

GROUND CONTROL SURVEY REPORT

**GPS SURVEY
FOR LIDAR CONTROL**

COLUMBIA COUNTY, WI WROC LIDAR SURVEY

COLUMBIA COUNTY, WISCONSIN

Services provided by:

AYRES

ASSOCIATES

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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 Columbia County, Wisconsin, in 2011. 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

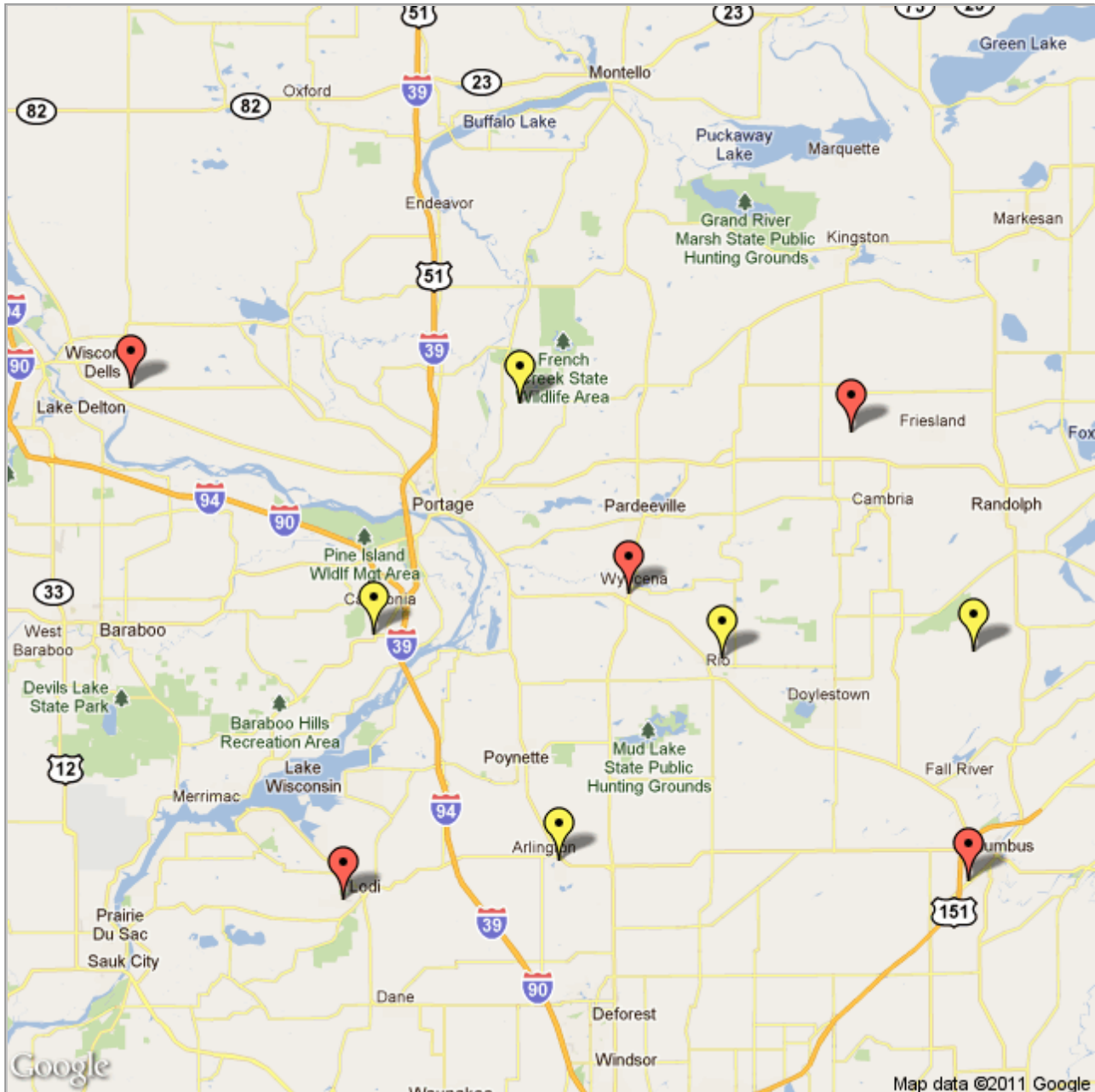
To qualify as an acceptable accuracy test, the lidar data must be compared with a dataset of higher accuracy – in this instance ground survey. To develop a comparable dataset of points from the lidar dataset, a utility from proprietary software was used.

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 0.219 feet. This is within the FEMA specified vertical accuracy tolerance of 0.6. This RMSE_z equates to a tested 0.4296 feet vertical accuracy at 95% confidence level.



Columbia Co. Index/FEMA

GROUND TRUTH ANALYSIS
Comparison of Lidar Points to Ground-Truth Points
Columbia 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 Columbia 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
1000	650710.06	364701.70	887.03	-0.259000	0.067081	FEMA1
1001	650032.83	364755.50	906.19	0.342000	0.116964	BRUSH/LOW
1002	650032.61	364760.09	906.45	0.164000	0.026896	BRUSH/LOW
1003	650032.89	364764.27	906.50	0.246000	0.060516	BRUSH/LOW
1004	650032.82	364768.38	906.55	0.186000	0.034596	BRUSH/LOW
1005	650032.77	364772.63	906.42	0.466000	0.217156	BRUSH/LOW
1006	650028.71	364773.62	907.05	0.106000	0.011236	BRUSH/LOW
1007	650028.20	364769.08	906.93	0.186000	0.034596	BRUSH/LOW
1008	650028.30	364764.23	906.87	0.285000	0.081225	BRUSH/LOW
1009	650028.18	364759.89	906.81	0.184000	0.033856	BRUSH/LOW
1010	650027.78	364755.39	906.66	0.384000	0.147456	BRUSH/LOW
1011	650022.91	364755.79	907.14	0.255000	0.065025	BRUSH/LOW
1012	650023.28	364760.26	907.48	0.034000	0.001156	BRUSH/LOW
1013	650023.05	364764.42	907.51	0.282000	0.079524	BRUSH/LOW
1014	650022.83	364769.05	907.70	0.109000	0.011881	BRUSH/LOW
1015	650022.84	364773.18	907.71	0.089000	0.007921	BRUSH/LOW
1016	650018.37	364773.73	908.16	0.231000	0.053361	BRUSH/LOW
1017	650017.93	364768.82	908.18	-0.030000	0.000900	BRUSH/LOW
1018	650017.27	364764.50	908.08	0.167000	0.027889	BRUSH/LOW
1019	650017.76	364760.22	907.93	0.131000	0.017161	BRUSH/LOW
1020	650018.06	364755.97	907.46	0.334000	0.111556	BRUSH/LOW
1021	650014.27	364756.20	907.92	0.151000	0.022801	BRUSH/LOW
1022	650014.00	364760.90	908.25	0.224000	0.050176	BRUSH/LOW
1023	650013.40	364765.31	908.48	0.104000	0.010816	BRUSH/LOW
1024	650013.27	364768.80	908.51	0.163000	0.026569	BRUSH/LOW
1025	650012.51	364773.38	908.73	0.232000	0.053824	BRUSH/LOW
1026	650078.38	364827.81	906.47	0.233000	0.054289	TALL GRASS
1027	650081.91	364827.77	906.19	0.271000	0.073441	TALL GRASS
1028	650085.61	364827.49	906.06	0.293000	0.085849	TALL GRASS
1029	650089.07	364827.22	905.89	0.263000	0.069169	TALL GRASS
1030	650092.49	364827.02	905.65	0.274000	0.075076	TALL GRASS
1031	650092.78	364831.22	905.86	0.457000	0.208849	TALL GRASS
1032	650089.26	364831.58	906.19	0.343000	0.117649	TALL GRASS
1033	650085.58	364831.82	906.37	0.407000	0.165649	TALL GRASS
1034	650081.46	364832.19	906.57	0.174000	0.030276	TALL GRASS
1035	650077.78	364832.90	906.87	0.102000	0.010404	TALL GRASS
1036	650078.05	364836.97	906.98	0.273000	0.074529	TALL GRASS
1037	650082.87	364837.19	906.66	0.279000	0.077841	TALL GRASS
1038	650086.48	364837.14	906.32	0.492000	0.242064	TALL GRASS
1039	650089.70	364837.41	906.00	0.547000	0.299209	TALL GRASS
1040	650092.93	364837.81	906.13	0.261000	0.068121	TALL GRASS
1041	650092.75	364842.18	906.34	0.255000	0.065025	TALL GRASS
1042	650089.09	364841.83	906.51	0.324000	0.104976	TALL GRASS
1043	650085.28	364841.99	906.81	0.354000	0.125316	TALL GRASS
1044	650081.53	364841.89	907.11	0.135000	0.018225	TALL GRASS
1045	650077.71	364842.28	907.30	0.296000	0.087616	TALL GRASS
1046	650077.49	364845.71	907.45	0.339000	0.114921	TALL GRASS
1047	650082.20	364845.81	907.27	0.172000	0.029584	TALL GRASS
1048	650086.48	364845.82	906.89	0.247000	0.061009	TALL GRASS
1049	650089.50	364845.79	906.70	0.168000	0.028224	TALL GRASS
1050	650092.40	364845.39	906.53	0.217000	0.047089	TALL GRASS
1051	650149.94	364697.81	897.30	-0.203000	0.041209	ASPH
1052	650150.04	364694.35	897.25	-0.183000	0.033489	ASPH
1053	650149.93	364690.83	897.22	-0.012000	0.000144	ASPH
1054	650150.11	364687.56	897.15	-0.008000	0.000064	ASPH
1055	650150.19	364684.44	897.08	-0.123000	0.015129	ASPH
1056	650153.09	364683.98	896.97	-0.182000	0.033124	ASPH
1057	650152.94	364687.26	897.06	-0.091000	0.008281	ASPH

1058	650153.02	364690.59	897.07	-0.071000	0.005041	ASPH
1059	650152.98	364694.47	897.18	-0.182000	0.033124	ASPH
1060	650152.87	364698.35	897.19	-0.072000	0.005184	ASPH
1061	650156.20	364698.22	897.08	-0.150000	0.022500	ASPH
1062	650156.35	364694.89	896.94	-0.054000	0.002916	ASPH
1063	650156.48	364691.66	896.94	-0.046000	0.002116	ASPH
1064	650156.48	364687.71	896.88	-0.183000	0.033489	ASPH
1065	650156.73	364684.37	896.76	-0.193000	0.037249	ASPH
1066	650160.12	364684.57	896.68	-0.166000	0.027556	ASPH
1067	650163.47	364684.64	896.60	-0.155000	0.024025	ASPH
1068	650163.47	364687.99	896.70	-0.170000	0.028900	ASPH
1069	650160.32	364688.36	896.78	-0.118000	0.013924	ASPH
1070	650160.31	364692.14	896.85	-0.104000	0.010816	ASPH
1071	650163.39	364692.44	896.67	-0.152000	0.023104	ASPH
1072	650163.15	364695.82	896.77	-0.229000	0.052441	ASPH
1073	650159.26	364695.95	896.91	-0.077000	0.005929	ASPH
1074	650159.57	364698.98	896.89	-0.127000	0.016129	ASPH
1075	650163.10	364698.71	896.84	-0.249000	0.062001	ASPH
1076	650143.96	371646.33	930.36	0.002000	0.000004	TREES
1077	650143.62	371648.88	930.31	-0.050000	0.002500	TREES
1078	650142.68	371652.02	929.92	0.180000	0.032400	TREES
1079	650142.01	371655.12	930.05	-0.174000	0.030276	TREES
1080	650140.92	371657.39	929.85	0.026000	0.000676	TREES
1081	650143.65	371658.81	929.76	0.033000	0.001089	TREES
1082	650144.32	371656.09	929.85	-0.025000	0.000625	TREES
1083	650144.93	371652.48	930.10	-0.064000	0.004096	TREES
1084	650146.19	371650.05	930.24	-0.009000	0.000081	TREES
1085	650146.44	371646.81	930.47	-0.015000	0.000225	TREES
1086	650150.19	371647.58	930.42	-0.013000	0.000169	TREES
1087	650149.08	371650.70	930.22	-0.042000	0.001764	TREES
1088	650147.86	371653.93	930.10	-0.027000	0.000729	TREES
1089	650151.21	371654.49	930.11	0.126000	0.015876	TREES
1090	650151.46	371651.68	930.05	0.174000	0.030276	TREES
1091	650152.26	371648.93	930.55	-0.229000	0.052441	TREES
1092	650155.20	371649.21	930.60	-0.026000	0.000676	TREES
1093	650155.11	371652.23	930.25	0.116000	0.013456	TREES
1094	650154.22	371654.52	930.34	-0.079000	0.006241	TREES
1095	650153.55	371657.84	930.05	0.213000	0.045369	TREES
1096	650153.46	371660.77	929.93	0.141000	0.019881	TREES
1097	650149.97	371660.40	929.92	0.061000	0.003721	TREES
1098	650149.49	371657.18	929.99	0.187000	0.034969	TREES
1099	650146.28	371659.19	929.81	0.052000	0.002704	TREES
1100	650146.74	371656.72	929.94	0.075000	0.005625	TREES
1101	650280.14	364762.17	887.61	-0.091000	0.008281	LOW GRASS
1102	650280.24	364765.80	887.63	0.042000	0.001764	LOW GRASS
1103	650280.30	364769.65	887.64	-0.117000	0.013689	LOW GRASS
1104	650280.31	364773.26	887.79	-0.169000	0.028561	LOW GRASS
1105	650280.31	364777.19	887.80	-0.261000	0.068121	LOW GRASS
1106	650276.46	364777.76	887.79	-0.082000	0.006724	LOW GRASS
1107	650276.48	364773.45	887.79	-0.081000	0.006561	LOW GRASS
1108	650276.43	364769.72	887.76	-0.150000	0.022500	LOW GRASS
1109	650276.11	364765.98	887.77	-0.002000	0.000004	LOW GRASS
1110	650275.84	364762.52	887.86	-0.153000	0.023409	LOW GRASS
1111	650271.96	364762.69	887.91	-0.208000	0.043264	LOW GRASS
1112	650272.29	364766.16	887.93	-0.094000	0.008836	LOW GRASS
1113	650272.42	364769.52	887.97	-0.195000	0.038025	LOW GRASS
1114	650272.44	364773.60	887.99	-0.246000	0.060516	LOW GRASS
1115	650272.40	364777.34	888.00	-0.187000	0.034969	LOW GRASS
1116	650268.88	364778.33	888.16	-0.159000	0.025281	LOW GRASS

1117	650268.60	364774.11	888.11	-0.155000	0.024025	LOW GRASS
1118	650268.24	364770.20	888.06	-0.163000	0.026569	LOW GRASS
1119	650268.12	364766.30	888.06	-0.025000	0.000625	LOW GRASS
1120	650267.52	364762.82	888.16	-0.129000	0.016641	LOW GRASS
1121	650263.64	364762.87	888.26	-0.041000	0.001681	LOW GRASS
1122	650263.83	364766.51	888.29	-0.060000	0.003600	LOW GRASS
1123	650264.24	364769.75	888.25	-0.106000	0.011236	LOW GRASS
1124	650265.04	364773.75	888.23	-0.116000	0.013456	LOW GRASS
1125	650265.06	364777.98	888.25	-0.057000	0.003249	LOW GRASS
200	553540.21	417494.90	814.69	0.191000	0.036481	FEMA
2026	553613.40	404412.92	795.05	-0.028000	0.000784	ASPH
2027	553617.66	404413.48	795.44	-0.436000	0.190096	ASPH
2028	553622.30	404414.14	795.43	-0.254000	0.064516	ASPH
2029	553626.38	404415.05	795.75	-0.586000	0.343396	ASPH
2030	553630.28	404415.72	795.61	-0.542000	0.293764	ASPH
2031	553631.54	404411.64	795.59	-0.516000	0.266256	ASPH
2032	553627.74	404411.04	795.66	-0.330000	0.108900	ASPH
2033	553623.97	404410.52	795.48	-0.164000	0.026896	ASPH
2034	553620.01	404409.92	795.50	-0.295000	0.087025	ASPH
2035	553615.96	404409.35	795.53	-0.477000	0.227529	ASPH
2036	553616.72	404405.19	795.59	-0.194000	0.037636	ASPH
2037	553621.22	404406.13	795.67	-0.213000	0.045369	ASPH
2038	553625.26	404406.79	795.70	-0.309000	0.095481	ASPH
2039	553628.94	404407.38	795.69	-0.381000	0.145161	ASPH
2040	553633.06	404407.79	795.69	-0.369000	0.136161	ASPH
2041	553634.47	404402.68	795.98	-0.416000	0.173056	ASPH
2042	553630.13	404402.07	795.97	-0.293000	0.085849	ASPH
2043	553626.04	404401.71	795.97	-0.402000	0.161604	ASPH
2044	553621.90	404401.16	795.90	-0.170000	0.028900	ASPH
2045	553617.33	404401.11	795.84	-0.224000	0.050176	ASPH
2046	553636.26	404399.11	796.04	-0.260000	0.067600	ASPH
2047	553631.91	404398.17	796.08	-0.330000	0.108900	ASPH
2048	553627.56	404397.83	796.03	-0.273000	0.074529	ASPH
2049	553623.22	404397.19	795.97	-0.038000	0.001444	ASPH
2050	553618.88	404396.26	796.00	-0.375000	0.140625	ASPH
2051	553534.09	404453.36	796.22	0.384000	0.147456	TREES
2052	553537.41	404453.44	796.02	0.256000	0.065536	TREES
2053	553540.54	404453.91	796.15	0.174000	0.030276	TREES
2054	553543.42	404454.05	795.97	0.315000	0.099225	TREES
2055	553543.25	404458.50	796.07	0.122000	0.014884	TREES
2056	553539.97	404458.28	796.30	-0.078000	0.006084	TREES
2057	553536.63	404457.83	796.35	-0.332000	0.110224	TREES
2058	553533.59	404458.04	796.39	0.024000	0.000576	TREES
2059	553530.35	404457.32	796.17	0.452000	0.204304	TREES
2060	553529.89	404462.17	796.41	0.241000	0.058081	TREES
2061	553533.16	404462.37	796.41	0.068000	0.004624	TREES
2062	553536.19	404462.25	796.14	0.026000	0.000676	TREES
2063	553539.47	404462.47	796.31	-0.222000	0.049284	TREES
2064	553542.97	404462.75	795.99	0.004000	0.000016	TREES
2065	553543.32	404466.30	795.95	-0.172000	0.029584	TREES
2066	553539.28	404466.49	796.33	-0.402000	0.161604	TREES
2067	553535.63	404466.19	796.19	-0.097000	0.009409	TREES
2068	553532.59	404465.72	796.54	0.058000	0.003364	TREES
2069	553529.84	404465.80	796.40	0.302000	0.091204	TREES
2070	553529.57	404469.30	796.52	0.082000	0.006724	TREES
2071	553533.08	404469.49	796.43	-0.150000	0.022500	TREES
2072	553535.79	404469.61	796.13	-0.099000	0.009801	TREES
2073	553538.88	404469.59	796.07	-0.128000	0.016384	TREES
2074	553542.75	404469.85	795.98	-0.083000	0.006889	TREES

2075	553530.81	404453.04	796.30	0.244000	0.059536	TREES
2076	553507.04	409806.36	809.84	0.364000	0.132496	TALL GRASS
2077	553511.06	409806.20	809.94	0.384000	0.147456	TALL GRASS
2078	553514.99	409805.97	809.81	0.652000	0.425104	TALL GRASS
2079	553519.06	409805.78	810.18	0.336000	0.112896	TALL GRASS
2080	553522.35	409805.64	810.12	0.381000	0.145161	TALL GRASS
2081	553522.37	409809.68	810.16	0.469000	0.219961	TALL GRASS
2082	553518.94	409810.03	810.30	0.266000	0.070756	TALL GRASS
2083	553515.20	409810.09	810.01	0.556000	0.309136	TALL GRASS
2084	553511.55	409809.86	810.01	0.420000	0.176400	TALL GRASS
2085	553507.65	409809.87	809.97	0.415000	0.172225	TALL GRASS
2086	553507.25	409813.39	809.92	0.395000	0.156025	TALL GRASS
2087	553511.25	409813.41	810.07	0.302000	0.091204	TALL GRASS
2088	553514.89	409813.37	810.00	0.529000	0.279841	TALL GRASS
2089	553518.75	409813.54	810.27	0.246000	0.060516	TALL GRASS
2090	553522.20	409813.19	810.26	0.206000	0.042436	TALL GRASS
2091	553522.51	409817.40	810.33	0.276000	0.076176	TALL GRASS
2092	553519.07	409817.26	810.37	0.176000	0.030976	TALL GRASS
2093	553515.17	409817.42	810.04	0.356000	0.126736	TALL GRASS
2094	553511.57	409817.31	810.07	0.356000	0.126736	TALL GRASS
2095	553507.77	409817.40	810.09	0.206000	0.042436	TALL GRASS
2096	553507.67	409821.39	809.99	0.367000	0.134689	TALL GRASS
2097	553511.22	409821.03	810.15	0.207000	0.042849	TALL GRASS
2098	553514.70	409821.04	810.10	0.311000	0.096721	TALL GRASS
2099	553518.47	409820.77	810.41	0.246000	0.060516	TALL GRASS
2100	553522.36	409820.64	810.31	0.411000	0.168921	TALL GRASS
2101	553489.69	416392.42	786.67	0.200000	0.040000	BRUSH/LOW
2102	553486.17	416392.84	786.67	0.272000	0.073984	BRUSH/LOW
2103	553482.43	416392.95	786.84	0.115000	0.013225	BRUSH/LOW
2104	553478.95	416393.12	786.79	0.236000	0.055696	BRUSH/LOW
2105	553475.65	416393.07	787.00	0.159000	0.025281	BRUSH/LOW
2106	553475.74	416396.31	786.91	0.266000	0.070756	BRUSH/LOW
2107	553478.74	416396.48	786.72	0.337000	0.113569	BRUSH/LOW
2108	553482.14	416396.60	786.59	0.309000	0.095481	BRUSH/LOW
2109	553485.61	416396.69	786.76	0.158000	0.024964	BRUSH/LOW
2110	553489.28	416396.42	786.66	0.102000	0.010404	BRUSH/LOW
2111	553489.33	416400.55	786.75	0.180000	0.032400	BRUSH/LOW
2112	553485.40	416400.26	786.95	0.081000	0.006561	BRUSH/LOW
2113	553482.35	416400.36	786.82	0.187000	0.034969	BRUSH/LOW
2114	553478.84	416400.69	787.02	0.099000	0.009801	BRUSH/LOW
2115	553475.38	416400.29	787.00	0.211000	0.044521	BRUSH/LOW
2116	553475.65	416404.31	787.02	0.068000	0.004624	BRUSH/LOW
2117	553479.09	416404.43	786.87	0.106000	0.011236	BRUSH/LOW
2118	553482.45	416404.60	786.78	0.199000	0.039601	BRUSH/LOW
2119	553486.62	416404.10	786.76	0.294000	0.086436	BRUSH/LOW
2120	553489.25	416403.95	786.84	0.103000	0.010609	BRUSH/LOW
2121	553488.82	416408.65	786.88	0.265000	0.070225	BRUSH/LOW
2122	553484.71	416408.70	786.75	0.187000	0.034969	BRUSH/LOW
2123	553481.48	416408.64	786.84	0.150000	0.022500	BRUSH/LOW
2124	553479.44	416409.28	786.78	0.379000	0.143641	BRUSH/LOW
2125	553475.50	416409.08	786.91	0.401000	0.160801	BRUSH/LOW
2126	553570.70	415371.86	812.00	0.170000	0.028900	MOWED GRASS
2127	553574.68	415371.87	811.96	0.149000	0.022201	MOWED GRASS
2128	553578.55	415371.55	811.97	0.253000	0.064009	MOWED GRASS
2129	553582.45	415371.25	811.90	0.182000	0.033124	MOWED GRASS
2130	553586.15	415371.48	811.79	0.265000	0.070225	MOWED GRASS
2131	553586.85	415375.84	811.87	0.071000	0.005041	MOWED GRASS
2132	553583.12	415375.54	811.72	0.140000	0.019600	MOWED GRASS
2133	553579.05	415375.38	811.74	0.155000	0.024025	MOWED GRASS

2134	553575.46	415375.66	811.74	0.116000	0.013456	MOWED GRASS
2135	553571.64	415375.56	811.86	0.198000	0.039204	MOWED GRASS
2136	553571.23	415380.48	811.72	0.198000	0.039204	MOWED GRASS
2137	553575.39	415380.27	811.61	0.171000	0.029241	MOWED GRASS
2138	553579.00	415380.23	811.67	0.162000	0.026244	MOWED GRASS
2139	553582.90	415380.33	811.64	0.113000	0.012769	MOWED GRASS
2140	553586.60	415380.44	811.74	0.054000	0.002916	MOWED GRASS
2141	553586.69	415384.12	811.65	0.071000	0.005041	MOWED GRASS
2142	553583.01	415383.97	811.62	-0.005000	0.000025	MOWED GRASS
2143	553579.18	415383.78	811.68	0.130000	0.016900	MOWED GRASS
2144	553575.08	415383.78	811.61	0.142000	0.020164	MOWED GRASS
2145	553571.29	415383.88	811.71	0.067000	0.004489	MOWED GRASS
2146	553571.79	415388.13	811.58	0.151000	0.022801	MOWED GRASS
2147	553575.30	415388.29	811.47	0.185000	0.034225	MOWED GRASS
2148	553578.78	415387.76	811.52	0.146000	0.021316	MOWED GRASS
2149	553582.49	415388.06	811.48	0.141000	0.019881	MOWED GRASS
2150	553586.59	415388.06	811.64	-0.021000	0.000441	MOWED GRASS
2151	553717.89	414010.86	829.88	0.021000	0.000441	GRAVEL
2152	553721.55	414010.66	829.99	-0.067000	0.004489	GRAVEL
2153	553725.00	414010.42	830.10	-0.085000	0.007225	GRAVEL
2154	553728.96	414010.09	830.25	0.002000	0.000004	GRAVEL
2155	553732.77	414009.89	830.34	0.040000	0.001600	GRAVEL
2156	553733.63	414013.40	830.59	-0.038000	0.001444	GRAVEL
2157	553729.80	414014.10	830.59	-0.067000	0.004489	GRAVEL
2158	553725.97	414014.47	830.40	-0.014000	0.000196	GRAVEL
2159	553722.54	414015.02	830.27	-0.115000	0.013225	GRAVEL
2160	553718.51	414015.37	830.16	-0.058000	0.003364	GRAVEL
2161	553719.30	414019.44	830.49	-0.012000	0.000144	GRAVEL
2162	553723.00	414019.18	830.49	0.058000	0.003364	GRAVEL
2163	553726.54	414018.76	830.61	0.015000	0.000225	GRAVEL
2164	553730.05	414018.23	830.80	0.020000	0.000400	GRAVEL
2165	553733.75	414017.68	830.84	0.119000	0.014161	GRAVEL
2166	553734.32	414020.79	831.08	0.140000	0.019600	GRAVEL
2167	553731.09	414021.62	831.12	0.011000	0.000121	GRAVEL
2168	553727.76	414022.57	831.05	0.034000	0.001156	GRAVEL
2169	553723.89	414023.03	831.04	-0.138000	0.019044	GRAVEL
2170	553719.97	414024.27	831.00	-0.129000	0.016641	GRAVEL
2171	553721.12	414028.17	831.45	-0.089000	0.007921	GRAVEL
2172	553723.84	414027.14	831.41	-0.053000	0.002809	GRAVEL
2173	553727.32	414026.41	831.40	-0.012000	0.000144	GRAVEL
2174	553730.93	414025.87	831.47	-0.037000	0.001369	GRAVEL
2175	553734.83	414024.73	831.47	0.000000	0.000000	GRAVEL
3000	596889.11	362904.19	1004.64	-0.053000	0.002809	FEMA3
3001	596302.72	361448.34	929.40	0.039000	0.001521	ASPH
3002	596304.93	361451.24	929.38	0.007000	0.000049	ASPH
3003	596307.09	361454.03	929.38	0.055000	0.003025	ASPH
3004	596309.38	361457.02	929.42	0.003000	0.000009	ASPH
3005	596311.26	361459.62	929.43	-0.132000	0.017424	ASPH
3006	596314.22	361457.27	929.48	-0.209000	0.043681	ASPH
3007	596312.10	361454.67	929.48	-0.101000	0.010201	ASPH
3008	596310.33	361452.33	929.47	0.096000	0.009216	ASPH
3009	596308.22	361449.67	929.47	0.084000	0.007056	ASPH
3010	596305.81	361446.60	929.45	-0.118000	0.013924	ASPH
3011	596308.95	361444.13	929.44	0.044000	0.001936	ASPH
3012	596311.09	361446.99	929.46	0.088000	0.007744	ASPH
3013	596313.14	361449.70	929.46	-0.106000	0.011236	ASPH
3014	596315.29	361452.47	929.46	-0.057000	0.003249	ASPH
3015	596317.54	361455.10	929.51	-0.127000	0.016129	ASPH
3016	596320.49	361452.96	929.43	0.050000	0.002500	ASPH

3017	596318.27	361449.85	929.44	0.070000	0.004900	ASPH
3018	596315.88	361447.11	929.45	-0.025000	0.000625	ASPH
3019	596313.81	361444.65	929.49	-0.054000	0.002916	ASPH
3020	596311.54	361441.67	929.51	-0.057000	0.003249	ASPH
3021	596314.55	361439.08	929.55	-0.100000	0.010000	ASPH
3022	596316.42	361441.91	929.48	0.071000	0.005041	ASPH
3023	596318.56	361444.74	929.45	0.184000	0.033856	ASPH
3024	596320.94	361447.60	929.45	0.025000	0.000625	ASPH
3025	596323.24	361450.54	929.39	0.065000	0.004225	ASPH
3026	596260.80	361540.55	929.70	0.103000	0.010609	MOWED GRASS
3027	596260.74	361544.01	929.77	-0.029000	0.000841	MOWED GRASS
3028	596260.66	361547.59	929.73	0.071000	0.005041	MOWED GRASS
3029	596260.50	361551.33	929.83	0.045000	0.002025	MOWED GRASS
3030	596260.47	361554.93	929.90	0.000000	0.000000	MOWED GRASS
3031	596257.04	361555.51	929.88	-0.055000	0.003025	MOWED GRASS
3032	596257.33	361551.63	929.87	-0.058000	0.003364	MOWED GRASS
3033	596257.55	361548.10	929.82	-0.031000	0.000961	MOWED GRASS
3034	596257.60	361544.49	929.80	-0.052000	0.002704	MOWED GRASS
3035	596257.51	361540.69	929.73	0.028000	0.000784	MOWED GRASS
3036	596253.26	361540.32	929.72	-0.040000	0.001600	MOWED GRASS
3037	596253.05	361544.35	929.69	-0.004000	0.000016	MOWED GRASS
3038	596253.03	361548.04	929.72	0.027000	0.000729	MOWED GRASS
3039	596253.03	361551.49	929.80	-0.073000	0.005329	MOWED GRASS
3040	596253.07	361555.10	929.87	-0.194000	0.037636	MOWED GRASS
3041	596248.92	361555.17	929.80	0.055000	0.003025	MOWED GRASS
3042	596249.09	361551.14	929.71	0.097000	0.009409	MOWED GRASS
3043	596249.21	361547.68	929.75	-0.090000	0.008100	MOWED GRASS
3044	596249.16	361543.94	929.80	-0.272000	0.073984	MOWED GRASS
3045	596249.23	361540.37	929.75	-0.038000	0.001444	MOWED GRASS
3046	596245.05	361540.10	929.72	-0.037000	0.001369	MOWED GRASS
3047	596244.88	361544.72	929.78	-0.342000	0.116964	MOWED GRASS
3048	596244.96	361548.11	929.74	0.007000	0.000049	MOWED GRASS
3049	596245.01	361551.93	929.74	-0.045000	0.002025	MOWED GRASS
3050	596244.96	361555.29	929.65	0.009000	0.000081	MOWED GRASS
3051	594355.60	361927.14	916.68	0.106000	0.011236	GRAVEL
3052	594359.14	361927.16	916.83	0.101000	0.010201	GRAVEL
3053	594362.55	361927.26	917.00	0.016000	0.000256	GRAVEL
3054	594366.08	361927.12	917.01	-0.118000	0.013924	GRAVEL
3055	594369.70	361927.14	917.01	-0.086000	0.007396	GRAVEL
3056	594369.92	361931.12	917.18	-0.127000	0.016129	GRAVEL
3057	594366.17	361931.22	917.13	-0.192000	0.036864	GRAVEL
3058	594362.98	361931.30	917.01	-0.095000	0.009025	GRAVEL
3059	594359.20	361931.41	916.91	0.004000	0.000016	GRAVEL
3060	594355.70	361931.28	916.72	0.177000	0.031329	GRAVEL
3061	594355.24	361935.40	916.84	0.086000	0.007396	GRAVEL
3062	594359.04	361935.76	916.89	0.138000	0.019044	GRAVEL
3063	594362.97	361935.77	916.94	0.125000	0.015625	GRAVEL
3064	594366.35	361935.95	916.96	0.065000	0.004225	GRAVEL
3065	594369.80	361935.41	917.00	0.120000	0.014400	GRAVEL
3066	594370.22	361939.59	917.04	0.156000	0.024336	GRAVEL
3067	594366.44	361939.75	917.04	0.115000	0.013225	GRAVEL
3068	594362.92	361940.04	917.11	0.057000	0.003249	GRAVEL
3069	594359.30	361939.96	917.14	0.015000	0.000225	GRAVEL
3070	594355.15	361940.10	917.05	0.010000	0.000100	GRAVEL
3071	594355.31	361943.94	917.11	0.029000	0.000841	GRAVEL
3072	594359.64	361943.75	917.16	0.200000	0.040000	GRAVEL
3073	594363.15	361943.96	917.22	0.129000	0.016641	GRAVEL
3074	594366.62	361944.13	917.19	0.069000	0.004761	GRAVEL
3075	594370.05	361944.28	917.23	0.033000	0.001089	GRAVEL

3076	598122.17	359417.22	946.37	0.407000	0.165649	TALL GRASS
3077	598122.04	359420.93	946.59	0.173000	0.029929	TALL GRASS
3078	598121.79	359425.03	946.56	0.380000	0.144400	TALL GRASS
3079	598121.22	359429.04	946.70	0.125000	0.015625	TALL GRASS
3080	598121.38	359432.73	946.75	0.114000	0.012996	TALL GRASS
3081	598117.44	359432.91	946.61	0.221000	0.048841	TALL GRASS
3082	598117.05	359429.43	946.61	0.210000	0.044100	TALL GRASS
3083	598117.15	359425.22	946.49	0.209000	0.043681	TALL GRASS
3084	598117.04	359421.26	946.52	0.079000	0.006241	TALL GRASS
3085	598117.02	359417.79	946.33	0.204000	0.041616	TALL GRASS
3086	598113.35	359417.82	946.18	0.360000	0.129600	TALL GRASS
3087	598113.33	359421.49	946.40	0.226000	0.051076	TALL GRASS
3088	598113.43	359425.06	946.37	0.268000	0.071824	TALL GRASS
3089	598113.54	359429.42	946.38	0.335000	0.112225	TALL GRASS
3090	598113.52	359433.24	946.33	0.316000	0.099856	TALL GRASS
3091	598109.75	359433.87	946.17	0.401000	0.160801	TALL GRASS
3092	598109.69	359430.22	946.21	0.432000	0.186624	TALL GRASS
3093	598109.74	359425.69	946.20	0.310000	0.096100	TALL GRASS
3094	598109.64	359421.28	946.25	0.093000	0.008649	TALL GRASS
3095	598109.34	359417.86	946.07	0.255000	0.065025	TALL GRASS
3096	598105.33	359418.14	945.91	0.303000	0.091809	TALL GRASS
3097	598105.35	359421.75	946.08	0.220000	0.048400	TALL GRASS
3098	598105.63	359425.25	946.07	0.342000	0.116964	TALL GRASS
3099	598105.76	359429.89	946.11	0.386000	0.148996	TALL GRASS
3100	598105.73	359434.08	946.08	0.327000	0.106929	TALL GRASS
3101	599167.26	361425.05	950.69	-0.057000	0.003249	BRUSH/LOW
3102	599163.60	361424.54	950.45	0.187000	0.034969	BRUSH/LOW
3103	599159.88	361424.50	950.42	0.343000	0.117649	BRUSH/LOW
3104	599156.58	361424.79	950.40	0.316000	0.099856	BRUSH/LOW
3105	599153.40	361425.96	950.36	0.372000	0.138384	BRUSH/LOW
3106	599153.63	361429.06	950.32	0.194000	0.037636	BRUSH/LOW
3107	599156.99	361428.28	950.33	0.094000	0.008836	BRUSH/LOW
3108	599160.78	361427.75	950.34	0.334000	0.111556	BRUSH/LOW
3109	599164.18	361427.43	950.40	0.159000	0.025281	BRUSH/LOW
3110	599168.16	361427.45	950.50	-0.009000	0.000081	BRUSH/LOW
3111	599168.45	361431.60	950.52	-0.010000	0.000100	BRUSH/LOW
3112	599164.16	361432.20	950.43	0.116000	0.013456	BRUSH/LOW
3113	599160.34	361432.23	950.46	0.189000	0.035721	BRUSH/LOW
3114	599157.01	361432.76	950.42	0.007000	0.000049	BRUSH/LOW
3115	599153.78	361433.38	950.35	0.076000	0.005776	BRUSH/LOW
3116	599153.81	361437.11	950.43	0.075000	0.005625	BRUSH/LOW
3117	599154.05	361440.52	950.39	0.000000	0.000000	BRUSH/LOW
3118	599157.25	361440.67	950.44	0.006000	0.000036	BRUSH/LOW
3119	599157.32	361436.62	950.65	-0.042000	0.001764	BRUSH/LOW
3120	599161.17	361436.49	950.45	0.181000	0.032761	BRUSH/LOW
3121	599161.40	361440.54	950.32	0.358000	0.128164	BRUSH/LOW
3122	599165.38	361436.13	950.46	0.269000	0.072361	BRUSH/LOW
3123	599169.48	361436.99	950.49	0.194000	0.037636	BRUSH/LOW
3124	599169.73	361440.50	950.51	-0.003000	0.000009	BRUSH/LOW
3125	599165.97	361440.88	950.50	0.116000	0.013456	BRUSH/LOW
3126	599234.28	361212.51	955.02	0.131000	0.017161	TREES
3127	599234.35	361210.19	955.03	0.325000	0.105625	TREES
3128	599234.21	361207.19	954.99	0.534000	0.285156	TREES
3129	599234.31	361203.97	955.05	0.479000	0.229441	TREES
3130	599234.46	361200.34	955.08	0.339000	0.114921	TREES
3131	599236.89	361200.47	955.06	0.210000	0.044100	TREES
3132	599240.23	361200.32	955.24	0.180000	0.032400	TREES
3133	599242.82	361200.58	955.52	0.217000	0.047089	TREES
3134	599232.21	361200.57	955.20	0.348000	0.121104	TREES

3135	599227.46	361201.48	954.99	0.556000	0.309136	TREES
3136	599227.61	361205.46	954.96	0.616000	0.379456	TREES
3137	599229.92	361204.70	954.93	0.747000	0.558009	TREES
3138	599229.90	361207.51	955.05	0.537000	0.288369	TREES
3139	599227.21	361208.91	955.21	-0.108000	0.011664	TREES
3140	599227.34	361212.55	954.96	0.172000	0.029584	TREES
3141	599229.56	361212.80	955.00	0.178000	0.031684	TREES
3142	599229.60	361210.46	955.02	0.176000	0.030976	TREES
3143	599237.14	361213.23	955.07	0.090000	0.008100	TREES
3144	599237.31	361209.50	955.13	0.064000	0.004096	TREES
3145	599237.63	361206.60	955.14	0.214000	0.045796	TREES
3146	599237.96	361204.09	955.20	0.273000	0.074529	TREES
3147	599240.61	361204.94	955.25	0.348000	0.121104	TREES
3148	599240.79	361208.15	955.29	0.285000	0.081225	TREES
3149	599240.47	361211.53	955.26	0.257000	0.066049	TREES
3150	599240.81	361213.18	955.30	0.224000	0.050176	TREES
3151	599242.37	361210.25	955.44	0.158000	0.024964	TREES
3152	599242.91	361207.20	955.55	0.100000	0.010000	TREES
3153	599243.50	361203.84	955.65	0.111000	0.012321	TREES
3154	599241.07	361215.79	955.42	0.179000	0.032041	TREES
3155	599238.25	361215.64	955.11	0.255000	0.065025	TREES
3156	599236.04	361215.60	954.94	0.231000	0.053361	TREES
3157	599233.38	361215.24	954.94	0.262000	0.068644	TREES
3158	599229.75	361215.06	954.87	0.266000	0.070756	TREES
3159	599227.25	361215.61	954.98	0.094000	0.008836	TREES
4001	522477.57	366956.11	890.97	-0.212000	0.044944	ASPH
4002	522474.43	366955.83	891.06	-0.344000	0.118336	ASPH
4003	522470.90	366955.81	891.00	-0.298000	0.088804	ASPH
4004	522467.54	366955.50	890.97	-0.106000	0.011236	ASPH
4005	522464.14	366955.34	891.00	-0.128000	0.016384	ASPH
4006	522464.05	366952.03	890.89	-0.004000	0.000016	ASPH
4007	522467.49	366952.39	890.82	0.097000	0.009409	ASPH
4008	522470.75	366952.42	890.84	-0.134000	0.017956	ASPH
4009	522474.29	366952.71	890.82	-0.083000	0.006889	ASPH
4010	522477.76	366953.02	890.82	0.004000	0.000016	ASPH
4011	522478.26	366949.31	890.80	0.115000	0.013225	ASPH
4012	522474.62	366949.40	890.70	0.094000	0.008836	ASPH
4013	522471.28	366949.34	890.72	0.012000	0.000144	ASPH
4014	522468.21	366949.09	890.73	0.118000	0.013924	ASPH
4015	522464.53	366948.82	890.76	0.225000	0.050625	ASPH
4016	522464.47	366945.55	890.76	0.230000	0.052900	ASPH
4017	522467.75	366945.79	890.68	0.292000	0.085264	ASPH
4018	522471.24	366945.94	890.66	0.170000	0.028900	ASPH
4019	522474.33	366946.34	890.71	-0.015000	0.000225	ASPH
4020	522478.38	366946.69	890.66	0.133000	0.017689	ASPH
4021	522478.97	366942.94	890.70	-0.140000	0.019600	ASPH
4022	522474.93	366942.64	890.70	0.079000	0.006241	ASPH
4023	522471.58	366942.43	890.74	0.001000	0.000001	ASPH
4024	522468.01	366942.11	890.77	0.059000	0.003481	ASPH
4025	522464.45	366942.12	890.86	-0.059000	0.003481	ASPH
4026	522753.41	366990.21	886.30	0.048000	0.002304	MOWED GRASS
4027	522756.88	366990.18	886.26	0.000000	0.000000	MOWED GRASS
4028	522760.32	366990.24	886.19	-0.021000	0.000441	MOWED GRASS
4029	522763.70	366990.23	886.09	0.152000	0.023104	MOWED GRASS
4030	522767.24	366990.19	886.06	0.037000	0.001369	MOWED GRASS
4031	522767.22	366993.49	886.15	0.017000	0.000289	MOWED GRASS
4032	522763.85	366993.64	886.27	0.032000	0.001024	MOWED GRASS
4033	522760.58	366993.70	886.37	-0.130000	0.016900	MOWED GRASS
4034	522756.90	366993.53	886.36	-0.026000	0.000676	MOWED GRASS

4035	522753.37	366993.93	886.42	0.003000	0.000009	MOWED GRASS
4036	522753.19	366997.86	886.48	-0.014000	0.000196	MOWED GRASS
4037	522757.05	366998.13	886.44	-0.012000	0.000144	MOWED GRASS
4038	522760.24	366998.02	886.36	0.013000	0.000169	MOWED GRASS
4039	522763.64	366997.67	886.35	-0.010000	0.000100	MOWED GRASS
4040	522767.25	366997.92	886.14	0.180000	0.032400	MOWED GRASS
4041	522767.33	367001.31	886.20	0.025000	0.000625	MOWED GRASS
4042	522763.57	367001.25	886.20	0.147000	0.021609	MOWED GRASS
4043	522760.19	367001.25	886.25	0.107000	0.011449	MOWED GRASS
4044	522756.95	367001.34	886.24	0.159000	0.025281	MOWED GRASS
4045	522753.37	367001.23	886.40	0.085000	0.007225	MOWED GRASS
4046	522753.16	367005.32	886.43	0.008000	0.000064	MOWED GRASS
4047	522756.95	367005.27	886.23	0.127000	0.016129	MOWED GRASS
4048	522760.26	367005.39	886.10	0.276000	0.076176	MOWED GRASS
4049	522763.36	367005.54	886.14	0.215000	0.046225	MOWED GRASS
4050	522766.76	367005.65	886.08	0.256000	0.065536	MOWED GRASS
4051	527341.69	373513.62	834.56	-0.256000	0.065536	GRAVEL
4052	527344.54	373515.09	834.53	-0.312000	0.097344	GRAVEL
4053	527347.37	373516.69	834.40	-0.156000	0.024336	GRAVEL
4054	527350.18	373518.32	834.26	0.414000	0.171396	GRAVEL
4055	527352.76	373519.97	834.20	0.304000	0.092416	GRAVEL
4056	527355.02	373517.29	834.21	-0.012000	0.000144	GRAVEL
4057	527352.38	373515.59	834.37	0.035000	0.001225	GRAVEL
4058	527349.89	373513.82	834.38	-0.082000	0.006724	GRAVEL
4059	527347.12	373512.58	834.50	-0.081000	0.006561	GRAVEL
4060	527344.36	373511.08	834.54	-0.207000	0.042849	GRAVEL
4061	527346.24	373508.84	834.63	-0.179000	0.032041	GRAVEL
4062	527349.30	373509.95	834.56	-0.138000	0.019044	GRAVEL
4063	527352.12	373511.51	834.51	-0.230000	0.052900	GRAVEL
4064	527354.72	373512.91	834.36	-0.162000	0.026244	GRAVEL
4065	527357.34	373514.76	834.24	0.042000	0.001764	GRAVEL
4066	527359.32	373512.19	834.32	-0.138000	0.019044	GRAVEL
4067	527357.04	373510.93	834.24	0.097000	0.009409	GRAVEL
4068	527354.22	373509.36	834.35	0.039000	0.001521	GRAVEL
4069	527351.53	373507.76	834.36	-0.026000	0.000676	GRAVEL
4070	527348.81	373506.64	834.42	0.055000	0.003025	GRAVEL
4071	527350.89	373504.14	834.40	-0.027000	0.000729	GRAVEL
4072	527353.54	373505.56	834.33	0.002000	0.000004	GRAVEL
4073	527356.14	373506.92	834.32	0.030000	0.000900	GRAVEL
4074	527358.72	373508.63	834.27	-0.138000	0.019044	GRAVEL
4075	527361.23	373510.17	834.18	-0.157000	0.024649	GRAVEL
4076	520088.00	372641.80	1222.23	0.315000	0.099225	TALL GRASS
4077	520084.62	372640.40	1222.47	0.283000	0.080089	TALL GRASS
4078	520081.46	372639.16	1222.78	0.153000	0.023409	TALL GRASS
4079	520078.62	372637.63	1223.08	0.164000	0.026896	TALL GRASS
4080	520075.78	372636.19	1223.20	0.152000	0.023104	TALL GRASS
4081	520073.38	372639.11	1223.20	0.174000	0.030276	TALL GRASS
4082	520076.62	372640.70	1223.07	0.165000	0.027225	TALL GRASS
4083	520079.49	372642.17	1222.80	0.283000	0.080089	TALL GRASS
4084	520082.72	372643.49	1222.52	0.205000	0.042025	TALL GRASS
4085	520085.73	372644.82	1222.24	0.339000	0.114921	TALL GRASS
4086	520084.59	372647.89	1222.19	0.374000	0.139876	TALL GRASS
4087	520081.07	372646.78	1222.57	0.238000	0.056644	TALL GRASS
4088	520078.11	372645.11	1222.84	0.242000	0.058564	TALL GRASS
4089	520075.62	372643.85	1223.02	0.180000	0.032400	TALL GRASS
4090	520072.62	372642.51	1223.13	0.195000	0.038025	TALL GRASS
4091	520070.40	372645.81	1223.07	0.236000	0.055696	TALL GRASS
4092	520073.76	372646.88	1222.96	0.310000	0.096100	TALL GRASS
4093	520076.73	372648.14	1222.81	0.299000	0.089401	TALL GRASS

4094	520079.38	372649.74	1222.48	0.385000	0.148225	TALL GRASS
4095	520082.74	372651.40	1222.26	0.362000	0.131044	TALL GRASS
4096	520080.93	372654.70	1222.28	0.323000	0.104329	TALL GRASS
4097	520077.34	372652.75	1222.55	0.363000	0.131769	TALL GRASS
4098	520074.18	372651.21	1222.77	0.384000	0.147456	TALL GRASS
4099	520071.32	372650.05	1222.87	0.246000	0.060516	TALL GRASS
4100	520068.37	372648.52	1222.96	0.478000	0.228484	TALL GRASS
4101	520004.32	370406.99	1151.09	0.107000	0.011449	TREES
4102	520003.46	370410.61	1151.29	-0.295000	0.087025	TREES
4103	520002.01	370414.93	1151.37	-0.132000	0.017424	TREES
4104	520001.05	370418.46	1151.47	0.031000	0.000961	TREES
4105	520000.25	370422.10	1151.38	-0.109000	0.011881	TREES
4106	520003.58	370422.74	1150.66	0.328000	0.107584	TREES
4107	520006.96	370424.19	1150.63	0.052000	0.002704	TREES
4108	520010.24	370425.55	1150.58	-0.069000	0.004761	TREES
4109	520012.16	370426.20	1150.56	0.006000	0.000036	TREES
4110	520014.99	370423.84	1150.65	0.022000	0.000484	TREES
4111	520012.09	370421.75	1150.43	0.208000	0.043264	TREES
4112	520007.74	370420.86	1150.48	0.239000	0.057121	TREES
4113	520004.55	370419.91	1150.53	0.456000	0.207936	TREES
4114	520006.25	370415.78	1150.60	0.255000	0.065025	TREES
4115	520008.95	370416.71	1150.40	0.206000	0.042436	TREES
4116	520011.82	370417.82	1150.64	-0.148000	0.021904	TREES
4117	520014.54	370418.23	1150.43	0.071000	0.005041	TREES
4118	520012.52	370413.66	1150.42	0.131000	0.017161	TREES
4119	520009.69	370413.44	1150.46	0.207000	0.042849	TREES
4120	520006.70	370411.18	1150.78	0.070000	0.004900	TREES
4121	520008.40	370408.00	1150.62	0.339000	0.114921	TREES
4122	520011.02	370408.89	1150.56	0.148000	0.021904	TREES
4123	520013.52	370408.90	1150.46	0.406000	0.164836	TREES
4124	520013.94	370406.80	1150.37	0.509000	0.259081	TREES
4125	520013.79	370410.94	1150.41	0.347000	0.120409	TREES
5000	561882.42	319640.22	1036.63	0.092000	0.008464	FEMA5
5001	560669.54	320222.01	1049.14	-0.024000	0.000576	MOWED GRASS
5002	560665.77	320222.12	1049.14	-0.082000	0.006724	MOWED GRASS
5003	560662.27	320222.71	1049.12	-0.146000	0.021316	MOWED GRASS
5004	560658.77	320222.64	1049.09	0.007000	0.000049	MOWED GRASS
5005	560655.37	320222.87	1049.16	-0.088000	0.007744	MOWED GRASS
5006	560655.32	320227.11	1049.03	-0.069000	0.004761	MOWED GRASS
5007	560658.99	320227.12	1049.18	-0.090000	0.008100	MOWED GRASS
5008	560662.67	320226.89	1049.13	0.014000	0.000196	MOWED GRASS
5009	560666.25	320226.63	1049.20	-0.080000	0.006400	MOWED GRASS
5010	560669.97	320226.58	1049.18	0.067000	0.004489	MOWED GRASS
5011	560670.35	320230.68	1049.15	0.166000	0.027556	MOWED GRASS
5012	560666.61	320230.96	1049.28	-0.124000	0.015376	MOWED GRASS
5013	560662.93	320231.35	1049.29	-0.114000	0.012996	MOWED GRASS
5014	560659.16	320231.75	1049.23	-0.099000	0.009801	MOWED GRASS
5015	560655.62	320232.03	1049.25	-0.145000	0.021025	MOWED GRASS
5016	560655.72	320236.18	1049.27	-0.198000	0.039204	MOWED GRASS
5017	560659.62	320235.87	1049.37	-0.121000	0.014641	MOWED GRASS
5018	560663.55	320236.12	1049.37	-0.092000	0.008464	MOWED GRASS
5019	560666.98	320235.94	1049.40	-0.151000	0.022801	MOWED GRASS
5020	560670.43	320235.72	1049.33	-0.073000	0.005329	MOWED GRASS
5021	560670.67	320239.21	1049.48	-0.185000	0.034225	MOWED GRASS
5022	560667.02	320239.39	1049.45	-0.155000	0.024025	MOWED GRASS
5023	560663.60	320239.51	1049.37	-0.056000	0.003136	MOWED GRASS
5024	560659.87	320239.97	1049.42	-0.059000	0.003481	MOWED GRASS
5025	560656.02	320240.12	1049.37	-0.113000	0.012769	MOWED GRASS
5026	558358.52	321515.53	1051.05	-0.130000	0.016900	ASPHALT

5027	558358.61	321519.53	1051.21	-0.334000	0.111556	ASPHALT
5028	558358.71	321523.47	1051.26	-0.320000	0.102400	ASPHALT
5029	558358.84	321527.04	1051.28	-0.268000	0.071824	ASPHALT
5030	558358.95	321530.67	1051.29	-0.314000	0.098596	ASPHALT
5031	558362.65	321530.50	1051.26	-0.381000	0.145161	ASPHALT
5032	558362.67	321526.94	1051.30	-0.156000	0.024336	ASPHALT
5033	558362.55	321523.18	1051.23	-0.113000	0.012769	ASPHALT
5034	558362.61	321519.58	1051.23	-0.199000	0.039601	ASPHALT
5035	558362.28	321515.33	1051.09	-0.148000	0.021904	ASPHALT
5036	558366.06	321515.18	1051.08	-0.239000	0.057121	ASPHALT
5037	558366.05	321519.07	1051.16	-0.159000	0.025281	ASPHALT
5038	558366.08	321522.90	1051.23	-0.181000	0.032761	ASPHALT
5039	558366.21	321526.72	1051.30	-0.074000	0.005476	ASPHALT
5040	558366.34	321530.85	1051.31	-0.194000	0.037636	ASPHALT
5041	558370.16	321530.77	1051.34	-0.280000	0.078400	ASPHALT
5042	558370.33	321527.02	1051.33	-0.303000	0.091809	ASPHALT
5043	558370.24	321523.23	1051.28	-0.230000	0.052900	ASPHALT
5044	558370.25	321519.60	1051.25	-0.202000	0.040804	ASPHALT
5045	558370.12	321515.04	1051.04	-0.321000	0.103041	ASPHALT
5046	558373.91	321514.63	1051.02	-0.148000	0.021904	ASPHALT
5047	558373.93	321519.01	1051.11	-0.077000	0.005929	ASPHALT
5048	558374.02	321522.96	1051.21	-0.200000	0.040000	ASPHALT
5049	558374.30	321527.13	1051.34	-0.203000	0.041209	ASPHALT
5050	558374.36	321530.95	1051.35	-0.236000	0.055696	ASPHALT
5051	558496.97	321601.50	1050.16	-0.124000	0.015376	SAND
5052	558497.01	321605.28	1050.17	-0.128000	0.016384	SAND
5053	558497.16	321609.09	1050.21	-0.124000	0.015376	SAND
5054	558497.53	321613.07	1050.25	-0.262000	0.068644	SAND
5055	558497.49	321617.38	1050.30	-0.202000	0.040804	SAND
5056	558501.39	321617.34	1050.26	-0.062000	0.003844	SAND
5057	558501.42	321613.31	1050.19	-0.093000	0.008649	SAND
5058	558501.13	321609.46	1050.19	-0.077000	0.005929	SAND
5059	558501.07	321605.71	1050.18	-0.117000	0.013689	SAND
5060	558500.88	321601.30	1050.16	-0.148000	0.021904	SAND
5061	558505.12	321601.06	1050.15	-0.168000	0.028224	SAND
5062	558505.43	321605.40	1050.19	-0.174000	0.030276	SAND
5063	558505.64	321609.50	1050.20	-0.090000	0.008100	SAND
5064	558505.93	321613.46	1050.22	-0.116000	0.013456	SAND
5065	558506.04	321617.46	1050.21	-0.167000	0.027889	SAND
5066	558510.18	321617.44	1050.27	-0.074000	0.005476	SAND
5067	558509.87	321612.88	1050.26	-0.088000	0.007744	SAND
5068	558509.57	321608.87	1050.23	-0.021000	0.000441	SAND
5069	558509.30	321604.47	1050.22	-0.151000	0.022801	SAND
5070	558509.22	321600.86	1050.21	-0.257000	0.066049	SAND
5071	558513.74	321600.52	1050.26	-0.282000	0.079524	SAND
5072	558514.02	321605.12	1050.26	-0.154000	0.023716	SAND
5073	558514.38	321609.50	1050.30	-0.060000	0.003600	SAND
5074	558514.60	321613.70	1050.37	-0.218000	0.047524	SAND
5075	558514.69	321617.62	1050.38	-0.222000	0.049284	SAND
5076	558177.71	316144.63	1029.99	0.308000	0.094864	TALL GRASS
5077	558180.94	316144.93	1030.08	0.268000	0.071824	TALL GRASS
5078	558184.62	316145.49	1030.05	0.262000	0.068644	TALL GRASS
5079	558187.55	316145.21	1030.10	0.178000	0.031684	TALL GRASS
5080	558191.13	316145.15	1030.19	0.005000	0.000025	TALL GRASS
5081	558191.29	316141.44	1030.24	0.206000	0.042436	TALL GRASS
5082	558187.17	316141.87	1030.20	0.153000	0.023409	TALL GRASS
5083	558183.67	316141.54	1030.17	0.096000	0.009216	TALL GRASS
5084	558180.45	316141.83	1030.21	0.005000	0.000025	TALL GRASS
5085	558176.73	316141.85	1030.06	0.081000	0.006561	TALL GRASS

5086	558176.80	316138.42	1030.15	0.107000	0.011449	TALL GRASS
5087	558180.47	316138.62	1030.26	0.037000	0.001369	TALL GRASS
5088	558184.09	316138.62	1030.24	0.175000	0.030625	TALL GRASS
5089	558187.78	316138.68	1030.35	0.231000	0.053361	TALL GRASS
5090	558191.08	316138.37	1030.25	0.571000	0.326041	TALL GRASS
5091	558190.81	316134.87	1030.09	0.567000	0.321489	TALL GRASS
5092	558187.41	316134.88	1030.21	0.261000	0.068121	TALL GRASS
5093	558184.19	316134.62	1030.17	0.279000	0.077841	TALL GRASS
5094	558180.38	316135.09	1030.18	0.312000	0.097344	TALL GRASS
5095	558176.91	316134.57	1030.16	0.354000	0.125316	TALL GRASS
5096	558176.78	316131.47	1030.19	0.219000	0.047961	TALL GRASS
5097	558180.99	316131.18	1030.28	0.157000	0.024649	TALL GRASS
5098	558185.41	316130.72	1030.17	0.174000	0.030276	TALL GRASS
5099	558188.44	316130.74	1030.23	0.218000	0.047524	TALL GRASS
5100	558191.07	316130.69	1030.22	0.384000	0.147456	TALL GRASS
5101	569234.83	315801.37	1074.84	-0.093000	0.008649	TREES
5102	569235.15	315797.67	1074.83	0.501000	0.251001	TREES
5103	569235.18	315793.56	1074.84	0.007000	0.000049	TREES
5104	569234.91	315789.35	1074.83	-0.209000	0.043681	TREES
5105	569234.38	315785.49	1074.83	-0.167000	0.027889	TREES
5106	569238.37	315784.82	1074.78	-0.132000	0.017424	TREES
5107	569238.36	315788.79	1074.80	-0.198000	0.039204	TREES
5108	569238.57	315792.85	1074.82	-0.035000	0.001225	TREES
5109	569238.20	315797.44	1074.81	0.395000	0.156025	TREES
5110	569238.79	315801.22	1074.83	0.091000	0.008281	TREES
5111	569242.91	315801.44	1074.80	0.185000	0.034225	TREES
5112	569242.57	315797.19	1074.80	-0.020000	0.000400	TREES
5113	569242.46	315793.29	1074.74	0.060000	0.003600	TREES
5114	569242.03	315789.38	1074.75	-0.177000	0.031329	TREES
5115	569242.08	315784.93	1074.73	-0.110000	0.012100	TREES
5116	569245.98	315784.87	1074.51	0.011000	0.000121	TREES
5117	569245.95	315789.47	1074.65	-0.185000	0.034225	TREES
5118	569246.40	315793.15	1074.67	-0.178000	0.031684	TREES
5119	569246.81	315797.45	1074.70	-0.053000	0.002809	TREES
5120	569246.84	315801.23	1074.71	0.087000	0.007569	TREES
5121	569251.01	315801.34	1074.72	0.007000	0.000049	TREES
5122	569250.93	315796.50	1074.70	-0.100000	0.010000	TREES
5123	569250.55	315792.90	1074.68	-0.139000	0.019321	TREES
5124	569250.33	315789.24	1074.61	0.002000	0.000004	TREES
5125	569250.06	315785.57	1074.58	0.234000	0.054756	TREES
ARLINGTON	555281.33	325863.33	1113.60	-0.521000	0.271441	CP
CP100	650082.77	371641.86	933.59	-0.163000	0.026569	CP
CP101	650185.45	371805.54	931.72	-0.592000	0.350464	CP
CP200	553536.45	404388.47	795.50	-0.412000	0.169744	CP
CP201	553760.88	404403.17	796.32	-0.305000	0.093025	CP
CP300	599230.30	361284.30	954.47	-0.294000	0.086436	CP
CP301	599048.50	361310.11	949.69	-0.187000	0.034969	CP
CP400	520024.19	370324.74	1152.47	-0.114000	0.012996	CP
CP401	520484.36	371108.17	1186.98	-0.195000	0.038025	CP
CP500	569241.74	315940.79	1078.18	-0.142000	0.020164	CP
CP501	569413.00	315937.36	1079.05	-0.152000	0.023104	CP
DEKORA CK	526295.74	361864.80	841.56	-0.561000	0.314721	CK
DEKORRA G	526295.70	361864.69	841.54	-0.542000	0.293764	CP
LOST LAKE	658131.45	366482.99	933.44	0.178000	0.031684	CP
MARCELLON	566640.93	417887.12	824.75	0.436000	0.190096	CP
RIO GPS	612199.41	361295.50	944.18	0.083000	0.006889	CP

SUM	33.835922
AVERAGE	0.048062
RMSE	0.219231
ACCURACYZ	0.429693

FIELD NOTES

Project FEMA ground survey notes

Contains point number and descriptions

Includes Control and Check Points left out of statistical analysis

COLUMBIA COUNTY
LIDAR

INDEX POINTS

FEMA GROUND
TRUTHING

MF

INDEX 1

Checked ELBA w GPS (0M1323)

Col-1: Mag nail in asphalt
parking lot of Columbus
Community Hospital $\pm 300'$
South of driveway entrance

Col-2: Mag nail in same
lot $\pm 150'$ South of Col-1

INDEX 2

Checked CAMBRIA GPS (DM1256)

COL 2-1: Mag nail in E Inglehart Rd. \pm 30' South of E Friesland Rd.

COL 2-2: Mag nail in E Inglehart Rd. \pm 30' North of E Friesland Rd.

INDEX 3

Checked PARDEEVILLE GPS (DH5554)

COL 3-1: Mag nail in asphalt surface of Westernmost driveway to County Garage on Old Hwy 18

COL 3-2: Mag nail in asphalt lot of county garage \pm 150' South of COL 3-1

INDEX 4

Checked NEWPORT E GPS (DH 5592)

COL 4-1: Set mag nail in E
Peterson Rd. $\pm 30'$ South
of E STH-127

COL 4-2: Set mag nail in E
Peterson Rd. $\pm 30'$ North
of E STH-127

INDEX 5

Checked LODI GPS (DH 5584)

COL 5-1: Mag nail in asphalt
parking lot of Lodi Middle
School $\pm 170'$ N. of E
Sank St. @ E. Driveway
entrance

COL 5-2: Mag nail in asphalt
parking lot $\pm 180'$ West of
COL 5-1