

GROUND CONTROL SURVEY REPORT

**GPS SURVEY
FOR LIDAR CONTROL**

MONROE COUNTY, WI WROC LIDAR SURVEY

MONROE COUNTY, WISCONSIN

Services provided by:

AYRES

ASSOCIATES

**Geospatial Services
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ABSTRACT

This report documents the GPS ground surveys conducted in support of FEMA accuracy testing of the lidar data collection for Monroe County, Wisconsin, in 2010. Surveys were conducted at 5 sites utilizing the base stations established in the static network. These surveys established “ground truth” data at each site on different surface types, including bare earth, low grass, brush lands, low trees, forest, high grass, weeds, crops, and urban areas. Statistical comparisons were made between ground truth points collected from the ground survey and the elevation at the associated horizontal coordinates represented on the LiDAR-derived digital terrain model.

SAMPLE POINTS/TEST POINTS

The ground survey test points were distributed and categorized into sites as shown in the Test Survey Locations map on the next page.

DATA ANALYSIS

To qualify as an acceptable accuracy test, the lidar data must be compared with a dataset of higher accuracy – in this instance ground survey. To develop a comparable dataset of points from the lidar dataset, a utility from proprietary software was used.

The ground control survey results were imported into an ESRI Pointz shapefile with each point’s information as attributes. The utility then accessed the lidar and generated a triangulated irregular network (TIN), which is a continuous digital terrain surface, using the bare-earth lidar points and the compiled breaklines. The utility probed the TIN surface to determine its elevations at each of the survey point’s horizontal locations.

The elevation was then appended as a field to the Pointz shapefile; the attributes for each point were exported to a database; and then statistical analysis was performed. The results can be seen on the following pages.

OVERALL ACCURACY

A comparison of ground survey versus lidar model values indicates a vertical root mean square error (RMSE_z) of 0.484 feet. This is within the FEMA specified vertical accuracy tolerance of 0.6. This RMSE_z equates to a tested 0.9480 feet vertical accuracy at 95% confidence level.

Jackson County

Point: 45033
X: 710215.132
Y: 448090.169008

Point: 45219
X: 618722.872
Y: 430639.192008

Point: 45141
X: 658833.02
Y: 402100.311008

Monroe County

Point: 40280
X: 635918.262
Y: 328643.971008

Point: 40102
X: 743742.447
Y: 323948.655008

Vernon County

GROUND TRUTH ANALYSIS
Comparison of Lidar Points to Ground-Truth Points
Monroe County Coordinate System WISCRS
NAD 83 HARN / NAVD 88, survey feet

Field definitions

Name – The designation given to the ground survey point to identify it with its coordinates and land cover type

X, Y, and Z – The coordinates that describe the point's horizontal and vertical location within the Monroe County WISCRS Coordinate System. The X and Y values are shared between the ground control points and lidar comparison points. The Z field shows the elevation of the survey number. The lidar comparison point's elevation is implicit in the analysis' delta Z

Delta Z – The error, the difference between the elevation at a horizontal location as determined by ground survey and as determined by the lidar dataset

Delta Z Squared – The value of squaring Delta Z

Land Cover – The predominant land cover category at the location of the survey point

Statistic definitions

Sum – The sum of the analysis' Delta Z Squared values

Average – The average of the analysis' Delta Z Squared values

RMSE – The root mean squared error, the square root of the average of the squared errors

Accuracyz – The product of multiplying the RMSE with 1.96, a conversion between the RMSE value and a value with a 95% confidence level

Name	X	Y	Z	Delta_Z	Delta_Z_Squared	TYPE
40013	708181.6560	447636.7240	1018.4200	0.095000	0.009025	CONC
40014	708178.7830	447636.6320	1018.4500	0.254000	0.064516	CONC
40015	708176.2060	447636.7490	1018.4500	0.270000	0.072900	CONC
40016	708173.4080	447636.8180	1018.4900	0.204000	0.041616	CONC
40017	708173.1270	447633.8100	1018.4800	0.351000	0.123201	CONC
40018	708175.8680	447633.8450	1018.4700	0.366000	0.133956	CONC
40019	708178.3690	447633.7980	1018.4300	0.334000	0.111556	CONC
40020	708181.3870	447633.6160	1018.4100	0.166000	0.027556	CONC
40021	708181.2620	447639.4920	1018.3600	0.131000	0.017161	CONC
40022	708178.6570	447639.4020	1018.3800	0.284000	0.080656	CONC
40023	708176.3990	447639.4080	1018.4400	0.301000	0.090601	CONC
40024	708173.7340	447639.5480	1018.4400	0.267000	0.071289	CONC
40025	708171.3740	447639.5620	1018.4800	0.223000	0.049729	CONC
40026	708171.5670	447642.3170	1018.4400	0.307000	0.094249	CONC
40027	708174.3840	447642.5190	1018.5600	0.138000	0.019044	CONC
40028	708176.5740	447642.5120	1018.3400	0.309000	0.095481	CONC
40029	708179.0870	447642.4140	1018.2700	0.326000	0.106276	CONC
40030	708181.5340	447642.4250	1018.2500	0.289000	0.083521	CONC
40031	708181.7820	447645.9600	1018.1800	0.261000	0.068121	CONC
40032	708179.0100	447645.8860	1018.2700	0.354000	0.125316	CONC
40033	708175.9160	447645.7890	1018.3200	0.308000	0.094864	CONC
40034	708172.9730	447645.7880	1018.4000	0.277000	0.076729	CONC
40035	708177.3080	447639.3740	1018.3500	0.381000	0.145161	CONC
40036	708067.2110	447844.2730	1016.3400	0.303000	0.091809	MOWED GRASS
40037	708064.7150	447845.8720	1016.3100	0.278000	0.077284	MOWED GRASS
40038	708061.8070	447848.0250	1016.2900	0.303000	0.091809	MOWED GRASS
40039	708059.0150	447849.8690	1016.2500	0.278000	0.077284	MOWED GRASS
40040	708056.2010	447851.7540	1016.2300	0.216000	0.046656	MOWED GRASS
40041	708057.8900	447854.4080	1016.1600	0.219000	0.047961	MOWED GRASS
40042	708060.8930	447852.9690	1016.2100	0.157000	0.024649	MOWED GRASS
40043	708063.5010	447851.0030	1016.2700	0.185000	0.034225	MOWED GRASS
40044	708066.4060	447849.1930	1016.3000	0.258000	0.066564	MOWED GRASS
40045	708069.5460	447847.1390	1016.3200	0.261000	0.068121	MOWED GRASS
40046	708072.2850	447845.0130	1016.3000	0.226000	0.051076	MOWED GRASS
40047	708074.2770	447848.0730	1016.2200	0.071000	0.005041	MOWED GRASS
40048	708071.6040	447850.0170	1016.2300	0.112000	0.012544	MOWED GRASS
40049	708069.0380	447852.1100	1016.2200	0.261000	0.068121	MOWED GRASS
40050	708065.3140	447854.3250	1016.1900	0.258000	0.066564	MOWED GRASS
40051	708062.1550	447856.1660	1016.1600	0.159000	0.025281	MOWED GRASS
40052	708064.1020	447859.1020	1016.1700	0.167000	0.027889	MOWED GRASS
40053	708066.9260	447857.0670	1016.1500	0.113000	0.012769	MOWED GRASS
40054	708069.7870	447855.2420	1016.1600	0.203000	0.041209	MOWED GRASS
40055	708072.5820	447853.5250	1016.1500	0.250000	0.062500	MOWED GRASS
40056	708075.1600	447851.8400	1016.1500	0.152000	0.023104	MOWED GRASS
40057	708076.8080	447854.3480	1016.0800	0.187000	0.034969	MOWED GRASS
40058	708073.6950	447856.7120	1016.0800	0.180000	0.032400	MOWED GRASS
40059	708071.1620	447858.5330	1016.0300	0.227000	0.051529	MOWED GRASS
40060	708068.0270	447860.6380	1016.0600	0.185000	0.034225	MOWED GRASS
40061	708065.3410	447862.6750	1016.1200	0.121000	0.014641	MOWED GRASS
40066	618561.5110	431696.7600	856.6000	0.254000	0.064516	GRAV
40067	618557.1790	431696.9900	856.5700	0.284000	0.080656	GRAV
40068	618553.6030	431697.2120	856.5900	0.201000	0.040401	GRAV
40069	618549.8560	431698.0440	856.5300	0.209000	0.043681	GRAV
40070	618546.8110	431698.3610	856.6300	0.256000	0.065536	GRAV
40071	618546.6730	431701.8460	856.5800	0.357000	0.127449	GRAV
40072	618550.0510	431701.7000	856.5700	0.127000	0.016129	GRAV
40073	618555.6110	431701.1720	856.5500	0.249000	0.062001	GRAV
40074	618560.1330	431701.1810	856.5300	0.196000	0.038416	GRAV

40075	618564.8700	431701.0910	856.5300	0.075000	0.005625 GRAV
40076	618565.2640	431705.6530	856.4700	0.351000	0.123201 GRAV
40077	618561.2180	431705.8250	856.4400	0.343000	0.117649 GRAV
40078	618556.7260	431706.0060	856.4800	0.397000	0.157609 GRAV
40079	618552.7620	431706.2540	856.5000	0.316000	0.099856 GRAV
40080	618547.8740	431706.3530	856.5200	0.291000	0.084681 GRAV
40081	618547.9050	431711.0150	856.5500	0.411000	0.168921 GRAV
40082	618551.5570	431710.8600	856.5400	0.408000	0.166464 GRAV
40083	618555.7550	431710.7630	856.5300	0.337000	0.113569 GRAV
40084	618559.5400	431710.4680	856.5100	0.300000	0.090000 GRAV
40085	618563.4610	431710.4230	856.5200	0.313000	0.097969 GRAV
40086	618564.0780	431715.2680	856.5300	0.419000	0.175561 GRAV
40087	618560.1160	431715.4890	856.5200	0.357000	0.127449 GRAV
40088	618555.6660	431715.6500	856.5100	0.215000	0.046225 GRAV
40089	618550.4920	431715.8520	856.5800	0.254000	0.064516 GRAV
40090	618544.6570	431716.1050	856.5200	0.319000	0.101761 GRAV
40093	742711.6850	324796.3290	1026.2900	0.065000	0.004225 ASPH
40094	743738.4950	323942.8810	1006.4100	0.065000	0.004225 MOWED GRASS
40095	743741.6660	323942.9940	1006.5000	0.006000	0.000036 MOWED GRASS
40096	743745.1460	323943.1090	1006.5500	0.030000	0.000900 MOWED GRASS
40097	743749.1240	323943.2300	1006.6400	0.171000	0.029241 MOWED GRASS
40098	743752.2040	323943.2880	1006.5900	0.142000	0.020164 MOWED GRASS
40099	743751.6420	323947.3800	1006.6000	0.121000	0.014641 MOWED GRASS
40100	743748.2230	323946.9960	1006.5800	0.101000	0.010201 MOWED GRASS
40101	743745.3670	323947.9230	1006.5700	-0.001000	0.000001 MOWED GRASS
40102	743742.4470	323948.6550	1006.5200	0.017000	0.000289 MOWED GRASS
40103	743738.1230	323949.7140	1006.4000	0.239000	0.057121 MOWED GRASS
40104	743738.2990	323952.9040	1006.4800	0.112000	0.012544 MOWED GRASS
40105	743741.7060	323952.9020	1006.5100	0.033000	0.001089 MOWED GRASS
40106	743744.8900	323953.2440	1006.5000	0.174000	0.030276 MOWED GRASS
40107	743748.8490	323954.2640	1006.5200	0.123000	0.015129 MOWED GRASS
40108	743752.9190	323954.9780	1006.6200	0.122000	0.014884 MOWED GRASS
40109	743752.5420	323957.9570	1006.6500	0.104000	0.010816 MOWED GRASS
40110	743749.6130	323957.3440	1006.5600	0.131000	0.017161 MOWED GRASS
40111	743747.1340	323957.6890	1006.6100	0.007000	0.000049 MOWED GRASS
40112	743743.8640	323957.4940	1006.6100	0.042000	0.001764 MOWED GRASS
40113	743740.0950	323957.2630	1006.5800	0.136000	0.018496 MOWED GRASS
40114	743739.4980	323960.9240	1006.5900	-0.023000	0.000529 MOWED GRASS
40116	743101.4140	324534.9570	1019.0600	0.012000	0.000144 CONC
40117	743100.2060	324532.9310	1018.9500	0.035000	0.001225 CONC
40118	743098.2470	324530.7500	1018.9700	-0.015000	0.000225 CONC
40119	743097.2990	324529.1910	1018.8800	0.061000	0.003721 CONC
40120	743100.6450	324528.2580	1018.9200	-0.017000	0.000289 CONC
40121	743101.6070	324529.6480	1018.9500	-0.058000	0.003364 CONC
40122	743102.4620	324531.6590	1018.9600	-0.078000	0.006084 CONC
40123	743103.6960	324533.2950	1019.0200	-0.115000	0.013225 CONC
40124	743105.8310	324531.6820	1018.9700	-0.120000	0.014400 CONC
40125	743104.4510	324529.8840	1018.9400	-0.084000	0.007056 CONC
40126	743102.6240	324527.1680	1018.8700	-0.071000	0.005041 CONC
40127	743105.3920	324525.7080	1018.9600	-0.200000	0.040000 CONC
40128	743106.5680	324527.4600	1018.9000	0.012000	0.000144 CONC
40129	743107.9110	324529.2900	1018.9500	-0.029000	0.000841 CONC
40130	743108.7060	324530.6010	1019.0000	-0.075000	0.005625 CONC
40131	743108.2740	324525.0530	1018.8800	-0.154000	0.023716 CONC
40132	743109.5900	324527.1840	1018.9000	-0.006000	0.000036 CONC
40133	743110.6810	324528.7240	1018.9800	-0.030000	0.000900 CONC
40134	743113.1120	324526.8240	1018.9000	-0.033000	0.001089 CONC
40135	743110.9890	324523.0050	1018.8100	-0.116000	0.013456 CONC
40136	744391.8180	323432.3740	1004.2200	-0.215000	0.046225 GRAV

40137	744394.5390	323434.0480	1004.2300	-0.239000	0.057121 GRAV
40138	744397.5560	323435.9970	1004.2400	-0.012000	0.000144 GRAV
40139	744400.3410	323438.1990	1004.2400	-0.050000	0.002500 GRAV
40140	744402.9870	323440.2800	1004.2000	-0.067000	0.004489 GRAV
40141	744401.4190	323442.5560	1004.2400	0.035000	0.001225 GRAV
40142	744403.8860	323444.8470	1004.2000	-0.029000	0.000841 GRAV
40143	744406.0290	323442.9250	1004.1900	0.085000	0.007225 GRAV
40144	744399.9690	323440.8360	1004.2000	-0.010000	0.000100 GRAV
40145	744397.1290	323438.2890	1004.2200	-0.016000	0.000256 GRAV
40146	744392.8730	323435.7460	1004.2400	-0.142000	0.020164 GRAV
40147	744390.6130	323437.9450	1004.2100	0.028000	0.000784 GRAV
40148	744393.8140	323439.6750	1004.2200	0.004000	0.000016 GRAV
40149	744396.8790	323441.4350	1004.1700	-0.046000	0.002116 GRAV
40150	744400.1870	323443.8680	1004.1400	0.245000	0.060025 GRAV
40151	744403.0750	323446.6380	1004.1200	0.028000	0.000784 GRAV
40152	744401.3540	323448.4990	1004.1200	0.016000	0.000256 GRAV
40153	744398.8210	323446.7670	1004.1100	0.076000	0.005776 GRAV
40154	744395.8800	323444.7910	1004.0900	-0.108000	0.011664 GRAV
40155	744392.3240	323442.7850	1004.0900	-0.060000	0.003600 GRAV
40156	744387.7160	323440.9270	1004.1000	-0.019000	0.000361 GRAV
40157	744384.5300	323440.4010	1004.1300	-0.079000	0.006241 GRAV
40158	744385.5060	323437.6970	1004.2200	-0.101000	0.010201 GRAV
40159	744386.6980	323434.6210	1004.2800	-0.078000	0.006084 GRAV
40160	744388.0880	323432.0410	1004.2800	0.075000	0.005625 GRAV
40161	744389.2700	323429.8800	1004.2800	0.035000	0.001225 GRAV
40164	635565.8220	326763.9040	874.8300	0.084000	0.007056 MOWED GRASS
40165	635564.4710	326761.1250	874.8700	-0.034000	0.001156 MOWED GRASS
40166	635563.0780	326758.0410	874.8100	0.060000	0.003600 MOWED GRASS
40167	635561.7620	326755.3650	874.8400	0.092000	0.008464 MOWED GRASS
40168	635560.4490	326752.4350	874.8600	0.122000	0.014884 MOWED GRASS
40169	635562.8090	326751.1630	874.8400	0.074000	0.005476 MOWED GRASS
40170	635564.2340	326753.5450	874.8000	0.175000	0.030625 MOWED GRASS
40171	635565.6110	326756.3150	874.8000	-0.043000	0.001849 MOWED GRASS
40172	635567.0170	326758.8630	874.8300	-0.023000	0.000529 MOWED GRASS
40173	635568.4170	326762.0080	874.8200	0.057000	0.003249 MOWED GRASS
40174	635571.1330	326760.7010	874.7400	0.123000	0.015129 MOWED GRASS
40175	635570.1880	326757.8950	874.7600	0.034000	0.001156 MOWED GRASS
40176	635569.2100	326754.6610	874.7400	0.020000	0.000400 MOWED GRASS
40177	635568.3720	326751.5830	874.7200	-0.019000	0.000361 MOWED GRASS
40178	635567.2930	326748.2520	874.7400	0.013000	0.000169 MOWED GRASS
40179	635569.8820	326746.8510	874.7400	-0.041000	0.001681 MOWED GRASS
40180	635571.3420	326749.4040	874.6500	0.091000	0.008281 MOWED GRASS
40181	635572.7890	326752.2850	874.6600	0.015000	0.000225 MOWED GRASS
40182	635574.1190	326755.0390	874.6800	0.120000	0.014400 MOWED GRASS
40183	635575.6850	326758.4630	874.6100	0.091000	0.008281 MOWED GRASS
40184	635578.3300	326757.3170	874.6100	0.022000	0.000484 MOWED GRASS
40185	635577.5410	326754.6230	874.6000	0.010000	0.000100 MOWED GRASS
40186	635576.3520	326751.6870	874.6300	-0.025000	0.000625 MOWED GRASS
40187	635575.2760	326748.7870	874.6000	0.033000	0.001089 MOWED GRASS
40188	635574.1360	326745.8300	874.6400	0.103000	0.010609 MOWED GRASS
40189	636472.0420	326546.9270	877.5100	-0.008000	0.000064 GRAV
40190	636472.3200	326544.3030	877.4800	0.067000	0.004489 GRAV
40191	636472.4980	326541.1580	877.4900	0.090000	0.008100 GRAV
40192	636472.6870	326538.0950	877.5000	-0.019000	0.000361 GRAV
40193	636472.9170	326535.2330	877.5100	0.010000	0.000100 GRAV
40194	636469.8280	326534.8320	877.5000	0.029000	0.000841 GRAV
40195	636469.8400	326538.1350	877.5000	0.082000	0.006724 GRAV
40196	636470.6160	326541.0460	877.4700	0.115000	0.013225 GRAV
40197	636471.3560	326544.1550	877.4500	0.100000	0.010000 GRAV

40198	636472.0430	326547.8190	877.4500	0.035000	0.001225 GRAV
40199	636468.6630	326548.3910	877.5800	-0.138000	0.019044 GRAV
40200	636468.2780	326544.4040	877.5300	0.020000	0.000400 GRAV
40201	636468.3650	326540.4750	877.5200	0.050000	0.002500 GRAV
40202	636468.3600	326536.8460	877.5100	0.048000	0.002304 GRAV
40203	636468.7190	326533.4790	877.5100	0.043000	0.001849 GRAV
40204	636465.8900	326532.9640	877.5800	0.059000	0.003481 GRAV
40205	636465.8240	326536.1090	877.5600	0.172000	0.029584 GRAV
40206	636465.6860	326539.2010	877.5600	0.110000	0.012100 GRAV
40207	636465.9900	326542.5280	877.5500	0.074000	0.005476 GRAV
40208	636466.5760	326546.5320	877.4600	0.057000	0.003249 GRAV
40209	636467.0440	326550.1210	877.3200	0.063000	0.003969 GRAV
40210	636463.5210	326550.8510	877.3000	0.023000	0.000529 GRAV
40211	636463.0100	326546.6950	877.3800	0.084000	0.007056 GRAV
40212	636462.9080	326542.4360	877.4200	0.193000	0.037249 GRAV
40213	636462.8670	326538.6830	877.5200	0.149000	0.022201 GRAV
40214	636462.9590	326535.1600	877.5700	0.153000	0.023409 GRAV
40215	636531.5050	326529.7100	878.0400	-1.662000	2.762244 CONC
40216	636534.4470	326527.3060	878.0700	-3.104000	9.634816 CONC
40223	636538.0290	326531.8530	878.4200	-3.166000	10.023556 CONC
40224	636534.6580	326534.2480	878.3800	-2.158000	4.656964 CONC
40225	636536.7350	326538.1670	878.6500	-2.815000	7.924225 CONC
40226	636539.8820	326535.7550	878.6600	-3.317000	11.002489 CONC
40231	636543.1660	326537.7500	878.8900	-4.034000	16.273156 CONC
40232	636539.9910	326540.0970	878.8400	-3.597000	12.938409 CONC
40233	636536.5000	326542.8610	878.8100	-3.120000	9.734400 CONC
40234	636540.5860	326544.4800	879.1100	-4.018000	16.144324 CONC
40239	636029.4460	326844.4980	872.8300	0.190000	0.036100 TALL GRASS
40240	636030.8530	326847.7710	872.8100	0.176000	0.030976 TALL GRASS
40241	636032.8770	326850.7260	872.8800	0.139000	0.019321 TALL GRASS
40242	636034.6690	326853.0350	872.6300	0.327000	0.106929 TALL GRASS
40243	636036.3790	326856.1610	872.6100	-0.053000	0.002809 TALL GRASS
40244	636033.6760	326858.3290	872.5200	0.316000	0.099856 TALL GRASS
40245	636032.2780	326854.7640	872.4800	0.536000	0.287296 TALL GRASS
40246	636031.0050	326851.7230	872.6800	0.222000	0.049284 TALL GRASS
40247	636028.9110	326848.2140	872.8400	0.119000	0.014161 TALL GRASS
40248	636027.1480	326844.6670	872.8200	0.196000	0.038416 TALL GRASS
40249	636024.5820	326845.8680	872.8400	0.071000	0.005041 TALL GRASS
40250	636026.0870	326848.0660	872.7700	0.135000	0.018225 TALL GRASS
40251	636027.0170	326850.7820	872.8700	-0.013000	0.000169 TALL GRASS
40252	636028.1600	326852.7480	872.8000	0.134000	0.017956 TALL GRASS
40253	636029.8760	326856.0520	872.6900	0.305000	0.093025 TALL GRASS
40254	636027.7200	326858.7720	872.6200	0.146000	0.021316 TALL GRASS
40255	636026.8870	326855.4100	872.6400	0.263000	0.069169 TALL GRASS
40256	636025.4490	326852.3310	872.7400	0.114000	0.012996 TALL GRASS
40257	636024.4420	326848.7090	872.6000	0.376000	0.141376 TALL GRASS
40258	636023.1710	326845.7510	872.7200	0.184000	0.033856 TALL GRASS
40259	636020.5780	326847.0070	872.6900	0.164000	0.026896 TALL GRASS
40260	636021.6710	326849.3250	872.7800	0.314000	0.098596 TALL GRASS
40261	636021.9930	326852.4220	872.7900	0.270000	0.072900 TALL GRASS
40262	636023.2810	326855.4880	872.7700	0.185000	0.034225 TALL GRASS
40263	636026.1760	326859.2370	872.5800	0.163000	0.026569 TALL GRASS
40266	635923.4390	328636.6220	868.3000	-0.155000	0.024025 ASPH
40267	635924.9440	328640.0330	868.2400	-0.096000	0.009216 ASPH
40268	635926.3230	328643.3620	868.2700	-0.132000	0.017424 ASPH
40269	635927.7930	328647.1490	868.2600	-0.085000	0.007225 ASPH
40270	635929.3190	328651.0060	868.2600	-0.245000	0.060025 ASPH
40271	635925.9860	328652.4460	868.2800	-0.197000	0.038809 ASPH
40272	635925.1120	328650.1280	868.3100	-0.373000	0.139129 ASPH

40273	635923.8550	328647.0670	868.3100	-0.075000	0.005625 ASPH
40274	635921.2590	328642.3870	868.3400	0.001000	0.000001 ASPH
40275	635918.9050	328637.1860	868.3400	-0.319000	0.101761 ASPH
40276	635917.0840	328634.1740	868.4100	-0.173000	0.029929 ASPH
40277	635914.4300	328635.5750	868.5300	-0.226000	0.051076 ASPH
40278	635915.8640	328638.3290	868.4600	-0.239000	0.057121 ASPH
40279	635917.2540	328641.3610	868.3900	-0.155000	0.024025 ASPH
40280	635918.2620	328643.9710	868.3700	-0.091000	0.008281 ASPH
40281	635919.2840	328647.6930	868.3300	-0.101000	0.010201 ASPH
40282	635916.5480	328648.8750	868.4400	-0.093000	0.008649 ASPH
40283	635915.7540	328646.0900	868.5000	-0.090000	0.008100 ASPH
40284	635914.6240	328643.3430	868.4900	-0.034000	0.001156 ASPH
40285	635913.4980	328640.5000	868.5500	-0.186000	0.034596 ASPH
40286	635911.9770	328638.0350	868.5000	-0.065000	0.004225 ASPH
40287	635908.5170	328639.0020	868.5000	-0.180000	0.032400 ASPH
40288	635909.7920	328641.7730	868.4400	-0.052000	0.002704 ASPH
40289	635911.0100	328644.8190	868.4000	0.090000	0.008100 ASPH
40290	635912.6330	328648.3480	868.3900	0.142000	0.020164 ASPH
40291	635913.9250	328651.9460	868.3700	0.110000	0.012100 ASPH
45001	710379.9810	448018.5140	995.9500	0.238000	0.056644 TALL GRASS
45002	710379.7880	448021.3150	995.8200	0.357000	0.127449 TALL GRASS
45003	710380.1030	448023.7990	995.7700	0.386000	0.148996 TALL GRASS
45004	710379.8830	448026.8730	995.8900	0.269000	0.072361 TALL GRASS
45005	710380.2930	448030.0890	995.9300	0.195000	0.038025 TALL GRASS
45006	710377.4670	448030.1950	995.8700	0.402000	0.161604 TALL GRASS
45007	710377.1710	448027.0420	995.9500	0.304000	0.092416 TALL GRASS
45008	710376.7320	448024.2730	995.8600	0.381000	0.145161 TALL GRASS
45009	710376.0780	448021.3460	995.8400	0.384000	0.147456 TALL GRASS
45010	710375.8640	448018.1330	995.9400	0.362000	0.131044 TALL GRASS
45011	710372.6060	448018.3780	995.8800	0.225000	0.050625 TALL GRASS
45012	710372.9550	448021.0080	995.7900	0.313000	0.097969 TALL GRASS
45013	710373.4240	448023.3720	995.8100	0.316000	0.099856 TALL GRASS
45014	710373.9970	448026.2770	995.8700	0.330000	0.108900 TALL GRASS
45015	710374.4470	448028.7740	995.8600	0.367000	0.134689 TALL GRASS
45016	710372.0900	448030.3140	995.8900	0.196000	0.038416 TALL GRASS
45017	710371.2630	448027.0660	995.8400	0.292000	0.085264 TALL GRASS
45018	710371.0790	448024.2940	995.7500	0.339000	0.114921 TALL GRASS
45019	710370.3680	448021.4550	995.6700	0.509000	0.259081 TALL GRASS
45020	710370.0440	448018.9140	995.6700	0.553000	0.305809 TALL GRASS
45021	710367.2600	448020.0360	995.7500	0.398000	0.158404 TALL GRASS
45022	710367.5210	448022.7700	995.5700	0.383000	0.146689 TALL GRASS
45023	710367.9420	448025.7510	995.7600	0.330000	0.108900 TALL GRASS
45024	710368.4930	448028.0150	995.7900	0.357000	0.127449 TALL GRASS
45025	710369.1230	448031.2440	995.8200	0.266000	0.070756 TALL GRASS
45026	710217.3290	448082.8440	991.5700	0.290000	0.084100 TREE COVE
45027	710215.7650	448085.3180	991.6700	0.181000	0.032761 TREE COVE
45028	710213.7840	448087.7790	991.4800	0.308000	0.094864 TREE COVE
45029	710211.8990	448090.0300	991.3800	0.429000	0.184041 TREE COVE
45030	710210.1570	448092.6210	991.2900	0.156000	0.024336 TREE COVE
45031	710211.7970	448094.7610	991.2100	0.295000	0.087025 TREE COVE
45032	710213.2140	448092.9290	991.2800	0.455000	0.207025 TREE COVE
45033	710215.1320	448090.1690	991.3000	0.490000	0.240100 TREE COVE
45034	710216.7900	448087.8970	991.4900	0.255000	0.065025 TREE COVE
45035	710219.0960	448084.9700	991.6600	0.258000	0.066564 TREE COVE
45036	710221.3140	448086.1960	991.6800	0.503000	0.253009 TREE COVE
45037	710219.7420	448088.3620	991.6000	0.424000	0.179776 TREE COVE
45038	710218.0390	448090.7770	991.4400	0.453000	0.205209 TREE COVE
45039	710215.8780	448093.7060	991.3700	0.564000	0.318096 TREE COVE
45040	710214.4180	448095.9720	991.3900	0.249000	0.062001 TREE COVE

45041	710216.3660	448097.7220	991.5100	0.179000	0.032041 TREE COVE
45042	710218.0640	448095.6050	991.5600	0.139000	0.019321 TREE COVE
45043	710219.8530	448093.2710	991.6400	0.314000	0.098596 TREE COVE
45044	710221.6290	448090.5950	991.7500	0.469000	0.219961 TREE COVE
45045	710223.9340	448088.0210	991.8900	0.263000	0.069169 TREE COVE
45046	710214.6840	448081.3900	991.6100	0.273000	0.074529 TREE COVE
45047	710213.1110	448083.7190	991.6500	0.245000	0.060025 TREE COVE
45048	710211.6480	448086.3160	991.5100	0.238000	0.056644 TREE COVE
45049	710211.1600	448086.5900	991.4900	0.251000	0.063001 TREE COVE
45050	710207.6280	448090.8710	991.2700	0.194000	0.037636 TREE COVE
45051	710404.2810	448073.1700	994.6400	0.365000	0.133225 BRUSH/LOW
45052	710408.0260	448072.5810	994.9500	0.436000	0.190096 BRUSH/LOW
45053	710411.0580	448072.9050	995.2700	0.252000	0.063504 BRUSH/LOW
45054	710412.8450	448073.1530	995.2600	0.160000	0.025600 BRUSH/LOW
45055	710413.0180	448076.1930	995.0200	0.428000	0.183184 BRUSH/LOW
45056	710414.8490	448075.9310	995.2500	0.577000	0.332929 BRUSH/LOW
45057	710409.7700	448077.3000	995.1800	0.490000	0.240100 BRUSH/LOW
45058	710408.0280	448076.6560	994.9800	0.375000	0.140625 BRUSH/LOW
45059	710406.9000	448077.5760	994.6400	0.552000	0.304704 BRUSH/LOW
45060	710406.8310	448080.5380	994.7500	0.329000	0.108241 BRUSH/LOW
45061	710409.1100	448080.3250	994.9200	0.351000	0.123201 BRUSH/LOW
45062	710411.7700	448080.1960	995.1700	0.246000	0.060516 BRUSH/LOW
45063	710415.6010	448080.4540	995.5600	0.305000	0.093025 BRUSH/LOW
45064	710417.6710	448080.2990	995.6400	0.479000	0.229441 BRUSH/LOW
45065	710418.8600	448080.3960	995.5800	0.388000	0.150544 BRUSH/LOW
45066	710419.2600	448082.9920	995.5700	0.450000	0.202500 BRUSH/LOW
45067	710416.4200	448084.2050	995.6600	0.357000	0.127449 BRUSH/LOW
45068	710413.7650	448084.4890	995.2300	0.307000	0.094249 BRUSH/LOW
45069	710412.0180	448084.6640	994.9900	0.266000	0.070756 BRUSH/LOW
45070	710409.1560	448084.9320	994.8300	0.376000	0.141376 BRUSH/LOW
45071	710406.4770	448085.8240	994.5700	0.391000	0.152881 BRUSH/LOW
45072	710404.7600	448081.9160	994.5600	0.303000	0.091809 BRUSH/LOW
45073	710404.7310	448078.2320	994.6700	0.214000	0.045796 BRUSH/LOW
45074	710404.5920	448073.9420	994.6700	0.315000	0.099225 BRUSH/LOW
45075	659302.4730	402234.4720	868.7000	0.283000	0.080089 MOWED GRASS
45076	659305.7950	402234.4860	868.6500	0.311000	0.096721 MOWED GRASS
45077	659309.1710	402234.6510	868.7000	0.221000	0.048841 MOWED GRASS
45078	659312.4160	402234.8220	868.6500	0.227000	0.051529 MOWED GRASS
45079	659315.3730	402234.7280	868.6000	0.241000	0.058081 MOWED GRASS
45080	659315.5410	402237.9410	868.6100	0.214000	0.045796 MOWED GRASS
45081	659312.1740	402237.9330	868.6700	0.247000	0.061009 MOWED GRASS
45082	659308.5130	402238.0280	868.7500	0.262000	0.068644 MOWED GRASS
45083	659304.4740	402237.8360	868.7700	0.184000	0.033856 MOWED GRASS
45084	659301.8370	402238.2470	868.8100	0.196000	0.038416 MOWED GRASS
45085	659303.8460	402240.8800	868.7300	0.214000	0.045796 MOWED GRASS
45086	659307.1520	402240.9760	868.7100	0.327000	0.106929 MOWED GRASS
45087	659310.2610	402241.1690	868.7000	0.308000	0.094864 MOWED GRASS
45088	659313.0470	402241.1850	868.7200	0.237000	0.056169 MOWED GRASS
45089	659315.8870	402241.0810	868.6600	0.219000	0.047961 MOWED GRASS
45090	659318.8430	402244.2740	868.6800	0.329000	0.108241 MOWED GRASS
45091	659315.4360	402244.4310	868.6400	0.293000	0.085849 MOWED GRASS
45092	659311.5060	402244.4210	868.6100	0.300000	0.090000 MOWED GRASS
45093	659307.6440	402244.2720	868.7200	0.309000	0.095481 MOWED GRASS
45094	659304.9390	402244.2620	868.7000	0.283000	0.080089 MOWED GRASS
45095	659307.5850	402247.9260	868.7200	0.209000	0.043681 MOWED GRASS
45096	659310.7550	402248.1720	868.6600	0.294000	0.086436 MOWED GRASS
45097	659313.4850	402248.1650	868.6500	0.292000	0.085264 MOWED GRASS
45098	659316.2520	402248.1620	868.6700	0.278000	0.077284 MOWED GRASS
45099	659318.9810	402248.1930	868.6800	0.282000	0.079524 MOWED GRASS

45100	659019.0360	402209.2430	868.0300	0.218000	0.047524 GRAV
45101	659019.1200	402205.1910	868.0200	0.082000	0.006724 GRAV
45102	659018.9520	402202.2140	867.9800	0.140000	0.019600 GRAV
45103	659018.9100	402198.3920	867.9500	0.031000	0.000961 GRAV
45104	659019.0240	402194.8520	867.8700	0.115000	0.013225 GRAV
45105	659016.3560	402194.4940	867.9100	0.118000	0.013924 GRAV
45106	659016.2490	402197.2570	867.9400	0.081000	0.006561 GRAV
45107	659016.4290	402200.3680	867.9300	0.128000	0.016384 GRAV
45108	659016.5340	402203.8420	867.9700	0.034000	0.001156 GRAV
45109	659016.5360	402207.6840	867.9400	0.170000	0.028900 GRAV
45110	659013.2320	402208.1580	867.8700	0.178000	0.031684 GRAV
45111	659013.2340	402205.0510	867.8500	0.154000	0.023716 GRAV
45112	659013.5260	402201.1520	867.8600	0.089000	0.007921 GRAV
45113	659013.6880	402197.1960	867.8700	0.109000	0.011881 GRAV
45114	659013.7350	402193.8920	867.8400	0.112000	0.012544 GRAV
45115	659010.6420	402194.2380	867.7200	0.147000	0.021609 GRAV
45116	659010.7410	402197.0740	867.7600	0.166000	0.027556 GRAV
45117	659010.8930	402200.3480	867.8100	0.042000	0.001764 GRAV
45118	659011.1320	402204.0080	867.7900	0.115000	0.013225 GRAV
45119	659011.4240	402207.7210	867.7900	0.203000	0.041209 GRAV
45120	659008.2170	402208.0140	867.6600	0.159000	0.025281 GRAV
45121	659008.1710	402204.3680	867.7000	0.143000	0.020449 GRAV
45122	659008.0900	402201.0790	867.7500	0.113000	0.012769 GRAV
45123	659008.0020	402197.1500	867.6800	0.257000	0.066049 GRAV
45124	659007.7950	402194.3550	867.6400	0.210000	0.044100 GRAV
45125	658842.7430	402092.5820	869.4000	0.338000	0.114244 TALL GRASS
45126	658840.3450	402092.0790	869.3300	0.353000	0.124609 TALL GRASS
45127	658836.9090	402091.3360	869.3300	0.392000	0.153664 TALL GRASS
45128	658833.8340	402090.8530	869.3700	0.330000	0.108900 TALL GRASS
45129	658830.8790	402090.3150	869.4100	0.250000	0.062500 TALL GRASS
45130	658830.5320	402093.0270	869.3300	0.241000	0.058081 TALL GRASS
45131	658833.3660	402093.6150	869.2800	0.304000	0.092416 TALL GRASS
45132	658836.2840	402094.6150	869.3200	0.293000	0.085849 TALL GRASS
45133	658839.4020	402095.1640	869.3400	0.205000	0.042025 TALL GRASS
45134	658842.5640	402095.8730	869.3500	0.300000	0.090000 TALL GRASS
45135	658842.3100	402098.5630	869.3300	0.298000	0.088804 TALL GRASS
45136	658839.6140	402098.0290	869.3000	0.281000	0.078961 TALL GRASS
45137	658836.5870	402097.6290	869.2900	0.222000	0.049284 TALL GRASS
45138	658833.8400	402097.2180	869.1600	0.306000	0.093636 TALL GRASS
45139	658830.9410	402096.6170	869.2200	0.195000	0.038025 TALL GRASS
45140	658830.5610	402099.4660	869.1000	0.241000	0.058081 TALL GRASS
45141	658833.0200	402100.3110	869.0900	0.392000	0.153664 TALL GRASS
45142	658835.6420	402100.7510	869.1200	0.283000	0.080089 TALL GRASS
45143	658838.1700	402101.1360	869.2000	0.210000	0.044100 TALL GRASS
45144	658841.1350	402101.6990	869.2900	0.185000	0.034225 TALL GRASS
45145	658841.1090	402105.6330	869.0700	0.294000	0.086436 TALL GRASS
45146	658837.5320	402104.8500	869.0200	0.254000	0.064516 TALL GRASS
45147	658834.9370	402104.4970	868.9700	0.285000	0.081225 TALL GRASS
45148	658832.1270	402104.0070	868.9600	0.377000	0.142129 TALL GRASS
45149	658828.7230	402103.4530	868.9000	0.255000	0.065025 TALL GRASS
45150	658992.5900	402099.0700	867.1300	0.528000	0.278784 BRUSH/LOW
45151	658990.7230	402096.6480	867.2400	0.476000	0.226576 BRUSH/LOW
45152	658989.0120	402093.9850	867.4500	0.338000	0.114244 BRUSH/LOW
45153	658987.4470	402091.5910	867.4700	0.341000	0.116281 BRUSH/LOW
45154	658988.4720	402089.0010	867.3200	0.631000	0.398161 BRUSH/LOW
45155	658989.9080	402087.4530	867.3000	0.456000	0.207936 BRUSH/LOW
45156	658991.6360	402089.2240	867.3100	0.782000	0.611524 BRUSH/LOW
45157	658993.0410	402091.1660	867.3000	0.686000	0.470596 BRUSH/LOW
45158	658994.6050	402093.3400	867.2200	0.658000	0.432964 BRUSH/LOW

45159	658996.0880	402096.7470	867.2300	0.570000	0.324900 BRUSH/LOW
45160	659000.6960	402094.7540	867.1300	0.800000	0.640000 BRUSH/LOW
45161	658999.0610	402091.8170	867.1200	1.117000	1.247689 BRUSH/LOW
45162	658997.8120	402089.5530	867.0800	1.136000	1.290496 BRUSH/LOW
45163	658996.5750	402086.3300	867.1700	0.798000	0.636804 BRUSH/LOW
45164	658995.6770	402083.9100	867.1700	0.465000	0.216225 BRUSH/LOW
45165	658985.5710	402093.6060	867.4100	0.556000	0.309136 BRUSH/LOW
45166	658987.3240	402096.5900	867.3200	0.604000	0.364816 BRUSH/LOW
45167	658988.8660	402099.2580	867.3100	0.412000	0.169744 BRUSH/LOW
45168	658989.8430	402101.5720	867.2200	0.471000	0.221841 BRUSH/LOW
45169	658991.7500	402104.0520	867.2100	0.475000	0.225625 BRUSH/LOW
45170	658987.9920	402106.3060	867.0900	0.415000	0.172225 BRUSH/LOW
45171	658985.9720	402103.0950	867.0800	0.587000	0.344569 BRUSH/LOW
45172	658983.2590	402100.1780	867.0400	0.530000	0.280900 BRUSH/LOW
45173	658981.4340	402097.9860	867.2300	0.432000	0.186624 BRUSH/LOW
45174	658980.1550	402096.1350	867.3800	0.518000	0.268324 BRUSH/LOW
45175	659066.9310	401813.1220	867.9600	0.409000	0.167281 TREE COVE
45176	659066.8410	401815.9250	868.1200	0.294000	0.086436 TREE COVE
45177	659066.4000	401818.5220	868.0100	0.473000	0.223729 TREE COVE
45178	659066.2500	401821.3040	868.0100	0.423000	0.178929 TREE COVE
45179	659065.8290	401824.2780	868.0200	0.465000	0.216225 TREE COVE
45180	659067.9880	401824.1320	867.9400	0.422000	0.178084 TREE COVE
45181	659068.2420	401821.0120	867.8700	0.451000	0.203401 TREE COVE
45182	659068.7320	401818.1640	867.9200	0.517000	0.267289 TREE COVE
45183	659068.8120	401815.1540	867.9900	0.373000	0.139129 TREE COVE
45184	659071.9180	401813.1250	868.0000	0.393000	0.154449 TREE COVE
45185	659071.9910	401816.0670	867.9700	0.380000	0.144400 TREE COVE
45186	659071.5740	401818.8740	867.9900	0.441000	0.194481 TREE COVE
45187	659071.2910	401821.8590	867.9800	0.361000	0.130321 TREE COVE
45188	659070.8620	401824.6970	868.1200	0.370000	0.136900 TREE COVE
45189	659070.5490	401827.6690	867.9300	0.831000	0.690561 TREE COVE
45190	659073.4450	401827.5940	867.9500	0.886000	0.784996 TREE COVE
45191	659073.8480	401824.6260	868.0700	0.610000	0.372100 TREE COVE
45192	659074.0980	401821.9200	868.0800	0.359000	0.128881 TREE COVE
45193	659074.2710	401819.3820	868.1600	0.262000	0.068644 TREE COVE
45194	659074.5480	401816.3200	867.9700	0.356000	0.126736 TREE COVE
45195	659075.0700	401814.1640	867.9600	0.321000	0.103041 TREE COVE
45196	659077.4320	401816.0840	867.9200	0.514000	0.264196 TREE COVE
45197	659077.2910	401819.2390	868.0000	0.620000	0.384400 TREE COVE
45198	659076.9670	401821.5310	868.2500	0.389000	0.151321 TREE COVE
45199	659076.7720	401824.7110	868.2300	0.466000	0.217156 TREE COVE
45200	659077.3570	401828.3190	868.1900	0.461000	0.212521 TREE COVE
45201	618728.3520	430646.7320	848.0300	0.225000	0.050625 TREE COVE
45202	618729.3890	430643.6260	848.0400	0.163000	0.026569 TREE COVE
45203	618730.6820	430640.8900	847.8900	0.132000	0.017424 TREE COVE
45204	618731.7380	430638.0930	847.7200	0.316000	0.099856 TREE COVE
45205	618733.0310	430635.3580	847.6500	0.379000	0.143641 TREE COVE
45206	618730.8460	430633.5490	847.6200	0.842000	0.708964 TREE COVE
45207	618729.7410	430636.0350	847.8100	0.522000	0.272484 TREE COVE
45208	618728.6500	430638.7900	847.8500	0.027000	0.000729 TREE COVE
45209	618726.7200	430642.6880	847.9900	0.167000	0.027889 TREE COVE
45210	618725.5260	430645.9470	848.0600	0.210000	0.044100 TREE COVE
45211	618723.0320	430645.7240	847.8900	0.329000	0.108241 TREE COVE
45212	618724.1320	430643.1100	847.8700	0.362000	0.131044 TREE COVE
45213	618725.3550	430639.4400	847.8100	0.133000	0.017689 TREE COVE
45214	618726.9730	430636.7680	847.7500	0.148000	0.021904 TREE COVE
45215	618729.1040	430632.8310	847.6300	0.829000	0.687241 TREE COVE
45216	618725.6180	430630.8970	847.5700	0.321000	0.103041 TREE COVE
45217	618724.7530	430633.6840	847.6800	0.270000	0.072900 TREE COVE

45218	618723.9160	430636.1880	847.7100	0.213000	0.045369 TREE COVE
45219	618722.8720	430639.1920	847.7500	0.217000	0.047089 TREE COVE
45220	618721.9250	430641.7590	847.7300	0.358000	0.128164 TREE COVE
45221	618719.0240	430640.4040	847.6600	0.552000	0.304704 TREE COVE
45222	618720.3180	430635.8470	847.7800	0.400000	0.160000 TREE COVE
45223	618722.8660	430631.2750	847.6300	0.258000	0.066564 TREE COVE
45224	618723.9280	430628.1530	847.4800	0.350000	0.122500 TREE COVE
45225	618724.4540	430626.1740	847.4900	0.296000	0.087616 TREE COVE
45226	618872.2940	430559.2690	847.9700	0.149000	0.022201 MOWED GRASS
45227	618872.0550	430555.8160	847.8900	0.103000	0.010609 MOWED GRASS
45228	618871.6210	430551.9100	847.8200	0.107000	0.011449 MOWED GRASS
45229	618871.8680	430548.1110	847.7800	0.094000	0.008836 MOWED GRASS
45230	618871.8720	430544.1020	847.7400	0.185000	0.034225 MOWED GRASS
45231	618874.5900	430544.1580	847.7700	0.075000	0.005625 MOWED GRASS
45232	618874.3990	430547.0560	847.8100	-0.008000	0.000064 MOWED GRASS
45233	618874.4950	430550.9010	847.8300	-0.012000	0.000144 MOWED GRASS
45234	618874.7600	430554.5570	847.8800	-0.093000	0.008649 MOWED GRASS
45235	618874.7190	430557.6610	848.0000	-0.061000	0.003721 MOWED GRASS
45236	618877.5460	430557.5310	847.9800	-0.071000	0.005041 MOWED GRASS
45237	618877.0400	430554.6670	847.9100	-0.070000	0.004900 MOWED GRASS
45238	618876.7190	430551.3090	847.8400	-0.050000	0.002500 MOWED GRASS
45239	618876.6090	430548.3610	847.8000	-0.061000	0.003721 MOWED GRASS
45240	618876.6390	430545.1490	847.7800	-0.007000	0.000049 MOWED GRASS
45241	618879.2360	430545.0320	847.8000	0.130000	0.016900 MOWED GRASS
45242	618879.1520	430547.8790	847.8100	0.164000	0.026896 MOWED GRASS
45243	618879.0530	430551.0510	847.8300	0.293000	0.085849 MOWED GRASS
45244	618878.9850	430553.9300	847.9000	0.105000	0.011025 MOWED GRASS
45245	618878.9730	430556.7160	847.8900	0.293000	0.085849 MOWED GRASS
45246	618881.3580	430556.7220	847.9000	-0.041000	0.001681 MOWED GRASS
45247	618881.0410	430553.9050	847.8500	-0.054000	0.002916 MOWED GRASS
45248	618880.7370	430550.7580	847.8400	-0.077000	0.005929 MOWED GRASS
45249	618880.4240	430547.2460	847.8000	0.170000	0.028900 MOWED GRASS
45250	618880.4790	430544.1290	847.8100	0.116000	0.013456 MOWED GRASS
45251	618979.6140	430438.3040	848.0400	0.262000	0.068644 TALL GRASS
45252	618977.0190	430440.5040	847.9500	0.004000	0.000016 TALL GRASS
45253	618974.5170	430442.8260	847.9000	0.041000	0.001681 TALL GRASS
45254	618972.1540	430445.5300	847.9700	-0.088000	0.007744 TALL GRASS
45255	618970.2730	430448.0950	847.9300	0.025000	0.000625 TALL GRASS
45256	618972.0070	430450.1210	847.9300	0.093000	0.008649 TALL GRASS
45257	618974.5310	430447.5080	847.9400	0.312000	0.097344 TALL GRASS
45258	618976.5220	430445.2730	848.2600	0.133000	0.017689 TALL GRASS
45259	618978.6630	430442.7430	848.1400	0.234000	0.054756 TALL GRASS
45260	618980.3130	430441.2200	848.1100	0.225000	0.050625 TALL GRASS
45261	618982.9500	430443.2830	848.2800	0.073000	0.005329 TALL GRASS
45262	618981.1200	430445.6490	848.4300	-0.084000	0.007056 TALL GRASS
45263	618978.3400	430448.7190	848.3400	-0.011000	0.000121 TALL GRASS
45264	618975.5360	430451.6190	848.3300	0.016000	0.000256 TALL GRASS
45265	618972.9820	430454.6290	848.0800	0.165000	0.027225 TALL GRASS
45266	618974.9860	430457.0210	848.0400	0.285000	0.081225 TALL GRASS
45267	618977.1520	430454.8490	848.1400	0.313000	0.097969 TALL GRASS
45268	618979.0290	430452.7280	848.2300	0.108000	0.011664 TALL GRASS
45269	618981.2610	430450.0710	848.2700	0.077000	0.005929 TALL GRASS
45270	618983.5930	430447.4770	848.4300	0.088000	0.007744 TALL GRASS
45271	618987.2760	430448.9950	848.4300	0.065000	0.004225 TALL GRASS
45272	618985.2650	430451.4070	848.3100	0.257000	0.066049 TALL GRASS
45273	618982.6590	430454.1330	848.5300	-0.090000	0.008100 TALL GRASS
45274	618980.4720	430456.1330	848.5400	-0.038000	0.001444 TALL GRASS
45275	618978.0210	430459.1220	848.3000	-0.060000	0.003600 TALL GRASS
45276	619174.5730	430388.6560	849.4000	0.281000	0.078961 BRUSH/LOW

45277	619177.9650	430386.6760	849.6400	0.778000	0.605284 BRUSH/LOW
45278	619179.7800	430385.4380	849.7500	0.995000	0.990025 BRUSH/LOW
45279	619181.2250	430384.6070	849.7500	1.037000	1.075369 BRUSH/LOW
45280	619174.4770	430392.0300	849.6200	-0.050000	0.002500 BRUSH/LOW
45281	619177.1220	430391.4050	849.8700	-0.108000	0.011664 BRUSH/LOW
45282	619177.6710	430390.1210	849.6600	0.201000	0.040401 BRUSH/LOW
45283	619180.6400	430388.5650	849.5300	0.944000	0.891136 BRUSH/LOW
45284	619169.6310	430400.7330	849.5500	0.750000	0.562500 BRUSH/LOW
45285	619173.2250	430397.8860	849.8100	0.164000	0.026896 BRUSH/LOW
45286	619176.5880	430395.8840	849.5500	0.771000	0.594441 BRUSH/LOW
45287	619178.8770	430394.3610	849.5800	0.938000	0.879844 BRUSH/LOW
45288	619180.7890	430392.8190	849.6400	0.500000	0.250000 BRUSH/LOW
45289	619182.0820	430397.8830	850.0500	0.592000	0.350464 BRUSH/LOW
45290	619179.6060	430399.6830	849.6700	0.738000	0.544644 BRUSH/LOW
45291	619176.0230	430401.1780	849.5800	0.673000	0.452929 BRUSH/LOW
45292	619173.3820	430402.7870	849.5900	0.657000	0.431649 BRUSH/LOW
45293	619173.3770	430402.7790	849.5900	0.657000	0.431649 BRUSH/LOW
45294	619171.2510	430404.3030	849.2400	1.336000	1.784896 BRUSH/LOW
45295	619168.4730	430405.5420	849.7400	0.828000	0.685584 BRUSH/LOW
45296	619166.6660	430406.5210	849.8300	0.272000	0.073984 BRUSH/LOW
45297	619167.7080	430408.2770	849.4500	0.528000	0.278784 BRUSH/LOW
45298	619169.5130	430407.6580	849.3800	0.803000	0.644809 BRUSH/LOW
45299	619172.4520	430405.9940	849.5100	0.721000	0.519841 BRUSH/LOW
45300	619174.5220	430404.2570	849.6600	0.622000	0.386884 BRUSH/LOW
45301	742706.5590	324816.9370	1026.7200	0.001000	0.000001 ASPH
45302	742709.1760	324815.2460	1026.7000	0.031000	0.000961 ASPH
45303	742712.6190	324813.1430	1026.6400	0.131000	0.017161 ASPH
45304	742716.2640	324811.1680	1026.6300	0.218000	0.047524 ASPH
45305	742720.1870	324808.8140	1026.5900	0.112000	0.012544 ASPH
45306	742718.0260	324805.6820	1026.5000	0.089000	0.007921 ASPH
45307	742715.3680	324807.4390	1026.5300	0.143000	0.020449 ASPH
45308	742712.8470	324809.1470	1026.5700	0.209000	0.043681 ASPH
45309	742709.9220	324810.7560	1026.6100	0.121000	0.014641 ASPH
45310	742707.3060	324812.6440	1026.6500	0.028000	0.000784 ASPH
45311	742705.0480	324809.7610	1026.6000	0.031000	0.000961 ASPH
45312	742707.7710	324807.9920	1026.5700	0.129000	0.016641 ASPH
45313	742710.5760	324806.2220	1026.5300	0.104000	0.010816 ASPH
45314	742713.6580	324804.0830	1026.4900	0.067000	0.004489 ASPH
45315	742716.5920	324802.0760	1026.4600	0.075000	0.005625 ASPH
45316	742714.9190	324799.4160	1026.4000	0.064000	0.004096 ASPH
45317	742712.3910	324801.0550	1026.4300	0.102000	0.010404 ASPH
45318	742710.1430	324802.6180	1026.4600	0.088000	0.007744 ASPH
45319	742707.4360	324804.3490	1026.4900	0.075000	0.005625 ASPH
45320	742704.4930	324806.0110	1026.5300	0.060000	0.003600 ASPH
45321	742702.8560	324803.2950	1026.4800	-0.068000	0.004624 ASPH
45322	742705.3780	324801.6620	1026.4400	-0.019000	0.000361 ASPH
45323	742708.6380	324799.4510	1026.4000	0.053000	0.002809 ASPH
45324	742712.1030	324797.2210	1026.3600	0.037000	0.001369 ASPH
45325	742715.1840	324795.4380	1026.3200	-0.024000	0.000576 ASPH
45326	743951.1410	323352.5830	1004.5300	-0.026000	0.000676 TREE COVE
45327	743954.6600	323352.8620	1004.5400	0.136000	0.018496 TREE COVE
45328	743957.6030	323352.9880	1004.5100	0.129000	0.016641 TREE COVE
45329	743960.6640	323353.3840	1004.4800	-0.044000	0.001936 TREE COVE
45330	743964.1630	323353.5150	1004.4400	-0.101000	0.010201 TREE COVE
45331	743963.8620	323356.4570	1004.5000	0.048000	0.002304 TREE COVE
45332	743960.2170	323356.1570	1004.5800	0.003000	0.000009 TREE COVE
45333	743957.3460	323355.8960	1004.5900	0.249000	0.062001 TREE COVE
45334	743953.7880	323355.6460	1004.5200	0.294000	0.086436 TREE COVE
45335	743949.9520	323355.3540	1004.5500	-0.074000	0.005476 TREE COVE

45336	743949.9140	323357.9160	1004.5300	-0.123000	0.015129 TREE COVE
45337	743952.8450	323358.3050	1004.5500	0.144000	0.020736 TREE COVE
45338	743955.9910	323358.5580	1004.5300	0.043000	0.001849 TREE COVE
45339	743958.8740	323358.8050	1004.6100	-0.108000	0.011664 TREE COVE
45340	743961.6620	323359.2070	1004.5700	-0.088000	0.007744 TREE COVE
45341	743961.5900	323362.1620	1004.5000	0.143000	0.020449 TREE COVE
45342	743959.4160	323361.8400	1004.6700	0.328000	0.107584 TREE COVE
45343	743954.9760	323362.3430	1004.6000	-0.080000	0.006400 TREE COVE
45344	743952.3280	323362.5740	1004.5900	0.112000	0.012544 TREE COVE
45345	743950.3590	323363.1750	1004.6300	-0.153000	0.023409 TREE COVE
45346	743950.7700	323365.5110	1004.6800	-0.169000	0.028561 TREE COVE
45347	743953.3340	323365.5320	1004.6600	0.215000	0.046225 TREE COVE
45348	743956.8820	323365.6170	1004.6000	0.068000	0.004624 TREE COVE
45349	743960.0800	323365.6460	1004.5500	0.108000	0.011664 TREE COVE
45350	743963.6040	323365.9130	1004.6200	-0.030000	0.000900 TREE COVE
45351	744275.3520	323291.7270	1003.1500	0.201000	0.040401 BRUSH/LOW
45352	744275.3150	323288.5060	1003.1500	0.080000	0.006400 BRUSH/LOW
45353	744275.9660	323285.6890	1003.2400	-0.081000	0.006561 BRUSH/LOW
45354	744275.4030	323282.2030	1003.2400	0.029000	0.000841 BRUSH/LOW
45355	744276.5340	323280.0570	1003.4400	0.044000	0.001936 BRUSH/LOW
45356	744278.7810	323280.1680	1003.5100	-0.149000	0.022201 BRUSH/LOW
45357	744278.5500	323282.5660	1003.2100	0.041000	0.001681 BRUSH/LOW
45358	744278.1360	323285.1270	1003.1400	0.013000	0.000169 BRUSH/LOW
45359	744278.0030	323287.9000	1003.1900	-0.058000	0.003364 BRUSH/LOW
45360	744278.4830	323290.8130	1003.0900	0.065000	0.004225 BRUSH/LOW
45361	744281.9280	323290.5590	1002.9300	0.065000	0.004225 BRUSH/LOW
45362	744282.0070	323287.7790	1002.9700	0.176000	0.030976 BRUSH/LOW
45363	744282.8140	323284.5350	1003.0400	0.147000	0.021609 BRUSH/LOW
45364	744283.3970	323282.4650	1003.1700	0.129000	0.016641 BRUSH/LOW
45365	744285.1970	323284.6550	1003.0900	-0.002000	0.000004 BRUSH/LOW
45366	744285.9060	323286.9720	1002.9200	-0.019000	0.000361 BRUSH/LOW
45367	744284.3510	323290.6240	1002.8800	0.086000	0.007396 BRUSH/LOW
45368	744270.9840	323291.8930	1003.2100	0.346000	0.119716 BRUSH/LOW
45369	744271.1760	323288.4530	1003.3800	0.383000	0.146689 BRUSH/LOW
45370	744272.4890	323283.9830	1003.3700	-0.031000	0.000961 BRUSH/LOW
45371	744268.9390	323283.1220	1003.2700	0.147000	0.021609 BRUSH/LOW
45372	744267.4530	323286.4990	1003.2700	0.340000	0.115600 BRUSH/LOW
45373	744266.4980	323291.5140	1003.1300	0.316000	0.099856 BRUSH/LOW
45374	744263.2470	323295.0320	1003.1000	0.421000	0.177241 BRUSH/LOW
45375	744262.4680	323298.4380	1003.1400	0.025000	0.000625 BRUSH/LOW
45376	744527.3470	323411.4220	1004.5800	0.186000	0.034596 TALL GRASS
45377	744530.5940	323411.4480	1004.6700	0.294000	0.086436 TALL GRASS
45378	744533.5450	323411.0910	1004.8900	0.195000	0.038025 TALL GRASS
45379	744536.6950	323411.9350	1004.7300	0.626000	0.391876 TALL GRASS
45380	744539.4360	323411.8390	1004.8900	0.321000	0.103041 TALL GRASS
45381	744539.3070	323414.2060	1004.8500	0.305000	0.093025 TALL GRASS
45382	744536.7340	323414.1850	1004.9500	0.356000	0.126736 TALL GRASS
45383	744533.3610	323415.2860	1004.8100	0.205000	0.042025 TALL GRASS
45384	744529.7830	323415.5840	1004.6900	0.328000	0.107584 TALL GRASS
45385	744526.1060	323416.1470	1004.6400	0.522000	0.272484 TALL GRASS
45386	744529.0200	323418.9730	1004.7100	0.282000	0.079524 TALL GRASS
45387	744532.1230	323418.4460	1004.8400	0.187000	0.034969 TALL GRASS
45388	744535.4980	323418.7420	1004.8900	0.204000	0.041616 TALL GRASS
45389	744539.5080	323418.8730	1004.7900	0.523000	0.273529 TALL GRASS
45390	744543.1380	323418.8910	1004.9500	0.149000	0.022201 TALL GRASS
45391	744542.5870	323422.5410	1004.9000	0.375000	0.140625 TALL GRASS
45392	744541.0740	323422.2980	1004.9900	0.643000	0.413449 TALL GRASS
45393	744534.8850	323421.7210	1004.8100	0.243000	0.059049 TALL GRASS
45394	744531.1120	323421.4090	1004.9100	0.199000	0.039601 TALL GRASS

45395	744532.5260	323424.9910	1004.6800	0.324000	0.104976 TALL GRASS
45396	744536.0800	323424.5160	1004.7900	0.180000	0.032400 TALL GRASS
45397	744539.2920	323424.0020	1004.9500	0.312000	0.097344 TALL GRASS
45398	744538.4410	323427.7900	1004.8100	0.198000	0.039204 TALL GRASS
45399	744534.2820	323428.3390	1004.7200	0.150000	0.022500 TALL GRASS
45400	744536.1530	323431.4900	1004.6400	0.182000	0.033124 TALL GRASS
45401	637722.7540	329253.3420	857.7100	0.170000	0.028900 BRUSH/LOW
45402	637724.5580	329255.1670	857.9500	0.016000	0.000256 BRUSH/LOW
45403	637725.7860	329256.2490	857.7900	0.254000	0.064516 BRUSH/LOW
45404	637727.9620	329258.0990	857.8500	0.192000	0.036864 BRUSH/LOW
45405	637729.2150	329259.7160	858.0100	0.182000	0.033124 BRUSH/LOW
45406	637729.8910	329258.4720	857.9900	0.064000	0.004096 BRUSH/LOW
45407	637727.9040	329256.7820	857.8600	0.033000	0.001089 BRUSH/LOW
45408	637726.3430	329254.7330	857.7800	0.386000	0.148996 BRUSH/LOW
45409	637724.6920	329253.0170	857.9200	0.280000	0.078400 BRUSH/LOW
45410	637722.9660	329251.3290	857.9700	0.121000	0.014641 BRUSH/LOW
45411	637725.9290	329250.7820	857.9300	0.785000	0.616225 BRUSH/LOW
45412	637728.4080	329252.6850	858.3600	-0.035000	0.001225 BRUSH/LOW
45413	637730.2890	329254.7360	858.2300	-0.057000	0.003249 BRUSH/LOW
45414	637732.0300	329256.2460	858.2000	-0.018000	0.000324 BRUSH/LOW
45415	637733.9640	329257.9310	858.2800	-0.026000	0.000676 BRUSH/LOW
45416	637735.8400	329256.4720	858.1100	0.186000	0.034596 BRUSH/LOW
45417	637734.4750	329255.3780	857.9300	0.325000	0.105625 BRUSH/LOW
45418	637732.1400	329253.6940	858.1300	0.366000	0.133956 BRUSH/LOW
45419	637731.8290	329252.5850	858.2700	0.363000	0.131769 BRUSH/LOW
45420	637729.9160	329250.6700	857.9600	0.717000	0.514089 BRUSH/LOW
45421	637735.1250	329251.5870	857.9700	0.819000	0.670761 BRUSH/LOW
45422	637737.3820	329253.4820	858.0300	0.528000	0.278784 BRUSH/LOW
45423	637739.7670	329254.7600	857.9200	0.787000	0.619369 BRUSH/LOW
45424	637796.1800	329137.5080	857.7800	0.163000	0.026569 TREE COVE
45425	637798.5070	329136.2420	857.8400	0.089000	0.007921 TREE COVE
45426	637801.5530	329134.5250	857.8800	-0.027000	0.000729 TREE COVE
45427	637803.9030	329133.3070	857.7900	0.082000	0.006724 TREE COVE
45428	637806.0880	329132.3280	857.8200	-0.353000	0.124609 TREE COVE
45429	637806.8500	329134.8060	857.7900	-0.236000	0.055696 TREE COVE
45430	637804.3200	329135.3820	857.7900	0.014000	0.000196 TREE COVE
45431	637801.7110	329136.1030	857.9100	0.079000	0.006241 TREE COVE
45432	637799.0870	329137.1910	857.9300	0.078000	0.006084 TREE COVE
45433	637795.4460	329138.5240	857.8400	0.073000	0.005329 TREE COVE
45434	637796.0360	329141.7470	857.8400	0.019000	0.000361 TREE COVE
45435	637798.5650	329140.6240	857.8800	-0.024000	0.000576 TREE COVE
45436	637800.6760	329139.6440	858.0000	-0.082000	0.006724 TREE COVE
45437	637803.2000	329138.6360	857.9300	0.090000	0.008100 TREE COVE
45438	637806.1570	329137.2090	857.9200	-0.286000	0.081796 TREE COVE
45439	637807.0760	329140.3930	857.8800	-0.075000	0.005625 TREE COVE
45440	637803.9150	329141.6810	857.8500	0.021000	0.000441 TREE COVE
45441	637800.3660	329142.7270	857.8600	0.084000	0.007056 TREE COVE
45442	637796.6020	329143.8570	857.8400	-0.013000	0.000169 TREE COVE
45443	637795.5650	329144.4290	857.8000	0.224000	0.050176 TREE COVE
45444	637797.1070	329146.0410	857.9300	-0.144000	0.020736 TREE COVE
45445	637800.5760	329144.9220	857.8900	0.105000	0.011025 TREE COVE
45446	637803.4130	329143.7160	857.8100	0.136000	0.018496 TREE COVE
45447	637806.7880	329143.0980	857.9500	-0.062000	0.003844 TREE COVE
45448	637810.3180	329142.6450	857.9500	0.122000	0.014884 TREE COVE

Sum	164.254837
Average	0.233981
RMSE	0.483716
AccuracyZ	0.948084

FIELD NOTES

Project FEMA ground survey notes

Contains point number and descriptions

Includes Control and Check Points left out of statistical analysis

7/29/10

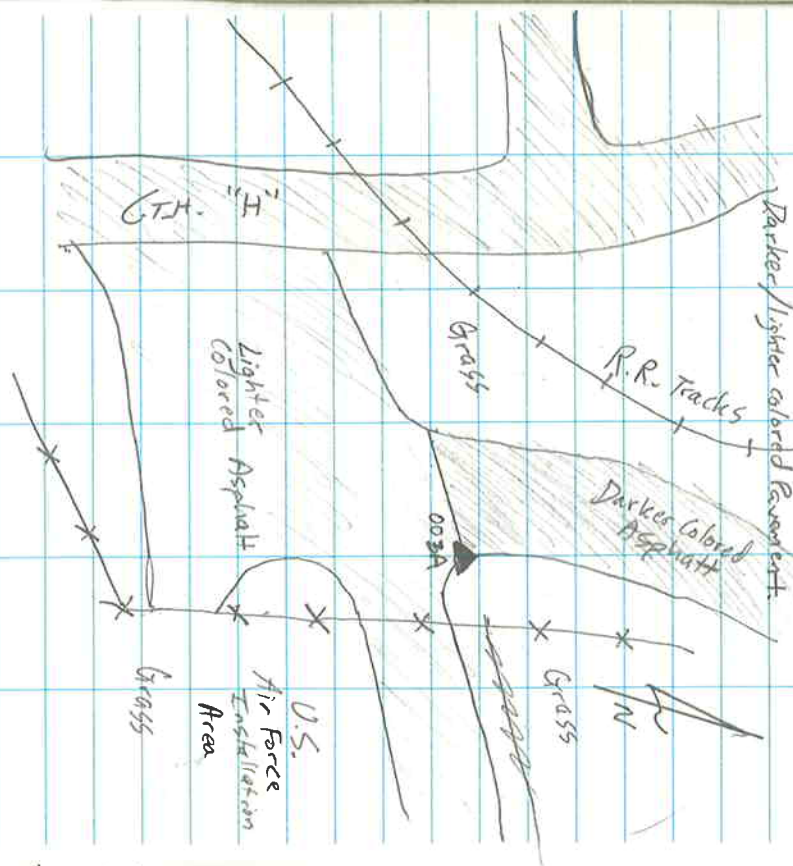
* Camp Douglas, WI *

Site: 003A Receiver: 3009

Start Time: 1:30pm PDDP: 2.8

Stop Time: 2:04pm PDDP: 2.4

Location: At E. end of crack in Pavement Separating



7/29/10

* Tomah, WI *

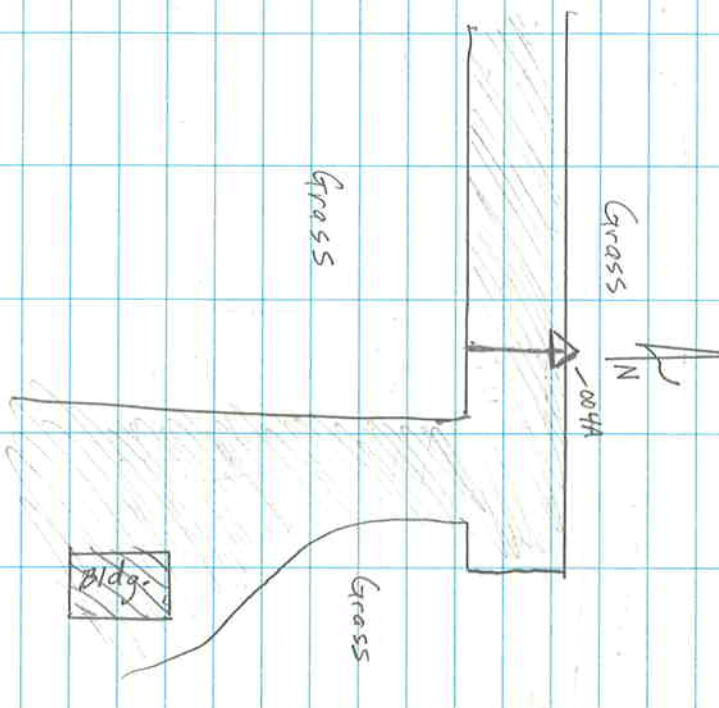
Site: 004A Receiver: 4021

Start Time: 2:28pm PDDP: 1.7

Stop Time: 3:22pm PDDP: 1.5

Location: At N. end of Tar strip intersecting w/

N. edge of Rd. (1st tar strip W. of Asphalt entrance that heads S.)



7/29/10

* Tomah, WI *

Site: 005A

Receiver: 3009

Start Time: 2:41 pm

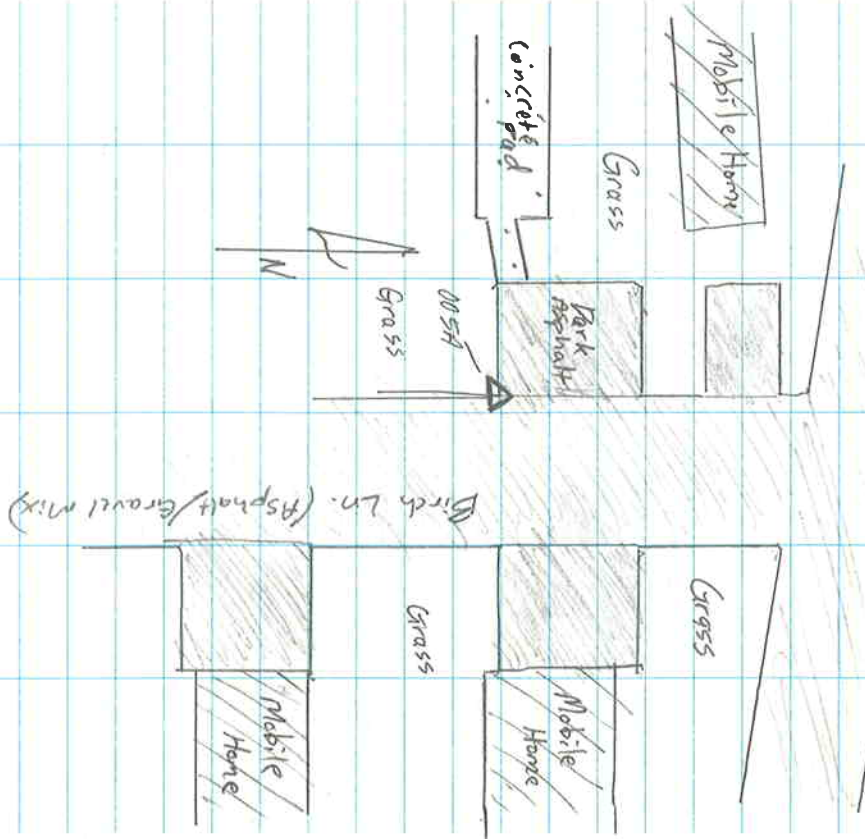
PDDP: 2.0

Stop Time: 3:14 pm

PDDP: 1.8

Location: In trailer Park - See Sketch. At intersection of

Darker Asphalt & lighter asphalt ~~area~~



7/30/10

* Tomah, WI *

Site: 006A

Receiver: 4021

Start Time: 7:05 am

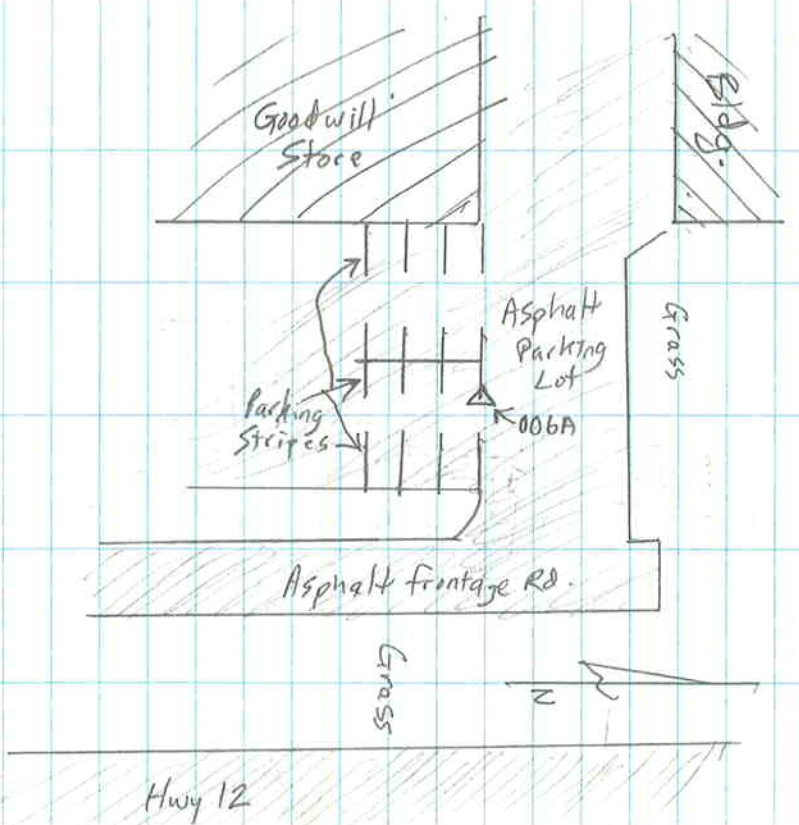
PDDP: 1.7

Stop Time: 8:01 am

PDDP: 1.7

Location: In "Goodwill" Store parking lot at

end of parking paint stripes.



7/30/10

* Tomah, WI *

Site: 007A

Receiver: 3009

Start Time: 7:16am

PDOP: 1.8

Stop Time: 7:50am

PDOP: 1.9

Location: At intersection of sidewalk's wedge w/

Address: 1503

back of curb.



Lakewood Dr. (Asphalt)

007A

Grass

Grass

Sidewalk

Garage

House 1504

7/30/10

* Sparta, WI *

Site: 008A

Receiver: 3009

Start Time: 8:45am

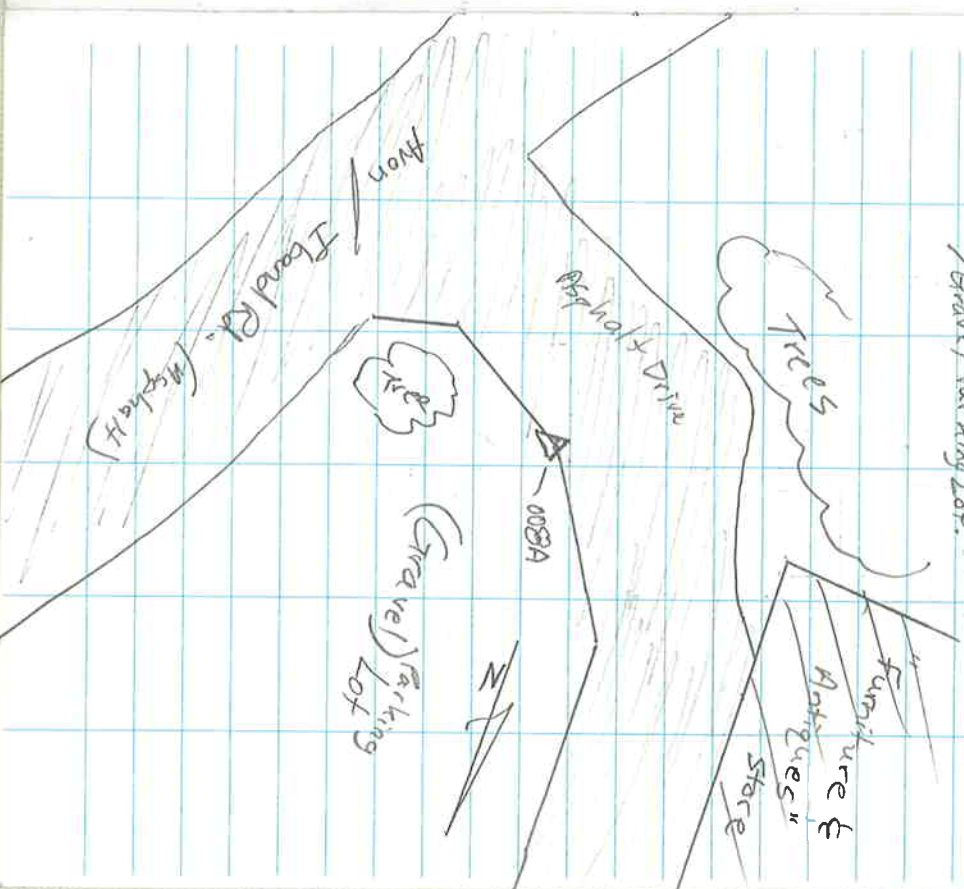
PDOP: 2.2

Stop Time: 10:10am

PDOP: 2.6

Location: An angle point at edge of asphalt

Gravel parking lot.



7/30/10

Sparta, WI

Site: 009A

Receiver: 4021

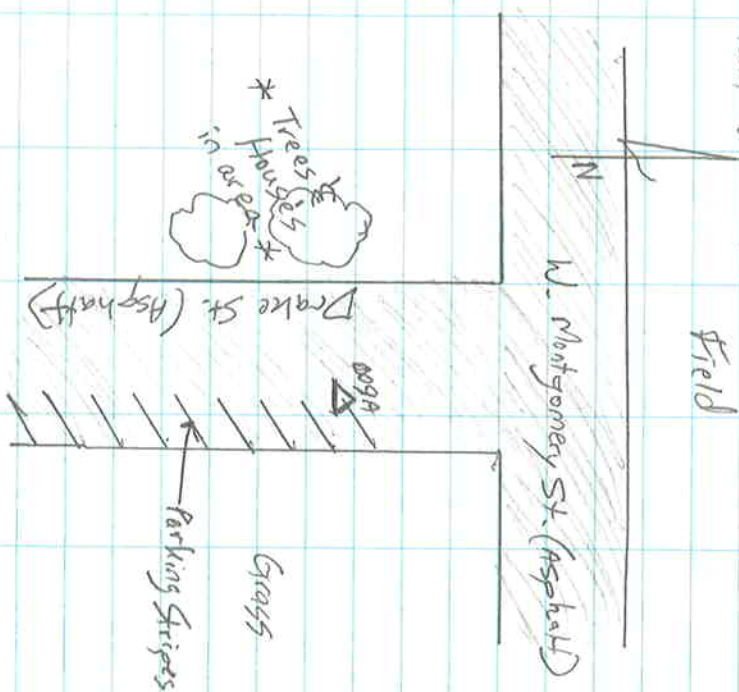
Start Time: 9:00am

PDDP: 2.3

Stop Time: 9:41am

PDOP: 1.9

Location: At end of center of parking stripe
furthest North.



7/30/10

Sparta, WI

Site: 010A

Receiver: 4021

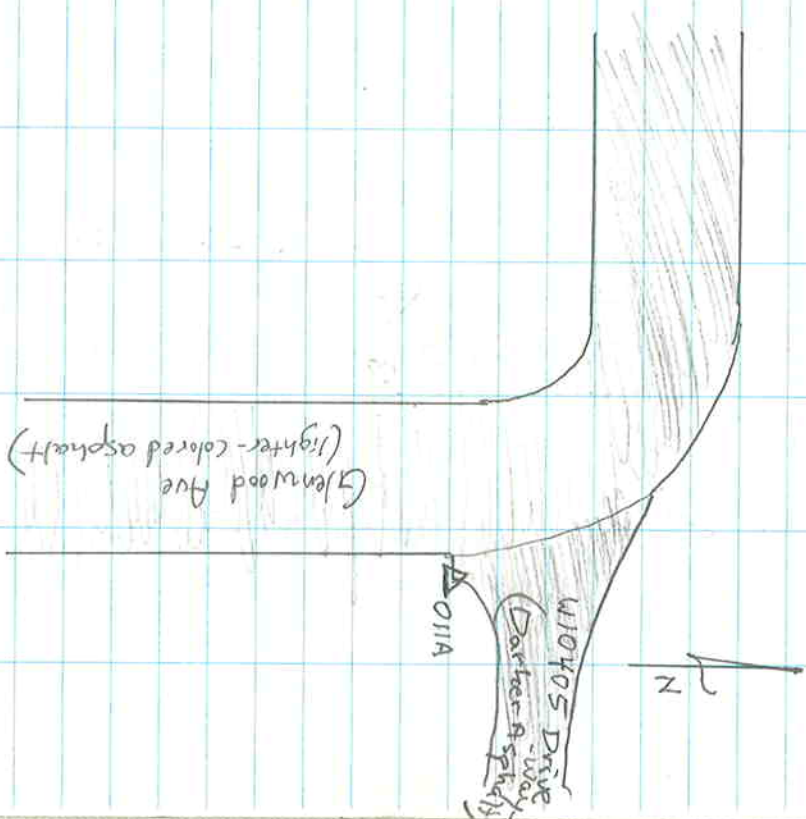
Start Time: 10:00am

PDDP: 2.5

Stop Time: 10:46am

PDOP: 3.0

Location: At angle - point in driveway -



7/30/10

* Sparta, WI *

Site: 011A

~~FDDP: 2.8~~ Receiver 3009

Start Time: 10:34am

FDDP: 2.8

Stop Time: 11:10am

FDDP: 1.9

Location: At angle point in Road separating old & new pavement.

