

# Ground Control Survey Report



UNITED STATES GEOLOGICAL SURVEY  
FEMA HQ – CARBON WY QL2 LIDAR

TASK ORDER NUMBER: G15PD00641

Contractor: Woolpert, Inc.  
Woolpert Project # 75826

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# Ground Control Survey Report

UNITED STATES GEOLOGICAL SURVEY FEMA HQ – CARBON WY QL2 LIDAR

Task Order G15PD00641

## Woolpert

4454 Idea Center Boulevard  
Dayton, Ohio 45430.1500  
Phone: 937.461.5660

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# Section 1: Survey Report

## TASK ORDER NAME: UNITED STATES GEOLOGICAL SURVEY MT STILLWATER COMPLEX QL2 LIDAR

Task Order: #G15PD00641

This report contains a comprehensive outline of the Ground Control Survey that supported the Carbon, WY airborne LiDAR collection. All surveys were performed in such a way as to achieve ground control accuracies that meet or exceed the National Mapping Accuracy Standards.

## Project Area

The project area consists of approximately 2,425 square miles over portions of Carbon County, WY.

## Purpose

The purpose of this survey was to establish three-dimensional coordinates for 67 LiDAR primary control points and 156 ground classification check points. The points were collected per the flight layout and were uniformly dispersed over the project area.

## Date of Survey

Multiple ground control field missions took place July 20<sup>th</sup> through August 18<sup>th</sup>, 2016.

## Monumentation

Prior to aerial acquisition, Woolpert field crews performed a field reconnaissance to verify the existence and suitability of pre-selected existing National Geodetic Survey (NGS) control stations. These existing NSRS control stations were utilized as checks to ensure that quality x, y, and z coordinate values were computed for each of the newly established LiDAR control stations. Recovery information sheets for the existing NGS control stations can be found in Section 4 of this report. A control diagram showing the ground control stations used to support this mapping project can be found in Section 5 of this report.

## Accuracy Standards

The relative accuracy of the lidar data will be  $\leq 8$  cm RMSEZ between adjacent swaths with a maximum difference of  $\pm 16$  cm.

The data collected shall meet the National Standard for Spatial Database Accuracy (NSSDA) accuracy standards. The NSSDA standards specify that vertical accuracy be reported at the 95 percent confidence level for data tested by an independent source of higher accuracy.

The accuracy (ACCz) for the derived DEM shall be calculated in three ways, and reported in the metadata accordingly.

The RMSEZ (Non-Vegetated) is required to meet  $\leq 10.0$  cm.

The Non-Vegetated Vertical Accuracy (NVA) is required to meet  $\leq 19.6$  cm at a 95% confidence level, derived according to NSSDA, i.e., based on RMSEZ of 10.0 cm in the “open terrain” and/or “urban” land cover categories.

The Vegetated Vertical Accuracy (VVA) is required to meet  $\leq 29.4$  cm at a 95th percentile level, derived according to ASPRS Guidelines, Vertical Accuracy Reporting for Lidar Data, i.e., based on the 95th percentile error in Vegetated land cover categories combined (Brush Lands/Trees and Forested Areas).

## GPS Equipment

Woolpert utilized 3 Trimble Navigation R8 Model 3 GNSS dual-frequency GPS receivers, 1 Trimble Navigation R10 Model GNSS dual-frequency GPS receiver and 1 TSC3 data collector for this project.

## Methodology

### Real-Time Kinematic (RTK) GPS

The field crew utilized Real-Time Kinematic (RTK) and GPS Rapid Static methods throughout the ground control data collection process. Using these techniques, observations were performed on a total of 67 LiDAR control points and 156 ground classification check points. The survey was conducted using a 1-second epoch rate, in a fixed solution RTK mode, with each observation lasting between 60 to 180 seconds. Each station was occupied twice to insure the necessary horizontal and vertical accuracies were being met for this LiDAR / photogrammetric project.

### GPS Data Analysis and Processing

The field crew chief processed all session baselines each day using Trimble Navigation’s Trimble Business Center (TBC) Version 3.80 baseline processor with the accompanying broadcast ephemeris. Daily processing ensured the integrity of the network as it was constructed, and allowed the field crews to immediately reschedule observations of poor baselines.

### Datum Reference and Final Coordinates

The spatial reference system for this project is will be UTM Zone 13 North. The datum shall be NAD83 (2011) meters to 2 decimal places horizontal and NAVD88 Meters vertical using the latest geoid model (GEOID12B) Units for both the horizontal and vertical datum will be expressed in meters to two (2) decimal places.

### Quality Assurance

Existing NSRS published continuously operating reference stations were utilized to assure that there were no discrepancies in the field observation data. Close examinations of the residuals showed no distortions in orientation or scale. The ground control data meets positional accuracies necessary to support 1.0 point per 0.3 meters squared (1’ GSD) data at 95% confidence level as outlined in the Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy (NSSDA), published by the Federal Geographic Data Committee (FGDC-STD-007.3-1998).

# Section 2: Ground/Geodetic Control Coordinate Listings

Coordinate System: Grid

HORIZONTAL DATUM: NAD83 2011 UTM 13 NORTH

VERTICAL DATUM: NAVD88

GEOID MODEL: GEOID 12A

UNITS: Meters

## LiDAR Ground Control

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
1001	4549951.755	282351.587	1992.913	LiDAR Control
1002	4556820.888	277417.403	1937.383	LiDAR Control
1003	4547449.277	276528.214	1906.547	LiDAR Control
1004	4544589.58	284642.318	1959.239	LiDAR Control
1005	4553603.889	278915.355	1930.007	LiDAR Control
1006	4555837.622	297395.121	2283.642	LiDAR Control
1007	4544490.452	300087.606	2144.675	LiDAR Control
1008	4544440.911	293903.245	1970.775	LiDAR Control
1009	4550487.89	304170.817	2152.36	LiDAR Control
1010	4551333.97	299259.408	2033.773	LiDAR Control
1011	4591255.094	316288.563	2259.382	LiDAR Control
1012	4585720.814	307654.364	2353.489	LiDAR Control
1013	4587612.783	314057.346	2438.802	LiDAR Control
1014	4588483.916	310188.931	2307.427	LiDAR Control
1015	4630609	314335.303	2095.264	LiDAR Control
1016	4627601.977	294991.908	2033.055	LiDAR Control
1017	4617994.247	298459.465	2193.824	LiDAR Control
1018	4620899.051	311367.107	2205.152	LiDAR Control
1019	4591315.819	349118.944	2068.089	LiDAR Control
1020	4584215.859	327797.369	2255.722	LiDAR Control
1021	4562744.874	346472.654	2385.033	LiDAR Control
1022	4581592.537	353347.38	2141.784	LiDAR Control

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
1023	4578929.468	344360.27	2179.392	LiDAR Control
1024	4580157.149	370550.255	2394.683	LiDAR Control
1025	4579799.141	367123.747	2379.295	LiDAR Control
1026	4564378.681	357284.055	2205.127	LiDAR Control
1027	4565437.118	372004.896	2399.428	LiDAR Control
1028	4569800.701	363331.884	2173.938	LiDAR Control
1029	4623651.458	311719.488	2181.944	LiDAR Control
1030	4622794.692	346204.744	2082.584	LiDAR Control
1031	4604762.63	332669.85	2053.942	LiDAR Control
1032	4627344.28	376743.263	2178.286	LiDAR Control
1033	4616356.875	366521.576	2200.284	LiDAR Control
1034	4603520.152	403162.701	2355.693	LiDAR Control
1039	4613097.847	410545.452	2184.174	LiDAR Control
1040	4636155.34	407594.22	2047.186	LiDAR Control
1041	4643056.976	398647.964	2024.004	LiDAR Control
1042	4638274.305	329585.937	1968.87	LiDAR Control
1043	4671624.704	340991.301	2159.606	LiDAR Control
1044	4654069.287	373834.302	1992.94	LiDAR Control
1045	4637045.986	352842.841	2077.636	LiDAR Control
1046	4617333.477	340527.573	2053.079	LiDAR Control
1047	4632239.297	365836.429	2149.583	LiDAR Control
1048	4609074.768	394699.197	2365.948	LiDAR Control
1049	4614599.981	367597.907	2273.626	LiDAR Control
1050	4635213.304	382335.214	2067.86	LiDAR Control
1051	4647844.391	399177.092	2052.49	LiDAR Control
1052	4634736.932	371394.01	2109.561	LiDAR Control
1053	4649975.273	373722.119	1998.701	LiDAR Control
1054	4628398.655	355388.006	2185.198	LiDAR Control
1055	4654804.514	360475.94	2028.502	LiDAR Control
1056	4668428.759	342398.814	2043.626	LiDAR Control
1057	4639062.073	355117.351	2003.823	LiDAR Control
1058	4669011.946	342300.393	1886.967	LiDAR Control
1059	4593431.704	352322.65	2091.295	LiDAR Control
1060	4594842.356	354238.783	2114.178	LiDAR Control
1061	4595363.032	355726.872	2115.984	LiDAR Control
1062	4559752.635	347424.546	2453.38	LiDAR Control
1063	4595807.26	358162.524	2136.7	LiDAR Control
1064	4557011.463	351970.272	2604.345	LiDAR Control

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
1065	4558920.914	347001.074	2532.943	LiDAR Control
1066	4650488.942	393599.329	2035.625	LiDAR Control
1067	4660526.58	340808.857	2005.571	LiDAR Control

### Quality Control Points

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
2001	4552919.28	279355.501	1924.459	QCP
2001 A	4552950.934	279358.9	1924.466	QCP
2002	4548376.1	277674.282	1913.902	QCP
2003	4549516.992	279760.395	1943.193	QCP
2004	4545854.016	294852.231	2028.759	QCP
2005	4554613.838	301634.001	2151.166	QCP
2006	4551301.949	299235.04	2033.071	QCP
2006 A	4551278.145	299211.506	2032.724	QCP
2007	4586856.35	309315.736	2340.881	QCP
2008	4588050.148	314197.181	2424.687	QCP
2008 A	4588118.965	314255.55	2421.61	QCP
2009	4589776.735	311910.954	2378.157	QCP
2009 A	4589737.779	311887.128	2377.588	QCP
2010	4627388.449	295049.39	2031.475	QCP
2011	4627435.712	307936.493	2113.242	QCP
2012	4620590.26	302844.169	2191.781	QCP
2013	4569391.933	363646.187	2164.333	QCP
2014	4576766.448	365653.437	2301.054	QCP
2015	4565343.383	366889.638	2258.942	QCP
2015 A	4565378.698	366869.901	2259.61	QCP
2016	4566925.017	349366.194	2208.155	QCP
2017	4589261.116	345881.097	2123.559	QCP
2018	4585342.717	329490.25	2223.979	QCP
2019	4571753.062	339348.969	2296.074	QCP
2020	4579613.955	344838.374	2168.224	QCP
2020 A	4579669.8	344879.618	2166.031	QCP
2021	4627296.973	324133.071	2011.177	QCP
2022	4624877.39	346586.008	2019.426	QCP
2023	4626838.831	338242.726	1982.577	QCP

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
2024	4615992.277	382160.248	2214.72	QCP
2025	4605349.491	399398.068	2348.595	QCP
2025 A	4605391.737	399289.302	2348.808	QCP
2026	4612226.001	406126.235	2212.752	QCP
2026 A	4612178.608	406153.764	2212.736	QCP
2027	4638280.787	401324.545	1987.548	QCP
2028	4636714.55	368683.165	2069.715	QCP
2029	4600444.553	343212.269	2041.316	QCP
2030	4616961.098	338967.899	2073.648	QCP
2031	4669286.9	341685.211	1948.153	QCP
2032	4652826.399	382770.868	1998.152	QCP
2033	4622980.057	399293.499	2073.681	QCP
2034	4659785.974	340862.766	2005.35	QCP
2035	4638537.867	329092.125	1957.431	QCP
2036	4653731.229	362192.229	2027.377	QCP
2037	4637073.554	352864.213	2077.202	QCP
2037 A	4637095.56	352832.742	2077.429	QCP
2038	4629881.195	359831.882	2127.84	QCP
2039	4643598.685	390213.694	2003.904	QCP
2040	4650022.275	373741.193	1997.977	QCP
2040 A	4650053.248	373752.37	1997.503	QCP
2041	4630588.884	375358.395	2207.215	QCP
2042	4614019.184	354507.234	2077.087	QCP
2043	4627771.444	302834.531	2108.174	QCP
2044	4587273.406	337174.78	2250.89	QCP
2044 A	4587307.928	337254.277	2248.493	QCP
2045	4564947.173	357298.24	2205.615	QCP
2046	4576958.945	357071.181	2129.418	QCP
2046 A	4576931.446	357092.949	2129.262	QCP
2047	4633875.781	338995.33	2016.499	QCP
2047 A	4633960.37	338993.005	2016.267	QCP
2048	4631710.01	332108.475	1974.919	QCP
2048 A	4631685.948	332016.497	1977.361	QCP
2048 B	4631689.102	332016.56	1981.903	QCP
2049	4623308.935	381088.813	2236.888	QCP
2050	4633848.441	393088.767	2042.345	QCP
2051	4598234.871	384250.129	2530.846	QCP
2052	4608482.982	381954.703	2310.988	QCP



Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
2053	4623098.117	372697.98	2231.253	QCP
2054	4621250.206	358835.677	2100.884	QCP
2054 A	4621251.312	358832.639	2100.823	QCP
2055	4639816.938	363717.164	2196.663	QCP
2055 A	4639839.455	363692.794	2195.831	QCP
2056	4623186.698	403864.013	2186.149	QCP
2056 A	4623217.647	403865.727	2185.74	QCP
2057	4619936.865	391007.153	2162.596	QCP
2058	4629180.997	367358.665	2097.757	QCP
2059	4612364.562	336058.176	2112.716	QCP
2059 A	4612392.843	336072.755	2114.172	QCP
2060	4619433.997	403364.942	2202.728	QCP
2061	4544469.922	299799.205	2125.985	QCP
2062	4645869.985	371776.437	2078.945	QCP
2062 A	4645898.813	371793.683	2078.973	QCP
2063	4627947.565	353768.327	2120.425	QCP
2064	4618557.727	299625.938	2217.193	QCP
2064 A	4618580.059	299650.366	2217.111	QCP
2065	4621655.224	366656.818	2181.058	QCP
2066	4647382.498	365424.632	2104.837	QCP
2066 A	4647366.023	365472.921	2106.504	QCP
2067	4630266.97	388502.305	2148.036	QCP
2068	4618324.71	373189.427	2236.39	QCP
2069	4617603.374	363624.191	2139.493	QCP
2070	4619288.326	348377.741	2012.82	QCP
2071	4669669.4	340611.51	2004.008	QCP
2072	4655705.565	374559.81	2001.226	QCP
2073	4620563.554	378648.805	2240.678	QCP
2074	4636232.595	404584.565	2024.742	QCP
2075	4632229.471	392282.306	2048.742	QCP
2076	4642229.417	349915.763	1978.869	QCP
2077	4628658.287	299709.882	2067.204	QCP
2077 A	4628602.389	299712.901	2067.477	QCP
2078	4590807.426	316105.127	2300.866	QCP
2079	4548892.93	297910.268	2017.274	QCP
2080	4608900.684	395442.443	2358.437	QCP
2081	4647839.53	388586.195	2061.966	QCP
2082	4581297.23	336320.812	2225.914	QCP

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
2083	4576159.592	353885.072	2134.006	QCP
2084	4571316.368	358600.006	2147.289	QCP
2084 A	4571295.581	358574.239	2148.634	QCP
2085	4556811.639	277389.702	1937.908	QCP
2086	4595936.616	355523.935	2116.077	QCP
2087	4606578.012	354368.788	2125.821	QCP
2088	4559607.143	347377.835	2471.457	QCP
3001	4548449.032	277775.214	1912.339	QCP
3002	4557877.669	276861.318	1940.702	QCP
3002 A	4557920.167	276855.073	1940.692	QCP
3003	4545896.194	294804.485	2032.298	QCP
3004	4546420.861	281843.257	1935.725	QCP
3004 A	4546436.974	281787.436	1935.934	QCP
3005	4554964.249	301192.477	2078.254	QCP
3006	4550371.996	298578.829	2023.844	QCP
3007	4586974.93	308901.427	2363.173	QCP
3007 A	4586955.36	308887.818	2366.431	QCP
3008	4587431.584	313926.606	2427.788	QCP
3009	4589814.449	311875.789	2381.034	QCP
3009 A	4589740.783	311830.545	2382.555	QCP
3010	4627415.741	307966.791	2112.372	QCP
3011	4627743.399	302741.667	2106.473	QCP
3012	4620550.659	302860.353	2190.468	QCP
3013	4618536.408	299651.898	2215.815	QCP
3014	4576861.919	365546.04	2311.023	QCP
3015	4572098.052	362886.684	2211.953	QCP
3016	4566902.74	349346.46	2207.635	QCP
3017	4571835.104	339506.361	2296.309	QCP
3018	4579679.691	344818.454	2164.825	QCP
3019	4600475.191	342774.34	2045.825	QCP
3020	4627302.38	324205.464	2011.024	QCP
3021	4626970.665	338287.255	1980.552	QCP
3021 A	4627035.784	338279.603	1978.595	QCP
3021 B	4627057.322	337939.618	1982.09	QCP
3022	4627062.023	338293.933	1974.243	QCP
3023	4615999.883	382406.432	2213.994	QCP
3024	4607705.147	381837.512	2314.306	QCP
3025	4598230.965	384262.233	2532.352	QCP

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
3026	4598254.078	384209.597	2526.277	QCP
3027	4605568.004	399168.728	2347.936	QCP
3028	4603900.9	397485.901	2389.769	QCP
3029	4620011.14	390347.597	2134.191	QCP
3030	4619814.933	390350.836	2152.673	QCP
3031	4638254.792	401358.49	1987.76	QCP
3032	4636761.292	368750.106	2072.406	QCP
3033	4631727.145	332547.827	1963.958	QCP
3033 A	4631749.248	332533.609	1964.209	QCP
3034	4631699.002	332081.823	1975.592	QCP
3034 B	4631695.627	332017.846	1976.336	QCP
3035	4614017.639	354428.33	2077.425	QCP
3036	4621693.505	366610.207	2182.265	QCP
3037	4618413.399	373942	2228.585	QCP
3038	4622996.128	399281.08	2075.552	QCP
3038 A	4622978.198	399246.115	2076.7	QCP
3039	4669648.646	340536.186	2007.088	QCP
3040	4669269.803	341710.955	1946.657	QCP
3040 A	4669265.966	341739.882	1946.357	QCP
3041	4659760.641	340849.745	2006.224	QCP
3042	4643915.378	390284.946	1998.916	QCP
3043	4652817.263	382738.239	1996.217	QCP
3044	4619250.358	348405.907	2012.371	QCP
3045	4627907.16	353767.101	2115.694	QCP
3046	4647388.741	365476.214	2107.17	QCP
3047	4629221.363	367353.178	2097.987	QCP
3048	4637738.95	329346.114	1956.389	QCP
3048 A	4637772.945	329377.606	1956.199	QCP
3049	4612334.141	336096.752	2108.527	QCP
3049 A	4612303.617	336117.955	2108.276	QCP
3050	4624759.173	346587.472	2019.301	QCP
3051	4638226.842	353119.577	2082.78	QCP
3052	4629913.648	359845.29	2126.638	QCP
3053	4653691.807	362226.059	2027.656	QCP
3054	4650033.075	373721.298	1998.344	QCP
3055	4610840.199	403896.67	2225.525	QCP
3056	4655734.382	374597.131	2001.667	QCP
3057	4620596.608	378669.286	2242.693	QCP

Point No.	UTM Zone 13 North (Meters)		Ortho Height (NAVD88) (m)	Description
	UTM Northing (m)	UTM Easting (m)		
3058	4636225.948	404535.391	2024.352	QCP
3059	4632259.276	392322.576	2048.43	QCP
3060	4639818.295	363763.169	2196.156	QCP
3060 A	4639764.75	363788.616	2195.969	QCP
3061	4633977.998	339022.179	2017.301	QCP
3061 A	4633994.485	339051.494	2017.845	QCP
3062	4590674.385	342627.925	2121.277	QCP
3062 A	4590680.005	342610.979	2120.839	QCP
3063	4622613.981	352588.141	2030.485	QCP
3064	4627273.934	295164.416	2031.336	QCP
3064 A	4627296.362	295061.089	2031.214	QCP
3065	4547833.848	297502.338	2002.769	QCP
3066	4559687.366	347381.265	2463.83	QCP
3067	4595777.365	358159.226	2136.245	QCP
3068	4606634	353043.607	2128.484	QCP

### NGS Control Points

Point No.	UTM Zone 13 North (Meters)			Description
	UTM Northing (m)	UTM Easting (m)	Ortho Height (NAVD88) (m)	
43 JFM	4618292.426	380247.426	2217.748	CONTROL
DISH	4586941.505	336054.754	2277.705	CONTROL
C 319 RESET	4627722.859	319503.893	2023.903	CONTROL
D 324	4624428.816	348193.428	2028.175	CONTROL
S 341	4628397.833	317234.206	2041.86	CONTROL
SINCLAIR	4629873.387	328816.487	2000.386	CONTROL
U 319	4625661.676	348214.935	2025.806	CONTROL
X 341	4624795.185	346617.836	2018.319	CONTROL
WALCOTT	4623586.336	347074.465	2053.962	CONTROL

### NGS Base Station Check Points

Point No.	Grid Deltas Published vs. Surveyed		
	Δ Northing (m)	Δ Easting (m)	Δ Ortho Height (NAVD88) (m)
U 319	N/A	N/A	-0.024
S 341	N/A	N/A	0.011
C 319 RESET	N/A	N/A	0.02

## Coordinate System: Geodetic

HORIZONTAL DATUM: NAD83 (2011) Epoch 2010.00

VERTICAL DATUM: NAVD88

UNITS: US Survey Feet

DATE: 3/5/2015

### LiDAR GROUND CONTROL

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
1001	41°04'18.16291"	-107°35'26.20376"	1978.67	LiDAR Control
1002	41°07'55.87836"	-107°39'06.37178"	1922.909	LiDAR Control
1003	41°02'51.41398"	-107°39'32.21331"	1891.973	LiDAR Control
1004	41°01'26.63956"	-107°33'41.39685"	1945.06	LiDAR Control
1005	41°06'13.13815"	-107°37'58.02303"	1915.597	LiDAR Control
1006	41°07'42.85456"	-107°24'49.13988"	2270.433	LiDAR Control
1007	41°01'37.59533"	-107°22'40.49486"	2131.408	LiDAR Control
1008	41°01'30.44380"	-107°27'05.02916"	1957.119	LiDAR Control
1009	41°04'55.49678"	-107°19'52.64788"	2139.47	LiDAR Control
1010	41°05'18.59981"	-107°23'23.95686"	2020.579	LiDAR Control
1011	41°27'06.71113"	-107°11'57.92170"	2246.973	LiDAR Control
1012	41°24'00.11474"	-107°18'03.43549"	2340.983	LiDAR Control
1013	41°25'06.84116"	-107°13'29.98404"	2426.495	LiDAR Control
1014	41°25'31.81208"	-107°16'17.48613"	2294.95	LiDAR Control
1015	41°48'20.21996"	-107°14'05.98832"	2081.641	LiDAR Control
1016	41°46'25.65448"	-107°27'59.80477"	2018.813	LiDAR Control
1017	41°41'17.59446"	-107°25'18.03516"	2179.917	LiDAR Control
1018	41°43'03.09685"	-107°16'03.43255"	2191.629	LiDAR Control
1019	41°27'33.31342"	-106°48'23.74317"	2055.89	LiDAR Control
1020	41°23'27.78078"	-107°03'34.99859"	2243.845	LiDAR Control
1021	41°12'05.48978"	-106°49'51.76821"	2373.682	LiDAR Control
1022	41°22'20.98366"	-106°45'13.07440"	2130.016	LiDAR Control
1023	41°20'48.59735"	-106°51'37.30056"	2167.649	LiDAR Control
1024	41°21'45.07673"	-106°32'51.70172"	2383.654	LiDAR Control
1025	41°21'31.46245"	-106°35'18.84757"	2368.078	LiDAR Control
1026	41°13'05.56789"	-106°42'09.15237"	2193.725	LiDAR Control

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
1027	41°13'48.74323"	-106°31'37.96937"	2388.477	LiDAR Control
1028	41°16'05.08154"	-106°37'53.89337"	2162.621	LiDAR Control
1029	41°44'32.57587"	-107°15'51.32664"	2168.37	LiDAR Control
1030	41°44'31.53370"	-106°50'58.37495"	2069.06	LiDAR Control
1031	41°34'37.34260"	-107°00'25.84321"	2041.115	LiDAR Control
1032	41°47'18.17401"	-106°29'00.12363"	2164.744	LiDAR Control
1033	41°41'16.08771"	-106°36'13.94926"	2187.242	LiDAR Control
1034	41°34'39.01254"	-106°09'41.83855"	2343.965	LiDAR Control
1039	41°39'52.62371"	-106°04'28.22838"	2171.936	LiDAR Control
1040	41°52'18.91657"	-106°06'48.73108"	2034.358	LiDAR Control
1041	41°55'58.70331"	-106°13'21.02076"	2010.867	LiDAR Control
1042	41°52'40.93518"	-107°03'13.45385"	1955.028	LiDAR Control
1043	42°10'50.22543"	-106°55'31.45647"	2146.52	LiDAR Control
1044	42°01'42.76727"	-106°31'26.68268"	1979.135	LiDAR Control
1045	41°52'17.93742"	-106°46'23.85016"	2063.502	LiDAR Control
1046	41°41'30.52125"	-106°54'58.76945"	2039.81	LiDAR Control
1047	41°49'50.46177"	-106°36'56.47716"	2135.616	LiDAR Control
1048	41°37'35.23061"	-106°15'50.75942"	2353.984	LiDAR Control
1049	41°40'19.78805"	-106°35'26.00437"	2260.732	LiDAR Control
1050	41°51'36.30586"	-106°25'03.54905"	2054.158	LiDAR Control
1051	41°58'34.14062"	-106°13'01.00109"	2039.421	LiDAR Control
1052	41°51'14.73619"	-106°32'57.57571"	2095.598	LiDAR Control
1053	41°59'30.00551"	-106°31'28.38942"	1984.755	LiDAR Control
1054	41°47'39.36777"	-106°44'25.88809"	2171.39	LiDAR Control
1055	42°01'58.47531"	-106°41'08.00822"	2014.577	LiDAR Control
1056	42°09'07.68568"	-106°54'27.02068"	2030.343	LiDAR Control
1057	41°53'24.78950"	-106°44'47.00321"	1989.636	LiDAR Control
1058	42°09'26.51260"	-106°54'31.87483"	1873.723	LiDAR Control
1059	41°28'44.03789"	-106°46'07.57520"	2079.051	LiDAR Control
1060	41°29'31.02176"	-106°44'46.22000"	2101.918	LiDAR Control
1061	41°29'48.86713"	-106°43'42.52040"	2103.748	LiDAR Control
1062	41°10'29.15235"	-106°49'08.23256"	2442.106	LiDAR Control
1063	41°30'04.83084"	-106°41'57.89163"	2124.53	LiDAR Control
1064	41°09'03.33652"	-106°45'50.84511"	2593.167	LiDAR Control
1065	41°10'01.90706"	-106°49'25.65044"	2521.699	LiDAR Control
1066	41°59'57.22618"	-106°17'05.03474"	2022.355	LiDAR Control
1067	42°04'50.45822"	-106°55'28.50576"	1991.889	LiDAR Control

## Quality Control Points

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
2001	41°05'51.39090"	-107°37'38.28826"	1910.067	QCP
2001 A	41°05'52.41965"	-107°37'38.18356"	1910.075	QCP
2002	41°03'22.56749"	-107°38'44.37617"	1899.39	QCP
2003	41°04'01.56845"	-107°37'16.56580"	1928.797	QCP
2004	41°02'17.09044"	-107°26'26.12066"	2015.192	QCP
2005	41°07'06.97036"	-107°21'46.07283"	2138.187	QCP
2006	41°05'17.54064"	-107°23'24.96284"	2019.875	QCP
2006 A	41°05'16.74844"	-107°23'25.94269"	2019.526	QCP
2007	41°24'38.33217"	-107°16'53.23012"	2328.413	QCP
2008	41°25'21.12942"	-107°13'24.44821"	2412.366	QCP
2008 A	41°25'23.40787"	-107°13'22.01155"	2409.288	QCP
2009	41°26'15.15992"	-107°15'04.80063"	2365.693	QCP
2009 A	41°26'13.87758"	-107°15'05.78289"	2365.125	QCP
2010	41°46'18.79063"	-107°27'57.05209"	2017.236	QCP
2011	41°46'31.92281"	-107°18'39.37865"	2099.508	QCP
2012	41°42'45.65196"	-107°22'11.61315"	2177.987	QCP
2013	41°15'52.02251"	-106°37'40.06095"	2153.029	QCP
2014	41°19'52.27965"	-106°36'19.68864"	2289.8	QCP
2015	41°13'42.73275"	-106°35'17.54002"	2247.783	QCP
2015 A	41°13'43.86582"	-106°35'18.41519"	2248.45	QCP
2016	41°14'22.93472"	-106°47'51.30179"	2196.662	QCP
2017	41°26'24.50491"	-106°50'41.35466"	2111.454	QCP
2018	41°24'05.59686"	-107°02'23.29021"	2212.072	QCP
2019	41°16'52.47134"	-106°55'06.00194"	2284.559	QCP
2020	41°21'11.11400"	-106°51'17.36758"	2156.461	QCP
2020 A	41°21'12.95257"	-106°51'15.64492"	2154.266	QCP
2021	41°46'40.94174"	-107°06'58.14605"	1997.655	QCP
2022	41°45'39.29626"	-106°50'43.81055"	2005.811	QCP
2023	41°46'36.89961"	-106°56'46.85433"	1968.988	QCP
2024	41°41'13.15604"	-106°24'57.41157"	2202.009	QCP
2025	41°35'36.64391"	-106°12'25.48165"	2336.846	QCP
2025 A	41°35'37.96414"	-106°12'30.20435"	2337.06	QCP
2026	41°39'22.52829"	-106°07'38.79802"	2200.517	QCP
2026 A	41°39'21.00351"	-106°07'37.58117"	2200.503	QCP
2027	41°53'25.09223"	-106°11'21.94402"	1974.492	QCP
2028	41°52'17.23309"	-106°34'56.68148"	2055.668	QCP

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
2029	41°32'25.09394"	-106°52'46.77439"	2028.717	QCP
2030	41°41'17.32313"	-106°56'05.84221"	2060.405	QCP
2031	42°09'34.97569"	-106°54'58.93629"	1934.938	QCP
2032	42°01'07.45744"	-106°24'57.27510"	1984.517	QCP
2033	41°45'08.15499"	-106°12'40.70144"	2060.863	QCP
2034	42°04'26.49804"	-106°55'25.43561"	1991.636	QCP
2035	41°52'49.09195"	-107°03'35.13902"	1943.592	QCP
2036	42°01'24.77925"	-106°39'52.48835"	2013.422	QCP
2037	41°52'18.84520"	-106°46'22.94811"	2063.067	QCP
2037 A	41°52'19.53733"	-106°46'24.33249"	2063.294	QCP
2038	41°48'30.29049"	-106°41'14.68216"	2113.942	QCP
2039	41°56'12.20201"	-106°19'27.53550"	1990.402	QCP
2040	41°59'31.53997"	-106°31'27.59702"	1984.032	QCP
2040 A	41°59'32.55031"	-106°31'27.13536"	1983.559	QCP
2041	41°49'02.56554"	-106°30'02.55762"	2193.493	QCP
2042	41°39'52.74359"	-106°44'51.38639"	2063.934	QCP
2043	41°46'38.29667"	-107°22'20.59485"	2094.247	QCP
2044	41°25'13.90146"	-106°56'54.40096"	2238.944	QCP
2044 A	41°25'15.07825"	-106°56'51.01160"	2236.545	QCP
2045	41°13'24.00401"	-106°42'09.02146"	2194.206	QCP
2046	41°19'53.20547"	-106°42'28.91411"	2117.842	QCP
2046 A	41°19'52.32803"	-106°42'27.95471"	2117.686	QCP
2047	41°50'25.49343"	-106°56'21.14824"	2002.644	QCP
2047 A	41°50'28.23293"	-106°56'21.33179"	2002.409	QCP
2048	41°49'10.16395"	-107°01'17.37676"	1961.227	QCP
2048 A	41°49'09.31405"	-107°01'21.33669"	1963.671	QCP
2048 B	41°49'09.41631"	-107°01'21.33714"	1968.213	QCP
2049	41°45'09.75546"	-106°25'49.00236"	2223.701	QCP
2050	41°50'57.55533"	-106°17'16.35998"	2029.013	QCP
2051	41°31'38.62371"	-106°23'14.68515"	2519.704	QCP
2052	41°37'09.62492"	-106°25'00.96177"	2298.871	QCP
2053	41°44'58.24029"	-106°31'52.05253"	2217.865	QCP
2054	41°43'49.91484"	-106°41'50.45745"	2087.415	QCP
2054 A	41°43'49.94874"	-106°41'50.58983"	2087.355	QCP
2055	41°53'54.76156"	-106°38'34.60488"	2182.541	QCP
2055 A	41°53'55.47623"	-106°38'35.68081"	2181.71	QCP
2056	41°45'16.89297"	-106°09'22.95320"	2173.449	QCP
2056 A	41°45'17.89704"	-106°09'22.89702"	2173.039	QCP



Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
2057	41°43'25.56598"	-106°18'37.41606"	2149.789	QCP
2058	41°48'12.25777"	-106°35'48.04428"	2083.923	QCP
2059	41°38'46.22673"	-106°58'07.09756"	2099.648	QCP
2059 A	41°38'47.15401"	-106°58'06.49555"	2101.102	QCP
2060	41°43'15.01681"	-106°09'42.36666"	2190.151	QCP
2061	41°01'36.67525"	-107°22'52.81042"	2112.699	QCP
2062	41°57'15.81208"	-106°32'49.70276"	2064.925	QCP
2062 A	41°57'16.75656"	-106°32'48.97650"	2064.953	QCP
2063	41°47'23.67898"	-106°45'35.63531"	2106.635	QCP
2064	41°41'36.90941"	-107°24'28.30119"	2203.321	QCP
2064 A	41°41'37.65502"	-107°24'27.27233"	2203.239	QCP
2065	41°44'07.90428"	-106°36'12.36850"	2167.662	QCP
2066	41°58'01.02494"	-106°37'26.74935"	2090.759	QCP
2066 A	41°58'00.52065"	-106°37'24.63864"	2092.426	QCP
2067	41°48'59.18042"	-106°20'32.78005"	2134.667	QCP
2068	41°42'23.79787"	-106°31'27.12140"	2223.321	QCP
2069	41°41'54.72199"	-106°38'20.25996"	2126.313	QCP
2070	41°42'39.39890"	-106°49'21.13051"	1999.41	QCP
2071	42°09'46.58645"	-106°55'46.07640"	1990.832	QCP
2072	42°02'36.22071"	-106°30'56.40287"	1987.511	QCP
2073	41°43'39.43554"	-106°27'32.60982"	2227.589	QCP
2074	41°52'20.13459"	-106°08'59.31534"	2011.808	QCP
2075	41°50'04.68027"	-106°17'50.26436"	2035.424	QCP
2076	41°55'03.94437"	-106°48'35.51212"	1964.661	QCP
2077	41°47'04.21103"	-107°24'36.90684"	2053.134	QCP
2077 A	41°47'02.40289"	-107°24'36.70832"	2053.408	QCP
2078	41°26'52.05407"	-107°12'05.33153"	2288.474	QCP
2079	41°03'58.30556"	-107°24'18.84868"	2003.947	QCP
2080	41°37'29.93902"	-106°15'18.53671"	2346.483	QCP
2081	41°58'28.84918"	-106°20'41.08140"	2048.439	QCP
2082	41°21'59.59822"	-106°57'25.35512"	2214.174	QCP
2083	41°19'25.23984"	-106°44'45.23083"	2122.375	QCP
2084	41°16'51.27873"	-106°41'18.44896"	2135.83	QCP
2084 A	41°16'50.58870"	-106°41'19.53881"	2137.174	QCP
2085	41°07'55.55142"	-107°39'07.54655"	1923.433	QCP
2086	41°30'07.32653"	-106°43'51.76445"	2103.806	QCP
2087	41°35'51.47696"	-106°44'50.85173"	2113.033	QCP
2088	41°10'24.40497"	-106°49'10.10583"	2460.188	QCP

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
3001	41°03'25.02933"	-107°38'40.15138"	1897.833	QCP
3002	41°08'29.56214"	-107°39'31.58043"	1926.205	QCP
3002 A	41°08'30.93262"	-107°39'31.90369"	1926.196	QCP
3003	41°02'18.41371"	-107°26'28.21429"	2018.729	QCP
3004	41°02'23.28599"	-107°35'43.46426"	1921.41	QCP
3004 A	41°02'23.75415"	-107°35'45.87321"	1921.617	QCP
3005	41°07'17.93546"	-107°22'05.39858"	2065.255	QCP
3006	41°04'46.82524"	-107°23'51.96919"	2010.59	QCP
3007	41°24'41.82020"	-107°17'11.19656"	2350.683	QCP
3007 A	41°24'41.17444"	-107°17'11.76008"	2353.941	QCP
3008	41°25'00.86086"	-107°13'35.41129"	2415.484	QCP
3009	41°26'16.35228"	-107°15'06.35704"	2368.568	QCP
3009 A	41°26'13.92722"	-107°15'08.22264"	2370.091	QCP
3010	41°46'31.30219"	-107°18'38.04406"	2098.639	QCP
3011	41°46'37.30505"	-107°22'24.58061"	2092.543	QCP
3012	41°42'44.38341"	-107°22'10.86625"	2176.676	QCP
3013	41°41'36.24225"	-107°24'27.15334"	2201.945	QCP
3014	41°19'55.30991"	-106°36'24.38325"	2299.763	QCP
3015	41°17'19.27818"	-106°38'14.88167"	2200.614	QCP
3016	41°14'22.19944"	-106°47'52.12939"	2196.142	QCP
3017	41°16'55.24297"	-106°54'59.31751"	2284.789	QCP
3018	41°21'13.23072"	-106°51'18.28493"	2153.06	QCP
3019	41°32'25.77756"	-106°53'05.69393"	2033.224	QCP
3020	41°46'41.17467"	-107°06'55.01795"	1997.501	QCP
3021	41°46'41.20456"	-106°56'45.05571"	1966.958	QCP
3021 A	41°46'43.30922"	-106°56'45.45083"	1964.999	QCP
3021 B	41°46'43.75755"	-106°57'00.19131"	1968.497	QCP
3022	41°46'44.17006"	-106°56'44.85612"	1960.647	QCP
3023	41°41'13.53364"	-106°24'46.77086"	2201.288	QCP
3024	41°36'44.34803"	-106°25'05.47184"	2302.252	QCP
3025	41°31'38.50341"	-106°23'14.16030"	2521.211	QCP
3026	41°31'39.22525"	-106°23'16.44695"	2515.132	QCP
3027	41°35'43.62380"	-106°12'35.51813"	2336.178	QCP
3028	41°34'48.80690"	-106°13'47.16788"	2378.196	QCP
3029	41°43'27.64725"	-106°19'06.00486"	2121.369	QCP
3030	41°43'21.28842"	-106°19'05.73470"	2139.864	QCP
3031	41°53'24.26481"	-106°11'20.45568"	1974.706	QCP
3032	41°52'18.78811"	-106°34'53.81591"	2058.36	QCP

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
3033	41°49'11.05383"	-107°00'58.36156"	1950.263	QCP
3033 A	41°49'11.75925"	-107°00'58.99994"	1950.514	QCP
3034	41°49'09.78689"	-107°01'18.52008"	1961.902	QCP
3034 B	41°49'09.62872"	-107°01'21.28808"	1962.646	QCP
3035	41°39'52.64164"	-106°44'54.79549"	2064.272	QCP
3036	41°44'09.11692"	-106°36'14.41639"	2168.865	QCP
3037	41°42'27.10321"	-106°30'54.63589"	2215.524	QCP
3038	41°45'08.67030"	-106°12'41.24887"	2062.733	QCP
3038 A	41°45'08.07306"	-106°12'42.75164"	2063.88	QCP
3039	42°09'45.85870"	-106°55'49.33675"	1993.913	QCP
3040	42°09'34.44039"	-106°54'57.79831"	1933.441	QCP
3040 A	42°09'34.33709"	-106°54'56.53470"	1933.14	QCP
3041	42°04'25.66761"	-106°55'25.97714"	1992.509	QCP
3042	41°56'22.50348"	-106°19'24.65441"	1985.419	QCP
3043	42°01'07.14381"	-106°24'58.68686"	1982.581	QCP
3044	41°42'38.18770"	-106°49'19.87752"	1998.962	QCP
3045	41°47'22.36864"	-106°45'35.65256"	2101.906	QCP
3046	41°58'01.25898"	-106°37'24.51435"	2093.092	QCP
3047	41°48'13.56282"	-106°35'48.31445"	2084.152	QCP
3048	41°52'23.40148"	-107°03'23.29579"	1942.56	QCP
3048 A	41°52'24.52752"	-107°03'21.96581"	1942.369	QCP
3049	41°38'45.26940"	-106°58'05.40086"	2095.46	QCP
3049 A	41°38'44.29592"	-106°58'04.45467"	2095.209	QCP
3050	41°45'35.46605"	-106°50'43.63739"	2005.691	QCP
3051	41°52'56.39318"	-106°46'12.90694"	2068.615	QCP
3052	41°48'31.35084"	-106°41'14.12891"	2112.738	QCP
3053	42°01'23.52292"	-106°39'50.98454"	2013.699	QCP
3054	41°59'31.87853"	-106°31'28.46979"	1984.399	QCP
3055	41°38'36.64471"	-106°09'14.37663"	2213.36	QCP
3056	42°02'37.17617"	-106°30'54.80222"	1987.953	QCP
3057	41°43'40.51824"	-106°27'31.74785"	2229.603	QCP
3058	41°52'19.89776"	-106°09'01.44429"	2011.416	QCP
3059	41°50'05.66617"	-106°17'48.53836"	2035.112	QCP
3060	41°53'54.83409"	-106°38'32.61018"	2182.035	QCP
3060 A	41°53'53.11442"	-106°38'31.46179"	2181.848	QCP
3061	41°50'28.82557"	-106°56'20.08472"	2003.442	QCP
3061 A	41°50'29.38128"	-106°56'18.83043"	2003.984	QCP
3062	41°27'08.03706"	-106°53'02.79507"	2109.124	QCP

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
3062 A	41°27'08.20723"	-106°53'03.53035"	2108.686	QCP
3063	41°44'30.03241"	-106°46'21.98278"	2016.913	QCP
3064	41°46'15.18775"	-107°27'51.93231"	2017.102	QCP
3064 A	41°46'15.81834"	-107°27'56.43152"	2016.977	QCP
3065	41°03'23.62563"	-107°24'35.05899"	1989.4	QCP
3066	41°10'27.00751"	-106°49'10.03064"	2452.558	QCP
3067	41°30'03.85979"	-106°41'58.00850"	2124.077	QCP
3068	41°35'52.41768"	-106°45'48.11922"	2115.677	QCP

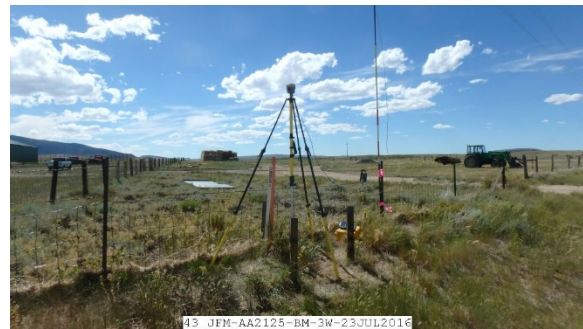
### NGS Control Points

Point No.	Geodetic Coordinates NAD-83 (2011) Epoch 2010.00		Ellipsoid Height (m)	Description
	Latitude (N)	Longitude (W)		
43 JFM	41°42'26.68887"	-106°26'21.79244"	2204.837	CONTROL
DISH	41°25'02.32537"	-106°57'42.30004"	2265.779	CONTROL
C 319 RESET	41°46'51.00000"	-107°10'19.00000"	2010.353	CONTROL
D 324	41°45'25.87061"	-106°49'33.82091"	2014.532	CONTROL
S 341	41°47'11.00000"	-107°11'58.00000"	2028.283	CONTROL
SINCLAIR	41°48'08.11469"	-107°03'38.07380"	1986.779	CONTROL
U 319	41°46'05.84095"	-106°49'34.02319"	2012.119	CONTROL
X 341	41°45'36.65427"	-106°50'42.35656"	2004.675	CONTROL
WALCOTT	41°44'57.79412"	-106°50'21.47268"	2040.393	CONTROL

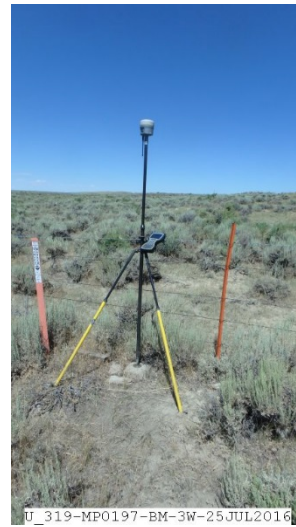
# Section 3: Ground/Geodetic Control Logs and Photos

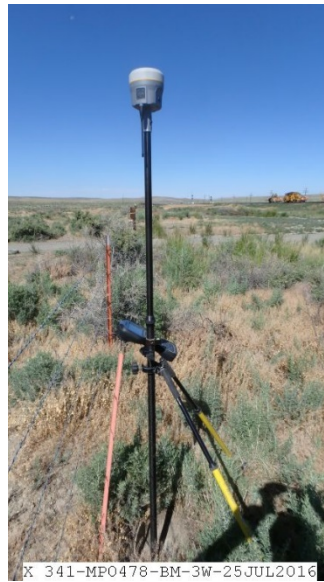
This section contains the station recovery information sheets and photographs for the ground control, geodetic control and checkpoint stations established for the project. The stations appear as they are ordered in the final coordinate listing of Section 2.

The data is assembled on the following pages.

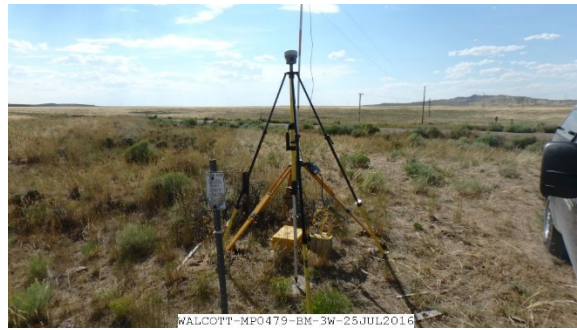
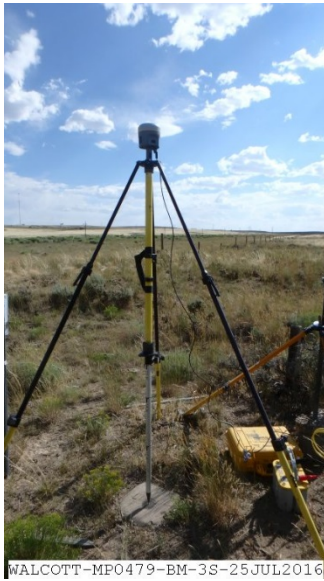












## Section 4: Existing NGS Datasheets

This section contains the published National Geodetic Survey (NGS) datasheets for those existing monumented control stations that were used to establish 3-dimensional coordinates for each of the newly established ground control survey points for the project.

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

```
PROGRAM = datasheet95, VERSION = 8.11
1      National Geodetic Survey,  Retrieval Date = DECEMBER 14, 2016
MP0499 *****
MP0499 FBN          -  This is a Federal Base Network Control Station.
MP0499 DESIGNATION -  B 343
MP0499 PID         -  MP0499
MP0499 STATE/COUNTY-  WY/CARBON
MP0499 COUNTRY     -  US
MP0499 USGS QUAD   -  MEDICINE BOW (1971)
MP0499
MP0499                                *CURRENT SURVEY CONTROL
MP0499
MP0499* NAD 83(2011) POSITION- 41 53 15.58732(N) 106 09 57.34765(W)  ADJUSTED
MP0499* NAD 83(2011) ELLIP HT- 2005.646 (meters)                (06/27/12)  ADJUSTED
MP0499* NAD 83(2011) EPOCH   - 2010.00
MP0499* NAVD 88 ORTHO HEIGHT - 2018.645 (meters)                6622.84 (feet) ADJUSTED
MP0499
MP0499 GEOID HEIGHT   -          -12.986 (meters)                GEOID12B
MP0499 NAD 83(2011) X - -1,324,397.336 (meters)                COMP
MP0499 NAD 83(2011) Y - -4,568,744.137 (meters)                COMP
MP0499 NAD 83(2011) Z -  4,237,662.181 (meters)                COMP
MP0499 LAPLACE CORR   -           5.62 (seconds)                DEFLEC12B
MP0499 DYNAMIC HEIGHT -          2016.949 (meters)                6617.27 (feet) COMP
MP0499 MODELED GRAVITY -          979,710.4 (mgal)                NAVD 88
MP0499
MP0499 VERT ORDER     -  FIRST      CLASS II
MP0499
MP0499 Network accuracy estimates per FGDC Geospatial Positioning Accuracy
MP0499 Standards:
MP0499          FGDC (95% conf, cm)      Standard deviation (cm)      CorrNE
MP0499          Horiz Ellip              SD_N   SD_E   SD_h          (unitless)
MP0499 -----
MP0499 NETWORK      0.93   2.76              0.41   0.34   1.41          0.07816190
MP0499 -----
MP0499 Click here for local accuracies and other accuracy information.
MP0499
MP0499
MP0499.The horizontal coordinates were established by GPS observations
MP0499.and adjusted by the National Geodetic Survey in June 2012.
MP0499
MP0499.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
MP0499.been affixed to the stable North American tectonic plate. See
MP0499.NA2011 for more information.
```

MP0499

MP0499.The horizontal coordinates are valid at the epoch date displayed above  
MP0499.which is a decimal equivalence of Year/Month/Day.

MP0499

MP0499.The orthometric height was determined by differential leveling and  
MP0499.adjusted by the NATIONAL GEODETIC SURVEY  
MP0499.in June 1991.

MP0499

MP0499.Significant digits in the geoid height do not necessarily reflect accuracy.  
MP0499.GEOID12B height accuracy estimate available [here](#).

MP0499

MP0499.The X, Y, and Z were computed from the position and the ellipsoidal ht.

MP0499

MP0499.The Laplace correction was computed from DEFLEC12B derived deflections.

MP0499

MP0499.The ellipsoidal height was determined by GPS observations

MP0499.and is referenced to NAD 83.

MP0499

MP0499.The dynamic height is computed by dividing the NAVD 88

MP0499.geopotential number by the normal gravity value computed on the

MP0499.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

MP0499.degrees latitude (g = 980.6199 gals.).

MP0499

MP0499.The modeled gravity was interpolated from observed gravity values.

MP0499

MP0499. The following values were computed from the NAD 83(2011) position.

MP0499

MP0499;		North	East	Units	Scale	Factor	Converg.
MP0499;SPC WYEC	-	254,760.047	496,884.875	MT	1.00005297		+0 46 46.2
MP0499;SPC WYEC	-	835,825.25	1,630,196.46	sFT	1.00005297		+0 46 46.2
MP0499;UTM 13	-	4,637,960.882	403,270.077	MT	0.99971513		-0 46 42.7

MP0499

MP0499!  
- Elev Factor x Scale Factor = Combined Factor

MP0499!SPC WYEC - 0.99968553 x 1.00005297 = 0.99973848

MP0499!UTM 13 - 0.99968553 x 0.99971513 = 0.99940075

MP0499

MP0499\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TDG0327037960(NAD 83)

MP0499

#### SUPERSEDED SURVEY CONTROL

MP0499

MP0499	NAD 83(2007)-	41 53 15.58708(N)	106 09 57.34864(W)	AD(2002.00)	0
MP0499	ELLIP H (02/10/07)	2005.673 (m)		GP(2002.00)	
MP0499	NAD 83(1993)-	41 53 15.58700(N)	106 09 57.34876(W)	AD( )	A
MP0499	ELLIP H (02/28/01)	2005.671 (m)		GP( )	2 1
MP0499	NAVD 88	2018.65 (m)	6622.9	(f) LEVELING	3
MP0499	NGVD 29 (06/08/92)	2017.503 (m)	6619.09	(f) ADJUSTED	1 2

MP0499

MP0499.Superseded values are not recommended for survey control.

MP0499

MP0499.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

MP0499.[See file dsdata.txt](#) to determine how the superseded data were derived.

MP0499

MP0499\_MARKER: I = METAL ROD

MP0499\_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)

MP0499\_STAMPING: B 343 1983  
 MP0499\_MARK LOGO: NGS  
 MP0499\_PROJECTION: FLUSH  
 MP0499\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 MP0499\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 MP0499\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
 MP0499+SATELLITE: SATELLITE OBSERVATIONS - July 25, 1999  
 MP0499\_ROD/PIPE-DEPTH: 4.9 meters

MP0499

MP0499	HISTORY	- Date	Condition	Report By
MP0499	HISTORY	- 1983	MONUMENTED	NGS
MP0499	HISTORY	- 1987	GOOD	USPSQD
MP0499	HISTORY	- 19990725	GOOD	NGS

MP0499

MP0499 STATION DESCRIPTION

MP0499

MP0499'DESCRIBED BY NATIONAL GEODETIC SURVEY 1983  
 MP0499'3.1 KM (1.95 MI) EAST FROM MEDICINE BOW.  
 MP0499'3.1 KM (1.95 MI) EASTERLY ALONG THE UNION PACIFIC RAILROAD FROM THE  
 MP0499'STATION IN MEDICINE BOW, 62.2 METERS (204.1 FT) SOUTHWEST OF THE  
 MP0499'CENTERLINE OF U.S. HIGHWAY 30 AND 287, 24.1 METERS (79.1 FT) NORTHEAST  
 MP0499'OF THE NEAR RAIL, AND 1.2 METERS (3.9 FT) NORTHWEST OF MILEPOST 621.  
 MP0499'NOTE=ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP.  
 MP0499'THE MARK IS 0.3 METERS SE FROM A WITNESS POST.  
 MP0499'THE MARK IS 0.3 M ABOVE THE TRACKS.

MP0499

MP0499 STATION RECOVERY (1987)

MP0499

MP0499'RECOVERY NOTE BY US POWER SQUADRON 1987 (LT)

MP0499'RECOVERED IN GOOD CONDITION.

MP0499

MP0499 STATION RECOVERY (1999)

MP0499

MP0499'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1999 (CSM)

MP0499'RECOVERED BY NATIONAL GEODETIC SURVEY 1999. RECOVERED IN GOOD  
 MP0499'CONDITION. NEW DESCRIPTION FOLLOWS, THE STATION IS LOCATED ABOUT 3.46  
 MP0499'KM (2.15 MI) EAST OF MEDICINE BOW ABOUT 60.96 M (200.00 FT) SOUTHWEST  
 MP0499'OF THE HIGHWAY ON THE NORTHWEST SIDE OF THE UNION PACIFIC RAILROAD AT  
 MP0499'MILEPOST 621 ATTACHED TO A POWER POLE. TO REACH THE STATION FROM THE  
 MP0499'JUNCTIONS OF US HIGHWAY 30, 287 AND STATE HIGHWAY 487 IN MEDICINE BOW,  
 MP0499'GO EAST ON COMBINED HIGHWAY 30 AND 287 FOR 3.46 KM (2.15 MI) TO THE  
 MP0499'STATION ON THE RIGHT ABOUT 60.96 M (200.00 FT) SOUTHWEST OF THE  
 MP0499'HIGHWAY. THE STATION IS A PUNCH MARK ON THE TOP OF A STAINLESS STEEL  
 MP0499'ROD DRIVEN TO REFUSAL, ENCASED IN A 13 CM PVC PIPE WITH AN NGS LOGO  
 MP0499'CAP SURROUNDED BY CONCRETE AND ABOUT FLUSH WITH THE GROUND AND ABOUT  
 MP0499'0.3 M (1.0 FT) ABOVE THE TRACKS. LOCATED 62.8 M (206.0 FT) SOUTHWEST  
 MP0499'OF THE CENTER OF THE HIGHWAY, 24.08 M (79.00 FT) NORTHEAST OF THE  
 MP0499'NORTHEAST RAIL OF THE TRACKS, 1.2 M (3.9 FT) NORTHWEST OF A POWER POLE  
 MP0499'WITH RAILROAD MILEPOST 621 SIGN ATTACHED AND 0.3 M (1.0 FT) SOUTHEAST  
 MP0499'OF A FIBERGLASS WITNESS POST.

1 National Geodetic Survey, Retrieval Date = DECEMBER 14, 2016

MP0552 \*\*\*\*\*

MP0552 CBN - This is a Cooperative Base Network Control Station.

MP0552 DESIGNATION - BARRETT

MP0552 PID - MP0552  
 MP0552 STATE/COUNTY- WY/CARBON  
 MP0552 COUNTRY - US  
 MP0552 USGS QUAD - RYAN PARK (1992)  
 MP0552  
 MP0552 \*CURRENT SURVEY CONTROL  
 MP0552  
 MP0552\* NAD 83(2011) POSITION- 41 19 35.67787(N) 106 31 34.57981(W) ADJUSTED  
 MP0552\* NAD 83(2011) ELLIP HT- 2751.158 (meters) (06/27/12) ADJUSTED  
 MP0552\* NAD 83(2011) EPOCH - 2010.00  
 MP0552\* [NAVD 88](#) ORTHO HEIGHT - 2762.2 (meters) 9062. (feet) GPS OBS  
 MP0552  
 MP0552 NAVD 88 orthometric height was determined with geoid model GEOID93  
 MP0552 GEOID HEIGHT - -10.52 (meters) GEOID93  
 MP0552 GEOID HEIGHT - -10.862 (meters) GEOID12B  
 MP0552 NAD 83(2011) X - -1,365,038.157 (meters) COMP  
 MP0552 NAD 83(2011) Y - -4,600,544.065 (meters) COMP  
 MP0552 NAD 83(2011) Z - 4,191,544.305 (meters) COMP  
 MP0552 LAPLACE CORR - 7.99 (seconds) DEFLEC12B  
 MP0552  
 MP0552 Network accuracy estimates per FGDC Geospatial Positioning Accuracy  
 MP0552 Standards:  
 MP0552 FGDC (95% conf, cm) Standard deviation (cm) CorrNE  
 MP0552 Horiz Ellip SD\_N SD\_E SD\_h (unitless)  
 MP0552 -----  
 MP0552 NETWORK 1.80 5.15 0.83 0.60 2.63 0.06517090  
 MP0552 -----  
 MP0552 Click [here](#) for local accuracies and other accuracy information.  
 MP0552  
 MP0552  
 MP0552.The horizontal coordinates were established by GPS observations  
 MP0552.and adjusted by the National Geodetic Survey in June 2012.  
 MP0552  
 MP0552.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has  
 MP0552.been affixed to the stable North American tectonic plate. See  
 MP0552.[NA2011](#) for more information.  
 MP0552  
 MP0552.The horizontal coordinates are valid at the epoch date displayed above  
 MP0552.which is a decimal equivalence of Year/Month/Day.  
 MP0552  
 MP0552.The orthometric height was determined by GPS observations and a  
 MP0552.high-resolution geoid model.  
 MP0552  
 MP0552.Significant digits in the geoid height do not necessarily reflect accuracy.  
 MP0552.GEOID12B height accuracy estimate available [here](#).  
 MP0552  
 MP0552.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
 MP0552  
 MP0552.The Laplace correction was computed from DEFLEC12B derived deflections.  
 MP0552  
 MP0552.The ellipsoidal height was determined by GPS observations  
 MP0552.and is referenced to NAD 83.  
 MP0552  
 MP0552. The following values were computed from the NAD 83(2011) position.

MP0552  
MP0552;  
MP0552;SPC WYEC - North East Units Scale Factor Converg.  
MP0552;SPC WYEC - 192,101.736 467,562.046 MT 0.99999366 +0 31 58.7  
MP0552;SPC WYEC - 630,253.78 1,533,993.15 sFT 0.99999366 +0 31 58.7  
MP0552;UTM 13 - 4,576,134.816 372,271.878 MT 0.99980078 -1 00 28.8  
MP0552  
MP0552!  
MP0552!SPC WYEC - Elev Factor x Scale Factor = Combined Factor  
MP0552!SPC WYEC - 0.99956866 x 0.99999366 = 0.99956232  
MP0552!UTM 13 - 0.99956866 x 0.99980078 = 0.99936952  
MP0552  
MP0552:  
MP0552:SPC WYEC - Primary Azimuth Mark Grid Az  
MP0552:SPC WYEC - MEDICINE BOW 077 17 59.6  
MP0552:UTM 13 - MEDICINE BOW 078 50 27.1  
MP0552  
MP0552\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCF7227176134(NAD 83)  
MP0552  
MP0552|-----|  
MP0552| PID Reference Object Distance Geod. Az  
MP0552| | | | dddmmss.s  
MP0552| MP0546 MEDICINE BOW APPROX.17.9 KM 0774958.3  
MP0552| CP5324 BARRETT LOT RM 1 9.285 METERS 14330  
MP0552| CP5325 BARRETT LOT RM 2 9.369 METERS 25058  
MP0552|-----|  
MP0552  
MP0552  
MP0552 SUPERSEDED SURVEY CONTROL  
MP0552  
MP0552 NAD 83(2007)- 41 19 35.67766(N) 106 31 34.58063(W) AD(2002.00) 0  
MP0552 ELLIP H (02/10/07) 2751.178 (m) GP(2002.00)  
MP0552 ELLIP H (09/07/01) 2751.186 (m) GP( ) 4 1  
MP0552 NAD 83(1993)- 41 19 35.67695(N) 106 31 34.58050(W) AD( ) B  
MP0552 ELLIP H (10/19/94) 2751.229 (m) GP( ) 4 1  
MP0552 NAD 83(1986)- 41 19 35.67052(N) 106 31 34.57480(W) AD( ) 3  
MP0552 NAD 27 - 41 19 35.79300(N) 106 31 32.49000(W) AD( ) 3  
MP0552 NGVD 29 (07/19/86) 2766. (m) 9075. (f) VERT ANG  
MP0552  
MP0552.Superseded values are not recommended for survey control.  
MP0552  
MP0552.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
MP0552.[See file dsdata.txt](#) to determine how the superseded data were derived.  
MP0552  
MP0552\_MARKER: DS = TRIANGULATION STATION DISK  
MP0552\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
MP0552\_STAMPING: BARRETT 1948  
MP0552\_MARK LOGO: CGS  
MP0552\_MAGNETIC: N = NO MAGNETIC MATERIAL  
MP0552\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
MP0552+STABILITY: SURFACE MOTION  
MP0552\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
MP0552+SATELLITE: SATELLITE OBSERVATIONS - August 12, 1993  
MP0552  
MP0552 HISTORY - Date Condition Report By  
MP0552 HISTORY - 1948 MONUMENTED CGS  
MP0552 HISTORY - 1959 GOOD USGS  
MP0552 HISTORY - 19930812 GOOD NGS

MP0552

MP0552

## STATION DESCRIPTION

MP0552

MP0552'DESCRIBED BY COAST AND GEODETIC SURVEY 1948 (DHK)

MP0552'THE STATION IS LOCATED ABOUT 17.0 MILES AIRLINE SOUTHEAST OF  
 MP0552'SARATOGA, ON A HIGH, HEAVILY TIMBERED, NORTHWEST-SOUTHEAST  
 MP0552'RIDGE, WHICH IS LOCALLY KNOWN AS BARRETT RIDGE. THE STATION  
 MP0552'IS BELIEVED TO BE NEAR THE HIGHEST POINT, IN THE CENTER OF THE  
 MP0552'BASE OF THE BARRETT RIDGE FOREST SERVICE LOOKOUT TOWER,  
 MP0552'APPROXIMATELY 25 YARDS SOUTHEAST OF THE HIGHEST POINT, 19  
 MP0552'FEET WEST-NORTHWEST OF A 4X4 WITNESS POST, PROJECTS 3 INCHES,  
 MP0552'STAMPED, BARRETT 1948.

MP0552'

MP0552'REFERENCE MARK NO. 1, IS APPROXIMATELY 3 FEET LOWER THAN  
 MP0552'THE STATION, 18 FEET SOUTH OF A 4X4 WITNESS POST, PROJECTS  
 MP0552'3 INCHES, STAMPED, BARRETT NO 1 1948.

MP0552'

MP0552'REFERENCE MARK NO. 2, IS APPROXIMATELY 2 FEET LOWER THAN THE  
 MP0552'STATION, ON THE WEST SLOPE, PROJECTS 4 INCHES, STAMPED, BARRETT  
 MP0552'NO 2 1948.

MP0552'

MP0552'TRIANGULATION STATION MEDICINE BOW 1948 IS THE AZIMUTH.

MP0552'

MP0552'TO REACH FROM SARATOGA. GO SOUTH ON STATE HIGHWAY 230 FOR  
 MP0552'8.4 MILES TO THE JUNCTION OF STATE HIGHWAY 130. TURN LEFT (EAST)  
 MP0552'AND FOLLOW STATE HIGHWAY 130 FOR 12.1 MILES TO THE BRUSH CREEK  
 MP0552'RANGER STATION ON LEFT. CONTINUE STRAIGHT AHEAD FOR 1.85  
 MP0552'MILES TO A DIRT ROAD SHARP RIGHT. TURN RIGHT ON DIRT ROAD  
 MP0552'FOR 0.25 MILE TO A FORK. TAKE THE EXTREME LEFT FORK FOR  
 MP0552'0.1 MILE TO A FORK. TAKE THE RIGHT FORK MAIN TRAVELED ROAD  
 MP0552'(PASSING CABINS) FOR 0.35 TO A FORK. TAKE THE LEFT FORK UP  
 MP0552'HILL AND CONTINUE FOR 0.95 MILE TO A FORK AND SIGN BARRETT  
 MP0552'RIDGE LOOKOUT. TAKE THE RIGHT FORK UP HILL FOR 0.5 MILE TO THE  
 MP0552'HIGHEST POINT AND STATION AS DESCRIBED. A DRIVE  
 MP0552'STATION.

MP0552

MP0552

## STATION RECOVERY (1959)

MP0552

MP0552'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1959

MP0552'RECOVERED.

MP0552'

MP0552'STATION MARK--STANDARD USC AND GS DISK, STAMPED ---BARRETT 1948---.

MP0552

MP0552

## STATION RECOVERY (1993)

MP0552

MP0552'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993 (GRH)

MP0552'STATION MARK AND REFERENCE MARKS 1 AND 2 WERE RECOVERED IN GOOD  
 MP0552'CONDITION. NO AZIMUTH MARK FOR THIS STATION. THE LOOKOUT TOWER HAS  
 MP0552'BEEN REMOVED, LEAVING ONLY THE CONCRETE PAD FOR THE LADDER. STATION IS  
 MP0552'LOCATED ABOUT 29 KM (18.00 MI) SOUTHEAST OF SARATOGA, 32 KM (19.90 MI)  
 MP0552'WEST OF CENTENNIAL, 2 KM (1.25 MI) NORTHWEST OF THE RYAN PARK  
 MP0552'COMMUNITY, IN THE MEDICINE BOW NATIONAL FOREST, ON BARRETT RIDGE, ON A  
 MP0552'MOSTLY CLEAR KNOLL, IN THE NORTHWEST 1/4 OF SECTION 29, T 16 N, R 81  
 MP0552'W. OWNERSHIP--US DEPARTMENT OF AGRICULTURE. TO REACH FROM THE

MP0552'CENTENNIAL SCHOOL IN CENTENNIAL, GO WEST ON STATE HIGHWAY 130 FOR  
 MP0552'18.93 KM (11.75 MI) TO THE LIBBY FLATS OBSERVATION POINT ON THE LEFT.  
 MP0552'CONTINUE AHEAD FOR 21.75 KM (13.50 MI) TO THE ENTRANCE TO THE RYAN  
 MP0552'PARK CAMPGROUND ON THE LEFT. CONTINUE AHEAD FOR 1.02 KM (0.65 MI) TO  
 MP0552'A DIRT ROAD LEFT. TURN LEFT, SOUTHWEST, ON RYAN PARK ROAD FOR 0.38 KM  
 MP0552'(0.25 MI) TO A FORK. BEAR LEFT, SOUTHEAST, ON GRADED ROAD FOR 0.23 KM  
 MP0552'(0.15 MI) TO A FORK. BEAR RIGHT, SOUTHERLY, ON GRADED ROAD FOR 0.26  
 MP0552'KM (0.15 MI) TO A ROAD RIGHT. TURN RIGHT, WEST, ON FOREST SERVICE  
 MP0552'ROAD 210 FOR 1.07 KM (0.65 MI) TO A CATTLE GUARD. CONTINUE AHEAD,  
 MP0552'WEST, ON GRADED ROAD FOR 0.82 KM (0.50 MI) TO A FORK. BEAR RIGHT,  
 MP0552'NORTHWEST, UPHILL, ON ROAD 232 FOR 0.31 KM (0.20 MI) TO A TRACK ROAD  
 MP0552'RIGHT AT TOP OF GRADE. TURN RIGHT, NORTH, ON ROAD 232 1A FOR 0.67 KM  
 MP0552'(0.40 MI) TO TOP OF RISE AND STATION ON THE LEFT. STATION MARK IS A  
 MP0552'DISK SET IN THE TOP OF A 30-CM SQUARE CONCRETE POST PROJECTING 5 CM  
 MP0552'ABOVE GROUND. IT IS ON THE SOUTHEAST END OF THE SHORT  
 MP0552'NORTHWEST-SOUTHEAST ROCKY KNOLL THAT IS COVERED WITH LOW ASPEN AND  
 MP0552'PINES. IT IS 13.9 M (45.6 FT) NORTH OF, AND 1 M (3.3 FT) HIGHER THAN  
 MP0552'THE ROAD CENTER, 1.5 M (4.9 FT) NORTH OF THE SMALL CONCRETE PAD, AND  
 MP0552'1.1 M (3.6 FT) SOUTH OF A FIBERGLASS WITNESS POST. DESCRIBED BY  
 MP0552'G.R.HEID

1 National Geodetic Survey, Retrieval Date = DECEMBER 14, 2016  
 MP0471 \*\*\*\*\*  
 MP0471 DESIGNATION - C 319 RESET  
 MP0471 PID - MP0471  
 MP0471 STATE/COUNTY- WY/CARBON  
 MP0471 COUNTRY - US  
 MP0471 USGS QUAD - RAWLINS (1981)  
 MP0471  
 MP0471 \*CURRENT SURVEY CONTROL  
 MP0471  
 MP0471 \* NAD 83(1986) POSITION- 41 46 51. (N) 107 10 19. (W) SCALED  
 MP0471 \* [NAVD 88](#) ORTHO HEIGHT - 2023.903 (meters) 6640.09 (feet) ADJUSTED  
 MP0471  
 MP0471 GEOID HEIGHT - -13.550 (meters) GEOID12B  
 MP0471 DYNAMIC HEIGHT - 2022.207 (meters) 6634.52 (feet) COMP  
 MP0471 MODELED GRAVITY - 979,712.1 (mgal) NAVD 88  
 MP0471  
 MP0471 VERT ORDER - FIRST CLASS II  
 MP0471  
 MP0471.The horizontal coordinates were scaled from a topographic map and have  
 MP0471.an estimated accuracy of +/- 6 seconds.  
 MP0471.  
 MP0471.The orthometric height was determined by differential leveling and  
 MP0471.adjusted by the NATIONAL GEODETIC SURVEY  
 MP0471.in June 1991.  
 MP0471  
 MP0471.Significant digits in the geoid height do not necessarily reflect accuracy.  
 MP0471.GEOID12B height accuracy estimate available [here](#).  
 MP0471  
 MP0471.The dynamic height is computed by dividing the NAVD 88  
 MP0471.geopotential number by the normal gravity value computed on the  
 MP0471.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 MP0471.degrees latitude (g = 980.6199 gals.).  
 MP0471



MP0471.The modeled gravity was interpolated from observed gravity values.  
MP0471  
MP0471;  
MP0471;SPC WYEC               North               East       Units   Estimated Accuracy  
-   242,250.               413,420.               MT   (+/- 180 meters Scaled)  
MP0471  
MP0471\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCG195277(NAD 83)  
MP0471  
MP0471                               SUPERSEDED SURVEY CONTROL  
MP0471  
MP0471   NGVD 29 (06/08/92) 2022.766   (m)               6636.36   (f) ADJUSTED   1 2  
MP0471  
MP0471.Superseded values are not recommended for survey control.  
MP0471  
MP0471.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
MP0471.[See file dsdata.txt](#) to determine how the superseded data were derived.  
MP0471  
MP0471\_MARKER: DB = BENCH MARK DISK  
MP0471\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
MP0471\_STAMPING: C 319 RESET 1979  
MP0471\_MARK LOGO: NGS  
MP0471\_PROJECTION: PROJECTING 10 CENTIMETERS  
MP0471\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
MP0471+STABILITY: SURFACE MOTION  
MP0471\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
MP0471+SATELLITE: SATELLITE OBSERVATIONS - June 16, 2008  
MP0471  
MP0471   HISTORY       -   Date       Condition               Report By  
MP0471   HISTORY       -   1979       MONUMENTED             NGS  
MP0471   HISTORY       -   1983       GOOD                    NGS  
MP0471   HISTORY       -   20030624   GOOD                    NGS  
MP0471   HISTORY       -   20080616   GOOD                    NGS  
MP0471  
MP0471                               STATION DESCRIPTION  
MP0471  
MP0471'DESCRIBED BY NATIONAL GEODETIC SURVEY 1983  
MP0471'3.6 MI EAST FROM RAWLINS.  
MP0471'3.6 MILES EAST ALONG THE UNION PACIFIC RAILWAY FROM THE STATION AT  
MP0471'RAWLINS, 209 FEET NORTH OF THE NORTH RAIL OF THE NORTH TRACK, 156 FEET  
MP0471'NORTHWEST OF A POWER LINE POLE WITH A TRANSFORMER ATTACHED, 43 FEET  
MP0471'SOUTH OF THE CENTERLINE OF OLD US HIGHWAY 30, 12 FEET EAST-SOUTHEAST  
MP0471'OF A SAWED OFF POWER LINE POLE PROJECTING ABOUT 5 FEET.  
MP0471'THE MARK IS 2.0 FT E FROM A WITNESS POST.  
MP0471'THE MARK IS 3 FT BELOW OLD US HIGHWAY 30.  
MP0471  
MP0471                               STATION RECOVERY (2003)  
MP0471  
MP0471'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2003 (DW)  
MP0471'OLD US 30 IS NOW WY 76.  
MP0471  
MP0471                               STATION RECOVERY (2008)  
MP0471  
MP0471'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2008 (DW)  
MP0471'AT WY87 MILEPOST 217.  
1           National Geodetic Survey,    Retrieval Date = DECEMBER 14, 2016

MP0225 \*\*\*\*\*

MP0225 DESIGNATION - D 324

MP0225 PID - MP0225

MP0225 STATE/COUNTY- WY/CARBON

MP0225 COUNTRY - US

MP0225 USGS QUAD - WALCOTT (1982)

MP0225

MP0225 \*CURRENT SURVEY CONTROL

MP0225

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MP0225\* NAD 83(1986) POSITION- 41 45 25.9 (N) 106 49 33.9 (W) HD\_HELD2

MP0225\* [NAVD 88](#) ORTHO HEIGHT - 2028.175 (meters) 6654.10 (feet) ADJUSTED

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MP0225 GEOID HEIGHT - -13.616 (meters) GEOID12B

MP0225 DYNAMIC HEIGHT - 2026.417 (meters) 6648.34 (feet) COMP

MP0225 MODELED GRAVITY - 979,683.5 (mgal) NAVD 88

MP0225

MP0225 VERT ORDER - FIRST CLASS II

MP0225

MP0225.The horizontal coordinates were established by autonomous hand held GPS

MP0225.observations and have an estimated accuracy of +/- 10 meters.

MP0225.

MP0225.The orthometric height was determined by differential leveling and

MP0225.adjusted by the NATIONAL GEODETIC SURVEY

MP0225.in June 1991.

MP0225

MP0225.Significant digits in the geoid height do not necessarily reflect accuracy.

MP0225.GEOID12B height accuracy estimate available [here](#).

MP0225

MP0225.[Photographs](#) are available for this station.

MP0225

MP0225.The dynamic height is computed by dividing the NAVD 88

MP0225.geopotential number by the normal gravity value computed on the

MP0225.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

MP0225.degrees latitude (g = 980.6199 gals.).

MP0225

MP0225.The modeled gravity was interpolated from observed gravity values.

MP0225

MP0225;	North	East	Units	Estimated Accuracy
MP0225;SPC WYEC -	239,735.	442,183.	MT	(+/- 10 meters HH2 GPS)

MP0225

MP0225\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCG4819124429(NAD 83)

MP0225

MP0225 SUPERSEDED SURVEY CONTROL

MP0225

MP0225	NGVD 29 (??/??/92)	2026.992 (m)	6650.22 (f)	SUPERSEDED	1 2
MP0225	NGVD 29 (06/08/92)	2026.984 (m)	6650.20 (f)	ADJUSTED	1 2

MP0225

MP0225.Superseded values are not recommended for survey control.

MP0225

MP0225.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

MP0225.[See file dsdata.txt](#) to determine how the superseded data were derived.

MP0225

MP0225\_MARKER: DB = BENCH MARK DISK

MP0225\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

MP0225\_STAMPING: D 324 1947

MP0225\_MARK LOGO: CGS

MP0225\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

MP0225+STABILITY: SURFACE MOTION

MP0225\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

MP0225+SATELLITE: SATELLITE OBSERVATIONS - May 24, 2009

MP0225

MP0225	HISTORY	- Date	Condition	Report By
MP0225	HISTORY	- 1947	MONUMENTED	CGS
MP0225	HISTORY	- 1983	GOOD	NGS
MP0225	HISTORY	- 20090524	GOOD	GEOCAC

MP0225

MP0225 STATION DESCRIPTION

MP0225

MP0225 'DESCRIBED BY COAST AND GEODETIC SURVEY 1947

MP0225 '1.1 MI SE FROM WALCOTT.

MP0225 '1.1 MILES SOUTHEAST ALONG THE SARATOGA AND ENCAMPMENT VALLEY RAILROAD

MP0225 'FROM THE STATION AT WALCOTT, AT THE CROSSING OF U. S. HIGHWAY 30,

MP0225 '171.0 FEET NORTHWEST OF THE CENTER LINE OF THE HIGHWAY, 65.0 FEET

MP0225 'SOUTHWEST OF THE SOUTHWEST RAIL OF THE TRACK AND 6.0 FEET HIGHER, 28.0

MP0225 'FEET SOUTHEAST OF THE FIRST TELEPHONE POLE SOUTHWEST OF THE TRACK, 3.0

MP0225 'FEET NORTHWEST OF A REFERENCE POST, SET IN THE TOP OF A CONCRETE POST

MP0225 'AND PROJECTS 0.4 FOOT ABOVE THE GROUND.

MP0225

MP0225 STATION RECOVERY (1983)

MP0225

MP0225 'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1983

MP0225 'RECOVERED IN GOOD CONDITION.

MP0225

MP0225 STATION RECOVERY (2009)

MP0225

MP0225 'RECOVERY NOTE BY GEOCACHING 2009 (MEL)

MP0225 'THE MARK IS EIGHT FEET NORTH OF A POWER POLE GUY WIRE.

1 National Geodetic Survey, Retrieval Date = DECEMBER 14, 2016

MP0470 \*\*\*\*\*

MP0470 DESIGNATION - S 341

MP0470 PID - MP0470

MP0470 STATE/COUNTY- WY/CARBON

MP0470 COUNTRY - US

MP0470 USGS QUAD - RAWLINS (1981)

MP0470

MP0470 \*CURRENT SURVEY CONTROL

MP0470

MP0470\* NAD 83(1986) POSITION- 41 47 11. (N) 107 11 58. (W) SCALED

MP0470\* [NAVD 88](#) ORTHO HEIGHT - 2041.860 (meters) 6699.00 (feet) ADJUSTED

MP0470

MP0470 GEOID HEIGHT - -13.576 (meters) GEOID12B

MP0470 DYNAMIC HEIGHT - 2040.140 (meters) 6693.36 (feet) COMP

MP0470 MODELED GRAVITY - 979,707.4 (mgal) NAVD 88

MP0470

MP0470 VERT ORDER - FIRST CLASS II

MP0470

MP0470.The horizontal coordinates were scaled from a topographic map and have

MP0470.an estimated accuracy of +/- 6 seconds.

MP0470.  
 MP0470.The orthometric height was determined by differential leveling and  
 MP0470.adjusted by the NATIONAL GEODETIC SURVEY  
 MP0470.in June 1991.  
 MP0470  
 MP0470.Significant digits in the geoid height do not necessarily reflect accuracy.  
 MP0470.GEOID12B height accuracy estimate available [here](#).  
 MP0470  
 MP0470.The dynamic height is computed by dividing the NAVD 88  
 MP0470.geopotential number by the normal gravity value computed on the  
 MP0470.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 MP0470.degrees latitude (g = 980.6199 gals.).  
 MP0470  
 MP0470.The modeled gravity was interpolated from observed gravity values.  
 MP0470  
 MP0470;  

	North	East	Units	Estimated Accuracy
MP0470;SPC WYEC	- 242,860.	411,130.	MT	(+/- 180 meters Scaled)

 MP0470  
 MP0470\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCG172283(NAD 83)  
 MP0470  
 MP0470 SUPERSEDED SURVEY CONTROL  
 MP0470  
 MP0470 NGVD 29 (06/08/92) 2040.715 (m) 6695.25 (f) ADJUSTED 1 2  
 MP0470  
 MP0470.Superseded values are not recommended for survey control.  
 MP0470  
 MP0470.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 MP0470.[See file dsdata.txt](#) to determine how the superseded data were derived.  
 MP0470  
 MP0470\_MARKER: I = METAL ROD  
 MP0470\_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
   
 MP0470\_STAMPING: S 341 1983  
 MP0470\_MARK LOGO: NGS  
 MP0470\_PROJECTION: FLUSH  
 MP0470\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 MP0470\_ROD/PIPE-DEPTH: 3.1 meters  
 MP0470  

HISTORY	- Date	Condition	Report By
MP0470 HISTORY	- 1983	MONUMENTED	NGS

 MP0470  
 MP0470 STATION DESCRIPTION  
 MP0470  
 MP0470'DESCRIBED BY NATIONAL GEODETIC SURVEY 1983  
 MP0470'3.5 KM (2.15 MI) EAST FROM RAWLINS.  
 MP0470'3.5 KM (2.15 MI) EASTERLY ALONG THE UNION PACIFIC RAILROAD FROM THE  
 MP0470'STATION IN RAWLINS, 0.4 KM (0.25 MI) EAST OF THE INTERSTATE HIGHWAY 80  
 MP0470'RAILROAD OVERPASS, 0.3 KM (0.2 MI) EAST OF MILEPOST 681, 26.9 METERS  
 MP0470'(88.3 FT) NORTH OF THE NEAR RAIL, 20.7 METERS (67.9 FT) NORTH OF A  
 MP0470'SIGNAL BOX, AND 1.4 METERS (4.6 FT) EAST OF A UTILITY POLE.  
 MP0470'NOTE=ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH LOGO CAP.  
 MP0470'THE MARK IS 0.3 METERS W FROM A WITNESS POST.  
 MP0470'THE MARK IS 0.3 M ABOVE THE TRACK.  
 1 National Geodetic Survey, Retrieval Date = DECEMBER 14, 2016  
 MP0232 \*\*\*\*\*

MP0232 DESIGNATION - SINCLAIR  
 MP0232 PID - MP0232  
 MP0232 STATE/COUNTY- WY/CARBON  
 MP0232 COUNTRY - US  
 MP0232 USGS QUAD - SINCLAIR (1981)  
 MP0232  
 MP0232 \*CURRENT SURVEY CONTROL  
 MP0232  
 MP0232\* NAD 83(1986) POSITION- 41 48 07. (N) 107 03 38. (W) SCALED  
 MP0232\* [NAVD 88](#) ORTHO HEIGHT - 2000.386 (meters) 6562.93 (feet) ADJUSTED  
 MP0232  
 MP0232 GEOID HEIGHT - -13.607 (meters) GEOID12B  
 MP0232 DYNAMIC HEIGHT - 1998.716 (meters) 6557.45 (feet) COMP  
 MP0232 MODELED GRAVITY - 979,716.5 (mgal) NAVD 88  
 MP0232  
 MP0232 VERT ORDER - FIRST CLASS II  
 MP0232  
 MP0232.The horizontal coordinates were scaled from a topographic map and have  
 MP0232.an estimated accuracy of +/- 6 seconds.  
 MP0232.  
 MP0232.The orthometric height was determined by differential leveling and  
 MP0232.adjusted by the NATIONAL GEODETIC SURVEY  
 MP0232.in June 1991.  
 MP0232  
 MP0232.Significant digits in the geoid height do not necessarily reflect accuracy.  
 MP0232.GEOID12B height accuracy estimate available [here](#).  
 MP0232  
 MP0232.The dynamic height is computed by dividing the NAVD 88  
 MP0232.geopotential number by the normal gravity value computed on the  
 MP0232.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 MP0232.degrees latitude (g = 980.6199 gals.).  
 MP0232  
 MP0232.The modeled gravity was interpolated from observed gravity values.  
 MP0232  
 MP0232;  

	North	East	Units	Estimated Accuracy
MP0232;SPC WYEC -	244,620.	422,670.	MT	(+/- 180 meters Scaled)

 MP0232  
 MP0232\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCG288298(NAD 83)  
 MP0232  
 MP0232 SUPERSEDED SURVEY CONTROL  
 MP0232  
 MP0232 NGVD 29 (??/??/92) 1999.269 (m) 6559.27 (f) ADJ UNCH 1 2  
 MP0232  
 MP0232.Superseded values are not recommended for survey control.  
 MP0232  
 MP0232.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 MP0232.[See file dsdata.txt](#) to determine how the superseded data were derived.  
 MP0232  
 MP0232\_MARKER: DB = BENCH MARK DISK  
 MP0232\_SETTING: 36 = SET IN A MASSIVE STRUCTURE  
 MP0232\_SP\_SET: FOUNDATION  
 MP0232\_STAMPING: SINCLAIR 1944  
 MP0232\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
 MP0232

MP0232 HISTORY - Date Condition Report By  
 MP0232 HISTORY - 1944 MONUMENTED CGS  
 MP0232 HISTORY - 1947 GOOD CGS  
 MP0232 HISTORY - 1983 MARK NOT FOUND NGS

MP0232

MP0232

MP0232

## STATION DESCRIPTION

MP0232'DESCRIBED BY COAST AND GEODETIC SURVEY 1947

MP0232'3.7 MI NE FROM PARCO (SINCLAIR).

MP0232'3.7 MILES NORTHEAST OF PARCO (SINCLAIR) AT THE SINCLAIR AIRPORT,

MP0232'APPROXIMATELY 74 YARDS NORTH OF THE ADMINISTRATION BUILDING, 125.0

MP0232'FEET EAST OF THE CENTER LINE OF THE MAIN ENTRANCE TO THE AIRPORT, SET

MP0232'IN A DRILL HOLE IN THE CENTER OF THE TOP OF THE CONCRETE FOUNDATION OF

MP0232'THE BEACON TOWER AND 0.2 FOOT ABOVE THE SURFACE OF THE GROUND.

MP0232

MP0232

MP0232

## STATION RECOVERY (1983)

MP0232'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1983

MP0232'MARK NOT FOUND.

1 National Geodetic Survey, Retrieval Date = DECEMBER 14, 2016

MP0197 \*\*\*\*\*

MP0197 DESIGNATION - U 319

MP0197 PID - MP0197

MP0197 STATE/COUNTY- WY/CARBON

MP0197 COUNTRY - US

MP0197 USGS QUAD - WALCOTT (1982)

MP0197

MP0197

MP0197

\*CURRENT SURVEY CONTROL

MP0197

MP0197\* NAD 83(1986) POSITION- 41 46 06. (N) 106 49 34. (W) SCALED

MP0197\* [NAVD 88](#) ORTHO HEIGHT - 2025.806 (meters) 6646.33 (feet) ADJUSTED

MP0197

MP0197 GEOID HEIGHT - -13.664 (meters)

GEOID12B

MP0197 DYNAMIC HEIGHT - 2024.041 (meters)

6640.54 (feet) COMP

MP0197 MODELED GRAVITY - 979,679.9 (mgal)

NAVD 88

MP0197

MP0197

MP0197

VERT ORDER - FIRST CLASS II

MP0197

MP0197.The horizontal coordinates were scaled from a topographic map and have

MP0197.an estimated accuracy of +/- 6 seconds.

MP0197.

MP0197.The orthometric height was determined by differential leveling and

MP0197.adjusted by the NATIONAL GEODETIC SURVEY

MP0197.in June 1991.

MP0197

MP0197.Significant digits in the geoid height do not necessarily reflect accuracy.

MP0197.GEOID12B height accuracy estimate available [here](#).

MP0197

MP0197.The dynamic height is computed by dividing the NAVD 88

MP0197.geopotential number by the normal gravity value computed on the

MP0197.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45

MP0197.degrees latitude (g = 980.6199 gals.).

MP0197

MP0197.The modeled gravity was interpolated from observed gravity values.

MP0197
MP0197; North East Units Estimated Accuracy
MP0197;SPC WYEC - 240,970. 442,170. MT (+/- 180 meters Scaled)

MP0197
MP0197\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCG482256(NAD 83)

MP0197
MP0197 SUPERSEDED SURVEY CONTROL

MP0197
MP0197 NGVD 29 (??/??/92) 2024.604 (m) 6642.39 (f) SUPERSEDED 1 2
MP0197 NGVD 29 (06/08/92) 2024.604 (m) 6642.39 (f) ADJUSTED 1 2

MP0197
MP0197.Superseded values are not recommended for survey control.

MP0197
MP0197.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
MP0197.See file dsdata.txt to determine how the superseded data were derived.

MP0197
MP0197\_MARKER: DB = BENCH MARK DISK
MP0197\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
MP0197\_STAMPING: U 319 1947
MP0197\_MARK LOGO: CGS
MP0197\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
MP0197+STABILITY: SURFACE MOTION

MP0197
MP0197 HISTORY - Date Condition Report By
MP0197 HISTORY - 1947 MONUMENTED CGS
MP0197 HISTORY - 1983 GOOD NGS

MP0197
MP0197 STATION DESCRIPTION

MP0197
MP0197'DESCRIBED BY COAST AND GEODETIC SURVEY 1947
MP0197'1.1 MI E FROM WALCOTT.
MP0197'1.1 MILES EAST ALONG THE UNION PACIFIC RAILWAY FROM THE STATION AT
MP0197'WALCOTT, 11 POLES EAST OF MILEPOST 661, 336.5 FEET SOUTHWEST OF A
MP0197'FENCE CORNER, 272.0 FEET WEST OF RAILWAY SIGNAL 6607, 194.4 FEET
MP0197'NORTHWEST OF THE NORTHWEST RAIL OF THE NORTHWEST TRACK, 2.5 FEET
MP0197'NORTHEAST OF A REFERENCE POST, 2.0 FEET SOUTHEAST OF A FENCE, SET IN
MP0197'THE TOP OF A CONCRETE POST AND PROJECTS 0.4 FOOT ABOVE THE GROUND.

MP0197
MP0197 STATION RECOVERY (1983)

MP0197
MP0197'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1983
MP0197'RECOVERED IN GOOD CONDITION EXCEPT ADD 0.5 KM (0.3 MI) EAST OF
MP0197'MILEPOST 661. DELETE 11 POLES EAST OF MILEPOST 661.

1 National Geodetic Survey, Retrieval Date = DECEMBER 14, 2016
MP0478 \*\*\*\*\*
MP0478 DESIGNATION - X 341
MP0478 PID - MP0478
MP0478 STATE/COUNTY- WY/CARBON
MP0478 COUNTRY - US
MP0478 USGS QUAD - WALCOTT (1982)
MP0478
MP0478 \*CURRENT SURVEY CONTROL
MP0478
MP0478\* NAD 83(1986) POSITION- 41 45 36.7 (N) 106 50 42.5 (W) HD\_HELD2

MP0478\* [NAVD 88](#) ORTHO HEIGHT - 2018.319 (meters) 6621.77 (feet) ADJUSTED  
MP0478

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MP0478 GEOID HEIGHT - -13.612 (meters) GEOID12B  
MP0478 DYNAMIC HEIGHT - 2016.569 (meters) 6616.03 (feet) COMP  
MP0478 MODELED GRAVITY - 979,683.8 (mgal) NAVD 88  
MP0478

MP0478 VERT ORDER - FIRST CLASS II  
MP0478

MP0478.The horizontal coordinates were established by autonomous hand held GPS  
MP0478.observations and have an estimated accuracy of +/- 10 meters.  
MP0478.

MP0478.The orthometric height was determined by differential leveling and  
MP0478.adjusted by the NATIONAL GEODETIC SURVEY  
MP0478.in June 1991.  
MP0478

MP0478.Significant digits in the geoid height do not necessarily reflect accuracy.  
MP0478.GEOID12B height accuracy estimate available [here](#).  
MP0478

MP0478.[Photographs](#) are available for this station.  
MP0478

MP0478.The dynamic height is computed by dividing the NAVD 88  
MP0478.geopotential number by the normal gravity value computed on the  
MP0478.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
MP0478.degrees latitude (g = 980.6199 gals.).  
MP0478

MP0478.The modeled gravity was interpolated from observed gravity values.  
MP0478

	North	East	Units	Estimated Accuracy
MP0478; SPC WYEC	- 240,059.	440,596.	MT	(+/- 10 meters HH2 GPS)

MP0478

MP0478\_U.S. NATIONAL GRID SPATIAL ADDRESS: 13TCG4661424796(NAD 83)  
MP0478

MP0478 SUPERSEDED SURVEY CONTROL  
MP0478

MP0478 NGVD 29 (06/08/92) 2017.128 (m) 6617.86 (f) ADJUSTED 1 2  
MP0478

MP0478.Superseded values are not recommended for survey control.  
MP0478

MP0478.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
MP0478.[See file dsdata.txt](#) to determine how the superseded data were derived.  
MP0478

MP0478\_MARKER: I = METAL ROD  
MP0478\_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)  
MP0478\_STAMPING: X 341 1983  
MP0478\_MARK LOGO: NGS  
MP0478\_PROJECTION: FLUSH  
MP0478\_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL  
MP0478\_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR  
MP0478+SATELLITE: SATELLITE OBSERVATIONS - April 25, 2012  
MP0478\_ROD/PIPE-DEPTH: 10.4 meters  
MP0478

HISTORY	Date	Condition	Report By
MP0478 HISTORY	- 1983	MONUMENTED	NGS
MP0478 HISTORY	- 20120425	GOOD	GEOCAC



MP0478

MP0478

STATION DESCRIPTION

MP0478

MP0478'DESCRIBED BY NATIONAL GEODETIC SURVEY 1983

MP0478'IN WALCOTT.

MP0478'IN WALCOTT, AT THE JUNCTION OF THE UNION PACIFIC RAILROAD AND A DIRT  
MP0478'ROAD, 59.7 METERS (195.9 FT) SOUTHWEST OF THE SOUTHWEST CORNER OF THE  
MP0478'RAILROAD STATION, 48.2 METERS (158.1FT) SOUTH OF THE NEAR RAIL,  
MP0478'29.1 METERS (95.5 FT) NORTH OF A UTILITY POLE, 16.5 METERS (54.1 FT)  
MP0478'EAST OF THE CENTER OF THE DIRT ROAD, AND 12.3 METERS (40.4 FT) EAST OF  
MP0478'A FENCE CORNER. NOTE=ACCESS TO THE DATUM POINT IS THROUGH A 5-INCH  
MP0478'LOGO CAP.

MP0478'THE MARK IS 0.3 METERS N FROM A WITNESS POST AND FENCE

MP0478'THE MARK IS 1.0 M BELOW THE TRACKS.

MP0478

MP0478

STATION RECOVERY (2012)

MP0478

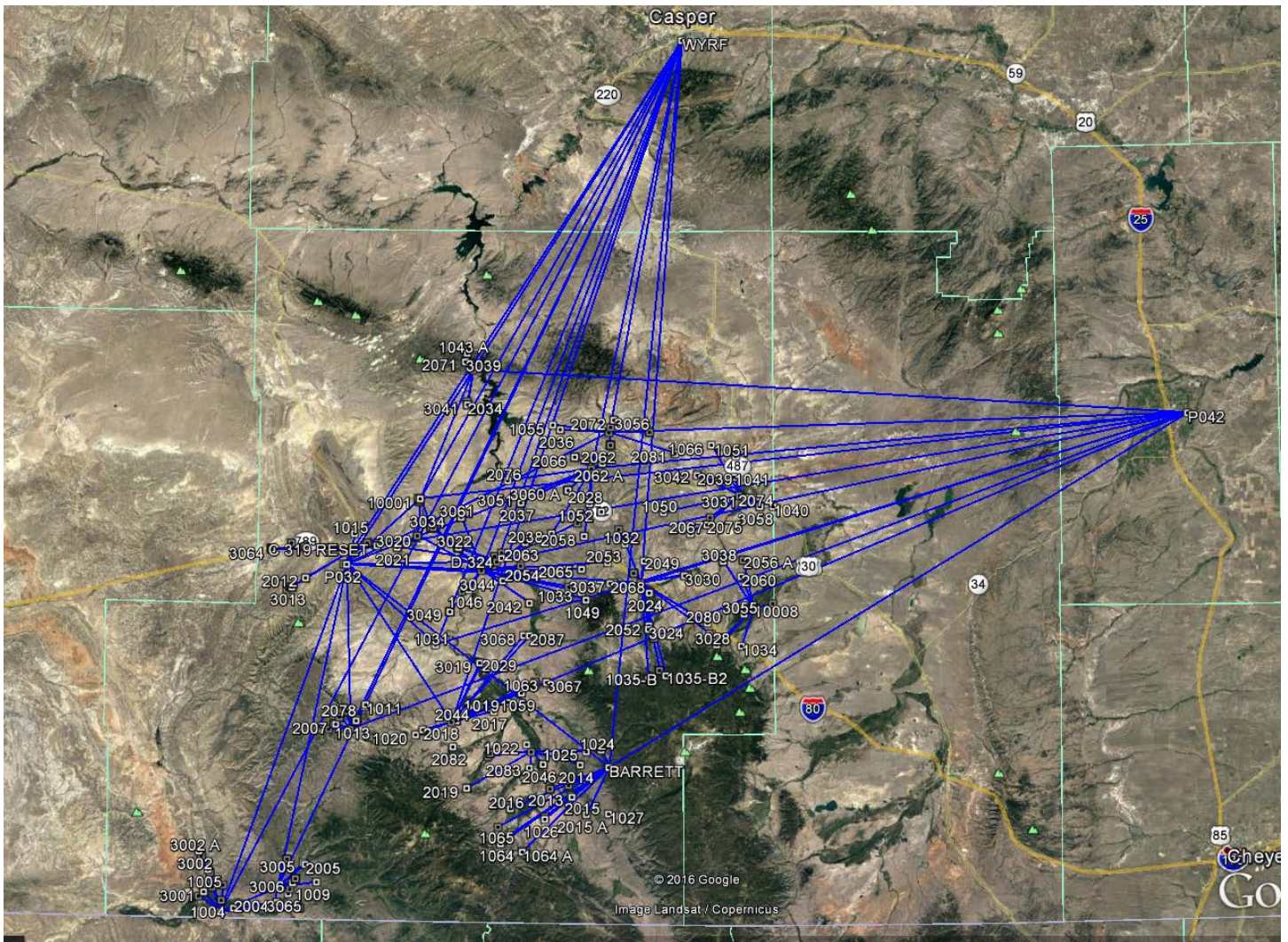
MP0478'RECOVERY NOTE BY GEOCACHING 2012 (BRB)

MP0478'RECOVERED IN GOOD CONDITION.

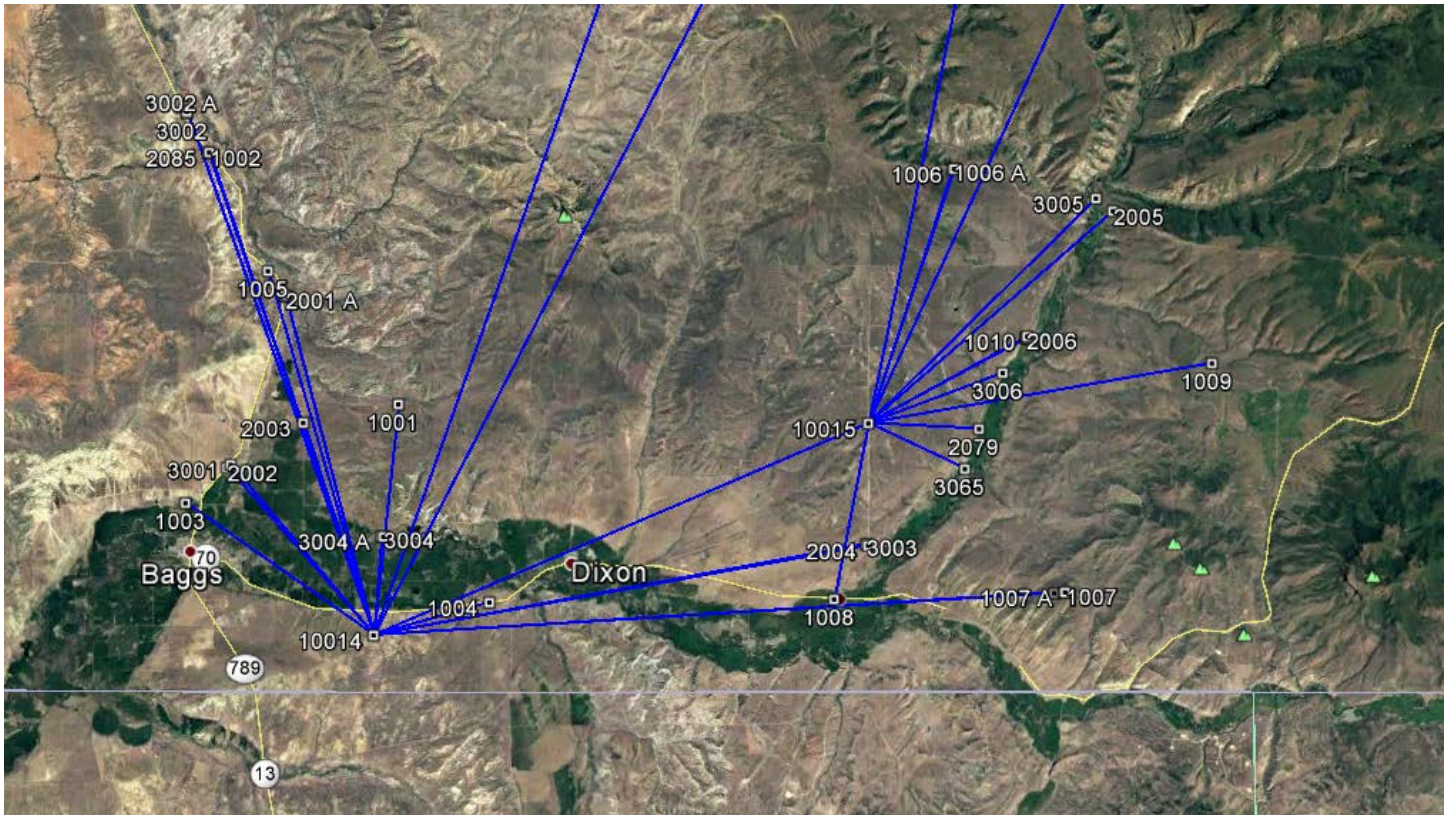
# Section 5: GPS Control Diagram

This section contains a graphical representation of the new and existing control stations used for the project.

## Overview of Control Network



Not to Scale



Not to Scale

