

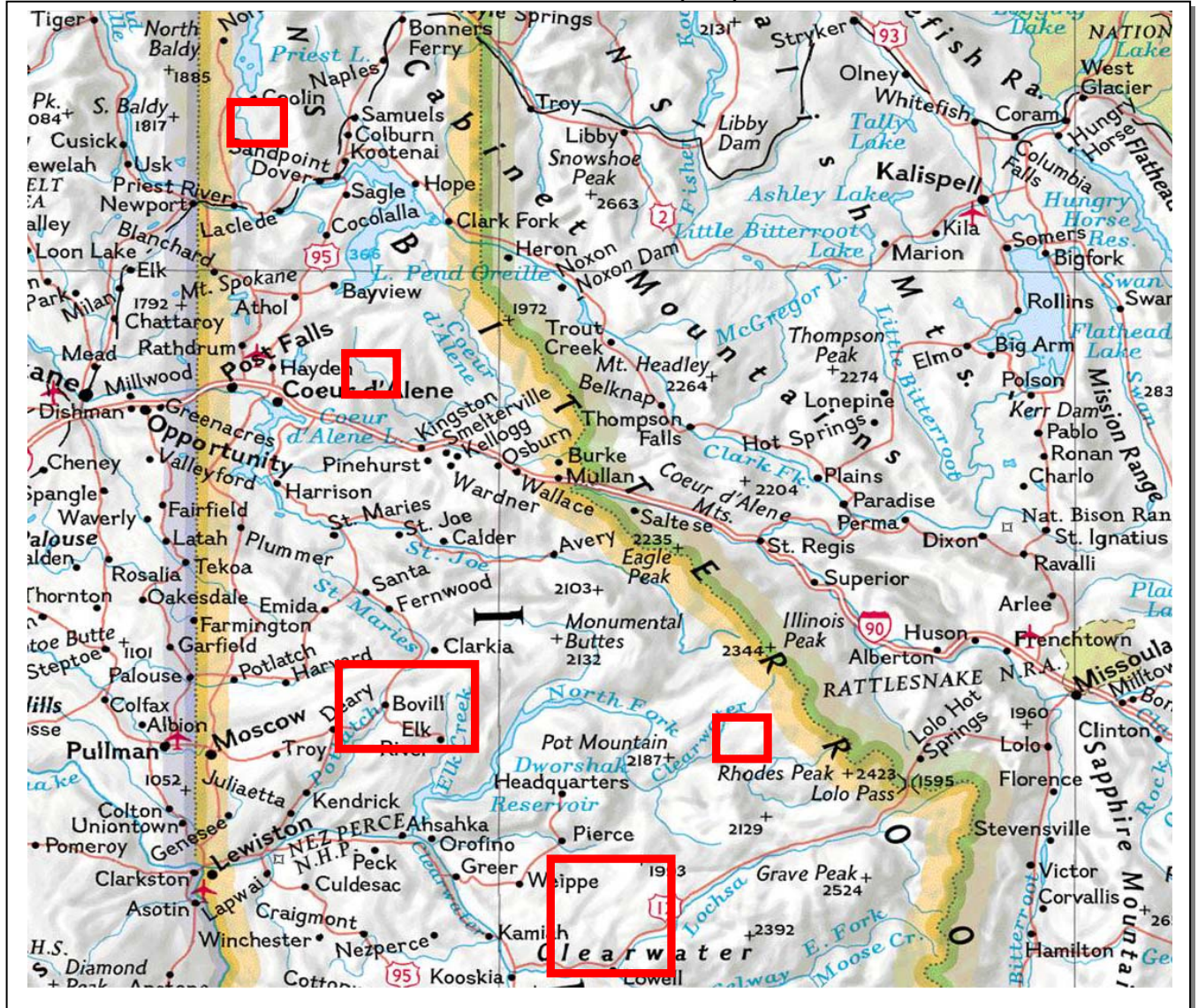
# LiDAR Assessment

## Clearwater National Forest – Northern Idaho

Survey Report – Control Verification  
Prepared For

Watershed Sciences, Inc.  
257B SW Madison Ave  
Corvallis, OR 97333  
for

Priest River, Deception Creek, Potlatch-Upper Elk, Walde-Pete King-Musselshell, and China-Osier  
Area of Interests (AOI)



**White Shield, Inc.**

*Progressive Solutions - Traditional Values*

Land Surveying \* Environmental \* Quality Control  
320 N. 20th Ave, Pasco WA, 99301  
Phone: (509)547-0100 Fax: (509)547-8292

# **Survey Report – Control Verification**

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Corvallis, OR 97333  
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## **Overview**

Watershed Sciences was contracted to acquire LiDAR datasets in five general project areas. The project areas are located in Northern Idaho lying North of Highway 12 to Priest Lake. The Clearwater National Forest – Grangeville, ID was the lead in administrating the prime contract.

Scope of survey services, Watershed Sciences, Inc. with White Shield, Inc.:

1. Provide Idaho Professional License Surveyor oversight and certification for ground control to support LiDAR data acquisition.
2. Watershed Sciences set the monuments prior the LiDAR acquisition for two AOI. White Shield monumented the remaining AOI sites. All base locations will be monumented with 5/8" rebar and 2" aluminum caps.
3. Watershed Sciences occupied all monuments with survey grade GPS for a minimum of one 8-hr session and one 4-hr session prior to and during the LiDAR missions for the southeasterly two AOI. These baselines were used in the control verification.

## **Coordinate System**

Horizontal Coordinates: UTM, Zone 11 North, NAD 1983(2007)

Vertical Datum: NAVD 1988

Units: Meters

Geoid 2003 (Conus) for orthometric height modeling.

## **Existing Control Stations**

Published NGS control stations that were occupied include:

1. Priest River AOI; N-283 (PID TO0264) and SNP-A (PID AC5222)
2. Deception Creek AOI; M-134 (PID SV0393) and SMLT GPS (PID AC5220)
3. Potlatch-Upper Elk AOI; MOSCOW CBL 0 (PID AC5215) AND BOVL GPS (PID AC5199)
4. Walde-Pete King-Musselshell AOI; IDNP Grangeville CORS (PID DG8521), Flat GPS (PID RY1021), and Kami GPS (PID AC210)
5. China-Osier-Laundry AOI; IDNP Grangeville CORS (PID DG8521), Flat GPS (PID RY1021), Missoula CORS (PID DE8232), and N-371 (PID RY0088)

Complete NGS control data sheets are attached. Retrieval data September, 2010.

## **Final Adjusted Coordinates**

ID	Northing	Easting	Ortho el.	Latitude	Longitude	Ellip. Ht.
PRIEST-1	5356539.319	511830.363	687.672	48°21'42.89884"N	116°50'25.03025"W	670.922
N-283	5358980.889	501429.735	746.610	48°23'02.36912"N	116°58'50.48314"W	729.747
SNP-A	5349092.495	532340.971	648.190	48°17'39.13445"N	116°33'50.26816"W	631.149
DECEP-1	5285313.075	534705.222	1255.232	47°43'12.94689"N	116°32'14.10042"W	1238.215
DECEP-2	5286315.949	533798.948	1347.442	47°43'45.60351"N	116°32'57.32122"W	1330.404
M-134	5301666.740	519199.998	705.068	47°52'04.98452"N	116°44'35.75671"W	687.701
SMLT	5266160.194	562041.000	685.060	47°32'45.23768"N	116°10'31.82848"W	668.311

POT_01	5195006.930	546316.326	884.959	46°54'25.13460"N	116°23'30.60100"W	867.604
Elk_01	5182283.625	563033.609	861.710	46°47'28.03299"N	116°10'26.76312"W	844.711
BOVL GPS	5189425.065	545582.471	873.550	46°51'24.49596"N	116°24'07.29886"W	856.161
IDNP	5087723.658	568116.782	1013.310	45°56'22.93599"N	116°07'16.53029"W	997.084
Moscow_CBL	5174687.131	503923.247	790.524	46°43'32.61627"N	116°56'55.16821"W	772.236
WALDE_02	5123588.310	594756.749	1056.227	46°15'33.33651"N	115°46'13.81605"W	1039.891
WALDE_03	5121885.543	590876.923	954.254	46°14'40.08771"N	115°49'16.18893"W	937.846
WALDE_05	5121132.106	602062.278	1278.153	46°14'09.96646"N	115°40'34.57108"W	1261.942
FLAT	5133065.059	629707.845	632.285	46°20'19.45645"N	115°18'52.42241"W	616.451
IDNP	5087723.658	568116.782	1013.310	45°56'22.93599"N	116°07'16.53029"W	997.084
KAMI	5118151.327	576727.906	371.646	46°12'45.39975"N	116°00'19.00160"W	354.796
CHIN_01	5189942.743	645338.028	1088.590	46°50'49.73711"N	115°05'37.34969"W	1073.279
CHIN_02	5185574.277	650244.124	1530.991	46°48'24.37557"N	115°01'50.99768"W	1515.745
FLAT	5133065.045	629707.871	632.285	46°20'19.45597"N	115°18'52.42119"W	616.451
IDNP	5087723.658	568116.782	1013.310	45°56'22.93598"N	116°07'16.53030"W	997.084
MSOL	5201376.587	720084.820	975.579	46°55'45.83733"N	114°06'31.84604"W	960.639
N-371	5181773.194	719524.421	991.978	46°45'12.22784"N	114°07'32.22540"W	977.278

### **GPS Sessions**

Watershed Sciences Inc. provided their static occupations in Trimble DAT format and log spreadsheet for the China and Walde AOI. The sessions were included in the final networks adjustment as redundant baselines. Session times varied  $\pm 4$ -8 hours. Observations by White Shield Inc. were generally  $\pm 1$ -hour sessions or longer. Each station was occupied a minimum of 2 sessions by White Shield. All antenna heights measured in feet and meters and checked in the field. On check-in to the project Trimble Business Center Software, height inputs were double checked by entering the heights in feet and allowing the software to convert to meters.

### **Adjustment notes**

All possible baselines were processed using the broadcast ephemeris. Then trivial baselines were disabled. See attached Network Diagrams and vector listings.

Observations to station Flat noted a 0.1m vertical difference to NGS published and was not held. Data was then processed out to IDNP with acceptable results. See attached final adjustment reports for complete results.

### **Equipment**

Static GPS occupations by Watershed Sciences included Trimble R7 (zephyr antenna) and R8 receivers (dual frequency, geodetic grade). White Shield, Inc. GPS equipment included 4-Trimble 4800, 1-5700 (zephyr antenna), 1-5800 receivers (dual frequency, geodetic grade).

### **Software**

GPS static observations were reduced and adjusted with Trimble Business Center 2.40.

### **Dates**

Notice to Proceed by Watershed Sciences was issued September 09, 2010. White Shield field occupation for the Southerly three AOI was during the week of October 4 with the remaining 2 AOI observed the week of November 1, 2010.

**Personnel**

Watershed Sciences, Inc.

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White Shield, Inc.:

Project Manager, Michael LeJeune, Phone (509) 547-0100, Email mlejeune@whiteshield.com

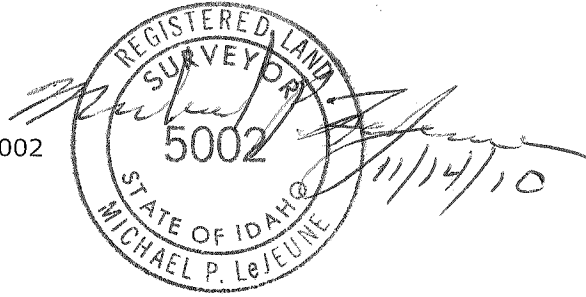
Partychief, Dennis Hartmans, Jay Garland

Instrumentman, Joe Rose, Travis Williams

Respectfully submitted

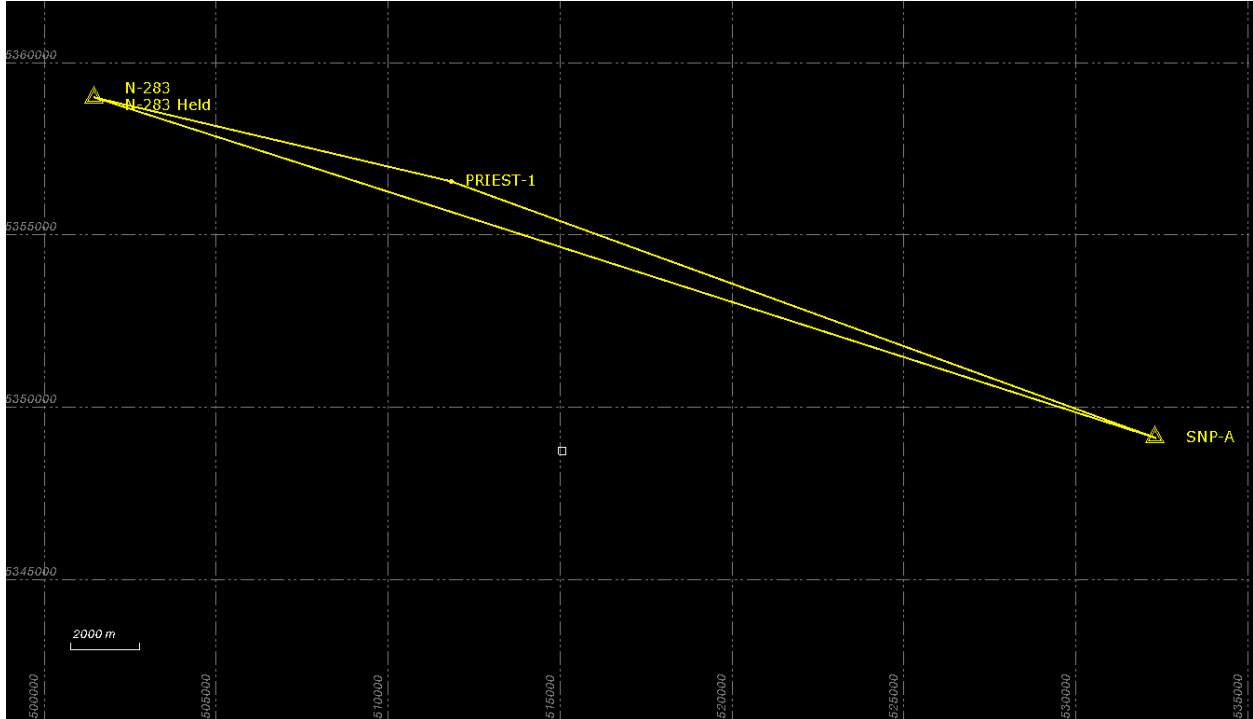
Michael P. LeJeune, PLS ID 5002  
Survey Project Manager

November 14, 2010



## Network Diagrams

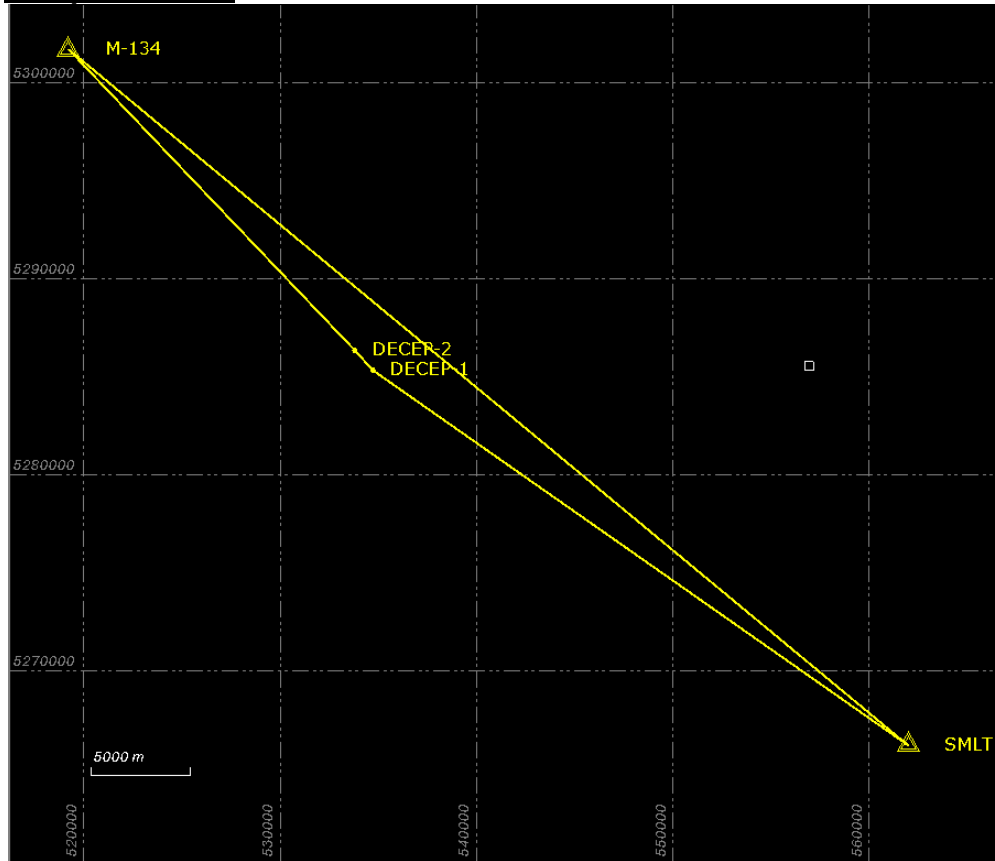
### Priest River:



**Precision Confidence Level: 95%**

Vector ID	From Point ID	To Point ID	Solution Type	Start Time	Duration	H Precision (Meter)	V Precision (Meter)	Ellip. Dist. (Meter)
<a href="#">PV48</a>	<a href="#">N-283</a>	<a href="#">PRIEST-1</a>	Fixed	11/4/2010 12:59:15 PM	02:13:45	0.006	0.024	10687.637
<a href="#">PV55</a>	<a href="#">N-283</a>	<a href="#">PRIEST-1</a>	Fixed	11/4/2010 3:39:45 PM	01:27:30	0.008	0.023	10687.635
<a href="#">PV53</a>	<a href="#">N-283</a>	<a href="#">SNP-A</a>	Fixed	11/4/2010 2:13:00 PM	01:25:30	0.005	0.025	32467.196
<a href="#">PV50</a>	<a href="#">N-283</a>	<a href="#">SNP-A</a>	Fixed	11/4/2010 12:59:15 PM	01:12:30	0.006	0.021	32467.200
<a href="#">PV51</a>	<a href="#">N-283</a>	<a href="#">SNP-A</a>	Fixed	11/4/2010 3:39:45 PM	01:04:00	0.006	0.022	32467.195
<a href="#">PV49</a>	<a href="#">SNP-A</a>	<a href="#">PRIEST-1</a>	Fixed	11/4/2010 12:20:00 PM	01:51:45	0.006	0.025	21829.232
<a href="#">PV54</a>	<a href="#">SNP-A</a>	<a href="#">PRIEST-1</a>	Fixed	11/4/2010 3:14:45 PM	01:29:00	0.005	0.023	21829.231
<a href="#">PV52</a>	<a href="#">SNP-A</a>	<a href="#">PRIEST-1</a>	Fixed	11/4/2010 2:13:00 PM	01:00:00	0.006	0.022	21829.230

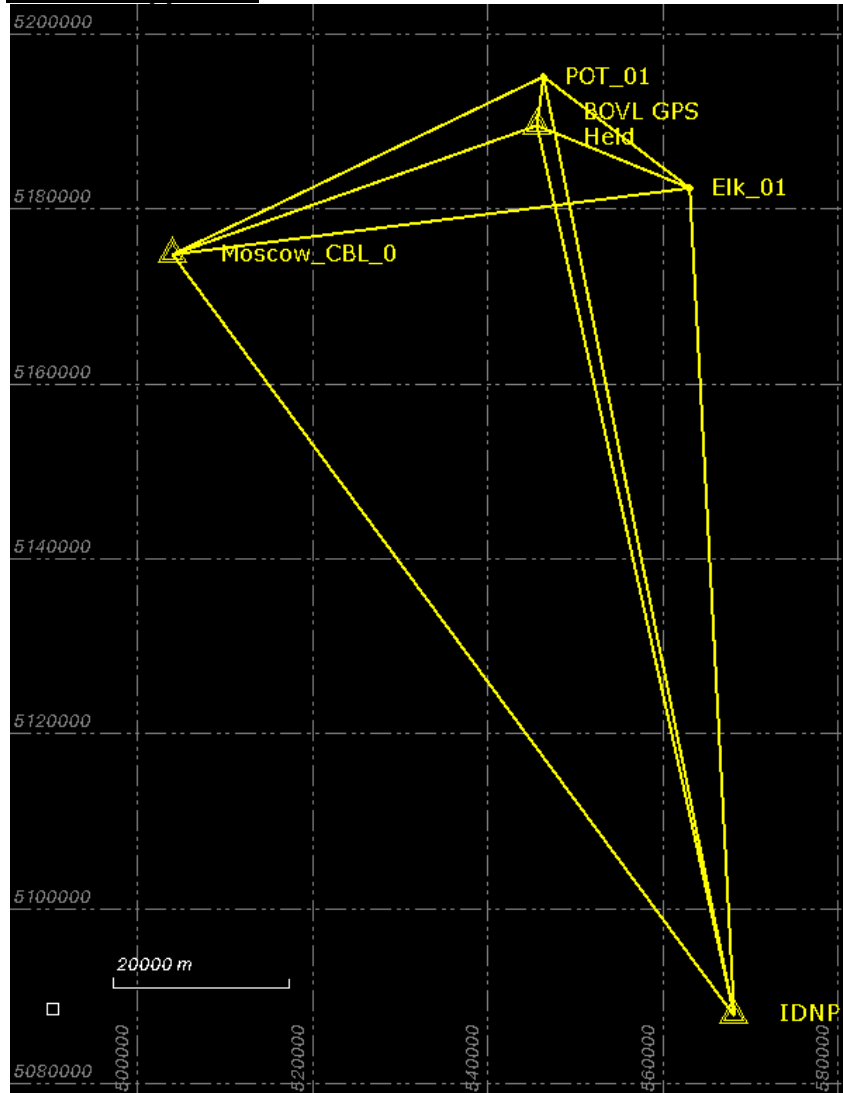
**Deception Creek:**



**Precision Confidence Level: 95%**

Vector ID	From Point ID	To Point ID	Solution Type	Start Time	Duration	H Precision (Meter)	V Precision (Meter)	Ellip. Dist. (Meter)
<a href="#">PV70</a>	<a href="#">M-134</a>	<a href="#">DECEP-2</a>	Fixed	11/3/2010 12:06:45 PM	02:26:00	0.006	0.028	21192.633
<a href="#">PV74</a>	<a href="#">M-134</a>	<a href="#">DECEP-2</a>	Fixed	11/3/2010 2:34:30 PM	01:02:45	0.006	0.024	21192.629
<a href="#">PV62</a>	<a href="#">M-134</a>	<a href="#">DECEP-2</a>	Fixed	11/3/2010 3:39:30 PM	00:54:45	0.006	0.013	21192.618
<a href="#">PV66</a>	<a href="#">DECEP-2</a>	<a href="#">DECEP-1</a>	Fixed	11/3/2010 10:58:00 AM	03:24:30	0.003	0.006	1352.216
<a href="#">PV59</a>	<a href="#">DECEP-2</a>	<a href="#">DECEP-1</a>	Fixed	11/3/2010 2:34:30 PM	02:58:00	0.003	0.005	1352.222
<a href="#">PV58</a>	<a href="#">SMLT</a>	<a href="#">DECEP-1</a>	Fixed	11/3/2010 2:24:45 PM	03:24:45	0.004	0.018	33390.175
<a href="#">PV67</a>	<a href="#">SMLT</a>	<a href="#">DECEP-1</a>	Fixed	11/3/2010 10:36:30 AM	02:38:30	0.004	0.019	33390.177
<a href="#">PV68</a>	<a href="#">SMLT</a>	<a href="#">DECEP-1</a>	Fixed	11/3/2010 1:16:30 PM	01:06:00	0.008	0.021	33390.173
<a href="#">PV73</a>	<a href="#">SMLT</a>	<a href="#">M-134</a>	Fixed	11/3/2010 1:16:30 PM	02:20:45	0.006	0.021	55663.356
<a href="#">PV71</a>	<a href="#">SMLT</a>	<a href="#">M-134</a>	Fixed	11/3/2010 12:06:45 PM	01:08:15	0.009	0.026	55663.355
<a href="#">PV61</a>	<a href="#">SMLT</a>	<a href="#">M-134</a>	Fixed	11/3/2010 3:39:30 PM	00:54:45	0.006	0.011	55663

### Potlatch-Upper Elk



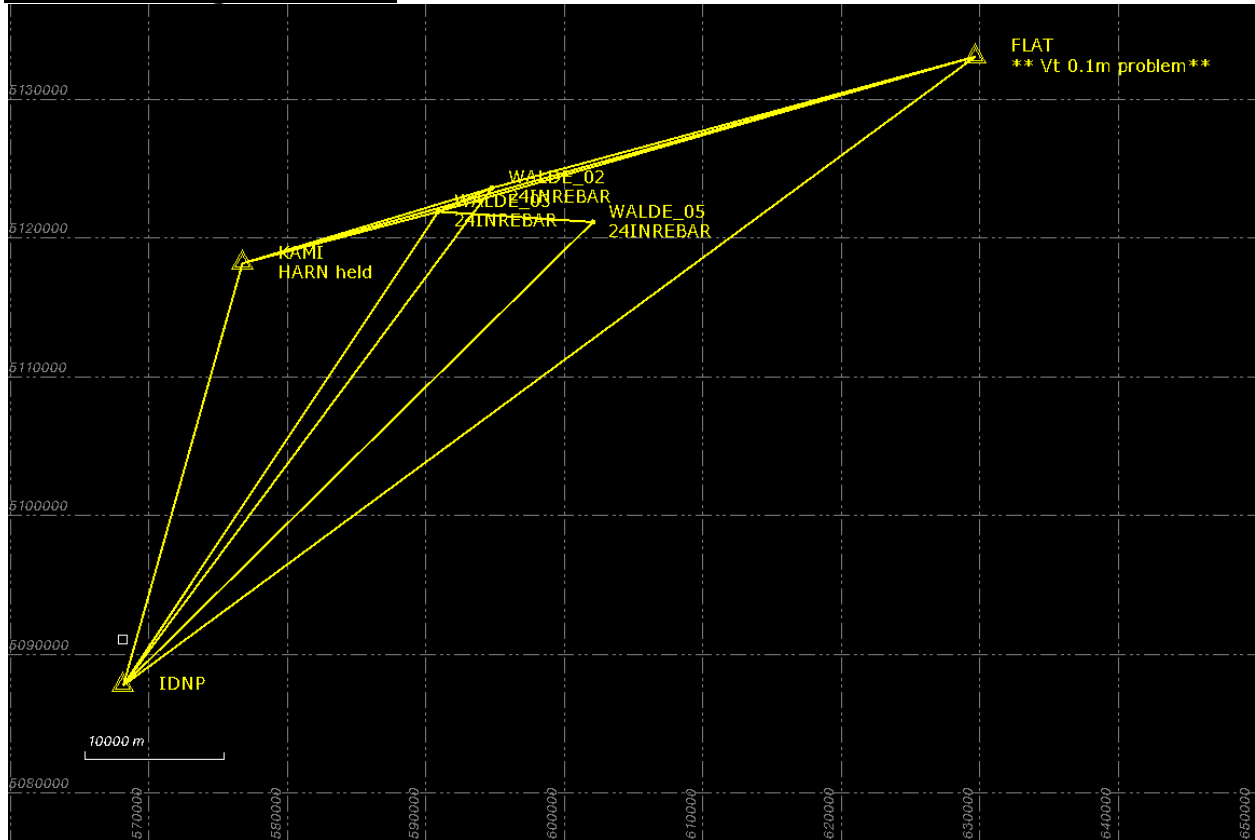
Precision Confidence Level: 95%

Vector ID	From Point ID	To Point ID	Solution Type	Start Time	Duration	H Precision (Meter)	V Precision (Meter)	Ellip. Dist. (Meter)
<a href="#">PV31</a>	<a href="#">BOVL GPS</a>	<a href="#">POT_01</a>	Fixed	10/7/2010 1:36:00 PM	05:04:00	0.003	0.014	5632.001
<a href="#">PV14</a>	<a href="#">BOVL GPS</a>	<a href="#">POT_01</a>	Fixed	10/7/2010 11:10:45 AM	02:22:00	0.006	0.015	5631.999
<a href="#">PV33</a>	<a href="#">BOVL GPS</a>	<a href="#">Elk_01</a>	Fixed	10/7/2010 1:36:00 PM	04:33:00	0.003	0.015	18862.685
<a href="#">PV8</a>	<a href="#">BOVL GPS</a>	<a href="#">Elk_01</a>	Fixed	10/7/2010 11:58:00 AM	01:34:45	0.008	0.016	18862.684
<a href="#">PV32</a>	<a href="#">BOVL GPS</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 2:25:30 PM	04:24:00	0.003	0.013	44206.601
<a href="#">PV23</a>	<a href="#">BOVL GPS</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 10:49:15	02:43:30	0.005	0.013	44206.601

				AM				
<a href="#">PV30</a>	<a href="#">BOVL GPS</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 1:36:00 PM	00:43:45	0.006	0.012	44206.603
<a href="#">PV15</a>	<a href="#">POT_01</a>	<a href="#">Elk_01</a>	Fixed	10/7/2010 11:58:00 AM	06:11:00	0.003	0.011	21015.955
<a href="#">PV13</a>	<a href="#">POT_01</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 2:25:30 PM	04:14:30	0.003	0.013	47029.707
<a href="#">PV22</a>	<a href="#">POT_01</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 11:10:45 AM	03:09:00	0.004	0.014	47029.710
<a href="#">PV24</a>	<a href="#">Elk_01</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 11:58:00 AM	02:21:45	0.005	0.018	59619.296
<a href="#">PV10</a>	<a href="#">Elk_01</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 2:25:30 PM	03:43:30	0.004	0.013	59619.294
<a href="#">PV36</a>	<a href="#">BOVL GPS</a>	<a href="#">IDNP</a>	Fixed	10/7/2010 1:36:00 PM	05:13:30	0.005	0.013	104205.476
<a href="#">PV40</a>	<a href="#">BOVL GPS</a>	<a href="#">IDNP</a>	Fixed	10/7/2010 10:49:15 AM	02:43:30	0.008	0.015	104205.473
<a href="#">PV41</a>	<a href="#">IDNP</a>	<a href="#">Elk_01</a>	Fixed	10/7/2010 11:58:00 AM	06:11:00	0.004	0.010	94729.360
<a href="#">PV39</a>	<a href="#">IDNP</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 2:25:30 PM	05:07:15	0.005	0.014	108131.095
<a href="#">PV37</a>	<a href="#">IDNP</a>	<a href="#">Moscow_CBL_0</a>	Fixed	10/7/2010 9:46:30 AM	04:33:15	0.005	0.012	108131.092
<a href="#">PV38</a>	<a href="#">IDNP</a>	<a href="#">POT_01</a>	Fixed	10/7/2010 11:10:45 AM	07:29:15	0.003	0.010	109515.173



### Walde-Pete King-Musselshell

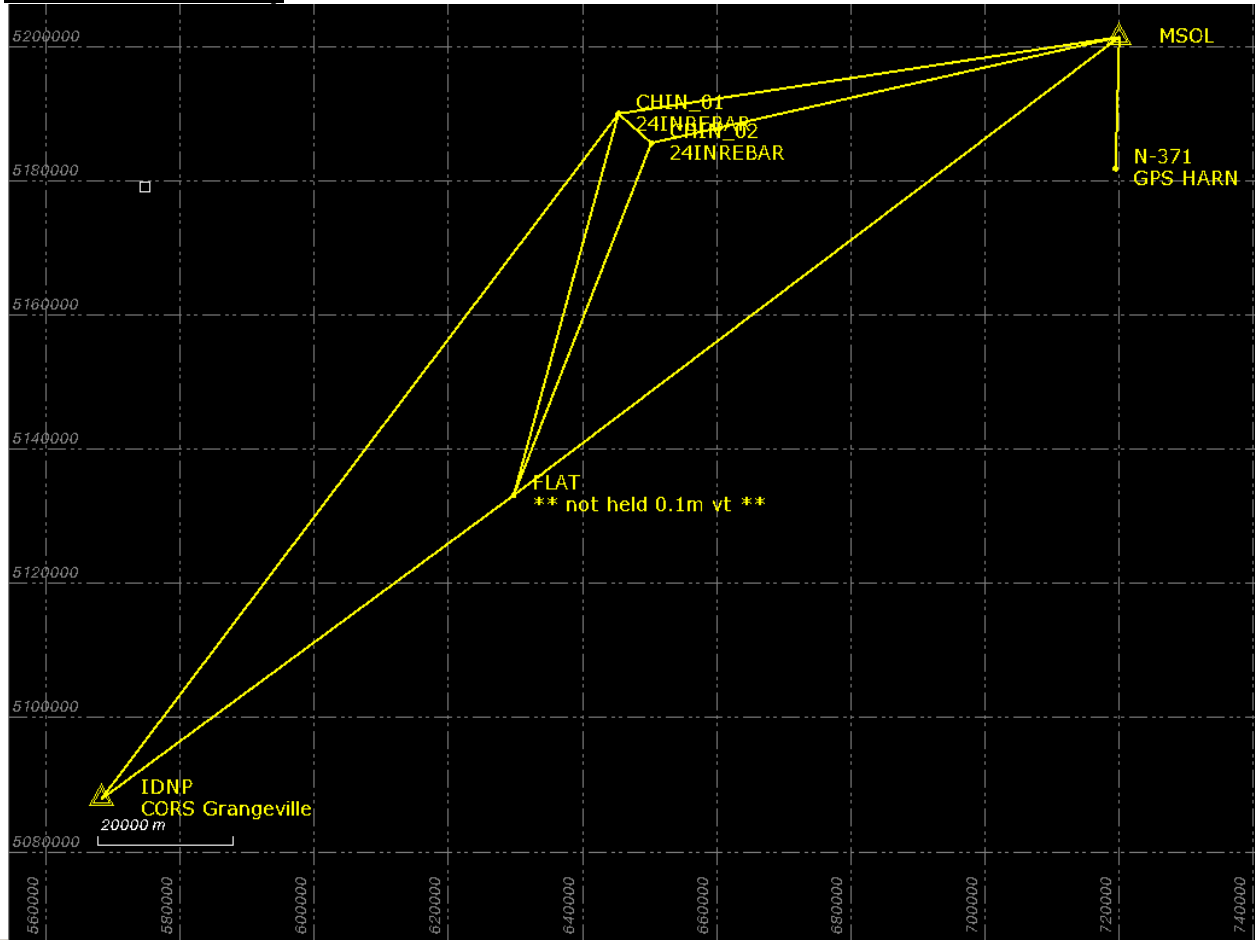


Precision Confidence Level: 95%

Vector ID	From Point ID	To Point ID	Solution Type	Start Time	Duration	H Precision (Meter)	V Precision (Meter)	Ellip. Dist. (Meter)
<a href="#">PV19</a>	<a href="#">WALDE_03</a>	<a href="#">WALDE_02</a>	Fixed	10/6/2010 8:49:45 AM	10:33:00	0.003	0.007	4238.280
<a href="#">PV29</a>	<a href="#">KAMI</a>	<a href="#">WALDE_03</a>	Fixed	10/6/2010 9:34:45 AM	01:35:45	0.008	0.025	14638.069
<a href="#">PV28</a>	<a href="#">KAMI</a>	<a href="#">WALDE_02</a>	Fixed	10/6/2010 9:34:45 AM	01:35:45	0.008	0.024	18836.642
<a href="#">PV25</a>	<a href="#">WALDE_02</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 2:13:45 PM	03:32:00	0.004	0.018	36221.926
<a href="#">PV17</a>	<a href="#">WALDE_02</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 12:33:15 PM	01:36:45	0.006	0.018	36221.932
<a href="#">PV27</a>	<a href="#">WALDE_03</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 2:13:45 PM	03:32:00	0.004	0.018	40418.258
<a href="#">PV12</a>	<a href="#">WALDE_03</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 12:33:15 PM	01:36:45	0.005	0.018	40418.263
<a href="#">PV7</a>	<a href="#">WALDE_03</a>	<a href="#">KAMI</a>	Fixed	10/6/2010 11:15:45 AM	07:28:45	0.003	0.013	14638.068
<a href="#">PV26</a>	<a href="#">KAMI</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 2:13:45 PM	03:32:00	0.005	0.019	55053.663
<a href="#">PV11</a>	<a href="#">KAMI</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 12:33:15 PM	01:36:45	0.006	0.019	55053.669
<a href="#">PV39</a>	<a href="#">KAMI</a>	<a href="#">IDNP</a>	Fixed	10/6/2010 11:15:45 AM	07:28:45	0.002	0.011	31633.299

<a href="#">PV40</a>	<a href="#">KAMI</a>	<a href="#">IDNP</a>	Fixed	10/6/2010 9:34:45 AM	01:35:45	0.006	0.016	31633.300
<a href="#">PV44</a>	<a href="#">IDNP</a>	<a href="#">WALDE_03</a>	Fixed	10/6/2010 8:11:30 AM	11:11:15	0.002	0.007	41062.676
<a href="#">PV37</a>	<a href="#">IDNP</a>	<a href="#">WALDE_03</a>	Fixed	9/29/2010 8:16:41 AM	07:19:51	0.003	0.008	41062.687
<a href="#">PV36</a>	<a href="#">IDNP</a>	<a href="#">WALDE_03</a>	Fixed	9/29/2010 3:55:08 PM	00:42:55	0.006	0.008	41062.686
<a href="#">PV42</a>	<a href="#">IDNP</a>	<a href="#">WALDE_02</a>	Fixed	10/6/2010 8:49:45 AM	10:56:45	0.002	0.007	44690.388
<a href="#">PV38</a>	<a href="#">IDNP</a>	<a href="#">WALDE_02</a>	Fixed	9/29/2010 8:59:14 AM	06:14:16	0.003	0.009	44690.384
<a href="#">PV41</a>	<a href="#">IDNP</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 2:13:45 PM	03:32:00	0.005	0.018	76501.840
<a href="#">PV43</a>	<a href="#">IDNP</a>	<a href="#">FLAT</a>	Fixed	10/6/2010 12:33:15 PM	01:36:45	0.007	0.019	76501.842
<a href="#">PV45</a>	<a href="#">IDNP</a>	<a href="#">WALDE_05</a>	Fixed	9/30/2010 10:34:34 AM	04:12:13	0.006	0.017	47642.711
<a href="#">PV46</a>	<a href="#">IDNP</a>	<a href="#">WALDE_05</a>	Fixed	9/30/2010 2:59:25 PM	00:41:04	0.007	0.012	47642.708
<a href="#">PV47</a>	<a href="#">WALDE_03</a>	<a href="#">WALDE_05</a>	Fixed	10/20/2010 3:50:30 PM	00:58:15	0.006	0.019	11213.898

# China-Osier-Laundry



Precision Confidence Level: 95%

Vector ID	From Point ID	To Point ID	Solution Type	Start Time	Duration	H Precision (Meter)	V Precision (Meter)	Ellip. Dist. (Meter)
<a href="#">PV38</a>	<a href="#">MSOL</a>	<a href="#">N-371</a>	Fixed	10/8/2010 10:42:00 AM	01:47:30	0.005	0.024	19607.595
<a href="#">PV36</a>	<a href="#">MSOL</a>	<a href="#">N-371</a>	Fixed	10/5/2010 8:59:45 AM	01:01:45	0.007	0.019	19607.610
<a href="#">PV6</a>	<a href="#">MSOL</a>	<a href="#">CHIN_01</a>	Fixed	9/27/2010 11:59:45 AM	08:00:00	0.011	0.013	75615.027
<a href="#">PV40</a>	<a href="#">MSOL</a>	<a href="#">CHIN_01</a>	Fixed	10/8/2010 1:04:45 PM	00:55:00	0.007	0.013	75615.026
<a href="#">PV5</a>	<a href="#">MSOL</a>	<a href="#">CHIN_02</a>	Fixed	9/27/2010 12:51:48 PM	05:40:51	0.004	0.016	71604.219
<a href="#">PV4</a>	<a href="#">MSOL</a>	<a href="#">CHIN_02</a>	Fixed	9/27/2010 6:43:33 PM	00:37:58	0.010	0.013	71604.223
<a href="#">PV39</a>	<a href="#">MSOL</a>	<a href="#">FLAT</a>	Fixed	10/8/2010 9:59:45 AM	04:00:00	0.007	0.023	113291.054
<a href="#">PV45</a>	<a href="#">FLAT</a>	<a href="#">IDNP</a>	Fixed	10/8/2010 11:59:45 AM	02:29:45	0.006	0.025	76501.840
<a href="#">PV42</a>	<a href="#">FLAT</a>	<a href="#">IDNP</a>	Fixed	10/8/2010 2:34:00 PM	01:52:30	0.008	0.022	76501.824
<a href="#">PV1</a>	<a href="#">CHIN_01</a>	<a href="#">CHIN_02</a>	Fixed	9/27/2010 12:51:48 PM	05:40:51	0.003	0.018	6569.980

<a href="#">PV2</a>	<a href="#">CHIN_01</a>	<a href="#">CHIN_02</a>	Fixed	9/27/2010 6:43:33 PM	00:37:58	0.011	0.013	6569.981
<a href="#">PV21</a>	<a href="#">CHIN_01</a>	<a href="#">CHIN_02</a>	Fixed	10/8/2010 1:50:45 PM	05:27:00	0.004	0.013	6569.980
<a href="#">PV20</a>	<a href="#">FLAT</a>	<a href="#">CHIN_02</a>	Fixed	10/8/2010 1:50:45 PM	00:38:45	0.007	0.019	56391.193
<a href="#">PV34</a>	<a href="#">CHIN_02</a>	<a href="#">FLAT</a>	Fixed	10/8/2010 2:34:00 PM	01:52:30	0.009	0.019	56391.173
<a href="#">PV9</a>	<a href="#">CHIN_01</a>	<a href="#">FLAT</a>	Fixed	10/8/2010 1:04:45 PM	01:24:45	0.011	0.051	58996.093
<a href="#">PV35</a>	<a href="#">CHIN_01</a>	<a href="#">FLAT</a>	Fixed	10/8/2010 2:34:00 PM	01:52:30	0.007	0.026	58996.082
<a href="#">PV46</a>	<a href="#">IDNP</a>	<a href="#">CHIN_01</a>	Fixed	10/8/2010 1:04:45 PM	06:55:45	0.004	0.015	128141.326

### **Final Adjustment Report**

**Priest River:**

**GNSS**

**Error in Height of Antenna:** 0.000 m

**Centering Error:** 0.000 m

**Horizontal:**

**Propagated Linear Error [E]:** U.S.

**Constant Term [C]:** 0.000 m

**Scale on Linear Error [S]:** 1.960

**Three-Dimensional**

**Propagated Linear Error [E]:** U.S.

**Constant Term [C]:** 0.000 m

**Scale on Linear Error [S]:** 1.960

Adjustment Statistics

**Number of Iterations for Successful Adjustment:** 2

**Network Reference Factor:** 0.92

**Chi Square Test (95%):** Passed

**Precision Confidence Level:** 95%

**Degrees of Freedom:** 22

**Reference Factor:** 0.92

**Redundancy Number:** 22.00

**A Priori Scalar:** 1.00

Control Coordinate Comparisons

Values shown are control coordinates minus adjusted coordinates.

<b>Point ID</b>	<b>ΔNorthing (Meter)</b>	<b>ΔEasting (Meter)</b>	<b>ΔElevation (Meter)</b>	<b>ΔHeight (Meter)</b>
<a href="#">N-283</a>	?	?	?	-0.001

Control Point Constraints

Point ID	Type	North $\sigma$ (Meter)	East $\sigma$ (Meter)	Height $\sigma$ (Meter)	Elevation $\sigma$ (Meter)
<a href="#">N-283</a>	Grid	Fixed	Fixed		Fixed
<a href="#">SNP-A</a>	Grid	Fixed	Fixed		Fixed
Fixed = 0.000001(Meter)					

Adjusted Grid Coordinates

Point ID	Northing (Meter)	Northing Error (Meter)	Easting (Meter)	Easting Error (Meter)	Elevation (Meter)	Elevation Error (Meter)	Constraint
<a href="#">N-283</a>	5358980.88 9	?	501429.73 5	?	746.610	?	NEe
<a href="#">PRIEST-1</a>	5356539.31 9	0.002	511830.36 3	0.001	687.672	0.008	
<a href="#">SNP-A</a>	5349092.49 5	?	532340.97 1	?	648.190	?	NEe

Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (Meter)	Height Error (Meter)	Constraint
<a href="#">N-283</a>	N48°23'02.36912"	W116°58'50.48314"	729.747	?	NEe
<a href="#">PRIEST-1</a>	N48°21'42.89884"	W116°50'25.03025"	670.922	0.008	
<a href="#">SNP-A</a>	N48°17'39.13445"	W116°33'50.26816"	631.149	?	NEe

Adjusted ECEF Coordinates

Point ID	X (Meter)	X Error (Meter)	Y (Meter)	Y Error (Meter)	Z (Meter)	Z Error (Meter)	3D Error (Meter)	Constraint
<a href="#">N-283</a>	1925631.931	?	3782416.340	?	4745885.602	?	?	NEe
<a href="#">PRIEST-1</a>	1917168.220	0.003	3788726.239	0.005	4744210.850	0.006	0.009	
<a href="#">SNP-A</a>	1901377.490	?	3802935.481	?	4739174.606	?	?	NEe

Error Ellipse Components

Point ID	Semi-major axis (Meter)	Semi-minor axis (Meter)	Azimuth
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<a href="#">PRIEST-1</a>	0.002	0.002	12°
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Adjusted GPS Observations

**Azimuth Rotation:** 0.125 sec (95%) 0.012 sec

**Scale Factor:** 0.99999988 (95%) 0.00000004

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
<a href="#">N-283 --&gt; SNP-A (PV50)</a>	<b>Az.</b>	107°45'13"	0.012 sec	0.023 sec	1.762
	<b>ΔHt.</b>	-98.598 m	0.000 m	0.015 m	1.521
	<b>Ellip Dist.</b>	32467.196 m	0.001 m	-0.004 m	-2.383
<a href="#">N-283 --&gt; SNP-A (PV53)</a>	<b>Az.</b>	107°45'13"	0.012 sec	-0.014 sec	-1.399
	<b>ΔHt.</b>	-98.598 m	0.000 m	0.001 m	0.099
	<b>Ellip Dist.</b>	32467.196 m	0.001 m	0.000 m	0.078
<a href="#">SNP-A --&gt; PRIEST-1 (PV49)</a>	<b>Az.</b>	290°16'49"	0.018 sec	0.008 sec	0.462
	<b>ΔHt.</b>	39.773 m	0.008 m	-0.013 m	-1.211
	<b>Ellip Dist.</b>	21829.231 m	0.001 m	-0.001 m	-0.484
<a href="#">SNP-A --&gt; PRIEST-1 (PV52)</a>	<b>Az.</b>	290°16'49"	0.018 sec	-0.016 sec	-0.841
	<b>ΔHt.</b>	39.773 m	0.008 m	-0.008 m	-0.868
	<b>Ellip Dist.</b>	21829.231 m	0.001 m	0.001 m	1.180
<a href="#">N-283 --&gt; PRIEST-1 (PV56)</a>	<b>Az.</b>	103°13'32"	0.041 sec	0.011 sec	0.184
	<b>ΔHt.</b>	-58.825 m	0.008 m	0.008 m	0.945
	<b>Ellip Dist.</b>	10687.637 m	0.001 m	0.002 m	1.065
<a href="#">N-283 --&gt; SNP-A (PV51)</a>	<b>Az.</b>	107°45'13"	0.012 sec	0.000 sec	0.037
	<b>ΔHt.</b>	-98.598 m	0.000 m	0.010 m	0.953
	<b>Ellip Dist.</b>	32467.196 m	0.001 m	0.001 m	0.456
<a href="#">N-283 --&gt; PRIEST-1 (PV55)</a>	<b>Az.</b>	103°13'32"	0.041 sec	-0.050 sec	-0.941
	<b>ΔHt.</b>	-58.825 m	0.008 m	0.000 m	0.034
	<b>Ellip Dist.</b>	10687.637 m	0.001 m	0.002 m	0.932

<a href="#">N-283 --&gt; PRIEST-1 (PV48)</a>	<b>Az.</b>	103°13'32"	0.041 sec	0.027 sec	0.727
	<b>ΔHt.</b>	-58.825 m	0.008 m	0.006 m	0.536
	<b>Ellip Dist.</b>	10687.637 m	0.001 m	0.000 m	-0.153
<a href="#">SNP-A --&gt; PRIEST-1 (PV54)</a>	<b>Az.</b>	290°16'49"	0.018 sec	0.005 sec	0.360
	<b>ΔHt.</b>	39.773 m	0.008 m	-0.005 m	-0.552
	<b>Ellip Dist.</b>	21829.231 m	0.001 m	0.001 m	0.611

#### Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
<a href="#">N-283</a>	<a href="#">PRIEST-1</a>	<b>Az.</b>	103°13'32"	0.036 sec	1 : 8268050	1 : 8266891
		<b>ΔHt.</b>	-58.825 m	0.008 m		
		<b>ΔElev.</b>	-58.938 m	0.008 m		
		<b>Ellip Dist.</b>	10687.635 m	0.001 m		
<a href="#">N-283</a>	<a href="#">SNP-A</a>	<b>Az.</b>	107°45'13"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	-98.598 m	0.000 m		
		<b>ΔElev.</b>	-98.420 m	0.000 m		
		<b>Ellip Dist.</b>	32467.192 m	0.000 m		
<a href="#">PRIEST-1</a>	<a href="#">SNP-A</a>	<b>Az.</b>	110°04'26"	0.018 sec	1 : 16700819	1 : 16695610
		<b>ΔHt.</b>	-39.773 m	0.008 m		
		<b>ΔElev.</b>	-39.482 m	0.008 m		
		<b>Ellip Dist.</b>	21829.229 m	0.001 m		

**Deception Creek:**Adjustment Statistics

**Number of Iterations for Successful Adjustment:** 2  
**Network Reference Factor:** 1.00  
**Chi Square Test (95%):** Passed  
**Precision Confidence Level:** 95%  
**Degrees of Freedom:** 28  
  
**Reference Factor:** 1.00  
**Redundancy Number:** 28.00  
**A Priori Scalar:** 2.05

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Control Point Constraints

Point ID	Type	North $\sigma$ (Meter)	East $\sigma$ (Meter)	Height $\sigma$ (Meter)	Elevation $\sigma$ (Meter)
<a href="#">M-134</a>	Grid	Fixed	Fixed		Fixed
<a href="#">SMLT</a>	Grid	Fixed	Fixed		Fixed
Fixed = 0.000001(Meter)					

Adjusted Grid Coordinates

Point ID	Northing (Meter)	Northing Error (Meter)	Easting (Meter)	Easting Error (Meter)	Elevation (Meter)	Elevation Error (Meter)	Constraint
<a href="#">DECEP-1</a>	5285313.075	0.004	534705.222	0.003	1255.232	0.015	
<a href="#">DECEP-2</a>	5286315.949	0.004	533798.948	0.003	1347.442	0.015	
<a href="#">M-134</a>	5301666.740	?	519199.998	?	705.068	?	NEe
<a href="#">SMLT</a>	5266160.194	?	562041.000	?	685.060	?	NEe

Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (Meter)	Height Error (Meter)	Constraint
<a href="#">DECEP-1</a>	N47°43'12.94690"	W116°32'14.10042"	1238.215	0.015	
<a href="#">DECEP-2</a>	N47°43'45.60352"	W116°32'57.32122"	1330.404	0.015	
<a href="#">M-134</a>	N47°52'04.98453"	W116°44'35.75671"	687.701	?	NEe
<a href="#">SMLT</a>	N47°32'45.23769"	W116°10'31.82848"	668.311	?	NEe

Adjusted ECEF Coordinates

Point	X	X Error	Y	Y Error	Z	Z Error	3D Error	Constraint
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ID	(Meter)	(Meter)	(Meter)	(Meter)	(Meter)	(Meter)	(Meter)	
<a href="#">DECEP-1</a>	1920979.675	0.005	3846624.367	0.010	4696923.946	0.012	0.016	
<a href="#">DECEP-2</a>	1921479.745	0.005	3845609.516	0.010	4697670.766	0.012	0.016	
<a href="#">M-134</a>	1929153.869	?	3828490.628	?	4707556.800	?	?	NEe
<a href="#">SMLT</a>	1902805.464	?	3871187.716	?	4683436.961	?	?	NEe

#### Error Ellipse Components

Point ID	Semi-major axis (Meter)	Semi-minor axis (Meter)	Azimuth
<a href="#">DECEP-1</a>	0.005	0.004	3°
<a href="#">DECEP-2</a>	0.005	0.004	4°

#### Adjusted GPS Observations

**Azimuth Rotation:** 0.003 sec (95%) 0.013 sec

**Scale Factor:** 0.99999983 (95%) 0.00000008

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
<a href="#">M-134 --&gt; DECEP-2 (PV62)</a>	<b>Az.</b>	136°37'41"	0.038 sec	0.015 sec	0.462
	<b>ΔHt.</b>	642.703 m	0.015 m	0.013 m	1.159
	<b>Ellip Dist.</b>	21192.630 m	0.004 m	0.013 m	2.928
<a href="#">SMLT --&gt; M-134 (PV73)</a>	<b>Az.</b>	310°15'41"	0.013 sec	-0.007 sec	-0.601
	<b>ΔHt.</b>	19.390 m	0.000 m	0.018 m	0.792
	<b>Ellip Dist.</b>	55663.348 m	0.004 m	-0.009 m	-2.216
<a href="#">DECEP-2 --&gt; DECEP-1 (PV66)</a>	<b>Az.</b>	138°13'48"	0.448 sec	0.177 sec	0.521
	<b>ΔHt.</b>	-92.188 m	0.007 m	0.002 m	0.466
	<b>Ellip Dist.</b>	1352.219 m	0.003 m	0.003 m	1.994
<a href="#">DECEP-2 --&gt; DECEP-1 (PV64)</a>	<b>Az.</b>	138°13'48"	0.448 sec	-0.425 sec	-0.430

	<b>ΔHt.</b>	-92.188 m	0.007 m	0.007 m	0.564
	<b>Ellip Dist.</b>	1352.219 m	0.003 m	0.010 m	1.696
<a href="#">DECEP-2 --&gt; DECEP-1 (PV59)</a>	<b>Az.</b>	138°13'48"	0.448 sec	0.117 sec	0.448
	<b>ΔHt.</b>	-92.188 m	0.007 m	0.000 m	-0.037
	<b>Ellip Dist.</b>	1352.219 m	0.003 m	-0.002 m	-1.382
<a href="#">SMLT --&gt; M-134 (PV61)</a>	<b>Az.</b>	310°15'41"	0.013 sec	0.002 sec	0.178
	<b>ΔHt.</b>	19.390 m	0.000 m	0.007 m	0.637
	<b>Ellip Dist.</b>	55663.348 m	0.004 m	0.005 m	1.160
<a href="#">SMLT --&gt; M-134 (PV71)</a>	<b>Az.</b>	310°15'41"	0.013 sec	-0.006 sec	-0.519
	<b>ΔHt.</b>	19.390 m	0.000 m	0.023 m	0.842
	<b>Ellip Dist.</b>	55663.348 m	0.004 m	-0.007 m	-1.013
<a href="#">SMLT --&gt; DECEP-1 (PV67)</a>	<b>Az.</b>	305°37'34"	0.022 sec	0.015 sec	0.891
	<b>ΔHt.</b>	569.904 m	0.015 m	-0.001 m	-0.078
	<b>Ellip Dist.</b>	33390.177 m	0.003 m	0.000 m	-0.050
<a href="#">SMLT --&gt; DECEP-1 (PV58)</a>	<b>Az.</b>	305°37'34"	0.022 sec	0.007 sec	0.434
	<b>ΔHt.</b>	569.904 m	0.015 m	0.006 m	0.385
	<b>Ellip Dist.</b>	33390.177 m	0.003 m	0.002 m	0.878
<a href="#">M-134 --&gt; DECEP-2 (PV74)</a>	<b>Az.</b>	136°37'41"	0.038 sec	0.033 sec	0.871
	<b>ΔHt.</b>	642.703 m	0.015 m	-0.007 m	-0.300
	<b>Ellip Dist.</b>	21192.630 m	0.004 m	0.001 m	0.249
<a href="#">SMLT --&gt; DECEP-1 (PV68)</a>	<b>Az.</b>	305°37'34"	0.022 sec	0.023 sec	0.580
	<b>ΔHt.</b>	569.904 m	0.015 m	0.003 m	0.156
	<b>Ellip Dist.</b>	33390.177 m	0.003 m	0.004 m	0.860
<a href="#">M-134 --&gt; DECEP-2 (PV70)</a>	<b>Az.</b>	136°37'41"	0.038 sec	0.036 sec	0.765
	<b>ΔHt.</b>	642.703 m	0.015 m	-0.015 m	-0.515
	<b>Ellip Dist.</b>	21192.630 m	0.004 m	-0.003 m	-0.759

## Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
<a href="#">DECEP-2</a>	<a href="#">DECEP-1</a>	<b>Az.</b>	138°13'48"	0.445 sec	1 : 494429	1 : 516249
		<b>ΔHt.</b>	-92.188 m	0.007 m		
		<b>ΔElev.</b>	-92.211 m	0.007 m		
		<b>Ellip Dist.</b>	1352.219 m	0.003 m		
<a href="#">DECEP-2</a>	<a href="#">M-134</a>	<b>Az.</b>	316°46'19"	0.034 sec	1 : 6104299	1 : 5993152
		<b>ΔHt.</b>	-642.703 m	0.015 m		
		<b>ΔElev.</b>	-642.374 m	0.015 m		
		<b>Ellip Dist.</b>	21192.627 m	0.003 m		
<a href="#">SMLT</a>	<a href="#">DECEP-1</a>	<b>Az.</b>	305°37'34"	0.022 sec	1 : 10332233	1 : 10314201
		<b>ΔHt.</b>	569.904 m	0.015 m		
		<b>ΔElev.</b>	570.172 m	0.015 m		
		<b>Ellip Dist.</b>	33390.172 m	0.003 m		
<a href="#">SMLT</a>	<a href="#">M-134</a>	<b>Az.</b>	310°15'41"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	19.390 m	0.000 m		
		<b>ΔElev.</b>	20.008 m	0.000 m		
		<b>Ellip Dist.</b>	55663.338 m	0.000 m		

## Potlatch-Upper Elk

### Adjustment Settings

#### GNSS

Error in Height of Antenna: 0.000 m

Centering Error: 0.000 m

#### Horizontal:

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 m

Scale on Linear Error [S]: 1.960

#### Three-Dimensional

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 m

Scale on Linear Error [S]: 1.960

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### Adjustment Statistics

Number of Iterations for Successful Adjustment: 2

Network Reference Factor: 2.71

Chi Square Test (95%): Failed

Precision Confidence Level: 95%

Degrees of Freedom: 44

Reference Factor: 2.71

Redundancy Number: 44.00

A Priori Scalar: 1.00

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### Control Coordinate Comparisons

Values shown are control coordinates minus adjusted coordinates.

Point ID	$\Delta$ Northing (Meter)	$\Delta$ Easting (Meter)	$\Delta$ Elevation (Meter)	$\Delta$ Height (Meter)
<a href="#">BOVL GPS</a>	?	?	?	0.004

### Control Point Constraints

Point ID	Type	North $\sigma$ (Meter)	East $\sigma$ (Meter)	Height $\sigma$ (Meter)	Elevation $\sigma$ (Meter)
<a href="#">BOVL GPS</a>	Grid	Fixed	Fixed		Fixed
<a href="#">IDNP</a>	Grid	Fixed	Fixed		Fixed
<a href="#">Moscow_CBL_0</a>	Grid	Fixed	Fixed		Fixed

Fixed = 0.000001(Meter)

### Adjusted Grid Coordinates

Point ID	Northing (Meter)	Northing Err or (Meter)	Easting (Meter)	Easting Err or (Meter)	Elevation (Meter)	Elevation Err or (Meter)	Constraint
<a href="#">BOVL GPS</a>	5189425.065	?	545582.471	?	873.550	?	NEe

<a href="#">Elk_01</a>	5182283.62 5	0.003	563033.60 9	0.003	861.710	0.019	
<a href="#">IDNP</a>	5087723.65 8	?	568116.78 2	?	1013.310	?	NEe
<a href="#">Moscow_CBL_0</a>	5174687.13 1	?	503923.24 7	?	790.524	?	NEe
<a href="#">POT_01</a>	5195006.93 0	0.003	546316.32 6	0.003	884.959	0.017	

#### Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (Meter)	Height Error (Meter)	Constraint
<a href="#">BOVL_GPS</a>	N46°51'24.49597"	W116°24'07.29886"	856.161	?	NEe
<a href="#">Elk_01</a>	N46°47'28.03299"	W116°10'26.76312"	844.711	0.019	
<a href="#">IDNP</a>	N45°56'22.93599"	W116°07'16.53029"	997.084	?	NEe
<a href="#">Moscow_CBL_0</a>	N46°43'32.61627"	W116°56'55.16821"	772.236	?	NEe
<a href="#">POT_01</a>	N46°54'25.13460"	W116°23'30.60100"	867.604	0.017	

#### Adjusted ECEF Coordinates

Point ID	X (Meter)	X Error (Meter)	Y (Meter)	Y Error (Meter)	Z (Meter)	Z Error (Meter)	3D Error (Meter)	Constraint
<a href="#">BOVL_GPS</a>	1943150.66 1	?	3914103.84 9	?	4631518.23 5	?	?	NEe
<a href="#">Elk_01</a>	1929910.45 4	0.006	3926575.39 2	0.012	4626512.92 4	0.015	0.020	
<a href="#">IDNP</a>	1956496.28 0	?	3989958.02 0	?	4561305.99 0	?	?	NEe
<a href="#">Moscow_CBL_0</a>	1985191.92 7	?	3904804.72 8	?	4621479.30 5	?	?	NEe
<a href="#">POT_01</a>	1940647.55 6	0.006	3910808.64 6	0.011	4635339.79 2	0.013	0.018	

#### Error Ellipse Components

Point ID	Semi-major axis (Meter)	Semi-minor axis (Meter)	Azimuth
<a href="#">Elk_01</a>	0.004	0.004	35°
<a href="#">POT_01</a>	0.004	0.003	23°

Adjusted GPS Observations

**Deflection in Latitude:** -0.112 sec (95%) 0.063 sec  
**Deflection in Longitude:** 0.251 sec (95%) 0.040 sec  
**Azimuth Rotation:** 0.014 sec (95%) 0.005 sec  
**Scale Factor:** 1.00000014 (95%) 0.00000003

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
<a href="#">BOVL GPS --&gt; POT_01 (PV14)</a>	<b>Az.</b>	7°55'35"	0.095 sec	0.123 sec	0.785
	<b>ΔHt.</b>	11.447 m	0.017 m	-0.041 m	-2.163
	<b>Ellip Dist.</b>	5632.004 m	0.003 m	0.006 m	0.975
<a href="#">BOVL GPS --&gt; Moscow CBL 0 (PV32)</a>	<b>Az.</b>	250°57'13"	0.005 sec	0.028 sec	2.120
	<b>ΔHt.</b>	-83.984 m	0.015 m	0.031 m	1.944
	<b>Ellip Dist.</b>	44206.603 m	0.001 m	0.003 m	1.081
<a href="#">BOVL GPS --&gt; POT_01 (PV31)</a>	<b>Az.</b>	7°55'35"	0.095 sec	0.166 sec	1.867
	<b>ΔHt.</b>	11.447 m	0.017 m	0.013 m	0.791
	<b>Ellip Dist.</b>	5632.004 m	0.003 m	0.003 m	1.143
<a href="#">BOVL GPS --&gt; Elk_01 (PV33)</a>	<b>Az.</b>	112°41'30"	0.038 sec	-0.030 sec	-0.852
	<b>ΔHt.</b>	-11.433 m	0.018 m	0.033 m	1.721
	<b>Ellip Dist.</b>	18862.684 m	0.003 m	-0.001 m	-0.357
<a href="#">BOVL GPS --&gt; IDNP (PV36)</a>	<b>Az.</b>	167°56'21"	0.005 sec	-0.002 sec	-0.332
	<b>ΔHt.</b>	140.894 m	0.016 m	0.028 m	1.680
	<b>Ellip Dist.</b>	104205.469 m	0.004 m	-0.006 m	-1.353
<a href="#">BOVL GPS --&gt; Moscow CBL 0 (PV30)</a>	<b>Az.</b>	250°57'13"	0.005 sec	0.048 sec	1.566
	<b>ΔHt.</b>	-83.984 m	0.015 m	-0.019 m	-1.298
	<b>Ellip Dist.</b>	44206.603 m	0.001 m	0.000 m	0.063
<a href="#">IDNP --&gt; POT_01 (PV38)</a>	<b>Az.</b>	349°08'59"	0.006 sec	-0.007 sec	-1.564
	<b>ΔHt.</b>	-129.447 m	0.017 m	0.004 m	0.379
	<b>Ellip</b>	109515.173	0.004 m	0.000 m	-0.077

	<b>Dist.</b>	m			
<a href="#">BOVL GPS --&gt; IDNP (PV40)</a>	<b>Az.</b>	167°56'21"	0.005 sec	0.014 sec	1.316
	<b>ΔHt.</b>	140.894 m	0.016 m	-0.016 m	-0.884
	<b>Ellip Dist.</b>	104205.469 m	0.004 m	-0.003 m	-0.395
<a href="#">IDNP --&gt; Elk 01 (PV41)</a>	<b>Az.</b>	357°33'32"	0.008 sec	-0.007 sec	-1.261
	<b>ΔHt.</b>	-152.328 m	0.018 m	0.002 m	0.197
	<b>Ellip Dist.</b>	94729.363 m	0.004 m	0.003 m	0.737
<a href="#">Elk 01 --&gt; Moscow CBL 0 (PV24)</a>	<b>Az.</b>	263°16'43"	0.011 sec	0.016 sec	0.971
	<b>ΔHt.</b>	-72.551 m	0.017 m	0.028 m	1.187
	<b>Ellip Dist.</b>	59619.295 m	0.003 m	-0.001 m	-0.159
<a href="#">POT 01 --&gt; Elk 01 (PV15)</a>	<b>Az.</b>	127°43'05"	0.038 sec	-0.010 sec	-0.389
	<b>ΔHt.</b>	-22.880 m	0.018 m	-0.002 m	-0.131
	<b>Ellip Dist.</b>	21015.958 m	0.003 m	0.002 m	1.122
<a href="#">POT 01 --&gt; Moscow CBL 0 (PV13)</a>	<b>Az.</b>	244°50'04"	0.013 sec	0.011 sec	1.011
	<b>ΔHt.</b>	-95.431 m	0.016 m	-0.014 m	-0.869
	<b>Ellip Dist.</b>	47029.707 m	0.003 m	0.000 m	0.112
<a href="#">IDNP --&gt; Moscow CBL 0 (PV37)</a>	<b>Az.</b>	324°12'03"	0.005 sec	0.007 sec	0.937
	<b>ΔHt.</b>	-224.878 m	0.016 m	-0.003 m	-0.171
	<b>Ellip Dist.</b>	108131.091 m	0.004 m	-0.001 m	-0.185
<a href="#">IDNP --&gt; Moscow CBL 0 (PV39)</a>	<b>Az.</b>	324°12'03"	0.005 sec	-0.004 sec	-0.847
	<b>ΔHt.</b>	-224.878 m	0.016 m	-0.005 m	-0.311
	<b>Ellip Dist.</b>	108131.091 m	0.004 m	-0.005 m	-0.871
<a href="#">POT 01 --&gt; Moscow CBL 0 (PV22)</a>	<b>Az.</b>	244°50'04"	0.013 sec	0.002 sec	0.119
	<b>ΔHt.</b>	-95.431 m	0.016 m	0.012 m	0.704

	<b>Ellip Dist.</b>	47029.707 m	0.003 m	-0.003 m	-0.764
<a href="#">BOVL GPS --&gt; Moscow CBL 0 (PV23)</a>	<b>Az.</b>	250°57'13"	0.005 sec	0.001 sec	0.051
	<b>ΔHt.</b>	-83.984 m	0.015 m	-0.011 m	-0.670
	<b>Ellip Dist.</b>	44206.603 m	0.001 m	0.003 m	0.636
<a href="#">BOVL GPS --&gt; Elk 01 (PV8)</a>	<b>Az.</b>	112°41'30"	0.038 sec	-0.035 sec	-0.386
	<b>ΔHt.</b>	-11.433 m	0.018 m	-0.012 m	-0.574
	<b>Ellip Dist.</b>	18862.684 m	0.003 m	0.001 m	0.155
<a href="#">Elk 01 --&gt; Moscow CBL 0 (PV10)</a>	<b>Az.</b>	263°16'43"	0.011 sec	0.004 sec	0.345
	<b>ΔHt.</b>	-72.551 m	0.017 m	0.005 m	0.329
	<b>Ellip Dist.</b>	59619.295 m	0.003 m	0.001 m	0.230

#### Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
<a href="#">BOVL GPS</a>	<a href="#">IDNP</a>	<b>Az.</b>	167°56'21"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	140.923 m	0.000 m		
		<b>ΔElev.</b>	139.760 m	0.000 m		
		<b>Ellip Dist.</b>	104205.484 m	0.000 m		
<a href="#">Elk 01</a>	<a href="#">BOVL GPS</a>	<b>Az.</b>	292°51'28"	0.038 sec	1 : 6425383	1 : 6432583
		<b>ΔHt.</b>	11.451 m	0.019 m		
		<b>ΔElev.</b>	11.840 m	0.019 m		
		<b>Ellip Dist.</b>	18862.687 m	0.003 m		
<a href="#">Elk 01</a>	<a href="#">IDNP</a>	<b>Az.</b>	177°31'14"	0.007 sec	1 : 28627634	1 : 28596852
		<b>ΔHt.</b>	152.374 m	0.019 m		
		<b>ΔElev.</b>	151.600 m	0.019 m		
		<b>Ellip Dist.</b>	94729.377 m	0.003 m		
<a href="#">Elk 01</a>	<a href="#">Moscow CBL 0</a>	<b>Az.</b>	263°16'43"	0.011 sec	1 : 18594816	1 : 18623783
		<b>ΔHt.</b>	-72.475 m	0.019 m		
		<b>ΔElev.</b>	-71.186 m	0.019 m		



		<b>Ellip Dist.</b>	59619.304 m	0.003 m		
<a href="#">Elk_01</a>	<a href="#">POT_01</a>	<b>Az.</b>	307°52'36"	0.038 sec	1 : 6500943	1 : 6496516
		<b>ΔHt.</b>	22.894 m	0.018 m		
		<b>ΔElev.</b>	23.249 m	0.018 m		
		<b>Ellip Dist.</b>	21015.961 m	0.003 m		
<a href="#">Moscow_CBL_0</a>	<a href="#">BOVL_GPS</a>	<b>Az.</b>	70°33'18"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	83.925 m	0.000 m		
		<b>ΔElev.</b>	83.026 m	0.000 m		
		<b>Ellip Dist.</b>	44206.610 m	0.000 m		
<a href="#">Moscow_CBL_0</a>	<a href="#">IDNP</a>	<b>Az.</b>	143°36'08"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	224.848 m	0.000 m		
		<b>ΔElev.</b>	222.786 m	0.000 m		
		<b>Ellip Dist.</b>	108131.106 m	0.000 m		
<a href="#">POT_01</a>	<a href="#">BOVL_GPS</a>	<b>Az.</b>	187°56'01"	0.097 sec	1 : 1791345	1 : 1789118
		<b>ΔHt.</b>	-11.443 m	0.017 m		
		<b>ΔElev.</b>	-11.409 m	0.017 m		
		<b>Ellip Dist.</b>	5632.005 m	0.003 m		
<a href="#">POT_01</a>	<a href="#">IDNP</a>	<b>Az.</b>	168°57'13"	0.005 sec	1 : 36440481	1 : 36400648
		<b>ΔHt.</b>	129.480 m	0.017 m		
		<b>ΔElev.</b>	128.351 m	0.017 m		
		<b>Ellip Dist.</b>	109515.189 m	0.003 m		
<a href="#">POT_01</a>	<a href="#">Moscow_CBL_0</a>	<b>Az.</b>	244°50'04"	0.013 sec	1 : 16014354	1 : 16031239
		<b>ΔHt.</b>	-95.368 m	0.017 m		
		<b>ΔElev.</b>	-94.435 m	0.017 m		
		<b>Ellip Dist.</b>	47029.714 m	0.003 m		

## Walde-Pete King-Musselshell

### Adjustment Settings

#### **GNSS**

**Error in Height of Antenna:** 0.000 m

**Centering Error:** 0.000 m

#### **Horizontal:**

**Propagated Linear Error [E]:** U.S.

**Constant Term [C]:** 0.000 m

**Scale on Linear Error [S]:** 1.960

#### **Three-Dimensional**

**Propagated Linear Error [E]:** U.S.

**Constant Term [C]:** 0.000 m

**Scale on Linear Error [S]:** 1.960

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### Adjustment Statistics

**Number of Iterations for Successful Adjustment:** 2

**Network Reference Factor:** 5.55

**Chi Square Test (95%):** Failed

**Precision Confidence Level:** 95%

**Degrees of Freedom:** 53

**Reference Factor:** 5.55

**Redundancy Number:** 53.00

**A Priori Scalar:** 1.00

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### Control Coordinate Comparisons

Values shown are control coordinates minus adjusted coordinates.

Point ID	$\Delta$ Northing (Meter)	$\Delta$ Easting (Meter)	$\Delta$ Elevation (Meter)	$\Delta$ Height (Meter)
<a href="#">KAMI</a>	?	?	?	-0.001

### Control Point Constraints

Point ID	Type	North $\sigma$ (Meter)	East $\sigma$ (Meter)	Height $\sigma$ (Meter)	Elevation $\sigma$ (Meter)
<a href="#">FLAT</a>	Grid	Fixed	Fixed		Fixed
<a href="#">IDNP</a>	Grid	Fixed	Fixed		Fixed
<a href="#">KAMI</a>	Grid	Fixed	Fixed		Fixed

Fixed = 0.000001(Meter)

### Adjusted Grid Coordinates

Point ID	Northing (Meter)	Northing Error (Meter)	Easting (Meter)	Easting Error (Meter)	Elevation (Meter)	Elevation Error (Meter)	Constraint
<a href="#">FLAT</a>	5133065.059	?	629707.845	?	632.285	?	NEe

<a href="#">IDNP</a>	5087723.65 8	?	568116.78 2	?	1013.310	?	NEe
<a href="#">KAMI</a>	5118151.32 7	?	576727.90 6	?	371.646	?	NEe
<a href="#">WALDE_02</a>	5123588.31 0	0.006	594756.74 9	0.005	1056.227	0.033	
<a href="#">WALDE_03</a>	5121885.54 3	0.005	590876.92 3	0.005	954.254	0.030	
<a href="#">WALDE_05</a>	5121132.10 6	0.013	602062.27 8	0.013	1278.153	0.054	

#### Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (Meter)	Height Error (Meter)	Constraint
<a href="#">FLAT</a>	N46°20'19.45645"	W115°18'52.42241"	616.451	?	NEe
<a href="#">IDNP</a>	N45°56'22.93599"	W116°07'16.53029"	997.084	?	NEe
<a href="#">KAMI</a>	N46°12'45.39976"	W116°00'19.00160"	354.796	?	NEe
<a href="#">WALDE_02</a>	N46°15'33.33651"	W115°46'13.81605"	1039.891	0.033	
<a href="#">WALDE_03</a>	N46°14'40.08771"	W115°49'16.18893"	937.846	0.030	
<a href="#">WALDE_05</a>	N46°14'09.96647"	W115°40'34.57108"	1261.942	0.054	

#### Adjusted ECEF Coordinates

Point ID	X (Meter)	X Error (Meter)	Y (Meter)	Y Error (Meter)	Z (Meter)	Z Error (Meter)	3D Error (Meter)	Constraint
<a href="#">FLAT</a>	1886338.611	?	3987956.601	?	4591768.761	?	?	NEe
<a href="#">IDNP</a>	1956496.280	?	3989958.020	?	4561305.990	?	?	NEe
<a href="#">KAMI</a>	1938639.654	?	3973871.158	?	4581888.565	?	?	NEe
<a href="#">WALDE_02</a>	1920917.913	0.011	3978835.509	0.022	4585970.368	0.024	0.034	
<a href="#">WALDE_03</a>	1924921.793	0.010	3978141.314	0.020	4584759.564	0.022	0.031	
<a href="#">WALDE_05</a>	1915243.649	0.020	3983803.994	0.035	4584350.279	0.040	0.057	

Error Ellipse Components

Point ID	Semi-major axis (Meter)	Semi-minor axis (Meter)	Azimuth
<a href="#">WALDE_02</a>	0.007	0.006	28°
<a href="#">WALDE_03</a>	0.007	0.006	28°
<a href="#">WALDE_05</a>	0.017	0.016	40°

Adjusted GPS Observations

**Deflection in Latitude:** 0.368 sec (95%) 0.230 sec

**Deflection in Longitude:** 0.128 sec (95%) 0.287 sec

**Azimuth Rotation:** 0.074 sec (95%) 0.016 sec

**Scale Factor:** 0.99999995 (95%) 0.00000010

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
<a href="#">KAMI --&gt; IDNP (PV39)</a>	<b>Az.</b>	196°31'06"	0.015 sec	-0.115 sec	-3.686
	<b>ΔHt.</b>	642.337 m	0.034 m	0.015 m	0.608
	<b>Ellip Dist.</b>	31633.301 m	0.003 m	0.002 m	0.521
<a href="#">KAMI --&gt; FLAT (PV26)</a>	<b>Az.</b>	74°59'50"	0.016 sec	0.058 sec	2.204
	<b>ΔHt.</b>	261.663 m	0.044 m	-0.007 m	-0.143
	<b>Ellip Dist.</b>	55053.672 m	0.005 m	0.009 m	0.813
<a href="#">KAMI --&gt; IDNP (PV40)</a>	<b>Az.</b>	196°31'06"	0.015 sec	-0.112 sec	-2.174
	<b>ΔHt.</b>	642.337 m	0.034 m	0.023 m	0.555
	<b>Ellip Dist.</b>	31633.301 m	0.003 m	0.001 m	0.068
<a href="#">WALDE_03 --&gt; KAMI (PV7)</a>	<b>Az.</b>	256°04'01"	0.066 sec	0.101 sec	1.399
	<b>ΔHt.</b>	-583.053 m	0.035 m	-0.008 m	-0.260
	<b>Ellip Dist.</b>	14638.080 m	0.005 m	0.012 m	2.079
<a href="#">WALDE_03 --&gt; FLAT (PV27)</a>	<b>Az.</b>	74°47'28"	0.033 sec	0.061 sec	1.839
	<b>ΔHt.</b>	-321.389 m	0.039 m	-0.007 m	-0.149
	<b>Ellip Dist.</b>	40418.256 m	0.007 m	-0.002 m	-0.315
<a href="#">IDNP --&gt; WALDE_03 (PV44)</a>	<b>Az.</b>	34°18'24"	0.023 sec	-0.032 sec	-1.745
	<b>ΔHt.</b>	-59.285 m	0.020 m	-0.002 m	-0.112

	<b>Ellip Dist.</b>	41062.678 m	0.005 m	0.002 m	0.437
<a href="#">IDNP --&gt; WALDE 03 (PV37)</a>	<b>Az.</b>	34°18'24"	0.023 sec	-0.001 sec	-0.060
	<b>ΔHt.</b>	-59.285 m	0.020 m	0.006 m	0.304
	<b>Ellip Dist.</b>	41062.678 m	0.005 m	-0.009 m	-1.570
<a href="#">IDNP --&gt; WALDE 02 (PV42)</a>	<b>Az.</b>	37°14'17"	0.023 sec	-0.019 sec	-1.272
	<b>ΔHt.</b>	42.760 m	0.024 m	-0.010 m	-0.674
	<b>Ellip Dist.</b>	44690.383 m	0.006 m	-0.005 m	-1.405
<a href="#">KAMI --&gt; FLAT (PV11)</a>	<b>Az.</b>	74°59'50"	0.016 sec	0.053 sec	1.249
	<b>ΔHt.</b>	261.663 m	0.044 m	0.009 m	0.187
	<b>Ellip Dist.</b>	55053.672 m	0.005 m	0.003 m	0.201
<a href="#">IDNP --&gt; WALDE 02 (PV38)</a>	<b>Az.</b>	37°14'17"	0.023 sec	0.024 sec	1.031
	<b>ΔHt.</b>	42.760 m	0.024 m	0.018 m	0.777
	<b>Ellip Dist.</b>	44690.383 m	0.006 m	-0.001 m	-0.196
<a href="#">WALDE 03 --&gt; FLAT (PV12)</a>	<b>Az.</b>	74°47'28"	0.033 sec	0.049 sec	0.895
	<b>ΔHt.</b>	-321.389 m	0.039 m	-0.002 m	-0.032
	<b>Ellip Dist.</b>	40418.256 m	0.007 m	-0.007 m	-0.811
<a href="#">KAMI --&gt; WALDE 03 (PV29)</a>	<b>Az.</b>	75°56'02"	0.066 sec	0.132 sec	0.622
	<b>ΔHt.</b>	583.053 m	0.035 m	0.005 m	0.070
	<b>Ellip Dist.</b>	14638.080 m	0.005 m	0.011 m	0.837
<a href="#">WALDE 03 --&gt; WALDE 05 (PV47)</a>	<b>Az.</b>	94°42'18"	0.242 sec	-0.044 sec	-0.189
	<b>ΔHt.</b>	324.105 m	0.051 m	0.039 m	0.809
	<b>Ellip Dist.</b>	11213.903 m	0.013 m	0.005 m	0.648
<a href="#">KAMI --&gt; WALDE 02 (PV28)</a>	<b>Az.</b>	73°56'12"	0.057 sec	0.116 sec	0.757
	<b>ΔHt.</b>	685.097 m	0.039 m	0.011 m	0.171
	<b>Ellip Dist.</b>	18836.652 m	0.005 m	0.010 m	0.791

<a href="#">WALDE 02 --&gt; FLAT (PV25)</a>	<b>Az.</b>	75°43'07"	0.039 sec	0.026 sec	0.706
	<b>ΔHt.</b>	-423.434 m	0.040 m	0.006 m	0.124
	<b>Ellip Dist.</b>	36221.927 m	0.007 m	0.001 m	0.084
<a href="#">WALDE 02 --&gt; FLAT (PV17)</a>	<b>Az.</b>	75°43'07"	0.039 sec	0.012 sec	0.188
	<b>ΔHt.</b>	-423.434 m	0.040 m	0.002 m	0.050
	<b>Ellip Dist.</b>	36221.927 m	0.007 m	-0.006 m	-0.703
<a href="#">IDNP --&gt; WALDE 03 (PV36)</a>	<b>Az.</b>	34°18'24"	0.023 sec	-0.008 sec	-0.159
	<b>ΔHt.</b>	-59.285 m	0.020 m	0.009 m	0.457
	<b>Ellip Dist.</b>	41062.678 m	0.005 m	-0.008 m	-0.588
<a href="#">WALDE 03 --&gt; WALDE 02 (PV19)</a>	<b>Az.</b>	67°09'22"	0.260 sec	-0.093 sec	-0.535
	<b>ΔHt.</b>	102.045 m	0.026 m	0.001 m	0.036
	<b>Ellip Dist.</b>	4238.282 m	0.006 m	0.002 m	0.347
<a href="#">IDNP --&gt; FLAT (PV43)</a>	<b>Az.</b>	54°16'30"	0.015 sec	-0.002 sec	-0.075
	<b>ΔHt.</b>	-380.674 m	0.038 m	-0.008 m	-0.167
	<b>Ellip Dist.</b>	76501.834 m	0.008 m	-0.008 m	-0.525
<a href="#">IDNP --&gt; WALDE 05 (PV45)</a>	<b>Az.</b>	46°05'25"	0.052 sec	-0.015 sec	-0.513
	<b>ΔHt.</b>	264.820 m	0.048 m	-0.013 m	-0.328
	<b>Ellip Dist.</b>	47642.707 m	0.013 m	-0.004 m	-0.399
<a href="#">IDNP --&gt; FLAT (PV41)</a>	<b>Az.</b>	54°16'30"	0.015 sec	0.006 sec	0.397
	<b>ΔHt.</b>	-380.674 m	0.038 m	-0.010 m	-0.215
	<b>Ellip Dist.</b>	76501.834 m	0.008 m	-0.006 m	-0.510
<a href="#">IDNP --&gt; WALDE 05 (PV46)</a>	<b>Az.</b>	46°05'25"	0.052 sec	0.010 sec	0.172
	<b>ΔHt.</b>	264.820 m	0.048 m	-0.008 m	-0.306
	<b>Ellip Dist.</b>	47642.707 m	0.013 m	-0.001 m	-0.096

## Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
<a href="#">FLAT</a>	<a href="#">IDNP</a>	<b>Az.</b>	234°51'24"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	380.633 m	0.000 m		
		<b>ΔElev.</b>	381.025 m	0.000 m		
		<b>Ellip Dist.</b>	76501.830 m	0.000 m		
<a href="#">FLAT</a>	<a href="#">KAMI</a>	<b>Az.</b>	255°29'47"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	-261.655 m	0.000 m		
		<b>ΔElev.</b>	-260.639 m	0.000 m		
		<b>Ellip Dist.</b>	55053.670 m	0.000 m		
<a href="#">IDNP</a>	<a href="#">WALDE_05</a>	<b>Az.</b>	46°05'25"	0.054 sec	1 : 3431581	1 : 3426971
		<b>ΔHt.</b>	264.858 m	0.054 m		
		<b>ΔElev.</b>	264.843 m	0.054 m		
		<b>Ellip Dist.</b>	47642.705 m	0.014 m		
<a href="#">KAMI</a>	<a href="#">IDNP</a>	<b>Az.</b>	196°31'06"	0.000 sec	1 : 0	1 : 0
		<b>ΔHt.</b>	642.289 m	0.000 m		
		<b>ΔElev.</b>	641.664 m	0.000 m		
		<b>Ellip Dist.</b>	31633.301 m	0.000 m		
<a href="#">WALDE_02</a>	<a href="#">FLAT</a>	<b>Az.</b>	75°43'06"	0.032 sec	1 : 6603091	1 : 6622136
		<b>ΔHt.</b>	-423.440 m	0.033 m		
		<b>ΔElev.</b>	-423.942 m	0.033 m		
		<b>Ellip Dist.</b>	36221.925 m	0.005 m		
<a href="#">WALDE_02</a>	<a href="#">IDNP</a>	<b>Az.</b>	217°29'27"	0.023 sec	1 : 7514658	1 : 7520744
		<b>ΔHt.</b>	-42.807 m	0.033 m		
		<b>ΔElev.</b>	-42.917 m	0.033 m		
		<b>Ellip Dist.</b>	44690.381 m	0.006 m		
<a href="#">WALDE_02</a>	<a href="#">KAMI</a>	<b>Az.</b>	254°06'22"	0.060 sec	1 : 3417172	1 : 3327571
		<b>ΔHt.</b>	-685.095 m	0.033 m		
		<b>ΔElev.</b>	-684.581 m	0.033 m		
		<b>Ellip Dist.</b>	18836.651 m	0.006 m		
<a href="#">WALDE_02</a>	<a href="#">WALDE_03</a>	<b>Az.</b>	247°11'34"	0.260 sec	1 : 672637	1 : 670522
		<b>ΔHt.</b>	-102.045 m	0.026 m		
		<b>ΔElev.</b>	-101.973 m	0.026 m		
		<b>Ellip Dist.</b>	4238.281 m	0.006 m		
<a href="#">WALDE_03</a>	<a href="#">FLAT</a>	<b>Az.</b>	74°47'28"	0.025 sec	1 : 8339919	1 : 8368483

		<b>ΔHt.</b>	-321.395 m	0.030 m		
		<b>ΔElev.</b>	-321.969 m	0.030 m		
		<b>Ellip Dist.</b>	40418.254 m	0.005 m		
<a href="#">WALDE_03</a>	<a href="#">IDNP</a>	<b>Az.</b>	214°31'22"	0.022 sec	1 : 7816784	1 : 7819238
		<b>ΔHt.</b>	59.239 m	0.030 m		
		<b>ΔElev.</b>	59.056 m	0.030 m		
		<b>Ellip Dist.</b>	41062.676 m	0.005 m		
<a href="#">WALDE_03</a>	<a href="#">KAMI</a>	<b>Az.</b>	256°04'01"	0.069 sec	1 : 3031950	1 : 2922908
		<b>ΔHt.</b>	-583.050 m	0.030 m		
		<b>ΔElev.</b>	-582.608 m	0.030 m		
		<b>Ellip Dist.</b>	14638.079 m	0.005 m		
<a href="#">WALDE_03</a>	<a href="#">WALDE_05</a>	<b>Az.</b>	94°42'18"	0.244 sec	1 : 866725	1 : 855228
		<b>ΔHt.</b>	324.096 m	0.052 m		
		<b>ΔElev.</b>	323.899 m	0.052 m		
		<b>Ellip Dist.</b>	11213.903 m	0.013 m		



## China-Osier-Laundry

### Adjustment Settings

#### **GNSS**

**Error in Height of Antenna:** 0.000 m

**Centering Error:** 0.000 m

#### **Horizontal:**

**Propagated Linear Error [E]:** U.S.

**Constant Term [C]:** 0.000 m

**Scale on Linear Error [S]:** 1.960

#### **Three-Dimensional**

**Propagated Linear Error [E]:** U.S.

**Constant Term [C]:** 0.000 m

**Scale on Linear Error [S]:** 1.960

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### Adjustment Statistics

**Number of Iterations for Successful Adjustment:** 2

**Network Reference Factor:** 3.05

**Chi Square Test (95%):** Failed

**Precision Confidence Level:** 95%

**Degrees of Freedom:** 40

**Reference Factor:** 3.05

**Redundancy Number:** 40.00

**A Priori Scalar:** 1.00

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### Control Point Constraints

Point ID	Type	North $\sigma$ (Meter)	East $\sigma$ (Meter)	Height $\sigma$ (Meter)	Elevation $\sigma$ (Meter)
<a href="#">IDNP</a>	Grid				Fixed
<a href="#">IDNP</a>	Global	Fixed	Fixed		
<a href="#">MSOL</a>	Global	Fixed	Fixed	Fixed	
Fixed = 0.000001(Meter)					

### Adjusted Grid Coordinates

Point ID	Northing (Meter)	Northing Error (Meter)	Easting (Meter)	Easting Error (Meter)	Elevation (Meter)	Elevation Error (Meter)	Constraint
<a href="#">CHIN_01</a>	5189942.74 3	0.005	645338.02 8	0.005	1088.590	0.019	
<a href="#">CHIN_02</a>	5185574.27 7	0.005	650244.12 4	0.005	1530.991	0.019	
<a href="#">FLAT</a>	5133065.04 5	0.006	629707.87 1	0.005	632.285	0.027	
<a href="#">IDNP</a>	5087723.65 8	?	568116.78 2	?	1013.310	?	LLe
<a href="#">MSOL</a>	5201376.58	?	720084.82	?	975.579	?	LLh

	7		0				
<a href="#">N-371</a>	5181773.19 4	0.010	719524.42 1	0.007	991.978	0.045	

#### Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (Meter)	Height Error (Meter)	Constraint
<a href="#">CHIN_01</a>	N46°50'49.73711"	W115°05'37.34969"	1073.279	0.019	
<a href="#">CHIN_02</a>	N46°48'24.37558"	W115°01'50.99768"	1515.745	0.019	
<a href="#">FLAT</a>	N46°20'19.45598"	W115°18'52.42119"	616.452	0.027	
<a href="#">IDNP</a>	N45°56'22.93598"	W116°07'16.53030"	997.084	?	LLe
<a href="#">MSOL</a>	N46°55'45.83733"	W114°06'31.84604"	960.639	?	LLh
<a href="#">N-371</a>	N46°45'12.22784"	W114°07'32.22540"	977.278	0.045	

#### Adjusted ECEF Coordinates

Point ID	X (Meter)	X Error (Meter)	Y (Meter)	Y Error (Meter)	Z (Meter)	Z Error (Meter)	3D Error (Meter)	Constraint
<a href="#">CHIN_01</a>	1853670.477	0.008	3958294.205	0.012	4630942.479	0.014	0.020	
<a href="#">CHIN_02</a>	1850839.037	0.008	3963567.062	0.013	4628193.326	0.014	0.020	
<a href="#">FLAT</a>	1886338.592	0.010	3987956.622	0.018	4591768.751	0.020	0.029	
<a href="#">IDNP</a>	1956496.280	?	3989958.020	?	4561305.990	?	?	LLe
<a href="#">MSOL</a>	1782602.076	?	3983406.750	?	4637110.215	?	?	LLh
<a href="#">N-371</a>	1789607.327	0.015	3995922.982	0.030	4623736.908	0.032	0.046	

#### Error Ellipse Components

Point ID	Semi-major axis (Meter)	Semi-minor axis (Meter)	Azimuth
<a href="#">CHIN_01</a>	0.007	0.005	60°
<a href="#">CHIN_02</a>	0.007	0.006	56°
<a href="#">FLAT</a>	0.008	0.006	32°
<a href="#">N-371</a>	0.012	0.009	7°

Adjusted GPS Observations

**Azimuth Rotation:** 0.018 sec (95%) 0.008 sec

**Scale Factor:** 1.00000003 (95%) 0.00000005

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
<a href="#">FLAT --&gt; IDNP (PV45)</a>	<b>Az.</b>	234°51'24"	0.015 sec	0.028 sec	2.749
	<b>ΔHt.</b>	380.633 m	0.027 m	-0.010 m	-0.287
	<b>Ellip Dist.</b>	76501.841 m	0.008 m	0.001 m	0.237
<a href="#">CHIN 01 --&gt; FLAT (PV35)</a>	<b>Az.</b>	196°45'04"	0.015 sec	0.029 sec	2.187
	<b>ΔHt.</b>	-456.827 m	0.029 m	-0.047 m	-1.256
	<b>Ellip Dist.</b>	58996.089 m	0.007 m	0.007 m	0.908
<a href="#">FLAT --&gt; IDNP (PV42)</a>	<b>Az.</b>	234°51'24"	0.015 sec	-0.020 sec	-1.539
	<b>ΔHt.</b>	380.633 m	0.027 m	-0.024 m	-0.787
	<b>Ellip Dist.</b>	76501.841 m	0.008 m	0.017 m	2.058
<a href="#">IDNP --&gt; CHIN 01 (PV46)</a>	<b>Az.</b>	37°42'27"	0.008 sec	-0.006 sec	-1.950
	<b>ΔHt.</b>	76.194 m	0.019 m	0.039 m	1.887
	<b>Ellip Dist.</b>	128141.319 m	0.008 m	-0.006 m	-1.909
<a href="#">CHIN 02 --&gt; FLAT (PV34)</a>	<b>Az.</b>	202°47'27"	0.018 sec	0.014 sec	1.091
	<b>ΔHt.</b>	-899.294 m	0.028 m	-0.004 m	-0.164
	<b>Ellip Dist.</b>	56391.191 m	0.007 m	0.018 m	1.783
<a href="#">MSOL --&gt; N-371 (PV36)</a>	<b>Az.</b>	183°44'50"	0.072 sec	0.011 sec	0.221
	<b>ΔHt.</b>	16.639 m	0.045 m	0.003 m	0.159
	<b>Ellip Dist.</b>	19607.600 m	0.010 m	-0.010 m	-1.443
<a href="#">CHIN 01 --&gt; CHIN 02 (PV21)</a>	<b>Az.</b>	133°04'22"	0.145 sec	0.165 sec	1.405
	<b>ΔHt.</b>	442.467 m	0.019 m	0.000 m	0.026
	<b>Ellip Dist.</b>	6569.979 m	0.004 m	-0.001 m	-0.269

<a href="#">MSOL --&gt; N-371 (PV38)</a>	<b>Az.</b>	183°44'50"	0.072 sec	-0.006 sec	-0.221
	<b>ΔHt.</b>	16.639 m	0.045 m	-0.008 m	-0.274
	<b>Ellip Dist.</b>	19607.600 m	0.010 m	0.005 m	1.403
<a href="#">MSOL --&gt; FLAT (PV39)</a>	<b>Az.</b>	235°01'12"	0.013 sec	0.001 sec	0.104
	<b>ΔHt.</b>	-344.188 m	0.027 m	0.038 m	1.154
	<b>Ellip Dist.</b>	113291.044 m	0.008 m	-0.010 m	-1.340
<a href="#">FLAT --&gt; CHIN_02 (PV20)</a>	<b>Az.</b>	22°35'06"	0.018 sec	-0.010 sec	-0.421
	<b>ΔHt.</b>	899.294 m	0.028 m	0.030 m	1.143
	<b>Ellip Dist.</b>	56391.191 m	0.007 m	-0.002 m	-0.283
<a href="#">MSOL --&gt; CHIN_01 (PV6)</a>	<b>Az.</b>	263°24'52"	0.015 sec	-0.012 sec	-1.059
	<b>ΔHt.</b>	112.640 m	0.019 m	-0.019 m	-1.023
	<b>Ellip Dist.</b>	75615.024 m	0.007 m	-0.002 m	-0.179
<a href="#">MSOL --&gt; CHIN_02 (PV5)</a>	<b>Az.</b>	259°21'41"	0.016 sec	-0.003 sec	-0.276
	<b>ΔHt.</b>	555.106 m	0.019 m	-0.020 m	-0.921
	<b>Ellip Dist.</b>	71604.222 m	0.006 m	0.003 m	0.919
<a href="#">MSOL --&gt; CHIN_01 (PV40)</a>	<b>Az.</b>	263°24'52"	0.015 sec	0.017 sec	0.871
	<b>ΔHt.</b>	112.640 m	0.019 m	-0.015 m	-0.828
	<b>Ellip Dist.</b>	75615.024 m	0.007 m	-0.002 m	-0.300
<a href="#">MSOL --&gt; CHIN_02 (PV4)</a>	<b>Az.</b>	259°21'41"	0.016 sec	0.010 sec	0.336
	<b>ΔHt.</b>	555.106 m	0.019 m	-0.015 m	-0.841
	<b>Ellip Dist.</b>	71604.222 m	0.006 m	-0.001 m	-0.101
<a href="#">CHIN_01 --&gt; CHIN_02 (PV1)</a>	<b>Az.</b>	133°04'22"	0.145 sec	-0.095 sec	-0.830
	<b>ΔHt.</b>	442.467 m	0.019 m	-0.007 m	-0.275
	<b>Ellip Dist.</b>	6569.979 m	0.004 m	-0.001 m	-0.312
<a href="#">CHIN_01 --&gt; CHIN_02</a>	<b>Az.</b>	133°04'22"	0.145 sec	0.025 sec	0.118

<a href="#">(PV2)</a>					
	<b>ΔHt.</b>	442.467 m	0.019 m	0.015 m	0.815
	<b>Ellip Dist.</b>	6569.979 m	0.004 m	-0.003 m	-0.189
<a href="#">CHIN_01 --&gt; FLAT (PV9)</a>	<b>Az.</b>	196°45'04"	0.015 sec	-0.002 sec	-0.133
	<b>ΔHt.</b>	-456.827 m	0.029 m	-0.052 m	-0.674
	<b>Ellip Dist.</b>	58996.089 m	0.007 m	-0.004 m	-0.319
<a href="#">MSOL --&gt; CHIN_02 (PV37)</a>	<b>Az.</b>	259°21'41"	0.016 sec	0.010 sec	0.231
	<b>ΔHt.</b>	555.106 m	0.019 m	-0.009 m	-0.334
	<b>Ellip Dist.</b>	71604.222 m	0.006 m	-0.001 m	-0.081

#### Covariance Terms

From Point	To Point	Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)	
<a href="#">CHIN_01</a>	<a href="#">CHIN_02</a>	<b>Az.</b>	133°04'22"	0.145 sec	1 : 1561525	1 : 1482932
		<b>ΔHt.</b>	442.467 m	0.019 m		
		<b>ΔElev.</b>	442.400 m	0.019 m		
		<b>Ellip Dist.</b>	6569.979 m	0.004 m		
<a href="#">CHIN_01</a>	<a href="#">FLAT</a>	<b>Az.</b>	196°45'04"	0.017 sec	1 : 8182441	1 : 8184059
		<b>ΔHt.</b>	-456.827 m	0.029 m		
		<b>ΔElev.</b>	-456.305 m	0.029 m		
		<b>Ellip Dist.</b>	58996.091 m	0.007 m		
<a href="#">CHIN_01</a>	<a href="#">IDNP</a>	<b>Az.</b>	218°27'05"	0.007 sec	1 : 23357128	1 : 23273478
		<b>ΔHt.</b>	-76.194 m	0.019 m		
		<b>ΔElev.</b>	-75.280 m	0.019 m		
		<b>Ellip Dist.</b>	128141.323 m	0.005 m		
<a href="#">CHIN_01</a>	<a href="#">MSOL</a>	<b>Az.</b>	82°41'43"	0.012 sec	1 : 13710412	1 : 13757770
		<b>ΔHt.</b>	-112.640 m	0.019 m		
		<b>ΔElev.</b>	-113.012 m	0.019 m		
		<b>Ellip Dist.</b>	75615.027 m	0.006 m		
<a href="#">CHIN_02</a>	<a href="#">FLAT</a>	<b>Az.</b>	202°47'27"	0.018 sec	1 : 7848509	1 : 7857638
		<b>ΔHt.</b>	-899.294 m	0.028 m		
		<b>ΔElev.</b>	-898.705 m	0.028 m		
		<b>Ellip</b>	56391.193 m	0.007 m		

		<b>Dist.</b>				
<a href="#">CHIN_02</a>	<a href="#">MSOL</a>	<b>Az.</b>	78°41'19"	0.014 sec	1 : 12936560	1 : 12978502
		<b>ΔHt.</b>	-555.106 m	0.019 m		
		<b>ΔElev.</b>	-555.412 m	0.019 m		
		<b>Ellip Dist.</b>	71604.225 m	0.006 m		
<a href="#">FLAT</a>	<a href="#">IDNP</a>	<b>Az.</b>	234°51'24"	0.013 sec	1 : 11756464	1 : 11784815
		<b>ΔHt.</b>	380.633 m	0.027 m		
		<b>ΔElev.</b>	381.025 m	0.027 m		
		<b>Ellip Dist.</b>	76501.843 m	0.007 m		
<a href="#">MSOL</a>	<a href="#">FLAT</a>	<b>Az.</b>	235°01'12"	0.009 sec	1 : 17463833	1 : 17634537
		<b>ΔHt.</b>	-344.188 m	0.027 m		
		<b>ΔElev.</b>	-343.293 m	0.027 m		
		<b>Ellip Dist.</b>	113291.047 m	0.006 m		
<a href="#">MSOL</a>	<a href="#">N-371</a>	<b>Az.</b>	183°44'50"	0.072 sec	1 : 1997064	1 : 1993095
		<b>ΔHt.</b>	16.639 m	0.045 m		
		<b>ΔElev.</b>	16.399 m	0.045 m		
		<b>Ellip Dist.</b>	19607.600 m	0.010 m		

## TO0264 DESIGNATION - N 283

TO0264 PID - TO0264  
TO0264 STATE/COUNTY- ID/BONNER  
TO0264 USGS QUAD - OUTLET BAY (1996)  
TO0264  
TO0264 \*CURRENT SURVEY CONTROL  
TO0264

TO0264*	NAD 83(2007)-	48 23 02.36911(N)	116 58 50.48312(W)	ADJUSTED
TO0264*	NAVD 88	- 746.61 (meters)	2449.5 (feet)	GPS OBS

TO0264

TO0264	EPOCH DATE	-	2002.00	
TO0264	X	-	-1,925,631.931 (meters)	COMP
TO0264	Y	-	-3,782,416.340 (meters)	COMP
TO0264	Z	-	4,745,885.602 (meters)	COMP
TO0264	LAPLACE CORR-		-0.40 (seconds)	DEFLEC09
TO0264	ELLIP HEIGHT-		729.746 (meters)	(10/23/09) ADJUSTED
TO0264	GEOID HEIGHT-		-16.87 (meters)	GEOID09
TO0264	HORZ ORDER	-	A	
TO0264	ELLP ORDER	-	THIRD CLASS I	

TO0264  
TO0264.The horizontal coordinates were established by GPS observations  
TO0264.and adjusted by the W + H PACIFIC, INCORPORATED in October 2009.  
TO0264  
TO0264.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).  
TO0264.See [National Readjustment](#) for more information.  
TO0264.The horizontal coordinates are valid at the epoch date displayed above.  
TO0264.The epoch date for horizontal control is a decimal equivalence  
TO0264.of Year/Month/Day.  
TO0264  
TO0264.The orthometric height was determined by GPS observations and a  
TO0264.high-resolution geoid model using precise GPS observation and  
TO0264.processing techniques. It supersedes the leveled height previously  
TO0264.determined for this station.  
TO0264  
TO0264.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
TO0264  
TO0264.The Laplace correction was computed from DEFLEC09 derived deflections.  
TO0264  
TO0264.The ellipsoidal height was determined by GPS observations  
TO0264.and is referenced to NAD 83.  
TO0264  
TO0264.The geoid height was determined by GEOID09.  
TO0264

TO0264;		North	East	Units	Scale	Factor	Converg.
TO0264;SPC ID W	-	747,193.778	708,849.845	MT	1.00003538	-0 55 12.5	
TO0264;SPC ID W	-	2,451,418.25	2,325,618.20	sFT	1.00003538	-0 55 12.5	
TO0264;UTM 11	-	5,358,980.889	501,429.735	MT	0.99960003	+0 00 52.0	

TO0264  
TO0264!  
TO0264!SPC ID W - Elev Factor x Scale Factor = Combined Factor  
TO0264!SPC ID W - 0.99988564 x 1.00003538 = 0.99992102  
TO0264!UTM 11 - 0.99988564 x 0.99960003 = 0.99948572  
TO0264

TO0264  
TO0264 SUPERSEDED SURVEY CONTROL  
TO0264

TO0264	NAVD 88 (06/15/91)	746.523 (m)	2449.22 (f)	ADJUSTED	1 2
TO0264	NGVD 29 (??/??/92)	745.330 (m)	2445.30 (f)	ADJ UNCH	1 2

TO0264  
TO0264.Superseded values are not recommended for survey control.  
TO0264.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
TO0264.[See file dsdata.txt](#) to determine how the superseded data were derived.  
TO0264  
TO0264\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11UNP0142958980(NAD 83)  
TO0264\_MARKER: DB = BENCH MARK DISK  
TO0264\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
TO0264\_SP\_SET: SET IN TOP OF CONCRETE MONUMENT  
TO0264\_STAMPING: N 283 1942  
TO0264\_MARK LOGO: CGS+SS

TO0264\_PROJECTION: PROJECTING 18 CENTIMETERS  
 TO0264\_MAGNETIC: O = OTHER; SEE DESCRIPTION  
 TO0264\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 TO0264+STABILITY: SURFACE MOTION  
 TO0264\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 TO0264+SATELLITE: SATELLITE OBSERVATIONS - August 21, 2009  
 TO0264  

TO0264	HISTORY	- Date	Condition	Report By
TO0264	HISTORY	- 1942	MONUMENTED	CGS
TO0264	HISTORY	- 20090821	GOOD	WHPACI

 TO0264  
 TO0264  

STATION DESCRIPTION

 TO0264  
 TO0264 DESCRIBED BY COAST AND GEODETIC SURVEY 1942  
 TO0264 11.3 MI SW FROM COOLIN.  
 TO0264 11.3 MILES SOUTHWEST OF POST OFFICE. 7.5 MI. N. OF FALLS RANGER STA.  
 TO0264 ON WEST BRANCH ROAD, ABOUT 300 FEET NORTHWEST OF RANCH HOUSE, 51 FEET  
 TO0264 WEST OF WEST BRANCH ROAD CENTER LINE, IN CORNER OF FENCE LINE. WITNESS  
 TO0264 POST SET. STAMPED N 283 1942.  
 TO0264  

STATION RECOVERY (2009)

 TO0264  
 TO0264 RECOVERY NOTE BY W + H PACIFIC, INCORPORATED 2009 (WHP)  
 TO0264 THE STATION IS LOCATED APPROXIMATELY 11.3 MI (18.2 KM) SOUTHWEST OF  
 TO0264 COOLIN, 16.3 MI (26.2 KM) NORTH OF PRIEST RIVER, AND 1.7 MI (2.7 KM)  
 TO0264 SOUTH OF THE INTERSECTION OF SR57 AND GLEASON-MCABEE ROAD.  
 TO0264  
 TO0264 THE STATION IS LOCATED ON THE WEST EDGE OF IDAHO DEPARTMENT OF  
 TO0264 TRANSPORTATION RIGHT-OF-WAY ON SR57.  
 TO0264  
 TO0264 TO REACH THE STATION FROM THE INTERSECTION OF HIGHWAY 2 AND HIGHWAY 57  
 TO0264 IN PRIEST RIVER, HEAD NORTH ON HIGHWAY 57 TO MILEPOST 16.3 AND MARK ON  
 TO0264 LEFT.  
 TO0264  
 TO0264 THE STATION IS A 3 1/2 INCH (1 CM) DIAMETER BRASS DISK WITH PUNCH SET  
 TO0264 IN A 6 INCH (15 CM) CONCRETE MONUMENT, 0.55 FT (0.2 M) ABOVE GROUND.  
 TO0264 THE STATION IS IN-LINE WITH A 4 FT (1.2 M) TALL NORTH-SOUTH BARBED  
 TO0264 WIRE FENCE, 2.2 FT (0.7 M) NORTH OF T FENCE INTERSECTION, 3.1 FT (0.9  
 TO0264 M) SOUTH-SOUTHWEST OF CARSONITE POST, 44.2 FT (13.5 M) SOUTH-SOUTHEAST  
 TO0264 OF POWER POLE, AND 45.5 FT (13.9 M) WEST OF EDGE PAVEMENT HIGHWAY 57.  
 TO0264 STATION IS WEST OF BLACK JACK RANCH.  
 TO0264  
 TO0264 RECOVERED IN GOOD CONDITION.



## AC5222 DESIGNATION - SNP A

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AC5222 PID - AC5222
AC5222 STATE/COUNTY- ID/BONNER
AC5222 USGS QUAD - SANDPOINT (1996)
AC5222
AC5222 *CURRENT SURVEY CONTROL
AC5222
AC5222* NAD 83(2007)- 48 17 39.13444(N) 116 33 50.26816(W) ADJUSTED
AC5222* NAVD 88 - 648.19 (meters) 2126.6 (feet) GPS OBS
AC5222
AC5222 EPOCH DATE - 2002.00
AC5222 X - -1,901,377.502 (meters) COMP
AC5222 Y - -3,802,935.505 (meters) COMP
AC5222 Z - 4,739,174.636 (meters) COMP
AC5222 LAPLACE CORR- -5.33 (seconds) DEFLEC09
AC5222 ELLIP HEIGHT- 631.190 (meters) (02/10/07) ADJUSTED
AC5222 GEOID HEIGHT- -17.01 (meters) GEOID09
AC5222
AC5222 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
AC5222 Type PID Designation North East Ellip
AC5222 -----
AC5222 NETWORK AC5222 SNP A 1.25 0.92 2.84
AC5222 -----
AC5222
AC5222.This mark is at Sandpoint Airport (SZT)
AC5222
AC5222.The horizontal coordinates were established by GPS observations
AC5222.and adjusted by the National Geodetic Survey in February 2007.
AC5222
AC5222.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
AC5222.See National Readjustment for more information.
AC5222.The horizontal coordinates are valid at the epoch date displayed above.
AC5222.The epoch date for horizontal control is a decimal equivalence
AC5222.of Year/Month/Day.
AC5222
AC5222.The orthometric height was determined by GPS observations and a
AC5222.high-resolution geoid model.
AC5222
AC5222.GPS derived orthometric heights for airport stations designated as
AC5222.PACS or SACS are published to 2 decimal places. This maintains
AC5222.centimeter relative accuracy between the PACS and SACS. It does
AC5222.not indicate centimeter accuracy relative to other marks which are
AC5222.part of the NAVD 88 network.
AC5222
AC5222.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC5222
AC5222.The Laplace correction was computed from DEFLEC09 derived deflections.
AC5222
AC5222.The ellipsoidal height was determined by GPS observations
AC5222.and is referenced to NAD 83.
AC5222
AC5222.The geoid height was determined by GEOID09.
AC5222
AC5222; North East Units Scale Factor Converg.
AC5222;SPC ID W - 736,798.714 739,608.117 MT 0.99997813 -0 36 27.7
AC5222;SPC ID W - 2,417,313.78 2,426,530.96 sFT 0.99997813 -0 36 27.7
AC5222;UTM 11 - 5,349,092.495 532,340.971 MT 0.99961285 +0 19 31.9
AC5222
AC5222! - Elev Factor x Scale Factor = Combined Factor
AC5222!SPC ID W - 0.99990109 x 0.99997813 = 0.99987922
AC5222!UTM 11 - 0.99990109 x 0.99961285 = 0.99951397
AC5222
AC5222 SUPERSEDED SURVEY CONTROL
AC5222
AC5222 NAD 83(1999)- 48 17 39.13422(N) 116 33 50.26870(W) AD( ) B
AC5222 ELLIP H (04/16/01) 631.187 (m) GP( ) 4 2
AC5222 NAD 83(1992)- 48 17 39.13276(N) 116 33 50.26928(W) AD( ) B
AC5222 ELLIP H (01/22/97) 631.264 (m) GP( ) 4 1
AC5222
AC5222.Superseded values are not recommended for survey control.

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AC5222.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
AC5222. [See file dsdata.txt](#) to determine how the superseded data were derived.

AC5222  
AC5222\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11UNP3234049092(NAD 83)  
AC5222\_MARKER: I = METAL ROD  
AC5222\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)  
AC5222\_STAMPING: SNP A 1995  
AC5222\_MARK LOGO: NGS  
AC5222\_PROJECTION: FLUSH  
AC5222\_MAGNETIC: I = MARKER IS A STEEL ROD  
AC5222\_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD  
AC5222+STABILITY: POSITION/ELEVATION WELL  
AC5222\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
AC5222+SATELLITE: SATELLITE OBSERVATIONS - December 22, 2005  
AC5222\_ROD/PIPE-DEPTH: 31.0 meters  
AC5222\_SLEEVE-DEPTH : 0.9 meters

AC5222  
AC5222 HISTORY - Date Condition Report By  
AC5222 HISTORY - 1995 MONUMENTED NGS  
AC5222 HISTORY - 20040707 GOOD ORION  
AC5222 HISTORY - 20051222 GOOD EVANS

AC5222  
AC5222 STATION DESCRIPTION

AC5222  
AC5222'DESCRIBED BY NATIONAL GEODETIC SURVEY 1995 (BEK)  
AC5222'STATION IS LOCATED IN SANDPOINT AT THE SANDPOINT AIRPORT.  
AC5222'OWNERSHIP--COUNTY OWNED. AIRPORT MANAGER ROB MAURICE 208-263-9102  
AC5222'REACHED FROM THE JUNCTION OF U.S. HIGHWAY 2, 95 AND STATE ROUTE 200  
AC5222'WHICH IS ABOUT 1-MILE NORTH OF SANDPOINT. GO NORTH ON U.S. HIGHWAYS  
AC5222'2 AND 95 FOR 2.16 KM (1.35 MI) TO A CROSSROADS AND A SIGN SCHWEITZER  
AC5222'MOUNTAIN RESORT ROAD. TURN LEFT AND GO WESTERLY ON A PAVED ROAD (DOWN  
AC5222'HILL) FOR 0.40 KM (0.25 MI) TO A SIDE ROAD LEFT. TURN LEFT AND GO  
AC5222'SOUTH ON A PAVED ROAD FOR 1.76 KM (1.10 MI) TO A SIDE ROAD RIGHT AND  
AC5222'SIGN SANDPOINT AIRPORT. TURN RIGHT AND GO WEST ON A PAVED ROAD FOR  
AC5222'0.43 KM (0.25 MI) TO A GATE AND THE SANDPOINT AIRPORT. PASS THRU GATE  
AC5222'AND CONTINUE WEST CROSSING TARMAC FOR .084 KM (0.05 MI) TO A GRASSY  
AC5222'AREA BETWEEN THE TARMAC AND THE TAXIWAY STRIP AND THE MARK ON THE LEFT  
AC5222'BETWEEN 2 FIBERGLASS WITNESS POSTS. LOCATED 9.85 M (32.32 FT)  
AC5222'SOUTHEAST OF THE SOUTHEAST EDGE OF THE TAXI STRIP, 14.4 M (47.2 FT)  
AC5222'WEST OF THE WEST EDGE OF THE TARMACK, 14.2 M (46.6 FT) SOUTH-SOUTHEAST  
AC5222'OF THE SOUTHEAST EDGE OF THE TARMACK, 0.7 M (2.3 FT) SOUTH OF A  
AC5222'FIBERGLASS WITNESS POST AND 0.65 M (2.13 FT) NORTH OF A FIBERGLASS  
AC5222'WITNESS POST. MARK IS A STAINLESS STEEL ROD DRIVEN TO 31.0 M (101.7  
AC5222'FT) ANCHORED REFUSAL WITH A PUNCH HOLE IN THE TOP AND INSIDE A 0.9 M  
AC5222'(3.0 FT) FOOD GRADE GREASE FILLED SLEEVE. ACCESS TO MARK IS HAD THUR  
AC5222'A 5-INCH LOGO CAP. DESCRIBED BY B.E. KELLY.

AC5222  
AC5222 STATION RECOVERY (2004)  
AC5222

AC5222'RECOVERY NOTE BY ORION GPS 2004 (JDP)  
AC5222'RECOVERED IN GOOD CONDITION.

AC5222  
AC5222 STATION RECOVERY (2005)  
AC5222

AC5222'RECOVERY NOTE BY DAVID EVANS + ASSOC 2005 (JOA)  
AC5222'RECOVERED AS DESCRIBED.

## SV0393 DESIGNATION - M 134

SV0393 PID - SV0393  
SV0393 STATE/COUNTY- ID/KOOTENAI  
SV0393 USGS QUAD - HAYDEN LAKE (1996)  
SV0393  
SV0393 \*CURRENT SURVEY CONTROL  
SV0393

SV0393*	NAD 83(2007)-	47 52 04.98452(N)	116 44 35.75670(W)	ADJUSTED
SV0393*	NAVD 88	- 705.068 (meters)	2313.21 (feet)	ADJUSTED

SV0393

SV0393	EPOCH DATE	-	2002.00	
SV0393	X	-	-1,929,153.855 (meters)	COMP
SV0393	Y	-	-3,828,490.601 (meters)	COMP
SV0393	Z	-	4,707,556.766 (meters)	COMP
SV0393	LAPLACE CORR-		3.70 (seconds)	DEFLEC09
SV0393	ELLIP HEIGHT-		687.656 (meters)	(10/23/09) ADJUSTED
SV0393	GEOID HEIGHT-		-17.40 (meters)	GEOID09
SV0393	DYNAMIC HT	-	705.101 (meters)	2313.32 (feet) COMP
SV0393	MODELED GRAV-		980,635.1 (mgal)	NAVD 88

SV0393  
SV0393 HORZ ORDER - A  
SV0393 VERT ORDER - SECOND CLASS 0  
SV0393 ELLP ORDER - THIRD CLASS I  
SV0393

SV0393.The horizontal coordinates were established by GPS observations  
SV0393.and adjusted by the W + H PACIFIC, INCORPORATED in October 2009.  
SV0393

SV0393.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).  
SV0393.See [National Readjustment](#) for more information.  
SV0393.The horizontal coordinates are valid at the epoch date displayed above.  
SV0393.The epoch date for horizontal control is a decimal equivalence  
SV0393.of Year/Month/Day.  
SV0393

SV0393.The orthometric height was determined by differential leveling and  
SV0393.adjusted in June 1991.  
SV0393

SV0393.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
SV0393

SV0393.The Laplace correction was computed from DEFLEC09 derived deflections.  
SV0393

SV0393.The ellipsoidal height was determined by GPS observations  
SV0393.and is referenced to NAD 83.  
SV0393

SV0393.The geoid height was determined by GEOID09.  
SV0393

SV0393.The dynamic height is computed by dividing the NAVD 88  
SV0393.geopotential number by the normal gravity value computed on the  
SV0393.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
SV0393.degrees latitude (g = 980.6199 gals.).  
SV0393

SV0393.The modeled gravity was interpolated from observed gravity values.  
SV0393

SV0393;		North	East	Units	Scale	Factor	Converg.
SV0393;SPC ID W	-	689,574.541	725,693.700	MT	1.00000116	-0 44 11.9	
SV0393;SPC ID W	-	2,262,379.14	2,380,880.08	sFT	1.00000116	-0 44 11.9	
SV0393;UTM 11	-	5,301,666.740	519,199.998	MT	0.99960453	+0 11 25.4	

SV0393

SV0393!	-	Elev Factor	x	Scale Factor	=	Combined Factor
SV0393!SPC ID W	-	0.99989223	x	1.00000116	=	0.99989339
SV0393!UTM 11	-	0.99989223	x	0.99960453	=	0.99949681

SV0393

SV0393  
SV0393 SUPERSEDED SURVEY CONTROL  
SV0393

SV0393	NAVD 88 (10/23/09)	705.07 (m)	2313.2 (f)	LEVELING	3
SV0393	NGVD 29 (??/??/92)	703.889 (m)	2309.34 (f)	ADJ UNCH	2 0

SV0393

SV0393.Superseded values are not recommended for survey control.  
SV0393.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
SV0393.[See file dsdata.txt](#) to determine how the superseded data were derived.  
SV0393

SV0393\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TNP1919901666(NAD 83)  
SV0393\_MARKER: DB = BENCH MARK DISK  
SV0393\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
SV0393\_SP\_SET: SET IN TOP OF CONCRETE MONUMENT  
SV0393\_STAMPING: M 134 1935  
SV0393\_MARK LOGO: CGS+SS  
SV0393\_PROJECTION: FLUSH  
SV0393\_MAGNETIC: O = OTHER; SEE DESCRIPTION  
SV0393\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
SV0393+STABILITY: SURFACE MOTION

SV0393\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

SV0393+SATELLITE: SATELLITE OBSERVATIONS - August 21, 2009

SV0393

SV0393	HISTORY	- Date	Condition	Report By
SV0393	HISTORY	- 1935	MONUMENTED	CGS
SV0393	HISTORY	- 1982	GOOD	BPA
SV0393	HISTORY	- 20090821	GOOD	WHPACI

SV0393

SV0393

STATION DESCRIPTION

SV0393

SV0393'DESCRIBED BY COAST AND GEODETIC SURVEY 1935

SV0393'3 MI N FROM GARWOOD.

SV0393'3.0 MILES NORTH ALONG THE SPOKANE INTERNATIONAL RAILROAD FROM THE

SV0393'STATION AT GARWOOD, KOOTENAI COUNTY, 0.3 MILE NORTH OF THE STATION AT

SV0393'CHILCO, 0.3 MILE SOUTH OF MILEPOST 37, 79.2 FEET NORTHEAST OF THE

SV0393'CENTER OF AN EAST-AND-WEST ROAD CROSSING, 48.4 FEET EAST OF THE

SV0393'CENTERLINE OF THE TRACK, 32.5 FEET NORTH OF THE CENTERLINE OF THE

SV0393'EAST-AND-WEST ROAD, 10.1 FEET NORTH OF THE SOUTHEAST CORNER OF THE

SV0393'RIGHT-OF-WAY FENCE, AND 1.3 FEET WEST OF THE RIGHT-OF-WAY FENCE. A

SV0393'STANDARD DISK, STAMPED M 134 1935 AND SET IN THE TOP OF A CONCRETE

SV0393'POST.

SV0393

SV0393

STATION RECOVERY (1982)

SV0393

SV0393'RECOVERY NOTE BY BONNEVILLE POWER ADMINISTRATION 1982

SV0393'RECOVERED IN GOOD CONDITION.

SV0393

SV0393

STATION RECOVERY (2009)

SV0393

SV0393

SV0393'RECOVERY NOTE BY W + H PACIFIC, INCORPORATED 2009 (WHP)

SV0393'THE STATION IS LOCATED 0.6 MI (1.0 KM) NORTH OF CHILCO IDAHO.

SV0393'

SV0393'TO REACH THE STATION FROM THE INTERSECTION OF SR95 AND E. CHILCO ROAD,

SV0393'HEAD NORTH ON SR95 TO THE INTERSECTION OF SR95 AND ESTATES DRIVE, TURN

SV0393'LEFT ONTO ESTATES DRIVE TO THE MARK ON YOUR RIGHT.

SV0393'

SV0393'THE STATION IS A BRASS DISK SET IN CONCRETE, 32 FT (9.8 M) NORTH OF

SV0393'THE CENTERLINE OF ESTATES DRIVE, 48 FT (14.6 M) EAST OF THE CENTERLINE

SV0393'RAILROAD TRACKS.

SV0393'

SV0393'RECOVERED IN GOOD CONDITION.

## AC5220 DESIGNATION - SMLT GPS

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AC5220 PID - AC5220
AC5220 STATE/COUNTY- ID/SHOSHONE
AC5220 USGS QUAD - KELLOGG WEST (1996)
AC5220
AC5220 *CURRENT SURVEY CONTROL
AC5220
AC5220* NAD 83(2007)- 47 32 45.23767(N) 116 10 31.82848(W) ADJUSTED
AC5220* NAVD 88 - 685.06 (meters) 2247.6 (feet) N HEIGHT
AC5220
AC5220 EPOCH DATE - 2002.00
AC5220 X - -1,902,805.462 (meters) COMP
AC5220 Y - -3,871,187.711 (meters) COMP
AC5220 Z - 4,683,436.954 (meters) COMP
AC5220 LAPLACE CORR- 7.26 (seconds) DEFLEC09
AC5220 ELLIP HEIGHT- 668.303 (meters) (02/10/07) ADJUSTED
AC5220 GEOID HEIGHT- -16.74 (meters) GEOID09
AC5220 DYNAMIC HT - 685.06 (meters) 2247.6 (feet) COMP
AC5220
AC5220 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
AC5220 Type PID Designation North East Ellip
AC5220 -----
AC5220 NETWORK AC5220 SMLT GPS 0.51 0.39 1.20
AC5220 -----
AC5220 MODELED GRAV- 980,590.5 (mgal) NAVD 88
AC5220
AC5220 VERT ORDER - THIRD
AC5220
AC5220.The horizontal coordinates were established by GPS observations
AC5220.and adjusted by the National Geodetic Survey in February 2007.
AC5220
AC5220.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
AC5220.See National Readjustment for more information.
AC5220.The horizontal coordinates are valid at the epoch date displayed above.
AC5220.The epoch date for horizontal control is a decimal equivalence
AC5220.of Year/Month/Day.
AC5220
AC5220.The orthometric height was determined by differential leveling
AC5220.and adjusted in October 1997.
AC5220.The height was determined by precise leveling from only one NSRS
AC5220.bench mark. This was not adequate "tie leveling" to NSRS and was
AC5220.allowed ONLY to validate the GPS-derived height.
AC5220
AC5220.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC5220
AC5220.The Laplace correction was computed from DEFLEC09 derived deflections.
AC5220
AC5220.The ellipsoidal height was determined by GPS observations
AC5220.and is referenced to NAD 83.
AC5220
AC5220.The geoid height was determined by GEOID09.
AC5220
AC5220.The dynamic height is computed by dividing the NAVD 88
AC5220.geopotential number by the normal gravity value computed on the
AC5220.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC5220.degrees latitude (g = 980.6199 gals.).
AC5220
AC5220.The modeled gravity was interpolated from observed gravity values.
AC5220
AC5220; North East Units Scale Factor Converg.
AC5220:SPC ID W - 653,368.671 767,970.829 MT 0.99994594 -0 18 50.2
AC5220:SPC ID W - 2,143,593.71 2,519,584.29 sFT 0.99994594 -0 18 50.2
AC5220:UTM 11 - 5,266,160.194 562,041.000 MT 0.99964730 +0 36 30.0
AC5220
AC5220! - Elev Factor x Scale Factor = Combined Factor
AC5220!SPC ID W - 0.99989526 x 0.99994594 = 0.99984121
AC5220!UTM 11 - 0.99989526 x 0.99964730 = 0.99954260
AC5220
AC5220 SUPERSEDED SURVEY CONTROL
AC5220

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AC5220 NAD 83(1999)- 47 32 45.23736(N) 116 10 31.82902(W) AD( ) A  
 AC5220 ELLIP H (09/01/00) 668.302 (m) GP( ) 3 1  
 AC5220 NAD 83(1992)- 47 32 45.23526(N) 116 10 31.83006(W) AD( ) B  
 AC5220 ELLIP H (01/22/97) 668.359 (m) GP( ) 4 1  
 AC5220 NAVD 88 (01/29/98) 685.06 (m) 2247.6 (f) LEVELING 3  
 AC5220 NGVD 29 (08/07/96) 683.93 (m) 2243.9 (f) N HEIGHT 3  
 AC5220

AC5220.Superseded values are not recommended for survey control.  
 AC5220.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 AC5220.[See file dsdata.txt](#) to determine how the superseded data were derived.

AC5220  
 AC5220\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TNN6204166160(NAD 83)  
 AC5220\_MARKER: I = METAL ROD  
 AC5220\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)  
 AC5220\_STAMPING: SMLT GPS 1995  
 AC5220\_MARK LOGO: NGS  
 AC5220\_PROJECTION: FLUSH  
 AC5220\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 AC5220\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 AC5220\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 AC5220+SATELLITE: SATELLITE OBSERVATIONS - May 19, 2009  
 AC5220\_ROD/PIPE-DEPTH: 3.1 meters  
 AC5220\_SLEEVE-DEPTH : 0.9 meters

AC5220  
 AC5220 HISTORY - Date Condition Report By  
 AC5220 HISTORY - 1995 MONUMENTED NGS  
 AC5220 HISTORY - 19950820 GOOD NGS  
 AC5220 HISTORY - 19990520 GOOD NGS  
 AC5220 HISTORY - 20000908 GOOD NGS  
 AC5220 HISTORY - 20011022 GOOD JCLS  
 AC5220 HISTORY - 20041113 GOOD DJC  
 AC5220 HISTORY - 20090519 GOOD INDIV

AC5220  
 AC5220  
 AC5220 STATION DESCRIPTION  
 AC5220  
 AC5220'DESCRIBED BY NATIONAL GEODETIC SURVEY 1995 (BEK)  
 AC5220'STATION IS LOCATED AT THE INTERSTATE HIGHWAY 90 EAST BOUND OFF-RAMP  
 AC5220'(EXIT 48) LEADING TO SMELTERVILLE, ABOUT 42 KM (26.10 MI)  
 AC5220'EAST-SOUTHEAST OF COEUR D ALENE. REACHED FROM THE JUNCTION OF  
 AC5220'INTERSTATE HIGHWAY 90 AND U.S. HIGHWAY 95 IN COEUR D ALENE, GO EAST  
 AC5220'ON INTERSTATE HIGHWAY 90 FOR 26.1 MI (42.0 KM) TO INTERSTATE EXIT 48.  
 AC5220'TAKE THE EXIT 48 OFF RAMP AND FOLLOW IT TO A STOP SIGN AND TO THE MARK  
 AC5220'ON THE LEFT. IT IS, 36.1 M (118.4 FT) EAST OF A WRONG WAY SIGN, 11.2  
 AC5220'M (36.7 FT) WEST OF A METAL POST SUPPORTING A DO NOT ENTER SIGN, 7.4 M  
 AC5220'(24.3 FT) NORTH OF THE CENTERLINE OF THE RAMP AND 0.6 M (2.0 FT) WEST  
 AC5220'OF A FIBREGLASS WITNESS POST. MARK IS A STAINLESS STEEL ROD DRIVEN TO  
 AC5220'ANCHORED REFUSAL AT 3.1 M (10.2 FT) WITH A PUNCH HOLE IN THE TOP AND  
 AC5220'INSIDE A 0.9 M (3.0 FT) FOOD GRADE GREASE FILLED SLEEVE AND ABOUT  
 AC5220'LEVEL WITH THE RAMP. NOTE--ACCESS TO MARK IS THROUGH A 5-INCH NGS  
 AC5220'LOGO CAP. DESCRIBED BY B.E. KELLY.

AC5220  
 AC5220 STATION RECOVERY (1995)  
 AC5220  
 AC5220'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (BEK)  
 AC5220'STATION IS LOCATED AT THE INTERSTATE 90 EAST BOUND OFF-RAMP (EXIT 48)  
 AC5220'LEADING TO SMELTERVILLE ABOUT 42.0 KM (26.10 MI) EAST-SOUTHEAST OF  
 AC5220'COEUR D ALENE. REACHED FROM THE JUNCTION OF INTERSTATE 90 AND U.S.  
 AC5220'HIGHWAY 95 IN COEUR D ALENE. GO EAST ON INTERSTATE 90 FOR 42.0 KM  
 AC5220'(26.10 MI) TO INTERSTATE 90 EXIT 48. TAKE THE EXIT 48 OFF-RAMP AND  
 AC5220'FOLLOW IT TO A STOP SIGN AND MARK ON THE LEFT. LOCATED 7.4 M (24.3  
 AC5220'FT) NORTH OF THE CENTER OF THE RAMP, 11.2 M (36.7 FT) WEST OF A METAL  
 AC5220'POST SUPPORTING A DO NOT ENTER SIGN, 36.1 M (118.4 FT) EAST OF A WRONG  
 AC5220'WAY SIGN AND 0.6 M (2.0 FT) WEST OF A FIBERGLASS WITNESS POST. MARK IS  
 AC5220'A STAINLESS ROD DRIVEN TO ANCHORED REFUSAL AT 3.1 M (10.2 FT) WITH A  
 AC5220'PUNCH HOLE IN THE TOP AND INSIDE A 0.9 M (3.0 FT) FOOD GRADE GREASE  
 AC5220'FILLED SLEEVE AND ABOUT LEVEL WITH THE RAMP. ACCESS TO MARK IS HAD  
 AC5220'THRU A 5-INCH LOGO CAP.

AC5220  
 AC5220 STATION RECOVERY (1999)  
 AC5220  
 AC5220'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

AC5220'RECOVERED AS DESCRIBED.  
AC5220  
AC5220 STATION RECOVERY (2000)  
AC5220  
AC5220'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2000 (CSM)  
AC5220'RECOVERED AS DESCRIBED.  
AC5220  
AC5220 STATION RECOVERY (2001)  
AC5220  
AC5220'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2001  
AC5220'RECOVERED IN GOOD CONDITION.  
AC5220  
AC5220 STATION RECOVERY (2004)  
AC5220  
AC5220'RECOVERY NOTE BY DAVID J COUCH SURVEYING 2004 (DJC)  
AC5220'RECOVERED IN GOOD CONDITION.  
AC5220  
AC5220 STATION RECOVERY (2009)  
AC5220  
AC5220'RECOVERY NOTE BY INDIVIDUAL CONTRIBUTORS 2009 (MB)  
AC5220'RECOVERED IN GOOD CONDITION.

## AC5199 DESIGNATION - BOVL GPS

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AC5199 PID - AC5199
AC5199 STATE/COUNTY- ID/LATAH
AC5199 USGS QUAD - BOVILL (1994)
AC5199
AC5199 *CURRENT SURVEY CONTROL
AC5199
AC5199* NAD 83(2007)- 46 51 24.49595(N) 116 24 07.29884(W) ADJUSTED
AC5199* NAVD 88 - 873.55 (meters) 2866.0 (feet) N HEIGHT
AC5199
AC5199 EPOCH DATE - 2002.00
AC5199 X - -1,943,150.662 (meters) COMP
AC5199 Y - -3,914,103.851 (meters) COMP
AC5199 Z - 4,631,518.237 (meters) COMP
AC5199 LAPLACE CORR- 7.05 (seconds) DEFLEC09
AC5199 ELLIP HEIGHT- 856.165 (meters) (02/10/07) ADJUSTED
AC5199 GEOID HEIGHT- -17.39 (meters) GEOID09
AC5199 DYNAMIC HT - 873.47 (meters) 2865.7 (feet) COMP
AC5199
AC5199 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
AC5199 Type PID Designation North East Ellip
AC5199 -----
AC5199 NETWORK AC5199 BOVL GPS 0.63 0.49 1.43
AC5199 -----
AC5199 MODELED GRAV- 980,489.1 (mgal) NAVD 88
AC5199
AC5199 VERT ORDER - THIRD
AC5199
AC5199.The horizontal coordinates were established by GPS observations
AC5199.and adjusted by the National Geodetic Survey in February 2007.
AC5199
AC5199.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
AC5199.See National Readjustment for more information.
AC5199.The horizontal coordinates are valid at the epoch date displayed above.
AC5199.The epoch date for horizontal control is a decimal equivalence
AC5199.of Year/Month/Day.
AC5199
AC5199.The orthometric height was determined by differential leveling
AC5199.and adjusted in October 1997.
AC5199.The height was determined by precise leveling from only one NSRS
AC5199.bench mark. This was not adequate "tie leveling" to NSRS and was
AC5199.allowed ONLY to validate the GPS-derived height.
AC5199
AC5199.Photographs are available for this station.
AC5199
AC5199.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC5199
AC5199.The Laplace correction was computed from DEFLEC09 derived deflections.
AC5199
AC5199.The ellipsoidal height was determined by GPS observations
AC5199.and is referenced to NAD 83.
AC5199
AC5199.The geoid height was determined by GEOID09.
AC5199
AC5199.The dynamic height is computed by dividing the NAVD 88
AC5199.geopotential number by the normal gravity value computed on the
AC5199.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC5199.degrees latitude (g = 980.6199 gals.).
AC5199
AC5199.The modeled gravity was interpolated from observed gravity values.
AC5199
AC5199; North East Units Scale Factor Converg.
AC5199;SPC ID W - 576,882.484 750,280.447 MT 0.99996371 -0 28 32.7
AC5199;SPC ID W - 1,892,655.28 2,461,545.10 sFT 0.99996371 -0 28 32.7
AC5199;UTM 11 - 5,189,425.065 545,582.471 MT 0.99962554 +0 26 10.7
AC5199
AC5199! - Elev Factor x Scale Factor = Combined Factor
AC5199!SPC ID W - 0.99986581 x 0.99996371 = 0.99982953
AC5199!UTM 11 - 0.99986581 x 0.99962554 = 0.99949140
AC5199

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AC5199 SUPERSEDED SURVEY CONTROL  
AC5199  
AC5199 NAD 83(1999)- 46 51 24.49562(N) 116 24 07.29928(W) AD( ) A  
AC5199 ELLIP H (09/01/00) 856.161 (m) GP( ) 3 1  
AC5199 NAD 83(1992)- 46 51 24.49387(N) 116 24 07.29987(W) AD( ) B  
AC5199 ELLIP H (01/22/97) 856.258 (m) GP( ) 4 1  
AC5199 NAVD 88 (01/29/98) 873.55 (m) 2866.0 (f) LEVELING 3  
AC5199 NGVD 29 (08/12/96) 872.41 (m) 2862.2 (f) N HEIGHT 3

AC5199  
AC5199.Superseded values are not recommended for survey control.  
AC5199.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
AC5199.[See file dsdata.txt](#) to determine how the superseded data were derived.

AC5199  
AC5199\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TNM4558289425(NAD 83)  
AC5199\_MARKER: I = METAL ROD  
AC5199\_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)  
AC5199\_STAMPING: BOVL GPS 1995  
AC5199\_MARK LOGO: NGS  
AC5199\_PROJECTION: FLUSH  
AC5199\_MAGNETIC: N = NO MAGNETIC MATERIAL  
AC5199\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
AC5199\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
AC5199+SATELLITE: SATELLITE OBSERVATIONS - November 13, 2004  
AC5199\_ROD/PIPE-DEPTH: 14.0 meters  
AC5199\_SLEEVE-DEPTH : 1.0 meters

AC5199  
AC5199 HISTORY - Date Condition Report By  
AC5199 HISTORY - 1995 MONUMENTED NGS  
AC5199 HISTORY - 19951010 GOOD NGS  
AC5199 HISTORY - 19990514 GOOD NGS  
AC5199 HISTORY - 20041113 GOOD DJC

AC5199  
AC5199 STATION DESCRIPTION

AC5199  
AC5199'DESCRIBED BY NATIONAL GEODETIC SURVEY 1995 (BEK)  
AC5199'STATION IS LOCATED IN BOVIL WHICH IS A ABOUT 65.0 KM (40.40 MI)  
AC5199'NORTHEAST OF LEWISTON. OWNERSHIP--HIGHWAY RIGHT-OF-WAY. REACHED FROM  
AC5199'THE JUNCTION OF STATE HIGHWAYS 3 AND 8 IN BOVIL. GO SOUTHWEST ON  
AC5199'STATE HIGHWAY 3 CROSSING A BRIDGE AND THE RAILROAD TRACKS FOR 0.42 KM  
AC5199'(0.25 MI) TO THE MARK ON THE RIGHT. LOCATED 17.5 M (57.4 FT)  
AC5199'NORTHWEST OF THE HIGHWAY CENTERLINE, 20.7 M (67.9 FT) WEST OF A  
AC5199'HIGHWAY MILEAGE SIGN, 0.85 M (2.79 FT) SOUTHEAST OF THE RIGHT-OF-WAY  
AC5199'FENCE AND 0.6 M (2.0 FT) NORTHWEST OF A FIBERGLASS WITNESS POST. MARK  
AC5199'IS A STAINLESS STEEL ROD DRIVEN TO ANCHORED REFUSAL AT 14.0 M (45.9  
AC5199'FT) WITH A PUNCH HOLE IN THE TOP AND INSIDE A 1.0 M (3.3 FT) FOOD  
AC5199'GRADE GREASE FILLED SLEEVE AND ABOUT LEVEL WITH THE HIGHWAY. ACCESS TO  
AC5199'MARK IS HAD THRU A 5-INCH LOGO CAP.

AC5199  
AC5199 STATION RECOVERY (1995)

AC5199  
AC5199'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (BEK)  
AC5199'RECOVERED AS DESCRIBED.

AC5199  
AC5199 STATION RECOVERY (1999)

AC5199  
AC5199'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)  
AC5199'RECOVERED AS DESCRIBED.

AC5199  
AC5199 STATION RECOVERY (2004)

AC5199  
AC5199'RECOVERY NOTE BY DAVID J COUCH SURVEYING 2004 (DJC)  
AC5199'RECOVERED IN GOOD CONDITION.

1 National Geodetic Survey, Retrieval Date = SEPTEMBER 19, 2010

# AC5215 DESIGNATION - MOSCOW CBL 0

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AC5215 PID - AC5215
AC5215 STATE/COUNTY- ID/LATAH
AC5215 USGS QUAD - MOSCOW EAST (1975)
AC5215
AC5215 *CURRENT SURVEY CONTROL
AC5215
AC5215* NAD 83(2007)- 46 43 32.61628(N) 116 56 55.16820(W) ADJUSTED
AC5215* NAVD 88 - 790.524 (meters) 2593.58 (feet) ADJUSTED
AC5215
AC5215 EPOCH DATE - 2002.00
AC5215 X - -1,985,191.930 (meters) COMP
AC5215 Y - -3,904,804.734 (meters) COMP
AC5215 Z - 4,621,479.313 (meters) COMP
AC5215 LAPLACE CORR- 5.40 (seconds) DEFLEC09
AC5215 ELLIP HEIGHT- 772.246 (meters) (02/10/07) ADJUSTED
AC5215 GEOID HEIGHT- -18.28 (meters) GEOID09
AC5215 DYNAMIC HT - 790.459 (meters) 2593.36 (feet) COMP
AC5215
AC5215 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
AC5215 Type PID Designation North East Ellip
AC5215 -----
AC5215 NETWORK AC5215 MOSCOW CBL 0 0.92 0.65 2.10
AC5215 -----
AC5215 MODELED GRAV- 980,506.5 (mgal) NAVD 88
AC5215
AC5215 VERT ORDER - SECOND CLASS II
AC5215
AC5215.The horizontal coordinates were established by GPS observations
AC5215.and adjusted by the National Geodetic Survey in February 2007.
AC5215
AC5215.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
AC5215.See National Readjustment for more information.
AC5215.The horizontal coordinates are valid at the epoch date displayed above.
AC5215.The epoch date for horizontal control is a decimal equivalence
AC5215.of Year/Month/Day.
AC5215
AC5215.The orthometric height was determined by differential leveling and
AC5215.adjusted in October 1997.
AC5215
AC5215.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC5215
AC5215.The Laplace correction was computed from DEFLEC09 derived deflections.
AC5215
AC5215.The ellipsoidal height was determined by GPS observations
AC5215.and is referenced to NAD 83.
AC5215
AC5215.The geoid height was determined by GEOID09.
AC5215
AC5215.The dynamic height is computed by dividing the NAVD 88
AC5215.geopotential number by the normal gravity value computed on the
AC5215.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC5215.degrees latitude (g = 980.6199 gals.).
AC5215
AC5215.The modeled gravity was interpolated from observed gravity values.
AC5215
AC5215; North East Units Scale Factor Converg.
AC5215;SPC ID W - 562,803.399 708,375.913 MT 1.00003648 -0 52 22.0
AC5215;SPC ID W - 1,846,464.15 2,324,063.31 sFT 1.00003648 -0 52 22.0
AC5215;UTM 11 - 5,174,687.131 503,923.247 MT 0.99960019 +0 02 14.6
AC5215
AC5215! - Elev Factor x Scale Factor = Combined Factor
AC5215!SPC ID W - 0.99987896 x 1.00003648 = 0.99991544
AC5215!UTM 11 - 0.99987896 x 0.99960019 = 0.99947920
AC5215
AC5215 SUPERSEDED SURVEY CONTROL
AC5215
AC5215 NAD 83(1999)- 46 43 32.61601(N) 116 56 55.16873(W) AD( ) A
AC5215 ELLIP H (09/01/00) 772.246 (m) GP( ) 3 1
AC5215 ELLIP H (07/24/97) 772.298 (m) GP( ) 1 1

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AC5215 NAD 83(1992)- 46 43 32.61411(N) 116 56 55.16933(W) AD( ) B  
AC5215 ELLIP H (01/22/97) 772.341 (m) GP( ) 4 1  
AC5215 NAVD 88 (01/29/98) 790.52 (m) 2593.6 (f) LEVELING 3  
AC5215 NAVD 88 (07/24/97) 790.52 (m) 2593.6 (f) LEVELING 3  
AC5215

AC5215.Superseded values are not recommended for survey control.  
AC5215.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
AC5215.[See file dsdata.txt](#) to determine how the superseded data were derived.  
AC5215

AC5215\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TNM0392374687(NAD 83)

AC5215\_MARKER: DQ = CALIBRATION BASE LINE DISK  
AC5215\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
AC5215\_STAMPING: 0 M 1987  
AC5215\_MARK LOGO: NGS

AC5215\_MAGNETIC: N = NO MAGNETIC MATERIAL  
AC5215\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
AC5215+STABILITY: SURFACE MOTION  
AC5215\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
AC5215+SATELLITE: SATELLITE OBSERVATIONS - November 13, 2004

AC5215  
AC5215 HISTORY - Date Condition Report By  
AC5215 HISTORY - 1987 MONUMENTED UID  
AC5215 HISTORY - 19951010 GOOD NGS  
AC5215 HISTORY - 19960520 GOOD IDTD  
AC5215 HISTORY - 19990518 GOOD NGS  
AC5215 HISTORY - 20011022 GOOD JCLS  
AC5215 HISTORY - 20041113 GOOD DJC

AC5215  
AC5215 STATION DESCRIPTION

AC5215'DESCRIBED BY UNIVERSITY OF IDAHO 1987 (GW)  
AC5215'STATION IS LOCATED ABOUT 4.8 KM (3.00 MI) EAST OF MOSCOW, 4.8 KM (3.00  
AC5215'MI) EAST OF THE JUNCTION OF STATE HIGHWAY 8 AND U.S. HIGHWAY 95, ON  
AC5215'THE GROUNDS OF THE UNIVERSITY OF IDAHO, COLLEGE OF AGRICULTURE,  
AC5215'COLLEGE OF FORESTRY FARM. OWNERSHIP--STATE OF IDAHO. POINT OF  
AC5215'CONTACT-MR. JERRY WILETTE, CIVIL ENGINEERING DEPARTMENT, PHONE  
AC5215'208-885-6516. REACHED FROM THE JUNCTION OF U.S. HIGHWAY 95 AND STATE  
AC5215'HIGHWAY 8 IN SOUTH MOSCOW, GO EAST ON STATE HIGHWAY 8 FOR 2.5 MI (4.0  
AC5215'KM) TO A GRAVEL SIDE ROAD LEFT AND THE ENTRANCE TO THE UNIVERSITY OF  
AC5215'IDAHO AGRICULTURE AND FORESTRY FARM. CONTINUE AHEAD ON STATE HIGHWAY  
AC5215'8 FOR 0.5 MI (0.8 KM) TO A CROSS ROADS AT THE WEST EDGE OF THE MOSCOW  
AC5215'ELKS GOLF COURSE. TURN LEFT AND GO NORTH ON A GRAVEL ROAD FOR 0.2 MI  
AC5215'(0.3 KM) TO A GRAVEL SIDE ROAD LEFT. TURN LEFT AND GO WEST ON THE  
AC5215'GRAVEL ROAD FOR 12 M (39.4 FT) AND TO THE MARK ON THE RIGHT. IT IS  
AC5215'12.4 M (40.7 FT) WEST OF THE CENTER OF THE MAIN GRAVEL ROAD, 16.5 M  
AC5215'(54.1 FT) NORTH OF THE GRAVEL ENTRANCE ROAD, 1.4 M (4.6 FT) WEST OF A  
AC5215'WIRE FENCE AND 1.0 M (3.3 FT) WEST OF A FIBREGLASS WITNESS POST. MARK  
AC5215'IS A CALIBRATION BASELINE DISK WITH A PUNCH HOLE IN THE TOP SET IN TOP  
AC5215'OF A 40 CM DIAMETER CONCRETE POST SET TO A DEPTH OF 1.1 M (3.6 FT) AND  
AC5215'FLUSH WITH GROUND SURFACE. DESCRIBED BY B.E. KELLY.

AC5215  
AC5215 STATION RECOVERY (1995)  
AC5215

AC5215'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (BEK)  
AC5215'RECOVERED AS DESCRIBED.

AC5215  
AC5215 STATION RECOVERY (1996)  
AC5215

AC5215'RECOVERY NOTE BY IDAHO TRANSPORTATION DEPARTMENT 1996  
AC5215'STATION IS LOCATED ABOUT 4.8 KM (3.00 MI) EAST OF MOSCOW, 4.8 KM (3.00  
AC5215'MI) EAST OF THE JUNCTION OF STATE HIGHWAY 8 AND U.S. HIGHWAY 95 AND  
AC5215'IS ON THE UNIVERSITY OF IDAHO, COLLEGE OF AGRICULTURE, COLLEGE OF  
AC5215'FORESTRY FARM. OWNERSHIP--STATE OF IDAHO. JERRY WILETTE, CIVIL  
AC5215'ENGINEERING DEPARTMENT 208-885-6516. REACHED FROM THE JUNCTION OF  
AC5215'STATE HIGHWAY 8 AND U.S. HIGHWAY 95 IN MOSCOW, GO EAST ON STATE  
AC5215'HIGHWAY 8 FOR 4.0 KM (2.50 MI) TO A GRAVEL SIDE ROAD LEFT AND THE  
AC5215'ENTRANCE TO THE UNIVERSITY OF IDAHO AGRICULTURE AND FORESTRY FARM.  
AC5215'CONTINUE AHEAD EAST ON STATE HIGHWAY 8 FOR 0.8 KM (0.50 MI) TO A CROSS  
AC5215'ROADS AT THE WEST EDGE OF THE MOSCOW ELKS GOLF COURSE. TURN LEFT AND  
AC5215'GO NORTH ON A GRAVEL ROAD FOR 0.32 KM (0.20 MI) TO A GRAVEL SIDE ROAD  
AC5215'LEFT. TURN LEFT AND GO WEST ON THE GRAVEL ROAD FOR ABOUT 12.0 M (39.4

AC5215' FT) AND THE MARK ON THE RIGHT. LOCATED 12.4 M (40.7 FT) WEST OF THE  
AC5215' CENTER OF THE MAIN GRAVEL ROAD (NORTH-SOUTH) , 16.5 M (54.1 FT) NORTH  
AC5215' OF THE CENTER OF THE GRAVEL ENTRANCE ROAD, 1.4 M (4.6 FT) WEST OF A  
AC5215' WIRE FENCE AND 1.0 M (3.3 FT) WEST OF A FIBERGLASS WITNESS POST. MARK  
AC5215' IS A CALIBRATION BASE LINE DISK WITH A PUNCH HOLE IN TOP AND SET IN  
AC5215' TOP OF A 40.0 CM IN DIAMETER CONCRETE POST TO A DEPTH OF 1.1 M (3.6  
AC5215' FT) AND FLUSH WITH THE GROUND SURFACE.

AC5215

AC5215

STATION RECOVERY (1999)

AC5215

AC5215' RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

AC5215' THE STATION IS LOCATED ABOUT 4.82 KM (3.00 MI) EAST OF MOSCOW, ON THE  
AC5215' PROPERTY OF THE UNIVERSITY OF IDAHO COLLEGE OF AGRICULTURE, ON THE  
AC5215' WEST SIDE OF MILL ROAD AND 0.32 KM (0.20 MI) NORTH OF THE JUNCTION OF  
AC5215' STATE HIGHWAY 8. OWNERSHIP--UNIVERSITY OF IDAHO COLLEGE OF  
AC5215' AGRICULTURE. CONTACT IS DR. JIM MILLIGAN, ENGINEERING DEPARTMENT,  
AC5215' PHONE 208-885-6516. TO REACH THE STATION FROM THE JUNCTION OF US  
AC5215' HIGHWAY 95 AND STATE HIGHWAY 8 EAST IN THE SOUTH SECTION OF MOSCOW, GO  
AC5215' EAST ON STATE HIGHWAY 8 FOR 4.82 KM (3.00 MI) TO THE JUNCTION OF MILL  
AC5215' ROAD ON THE LEFT. TURN LEFT, NORTH ON MILL ROAD FOR 0.32 KM (0.20 MI)  
AC5215' TO THE STATION ON THE LEFT, ON THE NORTH SIDE OF A GRAVEL ROAD LEADING  
AC5215' WEST. THE STATION IS SET IN TOP OF A 40 CM CONCRETE POST FLUSH WITH  
AC5215' GROUND AND ABOUT 0.9 M (3.0 FT) BELOW THE SURFACE OF MILL ROAD.  
AC5215' LOCATED 21.73 M (71.29 FT) SOUTH OF A POWER POLE WITH GUY WIRE, 16.15  
AC5215' M (52.99 FT) NORTH OF THE CENTER OF THE GRAVEL ROAD, 10.76 M (35.30  
AC5215' FT) NORTH-NORTHEAST OF THE NORTH END OF A PIPE CULVERT UNDER THE  
AC5215' GRAVEL ROAD, 9.60 M (31.50 FT) WEST OF THE CENTER OF MILL ROAD AND  
AC5215' 1.16 M (3.81 FT) WEST OF A FIBERGLASS WITNESS POST.

AC5215

AC5215

STATION RECOVERY (2001)

AC5215

AC5215' RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2001

AC5215' RECOVERED IN GOOD CONDITION.

AC5215

AC5215

STATION RECOVERY (2004)

AC5215

AC5215' RECOVERY NOTE BY DAVID J COUCH SURVEYING 2004 (DJC)

AC5215' RECOVERED IN GOOD CONDITION.

# RY0088 DESIGNATION - N 371

Used only as vertical check  
of MSOL CORS

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RY0088 PID - RY0088
RY0088 STATE/COUNTY- MT/MISSOULA
RY0088 USGS QUAD - SOUTHWEST MISSOULA (1978)
RY0088
RY0088 *CURRENT SURVEY CONTROL
RY0088
RY0088* NAD 83(2007)- 46 45 12.22800(N) 114 07 32.22558(W) ADJUSTED
RY0088* NAVD 88 - 991.969 (meters) 3254.49 (feet) ADJUSTED
RY0088
RY0088 EPOCH DATE - 2002.00
RY0088 X - -1,789,607.327 (meters) COMP
RY0088 Y - -3,995,922.972 (meters) COMP
RY0088 Z - 4,623,736.906 (meters) COMP
RY0088 LAPLACE CORR- -3.58 (seconds) DEFLEC09
RY0088 ELLIP HEIGHT- 977.270 (meters) (02/10/07) ADJUSTED
RY0088 GEOID HEIGHT- -14.71 (meters) GEOID09
RY0088 DYNAMIC HT - 991.807 (meters) 3253.95 (feet) COMP
RY0088
RY0088 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
RY0088 Type PID Designation North East Ellip
RY0088 -----
RY0088 NETWORK RY0088 N 371 1.06 0.92 1.43
RY0088 -----
RY0088 MODELED GRAV- 980,418.1 (mgal) NAVD 88
RY0088
RY0088 VERT ORDER - FIRST CLASS II
RY0088
RY0088.The horizontal coordinates were established by GPS observations
RY0088.and adjusted by the National Geodetic Survey in February 2007.
RY0088
RY0088.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
RY0088.See National Readjustment for more information.
RY0088.The horizontal coordinates are valid at the epoch date displayed above.
RY0088.The epoch date for horizontal control is a decimal equivalence
RY0088.of Year/Month/Day.
RY0088
RY0088.The orthometric height was determined by differential leveling and
RY0088.adjusted in June 1991.
RY0088
RY0088.The X, Y, and Z were computed from the position and the ellipsoidal ht.
RY0088
RY0088.The Laplace correction was computed from DEFLEC09 derived deflections.
RY0088
RY0088.The ellipsoidal height was determined by GPS observations
RY0088.and is referenced to NAD 83.
RY0088
RY0088.The geoid height was determined by GEOID09.
RY0088
RY0088.The dynamic height is computed by dividing the NAVD 88
RY0088.geopotential number by the normal gravity value computed on the
RY0088.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
RY0088.degrees latitude (g = 980.6199 gals.).
RY0088
RY0088.The modeled gravity was interpolated from observed gravity values.
RY0088
RY0088; North East Units Scale Factor Converg.
RY0088!SPC MT - 288,606.020 246,994.915 MT 0.99940282 -3 23 01.2
RY0088!SPC MT - 946,870.14 810,350.77 iFT 0.99940282 -3 23 01.2
RY0088!UTM 11 - 5,181,773.199 719,524.417 MT 1.00019236 +2 05 40.4
RY0088
RY0088! - Elev Factor x Scale Factor = Combined Factor
RY0088!SPC MT - 0.99984683 x 0.99940282 = 0.99924974
RY0088!UTM 11 - 0.99984683 x 1.00019236 = 1.00003916
RY0088
RY0088 SUPERSEDED SURVEY CONTROL
RY0088
RY0088 NAD 83(1992)- 46 45 12.22665(N) 114 07 32.22547(W) AD( ) B
RY0088 NAD 83(1999)- 46 45 12.22786(N) 114 07 32.22589(W) AD( ) A
RY0088 ELLIP H (10/12/00) 977.272 (m) GP( ) 3 1

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RY0088 NAD 83(1992)- 46 45 12.22678(N) 114 07 32.22439(W) AD( ) 1  
RY0088 ELLIP H (10/13/94) 977.390 (m) GP( ) 4 1  
RY0088 NAVD 88 (10/13/94) 991.97 (m) 3254.5 (f) LEVELING 3  
RY0088 NGVD 29 (??/??/92) 990.902 (m) 3250.98 (f) ADJ UNCH 1 2  
RY0088

RY0088.Superseded values are not recommended for survey control.  
RY0088.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
RY0088.[See file dsdata.txt](#) to determine how the superseded data were derived.

RY0088  
RY0088\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TQM1952481773(NAD 83)  
RY0088\_MARKER: DB = BENCH MARK DISK  
RY0088\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
RY0088\_SP\_SET: CONCRETE POST  
RY0088\_STAMPING: N 371 1950  
RY0088\_MARK LOGO: CGS  
RY0088\_PROJECTION: PROJECTING 5 CENTIMETERS  
RY0088\_MAGNETIC: A = STEEL ROD ADJACENT TO MONUMENT  
RY0088\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
RY0088+STABILITY: SURFACE MOTION  
RY0088\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
RY0088+SATELLITE: SATELLITE OBSERVATIONS - July 03, 2007

RY0088  
RY0088 HISTORY - Date Condition Report By  
RY0088 HISTORY - 1950 MONUMENTED CGS  
RY0088 HISTORY - 1956 GOOD NGS  
RY0088 HISTORY - 1980 GOOD NGS  
RY0088 HISTORY - 19940405 GOOD MTDOT  
RY0088 HISTORY - 20000212 GOOD MSLACO  
RY0088 HISTORY - 20050819 GOOD MSLACO  
RY0088 HISTORY - 20070703 GOOD ADACLA

RY0088  
RY0088 STATION DESCRIPTION  
RY0088

RY0088'DESCRIBED BY COAST AND GEODETIC SURVEY 1950  
RY0088'2.2 MI W FROM LOLO.  
RY0088'0.1 MILE SOUTH ALONG U. S. HIGHWAY 93 FROM THE LOLO COMMUNITY CHURCH  
RY0088'AT LOLO, THENCE 2.1 MILES WEST ALONG THE LEWIS AND CLARK HIGHWAY, AT A  
RY0088'JOG IN AN EAST-WEST FENCE LINE, 0.2 MILE EAST OF A DRIVEWAY LEADING  
RY0088'NORTH TO A FARMHOUSE, 67 FEET NORTH OF THE CENTER LINE OF THE HIGHWAY,  
RY0088'19.5 FEET NORTH OF A TELEPHONE POLE, 19 FEET NORTHEAST OF A FENCE  
RY0088'CORNER, 12 FEET SOUTHEAST OF A FENCE CORNER, 3.2 FEET EAST OF A  
RY0088'WITNESS POST, ABOUT 1.0 FOOT LOWER THAN THE HIGHWAY, CONCRETE POST  
RY0088'PROJECTS 0.3 FOOT.

RY0088  
RY0088 STATION RECOVERY (1956)  
RY0088

RY0088'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1956  
RY0088'RECOVERED IN GOOD CONDITION.

RY0088  
RY0088 STATION RECOVERY (1980)  
RY0088

RY0088'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1980  
RY0088'3.4 KILOMETERS (2.15 MILES) WEST ALONG U.S. HIGHWAY 12 FROM THE  
RY0088'JUNCTION OF U.S. HIGHWAY 93 IN LOLO, 0.6 KILOMETER (0.4 MILE)  
RY0088'SOUTHWEST OF HIGHWAY MILEPOST 31, 0.4 KILOMETER (0.25 MILE) NORTHEAST  
RY0088'OF A PRIVATE DRIVE LEADING NORTHWEST TO A TWO-STORY FRAME RANCH HOUSE,  
RY0088'AT A RIGHT-ANGLE OFFSET IN THE HIGHWAY RIGHT-OF-WAY FENCE, 18.9  
RY0088'METERS (62.0 FEET) NORTHWEST OF THE CENTERLINE OF THE HIGHWAY, 6.0  
RY0088'METERS (19.7 FEET) NORTHWEST OF A POWER LINE POLE, 6.35 METERS (20.8  
RY0088'FEET) NORTH OF THE EAST (OUTSIDE) CORNER FENCE POST, 3.6 METERS (11.8  
RY0088'FEET) EAST OF THE WEST (INSIDE) CORNER FENCE POST, 3.1 METERS (10.3  
RY0088'FEET) NORTHEAST OF THE NORTHWEST-SOUTHEAST FENCE LINE, 2.4 METERS  
RY0088'(7.9 FEET) SOUTHEAST OF THE SOUTHWEST-NORTHEAST FENCE LINE.  
RY0088'THE MARK IS 0.35 METERS SW FROM A WITNESS POST.  
RY0088'THE MARK IS 0.6 M BELOW THE HIGHWAY.

RY0088  
RY0088 STATION RECOVERY (1994)  
RY0088

RY0088'RECOVERY NOTE BY MONTANA DEPARTMENT OF TRANSPORTATION 1994 (DRD)  
RY0088'THE STATION WAS RECOVERED IN GOOD CONDITION. A NEW DESCRIPTION  
RY0088'FOLLOWS. THE STATION IS LOCATED 2.2 MI (3.5 KM) WEST OF LOLO, 0.4 MI

RY0088' (0.6 KM) SOUTHWEST OF MILEPOST 31 AND ALONG THE NORTHWEST SIDE OF U.S. HIGHWAY 12. TO REACH FROM THE JUNCTION OF U.S. HIGHWAYS 12 AND 191, IN RY0088' LOLO, GO WESTERLY ON U.S. HIGHWAY 12 FOR 1.8 MI (2.9 KM) TO MILEPOST RY0088' 31. CONTINUE SOUTHWEST ON U.S. HIGHWAY 12 FOR 0.4 MI (0.6 KM) TO THE RY0088' STATION ON THE RIGHT. THE STATION IS 62.0 FT (18.9 M) NORTHWEST OF THE RY0088' CENTER OF THE HIGHWAY, 19.7 FT (6.0 M) NORTHWEST OF A POWER POLE, 11.8 RY0088' FT (3.6 M) EAST OF THE WEST CORNER FENCE POST 7.9 FT (2.4 M) SOUTHEAST RY0088' OF A SOUTHWEST-NORTHEAST FENCE, 10.3 FT (3.1 M) NORTHEAST OF A RY0088' SOUTHWEST-NORTHEAST FENCE AND 1.2 FT (0.4 M) SOUTHWEST OF A WITNESS RY0088' POST.

RY0088  
 RY0088 STATION RECOVERY (2000)  
 RY0088

RY0088' RECOVERY NOTE BY MISSOULA COUNTY SURVEYOR 2000 (SEN)  
 RY0088' RECOVERED AS DESCRIBED.  
 RY0088'

RY0088' MONUMENT IS A 3-1/2 IN BRASS CAP IN A 12 IN DIAMETER CONCRETE RY0088' CYLINDER. THE MARK IS THE INTERSECTION OF THE PRE-STAMPED LINES NEAR RY0088' THE CENTER OF THE BRASS CAP.  
 RY0088'

RY0088' OWNERSHIP-MONTANA DEPARTMENT OF TRANSPORTATION-MISSOULA DISTRICT  
 RY0088' 2100 W BROADWAY, MISSOULA, MT, 59802 PHONE 406 523-5800  
 RY0088

RY0088 STATION RECOVERY (2005)  
 RY0088

RY0088' RECOVERY NOTE BY MISSOULA COUNTY SURVEYOR 2005 (KAL)  
 RY0088' RECOVERED AS DESCRIBED.  
 RY0088

RY0088 STATION RECOVERY (2007)  
 RY0088

RY0088' RECOVERY NOTE BY ADAMS AND CLARK INC 2007 (GMD)  
 RY0088' RECOVERED IN GOOD CONDITION.

National Geodetic Survey, Retrieval Date = OCTOBER 13, 2010

RY1021 \*\*\*\*\*  
 RY1021 FBN - This is a Federal Base Network Control Station.

## RY1021 DESIGNATION - FLAT GPS

vt values not held, see  
 adjustment report, Used in  
 both networks China and Walde

RY1021 PID - RY1021  
 RY1021 STATE/COUNTY- ID/IDAHO  
 RY1021 USGS QUAD - HUCKLEBERRY BUTTE (1994)  
 RY1021  
 RY1021 \*CURRENT SURVEY CONTROL  
 RY1021

RY1021*	NAD 83(2007)-	46 20 19.45646(N)	115 18 52.42240(W)	ADJUSTED
RY1021*	NAVD 88	- 632.16 (meters)	2074.0 (feet)	N HEIGHT

RY1021

RY1021	EPOCH DATE	-	2002.00	
RY1021	X	-	-1,886,338.582 (meters)	COMP
RY1021	Y	-	-3,987,956.540 (meters)	COMP
RY1021	Z	-	4,591,768.691 (meters)	COMP
RY1021	LAPLACE CORR-		9.69 (seconds)	DEFLECO9
RY1021	ELLIP HEIGHT-		616.354 (meters)	(02/10/07) ADJUSTED
RY1021	GEOID HEIGHT-		-15.81 (meters)	GEOID09
RY1021	DYNAMIC HT	-	632.07 (meters)	2073.7 (feet) COMP

RY1021

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

RY1021	Type	PID	Designation	North	East	Ellip
RY1021	NETWORK	RY1021	FLAT GPS	0.57	0.45	1.31

RY1021

RY1021	MODELED GRAV-	980,440.6 (mgal)	NAVD 88
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RY1021

RY1021 VERT ORDER - THIRD  
 RY1021

RY1021.The horizontal coordinates were established by GPS observations  
 RY1021.and adjusted by the National Geodetic Survey in February 2007.

RY1021  
 RY1021.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).

RY1021. See [National Readjustment](#) for more information.

RY1021. The horizontal coordinates are valid at the epoch date displayed above.

RY1021. The epoch date for horizontal control is a decimal equivalence  
 RY1021. of Year/Month/Day.

RY1021

RY1021. The orthometric height was determined by differential leveling  
 RY1021. and adjusted in August 1995.

RY1021. The height was determined by precise leveling from only one NSRS  
 RY1021. bench mark. This was not adequate "tie leveling" to NSRS and was  
 RY1021. allowed ONLY to validate the GPS-derived height.

RY1021

RY1021. The X, Y, and Z were computed from the position and the ellipsoidal ht.  
 RY1021

RY1021. The Laplace correction was computed from DEFLEC09 derived deflections.  
 RY1021

RY1021. The ellipsoidal height was determined by GPS observations  
 RY1021. and is referenced to NAD 83.

RY1021

RY1021. The geoid height was determined by GEOID09.  
 RY1021

RY1021. The dynamic height is computed by dividing the NAVD 88  
 RY1021. geopotential number by the normal gravity value computed on the  
 RY1021. Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 RY1021. degrees latitude (g = 980.6199 gals.).

RY1021

RY1021. The modeled gravity was interpolated from observed gravity values.  
 RY1021

RY1021;	North	East	Units	Scale	Factor	Converg.
RY1021:SPC ID W	- 519,182.226	833,521.806	MT	0.99994714	+0 18 54.0	
RY1021:SPC ID W	- 1,703,350.35	2,734,646.13	sFT	0.99994714	+0 18 54.0	
RY1021:UTM 11	- 5,133,065.059	629,707.845	MT	0.99980681	+1 13 10.1	

RY1021

RY1021!	Elev Factor	x	Scale Factor	=	Combined Factor
RY1021:SPC ID W	- 0.99990339	x	0.99994714	=	0.99985053
RY1021:UTM 11	- 0.99990339	x	0.99980681	=	0.99971022

RY1021

SUPERSEDED SURVEY CONTROL

RY1021

RY1021	NAD 83(1999)-	46 20 19.45628(N)	115 18 52.42237(W)	AD( )	A
RY1021	ELLIP H (09/01/00)	616.354 (m)		GP( )	3 1
RY1021	NAD 83(1986)-	46 20 19.45355(N)	115 18 52.41233(W)	AD( )	1
RY1021	NAD 83(1992)-	46 20 19.45477(N)	115 18 52.42173(W)	AD( )	B
RY1021	ELLIP H (05/15/92)	616.484 (m)		GP( )	4 2
RY1021	NAD 27	- 46 20 19.75969(N)	115 18 48.94950(W)	AD( )	1
RY1021	NAVD 88 (01/29/98)	632.16 (m)	2074.0	(f) LEVELING	3
RY1021	NAVD 88 (01/22/97)	632.16 (m)	2074.0	(f) LEVELING	3
RY1021	NGVD 29 (??/??/??)	631.03 (m)	2070.3	(f) N HEIGHT	3

RY1021

RY1021. Superseded values are not recommended for survey control.

RY1021. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

RY1021. [See file dsdata.txt](#) to determine how the superseded data were derived.

RY1021

RY1021\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TPM2970733065(NAD 83)

RY1021\_MARKER: DH = HORIZONTAL CONTROL DISK

RY1021\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

RY1021\_SP\_SET: CONCRETE POST

RY1021\_STAMPING: FLAT GPS 1991

RY1021\_MARK LOGO: NGS

RY1021\_MAGNETIC: N = NO MAGNETIC MATERIAL

RY1021\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

RY1021+STABILITY: SURFACE MOTION

RY1021\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

RY1021+SATELLITE: SATELLITE OBSERVATIONS - November 15, 2004

RY1021

RY1021	HISTORY	- Date	Condition	Report By
RY1021	HISTORY	- 1991	MONUMENTED	NGS
RY1021	HISTORY	- 19911008	GOOD	NGS
RY1021	HISTORY	- 19960806	GOOD	NGS
RY1021	HISTORY	- 19990514	GOOD	NGS
RY1021	HISTORY	- 19990903	GOOD	NGS
RY1021	HISTORY	- 20041115	GOOD	DJC



RY1021

RY1021

STATION DESCRIPTION

RY1021

RY1021'DESCRIBED BY NATIONAL GEODETIC SURVEY 1991

RY1021'THE STATION IS LOCATED ABOUT 45 KM (28.0 MI) SOUTHWEST OF POWELL, 25

RY1021'KM (15.5 MI) NORTHEAST OF LOWELL AND 3 KM (1.9 MI) WEST OF LONE KNOB

RY1021'MOUNTAIN IN A SMALL AREA KNOWN AS BOULDER FLATS. OWNERSHIP--U.S.

RY1021'FOREST SERVICE, CLEARWATER NATIONAL FOREST.

RY1021'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 12 AND STATE

RY1021'HIGHWAY 13 IN KOOSKIA, GO EAST ON HIGHWAY 12 FOR 26.16 KM (16.26 MI)

RY1021'TO THE SMALL TOWN OF SYRINGA AND CHEVRON GAS STATION AND CAFE ON THE

RY1021'LEFT. CONTINUE EAST ON HIGHWAY 12 FOR 10.94 KM (6.80 MI) TO SELWAY

RY1021'ROAD ON THE RIGHT THAT LEADS TO THE SMALL TOWN OF LOWELL. CONTINUE

RY1021'EAST-NORTHEAST ON HIGHWAY 12 FOR 39.9 KM (24.8 MI) TO THE OLD LOCHSA

RY1021'HISTORICAL RANGER STATION VISITOR CENTER ON THE LEFT. CONTINUE AHEAD

RY1021'ON HIGHWAY 12 FOR 1.0 KM (0.6 MI) TO A DIRT ROAD ON THE RIGHT (FIRST

RY1021'DIRT ROAD ON RIGHT AFTER THE RANGER STATION). TURN RIGHT AND GO FOR

RY1021'76 M (249.3 FT) TOWARDS THE RIVER, TO THE TOP OF A SMALL KNOLL AND

RY1021'THE STATION ON THE RIGHT.

RY1021'THE STATION IS A STANDARD DISK SET IN THE TOP OF A CONCRETE POST.

RY1021'LOCATED 6.8 M (22.3 FT) SOUTH OF THE CENTER OF THE DIRT ROAD, 1 M

RY1021'(3.3 FT) NORTHEAST OF A FIBERGLASS WITNESS POST AND 0.7 M (2.3 FT)

RY1021'SOUTHWEST OF A FIBERGLASS WITNESS POST.

RY1021

RY1021

STATION RECOVERY (1996)

RY1021

RY1021'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (CSM)

RY1021'RECOVERED AS DESCRIBED BY R.W. DANIEL.

RY1021

RY1021

STATION RECOVERY (1999)

RY1021

RY1021'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

RY1021'THE STATION IS LOCATED ABOUT 45 KM (27.95 MI) SOUTHWEST OF POWELL, 25

RY1021'KM (15.55 MI) NORTHEAST OF LOWELL AND 3 KM (1.85 MI) WEST OF LONE KNOB

RY1021'MOUNTAIN, IN A SMALL AREA KNOWN AS BOULDER FLATS. OWNERSHIP--US

RY1021'FOREST SERVICE. TO REACH THE STATION FROM THE JUNCTION OF US HIGHWAY

RY1021'12 AND STATE HIGHWAY 13 IN KOOSKIA, GO EAST ON US HIGHWAY 12 FOR 26.15

RY1021'KM (16.25 MI) TO THE CHEVRON GAS STATION, CAFE ON THE LEFT IN THE

RY1021'SMALL TOWN OF SYRINGA. CONTINUE AHEAD, EAST ON HIGHWAY 12 FOR 10.94

RY1021'KM (6.80 MI) TO THE JUNCTION OF SELWAY ROAD ON THE RIGHT, LEADING TO

RY1021'THE SMALL TOWN OF LOWELL. CONTINUE AHEAD, EAST-NORTHEAST ON HIGHWAY

RY1021'12 FOR 39.9 KM (24.80 MI) TO THE ENTRANCE ROAD TO THE OLD LOCHSA

RY1021'HISTORICAL RANGER STATION VISITOR CENTER ON THE LEFT. CONTINUE AHEAD

RY1021'NORTHEAST ON HIGHWAY 12 FOR 1.0 KM (0.60 MI) TO A DIRT ROAD ON THE

RY1021'RIGHT, 0.16 KM (0.10 MI) NORTHEAST OF HIGHWAY MILEPOST 122. TURN

RY1021'RIGHT, SOUTHEAST ON THE DIRT ROAD FOR 0.08 KM (0.05 MI) TO TWO SMALL

RY1021'KNOLLS ABOUT 3.66 M (12.01 FT) HIGH ON THE RIGHT AND THE STATION ON

RY1021'THE SOUTHWEST SIDE OF THE ROAD AT THE BASE OF THE NORTHWEST ONE OF THE

RY1021'TWO KNOLLS. THE STATION IS SET IN THE TOP OF A 20 CM CONCRETE POST

RY1021'RECESSED 15 CM BELOW GROUND. LOCATED ABOUT 0.08 KM (0.05 MI)

RY1021'NORTHWEST OF A SHARP CURVE IN THE DIRT ROAD AT A LONE SPRUCE TREE

RY1021'ABOUT 12.19 M (39.99 FT) HIGH AND NEAR THE BANK OF THE RIVER, 18.59 M

RY1021'(60.99 FT) SOUTHEAST OF A 30 CM LONE SPRUCE TREE ABOUT 4.57 M (14.99

RY1021'FT) HIGH LOCATED AT THE NORTHWEST END OF THE BASE OF THE NORTHWEST ONE

RY1021'OF THE TWO KNOLLS, 5.64 M (18.50 FT) SOUTHWEST OF THE CENTER OF THE

RY1021'DIRT ROAD AND 0.24 M (0.79 FT) NORTH OF A FIBERGLASS WITNESS POST.

RY1021

RY1021

STATION RECOVERY (1999)

RY1021

RY1021'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

RY1021'RECOVERED AS DESCRIBED EXCEPT THE TREES DESCRIBED ARE CEDAR AND FIR

RY1021'RESPECITELY.

RY1021

RY1021

STATION RECOVERY (2004)

RY1021

RY1021

RY1021'RECOVERY NOTE BY DAVID J COUCH SURVEYING 2004 (DJC)

RY1021'RECOVERED IN GOOD CONDITION.

## AC5210 DESIGNATION - KAMI GPS

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AC5210 PID - AC5210
AC5210 STATE/COUNTY- ID/IDAHO
AC5210 USGS QUAD - KAMIAH (1979)
AC5210
AC5210 *CURRENT SURVEY CONTROL
AC5210
AC5210* NAD 83(2007)- 46 12 45.39977(N) 116 00 19.00162(W) ADJUSTED
AC5210* NAVD 88 - 371.646 (meters) 1219.31 (feet) ADJUSTED
AC5210
AC5210 EPOCH DATE - 2002.00
AC5210 X - -1,938,639.654 (meters) COMP
AC5210 Y - -3,973,871.157 (meters) COMP
AC5210 Z - 4,581,888.565 (meters) COMP
AC5210 LAPLACE CORR- 5.25 (seconds) DEFLEC09
AC5210 ELLIP HEIGHT- 354.795 (meters) (02/10/07) ADJUSTED
AC5210 GEOID HEIGHT- -16.85 (meters) GEOID09
AC5210 DYNAMIC HT - 371.621 (meters) 1219.23 (feet) COMP
AC5210
AC5210 ----- Accuracy Estimates (at 95% Confidence Level in cm) -----
AC5210 Type PID Designation North East Ellip
AC5210 -----
AC5210 NETWORK AC5210 KAMI GPS 0.59 0.47 1.31
AC5210 -----
AC5210 MODELED GRAV- 980,539.0 (mgal) NAVD 88
AC5210
AC5210 VERT ORDER - SECOND CLASS II
AC5210
AC5210.The horizontal coordinates were established by GPS observations
AC5210.and adjusted by the National Geodetic Survey in February 2007.
AC5210
AC5210.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
AC5210.See National Readjustment for more information.
AC5210.The horizontal coordinates are valid at the epoch date displayed above.
AC5210.The epoch date for horizontal control is a decimal equivalence
AC5210.of Year/Month/Day.
AC5210
AC5210.The orthometric height was determined by differential leveling and
AC5210.adjusted in October 1997.
AC5210
AC5210.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC5210
AC5210.The Laplace correction was computed from DEFLEC09 derived deflections.
AC5210
AC5210.The ellipsoidal height was determined by GPS observations
AC5210.and is referenced to NAD 83.
AC5210
AC5210.The geoid height was determined by GEOID09.
AC5210
AC5210.The dynamic height is computed by dividing the NAVD 88
AC5210.geopotential number by the normal gravity value computed on the
AC5210.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC5210.degrees latitude (g = 980.6199 gals.).
AC5210
AC5210.The modeled gravity was interpolated from observed gravity values.
AC5210
AC5210; North East Units Scale Factor Converg.
AC5210;SPC ID W - 505,102.841 780,302.499 MT 0.99993810 -0 11 03.4
AC5210;SPC ID W - 1,657,158.24 2,560,042.45 sFT 0.99993810 -0 11 03.4
AC5210;UTM 11 - 5,118,151.327 576,727.906 MT 0.99967237 +0 43 05.3
AC5210
AC5210! - Elev Factor x Scale Factor = Combined Factor
AC5210!SPC ID W - 0.99994438 x 0.99993810 = 0.99988249
AC5210!UTM 11 - 0.99994438 x 0.99967237 = 0.99961677
AC5210
AC5210 SUPERSEDED SURVEY CONTROL
AC5210
AC5210 NAD 83(1999)- 46 12 45.39944(N) 116 00 19.00156(W) AD( ) A
AC5210 ELLIP H (09/01/00) 354.798 (m) GP( ) 3 1
AC5210 NAD 83(1992)- 46 12 45.39812(N) 116 00 19.00173(W) AD( ) B

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AC5210 ELLIP H (01/22/97) 354.860 (m) GP( ) 4 1  
AC5210 NAVD 88 (01/29/98) 371.65 (m) 1219.3 (f) LEVELING 3  
AC5210

AC5210.Superseded values are not recommended for survey control.  
AC5210.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
AC5210.[See file dsdata.txt](#) to determine how the superseded data were derived.  
AC5210

AC5210\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TNM7672718151(NAD 83)

AC5210\_MARKER: DH = HORIZONTAL CONTROL DISK

AC5210\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

AC5210\_STAMPING: KAMI GPS 1995

AC5210\_MARK LOGO: NGS

AC5210\_MAGNETIC: N = NO MAGNETIC MATERIAL

AC5210\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

AC5210+STABILITY: SURFACE MOTION

AC5210\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AC5210+SATELLITE: SATELLITE OBSERVATIONS - November 15, 2004

AC5210

AC5210	HISTORY	- Date	Condition	Report By
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AC5210	HISTORY	- 1995	MONUMENTED	NGS
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AC5210	HISTORY	- 19950618	GOOD	NGS
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AC5210	HISTORY	- 19990514	GOOD	NGS
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AC5210	HISTORY	- 20041115	GOOD	DJC
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AC5210

AC5210 STATION DESCRIPTION

AC5210

AC5210'DESCRIBED BY NATIONAL GEODETIC SURVEY 1995 (BEK)

AC5210'STATION IS LOCATED ABOUT 2.0 KM (1.25 MI) SOUTHEAST OF KAMIAH AND 30.0

AC5210'KM (18.65 MI) SOUTHEAST OF OROFINO. OWNERSHIP--HIGHWAY RIGHT-OF-WAY.

AC5210'REACHED FROM THE NORTHEAST END OF THE BRIDGE OVER THE CLEARWATER RIVER

AC5210'ON U.S. HIGHWAY 12 IN KAMIAH. GO SOUTHEAST ON U.S. HIGHWAY 12 FOR

AC5210'2.31 KM (1.45 MI) TO THE LEWIS AND CLARK RESORT AND CAFE AND THE MARK

AC5210'ON THE RIGHT AT A WALK IN ENTRANCE TO THE NEZ PERCE HISTORICAL PARK

AC5210'SITE (HEART OF THE MONSTER) . LOCATED 14.05 M (46.10 FT) WEST OF AND

AC5210'ABOUT 1.0 M (3.3 FT) ABOVE THE HIGHWAY CENTERLINE, 12.5 M (41.0 FT)

AC5210'NORTHWEST OF A MAIL BOX FOR THE LEWIS AND CLARK R.V. PARK, 5.95 NORTH

AC5210'OF THE NORTH GATE POST FOR THE WALK IN ENTRANCE TO THE PARK, 1.75 M

AC5210'(5.74 FT) EAST OF A POLE FENCE AND 0.60 M (1.97 FT) NORTH OF A

AC5210'FIBERGLASS WITNESS POST. MARK IS A 14-INCH IN DIAMETER CONCRETE POST

AC5210'SET 1.0 METER (3.3 FT) IN THE GROUND WITH A HORIZONTAL CONTROL DISK IN

AC5210'THE CENTER AND ABOUT FLUSH WITH THE GROUND SURFACE. DESCRIBED BY B.E.

AC5210'KELLY.

AC5210

AC5210 STATION RECOVERY (1995)

AC5210

AC5210'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (BEK)

AC5210'RECOVERED AS DESCRIBED.

AC5210

AC5210 STATION RECOVERY (1999)

AC5210

AC5210'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

AC5210'RECOVERED AS DESCRIBED.

AC5210

AC5210 STATION RECOVERY (2004)

AC5210

AC5210'RECOVERY NOTE BY DAVID J COUCH SURVEYING 2004 (DJC)

AC5210'RECOVERED IN GOOD CONDITION.

## DG8521 DESIGNATION - GRANGEVILLE APT CORS ARP

DG8521 CORS\_ID - IDNP  
DG8521 PID - DG8521  
DG8521 STATE/COUNTY- ID/IDAHO  
DG8521 USGS QUAD - GRANGEVILLE EAST (1995)  
DG8521  
DG8521 \*CURRENT SURVEY CONTROL  
DG8521

DG8521*	NAD 83(CORS)-	45 56 22.93598(N)	116 07 16.53030(W)	ADJUSTED
DG8521*	NAVD 88	- 1013.31 (meters)	3324.5 (feet)	GPS OBS

DG8521

DG8521	EPOCH DATE	- 2002.00		
DG8521	X	- 1,956,496.285 (meters)		COMP
DG8521	Y	- 3,989,958.031 (meters)		COMP
DG8521	Z	- 4,561,306.003 (meters)		COMP
DG8521	ELLIP HEIGHT-	997.103 (meters)	(12/??/04)	ADJUSTED
DG8521	GEOID HEIGHT-	-16.22 (meters)		GEOID09
DG8521	HORZ ORDER	- SPECIAL (CORS)		
DG8521	ELLP ORDER	- SPECIAL (CORS)		

DG8521  
DG8521. [ITRF positions](#) are available for this station.  
DG8521. The coordinates were established by GPS observations  
DG8521. and adjusted by the National Geodetic Survey in December 2004.  
DG8521. The coordinates are valid at the epoch date displayed above.  
DG8521. The epoch date for horizontal control is a decimal equivalence  
DG8521. of Year/Month/Day.  
DG8521  
DG8521. The orthometric height was determined by GPS observations and a  
DG8521. high-resolution geoid model using precise GPS observation and  
DG8521. processing techniques.  
DG8521  
DG8521. The PID for the CORS L1 Phase Center is DG8522.  
DG8521  
DG8521. The XYZ, and position/ellipsoidal ht. are equivalent.  
DG8521  
DG8521. The ellipsoidal height was determined by GPS observations  
DG8521. and is referenced to NAD 83.  
DG8521  
DG8521. The geoid height was determined by GEOID09.  
DG8521

DG8521;		North	East	Units	Scale	Factor	Converg.
DG8521;SPC ID W	-	474,805.874	771,211.802	MT	0.99994352	-0 16 00.4	
DG8521;SPC ID W	-	1,557,758.94	2,530,217.39	sFT	0.99994352	-0 16 00.4	

DG8521  
DG8521!  
DG8521! SPC ID W - Elev Factor x Scale Factor = Combined Factor  
DG8521! SPC ID W - 0.99984371 x 0.99994352 = 0.99978724  
DG8521  
DG8521 SUPERSEDED SURVEY CONTROL  
DG8521  
DG8521. No superseded survey control is available for this station.  
DG8521  
DG8521 U.S. NATIONAL GRID SPATIAL ADDRESS: 11TNL6811687723(NAD 83)  
DG8521 MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA  
DG8521  
DG8521 STATION DESCRIPTION  
DG8521  
DG8521 DESCRIBED BY NATIONAL GEODETIC SURVEY 2004  
DG8521 STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND  
DG8521 VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE  
DG8521 BY ANONYMOUS FTP OR THE WORLDWIDE WEB.  
DG8521 FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION\_LOG  
DG8521 HTTP://WWW.NGS.NOAA.GOV/CORS.

## DE8232 DESIGNATION - MISSOULA CORS ARP

DE8232 CORS\_ID - MSOL  
DE8232 PID - DE8232  
DE8232 STATE/COUNTY- MT/MISSOULA  
DE8232 USGS QUAD - NORTHWEST MISSOULA (1978)  
DE8232  
DE8232 \*CURRENT SURVEY CONTROL  
DE8232  
DE8232\* NAD 83(CORS)- 46 55 45.83733(N) 114 06 31.84604(W) ADJUSTED  
DE8232\* NAVD 88 - \*(meters) \*(feet)  
DE8232  
DE8232 EPOCH DATE - 2002.00  
DE8232 X - -1,782,602.076 (meters) COMP  
DE8232 Y - -3,983,406.750 (meters) COMP  
DE8232 Z - 4,637,110.215 (meters) COMP  
DE8232 ELLIP HEIGHT- 960.639 (meters) (10/??/02) ADJUSTED  
DE8232 GEOID HEIGHT- -14.97 (meters) GEOID09  
DE8232 HORZ ORDER - SPECIAL (CORS)  
DE8232 ELLP ORDER - SPECIAL (CORS)  
DE8232  
DE8232. [ITRF positions](#) are available for this station.  
DE8232. The coordinates were established by GPS observations  
DE8232. and adjusted by the National Geodetic Survey in October 2002.  
DE8232. The coordinates are valid at the epoch date displayed above.  
DE8232. The epoch date for horizontal control is a decimal equivalence  
DE8232. of Year/Month/Day.  
DE8232  
DE8232  
DE8232. The PID for the CORS L1 Phase Center is DI0173.  
DE8232  
DE8232. The XYZ, and position/ellipsoidal ht. are equivalent.  
DE8232  
DE8232. The ellipsoidal height was determined by GPS observations  
DE8232. and is referenced to NAD 83.  
DE8232  
DE8232. The geoid height was determined by GEOID09.  
DE8232  
DE8232;  
DE8232; SPC MT - North East Units Scale Factor Converg.  
DE8232; SPC MT - 308,050.748 249,423.332 MT 0.99939369 -3 22 17.0  
DE8232; SPC MT - 1,010,665.18 818,318.02 iFT 0.99939369 -3 22 17.0  
DE8232  
DE8232! - Elev Factor x Scale Factor = Combined Factor  
DE8232! SPC MT - 0.99984944 x 0.99939369 = 0.99924322  
DE8232  
DE8232 SUPERSEDED SURVEY CONTROL  
DE8232  
DE8232. No superseded survey control is available for this station.  
DE8232  
DE8232\_U.S. NATIONAL GRID SPATIAL ADDRESS: 11TQN2008401376(NAD 83)  
DE8232\_MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA  
DE8232  
DE8232 STATION DESCRIPTION  
DE8232  
DE8232 DESCRIBED BY NATIONAL GEODETIC SURVEY 2002  
DE8232 STATION IS A GPS CORS. LATEST INFORMATION INCLUDING POSITIONS AND  
DE8232 VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE  
DE8232 BY ANONYMOUS FTP OR THE WORLDWIDE WEB.  
DE8232' FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION\_LOG  
DE8232' HTTP://WWW.NGS.NOAA.GOV/CORS.

Information from Missoula County website:

STATION INFORMATION

Latitude of ARP: 46° 55' 45.83733" North

Longitude of ARP: 114° 06' 31.84604" West

Horizontal Datum: NAD83 (NSRS2007)

Vertical Datum: NAVD88

Height above Ellipsoid to L1 Antenna Phase Center (as per NGS): 3151.93 US Survey ft., 960.710 m

Height above Ellipsoid to Antenna Base (as per NGS): 3151.70 US Survey ft., 960.639 m

Orthometric Height of L1 Antenna Phase Center (by calculation): 3200.97 US Survey ft., 975.658 m

Orthometric Height of Antenna Base (by differential levels): 3200.72 US Survey ft., 975.581m \*

Antenna Dimension, Base (ARP) to L1 Phase Center (as per NGS): 0.234 US Survey ft., 0.0714m  
The horizontal positions of the L1 phase center and ARP are slightly different. See: COORDINATES  
Receiver: [Trimble NetRS](#)  
Antenna: [Trimble Zephyr Geodetic](#)  
Mapping Data epochs: SYNC measurements = 1 second; Positions = 15 seconds  
Survey Data epochs: 15 seconds  
Mask = 10°  
Receiver operates 24 hours/day, 7 days/week  
The orthometric height of the ARP was determined by 3-wire differential leveling to NGS  
benchmarks G 14 Reset and R 446, using a Zeiss Ni2 level, to be 975.587m on July 15, 2003.  
\*A new orthometric height of the ARP was determined using first-order equipment and methods to be  
975.581m. That level run will be submitted to NGS for publication.



Decep-1 (4).JPG  
11/03/2010



Decep-1 (E).JPG  
11/03/2010



Decep-1 (S).JPG  
11/03/2010



Decep-1 (W).JPG  
11/03/2010



Decep-1 N.JPG  
11/03/2010



Decep-2 (E).JPG  
11/03/2010



Decep-2 (N).JPG  
11/03/2010



Decep-2 (S).JPG  
11/03/2010





Decep-2 (W).JPG  
11/03/2010



Decep-2.JPG  
11/03/2010



BOVL GPS 01.jpg  
10/07/2010



Elk 01 From the North.jpg  
10/07/2010



Elk 01 From the South.jpg  
10/07/2010



Elk 01 From the West.jpg  
10/07/2010



Elk 01.jpg  
10/07/2010



FLAT GPS 01.jpg  
10/06/2010



KAMI GPS 01.jpg  
10/06/2010



MOSCOW CBL O.jpg  
10/07/2010



N-371.jpg  
10/05/2010



POTLACH\_01 From the East.jpg  
10/07/2010



POTLACH\_01 From the South.jpg  
10/07/2010



POTLACH\_01 From the West.jpg  
10/07/2010



POTLACH 01.jpg  
10/07/2010



POTLACH 01 From the North.jpg  
10/07/2010



WALDE 02.jpg  
10/06/2010



WALDE 03.jpg  
10/06/2010



DSCN0829.JPG  
09/27/2010



DSCN0830.JPG  
09/27/2010



DSCN0831.JPG  
09/27/2010



DSCN0832.JPG  
09/27/2010



DSCN0833.JPG  
09/27/2010



DSCN0834.JPG  
09/27/2010



DSCN0835.JPG  
09/27/2010



DSCN0836.JPG  
09/27/2010



09.27.2010 09:16

DSCN0837.JPG  
09/27/2010



09.27.2010 09:22

DSCN0838.JPG  
09/27/2010



09.27.2010 11:34

DSCN0839.JPG  
09/27/2010



09.27.2010 11:34

DSCN0840.JPG  
09/27/2010





DSCN0841.JPG  
09/27/2010



DSCN0842.JPG  
09/27/2010



DSCN0843.JPG  
09/27/2010



DSCN0844.JPG  
09/27/2010



DSCN0845.JPG  
09/27/2010



DSCN0846.JPG  
09/27/2010



DSCN0847.JPG  
09/27/2010



DSCN0848.JPG  
09/27/2010



DSCN0886.JPG  
09/29/2010



DSCN0887.JPG  
09/29/2010



DSCN0888.JPG  
09/29/2010



DSCN0889.JPG  
09/29/2010



DSCN0890.JPG  
09/29/2010



DSCN0891.JPG  
09/29/2010



DSCN0892.JPG  
09/29/2010



DSCN0893.JPG  
09/29/2010



DSCN0894.JPG  
09/29/2010



DSCN0895.JPG  
09/29/2010



DSCN0878.JPG  
09/29/2010



DSCN0879.JPG  
09/29/2010



DSCN0880.JPG  
09/29/2010



DSCN0881.JPG  
09/29/2010



DSCN0882.JPG  
09/29/2010



DSCN0883.JPG  
09/29/2010



DSCN0884.JPG  
09/29/2010



DSCN0885.JPG  
09/29/2010



DSCN0907.JPG  
09/29/2010

(A)

1/3

10-5-10

1808-10 WHITESHIELD

π & φ : J. GARLAND  
☐ : J. GALLAND

4/- 60°F  
PARTLY CLOUDY / CALM

" BM FOR CHINA "



1000 = NGS BM N 371

2/3

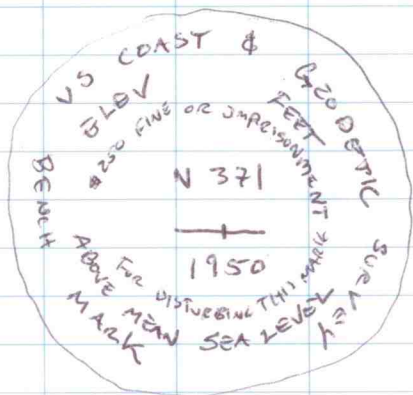
HI: 5<sup>370</sup> FT 163<sup>70</sup> CM BEGIN

HI: 5<sup>370</sup> FT 163<sup>70</sup> CM END

START: 8:56 AM (CENTER OF BUMP)

STOP: 10:01 AM

90 kb



3/4 BIL. IN 1<sup>2</sup> FT DIAM CONC.  
POST PROTRUDING 0<sup>4</sup> FT OUT  
OF GRND

π : R8 BASE RECEIVER  
INTERNAL DATA COLLECTION

LOCATION: SEE NGS DATA SHEET

1001 FLAT GPS

3/3

π : 5700 BASE BOTTOM OF NOTCH

HI 5<sup>91</sup> FT 180<sup>10</sup> CM

START: 11:56 AM

STOP: 5 PM ISH

\* NO OTHER OBS TO  
MATCH THIS DAY

\* RAN OUT OF TIME  
FINDING CNTRL

+ FND 3<sup>1</sup>/<sub>4</sub> BC ON ~~π~~  
1<sup>2</sup> DIAM CONC. CYL  
1<sup>2</sup> FT BELOW  
SURFACE

- SEE PHOTO

- SEE NGS DATA SHEET,  
FOR LOCATION

(B)

1/2

10-8-10

"CHINA"

1808-10 WHITESHIELD

5700/5800  $\pi$  : J. GARLAND

☒ : J. GARLAND

RB  $\pi$  : TRAVIS WILLIAMS

☒ : TRAVIS WILLIAMS

+/- 60°F  
CLOUDY /  
OCCASSIONAL RAIN

1016 = 1000

N-371

5700 BASE

2nd  
OBS

HI: 4768

145 <sup>250</sup> cm

(BOTTOM OF NOTCH)

START: 10:42 AM

STOP: 12:29 PM

\*\* SEE PAGE #2 OF  
10-5-10 NOTES  
FOR 1<sup>st</sup> OBS / ETC

2/2

1017

FLAT GPS

1<sup>ST</sup> OBS

5800 POWER

HI : 5 <sup>92</sup> FT

180 <sup>5</sup> CM

START: 8:47 AM

STOP: 2:30 PM

~~15 w/ CHN 01~~  
(15 w/ CHN 01  
40 MIN w/ CHN 02)

\* SEE PAGE #5 OF  
10-6-10 NOTES FOR  
MONUMENT DESC.

HI : 5 <sup>80</sup> FT

2<sup>ND</sup> OBS

173 <sup>1</sup> CM

START: 2:34 PM

STOP: 6:04 PM

(Full w/  
CHN-01 & CHN 02)

\* GOOD DATA STARTS @  
4:30 PM  
(2 hr DELAY)

- 1808-10\_CHINA -

(FZI, OCT 8, 2010)

~~~~ GOLF/LIGHTDRAW ~~~~

© 1/1

• T. WILLIAMS

• TRIMBLE RP, TSCZ, FILENAME: 1808-10\_CHINA

~~~~ STATIC OBSERVATIONS ~~~~

• CHIN-01 OBSERVATION (BASE)

- 1-3/4" AC

- Hi: 5.88ft, 1.79m  
(Center of Bumper)



- START TIME: FIZ, 1:04 pm

- END TIME: 8:00 pm

{ Started one at 1:02, but stopped restarted  
to check Hi was correct, 2nd start point name  
is CHIN-01, not CHIN01 }

• CHIN-02 OBSERVATION (ROVER)

- 1-3/4" AC

- Hi: 5.25ft, 1.6m  
(Center of Bumper)



- START TIME: 1:50 pm

- END TIME: 7:17 pm

WHITE  
SHIELD

PROJECT 110-043-01

DATE 11-8-10

INST

4800's

CLIENT

Joe ROSE  
DENNIS HARTMANS

PROJECT

DATE

CLIENT

WATERSHED

LIDAR

PROJECT

T

DATE

WHITE  
SHIELD

JOB NAME 9815 - SMELT

TASK STATIC

TQ SMELT GPS 1995 1/2" ROD  
IN 4" PVC COLLAR  
HT: 1.708m / 5.60'

START: 7:40 AM  
END: 12:14 PM

HT: 1.683m / 5.52'

START: 12:15 PM

WHITE  
SHIELD

JOB NO: 110-043-01

DATE: 11-3-10

ID#1  
4800/9815

CREW: J ROSE  
D HARTMANS

US. OFFICE

RE

INCHES

SCALE

1

SCALE

WHITE  
SHIELD

JOB NAME 0330-DECEP-01

TYPE STATIC

T/C DECEP-01: 0.7 mi SOUTH OF FR 434  
2" ALL 0-2' ABOVE GROUND.  
15' SOUTH OF EG

HT: 1.554 m / 5.10'

START: 9:35 AM

END: 1:23 PM

HT: 1.559 m / 5.115'

~~DRIVE TO DIR:~~

START: 1:25 PM

DRIVE TO DIR: FROM EXIT 22 ON I-90,

TURN NORTH OFF RAMP, TURN RIGHT @  
"T", HEADING <sup>WEST ON</sup> FOR WOLF LODGE CR. / FRONTAGE RD

TRAVEL 0.9 MILES TO WOLF LODGE CR RD. (124)  
LEFT. TRAVEL 3.6 MILES TO MARIES CR.

RD (125), TURN RIGHT. TRAVEL 10.3 MILES ON  
125 (ALSO 202) TO RD 434. TURN LEFT (NW) \*

TRAVEL 1.1 MILES TO UN-NAMED ROAD, TURN  
LEFT (S). TRAVEL 0.7 MILES TO WIDE AREA  
IN ROAD TO 2" ALL.

WHITE  
SHIELD

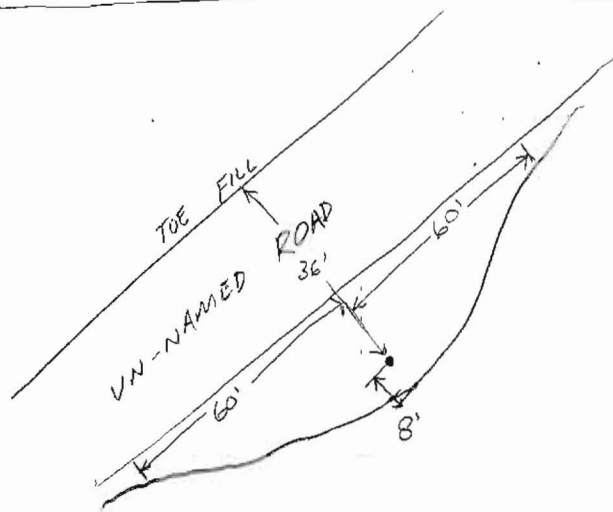
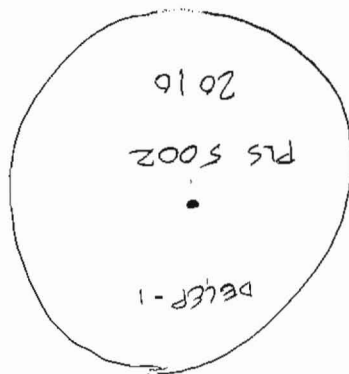
REFNO 110-043-01

DATE 11-3-10

INST  
4800/0330

PERSON  
ROSE  
HARTMANS

N



2

WHITE  
SHIELD

JOB NAME 9857-DECEP-02

DESC. STATIC

K@ DECEP-02 2" ALL PLS 500Z 2010  
10' SOUTH OF EG RD. 434

HT: 1.493 m / 4.90'

START: 9:57 AM

END: 1:32 PM

HT: 1.457 m / 4.78'

START: 1:33 PM

DRIVE TO DIR: SAME AS DECEP-01 UP TO \*.  
TRAVEL 1.9 MILES TO WIDE AREA  
IN ROAD, 2" ALL ON LEFT.

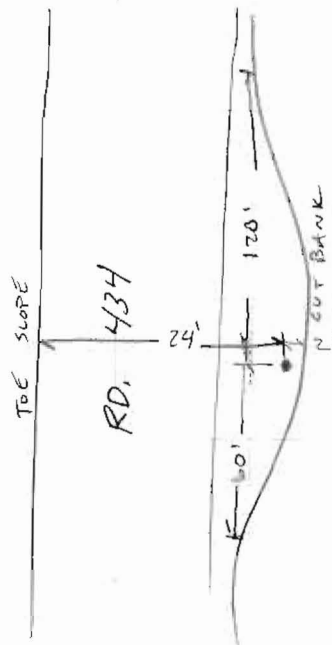
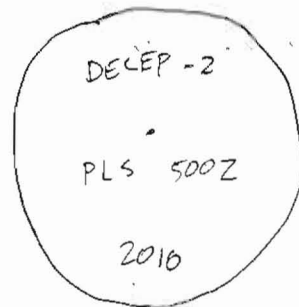
WHITE  
SHIELD

JOB NO. 110-043-01

DATE 11-3-10

INST.  
4800/9857

CLIENT  
ROSE  
HARTMANS



WHITE SHIELD

3



WHITE  
SHIELD

JOB NAME 0540 - SVO393 - M 134

DISK STATIC

# @ M-134 3 1/2" BD. IN CONC. 0.3'  
ABOVE GRD.

HT: 1.419 m / 4.655'

START: 11:06 AM

END: 2:37 PM

HT: 1.335 m / 4.38'

START: 2:39 PM

WHITE  
SHIELD

LOG # 110-043-01

DATE 11-3-10

DISK #

FE

WEATHER

INST:  
4800/0540

ESLW  
J ROSE  
D HARTMANS

1/7

10-7-10

"POTLACH / ELK"

BOB-10 WITESHIELD

π & φ : J. GARLAND

☰ : J. GARLAND

+/- 60°F

HARD RAIN

WILL CLEAR-UP

1009

MOSCOW CBL 0

1ST OBS

5700 BASE

HI 4973 FT 151<sup>60</sup> CM  
(BOTTOM OF NOTCH)

START: 9:46 AM

STOP: 2:20 PM

\* SEE NGS DATA SHEET FOR LOC.

\* SEE PHOTO

FOR INFORMATION OR TO REPORT DAMAGE WRITE  
 CALIBRATION BASELINE  
 O M  
 1987  
 THE DIRECTOR  
 NATIONAL GEODETIC SURVEY  
 WASHINGTON DC

\* 3/4 BC. ON 1 1/2 FT DIAM CON CYL  
FUSIT W/ GRND

2/7

1015 = 1009

MOSCOW CBL 0

2ND OBS

5700 BASE

HI 4755 FT 145<sup>0</sup> CM  
(BOTTOM OF NOTCH)

START: 2:25 PM

STOP: 7:37 PM

\* 2hr DELAY ...  
DATA STARTS @ 4:25 PM

3/7

1010

BOVL GPS

1<sup>ST</sup> OBS

5800 ROVER

HI : 5<sup>140</sup> FT      156<sup>60</sup> CM

(BOTTOM OF MOUNT)

START: 10:49 AM

STOP: 1:32 PM

= 1" IRON ROD IN  
CANISTER

- SEE PHOTO

- SEE NGS DATA SHEET  
FOR LOCATION

1014 = 1010

2<sup>ND</sup> OBS

BOVL GPS

5800 ROVER

HI : 4<sup>820</sup>      146<sup>9</sup> CM

(BOTTOM OF MOUNT)

START: 1:36 PM

STOP: 6:49 PM

- 2<sup>ND</sup> DELAY ...

DATA STARTS @ 3:36 PM

1013

T: RB ROVER

4/7

ELK-01

HI 4960

15120 cm

START: ~~4960~~ 11:50 AM

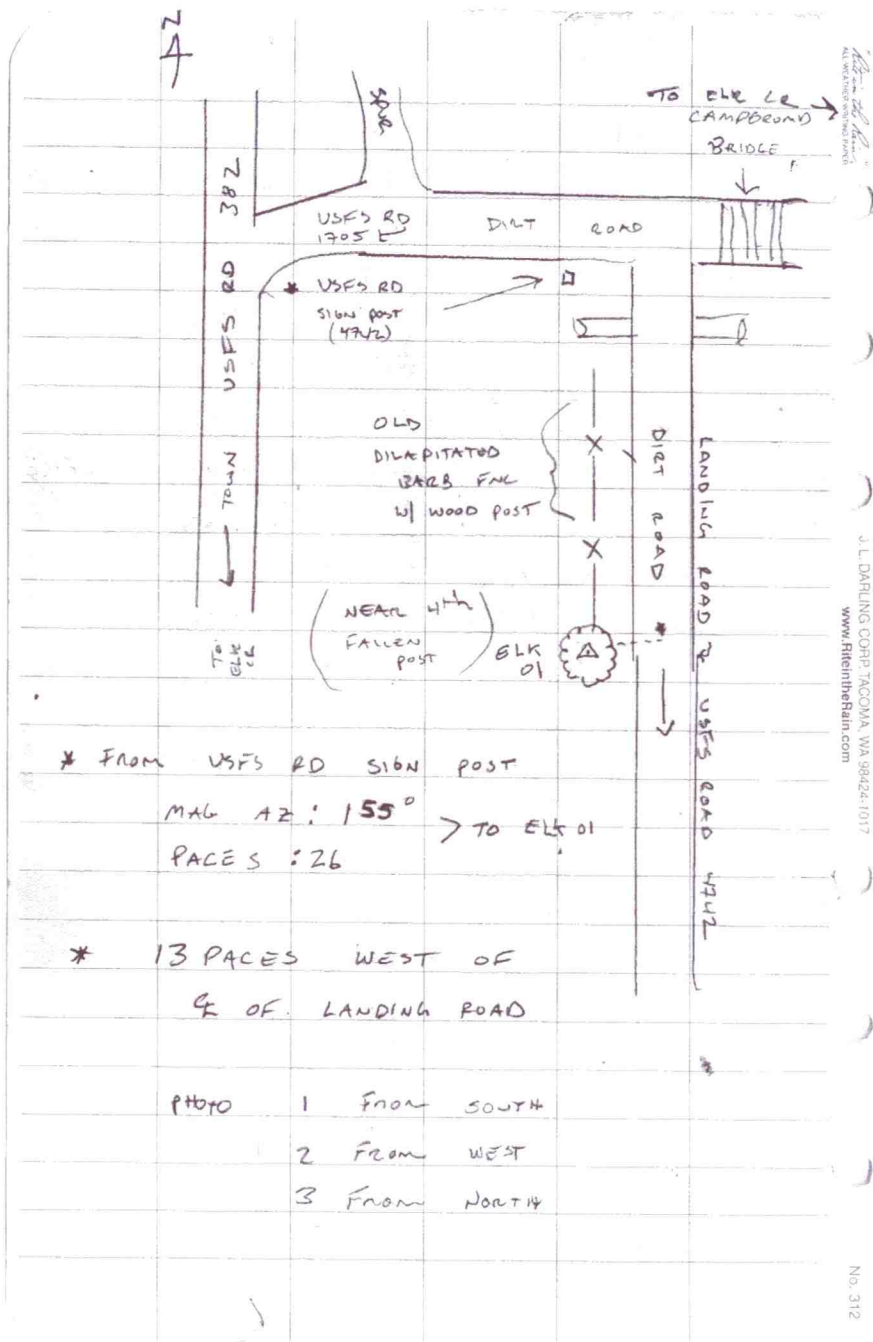
STOP: 6:09 PM

- SET  $\frac{5}{8}$ " x 24" REBAR w/  
2" AC. FLUSH w/ GRENDS SURFACE

- STAMPED AS SHOWN

- SEE PHOTO FOR STAMPING  
# LOCATION

- SEE LOCATION DESC BACK  
OF THIS PAGE



ELK 01 (CONT)... LOCATION

5/7

→ APPROACHING ELK RIVER (TOWN)

ON Hwy 8 COME TO

MAIN "T" INTERSECTION

→ GO LEFT TOWARD ELK CL

CAMPGROUND ON USFS 382

0.5 MILES TO INT

OF USFS RD 382 & 1705

→ (R) ONTO USFS RD 1705

GO 0.1 MILES TO

LANDING ROAD / USFS RD 4942

ON RIGHT

→ RIGHT ONTO SAID ROAD

A ELK 01 ON RIGHT +/- 150 FT

Down ROAD

→ SEE SKETCH

ID#

POT-01

6/7

π: RB BASE

HI ~~4.5~~ 5.55 FT 169.4 cm  
(BUMPER)

START: 11:10 AM

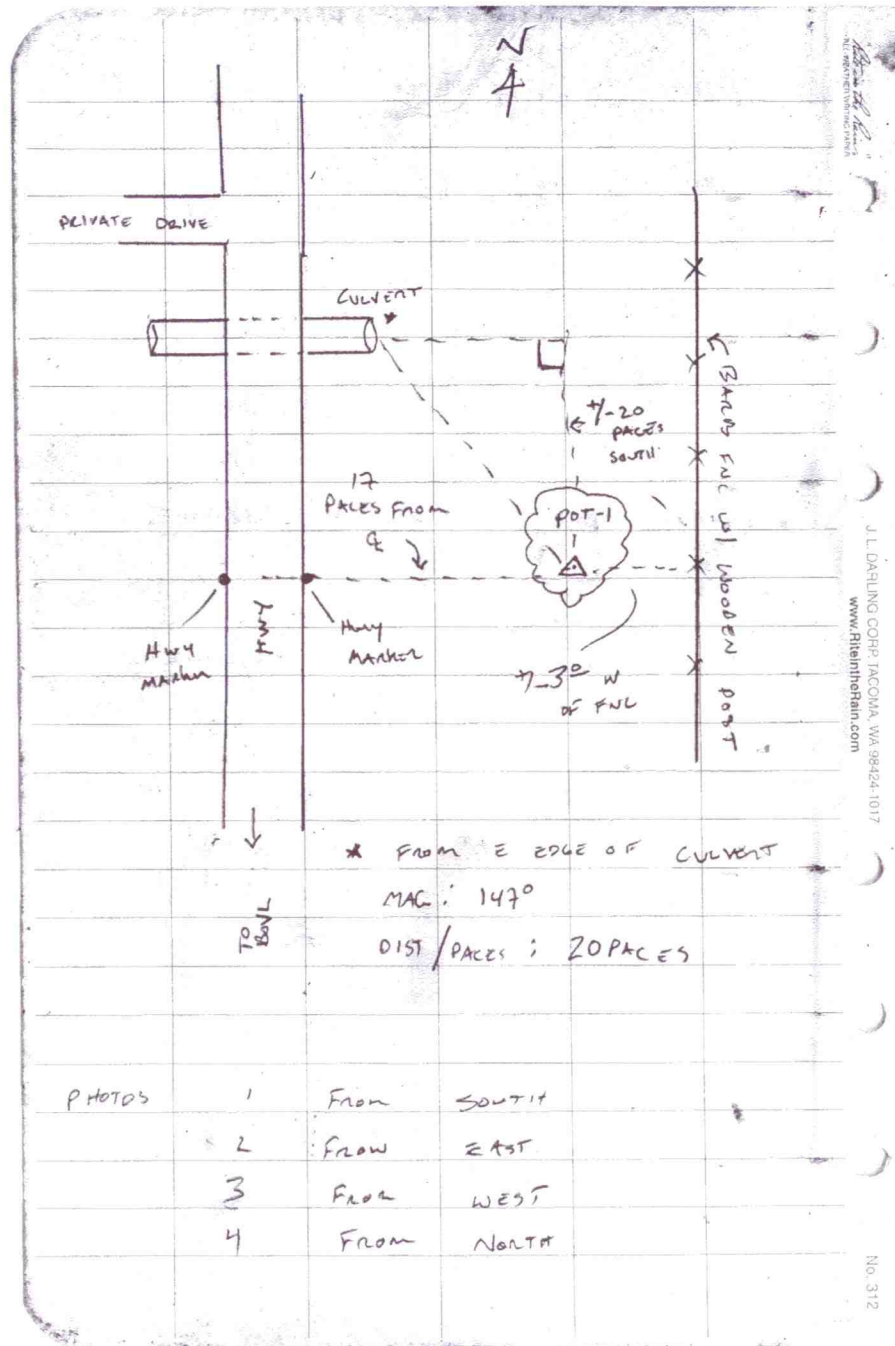
STOP: 6:40 PM

- SET 5/8 x 24" REBAR w/ 2" AC  
FLUSH w/ GRNDS SURFACE

- STAMPED AS SHOWN

- SEE PHOTOS FOR STAMPING  
LOCATION

- SEE LOCATION DESC ON  
BACK OF THIS PAGE



POT-01 CONT., LOCATION

7/7

→ IN THE TOWN OF  
BROVL

→ FROM INT OF HWY  
3&8

→ GO NORTH ON 1ST AVE  
(THIS IS A LEFT)

≈ 3.5 MILES AND

POINT IS ON (R)

ALONG BARB FUL

— SEE SKETCH



WHITE  
SHIELD

JOBNAME 9857-SNP A

TASK STATIC

TR@ SNP-A STEEL ROIDS IN 4" PVC IN

CONC. COLLECT 0.3' DWN

HT: 1.687m / 5.535' ✓

START: 9:27 AM

HT: 1.165m / 3.824' ✓

START: 1:13 PM

WHITE  
SHIELD

CRONO 110-043-01

DATE 11-04-110

INST  
4800/9857

CREW  
ROSE  
HARTMANS

DR TO/FROM

BY

WEATHER



NO. OF HOLE(S)

5

DATE

WHITE  
SHIELD

JOB NAME 0540 - PRIEST - 1

TASK

K@ PRIEST - 1 2 1/2" ALL FUSH W/  
GROUND.

HT: 1.646m / 5.40' ✓

START: 11:20 AM

HT: 1.614m / 5.30' ✓

START: 2:14 PM

DRIVE TO DIR: STARTING AT INT.  
OF HWY 57 & HWY 2 GO  
EAST ON 2 FOR 1.2 MILES. TURN  
LEFT ON EAST SIDE RD. GO  
NORTH FOR 12.7 MILES TO "4"  
INT. TURN RIGHT ON EAST RIVER  
RD. GO NORTH FOR 3.1 MILES  
TO 2 1/2" ALL ON RIGHT. 9'  
NORTH OF GUARDRAIL. 20' EAST  
OF 4" E. RIVER RD.

WHITE  
SHIELD

JOB NO 110-043-01

IN OFFICE

DATE 11-4-10

TO

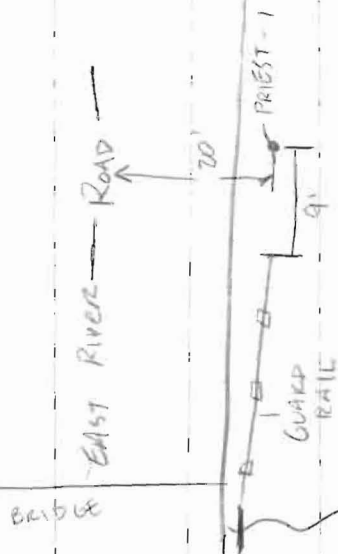
INST

4800/0540

CREW

ROSE  
HARTMAN

WEATHER



IN FIELD

6

OFFICE

WHITE  
SHIELD

JOB NAME 9815-N 283

TASK STATIC

π@ N 283 1982 3/2" BD

HT: 1.509 m / 4.95' ✓

START: 11:58 AM

HT: 1.474 m / 4.84'

START: 2:40 PM

WHITE  
SHIELD

JOB NO 110-043-01

DATE 11-4-10

INST  
4800/9815

CREW  
ROSE  
HARTMANS

#K/OFFIC.

PG

WEATHER

PG. (FIELD)

7

OF PG

1/5

10-6-10  
"WALDE"

1808-10 WHITESHIELD

π & φ : J. GARLAND  
☐ : J. GARLAND

+/- 65°F

COOL / CALM  
PARTLY CLOUDY

1003

2/5

RB BASE

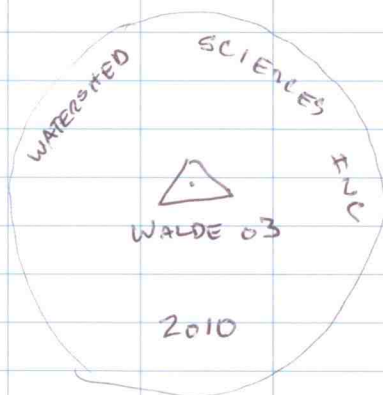
WALDE 03

HI: 6<sup>065</sup> FT      184<sup>0</sup> CM  
 (CENTER OF BUMP)

START: 8:11 AM

STOP: 7:23 PM

- 2" AC FLUSH W/ GRND



- SEE PHOTO
- SEE EXCEL DESG FOR LOCATION

1004

3/5

RB ROVER

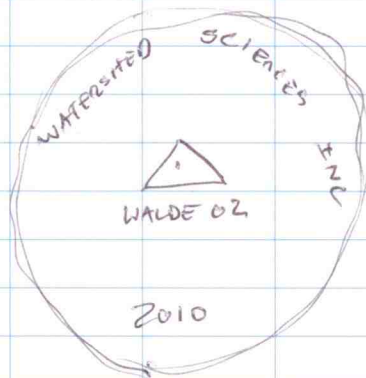
WALDE 02

HI: 5<sup>335</sup>      162<sup>5</sup> CM  
 (CENTER OF BUMPER)

START: 8:49 AM

STOP: 7:47 PM

- 2" AC FLUSH W/ GRND



- SEE PHOTO
- SEE EXCEL SHEET FOR LOCATION

1005

4/5

5700 BASE

1<sup>ST</sup> OBS

KAMI GPS

HI: 5 <sup>27~~8~~</sup> FT 160 <sup>80</sup> CM

(BOTTOM OF NOTCH)

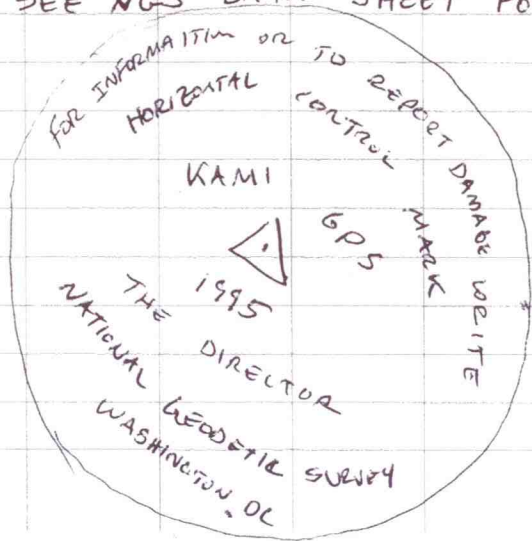
START: 9:35 AM

STOP: 11:10 AM

\* 3/4 BC. IN 1" FT DIAM  
CONC. CYLD FLUSH  
W/ BEND.

\* SEE PHOTO

\* SEE NGS DATA SHEET FOR LOC.



1006 = 1005

2<sup>ND</sup> OBS

KAMI GPS

HI: 5 <sup>065</sup> FT 154 <sup>40</sup> CM

(BOTTOM OF NOTCH)

START: 11:16 AM

STOP: 6:30 ISH PM

5700 BASE

1007

5/5

FLAT GPS

1<sup>st</sup> OBS

~~HI:~~ 5800 ROVER

HI: 5 <sup>850</sup> FT 178 <sup>30</sup> CM  
(BOTTOM OF MOUNT)

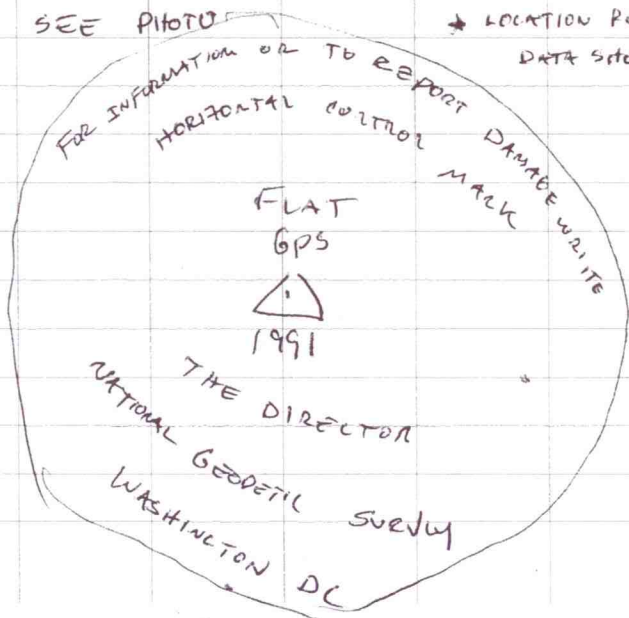
START: 12:33

STOP: 2:10 PM

\* 3/4 BC. ON 12 FT DIAM  
CONC. CYL 12 FT  
BELOW SURFACE

\* SEE PHOTO

\* LOCATION PER  
DATA SHEET



1008 = 1007

2<sup>nd</sup> OBS

FLAT GPS

5800 ROVER

HI: 5 <sup>570</sup> FT 169 <sup>70</sup> CM  
(BOTTOM OF MOUNT)

START: 2:14 PM

STOP: 5:46 PM

\* NOTE: GOOD DATA STARTS  
@ 4:14 PM  
(- 2h DELAY)