	(0.0033)	
	11973.3362	6.5841e-006	1.6614e-005	(0.0041)
	-3924.0793	2.6868e-006	-3.2575e-006	1.3213e-005
(0.0036)				
914301 to GVR5 (5)	-27938.4498	1.5229e-005	(0.0039)	
	11973.3404	1.9031e-005	5.3203e-005	(0.0073)
	-3924.0994	-9.9376e-006	-2.1002e-005	1.9535e-005
(0.0044)				
914301 to LEEP (2)	-42490.9070	1.5513e-004	(0.0125)	
	25621.0123	6.5500e-005	7.9864e-005	(0.0089)
	4267.7948	-1.8944e-005	-1.3471e-005	1.3462e-005
(0.0037)				
914301 to LEEP (3)	-42490.9715	1.7038e-005	(0.0041)	
	25620.9944	9.7746e-007	5.3217e-006	(0.0023)
	4267.8348	-3.4957e-006	-1.9978e-006	3.1284e-006
(0.0018)				
914301 to LEEP (4)	-42490.9276	2.6892e-005	(0.0052)	
	25621.0187	4.4238e-006	3.6207e-005	(0.0060)
	4267.7718	-3.8564e-006	-9.2723e-006	6.8121e-006
(0.0026)				
914301 to LEEP (5)	-42490.9459	1.8969e-005	(0.0044)	
	25620.9959	1.9317e-006	5.7336e-006	(0.0024)
	4267.7941	-3.9433e-006	-2.3180e-006	3.1095e-006
(0.0018)				
914301 to LORS (1)	3706.5627	1.1256e-006	(0.0011)	
	962.2875	1.0722e-006	2.7286e-006	(0.0017)
	4130.4773	-5.6343e-007	-1.2679e-006	1.6365e-006
(0.0013)				
914301 to LORS (3)	3706.5640	7.8300e-007	(0.0009)	

	962.3192	8.6306e-007	1.7329e-006	(0.0013)
	4130.4611	-4.9737e-007	-7.7016e-007	9.6564e-007
(0.0010)				
914301 to LORS (4)	3706.5771	5.0651e-007	(0.0007)	
	962.3012	5.7134e-007	1.3119e-006	(0.0011)
	4130.4413	-2.5444e-007	-4.9537e-007	6.8274e-007
(0.0008)				
914301 to LORS (5)	3706.5737	7.6325e-007	(0.0009)	
	962.2918	6.7844e-007	2.2969e-006	(0.0015)
	4130.4431	-3.1300e-007	-1.0203e-006	1.2781e-006
(0.0011)				
914301 to PKRD (3)	-36988.9766	3.6157e-004	(0.0190)	
	18542.1646	4.1186e-005	5.1085e-005	(0.0071)
	-1721.3287	-5.0102e-005	-9.3237e-006	2.5820e-005
(0.0051)				
914301 to PKRD (4)	-36988.9087	3.7516e-005	(0.0061)	
	18542.2021	-5.4646e-007	2.3472e-005	(0.0048)
	-1721.3838	-8.7887e-006	-6.8350e-006	9.4542e-006
(0.0031)				
914301 to SPMS (1)	-8010.5547	1.4275e-006	(0.0012)	
	-2513.8731	1.3622e-006	3.4518e-006	(0.0019)
	-8932.3123	-7.1350e-007	-1.6016e-006	2.0638e-006
(0.0014)				
914301 to SPMS (2)	-8010.6004	1.4092e-005	(0.0038)	
	-2513.9349	1.2868e-005	3.2478e-005	(0.0057)
	-8932.2739	-1.0264e-005	-1.9123e-005	3.0023e-005
(0.0055)				
914301 to SPMS (3)	-8010.5717	8.3702e-007	(0.0009)	
	-2513.8837	9.5899e-007	2.0843e-006	(0.0014)
	-8932.3011	-4.7226e-007	-8.4644e-007	1.0592e-006
(0.0010)				
914301 to SPMS (4)	-8010.5488	6.4020e-007	(0.0008)	
	-2513.8846	7.2242e-007	1.6575e-006	(0.0013)
	-8932.3364	-3.2166e-007	-6.2555e-007	8.6086e-007
(0.0009)				
914301 to SPMS (5)	-8010.5408	9.6341e-007	(0.0010)	
	-2513.8754	8.5206e-007	2.2206e-006	(0.0015)
	-8932.3447	-3.9713e-007	-1.0726e-006	1.5265e-006
(0.0012)				
914302 to 914303 (2)	-8906.9429	4.5075e-008	(0.0002)	
	11385.0371	4.7379e-008	1.1928e-007	(0.0003)
	9311.7546	-2.2176e-008	-4.6352e-008	5.8178e-008
(0.0002)				
914302 to GVRs (1)	-7129.6242	8.2384e-006	(0.0029)	

	1350.7353	4.3953e-006	7.3165e-006	(0.0027)
	-3015.2893	-3.3670e-006	-4.7869e-006	9.3231e-006
(0.0031)				
914302 to GVR5 (2)	-7129.6303	3.1353e-006	(0.0018)	
	1350.7304	3.1091e-006	7.7118e-006	(0.0028)
	-3015.2985	-1.7473e-006	-3.4502e-006	4.2993e-006
(0.0021)				
914302 to GVR5 (3)	-7129.6297	1.4035e-006	(0.0012)	
	1350.7308	1.4484e-006	3.4622e-006	(0.0019)
	-3015.2978	-6.1896e-007	-1.2820e-006	1.7093e-006
(0.0013)				
914302 to LEEP (1)	-21682.1128	1.6988e-005	(0.0041)	
	14998.4019	9.0835e-006	1.5155e-005	(0.0039)
	5176.5921	-6.9898e-006	-9.9642e-006	1.9312e-005
(0.0044)				
914302 to LEEP (2)	-21682.1109	1.2320e-005	(0.0035)	
	14998.4117	1.0092e-005	1.6722e-005	(0.0041)
	5176.5787	-6.6394e-006	-6.7719e-006	8.9729e-006
(0.0030)				
914302 to LEEP (3)	-21682.1119	5.7662e-006	(0.0024)	
	14998.4016	5.6982e-006	1.3949e-005	(0.0037)
	5176.5814	-3.1818e-006	-6.2370e-006	7.7773e-006
(0.0028)				
914302 to LORS (1)	24515.4212	9.7481e-006	(0.0031)	
	-9660.2638	4.9772e-006	7.6872e-006	(0.0028)
	5039.2243	-5.0130e-006	-5.4909e-006	1.1260e-005
(0.0034)				
914302 to LORS (3)	24515.4126	7.0120e-006	(0.0026)	
	-9660.2727	4.7231e-006	8.0562e-006	(0.0028)
	5039.2217	-3.8821e-006	-4.8128e-006	4.8076e-006
(0.0022)				
914302 to PKRD (1)	-16180.0747	6.5399e-006	(0.0026)	
	7919.6055	5.3997e-006	8.5928e-006	(0.0029)
	-812.5847	-4.2845e-006	-4.3233e-006	7.4915e-006
(0.0027)				
914302 to PKRD (2)	-16180.0745	1.8333e-005	(0.0043)	
	7919.6277	1.6871e-005	2.1465e-005	(0.0046)
	-812.6200	-9.7157e-006	-1.2656e-005	1.3142e-005
(0.0036)				
914302 to PKRD (3)	-16180.0685	3.5038e-005	(0.0059)	
	7919.6264	1.8246e-005	1.3555e-005	(0.0037)
	-812.6213	-1.3977e-005	-9.6334e-006	9.4640e-006
(0.0031)				
914302 to SPMS (1)	12798.2921	7.7175e-006	(0.0028)	

	-13136.4484	3.9329e-006	6.0769e-006	(0.0025)
	-8023.5601	-3.9491e-006	-4.3225e-006	8.8870e-006
(0.0030)				
914302 to SPMS (2)	12798.2696	2.2349e-006	(0.0015)	
	-13136.4857	2.2009e-006	5.5838e-006	(0.0024)
	-8023.5365	-1.2559e-006	-2.5121e-006	3.1501e-006
(0.0018)				
914302 to SPMS (3)	12798.2738	5.5432e-006	(0.0024)	
	-13136.4717	3.7165e-006	6.3289e-006	(0.0025)
	-8023.5391	-3.0615e-006	-3.7809e-006	3.7935e-006
(0.0019)				
914303 to 914304 (2)	9454.6698	2.5994e-007	(0.0005)	
	-11417.6053	3.1176e-007	8.2200e-007	(0.0009)
	-8965.1739	-1.5596e-007	-3.1245e-007	2.9263e-007
(0.0005)				
914303 to CIT1 (4)	3198.0855	2.2597e-006	(0.0015)	
	-4557.7531	2.7784e-006	7.4363e-006	(0.0027)
	-4093.0707	-8.9420e-007	-2.5484e-006	2.6784e-006
(0.0016)				
914303 to CIT1 (6)	3198.0796	2.4870e-006	(0.0016)	
	-4557.7576	2.3791e-006	6.0521e-006	(0.0025)
	-4093.0700	-1.1797e-006	-2.7530e-006	3.5263e-006
(0.0019)				
914303 to GVRs (1)	1777.3292	5.8954e-006	(0.0024)	
	-10034.2748	5.3980e-006	9.5959e-006	(0.0031)
	-12327.0759	-3.3386e-006	-4.3028e-006	5.8853e-006
(0.0024)				
914303 to GVRs (2)	1777.3133	4.7929e-006	(0.0022)	
	-10034.3036	4.9341e-006	1.2082e-005	(0.0035)
	-12327.0504	-2.8119e-006	-5.4697e-006	6.6685e-006
(0.0026)				
914303 to GVRs (3)	1777.3112	1.4439e-006	(0.0012)	
	-10034.3102	1.5614e-006	3.6308e-006	(0.0019)
	-12327.0511	-6.3165e-007	-1.3037e-006	1.7682e-006
(0.0013)				
914303 to GVRs (4)	1777.3443	3.0670e-006	(0.0018)	
	-10034.2637	3.7704e-006	1.0091e-005	(0.0032)
	-12327.0467	-1.2148e-006	-3.4612e-006	3.6373e-006
(0.0019)				
914303 to GVRs (6)	1777.3396	3.3762e-006	(0.0018)	
	-10034.2562	3.2326e-006	8.2367e-006	(0.0029)
	-12327.0636	-1.6027e-006	-3.7419e-006	4.7888e-006
(0.0022)				
914303 to LEEP (1)	-12775.1589	5.5415e-006	(0.0024)	

	3613.3875	5.0797e-006	9.0266e-006	(0.0030)
	-4135.1926	-3.1344e-006	-4.0425e-006	5.5185e-006
(0.0023)				
914303 to LEEP (2)	-12775.1746	1.4626e-006	(0.0012)	
	3613.3516	1.5814e-006	3.5355e-006	(0.0019)
	-4135.1643	-6.2300e-007	-1.2549e-006	1.6667e-006
(0.0013)				
914303 to LEEP (3)	-12775.1681	4.6185e-006	(0.0021)	
	3613.3687	4.7604e-006	1.1438e-005	(0.0034)
	-4135.1718	-2.6775e-006	-5.1591e-006	6.2768e-006
(0.0025)				
914303 to LEEP (4)	-12775.1393	3.3300e-006	(0.0018)	
	3613.4113	4.0597e-006	1.0082e-005	(0.0032)
	-4135.1757	-1.2591e-006	-3.3799e-006	3.4406e-006
(0.0019)				
914303 to LEEP (5)	-12775.1388	3.1832e-006	(0.0018)	
	3613.4049	3.0440e-006	7.6706e-006	(0.0028)
	-4135.1749	-1.4974e-006	-3.4824e-006	4.4640e-006
(0.0021)				
914303 to LORS (1)	33422.3711	6.3553e-006	(0.0025)	
	-21045.2778	6.6084e-006	1.2402e-005	(0.0035)
	-4272.5641	-4.0876e-006	-5.4284e-006	6.8768e-006
(0.0026)				
914303 to LORS (2)	33422.3394	1.0260e-005	(0.0032)	
	-21045.3555	1.3191e-005	3.4637e-005	(0.0059)
	-4272.5069	-6.8613e-006	-1.3734e-005	1.2349e-005
(0.0035)				
914303 to LORS (3)	33422.3384	4.9477e-006	(0.0022)	
	-21045.3330	2.5741e-006	9.9843e-006	(0.0032)
	-4272.5156	2.0695e-006	-1.8010e-006	9.2948e-006
(0.0030)				
914303 to LORS (4)	33422.3817	2.8849e-006	(0.0017)	
	-21045.2786	3.5714e-006	9.6983e-006	(0.0031)
	-4272.5249	-1.1235e-006	-3.1454e-006	3.7945e-006
(0.0019)				
914303 to LORS (6)	33422.3645	8.7080e-006	(0.0030)	
	-21045.3199	1.0414e-005	2.9494e-005	(0.0054)
	-4272.5155	-5.3770e-006	-1.1460e-005	1.0972e-005
(0.0033)				
914303 to PKRD (1)	-7273.1061	3.5036e-006	(0.0019)	
	-3465.3890	3.4122e-006	6.2979e-006	(0.0025)
	-10124.3818	-2.0928e-006	-2.7023e-006	3.3387e-006
(0.0018)				
914303 to PKRD (2)	-7273.1284	8.0105e-006	(0.0028)	

		-3465.4266	1.1784e-005	2.7142e-005	(0.0052)
		-10124.3591	-5.6980e-006	-1.5900e-005	1.4725e-005
		(0.0038)			
914303 to PKRD	(3)	-7273.1245	2.8754e-005	(0.0054)	
		-3465.4260	1.4974e-005	1.1124e-005	(0.0033)
		-10124.3653	-1.1470e-005	-7.9057e-006	7.7667e-006
		(0.0028)			
914303 to PKRD	(4)	-7273.0970	2.6753e-005	(0.0052)	
		-3465.3762	2.8221e-005	3.6932e-005	(0.0061)
		-10124.3678	-5.3395e-007	-2.7258e-006	4.1634e-006
		(0.0020)			
914303 to PKRD	(6)	-7273.1117	1.2521e-005	(0.0035)	
		-3465.4183	2.6790e-005	8.1828e-005	(0.0090)
		-10124.3591	-6.5970e-006	-2.0923e-005	7.2072e-006
		(0.0027)			
914303 to SPMS	(2)	21705.2167	9.5449e-006	(0.0031)	
		-24521.5288	1.2276e-005	3.2259e-005	(0.0057)
		-17335.2886	-6.3927e-006	-1.2809e-005	1.1514e-005
		(0.0034)			
914303 to SPMS	(3)	21705.2111	4.6079e-006	(0.0021)	
		-24521.5274	2.3967e-006	9.2928e-006	(0.0030)
		-17335.2784	1.9286e-006	-1.6764e-006	8.6560e-006
		(0.0029)			
914303 to SPMS	(4)	21705.2486	5.8585e-006	(0.0024)	
		-24521.4689	2.3904e-006	1.3723e-005	(0.0037)
		-17335.3143	1.8030e-006	-7.2979e-006	1.1663e-005
		(0.0034)			
914303 to SPMS	(6)	21705.2474	8.1021e-006	(0.0028)	
		-24521.4869	9.6919e-006	2.7472e-005	(0.0052)
		-17335.3009	-5.0091e-006	-1.0688e-005	1.0228e-005
		(0.0032)			
914304 to CIT1	(1)	-6256.5969	1.4091e-006	(0.0012)	
		6859.8390	1.4661e-006	3.4231e-006	(0.0019)
		4872.1084	-6.2192e-007	-1.2641e-006	1.6463e-006
		(0.0013)			
914304 to CIT1	(2)	-6256.5871	2.5389e-006	(0.0016)	
		6859.8435	2.3930e-006	6.1106e-006	(0.0025)
		4872.1025	-1.2438e-006	-2.9037e-006	4.0733e-006
		(0.0020)			
914304 to CIT1	(3)	-6256.6039	2.4284e-006	(0.0016)	
		6859.8525	2.6851e-006	7.3439e-006	(0.0027)
		4872.1114	-9.5365e-007	-2.5482e-006	3.5686e-006
		(0.0019)			
914304 to GVRs	(1)	-7677.3360	1.3274e-006	(0.0012)	

	1383.3320	1.3843e-006	3.2191e-006	(0.0018)
	-3361.8697	-5.8361e-007	-1.1858e-006	1.5382e-006
(0.0012)				
914304 to GVRs (2)	-7677.3281	2.3461e-006	(0.0015)	
	1383.3436	2.2151e-006	5.6859e-006	(0.0024)
	-3361.8870	-1.0736e-006	-2.6452e-006	3.4688e-006
(0.0019)				
914304 to GVRs (3)	-7677.3392	6.7779e-006	(0.0026)	
	1383.3451	5.7919e-006	1.0177e-005	(0.0032)
	-3361.8690	-1.0674e-006	-4.1036e-006	4.6949e-006
(0.0022)				
914304 to LEEP (1)	-22229.7991	3.1185e-005	(0.0056)	
	15031.0320	4.1749e-005	8.2362e-005	(0.0091)
	4829.9947	-1.5974e-005	-3.6091e-005	2.2459e-005
(0.0047)				
914304 to LEEP (2)	-22229.8249	1.2494e-005	(0.0035)	
	15030.9972	1.0239e-005	1.6975e-005	(0.0041)
	4830.0125	-6.7422e-006	-6.8705e-006	9.1218e-006
(0.0030)				
914304 to LEEP (3)	-22229.7932	3.6053e-005	(0.0060)	
	15031.0472	3.1616e-005	3.8415e-005	(0.0062)
	4830.0011	-2.4259e-006	-8.7312e-006	9.9679e-006
(0.0032)				
914304 to LORS (1)	23967.6984	1.1951e-006	(0.0011)	
	-9627.6892	1.3461e-006	3.2593e-006	(0.0018)
	4692.6558	-5.7950e-007	-1.1844e-006	1.5238e-006
(0.0012)				
914304 to LORS (2)	23967.6940	5.8607e-006	(0.0024)	
	-9627.7162	6.9949e-006	1.9831e-005	(0.0045)
	4692.6585	-3.6101e-006	-7.7007e-006	7.3821e-006
(0.0027)				
914304 to LORS (3)	23967.7091	1.9413e-006	(0.0014)	
	-9627.6731	2.1504e-006	5.9218e-006	(0.0024)
	4692.6503	-7.6297e-007	-2.0690e-006	2.8747e-006
(0.0017)				
914304 to PKRD (1)	-16727.7478	2.3762e-005	(0.0049)	
	7952.2588	1.6457e-005	1.5672e-005	(0.0040)
	-1159.2089	-4.6897e-006	-4.7431e-006	8.1001e-006
(0.0028)				
914304 to PKRD (2)	-16727.7682	1.9139e-005	(0.0044)	
	7952.2175	3.5804e-005	1.0120e-004	(0.0101)
	-1159.1923	-1.1306e-005	-2.9269e-005	1.1221e-005
(0.0033)				
914304 to PKRD (3)	-16727.7687	2.9702e-006	(0.0017)	

	7952.2455	2.8118e-006	5.8115e-006	(0.0024)
	-1159.1911	-9.6795e-007	-1.8590e-006	2.5107e-006
(0.0016)				
914304 to SPMS (1)	12250.5737	9.9656e-007	(0.0010)	
	-13103.8719	1.1225e-006	2.7149e-006	(0.0016)
	-8370.1228	-4.8385e-007	-9.8458e-007	1.2664e-006
(0.0011)				
914304 to SPMS (2)	12250.5770	4.7083e-006	(0.0022)	
	-13103.8830	5.6210e-006	1.5948e-005	(0.0040)
	-8370.1270	-2.9038e-006	-6.2010e-006	5.9418e-006
(0.0024)				
914304 to SPMS (3)	12250.5790	1.6920e-006	(0.0013)	
	-13103.8573	1.8962e-006	5.0823e-006	(0.0023)
	-8370.1232	-6.5212e-007	-1.7445e-006	2.3971e-006
(0.0015)				
AZU1 to 914303 (2)	-21708.7941	1.1607e-006	(0.0011)	
	15092.5989	1.3846e-006	3.3440e-006	(0.0018)
	5114.2198	-5.6730e-007	-1.1744e-006	1.4983e-006
(0.0012)				
AZU1 to 914301 (2)	8006.9844	1.6495e-006	(0.0013)	
	-6915.0218	1.9491e-006	5.7903e-006	(0.0024)
	-3288.7697	-8.3403e-007	-2.1323e-006	2.1436e-006
(0.0015)				
AZU1 to 914301 (3)	8006.9814	1.0223e-006	(0.0010)	
	-6915.0520	1.2032e-006	2.5377e-006	(0.0016)
	-3288.7674	-5.6442e-007	-9.3097e-007	1.1183e-006
(0.0011)				
AZU1 to 914301 (4)	8006.9676	6.9008e-007	(0.0008)	
	-6915.0372	8.1650e-007	1.9042e-006	(0.0014)
	-3288.7396	-3.4652e-007	-6.7721e-007	8.6182e-007
(0.0009)				
AZU1 to 914301 (5)	8006.9713	1.0373e-006	(0.0010)	
	-6915.0263	1.0756e-006	3.4797e-006	(0.0019)
	-3288.7439	-4.4188e-007	-1.3408e-006	1.5719e-006
(0.0013)				
AZU1 to 914302 (1)	-12801.8565	1.5108e-005	(0.0039)	
	3707.5523	9.3629e-006	1.0847e-005	(0.0033)
	-4197.5447	-1.2118e-005	-1.0551e-005	1.7779e-005
(0.0042)				
AZU1 to 914302 (2)	-12801.8643	5.7368e-006	(0.0024)	
	3707.5362	4.7408e-006	9.0908e-006	(0.0030)
	-4197.5201	-3.5879e-006	-5.4078e-006	4.5146e-006
(0.0021)				
AZU1 to 914302 (3)	-12801.8510	2.5049e-006	(0.0016)	

	3707.5733	2.7823e-006	7.0346e-006	(0.0027)
	-4197.5378	-1.4598e-006	-2.8844e-006	2.9900e-006
(0.0017)				
AZU1 to 914303 (1)	-21708.8298	5.5188e-006	(0.0023)	
	15092.5465	5.7665e-006	1.0070e-005	(0.0032)
	5114.2577	-3.3836e-006	-4.3855e-006	5.1837e-006
(0.0023)				
AZU1 to 914303 (4)	-21708.8399	7.6910e-006	(0.0028)	
	15092.5323	6.4534e-006	1.1288e-005	(0.0034)
	5114.2391	-4.4103e-006	-4.7015e-006	6.6056e-006
(0.0026)				
AZU1 to 914303 (6)	-21708.8220	5.9824e-006	(0.0024)	
	15092.5685	8.4210e-006	2.3531e-005	(0.0049)
	5114.2212	-3.4568e-006	-1.2103e-005	9.8996e-006
(0.0031)				
AZU1 to 914304 (1)	-12254.1509	9.3333e-007	(0.0010)	
	3674.9561	1.0857e-006	2.5403e-006	(0.0016)
	-3850.9567	-4.4394e-007	-8.8989e-007	1.0750e-006
(0.0010)				
AZU1 to 914304 (2)	-12254.1458	1.5573e-006	(0.0012)	
	3674.9750	1.7899e-006	5.8266e-006	(0.0024)
	-3850.9637	-7.2943e-007	-2.1179e-006	2.1727e-006
(0.0015)				
AZU1 to 914304 (3)	-12254.1510	1.4983e-006	(0.0012)	
	3674.9464	1.8312e-006	5.0856e-006	(0.0023)
	-3850.9617	-5.8832e-007	-1.6262e-006	2.0211e-006
(0.0014)				
AZU1 to CIT1 (3)	-18510.7451	6.9011e-006	(0.0026)	
	10534.8017	6.2628e-006	1.9191e-005	(0.0044)
	1021.1522	-3.8155e-006	-8.2625e-006	7.5512e-006
(0.0027)				
AZU1 to CIT1 (4)	-18510.7497	5.1198e-007	(0.0007)	
	10534.7992	5.7326e-007	1.4107e-006	(0.0012)
	1021.1499	-2.9003e-007	-5.4534e-007	6.4395e-007
(0.0008)				
AZU1 to GVRs (1)	-19931.4829	5.2126e-007	(0.0007)	
	5058.2925	5.8181e-007	1.4415e-006	(0.0012)
	-7212.8314	-2.9042e-007	-5.5304e-007	6.6248e-007
(0.0008)				
AZU1 to GVRs (2)	-19931.4850	6.9717e-006	(0.0026)	
	5058.2930	6.3366e-006	1.9426e-005	(0.0044)
	-7212.8304	-3.8576e-006	-8.3590e-006	7.6231e-006
(0.0028)				
AZU1 to GVRs (3)	-19931.4903	6.9852e-006	(0.0026)	

	5058.2817	6.3392e-006	1.9397e-005	(0.0044)
	-7212.8193	-3.8698e-006	-8.3692e-006	7.6605e-006
(0.0028)				
AZU1 to GVR5 (4)	-19931.4977	6.9488e-006	(0.0026)	
	5058.2736	6.3434e-006	1.9389e-005	(0.0044)
	-7212.8170	-3.8716e-006	-8.3738e-006	7.6402e-006
(0.0028)				
AZU1 to LEEP (1)	-34483.9717	1.1965e-005	(0.0035)	
	18705.9612	1.1024e-005	3.3653e-005	(0.0058)
	979.0479	-6.7491e-006	-1.4637e-005	1.3319e-005
(0.0036)				
AZU1 to LEEP (2)	-34483.9659	1.1833e-005	(0.0034)	
	18705.9664	1.0779e-005	3.2956e-005	(0.0057)
	979.0447	-6.5803e-006	-1.4228e-005	1.3019e-005
(0.0036)				
AZU1 to LEEP (3)	-34483.9690	1.1824e-005	(0.0034)	
	18705.9573	1.0737e-005	3.2902e-005	(0.0057)
	979.0535	-6.5458e-006	-1.4178e-005	1.2970e-005
(0.0036)				
AZU1 to LEEP (4)	-34483.9771	1.1842e-005	(0.0034)	
	18705.9469	1.0822e-005	3.3011e-005	(0.0057)
	979.0585	-6.6154e-006	-1.4278e-005	1.3069e-005
(0.0036)				
AZU1 to LORS (1)	11713.5509	1.9512e-007	(0.0004)	
	-5952.7270	2.1930e-007	5.4652e-007	(0.0007)
	841.6942	-1.1012e-007	-2.1108e-007	2.4804e-007
(0.0005)				
AZU1 to LORS (2)	11713.5485	1.9355e-007	(0.0004)	
	-5952.7328	2.1756e-007	5.4127e-007	(0.0007)
	841.6988	-1.0825e-007	-2.0738e-007	2.4495e-007
(0.0005)				
AZU1 to LORS (3)	11713.5599	2.4920e-006	(0.0016)	
	-5952.7131	2.2527e-006	6.8911e-006	(0.0026)
	841.6879	-1.3712e-006	-2.9572e-006	2.7069e-006
(0.0016)				
AZU1 to LORS (4)	11713.5499	1.9837e-007	(0.0004)	
	-5952.7257	2.2213e-007	5.4745e-007	(0.0007)
	841.6924	-1.1269e-007	-2.1184e-007	2.4975e-007
(0.0005)				
AZU1 to SPMS (1)	-3.5840	2.0814e-007	(0.0005)	
	-9428.9243	2.3335e-007	5.8084e-007	(0.0008)
	-12221.0727	-1.1716e-007	-2.2516e-007	2.6562e-007
(0.0005)				
AZU1 to SPMS (2)	-3.5791	2.0845e-007	(0.0005)	

	-9428.9179	2.3418e-007	5.8167e-007	(0.0008)
	-12221.0779	-1.1693e-007	-2.2325e-007	2.6404e-007
(0.0005)				
AZU1 to SPMS (3)	-3.5803	2.7181e-006	(0.0016)	
	-9428.9205	2.4511e-006	7.4954e-006	(0.0027)
	-12221.0729	-1.4923e-006	-3.2133e-006	2.9479e-006
(0.0017)				
AZU1 to SPMS (4)	-3.5825	2.2208e-007	(0.0005)	
	-9428.9222	2.4919e-007	6.0210e-007	(0.0008)
	-12221.0751	-1.2144e-007	-2.3040e-007	2.6877e-007
(0.0005)				
CIT1 to GVRs (1)	-1420.7460	3.9113e-006	(0.0020)	
	-5476.5241	2.6057e-006	5.2357e-006	(0.0023)
	-8233.9703	-1.6606e-006	-2.9844e-006	3.8833e-006
(0.0020)				
CIT1 to GVRs (2)	-1420.7381	3.0265e-007	(0.0006)	
	-5476.5075	2.9795e-007	6.7152e-007	(0.0008)
	-8233.9781	-1.6548e-007	-3.0614e-007	4.0705e-007
(0.0006)				
CIT1 to GVRs (3)	-1420.7400	3.0436e-007	(0.0006)	
	-5476.5086	2.9889e-007	6.7440e-007	(0.0008)
	-8233.9780	-1.6863e-007	-3.1028e-007	4.1554e-007
(0.0006)				
CIT1 to GVRs (4)	-1420.7419	3.0609e-007	(0.0006)	
	-5476.5127	3.0100e-007	6.7966e-007	(0.0008)
	-8233.9765	-1.6626e-007	-3.0723e-007	4.1535e-007
(0.0006)				
CIT1 to LEEP (1)	-15973.2245	5.3759e-006	(0.0023)	
	8171.1553	3.5841e-006	7.2044e-006	(0.0027)
	-42.0984	-2.2805e-006	-4.1038e-006	5.3384e-006
(0.0023)				
CIT1 to LEEP (2)	-15973.2208	5.8778e-006	(0.0024)	
	8171.1589	4.9348e-006	8.8190e-006	(0.0030)
	-42.1014	-3.1541e-006	-4.9152e-006	5.9799e-006
(0.0024)				
CIT1 to LEEP (3)	-15973.2242	5.8988e-006	(0.0024)	
	8171.1586	4.9473e-006	8.8533e-006	(0.0030)
	-42.0994	-3.1493e-006	-4.9161e-006	5.9725e-006
(0.0024)				
CIT1 to LEEP (4)	-15973.2237	4.1031e-007	(0.0006)	
	8171.1592	4.0069e-007	8.8093e-007	(0.0009)
	-42.0961	-2.2289e-007	-4.0332e-007	5.3182e-007
(0.0007)				
CIT1 to LORS (1)	30224.3051	9.1654e-006	(0.0030)	

	-16487.5153	6.1033e-006	1.2251e-005	(0.0035)
	-179.4619	-3.8935e-006	-6.9809e-006	9.0847e-006
(0.0030)				
CIT1 to LORS (2)	30224.2918	9.2169e-006	(0.0030)	
	-16487.5439	6.1476e-006	1.2339e-005	(0.0035)
	-179.4459	-3.9256e-006	-7.0323e-006	9.1249e-006
(0.0030)				
CIT1 to LORS (3)	30224.3048	1.0123e-005	(0.0032)	
	-16487.5187	8.5028e-006	1.5201e-005	(0.0039)
	-179.4628	-5.4331e-006	-8.4721e-006	1.0265e-005
(0.0032)				
CIT1 to LORS (4)	30224.2969	9.0315e-006	(0.0030)	
	-16487.5268	5.9884e-006	1.2026e-005	(0.0035)
	-179.4572	-3.7995e-006	-6.8111e-006	8.8868e-006
(0.0030)				
CIT1 to PKRD (1)	-10471.1835	9.4130e-006	(0.0031)	
	1092.3673	1.1275e-005	2.2916e-005	(0.0048)
	-6031.2841	-7.5211e-006	-1.0548e-005	1.0893e-005
(0.0033)				
CIT1 to PKRD (2)	-10471.1770	6.2187e-007	(0.0008)	
	1092.3841	5.5772e-007	1.0389e-006	(0.0010)
	-6031.2939	-3.2657e-007	-4.7753e-007	5.7721e-007
(0.0008)				
CIT1 to PKRD (3)	-10471.1825	9.1523e-006	(0.0030)	
	1092.3698	1.1134e-005	2.2784e-005	(0.0048)
	-6031.2872	-7.4716e-006	-1.0604e-005	1.0863e-005
(0.0033)				
CIT1 to PKRD (4)	-10471.1777	4.3918e-006	(0.0021)	
	1092.3814	4.9629e-006	1.0978e-005	(0.0033)
	-6031.2999	-3.3803e-006	-5.2544e-006	7.0794e-006
(0.0027)				
CIT1 to SPMS (1)	18507.1664	8.9311e-006	(0.0030)	
	-19963.7213	7.5162e-006	1.3413e-005	(0.0037)
	-13242.2282	-4.8381e-006	-7.5259e-006	9.1389e-006
(0.0030)				
CIT1 to SPMS (2)	18507.1618	8.9276e-006	(0.0030)	
	-19963.7341	7.5062e-006	1.3405e-005	(0.0037)
	-13242.2189	-4.8188e-006	-7.5047e-006	9.1079e-006
(0.0030)				
CIT1 to SPMS (3)	18507.1654	8.9099e-006	(0.0030)	
	-19963.7237	7.4594e-006	1.3325e-005	(0.0037)
	-13242.2249	-4.7620e-006	-7.4121e-006	9.0120e-006
(0.0030)				
CIT1 to SPMS (4)	18507.1583	7.9954e-006	(0.0028)	

	-19963.7343	5.2999e-006	1.0647e-005	(0.0033)
	-13242.2203	-3.3646e-006	-6.0355e-006	7.8759e-006
(0.0028)				
GVRs to LEEP (1)	-14552.4800	6.6952e-006	(0.0026)	
	13647.6760	5.6263e-006	1.0047e-005	(0.0032)
	8191.8752	-3.6057e-006	-5.6124e-006	6.8321e-006
(0.0026)				
GVRs to LEEP (2)	-14552.4806	6.7195e-006	(0.0026)	
	13647.6727	5.6375e-006	1.0077e-005	(0.0032)
	8191.8752	-3.5982e-006	-5.6071e-006	6.8214e-006
(0.0026)				
GVRs to LEEP (3)	-14552.4785	6.7356e-006	(0.0026)	
	13647.6764	5.6488e-006	1.0085e-005	(0.0032)
	8191.8725	-3.6130e-006	-5.6272e-006	6.8608e-006
(0.0026)				
GVRs to LEEP (4)	-14552.4800	6.1094e-006	(0.0025)	
	13647.6797	4.0660e-006	8.1754e-006	(0.0029)
	8191.8721	-2.5825e-006	-4.6495e-006	6.0609e-006
(0.0025)				
GVRs to LORS (1)	31645.0511	9.0901e-006	(0.0030)	
	-11010.9914	6.0366e-006	1.2121e-005	(0.0035)
	8054.5084	-3.8341e-006	-6.8666e-006	8.9339e-006
(0.0030)				
GVRs to LORS (2)	31645.0318	9.2196e-006	(0.0030)	
	-11011.0315	6.1477e-006	1.2340e-005	(0.0035)
	8054.5317	-3.9176e-006	-7.0038e-006	9.0664e-006
(0.0030)				
GVRs to LORS (3)	31645.0506	1.0161e-005	(0.0032)	
	-11011.0008	8.5339e-006	1.5221e-005	(0.0039)
	8054.5091	-5.4793e-006	-8.5245e-006	1.0366e-005
(0.0032)				
GVRs to LORS (4)	31645.0409	9.0395e-006	(0.0030)	
	-11011.0102	5.9937e-006	1.2037e-005	(0.0035)
	8054.5177	-3.8029e-006	-6.8171e-006	8.8946e-006
(0.0030)				
GVRs to PKRD (1)	-9050.4367	9.1282e-006	(0.0030)	
	6568.8921	1.0934e-005	2.2222e-005	(0.0047)
	2202.6835	-7.2935e-006	-1.0229e-005	1.0564e-005
(0.0033)				
GVRs to PKRD (2)	-9050.4348	8.9455e-006	(0.0030)	
	6568.8919	1.0803e-005	2.2068e-005	(0.0047)
	2202.6869	-7.2374e-006	-1.0217e-005	1.0520e-005
(0.0032)				
GVRs to PKRD (3)	-9050.4349	8.8754e-006	(0.0030)	

	6568.8930	1.0798e-005	2.2094e-005	(0.0047)
	2202.6823	-7.2455e-006	-1.0283e-005	1.0534e-005
(0.0032)				
GVRs to PKRD (4)	-9050.4321	4.2589e-006	(0.0021)	
	6568.9001	4.8127e-006	1.0646e-005	(0.0033)
	2202.6719	-3.2780e-006	-5.0954e-006	6.8652e-006
(0.0026)				
GVRs to SPMS (1)	19927.9116	7.5523e-006	(0.0027)	
	-14487.1989	6.3571e-006	1.1364e-005	(0.0034)
	-5008.2560	-4.0781e-006	-6.3548e-006	7.6952e-006
(0.0028)				
GVRs to SPMS (2)	19927.9020	7.5794e-006	(0.0028)	
	-14487.2204	6.3695e-006	1.1398e-005	(0.0034)
	-5008.2422	-4.0695e-006	-6.3487e-006	7.6831e-006
(0.0028)				
GVRs to SPMS (3)	19927.9111	7.6069e-006	(0.0028)	
	-14487.2058	6.3680e-006	1.1349e-005	(0.0034)
	-5008.2531	-4.0848e-006	-6.3435e-006	7.7404e-006
(0.0028)				
GVRs to SPMS (4)	19927.8981	4.9495e-007	(0.0007)	
	-14487.2180	4.9629e-007	1.1431e-006	(0.0011)
	-5008.2407	-2.7846e-007	-5.1572e-007	6.9218e-007
(0.0008)				
LEEP to LORS (1)	46197.5171	1.8758e-006	(0.0014)	
	-24658.6804	-2.2331e-007	1.8660e-006	(0.0014)
	-137.3615	-3.2047e-007	-6.4029e-007	6.4496e-007
(0.0008)				
LEEP to LORS (2)	46197.5140	1.8727e-006	(0.0014)	
	-24658.6875	-2.0705e-007	1.8438e-006	(0.0014)
	-137.3588	-3.2506e-007	-6.3809e-007	6.4542e-007
(0.0008)				
LEEP to LORS (3)	46197.5162	1.8702e-006	(0.0014)	
	-24658.6839	-2.1388e-007	1.8545e-006	(0.0014)
	-137.3611	-3.2338e-007	-6.3878e-007	6.4471e-007
(0.0008)				
LEEP to LORS (4)	46197.4926	1.8859e-006	(0.0014)	
	-24658.7121	-2.3371e-007	1.8756e-006	(0.0014)
	-137.3375	-3.2117e-007	-6.3957e-007	6.4571e-007
(0.0008)				
LEEP to PKRD (1)	5502.0383	8.6467e-006	(0.0029)	
	-7078.7888	1.0519e-005	2.1525e-005	(0.0046)
	-5989.1977	-7.0589e-006	-1.0018e-005	1.0263e-005
(0.0032)				
LEEP to PKRD (2)	5502.0339	9.0715e-006	(0.0030)	

	-7078.8000	1.0775e-005	2.1794e-005	(0.0047)
	-5989.1889	-7.1549e-006	-9.9679e-006	1.0328e-005
(0.0032)				
LEEP to PKRD (3)	5502.0338	6.2101e-007	(0.0008)	
	-7078.7898	5.3731e-007	1.0563e-006	(0.0010)
	-5989.1915	-3.3733e-007	-4.8887e-007	5.9860e-007
(0.0008)				
LEEP to PKRD (4)	5502.0383	8.7150e-006	(0.0030)	
	-7078.7914	1.0525e-005	2.1500e-005	(0.0046)
	-5989.1933	-7.0509e-006	-9.9541e-006	1.0249e-005
(0.0032)				
LEEP to SPMS (1)	34480.3833	1.8141e-006	(0.0013)	
	-28134.8775	-2.1540e-007	1.8026e-006	(0.0013)
	-13200.1300	-3.1132e-007	-6.1763e-007	6.2279e-007
(0.0008)				
LEEP to SPMS (2)	34480.3756	1.8099e-006	(0.0013)	
	-28134.8875	-1.9876e-007	1.7836e-006	(0.0013)
	-13200.1244	-3.1493e-007	-6.1687e-007	6.2311e-007
(0.0008)				
LEEP to SPMS (3)	34480.3800	1.8114e-006	(0.0013)	
	-28134.8845	-2.0559e-007	1.7919e-006	(0.0013)
	-13200.1260	-3.1487e-007	-6.1644e-007	6.2284e-007
(0.0008)				
LEEP to SPMS (4)	34480.3619	2.1241e-006	(0.0015)	
	-28134.8985	-3.0092e-007	1.9454e-006	(0.0014)
	-13200.1132	-3.6179e-007	-6.6529e-007	7.0965e-007
(0.0008)				
LORS to PKRD (1)	-40695.4893	3.0627e-005	(0.0055)	
	17579.8716	7.6218e-007	1.4221e-005	(0.0038)
	-5851.8174	-6.1150e-006	-3.8527e-006	5.5265e-006
(0.0024)				
LORS to PKRD (2)	-40695.4916	2.8353e-005	(0.0053)	
	17579.8880	6.7323e-007	1.3906e-005	(0.0037)
	-5851.8246	-5.7636e-006	-3.7607e-006	5.2973e-006
(0.0023)				
LORS to PKRD (3)	-40695.4778	1.5610e-005	(0.0040)	
	17579.9029	8.6754e-007	7.6624e-006	(0.0028)
	-5851.8354	-4.0636e-006	-1.9063e-006	2.8822e-006
(0.0017)				
LORS to PKRD (4)	-40695.4787	1.8199e-005	(0.0043)	
	17579.8973	7.0700e-007	8.6201e-006	(0.0029)
	-5851.8310	-4.6555e-006	-2.1434e-006	3.3196e-006
(0.0018)				
LORS to SPMS (1)	-11717.1336	1.9432e-007	(0.0004)	

```

-3476.1972  1.9522e-007  4.5329e-007  (0.0007)
-13062.7671 -1.1018e-007 -2.0617e-007  2.7288e-007
(0.0005)

LORS to SPMS (2)  -11717.1273  1.9453e-007  (0.0004)
                   -3476.1851  1.9541e-007  4.5355e-007  (0.0007)
                   -13062.7770 -1.1011e-007 -2.0625e-007  2.7250e-007
(0.0005)

LORS to SPMS (3)  -11717.1321  1.9491e-007  (0.0004)
                   -3476.1912  1.9522e-007  4.5116e-007  (0.0007)
                   -13062.7713 -1.1131e-007 -2.0628e-007  2.7590e-007
(0.0005)

LORS to SPMS (4)  -11717.1347  1.9433e-007  (0.0004)
                   -3476.1984  1.9514e-007  4.5232e-007  (0.0007)
                   -13062.7669 -1.0991e-007 -2.0605e-007  2.7272e-007
(0.0005)

PKRD to SPMS (1)  28978.3487  1.0424e-005  (0.0032)
                   -21056.0943  1.2415e-005  2.5264e-005  (0.0050)
                   -7210.9379 -8.3024e-006 -1.1591e-005  1.2059e-005
(0.0035)

PKRD to SPMS (2)  28978.3418  1.0282e-005  (0.0032)
                   -21056.1055  1.2342e-005  2.5197e-005  (0.0050)
                   -7210.9355 -8.2784e-006 -1.1626e-005  1.2045e-005
(0.0035)

PKRD to SPMS (3)  28978.3423  1.0093e-005  (0.0032)
                   -21056.1028  1.2185e-005  2.4955e-005  (0.0050)
                   -7210.9304 -8.1911e-006 -1.1556e-005  1.1942e-005
(0.0035)

PKRD to SPMS (4)  28978.3348  4.8972e-006  (0.0022)
                   -21056.1190  5.5201e-006  1.2205e-005  (0.0035)
                   -7210.9149 -3.7440e-006 -5.8054e-006  7.8276e-006
(0.0028)

```

```

*****
      OUTPUT VECTOR RESIDUALS (East, North, Height - Local Level)
*****

```

SESSION NAME	-- RE --	-- RN --	-- RH --	- PPM -
DIST - STD -				
	(m)	(m)	(m)	
(km) (m)				
914301 to 914302 (2)	0.0053	-0.0145	-0.0149	0.917
23.4 0.0085				
914301 to 914303 (4)	-0.0006	0.0162	-0.0107	0.513
37.9 0.0109				

914301 to 914304 (1)	-0.0058	0.0092	0.0087	0.609
22.9 0.0069				
914301 to CIT1 (1)	0.0076	0.0006	-0.0742	2.330
32.0 0.1252				
914301 to CIT1 (3)	0.0122	-0.0120	-0.1350	4.247
32.0 0.0544				
914301 to CIT1 (4)	-0.0039	-0.0037	0.0046	0.220
32.0 0.0417				
914301 to CIT1 (5)	-0.0059	0.0043	0.0205	0.678
32.0 0.0614				
914301 to GVRs (1)	0.0010	-0.0123	0.0073	0.468
30.6 0.0316				
914301 to GVRs (3)	0.0113	-0.0122	-0.0354	1.274
30.6 0.0532				
914301 to GVRs (4)	-0.0034	-0.0057	0.0097	0.382
30.6 0.0410				
914301 to GVRs (5)	-0.0044	0.0080	0.0253	0.878
30.6 0.0602				
914301 to LEEP (2)	-0.0244	-0.0096	0.0239	0.711
49.8 0.1012				
914301 to LEEP (3)	0.0242	-0.0169	-0.0368	0.946
49.8 0.0324				
914301 to LEEP (4)	-0.0032	0.0117	0.0334	0.714
49.8 0.0537				
914301 to LEEP (5)	0.0023	0.0093	-0.0029	0.201
49.8 0.0338				
914301 to LORS (1)	0.0001	-0.0127	-0.0375	7.024
5.6 0.0150				
914301 to LORS (3)	0.0137	-0.0153	-0.0047	3.737
5.6 0.0120				
914301 to LORS (4)	-0.0063	0.0066	-0.0017	1.648
5.6 0.0102				
914301 to LORS (5)	-0.0077	0.0107	-0.0109	3.032
5.6 0.0134				
914301 to PKRD (3)	0.0424	-0.0091	-0.1015	2.664
41.4 0.1344				
914301 to PKRD (4)	0.0000	0.0001	-0.0168	0.405
41.4 0.0539				
914301 to SPMS (1)	0.0025	-0.0167	0.0029	1.400
12.3 0.0169				
914301 to SPMS (2)	0.0140	-0.0060	-0.0816	6.772
12.3 0.0562				
914301 to SPMS (3)	0.0126	-0.0163	-0.0177	2.218
12.3 0.0128				
914301 to SPMS (4)	-0.0081	0.0074	0.0102	1.222
12.3 0.0114				
914301 to SPMS (5)	-0.0109	0.0076	0.0247	2.288
12.3 0.0139				
914302 to 914303 (2)	0.0002	-0.0036	0.0025	0.257
17.2 0.0030				
914302 to GVRs (1)	-0.0001	-0.0005	-0.0130	1.661
7.9 0.0320				
914302 to GVRs (2)	0.0030	0.0111	-0.0138	2.291
7.9 0.0250				

914302 to GVRs (3) 7.9 0.0165	0.0026	0.0102	-0.0137	2.199
914302 to LEEP (1) 26.9 0.0460	0.0051	0.0034	-0.0234	0.902
914302 to LEEP (2) 26.9 0.0396	0.0080	0.0091	-0.0080	0.542
914302 to LEEP (3) 26.9 0.0337	0.0041	0.0121	-0.0173	0.802
914302 to LORS (1) 26.8 0.0344	0.0004	-0.0042	0.0116	0.462
914302 to LORS (3) 26.8 0.0286	0.0039	0.0046	0.0033	0.255
914302 to PKRD (1) 18.0 0.0305	0.0008	-0.0057	-0.0395	2.213
914302 to PKRD (2) 18.0 0.0467	0.0111	0.0125	-0.0034	0.947
914302 to PKRD (3) 18.0 0.0489	0.0052	0.0127	-0.0013	0.762
914302 to SPMS (1) 20.0 0.0306	0.0020	0.0024	0.0270	1.356
914302 to SPMS (2) 20.0 0.0213	0.0044	0.0072	-0.0223	1.191
914302 to SPMS (3) 20.0 0.0254	0.0073	0.0013	-0.0090	0.581
914303 to 914304 (2) 17.3 0.0075	0.0016	-0.0142	0.0129	1.114
914303 to CIT1 (4) 6.9 0.0226	-0.0055	-0.0187	0.0252	4.606
914303 to CIT1 (6) 6.9 0.0223	-0.0024	-0.0155	0.0192	3.585
914303 to GVRs (1) 16.0 0.0297	0.0032	0.0135	0.0262	1.851
914303 to GVRs (2) 16.0 0.0311	0.0036	0.0108	-0.0154	1.195
914303 to GVRs (3) 16.0 0.0168	0.0024	0.0152	-0.0206	1.608
914303 to GVRs (4) 16.0 0.0263	-0.0049	-0.0202	0.0238	1.976
914303 to GVRs (6) 16.0 0.0260	0.0028	-0.0087	0.0369	2.377
914303 to LEEP (1) 13.9 0.0288	0.0059	0.0178	0.0118	1.591
914303 to LEEP (2) 13.9 0.0166	0.0028	0.0163	-0.0364	2.877
914303 to LEEP (3) 13.9 0.0303	0.0051	0.0123	-0.0172	1.566
914303 to LEEP (4) 13.9 0.0263	-0.0001	-0.0132	0.0273	2.181
914303 to LEEP (5) 13.9 0.0251	-0.0035	-0.0108	0.0224	1.806
914303 to LORS (1) 39.7 0.0325	0.0049	0.0141	0.0477	1.257
914303 to LORS (2) 39.7 0.0486	-0.0035	0.0136	-0.0535	1.393

914303 to LORS (3) 39.7 0.0316	0.0079	0.0099	-0.0326	0.880
914303 to LORS (4) 39.7 0.0260	-0.0048	-0.0208	0.0292	0.910
914303 to LORS (6) 39.7 0.0450	-0.0090	-0.0035	-0.0129	0.406
914303 to PKRD (1) 12.9 0.0233	-0.0019	0.0053	0.0229	1.824
914303 to PKRD (2) 12.9 0.0453	-0.0000	0.0110	-0.0260	2.178
914303 to PKRD (3) 12.9 0.0443	-0.0032	0.0148	-0.0205	1.969
914303 to PKRD (4) 12.9 0.0529	-0.0039	-0.0151	0.0280	2.474
914303 to PKRD (6) 12.9 0.0647	-0.0108	0.0024	-0.0134	1.343
914303 to SPMS (2) 37.1 0.0469	-0.0023	0.0106	-0.0290	0.835
914303 to SPMS (3) 37.1 0.0305	0.0033	0.0029	-0.0359	0.975
914303 to SPMS (4) 37.1 0.0359	-0.0023	-0.0061	0.0416	1.137
914303 to SPMS (6) 37.1 0.0434	-0.0097	-0.0080	0.0205	0.649
914304 to CIT1 (1) 10.5 0.0163	-0.0022	0.0011	-0.0052	0.553
914304 to CIT1 (2) 10.5 0.0229	-0.0088	0.0012	0.0052	0.978
914304 to CIT1 (3) 10.5 0.0234	0.0103	-0.0062	0.0002	1.147
914304 to GVRs (1) 8.5 0.0158	-0.0018	-0.0010	-0.0020	0.337
914304 to GVRs (2) 8.5 0.0218	-0.0033	0.0055	0.0193	2.390
914304 to GVRs (3) 8.5 0.0299	0.0072	-0.0072	0.0059	1.390
914304 to LEEP (1) 27.3 0.0749	-0.0033	-0.0063	0.0315	1.184
914304 to LEEP (2) 27.3 0.0399	0.0030	0.0030	-0.0140	0.536
914304 to LEEP (3) 27.3 0.0590	-0.0013	-0.0207	0.0413	1.695
914304 to LORS (1) 26.3 0.0157	-0.0019	-0.0007	-0.0044	0.185
914304 to LORS (2) 26.3 0.0369	-0.0106	0.0116	-0.0274	1.203
914304 to LORS (3) 26.3 0.0210	-0.0038	-0.0070	0.0146	0.633
914304 to PKRD (1) 18.6 0.0443	-0.0083	-0.0081	0.0526	2.900
914304 to PKRD (2) 18.6 0.0736	-0.0098	0.0040	0.0051	0.632
914304 to PKRD (3) 18.6 0.0216	0.0039	-0.0107	0.0247	1.467

914304 to SPMS (1) 19.8 0.0143	-0.0033	-0.0010	0.0107	0.570
914304 to SPMS (2) 19.8 0.0331	-0.0114	0.0071	0.0063	0.748
914304 to SPMS (3) 19.8 0.0194	-0.0011	-0.0093	0.0237	1.289
AZU1 to 914303 (2) 26.9 0.0157	-0.0057	-0.0130	0.0212	0.948
AZU1 to 914301 (2) 11.1 0.0199	-0.0004	0.0062	0.0252	2.338
AZU1 to 914301 (3) 11.1 0.0139	-0.0118	0.0200	0.0006	2.097
AZU1 to 914301 (4) 11.1 0.0119	0.0073	-0.0067	-0.0095	1.240
AZU1 to 914301 (5) 11.1 0.0158	0.0091	-0.0095	0.0023	1.211
AZU1 to 914302 (1) 14.0 0.0424	-0.0056	0.0050	0.0152	1.216
AZU1 to 914302 (2) 14.0 0.0282	-0.0063	-0.0054	-0.0134	1.125
AZU1 to 914302 (3) 14.0 0.0227	-0.0007	-0.0126	0.0289	2.254
AZU1 to 914303 (1) 26.9 0.0293	0.0012	-0.0089	-0.0522	1.967
AZU1 to 914303 (4) 26.9 0.0325	0.0034	0.0162	-0.0561	2.170
AZU1 to 914303 (6) 26.9 0.0403	0.0047	0.0083	-0.0126	0.587
AZU1 to 914304 (1) 13.4 0.0137	0.0018	0.0006	-0.0021	0.210
AZU1 to 914304 (2) 13.4 0.0198	0.0061	-0.0044	0.0176	1.433
AZU1 to 914304 (3) 13.4 0.0188	-0.0027	0.0095	-0.0064	0.884
AZU1 to CIT1 (3) 21.3 0.0372	0.0003	-0.0027	-0.0018	0.152
AZU1 to CIT1 (4) 21.3 0.0103	0.0031	0.0016	-0.0041	0.253
AZU1 to GVRs (1) 21.8 0.0104	-0.0015	0.0004	0.0035	0.175
AZU1 to GVRs (2) 21.8 0.0374	0.0006	-0.0001	0.0025	0.116
AZU1 to GVRs (3) 21.8 0.0374	-0.0000	-0.0023	-0.0141	0.655
AZU1 to GVRs (4) 21.8 0.0374	0.0027	0.0018	-0.0242	1.119
AZU1 to LEEP (1) 39.2 0.0493	0.0049	0.0051	-0.0043	0.211
AZU1 to LEEP (2) 39.2 0.0488	0.0022	0.0036	0.0036	0.142
AZU1 to LEEP (3) 39.2 0.0488	0.0007	0.0017	-0.0092	0.240
AZU1 to LEEP (4) 39.2 0.0488	0.0029	0.0048	-0.0228	0.598

AZU1 to LORS (1)	-0.0003	-0.0000	0.0020	0.154
13.2 0.0064				
AZU1 to LORS (2)	-0.0009	-0.0003	-0.0058	0.442
13.2 0.0064				
AZU1 to LORS (3)	-0.0018	-0.0041	0.0192	1.496
13.2 0.0223				
AZU1 to LORS (4)	0.0012	0.0011	0.0036	0.298
13.2 0.0064				
AZU1 to SPMS (1)	0.0005	-0.0001	-0.0040	0.263
15.4 0.0066				
AZU1 to SPMS (2)	-0.0008	-0.0003	0.0055	0.359
15.4 0.0066				
AZU1 to SPMS (3)	-0.0010	-0.0028	0.0003	0.195
15.4 0.0233				
AZU1 to SPMS (4)	0.0002	0.0004	-0.0006	0.047
15.4 0.0067				
CIT1 to GVRs (1)	-0.0015	0.0017	-0.0163	1.649
10.0 0.0232				
CIT1 to GVRs (2)	-0.0007	-0.0021	0.0033	0.397
10.0 0.0075				
CIT1 to GVRs (3)	0.0005	-0.0012	0.0017	0.210
10.0 0.0076				
CIT1 to GVRs (4)	0.0002	0.0001	-0.0029	0.293
10.0 0.0076				
CIT1 to LEEP (1)	0.0008	0.0045	-0.0081	0.517
17.9 0.0272				
CIT1 to LEEP (2)	-0.0008	0.0042	-0.0023	0.270
17.9 0.0292				
CIT1 to LEEP (3)	0.0021	0.0036	-0.0050	0.362
17.9 0.0292				
CIT1 to LEEP (4)	0.0019	0.0004	-0.0062	0.364
17.9 0.0087				
CIT1 to LORS (1)	-0.0023	-0.0031	0.0193	0.571
34.4 0.0354				
CIT1 to LORS (2)	-0.0039	0.0013	-0.0158	0.474
34.4 0.0356				
CIT1 to LORS (3)	-0.0036	-0.0006	0.0172	0.510
34.4 0.0383				
CIT1 to LORS (4)	-0.0004	0.0009	0.0050	0.149
34.4 0.0351				
CIT1 to PKRD (1)	-0.0021	-0.0021	-0.0119	1.011
12.1 0.0422				
CIT1 to PKRD (2)	0.0001	-0.0041	0.0084	0.769
12.1 0.0096				
CIT1 to PKRD (3)	-0.0018	-0.0011	-0.0079	0.677
12.1 0.0420				
CIT1 to PKRD (4)	-0.0005	0.0024	0.0095	0.811
12.1 0.0304				
CIT1 to SPMS (1)	-0.0022	0.0016	0.0051	0.190
30.3 0.0360				
CIT1 to SPMS (2)	-0.0042	0.0014	-0.0113	0.401
30.3 0.0360				
CIT1 to SPMS (3)	-0.0025	0.0003	0.0011	0.090
30.3 0.0359				

CIT1 to SPMS (4)	-0.0012	0.0036	-0.0120	0.417
30.3 0.0331				
GVRs to LEEP (1)	0.0021	0.0021	0.0033	0.205
21.6 0.0312				
GVRs to LEEP (2)	0.0010	0.0039	0.0007	0.190
21.6 0.0312				
GVRs to LEEP (3)	0.0009	0.0038	0.0057	0.319
21.6 0.0312				
GVRs to LEEP (4)	0.0038	0.0029	0.0077	0.421
21.6 0.0290				
GVRs to LORS (1)	-0.0009	-0.0047	0.0354	1.038
34.5 0.0352				
GVRs to LORS (2)	-0.0026	0.0009	-0.0144	0.427
34.5 0.0355				
GVRs to LORS (3)	-0.0049	-0.0005	0.0280	0.824
34.5 0.0384				
GVRs to LORS (4)	-0.0007	-0.0004	0.0125	0.364
34.5 0.0351				
GVRs to PKRD (1)	-0.0009	-0.0022	0.0068	0.627
11.4 0.0416				
GVRs to PKRD (2)	-0.0027	-0.0054	0.0054	0.711
11.4 0.0414				
GVRs to PKRD (3)	-0.0021	-0.0021	0.0088	0.813
11.4 0.0413				
GVRs to PKRD (4)	-0.0012	0.0023	0.0209	1.847
11.4 0.0299				
GVRs to SPMS (1)	-0.0008	-0.0006	0.0188	0.747
25.1 0.0331				
GVRs to SPMS (2)	-0.0024	0.0011	-0.0084	0.352
25.1 0.0331				
GVRs to SPMS (3)	-0.0036	0.0006	0.0119	0.495
25.1 0.0332				
GVRs to SPMS (4)	0.0021	-0.0003	-0.0090	0.369
25.1 0.0098				
LEEP to LORS (1)	0.0033	-0.0011	0.0142	0.280
52.4 0.0134				
LEEP to LORS (2)	0.0027	0.0010	0.0063	0.133
52.4 0.0134				
LEEP to LORS (3)	0.0025	0.0006	0.0111	0.217
52.4 0.0134				
LEEP to LORS (4)	0.0101	0.0012	-0.0319	0.640
52.4 0.0135				
LEEP to PKRD (1)	-0.0009	0.0044	0.0013	0.437
10.8 0.0408				
LEEP to PKRD (2)	-0.0023	0.0039	-0.0135	1.323
10.8 0.0412				
LEEP to PKRD (3)	0.0026	0.0010	-0.0047	0.506
10.8 0.0097				
LEEP to PKRD (4)	-0.0021	0.0021	-0.0031	0.396
10.8 0.0408				
LEEP to SPMS (1)	0.0032	-0.0002	0.0097	0.219
46.4 0.0132				
LEEP to SPMS (2)	0.0053	0.0021	-0.0038	0.148
46.4 0.0132				

LEEP to SPMS (3)	0.0028	0.0008	0.0010	0.067
46.4 0.0132				
LEEP to SPMS (4)	0.0122	0.0019	-0.0235	0.571
46.4 0.0140				
LORS to PKRD (1)	-0.0043	0.0026	-0.0422	0.950
44.7 0.0456				
LORS to PKRD (2)	0.0054	0.0011	-0.0271	0.617
44.7 0.0443				
LORS to PKRD (3)	0.0002	-0.0010	-0.0047	0.108
44.7 0.0328				
LORS to PKRD (4)	-0.0016	-0.0016	-0.0116	0.266
44.7 0.0352				
LORS to SPMS (1)	-0.0003	-0.0003	-0.0053	0.300
17.9 0.0062				
LORS to SPMS (2)	-0.0002	0.0002	0.0115	0.643
17.9 0.0062				
LORS to SPMS (3)	0.0012	-0.0002	0.0020	0.129
17.9 0.0062				
LORS to SPMS (4)	0.0001	0.0004	-0.0068	0.379
17.9 0.0062				
PKRD to SPMS (1)	-0.0018	0.0018	0.0089	0.252
36.5 0.0443				
PKRD to SPMS (2)	-0.0010	0.0071	-0.0034	0.217
36.5 0.0442				
PKRD to SPMS (3)	-0.0001	0.0014	-0.0041	0.118
36.5 0.0440				
PKRD to SPMS (4)	-0.0011	-0.0014	-0.0275	0.754
36.5 0.0320				

RMS	0.0063	0.0081	0.0245	

\$ - This session is flagged as a 3-sigma outlier

CHECK POINT RESIDUALS (East, North, Height - Local Level)

STA. NAME	-- RE --	-- RN --	-- RH --
	(m)	(m)	(m)
CIT1	0.0028	0.0051	-0.0841
GVR5	-0.0026	0.0080	-0.0911
LEEP	-0.0041	0.0063	0.0707
LORS	0.0008	0.0034	-0.0745
PKRD	-0.0020	0.0084	-0.0895
SPMS	-0.0014	0.0078	-0.0810

RMS	0.0025	0.0068	0.0822

CONTROL POINT RESIDUALS (ADJUSTMENT MADE)

STA. NAME	-- RE -- (m)	-- RN -- (m)	-- RH -- (m)
AZU1	0.0000	-0.0000	0.0000

RMS	0.0000	0.0000	0.0000

OUTPUT STATION COORDINATES (LAT/LONG/HT)

STA_ID	-- LATITUDE --	-- LONGITUDE --	- ELLHGT -	ORTHOHGT
914301	34 05 22.05532	-117 47 05.06989	267.9672	301.5262
914302	34 04 51.19359	-118 02 16.26507	51.6912	86.1078
914303	34 10 47.78109	-118 10 52.20515	437.5649	471.2875
914304	34 05 04.66824	-118 01 56.81072	56.5174	90.8907
AZU1	34 07 33.65306	-117 53 47.30380	145.4592	179.0805
CIT1	34 08 12.13779	-118 07 38.17655	215.9723	250.0107
GVR5	34 02 50.79480	-118 06 46.36724	155.1345	189.9850
LEEP	34 08 04.55016	-118 19 18.26680	485.8181	520.3569
LORS	34 07 59.96330	-117 45 14.60178	449.5323	482.5992
PKRD	34 04 17.60250	-118 13 58.40292	131.4625	166.3764
SPMS	33 59 33.54121	-117 50 55.54023	207.6718	241.9970

OUTPUT STATION COORDINATES (GRID)

STA_ID	- EASTING - (m)	- NORTHING - (m)	- ELLHGT - (m)	ORTHOHGT (m)
914301	427606.0206	3772353.0567	267.9672	301.5262
914302	404245.6483	3771610.6415	51.6912	86.1078
914303	391149.3547	3782737.9529	437.5649	471.2875
914304	404748.4432	3772020.6359	56.5174	90.8907
AZU1	417333.8248	3776491.2196	145.4592	179.0805
CIT1	396063.4979	3777887.5336	215.9723	250.0107
GVR5	397282.7047	3767974.9391	155.1345	189.9850
LEEP	378128.9220	3777868.8989	485.8181	520.3569
LORS	430472.7889	3777195.4735	449.5323	482.5992
PKRD	386237.5697	3770775.8037	131.4625	166.3764
SPMS	421610.9119	3761665.6903	207.6718	241.9970

OUTPUT VARIANCE/COVARIANCE

STA_ID	SE/SN/SUP	----- CX matrix (m)-----
		2

```

(95.00 %) (not scaled by confidence level)
(m) (ECEF, XYZ cartesian)
914301 0.0125 2.7544e-005
      0.0127 2.5916e-006 3.1065e-005
      0.0142 -1.3178e-006 -2.4385e-006 2.8059e-005

914302 0.0127 2.8821e-005
      0.0128 3.4645e-006 3.3041e-005
      0.0149 -1.9715e-006 -3.5893e-006 2.9497e-005

914303 0.0126 2.8229e-005
      0.0128 3.2172e-006 3.2769e-005
      0.0147 -1.6551e-006 -3.1694e-006 2.8743e-005

914304 0.0126 2.8479e-005
      0.0128 3.6497e-006 3.3607e-005
      0.0149 -1.7352e-006 -3.2208e-006 2.8841e-005

AZU1 0.0122 2.5000e-005
      0.0122 1.3991e-020 2.5000e-005
      0.0122 -6.4158e-021 -2.4514e-019 2.5000e-005

CIT1 0.0127 2.8590e-005
      0.0128 3.4177e-006 3.3088e-005
      0.0148 -1.8594e-006 -3.4734e-006 2.9236e-005

GVRS 0.0126 2.8377e-005
      0.0128 3.3041e-006 3.2803e-005
      0.0148 -1.7760e-006 -3.3538e-006 2.9097e-005

LEEP 0.0129 2.8871e-005
      0.0127 2.3278e-006 3.1904e-005
      0.0144 -1.5848e-006 -2.8568e-006 2.8185e-005

LORS 0.0124 2.6335e-005
      0.0125 1.4230e-006 2.8518e-005
      0.0134 -7.3409e-007 -1.4039e-006 2.6661e-005

PKRD 0.0130 3.2073e-005
      0.0131 6.2635e-006 3.8172e-005
      0.0164 -3.6623e-006 -5.5805e-006 3.1405e-005

SPMS 0.0124 2.6350e-005
      0.0125 1.4453e-006 2.8555e-005
      0.0134 -7.4361e-007 -1.4249e-006 2.6690e-005

```

VARIANCE FACTOR = 0.9847

Note: Values < 1.0 indicate statistics are pessimistic, while
values > 1.0 indicate optimistic statistics. Entering this
value as the network adjustment scale factor will bring

variance factor to one.

4.5 Published Control Stations:

4.5.1 CORS STATIONS

AZU1

LATITUDE 34 07 33.65306 LONGITUDE -117 53 47.30380

ELLHGT: 145.459m ORTHOHT: 179.1403m

```

1      National Geodetic Survey,  Retrieval Date = JUNE  2, 2009
AI4469 *****
AI4469 DESIGNATION -  AZU1 AZUSA CORS ANTENNA MOUNT
AI4469 PID          -  AI4469
AI4469 STATE/COUNTY-  CA/LOS ANGELES
AI4469 USGS QUAD    -  AZUSA (1972)
AI4469
AI4469                                     *CURRENT SURVEY CONTROL
AI4469* NAD 83(2007)- 34 07 33.65306(N)    117 53 47.30380(W)    ADJUSTED
AI4469* NAVD 88      -      179.1      (meters)      588. (feet)  GPS OBS
AI4469
AI4469 EPOCH DATE   -      2007.00
AI4469 X            -  -2,472,978.718 (meters)                      COMP
AI4469 Y            -  -4,671,339.311 (meters)                      COMP
AI4469 Z            -      3,558,107.850 (meters)                  COMP
AI4469 LAPLACE CORR-      4.75 (seconds)                          DEFLEC99
AI4469 ELLIP HEIGHT-      145.459 (meters)                        (02/10/07) ADJUSTED
AI4469 GEOID HEIGHT-      -33.62 (meters)                          GEOID03
AI4469
AI4469 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
AI4469 Type    PID    Designation                      North    East    Ellip
AI4469 -----
AI4469 NETWORK AI4469 AZU1 AZUSA CORS ANTENNA MOUNT      0.00    0.00    0.00
AI4469 -----
AI4469. ITRF positions are available for this station.
AI4469. The horizontal coordinates were established by GPS observations
AI4469. and adjusted by the National Geodetic Survey in February 2007.
AI4469
AI4469. The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
AI4469. See National Readjustment for more information.
AI4469. The horizontal coordinates are valid at the epoch date displayed above.
AI4469. The epoch date for horizontal control is a decimal equivalence
AI4469. of Year/Month/Day.
AI4469
AI4469. The orthometric height was determined by GPS observations and a
AI4469. high-resolution geoid model.
AI4469
AI4469. The X, Y, and Z were computed from the position and the ellipsoidal ht.
AI4469

```

```
AI4469.The Laplace correction was computed from DEFLEC99 derived deflections.
AI4469
AI4469.The ellipsoidal height was determined by GPS observations
AI4469.and is referenced to NAD 83.
AI4469
AI4469.The geoid height was determined by GEOID03.
AI4469
AI4469;              North          East          Units Scale Factor Converg.
AI4469;SPC CA 5      -    569,446.019  2,009,549.967   MT   0.99998121 +0 03 32.4
AI4469;SPC CA 5      -    1,868,257.48  6,592,998.52   sFT   0.99998121 +0 03 32.4
AI4469;UTM 11        -    3,776,491.219  417,333.825    MT   0.99968424 -0 30 10.7
AI4469
AI4469!              - Elev Factor x Scale Factor = Combined Factor
AI4469!SPC CA 5      -    0.99997717 x 0.99998121 = 0.99995838
AI4469!UTM 11        -    0.99997717 x 0.99968424 = 0.99966141
AI4469
AI4469                                     SUPERSEDED SURVEY CONTROL
AI4469
AI4469 NAD 83(1998)- 34 07 33.64750(N)     117 53 47.29780(W) AD(2000.35) A
AI4469 ELLIP H (04/03/01) 145.488 (m)                GP(2000.35) 1 1
AI4469 NAD 83(1998)- 34 07 33.64578(N)     117 53 47.29586(W) AD(1998.50) A
AI4469 ELLIP H (04/06/00) 145.487 (m)                GP(1998.50) 3 1
AI4469.Superseaded values are not recommended for survey control.
AI4469.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AI4469.See file dsdata.txt to determine how the superseded data were derived.
AI4469_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SMT1733476491(NAD 83)
AI4469_MARKER: Z = SEE DESCRIPTION
AI4469_SETTING: 0 = UNSPECIFIED SETTING
AI4469_MARK LOGO: NONE
AI4469_MAGNETIC: N = NO MAGNETIC MATERIAL
AI4469_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AI4469+STABILITY: POSITION/ELEVATION WELL
AI4469_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AI4469+SATELLITE: SATELLITE OBSERVATIONS - 1998
AI4469 HISTORY      - Date Condition Report By
AI4469 HISTORY      - 1998 MONUMENTED NGS
AI4469
AI4469 STATION DESCRIPTION
AI4469'DESCRIBED BY NATIONAL GEODETIC SURVEY 1998
AI4469'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A
AI4469'CALIFORNIA CORS. INFORMATION ABOUT THE GRM, ANTENNA TYPE
AI4469'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:
AI4469'HTTP://SOPAC.UCS.D.EDU/SCRIPTS/SIMPL.CGI
```

AZU1 Site Information Form (site log)

International GPS Service
See Instructions at:
ftp://igsb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : David Maggert
Date Prepared : 2008-10-03
Report Type : UPDATE
If Update:
Previous Site Log : azul_20080213.log
Modified/Added Sections : 3.4, 3.5

1. Site Identification of the GNSS Monument

Site Name : Azusa
Four Character ID : AZU1
Monument Inscription :
IERS DOMES Number : 49911M001
CDP Number : (A4)
Monument Description : shallow rod/braced antenna mount
Height of the Monument: 1.8
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description :
Date Installed : 1996-07-17T00:00Z
Geologic Characteristic : (BEDROCK/CLAY/CONGLOMERATE/GRAVEL/SAND/etc)
Bedrock Type : (IGNEOUS/METAMORPHIC/SEDIMENTARY)
Bedrock Condition : (FRESH/JOINTED/WEATHERED)
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault Zones Nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network

2. Site Location Information

City or Town : Azusa
State or Province : California
Country : USA
Tectonic Plate : North America Pacific
Approximate Position (ITRF)
X coordinate (m) : -2472979.39
Y coordinate (m) : -4671338.05
Z coordinate (m) : 3558107.76
Latitude (N is +) : +340748.00
Longitude (E is +) : -1175400.00

Elevation (m, ellips.) : 144.75
Additional Information : Located at Azusa High School, L.A. Co.
: Los Angeles County.
: Reference frame used is (ITRF2000).
: Coordinate system used is (WGS84).

3. GNSS Receiver Information

- 3.1 Receiver Type : ROGUE SNR-8000
Satellite System : GPS
Serial Number : T-129
Firmware Version : 3.2 link 03/09/95
Elevation Cutoff Setting: (deg)
Date Installed : 1996-07-17T00:00Z
Date Removed : 1999-01-06T00:00Z
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : Initial measurements.
- 3.2 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03031
Firmware Version : CB00
Elevation Cutoff Setting: 10
Date Installed : 1999-01-06T00:00Z
Date Removed : 1999-06-09T17:00Z
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : Receiver swap.
- 3.3 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP02627
Firmware Version : CC00
Elevation Cutoff Setting: 10
Date Installed : 1999-06-09T17:00Z
Date Removed : 2008-02-12T15:32Z
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : Firmware upgrade for GPS week
: rollover-compliance.
- 3.4 Receiver Type : TRIMBLE NETRS
Satellite System : GPS
Serial Number : 4641123518
Firmware Version : 1.1-2
Elevation Cutoff Setting: 0
Date Installed : 2008-02-12T15:32Z
Date Removed : 2008-10-03T17:31Z
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information :
- 3.5 Receiver Type : TRIMBLE NETRS
Satellite System : GPS
Serial Number : 4611206649
Firmware Version : 1.1-2
Elevation Cutoff Setting: 0
Date Installed : 2008-10-03T17:31Z
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information :

-
- 3.x Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Satellite System : (GPS/GLONASS/GPS+GLONASS)
Serial Number : (A5)
Firmware Version : (A11)
Elevation Cutoff Setting: (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)
4. GPS Antenna Information
- 4.1 Antenna Type : AOAD/M_T
Serial Number : 470
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0814
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : JPLA
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1996-07-17T00:00Z
Date Removed : 2004-08-05T00:00Z
Additional Information : (multiple lines)
- 4.2 Antenna Type : ASH701945B_M
Serial Number : CR19991901
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0814
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : SCIS
Radome Serial Number : 0210
Antenna Cable Type : 9913
Antenna Cable Length : (m)
Date Installed : 2004-08-05T00:00Z
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
- 4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
-

5. Surveyed Local Ties

5.1 Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number: (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number: (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : INTERNAL
Input Frequency : (if external)
Effective Dates : 1996-07-17/CCYY-MM-DD
Notes :

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.1 Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.1 Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)

```
Accuracy (% rel h)      : (% rel h)
Aspiration              : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant     : (m)
Calibration Date       : (CCYY-MM-DD)
Effective Dates        : (CCYY-MM-DD/CCYY-MM-DD)
Notes                  : (multiple lines)

8.1.x Humidity Sensor Model :
Manufacturer           :
Serial Number         :
Data Sampling Interval : (sec)
Accuracy (% rel h)    : (% rel h)
Aspiration            : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant    : (m)
Calibration Date      : (CCYY-MM-DD)
Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
Notes                 : (multiple lines)

8.2.1 Pressure Sensor Model :
Manufacturer           :
Serial Number         :
Data Sampling Interval : (sec)
Accuracy              : (hPa)
Height Diff to Ant    : (m)
Calibration Date      : (CCYY-MM-DD)
Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
Notes                 : (multiple lines)

8.2.x Pressure Sensor Model :
Manufacturer           :
Serial Number         :
Data Sampling Interval : (sec)
Accuracy              : (hPa)
Height Diff to Ant    : (m)
Calibration Date      : (CCYY-MM-DD)
Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
Notes                 : (multiple lines)

8.3.1 Temp. Sensor Model   :
Manufacturer           :
Serial Number         :
Data Sampling Interval : (sec)
Accuracy              : (deg C)
Aspiration            : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant    : (m)
Calibration Date      : (CCYY-MM-DD)
Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
Notes                 : (multiple lines)

8.3.x Temp. Sensor Model   :
Manufacturer           :
Serial Number         :
Data Sampling Interval : (sec)
Accuracy              : (deg C)
Aspiration            : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant    : (m)
Calibration Date      : (CCYY-MM-DD)
Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
Notes                 : (multiple lines)
```

-
- 8.4.1 Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration Date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration Date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 8.5.1 Other Instrumentation : (multiple lines)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
- 8.5.x Other Instrumentation : (multiple lines)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
9. Local Ongoing Conditions Possibly Affecting Computed Position
- 9.1.1 Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.2.1 Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.3.1 Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
10. Local Episodic Effects Possibly Affecting Data Quality
- 10.1 Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)
-

-
- 10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)
11. On-Site, Point of Contact Agency Information
- Agency : UNAVCO
Preferred Abbreviation : UNAVCO
Mailing Address : 6350 Nautilus Dr.
: Boulder, CO 80301 USA
- Primary Contact
Contact Name : Freddy Blume
Telephone (primary) : 303-381-7454
Telephone (secondary) :
Fax : 303-381-7451
E-mail : blume@unavco.org
- Secondary Contact
Contact Name : Michael Jackson
Telephone (primary) : 303-381-7554
Telephone (secondary) :
Fax :
E-mail : jackson@unavco.org
Additional Information :
12. Responsible Agency (if different from 11.)
- Agency : (multiple lines)
Preferred Abbreviation : (A10)
Mailing Address : (multiple lines)
- Primary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
- Secondary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Additional Information : (multiple lines)
13. More Information
Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center : Scripps Orbit and Permanent Array Center
URL For More Information: <http://www.unavco.org>
Hardcopy on File
Site Map : (Y or URL)
Site Diagram : (Y or URL)
Horizon Mask : (Y or URL)
Monument Description : (Y or URL)
Site Pictures : (Y or URL)
Additional Information : (multiple lines)
Antenna Graphics with Dimensions
- (insert text graphic from antenna.gra)
-

CIT1

LATITUDE 34 08 12.13762 LONGITUDE -118 07 38.17666

ELLHGT 216.056m ORTHOHT: 250.0759m

1 National Geodetic Survey, Retrieval Date = JUNE 2, 2009

AI4471 *****

AI4471 DESIGNATION - CIT1 CALTECH CORS ARP

AI4471 PID - AI4471

AI4471 STATE/COUNTY- CA/LOS ANGELES

AI4471 USGS QUAD - PASADENA (1994)

AI4471

AI4471 *CURRENT SURVEY CONTROL

AI4471

AI4471*	NAD 83(2007)-	34 08 12.13762(N)	118 07 38.17666(W)	ADJUSTED
AI4471*	NAVD 88	- 250.1 (meters)	821. (feet)	GPS OBS

AI4471

AI4471	EPOCH DATE	- 2007.00		
AI4471	X	- 2,491,489.500 (meters)		COMP
AI4471	Y	- 4,660,804.572 (meters)		COMP
AI4471	Z	- 3,559,129.041 (meters)		COMP
AI4471	LAPLACE CORR-	2.33 (seconds)		DEFLEC99
AI4471	ELLIP HEIGHT-	216.056 (meters)	(02/10/07)	ADJUSTED
AI4471	GEOID HEIGHT-	-34.04 (meters)		GEOID03

AI4471

AI4471 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----

AI4471	Type	PID	Designation	North	East	Ellip
AI4471	-----	-----	-----	-----	-----	-----
AI4471	NETWORK	AI4471	CIT1 CALTECH CORS ARP	0.00	0.00	0.00
AI4471	-----	-----	-----	-----	-----	-----

AI4471

AI4471 [ITRF positions](#) are available for this station.

AI4471 The horizontal coordinates were established by GPS observations

AI4471 and adjusted by the National Geodetic Survey in February 2007.

AI4471

AI4471 The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

AI4471 See [National Readjustment](#) for more information.

AI4471 The horizontal coordinates are valid at the epoch date displayed above.

AI4471 The epoch date for horizontal control is a decimal equivalence

AI4471 of Year/Month/Day.

AI4471

AI4471 The orthometric height was determined by GPS observations and a

AI4471 high-resolution geoid model.

AI4471

AI4471 The X, Y, and Z were computed from the position and the ellipsoidal ht.

AI4471

AI4471 The Laplace correction was computed from DEFLEC99 derived deflections.

AI4471

AI4471 The ellipsoidal height was determined by GPS observations

AI4471 and is referenced to NAD 83.

AI4471

AI4471 The geoid height was determined by GEOID03.

AI4471

```
AI4471;                                North      East      Units  Scale Factor Converg.
AI4471;SPC CA 5      -   570,634.312 1,988,261.185  MT   0.99997921  -0 04 21.2
AI4471;SPC CA 5      -  1,872,156.07 6,523,153.57  sFT   0.99997921  -0 04 21.2
AI4471;UTM 11        -  3,777,887.528 396,063.495  MT   0.99973316  -0 37 57.5
AI4471
AI4471!              - Elev Factor x Scale Factor = Combined Factor
AI4471!SPC CA 5      -   0.99996608 x 0.99997921 = 0.99994529
AI4471!UTM 11        -   0.99996608 x 0.99973316 = 0.99969925
AI4471
```

```
AI4471                                SUPERSEDED SURVEY CONTROL
AI4471
AI4471  NAD 83(1998)- 34 08 12.13192(N)    118 07 38.17080(W) AD(2000.35) A
AI4471  ELLIP H (04/03/01) 216.060 (m)      GP(2000.35) 1 1
AI4471  NAD 83(1998)- 34 08 12.13006(N)    118 07 38.16897(W) AD(1998.50) A
AI4471  ELLIP H (04/06/00) 216.050 (m)      GP(1998.50) 3 1
AI4471
AI4471.Superseded values are not recommended for survey control.
AI4471.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AI4471.See file dsdata.txt to determine how the superseded data were derived.
AI4471
AI4471_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SLT9606377888(NAD 83)
AI4471_MARKER: Z = SEE DESCRIPTION
AI4471_SETTING: 0 = UNSPECIFIED SETTING
AI4471_MARK LOGO: NONE
AI4471_MAGNETIC: N = NO MAGNETIC MATERIAL
AI4471_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AI4471+STABILITY: POSITION/ELEVATION WELL
AI4471_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AI4471+SATELLITE: SATELLITE OBSERVATIONS - 1998
AI4471
AI4471  HISTORY      - Date      Condition      Report By
AI4471  HISTORY      - 1998      MONUMENTED      NGS
AI4471
AI4471                                STATION DESCRIPTION
AI4471
AI4471'DESCRIBED BY NATIONAL GEODETIC SURVEY 1998
AI4471'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A
AI4471'CALIFORNIA CORS. INFORMATION ABOUT THE GRM, ANTENNA TYPE
AI4471'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:
AI4471'HTTP://SOPAC.UCSD.EDU/SCRIPTS/SIMPL.CGI
```

CIT1 Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igscb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : David Maggert
Date Prepared : 2008-09-19
Report Type : UPDATE
If Update:
Previous Site Log : cit1_20080513.log
Modified/Added Sections : 3.9, 3.10

1. Site Identification of the GNSS Monument

Site Name : Caltech
Four Character ID : CIT1
Monument Inscription :
IERS DOMES Number : 40400S201
CDP Number :
Monument Description : wall
Height of the Monument : (m)
Monument Foundation : ROOF
Foundation Depth : (m)
Marker Description : (CHISELLED CROSS/DIVOT/BRASS NAIL/etc)
Date Installed : 1994-09-01
Geologic Characteristic : (BEDROCK/CLAY/CONGLOMERATE/GRAVEL/SAND/etc)
Bedrock Type : (IGNEOUS/METAMORPHIC/SEDIMENTARY)
Bedrock Condition : (FRESH/JOINTED/WEATHERED)
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : Southern California Integrated GPS Network
- :
: SCIGN.

2. Site Location Information

City or Town : Pasadena
State or Province : California
Country : USA
Tectonic Plate : Pacific
Approximate Position (ITRF)
X coordinate (m) : -2491614.48294808
Y coordinate (m) : -4660504.50319449
Z coordinate (m) : 3559431.18764722
Latitude (N is +) : +340824.00
Longitude (E is +) : -1180748.00
Elevation (m,ellips.) : 215.36
Additional Information : Los Angeles County. Reference frame used is
: (ITRF2000). Coordinate system used is
(WGS84).

3. GNSS Receiver Information

- 3.1 Receiver Type : ROGUE SNR-8000
Satellite System : GPS
Serial Number : 326
Firmware Version : 2.8.32.1x-93/07/08 17:10:28
Elevation Cutoff Setting : deg
Date Installed : 1994-09-01
Date Removed : 1994-10-12
Temperature Stabiliz. : none
Additional Information : Initial measurements.
- 3.2 Receiver Type : ROGUE SNR-8000
Satellite System : GPS
Serial Number : 326
Firmware Version : 3.0 1994 10/10 17:01:54
Elevation Cutoff Setting : deg
Date Installed : 1994-10-12
Date Removed : 1995-03-02
Temperature Stabiliz. : none
Additional Information : Firmware upgrade.
- 3.3 Receiver Type : ROGUE SNR-8000
Satellite System : GPS
Serial Number : 326
Firmware Version : 3.2 link 03/02/95
Elevation Cutoff Setting : deg
Date Installed : 1995-03-02
Date Removed : 1995-03-16
Temperature Stabiliz. : none
Additional Information : Firmware upgrade.
- 3.4 Receiver Type : ROGUE SNR-8000
Satellite System : GPS
Serial Number : 326
Firmware Version : 3.2 link 03/09/95
Elevation Cutoff Setting : deg
Date Installed : 1995-03-16
Date Removed : 1995-05-12
Temperature Stabiliz. : none
Additional Information : Firmware upgrade.
- 3.5 Receiver Type : ROGUE SNR-8000
Satellite System : GPS
Serial Number : T-337
Firmware Version : 3.2 link 03/09/95
Elevation Cutoff Setting : deg
Date Installed : 1995-05-12
Date Removed : 1998-12-18
Temperature Stabiliz. : none
Additional Information : ASHTECH Z-XII3
- 3.6 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
-

```
Serial Number      : LP02915
Firmware Version   : CB00-1D02
Elevation Cutoff Setting : deg
Date Installed     : 1998-12-18
Date Removed      : 1999-06-28
Temperature Stabiliz. : none
Additional Information : Receiver swap. Continuing use of Dorne
Margolin
UT
                    : T Ant. Antenna cable swap 26-FEB-1999 00:07

3.7 Receiver Type   : ASHTECH Z-XII3
   Satellite System : GPS
   Serial Number    : LP02915
   Firmware Version : CC00
   Elevation Cutoff Setting : 10 deg
   Date Installed   : 1999-06-28
   Date Removed    : 2006-02-03
   Temperature Stabiliz. : none
   Additional Information : Firmware upgrade for GPS week
                        : rollover-compliance.

3.8 Receiver Type   : ASHTECH Z-XII3
   Satellite System : GPS
   Serial Number    : LP03314
   Firmware Version : CC00
   Elevation Cutoff Setting : deg
   Date Installed   : 2006-02-03
   Date Removed    : 2007-11-30
   Temperature Stabiliz. : none
   Additional Information : (multiple lines)

3.9 Receiver Type   : ASHTECH Z-XII3
   Satellite System : GPS
   Serial Number    : LP02774
   Firmware Version : CC00
   Elevation Cutoff Setting : deg
   Date Installed   : 2007-11-30
   Date Removed    : 2008-09-11
   Temperature Stabiliz. : none
   Additional Information : (multiple lines)

3.10 Receiver Type  : ASHTECH Z-XII3
   Satellite System  : GPS
   Serial Number     : LP03196
   Firmware Version  : CC00
   Elevation Cutoff Setting : deg
   Date Installed    : 2008-09-11
   Date Removed     : (CCYY-MM-DDThh:mmZ)
   Temperature Stabiliz. : none
   Additional Information : (multiple lines)

3.x Receiver Type   : (A20, from rcvr_ant.tab; see instructions)
   Satellite System  : (GPS/GLONASS/GPS+GLONASS)
   Serial Number     : (A5)
```

Firmware Version : (A11)
Elevation Cutoff Setting : (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type : AOAD/M_T NONE
Serial Number : 161
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : NONE
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1994-09-01
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : High gain/low noise amplifier with RFI

filters

4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in
SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see
instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5. Surveyed Local Ties

5.1 Tied Marker Name : NONE
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)

Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.2.x Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)

Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.3.x Temp. Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (deg C)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.5.x Other Instrumentation : (multiple lines)

9. Local Ongoing Conditions Possibly Affecting Computed Position

9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

10. Local Episodic Effects Possibly Affecting Data Quality

10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)

11. On-Site, Point of Contact Agency Information

Agency : USGS
Preferred Abbreviation : USGS
Mailing Address :
:
Primary Contact
Contact Name : Nancy King
Telephone (primary) : 626-583-7815

Telephone (secondary) :
Fax : 626-583-7827
E-mail : nking@usgs.gov
Secondary Contact
Contact Name : Keith Stark
Telephone (primary) : 818-438-6224
Telephone (secondary) :
Fax :
E-mail : stark@dukester.com
Additional Information : (multiple lines)

12. Responsible Agency (if different from 11.)

Agency :
Preferred Abbreviation : (A10)
Mailing Address :
Primary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Secondary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Additional Information : (multiple lines)

13. More Information

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center : Scripps Orbit and Permanent Array Center
URL for More Information : <http://www.unavco.org>
Hardcopy on File
Site Map : Y
Site Diagram : Y
Horizon Mask : Y
Monument Description : Y
Site Pictures : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

AOAD/M_T

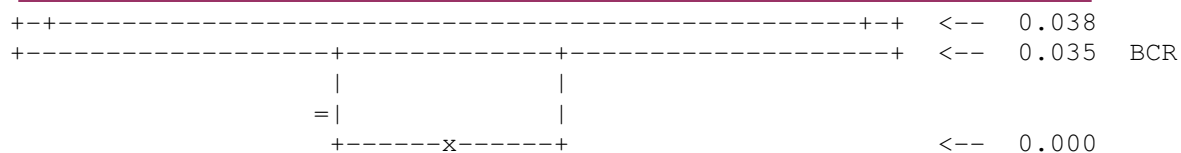
	/	+	\
		+	
+	-----	+	

<--	0.128	L2
<--	0.110	L1
<--	0.102	TCR



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com



BPA=ARP

<-- 0.381 -->

ARP: Antenna Reference Point

L1 : L1 Phase Center

TCR: Top of Choking

TGP: Top of Ground Plane

TPA: Top of Preamplifier

TOP: Top of Pole

L2 : L2 Phase Center

BCR: Bottom of Choking

BGP: Bottom of Ground Plane

BPA: Bottom of Preamplifier

CVHS

LATITUDE 34 04 55.22616 LONGITUDE -117 54 06.13191

ELLHGT 119.808m ORTHOHGT: 153.8123m

1 National Geodetic Survey, Retrieval Date = JUNE 2, 2009

AI4485 *****

AI4485 DESIGNATION - CVHS COVINA HS CORS GRM

AI4485 PID - AI4485

AI4485 STATE/COUNTY- CA/LOS ANGELES

AI4485 USGS QUAD - BALDWIN PARK (1981)

AI4485

AI4485 *CURRENT SURVEY CONTROL

AI4485

AI4485*	NAD 83(2007)-	34 04 55.22616(N)	117 54 06.13191(W)	ADJUSTED
AI4485*	NAVD 88 -	153.9 (meters)	505. (feet)	GPS OBS

AI4485

AI4485	EPOCH DATE -	2007.00		
AI4485	X -	-2,474,676.016 (meters)		COMP
AI4485	Y -	-4,673,513.699 (meters)		COMP
AI4485	Z -	3,554,051.401 (meters)		COMP
AI4485	LAPLACE CORR-	4.74 (seconds)		DEFLEC99
AI4485	ELLIP HEIGHT-	119.808 (meters)	(02/10/07)	ADJUSTED
AI4485	GEOID HEIGHT-	-34.03 (meters)		GEOID03

AI4485

AI4485 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----

AI4485	Type	PID	Designation	North	East	Ellip
AI4485	-----					
AI4485	NETWORK	AI4485	CVHS COVINA HS CORS GRM	0.00	0.00	0.00
AI4485	-----					

AI4485

AI4485. [ITRF positions](#) are available for this station.

AI4485. The horizontal coordinates were established by GPS observations

AI4485. and adjusted by the National Geodetic Survey in February 2007.

AI4485

AI4485. The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

AI4485. See [National Readjustment](#) for more information.

AI4485. The horizontal coordinates are valid at the epoch date displayed above.

AI4485. The epoch date for horizontal control is a decimal equivalence

AI4485. of Year/Month/Day.

AI4485

AI4485. The orthometric height was determined by GPS observations and a

AI4485. high-resolution geoid model.

AI4485

AI4485. The X, Y, and Z were computed from the position and the ellipsoidal ht.

AI4485

AI4485. The Laplace correction was computed from DEFLEC99 derived deflections.

AI4485

AI4485. The ellipsoidal height was determined by GPS observations

AI4485. and is referenced to NAD 83.

AI4485

AI4485. The geoid height was determined by GEOID03.

AI4485

AI4485;		North	East	Units	Scale Factor	Converg.
AI4485;SPC CA 5	-	564,564.112	2,009,072.289	MT	0.99998981	+0 03 21.7
AI4485;SPC CA 5	-	1,852,240.76	6,591,431.33	sFT	0.99998981	+0 03 21.7
AI4485;UTM 11	-	3,771,615.695	416,808.472	MT	0.99968531	-0 30 19.2

AI4485

AI4485!	-	Elev Factor	x	Scale Factor	=	Combined Factor
AI4485!SPC CA 5	-	0.99998119	x	0.99998981	=	0.99997100

AI4485!UTM 11 - 0.99998119 x 0.99968531 = 0.99966651
AI4485

AI4485 SUPERSEDED SURVEY CONTROL

AI4485
AI4485 NAD 83(1998)- 34 04 55.22054(N) 117 54 06.12578(W) AD(2000.35) A
AI4485 ELLIP H (04/03/01) 119.831 (m) GP(2000.35) 1 1
AI4485 NAD 83(1998)- 34 04 55.21860(N) 117 54 06.12361(W) AD(1998.50) A
AI4485 ELLIP H (04/06/00) 119.841 (m) GP(1998.50) 3 1

AI4485

AI4485.Superseded values are not recommended for survey control.

AI4485.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

AI4485.[See file dsdata.txt](#) to determine how the superseded data were derived.

AI4485

AI4485_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SMT1680871616(NAD 83)

AI4485_MARKER: Z = SEE DESCRIPTION

AI4485_SETTING: 0 = UNSPECIFIED SETTING

AI4485_MARK LOGO: NONE

AI4485_MAGNETIC: N = NO MAGNETIC MATERIAL

AI4485_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

AI4485+STABILITY: POSITION/ELEVATION WELL

AI4485_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AI4485+SATELLITE: SATELLITE OBSERVATIONS - 1998

AI4485

AI4485	HISTORY	- Date	Condition	Report By
--------	---------	--------	-----------	-----------

AI4485	HISTORY	- 1998	MONUMENTED	NGS
--------	---------	--------	------------	-----

AI4485

AI4485 STATION DESCRIPTION

AI4485

AI4485'DESCRIBED BY NATIONAL GEODETIC SURVEY 1998

AI4485'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A

AI4485'CALIFORNIA CORS. INFORMATION ABOUT THE GRM, ANTENNA TYPE

AI4485'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:

AI4485'HTTP://SOPAC.UCSD.EDU/SCRIPTS/SIMPL.CGI

CVHS Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igsch.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : Susan Jeffries
Date Prepared : 2009-03-18
Report Type : UPDATE
If Update:
Previous Site Log : cvhs_20080221.log
Modified/Added Sections : (n.n,n.n,...)

1. Site Identification of the GNSS Monument

Site Name : Covina H.S.
Four Character ID : CVHS
Monument Inscription :
IERS DOMES Number : 49921M001
CDP Number :
Monument Description : Wyatt/Agnew drilled-braced
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : Top of center support screw on SCIGN antenna
adaptor
Date Installed : 1998-07-25
Geologic Characteristic : ALLUVIAL SILT AND SAND DEPOSITS
Bedrock Type : N/A
Bedrock Condition : N/A
Fracture Spacing : N/A
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network. Monument is Wyatt-type drilled-braced
Geodetic Monument composed of stainless steel
supports and new SCIGN antenna adaptor. Fixed
antenna height is 0.0083 m. A secondary
measurement, the adaptor/divot distance, taken
from the bottom of the lower adaptor plate to
the center of a divot drill-mark on the
north-facing tripod leg, is not yet measured.

2. Site Location Information

City or Town : Covina
State or Province : California
Country : USA
Tectonic Plate : Pacific
Approximate Position (ITRF)
X coordinate (m) : -2474595.1841
Y coordinate (m) : -4673697.0063
Z coordinate (m) : 3553866.5831
Latitude (N is +) : +340448.00
Longitude (E is +) : -1175400.00
Elevation (m,ellips.) : 119.09
Additional Information : Los Angeles County. Reference frame used is
(ITRF2000). Coordinate system used is (WGS84).

3. GNSS Receiver Information

- 3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03021
Firmware Version : 1F50
Elevation Cutoff Setting : deg
Date Installed : 1998-07-24
Date Removed : 1999-01-25
Temperature Stabiliz. : none
Additional Information : Initial measurements.
- 3.2 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03097
Firmware Version : CB00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-01-25
Date Removed : 1999-07-01
Temperature Stabiliz. : none
Additional Information : Receiver swap. Prior unit suffered from DC power overload.
- 3.3 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03097
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-07-01
Date Removed : 2009-03-18
Temperature Stabiliz. : none
Additional Information : Firmware upgrade for GPS week rollover-compliance.
- 3.4 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03055
Firmware Version : CC00
Elevation Cutoff Setting : 0 deg
Date Installed : 2009-03-18
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : none
Additional Information : (multiple lines)
- 3.x Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Satellite System : (GPS/GLONASS/GPS+GLONASS)
Serial Number : (A5)
Firmware Version : (A11)
Elevation Cutoff Setting : (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

- 4.1 Antenna Type : ASH700936E_C NONE
Serial Number : CR14608

```
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : NONE
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1998-07-24
Date Removed : 1999-07-21
Additional Information : ASH700936E_C

4.2 Antenna Type : ASH700936E_C SCIS
Serial Number : CR14608
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCIS
Radome Serial Number : ???
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1999-07-21
Date Removed : 1999-07-22
Additional Information : Antenna height is fixed and measured from the
                        : raised nipple on the lower part of the antenna
                        : adaptor (peak of center support screw) to the
                        : BPA. temporary short dome (forgot to note S/N
                        : of dome) - KWH

4.3 Antenna Type : ASH701945B_M SCIT
Serial Number : CR519991783
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCIT
Radome Serial Number : 049
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1999-07-22
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
```

5. Surveyed Local Ties

5.1 Tied Marker Name : NONE
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)

8.2.x Pressure Sensor Model :

Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)

8.3.x Temp. Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (deg C)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)

8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : - dd-MMM-yyy
Notes : (multiple lines)

8.5.x Other Instrumentation : (multiple lines)

9. Local Ongoing Conditions Possibly Affecting Computed Position

9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

10. Local Episodic Effects Possibly Affecting Data Quality

10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)

11. On-Site, Point of Contact Agency Information

Agency : USGS
Preferred Abbreviation : USGS
Mailing Address :
:
Primary Contact
Contact Name : Nancy King
Telephone (primary) : 626-583-7815
Telephone (secondary) :
Fax : 626-583-7827

```

E-mail                : nking@usgs.gov
Secondary Contact
Contact Name          : Keith Stark
Telephone (primary)   : 818-438-6224
Telephone (secondary) :
Fax                   :
E-mail                : stark@dukester.com
Additional Information : (multiple lines)

```

12. Responsible Agency (if different from 11.)

```

Agency                :
Preferred Abbreviation : (A10)
Mailing Address        :
Primary Contact
Contact Name           :
Telephone (primary)    :
Telephone (secondary)  :
Fax                    :
E-mail                 :
Secondary Contact
Contact Name           :
Telephone (primary)    :
Telephone (secondary)  :
Fax                    :
E-mail                 :
Additional Information  : (multiple lines)

```

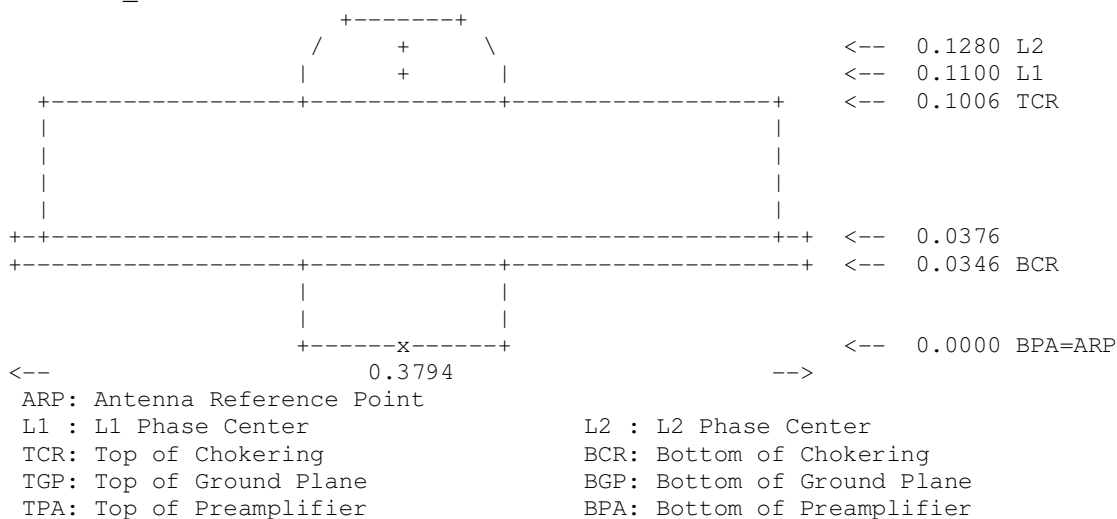
13. More Information

```

Primary Data Center    : UNAVCO Boulder Facility Archive
Secondary Data Center  :
URL for More Information : http://www.unavco.org
Hardcopy on File
Site Map               : Y
Site Diagram           : Y
Horizon Mask           : Y
Monument Description   : Y
Site Pictures          : Y
Additional Information  : (multiple lines)
Antenna Graphics with Dimensions

```

ASH701945B_M





8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

TOP: Top of Pole

GVRs

LATITUDE 34 02 50.79454 LONGITUDE -118 06 46.36714
ELLHGT 155.226m ORTHOHGT: 190.0475m

SIMpl Site Location Manager

Page 1 of 1

Site Metadata Type : Site Location	
Site : gvr0000	
SIM User : anonymous ?	
City or Town	Monterey Park
State or Province	California
Country	USA
Tectonic Plate	Pacific
X coordinate (m)	-2492911.03
Y coordinate (m)	-4666279.72
Z coordinate (m)	3550895.03
* Reference Frame	itrf2005
* Position Source	OPERATIONAL WEEKLY GLOBK
Latitude (N is +) (deg)	34.04745
Longitude (E is +) (deg)	-118.11289
Elevation (m)	154.5139
* Geodetic Datum	wgs84
* Position Source	OPERATIONAL WEEKLY GLOBK
Additional Information	Los Angeles County. Reference frame used is (ITRF2000). Coordinate system used is (WGS84).
* County	Los Angeles
* Directions	
* Street Address	
* Thomas Brothers	636, C4
Grid	
* USGS Quadrangle	El Monte

* DENOTES information not present in a standard IGS log file.

DENOTES fields reserved for secured access users only.



Site Name	Garvey Reservoir
Four Character ID	gvrs
* National Geodetic Survey (NGS) PID	
Type of Site	Continuously Operating GPS
* Network	SCIGN
Affiliation	
Monument	
Inscription	
IERS DOMES Number	49827M002
CDP Number	
Monument Description	Wyatt/Agnew drilled-braced
Height of the Monument (m)	
Monument (m)	n/a
Foundation Monument (m)	
Foundation Depth (m)	
Marker Description	Top of center support screw on SCIGN D3 antenna adaptor
Effective Date	08/03/2000
Geologic Characteristic	Bedrock
Bedrock Type	Sedimentary
Bedrock Condition	Weathered
Fracture Spacing	
Nearby Faults	
Nearby Fault Activity	
Additional Information	SCIGN - Southern California Integrated GPS Network
* Geologic Notes	Site located near head of mapped shallow landslide. Site may also experience
* Antenna	D3 SCIGN

Adaptor Type
 * Antenna 0208
 Adaptor Serial _____
 Number _____
 * Antenna
 Adaptor Divot
 Distance (m)
 * Update
 Reason
 * * Site
 Evaluation
 Report
 * * Site
 Construction
 Report
 * EarthPliocene
 Materials
 * EarthPoorly stratified to massive, poorly indurated siltstone bedrock of the
 Materials Fernando Formation. Moderately indurated, subrounded to
 Comments subangular, fine to medium grained gravel beds occur within this
 formation. There should be little, if any, artificial fill.
 * Field Notes
 Author
 * Field
 Notes
 * ConstructionThe enclosure was mounted on a 4-inch mast at 6-feet above grade.
 Summary Solar panels were installed facing south and angled at 45 degrees.
 An antenna trench was dug a distance of 20-feet from the mast to
 the monument. 1-inch conduit was laid in the trench and the trench
 was backfilled and compacted. The end connector was soldered. A
 2-way radio with Yagi antenna was mounted on top of the 4-inch
 mast and pointed north. Coax cable in a 1/2-inch liquid tight conduit
 was run. RNS connectors were installed.
 * AdditionalThe western terminus of the Whittier fault has been mapped
 Geologic approximately 1 km to the east-northeast of the reservoir. Garvey
 Information Reservoir is sitting atop a growing anticline. Tensional cracks at the
 crest of the anticline were exacerbated during the 1987 Whittier
 Narrows earthquake, resulting in structural damage to the reservoir.
 As a result, the reservoir was drained. The reservoir was recently
 relined and tested in April 1998. Partial filling in April resulted in
 approximately 20 mm of subsidence (Chris Hill, Safety of Dams,
 personal communication). The reservoir will be placed back in
 operation in approximately 6 months, when the dam will be filled to
 mid-capacity. Fluctuations from this level are anticipated to be in the
 order of 10 to 15 feet. Mr. Hill believes that ECIUs recommended
 location will respond to these water level fluctuations more than the
 site on the East would. Survey data should be available from MWD
 if needed.
 * Boring Log 1 Alluvium?, sandy loam with pebbles, grayish brown (dry), dark
 (m) 1 grayish brown (wet), slightly sticky and nonplastic wet
 2
 3
 4
 5 sandy gravely clay

* DENOTES information not present in a standard IGS log file.

GVRS Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igscb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : Susan Jeffries
Date Prepared : 2008-02-22
Report Type : UPDATE
If Update:
Previous Site Log : gvrs_20071119.log
Modified/Added Sections : (n.n,n.n,...)

1. Site Identification of the GNSS Monument

Site Name : Garvey Reservoir
Four Character ID : GVRS
Monument Inscription :
IERS DOMES Number : 49827M002
CDP Number :
Monument Description : Wyatt/Agnew drilled-braced
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : Top of center support screw on SCIGN D3
antenna : adaptor
Date Installed : 2000-08-03
Geologic Characteristic : Bedrock
Bedrock Type : Sedimentary
Bedrock Condition : Weathered
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network

2. Site Location Information

City or Town : Monterey Park
State or Province : California
Country : USA
Tectonic Plate : Pacific
Approximate Position (ITRF)
X coordinate (m) : -2492600.61162833
Y coordinate (m) : -4666265.80950293
Z coordinate (m) : 3551129.70497418
Latitude (N is +) : +340300.00
Longitude (E is +) : -1180636.00

Elevation (m,ellips.) : 154.55
Additional Information : Los Angeles County. Reference frame used is
(WGS84). : (ITRF2000). Coordinate system used is

3. GNSS Receiver Information

3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP02918
Firmware Version : CD00
Elevation Cutoff Setting : 10 deg
Date Installed : 2000-08-04
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : none
Additional Information : Initial measurements. Sampling interval set
to : 120 seconds until telemetry established.

3.x Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Satellite System : (GPS/GLONASS/GPS+GLONASS)
Serial Number : (A5)
Firmware Version : (A11)
Elevation Cutoff Setting : (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type : ASH701945B_M SCIT
Serial Number : CR519991802
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCIT
Radome Serial Number : 0117
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 2000-08-04
Date Removed : 2006-06-07
Additional Information :

4.2 Antenna Type : ASH701945B_M SCIT
Serial Number : CR51991747
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCIT
Radome Serial Number : 0117

```
Antenna Cable Type      : (vendor & type number)
Antenna Cable Length    : (m)
Date Installed          : 2006-06-07
Date Removed            : (CCYY-MM-DDThh:mmZ)
Additional Information   : (multiple lines)

4.x Antenna Type        : (A20, from rcvr_ant.tab; see instructions)
   Serial Number        : (A*, but note the first A5 is used in
SINEX)
   Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see
instr.)
   Marker->ARP Up Ecc. (m) : (F8.4)
   Marker->ARP North Ecc(m): (F8.4)
   Marker->ARP East Ecc(m) : (F8.4)
   Alignment from True N  : (deg; + is clockwise/east)
   Antenna Radome Type    : (A4 from rcvr_ant.tab; see instructions)
   Radome Serial Number   :
   Antenna Cable Type     : (vendor & type number)
   Antenna Cable Length   : (m)
   Date Installed         : (CCYY-MM-DDThh:mmZ)
   Date Removed           : (CCYY-MM-DDThh:mmZ)
   Additional Information  : (multiple lines)

5.   Surveyed Local Ties

5.1 Tied Marker Name      : NONE
   Tied Marker Usage      : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
   Tied Marker CDP Number : (A4)
   Tied Marker DOMES Number : (A9)
   Differential Components from GNSS Marker to the tied monument (ITRS)
     dx (m)                : (m)
     dy (m)                : (m)
     dz (m)                : (m)
   Accuracy (mm)          : (mm)
   Survey method          : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
   Date Measured          : (CCYY-MM-DDThh:mmZ)
   Additional Information  : (multiple lines)

5.x Tied Marker Name      :
   Tied Marker Usage      : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
   Tied Marker CDP Number : (A4)
   Tied Marker DOMES Number : (A9)
   Differential Components from GNSS Marker to the tied monument (ITRS)
     dx (m)                : (m)
     dy (m)                : (m)
     dz (m)                : (m)
   Accuracy (mm)          : (mm)
   Survey method          : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
   Date Measured          : (CCYY-MM-DDThh:mmZ)
   Additional Information  : (multiple lines)

6.   Frequency Standard
```

-
- 6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
7. Collocation Information
- 7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
8. Meteorological Instrumentation
- 8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)
- 8.2.x Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)
- 8.3.x Temp. Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (deg C)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)
- 8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
-

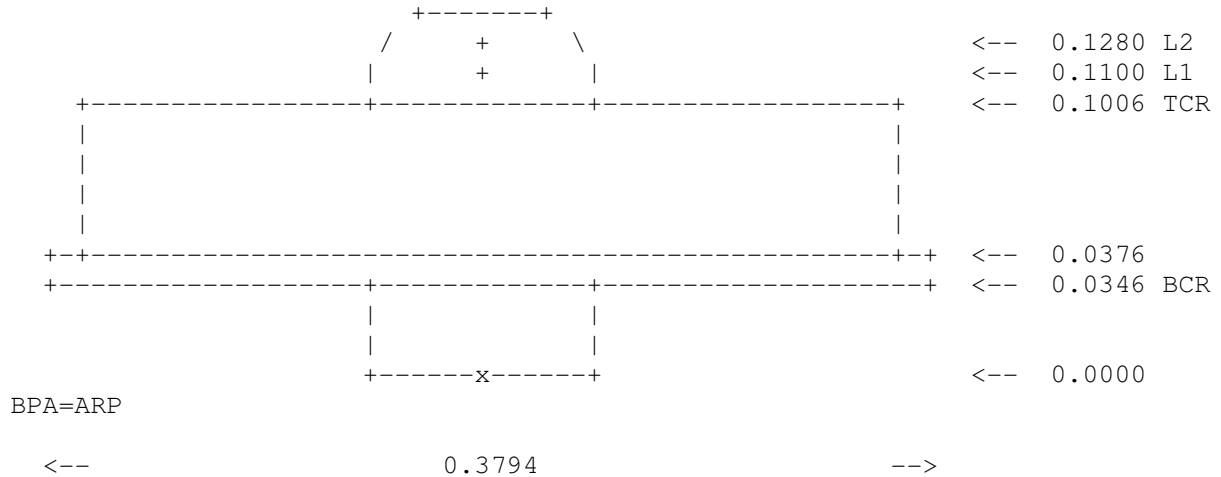
-
- Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : - dd-MMM-yyy
Notes : (multiple lines)
- 8.5.x Other Instrumentation : (multiple lines)
9. Local Ongoing Conditions Possibly Affecting Computed Position
- 9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
10. Local Episodic Effects Possibly Affecting Data Quality
- 10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)
11. On-Site, Point of Contact Agency Information
- Agency : USGS
Preferred Abbreviation : USGS
Mailing Address :
:
Primary Contact
Contact Name : Nancy King
Telephone (primary) : 626-583-7815
Telephone (secondary) :
Fax : 626-583-7827
E-mail : nking@usgs.gov
Secondary Contact
Contact Name : Keith Stark
Telephone (primary) : 818-438-6224
Telephone (secondary) :
Fax :
E-mail : stark@dukester.com
Additional Information : (multiple lines)
12. Responsible Agency (if different from 11.)
- Agency :
Preferred Abbreviation : (A10)
Mailing Address :
Primary Contact
Contact Name :
Telephone (primary) :
-

Telephone (secondary) :
Fax :
E-mail :
Secondary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Additional Information : (multiple lines)

13. More Information

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center :
URL for More Information : <http://www.unavco.org>
Hardcopy on File
Site Map : Y
Site Diagram : Y
Horizon Mask : Y
Monument Description : Y
Site Pictures : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

ASH701945B_M
ASH701945C_M
ASH701945D_M
ASH701945E_M



ARP: Antenna Reference Point
L1 : L1 Phase Center
TCR: Top of Choking
TGP: Top of Ground Plane
TPA: Top of Preamplifier
TOP: Top of Pole

L2 : L2 Phase Center
BCR: Bottom of Choking
BGP: Bottom of Ground Plane
BPA: Bottom of Preamplifier

LEEP

LATITUDE 34 08 04.54995 LONGITUDE -118 19 18.26664

ELLHGT 485.747m ORTHOHGT: 520.4171m

1 National Geodetic Survey, Retrieval Date = JUNE 2, 2009

AI4492 *****

AI4492 DESIGNATION - LEEP MT LEE CORS GRM

AI4492 PID - AI4492

AI4492 STATE/COUNTY- CA/LOS ANGELES

AI4492 USGS QUAD - BURBANK (1994)

AI4492

AI4492 *CURRENT SURVEY CONTROL

AI4492

AI4492*	NAD 83(2007)-	34 08 04.54995(N)	118 19 18.26664(W)	ADJUSTED
AI4492*	NAVD 88 -	520.3 (meters)	1707. (feet)	GPS OBS

AI4492

AI4492	EPOCH DATE -	2007.00		
AI4492	X -	-2,507,462.653 (meters)		COMP
AI4492	Y -	-4,652,633.300 (meters)		COMP
AI4492	Z -	3,559,086.854 (meters)		COMP
AI4492	LAPLACE CORR-	4.13 (seconds)		DEFLEC99
AI4492	ELLIP HEIGHT-	485.747 (meters)	(02/10/07)	ADJUSTED
AI4492	GEOID HEIGHT-	-34.54 (meters)		GEOID03

AI4492

AI4492 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----

AI4492	Type	PID	Designation	North	East	Ellip
AI4492	-----	-----	-----	-----	-----	-----
AI4492	NETWORK	AI4492	LEEP MT LEE CORS GRM	0.00	0.00	0.00
AI4492	-----	-----	-----	-----	-----	-----

AI4492

AI4492. [ITRF positions](#) are available for this station.

AI4492. The horizontal coordinates were established by GPS observations

AI4492. and adjusted by the National Geodetic Survey in February 2007.

AI4492

AI4492. The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

AI4492. See [National Readjustment](#) for more information.

AI4492. The horizontal coordinates are valid at the epoch date displayed above.

AI4492. The epoch date for horizontal control is a decimal equivalence

AI4492. of Year/Month/Day.

AI4492

AI4492. The orthometric height was determined by GPS observations and a

AI4492. high-resolution geoid model.

AI4492

AI4492. The X, Y, and Z were computed from the position and the ellipsoidal ht.

AI4492

AI4492. The Laplace correction was computed from DEFLEC99 derived deflections.

AI4492

AI4492. The ellipsoidal height was determined by GPS observations

AI4492. and is referenced to NAD 83.

AI4492

AI4492. The geoid height was determined by GEOID03.

AI4492

AI4492;		North	East	Units	Scale	Factor	Converg.
AI4492;SPC	CA 5	- 570,440.586	1,970,323.671	MT	0.99997960	-0 11	00.2
AI4492;SPC	CA 5	- 1,871,520.49	6,464,303.58	sFT	0.99997960	-0 11	00.2
AI4492;UTM	11	- 3,777,868.892	378,128.926	MT	0.99978309	-0 44	30.4

AI4492

AI4492!	-	Elev Factor	x	Scale Factor	=	Combined Factor
AI4492!SPC CA 5	-	0.99992375	x	0.99997960	=	0.99990335
AI4492!UTM 11	-	0.99992375	x	0.99978309	=	0.99970686

AI4492

AI4492 SUPERSEDED SURVEY CONTROL

AI4492
AI4492 NAD 83(1998)- 34 08 04.54406(N) 118 19 18.26022(W) AD(2000.35) A
AI4492 ELLIP H (04/03/01) 485.767 (m) GP(2000.35) 1 1
AI4492 NAD 83(1998)- 34 08 04.54203(N) 118 19 18.25834(W) AD(1998.50) A
AI4492 ELLIP H (04/06/00) 485.761 (m) GP(1998.50) 3 1
AI4492

AI4492.Superseded values are not recommended for survey control.

AI4492.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

AI4492.[See file dsdata.txt](#) to determine how the superseded data were derived.

AI4492

AI4492_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SLT7812977869(NAD 83)

AI4492_MARKER: Z = SEE DESCRIPTION

AI4492_SETTING: 0 = UNSPECIFIED SETTING

AI4492_MARK LOGO: NONE

AI4492_MAGNETIC: N = NO MAGNETIC MATERIAL

AI4492_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

AI4492+STABILITY: POSITION/ELEVATION WELL

AI4492_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AI4492+SATELLITE: SATELLITE OBSERVATIONS - 1998

AI4492

AI4492 HISTORY	-	Date	Condition	Report By
----------------	---	------	-----------	-----------

AI4492 HISTORY	-	1998	MONUMENTED	NGS
----------------	---	------	------------	-----

AI4492

AI4492 STATION DESCRIPTION

AI4492

AI4492'DESCRIBED BY NATIONAL GEODETIC SURVEY 1998

AI4492'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A

AI4492'CALIFORNIA CORS. INFORMATION ABOUT THE GRM, ANTENNA TYPE

AI4492'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:

AI4492'HTTP://SOPAC.UCSD.EDU/SCRIPTS/SIMPL.CGI

LEEP Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igscb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : David Maggert

Date Prepared : 2009-05-04

Report Type : UPDATE

If Update:

Previous Site Log : leep_20080514.log

Modified/Added Sections : 3.5, 3.6, 11

1. Site Identification of the GNSS Monument

Site Name : Mt. Lee
Four Character ID : LEEP
Monument Inscription :
IERS DOMES Number : 49902M001
CDP Number :
Monument Description : shallow rod/braced antenna mount
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : Filled notch in vertical rod
Date Installed : 1995-04-06
Geologic Characteristic : Topanga Fm: conglomerate (poorly indurated
matrix with coarse cobbles)
Bedrock Type : (IGNEOUS/METAMORPHIC/SEDIMENTARY)
Bedrock Condition : (FRESH/JOINTED/WEATHERED)
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network. Monument is driven-rod braced type

with

: 3/4" stainless rods driven to refusal with

a

: Whacker drill to varied depths, then welded
together.

2. Site Location Information

City or Town : Hollywood
State or Province : California
Country : USA
Tectonic Plate : North American
Approximate Position (ITRF)
X coordinate (m) : -2507463.3769
Y coordinate (m) : -4652631.9932
Z coordinate (m) : 3559086.80534
Latitude (N is +) : +340804.56
Longitude (E is +) : -1181918.32
Elevation (m, ellips.) : 485.0517
Additional Information : Los Angeles County. Reference frame used is
: (ITRF2000). Coordinate system used is

(WGS84).

3. GNSS Receiver Information

3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : 04374
Firmware Version : NAV 1E24 CHN 1C70
Elevation Cutoff Setting : deg

Date Installed : 1995-04-06
Date Removed : 1996-09-23
Temperature Stabiliz. : none
Additional Information : First measurements; (USGS Property #G-615681)

3.2 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : 04374
Firmware Version : NAV 1E95 CHN 1D01
Elevation Cutoff Setting : deg
Date Installed : 1996-09-23
Date Removed : 1998-02-10
Temperature Stabiliz. : none
Additional Information : firmware upgrade; (USGS Property #G-615681)

3.3 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : 04374
Firmware Version : 1F50
Elevation Cutoff Setting : deg
Date Installed : 1998-02-10
Date Removed : 1999-06-30
Temperature Stabiliz. : none
Additional Information : PJ added here 08-JAN-1999 based on rinex headers; USGS Property #G-615681

3.4 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03196
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-06-30
Date Removed : 2007-01-30
Temperature Stabiliz. : none
Additional Information : Rx powered off at 18:49 gmt.

3.5 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP00221
Firmware Version : CD00
Elevation Cutoff Setting : deg
Date Installed : 2007-01-30
Date Removed : 2009-04-30T22:18Z
Temperature Stabiliz. : none
Additional Information : (multiple lines)

3.6 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03025
Firmware Version : CC00
Elevation Cutoff Setting : 0 deg
Date Installed : 2009-04-30T22:18Z
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : none

Additional Information : (multiple lines)

3.x Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Satellite System : (GPS/GLONASS/GPS+GLONASS)
Serial Number : (A5)
Firmware Version : (A11)
Elevation Cutoff Setting : (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type : ASH700718A NONE
Serial Number : 870
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.1620
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : NONE
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1995-04-06
Date Removed : 1995-05-19
Additional Information : Vertical datum is filed notch in vertical
rod.

4.2 Antenna Type : ASH700936A_M SCPL
Serial Number : 11475
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.1620
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCPL
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1995-05-19
Date Removed : 2000-10-21
Additional Information : same filed notch used as vertical datum. DM
type
: antenna installed, old LGP antenna removed.
: ANTENNA HEIGHT CONFIRMED TO BE 0.162m ON
: 03DEC96. (PREVIOUSLY NOTED AS 0.163 m)

4.3 Antenna Type : ASH700936A_M SCPL
Serial Number : 11475
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.1620
Marker->ARP North Ecc(m) :

```
Marker->ARP East Ecc(m) :
Alignment from True N   : deg
Antenna Radome Type     : SCPL
Radome Serial Number    :
Antenna Cable Type      : (vendor & type number)
Antenna Cable Length    : (m)
Date Installed          : 2000-10-21
Date Removed            : (CCYY-MM-DDThh:mmZ)
Additional Information   : Shrub overgrowth was trimmed, an action
that may
                        : affect the station time series.

4.x Antenna Type        : (A20, from rcvr_ant.tab; see instructions)
   Serial Number        : (A*, but note the first A5 is used in
SINEX)
   Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see
instr.)
   Marker->ARP Up Ecc. (m) : (F8.4)
   Marker->ARP North Ecc(m): (F8.4)
   Marker->ARP East Ecc(m) : (F8.4)
   Alignment from True N   : (deg; + is clockwise/east)
   Antenna Radome Type     : (A4 from rcvr_ant.tab; see instructions)
   Radome Serial Number    :
   Antenna Cable Type      : (vendor & type number)
   Antenna Cable Length    : (m)
   Date Installed          : (CCYY-MM-DDThh:mmZ)
   Date Removed            : (CCYY-MM-DDThh:mmZ)
   Additional Information   : (multiple lines)

5.   Surveyed Local Ties

5.1 Tied Marker Name      : NONE
   Tied Marker Usage      : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
   Tied Marker CDP Number : (A4)
   Tied Marker DOMES Number : (A9)
   Differential Components from GNSS Marker to the tied monument (ITRS)
     dx (m)                : (m)
     dy (m)                : (m)
     dz (m)                : (m)
   Accuracy (mm)          : (mm)
   Survey method          : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
   Date Measured          : (CCYY-MM-DDThh:mmZ)
   Additional Information   : (multiple lines)

5.x Tied Marker Name      :
   Tied Marker Usage      : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
   Tied Marker CDP Number : (A4)
   Tied Marker DOMES Number : (A9)
   Differential Components from GNSS Marker to the tied monument (ITRS)
     dx (m)                : (m)
     dy (m)                : (m)
     dz (m)                : (m)
   Accuracy (mm)          : (mm)
```

Survey method : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.2.x Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.3.x Temp. Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (deg C)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)

-
- Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 8.5.x Other Instrumentation : (multiple lines)
9. Local Ongoing Conditions Possibly Affecting Computed Position
- 9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
- 9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)
10. Local Episodic Effects Possibly Affecting Data Quality
- 10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)
11. On-Site, Point of Contact Agency Information
- Agency : USGS
Preferred Abbreviation : USGS
Mailing Address :
Primary Contact
Contact Name : Nancy King
Telephone (primary) : 626-583-7815
Telephone (secondary) :
Fax : 626-583-7827
E-mail : nking@usgs.gov
Secondary Contact
Contact Name : Keith Stark
Telephone (primary) : 818-438-6224
Telephone (secondary) :
Fax :
E-mail : keith@stratait.com
Additional Information : (multiple lines)
12. Responsible Agency (if different from 11.)
-

```

Agency :
Preferred Abbreviation : (A10)
Mailing Address :
Primary Contact :
  Contact Name :
  Telephone (primary) :
  Telephone (secondary) :
  Fax :
  E-mail :
Secondary Contact :
  Contact Name :
  Telephone (primary) :
  Telephone (secondary) :
  Fax :
  E-mail :
Additional Information : (multiple lines)

```

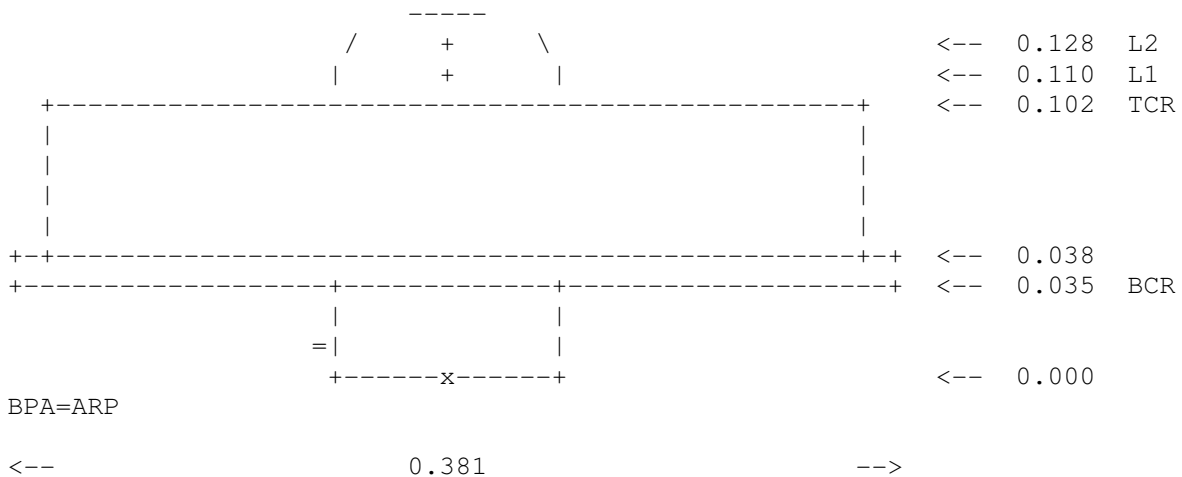
13. More Information

```

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center : Scripps Orbit and Permanent Array Center
URL for More Information : http://www.unavco.org
Hardcopy on File :
  Site Map : Y
  Site Diagram : Y
  Horizon Mask : Y
  Monument Description : Y
  Site Pictures : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

```

ASH700936A_M
ASH700936B_M
ASH700936C_M
ASH700936D_M



ARP: Antenna Reference Point
L1 : L1 Phase Center

L2 : L2 Phase Center

TCR: Top of Chokering
TGP: Top of Ground Plane
TPA: Top of Preamplifier
TOP: Top of Pole

BCR: Bottom of Chokering
BGP: Bottom of Ground Plane
BPA: Bottom of Preamplifier

LORS

LATITUDE 34 07 59.96318 LONGITUDE -117 45 14.60181

ELLHGT: 449.607m ORTHOHGT: 482.6602m

1 National Geodetic Survey, Retrieval Date = JUNE 2, 2009

AJ1881 *****

AJ1881 DESIGNATION - LORS LIVE OAK RESERVOIR GRM

AJ1881 PID - AJ1881

AJ1881 STATE/COUNTY- CA/LOS ANGELES

AJ1881 USGS QUAD - GLENDORA (1972)

AJ1881

AJ1881 *CURRENT SURVEY CONTROL

AJ1881

AJ1881*	NAD 83(2007)-	34 07 59.96318(N)	117 45 14.60181(W)	ADJUSTED
AJ1881*	NAVD 88 -	482.7 (meters)	1584. (feet)	GPS OBS

AJ1881

AJ1881	EPOCH DATE -	2007.00		
AJ1881	X -	-2,461,265.199 (meters)		COMP
AJ1881	Y -	-4,677,292.096 (meters)		COMP
AJ1881	Z -	3,558,949.584 (meters)		COMP
AJ1881	LAPLACE CORR-	5.06 (seconds)		DEFLEC99
AJ1881	ELLIP HEIGHT-	449.607 (meters)	(02/10/07)	ADJUSTED
AJ1881	GEOID HEIGHT-	-33.07 (meters)		GEOID03

AJ1881

AJ1881 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----

AJ1881	Type	PID	Designation	North	East	Ellip
AJ1881	NETWORK	AJ1881	LORS LIVE OAK RESERVOIR GRM	0.00	0.00	0.00

AJ1881

AJ1881 [ITRF positions](#) are available for this station.

AJ1881 The horizontal coordinates were established by GPS observations

AJ1881 and adjusted by the National Geodetic Survey in February 2007.

AJ1881

AJ1881 The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

AJ1881 See [National Readjustment](#) for more information.

AJ1881 The horizontal coordinates are valid at the epoch date displayed above.

AJ1881 The epoch date for horizontal control is a decimal equivalence

AJ1881 of Year/Month/Day.

AJ1881

AJ1881 The orthometric height was determined by GPS observations and a

AJ1881 high-resolution geoid model.

AJ1881

AJ1881 The X, Y, and Z were computed from the position and the ellipsoidal ht.

AJ1881

AJ1881 The Laplace correction was computed from DEFLEC99 derived deflections.

AJ1881

AJ1881 The ellipsoidal height was determined by GPS observations

AJ1881 and is referenced to NAD 83.

AJ1881

AJ1881 The geoid height was determined by GEOID03.

AJ1881

AJ1881;		North	East	Units	Scale	Factor	Converg.
AJ1881;SPC	CA 5	- 570,279.517	2,022,685.439	MT	0.99997984	+0 08	24.7
AJ1881;SPC	CA 5	- 1,870,992.05	6,636,093.81	sFT	0.99997984	+0 08	24.7
AJ1881;UTM	11	- 3,777,195.470	430,472.788	MT	0.99965959	-0 25	23.3

AJ1881

AJ1881! - Elev Factor x Scale Factor = Combined Factor
AJ1881!SPC CA 5 - 0.99992942 x 0.99997984 = 0.99990927
AJ1881!UTM 11 - 0.99992942 x 0.99965959 = 0.99958904
AJ1881

AJ1881 SUPERSEDED SURVEY CONTROL
AJ1881
AJ1881 NAD 83(1998)- 34 07 59.95778(N) 117 45 14.59596(W) AD(2000.35) A
AJ1881 ELLIP H (04/03/01) 449.623 (m) GP(2000.35) 1 1
AJ1881
AJ1881.Superseded values are not recommended for survey control.
AJ1881.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ1881.[See file dsdata.txt](#) to determine how the superseded data were derived.
AJ1881
AJ1881_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SMT3047377195(NAD 83)
AJ1881_MARKER: Z = SEE DESCRIPTION
AJ1881_SETTING: 0 = UNSPECIFIED SETTING
AJ1881_MARK LOGO: NONE
AJ1881_MAGNETIC: N = NO MAGNETIC MATERIAL
AJ1881_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AJ1881+STABILITY: POSITION/ELEVATION WELL
AJ1881_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ1881+SATELLITE: SATELLITE OBSERVATIONS - 2001
AJ1881
AJ1881 HISTORY - Date Condition Report By
AJ1881 HISTORY - 2001 MONUMENTED NGS
AJ1881
AJ1881 STATION DESCRIPTION
AJ1881
AJ1881'DESCRIBED BY NATIONAL GEODETIC SURVEY 2001
AJ1881'THIS IS A CALIFORNIA CORS.
AJ1881'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A
AJ1881'CALIFORNIA CORS. INFORMATION ABOUT THE GRM, ANTENNA TYPE
AJ1881'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:
AJ1881'HTTP://SOPAC.UCSD.EDU/SCRIPTS/SIMPL.CGI

LORS Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igsb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : Susan Jeffries
Date Prepared : 2008-02-20
Report Type : UPDATE
If Update:
Previous Site Log : lors_20060823.log
Modified/Added Sections : (n.n,n.n,...)

1. Site Identification of the GNSS Monument

Site Name : LORS_SCGN_CS1998
Four Character ID : LORS
Monument Inscription :
IERS DOMES Number : 49906M002
CDP Number :
Monument Description : Wyatt/Agnew drilled-braced
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : Top of center support screw on SCIGN D3 antenna
adaptor
Date Installed : 1998-09-09
Geologic Characteristic : (BEDROCK/CLAY/CONGLOMERATE/GRAVEL/SAND/etc)
Bedrock Type : (IGNEOUS/METAMORPHIC/SEDIMENTARY)
Bedrock Condition : (FRESH/JOINTED/WEATHERED)
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network. Monument is Wyatt-type drilled-braced
geodetic monument composed of stainless steel
supports and new SCIGN antenna adaptor. Fixed
antenna height is 0.0083 m. A secondary
measurement, the adaptor/divot distance, taken
from the bottom of the lower adaptor plate to
the center of a divot drill-mark on the
north-facing tripod leg, is not yet measured.

2. Site Location Information

City or Town : La Verne
State or Province : California
Country : USA
Tectonic Plate : Pacific
Approximate Position (ITRF)
X coordinate (m) : -2461265.9004765
Y coordinate (m) : -4677290.86530166
Z coordinate (m) : 3558949.45563008
Latitude (N is +) : +340759.97
Longitude (E is +) : -1174514.65
Elevation (m,ellips.) : 448.9042
Additional Information : PJ: proc. coords Los Angeles County. Reference
frame used is (ITRF2000). Coordinate system used

: is (WGS84).

3. GNSS Receiver Information

- 3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03055
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-09-24
Date Removed : 2008-02-20
Temperature Stabiliz. : none
Additional Information : Initial installation.
- 3.2 Receiver Type : TRIMBLE NETRS
Satellite System : GPS
Serial Number : 4420233994
Firmware Version : 1.1-2
Elevation Cutoff Setting : deg
Date Installed : 2008-02-20
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : none
Additional Information : (multiple lines)
- 3.x Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Satellite System : (GPS/GLONASS/GPS+GLONASS)
Serial Number : (A5)
Firmware Version : (A11)
Elevation Cutoff Setting : (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

- 4.1 Antenna Type : ASH701945B_M SCIT
Serial Number : CR519991810
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCIT
Radome Serial Number : 0246
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 1999-09-24
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information :
- 4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)

Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5. Surveyed Local Ties

5.1 Tied Marker Name : NONE
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)

Effective Dates	:	/CCYY-MM-DD
Notes	:	(multiple lines)

8.2.x Pressure Sensor Model :

Manufacturer	:	
Serial Number	:	
Data Sampling Interval	:	(sec)
Accuracy	:	(hPa)
Height Diff to Ant	:	(m)
Calibration date	:	(CCYY-MM-DD)
Effective Dates	:	/CCYY-MM-DD
Notes	:	(multiple lines)

8.3.x Temp. Sensor Model :

Manufacturer	:	
Serial Number	:	
Data Sampling Interval	:	(sec)
Accuracy	:	(deg C)
Aspiration	:	(UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant	:	(m)
Calibration date	:	(CCYY-MM-DD)
Effective Dates	:	/CCYY-MM-DD
Notes	:	(multiple lines)

8.4.x Water Vapor Radiometer :

Manufacturer	:	
Serial Number	:	
Distance to Antenna	:	(m)
Height Diff to Ant	:	(m)
Calibration date	:	(CCYY-MM-DD)
Effective Dates	:	- dd-MMM-yyy
Notes	:	(multiple lines)

8.5.x Other Instrumentation : (multiple lines)

9. Local Ongoing Conditions Possibly Affecting Computed Position

9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)

Observed Degradations	:	(SN RATIO/DATA GAPS/etc)
Effective Dates	:	(CCYY-MM-DD/CCYY-MM-DD)
Additional Information	:	(multiple lines)

9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)

Effective Dates	:	(CCYY-MM-DD/CCYY-MM-DD)
Additional Information	:	(multiple lines)

9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)

Effective Dates	:	(CCYY-MM-DD/CCYY-MM-DD)
Additional Information	:	(multiple lines)

10. Local Episodic Effects Possibly Affecting Data Quality

10.x Date : (CCYY-MM-DD/CCYY-MM-DD)

Event	:	(TREE CLEARING/CONSTRUCTION/etc)
-------	---	----------------------------------

11. On-Site, Point of Contact Agency Information

Agency	:	
Preferred Abbreviation	:	
Mailing Address	:	
	:	
Primary Contact	:	

```

Contact Name      : Michael Jackson
Telephone (primary) : 303-381-7554
Telephone (secondary) :
Fax              :
E-mail          : jackson@unavco.org
Secondary Contact
Contact Name      : Freddy Blume
Telephone (primary) : 303-381-7474
Telephone (secondary) :
Fax              : 303-381-7451
E-mail          : blume@unavco.org
Additional Information : (multiple lines)

```

12. Responsible Agency (if different from 11.)

```

Agency          :
Preferred Abbreviation : (A10)
Mailing Address   :
Primary Contact
Contact Name      :
Telephone (primary) :
Telephone (secondary) :
Fax              :
E-mail          :
Secondary Contact
Contact Name      :
Telephone (primary) :
Telephone (secondary) :
Fax              :
E-mail          :
Additional Information : (multiple lines)

```

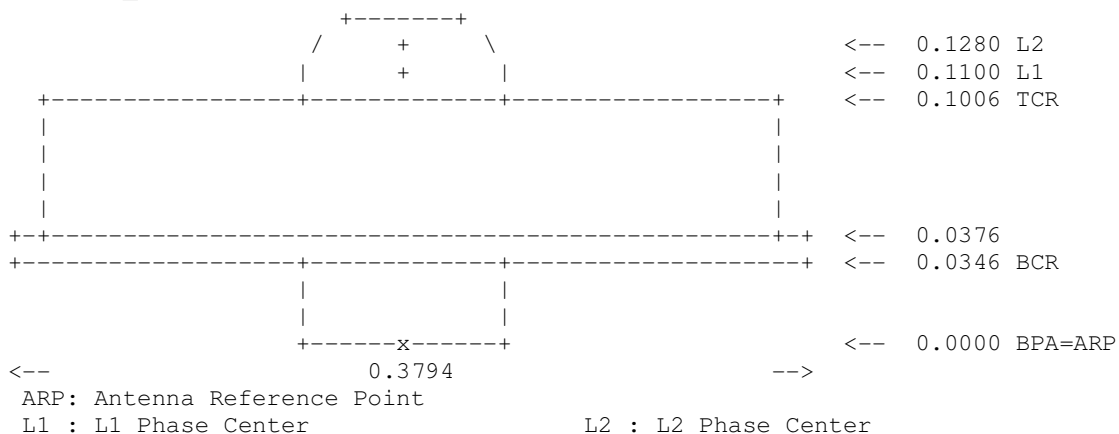
13. More Information

```

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center :
URL for More Information : http://www.unavco.org
Hardcopy on File
Site Map            : Y
Site Diagram        : Y
Horizon Mask        : Y
Monument Description : Y
Site Pictures       : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

```

ASH701945B_M



TCR: Top of Chokering
TGP: Top of Ground Plane
TPA: Top of Preamplifier

BCR: Bottom of Chokering
BGP: Bottom of Ground Plane
BPA: Bottom of Preamplifier

PKRD

LATITUDE 34 04 17.60222 LONGITUDE -118 13 58.40284

ELLHGT 131.552m ORTHOHGT: 166.4400m

City or Town	Los Angeles
State or Province	California
Country	USA
Tectonic Plate	Pacific
X coordinate (m)	-2501961.33
Y coordinate (m)	-4659711.
Z coordinate (m)	3553097.62
* Reference Frame	n/a
* Position Source	SITELOG
Latitude (N is +) (dec deg)	34.07139
Longitude (E is +) (dec deg)	-118.23278
Elevation (m)	130.858
* Geodetic Datum	n/a
* Position Source	SITELOG
Additional Information	Los Angeles County. Reference frame used is (ITRF2000). Coordinate system used is (WGS84).
* County	Los Angeles
* Directions	

* DENOTES information not present in a standard IGS log file.

DENOTES fields reserved for secured access users only.

Site Metadata Type : Site ID / Monument

Site : **pkrd0000**

1 of 1

SIM User : **anonymous**


Site Name	PKRD_SCGN_CS2000		
Four Character ID	pkrd		
* National Geodetic Survey (NGS) PID			
Type of Site	Continuously Operating GPS		
* Network Affiliation	PBO		
Monument Inscription			
IERS DOMES Number	40487M008		
CDP Number			
Monument Description	Wyatt/Agnew drilled-braced		
Height of the Monument (m)	(m)		
Monument Foundation	n/a		
Monument Foundation Depth (m)	(m)		
Marker Description	Top of center support screw on SCIGN D3 antenna adaptor		
Effective Date	07/12/2000		
Geologic Characteristic	Bedrock		
Bedrock Type	Sedimentary		
Bedrock Condition	Weathered		
Fracture Spacing			
Nearby Faults			
Nearby Fault Activity			
Additional Information	SCIGN - Southern California Integrated GPS Network. This site is named		
* Geologic Notes			
* Antenna Adaptor Type	D3 SCIGN		
* Antenna Adaptor Serial Number	0224		
* Antenna Adaptor Divot Distance (m)			
* Update Reason			

* DENOTES information not present in a standard IGS log file.

DENOTES fields reserved for secured access users only.

PKRD Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igschb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : Susan Jeffries
Date Prepared : 2008-03-06
Report Type : UPDATE
If Update:
Previous Site Log : pkrd_20060922.log
Modified/Added Sections : (n.n,n.n,...)

1. Site Identification of the GNSS Monument

Site Name : PKRD_SCGN_CS2000
Four Character ID : PKRD
Monument Inscription :
IERS DOMES Number : 40487M008
CDP Number :
Monument Description : Wyatt/Agnew drilled-braced
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : Top of center support screw on SCIGN D3
antenna : adaptor
Date Installed : 2000-07-12
Geologic Characteristic : Bedrock
Bedrock Type : Sedimentary
Bedrock Condition : Weathered
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network. This site is named for Robert
Packard,
tower : USGS volunteer. Site is adjacent to radio
: belonging to city of Los Angeles

2. Site Location Information

City or Town : Los Angeles
State or Province : California
Country : USA
Tectonic Plate : Pacific
Approximate Position (ITRF)
X coordinate (m) : -2501961.32700118
Y coordinate (m) : -4659711.00469039
Z coordinate (m) : 3553097.62049489

Latitude (N is +) : +340417.61
Longitude (E is +) : -1181358.45
Elevation (m,ellips.) : 130.858
Additional Information : Los Angeles County. Reference frame used is
: (ITRF2000). Coordinate system used is
(WGS84).

3. GNSS Receiver Information

3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP02776
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 2000-09-03
Date Removed : 2006-09-22
Temperature Stabiliz. : none
Additional Information : Initial installation.

3.2 Receiver Type : TRIMBLE NETRS
Satellite System : GPS
Serial Number : 4612261941
Firmware Version : 1.1-2
Elevation Cutoff Setting : deg
Date Installed : 2006-09-22
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : none
Additional Information : (multiple lines)

3.x Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Satellite System : (GPS/GLONASS/GPS+GLONASS)
Serial Number : (A5)
Firmware Version : (A11)
Elevation Cutoff Setting : (deg)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type : ASH701945B_M SCIT
Serial Number : CR519991816
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type : SCIT
Radome Serial Number : 0112
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : 2000-09-03
Date Removed : 2007-06-05
Additional Information :

-
- 4.2 Antenna Type : ASH701945B_M SCIT
 Serial Number : CR519991816
 Antenna Reference Point : BPA
 Marker->ARP Up Ecc. (m) : 0.0083
 Marker->ARP North Ecc(m) :
 Marker->ARP East Ecc(m) :
 Alignment from True N : deg
 Antenna Radome Type : SCIT
 Radome Serial Number : 1875
 Antenna Cable Type : (vendor & type number)
 Antenna Cable Length : (m)
 Date Installed : 2007-06-05
 Date Removed : (CCYY-MM-DDThh:mmZ)
 Additional Information : (multiple lines)
- 4.3 Antenna Type : TRM29659.00 SCIT
 Serial Number : 0220321808
 Antenna Reference Point : BPA
 Marker->ARP Up Ecc. (m) : 0.0083
 Marker->ARP North Ecc(m) :
 Marker->ARP East Ecc(m) :
 Alignment from True N : deg
 Antenna Radome Type : SCIT
 Radome Serial Number : 0638
 Antenna Cable Type : (vendor & type number)
 Antenna Cable Length : (m)
 Date Installed : 2008-03-06
 Date Removed : (CCYY-MM-DDThh:mmZ)
 Additional Information : (multiple lines)
- 4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
 Serial Number : (A*, but note the first A5 is used in
SINEX)
 Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see
instr.)
 Marker->ARP Up Ecc. (m) : (F8.4)
 Marker->ARP North Ecc(m): (F8.4)
 Marker->ARP East Ecc(m) : (F8.4)
 Alignment from True N : (deg; + is clockwise/east)
 Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
 Radome Serial Number :
 Antenna Cable Type : (vendor & type number)
 Antenna Cable Length : (m)
 Date Installed : (CCYY-MM-DDThh:mmZ)
 Date Removed : (CCYY-MM-DDThh:mmZ)
 Additional Information : (multiple lines)
5. Surveyed Local Ties
- 5.1 Tied Marker Name : NONE
 Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
 Tied Marker CDP Number : (A4)
 Tied Marker DOMES Number : (A9)
 Differential Components from GNSS Marker to the tied monument (ITRS)
-

```
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS
CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)
```

-
- 8.2.x Pressure Sensor Model :
- Manufacturer :
 - Serial Number :
 - Data Sampling Interval : (sec)
 - Accuracy : (hPa)
 - Height Diff to Ant : (m)
 - Calibration date : (CCYY-MM-DD)
 - Effective Dates : /CCYY-MM-DD
 - Notes : (multiple lines)
- 8.3.x Temp. Sensor Model :
- Manufacturer :
 - Serial Number :
 - Data Sampling Interval : (sec)
 - Accuracy : (deg C)
 - Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
 - Height Diff to Ant : (m)
 - Calibration date : (CCYY-MM-DD)
 - Effective Dates : /CCYY-MM-DD
 - Notes : (multiple lines)
- 8.4.x Water Vapor Radiometer :
- Manufacturer :
 - Serial Number :
 - Distance to Antenna : (m)
 - Height Diff to Ant : (m)
 - Calibration date : (CCYY-MM-DD)
 - Effective Dates : - dd-MMM-yyy
 - Notes : (multiple lines)
- 8.5.x Other Instrumentation : (multiple lines)
9. Local Ongoing Conditions Possibly Affecting Computed Position
- 9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
- Observed Degradations : (SN RATIO/DATA GAPS/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
- Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
- Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
10. Local Episodic Effects Possibly Affecting Data Quality
- 10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
- Event : (TREE CLEARING/CONSTRUCTION/etc)
11. On-Site, Point of Contact Agency Information
- Agency :
-



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

Preferred Abbreviation :
Mailing Address :
Primary Contact :
Contact Name : Michael Jackson
Telephone (primary) : 303-381-7554
Telephone (secondary) :
Fax :
E-mail : jackson@unavco.org
Secondary Contact :
Contact Name : Freddy Blume
Telephone (primary) : 303-381-7474
Telephone (secondary) :
Fax : 303-381-7451
E-mail : blume@unavco.org
Additional Information : (multiple lines)

12. Responsible Agency (if different from 11.)

Agency :
Preferred Abbreviation : (A10)
Mailing Address :
Primary Contact :
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Secondary Contact :
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Additional Information : (multiple lines)

13. More Information

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center :
URL for More Information : <http://www.unavco.org>
Hardcopy on File :
Site Map : Y
Site Diagram : Y
Horizon Mask : Y
Monument Description : Y
Site Pictures : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

TRM29659.00

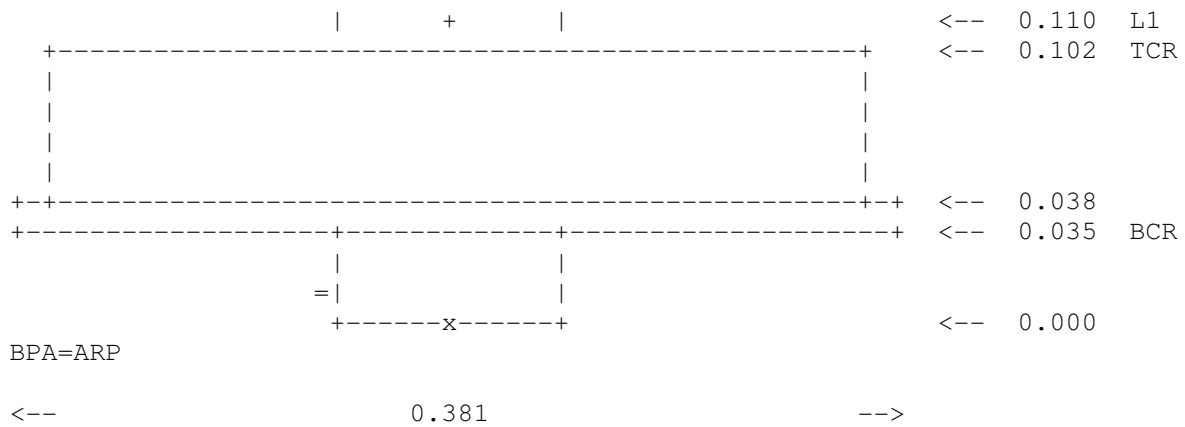
/ + \

<-- 0.128 L2



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com



ARP: Antenna Reference Point
L1 : L1 Phase Center
TCR: Top of Choking
TGP: Top of Ground Plane
TPA: Top of Preamplifier
TOP: Top of Pole

L2 : L2 Phase Center
BCR: Bottom of Choking
BGP: Bottom of Ground Plane
BPA: Bottom of Preamplifier

PSDM

LATITUDE 34 05 30.33981 LONGITUDE -117 48 25.47827

ELLHGT 279.091m ORTHOHGT: 312.6961m

1 National Geodetic Survey, Retrieval Date = JUNE 2, 2009

AJ1913 *****

AJ1913 DESIGNATION - PSDM PUDDINGSTONE RES GRM

AJ1913 PID - AJ1913

AJ1913 STATE/COUNTY- CA/LOS ANGELES

AJ1913 USGS QUAD - SAN DIMAS (1981)

AJ1913

AJ1913 *CURRENT SURVEY CONTROL

AJ1913

AJ1913*	NAD 83(2007)-	34 05 30.33981(N)	117 48 25.47827(W)	ADJUSTED
AJ1913*	NAVD 88 -	312.8 (meters)	1026. (feet)	GPS OBS

AJ1913

AJ1913	EPOCH DATE -	2007.00		
AJ1913	X -	-2,466,732.833 (meters)		COMP
AJ1913	Y -	-4,677,174.660 (meters)		COMP
AJ1913	Z -	3,555,036.741 (meters)		COMP
AJ1913	LAPLACE CORR-	5.18 (seconds)		DEFLEC99
AJ1913	ELLIP HEIGHT-	279.092 (meters)	(02/10/07)	ADJUSTED
AJ1913	GEOID HEIGHT-	-33.62 (meters)		GEOID03

AJ1913

AJ1913 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----

AJ1913	Type	PID	Designation	North	East	Ellip
AJ1913	NETWORK	AJ1913	PSDM PUDDINGSTONE RES GRM	0.00	0.00	0.00

AJ1913 -----

AJ1913

AJ1913. [ITRF positions](#) are available for this station.

AJ1913. The horizontal coordinates were established by GPS observations

AJ1913. and adjusted by the National Geodetic Survey in February 2007.

AJ1913

AJ1913. The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

AJ1913. See [National Readjustment](#) for more information.

AJ1913. The horizontal coordinates are valid at the epoch date displayed above.

AJ1913. The epoch date for horizontal control is a decimal equivalence

AJ1913. of Year/Month/Day.

AJ1913

AJ1913. The orthometric height was determined by GPS observations and a

AJ1913. high-resolution geoid model.

AJ1913

AJ1913. The X, Y, and Z were computed from the position and the ellipsoidal ht.

AJ1913

AJ1913. The Laplace correction was computed from DEFLEC99 derived deflections.

AJ1913

AJ1913. The ellipsoidal height was determined by GPS observations

AJ1913. and is referenced to NAD 83.

AJ1913

AJ1913. The geoid height was determined by GEOID03.

AJ1913

AJ1913;		North	East	Units	Scale Factor	Converg.
AJ1913;SPC CA 5	-	565,658.678	2,017,803.708	MT	0.99998785	+0 06 35.9
AJ1913;SPC CA 5	-	1,855,831.85	6,620,077.67	sFT	0.99998785	+0 06 35.9
AJ1913;UTM 11	-	3,772,624.272	425,547.476	MT	0.99966833	-0 27 08.7

AJ1913

AJ1913! - Elev Factor x Scale Factor = Combined Factor

```
AJ1913!SPC CA 5      -    0.99995619  x    0.99998785  =    0.99994404
AJ1913!UTM  11      -    0.99995619  x    0.99966833  =    0.99962453
AJ1913
```

```
AJ1913                                SUPERSEDED SURVEY CONTROL
AJ1913
AJ1913  NAD 83(1998)- 34 05 30.33422(N)    117 48 25.47225(W) AD(2000.35) A
AJ1913  ELLIP H (04/03/01) 279.107 (m)      GP(2000.35) 1 1
AJ1913
AJ1913.Superseded values are not recommended for survey control.
AJ1913.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ1913.See file dsdata.txt to determine how the superseded data were derived.
AJ1913
AJ1913_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SMT2554772624(NAD 83)
AJ1913_MARKER: Z = SEE DESCRIPTION
AJ1913_SETTING: 0 = UNSPECIFIED SETTING
AJ1913_MARK LOGO: NONE
AJ1913_MAGNETIC: N = NO MAGNETIC MATERIAL
AJ1913_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AJ1913+STABILITY: POSITION/ELEVATION WELL
AJ1913_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ1913+SATELLITE: SATELLITE OBSERVATIONS - 2001
AJ1913
AJ1913  HISTORY      - Date      Condition      Report By
AJ1913  HISTORY      - 2001      MONUMENTED      NGS
AJ1913
AJ1913                                STATION DESCRIPTION
AJ1913
AJ1913'DESCRIBED BY NATIONAL GEODETIC SURVEY 2001
AJ1913'THIS IS A CALIFORNIA CORS.
AJ1913'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A
AJ1913'CALIFORNIA CORS.  INFORMATION ABOUT THE GRM, ANTENNA TYPE
AJ1913'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:
AJ1913'HTTP://SOPAC.UCSD.EDU/SCRIPTS/SIMPL.CGI
```

PSDM Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igscb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

```
Prepared by (full name) : Susan Jeffries
Date Prepared           : 2008-02-22
Report Type             : UPDATE
If Update:
  Previous Site Log      : psdm_20071119.log
  Modified/Added Sections : (n.n,n.n,...)
```

1. Site Identification of the GNSS Monument

Site Name : Puddingstone Reservoir
Four Character ID : PSDM
Monument Inscription :
IERS DOMES Number : 49823M001
CDP Number :
Monument Description : Wyatt/Agnew drilled-braced
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : Top of center support screw on SCIGN D3 antenna
adaptor
Date Installed : 1999-05-04
Geologic Characteristic : BEDROCK
Bedrock Type : SEDIMENTARY
Bedrock Condition : (FRESH/JOINTED/WEATHERED)
Fracture Spacing : (1-10 cm/10-50 cm/50-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : SCIGN - Southern California Integrated GPS
Network. Monument is Wyatt-type drilled-braced
geodetic monument composed of stainless steel
supports and new SCIGN antenna adaptor. Fixed
antenna height is 0.0083 m. A secondary
measurement, the adaptor/divot distance, taken
from the bottom of the lower adaptor plate to
the center of a divot drill-mark on the
north-facing tripod leg, is not yet measured.

2. Site Location Information

City or Town : San Dimas
State or Province : California
Country : USA
Tectonic Plate : Pacific
Approximate Position (ITRF)
X coordinate (m) : -2467022.2297435
Y coordinate (m) : -4677145.15930009
Z coordinate (m) : 3554874.56689312
Latitude (N is +) : +340524.00
Longitude (E is +) : -1174836.00
Elevation (m, ellips.) : 278.39
Additional Information : Los Angeles County. Reference frame used is
(ITRF97). Coordinate system used is (WGS84).

3. GNSS Receiver Information

- 3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03100
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-10-26
Date Removed : 2006-05-03
Temperature Stabiliz. : none
Additional Information : Initial installation.
- 3.2 Receiver Type : ASHTECH UZ-12
Satellite System : GPS
Serial Number : UC1200303007
Firmware Version : CN00
Elevation Cutoff Setting : deg

```
Date Installed      : 2006-05-03
Date Removed       : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : none
Additional Information : (multiple lines)

3.x Receiver Type   : (A20, from rcvr_ant.tab; see instructions)
Satellite System    : (GPS/GLONASS/GPS+GLONASS)
Serial Number       : (A5)
Firmware Version    : (A11)
Elevation Cutoff Setting : (deg)
Date Installed      : (CCYY-MM-DDThh:mmZ)
Date Removed       : (CCYY-MM-DDThh:mmZ)
Temperature Stabiliz. : (none or tolerance in degrees C)
Additional Information : (multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type     : ASH701945B_M      SCIT
Serial Number        : CR519991749
Antenna Reference Point : BPA
Marker->ARP Up Ecc. (m) : 0.0083
Marker->ARP North Ecc(m) :
Marker->ARP East Ecc(m) :
Alignment from True N : deg
Antenna Radome Type   : SCIT
Radome Serial Number  : 00236
Antenna Cable Type     : (vendor & type number)
Antenna Cable Length   : (m)
Date Installed        : 1999-10-26
Date Removed         : (CCYY-MM-DDThh:mmZ)
Additional Information :

4.x Antenna Type     : (A20, from rcvr_ant.tab; see instructions)
Serial Number        : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type   : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number  :
Antenna Cable Type     : (vendor & type number)
Antenna Cable Length   : (m)
Date Installed        : (CCYY-MM-DDThh:mmZ)
Date Removed         : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5. Surveyed Local Ties

5.1 Tied Marker Name : NONE
Tied Marker Usage    : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
  dx (m)              : (m)
  dy (m)              : (m)
  dz (m)              : (m)
Accuracy (mm)         : (mm)
Survey method         : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured         : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
```

-
- 5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
6. Frequency Standard
- 6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
7. Collocation Information
- 7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
8. Meteorological Instrumentation
- 8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)
- 8.2.x Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)
- 8.3.x Temp. Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (deg C)
-

Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : /CCYY-MM-DD
Notes : (multiple lines)

8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : - dd-MMM-yyy
Notes : (multiple lines)

8.5.x Other Instrumentation : (multiple lines)

9. Local Ongoing Conditions Possibly Affecting Computed Position

9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

10. Local Episodic Effects Possibly Affecting Data Quality

10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)

11. On-Site, Point of Contact Agency Information

Agency : USGS
Preferred Abbreviation : USGS
Mailing Address :
:
Primary Contact
Contact Name : Nancy King
Telephone (primary) : 626-583-7815
Telephone (secondary) :
Fax : 626-583-7827
E-mail : nking@usgs.gov
Secondary Contact
Contact Name : Keith Stark
Telephone (primary) : 818-438-6224
Telephone (secondary) :
Fax :
E-mail : stark@dukester.com
Additional Information : (multiple lines)

12. Responsible Agency (if different from 11.)

Agency :
Preferred Abbreviation : (A10)

```

Mailing Address      :
Primary Contact
  Contact Name       :
  Telephone (primary) :
  Telephone (secondary) :
  Fax                :
  E-mail             :
Secondary Contact
  Contact Name       :
  Telephone (primary) :
  Telephone (secondary) :
  Fax                :
  E-mail             :
Additional Information : (multiple lines)

```

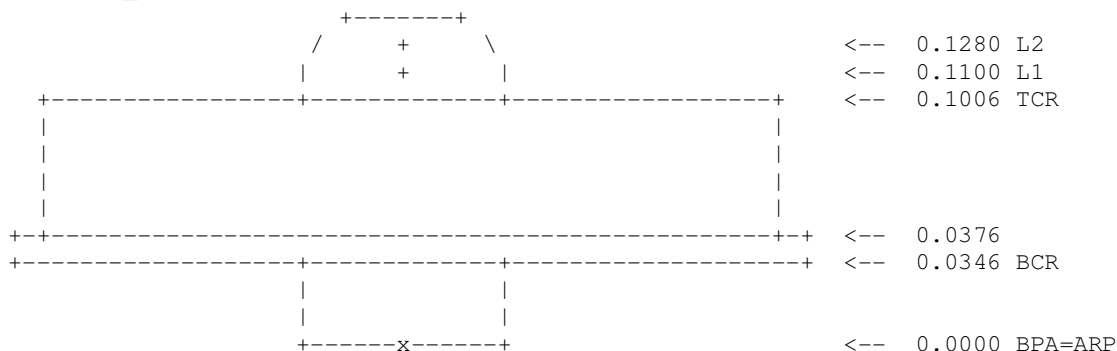
13. More Information

```

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center :
URL for More Information : http://www.unavco.org
Hardcopy on File
  Site Map           : Y
  Site Diagram       : Y
  Horizon Mask       : Y
  Monument Description : Y
  Site Pictures      : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

```

ASH701945B_M



```

<--          0.3794          -->
ARP: Antenna Reference Point
L1 : L1 Phase Center
TCR: Top of Choking
TGP: Top of Ground Plane
TPA: Top of Preamplifier
L2 : L2 Phase Center
BCR: Bottom of Choking
BGP: Bottom of Ground Plane
BPA: Bottom of Preamplifier

```


SPMS

LATITUDE 33 59 33.54095 LONGITUDE -117 50 55.54017

ELLHGT 207.753 m ORTHOHGT: 242.0579m

1 National Geodetic Survey, Retrieval Date = JUNE 2, 2009

AJ1929 *****

AJ1929 DESIGNATION - SPMS SOUTH PT MS GRM

AJ1929 PID - AJ1929

AJ1929 STATE/COUNTY- CA/LOS ANGELES

AJ1929 USGS QUAD - YORBA LINDA (1981)

AJ1929

AJ1929 *CURRENT SURVEY CONTROL

AJ1929

AJ1929*	NAD 83(2007)-	33 59 33.54096(N)	117 50 55.54017(W)	ADJUSTED
AJ1929*	NAVD 88 -	242.1 (meters)	794. (feet)	GPS OBS

AJ1929

AJ1929	EPOCH DATE -	2007.00		
AJ1929	X -	-2,472,982.332 (meters)		COMP
AJ1929	Y -	-4,680,768.297 (meters)		COMP
AJ1929	Z -	3,545,886.814 (meters)		COMP
AJ1929	LAPLACE CORR-	5.54 (seconds)		DEFLEC99
AJ1929	ELLIP HEIGHT-	207.753 (meters)	(02/10/07)	ADJUSTED
AJ1929	GEOID HEIGHT-	-34.33 (meters)		GEOID03

AJ1929

AJ1929 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----

AJ1929	Type	PID	Designation	North	East	Ellip
AJ1929	NETWORK	AJ1929	SPMS SOUTH PT MS GRM	0.00	0.00	0.00

AJ1929 -----

AJ1929 [ITRF positions](#) are available for this station.

AJ1929 The horizontal coordinates were established by GPS observations

AJ1929 and adjusted by the National Geodetic Survey in February 2007.

AJ1929

AJ1929 The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

AJ1929 See [National Readjustment](#) for more information.

AJ1929 The horizontal coordinates are valid at the epoch date displayed above.

AJ1929 The epoch date for horizontal control is a decimal equivalence

AJ1929 of Year/Month/Day.

AJ1929

AJ1929 The orthometric height was determined by GPS observations and a

AJ1929 high-resolution geoid model.

AJ1929

AJ1929 The X, Y, and Z were computed from the position and the ellipsoidal ht.

AJ1929

AJ1929 The Laplace correction was computed from DEFLEC99 derived deflections.

AJ1929

AJ1929 The ellipsoidal height was determined by GPS observations

AJ1929 and is referenced to NAD 83.

AJ1929

AJ1929 The geoid height was determined by GEOID03.

AJ1929

AJ1929;		North	East	Units	Scale	Factor	Converg.
AJ1929;SPC	CA 5	- 554,658.444	2,013,973.493	MT	1.00000906	+0 05	10.3
AJ1929;SPC	CA 5	- 1,819,741.91	6,607,511.37	sFT	1.00000906	+0 05	10.3
AJ1929;UTM	11	- 3,761,665.683	421,610.913	MT	0.99967575	-0 28	28.4

AJ1929

AJ1929! - Elev Factor x Scale Factor = Combined Factor
AJ1929!SPC CA 5 - 0.99996739 x 1.00000906 = 0.99997645
AJ1929!UTM 11 - 0.99996739 x 0.99967575 = 0.99964315
AJ1929
AJ1929 SUPERSEDED SURVEY CONTROL
AJ1929
AJ1929 NAD 83(1998)- 33 59 33.53512(N) 117 50 55.53404(W) AD(2000.35) A
AJ1929 ELLIP H (04/03/01) 207.771 (m) GP(2000.35) 1 1
AJ1929
AJ1929.Superseded values are not recommended for survey control.
AJ1929.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AJ1929.[See file dsdata.txt](#) to determine how the superseded data were derived.
AJ1929
AJ1929_U.S. NATIONAL GRID SPATIAL ADDRESS: 11SMT2161161666(NAD 83)
AJ1929_MARKER: Z = SEE DESCRIPTION
AJ1929_SETTING: 0 = UNSPECIFIED SETTING
AJ1929_MARK LOGO: NONE
AJ1929_MAGNETIC: N = NO MAGNETIC MATERIAL
AJ1929_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AJ1929+STABILITY: POSITION/ELEVATION WELL
AJ1929_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ1929+SATELLITE: SATELLITE OBSERVATIONS - 2001
AJ1929
AJ1929 HISTORY - Date Condition Report By
AJ1929 HISTORY - 2001 MONUMENTED NGS
AJ1929
AJ1929 STATION DESCRIPTION
AJ1929
AJ1929'DESCRIBED BY NATIONAL GEODETIC SURVEY 2001
AJ1929'THIS IS A CALIFORNIA CORS.
AJ1929'THESE COORDINATES ARE FOR THE GEODETIC REFERENCE MARK OF A
AJ1929'CALIFORNIA CORS. INFORMATION ABOUT THE GRM, ANTENNA TYPE
AJ1929'AND ANTENNA HEIGHT CAN BE FOUND AT THE SOPAC WEBSITE:
AJ1929'HTTP://SOPAC.UCSD.EDU/SCRIPTS/SIMPL.CGI



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

SPMS Site Information Form (site log)

International GPS Service

See Instructions at:

ftp://igsb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) : Susan Jeffries
Date Prepared : 2006-09-07
Report Type : UPDATE
If Update:
Previous Site Log : spms_20060809.log
Modified/Added Sections : (n.n,n.n,...)

1. Site Identification of the GNSS Monument

Site Name : SPMS_SCGN_CS1998
Four Character ID : SPMS
Monument Inscription :
IERS DOMES Number : 49932M001
CDP Number :
Monument Description : Wyatt/Agnew drilled-braced
Height of the Monument : (m)
Monument Foundation : (STEEL RODS/CONCRETE BLOCK/ROOF/etc)
Foundation Depth : (m)
Marker Description : (CHISELLED CROSS/DIVOT/BRASS NAIL/etc)Top of center
support screw on SCIGN D3 antenna
adaptor
Date Installed : 1998-08-04
Geologic Characteristic : SEDIMENTARY BEDROCK
Bedrock Type : SEDIMENTARY
Bedrock Condition : WEATHERED
Fracture Spacing : (1-10 cm/11-50 cm/51-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : (multiple lines)Roof mount SCIGN - Southern
California
Integrated GPS : Integrated GPS NetworkSCIGN - Southern California
Network. Monument is Wyatt-type drilled-braced
Geodetic Monument composed of stainless steel
supports and new SCIGN antenna adaptor. Fixed
antenna height is 0.0083 m. A secondary
measurement, the adaptor/divot distance, taken
from the bottom of the lower adaptor plate to
the center of a divot drill-mark on the
north-facing tripod leg, is not yet measured.

2. Site Location Information

City or Town : Diamond Bar
State or Province : California
Country : USA
Tectonic Plate : North American
Approximate Position (ITRF)
X coordinate (m) : -2472983.00163176
Y coordinate (m) : -4680767.02345286
Z coordinate (m) : 3545886.76512159
Latitude (N is +) : +335933.55
Longitude (E is +) : -1175055.59

Elevation (m,ellips.) : 207.0515
Additional Information : Ref. epoch: 2004.1694 Located at Fire Camp 8 Los Angeles County.
South Pointe Middle : Reference frame used is (ITRF2000). Coordinate system used is (WGS84). Located on the grounds of
South Pointe Middle : School Los Angeles County. Reference frame used is (ITRF97). Coordinate system used is (WGS84).

3. GNSS Receiver Information

3.1 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03011
Firmware Version : 1F50
Elevation Cutoff Setting : deg
Date Installed : 1998-08-19
Date Removed : 1999-06-24
Temperature Stabiliz. : none
Additional Information : New Installation; interpolation feature on

3.2 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03037
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-06-24
Date Removed : 1999-08-11
Temperature Stabiliz. : none
Additional Information : Firmware upgrade for GPS week rollover-compliance.

3.3 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03218
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-08-11
Date Removed : 1999-08-13
Temperature Stabiliz. : none
Additional Information : Swapped at 1:25 local.

3.4 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03027
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 1999-08-13
Date Removed : 2002-08-07
Temperature Stabiliz. : none
Additional Information : (multiple lines)

3.5 Receiver Type : ASHTECH Z-XII3
Satellite System : GPS
Serial Number : LP03027
Firmware Version : CC00
Elevation Cutoff Setting : 10 deg
Date Installed : 2002-08-07
Date Removed : 2006-03-09
Temperature Stabiliz. : none
Additional Information : Sampling interval increased to 5 seconds. Raw

```
: data stored permanently. Rinex data decimated to
: 30 seconds.

3.6 Receiver Type           : TRIMBLE NETRS
  Satellite System         : GPS
  Serial Number            : 4518249791
  Firmware Version         : 1.1-2
  Elevation Cutoff Setting : deg
  Date Installed           : 2006-03-09
  Date Removed             : (CCYY-MM-DDThh:mmZ)
  Temperature Stabiliz.    : none
  Additional Information    : (multiple lines)

3.x Receiver Type           : (A20, from rcvr_ant.tab; see instructions)
  Satellite System         : (GPS/GLONASS/GPS+GLONASS)
  Serial Number            : (A5)
  Firmware Version         : (A11)
  Elevation Cutoff Setting : (deg)
  Date Installed           : (CCYY-MM-DDThh:mmZ)
  Date Removed             : (CCYY-MM-DDThh:mmZ)
  Temperature Stabiliz.    : (none or tolerance in degrees C)
  Additional Information    : (multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type            : ASH700936E_C    NONE
  Serial Number             : CR14640
  Antenna Reference Point   : BPA
  Marker->ARP Up Ecc. (m)    : 0.0083
  Marker->ARP North Ecc(m)  :
  Marker->ARP East Ecc(m)   :
  Alignment from True N     : deg
  Antenna Radome Type       : NONE
  Radome Serial Number      : N/A
  Antenna Cable Type        : (vendor & type number)
  Antenna Cable Length     : (m)
  Date Installed            : 1998-08-04
  Date Removed              : 1999-07-21
  Additional Information     : Antenna height is fixed and measured from the
                             : raised nipple on the lower part of the antenna
                             : adaptor (peak of center support screw) to the
                             : BPA.

4.2 Antenna Type            : ASH701945B_M    SCIT
  Serial Number             : CR519991771
  Antenna Reference Point   : BPA
  Marker->ARP Up Ecc. (m)    : 0.0083
  Marker->ARP North Ecc(m)  :
  Marker->ARP East Ecc(m)   :
  Alignment from True N     : deg
  Antenna Radome Type       : SCIT
  Radome Serial Number      : 0242
  Antenna Cable Type        : (vendor & type number)
  Antenna Cable Length     : (m)
  Date Installed            : 1999-07-21
  Date Removed              : (CCYY-MM-DDThh:mmZ)
  Additional Information     : Antenna height is fixed and measured from the
                             : raised nipple on the lower part of the antenna
                             : adaptor (peak of center support screw) to the
                             : BPA.
```

-
- 4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
5. Surveyed Local Ties
- 5.1 Tied Marker Name : NONE
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
- 5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)
6. Frequency Standard
- 6.1 Standard Type : INTERNAL
Input Frequency :
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
- 6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)
7. Collocation Information
- 7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
-

Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.2.x Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.3.x Temp. Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (deg C)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.4.x Water Vapor Radiometer :
Manufacturer :
Serial Number :
Distance to Antenna : (m)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (dd-MMM-yyy - dd-MMM-yyy)
Notes : (multiple lines)

8.5.x Other Instrumentation : (multiple lines)

9. Local Ongoing Conditions Possibly Affecting Computed Position

9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
Observed Degradations : (SN RATIO/DATA GAPS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Additional Information : (multiple lines)

10. Local Episodic Effects Possibly Affecting Data Quality

10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
Event : (TREE CLEARING/CONSTRUCTION/etc)

11. On-Site, Point of Contact Agency Information

Agency : UNAVCO
Preferred Abbreviation : UNAVCO
Mailing Address : 6350 Nautilus Dr.
: Boulder, CO 80301 USA

Primary Contact
Contact Name : Freddy Blume
Telephone (primary) : 303-381-7474
Telephone (secondary) :
Fax : 303-381-7451
E-mail : blume@unavco.org

Secondary Contact
Contact Name : Michael Jackson
Telephone (primary) : 303-381-7554
Telephone (secondary) :
Fax :
E-mail : jackson@unavco.org
Additional Information : (multiple lines)

12. Responsible Agency (if different from 11.)

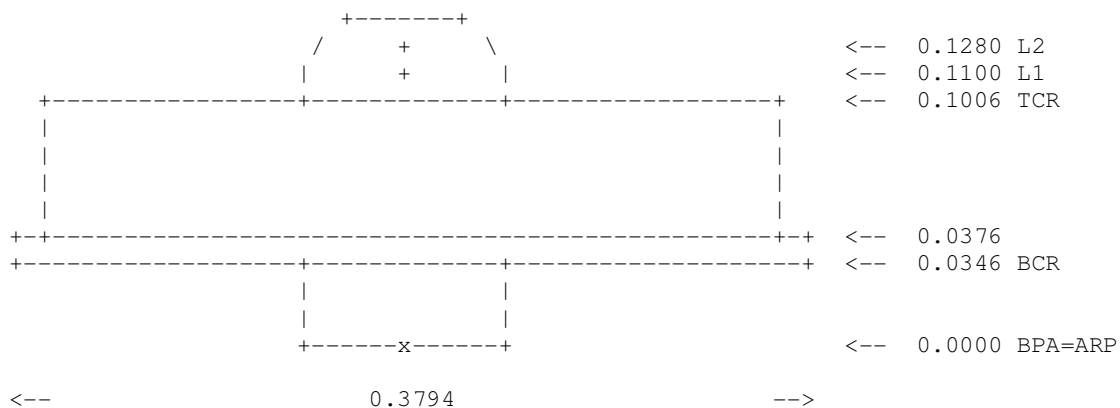
Agency :
Preferred Abbreviation : (A10)
Mailing Address :
Primary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Secondary Contact
Contact Name :
Telephone (primary) :
Telephone (secondary) :
Fax :
E-mail :
Additional Information : (multiple lines)

13. More Information

Primary Data Center : UNAVCO Boulder Facility Archive
Secondary Data Center :
URL for More Information : <http://www.unavco.org>
Hardcopy on File
Site Map : Y
Site Diagram : Y
Horizon Mask : Y
Monument Description : Y
Site Pictures : Y
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

ASH701945D_M

ASH701945E_M



ARP: Antenna Reference Point
 L1 : L1 Phase Center
 TCR: Top of Choking
 TGP: Top of Ground Plane
 TPA: Top of Preamplifier
 TOP: Top of Pole

L2 : L2 Phase Center
 BCR: Bottom of Choking
 BGP: Bottom of Ground Plane
 BPA: Bottom of Preamplifier



8401 Arlington Boulevard
Fairfax, Virginia 22031-4666

703 849 0396
703 849 0182 fax
www.dewberry.com

4.5.2 New Control Stations

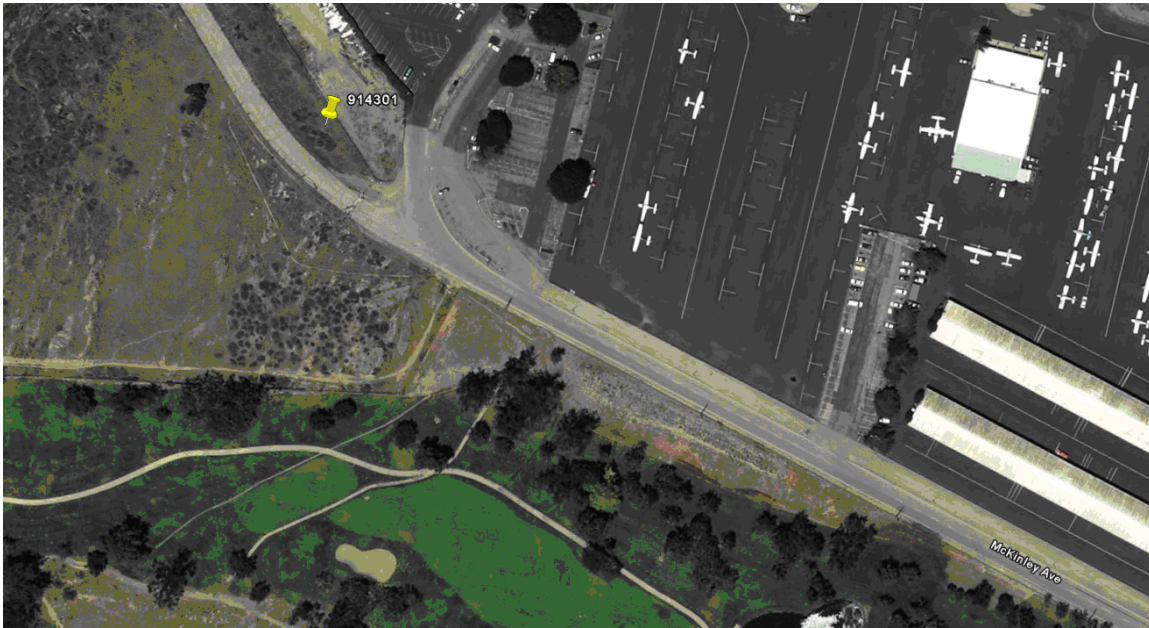
STA_ID: 914301

LATITUDE: 34 05 22.05520 LONGITUDE: -117 47 05.06989

ELLHGT: 268.0278m ORTHOHGT : 301.5868m



Control Location: Brackett Airport



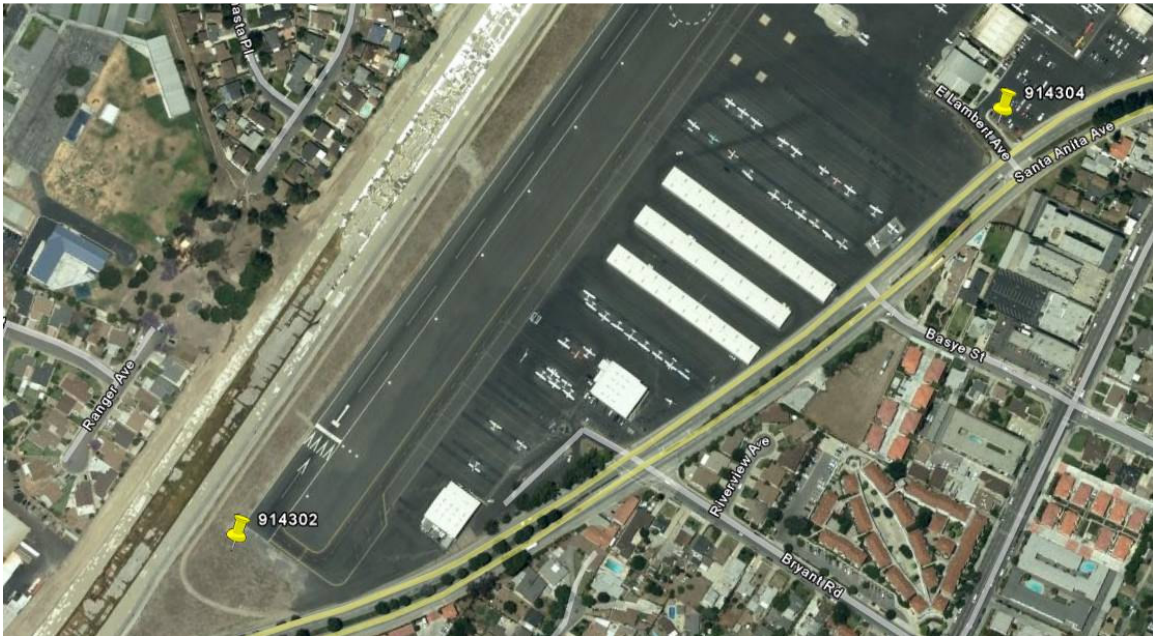
STA_ID: 914302

LATITUDE: 34 04 51.19350 LONGITUDE: -118 02 16.26505

ELLHGT: 51.7520m ORTHOHGT: 86.1686m

Control Location: El Monte airport





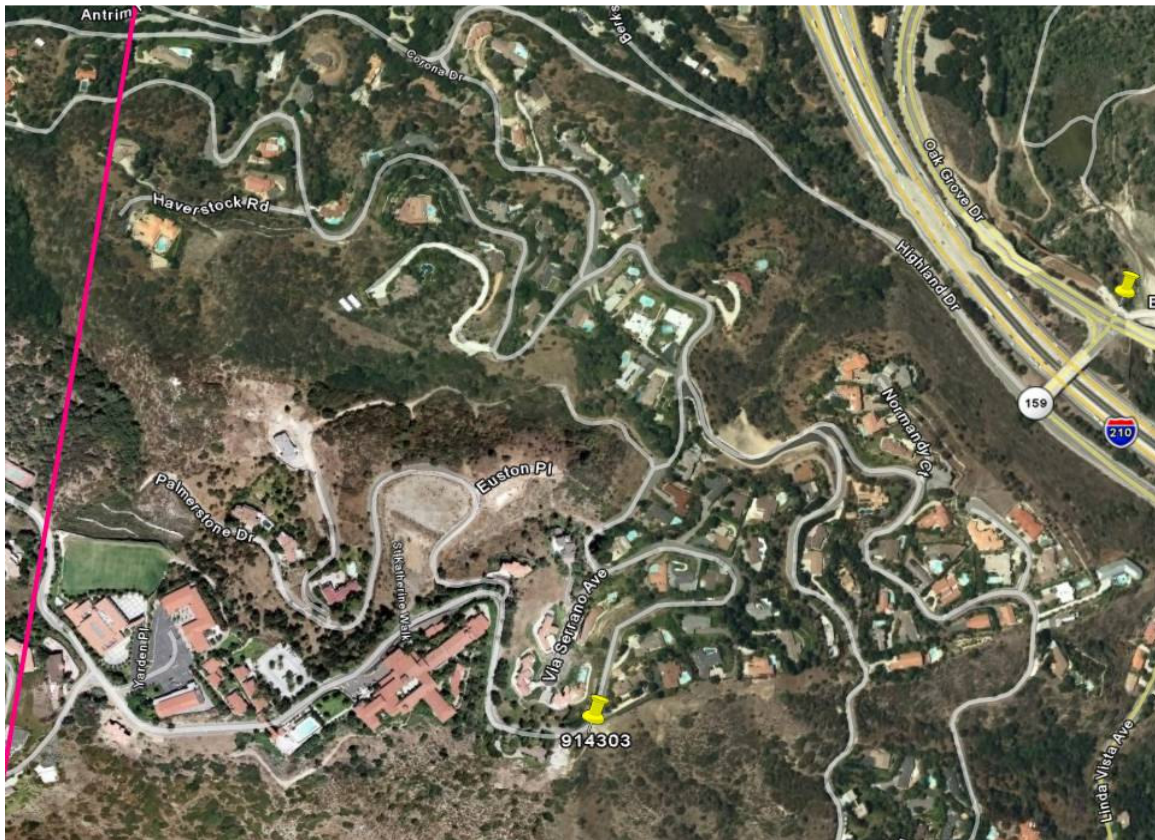
STA_ID: 914303

LATITUDE: 34 10 47.78100 LONGITUDE: -118 10 52.20514

ELLHGT: 437.6259 m ORTHOHGT: 471.3486m



Control location: St. Katherine Drive



STA_ID: 914304

LATITUDE: 34 05 04.66812 LONGITUDE: -118 01 56.81072

ELLHGT: 56.5790m ORTHOHGT: 90.9522m



Control Location: El Monte Airport

