Ground Control Survey Report for the U.S. Geological Survey

Contractor: Woolpert
Date: April 2023
Contract: 140G0221D0013
Task Order: 140G0222F0098
Project Name: MN Central Miss River B22

WOOLPERT

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1. Survey Report

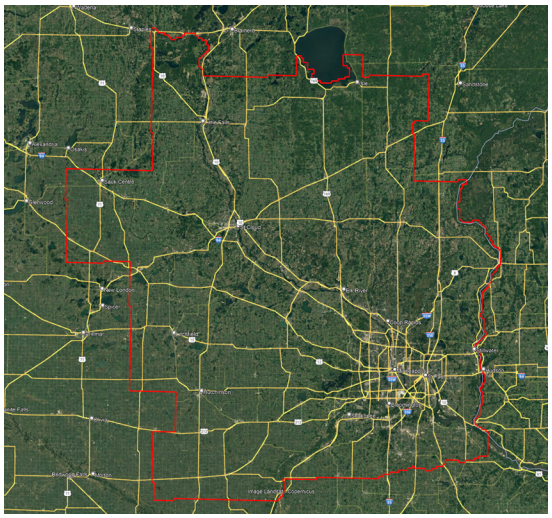
1.1. Introduction

This report contains a comprehensive outline of the Ground Control Survey that supported the lidar data collected for the task order. All survey activity was performed to achieve ground control accuracies that meet or exceed the National Mapping Accuracy Standards.

1.2. Project Area

The project area consists of approximately 10,490 square miles across Central Minnesota.

Figure 1.2.1 – Defined Project Area



1.3. Purpose

The purpose of this survey was to establish three-dimensional coordinates for 238 lidar control points, 238 non-vegetated checkpoints, and 169 vegetated check points. The points were collected per the flight layout and were uniformly dispersed over the project area.

1.4. Date of Survey

Ground control field operations were conducted from May 17, 2022 through June 23, 2022. Final ground collection continued on April 18, 2023 through April 24, 2023.

1.5. Monumentation

Prior to aerial imagery acquisition, Woolpert field crews performed a field reconnaissance to verify the existence and suitability of pre-selected existing National Geodetic Survey (NGS) control stations. Existing NSRS control stations were utilized as checks to ensure that quality x, y, z coordinate values were computed for each of the newly established photogrammetric control stations. Recovery information sheets for the existing NGS control stations can be found in section 4.

1.6. Accuracy Standards

The relative vertical accuracy of the LiDAR data will be 10 cm RMSEz with swath overlap (between adjacent swaths) and an absolutevertical accuracy of 15cm RMSE.

1.7. GPS Equipment

Woolpert survey crews used the following GPS equipment:

- One (1) R10 Model GNSS dual- frequency GPS receivers
- Two (2) R12 Model GNSS dual- frequency GPS receivers
- Three (3) TSC7 data collectors

1.8. Methodology

1.8.1. Static GPS

The field crew utilized Static GPS surveying throughout the ground control data collection process. The survey was conducted using a 5-second epoch rate with each observation lasting at least 20 minutes. Each station was occupied twice to ensure the required horizontal and vertical accuracies were met.

1.8.2. Real-time Kinematic (RTK) GPS

The field crew utilized Real-Time Kinematic (RTK) GPS surveying throughout the ground control data collection process. The survey was conducted using a 1-second epoch rate, in a fixed solution RTK mode, with each observation lasting between 60 and 180 seconds. Each station was occupied twice to insure the required horizontal and vertical accuracies were met.

1.8.3. GPS Data Analysis and Processing

The field crew chief processed all session baselines each day using Trimble Navigation's Trimble Business Center (TBC) software, version 5.31 baseline processor, with the accompanying broadcast ephemeris. Daily processing ensured the integrity of the network as it was constructed and allowing the field crews to immediately reschedule observations of any poor baselines.

1.8.4. Datum Reference and Final Coordinates

The spatial reference system for the project is NAD83 2011 (2010.00 epoch). Orthometric heights are based on NAVD88 vertical datum, Geoid18 was used to determine the orthometric heights from the ellipsoid heights. The projected coordinates are displayed in Universal Transverse Mercator, Zone 15N. Units for both the horizontal and vertical datums will be expressed in Meters to three (3) decimal places.

1.8.5. Quality Assurance

Existing NGS published benchmarks were surveyed to assure that there were no discrepancies in the field observation data. Close examinations of the residuals showed no distortions in orientation or scale. Ground control data meets positional accuracies necessary to support 1.0 point per 0.3 meters squared (1-foot 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).

2. Ground Control/Geodetic Control Coordinates

2.1. Ground Control – Worldwide UTM

- Horizontal Datum: NAD 1983 (Conus) 2011
- Horizontal Projection: 15N
- Vertical Datum: NAVD88
- Geoid Model: Geoid18 (Conus)
- Units: Meters

Table 2.1 Ground Control -Worldwide UTM

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
1001_2022_MN	4981770.703	439210.987	282.907	LiDAR Control
1001A_2023_MN	4981748.251	439230.421	282.873	LiDAR Control
1002_2023_MN	4984790.741	437969.094	292.983	LiDAR Control
1003_2023_MN	4990894.510	440142.230	278.805	LiDAR Control
1004_2023_MN	4996836.023	443133.442	306.668	LiDAR Control
1005_2023_MN	5002899.628	448467.841	279.675	LiDAR Control
1006_2022_MN	5008972.897	456639.016	278.796	LiDAR Control
1006A_2023_MN	5008842.043	456675.866	274.979	LiDAR Control
1007_2022_MN	5014929.604	455640.477	265.386	LiDAR Control
1007A_2023_MN	5014933.534	455651.236	265.409	LiDAR Control
1008_2023_MN	5020896.604	431034.171	294.027	LiDAR Control
1009_2023_MN	5026878.376	420435.494	294.040	LiDAR Control
1010_2023_MN	5032873.028	413927.313	305.406	LiDAR Control
1011_2023_MN	5038722.432	409926.227	308.480	LiDAR Control
1012_2023_MN	5044513.638	409310.647	316.584	LiDAR Control
1013_2022_MN	5048473.435	410360.408	325.730	LiDAR Control
1013A_2023_MN	5048462.624	410364.337	325.141	LiDAR Control
1014_2022_MN	5046462.070	416486.085	316.784	LiDAR Control
1015_2022_MN	5048035.812	422904.059	319.003	LiDAR Control
1016_2022_MN	5045976.767	429100.209	310.160	LiDAR Control
1017_2022_MN	5045490.053	435270.482	313.793	LiDAR Control
1018_2022_MN	5045391.774	440331.521	312.842	LiDAR Control
1019_2022_MN	5047965.685	446064.468	305.071	LiDAR Control
1020_2022_MN	5046475.879	452283.786	300.306	LiDAR Control
1021_2022_MN	5045174.087	458522.536	294.561	LiDAR Control
1022_2022_MN	5064451.913	464498.835	302.683	LiDAR Control
1023_2022_MN	5064611.739	470508.560	302.914	LiDAR Control
1024_2022_MN	5065829.803	476544.903	297.749	LiDAR Control
1025_2022_MN	5063904.568	482626.271	291.397	LiDAR Control
1026_2022_MN	5064129.720	487972.193	289.612	LiDAR Control
1027_2022_MN	5045028.262	487353.683	293.320	LiDAR Control
1028_2022_MN	5045762.650	490133.503	291.304	LiDAR Control

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
1029_2022_MN	5044011.207	493152.155	293.612	LiDAR Control
1030_2022_MN	5043987.941	496182.766	283.687	LiDAR Control
1031_2022_MN	5015932.010	499067.250	275.261	LiDAR Control
1032_2022_MN	5015543.793	502041.943	276.758	LiDAR Control
1033_2022_MN	5015713.902	505102.042	289.968	LiDAR Control
1034_2022_MN	5014315.703	508052.641	284.954	LiDAR Control
1035_2022_MN	5013890.165	511026.278	280.241	LiDAR Control
1036_2022_MN	5014277.663	514032.747	299.163	LiDAR Control
1037_2022_MN	5015400.322	518032.949	283.146	LiDAR Control
1038_2023_MN	4982738.655	392092.566	338.960	LiDAR Control
1039_2023_MN	4988875.079	393846.086	330.832	LiDAR Control
1040_2023_MN	4994832.592	395941.994	338.919	LiDAR Control
1041_2023_MN	5000410.397	396420.010	316.327	LiDAR Control
1042_2023_MN	5006888.760	396571.045	331.080	LiDAR Control
1042A_2023_MN	5006817.934	396573.858	331.073	LiDAR Control
1043_2023_MN	5012918.051	397039.362	319.829	LiDAR Control
1043A_2023_MN	5012394.058	397040.112	325.621	LiDAR Control
1044_2023_MN	5018943.015	398310.767	356.378	LiDAR Control
1045_2023_MN	5024889.947	400118.375	351.349	LiDAR Control
1046_2023_MN	5030840.810	402694.652	340.496	LiDAR Control
1047_2023_MN	5036843.760	359079.383	388.875	LiDAR Control
1048_2023_MN	5043134.979	358784.495	376.786	LiDAR Control
1049_2023_MN	5048398.056	356518.845	386.892	LiDAR Control
1050_2023_MN	5054350.769	354333.629	388.111	LiDAR Control
1051_2023_MN	5059644.739	354286.995	372.182	LiDAR Control
1052_2023_MN	5065827.577	355222.486	388.913	LiDAR Control
1053_2023_MN	5071193.877	355345.926	387.879	LiDAR Control
1054_2022_MN	5092811.675	371254.434	382.209	LiDAR Control
1055_2022_MN	5092729.107	374554.257	379.028	LiDAR Control
1056_2022_MN	5092689.383	377409.770	376.048	LiDAR Control
1057_2022_MN	5092663.120	380509.728	373.871	LiDAR Control
1058_2022_MN	5092592.874	383477.075	356.152	LiDAR Control
1059_2022_MN	5092533.744	386658.418	350.185	LiDAR Control
1060_2022_MN	5092479.338	389644.516	344.738	LiDAR Control
1061_2022_MN	5092290.051	392631.109	342.328	LiDAR Control
1062_2022_MN	5091573.732	395792.220	349.741	LiDAR Control
1063_2022_MN	5091517.349	398709.589	356.518	LiDAR Control
1064_2022_MN	5091489.652	402135.541	354.348	LiDAR Control
1065_2022_MN	5091498.536	405170.558	341.239	LiDAR Control
1066_2022_MN	5091425.767	408021.919	345.461	LiDAR Control
1067_2022_MN	5091325.598	413491.615	356.050	LiDAR Control

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
1068_2022_MN	5099129.074	419719.646	384.932	LiDAR Control
1069_2022_MN	5099867.748	425937.821	381.971	LiDAR Control
1070_2022_MN	5103037.445	432112.744	395.109	LiDAR Control
1071_2022_MN	5102976.818	437156.830	403.108	LiDAR Control
1072_2022_MN	5102898.145	443165.763	392.025	LiDAR Control
1073_2022_MN	5102358.025	449228.091	382.932	LiDAR Control
1074_2022_MN	5107405.126	455330.564	388.214	LiDAR Control
1075_2022_MN	5108921.910	461418.348	388.116	LiDAR Control
1076_2022_MN	5107047.143	467484.105	387.168	LiDAR Control
1077_2022_MN	5106957.430	473591.780	378.509	LiDAR Control
1078_2022_MN	5106922.914	479765.328	369.955	LiDAR Control
1079_2022_MN	5108437.695	485967.280	350.148	LiDAR Control
1080_2022_MN	5108422.138	492212.708	344.163	LiDAR Control
1081_2022_MN	5108421.205	497453.609	345.225	LiDAR Control
1082_2022_MN	5062544.011	488694.675	293.910	LiDAR Control
1083_2022_MN	5061370.478	491612.827	287.459	LiDAR Control
1084_2022_MN	5060606.387	494581.221	281.255	LiDAR Control
1085_2022_MN	5062159.840	497424.304	287.291	LiDAR Control
1086_2022_MN	5058822.516	500554.527	280.734	LiDAR Control
1087_2022_MN	5059601.626	503577.621	280.018	LiDAR Control
1088_2022_MN	5060559.297	506538.837	265.278	LiDAR Control
1089_2022_MN	5061086.341	509389.431	243.549	LiDAR Control
1090_2022_MN	5039973.656	512921.933	264.600	LiDAR Control
1091_2022_MN	5037578.300	515932.067	301.852	LiDAR Control
1092_2022_MN	5038390.539	519122.719	279.361	LiDAR Control
1093_2022_MN	5038415.361	520332.370	287.363	LiDAR Control
1094_2022_MN	5038412.600	521670.779	261.610	LiDAR Control
1095_2022_MN	5036745.590	523349.843	241.168	LiDAR Control
1096_2022_MN	5033416.662	524788.095	294.587	LiDAR Control
1097_2022_MN	5028856.207	526178.167	285.792	LiDAR Control
1098_2022_MN	5028709.563	527719.902	231.933	LiDAR Control
1099_2022_MN	5027969.186	528746.813	309.078	LiDAR Control
1100_2022_MN	5092418.321	439324.514	398.438	LiDAR Control
1101_2022_MN	5068616.086	402908.816	326.189	LiDAR Control
1101A_2023_MN	5068595.662	402170.663	323.976	LiDAR Control
1102_2022_MN	5068765.896	393683.263	352.516	LiDAR Control
1102A_2023_MN	5069153.875	393688.008	348.533	LiDAR Control
2001_2022_MN	4941167.035	477314.020	321.987	HOR/NVA
2002_2022_MN	4966681.116	465964.918	263.491	HOR/NVA
2003_2022_MN	5069987.568	426027.603	380.113	HOR/NVA
2004_2022_MN	4954432.849	485932.043	301.039	HOR/NVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
2005_2022_MN	5092022.420	414532.723	357.193	HOR/NVA
2006_2022_MN	4933967.094	402919.223	308.736	HOR/NVA
2007_2022_MN	5028803.513	524614.059	292.948	NVA
2008_2023_MN	5049497.909	407168.636	316.438	NVA
2009_2022_MN	4961573.395	470207.907	253.028	HOR/NVA
2010_2022_MN	4941501.223	500401.077	297.128	HOR/NVA
2011_2022_MN	5099261.461	424339.333	375.921	HOR/NVA
2012_2022_MN	5056056.724	426323.529	353.505	HOR/NVA
2013_2022_MN	5082944.061	448520.161	371.819	HOR/NVA
2014_2022_MN	4948597.932	460297.942	287.287	HOR/NVA
2015_2023_MN	4992239.588	406355.528	321.679	NVA
2016_2023_MN	4988630.980	393025.167	341.359	NVA
2017_2023_MN	4996141.544	431685.373	297.810	NVA
2018_2022_MN	4964761.646	492979.016	263.155	HOR/NVA
2019_2022_MN	4977079.174	504139.007	313.335	HOR/NVA
2020_2022_MN	5002386.137	518396.513	232.207	NVA
2021_2022_MN	5005594.447	470490.945	268.100	HOR/NVA
2022_2022_MN	4992855.928	490219.813	280.976	HOR/NVA
2023_2022_MN	4972019.599	468130.738	274.095	HOR/NVA
2024_2022_MN	5098466.220	479576.438	334.242	HOR/NVA
2025_2022_MN	4972303.635	493600.489	297.238	HOR/NVA
2026_2022_MN	5043217.852	454200.209	297.302	HOR/NVA
2027_2022_MN	4955454.273	470014.427	296.339	HOR/NVA
2028_2022_MN	4966050.128	498241.159	246.623	HOR/NVA
2029_2023_MN	5066638.505	346779.438	387.297	NVA
2030_2023_MN	5002797.400	418877.128	310.897	NVA
2031_2022_MN	4979640.866	478966.949	259.185	HOR/NVA
2032_2023_MN	5000008.399	367531.741	369.316	NVA
2033_2022_MN	4979943.955	463979.927	290.607	HOR/NVA
2034_2022_MN	4967668.103	461714.636	269.913	HOR/NVA
2035_2023_MN	5064623.131	335886.923	412.256	NVA
2036_2022_MN	4942001.824	390840.430	317.211	HOR/NVA
2037_2022_MN	4954511.024	511699.674	217.730	HOR/NVA
2038_2022_MN	4951402.175	476412.598	316.758	HOR/NVA
2039_2022_MN	5125168.833	386367.832	409.050	NVA
2040_2022_MN	5092067.501	473343.644	339.143	NVA
2041_2022_MN	5025894.571	471358.479	278.752	HOR/NVA
2042_2022_MN	5104564.565	388030.324	356.984	HOR/NVA
2043_2022_MN	5000350.320	460980.009	284.038	HOR/NVA
2044_2023_MN	5054306.093	377327.350	362.068	NVA
2045_2023_MN	4994079.430	439694.682	290.683	NVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
2046_2022_MN	5046714.345	475836.459	283.884	HOR/NVA
2047_2022_MN	4988034.000	464127.502	295.997	HOR/NVA
2048_2022_MN	5118776.075	460341.851	383.344	HOR/NVA
2049_2022_MN	4959739.512	494452.104	270.728	HOR/NVA
2050_2022_MN	4976284.330	432215.825	295.376	NVA
2051_2023_MN	5058490.185	358709.136	370.129	NVA
2052_2022_MN	4956408.971	483600.390	307.844	HOR/NVA
2053_2022_MN	5037610.218	504684.805	272.442	HOR/NVA
2054_2022_MN	4965913.229	488221.951	272.385	HOR/NVA
2055_2022_MN	4971669.755	480428.924	251.800	HOR/NVA
2056_2022_MN	4984748.949	517700.633	209.267	HOR/NVA
2057_2022_MN	4953343.321	386974.371	320.063	HOR/NVA
2058_2022_MN	4968313.110	468727.897	273.939	HOR/NVA
2059_2022_MN	4972229.804	390102.628	320.859	HOR/NVA
2060_2022_MN	5032313.971	460911.553	306.102	HOR/NVA
2061_2022_MN	5043246.766	494923.938	287.931	HOR/NVA
2062_2022_MN	4999894.413	489367.261	271.390	HOR/NVA
2063_2022_MN	5046244.795	466889.025	289.018	NVA
2064_2022_MN	5008005.913	475808.066	271.615	HOR/NVA
2065_2022_MN	4987643.587	516306.203	210.659	HOR/NVA
2066_2022_MN	5102006.926	490102.554	336.786	NVA
2067_2022_MN	5002705.101	483985.048	276.282	HOR/NVA
2068_2022_MN	5006917.429	451056.062	277.875	HOR/NVA
2068A_2023_MN	5006877.685	451114.884	277.824	NVA
2069_2022_MN	4972109.814	474844.947	268.329	HOR/NVA
2070_2022_MN	5025607.935	492191.042	279.874	HOR/NVA
2071_2022_MN	5037571.672	514314.800	294.155	HOR/NVA
2072_2022_MN	5014940.646	440761.874	292.340	HOR/NVA
2072_2023_MN	5014938.548	440763.653	292.348	NVA
2073_2022_MN	4977482.387	375042.121	330.544	HOR/NVA
2074_2023_MN	5002665.776	432047.888	299.327	NVA
2075_2022_MN	5114338.368	375663.175	404.224	NVA
2076_2023_MN	5070171.455	377920.819	376.057	NVA
2077_2022_MN	4948603.388	420687.600	304.332	HOR/NVA
2078_2022_MN	4965683.441	439087.657	312.394	HOR/NVA
2079_2022_MN	5010146.654	463013.574	268.917	HOR/NVA
2080_2022_MN	4989516.337	454754.003	303.117	HOR/NVA
2081_2022_MN	5032814.583	442458.918	299.288	HOR/NVA
2082_2022_MN	5036891.144	517535.832	293.120	HOR/NVA
2083_2022_MN	4968131.512	486606.180	256.862	HOR/NVA
2084_2022_MN	4962548.989	483224.701	243.935	HOR/NVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
2085_2022_MN	5048097.273	458895.070	296.006	HOR/NVA
2086_2022_MN	4992211.442	496075.561	285.948	HOR/NVA
2087_2022_MN	5011420.981	514628.052	316.057	HOR/NVA
2088_2023_MN	4997165.446	435801.916	288.113	NVA
2089_2022_MN	4954956.882	445847.865	262.266	HOR/NVA
2090_2022_MN	5003291.539	456613.112	299.712	HOR/NVA
2091_2022_MN	5106932.312	476561.267	374.395	HOR/NVA
2092_2023_MN	5015951.017	378705.878	354.264	NVA
2093_2022_MN	4958582.335	467749.443	227.422	HOR/NVA
2094_2022_MN	4971252.571	490574.996	276.244	HOR/NVA
2095_2022_MN	4992977.364	480922.576	264.475	HOR/NVA
2096_2023_MN	5041411.455	375110.829	358.709	NVA
2097_2022_MN	4946676.035	507658.219	255.483	HOR/NVA
2098_2022_MN	5047545.432	433542.752	315.130	NVA
2099_2022_MN	4975367.334	472485.260	277.260	HOR/NVA
2100_2022_MN	5070744.089	468163.642	309.698	HOR/NVA
2101_2022_MN	4969201.955	445491.018	308.098	NVA
2102_2022_MN	4979058.068	502979.324	326.701	HOR/NVA
2103_2023_MN	5037076.988	396459.571	335.858	NVA
2104_2022_MN	5024095.383	423663.740	298.701	HOR/NVA
2104A_2023_MN	5024143.782	423625.454	299.151	NVA
2105_2022_MN	5041235.052	454583.240	297.257	HOR/NVA
2106_2022_MN	4965902.556	437841.753	306.826	HOR/NVA
2107_2022_MN	4972907.426	405405.742	325.474	HOR/NVA
2108_2022_MN	4996564.276	473625.350	264.755	HOR/NVA
2109_2022_MN	5001606.647	489421.454	276.420	HOR/NVA
2110_2022_MN	5061499.792	468114.501	310.603	HOR/NVA
2111_2022_MN	4945531.811	447276.627	229.573	NVA
2112_2022_MN	4997846.337	462390.346	283.762	HOR/NVA
2113_2022_MN	4996560.380	452394.687	302.607	NVA
2114_2022_MN	4961616.224	472245.290	252.110	HOR/NVA
2115_2022_MN	5075211.316	390912.593	338.563	NVA
2116_2022_MN	4957954.351	411397.271	307.253	HOR/NVA
2117_2022_MN	5004903.504	487190.749	276.802	HOR/NVA
2118_2022_MN	5058917.119	501655.169	279.981	HOR/NVA
2119_2022_MN	4993600.305	470420.100	265.448	HOR/NVA
2120_2022_MN	4963905.768	456326.338	262.219	HOR/NVA
2121_2022_MN	5034520.556	420795.665	304.458	NVA
2122_2023_MN	5014489.461	407291.571	333.961	NVA
2123_2022_MN	5037953.740	410378.945	310.283	HOR/NVA
2123A_2023_MN	5037932.825	410343.624	309.809	NVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
2124_2022_MN	4988796.758	443106.015	317.038	NVA
2125_2022_MN	4968858.723	510858.286	308.472	NVA
2126_2022_MN	5070547.675	485803.151	289.139	HOR/NVA
2127_2022_MN	4935928.256	429484.057	224.567	NVA
2128_2022_MN	4960261.553	484287.633	285.500	HOR/NVA
2129_2022_MN	5101691.478	446858.413	386.247	HOR/NVA
2130_2022_MN	5007608.611	470373.876	262.812	HOR/NVA
2131_2022_MN	5084448.774	433973.993	389.981	HOR/NVA
2132_2022_MN	4967269.560	490129.990	277.350	HOR/NVA
2133_2022_MN	4999939.839	469360.712	268.887	HOR/NVA
2134_2022_MN	4937378.383	434206.314	301.628	HOR/NVA
2135_2022_MN	4984820.268	500250.690	299.180	HOR/NVA
2136_2022_MN	4942123.094	489182.425	275.411	HOR/NVA
2137_2022_MN	4958388.301	444276.725	303.694	NVA
2138_2022_MN	4966734.851	451273.639	304.582	NVA
2139_2022_MN	4949123.391	481030.312	319.203	HOR/NVA
2140_2022_MN	4993062.841	466827.007	281.066	HOR/NVA
2141_2022_MN	4966162.011	446440.141	291.085	HOR/NVA
2142_2023_MN	5024605.698	363452.753	366.050	NVA
2143_2023_MN	5062114.855	347902.069	385.657	NVA
2144_2022_MN	4991131.011	472270.926	264.207	HOR/NVA
2145_2022_MN	4982074.095	481874.631	259.840	HOR/NVA
2146_2022_MN	4942368.835	469483.076	310.649	NVA
2147_2022_MN	4967086.198	473822.008	256.237	HOR/NVA
2148_2022_MN	4957962.181	408729.802	302.932	HOR/NVA
2149_2022_MN	5041117.006	486079.529	298.175	NVA
2150_2022_MN	5060859.583	449818.746	315.088	HOR/NVA
2151_2022_MN	5080285.167	478868.594	309.373	HOR/NVA
2152_2022_MN	5013735.242	497164.603	278.177	HOR/NVA
2153_2022_MN	4951780.464	487554.453	290.723	HOR/NVA
2154_2022_MN	4945112.538	497265.774	260.860	HOR/NVA
2155_2022_MN	4963696.817	486742.719	272.460	HOR/NVA
2156_2022_MN	4977565.053	496190.974	257.325	HOR/NVA
2157_2022_MN	4932266.620	378805.006	317.841	HOR/NVA
2158_2022_MN	5026247.527	483660.602	282.467	NVA
2159_2022_MN	5047175.232	500741.835	276.123	HOR/NVA
2160_2022_MN	5020298.508	509217.630	284.594	HOR/NVA
2161_2023_MN	5056281.502	347773.851	401.384	NVA
2162_2022_MN	5023472.605	469597.142	278.811	HOR/NVA
2163_2022_MN	4983713.025	475509.052	278.628	HOR/NVA
2164_2022_MN	5087909.295	478609.013	324.841	HOR/NVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
2165_2022_MN	5037326.254	435906.619	305.448	HOR/NVA
2166_2022_MN	4954908.648	475160.910	277.402	HOR/NVA
2167_2022_MN	5068033.186	451868.672	326.213	HOR/NVA
2168_2022_MN	4996050.462	481840.494	278.334	HOR/NVA
2169_2022_MN	4953294.634	485262.489	298.800	HOR/NVA
2170_2023_MN	4998353.009	379632.046	343.575	NVA
2171_2022_MN	5026566.897	509004.473	277.550	NVA
2172_2022_MN	4990768.345	479847.014	268.079	HOR/NVA
2173_2022_MN	4946515.595	450361.676	233.229	HOR/NVA
2174_2022_MN	4943329.727	479825.966	303.333	HOR/NVA
2175_2022_MN	5035226.608	495055.859	281.127	HOR/NVA
2176_2022_MN	4963281.688	495129.216	287.476	HOR/NVA
2177_2022_MN	4956897.019	482632.832	313.430	HOR/NVA
2178_2022_MN	4974934.685	470352.486	273.749	HOR/NVA
2179_2022_MN	4968821.950	494699.591	288.845	HOR/NVA
2180_2022_MN	4965528.521	457326.758	281.424	HOR/NVA
2181_2022_MN	4971251.887	435364.444	301.303	HOR/NVA
2182_2022_MN	4946178.446	488123.497	277.584	HOR/NVA
2183_2022_MN	5097883.050	396509.852	344.410	HOR/NVA
2184_2023_MN	5044819.610	405759.826	324.473	NVA
2185_2022_MN	4980634.295	481627.062	253.791	HOR/NVA
2186_2022_MN	4967929.330	458656.224	287.964	HOR/NVA
2187_2022_MN	5016518.446	456527.081	272.987	HOR/NVA
2187A_2023_MN	5016516.747	456521.292	273.030	NVA
2188_2022_MN	4981446.958	440325.169	298.991	NVA
2188A_2023_MN	4981458.505	440318.625	298.590	NVA
2189_2022_MN	5092157.256	396573.771	355.980	HOR/NVA
2190_2022_MN	4983899.418	495446.282	262.725	HOR/NVA
2191_2022_MN	4979464.828	456246.838	284.917	HOR/NVA
2192_2022_MN	4953286.468	393029.584	316.712	HOR/NVA
2193_2022_MN	5095322.778	466488.751	370.007	HOR/NVA
2194_2023_MN	5064914.434	405517.923	323.720	NVA
2195_2023_MN	5047144.960	348052.288	400.371	NVA
2196_2022_MN	4979237.669	480487.017	255.824	HOR/NVA
2197_2022_MN	4953651.695	421199.810	305.228	HOR/NVA
2198_2022_MN	4952268.956	482823.553	290.438	HOR/NVA
2199_2022_MN	4981231.858	476830.473	247.921	HOR/NVA
2200_2022_MN	4973284.339	464255.059	293.931	HOR/NVA
2201_2022_MN	4991717.520	468992.834	269.043	HOR/NVA
2202_2022_MN	5107000.850	470945.269	383.593	HOR/NVA
2203_2022_MN	5066922.454	449924.759	330.221	HOR/NVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
2204_2022_MN	5022337.884	476661.025	279.094	HOR/NVA
2205_2022_MN	4957564.005	429663.546	296.851	HOR/NVA
2205A_2022_MN	4957562.417	429676.471	297.030	HOR/NVA
2206_2022_MN	4979545.942	417359.700	313.798	HOR/NVA
2207_2022_MN	4966126.253	510856.776	296.007	HOR/NVA
2208_2023_MN	5065048.567	348426.409	377.623	NVA
2209_2022_MN	4961277.400	454357.020	230.708	HOR/NVA
2210_2022_MN	4992075.560	516455.317	222.665	HOR/NVA
2211_2022_MN	4999123.446	495868.135	276.794	HOR/NVA
2212_2022_MN	5082996.103	415218.481	370.797	HOR/NVA
2213_2022_MN	5109045.478	406591.406	393.657	NVA
2214_2022_MN	4948666.157	432678.264	301.554	HOR/NVA
2215_2023_MN	5034267.460	382232.963	340.932	NVA
2216_2022_MN	4953955.852	500410.574	257.700	NVA
2217_2023_MN	5049819.075	395415.413	352.534	NVA
2218_2022_MN	4948196.890	405432.223	310.607	HOR/NVA
2219_2022_MN	5014207.506	481536.963	277.552	HOR/NVA
2220_2022_MN	5085018.540	380964.955	357.643	HOR/NVA
2221_2022_MN	4937331.964	451296.723	282.478	NVA
2222_2022_MN	5004698.557	509272.945	302.017	HOR/NVA
2223_2022_MN	5036871.913	471229.021	289.041	HOR/NVA
2224_2022_MN	5085223.857	466452.824	336.755	HOR/NVA
2225_2023_MN	5065667.903	385956.409	365.835	NVA
2226_2022_MN	5076170.473	443831.632	355.531	NVA
2227_2022_MN	5031056.273	431436.006	294.557	HOR/NVA
2228_2022_MN	4970266.710	418263.299	296.554	HOR/NVA
2229_2023_MN	5015994.299	420469.589	335.880	NVA
2230_2022_MN	5062464.852	439119.500	338.254	HOR/NVA
2231_2022_MN	5098636.342	455176.448	392.355	NVA
3001_2022_MN	5061560.185	468428.926	312.523	VVA
3002_2022_MN	5089873.549	405683.015	340.245	VVA
3003_2023_MN	5056351.629	408642.868	327.678	VVA
3004_2022_MN	4944612.558	430036.431	300.558	VVA
3005_2022_MN	5102290.860	385586.246	369.662	VVA
3006_2022_MN	5054489.210	428673.851	338.330	VVA
3007_2022_MN	5057786.399	489822.411	294.675	VVA
3008_2022_MN	5083062.399	408593.486	341.001	VVA
3009_2022_MN	5057745.909	499459.548	280.954	VVA
3010_2022_MN	4957563.931	464678.613	247.256	VVA
3011_2022_MN	4964814.583	432816.120	303.352	VVA
3012_2022_MN	4943540.012	514441.917	275.364	VVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
3013_2022_MN	5063410.796	470084.555	305.059	VVA
3014_2022_MN	4960926.873	421688.462	302.934	VVA
3015_2023_MN	4990702.254	422570.938	303.531	VVA
3016_2022_MN	5047671.524	438629.642	315.067	VVA
3017_2022_MN	5062642.409	486741.423	289.890	VVA
3018_2023_MN	5055690.159	374153.978	379.805	VVA
3019_2022_MN	5065918.938	428113.589	369.724	VVA
3020_2022_MN	5073098.512	431450.181	381.970	VVA
3021_2023_MN	5038348.760	363778.993	375.747	VVA
3022_2022_MN	4937894.037	494797.774	276.719	VVA
3023_2022_MN	4980961.642	477025.721	249.023	VVA
3024_2022_MN	4975398.598	423380.145	302.341	VVA
3025_2022_MN	5025591.330	478435.794	281.767	VVA
3026_2022_MN	5020428.498	469139.468	278.842	VVA
3027_2023_MN	5040010.829	403157.930	332.502	VVA
3028_2023_MN	5058317.939	342990.718	406.866	VVA
3029_2022_MN	4962031.065	432863.301	301.824	VVA
3030_2022_MN	5050306.457	439297.948	319.984	VVA
3031_2023_MN	4994119.146	406400.782	324.118	VVA
3032_2022_MN	5058391.689	451137.047	308.552	VVA
3033_2023_MN	5020158.579	390218.513	354.921	VVA
3034_2022_MN	5075439.757	466513.645	316.992	VVA
3035_2022_MN	5020998.625	437993.412	288.608	VVA
3035A_2023_MN	5021085.312	437845.269	288.998	VVA
3036_2022_MN	5108306.501	466652.405	392.519	VVA
3037_2022_MN	5102949.863	439127.062	394.917	VVA
3038_2022_MN	4936626.309	482987.175	295.424	VVA
3039_2023_MN	5000011.150	364984.393	372.075	VVA
3040_2022_MN	5073196.797	428644.462	381.023	VVA
3041_2022_MN	4955402.183	505352.085	266.889	VVA
3042_2022_MN	5002757.892	496800.826	277.863	VVA
3043_2022_MN	5071733.296	380711.373	371.700	VVA
3043A_2023_MN	5071708.014	380577.844	368.081	VVA
3044_2022_MN	5089885.741	479537.147	321.279	VVA
3045_2022_MN	4989095.738	458870.908	300.824	VVA
3046_2022_MN	5078852.030	392120.799	336.641	VVA
3047_2022_MN	5009556.173	517057.057	303.134	VVA
3048_2022_MN	5069990.483	428247.177	376.685	VVA
3049_2022_MN	4948569.972	438429.299	281.998	VVA
3050_2022_MN	5103264.354	408194.957	380.752	VVA
3051_2023_MN	5039970.481	398289.185	342.558	VVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
3052_2022_MN	4966036.979	510886.343	293.705	VVA
3053_2022_MN	4938513.683	408110.267	305.032	VVA
3054_2022_MN	5017664.038	508109.956	288.532	VVA
3055_2022_MN	5021455.788	511700.275	281.615	VVA
3056_2022_MN	4995679.974	443447.978	282.706	VVA
3056A_2023_MN	4995655.121	443355.214	280.861	VVA
3057_2022_MN	4955988.413	426823.042	300.194	VVA
3058_2022_MN	5102115.285	479055.263	342.372	VVA
3059_2022_MN	5038744.153	470813.808	285.386	VVA
3060_2022_MN	5055748.641	469642.869	295.389	VVA
3061_2022_MN	4975677.839	426589.088	299.529	VVA
3062_2022_MN	5108396.575	494041.715	347.629	VVA
3063_2022_MN	5047180.599	426266.708	316.145	VVA
3064_2022_MN	5102728.702	421223.495	386.106	VVA
3065_2022_MN	5014078.950	487263.249	274.091	VVA
3066_2022_MN	4974555.294	442781.568	307.667	VVA
3067_2022_MN	4968841.778	493325.050	308.309	VVA
3068_2022_MN	4953614.438	424811.780	304.718	VVA
3069_2022_MN	5052558.391	417150.205	329.670	VVA
3070_2022_MN	5056929.303	431841.148	334.353	VVA
3071_2023_MN	5040223.359	347480.940	381.861	VVA
3072_2022_MN	5042567.054	482409.726	290.858	VVA
3073_2022_MN	4952726.015	429602.104	299.572	VVA
3074_2022_MN	4958704.434	402045.367	312.853	VVA
3075_2022_MN	5053027.642	467343.575	299.639	VVA
3076_2022_MN	4980042.350	432208.489	288.462	VVA
3077_2022_MN	5045825.542	469576.359	288.766	VVA
3078_2022_MN	4961662.364	425481.090	301.601	VVA
3079_2022_MN	4949307.252	441725.649	278.599	VVA
3080_2022_MN	5045631.651	415815.281	313.118	VVA
3081_2023_MN	5025549.311	364562.207	359.323	VVA
3082_2022_MN	5114296.771	375622.868	408.234	VVA
3083_2022_MN	4947725.833	455821.017	289.690	VVA
3084_2022_MN	4933961.944	387225.898	317.652	VVA
3085_2022_MN	5054507.881	499812.133	282.398	VVA
3086_2022_MN	4942532.461	442692.592	256.990	VVA
3087_2022_MN	4956734.038	438210.614	280.599	VVA
3088_2022_MN	4984766.006	489235.204	271.576	VVA
3089_2022_MN	4982896.398	504423.770	307.645	VVA
3090_2022_MN	5028780.966	524603.877	292.430	VVA
3091_2022_MN	5076100.967	449354.795	355.113	VVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
3092_2022_MN	5038211.659	483107.891	294.409	VVA
3093_2022_MN	4991261.139	443573.562	300.783	VVA
3094_2022_MN	5024229.956	507829.295	281.895	VVA
3095_2022_MN	4948651.784	433687.841	290.893	VVA
3096_2022_MN	5075028.719	414975.803	365.082	VVA
3097_2022_MN	4976694.701	432216.770	289.045	VVA
3098_2022_MN	5054052.387	411617.349	337.107	VVA
3098A_2023_MN	5054126.660	411616.090	336.135	VVA
3099_2022_MN	5089685.916	484107.461	319.794	VVA
3100_2022_MN	4944382.904	482712.429	297.856	VVA
3101_2022_MN	4971255.196	440916.160	292.636	VVA
3102_2022_MN	4954338.921	495633.221	283.203	VVA
3103_2022_MN	4961697.189	449829.319	275.631	VVA
3104_2022_MN	5069612.382	423229.443	383.556	VVA
3105_2022_MN	4948065.914	390961.833	312.448	VVA
3106_2022_MN	5027370.446	483019.949	281.186	VVA
3107_2022_MN	4967290.780	423283.324	295.652	VVA
3108_2022_MN	5086077.411	423012.385	400.485	VVA
3109_2022_MN	5060183.544	477671.638	297.629	VVA
3110_2022_MN	5048855.155	418610.393	315.436	VVA
3111_2022_MN	5050382.240	414897.862	320.192	VVA
3112_2022_MN	5121582.981	384626.616	392.537	VVA
3113_2023_MN	5004046.939	390074.501	332.716	VVA
3114_2022_MN	4998739.990	481921.042	277.360	VVA
3115_2022_MN	5089485.123	387474.962	357.890	VVA
3116_2022_MN	4983972.150	442756.392	290.627	VVA
3117_2022_MN	5008662.795	463505.707	266.193	VVA
3118_2022_MN	5090475.228	448315.837	376.047	VVA
3119_2022_MN	4939446.963	469961.382	318.135	VVA
3120_2022_MN	5072504.100	423196.170	390.016	VVA
3121_2022_MN	4972899.883	435347.534	307.295	VVA
3122_2022_MN	5025506.608	517221.402	287.404	VVA
3123_2022_MN	4978322.831	392051.286	332.458	VVA
3124_2022_MN	4998980.300	447629.819	293.183	VVA
3124A_2023_MN	4998931.634	447631.729	292.528	VVA
3125_2022_MN	4953956.971	499234.336	257.004	VVA
3126_2023_MN	5004136.201	430082.430	313.521	VVA
3127_2022_MN	5041510.013	463017.665	293.074	VVA
3128_2023_MN	5012866.239	373866.211	352.287	VVA
3129_2022_MN	4961924.825	446105.625	295.287	VVA
3130_2022_MN	5032647.579	500006.970	274.601	VVA

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
3131_2022_MN	5056893.731	420069.851	326.873	VVA
3132_2022_MN	5037554.630	511549.942	276.101	VVA
3133_2022_MN	5032965.892	481323.370	284.973	VVA
3134_2022_MN	5065006.828	435195.884	356.139	VVA
3135_2023_MN	5016091.701	415105.882	312.203	VVA
3136_2022_MN	5057001.600	422514.751	347.861	VVA
3137_2022_MN	4988092.264	443511.726	308.406	VVA
3138_2022_MN	4984998.258	454492.514	306.597	VVA
3139_2022_MN	5061288.445	436949.483	343.197	VVA
3140_2022_MN	5032857.573	453294.501	299.981	VVA
3141_2023_MN	5066981.754	408102.336	310.365	VVA
3142_2022_MN	4978726.577	453333.256	286.141	VVA
3143_2022_MN	5011796.784	505136.934	293.545	VVA
3144_2022_MN	5023533.430	500521.899	275.279	VVA
3145_2022_MN	4968051.129	471058.087	256.100	VVA
3146_2022_MN	4980681.622	466741.730	288.360	VVA
3147_2022_MN	4937081.363	430849.858	303.164	VVA
3148_2022_MN	5033792.348	485255.240	281.400	VVA
3149_2022_MN	4973667.333	487967.214	282.185	VVA
3150_2022_MN	4994391.397	510750.617	283.517	VVA
3151_2022_MN	5030577.725	415757.451	295.624	VVA
3151A_2023_MN	5030701.540	417023.768	302.279	VVA
3152_2022_MN	5077420.348	475339.419	303.258	VVA
3153_2023_MN	4985072.771	376564.179	347.177	VVA
3154_2022_MN	4976609.545	409659.321	321.439	VVA
3155_2023_MN	5057932.811	394338.835	354.827	VVA
3156_2023_MN	5006501.527	406860.618	310.123	VVA
3157_2022_MN	5034240.291	436048.210	303.662	VVA
3158_2022_MN	5088041.686	466536.919	349.088	VVA
3159_2022_MN	4949804.536	408641.332	306.652	VVA
3160_2023_MN	5041360.607	377580.231	379.836	VVA
3161_2022_MN	5102991.122	461791.981	391.844	VVA
3162_2022_MN	4965340.676	397642.901	320.728	VVA
3163_2022_MN	4959610.228	484625.906	290.596	VVA
CA001_2022_MN	5045039.466	454281.913	295.922	LiDAR Control
CA002_2022_MN	5033331.629	421873.176	303.178	LiDAR Control
CA003_2022_MN	5037901.184	458407.519	312.796	LiDAR Control
CA004_2022_MN	5043802.864	413353.164	308.889	LiDAR Control
CA005_2022_MN	5034549.719	442426.257	300.449	LiDAR Control
CA006_2022_MN	5040682.540	428942.640	303.341	LiDAR Control
CA007_2022_MN	5031537.017	460084.851	311.587	LiDAR Control

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
CA008_2022_MN	5028309.343	430301.599	297.008	LiDAR Control
CA009_2022_MN	5020300.712	441574.525	285.887	LiDAR Control
CA009A_2023_MN	5020301.054	441575.663	285.900	LiDAR Control
CA010_2022_MN	5023749.474	456059.525	296.631	LiDAR Control
CA011_2022_MN	5016898.880	453100.725	268.746	LiDAR Control
CA011A_2023_MN	5016904.061	453124.117	268.848	LiDAR Control
CA012_2022_MN	5011414.796	459481.973	271.737	LiDAR Control
CA012A_2023_MN	5011413.702	459477.707	271.851	LiDAR Control
CA013_2022_MN	5005119.422	465442.666	264.159	LiDAR Control
CA014_2022_MN	5001459.116	452507.798	286.463	LiDAR Control
CA015_2022_MN	4997008.264	471865.212	266.504	LiDAR Control
CA016_2022_MN	4995011.903	444341.681	302.987	LiDAR Control
CA016A_2023_MN	4995011.860	444344.018	303.013	LiDAR Control
CA017_2022_MN	4989350.479	475399.959	256.969	LiDAR Control
CA018_2022_MN	4989453.686	453636.798	303.264	LiDAR Control
CA019_2022_MN	4987307.101	439294.138	295.747	LiDAR Control
CA019A_2023_MN	4987306.914	439294.730	295.751	LiDAR Control
CA020_2022_MN	4982360.367	468131.751	274.155	LiDAR Control
CA021_2022_MN	4981998.631	481214.403	255.727	LiDAR Control
CA022_2022_MN	4981427.216	456105.343	298.916	LiDAR Control
CA023_2022_MN	4967426.119	481877.425	249.846	LiDAR Control
CA024_2022_MN	4976008.915	449684.684	292.679	LiDAR Control
CA025_2022_MN	4977604.989	441468.050	300.100	LiDAR Control
CA026_2022_MN	4969313.231	472490.274	260.614	LiDAR Control
CA027_2022_MN	4970842.069	462024.526	274.723	LiDAR Control
CA028_2022_MN	4970640.968	439114.358	297.169	LiDAR Control
CA029_2022_MN	4962058.036	477141.911	245.499	LiDAR Control
CA030_2022_MN	4960909.251	459679.681	223.933	LiDAR Control
CA031_2022_MN	4980423.964	366217.978	338.917	LiDAR Control
CA032_2022_MN	4923716.772	374846.633	315.003	LiDAR Control
CA033_2022_MN	4982314.529	373506.478	339.766	LiDAR Control
CA033A_2023_MN	4981898.278	373455.592	339.411	LiDAR Control
CA034_2022_MN	4944672.603	370783.910	328.315	LiDAR Control
CA035_2022_MN	4972358.563	365777.058	336.965	LiDAR Control
CA036_2022_MN	4952769.030	370926.215	328.355	LiDAR Control
CA037_2022_MN	4967235.833	381625.727	329.166	LiDAR Control
CA038_2022_MN	4957419.806	384718.477	321.914	LiDAR Control
CA039_2022_MN	4936626.208	370624.966	322.344	LiDAR Control
CA040_2022_MN	4974734.944	384713.618	326.903	LiDAR Control
CA041_2022_MN	4924987.293	390917.435	310.022	LiDAR Control
CA042_2022_MN	4940391.869	390821.331	320.673	LiDAR Control

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
CA043_2022_MN	4978316.087	392059.392	333.354	LiDAR Control
CA044_2022_MN	4947652.675	390912.231	313.961	LiDAR Control
CA045_2022_MN	4929940.035	390979.176	308.348	LiDAR Control
CA046_2022_MN	4964394.330	399261.129	313.091	LiDAR Control
CA047_2022_MN	4933930.316	402807.369	305.961	LiDAR Control
CA048_2022_MN	4973210.706	409205.989	318.027	LiDAR Control
CA049_2022_MN	4923291.536	404458.159	297.882	LiDAR Control
CA050_2022_MN	4978502.283	416898.837	310.282	LiDAR Control
CA051_2022_MN	4940499.711	414946.379	298.541	LiDAR Control
CA052_2022_MN	4956198.930	407157.981	304.170	LiDAR Control
CA053_2022_MN	4930426.516	413356.724	299.663	LiDAR Control
CA054_2022_MN	4950442.258	419941.233	307.076	LiDAR Control
CA055_2022_MN	4960098.758	417671.604	300.461	LiDAR Control
CA056_2022_MN	4924193.463	425526.791	234.018	LiDAR Control
CA057_2022_MN	4980910.280	429939.484	305.549	LiDAR Control
CA058_2022_MN	4938781.897	428585.780	229.719	LiDAR Control
CA059_2022_MN	4930193.912	427774.720	249.716	LiDAR Control
CA060_2022_MN	4947054.146	432670.646	295.306	LiDAR Control
CA061_2022_MN	4960788.125	428702.376	303.664	LiDAR Control
CA062_2022_MN	4965765.117	437544.792	301.869	LiDAR Control
CA063_2022_MN	4939843.591	440130.364	262.542	LiDAR Control
CA064_2022_MN	4955066.694	441857.211	281.836	LiDAR Control
CA065_2022_MN	4947191.969	449100.389	240.551	LiDAR Control
CA066_2022_MN	4961412.015	449912.589	273.843	LiDAR Control
CA067_2022_MN	4954277.363	453030.423	230.290	LiDAR Control
CA068_2022_MN	4942653.477	460222.197	294.715	LiDAR Control
CA069_2022_MN	4967797.431	456989.607	290.684	LiDAR Control
CA070_2022_MN	4957983.809	457301.413	259.455	LiDAR Control
CA071_2022_MN	4951720.911	459622.230	290.239	LiDAR Control
CA072_2022_MN	5062392.523	461461.650	311.008	LiDAR Control
CA073_2022_MN	5019516.115	462436.997	284.879	LiDAR Control
CA074_2022_MN	4933113.895	453221.465	301.863	LiDAR Control
CA075_2022_MN	4945264.675	466705.338	306.715	LiDAR Control
CA076_2022_MN	5012393.551	463983.030	270.911	LiDAR Control
CA077_2022_MN	4954970.975	467698.689	308.327	LiDAR Control
CA078_2022_MN	5064204.015	469723.960	307.867	LiDAR Control
CA079_2022_MN	5015958.536	469750.276	269.094	LiDAR Control
CA080_2022_MN	4933156.855	473033.617	339.952	LiDAR Control
CA081_2022_MN	5038666.912	466375.934	290.025	LiDAR Control
CA082_2022_MN	5019886.605	475121.840	278.510	LiDAR Control
CA083_2022_MN	5005968.790	471760.156	266.012	LiDAR Control

Point Number	UTM 15N Northing (M)	UTM 15N Easting (M)	Orthometric Height (M)	Description
CA084_2022_MN	4943499.411	476199.295	335.188	LiDAR Control
CA085_2022_MN	5063371.079	478960.610	292.583	LiDAR Control
CA086_2022_MN	4957257.711	477013.378	278.438	LiDAR Control
CA087_2022_MN	4996660.659	479109.472	267.478	LiDAR Control
CA088_2022_MN	5048268.007	474425.752	287.965	LiDAR Control
CA089_2022_MN	5037772.212	481599.580	286.025	LiDAR Control
CA090_2022_MN	4935592.310	483480.166	310.086	LiDAR Control
CA091_2022_MN	4949028.860	482721.311	314.039	LiDAR Control
CA092_2022_MN	5018519.710	484203.301	277.249	LiDAR Control
CA093_2022_MN	4956714.323	485243.537	306.848	LiDAR Control
CA094_2022_MN	4982081.848	486710.663	292.086	LiDAR Control
CA095_2022_MN	5049802.962	486465.178	294.620	LiDAR Control
CA096_2022_MN	5064161.406	486830.828	291.299	LiDAR Control
CA097_2022_MN	4989968.967	488497.095	291.023	LiDAR Control
CA098_2022_MN	4965003.418	487631.202	273.321	LiDAR Control
CA099_2022_MN	4953956.492	500413.178	257.759	LiDAR Control
CA100_2022_MN	4942490.448	518023.996	295.554	LiDAR Control
CA101_2022_MN	4937861.436	493171.743	280.663	LiDAR Control
CA102_2022_MN	4993399.997	496017.702	291.971	LiDAR Control
CA103_2022_MN	5023275.364	494449.168	277.582	LiDAR Control
CA104_2022_MN	5043235.429	495477.261	282.703	LiDAR Control
CA105_2022_MN	5009179.229	497513.233	273.974	LiDAR Control
CA106_2022_MN	5014776.791	499051.730	279.795	LiDAR Control
CA107_2022_MN	4976465.530	486259.060	278.867	LiDAR Control
CA108_2022_MN	4962271.217	501267.030	226.528	LiDAR Control
CA109_2022_MN	4972010.522	499226.921	231.070	LiDAR Control
CA110_2022_MN	4948294.064	503645.060	251.823	LiDAR Control
CA111_2022_MN	4989546.065	504235.376	315.407	LiDAR Control
CA112_2022_MN	5001533.044	497275.106	277.261	LiDAR Control
CA113_2022_MN	4941832.070	503614.928	286.806	LiDAR Control
CA114_2022_MN	4982636.121	504187.430	305.400	LiDAR Control
CA115_2022_MN	5013013.072	517505.223	296.590	LiDAR Control
CA116_2022_MN	4967628.679	512453.176	274.319	LiDAR Control
CA117_2022_MN	4987099.462	514975.666	279.742	LiDAR Control
CA118_2022_MN	4998982.241	518745.719	257.102	LiDAR Control
CA119_2022_MN	4959644.236	515278.553	259.349	LiDAR Control
CA120_2022_MN	4972041.505	517257.181	209.787	LiDAR Control
CA121_2022_MN	4952729.065	515104.472	209.492	LiDAR Control
CA122_2022_MN	4978097.032	516542.348	261.800	LiDAR Control

2.2. Ground Control-Geodetic Coordinate System

- Horizontal Datum: NAD 1983 (Conus)
- Vertical Datum: NAVD88
- Units: Meters

Table 2.2 Ground Control -Worldwide UTM

Point Number	NAD1983 (Conus) Latitude (N)	NAD1983 (Conus) Longitude (W)	Ellipsoid Height (M)	Description
1001_2022_MN	44°59'12.39778"	-93°46'15.98544"	255.457	LiDAR Control
1001A_2023_MN	44°59'11.67621"	-93°46'15.08831"	255.423	LiDAR Control
1002_2023_MN	45°00'49.87190"	-93°47'14.03217"	265.448	LiDAR Control
1003_2023_MN	45°04'08.32983"	-93°45'37.37484"	251.143	LiDAR Control
1004_2023_MN	45°07'21.74546"	-93°43'23.02259"	278.871	LiDAR Control
1005_2023_MN	45°10'39.70360"	-93°39'21.11391"	251.695	LiDAR Control
1006_2022_MN	45°13'58.48287"	-93°33'08.64777"	250.630	LiDAR Control
1006A_2023_MN	45°13'54.25083"	-93°33'06.91677"	246.814	LiDAR Control
1007_2022_MN	45°17'11.27923"	-93°33'56.35686"	237.181	LiDAR Control
1007A_2023_MN	45°17'11.40902"	-93°33'55.86427"	237.203	LiDAR Control
1008_2023_MN	45°20'17.47271"	-93°52'48.80939"	266.283	LiDAR Control
1009_2023_MN	45°23'27.23969"	-94°00'59.18999"	266.513	LiDAR Control
1010_2023_MN	45°26'38.68563"	-94°06'02.22107"	278.080	LiDAR Control
1011_2023_MN	45°29'46.37705"	-94°09'10.23022"	281.303	LiDAR Control
1012_2023_MN	45°32'53.70924"	-94°09'42.44813"	289.489	LiDAR Control
1013_2022_MN	45°35'02.48503"	-94°08'56.65969"	298.661	LiDAR Control
1013A_2023_MN	45°35'02.13659"	-94°08'56.47128"	298.072	LiDAR Control
1014_2022_MN	45°34'00.06695"	-94°04'12.78730"	289.578	LiDAR Control
1015_2022_MN	45°34'53.72152"	-93°59'17.64430"	291.691	LiDAR Control
1016_2022_MN	45°33'49.38326"	-93°54'30.68070"	282.716	LiDAR Control
1017_2022_MN	45°33'35.77875"	-93°49'45.83905"	286.258	LiDAR Control
1018_2022_MN	45°33'34.22310"	-93°45'52.36239"	285.221	LiDAR Control
1019_2022_MN	45°34'59.30603"	-93°41'28.95892"	277.376	LiDAR Control
1020_2022_MN	45°34'12.67041"	-93°36'41.45007"	272.444	LiDAR Control
1021_2022_MN	45°33'31.92936"	-93°31'53.23281"	266.542	LiDAR Control
1022_2022_MN	45°43'57.76401"	-93°27'22.63681"	274.863	LiDAR Control
1023_2022_MN	45°44'03.95920"	-93°22'44.60900"	274.961	LiDAR Control
1024_2022_MN	45°44'44.25906"	-93°18'05.51604"	269.687	LiDAR Control
1025_2022_MN	45°43'42.52313"	-93°13'23.82055"	263.223	LiDAR Control
1026_2022_MN	45°43'50.22767"	-93°09'16.50503"	261.425	LiDAR Control
1027_2022_MN	45°33'31.24084"	-93°09'43.33511"	264.869	LiDAR Control
1028_2022_MN	45°33'55.19959"	-93°07'35.16440"	262.88	LiDAR Control
1029_2022_MN	45°32'58.57688"	-93°05'15.81885"	265.227	LiDAR Control
1030_2022_MN	45°32'57.90656"	-93°02'56.04817"	255.388	LiDAR Control

1031_2022_MN	45°17'48.80286"	-93°00'42.82643"	247.591	LiDAR Control
1032_2022_MN	45°17'36.21411"	-92°58'26.25169"	249.158	LiDAR Control
1033_2022_MN	45°17'41.67050"	-92°56'05.75226"	262.413	LiDAR Control
1034_2022_MN	45°16'56.26205"	-92°53'50.36465"	257.440	LiDAR Control
1035_2022_MN	45°16'42.32702"	-92°51'33.90208"	252.726	LiDAR Control
1036_2022_MN	45°16'54.69094"	-92°49'15.86854"	271.622	LiDAR Control
1037_2022_MN	45°17'30.74212"	-92°46'12.10551"	255.534	LiDAR Control
1038_2023_MN	44°59'23.60199"	-94°22'07.95695"	311.794	LiDAR Control
1039_2023_MN	45°02'43.36097"	-94°20'52.56180"	303.696	LiDAR Control
1040_2023_MN	45°05'57.49134"	-94°19'21.22871"	311.743	LiDAR Control
1041_2023_MN	45°08'58.45181"	-94°19'03.52146"	289.080	LiDAR Control
1042_2023_MN	45°12'28.41334"	-94°19'01.44350"	303.763	LiDAR Control
1042A_2023_MN	45°12'26.12025"	-94°19'01.26160"	303.757	LiDAR Control
1043_2023_MN	45°15'43.99182"	-94°18'44.47486"	292.529	LiDAR Control
1043A_2023_MN	45°15'27.01646"	-94°18'44.04933"	298.315	LiDAR Control
1044_2023_MN	45°18'59.84857"	-94°17'50.59850"	329.167	LiDAR Control
1045_2023_MN	45°22'13.44558"	-94°16'31.92079"	324.198	LiDAR Control
1046_2023_MN	45°25'27.54140"	-94°14'37.73672"	313.358	LiDAR Control
1047_2023_MN	45°28'15.22044"	-94°48'10.14536"	362.158	LiDAR Control
1048_2023_MN	45°31'38.76555"	-94°48'30.24129"	350.105	LiDAR Control
1049_2023_MN	45°34'27.55487"	-94°50'20.19567"	360.240	LiDAR Control
1050_2023_MN	45°37'38.70593"	-94°52'07.36674"	361.452	LiDAR Control
1051_2023_MN	45°40'30.12089"	-94°52'15.22726"	345.508	LiDAR Control
1052_2023_MN	45°43'51.06299"	-94°51'38.65118"	362.237	LiDAR Control
1053_2023_MN	45°46'44.94644"	-94°51'38.71822"	361.219	LiDAR Control
1054_2022_MN	45°58'36.44712"	-94°39'43.19318"	355.509	LiDAR Control
1055_2022_MN	45°58'35.97412"	-94°37'09.82535"	352.354	LiDAR Control
1056_2022_MN	45°58'36.54623"	-94°34'57.13660"	349.399	LiDAR Control
1057_2022_MN	45°58'37.66500"	-94°32'33.10215"	347.240	LiDAR Control
1058_2022_MN	45°58'37.22769"	-94°30'15.18697"	329.530	LiDAR Control
1059_2022_MN	45°58'37.23160"	-94°27'47.33900"	323.564	LiDAR Control
1060_2022_MN	45°58'37.22237"	-94°25'28.56448"	318.110	LiDAR Control
1061_2022_MN	45°58'32.79756"	-94°23'09.65683"	315.689	LiDAR Control
1062_2022_MN	45°58'11.34945"	-94°20'42.23318"	323.088	LiDAR Control
1063_2022_MN	45°58'11.09606"	-94°18'26.66477"	329.843	LiDAR Control
1064_2022_MN	45°58'11.98905"	-94°15'47.49040"	327.637	LiDAR Control
1065_2022_MN	45°58'13.81135"	-94°13'26.50101"	314.495	LiDAR Control
1066_2022_MN	45°58'12.85169"	-94°11'13.98383"	318.687	LiDAR Control
1067_2022_MN	45°58'12.16833"	-94°06'59.80635"	329.221	LiDAR Control
1068_2022_MN	46°02'27.69453"	-94°02'15.18037"	358.037	LiDAR Control
1069_2022_MN	46°02'54.14942"	-93°57'26.32517"	354.984	LiDAR Control
1070_2022_MN	46°04'39.14454"	-93°52'40.65149"	368.031	LiDAR Control
1071_2022_MN	46°04'38.91715"	-93°48'45.80823"	375.977	LiDAR Control

1072_2022_MN	46°04'38.26232"	-93°44'06.03925"	364.830	LiDAR Control
1073_2022_MN	46°04'22.48126"	-93°39'23.60699"	355.673	LiDAR Control
1074_2022_MN	46°07'07.53628"	-93°34'41.23965"	360.895	LiDAR Control
1075_2022_MN	46°07'58.01577"	-93°29'58.05331"	360.742	LiDAR Control
1076_2022_MN	46°06'58.41201"	-93°25'14.91163"	359.727	LiDAR Control
1077_2022_MN	46°06'56.45446"	-93°20'30.34354"	350.992	LiDAR Control
1078_2022_MN	46°06'56.09557"	-93°15'42.71974"	342.365	LiDAR Control
1079_2022_MN	46°07'45.73554"	-93°10'53.93805"	322.507	LiDAR Control
1080_2022_MN	46°07'45.59105"	-93°06'02.89490"	316.489	LiDAR Control
1081_2022_MN	46°07'45.70372"	-93°01'58.66420"	317.564	LiDAR Control
1082_2022_MN	45°42'58.89026"	-93°08'42.94401"	265.697	LiDAR Control
1083_2022_MN	45°42'21.01394"	-93°06'27.88792"	259.248	LiDAR Control
1084_2022_MN	45°41'56.36173"	-93°04'10.57576"	253.081	LiDAR Control
1085_2022_MN	45°42'46.75722"	-93°01'59.13535"	259.217	LiDAR Control
1086_2022_MN	45°40'58.63448"	-92°59'34.36484"	252.742	LiDAR Control
1087_2022_MN	45°41'23.84756"	-92°57'14.58988"	252.185	LiDAR Control
1088_2022_MN	45°41'54.80108"	-92°54'57.63274"	237.594	LiDAR Control
1089_2022_MN	45°42'11.76077"	-92°52'45.77979"	215.995	LiDAR Control
1090_2022_MN	45°30'47.43444"	-92°50'04.43212"	237.014	LiDAR Control
1091_2022_MN	45°29'29.59129"	-92°47'45.97700"	274.323	LiDAR Control
1092_2022_MN	45°29'55.62230"	-92°45'18.86434"	251.876	LiDAR Control
1093_2022_MN	45°29'56.30342"	-92°44'23.12295"	259.887	LiDAR Control
1094_2022_MN	45°29'56.06882"	-92°43'21.45276"	234.139	LiDAR Control
1095_2022_MN	45°29'01.85640"	-92°42'04.37142"	213.675	LiDAR Control
1096_2022_MN	45°27'13.80793"	-92°40'58.72310"	267.043	LiDAR Control
1097_2022_MN	45°24'45.84873"	-92°39'55.59687"	258.167	LiDAR Control
1098_2022_MN	45°24'40.88302"	-92°38'44.69587"	204.276	LiDAR Control
1099_2022_MN	45°24'16.74265"	-92°37'57.60746"	281.390	LiDAR Control
1100_2022_MN	45°58'57.54783"	-93°47'00.05958"	371.301	LiDAR Control
1101_2022_MN	45°45'51.41230"	-94°14'54.94435"	299.373	LiDAR Control
1101A_2023_MN	45°45'50.37585"	-94°15'29.09481"	297.167	LiDAR Control
1102_2022_MN	45°45'51.37656"	-94°22'02.05269"	325.798	LiDAR Control
1102A_2023_MN	45°46'03.94715"	-94°22'02.14014"	321.816	LiDAR Control
2001_2022_MN	44°37'24.59544"	-93°17'09.49426"	294.352	HOR/NVA
2002_2022_MN	44°51'09.83137"	-93°25'50.63325"	236.577	HOR/NVA
2003_2022_MN	45°46'46.14922"	-93°57'05.56232"	352.983	HOR/NVA
2004_2022_MN	44°44'35.31496"	-93°10'39.72205"	273.410	HOR/NVA
2005_2022_MN	45°58'35.21192"	-94°06'11.88636"	330.354	HOR/NVA
2006_2022_MN	44°33'08.99333"	-94°13'20.17961"	280.809	HOR/NVA
2007_2022_MN	45°24'44.34572"	-92°41'07.56661"	265.348	NVA
2008_2023_MN	45°35'34.16668"	-94°11'24.62257"	289.431	NVA
2009_2022_MN	44°48'24.98806"	-93°22'36.24904"	226.008	HOR/NVA
2010_2022_MN	44°37'36.71463"	-92°59'41.79801"	268.347	HOR/NVA

2011_2022_MN	46°02'33.87831"	-93°58'40.34991"	348.959	HOR/NVA
2012_2022_MN	45°39'14.92575"	-93°56'44.23832"	326.211	HOR/NVA
2013_2022_MN	45°53'53.29493"	-93°39'49.03331"	344.472	HOR/NVA
2014_2022_MN	44°41'22.75488"	-93°30'03.73675"	260.302	HOR/NVA
2015_2023_MN	45°04'38.72080"	-94°11'23.11606"	294.258	NVA
2016_2023_MN	45°02'35.00820"	-94°21'29.89037"	314.240	NVA
2017_2023_MN	45°06'55.59119"	-93°52'06.65231"	270.097	NVA
2018_2022_MN	44°50'10.42534"	-93°05'19.78370"	235.537	HOR/NVA
2019_2022_MN	44°56'49.68727"	-92°56'51.11862"	285.529	HOR/NVA
2020_2022_MN	45°10'28.97912"	-92°45'57.14779"	204.330	NVA
2021_2022_MN	45°12'11.58603"	-93°22'32.65792"	240.111	HOR/NVA
2022_2022_MN	45°05'20.76188"	-93°07'27.41783"	253.631	HOR/NVA
2023_2022_MN	44°54'03.19504"	-93°24'13.17037"	247.157	HOR/NVA
2024_2022_MN	46°02'22.07459"	-93°15'50.21261"	306.592	HOR/NVA
2025_2022_MN	44°54'14.86448"	-93°04'51.82045"	269.747	HOR/NVA
2026_2022_MN	45°32'27.56739"	-93°35'11.93938"	269.330	HOR/NVA
2027_2022_MN	44°45'06.65355"	-93°22'43.75948"	269.275	HOR/NVA
2028_2022_MN	44°50'52.29880"	-93°01'20.12580"	218.807	HOR/NVA
2029_2023_MN	45°44'10.77758"	-94°58'09.99590"	360.767	NVA
2030_2023_MN	45°10'26.37114"	-94°01'56.66855"	283.280	NVA
2031_2022_MN	44°58'11.62659"	-93°16'00.21164"	232.037	HOR/NVA
2032_2023_MN	45°08'28.04231"	-94°41'05.58606"	342.424	NVA
2033_2022_MN	44°58'19.28134"	-93°27'24.46757"	263.679	HOR/NVA
2034_2022_MN	44°51'41.04034"	-93°29'04.53720"	243.077	HOR/NVA
2035_2023_MN	45°42'56.52343"	-95°06'31.23659"	385.942	NVA
2036_2022_MN	44°37'23.09558"	-94°22'33.64073"	289.429	HOR/NVA
2037_2022_MN	44°44'38.00193"	-92°51'07.96572"	188.685	HOR/NVA
2038_2022_MN	44°42'56.19532"	-93°17'52.09761"	289.435	HOR/NVA
2039_2022_MN	46°16'14.10394"	-94°28'28.97485"	382.009	NVA
2040_2022_MN	45°58'53.98043"	-93°20'38.90412"	311.531	NVA
2041_2022_MN	45°23'09.53232"	-93°21'57.11517"	250.431	HOR/NVA
2042_2022_MN	46°05'07.72972"	-94°26'53.77335"	330.266	HOR/NVA
2043_2022_MN	45°09'19.98632"	-93°29'47.13550"	256.108	HOR/NVA
2044_2023_MN	45°37'53.25702"	-94°34'25.84006"	335.402	NVA
2045_2023_MN	45°05'51.39581"	-93°45'59.21965"	262.964	NVA
2046_2022_MN	45°34'24.77872"	-93°18'34.88290"	255.534	HOR/NVA
2047_2022_MN	45°02'41.47311"	-93°27'19.80694"	268.807	HOR/NVA
2048_2022_MN	46°13'17.05788"	-93°30'51.19385"	355.928	HOR/NVA
2049_2022_MN	44°47'27.71486"	-93°04'12.49190"	242.901	HOR/NVA
2050_2022_MN	44°56'12.33926"	-93°51'32.73733"	267.955	NVA
2051_2023_MN	45°39'56.02449"	-94°48'49.72128"	343.415	NVA
2052_2022_MN	44°45'39.17874"	-93°12'25.97910"	280.377	HOR/NVA
2053_2022_MN	45°29'31.22404"	-92°56'24.15970"	244.519	HOR/NVA

2054_2022_MN	44°50'47.51991"	-93°08'56.54865"	244.960	HOR/NVA
2055_2022_MN	44°53'53.45717"	-93°14'52.35749"	224.626	HOR/NVA
2056_2022_MN	45°00'57.48999"	-92°46'31.27392"	180.825	HOR/NVA
2057_2022_MN	44°43'28.39495"	-94°25'38.04126"	292.445	HOR/NVA
2058_2022_MN	44°52'03.17482"	-93°23'45.11783"	246.984	HOR/NVA
2059_2022_MN	44°53'42.04048"	-94°23'30.57306"	293.524	HOR/NVA
2060_2022_MN	45°26'35.72292"	-93°29'59.34795"	277.882	HOR/NVA
2061_2022_MN	45°32'33.86071"	-93°03'54.07669"	259.585	HOR/NVA
2062_2022_MN	45°09'08.80784"	-93°08'06.95843"	243.984	HOR/NVA
2063_2022_MN	45°34'08.23766"	-93°25'27.58457"	260.867	NVA
2064_2022_MN	45°13'30.45978"	-93°18'29.35366"	243.648	HOR/NVA
2065_2022_MN	45°02'31.41563"	-92°47'34.64562"	182.421	HOR/NVA
2066_2022_MN	46°04'17.63594"	-93°07'40.74862"	309.089	NVA
2067_2022_MN	45°10'39.52457"	-93°12'13.77653"	248.764	HOR/NVA
2068_2022_MN	45°12'50.55993"	-93°37'23.95428"	249.797	HOR/NVA
2068A_2023_MN	45°12'49.28679"	-93°37'21.24354"	249.746	NVA
2069_2022_MN	44°54'07.08674"	-93°19'07.03829"	241.267	HOR/NVA
2070_2022_MN	45°23'02.19660"	-93°05'59.09150"	251.613	HOR/NVA
2071_2022_MN	45°29'29.50276"	-92°49'00.48809"	266.596	HOR/NVA
2072_2022_MN	45°17'07.68729"	-93°45'19.32281"	264.423	HOR/NVA
2072_2023_MN	45°17'07.61985"	-93°45'19.24026"	264.431	NVA
2073_2022_MN	44°56'23.25778"	-94°35'01.65699"	303.517	HOR/NVA
2074_2023_MN	45°10'27.11794"	-93°51'53.25732"	271.540	NVA
2075_2022_MN	46°10'16.58267"	-94°36'38.64229"	377.300	NVA
2076_2023_MN	45°46'27.52506"	-94°34'12.81148"	349.448	NVA
2077_2022_MN	44°41'11.09973"	-94°00'03.10422"	276.687	HOR/NVA
2078_2022_MN	44°50'31.06033"	-93°46'14.63975"	285.273	HOR/NVA
2079_2022_MN	45°14'37.82790"	-93°28'16.61911"	240.700	HOR/NVA
2080_2022_MN	45°03'27.57609"	-93°34'28.75081"	275.638	HOR/NVA
2081_2022_MN	45°26'47.34967"	-93°44'08.92481"	271.459	HOR/NVA
2082_2022_MN	45°29'07.18624"	-92°46'32.17724"	265.608	HOR/NVA
2083_2022_MN	44°51'59.30651"	-93°10'10.36563"	229.513	HOR/NVA
2084_2022_MN	44°48'58.13261"	-93°12'43.79678"	216.605	HOR/NVA
2085_2022_MN	45°35'06.72692"	-93°31'36.93519"	268.041	HOR/NVA
2086_2022_MN	45°05'00.08061"	-93°02'59.51478"	258.542	HOR/NVA
2087_2022_MN	45°15'22.07580"	-92°48'48.84611"	288.492	HOR/NVA
2088_2023_MN	45°07'30.15819"	-93°48'58.73752"	260.360	NVA
2089_2022_MN	44°44'45.42046"	-93°41'02.61646"	235.366	HOR/NVA
2090_2022_MN	45°10'54.37699"	-93°33'08.05353"	271.665	HOR/NVA
2091_2022_MN	46°06'56.03101"	-93°18'11.99448"	346.842	HOR/NVA
2092_2023_MN	45°17'11.71524"	-94°32'48.11368"	327.145	NVA
2093_2022_MN	44°46'47.67147"	-93°24'27.48241"	200.423	HOR/NVA
2094_2022_MN	44°53'40.68111"	-93°07'09.71351"	248.827	HOR/NVA

2095_2022_MN	45°05'24.01432"	-93°14'32.75574"	237.199	HOR/NVA
2096_2023_MN	45°30'54.16381"	-94°35'56.30599"	331.965	NVA
2097_2022_MN	44°40'24.27804"	-92°54'12.17032"	226.421	HOR/NVA
2098_2022_MN	45°34'41.78694"	-93°51'06.53341"	287.641	NVA
2099_2022_MN	44°55'52.33830"	-93°20'55.27337"	250.239	HOR/NVA
2100_2022_MN	45°47'22.28389"	-93°24'34.56217"	281.887	HOR/NVA
2101_2022_MN	44°52'26.94409"	-93°41'24.34194"	281.147	NVA
2102_2022_MN	44°57'53.83856"	-92°57'43.99806"	298.987	HOR/NVA
2103_2023_MN	45°28'46.34260"	-94°19'29.31239"	308.837	NVA
2104_2022_MN	45°21'58.36480"	-93°58'29.19450"	271.093	HOR/NVA
2104A_2023_MN	45°21'59.91792"	-93°58'30.98121"	271.544	NVA
2105_2022_MN	45°31'23.41056"	-93°34'53.61553"	269.241	HOR/NVA
2106_2022_MN	44°50'37.77380"	-93°47'11.48372"	279.664	HOR/NVA
2107_2022_MN	44°54'11.90641"	-94°11'53.47599"	297.952	HOR/NVA
2108_2022_MN	45°07'19.40683"	-93°20'07.26537"	237.313	HOR/NVA
2109_2022_MN	45°10'04.29731"	-93°08'04.60713"	248.986	HOR/NVA
2110_2022_MN	45°42'22.74346"	-93°24'34.64557"	282.660	HOR/NVA
2111_2022_MN	44°39'40.37153"	-93°39'54.14715"	202.458	NVA
2112_2022_MN	45°07'59.12050"	-93°28'41.86498"	255.980	HOR/NVA
2113_2022_MN	45°07'15.27872"	-93°36'19.02782"	274.773	NVA
2114_2022_MN	44°48'26.67151"	-93°21'03.50986"	225.052	HOR/NVA
2115_2022_MN	45°49'18.60626"	-94°24'15.52766"	311.908	NVA
2116_2022_MN	44°46'10.17749"	-94°07'10.92286"	279.610	HOR/NVA
2117_2022_MN	45°11'51.00135"	-93°09'47.10109"	249.265	HOR/NVA
2118_2022_MN	45°41'01.69359"	-92°58'43.48221"	252.044	HOR/NVA
2119_2022_MN	45°05'42.90053"	-93°22'33.34789"	238.089	HOR/NVA
2120_2022_MN	44°49'38.00183"	-93°33'08.88765"	235.450	HOR/NVA
2121_2022_MN	45°27'34.98915"	-94°00'47.05475"	277.015	NVA
2122_2023_MN	45°16'40.03912"	-94°10'55.20250"	306.512	NVA
2123_2022_MN	45°29'21.68321"	-94°08'48.86945"	283.089	HOR/NVA
2123A_2023_MN	45°29'20.98928"	-94°08'50.48262"	282.616	NVA
2124_2022_MN	45°03'01.23429"	-93°43'20.99185"	289.430	NVA
2125_2022_MN	44°52'23.02898"	-92°51'45.12393"	280.036	NVA
2126_2022_MN	45°47'18.03706"	-93°10'57.54039"	261.055	HOR/NVA
2127_2022_MN	44°34'23.66805"	-93°53'17.26830"	196.736	NVA
2128_2022_MN	44°47'44.08878"	-93°11'55.14619"	258.099	HOR/NVA
2129_2022_MN	46°04'00.23772"	-93°41'13.64778"	359.016	HOR/NVA
2130_2022_MN	45°13'16.83738"	-93°22'38.45566"	234.732	HOR/NVA
2131_2022_MN	45°54'37.57119"	-93°51'04.75777"	362.874	HOR/NVA
2132_2022_MN	44°51'31.57973"	-93°07'29.72325"	249.887	HOR/NVA
2133_2022_MN	45°09'08.17380"	-93°23'23.21446"	241.174	HOR/NVA
2134_2022_MN	44°35'12.26991"	-93°49'43.84681"	273.954	HOR/NVA
2135_2022_MN	45°01'00.59646"	-92°59'48.54604"	271.641	HOR/NVA

2136_2022_MN	44°37'56.57615"	-93°08'10.97860"	247.205	HOR/NVA
2137_2022_MN	44°46'36.18437"	-93°42'15.41077"	276.799	NVA
2138_2022_MN	44°51'08.50358"	-93°36'59.95142"	277.812	NVA
2139_2022_MN	44°41'42.83746"	-93°14'21.91027"	291.620	HOR/NVA
2140_2022_MN	45°05'24.90976"	-93°25'17.60776"	253.669	HOR/NVA
2141_2022_MN	44°50'48.69243"	-93°40'39.93103"	264.214	HOR/NVA
2142_2023_MN	45°21'41.96474"	-94°44'36.61027"	339.177	NVA
2143_2023_MN	45°41'45.17578"	-94°57'12.97038"	359.096	NVA
2144_2022_MN	45°04'23.15100"	-93°21'08.17816"	236.968	HOR/NVA
2145_2022_MN	44°59'30.76830"	-93°13'47.78492"	232.640	HOR/NVA
2146_2022_MN	44°38'02.50040"	-93°23'05.11439"	283.356	NVA
2147_2022_MN	44°51'24.15320"	-93°19'52.74758"	229.181	HOR/NVA
2148_2022_MN	44°46'09.22361"	-94°09'12.25847"	275.267	HOR/NVA
2149_2022_MN	45°31'24.41414"	-93°10'41.70694"	269.701	NVA
2150_2022_MN	45°41'58.09621"	-93°38'40.50796"	287.479	HOR/NVA
2151_2022_MN	45°52'32.91085"	-93°16'20.25523"	281.505	HOR/NVA
2152_2022_MN	45°16'37.59756"	-93°02'10.13961"	250.535	HOR/NVA
2153_2022_MN	44°43'09.46370"	-93°09'25.71256"	262.919	HOR/NVA
2154_2022_MN	44°39'33.73529"	-93°02'04.15621"	232.353	HOR/NVA
2155_2022_MN	44°49'35.59758"	-93°10'03.72634"	245.042	HOR/NVA
2156_2022_MN	44°57'05.43988"	-93°02'53.83609"	229.813	HOR/NVA
2157_2022_MN	44°32'00.75423"	-94°31'31.36828"	290.001	HOR/NVA
2158_2022_MN	45°23'22.39263"	-93°12'31.43438"	254.066	NVA
2159_2022_MN	45°34'41.22291"	-92°59'25.76964"	248.052	HOR/NVA
2160_2022_MN	45°20'10.08391"	-92°52'56.48816"	257.020	HOR/NVA
2161_2023_MN	45°38'36.16565"	-94°57'12.31872"	374.807	NVA
2162_2022_MN	45°21'50.78338"	-93°23'17.57350"	250.490	HOR/NVA
2163_2022_MN	45°00'23.19213"	-93°18'38.78402"	251.521	HOR/NVA
2164_2022_MN	45°56'39.91421"	-93°16'33.52024"	297.078	HOR/NVA
2165_2022_MN	45°29'11.47856"	-93°49'12.65209"	277.800	HOR/NVA
2166_2022_MN	44°44'49.68075"	-93°18'49.60295"	250.192	HOR/NVA
2167_2022_MN	45°45'51.05110"	-93°37'08.28602"	298.652	HOR/NVA
2168_2022_MN	45°07'03.68836"	-93°13'51.16444"	250.992	HOR/NVA
2169_2022_MN	44°43'58.37888"	-93°11'10.05063"	271.159	HOR/NVA
2170_2023_MN	45°07'42.21638"	-94°31'50.29864"	316.613	NVA
2171_2022_MN	45°23'33.21975"	-92°53'05.87034"	249.895	NVA
2172_2022_MN	45°04'12.32109"	-93°15'21.64044"	240.845	HOR/NVA
2173_2022_MN	44°40'13.04478"	-93°37'34.40815"	206.186	HOR/NVA
2174_2022_MN	44°38'34.95511"	-93°15'15.80900"	275.635	HOR/NVA
2175_2022_MN	45°28'13.97868"	-93°03'47.70210"	252.778	HOR/NVA
2176_2022_MN	44°49'22.52753"	-93°03'41.79785"	259.727	HOR/NVA
2177_2022_MN	44°45'54.91323"	-93°13'10.05056"	286.013	HOR/NVA
2178_2022_MN	44°55'38.00901"	-93°22'32.48104"	246.768	HOR/NVA

2179_2022_MN	44°52'22.06412"	-93°04'01.56976"	261.256	HOR/NVA
2180_2022_MN	44°50'30.80736"	-93°32'23.82184"	254.650	HOR/NVA
2181_2022_MN	44°53'30.32292"	-93°49'06.77671"	274.011	HOR/NVA
2182_2022_MN	44°40'07.94509"	-93°08'59.37840"	249.547	HOR/NVA
2183_2022_MN	46°01'36.11462"	-94°20'13.81731"	317.716	HOR/NVA
2184_2023_MN	45°33'01.92379"	-94°12'26.38260"	297.435	NVA
2185_2022_MN	44°58'44.08612"	-93°13'58.90223"	226.597	HOR/NVA
2186_2022_MN	44°51'48.89084"	-93°31'23.97000"	261.180	HOR/NVA
2187_2022_MN	45°18'02.96321"	-93°33'16.16024"	244.766	HOR/NVA
2187A_2023_MN	45°18'02.90686"	-93°33'16.42553"	244.810	NVA
2188_2022_MN	44°59'02.24744"	-93°45'24.97175"	271.564	NVA
2188A_2023_MN	44°59'02.61965"	-93°45'25.27546"	271.163	NVA
2189_2022_MN	45°58'30.67707"	-94°20'06.38101"	329.320	HOR/NVA
2190_2022_MN	45°00'30.70210"	-93°03'28.02835"	235.292	HOR/NVA
2191_2022_MN	44°58'02.19127"	-93°33'17.35078"	257.952	HOR/NVA
2192_2022_MN	44°43'29.90044"	-94°21'02.81247"	289.048	HOR/NVA
2193_2022_MN	46°00'38.36981"	-93°25'58.31201"	342.517	HOR/NVA
2194_2023_MN	45°43'52.79804"	-94°12'51.57924"	296.863	NVA
2195_2023_MN	45°33'40.50080"	-94°56'49.21744"	373.777	NVA
2196_2022_MN	44°57'58.71645"	-93°14'50.76121"	228.651	HOR/NVA
2197_2022_MN	44°43'54.88682"	-93°59'42.64067"	277.659	HOR/NVA
2198_2022_MN	44°43'24.94280"	-93°13'00.81348"	262.869	HOR/NVA
2199_2022_MN	44°59'02.94593"	-93°17'38.00925"	220.803	HOR/NVA
2200_2022_MN	44°54'43.51816"	-93°27'10.20963"	267.063	HOR/NVA
2201_2022_MN	45°04'41.66749"	-93°23'38.22761"	241.748	HOR/NVA
2202_2022_MN	46°06'57.47416"	-93°22'33.64994"	356.110	HOR/NVA
2203_2022_MN	45°45'14.56541"	-93°38'37.86176"	302.677	HOR/NVA
2204_2022_MN	45°21'14.98882"	-93°17'52.66954"	250.775	HOR/NVA
2205_2022_MN	44°46'04.83600"	-93°53'19.82950"	269.452	HOR/NVA
2205A_2022_MN	44°46'04.78909"	-93°53'19.24077"	269.631	HOR/NVA
2206_2022_MN	44°57'52.36417"	-94°02'52.38607"	286.294	HOR/NVA
2207_2022_MN	44°50'54.47617"	-92°51'45.40338"	267.482	HOR/NVA
2208_2023_MN	45°43'20.59536"	-94°56'52.03956"	351.059	NVA
2209_2022_MN	44°48'12.38245"	-93°34'37.71569"	203.936	HOR/NVA
2210_2022_MN	45°04'55.02738"	-92°47'27.30637"	194.578	HOR/NVA
2211_2022_MN	45°08'44.06864"	-93°03'09.20851"	249.384	HOR/NVA
2212_2022_MN	45°53'43.10453"	-94°05'34.27442"	343.922	HOR/NVA
2213_2022_MN	46°07'42.92441"	-94°12'32.87953"	366.802	NVA
2214_2022_MN	44°41'17.54648"	-93°50'58.47193"	274.139	HOR/NVA
2215_2023_MN	45°27'07.21220"	-94°30'21.98412"	314.057	NVA
2216_2022_MN	44°44'20.35352"	-92°59'41.33103"	229.378	NVA
2217_2023_MN	45°35'38.56204"	-94°20'27.19796"	325.690	NVA
2218_2022_MN	44°40'51.27162"	-94°11'35.73655"	282.843	HOR/NVA

2219_2022_MN	45°16'52.04865"	-93°14'07.47980"	249.488	HOR/NVA
2220_2022_MN	45°54'30.34272"	-94°32'05.11591"	331.034	HOR/NVA
2221_2022_MN	44°35'15.65978"	-93°36'48.80617"	255.216	NVA
2222_2022_MN	45°11'44.55937"	-92°52'54.99578"	274.504	HOR/NVA
2223_2022_MN	45°29'05.22067"	-93°22'05.37933"	260.742	HOR/NVA
2224_2022_MN	45°55'11.15330"	-93°25'57.43346"	309.187	HOR/NVA
2225_2023_MN	45°44'06.59063"	-94°27'57.03372"	339.185	NVA
2226_2022_MN	45°50'12.51365"	-93°43'23.74993"	328.191	NVA
2227_2022_MN	45°25'46.79760"	-93°52'35.43142"	266.896	HOR/NVA
2228_2022_MN	44°52'52.07418"	-94°02'05.74258"	269.054	HOR/NVA
2229_2023_MN	45°17'34.61068"	-94°00'51.31960"	308.286	NVA
2230_2022_MN	45°42'47.01792"	-93°46'55.95104"	310.816	HOR/NVA
2231_2022_MN	46°02'23.39896"	-93°34'45.44459"	365.028	NVA
3001_2022_MN	45°42'24.75220"	-93°24'20.11851"	284.573	VVA
3002_2022_MN	45°57'21.42566"	-94°13'01.54075"	313.490	VVA
3003_2023_MN	45°39'16.90706"	-94°10'21.22091"	300.717	VVA
3004_2022_MN	44°39'05.27947"	-93°52'56.48454"	272.984	VVA
3005_2022_MN	46°03'52.62690"	-94°28'45.57313"	342.962	VVA
3006_2022_MN	45°38'25.02418"	-93°54'54.82813"	310.978	VVA
3007_2022_MN	45°40'24.79290"	-93°07'50.41991"	266.381	VVA
3008_2022_MN	45°53'42.19748"	-94°10'41.68844"	314.194	VVA
3009_2022_MN	45°40'23.74915"	-93°00'24.98020"	252.902	VVA
3010_2022_MN	44°46'14.14534"	-93°26'46.95468"	220.305	VVA
3011_2022_MN	44°50'00.87852"	-93°50'59.87286"	276.047	VVA
3012_2022_MN	44°38'42.26745"	-92°49'04.38006"	245.854	VVA
3013_2022_MN	45°43'24.98062"	-93°23'03.96088"	277.097	VVA
3014_2022_MN	44°47'50.82056"	-93°59'24.45242"	275.423	VVA
3015_2023_MN	45°03'55.96561"	-93°59'00.72117"	275.936	VVA
3016_2022_MN	45°34'47.55558"	-93°47'11.88958"	287.505	VVA
3017_2022_MN	45°43'01.95384"	-93°10'13.30379"	261.674	VVA
3018_2023_MN	45°38'36.04249"	-94°36'53.63753"	353.144	VVA
3019_2022_MN	45°44'35.12534"	-93°55'26.79892"	342.507	VVA
3020_2022_MN	45°48'28.95389"	-93°52'56.07137"	354.794	VVA
3021_2023_MN	45°29'07.32475"	-94°44'35.30911"	349.008	VVA
3022_2022_MN	44°35'39.74147"	-93°03'55.96010"	248.150	VVA
3023_2022_MN	44°58'54.21198"	-93°17'29.04924"	221.903	VVA
3024_2022_MN	44°55'40.40916"	-93°58'15.33798"	274.860	VVA
3025_2022_MN	45°23'00.61966"	-93°16'31.61293"	253.406	VVA
3026_2022_MN	45°20'12.06956"	-93°23'37.92728"	250.522	VVA
3027_2023_MN	45°30'24.85129"	-94°14'22.93076"	305.444	VVA
3028_2023_MN	45°39'38.27520"	-95°00'55.51306"	380.393	VVA
3029_2022_MN	44°48'30.69629"	-93°50'56.40016"	274.525	VVA
3030_2022_MN	45°36'13.14011"	-93°46'42.23396"	292.441	VVA

3031_2023_MN	45°05'39.63902"	-94°11'22.31053"	296.699	VVA
3032_2022_MN	45°40'38.47324"	-93°37'38.65593"	280.907	VVA
3033_2023_MN	45°19'34.83794"	-94°24'03.13973"	327.767	VVA
3034_2022_MN	45°49'54.14906"	-93°25'52.15633"	289.287	VVA
3035_2022_MN	45°20'23.11823"	-93°47'29.12788"	260.776	VVA
3035A_2023_MN	45°20'25.87984"	-93°47'35.97345"	261.168	VVA
3036_2022_MN	46°07'39.07028"	-93°25'53.97793"	365.092	VVA
3037_2022_MN	46°04'38.68584"	-93°47'14.07605"	367.765	VVA
3038_2022_MN	44°34'57.99919"	-93°12'51.50626"	267.401	VVA
3039_2023_MN	45°08'26.39441"	-94°43'02.17714"	345.190	VVA
3040_2022_MN	45°48'31.11393"	-93°55'06.10257"	353.889	VVA
3041_2022_MN	44°45'07.15511"	-92°55'56.58377"	238.330	VVA
3042_2022_MN	45°10'41.86395"	-93°02'26.58211"	250.428	VVA
3043_2022_MN	45°47'19.86965"	-94°32'05.03191"	345.096	VVA
3043A_2023_MN	45°47'18.96764"	-94°32'11.19177"	341.478	VVA
3044_2022_MN	45°57'44.05522"	-93°15'50.71697"	293.524	VVA
3045_2022_MN	45°03'14.85052"	-93°31'20.40062"	273.472	VVA
3046_2022_MN	45°51'17.22282"	-94°23'22.48675"	309.995	VVA
3047_2022_MN	45°14'21.44913"	-92°46'57.63143"	275.477	VVA
3048_2022_MN	45°46'47.08679"	-93°55'22.79204"	349.520	VVA
3049_2022_MN	44°41'16.29004"	-93°46'37.18195"	254.779	VVA
3050_2022_MN	46°04'36.43612"	-94°11'14.14747"	353.963	VVA
3051_2023_MN	45°30'21.04819"	-94°18'07.21798"	315.552	VVA
3052_2022_MN	44°50'51.58138"	-92°51'44.06330"	265.175	VVA
3053_2022_MN	44°35'38.76573"	-94°09'27.86725"	277.142	VVA
3054_2022_MN	45°18'44.76310"	-92°53'47.53652"	260.982	VVA
3055_2022_MN	45°20'47.45215"	-92°51'02.32268"	254.053	VVA
3056_2022_MN	45°06'44.37607"	-93°43'08.15562"	254.932	VVA
3056A_2023_MN	45°06'43.54400"	-93°43'12.39058"	253.088	VVA
3057_2022_MN	44°45'12.75441"	-93°55'28.22225"	272.722	VVA
3058_2022_MN	46°04'20.24962"	-93°16'15.03801"	314.758	VVA
3059_2022_MN	45°30'05.82558"	-93°22'24.90741"	257.098	VVA
3060_2022_MN	45°39'16.64023"	-93°23'22.66899"	267.309	VVA
3061_2022_MN	44°55'50.67585"	-93°55'49.11431"	272.062	VVA
3062_2022_MN	46°07'44.82914"	-93°04'37.66046"	319.954	VVA
3063_2022_MN	45°34'27.32627"	-93°56'42.02951"	288.764	VVA
3064_2022_MN	46°04'24.93648"	-94°01'07.36650"	359.184	VVA
3065_2022_MN	45°16'48.34050"	-93°09'44.62450"	246.188	VVA
3066_2022_MN	44°55'19.65392"	-93°43'29.99933"	280.504	VVA
3067_2022_MN	44°52'22.66509"	-93°05'04.21629"	280.771	VVA
3068_2022_MN	44°43'55.07763"	-93°56'58.42618"	277.193	VVA
3069_2022_MN	45°37'17.86127"	-94°03'45.88099"	302.511	VVA
3070_2022_MN	45°39'45.22790"	-93°52'29.76695"	306.967	VVA

3071_2023_MN	45°29'55.89440"	-94°57'07.79617"	355.253	VVA
3072_2022_MN	45°32'11.10223"	-93°13'31.06419"	262.406	VVA
3073_2022_MN	44°43'28.04171"	-93°53'20.22055"	272.129	VVA
3074_2022_MN	44°46'30.08970"	-94°14'16.80645"	285.196	VVA
3075_2022_MN	45°37'48.09725"	-93°25'08.24915"	271.571	VVA
3076_2022_MN	44°58'14.10991"	-93°51'34.88966"	260.989	VVA
3077_2022_MN	45°33'55.09444"	-93°23'23.51264"	260.552	VVA
3078_2022_MN	44°48'16.11348"	-93°56'32.23780"	274.138	VVA
3079_2022_MN	44°41'41.17387"	-93°44'07.74247"	251.492	VVA
3080_2022_MN	45°33'32.87199"	-94°04'43.21334"	285.916	VVA
3081_2023_MN	45°22'13.30358"	-94°43'46.56755"	332.451	VVA
3082_2022_MN	46°10'15.20896"	-94°36'40.48198"	381.310	VVA
3083_2022_MN	44°40'53.55002"	-93°33'26.85140"	262.712	VVA
3084_2022_MN	44°33'00.60028"	-94°25'11.27205"	289.785	VVA
3085_2022_MN	45°38'38.82740"	-93°00'08.67887"	254.336	VVA
3086_2022_MN	44°38'01.90874"	-93°43'21.08352"	229.700	VVA
3087_2022_MN	44°45'40.78293"	-93°46'50.67238"	253.483	VVA
3088_2022_MN	45°00'58.54394"	-93°08'11.83642"	244.262	VVA
3089_2022_MN	44°59'58.20031"	-92°56'37.93980"	279.937	VVA
3090_2022_MN	45°24'43.61640"	-92°41'08.03909"	264.829	VVA
3091_2022_MN	45°50'11.80253"	-93°39'07.70866"	327.677	VVA
3092_2022_MN	45°29'50.03327"	-93°12'58.33234"	265.936	VVA
3093_2022_MN	45°04'21.22487"	-93°43'00.61667"	273.112	VVA
3094_2022_MN	45°22'17.54273"	-92°54'00.05202"	254.241	VVA
3095_2022_MN	44°41'17.41934"	-93°50'12.60438"	263.510	VVA
3096_2022_MN	45°49'24.88444"	-94°05'40.46530"	338.159	VVA
3097_2022_MN	44°56'25.63707"	-93°51'32.89251"	261.619	VVA
3098_2022_MN	45°38'03.80629"	-94°08'02.30722"	310.071	VVA
3098A_2023_MN	45°38'06.21193"	-94°08'02.41389"	309.099	VVA
3099_2022_MN	45°57'38.01649"	-93°12'18.35502"	291.987	VVA
3100_2022_MN	44°39'09.35822"	-93°13'04.90564"	270.042	VVA
3101_2022_MN	44°53'32.16629"	-93°44'53.69438"	265.496	VVA
3102_2022_MN	44°44'32.72062"	-93°03'18.57112"	255.135	VVA
3103_2022_MN	44°48'24.89294"	-93°38'03.95838"	248.860	VVA
3104_2022_MN	45°46'32.89460"	-93°59'14.90769"	356.464	VVA
3105_2022_MN	44°40'39.63589"	-94°22'32.77639"	284.738	VVA
3106_2022_MN	45°23'58.72529"	-93°13'01.03645"	252.769	VVA
3107_2022_MN	44°51'17.65486"	-93°58'15.33088"	268.176	VVA
3108_2022_MN	45°55'26.22903"	-93°59'34.43671"	373.527	VVA
3109_2022_MN	45°41'41.44088"	-93°17'12.43432"	269.454	VVA
3110_2022_MN	45°35'18.50517"	-94°02'36.23797"	288.213	VVA
3111_2022_MN	45°36'06.37865"	-94°05'28.50444"	293.056	VVA
3112_2022_MN	46°14'16.90561"	-94°29'47.13710"	365.549	VVA

3113_2023_MN	45°10'52.80744"	-94°23'56.91800"	305.522	VVA
3114_2022_MN	45°08'30.85247"	-93°13'47.82787"	249.944	VVA
3115_2022_MN	45°56'58.96767"	-94°27'06.82331"	331.280	VVA
3116_2022_MN	45°00'24.79547"	-93°43'34.99588"	263.157	VVA
3117_2022_MN	45°13'49.83671"	-93°27'53.65286"	238.008	VVA
3118_2022_MN	45°57'57.24529"	-93°40'01.43840"	348.776	VVA
3119_2022_MN	44°36'27.87981"	-93°22'42.78983"	290.747	VVA
3120_2022_MN	45°48'06.56605"	-93°59'18.10372"	362.952	VVA
3121_2022_MN	44°54'23.71937"	-93°49'08.30557"	279.978	VVA
3122_2022_MN	45°22'58.30739"	-92°46'48.09645"	259.847	VVA
3123_2022_MN	44°57'00.51624"	-94°22'06.43793"	305.221	VVA
3124_2022_MN	45°08'32.48008"	-93°39'58.02768"	265.299	VVA
3124A_2023_MN	45°08'30.90361"	-93°39'57.92188"	264.645	VVA
3125_2022_MN	44°44'20.38871"	-93°00'34.81509"	228.744	VVA
3126_2023_MN	45°11'14.07095"	-93°53'24.03719"	285.753	VVA
3127_2022_MN	45°31'34.11569"	-93°28'24.89622"	264.911	VVA
3128_2023_MN	45°15'28.72308"	-94°36'27.37421"	325.226	VVA
3129_2022_MN	44°48'31.29307"	-93°40'53.55027"	268.441	VVA
3130_2022_MN	45°26'50.47003"	-92°59'59.67911"	246.503	VVA
3131_2022_MN	45°39'39.55003"	-94°01'33.64132"	299.699	VVA
3132_2022_MN	45°29'29.13510"	-92°51'07.87168"	248.469	VVA
3133_2022_MN	45°26'59.88581"	-93°14'19.83810"	256.522	VVA
3134_2022_MN	45°44'08.09391"	-93°49'58.63798"	328.785	VVA
3135_2023_MN	45°17'35.50610"	-94°04'57.58997"	284.656	VVA
3136_2022_MN	45°39'44.04390"	-93°59'40.73971"	320.646	VVA
3137_2022_MN	45°02'38.52270"	-93°43'02.16029"	280.819	VVA
3138_2022_MN	45°01'01.10707"	-93°34'39.23270"	279.354	VVA
3139_2022_MN	45°42'08.20332"	-93°48'35.76192"	315.773	VVA
3140_2022_MN	45°26'51.65334"	-93°35'50.14989"	271.896	VVA
3141_2023_MN	45°45'01.02402"	-94°10'53.43996"	283.483	VVA
3142_2022_MN	44°57'37.60031"	-93°35'30.10424"	259.141	VVA
3143_2022_MN	45°15'34.73406"	-92°56'04.29631"	266.043	VVA
3144_2022_MN	45°21'55.12878"	-92°59'36.00857"	247.413	VVA
3145_2022_MN	44°51'55.03918"	-93°21'58.87593"	229.100	VVA
3146_2022_MN	44°58'43.67129"	-93°25'18.55849"	261.399	VVA
3147_2022_MN	44°35'01.51201"	-93°52'15.90648"	275.399	VVA
3148_2022_MN	45°27'27.00510"	-93°11'18.91232"	252.908	VVA
3149_2022_MN	44°54'58.79570"	-93°09'08.81637"	254.857	VVA
3150_2022_MN	45°06'10.47003"	-92°51'48.06898"	255.792	VVA
3151_2022_MN	45°25'25.12381"	-94°04'36.57398"	268.230	VVA
3151A_2023_MN	45°25'29.68046"	-94°03'38.38738"	274.862	VVA
3152_2022_MN	45°50'59.66367"	-93°19'03.43745"	275.412	VVA
3153_2023_MN	45°00'30.10517"	-94°33'58.92490"	320.270	VVA

3154_2022_MN	44°56'13.84752"	-94°08'41.93538"	293.918	VVA
3155_2023_MN	45°40'00.81436"	-94°21'23.21165"	328.063	VVA
3156_2023_MN	45°12'21.03609"	-94°11'09.58987"	282.648	VVA
3157_2022_MN	45°27'31.53725"	-93°49'04.68308"	275.969	VVA
3158_2022_MN	45°56'42.46769"	-93°25'54.23772"	321.547	VVA
3159_2022_MN	44°41'44.85991"	-94°09'11.02638"	278.910	VVA
3160_2023_MN	45°30'54.09398"	-94°34'02.48559"	353.098	VVA
3161_2022_MN	46°04'45.93733"	-93°29'38.92346"	364.454	VVA
3162_2022_MN	44°50'02.88250"	-94°17'41.87148"	293.175	VVA
3163_2022_MN	44°47'23.00718"	-93°11'39.67901"	263.169	VVA
CA001_2022_MN	45°33'26.61085"	-93°35'08.78506"	267.985	LiDAR Control
CA002_2022_MN	45°26'56.90563"	-93°59'56.76685"	275.701	LiDAR Control
CA003_2022_MN	45°29'36.24414"	-93°31'56.31396"	284.657	LiDAR Control
CA004_2022_MN	45°32'32.53547"	-94°06'35.59653"	281.714	LiDAR Control
CA005_2022_MN	45°27'43.56130"	-93°44'11.15993"	272.640	LiDAR Control
CA006_2022_MN	45°30'57.79369"	-93°54'35.18082"	275.839	LiDAR Control
CA007_2022_MN	45°26'10.37890"	-93°30'37.17479"	283.375	LiDAR Control
CA008_2022_MN	45°24'17.39139"	-93°53'26.23288"	269.331	LiDAR Control
CA009_2022_MN	45°20'01.61147"	-93°44'44.29768"	257.988	LiDAR Control
CA009A_2023_MN	45°20'01.62286"	-93°44'44.24555"	258.001	LiDAR Control
CA010_2022_MN	45°21'57.16895"	-93°33'39.94067"	268.437	LiDAR Control
CA011_2022_MN	45°18'14.49672"	-93°35'53.61073"	240.581	LiDAR Control
CA011A_2023_MN	45°18'14.67024"	-93°35'52.53837"	240.682	LiDAR Control
CA012_2022_MN	45°15'18.22067"	-93°30'58.98457"	243.516	LiDAR Control
CA012A_2023_MN	45°15'18.18432"	-93°30'59.17999"	243.630	LiDAR Control
CA013_2022_MN	45°11'55.36653"	-93°26'23.93969"	236.095	LiDAR Control
CA014_2022_MN	45°09'54.04634"	-93°36'15.52718"	258.480	LiDAR Control
CA015_2022_MN	45°07'33.55004"	-93°21'27.92178"	239.008	LiDAR Control
CA016_2022_MN	45°06'22.98343"	-93°42'26.99015"	275.224	LiDAR Control
CA016A_2023_MN	45°06'22.98270"	-93°42'26.88320"	275.250	LiDAR Control
CA017_2022_MN	45°03'25.86742"	-93°18'44.76100"	229.783	LiDAR Control
CA018_2022_MN	45°03'25.28571"	-93°35'19.80847"	275.763	LiDAR Control
CA019_2022_MN	45°02'11.82449"	-93°46'14.59384"	268.161	LiDAR Control
CA019A_2023_MN	45°02'11.81860"	-93°46'14.56669"	268.165	LiDAR Control
CA020_2022_MN	44°59'38.30256"	-93°24'15.47467"	247.155	LiDAR Control
CA021_2022_MN	44°59'28.26093"	-93°14'17.92713"	228.537	LiDAR Control
CA022_2022_MN	44°59'05.75209"	-93°33'24.42505"	271.878	LiDAR Control
CA023_2022_MN	44°51'36.07015"	-93°13'45.76601"	222.613	LiDAR Control
CA024_2022_MN	44°56'08.63733"	-93°38'15.65805"	265.670	LiDAR Control
CA025_2022_MN	44°56'58.09330"	-93°44'31.18247"	272.812	LiDAR Control
CA026_2022_MN	44°52'36.14439"	-93°20'53.85938"	233.592	LiDAR Control
CA027_2022_MN	44°53'23.95715"	-93°28'51.27354"	247.890	LiDAR Control
CA028_2022_MN	44°53'11.71609"	-93°46'15.56716"	269.986	LiDAR Control

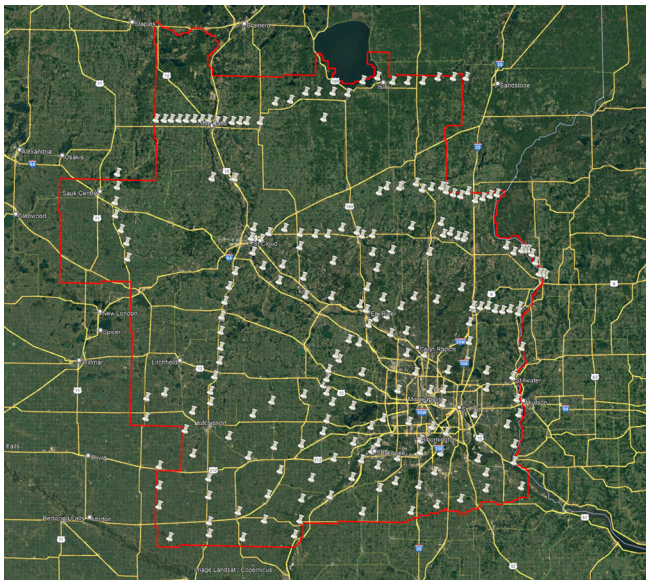
CA029_2022_MN	44°48'41.61422"	-93°17'20.66995"	218.333	LiDAR Control
CA030_2022_MN	44°48'01.60492"	-93°30'35.32778"	197.085	LiDAR Control
CA031_2022_MN	44°57'52.76440"	-94°41'46.92709"	312.006	LiDAR Control
CA032_2022_MN	44°27'21.32582"	-94°34'23.20313"	287.095	LiDAR Control
CA033_2022_MN	44°58'58.81475"	-94°36'16.06133"	312.841	LiDAR Control
CA033A_2023_MN	44°58'45.29793"	-94°36'18.00766"	312.479	LiDAR Control
CA034_2022_MN	44°38'37.64703"	-94°37'45.88478"	300.679	LiDAR Control
CA035_2022_MN	44°53'31.20210"	-94°41'59.33279"	309.883	LiDAR Control
CA036_2022_MN	44°43'00.02812"	-94°37'46.77711"	300.846	LiDAR Control
CA037_2022_MN	44°50'55.36181"	-94°29'52.73526"	301.812	LiDAR Control
CA038_2022_MN	44°45'39.17037"	-94°27'23.87541"	294.364	LiDAR Control
CA039_2022_MN	44°34'16.87280"	-94°37'45.80349"	294.595	LiDAR Control
CA040_2022_MN	44°55'00.13193"	-94°27'38.25260"	299.707	LiDAR Control
CA041_2022_MN	44°28'11.86351"	-94°22'17.18392"	282.057	LiDAR Control
CA042_2022_MN	44°36'30.92298"	-94°22'33.27505"	292.871	LiDAR Control
CA043_2022_MN	44°57'00.30218"	-94°22'06.06288"	306.117	LiDAR Control
CA044_2022_MN	44°40'26.22006"	-94°22'34.71182"	286.248	LiDAR Control
CA045_2022_MN	44°30'52.36854"	-94°22'18.15096"	280.423	LiDAR Control
CA046_2022_MN	44°49'33.05006"	-94°16'27.51158"	285.513	LiDAR Control
CA047_2022_MN	44°33'07.74739"	-94°13'25.22325"	278.034	LiDAR Control
CA048_2022_MN	44°54'23.51440"	-94°09'00.41722"	290.491	LiDAR Control
CA049_2022_MN	44°27'23.81782"	-94°12'03.33418"	269.843	LiDAR Control
CA050_2022_MN	44°57'18.35431"	-94°03'12.80116"	282.779	LiDAR Control
CA051_2022_MN	44°36'46.14603"	-94°04'19.03952"	270.688	LiDAR Control
CA052_2022_MN	44°45'11.36327"	-94°10'22.59602"	276.480	LiDAR Control
CA053_2022_MN	44°31'19.05588"	-94°05'25.04937"	271.636	LiDAR Control
CA054_2022_MN	44°42'10.38728"	-94°00'38.04215"	279.452	LiDAR Control
CA055_2022_MN	44°47'22.36172"	-94°02'26.77320"	272.910	LiDAR Control
CA056_2022_MN	44°28'01.96389"	-93°56'10.57571"	205.873	LiDAR Control
CA057_2022_MN	44°58'41.44083"	-93°53'18.89868"	278.053	LiDAR Control
CA058_2022_MN	44°35'55.82242"	-93°53'59.41855"	201.955	LiDAR Control
CA059_2022_MN	44°31'17.23421"	-93°54'31.86879"	221.705	LiDAR Control
CA060_2022_MN	44°40'25.30640"	-93°50'58.05453"	267.858	LiDAR Control
CA061_2022_MN	44°47'48.96826"	-93°54'05.17634"	276.255	LiDAR Control
CA062_2022_MN	44°50'33.22675"	-93°47'24.94895"	274.699	LiDAR Control
CA063_2022_MN	44°36'34.02034"	-93°45'16.23990"	235.112	LiDAR Control
CA064_2022_MN	44°44'47.85201"	-93°44'04.12570"	254.841	LiDAR Control
CA065_2022_MN	44°40'34.64582"	-93°38'31.93016"	213.508	LiDAR Control
CA066_2022_MN	44°48'15.67262"	-93°38'00.06672"	247.072	LiDAR Control
CA067_2022_MN	44°44'25.22617"	-93°35'35.77682"	203.427	LiDAR Control
CA068_2022_MN	44°38'10.09418"	-93°30'05.51612"	267.624	LiDAR Control
CA069_2022_MN	44°51'44.26148"	-93°32'39.87143"	263.919	LiDAR Control
CA070_2022_MN	44°46'26.30351"	-93°32'22.69523"	232.622	LiDAR Control

CA071_2022_MN	44°43'03.82649"	-93°30'35.32240"	263.306	LiDAR Control
CA072_2022_MN	45°42'50.45125"	-93°29'42.57252"	283.229	LiDAR Control
CA073_2022_MN	45°19'41.32755"	-93°28'45.62172"	256.581	LiDAR Control
CA074_2022_MN	44°32'59.42161"	-93°35'20.13950"	274.534	LiDAR Control
CA075_2022_MN	44°39'35.90495"	-93°25'11.86522"	279.570	LiDAR Control
CA076_2022_MN	45°15'50.81845"	-93°27'32.73682"	242.656	LiDAR Control
CA077_2022_MN	44°44'50.62821"	-93°24'28.96769"	281.309	LiDAR Control
CA078_2022_MN	45°43'50.62609"	-93°23'20.82093"	279.926	LiDAR Control
CA079_2022_MN	45°17'47.31895"	-93°23'08.88028"	240.803	LiDAR Control
CA080_2022_MN	44°33'04.46352"	-93°20'22.22462"	312.274	LiDAR Control
CA081_2022_MN	45°30'02.60312"	-93°25'49.38131"	261.789	LiDAR Control
CA082_2022_MN	45°19'55.36575"	-93°19'02.96601"	250.213	LiDAR Control
CA083_2022_MN	45°12'23.90397"	-93°21'34.55646"	238.035	LiDAR Control
CA084_2022_MN	44°38'40.05468"	-93°18'00.46958"	307.672	LiDAR Control
CA085_2022_MN	45°43'24.87039"	-93°16'13.33246"	264.441	LiDAR Control
CA086_2022_MN	44°46'06.03177"	-93°17'25.74109"	251.211	LiDAR Control
CA087_2022_MN	45°07'23.19067"	-93°15'56.25436"	240.102	LiDAR Control
CA088_2022_MN	45°35'14.94058"	-93°19'40.26351"	259.660	LiDAR Control
CA089_2022_MN	45°29'35.65610"	-93°14'07.77038"	257.566	LiDAR Control
CA090_2022_MN	44°34'24.52953"	-93°12'29.03049"	282.021	LiDAR Control
CA091_2022_MN	44°41'39.92772"	-93°13'05.06685"	286.369	LiDAR Control
CA092_2022_MN	45°19'12.01975"	-93°12'05.58685"	249.072	LiDAR Control
CA093_2022_MN	44°45'49.20344"	-93°11'11.26851"	279.324	LiDAR Control
CA094_2022_MN	44°59'31.40491"	-93°10'06.92541"	264.816	LiDAR Control
CA095_2022_MN	45°36'05.89759"	-93°10'24.79534"	266.197	LiDAR Control
CA096_2022_MN	45°43'51.17952"	-93°10'09.31679"	263.111	LiDAR Control
CA097_2022_MN	45°03'47.11253"	-93°08'45.98896"	263.711	LiDAR Control
CA098_2022_MN	44°50'17.99900"	-93°09'23.38029"	245.898	LiDAR Control
CA099_2022_MN	44°44'20.37423"	-92°59'41.21260"	229.436	LiDAR Control
CA100_2022_MN	44°38'07.96096"	-92°46'21.89829"	265.870	LiDAR Control
CA101_2022_MN	44°35'38.63596"	-93°05'09.71124"	252.175	LiDAR Control
CA102_2022_MN	45°05'38.59626"	-93°03'02.19541"	264.568	LiDAR Control
CA103_2022_MN	45°21'46.68773"	-93°04'15.15825"	249.491	LiDAR Control
CA104_2022_MN	45°32'33.50708"	-93°03'28.56051"	254.375	LiDAR Control
CA105_2022_MN	45°14'09.96257"	-93°01'54.05600"	246.452	LiDAR Control
CA106_2022_MN	45°17'11.36759"	-93°00'43.53107"	252.160	LiDAR Control
CA107_2022_MN	44°56'29.36604"	-93°10'26.99905"	251.594	LiDAR Control
CA108_2022_MN	44°48'49.83599"	-92°59'02.31312"	198.439	LiDAR Control
CA109_2022_MN	44°54'05.46746"	-93°00'35.25116"	203.359	LiDAR Control
CA110_2022_MN	44°41'16.83011"	-92°57'14.40294"	223.085	LiDAR Control
CA111_2022_MN	45°03'33.69858"	-92°56'46.34316"	287.817	LiDAR Control
CA112_2022_MN	45°10'02.17878"	-93°02'04.82710"	249.834	LiDAR Control
CA113_2022_MN	44°37'47.40475"	-92°57'15.93600"	257.847	LiDAR Control

CA114_2022_MN	44°59'49.77068"	-92°56'48.74266"	277.698	LiDAR Control
CA115_2022_MN	45°16'13.43112"	-92°46'36.63660"	268.968	LiDAR Control
CA116_2022_MN	44°51'43.07232"	-92°50'32.54447"	245.732	LiDAR Control
CA117_2022_MN	45°02'13.88817"	-92°48'35.52233"	251.577	LiDAR Control
CA118_2022_MN	45°08'38.64020"	-92°45'41.60893"	229.110	LiDAR Control
CA119_2022_MN	44°47'24.11668"	-92°48'24.66542"	230.246	LiDAR Control
CA120_2022_MN	44°54'05.72001"	-92°46'53.09978"	180.957	LiDAR Control
CA121_2022_MN	44°43'40.02223"	-92°48'33.32559"	180.152	LiDAR Control
CA122_2022_MN	44°57'22.02333"	-92°47'24.98099"	233.222	LiDAR Control

3. GPS Control Diagram

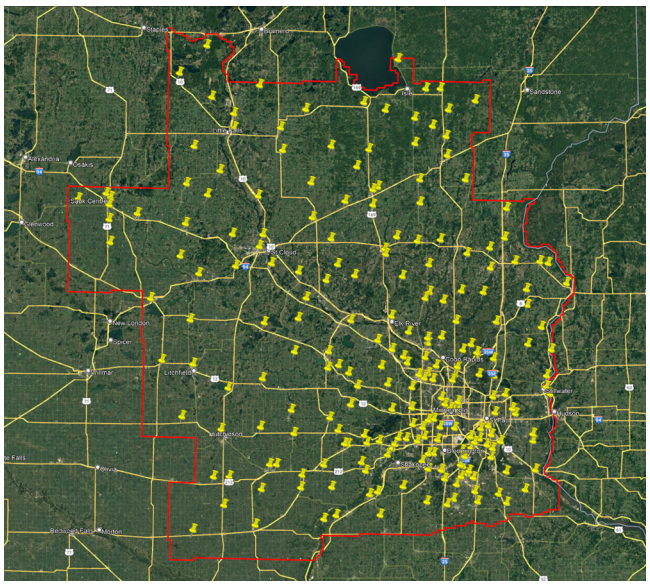
Image 3.1 Overview of the Lidar Control Network



N

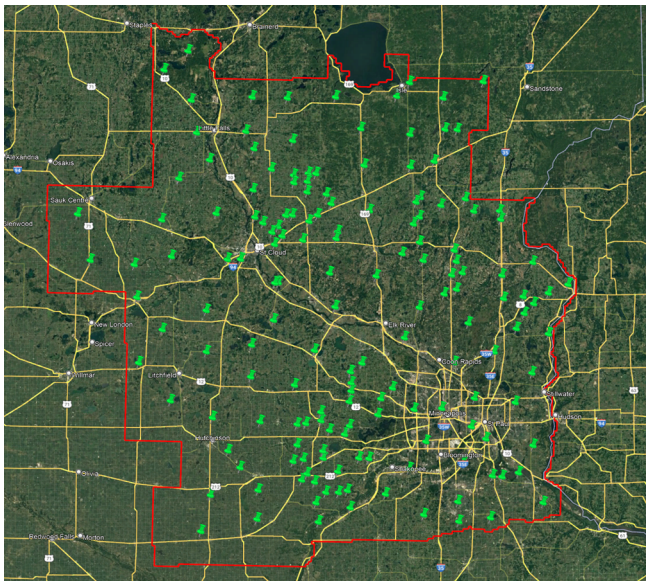
Not to Scale

Image 3.2 Overview of the Lidar NVA Network



N
Not to Scale

Image 3.3 Overview of the Lidar VVA Network



N
Not to Scale

4. NGS Datasheets

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

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.12.5.14
Starting Datasheet Retrieval...
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 DL9755 ***********************************************************************
 DL9755  DESIGNATION -  1001 D
 DL9755  PID         -  DL9755
 DL9755  STATE/COUNTY-  MN/CARVER
 DL9755  COUNTRY     -  US
 DL9755  USGS QUAD   -  NORWOOD (2019)
 DL9755
 DL9755                        *CURRENT SURVEY CONTROL
 DL9755  ______________________________________________________________________
 DL9755* NAD 83(2011) POSITION- 44 45 36.67511(N) 093 58 47.36962(W)   ADJUSTED
 DL9755* NAD 83(2011) ELLIP HT-   277.620 (meters)        (04/09/20)   ADJUSTED
 DL9755* NAD 83(2011) EPOCH   -  2010.00
 DL9755* NAVD 88 ORTHO HEIGHT -   305.133 (meters)     1001.09  (feet) ADJUSTED
 DL9755  ______________________________________________________________________
 DL9755  GEOID HEIGHT    -        -27.527 (meters)                     GEOID18
 DL9755  NAD 83(2011) X  -   -314,863.173 (meters)                     COMP
 DL9755  NAD 83(2011) Y  - -4,525,653.306 (meters)                     COMP
 DL9755  NAD 83(2011) Z  -  4,468,659.956 (meters)                     COMP
 DL9755  LAPLACE CORR    -          2.24  (seconds)                    DEFLEC18
 DL9755  DYNAMIC HEIGHT  -        305.104 (meters)     1001.00  (feet) COMP
 DL9755  MODELED GRAVITY -    980,512.9   (mgal)                       NAVD 88
 DL9755
 DL9755  VERT ORDER      -  SECOND    CLASS I
 DL9755
 DL9755  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 DL9755  Standards:
 DL9755         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 DL9755            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 DL9755  ------------------------------------------------------------------
 DL9755  NETWORK    0.76   1.37           0.35   0.26   0.70      0.10737534
 DL9755  ------------------------------------------------------------------
 DL9755  Click here for local accuracies and other accuracy information.
 DL9755
 DL9755
 DL9755.The horizontal coordinates were established by GPS observations
 DL9755.and adjusted by the MN DEPT OF TRANSP in April 2020.
 DL9755
 DL9755.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 DL9755.been affixed to the stable North American tectonic plate. See
 DL9755.NA2011 for more information.
 DL9755
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DL9755.The horizontal coordinates are valid at the epoch date displayed above
DL9755.which is a decimal equivalence of Year/Month/Day.
DL9755
DL9755.The orthometric height was determined by differential leveling and
DL9755.adjusted by the NATIONAL GEODETIC SURVEY
DL9755.in June 2017.
DL9755
DL9755.Significant digits in the geoid height do not necessarily reflect accuracy.
DL9755.GEOID18 height accuracy estimate available here.
DL9755
DL9755.Click photographs - Photos may exist for this station.
DL9755
DL9755.The X, Y, and Z were computed from the position and the ellipsoidal ht.
DL9755
DL9755.The Laplace correction was computed from DEFLEC18 derived deflections.
DL9755
DL9755.The ellipsoidal height was determined by GPS observations
DL9755.and is referenced to NAD 83.
DL9755
DL9755.The dynamic height is computed by dividing the NAVD 88
DL9755.geopotential number by the normal gravity value computed on the
DL9755.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DL9755.degrees latitude (g = 980.6199 gals.).
DL9755
DL9755.The modeled gravity was interpolated from observed gravity values.
DL9755
DL9755. The following values were computed from the NAD 83(2011) position.
DL9755
DL9755;                    North         East     Units Scale Factor Converg.
DL9755;SPC MN S     -   295,578.225   801,597.257   MT  0.99993221   +0 00 50.9
DL9755;SPC MN S     -   969,742.89  2,629,907.00   sFT  0.99993221   +0 00 50.9
DL9755;UTM  15      - 4,956,777.754   422,453.313   MT  0.99967395   -0 41 23.9
DL9755
DL9755!             -  Elev Factor  x  Scale Factor =   Combined Factor
DL9755!SPC MN S     -   0.99995647  x   0.99993221  =   0.99988869
DL9755!UTM  15      -   0.99995647  x   0.99967395  =   0.99963044
DL9755
DL9755_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVK2245356777(NAD 83)
DL9755
DL9755                           SUPERSEDED SURVEY CONTROL
DL9755
DL9755  NAVD 88 (09/23/10)  305.131   (m)         1001.08    (f) SUPERSEDED  2 1
DL9755
DL9755.Superseded values are not recommended for survey control.
DL9755
DL9755.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DL9755.See file dsdata.pdf to determine how the superseded data were derived.
DL9755
DL9755_MARKER: DB = BENCH MARK DISK
DL9755_SETTING: 9 = SET IN PREFABRICATED CONCRETE POST IMBEDDED IN GROUND
DL9755_STAMPING: 1001 D 19 1000.794
DL9755_MARK LOGO: MNHD
DL9755_PROJECTION: PROJECTING 3 CENTIMETERS
DL9755_MAGNETIC: R = STEEL ROD IMBEDDED IN MONUMENT
DL9755_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
DL9755_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
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 DL9755+SATELLITE: SATELLITE OBSERVATIONS - March 12, 2020
 DL9755
 DL9755  HISTORY     - Date     Condition        Report By
 DL9755  HISTORY     - 1964     MONUMENTED       MNDT
 DL9755  HISTORY     - 20031118 GOOD             MNDT
 DL9755  HISTORY     - 20150414 GOOD             MNDT
 DL9755  HISTORY     - 20200312 GOOD             MNDT
 DL9755
 DL9755                          STATION DESCRIPTION
 DL9755
 DL9755'DESCRIBED BY MN DEPT OF TRANSP 2003 (MPP)
 DL9755'THE STATION IS LOCATED ABOUT 3.1 MI (5.0 KM) EAST-SOUTHEAST OF PLATO,
 DL9755'2.6 MI (4.2 KM) WEST-SOUTHWEST OF NORWOOD AND 2.0 MI (3.2 KM)
 DL9755'NORTH-NORTHWEST OF HAMBURG.
 DL9755'
 DL9755'THE MARK IS 2.0 MI (3.2 KM) (3.2 KM) NORTH-NORTHWEST OF HAMBURG, 2.0
 DL9755'MI (3.2 KM) NORTH ALONG TRUNK HIGHWAY 5 FROM THE JUNCTION OF TRUNK
 DL9755'HIGHWAY 5 AND COUNTY ROAD 50 AT HAMBURG, AT TRUNK HIGHWAY 5 MILE POINT
 DL9755'20.50, 75 FT (22.9 M) RIGHT OF TRUNK HIGHWAY 5 AT STATION 1078+00,
 DL9755'33.6 FT (10.2 M) SOUTH OF POWER POLE, 1.4 FT (0.4 M) WEST OF A WITNESS
 DL9755'POST.
 DL9755
 DL9755                          STATION RECOVERY (2015)
 DL9755
 DL9755'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (KMS)
 DL9755'RECOVERED AS DESCRIBED.
 DL9755
 DL9755                          STATION RECOVERY (2020)
 DL9755
 DL9755'RECOVERY NOTE BY MN DEPT OF TRANSP 2020 (BXG)
 DL9755'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 DQ3143 ***********************************************************************
 DQ3143  DESIGNATION -  7202 J
 DQ3143  PID         -  DQ3143
 DQ3143  STATE/COUNTY-  MN/SIBLEY
 DQ3143  COUNTRY     -  US
 DQ3143  USGS QUAD   -  WINTHROP SW (2019)
 DQ3143
 DQ3143                        *CURRENT SURVEY CONTROL
 DQ3143  ______________________________________________________________________
 DQ3143* NAD 83(2011) POSITION- 44 32 34.11879(N) 094 22 35.69357(W)   ADJUSTED
 DQ3143* NAD 83(2011) ELLIP HT-   281.973 (meters)        (07/21/16)   ADJUSTED
 DQ3143* NAD 83(2011) EPOCH   -  2010.00
 DQ3143* NAVD 88 ORTHO HEIGHT -   309.862 (meters)     1016.61  (feet) ADJUSTED
 DQ3143  ______________________________________________________________________
 DQ3143  GEOID HEIGHT    -        -27.893 (meters)                     GEOID18
 DQ3143  NAD 83(2011) X  -   -347,490.016 (meters)                     COMP
 DQ3143  NAD 83(2011) Y  - -4,540,295.451 (meters)                     COMP
 DQ3143  NAD 83(2011) Z  -  4,451,477.833 (meters)                     COMP
 DQ3143  LAPLACE CORR    -         -0.98  (seconds)                    DEFLEC18
 DQ3143  DYNAMIC HEIGHT  -        309.820 (meters)     1016.47  (feet) COMP
 DQ3143  MODELED GRAVITY -    980,473.6   (mgal)                       NAVD 88
 DQ3143
 DQ3143  VERT ORDER      -  SECOND    CLASS I
 DQ3143
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DQ3143  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
DQ3143  Standards:
DQ3143         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
DQ3143            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
DQ3143  ---------------------------------------------------------------------
DQ3143  NETWORK    0.49   1.14           0.22   0.18   0.58      0.09503844
DQ3143  ---------------------------------------------------------------------
DQ3143  Click here for local accuracies and other accuracy information.
DQ3143
DQ3143
DQ3143.The horizontal coordinates were established by GPS observations
DQ3143.and adjusted by the MN DEPT OF TRANSP in July 2016.
DQ3143
DQ3143.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
DQ3143.been affixed to the stable North American tectonic plate. See
DQ3143.NA2011 for more information.
DQ3143
DQ3143.The horizontal coordinates are valid at the epoch date displayed above
DQ3143.which is a decimal equivalence of Year/Month/Day.
DQ3143
DQ3143.The orthometric height was determined by differential leveling and
DQ3143.adjusted by the NATIONAL GEODETIC SURVEY
DQ3143.in May 2019.
DQ3143
DQ3143.Significant digits in the geoid height do not necessarily reflect accuracy.
DQ3143.GEOID18 height accuracy estimate available here.
DQ3143
DQ3143.Click photographs - Photos may exist for this station.
DQ3143
DQ3143.The X, Y, and Z were computed from the position and the ellipsoidal ht.
DQ3143
DQ3143.The Laplace correction was computed from DEFLEC18 derived deflections.
DQ3143
DQ3143.The ellipsoidal height was determined by GPS observations
DQ3143.and is referenced to NAD 83.
DQ3143
DQ3143.The dynamic height is computed by dividing the NAVD 88
DQ3143.geopotential number by the normal gravity value computed on the
DQ3143.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DQ3143.degrees latitude (g = 980.6199 gals.).
DQ3143
DQ3143.The modeled gravity was interpolated from observed gravity values.
DQ3143
DQ3143. The following values were computed from the NAD 83(2011) position.
DQ3143
DQ3143;                    North         East     Units Scale Factor Converg.
DQ3143;SPC MN S     -   271,492.760   770,074.990   MT  0.99992230   -0 15 50.2
DQ3143;SPC MN S     -   890,722.50  2,526,487.70   sFT  0.99992230   -0 15 50.2
DQ3143;UTM  15      - 4,933,086.072   390,644.789   MT  0.99974706   -0 57 56.5
DQ3143
DQ3143!             -  Elev Factor  x  Scale Factor =   Combined Factor
DQ3143!SPC MN S     -   0.99995579  x   0.99992230  =   0.99987809
DQ3143!UTM  15      -   0.99995579  x   0.99974706  =   0.99970286
DQ3143
DQ3143_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TUK9064433086(NAD 83)
DQ3143
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 DQ3143                          SUPERSEDED SURVEY CONTROL
 DQ3143
 DQ3143.No superseded survey control is available for this station.
 DQ3143
 DQ3143_MARKER: F = FLANGE-ENCASED ROD
 DQ3143_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
 DQ3143_STAMPING: 7202 J 2015
 DQ3143_MARK LOGO: MNDT
 DQ3143_PROJECTION: RECESSED 5 CENTIMETERS
 DQ3143_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
 DQ3143_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
 DQ3143_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DQ3143+SATELLITE: SATELLITE OBSERVATIONS - June 05, 2019
 DQ3143_ROD/PIPE-DEPTH: 5.8  meters
 DQ3143
 DQ3143  HISTORY     - Date     Condition        Report By
 DQ3143  HISTORY     - 20150626 MONUMENTED       MNDT
 DQ3143  HISTORY     - 20160407 GOOD             MNDT
 DQ3143  HISTORY     - 20190605 GOOD             MNDT
 DQ3143
 DQ3143                          STATION DESCRIPTION
 DQ3143
 DQ3143'DESCRIBED BY MN DEPT OF TRANSP 2015
 DQ3143'IN WINTHROP, AT JUNCTION OF TRUNK HIGHWAY 15 AND TRUNK HIGHWAY 19 IN
 DQ3143'WINTHROP, AT TRUNK HIGHWAY 15 MILEPOINT 76.9, 165.0 FEET WEST OF
 DQ3143'SOUTHBOUND TRUNK HIGHWAY 15, 111.0 FEET SOUTH OF EASTBOUND TRUNK
 DQ3143'HIGHWAY 19, 2.0 FEET EAST OF RIGHT-OF-WAY POST, 2.0 FEET EAST OF
 DQ3143'WITNESS POST.
 DQ3143
 DQ3143                          STATION RECOVERY (2016)
 DQ3143
 DQ3143'RECOVERY NOTE BY MN DEPT OF TRANSP 2016 (KMS)
 DQ3143'RECOVERED AS DESCRIBED.
 DQ3143'
 DQ3143'NOTE-THE STATION CONSISTS OF A 3/4 INCH (19 MM) DIAMETER ALUMINUM ROD
 DQ3143'DRIVEN TO REFUSAL WITH A STANDARD MNDT CONTROL STATION REMOVABLE DISK
 DQ3143'SET ON A THREE FT (0.9 M) STABILIZER FIN SURROUNDED BY A SIX-INCH PVC
 DQ3143'PIPE BACK FILLED WITH WASHED SAND.
 DQ3143
 DQ3143                          STATION RECOVERY (2019)
 DQ3143
 DQ3143'RECOVERY NOTE BY MN DEPT OF TRANSP 2019 (BRB)
 DQ3143'RECOVERED AS DESCRIBED.
 DQ3143'
 DQ3143'NOTE-THE STATION CONSISTS OF A 3/4 INCH (19 MM) DIAMETER ALUMINUM ROD
 DQ3143'DRIVEN TO REFUSAL WITH A STANDARD MNDT CONTROL STATION REMOVABLE DISK
 DQ3143'SET ON A THREE FT (0.9 M) STABILIZER FIN SURROUNDED BY A SIX-INCH PVC
 DQ3143'PIPE BACK FILLED WITH WASHED SAND.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AA2867 ***********************************************************************
 AA2867  FBN         -  This is a Federal Base Network Control Station.
 AA2867  DESIGNATION -  8680 MA
 AA2867  PID         -  AA2867
 AA2867  STATE/COUNTY-  MN/WRIGHT
 AA2867  COUNTRY     -  US
 AA2867  USGS QUAD   -  BIG LAKE (2019)
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AA2867
AA2867                          *CURRENT SURVEY CONTROL
AA2867 ______________________________________________________________________________
AA2867* NAD 83(2011) POSITION- 45 16 14.75148(N) 093 43 33.01579(W)   ADJUSTED
AA2867* NAD 83(2011) ELLIP HT-   263.773 (meters)        (06/27/12)   ADJUSTED
AA2867* NAD 83(2011) EPOCH    -  2010.00
AA2867* NAVD 88 ORTHO HEIGHT -   291.737 (meters)      957.14  (feet) ADJUSTED
AA2867 ______________________________________________________________________________
AA2867  GEOID HEIGHT    -        -27.972 (meters)                     GEOID18
AA2867  NAD 83(2011) X  -   -292,189.639 (meters)                     COMP
AA2867  NAD 83(2011) Y  - -4,486,944.975 (meters)                     COMP
AA2867  NAD 83(2011) Z  -  4,508,763.164 (meters)                     COMP
AA2867  LAPLACE CORR    -         -4.19  (seconds)                    DEFLEC18
AA2867  DYNAMIC HEIGHT  -        291.716 (meters)      957.07  (feet) COMP
AA2867  MODELED GRAVITY -    980,536.7   (mgal)                       NAVD 88
AA2867
AA2867  VERT ORDER      -  SECOND    CLASS I
AA2867
AA2867  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AA2867  Standards:
AA2867         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AA2867            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
AA2867  ------------------------------------------------------------------
AA2867  NETWORK    0.26   0.39           0.12   0.09   0.20      0.02531316
AA2867  ------------------------------------------------------------------
AA2867  Click here for local accuracies and other accuracy information.
AA2867
AA2867
AA2867.The horizontal coordinates were established by GPS observations
AA2867.and adjusted by the National Geodetic Survey in June 2012.
AA2867
AA2867.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AA2867.been affixed to the stable North American tectonic plate. See
AA2867.NA2011 for more information.
AA2867
AA2867.The horizontal coordinates are valid at the epoch date displayed above
AA2867.which is a decimal equivalence of Year/Month/Day.
AA2867
AA2867.The orthometric height was determined by differential leveling and
AA2867.adjusted by the NATIONAL GEODETIC SURVEY
AA2867.in October 2008.
AA2867
AA2867.Significant digits in the geoid height do not necessarily reflect accuracy.
AA2867.GEOID18 height accuracy estimate available here.
AA2867
AA2867.Click photographs - Photos may exist for this station.
AA2867
AA2867.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AA2867
AA2867.The Laplace correction was computed from DEFLEC18 derived deflections.
AA2867
AA2867.The ellipsoidal height was determined by GPS observations
AA2867.and is referenced to NAD 83.
AA2867
AA2867.The dynamic height is computed by dividing the NAVD 88
AA2867.geopotential number by the normal gravity value computed on the
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AA2867.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AA2867.degrees latitude (g = 980.6199 gals.).
AA2867
AA2867.The modeled gravity was interpolated from observed gravity values.
AA2867
AA2867. The following values were computed from the NAD 83(2011) position.
AA2867
AA2867;                    North         East     Units Scale Factor Converg.
AA2867;SPC MN S     -   352,353.614   821,514.997   MT  1.00001227   +0 11 31.8
AA2867;SPC MN S     - 1,156,013.48  2,695,253.79   sFT  1.00001227   +0 11 31.8
AA2867;UTM  15      - 5,013,285.823   443,062.976   MT  0.99963986   -0 30 56.4
AA2867
AA2867!             -  Elev Factor  x  Scale Factor =   Combined Factor
AA2867!SPC MN S     -   0.99995865  x   1.00001227  =   0.99997092
AA2867!UTM  15      -   0.99995865  x   0.99963986  =   0.99959852
AA2867
AA2867:                Primary Azimuth Mark                    Grid Az
AA2867:SPC MN S     -  8680 P                                  123 45 05.3
AA2867:UTM  15      -  8680 P                                  124 27 33.5
AA2867
AA2867_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL4306213285(NAD 83)
AA2867
AA2867|-----------------------------------------------------------------------|
AA2867| PID    Reference Object                    Distance      Geod. Az   |
AA2867|                                                          dddmmss.s |
AA2867| DG9985 8680 P                           APPROX. 0.9 KM 1235637.1 |
AA2867| DG9976 8680 Q                           APPROX. 1.0 KM 1241253.8 |
AA2867| DG9975 8680 N                           141.902 METERS 12719     |
AA2867| DG9974 8680 LA                          348.406 METERS 29648     |
AA2867| DF9008 8680 KA                          446.285 METERS 2990840.2 |
AA2867|-----------------------------------------------------------------------|
AA2867
AA2867                          SUPERSEDED SURVEY CONTROL
AA2867
AA2867  NAD 83(2007)-  45 16 14.75168(N)    093 43 33.01644(W) AD(2002.00) 0
AA2867  ELLIP H (02/10/07)  263.802  (m)                       GP(2002.00)
AA2867  ELLIP H (04/01/05)  263.847  (m)                       GP(       ) 4 1
AA2867  ELLIP H (07/24/97)  263.785  (m)                       GP(       ) 1 1
AA2867  NAD 83(1994)-  45 16 14.75166(N)    093 43 33.01531(W) AD(       ) A
AA2867  ELLIP H (09/21/95)  263.847  (m)                       GP(       ) 2 1
AA2867  NAD 83(1992)-  45 16 14.75211(N)    093 43 33.01496(W) AD(       ) A
AA2867  ELLIP H (11/28/94)  263.872  (m)                       GP(       ) 1 1
AA2867  NAVD 88             291.74   (m)          957.2    (f) LEVELING    3
AA2867  NAVD 88 (01/15/97)  291.8    (m)  GEOID96 model used   GPS OBS
AA2867  NAVD 88 (11/28/94)  291.6    (m)  GEOID93 model used   GPS OBS
AA2867
AA2867.Superseded values are not recommended for survey control.
AA2867
AA2867.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AA2867.See file dsdata.pdf to determine how the superseded data were derived.
AA2867
AA2867_MARKER: I = METAL ROD
AA2867_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AA2867_STAMPING: 8680 MA 1992
AA2867_MARK LOGO: MNDT
AA2867_PROJECTION: RECESSED 15 CENTIMETERS
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AA2867_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
AA2867_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AA2867_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AA2867+SATELLITE: SATELLITE OBSERVATIONS - June 06, 2019
AA2867_ROD/PIPE-DEPTH: 12.8 meters
AA2867_SLEEVE-DEPTH  :  8.8 meters
AA2867
AA2867  HISTORY     - Date     Condition        Report By
AA2867  HISTORY     - 19920401 MONUMENTED       MNDT
AA2867  HISTORY     - 19930115 GOOD             MNDT
AA2867  HISTORY     - 19941114 GOOD             MNDT
AA2867  HISTORY     - 19960810 GOOD             MNDT
AA2867  HISTORY     - 200111   GOOD             MNDT
AA2867  HISTORY     - 20030401 GOOD             MNDT
AA2867  HISTORY     - 20031218 GOOD             MNDT
AA2867  HISTORY     - 20040812 GOOD             MNDT
AA2867  HISTORY     - 20040819 GOOD             MNDT
AA2867  HISTORY     - 20080707 GOOD             MNDT
AA2867  HISTORY     - 20090325 GOOD             MNDT
AA2867  HISTORY     - 20110810 GOOD             MNDT
AA2867  HISTORY     - 20120417 GOOD             MNDT
AA2867  HISTORY     - 20151001 GOOD             MNDT
AA2867  HISTORY     - 20190604 GOOD             MNDT
AA2867  HISTORY     - 20190606 GOOD             MNDT
AA2867
AA2867                          STATION DESCRIPTION
AA2867
AA2867'DESCRIBED BY MN DEPT OF TRANSP 1992 (HJS)
AA2867'THE STATION IS LOCATED 4.3 MILESNORTHWEST OF ALBERTVILLE AT THE
AA2867'MINNESOTA DEPARTMENT OF TRANSPORTATION COLD WEATHER ROAD RESEARCH
AA2867'PROJECT TEST SITE AT MILEPOST 197.6.
AA2867'
AA2867'TO REACH THE STATION FROM THE JUNCTION OF INTERSTATE 94 AND WRIGHT
AA2867'COUNTY ROAD 37 IN ALBERTVILLE, GO WESTERLY ALONG COUNTY ROAD 37 FOR
AA2867'0.7 MI (1.13 KM) TO A TEE INTERSECTION AT COUNTY ROAD 9.  TURN RIGHT
AA2867'AND GO NORTH ON COUNTY ROAD 9, (LABEAUX AVE NE) FOR 0.7 MI (1.13 KM)
AA2867'TO A CROSSROAD AT 70TH STREET.  TURN LEFT AND GO WESTERLY ON 70TH
AA2867'STREET FOR 1.9 MI (3.06 KM) TO A SIDE ROAD LEFT, GATE, AND MINNESOTA
AA2867'ROAD RESEARCH PROJECT SIGN. TURN LEFT, PASS THROUGH GATE AND GO
AA2867'WESTERLY FOR 0.1 MI (0.16 KM) TO A BLACKTOP ROAD TO THE LEFT.  TURN
AA2867'LEFT AND GO SOUTH FOR 200 FT (60.96 M) TO A CONCRETE ROAD.  TURN RIGHT
AA2867'AND GO NORTHWESTERLY ALONG ROAD (SURFACE MATERIAL WILL CHANGE) FOR 1.3
AA2867'MI (2.09 KM) TO A POND.  CONTINUE PAST POND TO WHERE THE PAVED ROAD
AA2867'TURNS TO THE NORTH.  CONTINUE STRAIGHT AHEAD (NORTHWESTERLY) ON GRAVEL
AA2867'ROAD FOR 0.4 MI (0.64 KM) AND STATION ON THE LEFT NEAR AN ELECTRICAL
AA2867'BOX.
AA2867'
AA2867'STATION IS LOCATED 19.6 FT (5.97 M) SOUTH SOUTHWEST OF THE APPROXIMATE
AA2867'CENTER OF A GRAVEL SERVICE ROAD, 94 FT (28.65 M) NORTH NORTHEAST OF
AA2867'THE NEW WESTBOUND (5 YEAR SECTION) LANE OF INTERSTATE I-94, 12.3 FT
AA2867'(3.75 M) SOUTHEAST OF THE EAST SIDE OF A TELEPHONE PEDESTAL, 36.2 FT
AA2867'(11.03 M) EAST SOUTHEAST OF THE EAST SIDE OF A 4 FT (1.22 M) WIDE BY 6
AA2867'FT (1.83 M) TALL ELECTRICAL CABINET.
AA2867'
AA2867'ACCESS TO THE DATUM POINT IS THROUGH A 6 IN ACCESS COVER WITH LOGO
AA2867'CAP.
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AA2867
AA2867                          STATION RECOVERY (1993)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 1993 (WAS)
AA2867'THE MARK IS 4.3 MI (6.9 KM) NORTHWEST OF ALBERTVILLE, 0.8 MI (1.3 KM)
AA2867'NORTH ALONG CO ROAD 19 FROM THE JUNCTION OF CO ROAD 19 AND FAI 94 THEN
AA2867'2.0 MI (3.2 KM) WEST ON 70TH ST NORTHEAST THEN 0.05 MI (0.08 KM)
AA2867'SOUTHWEST THEN 0.05 MI (0.08 KM) SOUTHEAST THEN 0.25 MI (0.40 KM)
AA2867'LIGHT AROUND LOOP THEN 1.1 MI (1.8 KM) WEST ON BIT ROAD THEN 0.35 MI
AA2867'(0.56 KM) WEST ON GRAVEL ROAD, AT MNDT COLD WEATHER ROAD TEST SITE,
AA2867'19.6 FT (6.0 M) SOUTH-SOUTHWEST OF GRAVEL SERVICE ROAD, 94 FT (28.7 M)
AA2867'NORTH-NORTHEAST OF NEW WEST BOUND (5 YEAR SEC) FAI 94, 12.3 FT (9.1
AA2867'CM) SOUTHEAST OF EAST SIDE OF TELEPHONE PEDESTAL, 36.2 FT (11.0 M)
AA2867'EAST-SOUTHEAST OF EAST SIDE OF 4 FT (1.2 M) BY 5.5 FT (1.7 M)
AA2867'ELECTRICAL CABINET, 2.6 FT (0.8 M) WEST-NORTHWEST OF A WITNESS POST,
AA2867'1.6 FT (0.5 M) SOUTH-SOUTHWEST OF A WITNESS POST, CONTACT JOHN ZOLLARS
AA2867'AT MINNESOTA ROADS.
AA2867
AA2867                          STATION RECOVERY (1994)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 1994 (DKH)
AA2867'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  A RR SPIKE WAS
AA2867'SET NEXT TO THE MARK TO MAKE IT MAGNETIC.  RECOVERY NOTE BY DAVID K.
AA2867'HERDER, TYPED BY G.W.O.
AA2867
AA2867                          STATION RECOVERY (1996)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 1996 (MPP)
AA2867'RECOVERED AS DESCRIBED.
AA2867
AA2867                          STATION RECOVERY (2001)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (DKH)
AA2867'RECOVERED EXCEPT OUUNTY ROAD 9 AS REFERENCED IN THE 1992
AA2867'DESCRIPTION IS NOW COUNTY ROAD 19.
AA2867'
AA2867'PERMISSION TO ACCESS THE STATION MUST BE GRANTED BY MNROAD
AA2867'PERSONNEL.
AA2867
AA2867                          STATION RECOVERY (2003)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (WAS)
AA2867'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  CONTACT JOHN
AA2867'ZOLLARS AT MN ROADS, NO DISK STAMPING ON LOGO CAP, 1/2 INCH STAINLESS
AA2867'STEEL ROD WITH GREASED SLEEVE.
AA2867
AA2867                          STATION RECOVERY (2003)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (KNB)
AA2867'THE MARK IS LOCATED 4.3 MILES NORTHWEST OF ALBERTVILLE, GO 0.8 MILES
AA2867'NORTH ALONG COUNTY ROAD 19 FROM JUNCTION OF COUNTY ROAD 19 AND
AA2867'INTERSTATE HIGHWAY 94, THENCE 2.0 MILES WEST ON 70TH ST NE, THENCE
AA2867'0.05 MILES SW, THENCE 0.05 MILES SE, THENCE 0.25 MILES LEFT AROUND
AA2867'LOOP, THENCE 1.1 MILES WEST ON BITUMINOUS ROAD, THENCE 0.35 MILES WEST
AA2867'ON GRAVEL ROAD, AT MNDT COLD WEATHER ROAD TEST SITE, THE MARK IS 19.6
AA2867'FEET SOUTH-SOUTHWEST OF GRAVEL SERVICE ROAD, 94 FEET NORTH-NORTHEAST
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AA2867'OF NEW WB (5 YEAR SEC) INTERSTATE HIGHWAY 94, 12.3 FEET SOUTHEAST OF
AA2867'EAST SIDE OF TELEPHONE PEDESTAL, 36.2 FEET EAST-SOUTHEAST OF EAST SIDE
AA2867'OF (4 FEET X 5.5 FT) ELECTRICAL CABINET NO 13, 2.6 FEET WEST-NORTHWEST
AA2867'OF WITNESS POST, 1.6 FEET SOUTH-SOUTHWEST OF WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2004)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (JW)
AA2867'4.3 MILES NORTHWEST OF ALBERTVILLE, AT MNDT COLD WEATHER ROAD TEST SIT
AA2867'E, 0.8 MILES NORTH ALONG COUNTY ROAD 19 FROM JUNCTION OF COUNTY ROAD 1
AA2867'9 AND INTERSTATE HIGHWAY 94, 2.0 MILES WEST ON 70TH STREET NORTHEAST,
AA2867'THEN 0.05 MILES SOUTHWEST, THEN 0.05 MILES SOUTHEAST, THEN 0.25 MILES
AA2867'LEFT AROUND LOOP, THEN 1.1 MILES WEST ON BITUMINOUS ROAD, THEN 0.35 MI
AA2867'LES WEST ON GRAVEL ROAD, 19.6 FEET SOUTH-SOUTHWEST OF GRAVEL SERVICE R
AA2867'OAD, 94 FEET NORTH-NORTHEAST OF NEW WESTBOUND INTERSTATE HIGHWAY 94, 1
AA2867'2.3 FEET SOUTHEAST OF EAST SIDE OF TELEPHONE PEDESTAL, 36.2 FEET EAST-
AA2867'SOUTHEAST OF EAST SIDE OF ELECTRICAL CABINET NUMBER 13, 2.6 FEET WEST-
AA2867'NORTHWEST OF WITNESS POST, 1.6 FEET SOUTH-SOUTHWEST OF WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2004)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (MPP)
AA2867'4.3 MILES NORTHWEST OF ALBERTVILLE, AT MNDT COLD WEATHER ROAD TEST
AA2867'SITE, 0.8 MILES NORTH ALONG COUNTY ROAD 19 FROM JUNCTION OF COUNTY
AA2867'ROAD 19 AND INTERSTATE HIGHWAY 94, 2.0 MILES WEST ON 70TH STREET
AA2867'NORTHEAST, THEN 0.05 MILES SOUTHWEST, THEN 0.05 MILES SOUTHEAST, THEN
AA2867'0.25 MILES LEFT AROUND LOOP, THEN 1.1 MILES WEST ON BITUMINOUS ROAD,
AA2867'THEN 0.35 MILES WEST ON GRAVEL ROAD, 19.6 FEET SOUTH-SOUTHWEST OF
AA2867'GRAVEL SERVICE ROAD, 94 FEET NORTH-NORTHEAST OF NEW WESTBOUND
AA2867'INTERSTATE HIGHWAY 94, 12.3 FEET SOUTHEAST OF EAST SIDE OF TELEPHONE
AA2867'PEDESTAL, 36.2 FEET EAST-SOUTHEAST OF EAST SIDE OF ELECTRICAL CABINET
AA2867'NUMBER 13, 2.6 FEET WEST-NORTHWEST OF WITNESS POST, 1.6 FEET
AA2867'SOUTH-SOUTHWEST OF WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2008)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (VWC)
AA2867'THE MARK IS LOCATED ABOUT 5.1 MI (8.2 KM) NORTHWEST OF SAINT MICHAEL,
AA2867'4.4 MI (7.1 KM) SOUTH-SOUTHEAST OF BIG LAKE AND 4.1 MI (6.6 KM)
AA2867'SOUTHEAST OF MONTICELLO.
AA2867'
AA2867'TO REACH TO THE MARK GO 4.3 MI (6.9 KM) NORTHWEST OF ALBERTVILLE, AT
AA2867'MINNESOTA DEPARTMENT OF TRANSPORTATION COLD WEATHER ROAD TEST SITE,
AA2867'0.8 MI (1.3 KM) NORTH ALONG COUNTY ROAD 19 FROM THE JUNCTION OF COUNTY
AA2867'ROAD 19 AND INTERSTATE HIGHWAY 94, 2.0 MI (3.2 KM) WEST ON 70TH STREET
AA2867'NORTHEAST, THEN 0.05 MI (0.1 KM) SOUTHWEST, THEN 0.05 MI (0.1 KM)
AA2867'SOUTHEAST, THEN 0.25 MI (0.4 KM) LEFT AROUND LOOP, THEN 1.1 MI (1.8
AA2867'KM) WEST ON BITUMINOUS ROAD, THEN 0.35 MI (0.6 KM) WEST ON GRAVEL
AA2867'ROAD, 19.6 FT (6.0 M) SOUTH-SOUTHWEST OF GRAVEL SERVICE ROAD, 94 FT
AA2867'(28.7 M) NORTH-NORTHEAST OF NEW WESTBOUND INTERSTATE HIGHWAY 94, 12.3
AA2867'FT (3.7 M) SOUTHEAST OF EAST SIDE OF TELEPHONE PEDESTAL, 36.2 FT (11.0
AA2867'M) EAST-SOUTHEAST OF EAST SIDE OF ELECTRICAL CABINET NUMBER 13, 2.6 FT
AA2867'(0.8 M) WEST-NORTHWEST OF A WITNESS POST, 1.6 FT (0.5 M)
AA2867'SOUTH-SOUTHWEST OF A WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2009)
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AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2009 (DKH)
AA2867'4.3 MILES NORTHWEST OF ALBERTVILLE, AT MINNESOTA DEPARTMENT OF
AA2867'TRANSPORTATION COLD WEATHER ROAD TEST SITE, 0.8 MILE NORTH ALONG
AA2867'COUNTY ROAD 19 FROM JUNCTION OF COUNTY ROAD 19 AND INTERSTATE HIGHWAY
AA2867'94, 2.0 MILES WEST ON 70TH STREET NORTHEAST, THEN 0.05 MILE SOUTHWEST,
AA2867'THEN 0.05 MILE SOUTHEAST, THEN 0.25 MILE LEFT AROUND LOOP, THEN 1.1
AA2867'MILES WEST ON BITUMINOUS ROAD, THEN 0.35 MILE WEST ON GRAVEL ROAD,
AA2867'36.2 FEET EAST-SOUTHEAST OF EAST SIDE OF ELECTRICAL CABINET NUMBER 13,
AA2867'19.6 FEET SOUTH-SOUTHWEST OF GRAVEL SERVICE ROAD, 94.0 FEET
AA2867'NORTH-NORTHEAST OF NEW WESTBOUND INTERSTATE HIGHWAY 94, 12.3 FEET
AA2867'SOUTHEAST OF EAST SIDE OF TELEPHONE PEDESTAL, 2.6 FEET WEST-NORTHWEST
AA2867'OF WITNESS POST, 1.6 FEET SOUTH-SOUTHWEST OF WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2011)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (BXJ)
AA2867'RECOVERED AS DESCRIBED.
AA2867
AA2867                          STATION RECOVERY (2012)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2012 (KMS)
AA2867'4.3 MI (6.9 KM) NORTHWEST OF ALBERTVILLE, 0.8 MI (1.3 KM) NORTH ALONG
AA2867'COUNTY ROAD 19  FROM THE JUNCTION OF COUNTY ROAD 19 AND INTERSTATE
AA2867'HIGHWAY 94 IN ALBERTVILLE, AT INTERSTATE HIGHWAY 94 MILE POINT 197.5,
AA2867'THEN 2.0 MI (3.2 KM) WEST ALONG 70TH STREET, THEN 0.05 MI (0.1 KM)
AA2867'SOUTHWEST, THEN 0.05 MI (0.1 KM) SOUTHEAST, THEN 0.25 MI (0.4 KM) LEFT
AA2867'AROUND LOOP, THEN 1.1 MI (1.8 KM) WEST ALONG BITUMINOUS ROAD, THEN
AA2867'0.35 MI (0.6 KM) WEST ALONG GRAVEL ROAD, 94.0 FT (28.7 M) NORTHEAST OF
AA2867'TEST SECTION OF WESTBOUND INTERSTATE HIGHWAY 94, 36.2 FT (11.0 M)
AA2867'EAST-SOUTHEAST OF EAST SIDE OF ELECTRICAL CABINET NUMBER 13, 19.6 FT
AA2867'(6.0 M) SOUTHWEST OF GRAVEL ROAD, 16.9 FT (5.2 M) NORTHWEST OF
AA2867'WALK-THROUGH GATE AT MNDT COLD WEATHER ROAD TEST SITE, 4.3 FT (1.3 M)
AA2867'NORTHEAST OF A FENCE, 2.6 FT (0.8 M) WEST-NORTHWEST OF A WITNESS POST,
AA2867'1.6 FT (0.5 M) SOUTH-SOUTHWEST OF A WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2015)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
AA2867'4.3 MILES NORTHWEST OF ALBERTVILLE, 3.75 MILES NORTHWEST ALONG
AA2867'WESTBOUND INTERSTATE 94 FROM JUNCTION OF INTERSTATE 94 AND COUNTY ROAD
AA2867'19 IN ALBERTVILLE, AT INTERSTATE HIGHWAY 94 MILEPOINT 197.5, THEN WALK
AA2867'ACROSS CEMENT PADS TO FENCE GATE, 94.0 FEET NORTHEAST OF TEST SECTION
AA2867'OF WESTBOUND INTERSTATE HIGHWAY 94, 36.2 FEET EAST-SOUTHEAST OF EAST
AA2867'SIDE OF ELECTRICAL CABINET NUMBER 13, 19.6 FEET SOUTHWEST OF GRAVEL
AA2867'ROAD, 16.9 FEET NORTHWEST OF WALK-THROUGH GATE AT MNDOT COLD WEATHER
AA2867'ROAD TEST SITE, 4.3 FEET NORTHEAST OF FENCE, 2.6 FEET WEST-NORTHWEST
AA2867'OF WITNESS POST, 1.6 FEET SOUTH-SOUTHWEST OF WITNESS POST.
AA2867
AA2867                          STATION RECOVERY (2019)
AA2867
AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2019 (KDJ)
AA2867'RECOVERED AS DESCRIBED.
AA2867
AA2867                          STATION RECOVERY (2019)
AA2867
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 AA2867'RECOVERY NOTE BY MN DEPT OF TRANSP 2019 (KDJ)
 AA2867'4.3 MI (6.9 KM) NORTHWEST OF ALBERTVILLE, 3.75 MI (6.03 KM) NORTHWEST
 AA2867'ALONG WESTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE
 AA2867'HIGHWAY 94 AND COUNTY ROAD 19 IN ALBERTVILLE, AT INTERSTATE HIGHWAY 94
 AA2867'MILE POINT 197.5, THEN WALK ACROSS THE CEMENT PADS TO A FENCE GATE,
 AA2867'94.0 FT (28.7 M) NORTHEAST OF THE TEST SECTION OF WESTBOUND INTERSTATE
 AA2867'HIGHWAY 94, 36.2 FT (11.0 M) EAST-SOUTHEAST OF THE EAST SIDE OF AN
 AA2867'ELECTRICAL CABINET NUMBER 13, 19.6 FT (6.0 M) SOUTHWEST OF A GRAVEL
 AA2867'ROAD, 16.9 FT (5.2 M) NORTHWEST OF A WALK-THROUGH GATE AT THE
 AA2867'MINNESOTA DEPARTMENT OF TRANSPORTATION COLD WEATHER ROAD TEST SITE,
 AA2867'4.3 FT (1.3 M) NORTHEAST OF A FENCE, 2.6 FT (0.8 M) WEST-NORTHWEST OF
 AA2867'A WITNESS POST.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4874 ***********************************************************************
 AC4874  CBN         -  This is a Cooperative Base Network Control Station.
 AC4874  DESIGNATION -  BALD
 AC4874  PID         -  AC4874
 AC4874  STATE/COUNTY-  MN/SHERBURNE
 AC4874  COUNTRY     -  US
 AC4874  USGS QUAD   -  PRINCETON (2019)
 AC4874
 AC4874                        *CURRENT SURVEY CONTROL
 AC4874 ______________________________________________________________________
 AC4874* NAD 83(2011) POSITION- 45 33 06.84901(N) 093 31 21.50156(W)   ADJUSTED
 AC4874* NAD 83(2011) ELLIP HT-   264.692 (meters)        (06/27/12)   ADJUSTED
 AC4874* NAD 83(2011) EPOCH   -  2010.00
 AC4874* NAVD 88 ORTHO HEIGHT -   292.749 (meters)      960.46  (feet) ADJUSTED
 AC4874 ______________________________________________________________________
 AC4874  GEOID HEIGHT    -        -28.048 (meters)                     GEOID18
 AC4874  NAD 83(2011) X  -   -274,907.722 (meters)                     COMP
 AC4874  NAD 83(2011) Y  - -4,465,742.733 (meters)                     COMP
 AC4874  NAD 83(2011) Z  -  4,530,699.532 (meters)                     COMP
 AC4874  LAPLACE CORR    -         -3.84  (seconds)                    DEFLEC18
 AC4874  DYNAMIC HEIGHT  -        292.736 (meters)      960.42  (feet) COMP
 AC4874  MODELED GRAVITY -    980,564.4   (mgal)                       NAVD 88
 AC4874
 AC4874  VERT ORDER      -  SECOND    CLASS I
 AC4874
 AC4874  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AC4874  Standards:
 AC4874         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AC4874            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 AC4874  ------------------------------------------------------------------
 AC4874  NETWORK    0.21   0.31           0.10   0.07   0.16     -0.01181265
 AC4874  ------------------------------------------------------------------
 AC4874  Click here for local accuracies and other accuracy information.
 AC4874
 AC4874
 AC4874.The horizontal coordinates were established by GPS observations
 AC4874.and adjusted by the National Geodetic Survey in June 2012.
 AC4874
 AC4874.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 AC4874.been affixed to the stable North American tectonic plate. See
 AC4874.NA2011 for more information.
 AC4874
 AC4874.The horizontal coordinates are valid at the epoch date displayed above
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AC4874.which is a decimal equivalence of Year/Month/Day.
AC4874
AC4874.The orthometric height was determined by differential leveling and
AC4874.adjusted by the NATIONAL GEODETIC SURVEY
AC4874.in February 2011.
AC4874
AC4874.No vertical observational check was made to the station.
AC4874
AC4874.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4874.GEOID18 height accuracy estimate available here.
AC4874
AC4874.Click photographs - Photos may exist for this station.
AC4874
AC4874.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4874
AC4874.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4874
AC4874.The ellipsoidal height was determined by GPS observations
AC4874.and is referenced to NAD 83.
AC4874
AC4874.The dynamic height is computed by dividing the NAVD 88
AC4874.geopotential number by the normal gravity value computed on the
AC4874.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4874.degrees latitude (g = 980.6199 gals.).
AC4874
AC4874.The modeled gravity was interpolated from observed gravity values.
AC4874
AC4874. The following values were computed from the NAD 83(2011) position.
AC4874
AC4874;                     North         East     Units Scale Factor Converg.
AC4874;SPC MN S     -   383,673.574   837,278.455   MT  1.00009056   +0 20 04.5
AC4874;SPC MN S     - 1,258,769.05  2,746,971.06   sFT  1.00009056   +0 20 04.5
AC4874;UTM  15      - 5,044,395.575   459,205.404   MT  0.99962046   -0 22 23.2
AC4874
AC4874!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4874!SPC MN S     -   0.99995850  x   1.00009056  =   1.00004906
AC4874!UTM  15      -   0.99995850  x   0.99962046  =   0.99957898
AC4874
AC4874_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL5920544395(NAD 83)
AC4874
AC4874                           SUPERSEDED SURVEY CONTROL
AC4874
AC4874  NAD 83(2007)-  45 33 06.84909(N)    093 31 21.50209(W) AD(2002.00) 0
AC4874  ELLIP H (02/10/07)  264.717  (m)                       GP(2002.00)
AC4874  NAD 83(1996)-  45 33 06.84887(N)    093 31 21.50197(W) AD(       ) B
AC4874  ELLIP H (01/15/97)  264.760  (m)                       GP(       ) 4 1
AC4874  NAVD 88             292.74   (m)          960.4    (f) LEVELING    3
AC4874  NAVD 88 (08/23/05)  292.75   (m)  GEOID03 model used   GPS OBS
AC4874  NAVD 88 (08/29/02)  292.7    (m)  GEOID99 model used   GPS OBS
AC4874  NAVD 88 (01/15/97)  292.8    (m)  GEOID96 model used   GPS OBS
AC4874
AC4874.Superseded values are not recommended for survey control.
AC4874
AC4874.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4874.See file dsdata.pdf to determine how the superseded data were derived.
AC4874
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AC4874_MARKER: DD = SURVEY DISK
AC4874_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
AC4874_STAMPING: BALD
AC4874_MARK LOGO: MN-141
AC4874_PROJECTION: RECESSED 8 CENTIMETERS
AC4874_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AC4874_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4874_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4874+SATELLITE: SATELLITE OBSERVATIONS - May 21, 2018
AC4874_ROD/PIPE-DEPTH:  5.5 meters
AC4874
AC4874  HISTORY     - Date     Condition        Report By
AC4874  HISTORY     - 19940401 MONUMENTED       MN-141
AC4874  HISTORY     - 19941103 GOOD             MNDT
AC4874  HISTORY     - 19970401 GOOD             MNDT
AC4874  HISTORY     - 20000926 GOOD             MNDT
AC4874  HISTORY     - 20040909 GOOD             MNDT
AC4874  HISTORY     - 20060619 GOOD             MNDT
AC4874  HISTORY     - 20081021 GOOD             MNDT
AC4874  HISTORY     - 20151001 GOOD             MNDT
AC4874  HISTORY     - 20171116 GOOD             MNDT
AC4874  HISTORY     - 20180521 GOOD             MNDT
AC4874
AC4874                          STATION DESCRIPTION
AC4874
AC4874'DESCRIBED BY MN DEPT OF TRANSP 1994 (DKH)
AC4874'THE MARK WAS RECOVERED IN GOOD CONDITION.  THE MARK IS LOCATED ABOUT
AC4874'3-1/2 MI SOUTH OF THE TOWN OF PRINCETON IN THE NW 1/4 OF SECTION 1,
AC4874'T35N, R26W.  TO REACH THE MARK FROM THE JCT OF TH 95 AND CO RD 29 IN
AC4874'PRINCETON, GO EAST FOR 0.3 MI (0.5 KM) ON TH 95 TO MP 24.25, THEN GO
AC4874'SOUTH AND EAST FOR 1.9 MI (3.1 KM) ON CO RD 1, THEN GO SOUTH AND EAST
AC4874'FOR 1.8 MI (2.9 KM) ON CO RD 37 TO THE MARK ON THE LEFT.  THE MARK, A
AC4874'SHERBURNE COUNTY GPS CONTROL MON DISK SET ON TOP OF A 3/4 INCH BY 18
AC4874'FT (5.5 M) ALUMINUM ROD, IS 34 FT (10.4 M) NORTH OF CO RD 37, 39 FT
AC4874'(11.9 M) WEST OF A FIELD ENT, 162.2 FT (49.4 M) NW OF A P-POLE, 158.1
AC4874'FT (48.2 M) NE OF A P-POLE, AND 1.0 FT (0.3 M) SOUTH OF A WIT POST.
AC4874'RECOVERED AND DESCRIBED BY DAVID K.  HERDER, TYPED BY D.J.E.
AC4874
AC4874                          STATION RECOVERY (1997)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 1997 (WAS)
AC4874'THE MARK WAS RECOVERED AS DESCRIBED.
AC4874
AC4874                          STATION RECOVERY (2000)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (DKH)
AC4874'THE MARK WAS RECOVERED AS DESCRIBED.  RECESSED 3 INCHES, GPSABLE,
AC4874'MAGNETIC.
AC4874
AC4874                          STATION RECOVERY (2004)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CB)
AC4874'3.5 MILES EAST AND 0.5 MILES SOUTH OF PRINCETON, 0.3 MILES EAST ALONG
AC4874'TRUNK HIGHWAY 95 FROM JUNCTION OF TRUNK HIGHWAY 95 AND COUNTY ROAD 29
AC4874'(LAGRANDE AVENUE) IN PRINCETON TO TRUNK HIGHWAY 95 MILEPOINT 24.25
AC4874'THEN 1.9 MILES SOUTH AND EAST ON MILLE LACS COUNTY ROAD 1 THEN 1.8
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AC4874'MILES SOUTH AND EAST ON COUNTY ROAD 37, 0.5 MILES SOUTH AND 0.5 MILES
AC4874'WEST OF NORTHWEST CORNER OF SHERBURN COUNTY, AT APPROXIMATE CENTER OF
AC4874'SECTION 1, 34 FEET NORTH OF COUNTY ROAD 37, 39 FEET WEST OF FIELD
AC4874'ENTRANCE, 162.2 FEET NORTHWEST OF POWER POLE, 158.1 FEET NORTHEAST OF
AC4874'POWER POLE, 1.0 FEET SOUTH OF WITNESS POST
AC4874
AC4874                          STATION RECOVERY (2006)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2006 (KMS)
AC4874'3.5 MILES EAST AND 0.5 MILES SOUTH OF PRINCETON, 0.3 MILES EAST ALONG
AC4874'TRUNK HIGHWAY 95 FROM JUNCTION OF TRUNK HIGHWAY 95 AND COUNTY ROAD 29
AC4874'(LAGRANDE AVENUE) IN PRINCETON TO TRUNK HIGHWAY 95 MILEPOINT 24.25
AC4874'THEN 1.9 MILES SOUTH AND EAST ON MILLE LACS COUNTY ROAD 1 THEN 1.8
AC4874'MILES SOUTH AND EAST ON COUNTY ROAD 37, 0.5 MILES SOUTH AND 0.5 MILES
AC4874'WEST OF NORTHWEST CORNER OF SHERBURN COUNTY, AT APPROXIMATE CENTER OF
AC4874'SECTION 1, 34 FEET NORTH OF COUNTY ROAD 37, 39 FEET WEST OF FIELD
AC4874'ENTRANCE, 162.2 FEET NORTHWEST OF POWER POLE, 158.1 FEET NORTHEAST OF
AC4874'POWER POLE, 1.0 FEET SOUTH OF WITNESS POST.
AC4874
AC4874                          STATION RECOVERY (2008)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (MPP)
AC4874'3.5 MILES EAST AND 0.5 MILES SOUTH OF PRINCETON, 0.3 MILES EAST ALONG
AC4874'TRUNK HIGHWAY 95 FROM JUNCTION OF TRUNK HIGHWAY 95 AND COUNTY ROAD 29
AC4874'(RUM RIVER DRIVE) IN PRINCETON TO TRUNK HIGHWAY 95 MILEPOINT 24.25
AC4874'THEN 1.9 MILES SOUTH AND EAST ON MILLE LACS COUNTY ROAD 1 THEN 1.8
AC4874'MILES SOUTH AND EAST ON COUNTY ROAD 37, 0.5 MILES SOUTH AND 0.5 MILES
AC4874'WEST OF NORTHWEST CORNER OF SHERBURNE COUNTY, AT APPROXIMATE CENTER OF
AC4874'SECTION 1, 34 FEET NORTH OF COUNTY ROAD 37, 39 FEET WEST OF FIELD
AC4874'ENTRANCE, 162.2 FEET NORTHWEST OF POWER POLE, 158.1 FEET NORTHEAST OF
AC4874'POWER POLE, 1.0 FEET SOUTH OF WITNESS POST.
AC4874
AC4874                          STATION RECOVERY (2015)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
AC4874'3.5 MILES EAST AND 0.5 MILE SOUTH OF PRINCETON, 0.3 MILE EAST ALONG
AC4874'TRUNK HIGHWAY 95 FROM JUNCTION OF TRUNK HIGHWAY 95 AND COUNTY ROAD 29
AC4874'(RUM RIVER DRIVE) IN PRINCETON TO TRUNK HIGHWAY 95 MILEPOINT 24.25,
AC4874'THEN 1.9 MILES SOUTH AND EAST ON MILLE LACS COUNTY ROAD 1, THEN 1.8
AC4874'MILES SOUTH AND EAST ON COUNTY ROAD 37, 0.5 MILE SOUTH AND 0.5 MILE
AC4874'WEST OF NORTHWEST CORNER OF SHERBURNE COUNTY, AT APPROXIMATE CENTER OF
AC4874'SECTION 1, 34 FEET NORTH OF COUNTY ROAD 37, 39 FEET WEST OF FIELD
AC4874'ENTRANCE, 162.2 FEET NORTHWEST OF POWER POLE, 158.1 FEET NORTHEAST OF
AC4874'POWER POLE, 1.0 FOOT SOUTH OF WITNESS POST.
AC4874
AC4874                          STATION RECOVERY (2017)
AC4874
AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (BXG)
AC4874'3.5 MILES EAST AND 0.5 MILE SOUTH OF PRINCETON, 0.3 MILE EAST ALONG
AC4874'TRUNK HIGHWAY 95 FROM THE JUNCTION OF TRUNK HIGHWAY 95 AND COUNTY ROAD
AC4874'29 (RUM RIVER DRIVE) IN PRINCETON TO TRUNK HIGHWAY 95 MILEPOINT 24.25,
AC4874'THEN 1.9 MILES SOUTH AND EAST ON MILLE LACS COUNTY ROAD 1, THEN 1.8
AC4874'MILES SOUTH AND EAST ON COUNTY ROAD 37, 0.5 MILE SOUTH AND 0.5 MILE
AC4874'WEST OF THE NORTHWEST CORNER OF SHERBURNE COUNTY, AT APPROXIMATE THE
AC4874'CENTER OF SECTION 1, 34 FEET NORTH OF COUNTY ROAD 37, 162.2 FEET
AC4874'NORTHWEST OF A POWER POLE, 158.1 FEET NORTHEAST OF A POWER POLE, 39
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 AC4874'FEET WEST OF A FIELD ENTRANCE, 1.0 FOOT SOUTH OF A WITNESS POST.
 AC4874
 AC4874                          STATION RECOVERY (2018)
 AC4874
 AC4874'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (MAS)
 AC4874'3.5 MI (5.6 KM) EAST-SOUTHEAST OF PRINCETON, 0.3 MI (0.5 KM) EAST
 AC4874'ALONG TRUNK HIGHWAY 95 FROM THE JUNCTION OF TRUNK HIGHWAY 95 AND
 AC4874'COUNTY ROAD 29 (RUM RIVER DRIVE) IN PRINCETON TO TRUNK HIGHWAY 95 MILE
 AC4874'POINT 24.25, THEN 1.9 MI (3.1 KM) SOUTH AND EAST ON MILLE LACS COUNTY
 AC4874'ROAD 1, THEN 1.8 MI (2.9 KM) SOUTH AND EAST ON COUNTY ROAD 37, 34.0 FT
 AC4874'(10.4 M) NORTH OF COUNTY ROAD 37, 162.2 FT (49.4 M) WEST-NORTHWEST OF
 AC4874'A POWER POLE, 158.1 FT (48.2 M) EAST-NORTHEAST OF A POWER POLE, 39 FT
 AC4874'(11.9 M) WEST OF A FIELD ENTRANCE, 1.0 FT (0.3 M) SOUTH OF A WITNESS
 AC4874'POST.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 DF8688 ***********************************************************************
 DF8688  DESIGNATION -  BERGMAN
 DF8688  PID         -  DF8688
 DF8688  STATE/COUNTY-  MN/KANABEC
 DF8688  COUNTRY     -  US
 DF8688  USGS QUAD   -  WARMAN (2019)
 DF8688
 DF8688                        *CURRENT SURVEY CONTROL
 DF8688  ______________________________________________________________________
 DF8688* NAD 83(2011) POSITION- 46 06 56.26508(N) 093 17 03.74425(W)   ADJUSTED
 DF8688* NAD 83(2011) ELLIP HT-   351.160 (meters)        (06/27/12)   ADJUSTED
 DF8688* NAD 83(2011) EPOCH   -  2010.00
 DF8688* NAVD 88 ORTHO HEIGHT -   378.733 (meters)     1242.56  (feet) ADJUSTED
 DF8688  ______________________________________________________________________
 DF8688  GEOID HEIGHT    -        -27.570 (meters)                     GEOID18
 DF8688  NAD 83(2011) X  -   -253,762.840 (meters)                     COMP
 DF8688  NAD 83(2011) Y  - -4,422,034.005 (meters)                     COMP
 DF8688  NAD 83(2011) Z  -  4,574,419.375 (meters)                     COMP
 DF8688  LAPLACE CORR    -         -2.42  (seconds)                    DEFLEC18
 DF8688  DYNAMIC HEIGHT  -        378.738 (meters)     1242.58  (feet) COMP
 DF8688  MODELED GRAVITY -    980,617.9   (mgal)                       NAVD 88
 DF8688
 DF8688  VERT ORDER      -  SECOND    CLASS I
 DF8688
 DF8688  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 DF8688  Standards:
 DF8688         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 DF8688            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 DF8688  ------------------------------------------------------------------
 DF8688  NETWORK    0.29   0.39          0.13   0.10   0.20      0.05550972
 DF8688  ------------------------------------------------------------------
 DF8688  Click here for local accuracies and other accuracy information.
 DF8688
 DF8688
 DF8688.The horizontal coordinates were established by GPS observations
 DF8688.and adjusted by the National Geodetic Survey in June 2012.
 DF8688
 DF8688.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 DF8688.been affixed to the stable North American tectonic plate. See
 DF8688.NA2011 for more information.
 DF8688
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DF8688.The horizontal coordinates are valid at the epoch date displayed above
DF8688.which is a decimal equivalence of Year/Month/Day.
DF8688
DF8688.The orthometric height was determined by differential leveling and
DF8688.adjusted by the NATIONAL GEODETIC SURVEY
DF8688.in November 2013.
DF8688
DF8688.Significant digits in the geoid height do not necessarily reflect accuracy.
DF8688.GEOID18 height accuracy estimate available here.
DF8688
DF8688.Click photographs - Photos may exist for this station.
DF8688
DF8688.The X, Y, and Z were computed from the position and the ellipsoidal ht.
DF8688
DF8688.The Laplace correction was computed from DEFLEC18 derived deflections.
DF8688
DF8688.The ellipsoidal height was determined by GPS observations
DF8688.and is referenced to NAD 83.
DF8688
DF8688.The dynamic height is computed by dividing the NAVD 88
DF8688.geopotential number by the normal gravity value computed on the
DF8688.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DF8688.degrees latitude (g = 980.6199 gals.).
DF8688
DF8688.The modeled gravity was interpolated from observed gravity values.
DF8688
DF8688. The following values were computed from the NAD 83(2011) position.
DF8688
DF8688;                    North         East     Units Scale Factor Converg.
DF8688;SPC MN C     -   224,452.565   874,637.531   MT  0.99992931   +0 41 54.7
DF8688;SPC MN C     -   736,391.46  2,869,539.97   sFT  0.99992931   +0 41 54.7
DF8688;UTM  15      - 5,106,934.121   478,026.226   MT  0.99960594   -0 12 17.9
DF8688
DF8688!             -  Elev Factor  x  Scale Factor =   Combined Factor
DF8688!SPC MN C     -   0.99994495  x   0.99992931  =   0.99987427
DF8688!UTM  15      -   0.99994495  x   0.99960594  =   0.99955091
DF8688
DF8688_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVM7802606934(NAD 83)
DF8688
DF8688|----------------------------------------------------------------------|
DF8688| PID    Reference Object                      Distance      Geod. Az  |
DF8688|                                                            dddmmss.s |
DF8688| DM5733 FORD                                172.344 METERS 16308     |
DF8688|----------------------------------------------------------------------|
DF8688
DF8688                          SUPERSEDED SURVEY CONTROL
DF8688
DF8688  NAD 83(2007)-  46 06 56.26533(N)    093 17 03.74499(W) AD(2002.00) 0
DF8688  ELLIP H (02/10/07)  351.187  (m)                       GP(2002.00)
DF8688  NAD 83(1996)-  46 06 56.26514(N)    093 17 03.74468(W) AD(       ) 1
DF8688  ELLIP H (10/22/03)  351.220  (m)                       GP(       ) 3 2
DF8688  NAVD 88             378.73   (m)         1242.6    (f) LEVELING    3
DF8688  NAVD 88 (10/22/03)  378.7    (m)  GEOID99 model used   GPS OBS
DF8688
DF8688.Superseded values are not recommended for survey control.
DF8688
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DF8688.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DF8688.See file dsdata.pdf to determine how the superseded data were derived.
DF8688
DF8688_MARKER: DD = SURVEY DISK
DF8688_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
DF8688_STAMPING: BERGMAN 2002
DF8688_MARK LOGO: MNDT
DF8688_PROJECTION: RECESSED 8 CENTIMETERS
DF8688_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DF8688_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DF8688_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DF8688+SATELLITE: SATELLITE OBSERVATIONS - May 12, 2020
DF8688_ROD/PIPE-DEPTH:  4.6 meters
DF8688
DF8688  HISTORY     - Date     Condition        Report By
DF8688  HISTORY     - 20021010 MONUMENTED       MNDT
DF8688  HISTORY     - 20061129 GOOD             MNDT
DF8688  HISTORY     - 20100331 GOOD             MNDT
DF8688  HISTORY     - 20170615 GOOD             MNDT
DF8688  HISTORY     - 20200512 GOOD             MNDT
DF8688
DF8688                          STATION DESCRIPTION
DF8688
DF8688'DESCRIBED BY MN DEPT OF TRANSP 2002 (MPP)
DF8688'IN WOODLAND, AT TH 27 MP 197.8, 203 FT (61.9 M) WEST OF TH 65, 75 FT
DF8688'(22.9 M) SOUTH OF TH 27, 58.6 FT (17.9 M) NW OF P-POLE, 23 FT (7.0 M)
DF8688'WEST OF ENTRANCE, 2.9 FT (0.9 M) WEST OF WIT POST.
DF8688
DF8688                          STATION RECOVERY (2006)
DF8688
DF8688'RECOVERY NOTE BY MN DEPT OF TRANSP 2006 (DAS)
DF8688'THE STATION IS LOCATED ABOUT 9.1 MI (14.6 KM) EAST OF ISLE, 8.6 MI
DF8688'(13.8 KM) SOUTH OF MCGRATH AND 4.0 MI (6.4 KM) NORTH OF WARMAN.
DF8688'
DF8688'THE MARK IS IN WOODLAND, AT TRUNK HIGHWAY 27 MILE POINT 197.8.
DF8688'
DF8688'IT IS 203.0 FT (61.9 M) WEST OF TRUNK HIGHWAY 65, 75.0 FT (22.9 M)
DF8688'SOUTH OF TRUNK HIGHWAY 27, 58.6 FT (17.9 M) NORTHWEST OF POWER POLE,
DF8688'23.0 FT (7.0 M) WEST OF A FIELD ENTRANCE, 2.9 FT (0.9 M) WEST OF A
DF8688'WITNESS POST.
DF8688
DF8688                          STATION RECOVERY (2010)
DF8688
DF8688'RECOVERY NOTE BY MN DEPT OF TRANSP 2010 (MAS)
DF8688'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
DF8688'THE MARK IN WOODLAND, AT THE JUNCTION OF TRUNK HIGHWAY 65 AND TRUNK
DF8688'HIGHWAY 27, AT TRUNK HIGHWAY 27 MILEPOINT 197.8, 203.0 FEET WEST OF
DF8688'TRUNK HIGHWAY 65, 75.0 FEET SOUTH OF TRUNK HIGHWAY 27, 58.6 FEET
DF8688'NORTHWEST OF POWER POLE, 23.0 FEET WEST OF FIELD ENTRANCE, 2.9 FEET
DF8688'WEST OF WITNESS POST.
DF8688
DF8688                          STATION RECOVERY (2017)
DF8688
DF8688'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (MAS)
DF8688'IN WOODLAND, AT THE JUNCTION OF TRUNK HIGHWAY 65 AND TRUNK HIGHWAY 27,
DF8688'AT TRUNK HIGHWAY 27 MILE POINT 197.8, 203.0 FT (61.9 M) WEST OF TRUNK
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 DF8688'HIGHWAY 65, 75.0 FT (22.9 M) SOUTH OF TRUNK HIGHWAY 27, 58.6 FT (17.9
 DF8688'M) NORTHWEST OF A POWER POLE, 23.0 FT (7.0 M) WEST OF A DRIVEWAY, 2.9
 DF8688'FT (0.9 M) WEST OF A WITNESS POST.
 DF8688
 DF8688                          STATION RECOVERY (2020)
 DF8688
 DF8688'RECOVERY NOTE BY MN DEPT OF TRANSP 2020 (TJD)
 DF8688'RECOVERED IN GOOD CONDITION.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4875 ***********************************************************************
 AC4875  CBN         -  This is a Cooperative Base Network Control Station.
 AC4875  DESIGNATION -  BREN
 AC4875  PID         -  AC4875
 AC4875  STATE/COUNTY-  MN/BENTON
 AC4875  COUNTRY     -  US
 AC4875  USGS QUAD   -  RAMEY (2019)
 AC4875
 AC4875                         *CURRENT SURVEY CONTROL
 AC4875  ______________________________________________________________________
 AC4875* NAD 83(2011) POSITION- 45 46 46.14035(N) 093 55 19.08895(W)   ADJUSTED
 AC4875* NAD 83(2011) ELLIP HT-   348.938 (meters)        (06/27/12)   ADJUSTED
 AC4875* NAD 83(2011) EPOCH   -  2010.00
 AC4875* NAVD 88 ORTHO HEIGHT -   376.109 (meters)     1233.95  (feet) ADJUSTED
 AC4875  ______________________________________________________________________
 AC4875  GEOID HEIGHT    -        -27.166 (meters)                     GEOID18
 AC4875  NAD 83(2011) X  -   -304,791.808 (meters)                     COMP
 AC4875  NAD 83(2011) Y  - -4,445,726.071 (meters)                     COMP
 AC4875  NAD 83(2011) Z  -  4,548,437.486 (meters)                     COMP
 AC4875  LAPLACE CORR    -         -3.25  (seconds)                    DEFLEC18
 AC4875  DYNAMIC HEIGHT  -        376.102 (meters)     1233.93  (feet) COMP
 AC4875  MODELED GRAVITY -    980,586.4   (mgal)                       NAVD 88
 AC4875
 AC4875  VERT ORDER      -  SECOND    CLASS I
 AC4875
 AC4875  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AC4875  Standards:
 AC4875         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AC4875            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 AC4875  ------------------------------------------------------------------
 AC4875  NETWORK    0.25   0.41           0.12   0.08   0.21     -0.00415340
 AC4875  ------------------------------------------------------------------
 AC4875  Click here for local accuracies and other accuracy information.
 AC4875
 AC4875
 AC4875.The horizontal coordinates were established by GPS observations
 AC4875.and adjusted by the National Geodetic Survey in June 2012.
 AC4875
 AC4875.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 AC4875.been affixed to the stable North American tectonic plate. See
 AC4875.NA2011 for more information.
 AC4875
 AC4875.The horizontal coordinates are valid at the epoch date displayed above
 AC4875.which is a decimal equivalence of Year/Month/Day.
 AC4875
 AC4875.The orthometric height was determined by differential leveling and
 AC4875.adjusted by the NATIONAL GEODETIC SURVEY
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AC4875.in February 2013.
AC4875
AC4875.No vertical observational check was made to the station.
AC4875
AC4875.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4875.GEOID18 height accuracy estimate available here.
AC4875
AC4875.Click photographs - Photos may exist for this station.
AC4875
AC4875.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4875
AC4875.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4875
AC4875.The ellipsoidal height was determined by GPS observations
AC4875.and is referenced to NAD 83.
AC4875
AC4875.The dynamic height is computed by dividing the NAVD 88
AC4875.geopotential number by the normal gravity value computed on the
AC4875.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4875.degrees latitude (g = 980.6199 gals.).
AC4875
AC4875.The modeled gravity was interpolated from observed gravity values.
AC4875
AC4875. The following values were computed from the NAD 83(2011) position.
AC4875
AC4875;                     North         East     Units Scale Factor Converg.
AC4875;SPC MN C     -   186,689.724   825,510.235   MT  0.99996870   +0 14 14.3
AC4875;SPC MN C     -   612,497.87  2,708,361.50   sFT  0.99996870   +0 14 14.3
AC4875;UTM  15      - 5,069,960.352   428,326.805   MT  0.99966315   -0 39 38.8
AC4875
AC4875!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4875!SPC MN C     -   0.99994530  x   0.99996870  =   0.99991400
AC4875!UTM  15      -   0.99994530  x   0.99966315  =   0.99960847
AC4875
AC4875_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL2832669960(NAD 83)
AC4875
AC4875                           SUPERSEDED SURVEY CONTROL
AC4875
AC4875  NAD 83(2007)-  45 46 46.14058(N)    093 55 19.08985(W) AD(2002.00) 0
AC4875  ELLIP H (02/10/07)  348.971  (m)                       GP(2002.00)
AC4875  NAD 83(1996)-  45 46 46.14080(N)    093 55 19.08936(W) AD(       ) B
AC4875  ELLIP H (01/15/97)  349.012  (m)                       GP(       ) 4 1
AC4875  NAVD 88             376.11   (m)         1234.0    (f) LEVELING    3
AC4875  NAVD 88 (08/23/10)  376.1    (m)  GEOID09 model used   GPS OBS
AC4875  NAVD 88             376.11   (m)         1234.0    (f) LEVELING    3
AC4875  NAVD 88 (06/26/09)  376.1    (m)  UNKNOWN model used   GPS OBS
AC4875  NAVD 88 (12/20/05)  376.1    (m)  UNKNOWN model used   GPS OBS
AC4875  NAVD 88 (08/23/05)  376.12   (m)  UNKNOWN model used   GPS OBS
AC4875  NAVD 88 (07/06/04)  376.1    (m)  GEOID03 model used   GPS OBS
AC4875  NAVD 88 (01/15/97)  376.1    (m)  GEOID96 model used   GPS OBS
AC4875
AC4875.Superseded values are not recommended for survey control.
AC4875
AC4875.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4875.See file dsdata.pdf to determine how the superseded data were derived.
AC4875
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AC4875_MARKER: F = FLANGE-ENCASED ROD
AC4875_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4875_STAMPING: BREN 1994
AC4875_MARK LOGO: MNDT
AC4875_PROJECTION: RECESSED 18 CENTIMETERS
AC4875_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
AC4875_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4875_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4875+SATELLITE: SATELLITE OBSERVATIONS - August 08, 2018
AC4875_ROD/PIPE-DEPTH:  3.7 meters
AC4875
AC4875  HISTORY     - Date     Condition        Report By
AC4875  HISTORY     - 19940401 MONUMENTED       MNDT
AC4875  HISTORY     - 19970407 GOOD             MNDT
AC4875  HISTORY     - 20031001 GOOD             MNDT
AC4875  HISTORY     - 20050419 GOOD             MNDT
AC4875  HISTORY     - 20050517 GOOD             MNDT
AC4875  HISTORY     - 20070417 GOOD             MNDT
AC4875  HISTORY     - 20070813 GOOD             MNDT
AC4875  HISTORY     - 20081217 GOOD             MNDT
AC4875  HISTORY     - 20100429 GOOD             MNDT
AC4875  HISTORY     - 20151001 GOOD             MNDT
AC4875  HISTORY     - 20171122 GOOD             MNDT
AC4875  HISTORY     - 20180808 GOOD             MNDT
AC4875  HISTORY     - 20180808 GOOD             MNDT
AC4875
AC4875                          STATION DESCRIPTION
AC4875
AC4875'DESCRIBED BY MN DEPT OF TRANSP 1994
AC4875'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
AC4875'LOCATED ABOUT 3-1/2 MI NORTH OF THE TOWN OF FOLEY IN THE NW 1/4 OF
AC4875'SECTION 23, T38N, R29W.  TO REACH THE MARK FROM THE JCT OF TH 25 AND
AC4875'TH 23 IN FOLEY, GO NORTH ON TH 25 FOR 3.5 MI (5.6 KM) TO TH 25 MP
AC4875'103.9, THEN GO NORTH FOR 2.55 MI (4.10 KM) ON CO RD 14, THEN GO NORTH
AC4875'FOR 2.0 MI (3.2 KM) ON CO RD 65, THEN GO EAST ON CO RD 12 FOR 0.2 MI
AC4875'(0.3 KM) TO THE MARK ON THE RIGHT.  THE MARK IS 43 FT (13.1 M) SOUTH
AC4875'OF CO RD 12, 22 FT (6.7 M) EAST OF A FIELD ENT, 175.5 FT (53.5 M) WEST
AC4875'OF A P-POLE, 118.9 FT (36.2 M) EAST OF A P-POLE, 14 FT (4.3 M) SE OF
AC4875'THE EAST END OF A 15 INCH METAL CULVERT, AND 3.5 FT (1.1 M) SOUTH OF A
AC4875'WIT POST.  THE MARK IS A PUNCH MARK ON THE TOP OF A DRIVEN 1/2 INCH
AC4875'DIAMETER BY 12 FT (3.7 M) LONG STAINLESS STEEL ROD WITH A 3 FT (0.9 M)
AC4875'PLASTIC STABILIZER SLEEVE.  ACCESS TO THE DATUM POINT IS THROUGH A 5
AC4875'INCH LOGO CAP THAT IS FLUSH WITH THE GROUND, STAMPED---BREN 1994---,
AC4875'SET ON TOP OF A 5 INCH DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE
AC4875'FILLED WITH SILICA SAND AND SET IN CONCRETE.  A METAL SPIKE WAS PLACED
AC4875'IN THE SILICA SAND MAKING THE MARK MAGNETIC. DESCRIBED BY DAVID K.
AC4875'HERDER, TYPED BY J.E.M.
AC4875
AC4875                          STATION RECOVERY (1997)
AC4875
AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 1997 (WAS)
AC4875'THE MARK WAS RECOVERED AS DESCRIBED.
AC4875
AC4875                          STATION RECOVERY (2003)
AC4875
AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (MPP)
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AC4875'8 MILES NORTH OF FOLEY, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 25 FROM
AC4875'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK
AC4875'HIGHWAY 25 MILEPOINT 103.9 THEN 2.55 MILES NORTH ON COUNTY ROAD 14
AC4875'THEN 2.0 MILES NORTH ON COUNTY ROAD 65 THEN 0.2 MILES EAST ON COUNTY
AC4875'ROAD 12, 43.0 FEET SOUTH OF COUNTY ROAD 12, 22 FEET EAST OF FIELD
AC4875'ENTRANCE, 175.5 FEET WEST OF POWER POLE, 118.9 FEET EAST OF POWER
AC4875'POLE, 14 FEET SOUTHEAST OF EAST END OF 15 INCH METAL CULVERT, 3.5 FEET
AC4875'SOUTH OF WITNESS POST
AC4875
AC4875                          STATION RECOVERY (2005)
AC4875
AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (DNR)
AC4875'8 MILES NORTH OF FOLEY, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 25 FROM
AC4875'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK
AC4875'HIGHWAY 25 MILEPOINT 103.9, THEN 2.55 MILES NORTH ON COUNTY ROAD 14,
AC4875'THEN 2.0 MILES NORTH ON COUNTY ROAD 65, THEN 0.2 MILES EAST ON COUNTY
AC4875'ROAD 12, 43.0 FEET SOUTH OF COUNTY ROAD 12, 22 FEET EAST OF FIELD
AC4875'ENTRANCE, 175.5 FEET WEST OF POWER POLE, 118.9 FEET EAST OF POWER
AC4875'POLE, 14 FEET SOUTHEAST OF EAST END OF 15 INCH METAL CULVERT, 3.5 FEET
AC4875'SOUTH OF WITNESS POST
AC4875
AC4875                          STATION RECOVERY (2005)
AC4875
AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (KNB)
AC4875'RECOVERED AS DESCRIBED.
AC4875
AC4875                          STATION RECOVERY (2007)
AC4875
AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (KMS)
AC4875'THE MARK IS 8.0 MI (12.9 KM) NORTH OF FOLEY.
AC4875'
AC4875'3.5 MI NORTH ALONG TRUNK HIGHWAY 25 FROM THE JUNCTION OF TRUNK HIGHWAY
AC4875'23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK HIGHWAY 25 MILE POINT 103.9,
AC4875'THENCE 2.55 MI (4.1 KM) NORTH ON COUNTY ROAD 14, THENCE 2.0 MI (3.2
AC4875'KM) NORTH ON COUNTY ROAD 65, THENCE 0.2 MI (0.3 KM) EAST ON COUNTY
AC4875'ROAD 12.
AC4875'
AC4875'IT IS 43.0 FT (13.1 M) SOUTH OF COUNTY ROAD 12, 22 FT (6.7 M) EAST OF
AC4875'A FIELD ENTRANCE, 175.5 FT (53.5 M) WEST OF POWER POLE, 118.9 FT (36.2
AC4875'M) EAST OF POWER POLE, 14 FT (4.3 M) SOUTHEAST OF EAST END OF 15 INCH
AC4875'(38 CM) METAL CULVERT, 3.5 FT (1.1 M) SOUTH OF A WITNESS POST.
AC4875
AC4875                          STATION RECOVERY (2007)
AC4875
AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (WAS)
AC4875'8 MILES NORTH OF FOLEY, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 25 FROM
AC4875'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK
AC4875'HIGHWAY 25 MILEPOINT 103.9, THEN 2.55 MILES NORTH ON COUNTY ROAD 14,
AC4875'THEN 2.0 MILES NORTH ON COUNTY ROAD 65, THEN 0.2 MILES EAST ON COUNTY
AC4875'ROAD 12, 43.0 FEET SOUTH OF COUNTY ROAD 12, 22 FEET EAST OF FIELD
AC4875'ENTRANCE, 175.5 FEET WEST OF POWER POLE, 118.9 FEET EAST OF POWER
AC4875'POLE, 14 FEET SOUTHEAST OF EAST END OF 15 INCH METAL CULVERT, 3.5 FEET
AC4875'SOUTH OF WITNESS POST.
AC4875
AC4875                          STATION RECOVERY (2008)
AC4875
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 AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (DJS)
 AC4875'8.0 MILES NORTH OF FOLEY, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 25 FROM
 AC4875'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK
 AC4875'HIGHWAY 25 MILEPOINT 103.9, THEN 2.55 MILES NORTH ON COUNTY ROAD 14,
 AC4875'THEN 2.0 MILES NORTH ON COUNTY ROAD 65, THEN 0.2 MILE EAST ON COUNTY
 AC4875'ROAD 12, 43.0 FEET SOUTH OF COUNTY ROAD 12, 22 FEET EAST OF FIELD
 AC4875'ENTRANCE, 175.5 FEET WEST OF POWER POLE, 118.9 FEET EAST OF POWER
 AC4875'POLE, 14 FEET SOUTHEAST OF EAST END OF 15 INCH METAL CULVERT, 3.5 FEET
 AC4875'SOUTH OF WITNESS POST.
 AC4875
 AC4875                          STATION RECOVERY (2010)
 AC4875
 AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2010 (DKH)
 AC4875'8.0 MILES NORTH OF FOLEY, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 25 FROM
 AC4875'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK
 AC4875'HIGHWAY 25 MILEPOINT 103.9, THEN 2.55 MILES NORTH ON COUNTY ROAD 14,
 AC4875'THEN 2.0 MILES NORTH ON COUNTY ROAD 65, THEN 0.2 MILE EAST ON COUNTY
 AC4875'ROAD 12, 43.0 FEET SOUTH OF COUNTY ROAD 12, 22 FEET EAST OF FIELD
 AC4875'ENTRANCE, 175.5 FEET WEST OF POWER POLE, 118.9 FEET EAST OF POWER
 AC4875'POLE, 14 FEET SOUTHEAST OF EAST END OF 15 INCH METAL CULVERT, 3.5 FEET
 AC4875'SOUTH OF WITNESS POST.
 AC4875
 AC4875                          STATION RECOVERY (2015)
 AC4875
 AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4875'8.0 MILES NORTH OF FOLEY, 3.5 MILES NORTH ALONG TRUNK HIGHWAY 25 FROM
 AC4875'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25 IN FOLEY TO TRUNK
 AC4875'HIGHWAY 25 MILEPOINT 103.9, THEN 2.55 MILES NORTH ON COUNTY ROAD 14,
 AC4875'THEN 2.0 MILES NORTH ON COUNTY ROAD 65, THEN 0.2 MILE EAST ON COUNTY
 AC4875'ROAD 12, 43.0 FEET SOUTH OF COUNTY ROAD 12, 22 FEET EAST OF FIELD
 AC4875'ENTRANCE, 175.5 FEET WEST OF POWER POLE, 118.9 FEET EAST OF POWER
 AC4875'POLE, 14 FEET SOUTHEAST OF EAST END OF 15 INCH METAL CULVERT, 3.5 FEET
 AC4875'SOUTH OF WITNESS POST.
 AC4875
 AC4875                          STATION RECOVERY (2017)
 AC4875
 AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (KXJ)
 AC4875'RECOVERED IN GOOD CONDITION.
 AC4875
 AC4875                          STATION RECOVERY (2018)
 AC4875
 AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (KMS)
 AC4875'RECOVERED AS DESCRIBED.
 AC4875
 AC4875                          STATION RECOVERY (2018)
 AC4875
 AC4875'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (KMS)
 AC4875'8.0 MI (12.9 KM) NORTH OF FOLEY, 3.5 MI (5.6 KM) NORTH ALONG TRUNK
 AC4875'HIGHWAY 25 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 25
 AC4875'IN FOLEY TO TRUNK HIGHWAY 25 MILE POINT 103.9, THEN 2.55 MI (4.10 KM)
 AC4875'NORTH ON COUNTY ROAD 14, THEN 2.0 MI (3.2 KM) NORTH ON COUNTY ROAD 65,
 AC4875'THEN 0.2 MI (0.3 KM) EAST ON COUNTY ROAD 12, 43.0 FT (13.1 M) SOUTH OF
 AC4875'COUNTY ROAD 12, 175.5 FT (53.5 M) WEST OF A POWER POLE, 118.9 FT (36.2
 AC4875'M) EAST OF A POWER POLE, 22.0 FT (6.7 M) EAST OF A FIELD ENTRANCE, 1.3
 AC4875'FT (0.4 M) NORTH OF A WITNESS POST.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
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AC4859 ******************************************************************
AC4859  CBN         -  This is a Cooperative Base Network Control Station.
AC4859  DESIGNATION -  CULDRUM
AC4859  PID         -  AC4859
AC4859  STATE/COUNTY-  MN/MORRISON
AC4859  COUNTRY     -  US
AC4859  USGS QUAD   -  FLENSBURG (2019)
AC4859
AC4859                        *CURRENT SURVEY CONTROL
AC4859  ______________________________________________________________________
AC4859* NAD 83(2011) POSITION- 45 58 35.69496(N) 094 34 42.00725(W)   ADJUSTED
AC4859* NAD 83(2011) ELLIP HT-   348.691 (meters)        (06/27/12)   ADJUSTED
AC4859* NAD 83(2011) EPOCH   -  2010.00
AC4859* NAVD 88 ORTHO HEIGHT -   375.332 (meters)     1231.40  (feet) ADJUSTED
AC4859  ______________________________________________________________________
AC4859  GEOID HEIGHT    -        -26.647 (meters)                     GEOID18
AC4859  NAD 83(2011) X  -   -354,444.435 (meters)                     COMP
AC4859  NAD 83(2011) Y  - -4,426,265.620 (meters)                     COMP
AC4859  NAD 83(2011) Z  -  4,563,689.730 (meters)                     COMP
AC4859  LAPLACE CORR    -          1.37  (seconds)                    DEFLEC18
AC4859  DYNAMIC HEIGHT  -        375.336 (meters)     1231.41  (feet) COMP
AC4859  MODELED GRAVITY -    980,614.9   (mgal)                       NAVD 88
AC4859
AC4859  VERT ORDER      -  SECOND    CLASS I
AC4859
AC4859  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC4859  Standards:
AC4859         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AC4859            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
AC4859  ----------------------------------------------------------------------
AC4859  NETWORK    0.21   0.37           0.10   0.07   0.19      0.00172187
AC4859  ----------------------------------------------------------------------
AC4859  Click here for local accuracies and other accuracy information.
AC4859
AC4859
AC4859.The horizontal coordinates were established by GPS observations
AC4859.and adjusted by the National Geodetic Survey in June 2012.
AC4859
AC4859.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4859.been affixed to the stable North American tectonic plate. See
AC4859.NA2011 for more information.
AC4859
AC4859.The horizontal coordinates are valid at the epoch date displayed above
AC4859.which is a decimal equivalence of Year/Month/Day.
AC4859
AC4859.The orthometric height was determined by differential leveling and
AC4859.adjusted by the NATIONAL GEODETIC SURVEY
AC4859.in May 2009.
AC4859
AC4859.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4859.GEOID18 height accuracy estimate available here.
AC4859
AC4859.Click photographs - Photos may exist for this station.
AC4859
AC4859.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4859
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AC4859.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4859
AC4859.The ellipsoidal height was determined by GPS observations
AC4859.and is referenced to NAD 83.
AC4859
AC4859.The dynamic height is computed by dividing the NAVD 88
AC4859.geopotential number by the normal gravity value computed on the
AC4859.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4859.degrees latitude (g = 980.6199 gals.).
AC4859
AC4859.The modeled gravity was interpolated from observed gravity values.
AC4859
AC4859. The following values were computed from the NAD 83(2011) position.
AC4859
AC4859;                    North         East     Units Scale Factor Converg.
AC4859;SPC MN C     -   208,595.918   774,556.895   MT  0.99994147   -0 14 15.0
AC4859;SPC MN C     -   684,368.44  2,541,192.08   sFT  0.99994147   -0 14 15.0
AC4859;UTM  15      - 5,092,656.652   377,734.798   MT  0.99978377   -1 08 06.2
AC4859
AC4859!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4859!SPC MN C     -   0.99994534  x   0.99994147  =   0.99988681
AC4859!UTM  15      -   0.99994534  x   0.99978377  =   0.99972912
AC4859
AC4859_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TUL7773492656(NAD 83)
AC4859
AC4859                           SUPERSEDED SURVEY CONTROL
AC4859
AC4859  NAD 83(2007)-  45 58 35.69502(N)    094 34 42.00816(W) AD(2002.00) 0
AC4859  ELLIP H (02/10/07)  348.721  (m)                       GP(2002.00)
AC4859  NAD 83(1996)-  45 58 35.69487(N)    094 34 42.00789(W) AD(       ) B
AC4859  ELLIP H (01/15/97)  348.763  (m)                       GP(       ) 4 1
AC4859  NAVD 88             375.33   (m)         1231.4    (f) LEVELING    3
AC4859  NAVD 88 (07/29/03)  375.3    (m)  GEOID99 model used   GPS OBS
AC4859  NAVD 88 (01/15/97)  375.4    (m)  GEOID96 model used   GPS OBS
AC4859
AC4859.Superseded values are not recommended for survey control.
AC4859
AC4859.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4859.See file dsdata.pdf to determine how the superseded data were derived.
AC4859
AC4859_MARKER: F = FLANGE-ENCASED ROD
AC4859_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4859_STAMPING: CULDRUM 1994
AC4859_MARK LOGO: MNDT
AC4859_PROJECTION: RECESSED 18 CENTIMETERS
AC4859_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
AC4859_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4859_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4859+SATELLITE: SATELLITE OBSERVATIONS - March 03, 2022
AC4859_ROD/PIPE-DEPTH: 4.9  meters
AC4859
AC4859  HISTORY     - Date     Condition        Report By
AC4859  HISTORY     - 19940401 MONUMENTED       MNDT
AC4859  HISTORY     - 20010123 GOOD             MNDT
AC4859  HISTORY     - 20020422 GOOD             MNDT
AC4859  HISTORY     - 20020424 GOOD             MNDT
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AC4859  HISTORY     - 20020424 GOOD            MNDT
AC4859  HISTORY     - 20020828 GOOD            MNDT
AC4859  HISTORY     - 2003     GOOD            MNDT
AC4859  HISTORY     - 2003     GOOD            MNDT
AC4859  HISTORY     - 20031105 GOOD            DUCKS
AC4859  HISTORY     - 20040901 GOOD            MNDT
AC4859  HISTORY     - 20050516 GOOD            MNDT
AC4859  HISTORY     - 20151001 GOOD            MNDT
AC4859  HISTORY     - 20210914 GOOD            MNDT
AC4859  HISTORY     - 20220303 GOOD            MNDT
AC4859
AC4859                          STATION DESCRIPTION
AC4859
AC4859'DESCRIBED BY MN DEPT OF TRANSP 1994
AC4859'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
AC4859'LOCATED ABOUT 10 MI (16.1 KM) WEST OF THE TOWN OF LITTLE FALLS IN THE
AC4859'NE 1/4 OF SECTION 21, T129N, R31W.  TO REACH THE MARK FROM THE JCT OF
AC4859'TH 27 AND TH 238 AT THE WEST EDGE OF LITTLE FALLS, GO WEST ON TH 27
AC4859'FOR 8.1 MI (13.0 KM) TO TH 27 MP 125.2 AND THE MARK ON THE LEFT.  THE
AC4859'MARK IS 76.0 FT (23.2 M) SOUTH OF TH 27, 299.5 FT (91.3 M) WEST OF A
AC4859'GRAVEL RD, 273.0 FT (83.2 M) WEST OF A CABLE BOX, 3.3 FT (1.0 M) NE OF
AC4859'A COR FENCE POST, AND 2.7 FT (0.8 M) NORTH OF A WIT POST.  THE MARK IS
AC4859'A PUNCH MARK ON THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 16 FT (4.9 M)
AC4859'LONG STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER
AC4859'SLEEVE.  ACCESS TO THE DATUM POINT IS THROUGH A 5 INCH LOGO CAP THAT
AC4859'IS FLUSH WITH THE GROUND, STAMPED---CULDRUM 1994---, SET ON TOP OF A 5
AC4859'INCH DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND
AC4859'AND SET IN CONCRETE.  A METAL SPIKE WAS PLACED IN THE SILICA SAND
AC4859'MAKING THE MARK MAGNETIC.  DESCRIBED BY D.K.  HERDER AND TYPED BY
AC4859'D.J.E.
AC4859
AC4859                          STATION RECOVERY (2001)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (DKH)
AC4859'RECOVERED AS DESCRIBED.
AC4859
AC4859                          STATION RECOVERY (2002)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (WAS)
AC4859'RECOVERED AS DESCRIBED.
AC4859
AC4859                          STATION RECOVERY (2002)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (DKH)
AC4859'THE MARK WAS RECOVERED AS DESCRIBED, FLUSH.
AC4859
AC4859                          STATION RECOVERY (2002)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (DKH)
AC4859'THE MARK WAS RECOVERED AS DESCRIBED, ACCESS COVER FLUSH.
AC4859
AC4859                          STATION RECOVERY (2002)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (DKH)
AC4859'10 MILES WEST OF LITTLE FALLS, 8.1 MILES WEST ALONG TRUNK HIGHWAY 27
AC4859'FROM JUNCTION OF TRUNK HIGHWAY 238 AND TRUNK HIGHWAY 27 AT WEST EDGE
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AC4859'OF LITTLE FALLS, AT TRUNK HIGHWAY 27 MILEPOINT 125.2, 76 FEET SOUTH OF
AC4859'TRUNK HIGHWAY 27, 299.5 FEET WEST OF GRAVEL ROAD, 273.0 FEET WEST OF
AC4859'CABLE BOX, 3.3 FEET NORTHEAST OF CORNER FENCE POST, 2.7 FEET NORTH OF
AC4859'WITNESS POST
AC4859
AC4859                          STATION RECOVERY (2003)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (DKH)
AC4859'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.
AC4859
AC4859                          STATION RECOVERY (2003)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (MPP)
AC4859'10 MI WEST OF LITTLE FALLS, 8.1 MI WEST ALONG TH 27 FROM JCT OF TH 238
AC4859'AND TH  27 AT WEST EDGE OF LITTLE FALLS, AT TH 27 MP 125.2, 76 FT
AC4859'SOUTH OF TH 27, 299.5 FT WEST OF GRAVEL RD, 273.0 FT WEST OF CABLE
AC4859'BOX, 3.3 FT NE OF COR FENCE POST, 2.7 FT NORTH OF WIT POST, STA IS
AC4859'PUNCH MARK ON 16 FT LONG DRIVEN STEEL ROD WITH ACCESS COVER, FLUSH,
AC4859'MAGNETIC, SUITABLE FOR GPS
AC4859
AC4859                          STATION RECOVERY (2003)
AC4859
AC4859'RECOVERY NOTE BY DUCKS UNLIMITED 2003 (GLJ)
AC4859'RECOVERED IN GOOD CONDITION.
AC4859
AC4859                          STATION RECOVERY (2004)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CB)
AC4859'10 MILES WEST OF LITTLE FALLS, 8.1 MILES WEST ALONG TRUNK HIGHWAY 27
AC4859'FROM JUNCTION OF TRUNK HIGHWAY 238 AND TRUNK HIGHWAY 27 AT WEST EDGE
AC4859'OF LITTLE FALLS, AT TRUNK HIGHWAY 27 MILEPOINT 125.2, 76 FEET SOUTH OF
AC4859'TRUNK HIGHWAY 27, 299.5 FEET WEST OF GRAVEL ROAD, 273.0 FEET WEST OF
AC4859'CABLE BOX, 3.3 FEET NORTHEAST OF CORNER FENCE POST, 2.7 FEET NORTH OF
AC4859'WITNESS POST
AC4859
AC4859                          STATION RECOVERY (2005)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (JBG)
AC4859'RECOVERED AS DESCRIBED.
AC4859
AC4859                          STATION RECOVERY (2015)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
AC4859'RECOVERED IN GOOD CONDITION.
AC4859
AC4859                          STATION RECOVERY (2021)
AC4859
AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2021 (KMS)
AC4859'10.0 MI (16.1 KM) WEST OF LITTLE FALLS, 8.1 MI (13.0 KM) WEST ALONG
AC4859'TRUNK HIGHWAY 27 FROM THE JUNCTION OF TRUNK HIGHWAY 27 AND TRUNK
AC4859'HIGHWAY 238 AT WEST EDGE OF LITTLE FALLS, AT TRUNK HIGHWAY 27 MILE
AC4859'POINT 125.2, 76.0 FT (23.2 M) SOUTH OF TRUNK HIGHWAY 27, 299.5 FT
AC4859'(91.3 M) WEST OF 40TH AVENUE, 273.0 FT (83.2 M) WEST OF A CABLE BOX,
AC4859'3.3 FT (1.0 M) NORTHEAST OF A CORNER FENCE POST, 2.7 FT (0.8 M) NORTH
AC4859'OF A WITNESS POST.
AC4859
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 AC4859                          STATION RECOVERY (2022)
 AC4859
 AC4859'RECOVERY NOTE BY MN DEPT OF TRANSP 2022 (KXJ)
 AC4859'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4946 ***********************************************************************
 AC4946  CBN         -  This is a Cooperative Base Network Control Station.
 AC4946  DESIGNATION -  DENN
 AC4946  PID         -  AC4946
 AC4946  STATE/COUNTY-  MN/ANOKA
 AC4946  COUNTRY     -  US
 AC4946  USGS QUAD   -  COON LAKE BEACH (2019)
 AC4946
 AC4946                        *CURRENT SURVEY CONTROL
 AC4946  ______________________________________________________________________
 AC4946* NAD 83(2011) POSITION- 45 18 36.05208(N) 093 14 05.43344(W)   ADJUSTED
 AC4946* NAD 83(2011) ELLIP HT-   245.889 (meters)        (06/27/12)   ADJUSTED
 AC4946* NAD 83(2011) EPOCH    -  2010.00
 AC4946* NAVD 88 ORTHO HEIGHT -   274.075 (meters)      899.19  (feet) ADJUSTED
 AC4946  ______________________________________________________________________
 AC4946  GEOID HEIGHT    -        -28.184 (meters)                     GEOID18
 AC4946  NAD 83(2011) X  -   -253,552.939 (meters)                     COMP
 AC4946  NAD 83(2011) Y  - -4,486,176.253 (meters)                     COMP
 AC4946  NAD 83(2011) Z  -  4,511,819.419 (meters)                     COMP
 AC4946  LAPLACE CORR    -          3.50  (seconds)                    DEFLEC18
 AC4946  DYNAMIC HEIGHT  -        274.057 (meters)      899.14  (feet) COMP
 AC4946  MODELED GRAVITY -    980,541.2   (mgal)                       NAVD 88
 AC4946
 AC4946  VERT ORDER      -  SECOND    CLASS I
 AC4946
 AC4946  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AC4946  Standards:
 AC4946         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AC4946            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 AC4946  ------------------------------------------------------------------
 AC4946  NETWORK    0.30   0.59           0.14   0.10   0.30     -0.00051221
 AC4946  ------------------------------------------------------------------
 AC4946  Click here for local accuracies and other accuracy information.
 AC4946
 AC4946
 AC4946.The horizontal coordinates were established by GPS observations
 AC4946.and adjusted by the National Geodetic Survey in June 2012.
 AC4946
 AC4946.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 AC4946.been affixed to the stable North American tectonic plate. See
 AC4946.NA2011 for more information.
 AC4946
 AC4946.The horizontal coordinates are valid at the epoch date displayed above
 AC4946.which is a decimal equivalence of Year/Month/Day.
 AC4946
 AC4946.The orthometric height was determined by differential leveling and
 AC4946.adjusted by the NATIONAL GEODETIC SURVEY
 AC4946.in November 2008.
 AC4946
 AC4946.Significant digits in the geoid height do not necessarily reflect accuracy.
 AC4946.GEOID18 height accuracy estimate available here.
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AC4946
AC4946.Click photographs - Photos may exist for this station.
AC4946
AC4946.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4946
AC4946.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4946
AC4946.The ellipsoidal height was determined by GPS observations
AC4946.and is referenced to NAD 83.
AC4946
AC4946.The dynamic height is computed by dividing the NAVD 88
AC4946.geopotential number by the normal gravity value computed on the
AC4946.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4946.degrees latitude (g = 980.6199 gals.).
AC4946
AC4946.The modeled gravity was interpolated from observed gravity values.
AC4946
AC4946. The following values were computed from the NAD 83(2011) position.
AC4946
AC4946;                     North         East     Units Scale Factor Converg.
AC4946;SPC MN S     -   356,960.610   860,004.441   MT  1.00002174   +0 32 10.8
AC4946;SPC MN S     - 1,171,128.27  2,821,531.24   sFT  1.00002174   +0 32 10.8
AC4946;UTM  15      - 5,017,416.838   481,590.895   MT  0.99960417   -0 10 01.0
AC4946
AC4946!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4946!SPC MN S     -   0.99996145  x   1.00002174  =   0.99998319
AC4946!UTM  15      -   0.99996145  x   0.99960417  =   0.99956564
AC4946
AC4946_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL8159017416(NAD 83)
AC4946
AC4946                           SUPERSEDED SURVEY CONTROL
AC4946
AC4946  NAD 83(2007)-  45 18 36.05212(N)    093 14 05.43431(W) AD(2002.00) 0
AC4946  ELLIP H (02/10/07)  245.915  (m)                       GP(2002.00)
AC4946  NAD 83(1996)-  45 18 36.05178(N)    093 14 05.43401(W) AD(       ) B
AC4946  ELLIP H (01/15/97)  245.964  (m)                       GP(       ) 4 1
AC4946  NAVD 88             274.08   (m)          899.2    (f) LEVELING    3
AC4946  NAVD 88 (08/23/05)  274.06   (m)  UNKNOWN model used   GPS OBS
AC4946  NAVD 88 (01/15/97)  274.1    (m)  GEOID96 model used   GPS OBS
AC4946
AC4946.Superseded values are not recommended for survey control.
AC4946
AC4946.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4946.See file dsdata.pdf to determine how the superseded data were derived.
AC4946
AC4946_MARKER: I = METAL ROD
AC4946_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4946_STAMPING: DENN 1995
AC4946_MARK LOGO: MNDT
AC4946_PROJECTION: RECESSED 5 CENTIMETERS
AC4946_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
AC4946_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4946_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4946+SATELLITE: SATELLITE OBSERVATIONS - July 03, 2017
AC4946_ROD/PIPE-DEPTH: 18.3 meters
AC4946
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AC4946  HISTORY     - Date     Condition        Report By
AC4946  HISTORY     - 19950401 MONUMENTED       MNDT
AC4946  HISTORY     - 20030904 GOOD             MNDT
AC4946  HISTORY     - 20040903 GOOD             MNDT
AC4946  HISTORY     - 20051027 GOOD             MNDT
AC4946  HISTORY     - 20081117 GOOD             MNDT
AC4946  HISTORY     - 20150311 GOOD             MNDT
AC4946  HISTORY     - 20151001 GOOD             MNDT
AC4946  HISTORY     - 20170703 GOOD             MNDT
AC4946
AC4946                          STATION DESCRIPTION
AC4946
AC4946'DESCRIBED BY MN DEPT OF TRANSP 1995 (JEM)
AC4946'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1995.  THE MARK IS
AC4946'LOCATED 1.5 MI (2.4 KM) NORTH OF THE TOWN OF SODERVILLE IN THE NE 1/4
AC4946'OF SECTION 32, T33N, R23W.  TO REACH THE MARK FROM THE JCT OF TH 65
AC4946'AND CO RD 18 (CROSSTOWN BLVD) GO NORTH ALONG TH 65 FOR 1.5 MI (2.4 KM)
AC4946'TO TH 65 MP 23.2 AND THE MARK ON THE RIGHT.  THE DATUM POINT IS A
AC4946'PUNCHMARK ON TOP OF A 1/2 INCH DIAMETER BY 60 FT (18.3 M) LONG DRIVEN
AC4946'STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE.
AC4946'ACCESS TO THE MARK IS THROUGH A 5 INCH DIAMETER ALUMINUM ACCESS COVER
AC4946'STAMPED---DENN 1995---, SET ON A 5 INCH BY 20 INCH PVC PLASTIC PIPE
AC4946'FILLED WITH SILICA SAND SET IN CONCRETE AND FLUSH WITH THE SURFACE OF
AC4946'THE GROUND.  A RR SPIKE IN THE SILICA SAND MAKES THE MARK MAGNETIC.
AC4946'THE MARK IS 70 FT (21.3 M) EAST OF TH 65, 61.1 FT (18.6 M) NW OF THE
AC4946'WEST OF 3 DOUBLE E TRAILER SALES SIGN POSTS, 22.5 FT (6.9 M) NORTH OF
AC4946'A P-POLE, 31.5 FT (9.6 M) SSW OF A R/W POST, 9.4 FT (2.9 M) SW OF A
AC4946'R/W POST, AND 3.0 FT (0.9 M) NORTH OF A WIT POST. DESCRIBED BY JAMES
AC4946'E.  MAGOON, TYPED BY G.W.O.
AC4946
AC4946                          STATION RECOVERY (2003)
AC4946
AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (DAZ)
AC4946'1.5 MILES NORTH OF SODERVILLE, 1.5 MILES NORTH ALONG TRUNK HIGHWAY 65
AC4946'FROM JUNCTION OF TRUNK HIGHWAY 65 AND COUNTY ROAD 18 (CROSSTOWN BLVD),
AC4946'AT TRUNK HIGHWAY 65 MILEPOINT 23.2, 70 FEET EAST OF TRUNK HIGHWAY 65,
AC4946'61.1 FEET NORTHWEST OF WESTERN MOST LEG OF DRESSING UP THE HOUSE
AC4946'INSIDE AND OUT SIGN, 22.5 FEET NORTH OF POWER POLE, 31.5 FEET
AC4946'WEST-SOUTHWEST OF R/W POST, 9.4 FEET SOUTHWEST OF R/W POST, 3.0 FEET
AC4946'NORTH OF WITNESS POST, STATION IS DRIVEN STAINLESS STEEL ROD WITH LOGO
AC4946'CAP
AC4946
AC4946                          STATION RECOVERY (2004)
AC4946
AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CB)
AC4946'1.5 MILES NORTH OF SODERVILLE, AT TRUNK HIGHWAY 65 MILEPOINT 23.2, 1.5
AC4946'MILES NORTH ALONG TRUNK HIGHWAY 65 FROM JUNCTION OF TRUNK HIGHWAY 65
AC4946'AND COUNTY ROAD 18 (CROSSTOWN BOULEVARD), 70 FEET EAST OF TRUNK
AC4946'HIGHWAY 65, 61.1 FEET NORTHWEST OF WESTERN MOST LEG OF DRESSING UP THE
AC4946'HOUSE INSIDE AND OUT SIGN, 22.5 FEET NORTH OF POWER POLE, 31.5 FEET
AC4946'WEST-SOUTHWEST OF RIGHT OF WAY POST, 9.4 FEET SOUTHWEST OF RIGHT OF
AC4946'WAY POST, 3.0 FEET NORTH OF WITNESS POST
AC4946
AC4946                          STATION RECOVERY (2005)
AC4946
AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (GJF)
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 AC4946'THE MARK IS LOCATED ABOUT 6.8 MI (10.9 KM) WEST-SOUTHWEST OF LINWOOD,
 AC4946'AND 2.6 MI ESE OF CEDAR, 1.5 MI (2.4 KM) NORTH OF SODERVILLE, AT TRUNK
 AC4946'HIGHWAY 65 MILE POINT 23.2, 1.5 MI (2.4 KM) NORTH ALONG TRUNK HIGHWAY
 AC4946'65 FROM THE JUNCTION OF TRUNK HIGHWAY 65 AND COUNTY ROAD 18 (CROSSTOWN
 AC4946'BOULEVARD), 70 FT (21.3 M) EAST OF TRUNK HIGHWAY 65, 61.1 FT (18.6 M)
 AC4946'NORTHWEST OF WESTERN MOST LEG OF ANTIQUES SIGN, 22.5 FT (6.9 M) NORTH
 AC4946'OF POWER POLE, 31.5 FT (9.6 M) WEST-SOUTHWEST OF RIGHT OF WAY POST,
 AC4946'9.4 FT (2.9 M) SOUTHWEST OF RIGHT OF WAY POST, 3.0 FT (0.9 M) NORTH OF
 AC4946'A WITNESS POST
 AC4946
 AC4946                          STATION RECOVERY (2008)
 AC4946
 AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (KMS)
 AC4946'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
 AC4946'THE MARK IS 1.5 MILES NORTH OF HAM LAKE, AT TRUNK HIGHWAY 65 MILEPOINT
 AC4946'23.2, 1.5 MILES NORTH ALONG TRUNK HIGHWAY 65 FROM JUNCTION OF TRUNK
 AC4946'HIGHWAY 65 AND COUNTY ROAD 18 (CROSSTOWN BOULEVARD), 70 FEET EAST OF
 AC4946'TRUNK HIGHWAY 65, 61.1 FEET NORTHWEST OF WESTERN MOST LEG OF ANTIQUES
 AC4946'SIGN, 22.5 FEET NORTH OF POWER POLE, 31.5 FEET WEST-SOUTHWEST OF
 AC4946'RIGHT-OF-WAY POST, 9.4 FEET SOUTHWEST OF RIGHT-OF-WAY POST, 3.0 FEET
 AC4946'NORTH OF WITNESS POST.
 AC4946
 AC4946                          STATION RECOVERY (2015)
 AC4946
 AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (KMS)
 AC4946'RECOVERED AS DESCRIBED.
 AC4946
 AC4946                          STATION RECOVERY (2015)
 AC4946
 AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4946'1.5 MILES NORTH OF HAM LAKE, AT TRUNK HIGHWAY 65 MILEPOINT 23.2, 1.5
 AC4946'MILES NORTH ALONG TRUNK HIGHWAY 65 FROM JUNCTION OF TRUNK HIGHWAY 65
 AC4946'AND COUNTY ROAD 18 (CROSSTOWN BOULEVARD), 70 FEET EAST OF TRUNK
 AC4946'HIGHWAY 65, 61.1 FEET NORTHWEST OF WESTERN MOST LEG OF ANTIQUES SIGN,
 AC4946'22.5 FEET NORTH OF POWER POLE, 31.5 FEET WEST-SOUTHWEST OF
 AC4946'RIGHT-OF-WAY POST, 9.4 FEET SOUTHWEST OF RIGHT-OF-WAY POST, 3.0 FEET
 AC4946'NORTH OF WITNESS POST.
 AC4946
 AC4946                          STATION RECOVERY (2017)
 AC4946
 AC4946'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (MXL)
 AC4946'IN EAST BETHEL, AT TRUNK HIGHWAY 65 MILEPOINT 23.2, 1.5 MILES NORTH
 AC4946'ALONG TRUNK HIGHWAY 65 FROM THE JUNCTION OF TRUNK HIGHWAY 65 AND
 AC4946'COUNTY ROAD 18 (CROSSTOWN BOULEVARD), 70.0 FEET EAST OF TRUNK HIGHWAY
 AC4946'65, 61.1 FEET NORTHWEST OF WESTERN MOST LEG OF ANTIQUES SIGN, 22.5
 AC4946'FEET NORTH OF A POWER POLE, 31.5 FEET WEST-SOUTHWEST OF A RIGHT-OF-WAY
 AC4946'POST, 9.4 FEET SOUTHWEST OF A RIGHT-OF-WAY POST, 3.0 FEET NORTH OF A
 AC4946'WITNESS POST.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4877 ***********************************************************************
 AC4877  CBN         -  This is a Cooperative Base Network Control Station.
 AC4877  DESIGNATION -  HALE
 AC4877  PID         -  AC4877
 AC4877  STATE/COUNTY-  MN/MCLEOD
 AC4877  COUNTRY     -  US
 AC4877  USGS QUAD   -  SILVER LAKE (2019)
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AC4877
AC4877                          *CURRENT SURVEY CONTROL
AC4877 ______________________________________________________________________________
AC4877* NAD 83(2011) POSITION- 44 54 23.13719(N) 094 11 08.60700(W)   ADJUSTED
AC4877* NAD 83(2011) ELLIP HT-   296.152 (meters)        (06/27/12)   ADJUSTED
AC4877* NAD 83(2011) EPOCH    -  2010.00
AC4877* NAVD 88 ORTHO HEIGHT -   323.685 (meters)     1061.96  (feet) ADJUSTED
AC4877 ______________________________________________________________________________
AC4877  GEOID HEIGHT    -        -27.527 (meters)                     GEOID18
AC4877  NAD 83(2011) X  -   -330,289.191 (meters)                     COMP
AC4877  NAD 83(2011) Y  - -4,513,077.768 (meters)                     COMP
AC4877  NAD 83(2011) Z  -  4,480,198.380 (meters)                     COMP
AC4877  LAPLACE CORR    -         -1.32  (seconds)                    DEFLEC18
AC4877  DYNAMIC HEIGHT  -        323.654 (meters)     1061.85  (feet) COMP
AC4877  MODELED GRAVITY -    980,511.5   (mgal)                       NAVD 88
AC4877
AC4877  VERT ORDER      -  SECOND    CLASS I
AC4877
AC4877  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC4877  Standards:
AC4877         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AC4877            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
AC4877  ------------------------------------------------------------------
AC4877  NETWORK    0.20   0.31           0.09   0.07   0.16      0.00902603
AC4877  ------------------------------------------------------------------
AC4877  Click here for local accuracies and other accuracy information.
AC4877
AC4877
AC4877.The horizontal coordinates were established by GPS observations
AC4877.and adjusted by the National Geodetic Survey in June 2012.
AC4877
AC4877.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4877.been affixed to the stable North American tectonic plate. See
AC4877.NA2011 for more information.
AC4877
AC4877.The horizontal coordinates are valid at the epoch date displayed above
AC4877.which is a decimal equivalence of Year/Month/Day.
AC4877
AC4877.The orthometric height was determined by differential leveling and
AC4877.adjusted by the NATIONAL GEODETIC SURVEY
AC4877.in February 2005.
AC4877
AC4877.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4877.GEOID18 height accuracy estimate available here.
AC4877
AC4877.Click photographs - Photos may exist for this station.
AC4877
AC4877.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4877
AC4877.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4877
AC4877.The ellipsoidal height was determined by GPS observations
AC4877.and is referenced to NAD 83.
AC4877
AC4877.The dynamic height is computed by dividing the NAVD 88
AC4877.geopotential number by the normal gravity value computed on the
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AC4877.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4877.degrees latitude (g = 980.6199 gals.).
AC4877
AC4877.The modeled gravity was interpolated from observed gravity values.
AC4877
AC4877. The following values were computed from the NAD 83(2011) position.
AC4877
AC4877;                    North         East     Units Scale Factor Converg.
AC4877;SPC MN S     -   311,845.075   785,333.212   MT  0.99994699   -0 07 48.6
AC4877;SPC MN S     - 1,023,111.72  2,576,547.38   sFT  0.99994699   -0 07 48.6
AC4877;UTM  15      - 4,973,239.523   406,394.780   MT  0.99970774   -0 50 13.6
AC4877
AC4877!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4877!SPC MN S     -   0.99995357  x   0.99994699  =   0.99990056
AC4877!UTM  15      -   0.99995357  x   0.99970774  =   0.99966132
AC4877
AC4877_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVK0639473239(NAD 83)
AC4877
AC4877                           SUPERSEDED SURVEY CONTROL
AC4877
AC4877  NAD 83(2007)-  44 54 23.13731(N)    094 11 08.60768(W) AD(2002.00) 0
AC4877  ELLIP H (02/10/07)  296.182  (m)                       GP(2002.00)
AC4877  NAD 83(1996)-  44 54 23.13674(N)    094 11 08.60735(W) AD(       ) B
AC4877  ELLIP H (01/15/97)  296.221  (m)                       GP(       ) 4 1
AC4877  NAVD 88             323.69   (m)         1062.0    (f) LEVELING    3
AC4877  NAVD 88             323.67   (m)         1061.9    (f) LEVELING    3
AC4877  NAVD 88             323.69   (m)         1062.0    (f) LEVELING    3
AC4877  NAVD 88             323.68   (m)         1061.9    (f) LEVELING    3
AC4877  NAVD 88 (02/25/04)  323.7    (m)  UNKNOWN model used   GPS OBS
AC4877  NAVD 88             323.68   (m)         1061.9    (f) LEVELING    3
AC4877  NAVD 88 (01/15/97)  323.6    (m)  GEOID96 model used   GPS OBS
AC4877
AC4877.Superseded values are not recommended for survey control.
AC4877
AC4877.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4877.See file dsdata.pdf to determine how the superseded data were derived.
AC4877
AC4877_MARKER: DH = HORIZONTAL CONTROL DISK
AC4877_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
AC4877_STAMPING: HALE 1989
AC4877_MARK LOGO: MNDT
AC4877_PROJECTION: FLUSH
AC4877_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AC4877_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4877_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4877+SATELLITE: SATELLITE OBSERVATIONS - May 30, 2019
AC4877_ROD/PIPE-DEPTH:  5.5 meters
AC4877
AC4877  HISTORY     - Date     Condition        Report By
AC4877  HISTORY     - 19890601 MONUMENTED       MNDT
AC4877  HISTORY     - 1989     GOOD             MNDT
AC4877  HISTORY     - 19941020 GOOD             MNDT
AC4877  HISTORY     - 19980401 GOOD             MNDT
AC4877  HISTORY     - 20010116 GOOD             MNDT
AC4877  HISTORY     - 20030625 GOOD             MNDT
AC4877  HISTORY     - 20030819 GOOD             MNDT
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AC4877  HISTORY     - 20040707 GOOD             MNDT
AC4877  HISTORY     - 20051122 GOOD             MNDT
AC4877  HISTORY     - 20070327 GOOD             MNDT
AC4877  HISTORY     - 20101122 GOOD             MNDT
AC4877  HISTORY     - 20110510 GOOD             MNDT
AC4877  HISTORY     - 20150728 GOOD             MNDT
AC4877  HISTORY     - 20151001 GOOD             MNDT
AC4877  HISTORY     - 20190530 GOOD             MNDT
AC4877
AC4877                          STATION DESCRIPTION
AC4877
AC4877'DESCRIBED BY MN DEPT OF TRANSP 1989 (OCO)
AC4877'THE MARK IS LOCATED ABOUT 1/2 MILE EAST-NORTHEAST OF THE CITY OF
AC4877'SILVER LAKE, 1.15 MILES EAST ALONG TRUNK HIGHWAY 7 FROM ITS JUNCTION
AC4877'WITH COUNTY ROAD 16 (ON THE WEST EDGE OF SILVER LAKE), IN THE
AC4877'SOUTHWEST QUADRANT OF THE INTERSECTION OF HIGHWAY 7 AND COUNTY ROAD 2,
AC4877'AND IN THE NW 1/4 OF SECTION 34, T117N, R28W.  THE MARK IS 154.0 FEET
AC4877'SOUTH OF AND ABOUT 2 FEET HIGHER THAN THE CENTERLINE OF HIGHWAY 7, AT
AC4877'MILEPOINT 151.45, 49.5 FEET WEST OF THE CENTERLINE OF THE CENTERLINE
AC4877'OF COUNTY ROAD 2, 85.3 FEET SOUTH-SOUTHEAST OF POWER POLE NUMBER 24
AC4877'WITH A BURIED CABLE BOX, 5.9 FEET NORTH OF A RIGHT - OF - WAY POST,
AC4877'AND 3.0 FEET SOUTH OF A STEEL WITNESS POST.  THE MARK, A STANDARD MNDT
AC4877'MAGNETIC ALUMINUM HORIZONTAL CONTROL MONUMENT DISK STAMPED---HALE
AC4877'1989---, IS FORCED ONTO THE TOP OF A 3/4 INCH DIAMETER BY 18 FOOT LONG
AC4877'DRIVEN ALUMINUM ALLOY ROD AND IS 0.1 FOOT BELOW THE SURFACE OF THE
AC4877'GROUND.
AC4877
AC4877                          STATION RECOVERY (1994)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 1994 (DKH)
AC4877'THE STATION, RM 1, AND RM 2 WERE RECOVERED IN GOOD CONDITION.  A NEW
AC4877'DESRIPTION FOLLOWS.  THE MARK IS LOCATED ABOUT 1-1/4 MI EAST OF THE
AC4877'TOWN OF SILVER LAKE IN THE NW 1/4 OF SECTION 34, T117N, R28W.  TO
AC4877'REACH THE MARK FROM THE JCT OF CO RD 16 AND TH 7 IN SILVER LAKE, GO
AC4877'EAST FOR 1.15 MI (1.85 KM) ON TH 7 TO TH 7 MP 151.45 AND THE MARK ON
AC4877'THE RIGHT.  THE MARK, A DISK SET ON AN 18 FT (5.5 M) LONG DRIVEN
AC4877'ALUMINUM ROD, IS 152.5 FT (46.5 M) SOUTH OF TH 7, 49.5 FT (15.1 M)
AC4877'WEST OF CO RD 2, 84.9 FT (25.9 M) SSE OF A P-POLE NO 24, 6.1 FT (1.9
AC4877'M) NORTH OF A R/W POST, 3.0 FT (0.9 M) SOUTH OF A WIT POST, 30.22 FT
AC4877'(9.21 M) NORTH OF RM 1, AND 27.27 FT (8.31 M) ESE OF RM 2. RECOVERED
AC4877'AND DESCRIBED BY DAVID K.  HERDER, TYPED BY D.J.E.
AC4877
AC4877                          STATION RECOVERY (1998)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 1998 (DKH)
AC4877'THE MARK WAS RECOVERED AS DESCRIBED.  RM 1 AND RM 2 OK.
AC4877
AC4877                          STATION RECOVERY (2001)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (DKH)
AC4877'RECOVERED AS DESCRIBED.
AC4877
AC4877                          STATION RECOVERY (2003)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (TLM)
AC4877'RECOVERED AS DESCRIBED.
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AC4877
AC4877                          STATION RECOVERY (2003)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (KNB)
AC4877'THE MARK IS LOCATED IN SILVER LAKE, 1.15 MILES EAST ALONG TRUNK
AC4877'HIGHWAY 7 FROM THE JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN
AC4877'THE WEST EDGE OF SILVER LAKE, IN SOUTHWEST QUADRANT OF THE JUNCTION OF
AC4877'TRUNK HIGHWAY 7 AND COUNTY ROAD 2, AT TRUNK HIGHWAY 7 MILEPOINT
AC4877'151.45, THE MARK IS 152.5 FEET SOUTH OF TRUNK HIGHWAY 7, 49.5 FEET
AC4877'WEST OF COUNTY ROAD 2, 84.9 FEET SOUTH-SOUTHEAST OF POWER POLE 24 WITH
AC4877'BURIED CABLE BOX, 6.1 FEET NORTH OF R/W POST, 3.0 FEET SOUTH OF
AC4877'WITNESS POST, 30.22 FEET NORTH OF HALE REFERENCE MARK 1, 27.27 FEET
AC4877'EAST-SOUTHEAST OF HALE REFERENCE MARK 2
AC4877
AC4877                          STATION RECOVERY (2004)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (MPP)
AC4877'THE MARK IS LOCATED IN SILVER LAKE, 1.15 MILES EAST ALONG TRUNK HIGHWA
AC4877'Y 7 FROM THE JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN THE WES
AC4877'T EDGE OF SILVER LAKE, IN SOUTHWEST QUADRANT OF THE JUNCTION OF TRUNK
AC4877'HIGHWAY 7 AND COUNTY ROAD 92, AT TRUNK HIGHWAY 7 MILEPOINT 151.45, THE
AC4877'MARK IS 152.5 FEET SOUTH OF TRUNK HIGHWAY 7, 49.5 FEET WEST OF COUNTY
AC4877'ROAD 92, 84.9 FEET SOUTH-SOUTHEAST OF POWER POLE 24 WITH BURIED CABLE
AC4877'BOX, 6.1 FEET NORTH OF R/W POST, 30.22 FEET NORTH OF HALE REFERENCE M
AC4877'ARK 1, 27.27 FEET EAST-SOUTHEAST OF HALE REFERENCE MARK 2, 3.0 FEET SO
AC4877'UTH OF WITNESS POST,
AC4877
AC4877                          STATION RECOVERY (2005)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (DKH)
AC4877'THE MARK IS LOCATED IN SILVER LAKE, 1.15 MILES EAST ALONG TRUNK
AC4877'HIGHWAY 7 FROM THE JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN
AC4877'THE WEST EDGE OF SILVER LAKE, IN SOUTHWEST QUADRANT OF THE JUNCTION OF
AC4877'TRUNK HIGHWAY 7 AND COUNTY ROAD 92, AT TRUNK HIGHWAY 7 MILEPOINT
AC4877'151.45, THE MARK IS 152.5 FEET SOUTH OF TRUNK HIGHWAY 7, 49.5 FEET
AC4877'WEST OF COUNTY ROAD 92, 84.9 FEET SOUTH-SOUTHEAST OF POWER POLE 24
AC4877'WITH BURIED CABLE BOX, 6.1 FEET NORTH OF R/W POST, 30.22 FEET NORTH OF
AC4877'HALE REFERENCE MARK 1, 27.27 FEET EAST-SOUTHEAST OF HALE REFERENCE
AC4877'MARK 2, 3.0 FEET SOUTH OF WITNESS POST,
AC4877
AC4877                          STATION RECOVERY (2007)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (KMS)
AC4877'THE MARK IS LOCATED IN SILVER LAKE, 1.15 MILES EAST ALONG TRUNK
AC4877'HIGHWAY 7 FROM THE JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN
AC4877'THE WEST EDGE OF SILVER LAKE, IN SOUTHWEST QUADRANT OF THE JUNCTION OF
AC4877'TRUNK HIGHWAY 7 AND COUNTY ROAD 92, AT TRUNK HIGHWAY 7 MILEPOINT
AC4877'151.45, THE MARK IS 152.5 FEET SOUTH OF TRUNK HIGHWAY 7, 49.5 FEET
AC4877'WEST OF COUNTY ROAD 92, 84.9 FEET SOUTH-SOUTHEAST OF POWER POLE 24
AC4877'WITH BURIED CABLE BOX, 6.1 FEET NORTH OF R/W POST, 30.22 FEET NORTH OF
AC4877'HALE REFERENCE MARK 1, 27.27 FEET EAST-SOUTHEAST OF HALE REFERENCE
AC4877'MARK 2, 3.0 FEET SOUTH OF WITNESS POST.
AC4877
AC4877                          STATION RECOVERY (2010)
AC4877
AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2010 (RJG)
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 AC4877'IN SILVER LAKE, 1.15 MI (1.9 KM) EAST ALONG TRUNK HIGHWAY 7 FROM THE
 AC4877'JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN THE WEST EDGE OF
 AC4877'SILVER LAKE, IN SOUTHWEST QUADRANT OF THE JUNCTION TRUNK HIGHWAY 7 AND
 AC4877'COUNTY ROAD 92, AT TRUNK HIGHWAY 7 MILE POINT 151.45, 152.5 FT (46.5
 AC4877'M) SOUTH OF TRUNK HIGHWAY 7, 49.5 FT (15.1 M) WEST OF COUNTY ROAD 92,
 AC4877'30.22 FT (9.2 M) NORTH OF HALE REFERENCE MARK 1, 27.27 FT (8.3 M)
 AC4877'EAST-SOUTHEAST OF HALE REFERENCE MARK 2, 6.1 FT (1.9 M) NORTH OF
 AC4877'RIGHT-OF-WAY POST, 3.0 FT (0.9 M) SOUTH OF A WITNESS POST.
 AC4877
 AC4877                          STATION RECOVERY (2011)
 AC4877
 AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (AJ)
 AC4877'IN SILVER LAKE, 1.15 MI (1.9 KM) EAST ALONG TRUNK HIGHWAY 7  FROM THE
 AC4877'JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN WEST EDGE OF SILVER
 AC4877'LAKE, IN SOUTHWEST QUADRANT OF THE JUNCTION OF TRUNK HIGHWAY 7 AND
 AC4877'COUNTY ROAD 92, AT TRUNK HIGHWAY 7 MILE POINT 151.45, 152.5 FT (46.5
 AC4877'M) SOUTH OF TRUNK HIGHWAY 7, 49.5 FT (15.1 M) WEST OF COUNTY ROAD 92,
 AC4877'30.22 FT (9.2 M) NORTH OF HALE REFERENCE MARK 1, 27.27 FT (8.3 M)
 AC4877'EAST-SOUTHEAST OF HALE REFERENCE MARK 2, 6.1 FT (1.9 M) NORTH OF
 AC4877'RIGHT-OF-WAY POST, 3.0 FT (0.9 M) SOUTH OF A WITNESS POST.
 AC4877
 AC4877                          STATION RECOVERY (2015)
 AC4877
 AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MAS)
 AC4877'RECOVERED AS DESCRIBED.
 AC4877
 AC4877                          STATION RECOVERY (2015)
 AC4877
 AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4877'IN SILVER LAKE, 1.15 MILES EAST ALONG TRUNK HIGHWAY 7 FROM JUNCTION OF
 AC4877'TRUNK HIGHWAY 7 AND COUNTY ROAD 16 IN WEST EDGE OF SILVER LAKE, IN
 AC4877'SOUTHWEST QUADRANT OF JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 92,
 AC4877'AT TRUNK HIGHWAY 7 MILEPOINT 151.45, 152.5 FEET SOUTH OF TRUNK HIGHWAY
 AC4877'7, 49.5 FEET WEST OF COUNTY ROAD 92, 30.22 FEET NORTH OF HALE
 AC4877'REFERENCE MARK 1, 27.27 FEET EAST-SOUTHEAST OF HALE REFERENCE MARK 2,
 AC4877'6.1 FEET NORTH OF RIGHT-OF-WAY POST, 3.0 FEET SOUTH OF WITNESS POST.
 AC4877
 AC4877                          STATION RECOVERY (2019)
 AC4877
 AC4877'RECOVERY NOTE BY MN DEPT OF TRANSP 2019 (BRB)
 AC4877'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4957 ***********************************************************************
 AC4957  CBN         -  This is a Cooperative Base Network Control Station.
 AC4957  DESIGNATION -  LACA
 AC4957  PID         -  AC4957
 AC4957  STATE/COUNTY-  MN/MILLE LACS
 AC4957  COUNTRY     -  US
 AC4957  USGS QUAD   -  MILACA (2019)
 AC4957
 AC4957                        *CURRENT SURVEY CONTROL
 AC4957 ______________________________________________________________________
 AC4957* NAD 83(2011) POSITION- 45 46 57.24039(N) 093 38 59.53172(W)   ADJUSTED
 AC4957* NAD 83(2011) ELLIP HT-   309.353 (meters)        (06/27/12)   ADJUSTED
 AC4957* NAD 83(2011) EPOCH    -  2010.00
 AC4957* NAVD 88 ORTHO HEIGHT -   336.849 (meters)     1105.15  (feet) ADJUSTED
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AC4957  _____________________________________________________________________
AC4957  GEOID HEIGHT    -        -27.498 (meters)                     GEOID18
AC4957  NAD 83(2011) X  -   -283,658.182 (meters)                     COMP
AC4957  NAD 83(2011) Y  - -4,446,850.723 (meters)                     COMP
AC4957  NAD 83(2011) Z  -  4,548,648.132 (meters)                     COMP
AC4957  LAPLACE CORR    -         -3.56  (seconds)                    DEFLEC18
AC4957  DYNAMIC HEIGHT  -       336.843 (meters)     1105.13  (feet) COMP
AC4957  MODELED GRAVITY -    980,590.3   (mgal)                       NAVD 88
AC4957
AC4957  VERT ORDER      -  SECOND    CLASS I
AC4957
AC4957  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC4957  Standards:
AC4957         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AC4957            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
AC4957  ------------------------------------------------------------------
AC4957  NETWORK    0.25   0.33           0.12   0.07   0.17      0.00479986
AC4957  ------------------------------------------------------------------
AC4957  Click here for local accuracies and other accuracy information.
AC4957
AC4957
AC4957.The horizontal coordinates were established by GPS observations
AC4957.and adjusted by the National Geodetic Survey in June 2012.
AC4957
AC4957.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4957.been affixed to the stable North American tectonic plate. See
AC4957.NA2011 for more information.
AC4957
AC4957.The horizontal coordinates are valid at the epoch date displayed above
AC4957.which is a decimal equivalence of Year/Month/Day.
AC4957
AC4957.The orthometric height was determined by differential leveling and
AC4957.adjusted by the NATIONAL GEODETIC SURVEY
AC4957.in April 2021.
AC4957
AC4957.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4957.GEOID18 height accuracy estimate available here.
AC4957
AC4957.Click photographs - Photos may exist for this station.
AC4957
AC4957.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4957
AC4957.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4957
AC4957.The ellipsoidal height was determined by GPS observations
AC4957.and is referenced to NAD 83.
AC4957
AC4957.The dynamic height is computed by dividing the NAVD 88
AC4957.geopotential number by the normal gravity value computed on the
AC4957.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4957.degrees latitude (g = 980.6199 gals.).
AC4957
AC4957.The modeled gravity was interpolated from observed gravity values.
AC4957
AC4957. The following values were computed from the NAD 83(2011) position.
AC4957
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AC4957;                    North         East     Units Scale Factor Converg.
AC4957;SPC MN C     -   187,156.393   846,667.881   MT  0.99996818   +0 26 02.9
AC4957;SPC MN C     -   614,028.93  2,777,776.21   sFT  0.99996818   +0 26 02.9
AC4957;UTM  15      - 5,070,094.966   449,482.353   MT  0.99963137   -0 27 56.8
AC4957
AC4957!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4957!SPC MN C     -   0.99995150  x   0.99996818  =   0.99991969
AC4957!UTM  15      -   0.99995150  x   0.99963137  =   0.99958289
AC4957
AC4957_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL4948270094(NAD 83)
AC4957
AC4957                           SUPERSEDED SURVEY CONTROL
AC4957
AC4957  NAD 83(2007)-  45 46 57.24046(N)    093 38 59.53247(W) AD(2002.00) 0
AC4957  ELLIP H (02/10/07)  309.387  (m)                       GP(2002.00)
AC4957  NAD 83(1996)-  45 46 57.24029(N)    093 38 59.53220(W) AD(       ) B
AC4957  ELLIP H (01/15/97)  309.415  (m)                       GP(       ) 4 1
AC4957  NAVD 88 (08/14/03)  336.847  (m)         1105.14    (f) SUPERSEDED  2 1
AC4957  NAVD 88             336.85   (m)         1105.1     (f) LEVELING    3
AC4957  NAVD 88 (01/15/97)  336.9    (m)  GEOID96 model used   GPS OBS
AC4957
AC4957.Superseded values are not recommended for survey control.
AC4957
AC4957.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4957.See file dsdata.pdf to determine how the superseded data were derived.
AC4957
AC4957_MARKER: F = FLANGE-ENCASED ROD
AC4957_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4957_STAMPING: LACA 1994
AC4957_MARK LOGO: MNDT
AC4957_PROJECTION: RECESSED 5 CENTIMETERS
AC4957_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
AC4957_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4957_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4957+SATELLITE: SATELLITE OBSERVATIONS - January 10, 2018
AC4957_ROD/PIPE-DEPTH:  3.0 meters
AC4957
AC4957  HISTORY     - Date     Condition        Report By
AC4957  HISTORY     - 19941201 MONUMENTED       MNDT
AC4957  HISTORY     - 19970407 GOOD             MNDT
AC4957  HISTORY     - 20000401 GOOD             MNDT
AC4957  HISTORY     - 20000401 GOOD             MNDT
AC4957  HISTORY     - 20000927 GOOD             MNDT
AC4957  HISTORY     - 20021203 GOOD             MNDT
AC4957  HISTORY     - 20040729 GOOD             MNDT
AC4957  HISTORY     - 20050517 GOOD             MNDT
AC4957  HISTORY     - 20081021 GOOD             MNDT
AC4957  HISTORY     - 20100428 GOOD             MNDT
AC4957  HISTORY     - 20151001 GOOD             MNDT
AC4957  HISTORY     - 20171116 GOOD             MNDT
AC4957  HISTORY     - 20180110 GOOD             MNDT
AC4957
AC4957                           STATION DESCRIPTION
AC4957
AC4957'DESCRIBED BY MN DEPT OF TRANSP 1994
AC4957'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
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AC4957'LOCATED ABOUT 1-1/2 MI NORTH OF THE TOWN OF MILACA IN THE SW 1/4 OF
AC4957'SECTION 13, T38N, R27W.  TO REACH THE MARK FROM THE JCT OF TH 23 AND
AC4957'TH 169 IN MILICA, GO NORTH ON TH 169 FOR 1.35 MI (2.17 KM) TO CO RD 9,
AC4957'CONTINUE GOING NORTH ON TH 169 FOR 0.5 MI (0.8 KM) TO TH 169 MP 193.45
AC4957'AND THE MARK ON THE LEFT.  THE MARK IS 49.5 FT (15.1 M) WEST OF NB TH
AC4957'169, 49.0 FT (14.9 M) EAST OF SB TH 169, 104.9 FT (32.0 M) SW OF THE
AC4957'WEST LEG OF CO RD 36 SIGN POST, 24 FT (7.3 M) SOUTH OF A DITCH BLOCK,
AC4957'AND 3.1 FT (0.9 M) NORTH OF A WIT POST.  THE MARK IS A PUNCH MARK ON
AC4957'THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 10 FT (3.0 M) LONG STAINLESS
AC4957'STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE.  ACCESS TO
AC4957'THE DATUM POINT IS THROUGH A 5 INCH LOGO CAP THAT IS FLUSH WITH THE
AC4957'GROUND, STAMPED---LACA 1994---, SET ON TOP OF A 5 INCH DIAMETER BY 24
AC4957'INCH LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND AND SET IN
AC4957'CONCRETE.  A METAL SPIKE WAS PLACED IN THE SILICA SAND MAKING THE MARK
AC4957'MAGNETIC.  DESCRIBED BY DAVID K.  HERDER, TYPED BY J.E.M.
AC4957
AC4957                          STATION RECOVERY (1997)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 1997 (WAS)
AC4957'THE MARK WAS RECOVERED AS DESCRIBED.
AC4957
AC4957                          STATION RECOVERY (2000)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (DKH)
AC4957'THE MARK WAS RECOVERED AS DESCRIBED.
AC4957
AC4957                          STATION RECOVERY (2000)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (WAS)
AC4957'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.
AC4957
AC4957                          STATION RECOVERY (2000)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (DKH)
AC4957'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  RR SPIKE BY
AC4957'STATION  MAKES MARK MAGNETIC, SUITABLE FOR GPS, MAGNETIC, FLUSH.
AC4957
AC4957                          STATION RECOVERY (2002)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (DJS)
AC4957'RECOVERED AS DESCRIBED.
AC4957
AC4957                          STATION RECOVERY (2004)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (KMS)
AC4957'1.5 MILES NORTH OF MILACA, 1.85 MILES NORTH ALONG TRUNK HIGHWAY 169
AC4957'FROM JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 169 IN MILACA,
AC4957'0.25 MILES NORTH OF COUNTY ROAD 9, AT TRUNK HIGHWAY 169 MILEPOINT
AC4957'193.45, IN TRUNK HIGHWAY 169 MEDIAN, 49.5 FEET WEST OF NORTHBOUND
AC4957'TRUNK HIGHWAY 169, 49.0 FEET EAST OF SOUTHBOUND TRUNK HIGHWAY 169,
AC4957'104.9 FEET SOUTHWEST OF WEST LEG OF COUNTY ROAD 36 SIGN POST, 24 FEET
AC4957'SOUTH OF DITCH BLOCK, 3.1 FEET NORTH OF WITNESS POST.
AC4957
AC4957                          STATION RECOVERY (2005)
AC4957
AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (KNB)
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 AC4957'RECOVERED AS DESCRIBED.
 AC4957
 AC4957                          STATION RECOVERY (2008)
 AC4957
 AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (MPP)
 AC4957'RECOVERED AS DESCRIBED.
 AC4957
 AC4957                          STATION RECOVERY (2010)
 AC4957
 AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2010 (DJS)
 AC4957'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
 AC4957'THE MARK IS 1.5 MILES NORTH OF MILACA, 1.85 MILES NORTH ALONG TRUNK
 AC4957'HIGHWAY 169 FROM JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 169 IN
 AC4957'MILACA, AT TRUNK HIGHWAY 169 MILEPOINT 193.45, 0.25 MILES NORTH OF
 AC4957'COUNTY ROAD 9, IN TRUNK HIGHWAY 169 MEDIAN, 49.5 FEET WEST OF
 AC4957'NORTHBOUND TRUNK HIGHWAY 169, 49.0 FEET EAST OF SOUTHBOUND TRUNK
 AC4957'HIGHWAY 169, 104.9 FEET SOUTHWEST OF WEST LEG OF COUNTY ROAD 36 SIGN
 AC4957'POST, 24 FEET SOUTH OF DITCH BLOCK, 3.1 FEET NORTH OF WITNESS POST.
 AC4957
 AC4957                          STATION RECOVERY (2015)
 AC4957
 AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4957'1.5 MILES NORTH OF MILACA, 1.85 MILES NORTH ALONG TRUNK HIGHWAY 169
 AC4957'FROM JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 169 IN MILACA, AT
 AC4957'TRUNK HIGHWAY 169 MILEPOINT 193.45, 0.25 MILE NORTH OF COUNTY ROAD 9,
 AC4957'IN TRUNK HIGHWAY 169 MEDIAN, 49.5 FEET WEST OF NORTHBOUND TRUNK
 AC4957'HIGHWAY 169, 49.0 FEET EAST OF SOUTHBOUND TRUNK HIGHWAY 169, 104.9
 AC4957'FEET SOUTHWEST OF WEST LEG OF COUNTY ROAD 36 SIGN POST, 24 FEET SOUTH
 AC4957'OF DITCH BLOCK, 3.1 FEET NORTH OF WITNESS POST.
 AC4957
 AC4957                          STATION RECOVERY (2017)
 AC4957
 AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (MPP)
 AC4957'1.5 MILES NORTH OF MILACA, 1.85 MILES NORTH ALONG TRUNK HIGHWAY 169
 AC4957'FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 169 IN MILACA,
 AC4957'AT TRUNK HIGHWAY 169 MILEPOINT 193.45, 0.25 MILE NORTH OF COUNTY ROAD
 AC4957'9, IN TRUNK HIGHWAY 169 MEDIAN, 49.5 FEET WEST OF NORTHBOUND TRUNK
 AC4957'HIGHWAY 169, 49.0 FEET EAST OF SOUTHBOUND TRUNK HIGHWAY 169, 104.9
 AC4957'FEET SOUTHWEST OF THE WEST LEG OF A COUNTY ROAD 36 SIGN POST, 24.0
 AC4957'FEET SOUTH OF A DITCH BLOCK, 3.1 FEET NORTH OF A WITNESS POST.
 AC4957
 AC4957                          STATION RECOVERY (2018)
 AC4957
 AC4957'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (DAS)
 AC4957'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 DM2727 ***********************************************************************
 DM2727  DESIGNATION -  MATT RESET
 DM2727  PID         -  DM2727
 DM2727  STATE/COUNTY-  MN/PINE
 DM2727  COUNTRY     -  US
 DM2727  USGS QUAD   -  FINLAYSON (2019)
 DM2727
 DM2727                         *CURRENT SURVEY CONTROL
 DM2727 ______________________________________________________________________
 DM2727* NAD 83(2011) POSITION- 46 12 06.68902(N) 092 58 12.90894(W)   ADJUSTED
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DM2727* NAD 83(2011) ELLIP HT-   317.556 (meters)        (06/27/12)   ADJUSTED
DM2727* NAD 83(2011) EPOCH   -  2010.00
DM2727* NAVD 88 ORTHO HEIGHT -   345.193 (meters)     1132.52  (feet) ADJUSTED
DM2727  ____________________________________________________________________
DM2727  GEOID HEIGHT    -        -27.659 (meters)                     GEOID18
DM2727  NAD 83(2011) X  -   -229,156.149 (meters)                     COMP
DM2727  NAD 83(2011) Y  - -4,416,431.371 (meters)                     COMP
DM2727  NAD 83(2011) Z  -  4,581,034.464 (meters)                     COMP
DM2727  LAPLACE CORR    -          0.82  (seconds)                    DEFLEC18
DM2727  DYNAMIC HEIGHT  -        345.201 (meters)     1132.55  (feet) COMP
DM2727  MODELED GRAVITY -    980,629.8   (mgal)                       NAVD 88
DM2727
DM2727  VERT ORDER      -  SECOND    CLASS I
DM2727
DM2727  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
DM2727  Standards:
DM2727         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
DM2727            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
DM2727  ------------------------------------------------------------------
DM2727  NETWORK    0.46   0.86          0.21   0.16   0.44      0.06006875
DM2727  ------------------------------------------------------------------
DM2727  Click here for local accuracies and other accuracy information.
DM2727
DM2727
DM2727.The horizontal coordinates were established by GPS observations
DM2727.and adjusted by the National Geodetic Survey in June 2012.
DM2727
DM2727.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
DM2727.been affixed to the stable North American tectonic plate. See
DM2727.NA2011 for more information.
DM2727
DM2727.The horizontal coordinates are valid at the epoch date displayed above
DM2727.which is a decimal equivalence of Year/Month/Day.
DM2727
DM2727.The orthometric height was determined by differential leveling and
DM2727.adjusted by the NATIONAL GEODETIC SURVEY
DM2727.in March 2011.
DM2727
DM2727.Significant digits in the geoid height do not necessarily reflect accuracy.
DM2727.GEOID18 height accuracy estimate available here.
DM2727
DM2727.Click photographs - Photos may exist for this station.
DM2727
DM2727.The X, Y, and Z were computed from the position and the ellipsoidal ht.
DM2727
DM2727.The Laplace correction was computed from DEFLEC18 derived deflections.
DM2727
DM2727.The ellipsoidal height was determined by GPS observations
DM2727.and is referenced to NAD 83.
DM2727
DM2727.The dynamic height is computed by dividing the NAVD 88
DM2727.geopotential number by the normal gravity value computed on the
DM2727.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DM2727.degrees latitude (g = 980.6199 gals.).
DM2727
DM2727.The modeled gravity was interpolated from observed gravity values.
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DM2727
DM2727. The following values were computed from the NAD 83(2011) position.
DM2727
DM2727;                    North         East     Units Scale Factor Converg.
DM2727;SPC MN C     -   234,379.483   898,760.619   MT  0.99992471   +0 55 32.7
DM2727;SPC MN C     -   768,960.02  2,948,683.80   sFT  0.99992471   +0 55 32.7
DM2727;UTM  15      - 5,116,476.135   502,295.028   MT  0.99960006   +0 01 17.3
DM2727
DM2727!             -  Elev Factor  x  Scale Factor =   Combined Factor
DM2727!SPC MN C     -   0.99995022  x   0.99992471  =   0.99987493
DM2727!UTM  15      -   0.99995022  x   0.99960006  =   0.99955030
DM2727
DM2727_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TWM0229516476(NAD 83)
DM2727
DM2727                           SUPERSEDED SURVEY CONTROL
DM2727
DM2727  NAD 83(2007)-  46 12 06.68893(N)    092 58 12.90966(W) AD(2002.00) B
DM2727  ELLIP H (08/23/10)  317.573  (m)                       GP(2002.00) 4 2
DM2727  NAVD 88 (08/23/10)  345.2    (m)  GEOID09 model used   GPS OBS
DM2727
DM2727.Superseded values are not recommended for survey control.
DM2727
DM2727.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DM2727.See file dsdata.pdf to determine how the superseded data were derived.
DM2727
DM2727_MARKER: I = METAL ROD
DM2727_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
DM2727_STAMPING: MATT RESET 1991 2009
DM2727_MARK LOGO: MNDT
DM2727_PROJECTION: RECESSED 5 CENTIMETERS
DM2727_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
DM2727_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DM2727_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DM2727+SATELLITE: SATELLITE OBSERVATIONS - February 11, 2016
DM2727_ROD/PIPE-DEPTH:  5.5 meters
DM2727
DM2727  HISTORY     - Date     Condition        Report By
DM2727  HISTORY     - 20090201 MONUMENTED       MNDT
DM2727  HISTORY     - 2008     GOOD             MNDT
DM2727  HISTORY     - 20151001 GOOD             MNDT
DM2727  HISTORY     - 20160211 GOOD             MNDT
DM2727
DM2727                           STATION DESCRIPTION
DM2727
DM2727'DESCRIBED BY MN DEPT OF TRANSP 2009
DM2727'2.5 MILES WEST OF FINLAYSON, 2.6 MILES WEST ALONG TRUNK HIGHWAY 18
DM2727'FROM JUNCTION OF TRUNK HIGHWAY 18 AND FRONT STREET IN FINLAYSON, AT
DM2727'TRUNK HIGHWAY 18 MILEPOINT 73.95, 107.7 FEET SOUTH OF TRUNKHIGHWAY 18,
DM2727'86.7 FEET SOUTHEAST OF POWER POLE, 79.7 FEET SOUTHEAST OF SOUTHEAST
DM2727'CORNER OF JUNCTION BOX, 58.0 FEET SOUTH OF FENCE CORNER, 31.0 FEET
DM2727'EAST OF MATSON LINE ROAD, 3.0 FEET SOUTH OF WITNESS POST, 1.0 FEET
DM2727'WEST OF ELECTRIC FENCE LINE.
DM2727
DM2727                           STATION RECOVERY (2008)
DM2727
DM2727'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (MPP)
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 DM2727'RECOVERED AS DESCRIBED.
 DM2727
 DM2727                          STATION RECOVERY (2015)
 DM2727
 DM2727'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 DM2727'2.5 MILES WEST OF FINLAYSON, 2.6 MILES WEST ALONG TRUNK HIGHWAY 18
 DM2727'FROM JUNCTION OF TRUNK HIGHWAY 18 AND FRONT STREET IN FINLAYSON, AT
 DM2727'TRUNK HIGHWAY 18 MILEPOINT 73.95, 107.7 FEET SOUTH OF TRUNK HIGHWAY
 DM2727'18, 86.7 FEET SOUTHEAST OF POWER POLE, 79.7 FEET SOUTHEAST OF
 DM2727'SOUTHEAST CORNER OF JUNCTION BOX, 58.0 FEET SOUTH OF FENCE CORNER,
 DM2727'31.0 FEET EAST OF MATSON LINE ROAD, 3.0 FEET SOUTH OF WITNESS POST,
 DM2727'1.0 FOOT WEST OF ELECTRIC FENCE LINE.
 DM2727
 DM2727                          STATION RECOVERY (2016)
 DM2727
 DM2727'RECOVERY NOTE BY MN DEPT OF TRANSP 2016 (SXS)
 DM2727'RECOVERED IN GOOD CONDITION.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4956 ***********************************************************************
 AC4956  FBN         -  This is a Federal Base Network Control Station.
 AC4956  DESIGNATION -  MCLEOD
 AC4956  PID         -  AC4956
 AC4956  STATE/COUNTY-  MN/WASHINGTON
 AC4956  COUNTRY     -  US
 AC4956  USGS QUAD   -  SCANDIA (2019)
 AC4956
 AC4956                        *CURRENT SURVEY CONTROL
 AC4956  ______________________________________________________________________
 AC4956* NAD 83(2011) POSITION- 45 15 22.13049(N) 092 46 19.77712(W)   ADJUSTED
 AC4956* NAD 83(2011) ELLIP HT-   253.198 (meters)        (06/27/12)   ADJUSTED
 AC4956* NAD 83(2011) EPOCH   -  2010.00
 AC4956* NAVD 88 ORTHO HEIGHT -   280.863 (meters)      921.46  (feet) ADJUSTED
 AC4956  ______________________________________________________________________
 AC4956  GEOID HEIGHT    -        -27.657 (meters)                     GEOID18
 AC4956  NAD 83(2011) X  -   -217,523.715 (meters)                     COMP
 AC4956  NAD 83(2011) Y  - -4,492,331.866 (meters)                     COMP
 AC4956  NAD 83(2011) Z  -  4,507,612.217 (meters)                     COMP
 AC4956  LAPLACE CORR    -         -7.42  (seconds)                    DEFLEC18
 AC4956  DYNAMIC HEIGHT  -        280.864 (meters)      921.47  (feet) COMP
 AC4956  MODELED GRAVITY -    980,612.0   (mgal)                       NAVD 88
 AC4956
 AC4956  VERT ORDER      -  SECOND    CLASS I
 AC4956
 AC4956  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AC4956  Standards:
 AC4956         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AC4956            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 AC4956  ------------------------------------------------------------------
 AC4956  NETWORK    0.31   0.53           0.14   0.11   0.27      0.02648849
 AC4956  ------------------------------------------------------------------
 AC4956  Click here for local accuracies and other accuracy information.
 AC4956
 AC4956
 AC4956.The horizontal coordinates were established by GPS observations
 AC4956.and adjusted by the National Geodetic Survey in June 2012.
 AC4956
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AC4956.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4956.been affixed to the stable North American tectonic plate. See
AC4956.NA2011 for more information.
AC4956
AC4956.The horizontal coordinates are valid at the epoch date displayed above
AC4956.which is a decimal equivalence of Year/Month/Day.
AC4956
AC4956.The orthometric height was determined by differential leveling and
AC4956.adjusted by the NATIONAL GEODETIC SURVEY
AC4956.in April 2004.
AC4956
AC4956.No vertical observational check was made to the station.
AC4956
AC4956.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4956.GEOID18 height accuracy estimate available here.
AC4956
AC4956.Click photographs - Photos may exist for this station.
AC4956
AC4956.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4956
AC4956.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4956
AC4956.The ellipsoidal height was determined by GPS observations
AC4956.and is referenced to NAD 83.
AC4956
AC4956.The dynamic height is computed by dividing the NAVD 88
AC4956.geopotential number by the normal gravity value computed on the
AC4956.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4956.degrees latitude (g = 980.6199 gals.).
AC4956
AC4956.The modeled gravity was interpolated from observed gravity values.
AC4956
AC4956. The following values were computed from the NAD 83(2011) position.
AC4956
AC4956;                    North         East     Units Scale Factor Converg.
AC4956;SPC MN S     -   351,416.870   896,376.179   MT  1.00000887   +0 51 38.3
AC4956;SPC MN S     - 1,152,940.18  2,940,860.85   sFT  1.00000887   +0 51 38.3
AC4956;UTM  15      - 5,011,431.012   517,877.062   MT  0.99960393   +0 09 42.6
AC4956
AC4956!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4956!SPC MN S     -   0.99996030  x   1.00000887  =   0.99996917
AC4956!UTM  15      -   0.99996030  x   0.99960393  =   0.99956425
AC4956
AC4956_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TWL1787711431(NAD 83)
AC4956
AC4956                           SUPERSEDED SURVEY CONTROL
AC4956
AC4956  NAD 83(2007)-  45 15 22.13059(N)    092 46 19.77793(W) AD(2002.00) 0
AC4956  ELLIP H (02/10/07)  253.225  (m)                       GP(2002.00)
AC4956  NAD 83(1996)-  45 15 22.13033(N)    092 46 19.77737(W) AD(       ) B
AC4956  ELLIP H (01/15/97)  253.268  (m)                       GP(       ) 4 1
AC4956  NAVD 88             280.86   (m)          921.5    (f) LEVELING    3
AC4956  NAVD 88 (05/28/02)  280.9    (m)  GEOID99 model used   GPS OBS
AC4956  NAVD 88 (01/15/97)  280.9    (m)  GEOID96 model used   GPS OBS
AC4956
AC4956.Superseded values are not recommended for survey control.
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AC4956
AC4956.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4956.See file dsdata.pdf to determine how the superseded data were derived.
AC4956
AC4956_MARKER: F = FLANGE-ENCASED ROD
AC4956_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4956_STAMPING: MCLEOD 1995
AC4956_MARK LOGO: MNDT
AC4956_PROJECTION: RECESSED 5 CENTIMETERS
AC4956_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
AC4956_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4956_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4956+SATELLITE: SATELLITE OBSERVATIONS - February 18, 2016
AC4956_ROD/PIPE-DEPTH:  9.8 meters
AC4956
AC4956  HISTORY     - Date     Condition        Report By
AC4956  HISTORY     - 19950401 MONUMENTED       MNDT
AC4956  HISTORY     - 200111   GOOD             MNDT
AC4956  HISTORY     - 20020220 GOOD             MNDT
AC4956  HISTORY     - 20040429 GOOD             USPSQD
AC4956  HISTORY     - 20040904 GOOD             MNDT
AC4956  HISTORY     - 20050928 GOOD             MNDT
AC4956  HISTORY     - 20070709 GOOD             WIDT
AC4956  HISTORY     - 20110519 GOOD             MNDT
AC4956  HISTORY     - 20150312 GOOD             MNDT
AC4956  HISTORY     - 20150622 GOOD             MNDT
AC4956  HISTORY     - 20151001 GOOD             MNDT
AC4956  HISTORY     - 20160218 GOOD             MNDT
AC4956
AC4956                          STATION DESCRIPTION
AC4956
AC4956'DESCRIBED BY MN DEPT OF TRANSP 1995 (DKH)
AC4956'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1995.  THE MARK IS
AC4956'LOCATED 1.75 MI (2.82 KM) EAST OF THE TOWN OF SCANDIA IN THE SW 1/4 OF
AC4956'SECTION 18, T32N, R19W.  THE MARK IS AT THE JCT OF TH 97 AND TH 95.
AC4956'THE MARK IS 57 FT (17.4 M) WEST OF TH 95, 121 FT (36.9 M) SOUTH OF TH
AC4956'97, 76.3 FT (23.3 M) NE OF A P-POLE, 73.2 FT (22.3 M) SE OF A P-POLE,
AC4956'AND 7.1 FT (2.2 M) WEST OF A WIT POST.  THE MARK IS A PUNCH MARK ON
AC4956'THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 32 FT (9.8 M) LONG STAINLESS
AC4956'STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE. ACCESS TO THE
AC4956'DATUM POINT IS THROUGH A 5 INCH LOGO CAP THAT IS FLUSH WITH THE
AC4956'GROUND, STAMPED---MCLEOD 1995---.  SET ON TOP OF A 5 INCH DIAMETER BY
AC4956'24 INCH LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND AND SET IN
AC4956'CONCRETE.  A METAL SPIKE WAS PLACED IN THE SILICA SAND MAKES THE MARK
AC4956'MAGNETIC.  DESCRIBED BY DAVID K.  HERDER AND TYPED BY G.W.O.
AC4956
AC4956                          STATION RECOVERY (2001)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (DKH)
AC4956'RECOVERED AS DESCRIBED.
AC4956'
AC4956
AC4956                          STATION RECOVERY (2002)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (WAS)
AC4956'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.
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AC4956
AC4956                          STATION RECOVERY (2004)
AC4956
AC4956'RECOVERY NOTE BY US POWER SQUADRON 2004 (JRD)
AC4956'RECOVERED IN GOOD CONDITION AS DESCRIBED. USPSQD JRD
AC4956
AC4956                          STATION RECOVERY (2004)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CB)
AC4956'1.75 MILES EAST OF SCANDIA, AT JUNCTION OF TRUNK HIGHWAY 97 AND TRUNK
AC4956'HIGHWAY 95, AT TRUNK HIGHWAY 95 MILEPOINT 88.55, 57 FEET WEST OF TRUNK
AC4956'HIGHWAY 95, 121 FEET SOUTH OF TRUNK HIGHWAY 97, 76.3 FEET NORTHEAST OF
AC4956'POWER POLE, 73.2 FEET SOUTHEAST OF POWER POLE, 7.1 FEET WEST OF
AC4956'WITNESS POST.
AC4956
AC4956                          STATION RECOVERY (2005)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (GJF)
AC4956'1.75 MILES EAST OF SCANDIA, AT JUNCTION OF TRUNK HIGHWAY 97 AND TRUNK
AC4956'HIGHWAY 95, AT TRUNK HIGHWAY 95 MILEPOINT 88.55, 57 FEET WEST OF TRUNK
AC4956'HIGHWAY 95, 121 FEET SOUTH OF TRUNK HIGHWAY 97, 76.3 FEET NORTHEAST OF
AC4956'POWER POLE, 73.2 FEET SOUTHEAST OF POWER POLE, 7.1 FEET WEST OF
AC4956'WITNESS POST.
AC4956
AC4956                          STATION RECOVERY (2007)
AC4956
AC4956'RECOVERY NOTE BY WI DEPT OF TRANSP 2007 (EPS)
AC4956'RECOVERED AS DESCRIBED.
AC4956
AC4956                          STATION RECOVERY (2011)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (BRE)
AC4956'1.75 MI (2.8 KM) EAST OF SCANDIA, AT THE JUNCTION OF TRUNK HIGHWAY 97
AC4956'AND TRUNK HIGHWAY 95, AT TRUNK HIGHWAY 95 MILE POINT 88.55, 121.0 FT
AC4956'(36.9 M) SOUTH OF TRUNK HIGHWAY 97, 76.3 FT (23.3 M) NORTHEAST OF
AC4956'POWER POLE, 73.2 FT (22.3 M) SOUTHEAST OF POWER POLE, 57.0 FT (17.4 M)
AC4956'WEST OF TRUNK HIGHWAY 95, 7.1 FT (2.2 M) WEST OF A WITNESS POST.
AC4956
AC4956                          STATION RECOVERY (2015)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (DAS)
AC4956'RECOVERED AS DESCRIBED.
AC4956
AC4956                          STATION RECOVERY (2015)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (JXD)
AC4956'1.75 MILES EAST OF SCANDIA, AT JUNCTION OF TRUNK HIGHWAY 97 AND TRUNK
AC4956'HIGHWAY 95, AT TRUNK HIGHWAY 95 MILEPOINT 88.55, 121.0 FEET SOUTH OF
AC4956'TRUNK HIGHWAY 97, 76.3 FEET NORTHEAST OF POWER POLE, 73.2 FEET
AC4956'SOUTHEAST OF POWER POLE, 57.0 FEET WEST OF TRUNK HIGHWAY 95, 7.1 FEET
AC4956'WEST OF WITNESS POST.
AC4956
AC4956                          STATION RECOVERY (2015)
AC4956
AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
AC4956'1.75 MILES EAST OF SCANDIA, AT JUNCTION OF TRUNK HIGHWAY 97 AND TRUNK
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 AC4956'HIGHWAY 95, AT TRUNK HIGHWAY 95 MILEPOINT 88.55, 121.0 FEET SOUTH OF
 AC4956'TRUNK HIGHWAY 97, 76.3 FEET NORTHEAST OF POWER POLE, 73.2 FEET
 AC4956'SOUTHEAST OF POWER POLE, 57.0 FEET WEST OF TRUNK HIGHWAY 95, 7.1 FEET
 AC4956'WEST OF WITNESS POST.
 AC4956
 AC4956                          STATION RECOVERY (2016)
 AC4956
 AC4956'RECOVERY NOTE BY MN DEPT OF TRANSP 2016 (AXP)
 AC4956'RECOVERED IN GOOD CONDITION.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 PQ0850 ***********************************************************************
 PQ0850  CBN         -  This is a Cooperative Base Network Control Station.
 PQ0850  DESIGNATION -  MILLS
 PQ0850  PID         -  PQ0850
 PQ0850  STATE/COUNTY-  MN/MEEKER
 PQ0850  COUNTRY     -  US
 PQ0850  USGS QUAD   -  CEDAR MILLS (2019)
 PQ0850
 PQ0850                         *CURRENT SURVEY CONTROL
 PQ0850  ______________________________________________________________________
 PQ0850* NAD 83(2011) POSITION- 44 56 41.88656(N) 094 30 08.19211(W)   ADJUSTED
 PQ0850* NAD 83(2011) ELLIP HT-   311.620 (meters)        (06/27/12)   ADJUSTED
 PQ0850* NAD 83(2011) EPOCH   -  2010.00
 PQ0850* NAVD 88 ORTHO HEIGHT -   338.695 (meters)     1111.20  (feet) ADJUSTED
 PQ0850  ______________________________________________________________________
 PQ0850  GEOID HEIGHT    -        -27.078 (meters)                     GEOID18
 PQ0850  NAD 83(2011) X  -   -354,981.580 (meters)                     COMP
 PQ0850  NAD 83(2011) Y  - -4,508,179.504 (meters)                     COMP
 PQ0850  NAD 83(2011) Z  -  4,483,242.002 (meters)                     COMP
 PQ0850  LAPLACE CORR    -         -2.52  (seconds)                    DEFLEC18
 PQ0850  DYNAMIC HEIGHT  -        338.669 (meters)     1111.12  (feet) COMP
 PQ0850  MODELED GRAVITY -    980,529.6   (mgal)                       NAVD 88
 PQ0850
 PQ0850  VERT ORDER      -  SECOND    CLASS I
 PQ0850
 PQ0850  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 PQ0850  Standards:
 PQ0850         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 PQ0850            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 PQ0850  ------------------------------------------------------------------
 PQ0850  NETWORK    0.16   0.29           0.07   0.06   0.15      0.01530194
 PQ0850  ------------------------------------------------------------------
 PQ0850  Click here for local accuracies and other accuracy information.
 PQ0850
 PQ0850
 PQ0850.The horizontal coordinates were established by GPS observations
 PQ0850.and adjusted by the National Geodetic Survey in June 2012.
 PQ0850
 PQ0850.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 PQ0850.been affixed to the stable North American tectonic plate. See
 PQ0850.NA2011 for more information.
 PQ0850
 PQ0850.The horizontal coordinates are valid at the epoch date displayed above
 PQ0850.which is a decimal equivalence of Year/Month/Day.
 PQ0850
 PQ0850.The orthometric height was determined by differential leveling and
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PQ0850.adjusted by the NATIONAL GEODETIC SURVEY
PQ0850.in June 1995.
PQ0850
PQ0850.Significant digits in the geoid height do not necessarily reflect accuracy.
PQ0850.GEOID18 height accuracy estimate available here.
PQ0850
PQ0850.Click photographs - Photos may exist for this station.
PQ0850
PQ0850.The X, Y, and Z were computed from the position and the ellipsoidal ht.
PQ0850
PQ0850.The Laplace correction was computed from DEFLEC18 derived deflections.
PQ0850
PQ0850.The ellipsoidal height was determined by GPS observations
PQ0850.and is referenced to NAD 83.
PQ0850
PQ0850.The dynamic height is computed by dividing the NAVD 88
PQ0850.geopotential number by the normal gravity value computed on the
PQ0850.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
PQ0850.degrees latitude (g = 980.6199 gals.).
PQ0850
PQ0850.The modeled gravity was interpolated from observed gravity values.
PQ0850
PQ0850. The following values were computed from the NAD 83(2011) position.
PQ0850
PQ0850;                    North         East     Units Scale Factor Converg.
PQ0850;SPC MN S     -   316,233.107   760,361.422   MT  0.99995197   -0 21 07.4
PQ0850;SPC MN S     - 1,037,508.12  2,494,619.10   sFT  0.99995197   -0 21 07.4
PQ0850;UTM  15      - 4,977,934.843   381,484.371   MT  0.99977271   -1 03 40.9
PQ0850
PQ0850!             -  Elev Factor  x  Scale Factor =   Combined Factor
PQ0850!SPC MN S     -   0.99995114  x   0.99995197  =   0.99990312
PQ0850!UTM  15      -   0.99995114  x   0.99977271  =   0.99972387
PQ0850
PQ0850:                Primary Azimuth Mark                    Grid Az
PQ0850:SPC MN S     -  MILLS AZ MK                             000 31 40.7
PQ0850:UTM  15      -  MILLS AZ MK                             001 14 14.2
PQ0850
PQ0850_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TUK8148477934(NAD 83)
PQ0850
PQ0850|----------------------------------------------------------------------|
PQ0850| PID    Reference Object                    Distance      Geod. Az   |
PQ0850|                                                          dddmmss.s |
PQ0850| PQ0849 MILLS AZ MK                       APPROX. 1.3 KM 0001033.3 |
PQ0850| PQ1478 147 ES                            293.846 METERS 15119     |
PQ0850| PQ1480 MILLS RM 2                         15.324 METERS 18346     |
PQ0850| QP1232 GREENLEAF RADIO MAST              APPROX. 8.7 KM 3483301.0 |
PQ0850| PQ1479 MILLS RM 1                         34.133 METERS 35936     |
PQ0850|----------------------------------------------------------------------|
PQ0850
PQ0850                          SUPERSEDED SURVEY CONTROL
PQ0850
PQ0850  NAD 83(2007)-  44 56 41.88661(N)    094 30 08.19276(W) AD(2002.00) 0
PQ0850  ELLIP H (02/10/07)  311.657  (m)                       GP(2002.00)
PQ0850  NAD 83(1996)-  44 56 41.88602(N)    094 30 08.19243(W) AD(       ) B
PQ0850  ELLIP H (01/15/97)  311.681  (m)                       GP(       ) 4 1
PQ0850  NAD 83(1986)-  44 56 41.87946(N)    094 30 08.18624(W) AD(       ) 2
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PQ0850  NAD 27      -  44 56 42.01533(N)    094 30 07.22791(W) AD(       ) 2
PQ0850  NAVD 88             338.70   (m)          1111.2    (f) LEVELING    3
PQ0850  NGVD 29             338.61   (m)          1110.9    (f) LEVELING    3
PQ0850
PQ0850.Superseded values are not recommended for survey control.
PQ0850
PQ0850.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
PQ0850.See file dsdata.pdf to determine how the superseded data were derived.
PQ0850
PQ0850_MARKER: DH = HORIZONTAL CONTROL DISK
PQ0850_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
PQ0850_STAMPING: MILLS 1976
PQ0850_MARK LOGO: MNHD
PQ0850_PROJECTION: FLUSH
PQ0850_MAGNETIC: R = STEEL ROD IMBEDDED IN MONUMENT
PQ0850_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
PQ0850+STABILITY: SURFACE MOTION
PQ0850_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
PQ0850+SATELLITE: SATELLITE OBSERVATIONS - March 23, 2016
PQ0850
PQ0850  HISTORY     - Date     Condition        Report By
PQ0850  HISTORY     - 19760401 MONUMENTED       MNHD
PQ0850  HISTORY     - 1976     GOOD             MNDT
PQ0850  HISTORY     - 19780724 GOOD             MNDT
PQ0850  HISTORY     - 19941025 GOOD             MNDT
PQ0850  HISTORY     - 19981124 GOOD             MNDT
PQ0850  HISTORY     - 20010116 GOOD             MNDT
PQ0850  HISTORY     - 20021001 GOOD             MNDT
PQ0850  HISTORY     - 20030701 GOOD             MNDT
PQ0850  HISTORY     - 20030821 GOOD             MNDT
PQ0850  HISTORY     - 20040707 GOOD             MNDT
PQ0850  HISTORY     - 20051208 GOOD             MNDT
PQ0850  HISTORY     - 20070327 GOOD             MNDT
PQ0850  HISTORY     - 20110413 GOOD             MNDT
PQ0850  HISTORY     - 20151001 GOOD             MNDT
PQ0850  HISTORY     - 20160323 GOOD             MNDT
PQ0850
PQ0850                          STATION DESCRIPTION
PQ0850
PQ0850'DESCRIBED BY MN HIGHWAY DEPT 1976 (DKH)
PQ0850'THE STATION IS LOCATED ABOUT 1 MILE EAST OF THE CITY OF CEDAR MILLS
PQ0850'IN THE NE QUARTER OF SECTION 13, T 117N, R 31W, ON THE WEST
PQ0850'RIGHT-OF-WAY OF TRUNK HIGHWAY 22 AT THE JUNCTION OF TRUNK HIGHWAY 7
PQ0850'AND TRUNK HIGHWAY 22.
PQ0850'
PQ0850'THE STATION DISKS ARE STANDARD MNHD HORIZONTAL CONTROL MARK DISKS
PQ0850'STAMPED MILLS 1976.  THE SURFACE STATION DISK IS SET IN A 12 INCH
PQ0850'ROUND CONCRETE MONUMENT AND IS FLUSH WITH THE SURFACE OF THE
PQ0850'GROUND.  THE MARK IS 86.5 FEET WEST OF THE CENTERLINE OF TRUNK
PQ0850'HIGHWAY 22, 0.1 MILE NORTH OF TRUNK HIGHWAY 7, 115.0 FEET SOUTH OF A
PQ0850'POWER POLE, AND 2.7 FEET EAST OF A STEEL WITNESS POST.  THE
PQ0850'UNDERGROUND STATION DISK IS SET IN AN IRREGULAR MASS OF CONCRETE
PQ0850'5 FEET BELOW THE SURFACE OF THE GROUND.
PQ0850'
PQ0850'REFERENCE MARK NUMBER 1, A STANDARD MNHD REFERENCE MARK DISK STAMPED
PQ0850'MILLS NO 1 1976, IS SET IN A 12 INCH ROUND CONCRETE MONUMENT AND IS
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PQ0850'FLUSH WITH THE SURFACE OF THE GROUND.  THE MARK IS 66.3 FEET WEST
PQ0850'OF THE CENTERLINE OF TRUNK HIGHWAY 22, 111.7 FEET NORTH OF A STEEL
PQ0850'WINTNESS POST, AND 3.0 FEET SOUTH OF A POWER POLE.
PQ0850'
PQ0850'REFERENCE MARK NUMBER 2, A STANDARD MNHD REFERENCE MARK DISK STAMPED
PQ0850'MILLS NO 2 1976, IS SET IN A 12 INCH ROUND CONCRETE MONUMENT AND IS
PQ0850'FLUSH WITH THE SURFACE OF THE GROUND.  THE MARK 62.2 FEET WEST OF
PQ0850'THE CENTERLINE OF TRUNK HIGHWAY 22, AND 50.4 FEET SOUTH OF A STEEL
PQ0850'WITNESS POST.
PQ0850'
PQ0850'TO REACH THE AZIMUTH MARK FROM THE STATION GO NORTH ON TRUNK
PQ0850'HIGHWAY 22 FOR 0.8 MILE TO A FARM DRIVE AND THE MARK ON THE LEFT.
PQ0850'
PQ0850'THE AZIMUTH MARK, A STANDARD MNHD AZIMUTH MARK DISK STAMPED MILLS
PQ0850'1976, IS SET IN A 12 INCH ROUND CONCRETE MONUMENT AND IS FLUSH WITH
PQ0850'THE SURFACE OF THE GROUND.  THE MARK IS 59.6 FEET WEST OF THE
PQ0850'CENTERLINE OF TRUNK HIGHWAY 22, 22.5 FEET SOUTH OF THE CENTER OF A
PQ0850'FARM DRIVE, 23.7 FEET WEST-SOUTHWEST OF THE SOUTH END OF AN 18
PQ0850'INCH CORRAGATED METAL PIPE, 14.4 FEET EAST OF A POWER POLE, 157.0
PQ0850'FEET NORTHWEST OF TRUNK HIGHWAY 22 MILE POST NUMBER 131, AND 2.7
PQ0850'FEET EAST OF A STEEL WITNESS POST.
PQ0850'
PQ0850'ALL OF THE MARKS ARE MAGNETIC.
PQ0850'
PQ0850'NEAREST TOWN--CEDAR MILLS.
PQ0850'
PQ0850'HEIGHT OF LIGHT ABOVE STATION MARK 1.78 METERS.
PQ0850
PQ0850                          STATION RECOVERY (1976)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 1976
PQ0850'RECOVERED IN GOOD CONDITION.
PQ0850
PQ0850                          STATION RECOVERY (1978)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 1978
PQ0850'THE MARK IS LOCATED 1 MILE (1.6 KM) EAST ALONG TRUNK HIGHWAY 7 FROM
PQ0850'ITS JUNCTION WITH COUNTY ROAD 26 AT CEDAR MILLS, IN THE NE 1/4 OF
PQ0850'SECTION 13, T117N, R31W, AT THE JUNCTION OF TRUNK HIGHWAY 7 AND TRUNK
PQ0850'HIGHWAY 22, NEAR TRUNK HIGHWAY 22 MILEPOINT 130.2.  THE MARK IS 86.5
PQ0850'FEET (26.4 M) WEST OF THE CENTERLINE OF TRUNK HIGHWAY 22, 0.1 MILE
PQ0850'(0.2 KM) NORTH OF TRUNK HIGHWAY 7, 115 FEET (35.1 M) SOUTH OF A POWER
PQ0850'POLE, 112 FEET (34.1 M) SOUTH OF MILLS RM 1, 50.3 FEET (15.3 M) NORTH
PQ0850'OF MILLS RM 2, AND 2.7 FEET (0.8 M) EAST OF A STEEL WITNESS POST.
PQ0850'THE MARK, A STANDARD MNDT HORIZONTAL CONTROL MONUMENT DISK
PQ0850'STAMPED---MILLS 1976---, IS SET IN THE TOP OF A MAGNETIC CONCRETE
PQ0850'MONUMENT THAT IS FLUSH WITH THE SURFACE OF THE GROUND.
PQ0850
PQ0850                          STATION RECOVERY (1994)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 1994 (DKH)
PQ0850'THE STATION, RM 1, AND RM 2 WERE RECOVERED IN GOOD CONDITION AS
PQ0850'DESCRIBED.  THE CHAINED DISTANCE BETWEEN THE STATION AND THE REFERENCE
PQ0850'MARKS CHECKED.  RECOVERY NOTE BY DAVID K.  HERDER, TYPED BY G.W.O.
PQ0850
PQ0850                          STATION RECOVERY (1998)
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PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 1998 (MPP)
PQ0850'RECOVERED AS DESCRIBED.  RM 1 AND 2 OK.
PQ0850
PQ0850                          STATION RECOVERY (2001)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (DJS)
PQ0850'RECOVERED AS DESCRIBED.
PQ0850
PQ0850                          STATION RECOVERY (2002)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (DKH)
PQ0850'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  RM NO 1 AND 2
PQ0850'WERE NOT SEARCHED FOR AT THIS TIME.  THE MARK IS MAGNETIC, FLUSH, AND
PQ0850'SUITABLE FOR GPS.
PQ0850
PQ0850                          STATION RECOVERY (2003)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (TLM)
PQ0850'THE MARK WAS RECOVERED AS DESCRIBED, 24.5 FT (7.5 M) SSW OF TELEPHONE
PQ0850'CABLE PEDESTAL NUMBER K4162, FLUSH, MAGNETIC.
PQ0850
PQ0850                          STATION RECOVERY (2003)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (KNB)
PQ0850'THE MARK IS LOCATED 1 MILES EAST OF CEDAR MILLS, AT JUNCTION OF TRUNK
PQ0850'HIGHWAY 7 AND TRUNK HIGHWAY 22, AT TRUNK HIGHWAY 22 MILEPOINT 130.20,
PQ0850'THE MARK IS 86.5 FEET WEST OF TRUNK HIGHWAY 22, 0.1 MILES NORTH OF
PQ0850'TRUNK HIGHWAY 7, 115 FEET SOUTH OF POWER POLE, 111.98 FEET SOUTH OF
PQ0850'REFERENCE MARK 1, 86.5 FEET WEST OF TRUNK HIGHWAY 22, 50.27 FEET NORTH
PQ0850'OF REFERENCE MARK 2, 24.5 FEET SOUTH-SOUTHWEST OF TELEPHONE CABLE
PQ0850'PEDESTAL K4 16 2, 2.7 FEET EAST OF WITNESS POST
PQ0850
PQ0850                          STATION RECOVERY (2004)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (MPP)
PQ0850'1.0 MILES EAST OF CEDAR MILLS, AT JUNCTION OF TRUNK HIGHWAY 7 AND
PQ0850'TRUNK HIGHWAY 22, AT TRUNK HIGHWAY 22 MILEPOINT 130.20, THE MARK IS
PQ0850'86.5 FEET WEST OF TRUNK HIGHWAY 22, 0.1 MILES NORTH OF TRUNK HIGHWAY
PQ0850'7, 115 FEET SOUTH OF POWER POLE, 111.98 FEET SOUTH OF REFERENCE MARK
PQ0850'1, 86.5 FEET WEST OF TRUNK HIGHWAY 22, 50.27 FEET NORTH OF REFERENCE
PQ0850'MARK 2, 24.5 FEET SOUTH-SOUTHWEST OF TELEPHONE CABLE PEDESTAL K4 16 2,
PQ0850'2.7 FEET EAST OF WITNESS POST
PQ0850
PQ0850                          STATION RECOVERY (2005)
PQ0850
PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (KNB)
PQ0850'1.0 MILES EAST OF CEDAR MILLS, AT JUNCTION OF TRUNK HIGHWAY 7 AND
PQ0850'TRUNK HIGHWAY 22, AT TRUNK HIGHWAY 22 MILEPOINT 130.20, THE MARK IS
PQ0850'86.5 FEET WEST OF TRUNK HIGHWAY 22, 0.1 MILES NORTH OF TRUNK HIGHWAY
PQ0850'7, 115 FEET SOUTH OF POWER POLE, 111.98 FEET SOUTH OF REFERENCE MARK
PQ0850'1, 86.5 FEET WEST OF TRUNK HIGHWAY 22, 50.27 FEET NORTH OF REFERENCE
PQ0850'MARK 2, 24.5 FEET SOUTH-SOUTHWEST OF TELEPHONE CABLE PEDESTAL K4 16 2,
PQ0850'2.7 FEET EAST OF WITNESS POST
PQ0850
PQ0850                          STATION RECOVERY (2007)
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 PQ0850
 PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (KMS)
 PQ0850'1.0 MILES EAST OF CEDAR MILLS, AT JUNCTION OF TRUNK HIGHWAY 7 AND
 PQ0850'TRUNK HIGHWAY 22, AT TRUNK HIGHWAY 22 MILEPOINT 130.20, THE MARK IS
 PQ0850'86.5 FEET WEST OF TRUNK HIGHWAY 22, 0.1 MILES NORTH OF TRUNK HIGHWAY
 PQ0850'7, 115 FEET SOUTH OF POWER POLE, 111.98 FEET SOUTH OF REFERENCE MARK
 PQ0850'1, 86.5 FEET WEST OF TRUNK HIGHWAY 22, 50.27 FEET NORTH OF REFERENCE
 PQ0850'MARK 2, 24.5 FEET SOUTH-SOUTHWEST OF TELEPHONE CABLE PEDESTAL K4 16 2,
 PQ0850'2.7 FEET EAST OF WITNESS POST.
 PQ0850
 PQ0850                          STATION RECOVERY (2011)
 PQ0850
 PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (MAS)
 PQ0850'THE MARK IS 1.0 MI (1.6 KM) EAST OF CEDAR MILLS.
 PQ0850'
 PQ0850'TO REACH GO 1.0 MI (1.6 KM) EAST ALONG TRUNK HIGHWAY 7  FROM THE
 PQ0850'JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 26 IN CEDAR MILLS, THEN
 PQ0850'0.1 MI (0.2 KM) NORTH ON TRUNK HIGHWAY 22, AT TRUNK HIGHWAY 22 MILE
 PQ0850'POINT 130.20.
 PQ0850'
 PQ0850'THE MARK IS LOCATED 86.5 FT (26.4 M) WEST OF TRUNK HIGHWAY 22, 115 FT
 PQ0850'(35.1 M) SOUTH OF POWER POLE, 111.98 FT (34.1 M) SOUTH OF REFERENCE
 PQ0850'MARK 1, 86.5 FT (26.4 M) WEST OF TRUNK HIGHWAY 22, 50.27 FT (15.3 M)
 PQ0850'NORTH OF REFERENCE MARK 2, 24.5 FT (7.5 M) SOUTH-SOUTHWEST OF
 PQ0850'TELEPHONE CABLE PEDESTAL K4 16 2, 2.0 FT (0.6 M) EAST OF A WITNESS
 PQ0850'POST.
 PQ0850
 PQ0850                          STATION RECOVERY (2015)
 PQ0850
 PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 PQ0850'1.0 MILE EAST OF CEDAR MILLS, 1.0 MILE EAST ALONG TRUNK HIGHWAY 7 FROM
 PQ0850'JUNCTION OF TRUNK HIGHWAY 7 AND COUNTY ROAD 26 IN CEDAR MILLS, THEN
 PQ0850'0.1 MILE NORTH ON TRUNK HIGHWAY 22, AT TRUNK HIGHWAY 22 MILEPOINT
 PQ0850'130.20, 86.5 FEET WEST OF TRUNK HIGHWAY 22, 115 FEET SOUTH OF POWER
 PQ0850'POLE, 111.98 FEET SOUTH OF REFERENCE MARK 1, 86.5 FEET WEST OF TRUNK
 PQ0850'HIGHWAY 22, 50.27 FEET NORTH OF REFERENCE MARK 2, 24.5 FEET
 PQ0850'SOUTH-SOUTHWEST OF TELEPHONE CABLE PEDESTAL K4 16 2, 2.0 FEET EAST OF
 PQ0850'WITNESS POST.
 PQ0850
 PQ0850                          STATION RECOVERY (2016)
 PQ0850
 PQ0850'RECOVERY NOTE BY MN DEPT OF TRANSP 2016 (KXJ)
 PQ0850'RECOVERED IN GOOD CONDITION.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4969 ***********************************************************************
 AC4969  CBN         -  This is a Cooperative Base Network Control Station.
 AC4969  DESIGNATION -  NABEC
 AC4969  PID         -  AC4969
 AC4969  STATE/COUNTY-  MN/KANABEC
 AC4969  COUNTRY     -  US
 AC4969  USGS QUAD   -  WARMAN (2019)
 AC4969
 AC4969                        *CURRENT SURVEY CONTROL
 AC4969  ______________________________________________________________________
 AC4969* NAD 83(2011) POSITION- 46 01 29.32330(N) 093 17 02.40312(W)   ADJUSTED
 AC4969* NAD 83(2011) ELLIP HT-   309.071 (meters)        (06/27/12)   ADJUSTED
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AC4969* NAD 83(2011) EPOCH    -  2010.00
AC4969* NAVD 88 ORTHO HEIGHT -   336.715 (meters)     1104.71   (feet) ADJUSTED
AC4969  ____________________________________________________________________
AC4969  GEOID HEIGHT     -        -27.642 (meters)                    GEOID18
AC4969  NAD 83(2011) X   -   -254,148.901 (meters)                    COMP
AC4969  NAD 83(2011) Y   - -4,429,264.956 (meters)                    COMP
AC4969  NAD 83(2011) Z   -  4,567,385.326 (meters)                    COMP
AC4969  LAPLACE CORR     -         -3.49  (seconds)                   DEFLEC18
AC4969  DYNAMIC HEIGHT   -        336.717 (meters)     1104.71   (feet) COMP
AC4969  MODELED GRAVITY  -    980,611.8   (mgal)                      NAVD 88
AC4969
AC4969  VERT ORDER       -  SECOND    CLASS I
AC4969
AC4969  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC4969  Standards:
AC4969         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AC4969            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
AC4969  ------------------------------------------------------------------
AC4969  NETWORK    0.24   0.39           0.11   0.08   0.20      0.01522257
AC4969  ------------------------------------------------------------------
AC4969  Click here for local accuracies and other accuracy information.
AC4969
AC4969
AC4969.The horizontal coordinates were established by GPS observations
AC4969.and adjusted by the National Geodetic Survey in June 2012.
AC4969
AC4969.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4969.been affixed to the stable North American tectonic plate. See
AC4969.NA2011 for more information.
AC4969
AC4969.The horizontal coordinates are valid at the epoch date displayed above
AC4969.which is a decimal equivalence of Year/Month/Day.
AC4969
AC4969.The orthometric height was determined by differential leveling and
AC4969.adjusted by the NATIONAL GEODETIC SURVEY
AC4969.in April 2021.
AC4969
AC4969.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4969.GEOID18 height accuracy estimate available here.
AC4969
AC4969.Click photographs - Photos may exist for this station.
AC4969
AC4969.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4969
AC4969.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4969
AC4969.The ellipsoidal height was determined by GPS observations
AC4969.and is referenced to NAD 83.
AC4969
AC4969.The dynamic height is computed by dividing the NAVD 88
AC4969.geopotential number by the normal gravity value computed on the
AC4969.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4969.degrees latitude (g = 980.6199 gals.).
AC4969
AC4969.The modeled gravity was interpolated from observed gravity values.
AC4969
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AC4969. The following values were computed from the NAD 83(2011) position.
AC4969
AC4969;                    North         East     Units Scale Factor Converg.
AC4969;SPC MN C     -   214,359.774   874,789.428   MT  0.99993659   +0 41 55.7
AC4969;SPC MN C     -   703,278.69  2,870,038.32   sFT  0.99993659   +0 41 55.7
AC4969;UTM  15      - 5,096,843.489   478,018.990   MT  0.99960594   -0 12 15.8
AC4969
AC4969!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4969!SPC MN C     -   0.99995155  x   0.99993659  =   0.99988814
AC4969!UTM  15      -   0.99995155  x   0.99960594  =   0.99955751
AC4969
AC4969_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL7801896843(NAD 83)
AC4969
AC4969                           SUPERSEDED SURVEY CONTROL
AC4969
AC4969  NAD 83(2007)-  46 01 29.32338(N)    093 17 02.40394(W) AD(2002.00) 0
AC4969  ELLIP H (02/10/07)  309.101  (m)                       GP(2002.00)
AC4969  NAD 83(1996)-  46 01 29.32321(N)    093 17 02.40371(W) AD(       ) B
AC4969  ELLIP H (01/15/97)  309.136  (m)                       GP(       ) 4 1
AC4969  NAVD 88 (11/25/13)  336.723  (m)         1104.73   (f) SUPERSEDED  2 1
AC4969  NAVD 88             336.72   (m)         1104.7    (f) LEVELING    3
AC4969  NAVD 88             336.73   (m)         1104.8    (f) LEVELING    3
AC4969  NAVD 88 (09/16/04)  336.70   (m)  GEOID03 model used   GPS OBS
AC4969  NAVD 88 (10/22/03)  336.7    (m)  UNKNOWN model used   GPS OBS
AC4969  NAVD 88             336.73   (m)         1104.8    (f) LEVELING    3
AC4969  NAVD 88 (05/27/03)  336.7    (m)  UNKNOWN model used   GPS OBS
AC4969  NAVD 88 (03/21/03)  336.7    (m)  GEOID99 model used   GPS OBS
AC4969  NAVD 88 (01/15/97)  336.7    (m)  GEOID96 model used   GPS OBS
AC4969
AC4969.Superseded values are not recommended for survey control.
AC4969
AC4969.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4969.See file dsdata.pdf to determine how the superseded data were derived.
AC4969
AC4969_MARKER: F = FLANGE-ENCASED ROD
AC4969_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4969_STAMPING: NABEC 1995
AC4969_MARK LOGO: MNDT
AC4969_PROJECTION: RECESSED 6 CENTIMETERS
AC4969_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
AC4969_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4969_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4969+SATELLITE: SATELLITE OBSERVATIONS - June 19, 2017
AC4969_ROD/PIPE-DEPTH:  1.5 meters
AC4969_SLEEVE-DEPTH  :  0.9 meters
AC4969
AC4969  HISTORY     - Date     Condition        Report By
AC4969  HISTORY     - 19950401 MONUMENTED       MNDT
AC4969  HISTORY     - 19990501 GOOD             MNDT
AC4969  HISTORY     - 20000401 GOOD             MNDT
AC4969  HISTORY     - 20000424 GOOD             MNDT
AC4969  HISTORY     - 20021009 GOOD             MNDT
AC4969  HISTORY     - 20040405 GOOD             MNDT
AC4969  HISTORY     - 20040729 GOOD             MNDT
AC4969  HISTORY     - 20061129 GOOD             MNDT
AC4969  HISTORY     - 20100412 GOOD             MNDT
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AC4969  HISTORY     - 20151001 GOOD             MNDT
AC4969  HISTORY     - 20170619 GOOD             MNDT
AC4969
AC4969                          STATION DESCRIPTION
AC4969
AC4969'DESCRIBED BY MN DEPT OF TRANSP 1995 (DKH)
AC4969'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
AC4969'LOCATED ABOUT 11 MI (17.7 KM) NORTH OF THE TOWN OF MORA IN THE NW 1/4
AC4969'OF SECTION 20, T41N, R23W.  TO REACH THE MARK FROM THE JCT OF TH 23
AC4969'AND TH 65 IN MORA, GO NORTH ON TH 65 FOR 10.55 MI (16.98 KM) TO TH 65
AC4969'MP 75.50 AND THE MARK ON THE RIGHT.  THE MARK IS 158.5 FT (48.3 M)
AC4969'EAST OF TH 65, 60.7 FT (18.5 M) SOUTH OF CO RD 3, 79.5 FT (24.2 M) ESE
AC4969'OF A CABLE MARKER, 109.9 FT (33.5 M) NE OF A R/W POST, 9.5 FT (2.9 M)
AC4969'WEST OF A WOOD FENCE POST, 6.0 FT (1.8 M) NW OF A FENCE, AND 6.2 FT
AC4969'(1.9 M) NORTH OF A WIT POST.  THE MARK IS A PUNCH MARK ON THE TOP OF A
AC4969'DRIVEN 1/2 INCH DIAMETER BY 5 FT (1.5 M) LONG STAINLESS STEEL ROD WITH
AC4969'A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE.  ACCESS TO THE DATUM POINT
AC4969'IS THROUGH A 5 INCH LOGO CAP THAT IS FLUSH WITH THE GROUND,
AC4969'STAMPED---NABEC 1995---, SET ON TOP OF A 5 INCH DIAMETER BY 24 INCH
AC4969'LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND AND SET IN CONCRETE.  A
AC4969'METAL SPIKE WAS PLACED IN THE SILICA SAND MAKING THE MARK MAGNETIC.
AC4969'DESCRIBED BY DAVID K.  HERDER AND TYPED BY D.J.E.
AC4969
AC4969                          STATION RECOVERY (1999)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 1999 (DKH)
AC4969'RECOVERED AS DESCRIBED.
AC4969
AC4969                          STATION RECOVERY (2000)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (DKH)
AC4969'THE MARK WAS RECOVERED AS DESCRIBED.
AC4969
AC4969                          STATION RECOVERY (2000)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (MPP)
AC4969'RECOVERED AS DESCRIBED.
AC4969
AC4969                          STATION RECOVERY (2002)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (MPP)
AC4969'RECOVERED AS DESCRIBED.
AC4969
AC4969                          STATION RECOVERY (2004)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (DKH)
AC4969'11 MILES NORTH OF MORA, 10.55 MILES NORTH ALONG TRUNK HIGHWAY 65 FROM
AC4969'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 65 IN MORA, AT TRUNK
AC4969'HIGHWAY 65 MILEPOINT 75.5, 158.5 FEET EAST OF TRUNK HIGHWAY 65, 60.5
AC4969'FEET SOUTH OF COUNTY ROAD 3, 109.9 FEET NORTHEAST OF RIGHT OF WAY
AC4969'POST, 79.5 FEET EAST-SOUTHEAST OF CABLE MARKER, 9.5 FEET WEST OF WOOD
AC4969'FENCE POST, 6.0 FEET NORTHWEST OF FENCE, 6.2 FEET NORTH OF WITNESS
AC4969'POST
AC4969
AC4969                          STATION RECOVERY (2004)
AC4969
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AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (KMS)
AC4969'11 MILES NORTH OF MORA, 10.55 MILES NORTH ALONG TRUNK HIGHWAY 65 FROM
AC4969'JUNCTION OF  TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 65 IN MORA, AT TRUNK
AC4969'HIGHWAY 65 MILEPOINT 75.5, 158.5  FEET EAST OF TRUNK HIGHWAY 65, 60.5
AC4969'FEET SOUTH OF COUNTY ROAD 3, 109.9 FEET NORTHEAST OF  RIGHT OF WAY
AC4969'POST, 79.5 FEET EAST-SOUTHEAST OF CABLE MARKER, 9.5 FEET WEST OF WOOD
AC4969'FENCE POST, 6.0 FEET NORTHWEST OF FENCE, 6.2 FEET NORTH OF WITNESS
AC4969'POST. ROD DRIVEN TO  REFUSAL IN SOFT SHELF ROCK, KNOWN TO HOLD
AC4969'ELEVATIONS WELL IN THIS REGION.
AC4969
AC4969                          STATION RECOVERY (2006)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2006 (DAS)
AC4969'THE STATION IS LOCATED ABOUT 10.2 MI (16.4 KM) NORTH OF MORA, 9.2 MI
AC4969'(14.8 KM) NORTHWEST OF QUAMBA AND 2.3 MI (3.7 KM) SOUTH OF WARMAN.
AC4969'
AC4969'THE MARK IS 10.55 MI (17.0 KM) NORTH ALONG TRUNK HIGHWAY 65 FROM THE
AC4969'JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 65 IN MORA, AT TRUNK
AC4969'HIGHWAY 65 MILE POINT 75.5.
AC4969'
AC4969'IT IS 158.5 FT (48.3 M) EAST OF TRUNK HIGHWAY 65, 109.9 FT (33.5 M)
AC4969'NORTHEAST OF RIGHT OF WAY POST, 79.5 FT (24.2 M) EAST-SOUTHEAST OF
AC4969'CABLE MARKER, 60.5 FT (18.4 M) SOUTH OF COUNTY ROAD 3, 6.2 FT (1.9 M)
AC4969'NORTH OF A WITNESS POST.
AC4969
AC4969                          STATION RECOVERY (2010)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2010 (KMS)
AC4969'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
AC4969'THE MARK 11.0 MILES NORTH OF MORA, 10.55 MILES NORTH ALONG TRUNK
AC4969'HIGHWAY 65 FROM JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 65 IN
AC4969'MORA, AT TRUNK HIGHWAY 65 MILEPOINT 75.5, 158.5 FEET EAST OF TRUNK
AC4969'HIGHWAY 65, 109.9 FEET NORTHEAST OF RIGHT-OF-WAY POST, 79.5 FEET
AC4969'EAST-SOUTHEAST OF CABLE MARKER, 60.5 FEET SOUTH OF COUNTY ROAD 3, 6.2
AC4969'FEET NORTH OF WITNESS POST.
AC4969
AC4969                          STATION RECOVERY (2015)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
AC4969'11.0 MILES NORTH OF MORA, 10.55 MILES NORTH ALONG TRUNK HIGHWAY 65
AC4969'FROM JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 65 IN MORA, AT
AC4969'TRUNK HIGHWAY 65 MILEPOINT 75.5, 158.5 FEET EAST OF TRUNK HIGHWAY 65,
AC4969'109.9 FEET NORTHEAST OF RIGHT-OF-WAY POST, 79.5 FEET EAST-SOUTHEAST OF
AC4969'CABLE MARKER, 60.5 FEET SOUTH OF COUNTY ROAD 3, 6.2 FEET NORTH OF
AC4969'WITNESS POST.
AC4969
AC4969                          STATION RECOVERY (2017)
AC4969
AC4969'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (MAS)
AC4969'11.0 MI (17.7 KM) NORTH OF MORA, 10.7 MI (17.2 KM) NORTH ALONG TRUNK
AC4969'HIGHWAY 65 FROM THE JUNCTION OF TRUNK HIGHWAY 23 AND TRUNK HIGHWAY 65
AC4969'IN MORA, AT TRUNK HIGHWAY 65 MILE POINT 75.5, 158.5 FT (48.3 M) EAST
AC4969'OF TRUNK HIGHWAY 65, 60.5 FT (18.4 M) SOUTH OF COUNTY ROAD 3, 109.9 FT
AC4969'(33.5 M) NORTHEAST OF A RIGHT-OF-WAY POST, 79.5 FT (24.2 M)
AC4969'EAST-SOUTHEAST OF A CABLE MARKER, 6.2 FT (1.9 M) NORTH OF A WITNESS
AC4969'POST.
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1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 DI4581 ***********************************************************************
 DI4581  DESIGNATION -  PAYUP
 DI4581  PID         -  DI4581
 DI4581  STATE/COUNTY-  MN/CASS
 DI4581  COUNTRY     -  US
 DI4581  USGS QUAD   -  PILLAGER (2019)
 DI4581
 DI4581                        *CURRENT SURVEY CONTROL
 DI4581  ______________________________________________________________________
 DI4581* NAD 83(2011) POSITION- 46 20 08.49322(N) 094 26 54.28947(W)   ADJUSTED
 DI4581* NAD 83(2011) ELLIP HT-   340.643 (meters)        (06/27/12)   ADJUSTED
 DI4581* NAD 83(2011) EPOCH   -  2010.00
 DI4581* NAVD 88 ORTHO HEIGHT -   367.805 (meters)     1206.71  (feet) ADJUSTED
 DI4581  ______________________________________________________________________
 DI4581  GEOID HEIGHT    -        -27.158 (meters)                    GEOID18
 DI4581  NAD 83(2011) X  -   -342,173.233 (meters)                    COMP
 DI4581  NAD 83(2011) Y  - -4,398,348.486 (meters)                    COMP
 DI4581  NAD 83(2011) Z  -  4,591,335.505 (meters)                    COMP
 DI4581  LAPLACE CORR    -         -0.33  (seconds)                   DEFLEC18
 DI4581  DYNAMIC HEIGHT  -        367.815 (meters)     1206.74  (feet) COMP
 DI4581  MODELED GRAVITY -    980,631.1   (mgal)                      NAVD 88
 DI4581
 DI4581  VERT ORDER      -  SECOND    CLASS I
 DI4581
 DI4581  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 DI4581  Standards:
 DI4581         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 DI4581            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 DI4581  ------------------------------------------------------------------
 DI4581  NETWORK    0.32   0.57          0.15   0.10   0.29      0.11942285
 DI4581  ------------------------------------------------------------------
 DI4581  Click here for local accuracies and other accuracy information.
 DI4581
 DI4581
 DI4581.The horizontal coordinates were established by GPS observations
 DI4581.and adjusted by the National Geodetic Survey in June 2012.
 DI4581
 DI4581.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 DI4581.been affixed to the stable North American tectonic plate. See
 DI4581.NA2011 for more information.
 DI4581
 DI4581.The horizontal coordinates are valid at the epoch date displayed above
 DI4581.which is a decimal equivalence of Year/Month/Day.
 DI4581
 DI4581.The orthometric height was determined by differential leveling and
 DI4581.adjusted by the NATIONAL GEODETIC SURVEY
 DI4581.in January 2008.
 DI4581
 DI4581.Significant digits in the geoid height do not necessarily reflect accuracy.
 DI4581.GEOID18 height accuracy estimate available here.
 DI4581
 DI4581.Click photographs - Photos may exist for this station.
 DI4581
 DI4581.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 DI4581
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DI4581.The Laplace correction was computed from DEFLEC18 derived deflections.
DI4581
DI4581.The ellipsoidal height was determined by GPS observations
DI4581.and is referenced to NAD 83.
DI4581
DI4581.The dynamic height is computed by dividing the NAVD 88
DI4581.geopotential number by the normal gravity value computed on the
DI4581.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DI4581.degrees latitude (g = 980.6199 gals.).
DI4581
DI4581.The modeled gravity was interpolated from observed gravity values.
DI4581
DI4581. The following values were computed from the NAD 83(2011) position.
DI4581
DI4581;                    North         East     Units Scale Factor Converg.
DI4581;SPC MN C     -   248,476.175   784,724.637   MT  0.99992202   -0 08 36.7
DI4581;SPC MN C     -   815,208.92  2,574,550.75   sFT  0.99992202   -0 08 36.7
DI4581;UTM  15      - 5,132,365.711   388,526.689   MT  0.99975275   -1 02 52.4
DI4581
DI4581!             -  Elev Factor  x  Scale Factor =   Combined Factor
DI4581!SPC MN C     -   0.99994660  x   0.99992202  =   0.99986863
DI4581!UTM  15      -   0.99994660  x   0.99975275  =   0.99969937
DI4581
DI4581_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TUM8852632365(NAD 83)
DI4581
DI4581|----------------------------------------------------------------------|
DI4581| PID    Reference Object                    Distance      Geod. Az  |
DI4581|                                                          dddmmss.s |
DI4581| DF8729 TRELLIS                          381.602 METERS 35925     |
DI4581|----------------------------------------------------------------------|
DI4581
DI4581                          SUPERSEDED SURVEY CONTROL
DI4581
DI4581  NAD 83(2007)-  46 20 08.49340(N)    094 26 54.29033(W) AD(2002.00) 1
DI4581  ELLIP H (06/22/11)  340.678  (m)                       GP(2002.00) 3 2
DI4581  NAD 83(1996)-  46 20 08.49315(N)    094 26 54.28985(W) AD(       ) 1
DI4581  ELLIP H (03/21/07)  340.707  (m)                       GP(       ) 3 2
DI4581  NAVD 88             367.80   (m)         1206.7    (f) LEVELING    3
DI4581
DI4581.Superseded values are not recommended for survey control.
DI4581
DI4581.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DI4581.See file dsdata.pdf to determine how the superseded data were derived.
DI4581
DI4581_MARKER: DD = SURVEY DISK
DI4581_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
DI4581_STAMPING: PAYUP 2005
DI4581_MARK LOGO: MNDT
DI4581_PROJECTION: PROJECTING 25 CENTIMETERS
DI4581_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DI4581_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DI4581_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DI4581+SATELLITE: SATELLITE OBSERVATIONS - June 12, 2006
DI4581_ROD/PIPE-DEPTH: 19.2 meters
DI4581
DI4581  HISTORY     - Date     Condition        Report By
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 DI4581  HISTORY     - 2005     MONUMENTED       MNDT
 DI4581  HISTORY     - 20060612 GOOD             MNDT
 DI4581
 DI4581                          STATION DESCRIPTION
 DI4581
 DI4581'DESCRIBED BY MN DEPT OF TRANSP 2005
 DI4581'1.25 MILES EAST OF PILLAGER, 1.3 MILES EAST ALONG TRUNK HIGHWAY 210
 DI4581'FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 1 IN PILLAGER,
 DI4581'AT TRUNK HIGHWAY 210 MILEPOINT 110.5, 40 FEET EAST OF JANICK TRAIL
 DI4581'SOUTHWEST, 111 FEET NORTH OF TRUNK HIGHWAY 210, 3.0 FEET WEST OF
 DI4581'WITNESS POST.
 DI4581
 DI4581                          STATION RECOVERY (2006)
 DI4581
 DI4581'RECOVERY NOTE BY MN DEPT OF TRANSP 2006 (WS)
 DI4581'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4940 ***********************************************************************
 AC4940  CBN         -  This is a Cooperative Base Network Control Station.
 AC4940  DESIGNATION -  PEMBLE
 AC4940  PID         -  AC4940
 AC4940  STATE/COUNTY-  MN/DAKOTA
 AC4940  COUNTRY     -  US
 AC4940  USGS QUAD   -  ORCHARD LAKE (2019)
 AC4940
 AC4940                         *CURRENT SURVEY CONTROL
 AC4940  ______________________________________________________________________
 AC4940* NAD 83(2011) POSITION- 44 43 49.43756(N) 093 16 56.81810(W)   ADJUSTED
 AC4940* NAD 83(2011) ELLIP HT-   284.271 (meters)        (06/27/12)   ADJUSTED
 AC4940* NAD 83(2011) EPOCH   -  2010.00
 AC4940* NAVD 88 ORTHO HEIGHT -   311.608 (meters)     1022.33  (feet) ADJUSTED
 AC4940  ______________________________________________________________________
 AC4940  GEOID HEIGHT    -        -27.332 (meters)                    GEOID18
 AC4940  NAD 83(2011) X  -   -259,890.938 (meters)                    COMP
 AC4940  NAD 83(2011) Y  - -4,531,481.625 (meters)                    COMP
 AC4940  NAD 83(2011) Z  -  4,466,313.439 (meters)                    COMP
 AC4940  LAPLACE CORR    -         -7.58  (seconds)                   DEFLEC18
 AC4940  DYNAMIC HEIGHT  -        311.590 (meters)     1022.27  (feet) COMP
 AC4940  MODELED GRAVITY -    980,549.8   (mgal)                      NAVD 88
 AC4940
 AC4940  VERT ORDER      -  SECOND    CLASS I
 AC4940
 AC4940  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AC4940  Standards:
 AC4940         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AC4940            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 AC4940  ----------------------------------------------------------------------
 AC4940  NETWORK    0.30   0.67           0.14   0.10   0.34     -0.02472100
 AC4940  ----------------------------------------------------------------------
 AC4940  Click here for local accuracies and other accuracy information.
 AC4940
 AC4940
 AC4940.The horizontal coordinates were established by GPS observations
 AC4940.and adjusted by the National Geodetic Survey in June 2012.
 AC4940
 AC4940.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
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AC4940.been affixed to the stable North American tectonic plate. See
AC4940.NA2011 for more information.
AC4940
AC4940.The horizontal coordinates are valid at the epoch date displayed above
AC4940.which is a decimal equivalence of Year/Month/Day.
AC4940
AC4940.The orthometric height was determined by differential leveling and
AC4940.adjusted by the NATIONAL GEODETIC SURVEY
AC4940.in September 2016.
AC4940
AC4940.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4940.GEOID18 height accuracy estimate available here.
AC4940
AC4940.Click photographs - Photos may exist for this station.
AC4940
AC4940.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4940
AC4940.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4940
AC4940.The ellipsoidal height was determined by GPS observations
AC4940.and is referenced to NAD 83.
AC4940
AC4940.The dynamic height is computed by dividing the NAVD 88
AC4940.geopotential number by the normal gravity value computed on the
AC4940.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4940.degrees latitude (g = 980.6199 gals.).
AC4940
AC4940.The modeled gravity was interpolated from observed gravity values.
AC4940
AC4940. The following values were computed from the NAD 83(2011) position.
AC4940
AC4940;                     North         East     Units Scale Factor Converg.
AC4940;SPC MN S     -   292,517.449   856,836.571   MT  0.99993000   +0 30 10.6
AC4940;SPC MN S     -   959,701.00  2,811,137.98   sFT  0.99993000   +0 30 10.6
AC4940;UTM  15      - 4,953,040.689   477,634.511   MT  0.99960615   -0 11 55.6
AC4940
AC4940!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4940!SPC MN S     -   0.99995543  x   0.99993000  =   0.99988543
AC4940!UTM  15      -   0.99995543  x   0.99960615  =   0.99956160
AC4940
AC4940_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVK7763453040(NAD 83)
AC4940
AC4940                           SUPERSEDED SURVEY CONTROL
AC4940
AC4940  NAD 83(2007)-  44 43 49.43759(N)    093 16 56.81857(W) AD(2002.00) 0
AC4940  ELLIP H (02/10/07)  284.293  (m)                       GP(2002.00)
AC4940  NAD 83(1986)-  44 43 49.42986(N)    093 16 56.81595(W) AD(       ) 1
AC4940  NAD 83(1996)-  44 43 49.43710(N)    093 16 56.81813(W) AD(       ) B
AC4940  ELLIP H (01/15/97)  284.327  (m)                       GP(       ) 4 1
AC4940  NAVD 88 (03/31/14)  311.59   (m)  UNKNOWN model used   GPS OBS
AC4940  NAVD 88 (08/23/10)  311.6    (m)  GEOID09 model used   GPS OBS
AC4940  NAVD 88             311.62   (m)         1022.4    (f) LEVELING    3
AC4940  NAVD 88 (08/23/05)  311.61   (m)  GEOID03 model used   GPS OBS
AC4940  NAVD 88 (08/22/03)  311.6    (m)  UNKNOWN model used   GPS OBS
AC4940  NAVD 88 (09/11/00)  311.7    (m)  GEOID99 model used   GPS OBS
AC4940  NAVD 88 (01/15/97)  311.6    (m)  GEOID96 model used   GPS OBS
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AC4940
AC4940.Superseded values are not recommended for survey control.
AC4940
AC4940.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4940.See file dsdata.pdf to determine how the superseded data were derived.
AC4940
AC4940_MARKER: DH = HORIZONTAL CONTROL DISK
AC4940_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
AC4940_STAMPING: PEMBLE 1992
AC4940_MARK LOGO: MNDT
AC4940_PROJECTION: RECESSED 8 CENTIMETERS
AC4940_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AC4940_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4940_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4940+SATELLITE: SATELLITE OBSERVATIONS - September 08, 2022
AC4940_ROD/PIPE-DEPTH: 15.2 meters
AC4940
AC4940  HISTORY     - Date     Condition        Report By
AC4940  HISTORY     - 19920928 MONUMENTED       MNDT
AC4940  HISTORY     - 19941020 GOOD             MNDT
AC4940  HISTORY     - 19990929 GOOD             MN-037
AC4940  HISTORY     - 20020819 GOOD             MNDT
AC4940  HISTORY     - 20040729 GOOD             MNDT
AC4940  HISTORY     - 20050301 GOOD             MNDT
AC4940  HISTORY     - 20050301 GOOD             MNDT
AC4940  HISTORY     - 20051025 GOOD             MNDT
AC4940  HISTORY     - 20071030 GOOD             MNDT
AC4940  HISTORY     - 20081024 GOOD             MNDT
AC4940  HISTORY     - 20111228 GOOD             MNDT
AC4940  HISTORY     - 20131210 GOOD             MNDT
AC4940  HISTORY     - 20140610 GOOD             MNDT
AC4940  HISTORY     - 20140820 GOOD             MNDT
AC4940  HISTORY     - 20151001 GOOD             MNDT
AC4940  HISTORY     - 20220908 GOOD             MNDT
AC4940
AC4940                          STATION DESCRIPTION
AC4940
AC4940'DESCRIBED BY MN DEPT OF TRANSP 1992 (DKH)
AC4940'THE MARK IS LOCATED IN THE SW PART OF BURNSVILLE, AT JCT OF FAI 35 AND
AC4940'CRYSTAL LAKE RD, AT FAI 35 MP 87.8, 34.8 FT (10.6 M) NE OF CRYSTAL
AC4940'LAKE RD, 34.4 FT (10.5 M) ESE OF SE COR FAI 35 BRDG NO 19804 UNDER
AC4940'CRYSTAL LAKE RD, 1.8 FT (0.5 M) SW OF R/W FENCE, 2.6 FT (0.8 M) NE OF
AC4940'GUARD RAIL, 1.6 FT (0.5 M) SW OF A WIT POST.
AC4940
AC4940                          STATION RECOVERY (1994)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 1994 (DKH)
AC4940'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  RECOVERY NOTE
AC4940'BY DAVID K.  HERDER, TYPED BY G.W.O.
AC4940
AC4940                          STATION RECOVERY (1999)
AC4940
AC4940'RECOVERY NOTE BY DAKOTA COUNTY MINNESOTA 1999 (RGS)
AC4940'RECOVERED AS DESCRIBED IN 1992 (DKH).
AC4940'
AC4940
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AC4940                          STATION RECOVERY (2002)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (MPP)
AC4940'RECOVERED 34.4 FT (10.5 M) ENE OF NE CORNER OF CRYSTAL LAKE ROAD
AC4940'BRIDGE OVER FAI 35, TRAFFIC SIGNAL SIGN NEAR STATION, OTHER TIES OK.
AC4940
AC4940                          STATION RECOVERY (2004)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (MPP)
AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
AC4940'SOUTHWEST OF RIGHT OF WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
AC4940
AC4940                          STATION RECOVERY (2005)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (TW)
AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
AC4940'SOUTHWEST OF RIGHT OF WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
AC4940
AC4940                          STATION RECOVERY (2005)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (TW)
AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
AC4940'SOUTHWEST OF RIGHT OF WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
AC4940
AC4940                          STATION RECOVERY (2005)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (MPP)
AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
AC4940'SOUTHWEST OF RIGHT OF WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
AC4940
AC4940                          STATION RECOVERY (2007)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (DMW)
AC4940'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
AC4940'THE MARK IS IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35
AC4940'MILEPOINT 87.8, 34.8 FEET (10.6 M) NORTHEAST OF CRYSTAL LAKE ROAD,
AC4940'34.4 FEET (10.5 M) EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE
AC4940'(CRYSTAL LAKE ROAD OVER INTERSTATE HIGHWAY 35), 2.6 FEET (0.8 M)
AC4940'NORTHEAST OF GUARDRAIL, 1.8 FEET (0.5 M) SOUTHWEST OF RIGHT OF WAY
AC4940'FENCE, 1.6 FEET (0.5 M) SOUTHWEST OF WITNESS POST.
AC4940
AC4940                          STATION RECOVERY (2008)
AC4940
AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (MPP)
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 AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
 AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
 AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
 AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
 AC4940'SOUTHWEST OF RIGHT-OF-WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
 AC4940
 AC4940                          STATION RECOVERY (2011)
 AC4940
 AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (DB)
 AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
 AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
 AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
 AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
 AC4940'SOUTHWEST OF RIGHT-OF-WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
 AC4940
 AC4940                          STATION RECOVERY (2013)
 AC4940
 AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2013 (KXS)
 AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
 AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
 AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
 AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
 AC4940'SOUTHWEST OF RIGHT-OF-WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
 AC4940
 AC4940                          STATION RECOVERY (2014)
 AC4940
 AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2014 (DAS)
 AC4940'RECOVERED AS DESCRIBED.
 AC4940
 AC4940                          STATION RECOVERY (2014)
 AC4940
 AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2014 (AXD)
 AC4940'RECOVERED AS DESCRIBED.
 AC4940
 AC4940                          STATION RECOVERY (2015)
 AC4940
 AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4940'IN SOUTHWEST PART OF BURNSVILLE, AT INTERSTATE HIGHWAY 35 MILEPOINT
 AC4940'87.8, 34.8 FEET NORTHEAST OF CRYSTAL LAKE ROAD, 34.4 FEET
 AC4940'EAST-NORTHEAST OF NORTHEAST CORNER OF BRIDGE (CRYSTAL LAKE ROAD OVER
 AC4940'INTERSTATE HIGHWAY 35), 2.6 FEET NORTHEAST OF GUARDRAIL, 1.8 FEET
 AC4940'SOUTHWEST OF RIGHT-OF-WAY FENCE, 1.6 FEET SOUTHWEST OF WITNESS POST.
 AC4940
 AC4940                          STATION RECOVERY (2022)
 AC4940
 AC4940'RECOVERY NOTE BY MN DEPT OF TRANSP 2022 (BXG)
 AC4940'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4885 ***********************************************************************
 AC4885  CBN         -  This is a Cooperative Base Network Control Station.
 AC4885  DESIGNATION -  QUINN
 AC4885  PID         -  AC4885
 AC4885  STATE/COUNTY-  MN/STEARNS
 AC4885  COUNTRY     -  US
 AC4885  USGS QUAD   -  CLEARWATER (2019)
 AC4885
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AC4885                          *CURRENT SURVEY CONTROL
AC4885  ______________________________________________________________________
AC4885* NAD 83(2011) POSITION- 45 22 31.94425(N) 094 06 51.57039(W)   ADJUSTED
AC4885* NAD 83(2011) ELLIP HT-   278.388 (meters)        (06/27/12)   ADJUSTED
AC4885* NAD 83(2011) EPOCH    -  2010.00
AC4885* NAVD 88 ORTHO HEIGHT -   305.787 (meters)     1003.24  (feet) ADJUSTED
AC4885  ______________________________________________________________________
AC4885  GEOID HEIGHT    -        -27.407 (meters)                    GEOID18
AC4885  NAD 83(2011) X  -   -322,012.529 (meters)                    COMP
AC4885  NAD 83(2011) Y  - -4,476,611.660 (meters)                    COMP
AC4885  NAD 83(2011) Z  -  4,516,961.294 (meters)                    COMP
AC4885  LAPLACE CORR    -         -3.79  (seconds)                   DEFLEC18
AC4885  DYNAMIC HEIGHT  -        305.772 (meters)     1003.19  (feet) COMP
AC4885  MODELED GRAVITY -    980,558.3   (mgal)                      NAVD 88
AC4885
AC4885  VERT ORDER      -  SECOND    CLASS I
AC4885
AC4885  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC4885  Standards:
AC4885         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AC4885            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
AC4885  ------------------------------------------------------------------
AC4885  NETWORK    0.25   0.45           0.11   0.09   0.23      0.00239294
AC4885  ------------------------------------------------------------------
AC4885  Click here for local accuracies and other accuracy information.
AC4885
AC4885
AC4885.The horizontal coordinates were established by GPS observations
AC4885.and adjusted by the National Geodetic Survey in June 2012.
AC4885
AC4885.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4885.been affixed to the stable North American tectonic plate. See
AC4885.NA2011 for more information.
AC4885
AC4885.The horizontal coordinates are valid at the epoch date displayed above
AC4885.which is a decimal equivalence of Year/Month/Day.
AC4885
AC4885.The orthometric height was determined by differential leveling and
AC4885.adjusted by the NATIONAL GEODETIC SURVEY
AC4885.in February 2010.
AC4885
AC4885.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4885.GEOID18 height accuracy estimate available here.
AC4885
AC4885.Click photographs - Photos may exist for this station.
AC4885
AC4885.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4885
AC4885.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4885
AC4885.The ellipsoidal height was determined by GPS observations
AC4885.and is referenced to NAD 83.
AC4885
AC4885.The dynamic height is computed by dividing the NAVD 88
AC4885.geopotential number by the normal gravity value computed on the
AC4885.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
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AC4885.degrees latitude (g = 980.6199 gals.).
AC4885
AC4885.The modeled gravity was interpolated from observed gravity values.
AC4885
AC4885. The following values were computed from the NAD 83(2011) position.
AC4885
AC4885;                    North         East     Units Scale Factor Converg.
AC4885;SPC MN C     -   141,750.016   810,628.067   MT  1.00006095   +0 05 53.3
AC4885;SPC MN C     -   465,058.18  2,659,535.58   sFT  1.00006095   +0 05 53.3
AC4885;UTM  15      - 5,025,273.421   412,749.808   MT  0.99969360   -0 47 35.3
AC4885
AC4885!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4885!SPC MN C     -   0.99995636  x   1.00006095  =   1.00001730
AC4885!UTM  15      -   0.99995636  x   0.99969360  =   0.99964997
AC4885
AC4885_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL1274925273(NAD 83)
AC4885
AC4885                           SUPERSEDED SURVEY CONTROL
AC4885
AC4885  NAD 83(2007)-  45 22 31.94438(N)    094 06 51.57105(W) AD(2002.00) 0
AC4885  ELLIP H (02/10/07)  278.417  (m)                       GP(2002.00)
AC4885  NAD 83(1996)-  45 22 31.94410(N)    094 06 51.57083(W) AD(       ) B
AC4885  ELLIP H (01/15/97)  278.460  (m)                       GP(       ) 4 1
AC4885  NAVD 88             305.79   (m)          1003.2    (f) LEVELING    3
AC4885  NAVD 88 (08/23/05)  305.79   (m)  UNKNOWN model used   GPS OBS
AC4885  NAVD 88 (11/19/03)  305.8    (m)  UNKNOWN model used   GPS OBS
AC4885  NAVD 88 (08/04/03)  305.8    (m)  UNKNOWN model used   GPS OBS
AC4885  NAVD 88 (07/14/03)  305.8    (m)  GEOID99 model used   GPS OBS
AC4885  NAVD 88 (01/15/97)  305.8    (m)  GEOID96 model used   GPS OBS
AC4885
AC4885.Superseded values are not recommended for survey control.
AC4885
AC4885.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4885.See file dsdata.pdf to determine how the superseded data were derived.
AC4885
AC4885_MARKER: F = FLANGE-ENCASED ROD
AC4885_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AC4885_STAMPING: QUINN 1994
AC4885_MARK LOGO: MNDT
AC4885_PROJECTION: RECESSED 13 CENTIMETERS
AC4885_MAGNETIC: H = BAR MAGNET SET IN DRILL HOLE
AC4885_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4885_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4885+SATELLITE: SATELLITE OBSERVATIONS - February 09, 2021
AC4885_ROD/PIPE-DEPTH: 14.6 meters
AC4885
AC4885  HISTORY     - Date     Condition        Report By
AC4885  HISTORY     - 19940401 MONUMENTED       MNDT
AC4885  HISTORY     - 19960709 GOOD             MNDT
AC4885  HISTORY     - 19960810 GOOD             MNDT
AC4885  HISTORY     - 20010503 GOOD             MNDT
AC4885  HISTORY     - 20030401 GOOD             MNDT
AC4885  HISTORY     - 20040105 GOOD             MNDT
AC4885  HISTORY     - 20040812 GOOD             MNDT
AC4885  HISTORY     - 20050808 GOOD             MNDT
AC4885  HISTORY     - 20060427 GOOD             MNDT
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AC4885  HISTORY     - 20070813 GOOD             MNDT
AC4885  HISTORY     - 20081216 GOOD             MNDT
AC4885  HISTORY     - 20120118 GOOD             MNDT
AC4885  HISTORY     - 20151001 GOOD             MNDT
AC4885  HISTORY     - 20180105 GOOD             MNDT
AC4885  HISTORY     - 20190701 GOOD             MNDT
AC4885  HISTORY     - 20210209 GOOD             MNDT
AC4885
AC4885                          STATION DESCRIPTION
AC4885
AC4885'DESCRIBED BY MN DEPT OF TRANSP 1994
AC4885'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
AC4885'LOCATED ABOUT 4 MI (6.4 KM) SW OF THE TOWN OF CLEARWATER IN THE NW 1/4
AC4885'OF SECTION 17, T122N, R27W.  TO REACH THE MARK FROM THE JCT OF FAI 94
AC4885'AND TH 24 IN CLEARWATER, GO SOUTH ON TH 24 FOR 2.0 MI (3.2 KM) TO TH
AC4885'24 MP 41.95, THEN GO WEST FOR 0.55 MI (0.89 KM) ON CO RD 40, THEN GO
AC4885'WEST FOR 0.9 MI (1.4 KM) ON CO RD 46, THEN GO WEST AND SOUTH ON CO RD
AC4885'145 FOR 1.3 MI (2.1 KM) TO THE MARK ON THE LEFT.  THE MARK IS 60 FT
AC4885'(18.3 M) EAST OF CO RD 145, 12 FT (3.7 M) SOUTH OF A FIELD ENT, 167.4
AC4885'FT (51.0 M) NE OF A P-POLE, 117.5 FT (35.8 M) SE OF A NO PASSING SIGN
AC4885'POST, 26 FT (7.9 M) EAST END OF THE SOUTH END OF A 15 INCH METAL
AC4885'CULVERT, AND 3.4 FT (1.0 M) NORTH OF A WIT POST.  THE MARK IS A PUNCH
AC4885'MARK ON THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 48 FT (14.6 M) LONG
AC4885'STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE.
AC4885'ACCESS TO THE DATUM POINT IS THROUGH A 5 INCH LOGO CAP THAT IS FLUSH
AC4885'WITH THE GROUND, STAMPED---QUINN 1994---, SET ON TOP OF A 5 INCH
AC4885'DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND AND
AC4885'SET IN CONCRETE.  A METAL SPIKE WAS PLACED IN THE SILICA SAND MAKING
AC4885'THE MARK MAGNETIC.  DESCRIBED BY DAVID K. HERDER, TYPED BY J.E.M.
AC4885
AC4885                          STATION RECOVERY (1996)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 1996 (GWO)
AC4885'RECOVERED AS DESCRIBED.
AC4885
AC4885                          STATION RECOVERY (1996)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 1996 (MPP)
AC4885'RECOVERED AS DESCRIBED.
AC4885
AC4885                          STATION RECOVERY (2001)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (WAS)
AC4885'THE MARK WAS RECOVERED AS DESCRIBED.
AC4885
AC4885                          STATION RECOVERY (2003)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (WAS)
AC4885'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.
AC4885
AC4885                          STATION RECOVERY (2004)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CL)
AC4885'4 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY
AC4885'24 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN
AC4885'CLEARWATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95, THEN 0.55 MILES WEST
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AC4885'ON COUNTY ROAD 40, THEN 0.9 MILES WEST ON COUNTY ROAD 46, THEN 1.3
AC4885'MILES WEST AND SOUTH ON COUNTY ROAD 145, 60.0 FEET EAST OF COUNTY ROAD
AC4885'145, 167.4 FEET NORTHEAST OF POWER POLE, 117.5 FEET SOUTHEAST OF NO
AC4885'PASSING SIGN POST, 26 FEET EAST OF SOUTH END OF 15 INCH METAL CULVERT,
AC4885'12 FEET SOUTH OF FIELD ENTRANCE, 3.4 FEET NORTH OF WITNESS POST.
AC4885
AC4885                          STATION RECOVERY (2004)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (JW)
AC4885'4 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY 2
AC4885'4 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN CLEAR
AC4885'WATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95 THEN 0.55 MILES WEST ON COUN
AC4885'TY ROAD 40 THEN 0.9 MILES WEST ON COUNTY ROAD 46 THEN 1.3 MILES WEST A
AC4885'ND SOUTH ON COUNTY ROAD 145, 60.0 FEET EAST OF COUNTY ROAD 145, 12 FEE
AC4885'T SOUTH OF FIELD ENTRANCE, 167.4 FEET NORTHEAST OF POWER POLE, 117.5 F
AC4885'EET SOUTHEAST OF NO PASSING SIGN POST, 26 FEET EAST OF SOUTH END OF 15
AC4885'INCH METAL CULVERT, 3.4 FEET NORTH OF WITNESS POST.
AC4885
AC4885                          STATION RECOVERY (2005)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (MPP)
AC4885'4 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY 2
AC4885'4 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN CLEAR
AC4885'WATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95, THEN 0.55 MILES WEST ON COU
AC4885'NTY ROAD 40, THEN 0.9 MILES WEST ON COUNTY ROAD 46, THEN 1.3 MILES WES
AC4885'T AND SOUTH ON COUNTY ROAD 145, 60.0 FEET EAST OF COUNTY ROAD 145, 167
AC4885'.4 FEET NORTHEAST OF POWER POLE, 117.5 FEET SOUTHEAST OF NO PASSING SI
AC4885'GN POST, 26 FEET EAST OF SOUTH END OF 15 INCH METAL CULVERT, 12 FEET S
AC4885'OUTH OF FIELD ENTRANCE, 3.4 FEET NORTH OF WITNESS POST.
AC4885
AC4885                          STATION RECOVERY (2006)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2006 (MPP)
AC4885'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
AC4885'THE MARK IS 4 MILES (6.4 KM) SOUTHWEST OF CLEARWATER, 2.0 MILES (3.2
AC4885'KM) SOUTH ALONG TRUNK HIGHWAY 24 FROM JUNCTION OF INTERSTATE HIGHWAY
AC4885'94 AND TRUNK HIGHWAY 24 IN CLEAR WATER TO TRUNK HIGHWAY 24 MILEPOINT
AC4885'41.95, THENCE 0.55 MILES (0.89 KM) WEST ON COUNTY ROAD 40, THENCE 0.9
AC4885'MILES (1.4 KM) WEST ON COUNTY ROAD 46, THENCE 1.3 MILES (2.1 KM) WEST
AC4885'AND SOUTH ON COUNTY ROAD 145, 60.0 FEET (18.3 M) EAST   OF COUNTY ROAD
AC4885'145, 167.4 FEET (51.0 M) NORTHEAST OF POWER POLE, 117.5 FEET (35.8 M)
AC4885'SOUTHEAST OF NO PASSING SIGN POST, 26 FEET (7.9 M) EAST OF SOUTH END
AC4885'OF 15 INCH METAL CULVERT, 12 FEET (3.7 M) SOUTH OF FIELD ENTRANCE, 3.4
AC4885'FEET (1.0 M) NORTH OF WITNESS POST.
AC4885
AC4885                          STATION RECOVERY (2007)
AC4885
AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (WAS)
AC4885'4 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY
AC4885'24 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN
AC4885'CLEARWATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95, THEN 0.55 MILES WEST
AC4885'ON COUNTY ROAD 40 TO WRIGHT/STEARNS COUNTY LINE THEN CONTINUE 0.9
AC4885'MILES WEST ON COUNTY ROAD 46, THEN 1.3 MILES WEST AND SOUTH ON COUNTY
AC4885'ROAD 145, 60.0 FEET EAST OF COUNTY ROAD 145, 167.4 FEET NORTHEAST OF
AC4885'POWER POLE, 117.5 FEET SOUTHEAST OF NO PASSING SIGN POST, 26 FEET EAST
AC4885'OF SOUTH END OF 15 INCH METAL CULVERT, 12 FEET SOUTH OF FIELD
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 AC4885'ENTRANCE, 3.4 FEET NORTH OF WITNESS POST.
 AC4885
 AC4885                          STATION RECOVERY (2008)
 AC4885
 AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (DKH)
 AC4885'4.0 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY
 AC4885'24 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN
 AC4885'CLEARWATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95, THEN 0.55 MILE WEST ON
 AC4885'COUNTY ROAD 40 TO WRIGHT/STEARNS COUNTY LINE, THEN CONTINUE 0.9 MILE
 AC4885'WEST ON COUNTY ROAD 46, THEN 1.3 MILES WEST AND SOUTH ON COUNTY ROAD
 AC4885'145, 60.0 FEET EAST OF COUNTY ROAD 145, 167.4 FEET NORTHEAST OF POWER
 AC4885'POLE, 117.5 FEET SOUTHEAST OF NO PASSING SIGN POST, 26 FEET EAST OF
 AC4885'SOUTH END OF 15 INCH METAL CULVERT, 12 FEET SOUTH OF FIELD ENTRANCE,
 AC4885'3.4 FEET NORTH OF WITNESS POST.
 AC4885
 AC4885                          STATION RECOVERY (2012)
 AC4885
 AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2012 (KXS)
 AC4885'4.0 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY
 AC4885'24 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN
 AC4885'CLEARWATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95, THEN 0.55 MILE WEST ON
 AC4885'COUNTY ROAD 40 TO WRIGHT/STEARNS COUNTY LINE, THEN 0.9 MILE WEST ON
 AC4885'COUNTY ROAD 46, THEN 1.3 MILES WEST AND SOUTH ON COUNTY ROAD 145, 60.0
 AC4885'FEET EAST OF COUNTY ROAD 145, 167.4 FEET NORTHEAST OF POWER POLE,
 AC4885'117.5 FEET SOUTHEAST OF NO PASSING SIGN POST, 26 FEET EAST OF SOUTH
 AC4885'END OF 15 INCH METAL CULVERT, 12 FEET SOUTH OF FIELD ENTRANCE, 3.4
 AC4885'FEET NORTH OF WITNESS POST.
 AC4885
 AC4885                          STATION RECOVERY (2015)
 AC4885
 AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4885'4.0 MILES SOUTHWEST OF CLEARWATER, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY
 AC4885'24 FROM JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 24 IN
 AC4885'CLEARWATER TO TRUNK HIGHWAY 24 MILEPOINT 41.95, THEN 0.55 MILE WEST ON
 AC4885'COUNTY ROAD 40 TO WRIGHT/STEARNS COUNTY LINE, THEN 0.9 MILE WEST ON
 AC4885'COUNTY ROAD 46, THEN 1.3 MILES WEST AND SOUTH ON COUNTY ROAD 145, 60.0
 AC4885'FEET EAST OF COUNTY ROAD 145, 167.4 FEET NORTHEAST OF POWER POLE,
 AC4885'117.5 FEET SOUTHEAST OF NO PASSING SIGN POST, 26 FEET EAST OF SOUTH
 AC4885'END OF 15 INCH METAL CULVERT, 12 FEET SOUTH OF FIELD ENTRANCE, 3.4
 AC4885'FEET NORTH OF WITNESS POST.
 AC4885
 AC4885                          STATION RECOVERY (2018)
 AC4885
 AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (DXK)
 AC4885'RECOVERED IN GOOD CONDITION.
 AC4885
 AC4885                          STATION RECOVERY (2019)
 AC4885
 AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2019 (MAS)
 AC4885'RECOVERED AS DESCRIBED.
 AC4885
 AC4885                          STATION RECOVERY (2021)
 AC4885
 AC4885'RECOVERY NOTE BY MN DEPT OF TRANSP 2021 (MPP)
 AC4885'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
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DH7816 ***********************************************************************
DH7816  DESIGNATION -  RAGE
DH7816  PID         -  DH7816
DH7816  STATE/COUNTY-  MN/MORRISON
DH7816  COUNTRY     -  US
DH7816  USGS QUAD   -  HILLMAN (2019)
DH7816
DH7816                        *CURRENT SURVEY CONTROL
DH7816  ______________________________________________________________________
DH7816* NAD 83(2011) POSITION- 46 04 20.47976(N) 093 53 34.61489(W)   ADJUSTED
DH7816* NAD 83(2011) ELLIP HT-   368.174 (meters)        (08/04/22)   ADJUSTED
DH7816* NAD 83(2011) EPOCH   -  2010.00
DH7816* NAVD 88 ORTHO HEIGHT -   395.242 (meters)     1296.72  (feet) ADJUSTED
DH7816  ______________________________________________________________________
DH7816  GEOID HEIGHT    -        -27.062 (meters)                     GEOID18
DH7816  NAD 83(2011) X  -   -300,952.994 (meters)                     COMP
DH7816  NAD 83(2011) Y  - -4,422,558.713 (meters)                     COMP
DH7816  NAD 83(2011) Z  -  4,571,095.813 (meters)                     COMP
DH7816  LAPLACE CORR    -         -2.55  (seconds)                    DEFLEC18
DH7816  DYNAMIC HEIGHT  -        395.247 (meters)     1296.74  (feet) COMP
DH7816  MODELED GRAVITY -    980,616.3   (mgal)                       NAVD 88
DH7816
DH7816  VERT ORDER      -  SECOND    CLASS I
DH7816
DH7816  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
DH7816  Standards:
DH7816         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
DH7816            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
DH7816  ----------------------------------------------------------------------
DH7816  NETWORK    0.71   0.94           0.32   0.25   0.48     -0.01940952
DH7816  ----------------------------------------------------------------------
DH7816  Click here for local accuracies and other accuracy information.
DH7816
DH7816
DH7816.The horizontal coordinates were established by GPS observations
DH7816.and adjusted by the MN DEPT OF TRANSP in August 2022.
DH7816
DH7816.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
DH7816.been affixed to the stable North American tectonic plate. See
DH7816.NA2011 for more information.
DH7816
DH7816.The horizontal coordinates are valid at the epoch date displayed above
DH7816.which is a decimal equivalence of Year/Month/Day.
DH7816
DH7816.The orthometric height was determined by differential leveling and
DH7816.adjusted by the NATIONAL GEODETIC SURVEY
DH7816.in April 2021.
DH7816
DH7816.Significant digits in the geoid height do not necessarily reflect accuracy.
DH7816.GEOID18 height accuracy estimate available here.
DH7816
DH7816.Click photographs - Photos may exist for this station.
DH7816
DH7816.The X, Y, and Z were computed from the position and the ellipsoidal ht.
DH7816
DH7816.The Laplace correction was computed from DEFLEC18 derived deflections.
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DH7816
DH7816.The ellipsoidal height was determined by GPS observations
DH7816.and is referenced to NAD 83.
DH7816
DH7816.The dynamic height is computed by dividing the NAVD 88
DH7816.geopotential number by the normal gravity value computed on the
DH7816.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DH7816.degrees latitude (g = 980.6199 gals.).
DH7816
DH7816.The modeled gravity was interpolated from observed gravity values.
DH7816
DH7816. The following values were computed from the NAD 83(2011) position.
DH7816
DH7816;                    North         East     Units Scale Factor Converg.
DH7816;SPC MN C     -   219,250.167   827,620.348   MT  0.99993247   +0 15 29.8
DH7816;SPC MN C     -   719,323.26  2,715,284.43   sFT  0.99993247   +0 15 29.8
DH7816;UTM  15      - 5,102,474.291   430,947.207   MT  0.99965862   -0 38 35.3
DH7816
DH7816!             -  Elev Factor  x  Scale Factor =   Combined Factor
DH7816!SPC MN C     -   0.99994229  x   0.99993247  =   0.99987476
DH7816!UTM  15      -   0.99994229  x   0.99965862  =   0.99960093
DH7816
DH7816:                Primary Azimuth Mark                    Grid Az
DH7816:SPC MN C     -  ROID                                    357 04 50.1
DH7816:UTM  15      -  ROID                                    357 58 55.2
DH7816
DH7816_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVM3094702474(NAD 83)
DH7816
DH7816|---------------------------------------------------------------------|
DH7816| PID    Reference Object                    Distance      Geod. Az   |
DH7816|                                                          dddmmss.s |
DH7816| DH7818 ROID                              APPROX. 0.6 KM 3572019.9 |
DH7816|---------------------------------------------------------------------|
DH7816
DH7816                          SUPERSEDED SURVEY CONTROL
DH7816
DH7816  NAD 83(2011)-  46 04 20.48005(N)    093 53 34.61378(W) AD(2010.00) 0
DH7816  ELLIP H (06/27/12)  368.183  (m)                       GP(2010.00)
DH7816  NAD 83(2007)-  46 04 20.48016(N)    093 53 34.61477(W) AD(2002.00) 1
DH7816  ELLIP H (08/05/10)  368.211  (m)                       GP(2002.00) 3 2
DH7816  NAD 83(1996)-  46 04 20.47988(N)    093 53 34.61423(W) AD(       ) 1
DH7816  ELLIP H (01/20/06)  368.248  (m)                       GP(       ) 3 2
DH7816  NAVD 88             395.24   (m)         1296.7    (f) LEVELING    3
DH7816
DH7816.Superseded values are not recommended for survey control.
DH7816
DH7816.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DH7816.See file dsdata.pdf to determine how the superseded data were derived.
DH7816
DH7816_MARKER: DD = SURVEY DISK
DH7816_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
DH7816_STAMPING: RAGE 2005
DH7816_MARK LOGO: MNDT
DH7816_PROJECTION: FLUSH
DH7816_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DH7816_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
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 DH7816_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
 DH7816+SATELLITE: SATELLITE OBSERVATIONS - June 15, 2022
 DH7816_ROD/PIPE-DEPTH:  4.3 meters
 DH7816
 DH7816  HISTORY     - Date     Condition        Report By
 DH7816  HISTORY     - 2005     MONUMENTED       MNDT
 DH7816  HISTORY     - 20170725 GOOD             MNDT
 DH7816  HISTORY     - 20200813 GOOD             MNDT
 DH7816  HISTORY     - 20210831 GOOD             MNDT
 DH7816  HISTORY     - 20220615 GOOD             MNDT
 DH7816
 DH7816                          STATION DESCRIPTION
 DH7816
 DH7816'DESCRIBED BY MN DEPT OF TRANSP 2005
 DH7816'5.0 MILES SOUTH OF SULLIVAN, 0.35 MILES SOUTH ALONG COUNTY ROAD 8 FROM
 DH7816'THE JUNCTION OF TRUNK HIGHWAY 27 AND COUINTY ROAD 8 SOUTH OF SULLIVAN
 DH7816'AT STORAGE RANCH, 22.2 FEET WEST OF COUNTY ROAD 8, 13.9 FEET SOUTH OF
 DH7816'FIELD ENTRANCE, 1.0 FEET EAST OF WITNESS POST
 DH7816
 DH7816                          STATION RECOVERY (2017)
 DH7816
 DH7816'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (MAS)
 DH7816'4.65 MI (7.48 KM) NORTH OF HILLMAN, 0.35 MI (0.56 KM) SOUTH ALONG
 DH7816'COUNTY ROAD 8 FROM THE JUNCTION OF TRUNK HIGHWAY 27 AND COUINTY ROAD 8
 DH7816'(THE JUNCTION IS 5.0 MI (8.0 KM) NORTH OF HILLMAN), 22.2 FT (6.8 M)
 DH7816'WEST OF COUNTY ROAD 8, 13.9 FT (4.2 M) SOUTH OF A FIELD ENTRANCE, 1.0
 DH7816'FT (0.3 M) EAST OF A WITNESS POST.
 DH7816
 DH7816                          STATION RECOVERY (2020)
 DH7816
 DH7816'RECOVERY NOTE BY MN DEPT OF TRANSP 2020 (DAS)
 DH7816'RECOVERED IN GOOD CONDITION.
 DH7816
 DH7816                          STATION RECOVERY (2021)
 DH7816
 DH7816'RECOVERY NOTE BY MN DEPT OF TRANSP 2021 (KMS)
 DH7816'4.65 MI (7.48 KM) NORTH OF HILLMAN, 0.35 MI (0.56 KM) SOUTH ALONG
 DH7816'COUNTY ROAD 8 FROM THE JUNCTION OF TRUNK HIGHWAY 27 AND COUNTY ROAD 8
 DH7816'(THE JUNCTION IS 5.0 MI (8.0 KM) NORTH OF HILLMAN), 22.2 FT (6.8 M)
 DH7816'WEST OF COUNTY ROAD 8, 13.9 FT (4.2 M) SOUTH OF A FIELD ENTRANCE, 1.0
 DH7816'FT (0.3 M) EAST OF A WITNESS POST.
 DH7816
 DH7816                          STATION RECOVERY (2022)
 DH7816
 DH7816'RECOVERY NOTE BY MN DEPT OF TRANSP 2022 (MPP)
 DH7816'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AB9786 ***********************************************************************
 AB9786  CBN         -  This is a Cooperative Base Network Control Station.
 AB9786  DESIGNATION -  SCHMITTY
 AB9786  PID         -  AB9786
 AB9786  STATE/COUNTY-  MN/HENNEPIN
 AB9786  COUNTRY     -  US
 AB9786  USGS QUAD   -  MINNEAPOLIS SOUTH (2019)
 AB9786
 AB9786                        *CURRENT SURVEY CONTROL
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AB9786  ____________________________________________________________________
AB9786* NAD 83(2011) POSITION- 44 59 02.72106(N) 093 19 03.62716(W)   ADJUSTED
AB9786* NAD 83(2011) ELLIP HT-   231.831 (meters)        (01/09/18)   ADJUSTED
AB9786* NAD 83(2011) EPOCH    -  2010.00
AB9786* NAVD 88 ORTHO HEIGHT -   258.936 (meters)      849.53  (feet) ADJUSTED
AB9786  ____________________________________________________________________
AB9786  GEOID HEIGHT    -        -27.086 (meters)                     GEOID18
AB9786  NAD 83(2011) X  -   -261,523.793 (meters)                     COMP
AB9786  NAD 83(2011) Y  - -4,511,431.185 (meters)                     COMP
AB9786  NAD 83(2011) Z  -  4,486,261.816 (meters)                     COMP
AB9786  LAPLACE CORR    -         -3.47  (seconds)                    DEFLEC18
AB9786  DYNAMIC HEIGHT  -        258.931 (meters)      849.51  (feet) COMP
AB9786  MODELED GRAVITY -    980,588.4   (mgal)                       NAVD 88
AB9786
AB9786  VERT ORDER      -  SECOND    CLASS I
AB9786
AB9786  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AB9786  Standards:
AB9786         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AB9786            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
AB9786  ------------------------------------------------------------------
AB9786  NETWORK    0.45   0.92           0.21   0.15   0.47      0.07680761
AB9786  ------------------------------------------------------------------
AB9786  Click here for local accuracies and other accuracy information.
AB9786
AB9786
AB9786.The horizontal coordinates were established by GPS observations
AB9786.and adjusted by the MN DEPT OF TRANSP in January 2018.
AB9786
AB9786.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AB9786.been affixed to the stable North American tectonic plate. See
AB9786.NA2011 for more information.
AB9786
AB9786.The horizontal coordinates are valid at the epoch date displayed above
AB9786.which is a decimal equivalence of Year/Month/Day.
AB9786
AB9786.The orthometric height was determined by differential leveling and
AB9786.adjusted by the NATIONAL GEODETIC SURVEY
AB9786.in September 2016.
AB9786
AB9786.Significant digits in the geoid height do not necessarily reflect accuracy.
AB9786.GEOID18 height accuracy estimate available here.
AB9786
AB9786.Click photographs - Photos may exist for this station.
AB9786
AB9786.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AB9786
AB9786.The Laplace correction was computed from DEFLEC18 derived deflections.
AB9786
AB9786.The ellipsoidal height was determined by GPS observations
AB9786.and is referenced to NAD 83.
AB9786
AB9786.The dynamic height is computed by dividing the NAVD 88
AB9786.geopotential number by the normal gravity value computed on the
AB9786.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AB9786.degrees latitude (g = 980.6199 gals.).
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AB9786
AB9786.The modeled gravity was interpolated from observed gravity values.
AB9786
AB9786. The following values were computed from the NAD 83(2011) position.
AB9786
AB9786;                    North         East     Units Scale Factor Converg.
AB9786;SPC MN S     -   320,683.242   853,811.204   MT  0.99995749   +0 28 41.7
AB9786;SPC MN S     - 1,052,108.27  2,801,212.26   sFT  0.99995749   +0 28 41.7
AB9786;UTM  15      - 4,981,231.993   474,955.484   MT  0.99960771   -0 13 28.4
AB9786
AB9786!             -  Elev Factor  x  Scale Factor =   Combined Factor
AB9786!SPC MN S     -   0.99996365  x   0.99995749  =   0.99992114
AB9786!UTM  15      -   0.99996365  x   0.99960771  =   0.99957138
AB9786
AB9786:                Primary Azimuth Mark                    Grid Az
AB9786:SPC MN S     -  IDS MPLS NW MAST                       103 38 25.3
AB9786:UTM  15      -  IDS MPLS NW MAST                       104 20 35.4
AB9786
AB9786_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVK7495581231(NAD 83)
AB9786
AB9786|----------------------------------------------------------------------|
AB9786| PID    Reference Object                    Distance      Geod. Az   |
AB9786|                                                          dddmmss.s  |
AB9786| AE9014 IDS MPLS NW MAST                  APPROX. 3.7 KM 1040707.0  |
AB9786| AE9015 IDS MPLS SE MAST                  APPROX. 3.7 KM 1041538.8  |
AB9786| AE9057 SCHMITTY RM 1                      18.306 METERS 14103      |
AB9786| AE9058 SCHMITTY RM 2                      17.320 METERS 21929      |
AB9786|----------------------------------------------------------------------|
AB9786
AB9786                          SUPERSEDED SURVEY CONTROL
AB9786
AB9786  NAD 83(2011)-  44 59 02.72029(N)    093 19 03.62706(W) AD(2010.00) 0
AB9786  ELLIP H (06/27/12)  231.892  (m)                       GP(2010.00)
AB9786  NAD 83(2007)-  44 59 02.71960(N)    093 19 03.62737(W) AD(2002.00) 0
AB9786  ELLIP H (02/10/07)  231.947  (m)                       GP(2002.00)
AB9786  ELLIP H (08/23/05)  231.971  (m)                       GP(       ) 4 2
AB9786  NAD 83(1996)-  44 59 02.71972(N)    093 19 03.62686(W) AD(       ) B
AB9786  ELLIP H (12/01/04)  231.987  (m)                       GP(       ) 4 1
AB9786  NAD 83(1986)-  44 59 02.71162(N)    093 19 03.62140(W) AD(       ) 1
AB9786  NAD 83(1996)-  44 59 02.71891(N)    093 19 03.62678(W) AD(       ) B
AB9786  ELLIP H (01/15/97)  232.038  (m)                       GP(       ) 4 1
AB9786  NAVD 88             258.95   (m)          849.6    (f) LEVELING    3
AB9786  NAVD 88 (05/05/10)  258.982  (m)          849.68   (f) SUPERSEDED  2 1
AB9786  NAVD 88             258.98   (m)          849.7    (f) LEVELING    3
AB9786  NAVD 88 (08/23/05)  259.00   (m)  UNKNOWN model used   GPS OBS
AB9786  NAVD 88 (12/01/04)  259.0    (m)  GEOID03 model used   GPS OBS
AB9786  NAVD 88 (01/15/97)  259.1    (m)  GEOID96 model used   GPS OBS
AB9786
AB9786.Superseded values are not recommended for survey control.
AB9786
AB9786.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AB9786.See file dsdata.pdf to determine how the superseded data were derived.
AB9786
AB9786_MARKER: DH = HORIZONTAL CONTROL DISK
AB9786_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
AB9786_STAMPING: SCHMITTY 1987
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AB9786_MARK LOGO: MNDT
AB9786_PROJECTION: FLUSH
AB9786_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AB9786_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AB9786_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AB9786+SATELLITE: SATELLITE OBSERVATIONS - March 02, 2016
AB9786_ROD/PIPE-DEPTH:  8.5 meters
AB9786
AB9786  HISTORY     - Date     Condition        Report By
AB9786  HISTORY     - 19870401 MONUMENTED       MNDT
AB9786  HISTORY     - 19880601 GOOD             MNDT
AB9786  HISTORY     - 19950601 GOOD             MNDT
AB9786  HISTORY     - 19950905 GOOD             MNDT
AB9786  HISTORY     - 20040414 GOOD             MNDT
AB9786  HISTORY     - 20040909 GOOD             MNDT
AB9786  HISTORY     - 20051114 GOOD             MNDT
AB9786  HISTORY     - 20070717 GOOD             MNDT
AB9786  HISTORY     - 20070813 GOOD             MNDT
AB9786  HISTORY     - 20080506 GOOD             MNDT
AB9786  HISTORY     - 20081106 GOOD             MNDT
AB9786  HISTORY     - 20111228 GOOD             MNDT
AB9786  HISTORY     - 20130808 GOOD             MNDT
AB9786  HISTORY     - 20140604 GOOD             MNDT
AB9786  HISTORY     - 20151001 GOOD             MNDT
AB9786  HISTORY     - 20160302 GOOD             MNDT
AB9786
AB9786                          STATION DESCRIPTION
AB9786
AB9786'DESCRIBED BY MN DEPT OF TRANSP 1987 (DKH)
AB9786'THE STATION IS LOCATED IN THE WEST PART OF THE TOWN OF MINNEAPOLIS, IN
AB9786'THE NE 1/4 OF SECTION 20, T118N, R24W, ON THE NORTH SIDE OF TRUNK
AB9786'HIGHWAY 55, 0.45 MILE (0.72 KM) WEST OF PENN AVENUE. THE STATION MARK,
AB9786'A STANDARD MNDT ALUMINUM HORIZONTAL CONTROL MONUMENT DISK
AB9786'STAMPED---SCHMITTY 1987---, IS SET ON THE TOP OF A DRIVEN 3/4 INCH
AB9786'DIAMETER ALUMINUM ROD THAT IS FLUSH WITH THE SURFACE OF THE GROUND.
AB9786'THE MARK IS 31.0 FEET (9.4 M) NORTH OF THE CENTERLINE OF THE WESTBOUND
AB9786'LANE OF TRUNK HIGHWAY 55, 7.8 FEET (2.4 M) NORTH OF THE FACE OF THE
AB9786'CURB ON THE NORTH SIDE OF TRUNK HIGHWAY 55, 160.6 FEET (49.0 M) WEST
AB9786'OF THE WEST END OF THE TRUNK HIGHWAY 55 BRIDGE OVER THE BURLINGTON
AB9786'NORTHERN AND SOO LINE RAILROAD TRACKS, AND 4.7 FEET (1.4 M)
AB9786'NORTH-NORTHEAST OF A STEEL WITNESS POST. REFERENCE MARK NUMBER 1, A
AB9786'STANDARD MNDT ALUMINUM REFERENCE MARK DISK STAMPED---SCHMITTY NO 1
AB9786'1987---, IS SET FLUSH IN A DRILL HOLE IN THE TOP OF THE CURB ON THE
AB9786'SOUTH SIDE OF THE WESTBOUND LANE OF TRUNK HIGHWAY 55.  THE MARK IS 0.3
AB9786'FOOT (9.1 CM) SOUTH OF THE FACE OF THE CURB AND 57.1 FEET (17.4 M)
AB9786'SOUTHEAST OF A STEEL WITNESS POST NEAR THE STATION MARK. REFERENCE
AB9786'MARK NUMBER 2, A STANDARD MNDT ALUMINUM REFERENCE MARK DISK
AB9786'STAMPED---SCHMITTY NO 2 1987---, IS SET FLUSH IN A DRILL HOLE IN THE
AB9786'TOP OF THE CURB ON THE SOUTH SIDE OF THE WESTBOUND LANE OF TRUNK
AB9786'HIGHWAY 55.  THE MARK IS 0.4 FOOT (12.2 CM) SOUTH OF THE FACE OF THE
AB9786'CURB AND 52.9 FEET (16.1 M) SOUTHWEST OF A STEEL WITNESS POST NEAR THE
AB9786'STATION MARK. A MAGNET IN THE DISKS MAKES ALL OF THE MARKS MAGNETIC.
AB9786
AB9786                          STATION RECOVERY (1988)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 1988 (DKH)
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AB9786'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED IN 1987.
AB9786
AB9786                          STATION RECOVERY (1995)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 1995 (DKH)
AB9786'DESCRIBED BY MNDT 1987 THE STATION IS LOCATED IN THE WEST PART OF THE
AB9786'TOWN OF MINNEAPOLIS, IN THE NE 1/4 OF SECTION 20, T118N, R24W, ON THE
AB9786'NORTH SIDE OF TRUNK HIGHWAY 55, 0.45 MILE (0.72 KM) WEST OF PENN
AB9786'AVENUE. THE STATION MARK, A STANDARD MNDT ALUMINUM HORIZONTAL CONTROL
AB9786'MONUMENT DISK STAMPED---SCHMITTY 1987---, IS SET ON THE TOP OF A
AB9786'DRIVEN 3/4 INCH DIAMETER ALUMINUM ROD THAT IS FLUSH WITH THE SURFACE
AB9786'OF THE GROUND.  THE MARK IS 31.0 FEET (9.4 M) NORTH OF THE CENTERLINE
AB9786'OF THE WESTBOUND LANE OF TRUNK HIGHWAY 55, 7.8 FEET (2.4 M) NORTH OF
AB9786'THE FACE OF THE CURB ON THE NORTH SIDE OF TRUNK HIGHWAY 55, 160.6 FEET
AB9786'(49.0 M) WEST OF THE WEST END OF THE TRUNK HIGHWAY 55 BRIDGE OVER THE
AB9786'BURLINGTON NORTHERN AND SOO LINE RAILROAD TRACKS, AND 4.7 FEET (1.4 M)
AB9786'NORTH-NORTHEAST OF A STEEL WITNESS POST. REFERENCE MARK NUMBER 1, A
AB9786'STANDARD MNDT ALUMINUM REFERENCE MARK DISK STAMPED---SCHMITTY NO 1
AB9786'1987---, IS SET FLUSH IN A DRILL HOLE IN THE TOP OF THE CURB ON THE
AB9786'SOUTH SIDE OF THE WESTBOUND LANE OF TRUNK HIGHWAY 55.  THE MARK IS 0.3
AB9786'FOOT (9.1 CM) SOUTH OF THE FACE OF THE CURB AND 57.1 FEET (17.4 M)
AB9786'SOUTHEAST OF A STEEL WITNESS POST NEAR THE STATION MARK. REFERENCE
AB9786'MARK NUMBER 2, A STANDARD MNDT ALUMINUM REFERENCE MARK DISK
AB9786'STAMPED---SCHMITTY NO 2 1987---, IS SET FLUSH IN A DRILL HOLE IN THE
AB9786'TOP OF THE CURB ON THE SOUTH SIDE OF THE WESTBOUND LANE OF TRUNK
AB9786'HIGHWAY 55.  THE MARK IS 0.4 FOOT (12.2 CM) SOUTH OF THE FACE OF THE
AB9786'CURB AND 52.9 FEET (16.1 M) SOUTHWEST OF A STEEL WITNESS POST NEAR THE
AB9786'STATION MARK. A MAGNET IN THE DISKS MAKES ALL OF THE MARKS MAGNETIC.
AB9786'RECOVERED BY MNDT 1988. RECOVERED BY MNDT 1995. THE STATION MARK WAS
AB9786'RECOVERED IN GOOD CONDITION AS DESCRIBED IN 1987. THE REFERENCE MARKS
AB9786'WERE SEARCHED FOR, NOT FOUND, AND PRESUMED LOST. THE TIES PLACE THEM
AB9786'IN THE ROAD.
AB9786
AB9786                          STATION RECOVERY (1995)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 1995 (JEM)
AB9786'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  A NEW WIT POST
AB9786'WAS SET 4.3 FT (1.3 M) NORTH OF THE MARK.  THE REFERENCE MARKS WERE
AB9786'LOOKED FOR, NOT FOUND, AND PRESUMED LOST AS THE TIES PUT THEM IN THE
AB9786'ROAD.  RECOVERY NOTE BY JAMES E.  MAGOON, TYPED BY G.W.O.
AB9786
AB9786                          STATION RECOVERY (2004)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (KMB)
AB9786'IN WEST PART OF MINNEAPOLIS, 0.45 MILES WEST ALONG TRUNK HIGHWAY 55
AB9786'FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, THE MARK IS
AB9786'31.0 FEET NORTH OF WESTBOUND TRUNK HIGHWAY 55, 163.6 FEET WEST OF WEST
AB9786'END OF TRUNK HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7 FEET EAST OF SOUTH
AB9786'POST OF GOLDEN VALLEY SIGN, 60.06 FEET NORTHWEST OF REFERENCE MARK 1,
AB9786'56.82 FEET NORTHEAST OF REFERENCE MARK 2,  7.8 FEET NORTH OF CURB, 5.1
AB9786'FEET NORTH OF GUARD FENCE, 5.2 FEET SOUTH OF WITNESS POST
AB9786
AB9786                          STATION RECOVERY (2004)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CB)
AB9786'IN WEST PART OF MINNEAPOLIS, 0.45 MILES WEST ALONG TRUNK HIGHWAY 55
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AB9786'FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, THE MARK IS
AB9786'31.0 FEET NORTH OF WESTBOUND TRUNK HIGHWAY 55, 163.6 FEET WEST OF WEST
AB9786'END OF TRUNK HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7 FEET EAST OF SOUTH
AB9786'POST OF GOLDEN VALLEY SIGN, 60.06 FEET NORTHWEST OF REFERENCE MARK 1,
AB9786'56.82 FEET NORTHEAST OF REFERENCE MARK 2,  7.8 FEET NORTH OF CURB, 5.1
AB9786'FEET NORTH OF GUARD FENCE, 5.2 FEET SOUTH OF WITNESS POST
AB9786
AB9786                          STATION RECOVERY (2005)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (MPP)
AB9786'RECOVERED AS DESCRIBED.
AB9786
AB9786                          STATION RECOVERY (2007)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (JJB)
AB9786'THE MARK IS LOCATED ABOUT 8.2 MI (13.2 KM) EAST-NORTHEAST OF HOPKINS,
AB9786'8.0 MI (12.9 KM) SOUTHWEST OF NEW BRIGHTON AND 2.7 MI (4.3 KM) WEST OF
AB9786'MINNEAPOLIS.
AB9786'
AB9786'TO REACH TO THE MARK IN WEST PART OF MINNEAPOLIS, GO 0.45 MI (0.7 KM)
AB9786'WEST ALONG TRUNK HIGHWAY 55 FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND
AB9786'PENN AVENUE, 31.0 FT (9.4 M) NORTH OF WESTBOUND TRUNK HIGHWAY 55,
AB9786'163.6 FT (49.9 M) WEST OF WEST END OF TRUNK HIGHWAY 55 BRIDGE OVER
AB9786'RAILROAD, 57.7 FT (17.6 M) EAST OF SOUTH POST OF GOLDEN VALLEY SIGN,
AB9786'60.06 FT (18.3 M) NORTHWEST OF REFERENCE MARK 1, 56.82 FT (17.3 M)
AB9786'NORTHEAST OF REFERENCE MARK 2, 7.8 FT (2.4 M) NORTH OF CURB, 5.1 FT
AB9786'(1.6 M) NORTH OF GUARD FENCE, 5.2 FT (1.6 M) SOUTH OF A WITNESS POST.
AB9786
AB9786                          STATION RECOVERY (2007)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (MPP)
AB9786'IN WEST PART OF MINNEAPOLIS, 0.45 MILES WEST ALONG TRUNK HIGHWAY 55
AB9786'FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, 31.0 FEET NORTH
AB9786'OF WESTBOUND TRUNK HIGHWAY 55, 163.6 FEET WEST OF WEST END OF TRUNK
AB9786'HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7 FEET EAST OF SOUTH POST OF
AB9786'GOLDEN VALLEY SIGN, 60.06 FEET NORTHWEST OF REFERENCE MARK 1, 56.82
AB9786'FEET NORTHEAST OF REFERENCE MARK 2, 7.8 FEET NORTH OF CURB, 5.1 FEET
AB9786'NORTH OF GUARD FENCE, 5.2 FEET SOUTH OF WITNESS POST.
AB9786
AB9786                          STATION RECOVERY (2008)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (DAB)
AB9786'IN WEST PART OF MINNEAPOLIS, 0.45 MILES WEST ALONG TRUNK HIGHWAY 55
AB9786'FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, 31.0 FEET NORTH
AB9786'OF WESTBOUND TRUNK HIGHWAY 55, 163.6 FEET WEST OF WEST END OF TRUNK
AB9786'HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7 FEET EAST OF SOUTH POST OF
AB9786'GOLDEN VALLEY SIGN, 60.06 FEET NORTHWEST OF REFERENCE MARK 1, 56.82
AB9786'FEET NORTHEAST OF REFERENCE MARK 2, 7.8 FEET NORTH OF CURB, 5.1 FEET
AB9786'NORTH OF GUARD FENCE, 5.2 FEET SOUTH OF WITNESS POST.
AB9786
AB9786                          STATION RECOVERY (2008)
AB9786
AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (MMP)
AB9786'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
AB9786'THE MARK IS IN WEST PART OF MINNEAPOLIS, 0.45 MILE WEST ALONG TRUNK
AB9786'HIGHWAY 55 FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, 31.0
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 AB9786'FEET NORTH OF WESTBOUND TRUNK HIGHWAY 55, 163.6 FEET WEST OF WEST END
 AB9786'OF TRUNK HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7 FEET EAST OF SOUTH POST
 AB9786'OF GOLDEN VALLEY SIGN, 60.06 FEET NORTHWEST OF REFERENCE MARK 1, 56.82
 AB9786'FEET NORTHEAST OF REFERENCE MARK 2, 7.8 FEET NORTH OF CURB, 5.1 FEET
 AB9786'NORTH OF GUARD FENCE, 5.2 FEET SOUTH OF WITNESS POST.
 AB9786
 AB9786                          STATION RECOVERY (2011)
 AB9786
 AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (PJG)
 AB9786'IN WEST PART OF MINNEAPOLIS, 0.45 MILE WEST ALONG TRUNK HIGHWAY 55
 AB9786'FROM JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, TRUNK HIGHWAY 55
 AB9786'MILEPOINT 188.15, 31.0 FEET NORTH OF WESTBOUND TRUNK HIGHWAY 55, 163.6
 AB9786'FEET WEST OF WEST END OF TRUNK HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7
 AB9786'FEET EAST OF SOUTH POST OF GOLDEN VALLEY SIGN, 56.82 FEET NORTHEAST OF
 AB9786'REFERENCE MARK 2, 7.8 FEET NORTH OF CURB, 5.1 FEET NORTH OF GUARD
 AB9786'FENCE, 4.3 FEET SOUTH OF WITNESS POST.
 AB9786
 AB9786                          STATION RECOVERY (2013)
 AB9786
 AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2013 (MXJ)
 AB9786'IN WEST PART OF MINNEAPOLIS, 0.45 MILE WEST ALONG TRUNK HIGHWAY 55
 AB9786'FROM JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, TRUNK HIGHWAY 55
 AB9786'MILEPOINT 188.15, 31.0 FEET NORTH OF WESTBOUND TRUNK HIGHWAY 55, 163.6
 AB9786'FEET WEST OF WEST END OF TRUNK HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7
 AB9786'FEET EAST OF SOUTH POST OF GOLDEN VALLEY SIGN, 56.82 FEET NORTHEAST OF
 AB9786'REFERENCE MARK 2, 7.8 FEET NORTH OF CURB, 5.1 FEET NORTH OF GUARD
 AB9786'FENCE, 4.3 FEET SOUTH OF WITNESS POST.
 AB9786
 AB9786                          STATION RECOVERY (2014)
 AB9786
 AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2014 (MAS)
 AB9786'IN WEST EDGE OF MINNEAPOLIS, 0.45 MI (0.7 KM) WEST ALONG TRUNK HIGHWAY
 AB9786'55  FROM THE JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, AT TRUNK
 AB9786'HIGHWAY 55 MILE POINT 188.15, 31.0 FT (9.4 M) NORTH OF WESTBOUND TRUNK
 AB9786'HIGHWAY 55, 163.6 FT (49.9 M) WEST OF WEST END OF TRUNK HIGHWAY 55
 AB9786'BRIDGE OVER RAILROAD, 57.7 FT (17.6 M) EAST OF SOUTH POST OF GOLDEN
 AB9786'VALLEY SIGN, 7.8 FT (2.4 M) NORTH OF CURB, 5.1 FT (1.6 M) NORTH OF
 AB9786'GUARD RAIL, 56.82 FT (17.3 M) NORTHEAST OF REFERENCE MARK 2, 4.3 FT
 AB9786'(1.3 M) SOUTH OF A WITNESS POST.
 AB9786
 AB9786                          STATION RECOVERY (2015)
 AB9786
 AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AB9786'IN WEST EDGE OF MINNEAPOLIS, 0.45 MILE WEST ALONG TRUNK HIGHWAY 55
 AB9786'FROM JUNCTION OF TRUNK HIGHWAY 55 AND PENN AVENUE, AT TRUNK HIGHWAY 55
 AB9786'MILEPOINT 188.15, 31.0 FEET NORTH OF WESTBOUND TRUNK HIGHWAY 55, 163.6
 AB9786'FEET WEST OF WEST END OF TRUNK HIGHWAY 55 BRIDGE OVER RAILROAD, 57.7
 AB9786'FEET EAST OF SOUTH POST OF GOLDEN VALLEY SIGN, 7.8 FEET NORTH OF CURB,
 AB9786'5.1 FEET NORTH OF GUARD RAIL, 56.82 FEET NORTHEAST OF REFERENCE MARK
 AB9786'2, 4.3 FEET SOUTH OF WITNESS POST.
 AB9786
 AB9786                          STATION RECOVERY (2016)
 AB9786
 AB9786'RECOVERY NOTE BY MN DEPT OF TRANSP 2016 (SXS)
 AB9786'RECOVERED IN GOOD CONDITION.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
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AC4887 ******************************************************************
AC4887  CBN         -  This is a Cooperative Base Network Control Station.
AC4887  DESIGNATION -  SCHOLZ
AC4887  PID         -  AC4887
AC4887  STATE/COUNTY-  MN/STEARNS
AC4887  COUNTRY     -  US
AC4887  USGS QUAD   -  UPSALA (2019)
AC4887
AC4887                        *CURRENT SURVEY CONTROL
AC4887  ______________________________________________________________________
AC4887* NAD 83(2011) POSITION- 45 45 35.71600(N) 094 34 59.75945(W)   ADJUSTED
AC4887* NAD 83(2011) ELLIP HT-   353.667 (meters)        (06/27/12)   ADJUSTED
AC4887* NAD 83(2011) EPOCH   -  2010.00
AC4887* NAVD 88 ORTHO HEIGHT -   380.283 (meters)     1247.65  (feet) ADJUSTED
AC4887  ______________________________________________________________________
AC4887  GEOID HEIGHT    -        -26.615 (meters)                     GEOID18
AC4887  NAD 83(2011) X  -   -356,206.886 (meters)                     COMP
AC4887  NAD 83(2011) Y  - -4,443,468.548 (meters)                     COMP
AC4887  NAD 83(2011) Z  -  4,546,924.128 (meters)                     COMP
AC4887  LAPLACE CORR    -          0.78  (seconds)                    DEFLEC18
AC4887  DYNAMIC HEIGHT  -        380.278 (meters)     1247.63  (feet) COMP
AC4887  MODELED GRAVITY -    980,592.1   (mgal)                       NAVD 88
AC4887
AC4887  VERT ORDER      -  SECOND    CLASS I
AC4887
AC4887  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AC4887  Standards:
AC4887         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AC4887            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
AC4887  ------------------------------------------------------------------
AC4887  NETWORK    0.23   0.39          0.11   0.07   0.20      0.00313060
AC4887  ------------------------------------------------------------------
AC4887  Click here for local accuracies and other accuracy information.
AC4887
AC4887
AC4887.The horizontal coordinates were established by GPS observations
AC4887.and adjusted by the National Geodetic Survey in June 2012.
AC4887
AC4887.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AC4887.been affixed to the stable North American tectonic plate. See
AC4887.NA2011 for more information.
AC4887
AC4887.The horizontal coordinates are valid at the epoch date displayed above
AC4887.which is a decimal equivalence of Year/Month/Day.
AC4887
AC4887.The orthometric height was determined by differential leveling and
AC4887.adjusted by the NATIONAL GEODETIC SURVEY
AC4887.in May 2009.
AC4887
AC4887.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4887.GEOID18 height accuracy estimate available here.
AC4887
AC4887.Click photographs - Photos may exist for this station.
AC4887
AC4887.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4887
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AC4887.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4887
AC4887.The ellipsoidal height was determined by GPS observations
AC4887.and is referenced to NAD 83.
AC4887
AC4887.The dynamic height is computed by dividing the NAVD 88
AC4887.geopotential number by the normal gravity value computed on the
AC4887.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4887.degrees latitude (g = 980.6199 gals.).
AC4887
AC4887.The modeled gravity was interpolated from observed gravity values.
AC4887
AC4887. The following values were computed from the NAD 83(2011) position.
AC4887
AC4887;                    North         East     Units Scale Factor Converg.
AC4887;SPC MN C     -   184,517.218   774,073.453   MT  0.99997204   -0 14 27.9
AC4887;SPC MN C     -   605,370.24  2,539,605.99   sFT  0.99997204   -0 14 27.9
AC4887;UTM  15      - 5,068,592.552   376,875.263   MT  0.99978637   -1 08 03.9
AC4887
AC4887!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4887!SPC MN C     -   0.99994456  x   0.99997204  =   0.99991660
AC4887!UTM  15      -   0.99994456  x   0.99978637  =   0.99973094
AC4887
AC4887_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TUL7687568592(NAD 83)
AC4887
AC4887                           SUPERSEDED SURVEY CONTROL
AC4887
AC4887  NAD 83(2007)-  45 45 35.71608(N)    094 34 59.76021(W) AD(2002.00) 0
AC4887  ELLIP H (02/10/07)  353.694  (m)                       GP(2002.00)
AC4887  NAD 83(1996)-  45 45 35.71607(N)    094 34 59.75998(W) AD(       ) B
AC4887  ELLIP H (01/15/97)  353.729  (m)                       GP(       ) 4 1
AC4887  NAVD 88             380.28   (m)         1247.6    (f) LEVELING    3
AC4887  NAVD 88 (01/15/97)  380.3    (m)  GEOID96 model used   GPS OBS
AC4887
AC4887.Superseded values are not recommended for survey control.
AC4887
AC4887.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4887.See file dsdata.pdf to determine how the superseded data were derived.
AC4887
AC4887_MARKER: F = FLANGE-ENCASED ROD
AC4887_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AC4887_STAMPING: SCHOLZ 1994
AC4887_MARK LOGO: MNDT
AC4887_PROJECTION: RECESSED 10 CENTIMETERS
AC4887_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
AC4887_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4887_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4887+SATELLITE: SATELLITE OBSERVATIONS - April 19, 2022
AC4887_ROD/PIPE-DEPTH:  7.6 meters
AC4887_SLEEVE-DEPTH  :  0.6 meters
AC4887
AC4887  HISTORY     - Date     Condition        Report By
AC4887  HISTORY     - 19940401 MONUMENTED       MNDT
AC4887  HISTORY     - 20020710 GOOD             MNDT
AC4887  HISTORY     - 2003     GOOD             MNDT
AC4887  HISTORY     - 20030929 GOOD             MNDT
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AC4887  HISTORY     - 20040909 GOOD             MNDT
AC4887  HISTORY     - 20050411 GOOD             MNDT
AC4887  HISTORY     - 20090401 GOOD             MNDT
AC4887  HISTORY     - 20151001 GOOD             MNDT
AC4887  HISTORY     - 20180109 GOOD             MNDT
AC4887  HISTORY     - 20190619 GOOD             MNDT
AC4887  HISTORY     - 20210209 GOOD             MNDT
AC4887  HISTORY     - 20220222 GOOD             MNDT
AC4887  HISTORY     - 20220419 GOOD             MNDT
AC4887
AC4887                          STATION DESCRIPTION
AC4887
AC4887'DESCRIBED BY MN DEPT OF TRANSP 1994
AC4887'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
AC4887'LOCATED IN THE TOWN OF ST FRANCIS AT THE ST FRANCIS CEMETERY, IN THE
AC4887'SE 1/4 OF SECTION 33, T127N, R31W.  TO REACH THE MARK FROM THE JCT OF
AC4887'TH 238 AND A GRAVEL RD IN ST FRANCIS, GO EAST ON GRAVEL RD FOR 0.1 MI
AC4887'(0.2 KM) TO THE MARK ON THE LEFT.  THE MARK IS 29 FT (8.8 M) NORTH OF
AC4887'A GRAVEL RD, 72 FT (21.9 M) EAST OF A FIELD ENT, 82.7 FT (25.2 M) WEST
AC4887'OF A P-POLE, 21.2 FT (6.5 M) SW OF THE SW COR OF THE SCHOLZ HEADSTONE,
AC4887'6.6 FT (2.0 M) NW OF THE EAST END OF A 12 INCH METAL CULVERT, AND 4.3
AC4887'FT (1.3 M) WEST OF A WIT POST.  THE MARK IS A PUNCH MARK ON THE TOP OF
AC4887'A DRIVEN 1/2 INCH DIAMETER BY 25 FT (7.6 M) LONG STAINLESS STEEL ROD
AC4887'WITH A 3 FT (0.9 M) PLASTIC STABILIZER SLEEVE. ACCESS TO THE DATUM
AC4887'POINT IS THROUGH A 5 INCH LOGO CAP THAT IS FLUSH WITH THE GROUND,
AC4887'STAMPED---SCHOLZ 1994---, SET ON TOP OF A 5 INCH DIAMETER BY 24 INCH
AC4887'LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND AND SET IN CONCRETE.  A
AC4887'METAL SPIKE WAS PLACED IN THE SILICA SAND MAKING THE MARK MAGNETIC.
AC4887'DESCRIBED BY DAVID K.  HERDER, TYPED BY J.E.M.
AC4887
AC4887                          STATION RECOVERY (2002)
AC4887
AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (MPP)
AC4887'THE MARK WAS RECOVERED AS DESCRIBED, FLUSH, MAGNETIC.
AC4887
AC4887                          STATION RECOVERY (2003)
AC4887
AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (MPP)
AC4887'IN ST FRANCIS, AT ST FRANCIS CEMETERY, 0.1 MI EAST ALONG GRAVEL RD
AC4887'FROM JCT OF  TH 238 AND GRAVEL RD IN ST FRANCIS, 29 FT NORTH OF GRAVEL
AC4887'RD, 72 FT EAST OF  FIELD ENT, 82.7 FT WEST OF P-POLE, 21.2 FT SW OF SW
AC4887'COR OF SCHOLZ HEADSTONE,  6.6 FT NW OF EAST END OF 12 INCH METAL
AC4887'CULVERT, 4.3 FT WEST OF WIT POST, STA IS  PUNCH MARK ON 25 FT LONG
AC4887'DRIVEN STEEL ROD WITH ACCESS COVER, FLUSH, MAGNETIC, GOOD  FOR GPS
AC4887
AC4887                          STATION RECOVERY (2003)
AC4887
AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (DKH)
AC4887'THE MARK WAS RECOVERED AS DESCRIBED.
AC4887
AC4887                          STATION RECOVERY (2004)
AC4887
AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (CB)
AC4887'IN SAINT FRANCIS, AT SAINT FRANCIS CEMETERY, 0.1 MILES EAST ALONG
AC4887'GRAVEL ROAD FROM JUNCTION OF TRUNK HIGHWAY 238 AND GRAVEL ROAD IN
AC4887'SAINT FRANCIS, 29 FEET NORTH OF GRAVEL ROAD, 72 FEET EAST OF FIELD
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 AC4887'ENTRANCE, 82.7 FEET WEST OF POWER POLE, 21.2 FEET SOUTHWEST OF
 AC4887'SOUTHWEST CORNER OF SCHOLZ HEADSTONE, 6.6 FEET NORTHWEST OF EAST END
 AC4887'OF 12 INCH METAL CULVERT, 4.3 FEET WEST OF WITNESS POST
 AC4887
 AC4887                          STATION RECOVERY (2005)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (SD)
 AC4887'RECOVERED IN GOOD CONDITION.
 AC4887
 AC4887                          STATION RECOVERY (2009)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2009 (MAS)
 AC4887'IN SAINT FRANCIS, AT SAINT FRANCIS CEMETERY, 0.1 MILE EAST ALONG
 AC4887'GRAVEL ROAD (440TH STREET) FROM JUNCTION OF TRUNK HIGHWAY 238 AND
 AC4887'GRAVEL ROAD IN SAINT FRANCIS, 29 FEET NORTH OF GRAVEL ROAD, 72 FEET
 AC4887'EAST OF A CEMETARY ENTRANCE, 82.7 FEET WEST OF POWER POLE, 21.2 FEET
 AC4887'SOUTHWEST OF SOUTHWEST CORNER OF SCHOLZ HEADSTONE, 4.3 FEET WEST OF
 AC4887'WITNESS POST.
 AC4887
 AC4887                          STATION RECOVERY (2015)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4887'RECOVERED IN GOOD CONDITION.
 AC4887
 AC4887                          STATION RECOVERY (2018)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (KXJ)
 AC4887'RECOVERED IN GOOD CONDITION.
 AC4887
 AC4887                          STATION RECOVERY (2019)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2019 (KMS)
 AC4887'RECOVERED IN GOOD CONDITION.
 AC4887
 AC4887                          STATION RECOVERY (2021)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2021 (MPP)
 AC4887'RECOVERED AS DESCRIBED.
 AC4887
 AC4887                          STATION RECOVERY (2022)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2022 (MES)
 AC4887'RECOVERED AS DESCRIBED.
 AC4887
 AC4887                          STATION RECOVERY (2022)
 AC4887
 AC4887'RECOVERY NOTE BY MN DEPT OF TRANSP 2022 (DJH)
 AC4887'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 DK3406 ***********************************************************************
 DK3406  DESIGNATION -  SEVE
 DK3406  PID         -  DK3406
 DK3406  STATE/COUNTY-  MN/SIBLEY
 DK3406  COUNTRY     -  US
 DK3406  USGS QUAD   -  GIBBON (2019)
 DK3406
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DK3406                          *CURRENT SURVEY CONTROL
DK3406 ______________________________________________________________________
DK3406* NAD 83(2011) POSITION- 44 31 42.80037(N) 094 32 50.91835(W)   ADJUSTED
DK3406* NAD 83(2011) ELLIP HT-   296.902 (meters)        (06/27/12)   ADJUSTED
DK3406* NAD 83(2011) EPOCH    -  2010.00
DK3406* NAVD 88 ORTHO HEIGHT -   324.735 (meters)     1065.40  (feet) ADJUSTED
DK3406 ______________________________________________________________________
DK3406  GEOID HEIGHT    -        -27.836 (meters)                     GEOID18
DK3406  NAD 83(2011) X  -   -361,119.694 (meters)                     COMP
DK3406  NAD 83(2011) Y  - -4,540,356.952 (meters)                     COMP
DK3406  NAD 83(2011) Z  -  4,450,359.107 (meters)                     COMP
DK3406  LAPLACE CORR    -         -0.97  (seconds)                    DEFLEC18
DK3406  DYNAMIC HEIGHT  -        324.690 (meters)     1065.25  (feet) COMP
DK3406  MODELED GRAVITY -    980,470.9   (mgal)                       NAVD 88
DK3406
DK3406  VERT ORDER      -  SECOND    CLASS I
DK3406
DK3406  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
DK3406  Standards:
DK3406         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
DK3406            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
DK3406  ------------------------------------------------------------------
DK3406  NETWORK    0.29   0.49           0.13   0.10   0.25     -0.12789766
DK3406  ------------------------------------------------------------------
DK3406  Click here for local accuracies and other accuracy information.
DK3406
DK3406
DK3406.The horizontal coordinates were established by GPS observations
DK3406.and adjusted by the National Geodetic Survey in June 2012.
DK3406
DK3406.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
DK3406.been affixed to the stable North American tectonic plate. See
DK3406.NA2011 for more information.
DK3406
DK3406.The horizontal coordinates are valid at the epoch date displayed above
DK3406.which is a decimal equivalence of Year/Month/Day.
DK3406
DK3406.The orthometric height was determined by differential leveling and
DK3406.adjusted by the NATIONAL GEODETIC SURVEY
DK3406.in October 2013.
DK3406
DK3406.No vertical observational check was made to the station.
DK3406
DK3406.Significant digits in the geoid height do not necessarily reflect accuracy.
DK3406.GEOID18 height accuracy estimate available here.
DK3406
DK3406.Click photographs - Photos may exist for this station.
DK3406
DK3406.The X, Y, and Z were computed from the position and the ellipsoidal ht.
DK3406
DK3406.The Laplace correction was computed from DEFLEC18 derived deflections.
DK3406
DK3406.The ellipsoidal height was determined by GPS observations
DK3406.and is referenced to NAD 83.
DK3406
DK3406.The dynamic height is computed by dividing the NAVD 88
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DK3406.geopotential number by the normal gravity value computed on the
DK3406.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
DK3406.degrees latitude (g = 980.6199 gals.).
DK3406
DK3406.The modeled gravity was interpolated from observed gravity values.
DK3406
DK3406. The following values were computed from the NAD 83(2011) position.
DK3406
DK3406;                    North         East     Units Scale Factor Converg.
DK3406;SPC MN S     -   269,985.610   756,484.339   MT  0.99992215   -0 23 01.5
DK3406;SPC MN S     -   885,777.79  2,481,899.04   sFT  0.99992215   -0 23 01.5
DK3406;UTM  15      - 4,931,745.676   377,038.826   MT  0.99978593   -1 05 07.2
DK3406
DK3406!             -  Elev Factor  x  Scale Factor =   Combined Factor
DK3406!SPC MN S     -   0.99995345  x   0.99992215  =   0.99987560
DK3406!UTM  15      -   0.99995345  x   0.99978593  =   0.99973939
DK3406
DK3406_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TUK7703831745(NAD 83)
DK3406
DK3406                           SUPERSEDED SURVEY CONTROL
DK3406
DK3406  NAD 83(2007)-  44 31 42.80036(N)    094 32 50.91930(W) AD(2002.00) 1
DK3406  ELLIP H (03/13/09)  296.935  (m)                       GP(2002.00) 3 1
DK3406  NAD 83(1996)-  44 31 42.79986(N)    094 32 50.91881(W) AD(       ) 1
DK3406  ELLIP H (01/10/08)  296.970  (m)                       GP(       ) 3 1
DK3406  NAVD 88 (01/10/08)  324.7    (m)  GEOID03 model used   GPS OBS
DK3406
DK3406.Superseded values are not recommended for survey control.
DK3406
DK3406.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DK3406.See file dsdata.pdf to determine how the superseded data were derived.
DK3406
DK3406_MARKER: DH = HORIZONTAL CONTROL DISK
DK3406_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
DK3406_STAMPING: SEVE 1988
DK3406_MARK LOGO: MNDT
DK3406_PROJECTION: RECESSED 8 CENTIMETERS
DK3406_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
DK3406_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
DK3406_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
DK3406+SATELLITE: SATELLITE OBSERVATIONS - August 02, 2011
DK3406_ROD/PIPE-DEPTH:  3.0 meters
DK3406
DK3406  HISTORY     - Date     Condition        Report By
DK3406  HISTORY     - 1988     MONUMENTED       MNDT
DK3406  HISTORY     - 20110802 GOOD             MNDT
DK3406
DK3406                           STATION DESCRIPTION
DK3406
DK3406'DESCRIBED BY MN DEPT OF TRANSP 1988
DK3406'1 MILE WEST OF GIBBON, 0.5 MILE SOUTH ALONG COUNTY ROAD 2 FROM
DK3406'JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 19 THEN 1 MILE WEST ON 7TH
DK3406'STREET, 29.5 FEET NORTH OF GRAVEL ROAD, 11 FEET WEST OF ENTRANCE, 39
DK3406'FEET WEST OF POWER POLE, 38 FEET WEST OF WITNESS POST, 37.80 FEET WEST
DK3406'OF REFERENCE MARK 1, 53.92 FEET NORTH-NORTHEAST OF REFERENCE MARK 2.
DK3406
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 DK3406                          STATION RECOVERY (2011)
 DK3406
 DK3406'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (JBG)
 DK3406'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AB9788 ***********************************************************************
 AB9788  CBN         -  This is a Cooperative Base Network Control Station.
 AB9788  DESIGNATION -  WELTZIN
 AB9788  PID         -  AB9788
 AB9788  STATE/COUNTY-  MN/RAMSEY
 AB9788  COUNTRY     -  US
 AB9788  USGS QUAD   -  WHITE BEAR LAKE WEST (2019)
 AB9788
 AB9788                         *CURRENT SURVEY CONTROL
 AB9788 ______________________________________________________________________
 AB9788* NAD 83(2011) POSITION- 45 07 24.91566(N) 093 00 14.36791(W)   ADJUSTED
 AB9788* NAD 83(2011) ELLIP HT-   260.031 (meters)        (06/27/12)   ADJUSTED
 AB9788* NAD 83(2011) EPOCH   -  2010.00
 AB9788* NAVD 88 ORTHO HEIGHT -   287.465 (meters)      943.12  (feet) ADJUSTED
 AB9788 ______________________________________________________________________
 AB9788  GEOID HEIGHT    -        -27.435 (meters)                     GEOID18
 AB9788  NAD 83(2011) X  -   -236,246.802 (meters)                     COMP
 AB9788  NAD 83(2011) Y  - -4,501,857.434 (meters)                     COMP
 AB9788  NAD 83(2011) Z  -  4,497,234.070 (meters)                     COMP
 AB9788  LAPLACE CORR    -         -2.06  (seconds)                    DEFLEC18
 AB9788  DYNAMIC HEIGHT  -        287.462 (meters)      943.11  (feet) COMP
 AB9788  MODELED GRAVITY -    980,596.5   (mgal)                       NAVD 88
 AB9788
 AB9788  VERT ORDER      -  SECOND    CLASS I
 AB9788
 AB9788  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AB9788  Standards:
 AB9788         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AB9788            Horiz  Ellip           SD_N   SD_E   SD_h      (unitless)
 AB9788  ------------------------------------------------------------------
 AB9788  NETWORK    0.29   0.57           0.13   0.10   0.29      0.02287997
 AB9788  ------------------------------------------------------------------
 AB9788  Click here for local accuracies and other accuracy information.
 AB9788
 AB9788
 AB9788.The horizontal coordinates were established by GPS observations
 AB9788.and adjusted by the National Geodetic Survey in June 2012.
 AB9788
 AB9788.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 AB9788.been affixed to the stable North American tectonic plate. See
 AB9788.NA2011 for more information.
 AB9788
 AB9788.The horizontal coordinates are valid at the epoch date displayed above
 AB9788.which is a decimal equivalence of Year/Month/Day.
 AB9788
 AB9788.The orthometric height was determined by differential leveling and
 AB9788.adjusted by the NATIONAL GEODETIC SURVEY
 AB9788.in June 2008.
 AB9788
 AB9788.No vertical observational check was made to the station.
 AB9788
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AB9788.Significant digits in the geoid height do not necessarily reflect accuracy.
AB9788.GEOID18 height accuracy estimate available here.
AB9788
AB9788.Click photographs - Photos may exist for this station.
AB9788
AB9788.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AB9788
AB9788.The Laplace correction was computed from DEFLEC18 derived deflections.
AB9788
AB9788.The ellipsoidal height was determined by GPS observations
AB9788.and is referenced to NAD 83.
AB9788
AB9788.The dynamic height is computed by dividing the NAVD 88
AB9788.geopotential number by the normal gravity value computed on the
AB9788.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AB9788.degrees latitude (g = 980.6199 gals.).
AB9788
AB9788.The modeled gravity was interpolated from observed gravity values.
AB9788
AB9788. The following values were computed from the NAD 83(2011) position.
AB9788
AB9788;                    North         East     Units Scale Factor Converg.
AB9788;SPC MN S     -   336,438.431   878,359.713   MT  0.99998099   +0 41 53.3
AB9788;SPC MN S     - 1,103,798.42  2,881,751.83   sFT  0.99998099   +0 41 53.3
AB9788;UTM  15      - 4,996,679.582   499,686.118   MT  0.99960000   -0 00 10.2
AB9788
AB9788!             -  Elev Factor  x  Scale Factor =   Combined Factor
AB9788!SPC MN S     -   0.99995923  x   0.99998099  =   0.99994022
AB9788!UTM  15      -   0.99995923  x   0.99960000  =   0.99955925
AB9788
AB9788:                Primary Azimuth Mark                    Grid Az
AB9788:SPC MN S     -  WELTZIN RM 3                            010 05 33.2
AB9788:UTM  15      -  WELTZIN RM 3                            010 47 36.7
AB9788
AB9788_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVK9968696679(NAD 83)
AB9788
AB9788|-----------------------------------------------------------------------|
AB9788| PID    Reference Object                    Distance      Geod. Az   |
AB9788|                                                          dddmmss.s |
AB9788| AE8921 WELTZIN RM 3                      APPROX. 0.8 KM 0104726.5 |
AB9788| DO4879 DAVE RESET                        433.385 METERS 1811524.5 |
AB9788| AG9990 DAVE                              433.381 METERS 1811522.3 |
AB9788| AE9068 WELTZIN RM 1                        8.510 METERS 18846     |
AB9788| QO1662 SHOREVIEW KMSP TV TOWER           APPROX.12.0 KM 2323544.2 |
AB9788| QO1676 SHOREVIEW WCCO EAST TV TOWER      APPROX.12.7 KM 2372633.8 |
AB9788| QO1675 SHOREVIEW WCCO W TV TOWER         APPROX.12.7 KM 2373433.6 |
AB9788| AE9069 WELTZIN RM 2                        7.675 METERS 31343     |
AB9788|-----------------------------------------------------------------------|
AB9788
AB9788                          SUPERSEDED SURVEY CONTROL
AB9788
AB9788  NAD 83(2007)-  45 07 24.91602(N)    093 00 14.36889(W) AD(2002.00) 0
AB9788  ELLIP H (02/10/07)  260.056  (m)                       GP(2002.00)
AB9788  NAD 83(1986)-  45 07 24.91060(N)    093 00 14.36126(W) AD(       ) 1
AB9788  NAD 83(1996)-  45 07 24.91542(N)    093 00 14.36819(W) AD(       ) B
AB9788  ELLIP H (01/15/97)  260.111  (m)                       GP(       ) 4 1
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AB9788  NAVD 88              287.47   (m)          943.1    (f) LEVELING    3
AB9788  NAVD 88 (08/23/05)   287.48   (m)   GEOID03 model used   GPS OBS
AB9788  NAVD 88 (01/15/97)   287.5    (m)   GEOID96 model used   GPS OBS
AB9788
AB9788.Superseded values are not recommended for survey control.
AB9788
AB9788.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AB9788.See file dsdata.pdf to determine how the superseded data were derived.
AB9788
AB9788_MARKER: DH = HORIZONTAL CONTROL DISK
AB9788_SETTING: 50 = ALUMINUM ALLOY ROD W/O SLEEVE (10 FT.+)
AB9788_STAMPING: WELTZIN 1985
AB9788_MARK LOGO: MNDT
AB9788_PROJECTION: PROJECTING 5 CENTIMETERS
AB9788_MAGNETIC: M = MARKER EQUIPPED WITH BAR MAGNET
AB9788_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AB9788_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AB9788+SATELLITE: SATELLITE OBSERVATIONS - March 02, 2016
AB9788_ROD/PIPE-DEPTH:  8.5 meters
AB9788
AB9788  HISTORY     - Date     Condition        Report By
AB9788  HISTORY     - 19850401 MONUMENTED       MNDT
AB9788  HISTORY     - 19880601 GOOD             MNDT
AB9788  HISTORY     - 19930308 GOOD             MNDT
AB9788  HISTORY     - 19950601 GOOD             MNDT
AB9788  HISTORY     - 19950906 GOOD             MNDT
AB9788  HISTORY     - 20030717 GOOD             MNDT
AB9788  HISTORY     - 20040728 GOOD             MNDT
AB9788  HISTORY     - 20051013 GOOD             MNDT
AB9788  HISTORY     - 20060724 GOOD             MNDT
AB9788  HISTORY     - 20070621 GOOD             MNDT
AB9788  HISTORY     - 20101116 GOOD             MNDT
AB9788  HISTORY     - 20111103 GOOD             MNDT
AB9788  HISTORY     - 20140424 GOOD             MNDT
AB9788  HISTORY     - 20151001 GOOD             MNDT
AB9788  HISTORY     - 20160302 GOOD             MNDT
AB9788
AB9788                          STATION DESCRIPTION
AB9788
AB9788'DESCRIBED BY MN DEPT OF TRANSP 1985 (DKH)
AB9788'THE STATION IS LOCATED IN THE NORTHEAST CORNER OF WHITE BEAR TOWNSHIP
AB9788'NEAR THE RAMSEY-WASHINGTON COUNTY LINE, ABOUT 2-1/2 MILES NORTH ALONG
AB9788'TRUNK HIGHWAY 61 FROM DOWNTOWN WHITE BEAR LAKE, ABOUT 1/4 MILE EAST OF
AB9788'BALD EAGLE LAKE, IN THE NW 1/4 OF SECTION 1, T30N, R22W. TO REACH THE
AB9788'STATION FROM THE NORTH JUNCTION OF TRUNK HIGHWAY 96 AND TRUNK HIGHWAY
AB9788'61 IN THE CITY OF WHITE BEAR LAKE, GO NORTH ON TRUNK HIGHWAY 61 FOR
AB9788'2.2 MILES (3.5 KM) TO THE STATION ON THE LEFT ABOUT 250 FEET (76.2 M)
AB9788'WEST OF THE HIGHWAY. THE STATION MARK, A STANDARD MNDT ALUMINUM
AB9788'HORIZONTAL CONTROL MONUMENT DISK STAMPED---WELTZIN 1985---, IS SET ON
AB9788'THE TOP OF A 3/4 INCH DIAMETER BY 28 FOOT (8.5 M) LONG DRIVEN ALUMINUM
AB9788'ROD THAT IS FLUSH WITH THE SURFACE OF THE GROUND.  THE MARK IS 34.5
AB9788'FEET (10.5 M) WEST OF THE CENTERLINE OF FALCON AVENUE, 64.5 FEET (19.7
AB9788'M) SOUTH OF THE CENTERLINE OF 120TH STREET NORTH (RAMSEY-WASHINGTON
AB9788'COUNTY LINE), 100 FEET (30.5 M) SOUTH OF A LIGHT POLE, 5.8 FEET (1.8
AB9788'M) EAST-SOUTHEAST OF A FENCE CORNER, AND 4.2 FEET (1.3 M) EAST OF A
AB9788'STEEL WITNESS POST. REFERENCE MARK NUMBER 1, A STANDARD MNDT ALUMINUM
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AB9788'REFERENCE MARK DISK STAMPED---WELTZIN NO 1 1985---, IS SET ON THE TOP
AB9788'OF A 3/4 INCH DIAMETER BY 28 FOOT (8.5 M) LONG DRIVEN ALUMINUM ROD
AB9788'THAT IS FLUSH WITH THE SURFACE OF THE GROUND.  THE MARK IS 37.3 FEET
AB9788'(11.4 M) WEST OF THE CENTERLINE FALCON AVENUE, 92.5 FEET (28.2 M)
AB9788'SOUTH OF THE CENTERLINE OF 120TH STREET NORTH, 128 FEET (39.0 M) SOUTH
AB9788'OF A LIGHT POLE, AND 28.2 FEET (8.6 M) SOUTH OF A STEEL WITNESS POST.
AB9788'REFERENCE MARK NUMBER 2, A STANDARD MNDT ALUMINUM REFERENCE MARK DISK
AB9788'STAMPED---WELTZIN NO 2 1985---, IS SET IN THE TOP OF A 3/4 INCH
AB9788'DIAMETER BY 28 FOOT (8.5 M) LONG DRIVEN ALUMINUM ROD THAT IS FLUSH
AB9788'WITH THE SURFACE OF THE GROUND.  THE MARK IS 53 FEET (16.2 M) WEST OF
AB9788'THE CENTERLINE OF FALCON AVENUE, 46.8 FEET (14.3 M) SOUTH OF THE
AB9788'CENTERLINE OF 120TH STREET NORTH, 87 FEET (26.5 M) SOUTH-SOUTHWEST OF
AB9788'A LIGHT POLE, 72 FEET (21.9 M) SOUTHEAST OF A POWER POLE, AND 22.0
AB9788'FEET (6.7 M) NORTHWEST OF A STEEL WITNESS POST. TO REACH REFERENCE
AB9788'MARK NUMBER 3 FROM THE STATION, GO NORTH ON TRUNK HIGHWAY 61 FOR 0.5
AB9788'MILE (0.8 KM) TO THE MARK ON THE LEFT. REFERENCE MARK NUMBER 3, A
AB9788'STANDARD MNDT ALUMINUM REFERENCE MARK DISK STAMPED---WELTZIN NO 3
AB9788'1985---, IS SET ON THE TOP OF A 3/4 INCH DIAMETER BY 38 FOOT (11.6 M)
AB9788'LONG DRIVEN ALUMINUM ROD THAT IS FLUSH WITH THE SURFACE OF THE GROUND.
AB9788'THE MARK IS 71.8 FEET (21.9 M) WEST OF THE CENTERLINE OF TRUNK HIGHWAY
AB9788'61, 12 FEET (3.7 M) EAST OF THE EAST RAIL OF THE BURLINGTON NORTHERN
AB9788'RAILROAD TRACKS, 14 FEET (4.3 M) SOUTH OF THE CENTER OF AN ENTRANCE,
AB9788'68.8 FEET (21.0 M) SOUTHEAST OF A POWER POLE, AND 9.3 FEET (2.8 M)
AB9788'WEST-NORTHWEST OF A STEEL WITNESS POST. A MAGNET IN THE DISKS MAKES
AB9788'ALL OF THE MARKS MAGNETIC.
AB9788
AB9788                          STATION RECOVERY (1988)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 1988 (DKH)
AB9788'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED IN 1985.
AB9788
AB9788                          STATION RECOVERY (1993)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 1993 (DKH)
AB9788'THE MARK WAS RECOVERED IN GOOD CONDITION AS PREVIOUSLY DESCRIBED.  RM
AB9788'1 AND 2 WERE NOT LOOKED FOR AT THIS TIME RECOVERY NOTE BY DAVID K
AB9788'HERDER, TYPED BY G.W.O.
AB9788
AB9788                          STATION RECOVERY (1995)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 1995 (DKH)
AB9788'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED IN 1985.
AB9788
AB9788                          STATION RECOVERY (1995)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 1995 (JEM)
AB9788'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  THE REFERENCE
AB9788'MARKS WERE LOOKED FOR AND NOT FOUND.  THE TIES PUT THEM NEAR AN
AB9788'UNDERGROUND CABLE.  A NEW TO REACH FOLLOWS.  TO REACH THE MARK FROM
AB9788'THE JCT OF TH 61 AND CO RD 96 IN WHITE BEAR LAKE, GO NORTH ON TH 61
AB9788'FOR 2.15 MI (3.46 KM) TO TH 61 MP 150.05, THEN GO WEST ON 120TH ST
AB9788'NORTH FOR 0.05 MI (0.08 KM) TO MARK ON THE LEFT.  RECOVERY NOTE BY
AB9788'JAMES E.  MAGOON, TYPED BY G.W.O.
AB9788
AB9788                          STATION RECOVERY (2003)
AB9788
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AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2003 (RIC)
AB9788'IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP, ON COUNTY LINE, 2.15 MILES
AB9788'NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK HIGHWAY 61
AB9788'AND TRUNK HIGHWAY 96 TO TRUNK HIGHWAY 61 MILEPOINT 150.05 THEN 0.05
AB9788'MILES WEST ON 120TH ST NORTH, 34.5 FEET WEST OF FALCON AVE, 64.5 FEET
AB9788'SOUTH OF 120TH ST NORTH, 100 FEET SOUTH OF LIGHT POLE, 5.8 FEET
AB9788'EAST-SOUTHEAST OF FENCE CORNER, 4.2 FEET EAST OF WITNESS POST, 27.92
AB9788'FEET NORTH OF REFERENCE MARK 1, 25.18 FEET SOUTHEAST OF REFERENCE MARK
AB9788'2, IN 1995 GEODETIC UNIT COULD NOT FIND REFERENCE MARKS-UNDERGROUND
AB9788'CABLE IN AREA, RECESSED 2 INCHES BELOW PVC PIPE.
AB9788
AB9788                          STATION RECOVERY (2004)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (MPP)
AB9788'IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ON COUNTY LINE, 2.15 MILES
AB9788'NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK HIGHWAY 61
AB9788'AND TRUNK HIGHWAY 96 TO TRUNK HIGHWAY 61 MILEPOINT 150.05, 0.05 MILES
AB9788'WEST ON 120TH STREET NORTH (COUNTY ROAD 81) , 100 FEET SOUTH OF LIGHT
AB9788'POLE, 64.5 FEET SOUTH OF 120TH STREET NORTH, 34.5 FEET WEST OF FALCON
AB9788'AVENUE,  5.8 FEET EAST-SOUTHEAST OF FENCE CORNER, 4.2 FEET EAST OF
AB9788'WITNESS POST, 27.92 FEET NORTH OF REFERENCE MARK 1, 25.18 FEET
AB9788'SOUTHEAST OF REFERENCE MARK 2
AB9788
AB9788                          STATION RECOVERY (2005)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (GJF)
AB9788'THE MARK WAS RECOVERED IN GOOD CONDITION.  A NEW DESCRIPTION FOLLOWS.
AB9788'THE MARK IS IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ON COUNTY
AB9788'LINE, 2.15 MILES (3.46 KM) NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH
AB9788'JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 96 TO TRUNK HIGHWAY 61
AB9788'MILEPOINT 150.05, THENCE 0.05 MILES (0.08 KM) WEST ON 120TH STREET
AB9788'NORTH (COUNTY ROAD 81) , 64.5 FEET (19.7 M) SOUTH OF 120TH STREET
AB9788'NORTH, 34.5 FEET (10.5 M) WEST OF FALCON AVENUE, 100 FEET (30.5 M)
AB9788'SOUTH OF LIGHT POLE, 5.8 FEET (1.8 M) EAST-SOUTHEAST OF FENCE CORNER,
AB9788'4.2 FEET (1.3 M) EAST OF WITNESS POST, 27.92 FEET (8.51 M) NORTH OF
AB9788'REFERENCE MARK 1, 25.18 FEET (7.67 M) SOUTH EAST OF REFERENCE MARK
AB9788'2.
AB9788
AB9788                          STATION RECOVERY (2006)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2006 (MAS)
AB9788'IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ON COUNTY LINE, 2.15 MILES
AB9788'NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK HIGHWAY 61
AB9788'AND TRUNK HIGHWAY 96 TO TRUNK HIGHWAY 61 MILEPOINT 150.05, THENCE 0.05
AB9788'MILES WEST ON 120TH STREET NORTH (COUNTY ROAD 81), 64.5 FEET SOUTH OF
AB9788'120TH STREET NORTH, 34.5 FEET WEST OF FALCON AVENUE, 100 FEET SOUTH OF
AB9788'LIGHT POLE, 5.8 FEET EAST-SOUTHEAST OF FENCE CORNER, 4.2 FEET EAST OF
AB9788'WITNESS POST, 27.92 FEET NORTH OF REFERENCE MARK 1, 25.18 FEET
AB9788'SOUTHEAST OF REFERENCE MARK 2.
AB9788
AB9788                          STATION RECOVERY (2007)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2007 (WEF)
AB9788'IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ON COUNTY LINE, 2.15 MILES
AB9788'NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK HIGHWAY 61
AB9788'AND TRUNK HIGHWAY 96 TO TRUNK HIGHWAY 61 MILEPOINT 150.05, THENCE 0.05
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AB9788'MILES WEST ON 120TH STREET NORTH (COUNTY ROAD 81), 64.5 FEET SOUTH OF
AB9788'120TH STREET NORTH, 34.5 FEET WEST OF FALCON AVENUE, 100 FEET SOUTH OF
AB9788'LIGHT POLE, 5.8 FEET EAST-SOUTHEAST OF FENCE CORNER, 4.2 FEET EAST OF
AB9788'WITNESS POST, 27.92 FEET NORTH OF REFERENCE MARK 1, 25.18 FEET
AB9788'SOUTHEAST OF REFERENCE MARK 2.
AB9788
AB9788                          STATION RECOVERY (2010)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2010 (MPP)
AB9788'IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ALONG COUNTY LINE, 2.15
AB9788'MILES NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK
AB9788'HIGHWAY 61 AND TRUNK HIGHWAY 96 TO TRUNK HIGHWAY 61 MILEPOINT 150.05,
AB9788'THEN 0.05 MILE WEST ALONG 120TH STREET NORTH (COUNTY ROAD 81) , 64.5
AB9788'FEET SOUTH OF 120TH STREET NORTH, 34.5 FEET WEST OF FALCON AVENUE
AB9788'(RAMSEY COUNTY ROAD 154, 100.0 FEET SOUTH OF LIGHT POLE, 5.8 FEET
AB9788'EAST-SOUTHEAST OF FENCE CORNER, 27.92 FEET NORTH OF REFERENCE MARK 1,
AB9788'25.18 FEET SOUTHEAST OF REFERENCE MARK 2, 4.2 FEET EAST OF WITNESS
AB9788'POST.
AB9788
AB9788                          STATION RECOVERY (2011)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (LDB)
AB9788'THE STATION IS LOCATED ABOUT 6.0 KM (3.7 MI) SOUTHEAST OF CENTERVILLE,
AB9788'4.3 KM (2.7 MI) NORTH OF WHITE BEAR LAKE AND 4.1 KM (2.5 MI)
AB9788'SOUTH-SOUTHWEST OF HUGO, MN.
AB9788'
AB9788'TO REACH THE STATION FROM THE NORTH JUNCTION OF TRUNK HIGHWAY 61 AND
AB9788'TRUNK HIGHWAY 96, GO 2.15 MI (3.5 KM) NORTH ALONG TRUNK HIGHWAY 61 TO
AB9788'MILE POINT 150.05, THENCE 0.05 MI (0.1 KM) WEST ALONG 120TH STREET
AB9788'NORTH (COUNTY ROAD 81) TO THE SOUTHWEST CORNER OF THE INTERSECTION AND
AB9788'NORTHEAST CORNER OF WHITE BEAR TOWNSHIP AND THE MARK JUST SOUTH OF THE
AB9788'COUNTY LINE.
AB9788'
AB9788'THE STATION IS FOUND 64.5 FT (19.7 M) SOUTH OF 120TH STREET NORTH,
AB9788'34.5 FT (10.5 M) WEST OF FALCON AVENUE (RAMSEY COUNTY ROAD 154), 27.92
AB9788'FT (8.5 M) NORTH OF REFERENCE MARK 1, 25.18 FT (7.7 M) SOUTHEAST OF
AB9788'REFERENCE MARK 2, 5.8 FT (1.8 M) EAST-SOUTHEAST OF A FENCE CORNER AND
AB9788'4.2 FT (1.3 M) EAST OF A WITNESS POST.
AB9788
AB9788                          STATION RECOVERY (2014)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2014 (TXB)
AB9788'IN NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ALONG COUNTY LINE, 2.15
AB9788'MILES NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK
AB9788'HIGHWAY 61 AND TRUNK HIGHWAY 96, TO TRUNK HIGHWAY 61 MILEPOINT 150.05,
AB9788'THEN 0.05 MILE WEST ALONG 120TH STREET NORTH (COUNTY ROAD 81) , 64.5
AB9788'FEET SOUTH OF 120TH STREET NORTH (COUNTY ROAD 81), 34.5 FEET WEST OF
AB9788'FALCON AVENUE (RAMSEY COUNTY ROAD 154), 100.0 FEET SOUTH OF LIGHT
AB9788'POLE, 5.8 FEET EAST-SOUTHEAST OF FENCE CORNER, 27.92 FEET NORTH OF
AB9788'REFERENCE MARK 1, 25.18 FEET SOUTHEAST OF REFERENCE MARK 2, 4.2 FEET
AB9788'EAST OF WITNESS POST.
AB9788
AB9788                          STATION RECOVERY (2015)
AB9788
AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
AB9788'NORTHEAST CORNER OF WHITE BEAR TOWNSHIP ALONG COUNTY LINE, 2.15 MILES
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 AB9788'NORTH ALONG TRUNK HIGHWAY 61 FROM NORTH JUNCTION OF TRUNK HIGHWAY 61
 AB9788'AND TRUNK HIGHWAY 96, TO TRUNK HIGHWAY 61 MILEPOINT 150.05, THEN 0.05
 AB9788'MILE WEST ALONG COUNTY ROAD 81 (COUNTY ROAD J / 120TH STREET NORTH),
 AB9788'64.5 FEET SOUTH OF COUNTY ROAD 81, 34.5 FEET WEST OF COUNTY ROAD 154
 AB9788'(FALCON AVENUE), 100.0 FEET SOUTH OF LIGHT POLE, 5.8 FEET
 AB9788'EAST-SOUTHEAST OF FENCE CORNER, 27.92 FEET NORTH OF REFERENCE MARK 1,
 AB9788'25.18 FEET SOUTHEAST OF REFERENCE MARK 2, 4.2 FEET EAST OF WITNESS
 AB9788'POST.
 AB9788
 AB9788                          STATION RECOVERY (2016)
 AB9788
 AB9788'RECOVERY NOTE BY MN DEPT OF TRANSP 2016 (DXS)
 AB9788'RECOVERED IN GOOD CONDITION.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AC4958 ***********************************************************************
 AC4958  CBN         -  This is a Cooperative Base Network Control Station.
 AC4958  DESIGNATION -  YUKON
 AC4958  PID         -  AC4958
 AC4958  STATE/COUNTY-  MN/MILLE LACS
 AC4958  COUNTRY     -  US
 AC4958  USGS QUAD   -  ONAMIA (2019)
 AC4958
 AC4958                        *CURRENT SURVEY CONTROL
 AC4958  ______________________________________________________________________
 AC4958* NAD 83(2011) POSITION- 46 01 02.06825(N) 093 39 45.66521(W)   ADJUSTED
 AC4958* NAD 83(2011) ELLIP HT-   350.876 (meters)        (06/27/12)   ADJUSTED
 AC4958* NAD 83(2011) EPOCH   -  2010.00
 AC4958* NAVD 88 ORTHO HEIGHT -   378.127 (meters)     1240.57  (feet) ADJUSTED
 AC4958  ______________________________________________________________________
 AC4958  GEOID HEIGHT    -        -27.251 (meters)                     GEOID18
 AC4958  NAD 83(2011) X  -   -283,457.935 (meters)                     COMP
 AC4958  NAD 83(2011) Y  - -4,428,121.798 (meters)                     COMP
 AC4958  NAD 83(2011) Z  -  4,566,831.037 (meters)                     COMP
 AC4958  LAPLACE CORR    -         -3.06  (seconds)                    DEFLEC18
 AC4958  DYNAMIC HEIGHT  -        378.132 (meters)     1240.59  (feet) COMP
 AC4958  MODELED GRAVITY -    980,616.3   (mgal)                       NAVD 88
 AC4958
 AC4958  VERT ORDER      -  SECOND    CLASS I
 AC4958
 AC4958  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
 AC4958  Standards:
 AC4958         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
 AC4958            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
 AC4958  ----------------------------------------------------------------------
 AC4958  NETWORK    0.28   0.35          0.13   0.09   0.18      0.00558735
 AC4958  ----------------------------------------------------------------------
 AC4958  Click here for local accuracies and other accuracy information.
 AC4958
 AC4958
 AC4958.The horizontal coordinates were established by GPS observations
 AC4958.and adjusted by the National Geodetic Survey in June 2012.
 AC4958
 AC4958.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
 AC4958.been affixed to the stable North American tectonic plate. See
 AC4958.NA2011 for more information.
 AC4958
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AC4958.The horizontal coordinates are valid at the epoch date displayed above
AC4958.which is a decimal equivalence of Year/Month/Day.
AC4958
AC4958.The orthometric height was determined by differential leveling and
AC4958.adjusted by the NATIONAL GEODETIC SURVEY
AC4958.in August 2004.
AC4958
AC4958.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4958.GEOID18 height accuracy estimate available here.
AC4958
AC4958.Click photographs - Photos may exist for this station.
AC4958
AC4958.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AC4958
AC4958.The Laplace correction was computed from DEFLEC18 derived deflections.
AC4958
AC4958.The ellipsoidal height was determined by GPS observations
AC4958.and is referenced to NAD 83.
AC4958
AC4958.The dynamic height is computed by dividing the NAVD 88
AC4958.geopotential number by the normal gravity value computed on the
AC4958.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4958.degrees latitude (g = 980.6199 gals.).
AC4958
AC4958.The modeled gravity was interpolated from observed gravity values.
AC4958
AC4958. The following values were computed from the NAD 83(2011) position.
AC4958
AC4958;                    North         East     Units Scale Factor Converg.
AC4958;SPC MN C     -   213,230.848   845,477.974   MT  0.99993731   +0 25 29.5
AC4958;SPC MN C     -   699,574.87  2,773,872.32   sFT  0.99993731   +0 25 29.5
AC4958;UTM  15      - 5,096,176.569   448,702.763   MT  0.99963235   -0 28 36.6
AC4958
AC4958!             -  Elev Factor  x  Scale Factor =   Combined Factor
AC4958!SPC MN C     -   0.99994500  x   0.99993731  =   0.99988231
AC4958!UTM  15      -   0.99994500  x   0.99963235  =   0.99957737
AC4958
AC4958_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVL4870296176(NAD 83)
AC4958
AC4958                           SUPERSEDED SURVEY CONTROL
AC4958
AC4958  NAD 83(2007)-  46 01 02.06835(N)    093 39 45.66594(W) AD(2002.00) 0
AC4958  ELLIP H (02/10/07)  350.906  (m)                       GP(2002.00)
AC4958  NAD 83(1996)-  46 01 02.06806(N)    093 39 45.66550(W) AD(       ) B
AC4958  ELLIP H (01/15/97)  350.938  (m)                       GP(       ) 4 1
AC4958  NAVD 88             378.13   (m)         1240.6    (f) LEVELING    3
AC4958  NAVD 88 (05/10/02)  378.1    (m)  GEOID99 model used   GPS OBS
AC4958  NAVD 88 (01/15/97)  378.2    (m)  GEOID96 model used   GPS OBS
AC4958
AC4958.Superseded values are not recommended for survey control.
AC4958
AC4958.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4958.See file dsdata.pdf to determine how the superseded data were derived.
AC4958
AC4958_MARKER: F = FLANGE-ENCASED ROD
AC4958_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
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AC4958_STAMPING: YUKON 1994
AC4958_MARK LOGO: MNDT
AC4958_PROJECTION: RECESSED 18 CENTIMETERS
AC4958_MAGNETIC: T = STEEL SPIKE ADJACENT TO MONUMENT
AC4958_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AC4958_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4958+SATELLITE: SATELLITE OBSERVATIONS - January 10, 2018
AC4958_ROD/PIPE-DEPTH:  8.5 meters
AC4958_SLEEVE-DEPTH  :  0.9 meters
AC4958
AC4958  HISTORY     - Date     Condition        Report By
AC4958  HISTORY     - 19940401 MONUMENTED       MNDT
AC4958  HISTORY     - 20000401 GOOD             MNDT
AC4958  HISTORY     - 20000817 GOOD             MNDT
AC4958  HISTORY     - 20000924 GOOD             MNDT
AC4958  HISTORY     - 20021203 GOOD             MNDT
AC4958  HISTORY     - 20040729 GOOD             MNDT
AC4958  HISTORY     - 20050517 GOOD             MNDT
AC4958  HISTORY     - 20151001 GOOD             MNDT
AC4958  HISTORY     - 20171108 GOOD             MNDT
AC4958  HISTORY     - 20180110 GOOD             MNDT
AC4958
AC4958                          STATION DESCRIPTION
AC4958
AC4958'DESCRIBED BY MN DEPT OF TRANSP 1994
AC4958'DESCRIBED BY MINNESOTA DEPARTMENT OF TRANSPORTATION 1994.  THE MARK IS
AC4958'LOCATED ABOUT 4 MI (6.4 KM) SOUTH OF THE TOWN OF ONAMIA IN THE SW 1/4
AC4958'OF SECTION 19, T41N, R26W.  TO REACH THE MARK FROM THE SOUTH JCT OF TH
AC4958'169 AND TH 27 IN ONAMIA, GO SOUTH ON TH 169 FOR 3.25 MI (5.23 KM) TO
AC4958'TH 169 MP 209.65 AND THE MARK ON THE RIGHT.  THE MARK IS 60.5 FT (18.4
AC4958'M) WEST OF NB TH 169, 64.0 FT (19.5 M) EAST OF SB TH 169, 70 FT (21.3
AC4958'M) NORTH A CROSSOVER, AND 2.3 FT (0.7 M) SOUTH OF A WIT POST. THE MARK
AC4958'IS A PUNCH MARK ON THE TOP OF A DRIVEN 1/2 INCH DIAMETER BY 28 FT (8.5
AC4958'M) LONG STAINLESS STEEL ROD WITH A 3 FT (0.9 M) PLASTIC STABILIZER
AC4958'SLEEVE.  ACCESS TO THE DATUM POINT IS THROUGH A 5 INCH LOGO CAP THAT
AC4958'IS FLUSH WITH THE GROUND, STAMPED---YUKON 1994---, SET ON TOP OF A 5
AC4958'INCH DIAMETER BY 24 INCH LONG PVC PLASTIC PIPE FILLED WITH SILICA SAND
AC4958'AND SET IN CONCRETE.  A METAL SPIKE WAS PLACED IN THE SILICA SAND
AC4958'MAKING THE MARK MAGNETIC.  DESCRIBED BY DAVID K. HERDER, TYPED BY
AC4958'J.E.M.
AC4958
AC4958                          STATION RECOVERY (2000)
AC4958
AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (DKH)
AC4958'THE MARK WAS RECOVERED AS DESCRIBED.
AC4958
AC4958                          STATION RECOVERY (2000)
AC4958
AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (TJA)
AC4958'RECOVERED AS DESCRIBED.
AC4958
AC4958                          STATION RECOVERY (2000)
AC4958
AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2000 (DKH)
AC4958'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  RR SPIKE BY
AC4958'MARK MAKES MARK MAGNETIC, FLUSH, SUITABLE FOR GPS.
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 AC4958
 AC4958                          STATION RECOVERY (2002)
 AC4958
 AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2002 (DKH)
 AC4958'RECOVERED AS DESCRIBED.
 AC4958
 AC4958                          STATION RECOVERY (2004)
 AC4958
 AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2004 (KMS)
 AC4958'4.0 MILES SOUTH OF ONAMIA, 3.25 MILES SOUTH ALONG TRUNK HIGHWAY 169
 AC4958'FROM SOUTH JUNCTION OF TRUNK HIGHWAY 27 AND TRUNK HIGHWAY 169 IN
 AC4958'ONAMIA, AT TRUNK HIGHWAY 169 MILEPOINT 209.65, IN TRUNK HIGHWAY 169
 AC4958'MEDIAN, 60.5 FEET WEST OF NORTHBOUND TRUNK HIGHWAY 169, 64.0 FEET EAST
 AC4958'OF SOUTHBOUND TRUNK HIGHWAY 169, 70 FEET NORTH OF CROSSOVER, 2.3 FEET
 AC4958'SOUTH OF WITNESS POST.
 AC4958
 AC4958                          STATION RECOVERY (2005)
 AC4958
 AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2005 (KNB)
 AC4958'RECOVERED AS DESCRIBED.
 AC4958
 AC4958                          STATION RECOVERY (2015)
 AC4958
 AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2015 (MPP)
 AC4958'3.31 MILES SOUTH OF ONAMIA, 3.25 MILES SOUTH ALONG TRUNK HIGHWAY 169
 AC4958'FROM JUNCTION OF TRUNK HIGHWAY 169 AND COUNTY ROAD 38 IN ONAMIA, AT
 AC4958'TRUNK HIGHWAY 169 MILEPOINT 209.65, IN TRUNK HIGHWAY 169 MEDIAN, 60.5
 AC4958'FEET WEST OF NORTHBOUND TRUNK HIGHWAY 169, 64.0 FEET EAST OF
 AC4958'SOUTHBOUND TRUNK HIGHWAY 169, 70 FEET NORTH OF CROSSOVER, 2.3 FEET
 AC4958'SOUTH OF WITNESS POST.
 AC4958
 AC4958                          STATION RECOVERY (2017)
 AC4958
 AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2017 (BXB)
 AC4958'3.31 MILES SOUTH OF ONAMIA, 3.9 MILES SOUTH ALONG TRUNK HIGHWAY 169
 AC4958'FROM THE JUNCTION OF TRUNK HIGHWAY 169 AND TRUNK HIGHWAY 27 IN ONAMIA,
 AC4958'AT TRUNK HIGHWAY 169 MILEPOINT 209.65, IN TRUNK HIGHWAY 169 MEDIAN,
 AC4958'60.5 FEET WEST OF NORTHBOUND TRUNK HIGHWAY 169, 64.0 FEET EAST OF
 AC4958'SOUTHBOUND TRUNK HIGHWAY 169, 70.0 FEET NORTH OF A CROSSOVER, 2.3 FEET
 AC4958'SOUTH OF A WITNESS POST.
 AC4958
 AC4958                          STATION RECOVERY (2018)
 AC4958
 AC4958'RECOVERY NOTE BY MN DEPT OF TRANSP 2018 (DAS)
 AC4958'RECOVERED AS DESCRIBED.
1        National Geodetic Survey,   Retrieval Date = APRIL 27, 2023
 AA5380 ***********************************************************************
 AA5380  FBN         -  This is a Federal Base Network Control Station.
 AA5380  DESIGNATION -  ZMP A
 AA5380  PID         -  AA5380
 AA5380  STATE/COUNTY-  MN/DAKOTA
 AA5380  COUNTRY     -  US
 AA5380  USGS QUAD   -  FARMINGTON (2019)
 AA5380
 AA5380                        *CURRENT SURVEY CONTROL
 AA5380  ______________________________________________________________________
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AA5380* NAD 83(2011) POSITION- 44 38 07.81062(N) 093 09 05.64557(W)   ADJUSTED
AA5380* NAD 83(2011) ELLIP HT-   249.147 (meters)        (06/27/12)   ADJUSTED
AA5380* NAD 83(2011) EPOCH    -  2010.00
AA5380* NAVD 88 ORTHO HEIGHT -   277.296 (meters)      909.76  (feet) ADJUSTED
AA5380  ____________________________________________________________________
AA5380  GEOID HEIGHT    -        -28.137 (meters)                    GEOID18
AA5380  NAD 83(2011) X  -   -249,945.287 (meters)                    COMP
AA5380  NAD 83(2011) Y  - -4,539,442.989 (meters)                    COMP
AA5380  NAD 83(2011) Z  -  4,458,790.545 (meters)                    COMP
AA5380  LAPLACE CORR    -        -10.01  (seconds)                   DEFLEC18
AA5380  DYNAMIC HEIGHT  -        277.267 (meters)      909.67  (feet) COMP
AA5380  MODELED GRAVITY -    980,506.6   (mgal)                      NAVD 88
AA5380
AA5380  VERT ORDER      -  SECOND    CLASS I
AA5380
AA5380  Network accuracy estimates per FGDC Geospatial Positioning Accuracy
AA5380  Standards:
AA5380         FGDC (95% conf, cm)     Standard deviation (cm)     CorrNE
AA5380            Horiz  Ellip          SD_N   SD_E   SD_h      (unitless)
AA5380  ------------------------------------------------------------------
AA5380  NETWORK    0.29   0.57          0.13   0.10   0.29     -0.04604500
AA5380  ------------------------------------------------------------------
AA5380  Click here for local accuracies and other accuracy information.
AA5380
AA5380
AA5380.The horizontal coordinates were established by GPS observations
AA5380.and adjusted by the National Geodetic Survey in June 2012.
AA5380
AA5380.NAD 83(2011) refers to NAD 83 coordinates where the reference frame has
AA5380.been affixed to the stable North American tectonic plate. See
AA5380.NA2011 for more information.
AA5380
AA5380.The horizontal coordinates are valid at the epoch date displayed above
AA5380.which is a decimal equivalence of Year/Month/Day.
AA5380
AA5380.The orthometric height was determined by differential leveling and
AA5380.adjusted by the NATIONAL GEODETIC SURVEY
AA5380.in April 2001.
AA5380
AA5380.Significant digits in the geoid height do not necessarily reflect accuracy.
AA5380.GEOID18 height accuracy estimate available here.
AA5380
AA5380.Click photographs - Photos may exist for this station.
AA5380
AA5380.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AA5380
AA5380.The Laplace correction was computed from DEFLEC18 derived deflections.
AA5380
AA5380.The ellipsoidal height was determined by GPS observations
AA5380.and is referenced to NAD 83.
AA5380
AA5380.The dynamic height is computed by dividing the NAVD 88
AA5380.geopotential number by the normal gravity value computed on the
AA5380.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AA5380.degrees latitude (g = 980.6199 gals.).
AA5380
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AA5380.The modeled gravity was interpolated from observed gravity values.
AA5380
AA5380. The following values were computed from the NAD 83(2011) position.
AA5380
AA5380;                    North         East     Units Scale Factor Converg.
AA5380;SPC MN S     -   282,072.673   867,312.665   MT  0.99992477   +0 35 40.9
AA5380;SPC MN S     -   925,433.43  2,845,508.30   sFT  0.99992477   +0 35 40.9
AA5380;UTM  15      - 4,942,471.867   487,978.609   MT  0.99960178   -0 06 23.4
AA5380
AA5380!             -  Elev Factor  x  Scale Factor =   Combined Factor
AA5380!SPC MN S     -   0.99996094  x   0.99992477  =   0.99988571
AA5380!UTM  15      -   0.99996094  x   0.99960178  =   0.99956273
AA5380
AA5380_U.S. NATIONAL GRID SPATIAL ADDRESS: 15TVK8797842471(NAD 83)
AA5380
AA5380                           SUPERSEDED SURVEY CONTROL
AA5380
AA5380  NAD 83(2007)-  44 38 07.81072(N)    093 09 05.64634(W) AD(2002.00) 0
AA5380  ELLIP H (02/10/07)  249.173  (m)                       GP(2002.00)
AA5380  NAD 83(1992)-  44 38 07.81064(N)    093 09 05.64713(W) AD(       ) A
AA5380  ELLIP H (06/30/95)  249.206  (m)                       GP(       ) 1 1
AA5380  NAVD 88             277.30   (m)          909.8    (f) LEVELING    3
AA5380
AA5380.Superseded values are not recommended for survey control.
AA5380
AA5380.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AA5380.See file dsdata.pdf to determine how the superseded data were derived.
AA5380
AA5380_MARKER: F = FLANGE-ENCASED ROD
AA5380_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AA5380_STAMPING: ZMP A 1995
AA5380_MARK LOGO: NGS
AA5380_PROJECTION: RECESSED 5 CENTIMETERS
AA5380_MAGNETIC: N = NO MAGNETIC MATERIAL
AA5380_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AA5380_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AA5380+SATELLITE: SATELLITE OBSERVATIONS - September 13, 2011
AA5380_ROD/PIPE-DEPTH: 40.2 meters
AA5380_SLEEVE-DEPTH  : 1.8 meters
AA5380
AA5380  HISTORY     - Date     Condition        Report By
AA5380  HISTORY     - 19950322 MONUMENTED       NGS
AA5380  HISTORY     - 19950502 GOOD             NGS
AA5380  HISTORY     - 19950913 GOOD             MNDT
AA5380  HISTORY     - 200111   GOOD             MNDT
AA5380  HISTORY     - 20081024 GOOD             MNDT
AA5380  HISTORY     - 20110913 GOOD             MNDT
AA5380
AA5380                           STATION DESCRIPTION
AA5380
AA5380'DESCRIBED BY NATIONAL GEODETIC SURVEY 1995 (DBH)
AA5380'THE MARK IS LOCATED AT THE FAA AIR TRAFFIC CONTROL CENTER IN THE TOWN
AA5380'OF FARMINGTON, IN THE SW 1/4 OF SECTION 31, T114N, R19W.  TO REACH THE
AA5380'MARK FROM THE POST OFFICE AT THE JCT OF THIRD ST AND SPRUCE ST IN
AA5380'FARMINGTON, GO WEST ON SPRUCE ST FOR 0.3 MI (0.5 KM) TO THE SECURITY
AA5380'GATE AT THE FAA FACILITY, OBTAIN PERMISSION AT THE GATE TO ENTER THE
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AA5380'GROUNDS, THEN GO SOUTH ON A CONCRETE DRIVE TO THE SOUTHERN MOST SW COR
AA5380'OF THE PARKING LOT AND THE MARK ON THE RIGHT.  THE MARK, A PUNCH MARK
AA5380'ON A 9/16 INCH BY 132.0 FT (40.2 M) DRIVEN STEEL ROD WITH A 6.0 FT
AA5380'(1.8 M) PLASTIC STABILIZER SLEEVE, IS 79.6 FT (24.3 M) SOUTH OF A
AA5380'LIGHT POLE, 16.2 FT (4.9 M) WNW OF THE CORNER OF THE CURB AND GUTTER,
AA5380'5.8 FT (1.8 M) SW OF A WOOD POST WITH A VEHICLE ELECTRIC PLUG IN, AND
AA5380'10.1 FT (3.1 M) EAST OF A WITNESS POST.  ACCESS TO THE DATUM POINT IS
AA5380'THROUGH A 5-INCH LOGO CAP.  DESCRIBED BY DIXON B.HOYLE, TYPED BY
AA5380'J.E.M.
AA5380
AA5380                          STATION RECOVERY (1995)
AA5380
AA5380'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (BJY)
AA5380'THE STATION WAS RECOVERED IN GOOD CONDITION AS PREVIOUSLY DESCRIBED.
AA5380'RECOVERY NOTE BY DIXON B HOYLE, TYPED BY J.E.M.
AA5380
AA5380                          STATION RECOVERY (1995)
AA5380
AA5380'RECOVERY NOTE BY MN DEPT OF TRANSP 1995
AA5380'THE MARK WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  RECOVERY NOTE
AA5380'BY JAMES E.  MAGOON, TYPED BY G.W.O.
AA5380
AA5380                          STATION RECOVERY (2001)
AA5380
AA5380'RECOVERY NOTE BY MN DEPT OF TRANSP 2001 (DKH)
AA5380'THE MARK IS LOCATED AT THE FAA AIR TRAFFIC CONTROL CENTER IN THE
AA5380'TOWNOF FARMINGTON, IN THE SW 1/4 OF SECTION 31, T114N, R19W.  TO
AA5380'REACH THE MARK FROM THE POST OFFICE IN THE MIDDLE OF N OAK STREET
AA5380'BETWEEN 2ND AND 3RD STREETS IN FARMINGTON , GO SOUTH ON 3RD
AA5380'STREET FOR ONE BLOCK TO SPRUCE STREET.  TURN RIGHT AND GO WEST
AA5380'ON SPRUCE ST FOR 0.3 MI (0.5 KM) TO THE SECURITY GATE AT THE FAA
AA5380'FACILITY, OBTAIN PERMISSION AT THE GATE TO ENTER THE GROUNDS, THEN
AA5380'GO SOUTH ON A CONCRETE DRIVE TO THE SOUTHERN MOST SW CORNER OF
AA5380'THE
AA5380'PARKING LOT AND THE MARK ON THE RIGHT.  THE MARK, A PUNCH MARK ON
AA5380'A 9/16 INCH BY 132.0 FT (40.2 M) DRIVEN STEEL ROD WITH A 6.0 FT(1.8 M)
AA5380'PLASTIC STABILIZER SLEEVE, IS 79.6 FT (24.3 M) SOUTH OF A LIGHT POLE,
AA5380'16.2
AA5380'FT (4.9 M) WNW OF THE CORNER OF THE CURB AND GUTTER,5.8 FT (1.8 M) SW
AA5380'OF A WOOD POST WITH A VEHICLE ELECTRIC PLUG IN, AND10.1 FT (3.1 M)
AA5380'EAST OF A WITNESS POST.  ACCESS TO THE DATUM POINT IS THROUGH A
AA5380'5-INCH LOGO CAP.
AA5380'
AA5380'THE STAMPING ON THE MARK HAD BEEN COMPLETELY SCRAPED OFF BY
AA5380'LAWN MOWING OPERATIONS.  STATION WAS RESTAMPED - ZMP A 1995 - ON
AA5380'THIS DATE.  OTHERWISE, LOGO CAP AND DATUM POINT APPEARED IN
AA5380'EXCELLENT CONDITION.  THE ELECTRICAL PLUG IN THE POST CLOSEST TO
AA5380'THE MARK HAS NOT HAD POWER FOR AT LEAST SEVEN YEARS, HOWEVER,
AA5380'THE NEXT POST, 20 FEET NORTH, DOES HAVE POWER.
AA5380'
AA5380'THIS STATION IS LOCATED ON A SITE CRITICAL TO THE NATIONAL
AA5380'INFRASTRUCTURE.  GETTING PERMISSION TO ACCESS THE SITE MAY TAKE
AA5380'MORE TIME THAN EXPECTED.
AA5380
AA5380                          STATION RECOVERY (2008)
AA5380
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AA5380'RECOVERY NOTE BY MN DEPT OF TRANSP 2008 (DLB)
AA5380'IN FARMINGTON, 0.3 MI (0.5 KM) WEST ON SPRUCE STREET FROM THE JUNCTION
AA5380'OF THIRD STREET AND SPRUCE STREET IN FARMINGTON TO SECURITY GATE AT
AA5380'FEDERAL AVIATION ADMINISTRATION AIR ROUTE TRAFFIC CONTROL CENTER, THEN
AA5380'0.15 MI (0.24 KM) SOUTH ON DRIVE TO SOUTHWEST CORNER OF PARKING LOT,
AA5380'79.6 FT (24.3 M) SOUTH OF LIGHT POLE, 16.2 FT (4.9 M) WEST-NORTHWEST
AA5380'OF CORNER PARKING LOT CURB AND GUTTER, 5.8 FT (1.8 M) SOUTHWEST OF
AA5380'WOODEN POST WITH ELECTRIC VEHICLE PLUG IN, 10.1 FT (3.1 M) EAST OF A
AA5380'WITNESS POST.
AA5380
AA5380                          STATION RECOVERY (2011)
AA5380
AA5380'RECOVERY NOTE BY MN DEPT OF TRANSP 2011 (DB)
AA5380'RECOVERED IN GOOD CONDITION.



*** retrieval complete.
Elapsed Time = 00:00:09
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