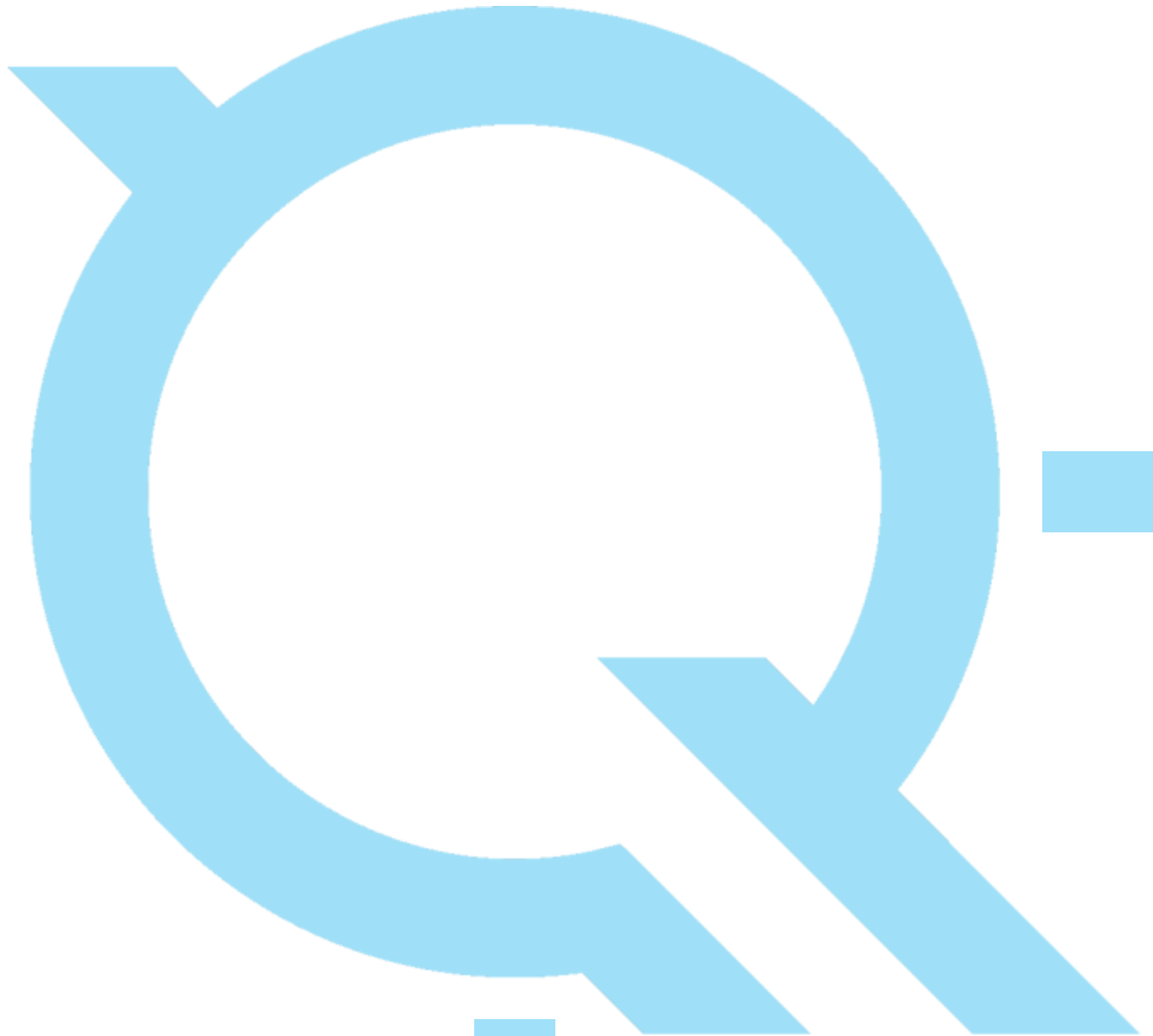


FOCUS on Accuracy



USGS_Umbagog_LiDAR
LiDAR Accuracy Assessment

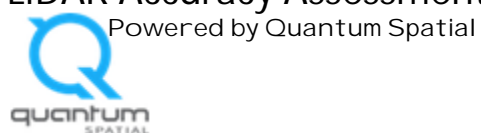
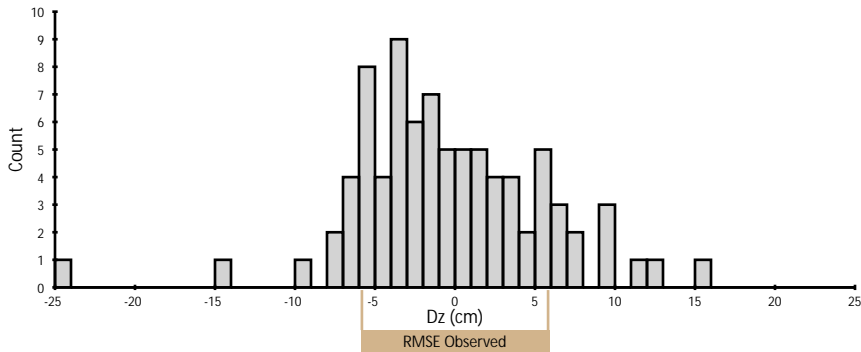


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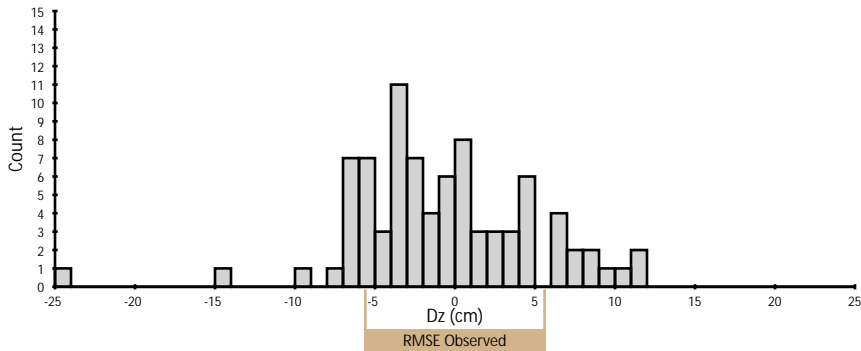
Project Summary

Nonvegetated Vertical Accuracy (Point Cloud)



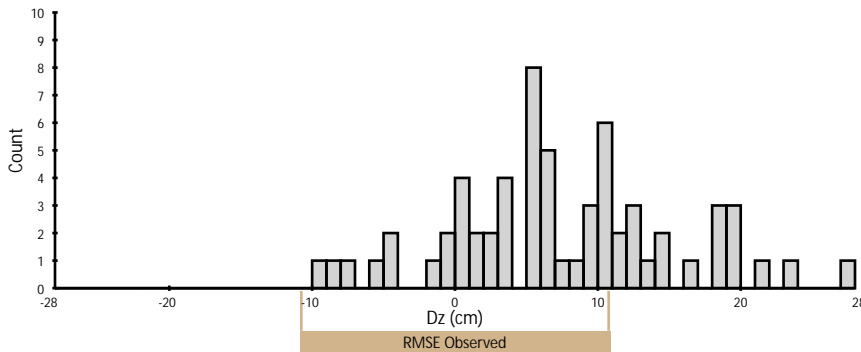
	Observed	Required
RMSE	5.90 cm	10.00 cm
95% Confidence Level	11.57 cm	19.60 cm
Mean	-0.51 cm	N/A
Count	84	N/A

Nonvegetated Vertical Accuracy (DEM)



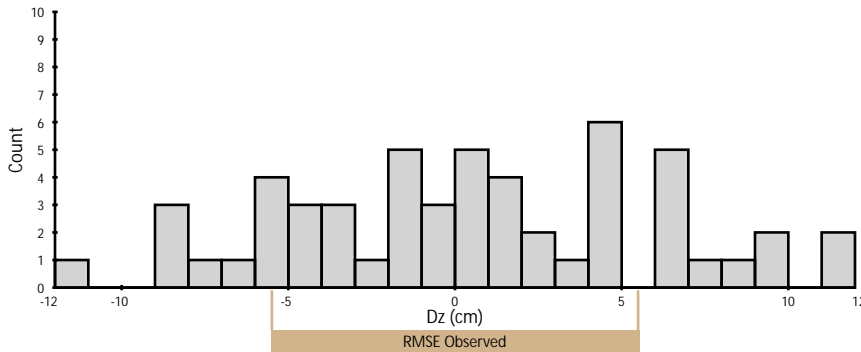
	Observed	Required
RMSE	5.68 cm	N/A
95% Confidence Level	11.14 cm	19.60 cm
Mean	-0.73 cm	N/A
Count	84	N/A

Vegetated Vertical Accuracy (DEM)



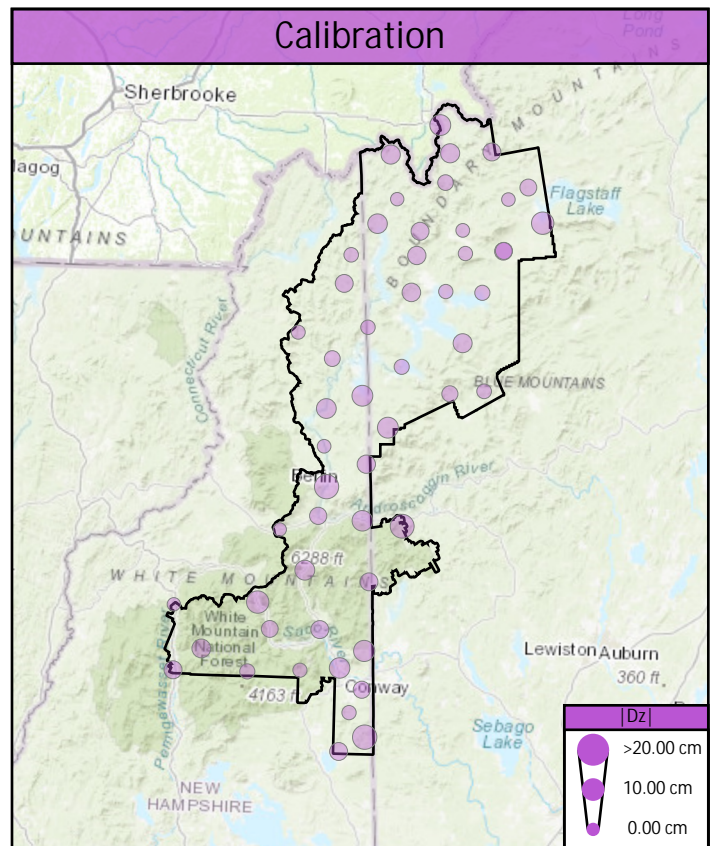
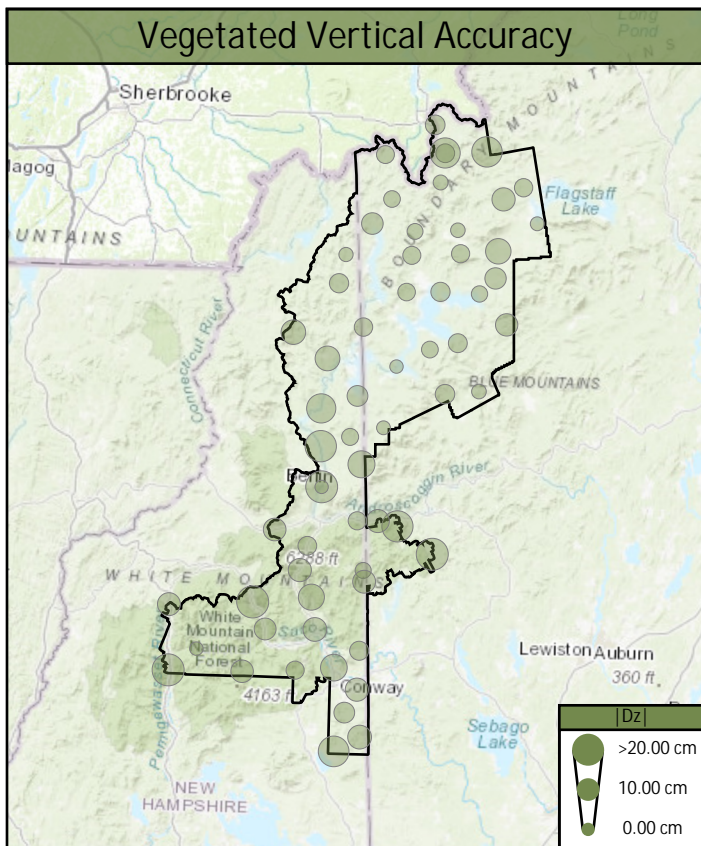
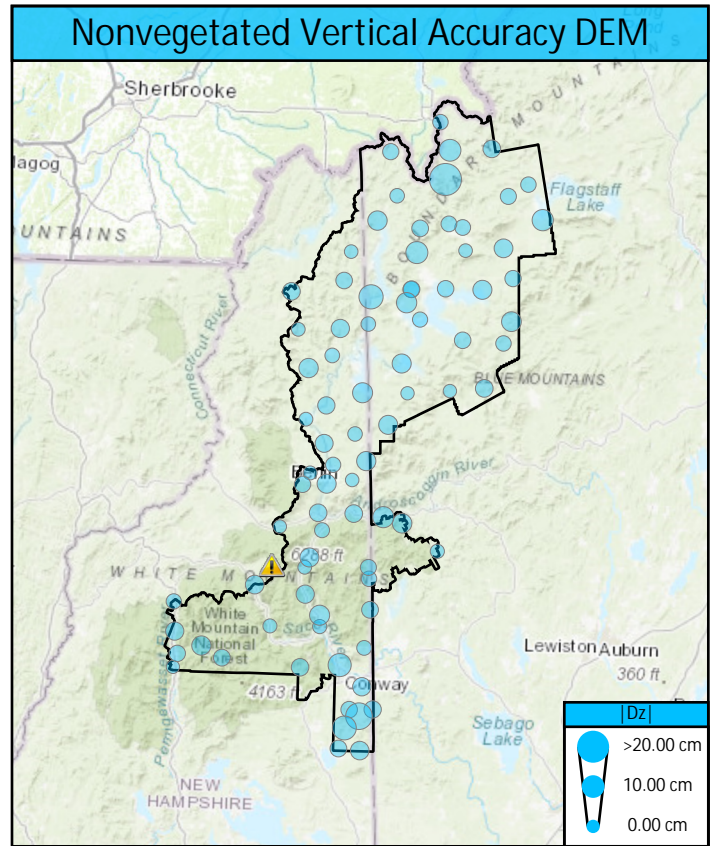
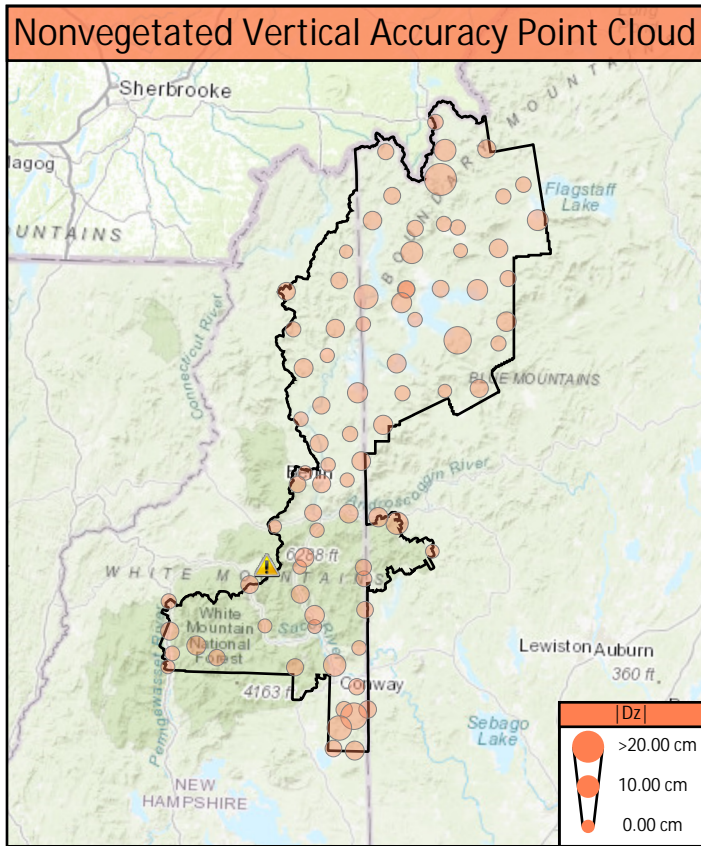
	Observed	Required
RMSE	10.85 cm	N/A
95th Percentile	19.83 cm	29.40 cm
Mean	7.44 cm	N/A
Count	63	N/A

Calibration (Point Cloud)



	Observed	Required
RMSE	5.53 cm	N/A
Mean	0.49 cm	N/A
Count	54	N/A

Control Point Locations



⚠ Point has been flagged as an Anomaly. See Anomaly Breakdown for exclusion details.

Control Point Breakdown

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
BE01	NVA	3.55 cm	3.63 cm	3.78 ppsm	0.20 m	1.57°
BE02	NVA	-3.20 cm	-3.40 cm	2.86 ppsm	0.21 m	0.37°
BE03	NVA	-1.38 cm	-1.57 cm	3.01 ppsm	0.31 m	3.39°
BE04	NVA	-0.65 cm	-0.01 cm	3.01 ppsm	0.16 m	0.48°
BE05	NVA	0.49 cm	0.43 cm	3.71 ppsm	0.23 m	2.67°
BE06	NVA	-2.54 cm	-2.27 cm	2.44 ppsm	0.27 m	2.09°
BE07	NVA	-6.32 cm	-6.09 cm	2.69 ppsm	0.23 m	1.63°
BE08	NVA	9.60 cm	6.61 cm	2.48 ppsm	0.09 m	2.90°
BE09	NVA	-5.77 cm	-6.28 cm	4.95 ppsm	0.26 m	0.75°
BE10	NVA	4.18 cm	4.20 cm	2.44 ppsm	0.34 m	2.15°
BE11	NVA	-7.34 cm	-7.15 cm	4.85 ppsm	0.19 m	3.54°
BE12	NVA	1.00 cm	1.45 cm	2.51 ppsm	0.09 m	0.51°
BE13	NVA	2.04 cm	0.46 cm	2.55 ppsm	0.07 m	2.46°
BE14	NVA	-1.29 cm	-1.34 cm	1.80 ppsm	0.18 m	1.53°
BE15	NVA	0.25 cm	-0.06 cm	2.44 ppsm	0.27 m	3.12°
BE16	NVA	-4.32 cm	-3.31 cm	2.55 ppsm	0.15 m	2.39°
BE16_ALT	NVA	-3.57 cm	-3.59 cm	2.26 ppsm	0.54 m	2.24°
BE17	NVA	3.47 cm	3.46 cm	2.55 ppsm	0.28 m	1.06°
BE18	NVA	-5.66 cm	-5.80 cm	2.65 ppsm	0.20 m	4.44°
BE19	NVA	-0.62 cm	-0.33 cm	2.76 ppsm	0.21 m	3.96°
BE20	NVA	-9.29 cm	-9.30 cm	2.94 ppsm	0.32 m	3.06°
BE21	NVA	-0.03 cm	-0.29 cm	2.02 ppsm	0.16 m	1.31°
BE22	NVA	5.57 cm	6.43 cm	4.85 ppsm	0.18 m	0.84°
BE23	NVA	-3.19 cm	-3.63 cm	2.30 ppsm	0.25 m	0.41°
BE24	NVA	-2.11 cm	-2.61 cm	1.87 ppsm	0.38 m	4.05°
BE25	NVA	2.38 cm	2.29 cm	2.30 ppsm	0.19 m	0.83°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
BE26	NVA	5.19 cm	4.63 cm	4.14 ppsm	0.21 m	3.76°
BE27	NVA	9.12 cm	9.05 cm	2.09 ppsm	0.33 m	3.29°
BE28	NVA	-24.52 cm	-24.32 cm	2.94 ppsm	0.23 m	0.70°
BE29	NVA	-2.99 cm	-3.08 cm	1.84 ppsm	0.29 m	1.95°
BE30	NVA	3.80 cm	1.30 cm	2.23 ppsm	0.36 m	4.45°
BE31	NVA	-1.98 cm	-2.97 cm	2.48 ppsm	0.29 m	2.20°
BE32	NVA	-0.67 cm	-0.75 cm	3.11 ppsm	0.14 m	3.86°
BE33	NVA	15.01 cm	3.43 cm	2.05 ppsm	0.58 m	7.97°
BE34	NVA	-6.00 cm	-6.11 cm	2.62 ppsm	0.26 m	0.61°
BE35	NVA	-3.37 cm	-3.75 cm	3.15 ppsm	0.13 m	4.80°
BE36	NVA	-3.08 cm	-2.90 cm	2.76 ppsm	0.08 m	0.21°
BE37	NVA	-0.84 cm	0.18 cm	2.94 ppsm	0.33 m	1.29°
BE38	NVA	-2.19 cm	-1.30 cm	2.41 ppsm	0.28 m	0.98°
BE39	NVA	-5.38 cm	-5.32 cm	2.51 ppsm	0.16 m	3.90°
BE40	NVA	-2.00 cm	-2.61 cm	2.41 ppsm	0.02 m	1.47°
BE41	NVA	1.19 cm	0.65 cm	3.82 ppsm	0.20 m	0.88°
BE42	NVA	0.40 cm	0.90 cm	2.86 ppsm	0.37 m	4.06°
BE43	NVA	2.02 cm	0.00 cm	2.55 ppsm	0.10 m	0.93°
BE44	NVA	-4.94 cm	-4.63 cm	2.05 ppsm	0.21 m	2.07°
BE45	NVA	-3.56 cm	-3.25 cm	3.18 ppsm	0.09 m	3.14°
BE46	NVA	-5.97 cm	-6.41 cm	2.12 ppsm	0.04 m	0.35°
BE47	NVA	-6.63 cm	-6.85 cm	2.26 ppsm	0.33 m	5.04°
BE48	NVA	-3.61 cm	-3.74 cm	3.86 ppsm	0.16 m	1.84°
BE49	NVA	-2.95 cm	-3.17 cm	6.12 ppsm	0.23 m	0.37°
BE50	NVA	-4.60 cm	-4.26 cm	3.36 ppsm	0.26 m	1.34°
BE51	NVA	-14.14 cm	-14.23 cm	3.08 ppsm	0.08 m	2.76°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
BE52	NVA	-5.06 cm	-5.26 cm	3.96 ppsm	0.14 m	1.50°
BE53	NVA	-1.93 cm	-2.30 cm	2.72 ppsm	0.41 m	2.56°
BE54	NVA	-1.21 cm	-1.97 cm	2.62 ppsm	0.17 m	1.78°
BE54_ALT	NVA	7.22 cm	7.43 cm	2.05 ppsm	0.33 m	2.15°
BE55	NVA	11.42 cm	11.60 cm	1.84 ppsm	0.20 m	1.46°
UA01	NVA	-3.24 cm	-5.34 cm	3.43 ppsm	0.28 m	1.75°
UA02	NVA	9.69 cm	10.44 cm	3.68 ppsm	0.27 m	1.24°
UA03	NVA	0.62 cm	0.93 cm	3.89 ppsm	0.16 m	2.72°
UA04	NVA	-2.04 cm	-2.07 cm	3.04 ppsm	0.22 m	2.85°
UA05	NVA	4.00 cm	4.57 cm	3.15 ppsm	0.55 m	0.92°
UA06	NVA	5.00 cm	4.95 cm	2.41 ppsm	0.38 m	0.49°
UA07	NVA	0.12 cm	0.15 cm	3.29 ppsm	0.17 m	1.25°
UA08	NVA	5.12 cm	6.12 cm	2.79 ppsm	0.13 m	1.43°
UA09	NVA	-5.20 cm	-4.63 cm	2.12 ppsm	0.30 m	0.20°
UA10	NVA	-7.66 cm	-6.08 cm	1.73 ppsm	0.31 m	0.77°
UA11	NVA	-3.73 cm	-3.36 cm	2.55 ppsm	0.15 m	0.75°
UA12	NVA	8.00 cm	8.45 cm	2.44 ppsm	0.27 m	1.00°
UA13	NVA	2.39 cm	2.27 cm	2.09 ppsm	0.27 m	1.38°
UA14	NVA	5.84 cm	4.66 cm	3.50 ppsm	0.03 m	0.86°
UA15	NVA	6.66 cm	7.19 cm	3.86 ppsm	0.29 m	0.48°
UA17	NVA	1.12 cm	2.06 cm	3.36 ppsm	0.20 m	3.02°
UA18	NVA	12.00 cm	11.29 cm	3.29 ppsm	0.36 m	0.72°
UA19	NVA	6.48 cm	8.36 cm	2.72 ppsm	0.14 m	2.14°
UA20	NVA	-1.51 cm	-3.27 cm	2.30 ppsm	0.14 m	1.07°
UA21	NVA	1.11 cm	1.78 cm	3.54 ppsm	0.23 m	1.96°
UA22	NVA	-4.87 cm	-5.72 cm	2.69 ppsm	0.29 m	1.00°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
UA23	NVA	-5.99 cm	-5.58 cm	3.11 ppsm	0.45 m	3.64°
UA24	NVA	4.12 cm	4.47 cm	4.31 ppsm	0.26 m	2.59°
UA25	NVA	1.34 cm	0.50 cm	2.55 ppsm	0.24 m	1.59°
UA26	NVA	6.18 cm	6.07 cm	3.61 ppsm	0.30 m	1.17°
UA27	NVA	-5.24 cm	-5.28 cm	3.54 ppsm	0.29 m	2.33°
UA28	NVA	-6.26 cm	-6.35 cm	3.47 ppsm	0.10 m	1.05°
FO01	VVA	N/A	18.55 cm	1.59 ppsm	0.60 m	2.14°
FO02	VVA	N/A	7.89 cm	1.59 ppsm	0.45 m	1.49°
FO03	VVA	N/A	14.29 cm	2.58 ppsm	0.30 m	6.12°
FO04	VVA	N/A	6.08 cm	2.79 ppsm	0.33 m	4.28°
FO05	VVA	N/A	11.13 cm	1.77 ppsm	0.71 m	8.39°
FO06	VVA	N/A	5.13 cm	1.27 ppsm	0.22 m	3.74°
FO07	VVA	N/A	9.11 cm	2.79 ppsm	0.20 m	1.59°
FO08	VVA	N/A	27.57 cm	0.46 ppsm	0.56 m	17.42°
FO09	VVA	N/A	10.27 cm	2.76 ppsm	0.35 m	1.36°
FO10	VVA	N/A	0.12 cm	2.58 ppsm	0.30 m	3.08°
FO11	VVA	N/A	10.51 cm	3.25 ppsm	0.10 m	18.99°
FO12	VVA	N/A	23.82 cm	3.47 ppsm	0.31 m	5.02°
FO13	VVA	N/A	5.14 cm	2.94 ppsm	0.50 m	10.52°
FO14	VVA	N/A	9.80 cm	2.65 ppsm	0.33 m	7.64°
FO15	VVA	N/A	9.96 cm	2.97 ppsm	0.35 m	3.30°
FO16	VVA	N/A	19.11 cm	1.80 ppsm	0.38 m	1.06°
FO17	VVA	N/A	19.89 cm	1.80 ppsm	0.18 m	1.38°
FO18	VVA	N/A	14.60 cm	4.07 ppsm	0.07 m	21.73°
FO19	VVA	N/A	16.97 cm	1.80 ppsm	0.33 m	2.92°
FO20	VVA	N/A	-7.96 cm	2.02 ppsm	0.49 m	5.03°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
FO21	VVA	N/A	12.20 cm	0.67 ppsm	0.25 m	0.15°
FO22	VVA	N/A	12.03 cm	1.45 ppsm	0.29 m	2.29°
FO23	VVA	N/A	0.07 cm	2.12 ppsm	0.23 m	0.68°
FO24	VVA	N/A	6.58 cm	2.51 ppsm	0.29 m	7.49°
FO25	VVA	N/A	1.42 cm	1.80 ppsm	0.07 m	3.55°
FO26	VVA	N/A	5.92 cm	1.06 ppsm	0.23 m	10.34°
FO27	VVA	N/A	6.28 cm	1.13 ppsm	0.23 m	2.83°
FO28	VVA	N/A	-4.52 cm	2.37 ppsm	0.21 m	6.84°
FO29	VVA	N/A	6.30 cm	1.52 ppsm	0.28 m	3.37°
FO30	VVA	N/A	12.97 cm	2.72 ppsm	0.32 m	3.86°
FO31	VVA	N/A	5.20 cm	1.27 ppsm	0.11 m	4.97°
FO32	VVA	N/A	-5.04 cm	1.38 ppsm	0.37 m	4.68°
FO33	VVA	N/A	-0.93 cm	0.57 ppsm	0.81 m	3.88°
FO34	VVA	N/A	8.82 cm	2.16 ppsm	0.17 m	4.98°
FO35	VVA	N/A	2.72 cm	1.03 ppsm	1.04 m	4.13°
FO36	VVA	N/A	1.29 cm	0.50 ppsm	0.42 m	3.14°
FO37	VVA	N/A	0.58 cm	0.46 ppsm	0.28 m	3.99°
FO38	VVA	N/A	5.34 cm	2.41 ppsm	0.34 m	4.13°
FO39	VVA	N/A	18.28 cm	1.77 ppsm	1.42 m	2.83°
FO40	VVA	N/A	6.77 cm	0.11 ppsm	1.12 m	0.79°
FO41	VVA	N/A	5.82 cm	1.77 ppsm	0.45 m	3.80°
FO42	VVA	N/A	-1.69 cm	1.84 ppsm	0.38 m	3.25°
FO43	VVA	N/A	-4.92 cm	1.13 ppsm	0.85 m	3.82°
FO44	VVA	N/A	10.55 cm	1.31 ppsm	0.80 m	1.51°
FO45	VVA	N/A	-9.62 cm	0.81 ppsm	0.26 m	2.22°
FO46	VVA	N/A	-0.51 cm	1.24 ppsm	0.95 m	3.72°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
FO47	VVA	N/A	21.53 cm	2.37 ppsm	0.20 m	7.63°
FO48	VVA	N/A	3.19 cm	0.32 ppsm	1.80 m	7.07°
FO49	VVA	N/A	5.82 cm	2.30 ppsm	0.15 m	1.93°
FO50	VVA	N/A	10.39 cm	2.23 ppsm	0.73 m	4.41°
FO51	VVA	N/A	3.94 cm	2.12 ppsm	0.13 m	8.55°
FO52	VVA	N/A	-8.56 cm	0.74 ppsm	1.85 m	4.68°
FO53	VVA	N/A	3.67 cm	1.06 ppsm	0.39 m	6.87°
FO54	VVA	N/A	13.59 cm	3.15 ppsm	0.23 m	3.26°
FO55	VVA	N/A	2.90 cm	2.79 ppsm	0.39 m	3.55°
SH01	VVA	N/A	3.55 cm	0.85 ppsm	0.60 m	9.17°
SH02	VVA	N/A	5.42 cm	1.91 ppsm	0.30 m	2.30°
SH03	VVA	N/A	0.01 cm	2.86 ppsm	0.69 m	3.29°
SH04	VVA	N/A	10.19 cm	2.55 ppsm	0.33 m	4.15°
SH05	VVA	N/A	10.53 cm	3.61 ppsm	0.23 m	5.99°
TW01	VVA	N/A	11.17 cm	2.79 ppsm	0.22 m	13.39°
TW02	VVA	N/A	19.29 cm	2.58 ppsm	0.47 m	4.04°
TW03	VVA	N/A	18.02 cm	2.72 ppsm	0.30 m	3.24°
CA01	CAL	4.92 cm	4.54 cm	3.61 ppsm	0.15 m	0.81°
CA02	CAL	-11.79 cm	-13.21 cm	2.94 ppsm	0.06 m	4.61°
CA03	CAL	-1.01 cm	-2.21 cm	2.83 ppsm	0.24 m	0.62°
CA04	CAL	-4.00 cm	-3.63 cm	3.68 ppsm	0.40 m	0.92°
CA05	CAL	7.65 cm	8.48 cm	3.40 ppsm	0.16 m	1.42°
CA06	CAL	-8.34 cm	-8.38 cm	3.04 ppsm	0.29 m	3.64°
CA07	CAL	4.94 cm	4.50 cm	4.07 ppsm	0.03 m	1.51°
CA08	CAL	0.87 cm	0.34 cm	4.28 ppsm	0.23 m	2.79°
CA09	CAL	-3.75 cm	-3.90 cm	3.15 ppsm	0.25 m	4.25°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
CA10	CAL	4.99 cm	5.09 cm	3.61 ppsm	0.23 m	1.41°
CA11	CAL	0.01 cm	0.17 cm	3.25 ppsm	0.29 m	1.25°
CA12	CAL	-5.83 cm	-5.46 cm	3.01 ppsm	0.35 m	1.15°
CA13	CAL	6.98 cm	6.72 cm	3.75 ppsm	0.35 m	2.85°
CA14	CAL	9.64 cm	9.10 cm	3.47 ppsm	0.24 m	3.61°
CA15	CAL	4.15 cm	4.47 cm	3.04 ppsm	0.37 m	1.66°
CA16	CAL	-4.85 cm	-4.44 cm	2.37 ppsm	0.09 m	2.36°
CA17	CAL	-7.72 cm	-7.69 cm	3.36 ppsm	0.35 m	2.17°
CA18	CAL	-0.34 cm	-1.23 cm	2.51 ppsm	0.22 m	0.52°
CA19	CAL	-8.05 cm	-8.05 cm	1.73 ppsm	0.44 m	3.12°
CA20	CAL	1.97 cm	1.81 cm	3.50 ppsm	0.22 m	3.05°
CA21	CAL	0.00 cm	-0.07 cm	3.68 ppsm	0.26 m	1.73°
CA22	CAL	11.24 cm	9.66 cm	2.51 ppsm	0.39 m	3.19°
CA23	CAL	11.66 cm	12.12 cm	3.43 ppsm	0.42 m	0.59°
CA24	CAL	-5.31 cm	-4.74 cm	5.41 ppsm	0.20 m	1.52°
CA25	CAL	6.88 cm	5.77 cm	3.15 ppsm	0.20 m	1.14°
CA26	CAL	-8.00 cm	-7.97 cm	4.85 ppsm	0.09 m	2.14°
CA27	CAL	2.65 cm	2.19 cm	2.41 ppsm	0.23 m	1.11°
CA28	CAL	-0.71 cm	-0.77 cm	2.33 ppsm	0.26 m	4.29°
CA29	CAL	1.21 cm	1.00 cm	2.33 ppsm	0.26 m	1.37°
CA30	CAL	-1.87 cm	-2.03 cm	2.26 ppsm	0.19 m	1.10°
CA31	CAL	3.00 cm	3.02 cm	2.90 ppsm	0.29 m	1.81°
CA32	CAL	-1.46 cm	-1.38 cm	2.37 ppsm	0.32 m	1.60°
CA33	CAL	6.03 cm	6.09 cm	2.44 ppsm	0.25 m	2.06°
CA34	CAL	-1.95 cm	-1.99 cm	1.66 ppsm	0.33 m	1.57°
CA35	CAL	-1.03 cm	-1.32 cm	2.58 ppsm	0.32 m	0.19°

Control Point Breakdown (Continued)

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
CA36	CAL	-5.56 cm	-4.61 cm	2.44 ppsm	0.40 m	0.42°
CA37	CAL	4.85 cm	4.14 cm	2.30 ppsm	0.30 m	3.05°
CA38	CAL	-4.54 cm	-4.14 cm	2.65 ppsm	0.31 m	2.34°
CA381	CAL	-3.98 cm	-3.43 cm	2.62 ppsm	0.34 m	1.20°
CA39	CAL	1.04 cm	0.92 cm	2.37 ppsm	0.24 m	4.55°
CA40	CAL	-5.29 cm	-5.33 cm	2.76 ppsm	0.21 m	1.04°
CA41	CAL	1.29 cm	1.05 cm	2.12 ppsm	0.34 m	2.31°
CA42	CAL	6.65 cm	5.66 cm	3.61 ppsm	0.11 m	2.23°
CA43	CAL	-4.92 cm	-5.14 cm	2.16 ppsm	0.44 m	2.76°
CA44	CAL	0.43 cm	0.00 cm	2.26 ppsm	0.29 m	3.85°
CA45	CAL	9.66 cm	10.35 cm	2.19 ppsm	0.36 m	1.15°
CA46	CAL	3.77 cm	3.72 cm	2.41 ppsm	0.27 m	1.18°
CA47	CAL	4.89 cm	4.92 cm	2.97 ppsm	0.18 m	0.74°
CA48	CAL	8.02 cm	8.03 cm	1.95 ppsm	0.27 m	0.74°
CA49	CAL	6.17 cm	6.63 cm	2.02 ppsm	0.19 m	2.52°
CA50	CAL	-2.53 cm	-3.01 cm	2.94 ppsm	0.25 m	0.93°
CA51	CAL	-6.20 cm	-6.38 cm	1.98 ppsm	0.25 m	1.25°
CA52	CAL	0.04 cm	0.09 cm	1.91 ppsm	0.21 m	5.11°
CA53	CAL	-0.23 cm	-0.14 cm	2.05 ppsm	0.19 m	1.55°

Anomaly Breakdown

Point	Type	All Points TIN Dz	DEM Dz	Ground Density	Nearest Ground	Slope
UA16	NVA	N/A	N/A	N/A	N/A	N/A
Comment: Outside AOI						