

Mike Berry

DGMC 21 DESCHUTES13 REPORT

**From:** Mike Berry  
**Sent:** Sunday, April 21, 2013 9:29 PM  
**To:** Mike Berry  
**Subject:** New Deschutes13 transformation for use with ORGN  
**Attachments:** Deschutes13 intro and narrative.pdf  
  
**Categories:** Important

From: Deschutes County Surveyor's Office  
To: Local Surveyors (Deschutes County) distribution list  
Subject: New Deschutes13 transformation for use with ORGN  
Sunday, April 21, 2013

Our office has created a 3D transformation for using ODOT's new coordinate values for the GPS base stations of the Oregon Real Time GPS Network with the Central Oregon Coordinate System.

If you are interested in using this information for your RTK work, please see the attached .pdf file.

Sincerely,  
Mike Berry  
Deschutes County Surveyor  
61150 S.E. 27th Street  
Bend, Oregon 97702  
(541) 322-7112 Cell (541) 815-2352  
Fax (541) 388-2719  
[mikeb@co.deschutes.or.us](mailto:mikeb@co.deschutes.or.us)

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This email is sent to a "Bcc" (Blind Carbon Copy) mailing list to keep the recipients email addresses confidential. You are on this list because you have either recently filed surveys here in Deschutes County or have requested to be on this list. If you do not wish to receive emails addressed to our Deschutes County Surveyor's Office Notification email list please contact Mike Berry at [mikeb@deschutes.org](mailto:mikeb@deschutes.org).

## Mike Berry

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**From:** Mike Berry  
**Sent:** Friday, August 16, 2013 2:08 PM  
**To:** Mike Berry  
**Subject:** CORRECTION: New Deschutes13 transformation for use with ORGN  
**Attachments:** Deschutes13\_intro\_and\_narrative\_Correction.pdf

From: Deschutes County Surveyor's Office  
To: Local Surveyors (Deschutes County) distribution list  
Subject: CORRECTION: New Deschutes13 transformation for use with ORGN  
Friday, August 16, 2013

Please find attached a corrected copy of the file "Deschutes13\_intro\_and\_narrative\_Correction.pdf". This was modified to correct the erroneous Central Oregon Coordinate system value of "Easting at Central Meridian" to 3,300,000.00 ift.

The original document I sent out had this fat-fingered at 3,000,000.00. Fortunately a local GPS enthusiast pointed out this typo which he discovered in his quest to develop a calibration for his Trimble GPS units. The COCS has always had the Central Meridian at 3,300,000.00 and our Deschutes13 transformation was built around the correct values of the COCS. It was just typed incorrectly in the 4/21/2013 document.

Please disregard previous copies of the 4/21/2013 document.

Thanks,  
Mike

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**From:** Mike Berry  
**Sent:** Thursday, May 09, 2013 4:54 PM  
**To:** Mike Berry  
**Subject:** New Deschutes13 transformation for use with ORGN

From: Deschutes County Surveyor's Office  
To: Local Surveyors (Deschutes County) distribution list  
Subject: New Deschutes13 transformation for use with ORGN  
Sunday, April 21, 2013\*

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Sincerely,  
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\*This email was originally sent 4/21/2013, but it appears it did not reach all of the intended recipients.



## Surveyor's Office

61150 SE 27th St. • Bend, Oregon 97702  
(541) 388-6581 • FAX (541) 388-2719

### "Deschutes13" Transformation

(updated Nov. 2016 to include information about Trimble calibration .jxl file)

#### Introduction:

The purpose of this transformation is to provide a method to transform positions from the new NAD 83 (2011) epoch 2010.00 base station coordinates as broadcast by the Oregon Real Time GPS Network (ORGN) to Central Oregon Coordinate System (COCS) values. This transformation is named the "**Deschutes13**" transformation and will allow users to utilize the ORGN as a source for providing COCS positions without the need to do a 'local transformation'.

Prior to ODOT's March 2013 update of the GPS base station coordinates of the ORGN, the Deschutes County Surveyors Office (DCSO) had developed and circulated a county-wide "Transformation" (or "localization" or "calibration", depending on the nomenclature of the software one uses) known as "**Deschutes09**". With the change of ORGN GPS base station coordinates the **Deschutes09 transformation became obsolete**. Therefore the DCSO developed the **Deschutes13** transformation to work with the new broadcast coordinate values.

#### Background information:

The COCS is a low distortion projection developed by the Deschutes County Surveyors office in the early 1990s which has been adopted and used by many local surveyors over the intervening years. The COCS was designed to reduce the distortion between ground distances and grid distances and is defined as follows:

Linear unit: International foot (ift)  
Geodetic datum: North American Datum of 1983 (1991)  
Vertical datum: National Geodetic Vertical Datum of 1929 (NGVD29)  
System: Central Oregon Coordinate System  
Projection: Transverse Mercator  
Latitude of grid origin: 43° 00' 00" N  
Longitude of central meridian: 121° 17' 00"W  
Northing at grid origin: 0.000 ift  
Easting at central meridian: 3,300,000.000 ift  
Scale factor on central meridian: 1.00016 (exact)

#### Transformation Explanation:

In order to utilize Real Time network GNSS technology broadcasting data on newer datums (in this case the ORGN), a transformation is needed to obtain legacy values that are compatible with the many existing surveys and monuments.

A Classical 3D transformation approach (3D similarity transformation) consisting of three translations, three rotations and one scale factor was selected as the transformation method

## **“Deschutes13” Transformation**

utilizing the Molodensky-Badekas model (transformation model where the rotation origin is the center of gravity of the common points of system A, in this case the ORGN derived positions). The transformation was performed within the Leica GNSS suite of software using Leica Geo Office (LGO) version 8.2.

In order to utilize this type of transformation, a number of common points must be included. For the **Deschute13** transformation project, 14 COCS monuments were selected that were randomly distributed across the original extent of the COCS within Deschutes County, favoring those points that were considered to be solid primary points in both the horizontal and vertical components from the original 1990’s surveys. 13 of these points had been used in developing the **Deschutes09** transformation.

GEOID12a<sup>1</sup> was utilized to provide ellipsoid heights by adding the geoid height to the published NGVD29 heights. It should be noted that these published COCS “ellipsoid heights” are actually pseudo ellipsoid heights due to the fact that the NGS developed geoid models are developed to work with NAD83 and NAVD88, NOT NGVD29. The original COCS mark information sheets as published by DCSO do not have correct NAD83 ellipsoid heights published, therefore users who wish to obtain measured NAD83 ellipsoid heights on a mark can do so by measuring a point with no transformation selected in either their hardware or software.

### **Transformation Field Work:**

Each of the 14 points was occupied multiple times by dual frequency Leica GNSS receivers in March and April of 2013. Using the weighted mean measured positions of these 14 occupations as obtained from a network solution from the ORGN served as the basis of the resulting transformation. The transformation was then computed from the 14 measured points to the record positions of those same points.

### **Field Checks:**

After the **Deschutes13** transformation was created, we performed field checks by loading the transformation into our GPS rovers and staking out to 61 points throughout Deschutes County. Observations were 2 minutes in durations with a GDOP < 5.0. For the sake of expediency these checks were not necessarily performed during optimum satellite constellations for the horizon obstructions at any given check point. Prudent field practices and cognizance of site conditions vs. satellite locations will hopefully assist users in obtaining desirable accuracies with this transformation.

The overall results of this transformation are similar to those of the now obsolete **Deschutes09** transformation. When all the inverses are added up, the totals pretty much zero out. Therefore we calculated the N, E and Z absolute values to see what the average fallings were (since being off by -0.03’ is still missing the point by 0.03’).

*(see DGMC 21 MAP filed in Plot Cabinet 22)*

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<sup>1</sup> ODOT recommends using Geoid12a with the ORGN and also using absolute antenna values on GPS receivers. Please see the information at <http://www.theorgn.org/>

## “Deschutes13” Transformation

In horizontal positioning, the average difference in Northing in both **Deschutes09** and **Deschutes13** is 0.04’, the average difference in Easting in both **Deschutes09** and **Deschutes13** is 0.04’ and the average delta difference in Northing and Easting is 0.06’.

The average difference in ortho heights for **Deschutes13** field checks is 0.06’, whereas the **Deschutes09** was 0.13

### Data Available to Local Surveyors:

To distribute this information to interested parties, I have posted the following information to the County’s ftp site:

#### Reports –

<ftp://ftp.deschutes.org/Road/Mike/Deschutes13/Reports/>

This directory contains .pdf files with the transformation parameters together with a spread sheet and map of the field check inverses.

#### Leica Data –

[ftp://ftp.deschutes.org/Road/Mike/Deschutes13/Leica\\_data/](ftp://ftp.deschutes.org/Road/Mike/Deschutes13/Leica_data/)

This directory contains a transformation data set to load the **Deschutes13** transformation into Leica software and GPS units and a Geoid12a field geoid file sampled at a spacing of 1320 feet which covers Deschutes County.

#### Trimble Data –

[ftp://ftp.deschutes.org/Road/Mike/Deschutes13/Trimble\\_data/](ftp://ftp.deschutes.org/Road/Mike/Deschutes13/Trimble_data/)

This directory contains a transformation data set created by Trimble Navigation Limited in Corvallis, Oregon to load the Trimble “.jx1” file that emulates the Leica **Deschutes13** transformation into Trimble software and GPS units.

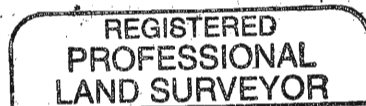
### Using **Deschutes13** with other receivers and software:

Unfortunately there is no universal transfer file language that I am aware of to convert a Leica “transformation” to other brand name “calibrations”.

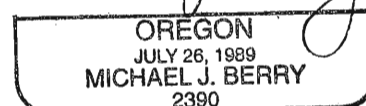
We will be glad to supply you any information we can to help you do likewise with the **Deschutes13** transformation. And, if you get a viable transformation loaded up in your GPS receiver we would be glad to meet with you in the field to see how it compares with the results we get on our Rovers.

Feel free to contact me if you have any questions or need additional data regarding **Deschutes13**. Our office will serve as a clearing house for any information we obtain on how non-Leica users can translate the information we have on hand to other GPS brands.

Sincerely,  
Mike Berry  
Deschutes County Surveyor  
541-322-7112  
Cell 541-815-2352  
[mibeb@deschutes.org](mailto:mibeb@deschutes.org)



*Michael J. Berry*



RENEWAL DATE: 12/31/



## Classical 3D - Transformation Report

Processed: 04/12/2013 02:11:19 pm

### Project Information

	<b>System A</b>	<b>System B</b>
Project name:	Deschutes13-WGS1984	Deschutes13-COCS Geoid12A

### Coordinate System Information System B

Coordinate system name:	COCS
Created:	-
Transformation name:	-
Transformation type:	-
Height mode:	-
Residuals:	-
Local Ellipsoid:	GRS 1980
Projection:	COCS
Geoid model:	Geoid12A
CSCS model:	-

### Transformation details

Height mode: Ellipsoidal

#### 3D-Helmert transformation

Number of common points:	14
Sigma a priori:	1.0000
Sigma a posteriori:	0.0195
Transformation model:	Molodensky-Badekas
Rotation origin:	
	X0: -7814768.703 fti
	Y0: -12872554.357 fti
	Z0: 14485383.167 fti

No.	Parameter	Value	rms
1	Shift dX	1.335 fti	0.017 fti
2	Shift dY	2.158 fti	0.017 fti
3	Shift dZ	-2.946 fti	0.017 fti
4	Rotation about X	-0.24795 "	0.04047 "
5	Rotation about Y	0.19713 "	0.03771 "
6	Rotation about Z	-0.07041 "	0.04263 "
7	Scale	-0.0666 ppm	0.1408 ppm

### Residuals

#### Cartesian:

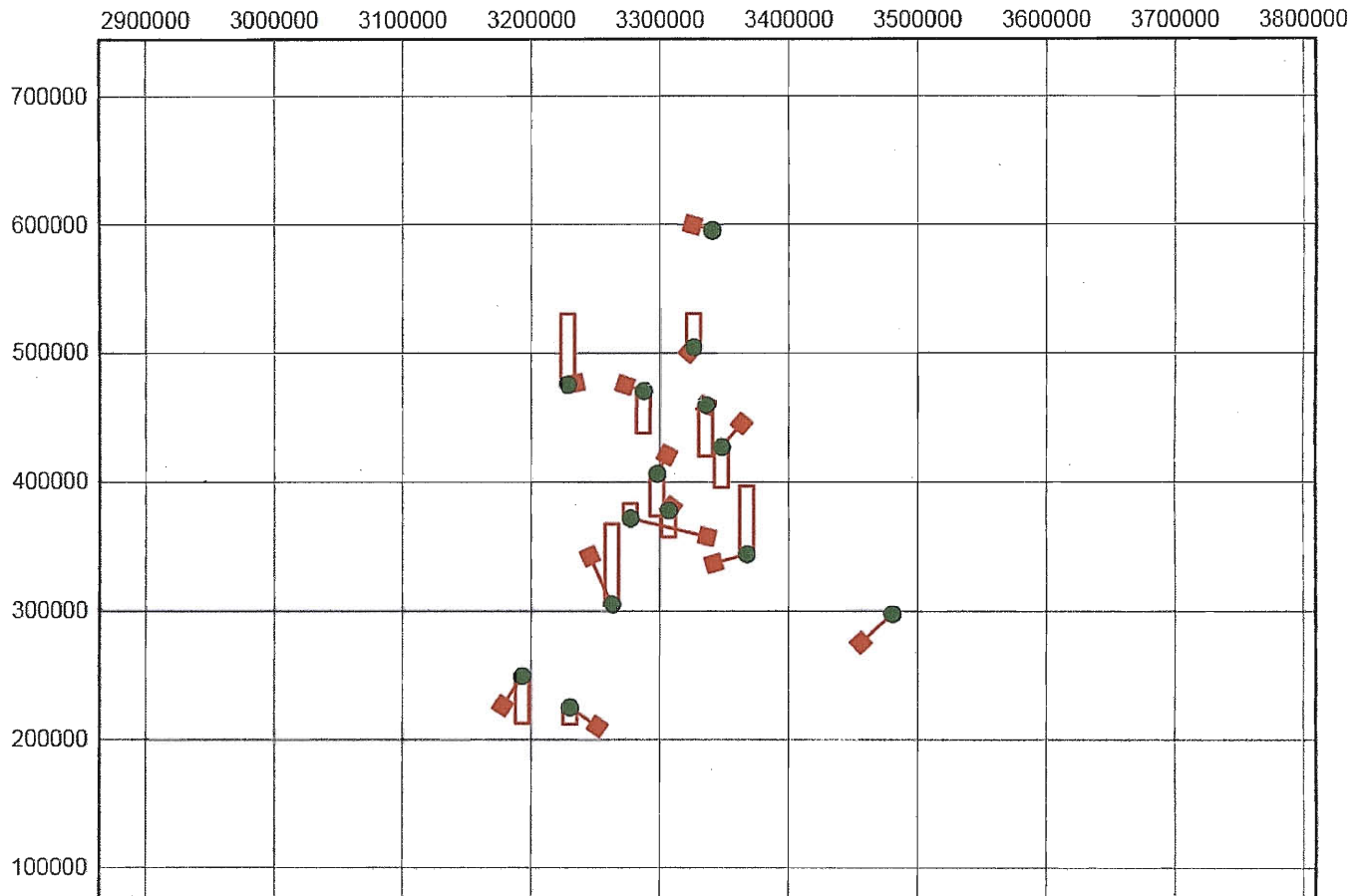
System A	System B	Point type	dX [fti]	dY [fti]	dZ [fti]
15	15	Position + height	0.039 fti	0.047 fti	-0.065 fti
22	22	Position + height	0.060 fti	0.057 fti	-0.021 fti
24	24	Position + height	0.097 fti	-0.108 fti	-0.006 fti
35	35	Position + height	0.077 fti	0.049 fti	-0.014 fti
38	38	Position + height	0.044 fti	-0.033 fti	-0.046 fti
39	39	Position + height	-0.023 fti	0.035 fti	-0.097 fti
42	42	Position + height	-0.054 fti	-0.009 fti	0.160 fti
48	48	Position + height	-0.070 fti	-0.003 fti	-0.039 fti
49	49	Position + height	-0.104 fti	-0.049 fti	0.068 fti
516	516	Position + height	-0.038 fti	-0.037 fti	0.029 fti
54	54	Position + height	-0.024 fti	-0.082 fti	0.086 fti
550	550	Position + height	-0.030 fti	0.029 fti	0.008 fti
6	6	Position + height	-0.002 fti	0.073 fti	-0.042 fti
62	62	Position + height	0.030 fti	0.030 fti	-0.022 fti

#### Grid:

System A	System B	Point type	dE [fti]	dN [fti]	dHgt [fti]
15	15	Position + height	0.009 fti	-0.004 fti	-0.088 fti
22	22	Position + height	0.021 fti	0.040 fti	-0.072 fti

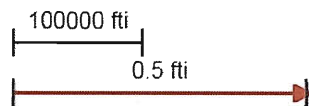
24	24	Position + height	0.139 fti	-0.033 fti	0.025 fti
35	35	Position + height	0.040 fti	0.047 fti	-0.069 fti
38	38	Position + height	0.054 fti	-0.037 fti	-0.028 fti
39	39	Position + height	-0.038 fti	-0.058 fti	-0.080 fti
42	42	Position + height	-0.041 fti	0.091 fti	0.137 fti
48	48	Position + height	-0.059 fti	-0.055 fti	0.000 fti
49	49	Position + height	-0.064 fti	-0.018 fti	0.116 fti
516	516	Position + height	-0.013 fti	-0.015 fti	0.057 fti
54	54	Position + height	0.022 fti	0.004 fti	0.119 fti
550	550	Position + height	-0.041 fti	0.012 fti	-0.001 fti
6	6	Position + height	-0.040 fti	0.013 fti	-0.073 fti
62	62	Position + height	0.010 fti	0.013 fti	-0.045 fti

Graphical overview:



Scale:

Coordinates



Residuals

- Show Point Id
- Show Residuals Position
- Show Residuals Height
- Show Grid

List of identical points

System A:

WGS 84 Cartesian:

	X [fti]	Y [fti]	Z [fti]
15	-7765427.072	-12848250.030	14532893.148
22	-7816876.648	-12861094.692	14494716.787
24	-7847179.086	-12871178.761	14470177.531
35	-7767010.740	-12874341.690	14509374.115
38	-7940643.953	-12933831.574	14364207.170
39	-7963539.866	-12900283.377	14381698.062
42	-7883488.701	-12903456.906	14422411.422
48	-7700529.372	-13020739.640	14416514.904
49	-7780406.993	-12933882.798	14450077.666
516	-7757374.653	-12816542.435	14564523.824



54	-7850800.865	-12783333.397	14544366.834
550	-7711390.678	-12769284.307	14629128.801
6	-7802337.396	-12816801.769	14540825.177
62	-7819755.824	-12882739.625	14474448.898

**WGS 84 Geodetic:**

	Lat [°]	Lon [°]	Hgt [fti]
15	44° 15' 43.38961" N	121° 08' 54.90602" W	2984.323
22	44° 06' 53.98092" N	121° 17' 27.31052" W	3372.982
24	44° 01' 12.53753" N	121° 22' 09.96033" W	3816.109
35	44° 10' 17.52856" N	121° 06' 08.35541" W	3177.393
38	43° 36' 58.73663" N	121° 32' 51.29110" W	4202.115
39	43° 40' 56.60331" N	121° 41' 15.57758" W	4288.748
42	43° 50' 14.56682" N	121° 25' 23.65560" W	4143.967
48	43° 48' 49.79397" N	120° 36' 01.00246" W	4573.856
49	43° 56' 39.14089" N	121° 01' 44.79290" W	3562.921
516	44° 23' 02.73429" N	121° 11' 05.83463" W	2693.521
54	44° 18' 20.44582" N	121° 33' 21.22103" W	3107.684
550	44° 38' 02.20824" N	121° 07' 40.23596" W	2176.202
6	44° 17' 32.85429" N	121° 19' 52.75722" W	2976.155
62	44° 02' 12.88671" N	121° 15' 27.11736" W	3638.782

**Local Grid (Transf.):**

	Easting [fti]	Northing [fti]	Hgt [fti]
15	3335307.382	460142.986	2980.548
22	3298007.281	406494.996	3369.131
24	3277347.377	371925.701	3812.207
35	3347502.433	427162.573	3173.567
38	3230007.266	224792.233	4197.997
39	3193020.857	249030.698	4284.671
42	3263078.796	305308.139	4139.966
48	3480331.755	297435.862	4569.820
49	3366970.918	344328.107	3558.968
516	3325724.389	504627.814	2689.815
54	3228635.011	476139.624	3103.945
550	3340484.465	595755.802	2172.631
6	3287432.405	471204.542	2972.402
62	3306786.203	378027.005	3634.886

**System B:**

**Local Cartesian:**

	X [fti]	Y [fti]	Z [fti]
15	-7765425.833	-12848247.961	14532890.341
22	-7816875.385	-12861092.604	14494713.874
24	-7847177.833	-12871176.489	14470174.563
35	-7767009.508	-12874339.594	14509371.225
38	-7940642.516	-12933829.277	14364204.084
39	-7963538.390	-12900281.179	14381695.045
42	-7883487.237	-12903454.685	14422408.217
48	-7700527.858	-13020737.348	14416511.933
49	-7780405.501	-12933880.533	14450074.614
516	-7757373.378	-12816540.319	14564520.965
54	-7850799.590	-12783331.247	14544363.871
550	-7711389.492	-12769282.323	14629126.061
6	-7802336.132	-12816799.751	14540822.348
62	-7819754.505	-12882737.485	14474445.958

**Local Geodetic:**

	Lat [°]	Lon [°]	Hgt [fti]
15	44° 15' 43.38638" N	121° 08' 54.90615" W	2980.636
22	44° 06' 53.97704" N	121° 17' 27.31060" W	3369.203
24	44° 01' 12.53426" N	121° 22' 09.96186" W	3812.182
35	44° 10' 17.52483" N	121° 06' 08.35579" W	3173.635
38	43° 36' 58.73302" N	121° 32' 51.29080" W	4198.025
39	43° 40' 56.59981" N	121° 41' 15.57620" W	4284.751
42	43° 50' 14.56218" N	121° 25' 23.65435" W	4139.829
48	43° 48' 49.79156" N	120° 36' 01.00060" W	4569.820
49	43° 56' 39.13776" N	121° 01' 44.79138" W	3558.852
516	44° 23' 02.73119" N	121° 11' 05.83470" W	2689.757
54	44° 18' 20.44212" N	121° 33' 21.22157" W	3103.825
550	44° 38' 02.20502" N	121° 07' 40.23611" W	2172.631
6	44° 17' 32.85072" N	121° 19' 52.75680" W	2972.475
62	44° 02' 12.88309" N	121° 15' 27.11712" W	3634.931

**Local Grid:**

Easting [fti]	Northing [fti]	Hgt [fti]
---------------	----------------	-----------

15	3335307.373	460142.991	2980.636
22	3298007.260	406494.956	3369.203
24	3277347.238	371925.734	3812.182
35	3347502.392	427162.526	3173.635
38	3230007.212	224792.270	4198.025
39	3193020.895	249030.756	4284.751
42	3263078.837	305308.048	4139.829
48	3480331.814	297435.917	4569.820
49	3366970.982	344328.125	3558.852
516	3325724.402	504627.830	2689.757
54	3228634.989	476139.620	3103.825
550	3340484.506	595755.790	2172.631
6	3287432.445	471204.529	2972.475
62	3306786.193	378026.992	3634.931

Deschutes13 Transformation Field Checks

Sort by  
POINT NUMBER

Point Id	Code	Diff N	Diff E	Diff Elev (ORHTO)	Diff Delta NE	Absolute Diff Elev	Point Id	count
1	GIS 013	-0.01	0.07	0.05	0.07	0.05	1	1
2	GIS 014	0.00	0.06	-0.05	0.06	0.05	2	2
3	GIS 015	0.01	0.03	0.02	0.04	0.02	3	3
5	GIS 017	0.01	0.01	-0.02	0.02	0.02	5	4
6	GIS 018*	-0.01	0.01	0.06	0.01	0.06	6	5
7	GIS 019	-0.05	0.01	-0.02	0.05	0.02	7	6
12	GIS 024	0.01	-0.02	0.13	0.03	0.13	12	7
15	15131400-GIS27*	0.01	0.01	0.00	0.01	0.00	15	8
22	C-30 1921-GIS34*	-0.02	0.00	0.00	0.02	0.00	22	9
24	GIS 036*	0.00	-0.03	-0.07	0.03	0.07	24	10
29	GIS 041	-0.04	-0.17	0.10	0.17	0.10	29	11
35	T 463-GIS47*	0.00	0.01	0.01	0.01	0.01	35	12
36	GIS 048	0.06	0.06	-0.01	0.08	0.01	36	13
37	Y 370 1942-GIS49	0.07	-0.01	0.13	0.07	0.13	37	14
38	BEAL RM-1-GIS50*	-0.05	-0.11	0.04	0.12	0.04	38	15
39	WICKIUP-GIS51*	0.12	-0.01	-0.11	0.12	0.11	39	16
40	CAREY 1971-GIS52	-0.08	0.02	0.12	0.09	0.12	40	17
42	BNRR STA 369+48.*	-0.03	-0.05	0.02	0.06	0.02	42	18
48	BROTHERS-GIS60*	0.02	0.01	0.00	0.02	0.00	48	19
49	STATE HWY PI-GIS*	0.03	-0.03	0.09	0.05	0.09	49	20
53	X-359 1942-GIS65	-0.01	-0.03	-0.14	0.03	0.14	53	21
54	SISTERS-GIS66*	0.02	0.02	-0.04	0.03	0.04	54	22
57	GIS 069	-0.01	0.09	0.15	0.09	0.15	57	23
62	STEVENS*	0.02	-0.01	-0.03	0.02	0.03	62	24
177	17132700	0.06	-0.05	-0.01	0.08	0.01	177	25
198	17133400	-0.03	-0.02	0.00	0.03	0.00	198	26
209	BA50	-0.03	0.03	0.09	0.05	0.09	209	27
223	CB11	0.02	-0.02	0.07	0.03	0.07	223	28
224	CB12	-0.01	-0.05	0.01	0.05	0.01	224	29
234	DL80	0.03	0.00	0.02	0.03	0.02	234	30
353	18121104	-0.06	0.01	0.04	0.06	0.04	353	31
447	18120540	0.01	0.05	0.05	0.05	0.05	447	32
450	18120800	-0.08	0.02	0.08	0.09	0.08	450	33
513	2711 PP&L	-0.03	-0.01	-0.09	0.03	0.09	513	34
514	2906 ORE	-0.01	-0.02	-0.05	0.03	0.05	514	35
516	B-366*	0.05	-0.01	-0.06	0.05	0.06	516	36
552	Y-419	0.02	-0.01	-0.08	0.02	0.08	552	37
571	14131340	-0.04	-0.04	-0.03	0.06	0.03	571	38
596	14141800	-0.02	-0.03	-0.09	0.04	0.09	596	39
715	15-PSM	0.00	0.02	0.02	0.02	0.02	715	40
718	17-PSM	-0.02	0.04	-0.03	0.04	0.03	718	41
723	23-PSM	-0.01	0.05	-0.16	0.05	0.16	723	42
726	42-WS	-0.14	0.06	-0.05	0.15	0.05	726	43
734	F-112	-0.17	-0.11	0.08	0.20	0.08	734	44
751	SWEET	0.03	-0.03	-0.23	0.04	0.23	751	45
755	X 373	-0.06	0.05	-0.02	0.08	0.02	755	46
800	14132144	-0.15	-0.04	0.02	0.16	0.02	800	47
802	14133340	-0.06	0.03	0.06	0.07	0.06	802	48
806	14132040	-0.05	-0.02	0.13	0.05	0.13	806	49
808	14133204	-0.02	0.01	0.01	0.02	0.01	808	50
813	22101900	0.04	-0.06	0.01	0.07	0.01	813	51
814	22102000	0.04	-0.03	0.02	0.05	0.02	814	52
815	22101904	0.02	-0.06	0.09	0.06	0.09	815	53
816	22093640	-0.01	-0.03	-0.02	0.04	0.02	816	54
817	22092406	0.13	0.00	-0.01	0.13	0.01	817	55
831	17121640	-0.02	-0.10	0.00	0.10	0.00	831	56
852	17133204-RESET	0.12	-0.01	0.00	0.12	0.00	852	57
855	14131500-RESET	-0.07	0.03	0.16	0.07	0.16	855	58
856	14131440-RESET	-0.08	0.03	0.17	0.09	0.17	856	59
857	15131904	0.02	0.01	0.03	0.02	0.03	857	60
865	18120440	0.06	0.02	-0.04	0.07	0.04	865	61
	<b>Averages</b>	<b>-0.01</b>	<b>-0.01</b>	<b>0.01</b>	<b>0.06</b>	<b>0.06</b>		
	<b>CO GRID Averages</b>	<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.06</b>			
	<b>(Absolute Averages)</b>	<b>0.04</b>	<b>0.04</b>	<b>0.06</b>				
	<b>800 RTK Points Averages</b>	<b>0.00</b>	<b>-0.01</b>	<b>0.04</b>	<b>0.07</b>			
	<b>Absolute Averages</b>	<b>0.06</b>	<b>0.03</b>	<b>0.05</b>				
	*=transformation point				Diff Delta NE = hypotenuse of Diff N and Diff E			

Deschutes13 Transformation Field Checks

Sort by

DIFFERENCE IN NORTHING

Point Id	Code	Diff N	Diff E	Diff Elev (ORHTO)	Diff Delta NE	Absolute Diff Elev	Point Id	count
734	F-112	-0.17	-0.11	0.08	0.20	0.08	734	1
800	14132144	-0.15	-0.04	0.02	0.16	0.02	800	2
726	42-WS	-0.14	0.06	-0.05	0.15	0.05	726	3
40	CAREY 1971-GIS52	-0.08	0.02	0.12	0.09	0.12	40	4
856	14131440-RESET	-0.08	0.03	0.17	0.09	0.17	856	5
450	18120800	-0.08	0.02	0.08	0.09	0.08	450	6
855	14131500-RESET	-0.07	0.03	0.16	0.07	0.16	855	7
802	14133340	-0.06	0.03	0.06	0.07	0.06	802	8
755	X 373	-0.06	0.05	-0.02	0.08	0.02	755	9
353	18121104	-0.06	0.01	0.04	0.06	0.04	353	10
38	BEAL RM-1-GIS50*	-0.05	-0.11	0.04	0.12	0.04	38	11
806	14132040	-0.05	-0.02	0.13	0.05	0.13	806	12
7	GIS 019	-0.05	0.01	-0.02	0.05	0.02	7	13
571	14131340	-0.04	-0.04	-0.03	0.06	0.03	571	14
29	GIS 041	-0.04	-0.17	0.10	0.17	0.10	29	15
209	BA50	-0.03	0.03	0.09	0.05	0.09	209	16
513	2711 PP&L	-0.03	-0.01	-0.09	0.03	0.09	513	17
42	BNRR STA 369+48.*	-0.03	-0.05	0.02	0.06	0.02	42	18
198	17133400	-0.03	-0.02	0.00	0.03	0.00	198	19
596	14141800	-0.02	-0.03	-0.09	0.04	0.09	596	20
718	17-PSM	-0.02	0.04	-0.03	0.04	0.03	718	21
22	C-30 1921-GIS34*	-0.02	0.00	0.00	0.02	0.00	22	22
808	14133204	-0.02	0.01	0.01	0.02	0.01	808	23
831	17121640	-0.02	-0.10	0.00	0.10	0.00	831	24
224	CB12	-0.01	-0.05	0.01	0.05	0.01	224	25
57	GIS 069	-0.01	0.09	0.15	0.09	0.15	57	26
1	GIS 013	-0.01	0.07	0.05	0.07	0.05	1	27
816	22093640	-0.01	-0.03	-0.02	0.04	0.02	816	28
53	X-359 1942-GIS65	-0.01	-0.03	-0.14	0.03	0.14	53	29
514	2906 ORE	-0.01	-0.02	-0.05	0.03	0.05	514	30
723	23-PSM	-0.01	0.05	-0.16	0.05	0.16	723	31
6	GIS 018*	-0.01	0.01	0.06	0.01	0.06	6	32
2	GIS 014	0.00	0.06	-0.05	0.06	0.05	2	33
35	T 463-GIS47*	0.00	0.01	0.01	0.01	0.01	35	34
715	15-PSM	0.00	0.02	0.02	0.02	0.02	715	35
24	GIS 036*	0.00	-0.03	-0.07	0.03	0.07	24	36
15	15131400-GIS27*	0.01	0.01	0.00	0.01	0.00	15	37
12	GIS 024	0.01	-0.02	0.13	0.03	0.13	12	38
5	GIS 017	0.01	0.01	-0.02	0.02	0.02	5	39
447	18120540	0.01	0.05	0.05	0.05	0.05	447	40
3	GIS 015	0.01	0.03	0.02	0.04	0.02	3	41
48	BROTHERS-GIS60*	0.02	0.01	0.00	0.02	0.00	48	42
62	STEVENS*	0.02	-0.01	-0.03	0.02	0.03	62	43
54	SISTERS-GIS66*	0.02	0.02	-0.04	0.03	0.04	54	44
815	22101904	0.02	-0.06	0.09	0.06	0.09	815	45
223	CB11	0.02	-0.02	0.07	0.03	0.07	223	46
552	Y-419	0.02	-0.01	-0.08	0.02	0.08	552	47
857	15131904	0.02	0.01	0.03	0.02	0.03	857	48
234	DL80	0.03	0.00	0.02	0.03	0.02	234	49
751	SWEET	0.03	-0.03	-0.23	0.04	0.23	751	50
49	STATE HWY PI-GIS*	0.03	-0.03	0.09	0.05	0.09	49	51
813	22101900	0.04	-0.06	0.01	0.07	0.01	813	52
814	22102000	0.04	-0.03	0.02	0.05	0.02	814	53
516	B-366*	0.05	-0.01	-0.06	0.05	0.06	516	54
36	GIS 048	0.06	0.06	-0.01	0.08	0.01	36	55
177	17132700	0.06	-0.05	-0.01	0.08	0.01	177	56
865	18120440	0.06	0.02	-0.04	0.07	0.04	865	57
37	Y 370 1942-GIS49	0.07	-0.01	0.13	0.07	0.13	37	58
39	WICKIUP-GIS51*	0.12	-0.01	-0.11	0.12	0.11	39	59
852	17133204-RESET	0.12	-0.01	0.00	0.12	0.00	852	60
817	22092406	0.13	0.00	-0.01	0.13	0.01	817	61
	Averages	-0.01	-0.01	0.01	0.06	0.06		
	CO GRID Averages (Absolute Averages)	-0.01	0.00	0.00	0.06			
	800 RTK Points Averages Absolute Averages	0.00	-0.01	0.04	0.07			
	*=transformation point				Diff Delta NE = hypotenuse of Diff N and Diff E			

Deschutes13 Transformation Field Checks

Sort by

DIFFERENCE in EASTING

Point Id	Code	Diff N	Diff E	Diff Elev (ORHTO)	Diff Delta NE	Absolute Diff Elev	Point Id	count
29	GIS 041	-0.04	-0.17	0.10	0.17	0.10	29	1
38	BEAL RM-1-GIS50*	-0.05	-0.11	0.04	0.12	0.04	38	2
734	F-112	-0.17	-0.11	0.08	0.20	0.08	734	3
831	17121640	-0.02	-0.10	0.00	0.10	0.00	831	4
813	22101900	0.04	-0.06	0.01	0.07	0.01	813	5
815	22101904	0.02	-0.06	0.09	0.06	0.09	815	6
177	17132700	0.06	-0.05	-0.01	0.08	0.01	177	7
42	BNRR STA 369+48.*	-0.03	-0.05	0.02	0.06	0.02	42	8
224	CB12	-0.01	-0.05	0.01	0.05	0.01	224	9
800.	14132144	-0.15	-0.04	0.02	0.16	0.02	800	10
571	14131340	-0.04	-0.04	-0.03	0.06	0.03	571	11
816	22093640	-0.01	-0.03	-0.02	0.04	0.02	816	12
751	SWEET	0.03	-0.03	-0.23	0.04	0.23	751	13
53	X-359 1942-GIS65	-0.01	-0.03	-0.14	0.03	0.14	53	14
49	STATE HWY PI-GIS*	0.03	-0.03	0.09	0.05	0.09	49	15
24	GIS 036*	0.00	-0.03	-0.07	0.03	0.07	24	16
596	14141800	-0.02	-0.03	-0.09	0.04	0.09	596	17
814	22102000	0.04	-0.03	0.02	0.05	0.02	814	18
12	GIS 024	0.01	-0.02	0.13	0.03	0.13	12	19
514	2906 ORE	-0.01	-0.02	-0.05	0.03	0.05	514	20
198	17133400	-0.03	-0.02	0.00	0.03	0.00	198	21
223	CB11	0.02	-0.02	0.07	0.03	0.07	223	22
806	14132040	-0.05	-0.02	0.13	0.05	0.13	806	23
39	WICKIUP-GIS51*	0.12	-0.01	-0.11	0.12	0.11	39	24
852	17133204-RESET	0.12	-0.01	0.00	0.12	0.00	852	25
516	B-366*	0.05	-0.01	-0.06	0.05	0.06	516	26
37	Y 370 1942-GIS49	0.07	-0.01	0.13	0.07	0.13	37	27
513	2711 PP&L	-0.03	-0.01	-0.09	0.03	0.09	513	28
552	Y-419	0.02	-0.01	-0.08	0.02	0.08	552	29
62	STEVENS*	0.02	-0.01	-0.03	0.02	0.03	62	30
234	DL80	0.03	0.00	0.02	0.03	0.02	234	31
817	22092406	0.13	0.00	-0.01	0.13	0.01	817	32
22	C-30 1921-GIS34*	-0.02	0.00	0.00	0.02	0.00	22	33
6	GIS 018*	-0.01	0.01	0.06	0.01	0.06	6	34
15	15131400-GIS27*	0.01	0.01	0.00	0.01	0.00	15	35
48	BROTHERS-GIS60*	0.02	0.01	0.00	0.02	0.00	48	36
857	15131904	0.02	0.01	0.03	0.02	0.03	857	37
353	18121104	-0.06	0.01	0.04	0.06	0.04	353	38
5	GIS 017	0.01	0.01	-0.02	0.02	0.02	5	39
808	14133204	-0.02	0.01	0.01	0.02	0.01	808	40
7	GIS 019	-0.05	0.01	-0.02	0.05	0.02	7	41
35	T 463-GIS47*	0.00	0.01	0.01	0.01	0.01	35	42
865	18120440	0.06	0.02	-0.04	0.07	0.04	865	43
450	18120800	-0.08	0.02	0.08	0.09	0.08	450	44
715	15-PSM	0.00	0.02	0.02	0.02	0.02	715	45
54	SISTERS-GIS66*	0.02	0.02	-0.04	0.03	0.04	54	46
40	CAREY 1971-GIS52	-0.08	0.02	0.12	0.09	0.12	40	47
802	14133340	-0.06	0.03	0.06	0.07	0.06	802	48
855	14131500-RESET	-0.07	0.03	0.16	0.07	0.16	855	49
856	14131440-RESET	-0.08	0.03	0.17	0.09	0.17	856	50
209	BA50	-0.03	0.03	0.09	0.05	0.09	209	51
3	GIS 015	0.01	0.03	0.02	0.04	0.02	3	52
718	17-PSM	-0.02	0.04	-0.03	0.04	0.03	718	53
447	18120540	0.01	0.05	0.05	0.05	0.05	447	54
755	X 373	-0.06	0.05	-0.02	0.08	0.02	755	55
723	23-PSM	-0.01	0.05	-0.11	0.05	0.16	723	56
36	GIS 048	0.06	0.06	-0.01	0.08	0.01	36	57
726	42-WS	-0.14	0.06	-0.05	0.15	0.05	726	58
2	GIS 014	0.00	0.06	-0.05	0.06	0.05	2	59
1	GIS 013	-0.01	0.07	0.05	0.07	0.05	1	60
57	GIS 069	-0.01	0.09	0.15	0.09	0.15	57	61
<b>Averages</b>		<b>-0.01</b>	<b>-0.01</b>	<b>0.01</b>	<b>0.06</b>	<b>0.06</b>		
<b>CO GRID Averages</b>		<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.06</b>			
<b>(Absolute Averages)</b>		<b>0.04</b>	<b>0.04</b>	<b>0.06</b>				
<b>800 RTK Points Averages</b>		<b>0.00</b>	<b>-0.01</b>	<b>0.04</b>	<b>0.07</b>			
<b>Absolute Averages</b>		<b>0.06</b>	<b>0.03</b>	<b>0.05</b>				
* = transformation point								
					Diff Delta NE = hypotenuse of Diff N and Diff E			

Deschutes13 Transformation Field Checks

Sort by

DIFFERENCE IN ELEVATION

Point Id	Code	Diff N	Diff E	Diff Elev (ORHTO)	Diff Delta NE	Absolute Diff Elev	Point Id	count
751	SWEET	0.03	-0.03	-0.23	0.04	0.23	751	1
723	23-PSM	-0.01	0.05	-0.16	0.05	0.16	723	2
53	X-359 1942-GIS65	-0.01	-0.03	-0.14	0.03	0.14	53	3
39	WICKIUP-GIS51*	0.12	-0.01	-0.11	0.12	0.11	39	4
513	2711 PP&L	-0.03	-0.01	-0.09	0.03	0.09	513	5
596	14141800	-0.02	-0.03	-0.09	0.04	0.09	596	6
552	Y-419	0.02	-0.01	-0.08	0.02	0.08	552	7
24	GIS 036*	0.00	-0.03	-0.07	0.03	0.07	24	8
516	B-366*	0.05	-0.01	-0.06	0.05	0.06	516	9
514	2906 ORE	-0.01	-0.02	-0.05	0.03	0.05	514	10
2	GIS 014	0.00	0.06	-0.05	0.06	0.05	2	11
726	42-W5	-0.14	0.06	-0.05	0.15	0.05	726	12
865	18120440	0.06	0.02	-0.04	0.07	0.04	865	13
54	SISTERS-GIS66*	0.02	0.02	-0.04	0.03	0.04	54	14
718	17-PSM	-0.02	0.04	-0.03	0.04	0.03	718	15
571	14131340	-0.04	-0.04	-0.03	0.06	0.03	571	16
62	STEVENS*	0.02	-0.01	-0.03	0.02	0.03	62	17
755	X 373	-0.06	0.05	-0.02	0.08	0.02	755	18
5	GIS 017	0.01	0.01	-0.02	0.02	0.02	5	19
816	22093640	-0.01	-0.03	-0.02	0.04	0.02	816	20
7	GIS 019	-0.05	0.01	-0.02	0.05	0.02	7	21
177	17132700	0.06	-0.05	-0.01	0.08	0.01	177	22
36	GIS 048	0.06	0.06	-0.01	0.08	0.01	36	23
817	22092406	0.13	0.00	-0.01	0.13	0.01	817	24
15	15131400-GIS27*	0.01	0.01	0.00	0.01	0.00	15	25
48	BROTHERS-GIS60*	0.02	0.01	0.00	0.02	0.00	48	26
22	C-30 1921-GIS34*	-0.02	0.00	0.00	0.02	0.00	22	27
198	17133400	-0.03	-0.02	0.00	0.03	0.00	198	28
831	17121640	-0.02	-0.10	0.00	0.10	0.00	831	29
852	17133204-RESET	0.12	-0.01	0.00	0.12	0.00	852	30
813	22101900	0.04	-0.06	0.01	0.07	0.01	813	31
808	14133204	-0.02	0.01	0.01	0.02	0.01	808	32
35	T 463-GIS47*	0.00	0.01	0.01	0.01	0.01	35	33
	Averages	0.01	0.00	-0.04	0.05	0.05		34
224	CB12	-0.01	-0.05	0.01	0.05	0.01	224	35
234	DL80	0.03	0.00	0.02	0.03	0.02	234	36
800	14132144	-0.15	-0.04	0.02	0.16	0.02	800	37
42	BNRR STA 369+48.*	-0.03	-0.05	0.02	0.06	0.02	42	38
814	22102000	0.04	-0.03	0.02	0.05	0.02	814	39
3	GIS 015	0.01	0.03	0.02	0.04	0.02	3	40
715	15-PSM	0.00	0.02	0.02	0.02	0.02	715	41
857	15131904	0.02	0.01	0.03	0.02	0.03	857	42
353	18121104	-0.06	0.01	0.04	0.06	0.04	353	43
38	BEAL RM-1-GIS50*	-0.05	-0.11	0.04	0.12	0.04	38	44
1	GIS 013	-0.01	0.07	0.05	0.07	0.05	1	45
447	18120540	0.01	0.05	0.05	0.05	0.05	447	46
6	GIS 018*	-0.01	0.01	0.06	0.01	0.06	6	47
802	14133340	-0.06	0.03	0.06	0.07	0.06	802	48
223	CB11	0.02	-0.02	0.07	0.03	0.07	223	49
450	18120800	-0.08	0.02	0.08	0.09	0.08	450	50
734	F-112	-0.17	-0.11	0.08	0.20	0.08	734	51
209	BA50	-0.03	0.03	0.09	0.05	0.09	209	52
49	STATE HWY PI-GIS*	0.03	-0.03	0.09	0.05	0.09	49	53
815	22101904	0.02	-0.06	0.09	0.06	0.09	815	54
29	GIS 041	-0.04	-0.17	0.10	0.17	0.10	29	55
40	CAREY 1971-GIS52	-0.08	0.02	0.12	0.09	0.12	40	56
12	GIS 024	0.01	-0.02	0.13	0.03	0.13	12	57
806	14132040	-0.05	-0.02	0.13	0.05	0.13	806	58
37	Y 370 1942-GIS49	0.07	-0.01	0.13	0.07	0.13	37	59
57	GIS 069	-0.01	0.09	0.15	0.09	0.15	57	60
855	14131500-RESET	-0.07	0.03	0.16	0.07	0.16	855	61
856	14131440-RESET	-0.08	0.03	0.17	0.09	0.17	856	
	CO GRID Averages	-0.01	0.00	0.00	0.06			
	(Absolute Averages)	0.04	0.04	0.06				
	800 RTK Points Averages	0.00	-0.01	0.04	0.07			
	Absolute Averages	0.06	0.03	0.05				
	*=transformation point				Diff Delta NE = hypotenuse of Diff N and Diff E			

Deschutes13 Transformation Field Checks

Sort by

DIFFERENCE in DELTA NORTHING~EASTING

Point Id	Code	Diff N	Diff E	Diff Elev (ORHTO)	Diff Delta NE	Absolute Diff Elev	Point Id	count
6	GIS 018*	-0.01	0.01	0.06	0.01	0.06	6	1
15	15131400-GIS27*	0.01	0.01	0.00	0.01	0.00	15	2
35	T 463-GIS47*	0.00	0.01	0.01	0.01	0.01	35	3
5	GIS 017	0.01	0.01	-0.02	0.02	0.02	5	4
48	BROTHERS-GIS60*	0.02	0.01	0.00	0.02	0.00	48	5
62	STEVENS*	0.02	-0.01	-0.03	0.02	0.03	62	6
715	15-PSM	0.00	0.02	0.02	0.02	0.02	715	7
22	C-30 1921-GIS34*	-0.02	0.00	0.00	0.02	0.00	22	8
808	14133204	-0.02	0.01	0.01	0.02	0.01	808	9
552	Y-419	0.02	-0.01	-0.08	0.02	0.08	552	10
857	15131904	0.02	0.01	0.03	0.02	0.03	857	11
12	GIS 024	0.01	-0.02	0.13	0.03	0.13	12	12
514	2906 ORE	-0.01	-0.02	-0.05	0.03	0.05	514	13
234	DL80	0.03	0.00	0.02	0.03	0.02	234	14
223	CB11	0.02	-0.02	0.07	0.03	0.07	223	15
24	GIS 036*	0.00	-0.03	-0.07	0.03	0.07	24	16
54	SISTERS-GIS66*	0.02	0.02	-0.04	0.03	0.04	54	17
53	X-359 1942-GIS65	-0.01	-0.03	-0.14	0.03	0.14	53	18
513	2711 PP&L	-0.03	-0.01	-0.09	0.03	0.09	513	19
198	17133400	-0.03	-0.02	0.00	0.03	0.00	198	20
816	22093640	-0.01	-0.03	-0.02	0.04	0.02	816	21
3	GIS 015	0.01	0.03	0.02	0.04	0.02	3	22
596	14141800	-0.02	-0.03	-0.09	0.04	0.09	596	23
718	17-PSM	-0.02	0.04	-0.03	0.04	0.03	718	24
751	SWEET	0.03	-0.03	-0.23	0.04	0.23	751	25
49	STATE HWY PI-GIS*	0.03	-0.03	0.09	0.05	0.09	49	26
7	GIS 019	-0.05	0.01	-0.02	0.05	0.02	7	27
516	B-366*	0.05	-0.01	-0.06	0.05	0.06	516	28
224	CB12	-0.01	-0.05	0.01	0.05	0.01	224	29
806	14132040	-0.05	-0.02	0.13	0.05	0.13	806	30
447	18120540	0.01	0.05	0.05	0.05	0.05	447	31
209	BA50	-0.03	0.03	0.09	0.05	0.09	209	32
814	22102000	0.04	-0.03	0.02	0.05	0.02	814	33
723	23-PSM	-0.01	0.05	-0.16	0.05	0.16	723	34
42	BNRR STA 369+48.*	-0.03	-0.05	0.02	0.06	0.02	42	35
353	18121104	-0.06	0.01	0.04	0.06	0.04	353	36
815	22101904	0.02	-0.06	0.09	0.06	0.09	815	37
2	GIS 014	0.00	0.06	-0.05	0.06	0.05	2	38
571	14131340	-0.04	-0.04	-0.03	0.06	0.03	571	39
865	18120440	0.06	0.02	-0.04	0.07	0.04	865	40
1	GIS 013	-0.01	0.07	0.05	0.07	0.05	1	41
802	14133340	-0.06	0.03	0.06	0.07	0.06	802	42
37	Y 370 1942-GIS49	0.07	-0.01	0.13	0.07	0.13	37	43
813	22101900	0.04	-0.06	0.01	0.07	0.01	813	44
855	14131500-RESET	-0.07	0.03	0.16	0.07	0.16	855	45
177	17132700	0.06	-0.05	-0.01	0.08	0.01	177	46
755	X 373	-0.06	0.05	-0.02	0.08	0.02	755	47
36	GIS 048	0.06	0.06	-0.01	0.08	0.01	36	48
450	18120800	-0.08	0.02	0.08	0.09	0.08	450	49
40	CAREY 1971-GIS52	-0.08	0.02	0.12	0.09	0.12	40	50
57	GIS 069	-0.01	0.09	0.15	0.09	0.15	57	51
856	14131440-RESET	-0.08	0.03	0.17	0.09	0.17	856	52
831	17121640	-0.02	-0.10	0.00	0.10	0.00	831	53
39	WICKIUP-GIS51*	0.12	-0.01	-0.11	0.12	0.11	39	54
852	17133204-RESET	0.12	-0.01	0.00	0.12	0.00	852	55
38	BEAL RM-1-GIS50*	-0.05	-0.11	0.04	0.12	0.04	38	56
817	22092406	0.13	0.00	-0.01	0.13	0.01	817	57
726	42-VS	-0.14	0.06	-0.05	0.15	0.05	726	58
800	14132144	-0.15	-0.04	0.02	0.16	0.02	800	59
29	GIS 041	-0.04	-0.17	0.10	0.17	0.10	29	60
734	F-112	-0.17	-0.11	0.08	0.20	0.08	734	61
<b>Averages</b>		<b>-0.01</b>	<b>-0.01</b>	<b>0.01</b>	<b>0.06</b>	<b>0.06</b>		
<b>CO GRID Averages</b>		<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.06</b>			
<b>(Absolute Averages)</b>		<b>0.04</b>	<b>0.04</b>	<b>0.06</b>				
<b>800 RTK Points Averages</b>		<b>0.00</b>	<b>-0.01</b>	<b>0.04</b>	<b>0.07</b>			
<b>Absolute Averages</b>		<b>0.06</b>	<b>0.03</b>	<b>0.05</b>				
*transformation point					Diff Delta NE = hypotenuse of Diff N and Diff E			

Deschutes13 Transformation Field Checks

Sort by

DIFFERENCE in ABSOLUTE DIFF IN ELEV

Point Id	Code	Diff N	Diff E	Diff Elev (ORHTO)	Diff Delta NE	Absolute Diff Elev	Point Id	count
831	17121640	-0.02	-0.10	0.00	0.10	0.00	831	1
198	17133400	-0.03	-0.02	0.00	0.03	0.00	198	2
22	<b>C-30 1921-GIS34*</b>	-0.02	0.00	0.00	0.02	0.00	22	3
48	<b>BROTHERS-GIS60*</b>	0.02	0.01	0.00	0.02	0.00	48	4
852	17133204-RESET	0.12	-0.01	0.00	0.12	0.00	852	5
15	<b>15131400-GIS27*</b>	0.01	0.01	0.00	0.01	0.00	15	6
813	22101900	0.04	-0.06	0.01	0.07	0.01	813	7
817	22092406	0.13	0.00	-0.01	0.13	0.01	817	8
808	14133204	-0.02	0.01	0.01	0.02	0.01	808	9
35	<b>T 463-GIS47*</b>	0.00	0.01	0.01	0.01	0.01	35	10
36	GIS 048	0.06	0.06	-0.01	0.08	0.01	36	11
224	CB12	-0.01	-0.05	0.01	0.05	0.01	224	12
177	17132700	0.06	-0.05	-0.01	0.08	0.01	177	13
234	DL80	0.03	0.00	0.02	0.03	0.02	234	14
7	GIS 019	-0.05	0.01	-0.02	0.05	0.02	7	15
800	14132144	-0.15	-0.04	0.02	0.16	0.02	800	16
816	22093640	-0.01	-0.03	-0.02	0.04	0.02	816	17
5	GIS 017	0.01	0.01	-0.02	0.02	0.02	5	18
755	X 373	-0.06	0.05	-0.02	0.08	0.02	755	19
42	<b>BNRR STA 369+48.*</b>	-0.03	-0.05	0.02	0.06	0.02	42	20
814	22102000	0.04	-0.03	0.02	0.05	0.02	814	21
3	GIS 015	0.01	0.03	0.02	0.04	0.02	3	22
715	15-PSM	0.00	0.02	0.02	0.02	0.02	715	23
857	15131904	0.02	0.01	0.03	0.02	0.03	857	24
62	<b>STEVENS*</b>	0.02	-0.01	-0.03	0.02	0.03	62	25
571	14131340	-0.04	-0.04	-0.03	0.06	0.03	571	26
718	17-PSM	-0.02	0.04	-0.03	0.04	0.03	718	27
54	<b>SISTERS-GIS66*</b>	0.02	0.02	-0.04	0.03	0.04	54	28
353	18121104	-0.06	0.01	0.04	0.06	0.04	353	29
38	<b>BEAL RM-1-GIS50*</b>	-0.05	-0.11	0.04	0.12	0.04	38	30
865	18120440	0.06	0.02	-0.04	0.07	0.04	865	31
726	42-WS	-0.14	0.06	-0.05	0.15	0.05	726	32
1	GIS 013	-0.01	0.07	0.05	0.07	0.05	1	33
447	18120540	0.01	0.05	0.05	0.05	0.05	447	34
2	GIS 014	0.00	0.06	-0.05	0.06	0.05	2	35
514	2906 ORE	-0.01	-0.02	-0.05	0.03	0.05	514	36
6	GIS 018*	-0.01	0.01	0.06	0.01	0.06	6	37
516	<b>B-366*</b>	0.05	-0.01	-0.06	0.05	0.06	516	38
802	14133340	-0.06	0.03	0.06	0.07	0.06	802	39
223	CB11	0.02	-0.02	0.07	0.03	0.07	223	40
24	<b>GIS 036*</b>	0.00	-0.03	-0.07	0.03	0.07	24	41
552	Y-419	0.02	-0.01	-0.08	0.02	0.08	552	42
450	18120800	-0.08	0.02	0.08	0.09	0.08	450	43
734	F-112	-0.17	-0.11	0.08	0.20	0.08	734	44
209	BA50	-0.03	0.03	0.09	0.05	0.09	209	45
49	<b>STATE HWY PI-GIS*</b>	0.03	-0.03	0.09	0.05	0.09	49	46
596	14141800	-0.02	-0.03	-0.09	0.04	0.09	596	47
815	22101904	0.02	-0.06	0.09	0.06	0.09	815	48
513	2711 PP&L	-0.03	-0.01	-0.09	0.03	0.09	513	49
29	GIS 041	-0.04	-0.17	0.10	0.17	0.10	29	50
39	<b>WICKIUP-GIS51*</b>	0.12	-0.01	-0.11	0.12	0.11	39	51
40	CAREY 1971-GIS52	-0.08	0.02	0.12	0.09	0.12	40	52
12	GIS 024	0.01	-0.02	0.13	0.03	0.13	12	53
806	14132040	-0.05	-0.02	0.13	0.05	0.13	806	54
37	Y 370 1942-GIS49	0.07	-0.01	0.13	0.07	0.13	37	55
53	X-359 1942-GIS65	-0.01	-0.03	-0.14	0.03	0.14	53	56
57	GIS 069	-0.01	0.09	0.15	0.09	0.15	57	57
723	23-PSM	-0.01	0.05	-0.16	0.05	0.16	723	58
855	14131500-RESET	-0.07	0.03	0.16	0.07	0.16	855	59
856	14131440-RESET	-0.08	0.03	0.17	0.09	0.17	856	60
751	SWEET	0.03	-0.03	-0.23	0.04	0.23	751	61
<b>Averages</b>		<b>-0.01</b>	<b>-0.01</b>	<b>0.01</b>	<b>0.06</b>	<b>0.06</b>		
<b>CO GRID Averages</b>		<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.06</b>			
<b>(Absolute Averages)</b>		<b>0.04</b>	<b>0.04</b>	<b>0.06</b>				
<b>800 RTK Points Averages</b>		<b>0.00</b>	<b>-0.01</b>	<b>0.04</b>	<b>0.07</b>			
<b>Absolute Averages</b>		<b>0.06</b>	<b>0.03</b>	<b>0.05</b>				
<b>*=transformation point</b>				<b>Diff Delta NE = hypotenuse of Diff N and Diff E</b>				