



Vertical Accuracy Report

Wisconsin WROC - 3DEP 2020

Sauk County Lidar

Ingenuity, Integrity, and Intelligence.

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Vertical Accuracy Report

Project Information

Prepared By: Ayres

Project Name: Wisconsin WROC – 3DEP Sauk County Lidar 2020

Sensor Info: Riegl LMS-Q1560 SN 1264

Required Nominal Pulse Spacing: 0.7

Consultant Name: Ayres primary and Quantum Spatial (now NV5 Geospatial) as lidar acquisition partner

Units: U.S. Survey Feet

Date of Acquisition: Start: 4/18/2020 | Finish: 4/21/2020

Report Information

This report documents the absolute vertical accuracy of the lidar data collected for the Sauk County, WI, QL2 lidar project. Independent vertical checkpoints were collected by land surveyors using Trimble GNSS equipment connected to WISCRS base stations. The checkpoints were collected from April 27 to May 6, 2020.

The checkpoints were collected under various land cover types that are predominant in the County. Each land cover type falls into either the Non-vegetated Vertical Accuracy (NVA) or the Vegetated Vertical Accuracy (VVA) group. For this project, 58 NVA points and 46 VVA points were collected throughout the County.

The following report shows the final statistics for the NVA checkpoints compared against the raw swath point cloud and the bare earth DEM, and the VVA statistics compared against the DEM. Statistics are reported for LAS and DEM by NVA and VVA categories.

Vertical Accuracy Specifications per USGS QL2 level:

LAS:

NVA equates to 10 cm RMSEz, or 19.6 cm (0.64 ft) at the 95% confidence level.

DEM:

NVA equates to 10 cm RMSEz, or 19.6 cm (0.64 ft) at the 95% confidence level.

VVA equates to 29.4 cm (0.96 ft) at the 95th percentile.

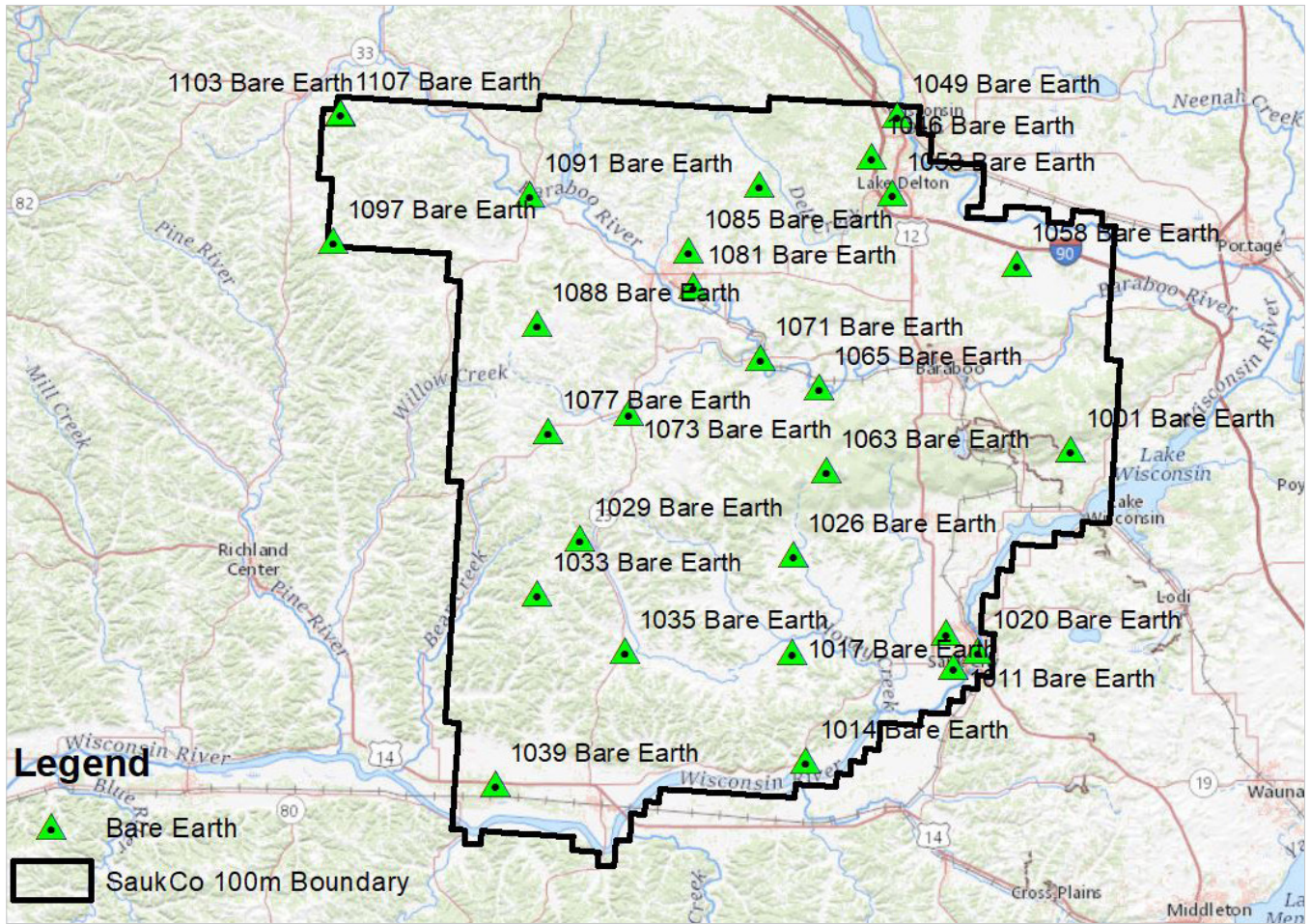
The NVA and VVA statistics for this project are within the above stated specifications.

Lidar Accuracy Assessment Summary

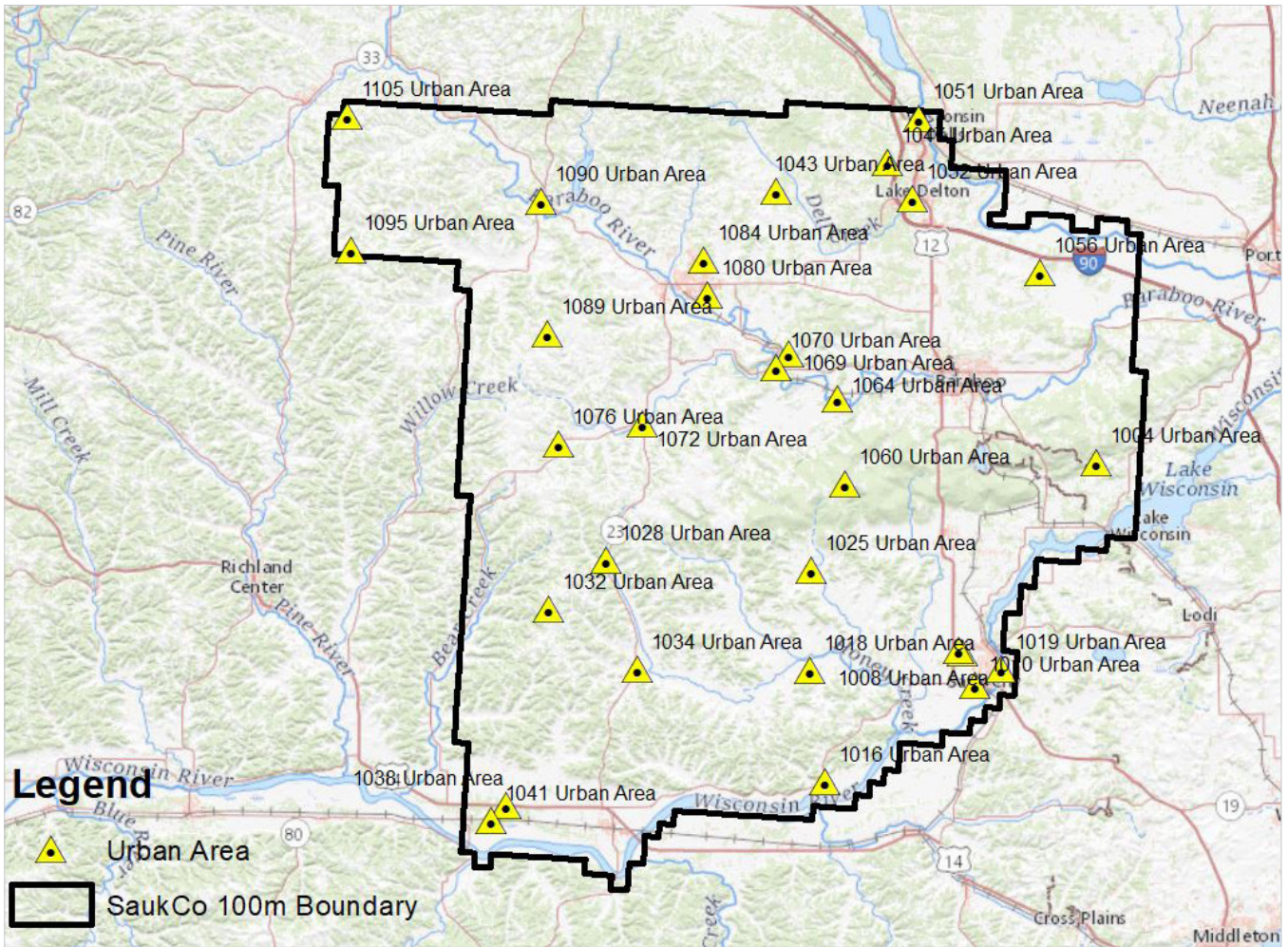
| LAND COVER TYPE | # OF POINTS | NVA | VVA |
|-----------------|-------------|-----------------------|------------------------|
| LAS | | 95% confidence | |
| Bare Earth | 28 | 0.213 | N/A |
| Urban Area | 30 | 0.140 | N/A |
| Forest | 23 | N/A | N/A |
| Tall Weeds | 23 | N/A | N/A |
| Total | 104 | 0.179 | N/A |
| DEM | | 95% confidence | 95th percentile |
| Bare Earth | 28 | 0.207 | N/A |
| Urban Area | 30 | 0.128 | N/A |
| Forest | 23 | N/A | 0.311 |
| Tall Weeds | 23 | N/A | 0.655 |
| Total | 104 | 0.171 | 0.591 |

Units: U.S. Survey Feet

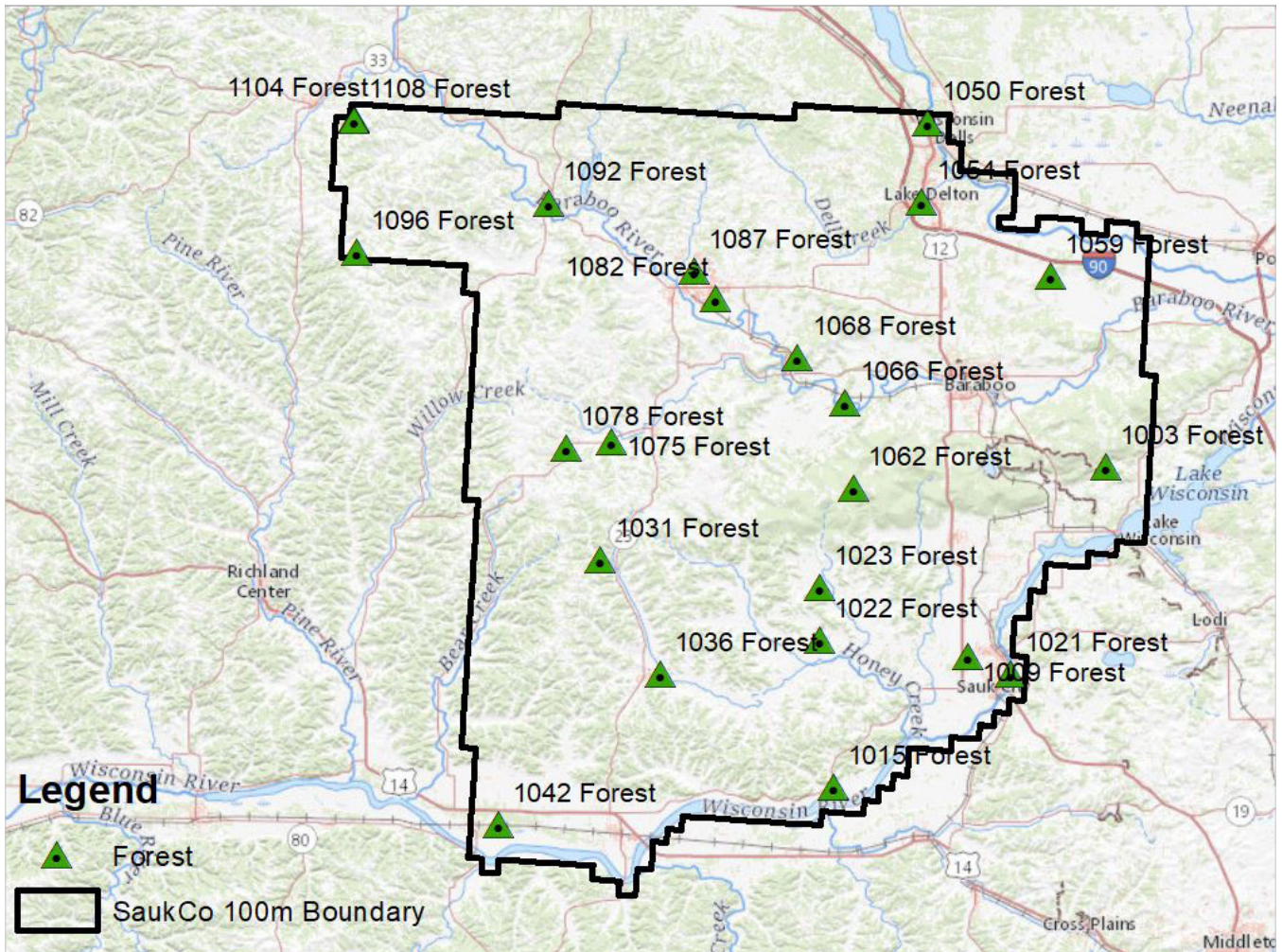
Map of NVA Checkpoint Locations - Bare Earth



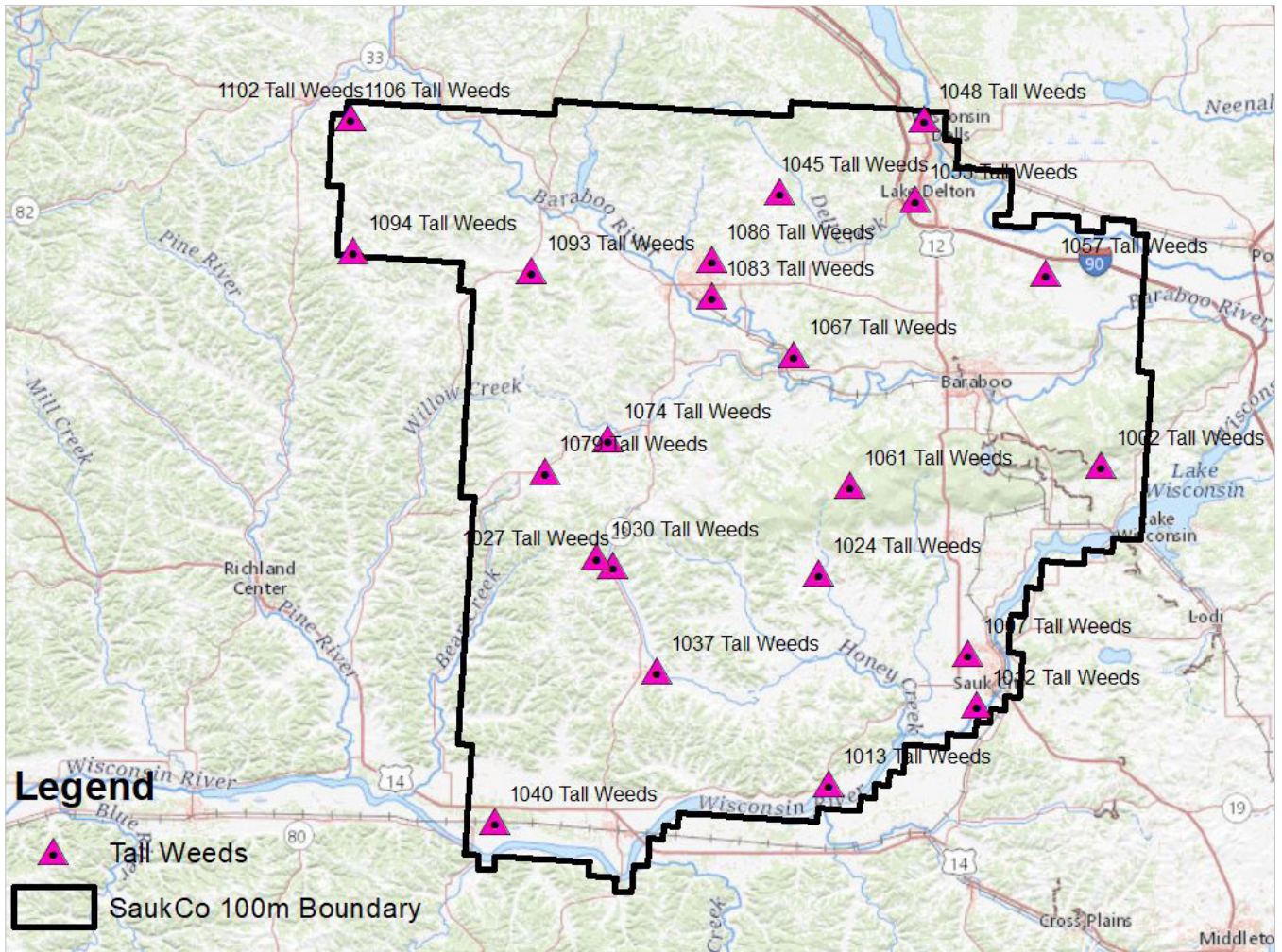
Map of NVA Checkpoint Locations - Urban Areas



Map of NVA Checkpoint Locations - Forested Areas



Map of NVA Checkpoint Locations - Tall Weeds



LAS

| NONVEGETATED VERTICAL ACCURACY – OVERALL | |
|--|------------------------|
| LAND COVER TYPE | BARE EARTH, URBAN AREA |
| Minimum DZ | -0.173 |
| Maximum DZ | 0.203 |
| Mean DZ | 0.005 |
| Mean Magnitude DZ | 0.272 |
| Number Observations | 58 |
| Standard Deviation DZ | 0.092 |
| RMSE Z | 0.091 |
| 95% Confidence Level Z | 0.179 |
| Units | U.S. Survey Feet |

DEM

| NONVEGETATED VERTICAL ACCURACY | |
|--------------------------------|------------------------|
| LAND COVER TYPE | BARE EARTH, URBAN AREA |
| Minimum DZ | -0.129 |
| Maximum DZ | 0.275 |
| Mean DZ | 0.015 |
| Mean Magnitude DZ | 0.259 |
| Number Observations | 58 |
| Standard Deviation DZ | 0.087 |
| RMSE Z | 0.087 |
| 95% Confidence Level Z | 0.171 |
| Units | U.S. Survey Feet |

DEM (Continued)

| VEGETATED VERTICAL ACCURACY | |
|-----------------------------|------------------|
| LAND COVER TYPE | FOREST |
| Minimum DZ | -0.118 |
| Maximum DZ | 0.507 |
| Mean DZ | 0.111 |
| Mean Magnitude DZ | 0.384 |
| Number Observations | 23 |
| Standard Deviation DZ | 0.15 |
| RMSE Z | 0.184 |
| 95th percentile | 0.311 |
| Units | U.S. Survey Feet |

| VEGETATED VERTICAL ACCURACY | |
|-----------------------------|------------------|
| LAND COVER TYPE | TALL WEEDS |
| Minimum DZ | -0.007 |
| Maximum DZ | 0.712 |
| Mean DZ | 0.257 |
| Mean Magnitude DZ | 0.508 |
| Number Observations | 23 |
| Standard Deviation DZ | 0.203 |
| RMSE Z | 0.325 |
| 95th percentile | 0.655 |
| Units | U.S. Survey Feet |

Point: 1001 Bare Earth

Survey X: 680506.63, Survey Y: 217193.92, Z1: 899.25, Z DEM: 899.2, Z LAS: 899.24, ΔZ DEM: -0.06, ΔZ LAS: -0.01



North



South



East



West

Point: 1002 Tall Weeds

Survey X: 680491.73, Survey Y: 216876.22, Z1: 890.29, Z DEM: 890.32, Z LAS: 890.28, ΔZ DEM: 0.03, ΔZ LAS: 0



North



South



East



West

Point: 1003 Forested

Survey X: 680621.28, Survey Y: 217179.97, Z1: 895.79, Z DEM: 895.95, Z LAS: 895.95, ΔZ DEM: 0.17, ΔZ LAS: 0.17



North



South



East



West

Point: 1004 Urban Area

Survey X: 680561.03, Survey Y: 217196.92, Z1: 901.1, Z DEM: 901.07, Z LAS: 901.01, ΔZ DEM: -0.03, ΔZ LAS: -0.09



North



South



East



West

Point: 1005 Bare Earth

Survey X: 649791.15, Survey Y: 172341.83, Z1: 818.04, Z DEM: 818.03, Z LAS: 818, ΔZ DEM: -0.01, ΔZ LAS: -0.03



North



South



East



West

Point: 1006 Urban Area

Survey X: 648852.43, Survey Y: 171834.01, Z1: 803.76, Z DEM: 803.78, Z LAS: 803.72, ΔZ DEM: 0.02, ΔZ LAS: -0.04



North



South



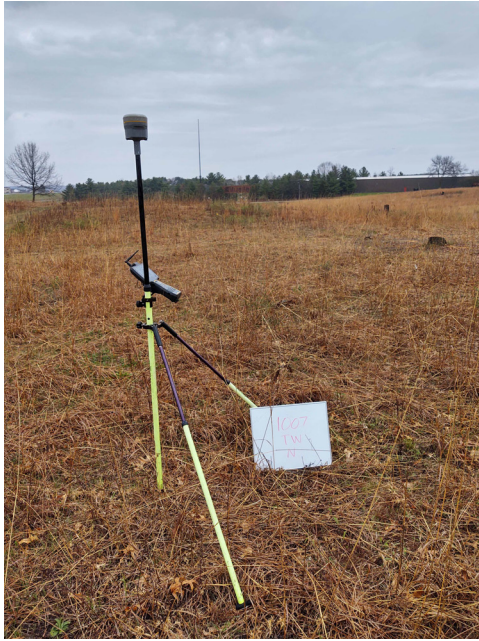
East



West

Point: 1007 Tall Weeds

Survey X: 648813.95, Survey Y: 172024.95, Z1: 810.32, Z DEM: 810.48, Z LAS: 810.56, ΔZ DEM: 0.16, ΔZ LAS: 0.24



North



South



East



West

Point: 1008 Urban Area

Survey X: 647738.34, Survey Y: 172432.44, Z1: 799.24, Z DEM: 799.16, Z LAS: 799.19, ΔZ DEM: -0.08, ΔZ LAS: -0.05



North



South



East



West

Point: 1009 Forested

Survey X: 647794.88, Survey Y: 172194.04, Z1: 799.5, Z DEM: 799.43, Z LAS: 799.59, ΔZ DEM: -0.07, ΔZ LAS: 0.09



North



South



East



West

Point: 1010 Urban Area

Survey X: 651820.7, Survey Y: 164017.56, Z1: 749.09, Z DEM: 748.97, Z LAS: 749.04, ΔZ DEM: -0.12, ΔZ LAS: -0.05



North



South



East



West

Point: 1011 Bare Earth

Survey X: 651838.06, Survey Y: 163928.16, Z1: 748.52, Z DEM: 748.58, Z LAS: 748.56, ΔZ DEM: 0.06, ΔZ LAS: 0.04



North



South



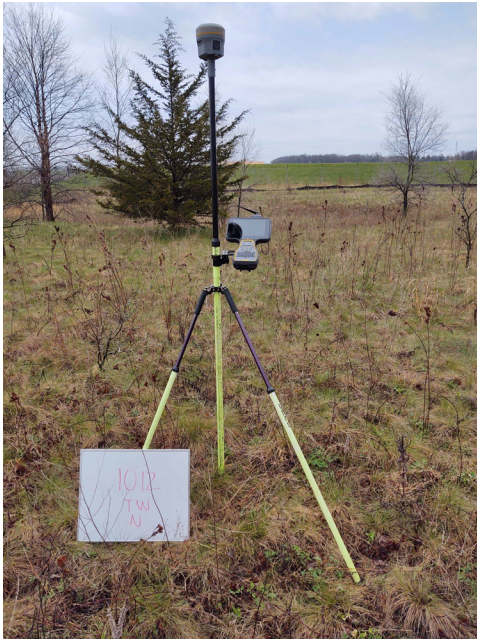
East



West

Point: 1012 Tall Weeds

Survey X: 650945.27, Survey Y: 159856.78, Z1: 738.65, Z DEM: 738.85, Z LAS: 738.77, ΔZ DEM: 0.2, ΔZ LAS: 0.12



North



South



East



West

Point: 1013 Tall Weeds

Survey X: 615663.11, Survey Y: 141018.7, Z1: 731.94, Z DEM: 732.12, Z LAS: 732.04, ΔZ DEM: 0.18, ΔZ LAS: 0.1



North



South



East



West

Point: 1014 Bare Earth

Survey X: 615520.23, Survey Y: 140896.04, Z1: 732.7, Z DEM: 732.71, Z LAS: 732.66, ΔZ DEM: 0.01, ΔZ LAS: -0.04



North



South



East



West

Point: 1015 Forested

Survey X: 615770.4, Survey Y: 140937.48, Z1: 730.25, Z DEM: 730.19, Z LAS: 729.97, ΔZ DEM: -0.07, ΔZ LAS: -0.28



North



South



East



West

Point: 1016 Urban Area

Survey X: 615838.91, Survey Y: 141061.63, Z1: 732.34, Z DEM: 732.36, Z LAS: 732.34, ΔZ DEM: 0.03, ΔZ LAS: 0



North



South



East



West

Point: 1017 Bare Earth

Survey X: 612435.98, Survey Y: 167620.84, Z1: 789.11, Z DEM: 789.33, Z LAS: 789.31, ΔZ DEM: 0.22, ΔZ LAS: 0.2



North



South



East



West

Point: 1018 Urban Area

Survey X: 612399.69, Survey Y: 167693.58, Z1: 790.73, Z DEM: 790.89, Z LAS: 790.81, ΔZ DEM: 0.16, ΔZ LAS: 0.08



North



South



East



West

Point: 1019 Urban Area

Survey X: 657881.59, Survey Y: 167892.68, Z1: 740.12, Z DEM: 740.14, Z LAS: 740.15, ΔZ DEM: 0.02, ΔZ LAS: 0.03



North



South



East



West

Point: 1020 Bare Earth

Survey X: 657694.78, Survey Y: 167826.15, Z1: 741.52, Z DEM: 741.59, Z LAS: 741.59, ΔZ DEM: 0.07, ΔZ LAS: 0.07



North



South



East



West

Point: 1021 Forested

Survey X: 657881.94, Survey Y: 167998.54, Z1: 745.11, Z DEM: 745.36, Z LAS: 745.33, ΔZ DEM: 0.25, ΔZ LAS: 0.22



North



South



East



West

Point: 1022 Forested

Survey X: 612469.2, Survey Y: 176043.25, Z1: 764.49, Z DEM: 764.54, Z LAS: 764.59, ΔZ DEM: 0.05, ΔZ LAS: 0.09



North



South



East



West

Point: 1023 Forested

Survey X: 612475.99, Survey Y: 188485.67, Z1: 788.66, Z DEM: 788.72, Z LAS: 788.76, ΔZ DEM: 0.07, ΔZ LAS: 0.11



North



South



East



West

Point: 1024 Tall Weeds

Survey X: 613114.55, Survey Y: 191119.66, Z1: 793.93, Z DEM: 794.52, Z LAS: 794.61, ΔZ DEM: 0.59, ΔZ LAS: 0.68



North



South



East



West

Point: 1025 Urban Area

Survey X: 612625.91, Survey Y: 191339.13, Z1: 810.37, Z DEM: 810.41, Z LAS: 810.43, ΔZ DEM: 0.04, ΔZ LAS: 0.05



North



South



East



West

Point: 1026 Bare Earth

Survey X: 612679.58, Survey Y: 191381.97, Z1: 809.71, Z DEM: 809.87, Z LAS: 809.87, ΔZ DEM: 0.17, ΔZ LAS: 0.17



North



South



East



West

Point: 1027 Tall Weeds

Survey X: 564124.53, Survey Y: 192830.85, Z1: 860.76, Z DEM: 861.19, Z LAS: 861.09, ΔZ DEM: 0.43, ΔZ LAS: 0.33



North



South



East



West

Point: 1028 Urban Area

Survey X: 563731.18, Survey Y: 193815.31, Z1: 873.74, Z DEM: 873.72, Z LAS: 873.7, ΔZ DEM: -0.02, ΔZ LAS: -0.04



North



South



East



West

Point: 1029 Bare Earth

Survey X: 560442.84, Survey Y: 195261.8, Z1: 898.63, Z DEM: 898.51, Z LAS: 898.54, ΔZ DEM: -0.12, ΔZ LAS: -0.09



North



South



East



West

Point: 1030 Tall Weeds

Survey X: 560300.9, Survey Y: 195139.53, Z1: 890.09, Z DEM: 890.39, Z LAS: 890.42, ΔZ DEM: 0.3, ΔZ LAS: 0.33



North



South



East



West

Point: 1031 Forested

Survey X: 560471.74, Survey Y: 195114.78, Z1: 889.17, Z DEM: 889.29, Z LAS: 889.34, ΔZ DEM: 0.12, ΔZ LAS: 0.17



North



South



East



West

Point: 1032 Urban Area

Survey X: 550074.88, Survey Y: 182105.36, Z1: 1164.68, Z DEM: 1164.6, Z LAS: 1164.6, ΔZ DEM: -0.08, ΔZ LAS: -0.08



North



South



East



West

Point: 1033 Bare Earth

Survey X: 550030.97, Survey Y: 182029, Z1: 1162.44, Z DEM: 1162.46, Z LAS: 1162.45, ΔZ DEM: 0.02, ΔZ LAS: 0.01



North



South



East



West

Point: 1034 Urban Area

Survey X: 571105.02, Survey Y: 167818.86, Z1: 799.69, Z DEM: 799.65, Z LAS: 799.59, ΔZ DEM: -0.04, ΔZ LAS: -0.09



North



South



East



West

Point: 1035 Bare Earth

Survey X: 571352.44, Survey Y: 167742.11, Z1: 798.47, Z DEM: 798.41, Z LAS: 798.4, ΔZ DEM: -0.06, ΔZ LAS: -0.08



North



South



East



West

Point: 1036 Forested

Survey X: 574652.45, Survey Y: 167823.07, Z1: 794.52, Z DEM: 794.67, Z LAS: 794.73, ΔZ DEM: 0.15, ΔZ LAS: 0.21



North



South



East



West

Point: 1037 Tall Weeds

Survey X: 574689.49, Survey Y: 167853.03, Z1: 795, Z DEM: 795.24, Z LAS: 795.21, ΔZ DEM: 0.24, ΔZ LAS: 0.21



North



South



East



West

Point: 1038 Urban Area

Survey X: 539738.93, Survey Y: 135379.18, Z1: 713.92, Z DEM: 713.93, Z LAS: 713.93, ΔZ DEM: 0.01, ΔZ LAS: 0



North



South



East



West

Point: 1039 Bare Earth

Survey X: 539690.94, Survey Y: 135377.48, Z1: 713.54, Z DEM: 713.61, Z LAS: 713.63, ΔZ DEM: 0.07, ΔZ LAS: 0.1



North



South



East



West

Point: 1040 Tall Weeds

Survey X: 536225.76, Survey Y: 131992.74, Z1: 706.67, Z DEM: 706.88, Z LAS: 706.7, ΔZ DEM: 0.21, ΔZ LAS: 0.03



North



South



East



West

Point: 1041 Urban Area

Survey X: 536150.93, Survey Y: 131918.48, Z1: 706.78, Z DEM: 706.76, Z LAS: 706.74, ΔZ DEM: -0.02, ΔZ LAS: -0.04



North



South



East



West

Point: 1042 Forested

Survey X: 536257.67, Survey Y: 132058.5, Z1: 705.87, Z DEM: 706.37, Z LAS: 706.39, ΔZ DEM: 0.51, ΔZ LAS: 0.53



North



South



East



West

Point: 1043 Urban Area

Survey X: 604170.12, Survey Y: 281915.15, Z1: 926.77, Z DEM: 926.85, Z LAS: 926.86, ΔZ DEM: 0.08, ΔZ LAS: 0.09



North



South



East



West

Point: 1044 Bare Earth

Survey X: 604177.8, Survey Y: 281955.52, Z1: 926.9, Z DEM: 927.18, Z LAS: 927.1, ΔZ DEM: 0.27, ΔZ LAS: 0.2



North



South



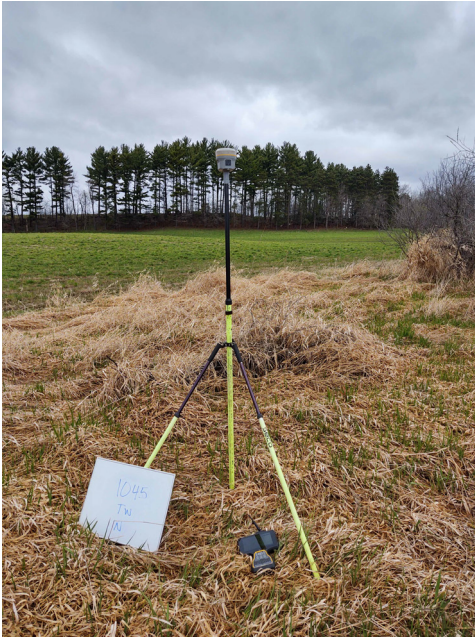
East



West

Point: 1045 Tall Weeds

Survey X: 603933.28, Survey Y: 281956.64, Z1: 923.69, Z DEM: 924.4, Z LAS: 924.32, ΔZ DEM: 0.71, ΔZ LAS: 0.64



North



South



East



West

Point: 1046 Bare Earth

Survey X: 631577.14, Survey Y: 288874.82, Z1: 911.47, Z DEM: 911.39, Z LAS: 911.3, ΔZ DEM: -0.08, ΔZ LAS: -0.17



North



South



East



West

Point: 1047 Urban Area

Survey X: 630796.03, Survey Y: 288811.18, Z1: 907.04, Z DEM: 906.91, Z LAS: 906.87, ΔZ DEM: -0.13, ΔZ LAS: -0.17



North



South



East



West

Point: 1048 Tall Weeds

Survey X: 638181.77, Survey Y: 299052.45, Z1: 883.67, Z DEM: 883.66, Z LAS: 883.58, ΔZ DEM: -0.01, ΔZ LAS: -0.09



North



South



East



West

Point: 1049 Bare Earth

Survey X: 638034.41, Survey Y: 298932.44, Z1: 884.79, Z DEM: 884.77, Z LAS: 884.71, ΔZ DEM: -0.02, ΔZ LAS: -0.08



North



South



East



West

Point: 1050 Forested

Survey X: 638214.08, Survey Y: 298939.71, Z1: 880.82, Z DEM: 880.77, Z LAS: 880.74, ΔZ DEM: -0.05, ΔZ LAS: -0.08



North



South



East



West

Point: 1051 Urban Area

Survey X: 638185.89, Survey Y: 299147.08, Z1: 883.04, Z DEM: 882.97, Z LAS: 882.99, ΔZ DEM: -0.07, ΔZ LAS: -0.05



North



South



East



West

Point: 1052 Urban Area

Survey X: 636760.91, Survey Y: 280150.7, Z1: 890.05, Z DEM: 890.13, Z LAS: 890.14, ΔZ DEM: 0.08, ΔZ LAS: 0.09



North



South



East



West

Point: 1053 Bare Earth

Survey X: 636775.02, Survey Y: 279911.33, Z1: 890.58, Z DEM: 890.65, Z LAS: 890.72, ΔZ DEM: 0.07, ΔZ LAS: 0.14



North



South



East



West

Point: 1054 Forested

Survey X: 636858.47, Survey Y: 280228.71, Z1: 890.92, Z DEM: 891.08, Z LAS: 891.13, ΔZ DEM: 0.16, ΔZ LAS: 0.21



North



South



East



West

Point: 1055 Tall Weeds

Survey X: 636035.03, Survey Y: 280188.77, Z1: 895.29, Z DEM: 895.45, Z LAS: 895.35, ΔZ DEM: 0.16, ΔZ LAS: 0.06



North



South



East



West

Point: 1056 Urban Area

Survey X: 667299.55, Survey Y: 262610.56, Z1: 834.48, Z DEM: 834.47, Z LAS: 834.49, ΔZ DEM: -0.01, ΔZ LAS: 0



North



South



East



West

Point: 1057 Tall Weeds

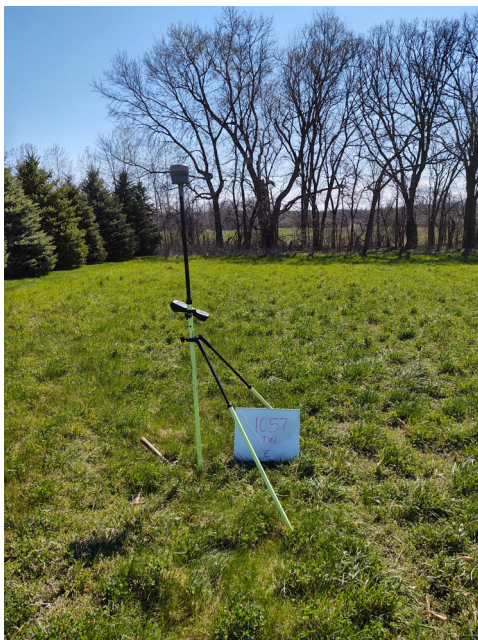
Survey X: 667258.17, Survey Y: 262372.92, Z1: 828.82, Z DEM: 828.96, Z LAS: 828.94, ΔZ DEM: 0.14, ΔZ LAS: 0.11



North



South



East



West

Point: 1058 Bare Earth

Survey X: 667260.8, Survey Y: 262458.09, Z1: 832.15, Z DEM: 832.34, Z LAS: 832.34, ΔZ DEM: 0.19, ΔZ LAS: 0.19



North



South



East



West

Point: 1059 Forested

Survey X: 667399.35, Survey Y: 262339.53, Z1: 823.13, Z DEM: 823.35, Z LAS: 823.55, ΔZ DEM: 0.22, ΔZ LAS: 0.42



North



South



East



West

Point: 1060 Urban Area

Survey X: 620630.81, Survey Y: 211967.93, Z1: 1458.3, Z DEM: 1458.28, Z LAS: 1458.23, ΔZ DEM: -0.02, ΔZ LAS: -0.07



North



South



East



West

Point: 1061 Tall Weeds

Survey X: 620666.37, Survey Y: 212020.11, Z1: 1456.62, Z DEM: 1456.73, Z LAS: 1456.72, ΔZ DEM: 0.11, ΔZ LAS: 0.1



North



South



East



West

Point: 1062 Forested

Survey X: 620679.63, Survey Y: 212099.99, Z1: 1454.66, Z DEM: 1454.82, Z LAS: 1454.8, Δ Z DEM: 0.16, Δ Z LAS: 0.14



North



South



East



West

Point: 1063 Bare Earth

Survey X: 620570.06, Survey Y: 211951.15, Z1: 1459.64, Z DEM: 1459.58, Z LAS: 1459.59, ΔZ DEM: -0.06, ΔZ LAS: -0.05



North



South



East



West

Point: 1064 Urban Area

Survey X: 618768.5, Survey Y: 232446.45, Z1: 859.96, Z DEM: 859.9, Z LAS: 859.86, ΔZ DEM: -0.06, ΔZ LAS: -0.1



North



South



East



West

Point: 1065 Bare Earth

Survey X: 618937.73, Survey Y: 232449.86, Z1: 859.86, Z DEM: 859.9, Z LAS: 859.83, ΔZ DEM: 0.04, ΔZ LAS: -0.03



North



South



East



West

Point: 1066 Forested

Survey X: 618670.39, Survey Y: 232413.73, Z1: 857.99, Z DEM: 857.96, Z LAS: 858.12, ΔZ DEM: -0.03, ΔZ LAS: 0.13



North



South



East



West

Point: 1067 Tall Weeds

Survey X: 607334.56, Survey Y: 243125.66, Z1: 1082.52, Z DEM: 1082.76, Z LAS: 1082.74, ΔZ DEM: 0.24, ΔZ LAS: 0.22



North



South



East



West

Point: 1068 Forested

Survey X: 607350.97, Survey Y: 242999.27, Z1: 1075.34, Z DEM: 1075.32, Z LAS: 1075.36, ΔZ DEM: -0.02, ΔZ LAS: 0.02



North



South



East



West

Point: 1069 Urban Area

Survey X: 607294.84, Survey Y: 243102.91, Z1: 1083.84, Z DEM: 1083.8, Z LAS: 1083.7, ΔZ DEM: -0.03, ΔZ LAS: -0.14



North



South



East



West

Point: 1070 Urban Area

Survey X: 604393.7, Survey Y: 239789.64, Z1: 864.05, Z DEM: 864.14, Z LAS: 864.13, ΔZ DEM: 0.09, ΔZ LAS: 0.08



North



South



East



West

Point: 1071 Bare Earth

Survey X: 604425.85, Survey Y: 239576.44, Z1: 862.51, Z DEM: 862.65, Z LAS: 862.67, ΔZ DEM: 0.14, ΔZ LAS: 0.16



North



South



East



West

Point: 1072 Urban Area

Survey X: 572372.5, Survey Y: 226233.73, Z1: 917.36, Z DEM: 917.36, Z LAS: 917.33, ΔZ DEM: -0.01, ΔZ LAS: -0.03



North



South



East



West

Point: 1073 Bare Earth

Survey X: 572383.03, Survey Y: 226072.4, Z1: 917, Z DEM: 916.96, Z LAS: 916.9, ΔZ DEM: -0.04, ΔZ LAS: -0.1



North



South



East



West

Point: 1074 Tall Weeds

Survey X: 563209.93, Survey Y: 223185.82, Z1: 942.08, Z DEM: 942.62, Z LAS: 942.8, ΔZ DEM: 0.55, ΔZ LAS: 0.72



North



South



East



West

Point: 1075 Forested

Survey X: 563199.26, Survey Y: 223010.34, Z1: 942.19, Z DEM: 942.48, Z LAS: 942.51, ΔZ DEM: 0.3, ΔZ LAS: 0.33



North



South



East



West

Point: 1076 Urban Area

Survey X: 552454.18, Survey Y: 221564.84, Z1: 1043.37, Z DEM: 1043.42, Z LAS: 1043.45, ΔZ DEM: 0.06, ΔZ LAS: 0.09



North



South



East



West

Point: 1077 Bare Earth

Survey X: 552526.51, Survey Y: 221628.25, Z1: 1043.43, Z DEM: 1043.57, Z LAS: 1043.57, ΔZ DEM: 0.15, ΔZ LAS: 0.14



North



South



East



West

Point: 1078 Forested

Survey X: 552376.8, Survey Y: 221605.09, Z1: 1044.51, Z DEM: 1044.68, Z LAS: 1044.68, ΔZ DEM: 0.17, ΔZ LAS: 0.17



North



South



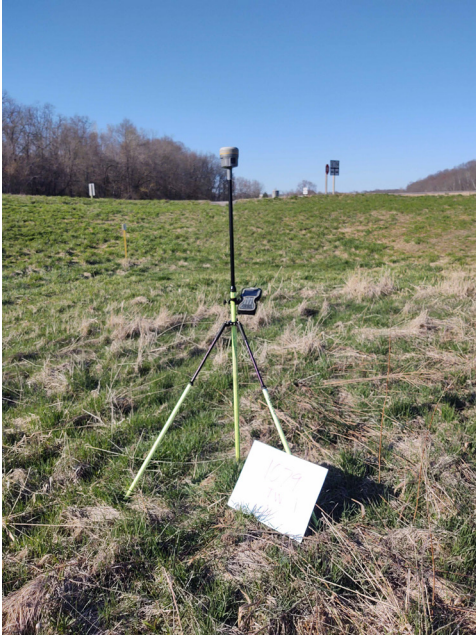
East



West

Point: 1079 Tall Weeds

Survey X: 548046.13, Survey Y: 215328.71, Z1: 1049.03, Z DEM: 1049.16, Z LAS: 1049.17, ΔZ DEM: 0.14, ΔZ LAS: 0.14



North



South



East



West

Point: 1080 Urban Area

Survey X: 587825.57, Survey Y: 257210.15, Z1: 897.05, Z DEM: 897.04, Z LAS: 897.05, ΔZ DEM: -0.01, ΔZ LAS: 0



North



South



East



West

Point: 1081 Bare Earth

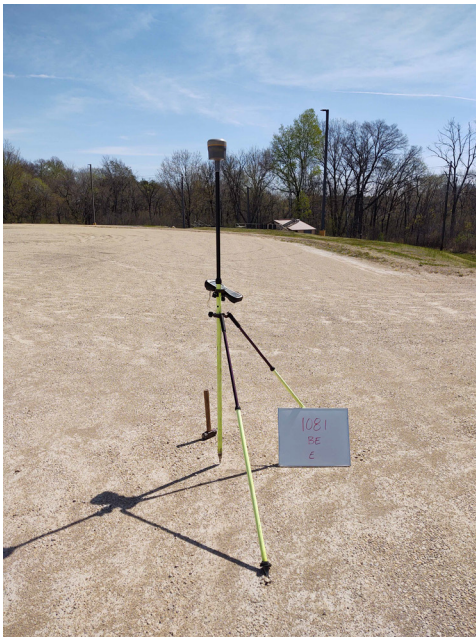
Survey X: 588076.61, Survey Y: 257217.19, Z1: 899.71, Z DEM: 899.68, Z LAS: 899.74, ΔZ DEM: -0.02, ΔZ LAS: 0.04



North



South



East



West

Point: 1082 Forested

Survey X: 587951.44, Survey Y: 257084.17, Z1: 885.39, Z DEM: 885.46, Z LAS: 885.52, ΔZ DEM: 0.07, ΔZ LAS: 0.13



North



South



East



West

Point: 1083 Tall Weeds

Survey X: 587878.22, Survey Y: 257052.13, Z1: 887, Z DEM: 887.65, Z LAS: 887.76, ΔZ DEM: 0.65, ΔZ LAS: 0.76



North



South



East



West

Point: 1084 Urban Area

Survey X: 586913.49, Survey Y: 265556.47, Z1: 946.95, Z DEM: 946.83, Z LAS: 947, ΔZ DEM: -0.12, ΔZ LAS: 0.05



North



South



East



West

Point: 1085 Bare Earth

Survey X: 587068.71, Survey Y: 265699.44, Z1: 944.17, Z DEM: 944.28, Z LAS: 944.2, ΔZ DEM: 0.11, ΔZ LAS: 0.03



North



South



East



West

Point: 1086 Tall Weeds

Survey X: 587776.47, Survey Y: 265807.08, Z1: 954.67, Z DEM: 954.8, Z LAS: 954.78, ΔZ DEM: 0.13, ΔZ LAS: 0.1



North



South



East



West

Point: 1087 Forested

Survey X: 582730.27, Survey Y: 263614.37, Z1: 973.2, Z DEM: 973.08, Z LAS: 973.14, ΔZ DEM: -0.12, ΔZ LAS: -0.06



North



South



East



West

Point: 1088 Bare Earth

Survey X: 549833.51, Survey Y: 247934.52, Z1: 1218.19, Z DEM: 1218.14, Z LAS: 1218.24, ΔZ DEM: -0.04, ΔZ LAS: 0.06



North



South



East



West

Point: 1089 Urban Area

Survey X: 549762.47, Survey Y: 247985.87, Z1: 1216.59, Z DEM: 1216.61, Z LAS: 1216.53, ΔZ DEM: 0.03, ΔZ LAS: -0.05



North



South



East



West

Point: 1090 Urban Area

Survey X: 548235.2, Survey Y: 279570.71, Z1: 909.98, Z DEM: 909.99, Z LAS: 910, ΔZ DEM: 0.01, ΔZ LAS: 0.02



North



South



East



West

Point: 1091 Bare Earth

Survey X: 548174.4, Survey Y: 279403.88, Z1: 904.25, Z DEM: 904.3, Z LAS: 904.24, ΔZ DEM: 0.05, ΔZ LAS: -0.01



North



South



East



West

Point: 1092 Forested

Survey X: 548095.02, Survey Y: 279647.43, Z1: 912.25, Z DEM: 912.56, Z LAS: 912.51, ΔZ DEM: 0.31, ΔZ LAS: 0.26



North



South



East



West

Point: 1093 Tall Weeds

Survey X: 544994.67, Survey Y: 263020.4, Z1: 959.69, Z DEM: 960.09, Z LAS: 960.12, ΔZ DEM: 0.4, ΔZ LAS: 0.42



North



South



East



West

Point: 1094 Tall Weeds

Survey X: 502587.54, Survey Y: 267976.5, Z1: 1243.67, Z DEM: 1243.81, Z LAS: 1243.92, ΔZ DEM: 0.14, ΔZ LAS: 0.25



North



South



East



West

Point: 1095 Urban Area

Survey X: 502651.44, Survey Y: 267988.2, Z1: 1239.8, Z DEM: 1239.83, Z LAS: 1239.77, ΔZ DEM: 0.04, ΔZ LAS: -0.02



North



South



East



West

Point: 1096 Forested

Survey X: 502496.7, Survey Y: 268064.54, Z1: 1254.95, Z DEM: 1255.11, Z LAS: 1255.02, ΔZ DEM: 0.16, ΔZ LAS: 0.07



North



South



East



West

Point: 1097 Bare Earth

Survey X: 500111.65, Survey Y: 268072.22, Z1: 1299.95, Z DEM: 1299.99, Z LAS: 1300.09, ΔZ DEM: 0.04, ΔZ LAS: 0.15



North



South



East



West

Point: 1102 Tall Weeds

Survey X: 501971.62, Survey Y: 299610.03, Z1: 1029.33, Z DEM: 1029.35, Z LAS: 1029.31, ΔZ DEM: 0.02, ΔZ LAS: -0.02



North



South



East



West

Point: 1103 Bare Earth

Survey X: 501883.78, Survey Y: 299195.4, Z1: 1036.74, Z DEM: 1036.78, Z LAS: 1036.76, ΔZ DEM: 0.04, ΔZ LAS: 0.02



North



South



East



West

Point: 1104 Forested

Survey X: 501882.63, Survey Y: 299710.11, Z1: 1036.28, Z DEM: 1036.22, Z LAS: 1036.04, ΔZ DEM: -0.06, ΔZ LAS: -0.24



North



South



East



West

Point: 1105 Urban Area

Survey X: 501829.54, Survey Y: 299661.01, Z1: 1038.79, Z DEM: 1038.74, Z LAS: 1038.7, ΔZ DEM: -0.05, ΔZ LAS: -0.09



North



South



East



West

Point: 1106 Tall Weeds

Survey X: 501750, Survey Y: 299632.82, Z1: 1037.92, Z DEM: 1038.11, Z LAS: 1038.2, ΔZ DEM: 0.19, ΔZ LAS: 0.28



North



South



East



West

Point: 1107 Bare Earth

Survey X: 501868, Survey Y: 299356.1, Z1: 1037.3, Z DEM: 1037.22, Z LAS: 1037.2, ΔZ DEM: -0.08, ΔZ LAS: -0.1



North



South



East



West

Point: 1108 Forested

Survey X: 501811.53, Survey Y: 299580.49, Z1: 1037.05, Z DEM: 1037.17, Z LAS: 1037.11, ΔZ DEM: 0.12, ΔZ LAS: 0.06



North



South



East



West