ST-008 Appendix IX-C2: e-Compaction Reports

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_152124a	No. of Measurements:	13142	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:21:24 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	96.7	111.01	0.94	9037	5908.78	17827.2	40478.23	5606.58	31.45	-3128.22	8790.2	31441.23
k-value	Yes	8.9	22.57	0.3	150	20	106.4	190	34.75	32.66	-130	-43.6	40
Moisture Content	No												

Mapped Area

square feet	acres
13142	0.3

Pass Count

min.	avg.	max.
1	1.09	4

Elevation (ft)

min.	avg.	max.
981.7	984.08	985.61

Velocity (fps)

min.	avg.	max.
0.36	5.44	6.63

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	13142	0.302	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_152124a	No. of Measurements:	13142	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:21:24 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
111.01	CQI > = 95
96.7	80% of Resilient Modulus MVs >= 9037
31.45	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_152124a	No. of Measurements:	13142	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:21:24 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
22.57	CQI > = 95
8.9	80% of k-Value MVs >= 150
32.66	COV <= 20
99.99	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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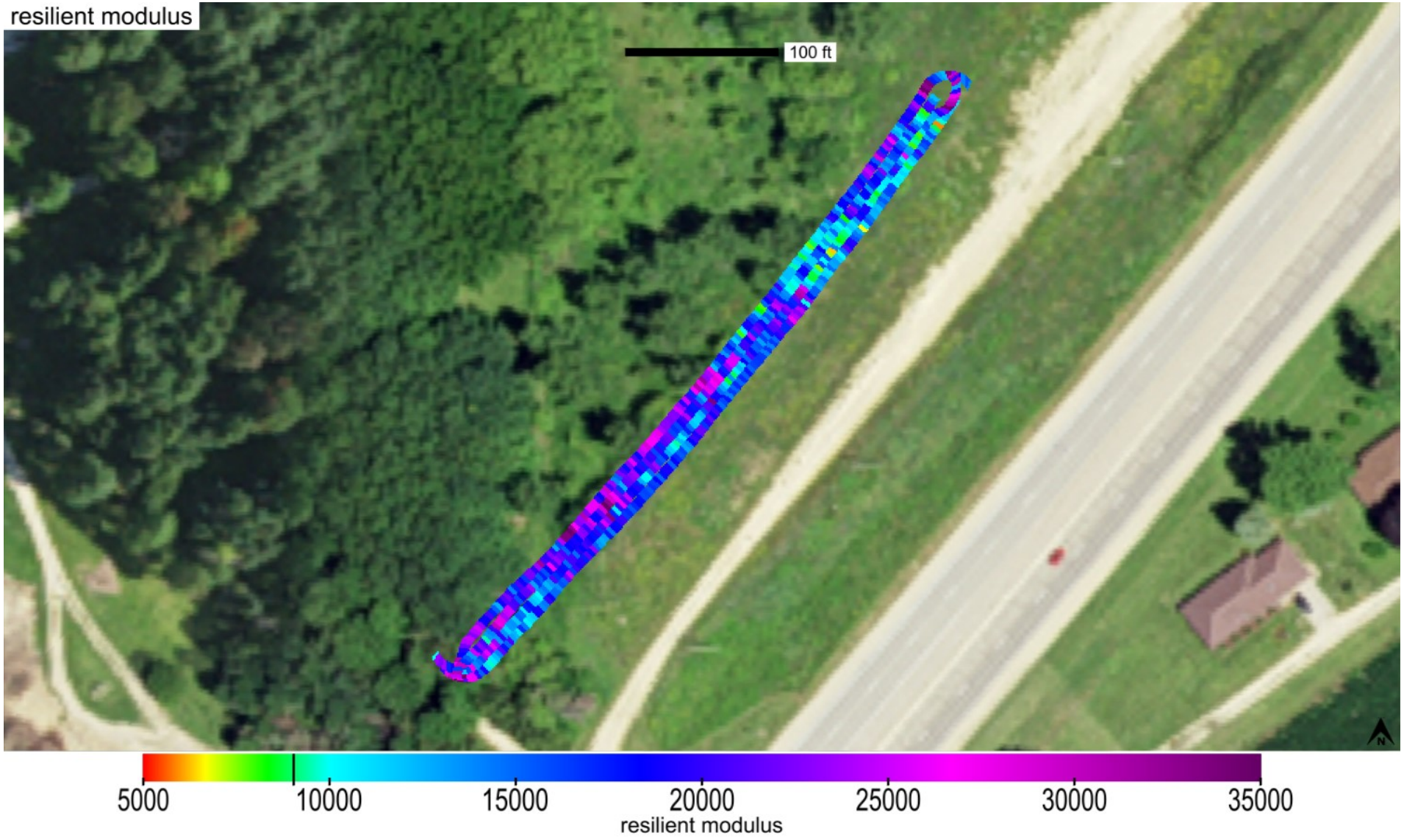
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	96.7	111.01	0.94	9037	5908.78	17827.2	40478.23	5606.58	31.45	-3128.22	8790.2	31441.23



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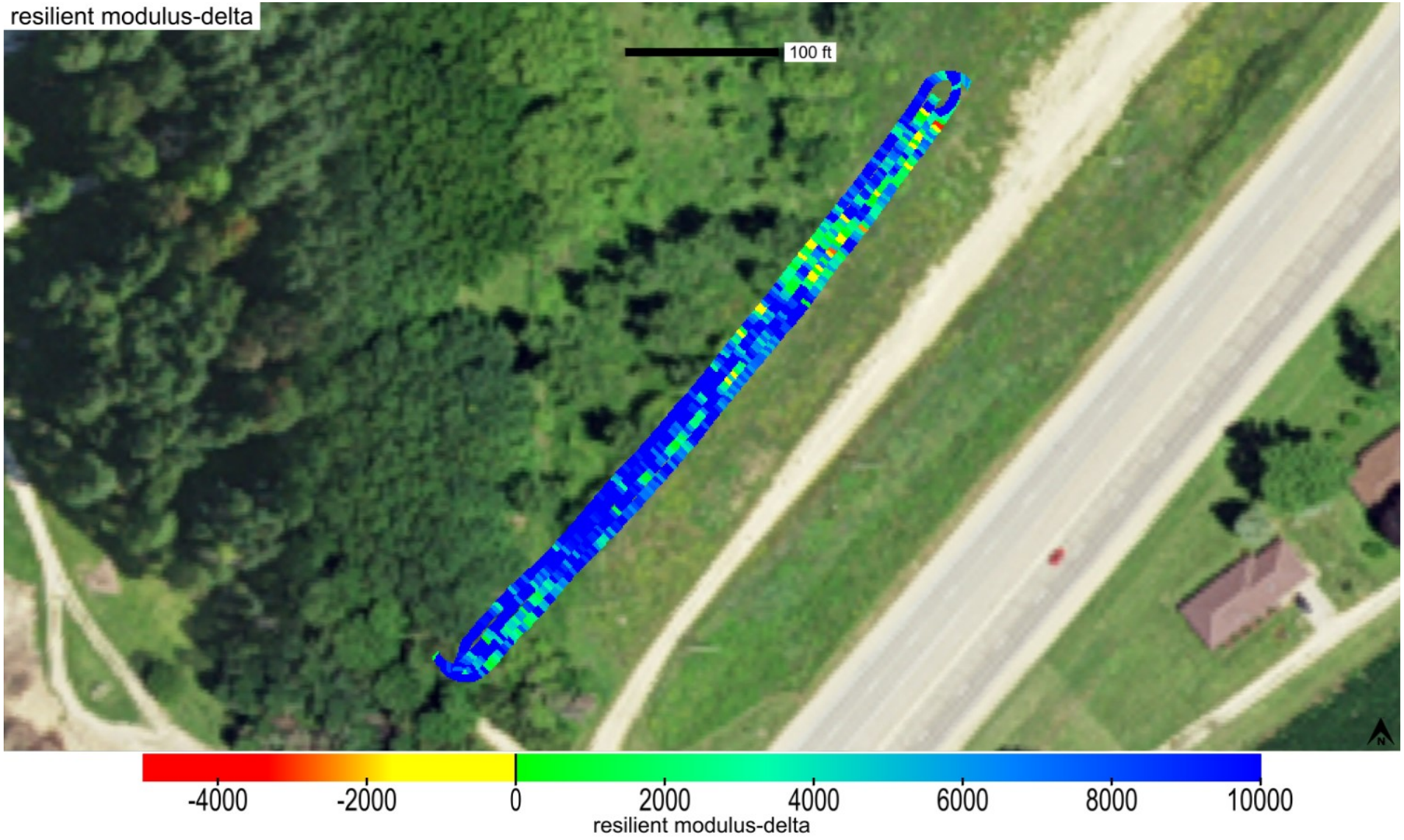
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	96.7	111.01	0.94	9037	5908.78	17827.2	40478.23	5606.58	31.45	-3128.22	8790.2	31441.23



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	96.7	9037	-3128.22	8790.2	31441.23	1779.09	8761.92	17808.87

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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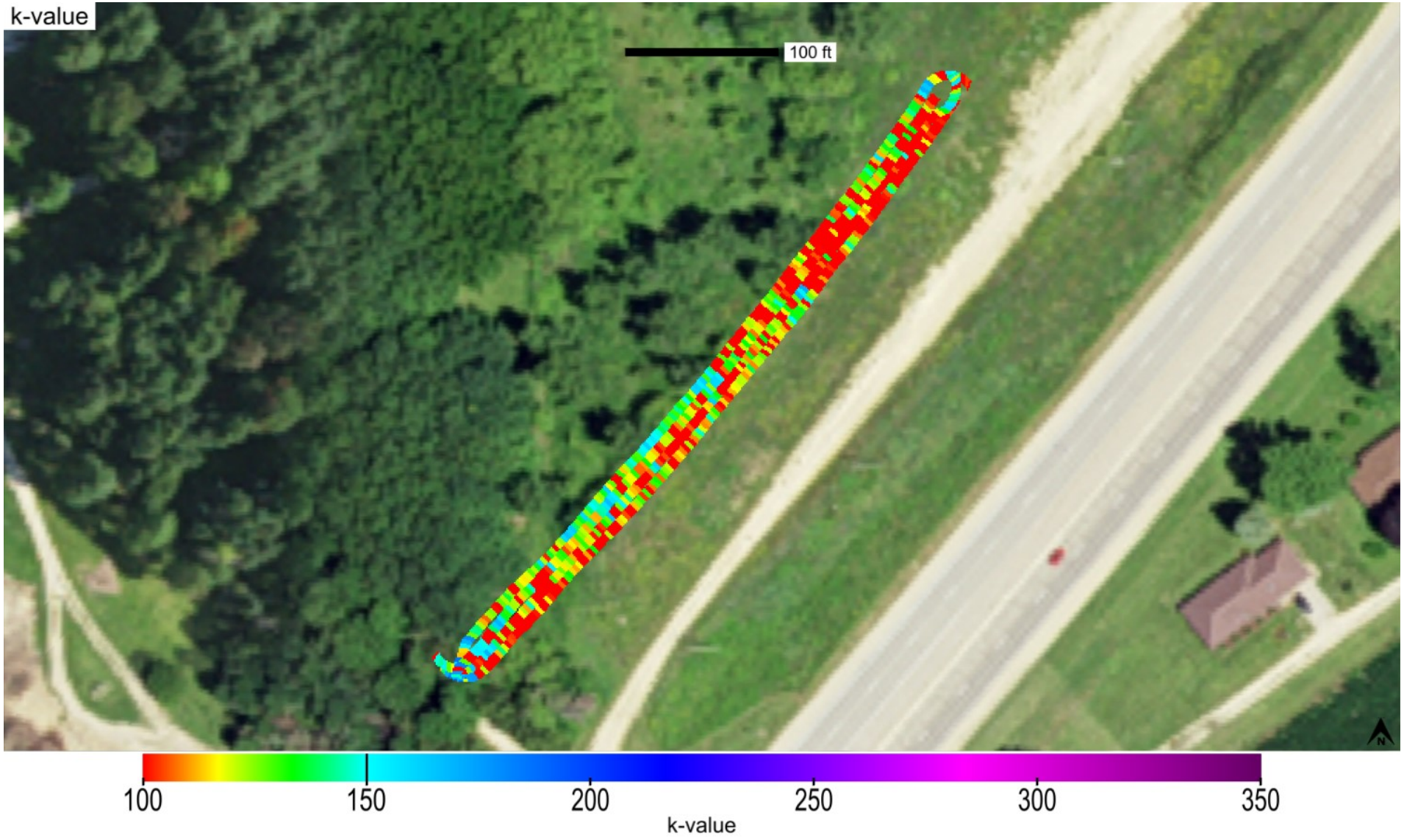
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.9	22.57	0.3	150	20	106.4	190	34.75	32.66	-130	-43.6	40



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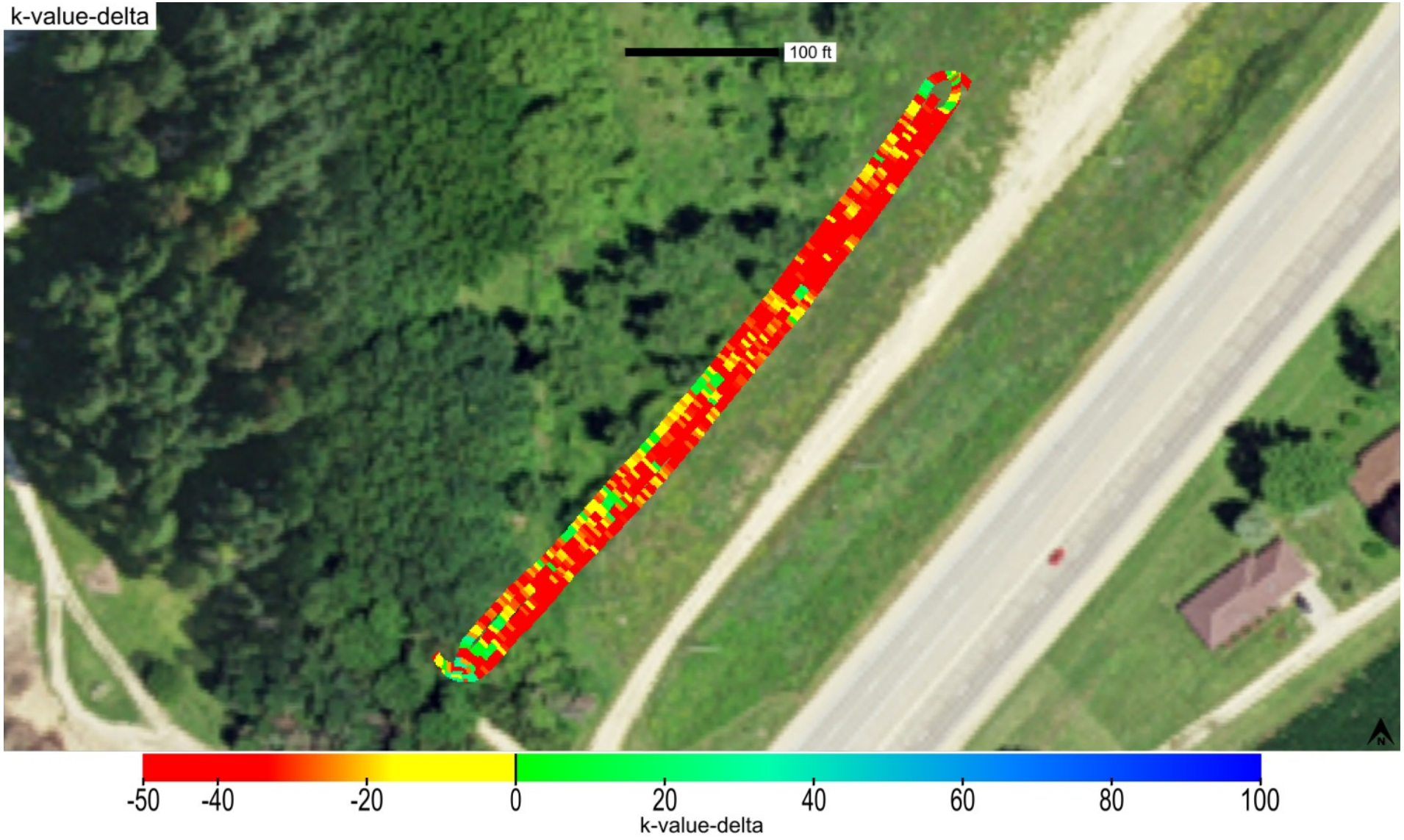
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.9	22.57	0.3	150	20	106.4	190	34.75	32.66	-130	-43.6	40



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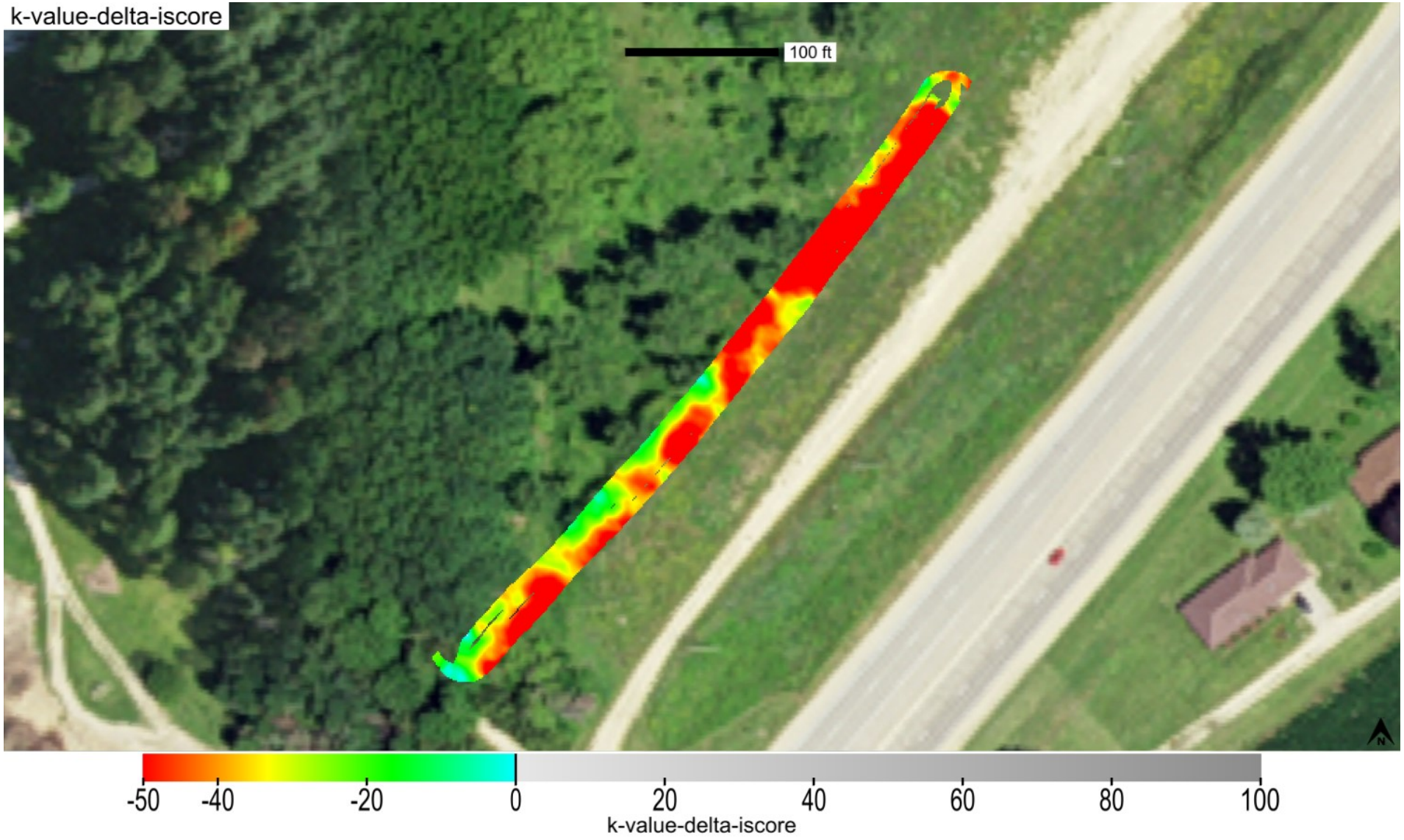
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.9	150	-130	-43.6	40	-86.36	-43.9	0.14



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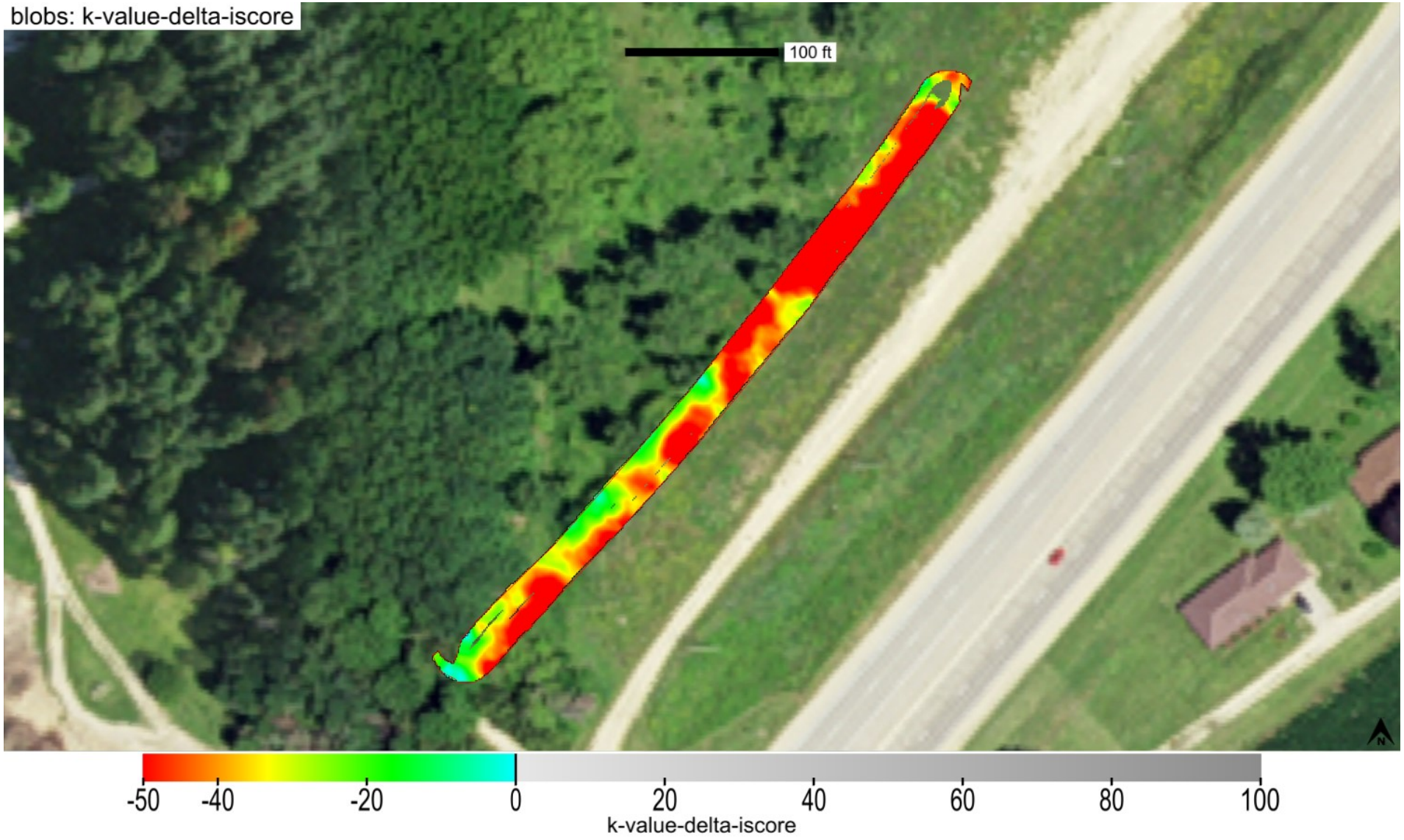
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	13141	99.99	none	0



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

minimum	average	maximum
1	1.09	4

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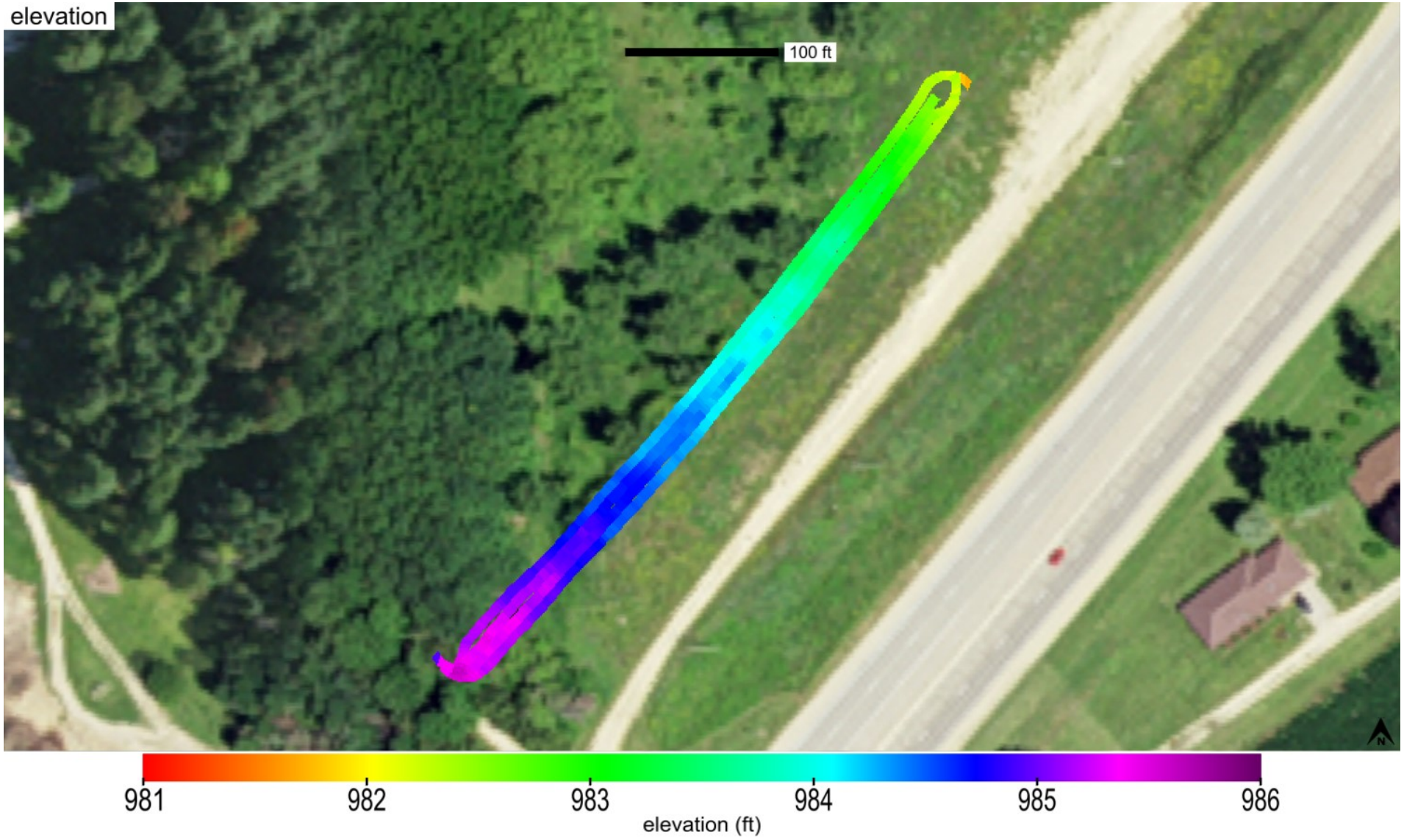
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

minimum	average	maximum
981.698	984.085	985.612



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	13142	0.302	12	9037	150	40

Modified Subbase_IADOT (2115)

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152124a

20200929_164126.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_152847a	No. of Measurements:	11914	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:28:47 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	96.8	110.49	0.91	9037	6228.38	18469.5	38954.9	6037.04	32.69	-2808.62	9432.5	29917.9
k-value	Yes	8.7	22.61	0.33	150	20	110	190	35.48	32.26	-130	-40	40
Moisture Content	No												

Mapped Area

square feet	acres
11914	0.27

Pass Count

min.	avg.	max.
1	1.2	3

Elevation (ft)

min.	avg.	max.
981.72	984.12	985.69

Velocity (fps)

min.	avg.	max.
0.91	5.45	6.13

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11914	0.274	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_152847a	No. of Measurements:	11914	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:28:47 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
110.49	CQI > = 95
96.8	80% of Resilient Modulus MVs >= 9037
32.69	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_152847a	No. of Measurements:	11914	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:28:47 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
22.61	CQI > = 95
8.7	80% of k-Value MVs >= 150
32.26	COV <= 20
99.76	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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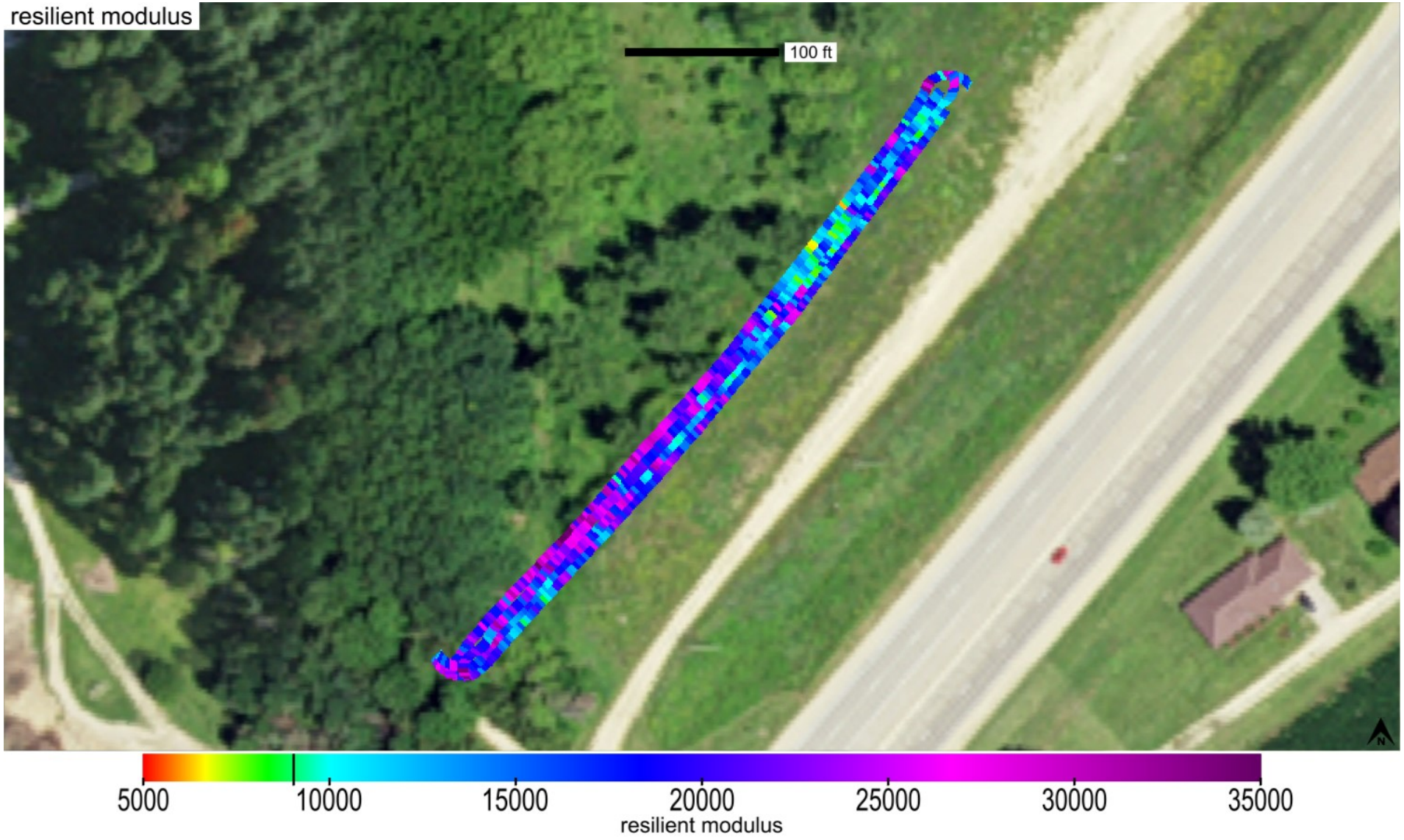
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	96.8	110.49	0.91	9037	6228.38	18469.5	38954.9	6037.04	32.69	-2808.62	9432.5	29917.9



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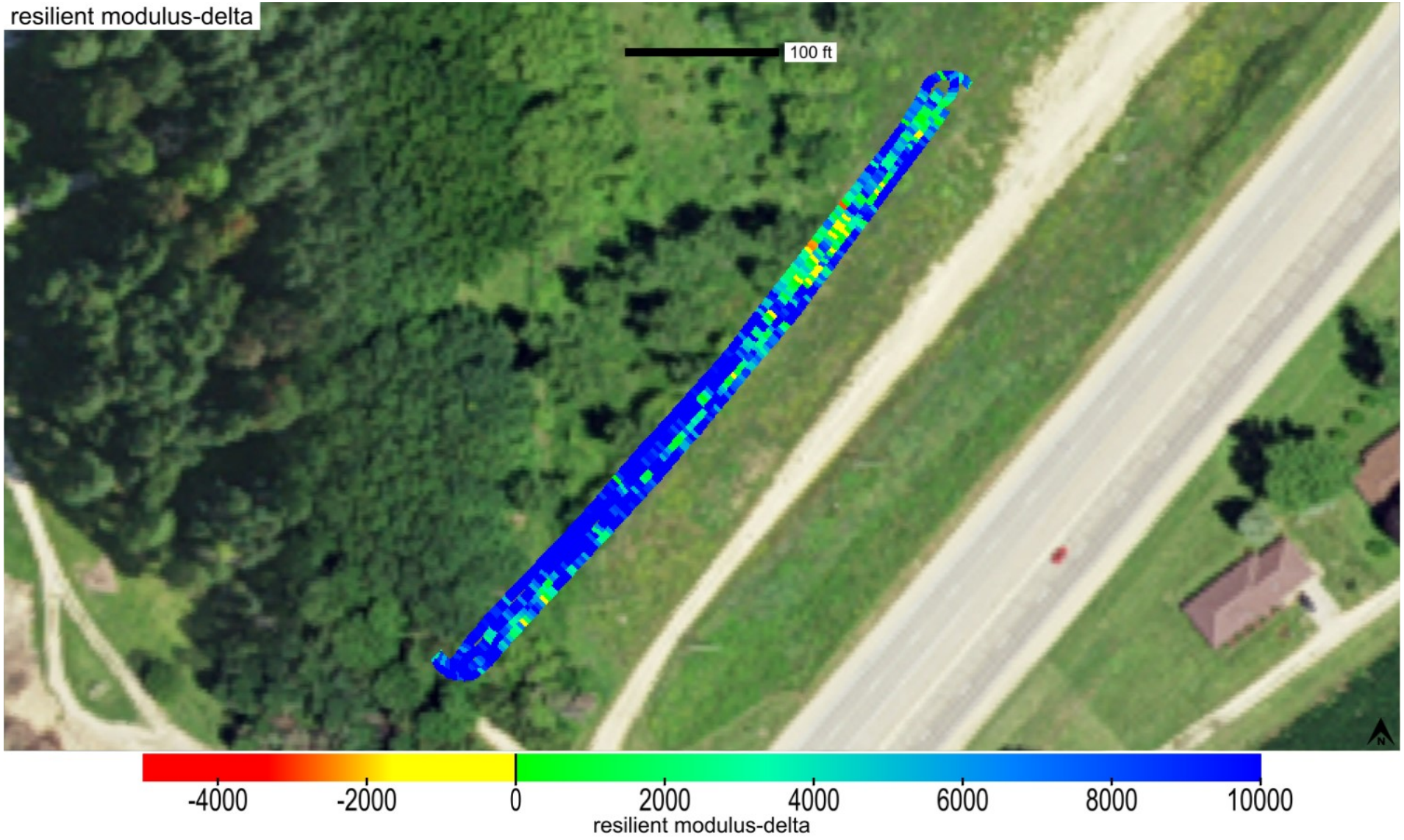
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	96.8	110.49	0.91	9037	6228.38	18469.5	38954.9	6037.04	32.69	-2808.62	9432.5	29917.9



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	96.8	9037	-2808.62	9432.5	29917.9	1270.68	9320.15	20570.66

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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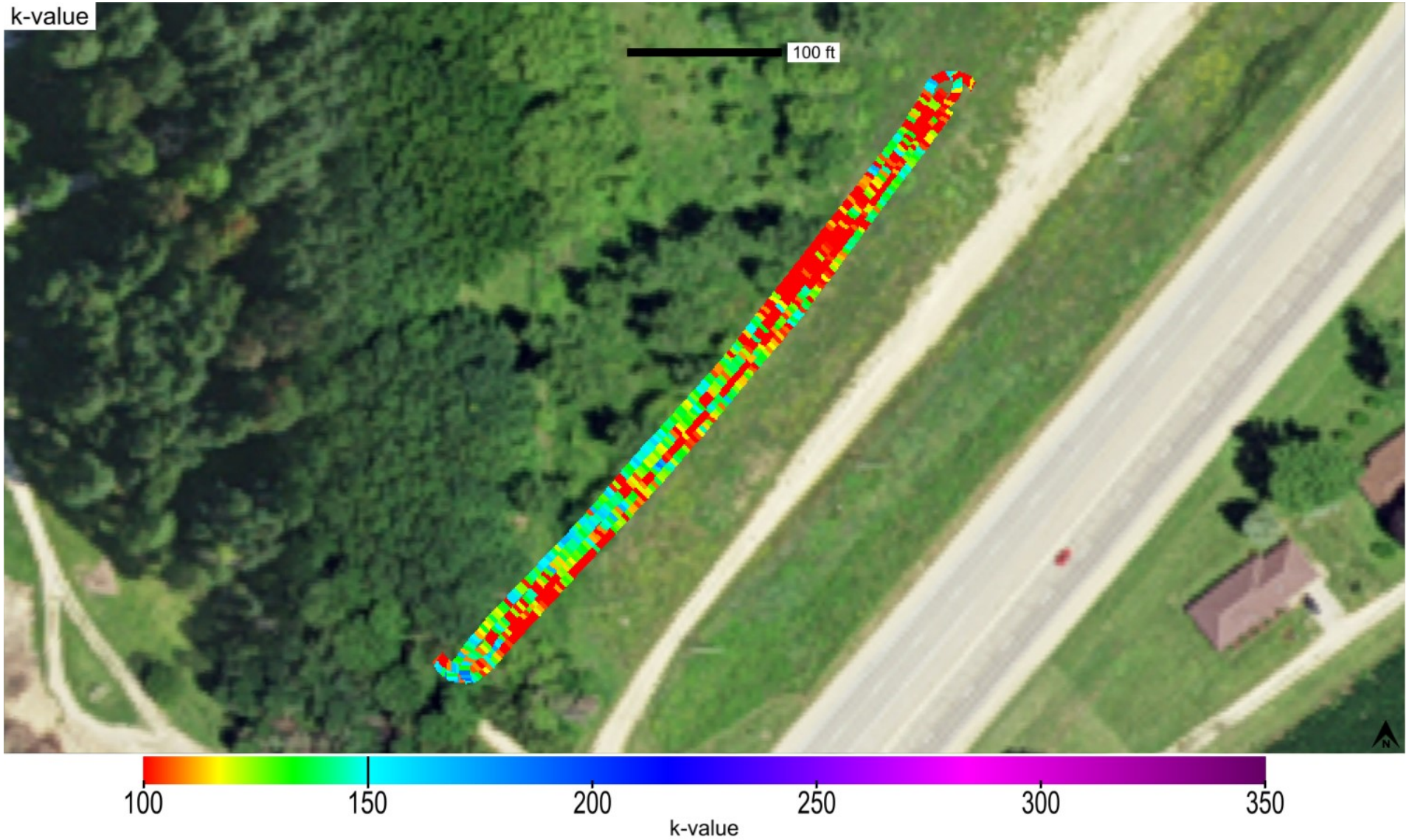
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.7	22.61	0.33	150	20	110	190	35.48	32.26	-130	-40	40



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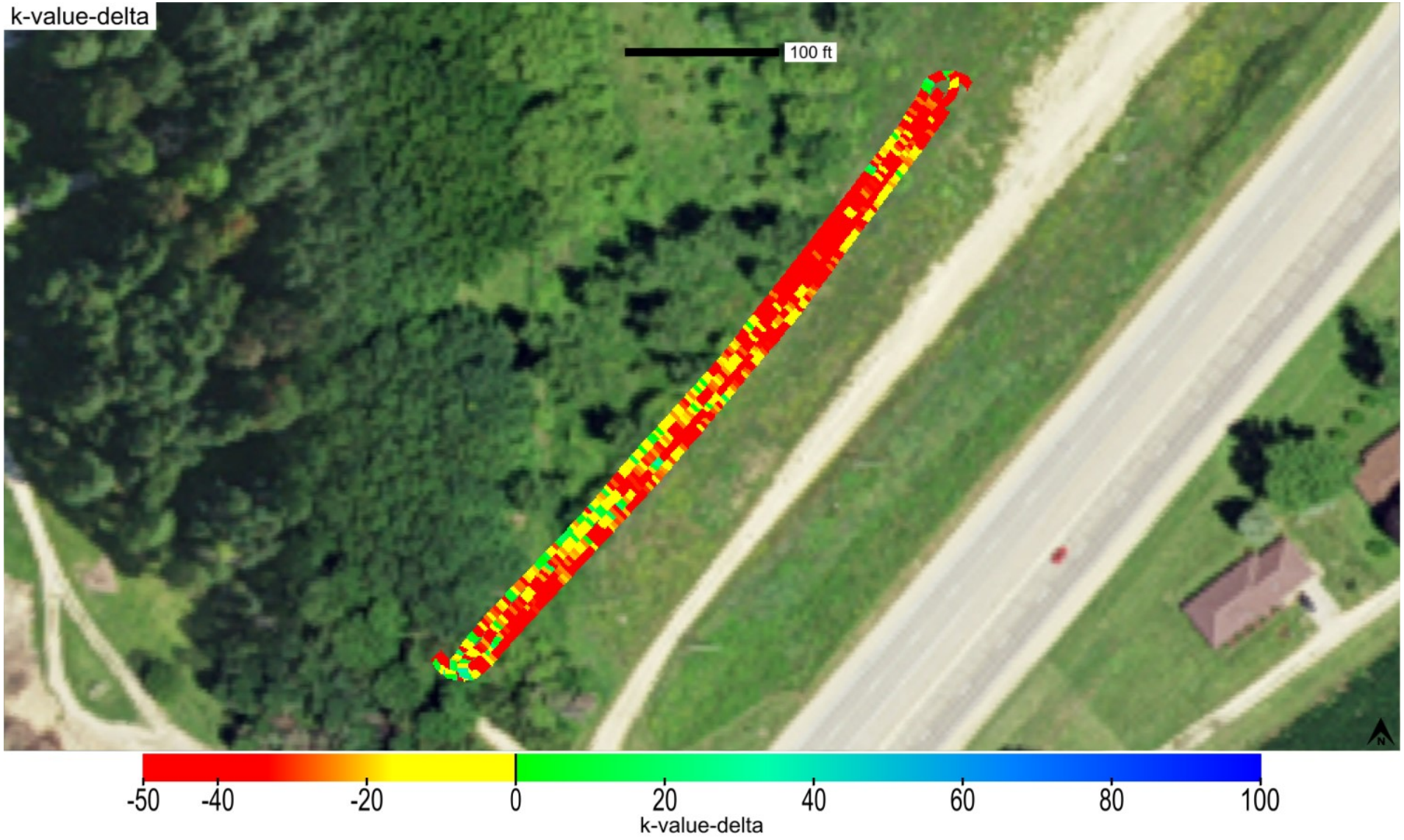
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.7	22.61	0.33	150	20	110	190	35.48	32.26	-130	-40	40



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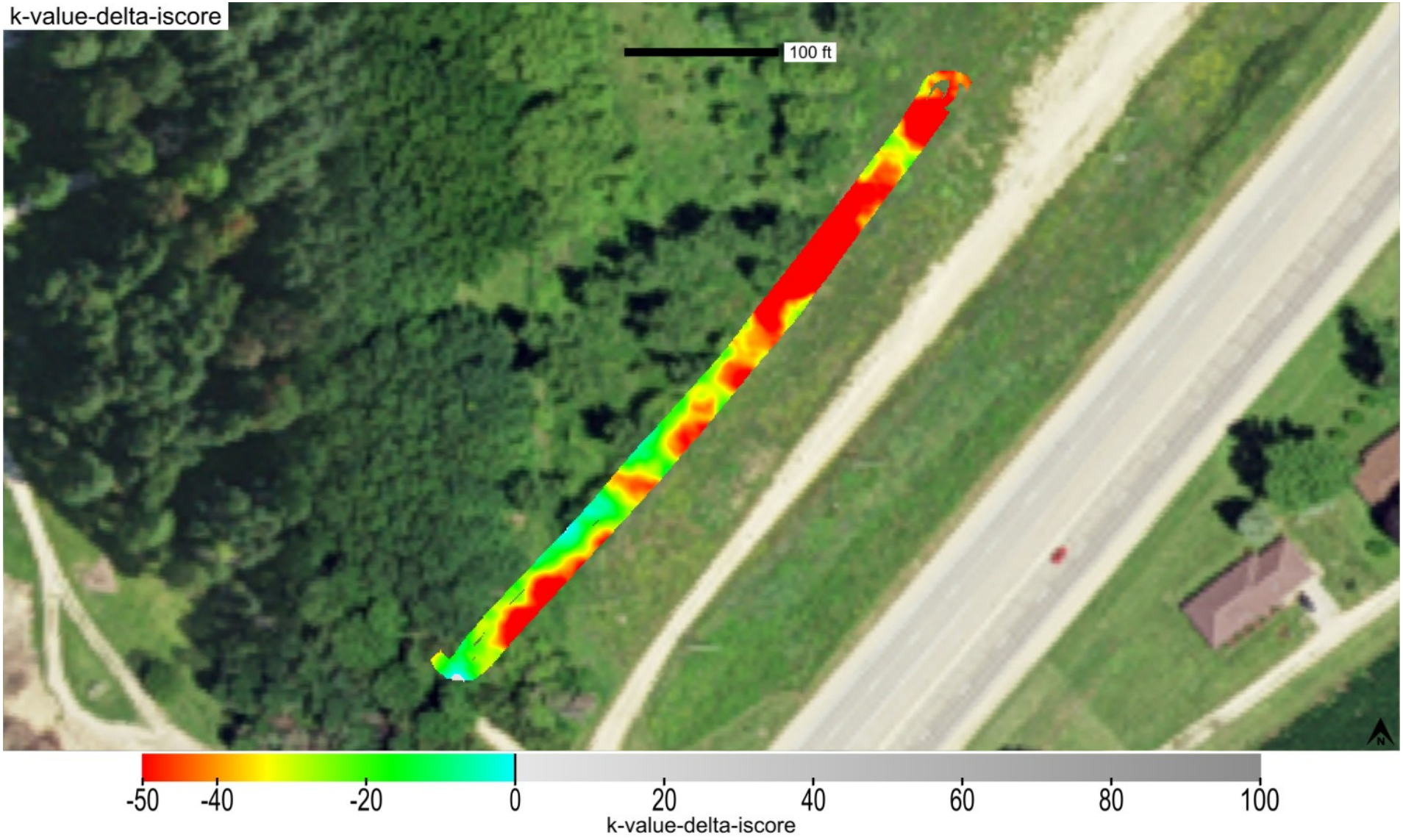
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.7	150	-130	-40	40	-94.47	-40.67	6.65



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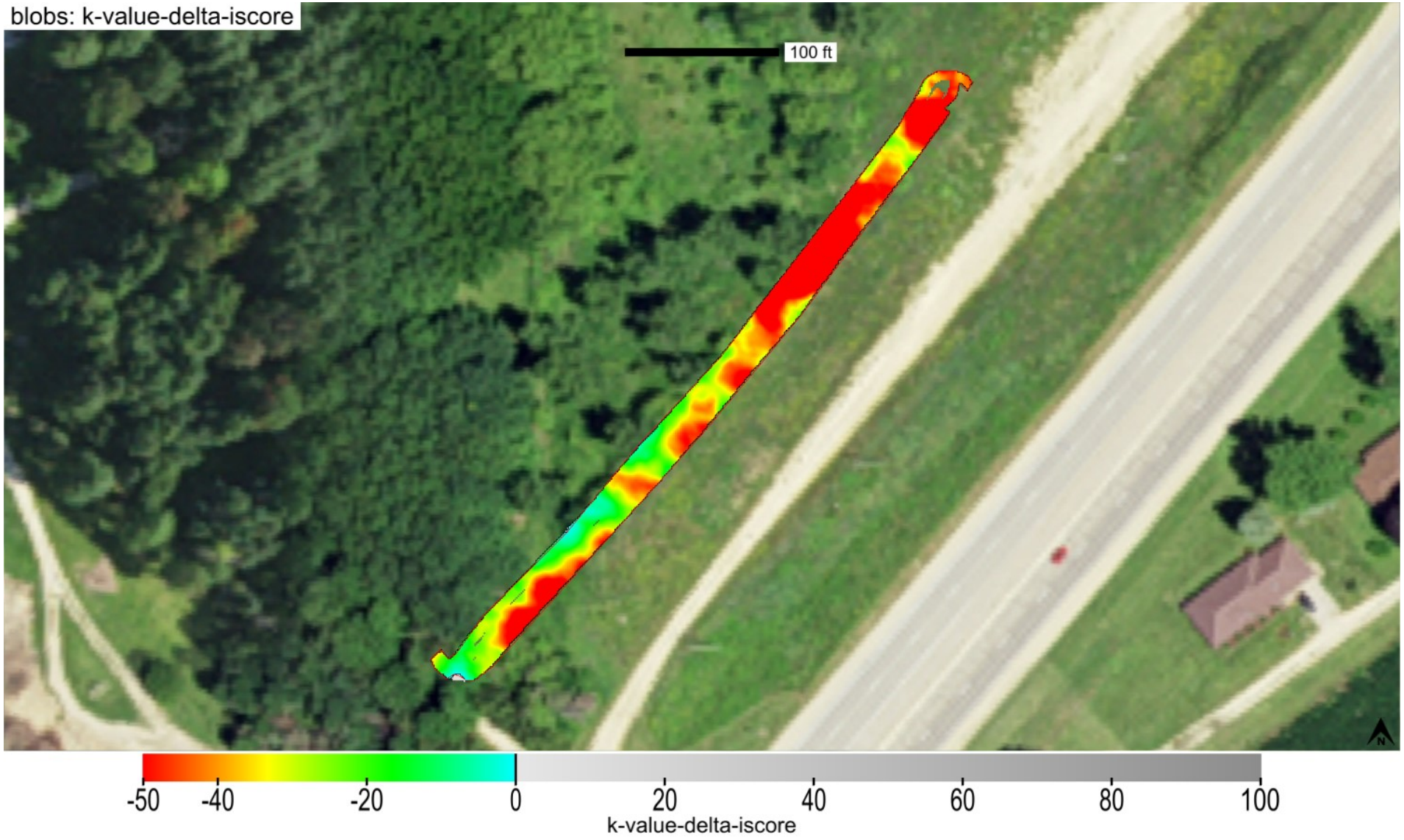
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	11885	99.76	none	0



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

minimum	average	maximum
1	1.2	3

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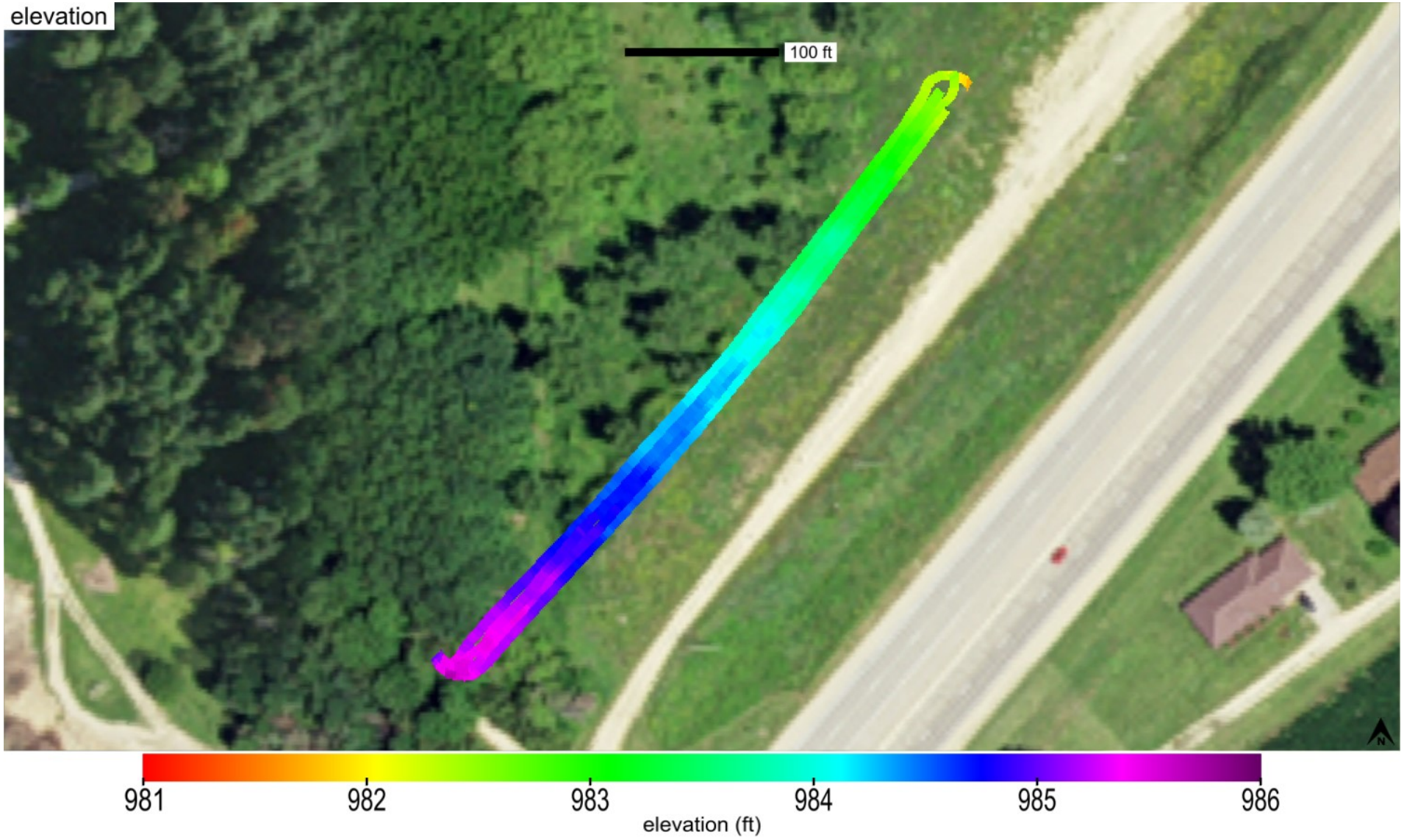
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

minimum	average	maximum
981.724	984.122	985.69



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11914	0.274	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_152847a

20200929_164126.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_153607a	No. of Measurements:	11770	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:36:07 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	97.1	110.47	0.9	9037	6542.36	19289	39029.3	6421.97	33.29	-2494.64	10252	29992.3
k-value	Yes	13.1	28.33	0.4	150	20	115.4	190	34.02	29.47	-130	-34.6	40
Moisture Content	No												

Mapped Area

square feet	acres
11770	0.27

Pass Count

min.	avg.	max.
1	1.21	4

Elevation (ft)

min.	avg.	max.
981.56	984.08	985.68

Velocity (fps)

min.	avg.	max.
0.37	5.46	5.99

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11770	0.27	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_153607a	No. of Measurements:	11770	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:36:07 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
110.47	CQI > = 95
97.1	80% of Resilient Modulus MVs >= 9037
33.29	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_153607a	No. of Measurements:	11770	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:36:07 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
28.33	CQI > = 95
13.1	80% of k-Value MVs >= 150
29.47	COV <= 20
99.81	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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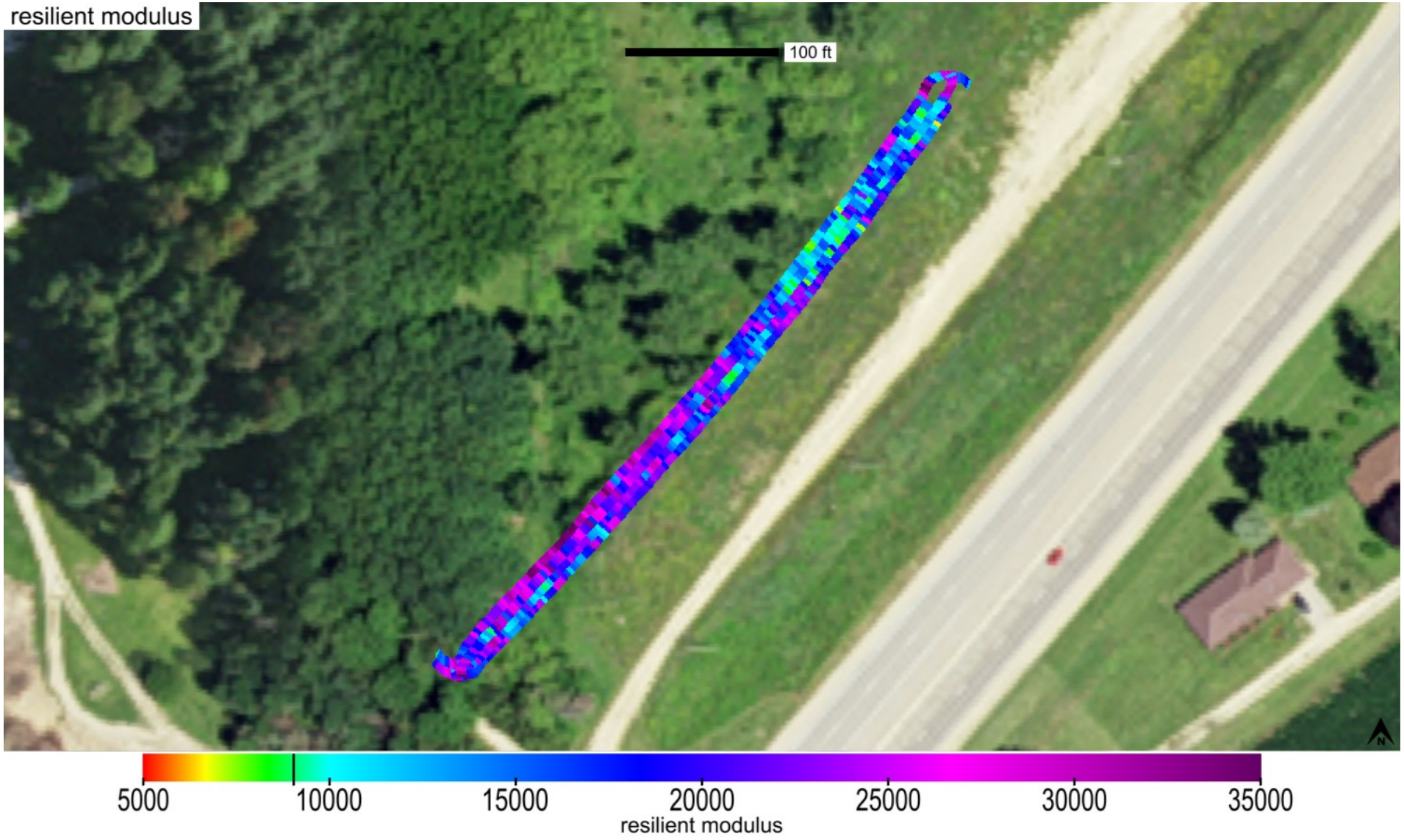
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	97.1	110.47	0.9	9037	6542.36	19289	39029.3	6421.97	33.29	-2494.64	10252	29992.3

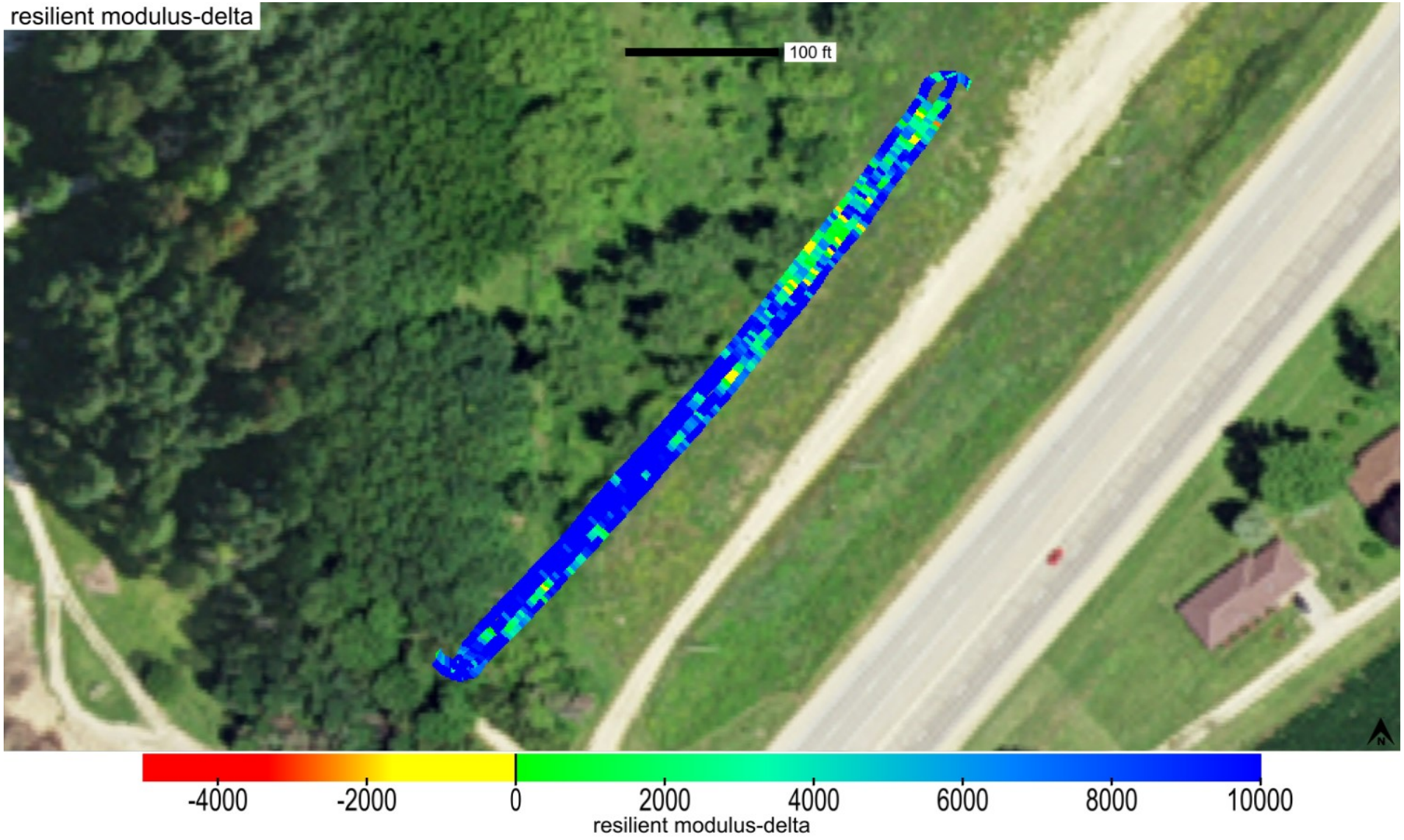


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	97.1	110.47	0.9	9037	6542.36	19289	39029.3	6421.97	33.29	-2494.64	10252	29992.3



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	97.1	9037	-2494.64	10252	29992.3	1428.15	10115.88	20764.98

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

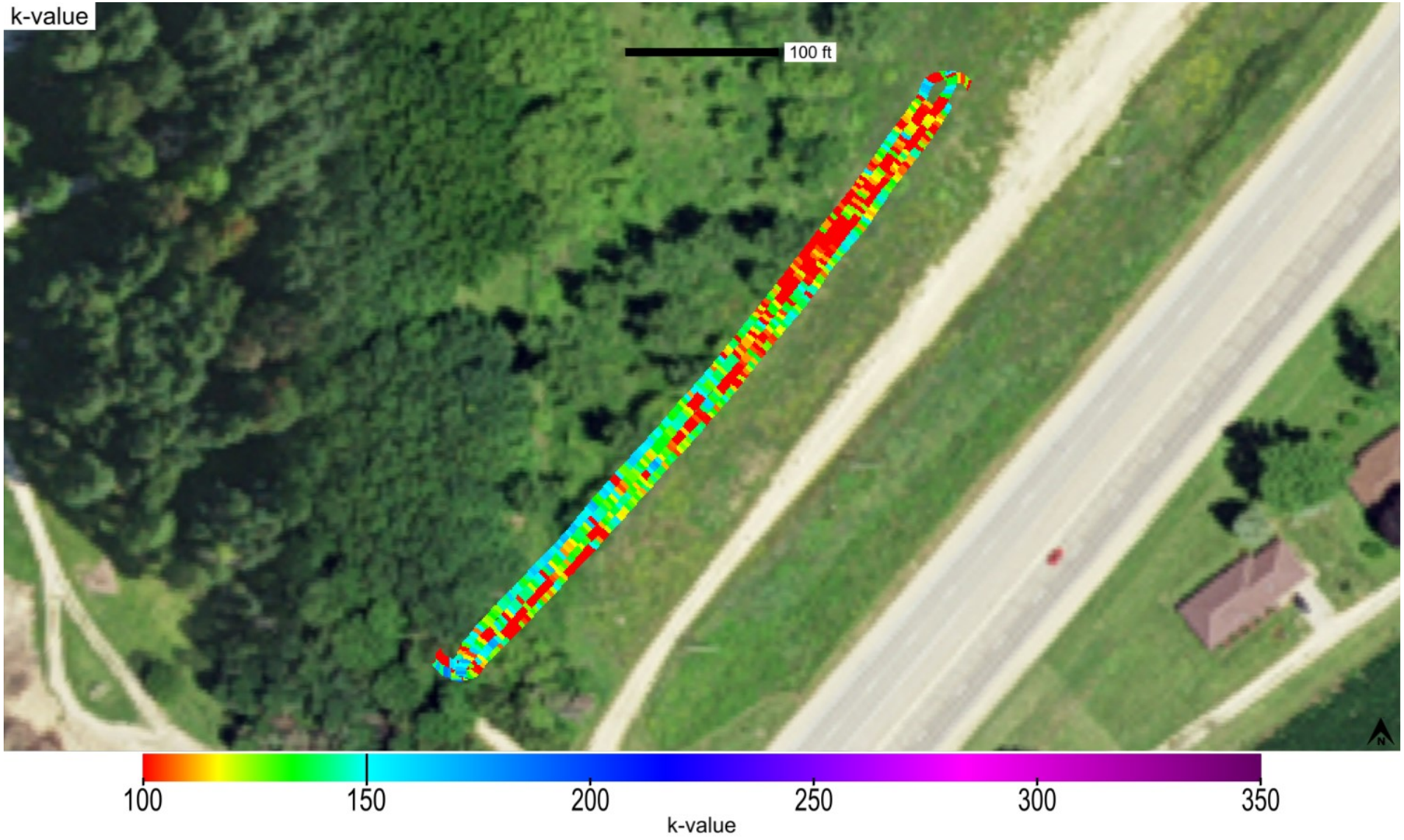
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	13.1	28.33	0.4	150	20	115.4	190	34.02	29.47	-130	-34.6	40

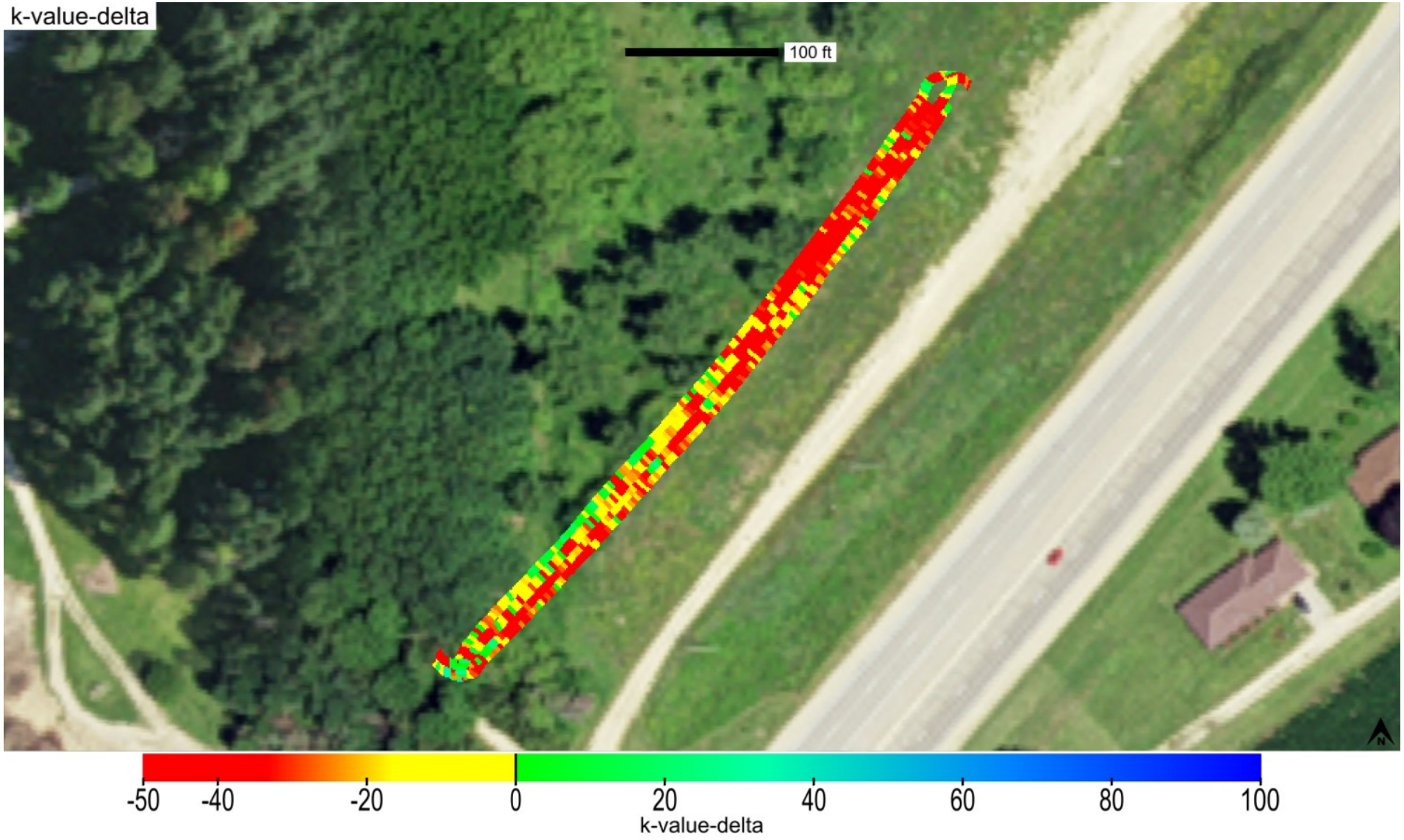


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

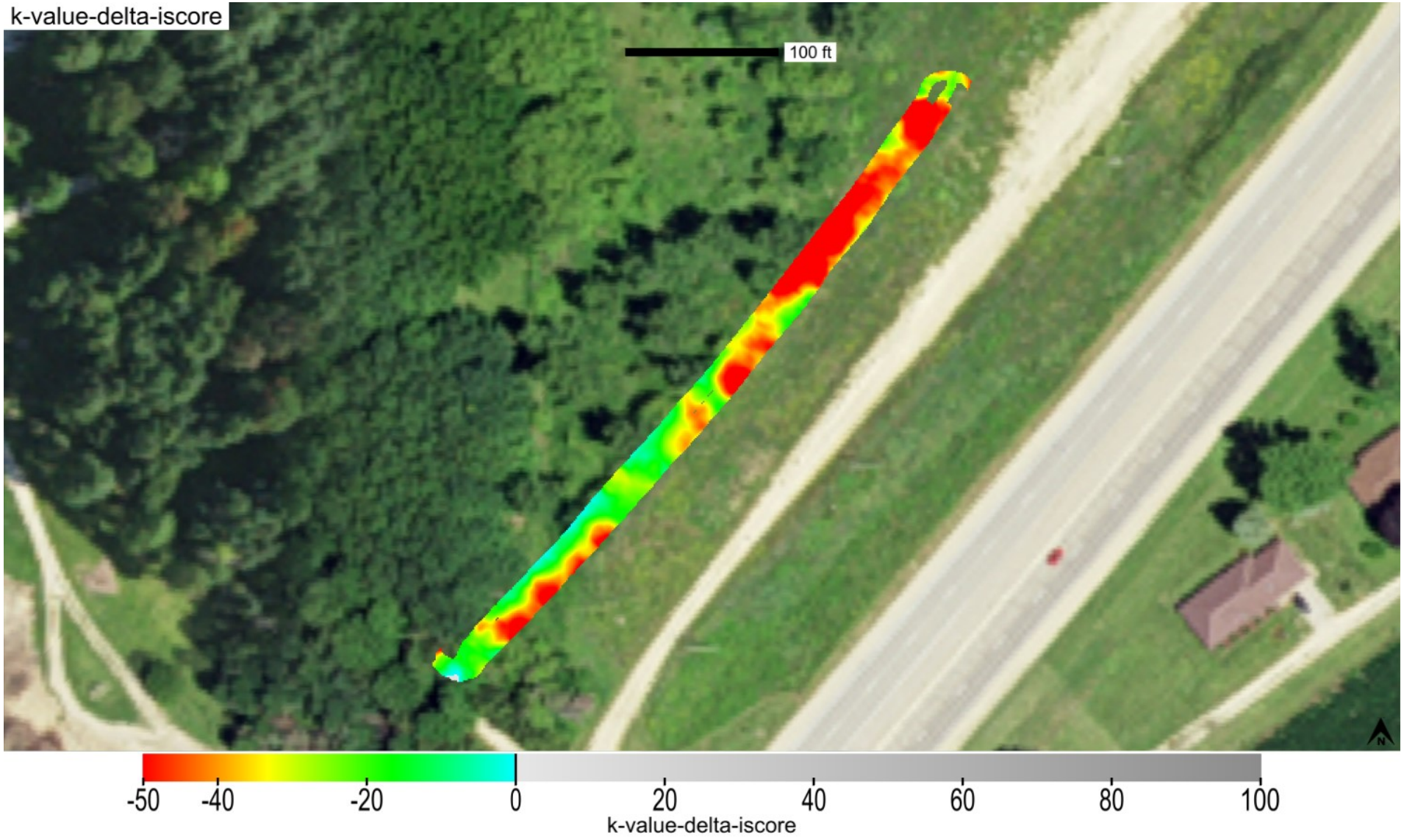
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	13.1	28.33	0.4	150	20	115.4	190	34.02	29.47	-130	-34.6	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	13.1	150	-130	-34.6	40	-80.46	-35.47	5.4



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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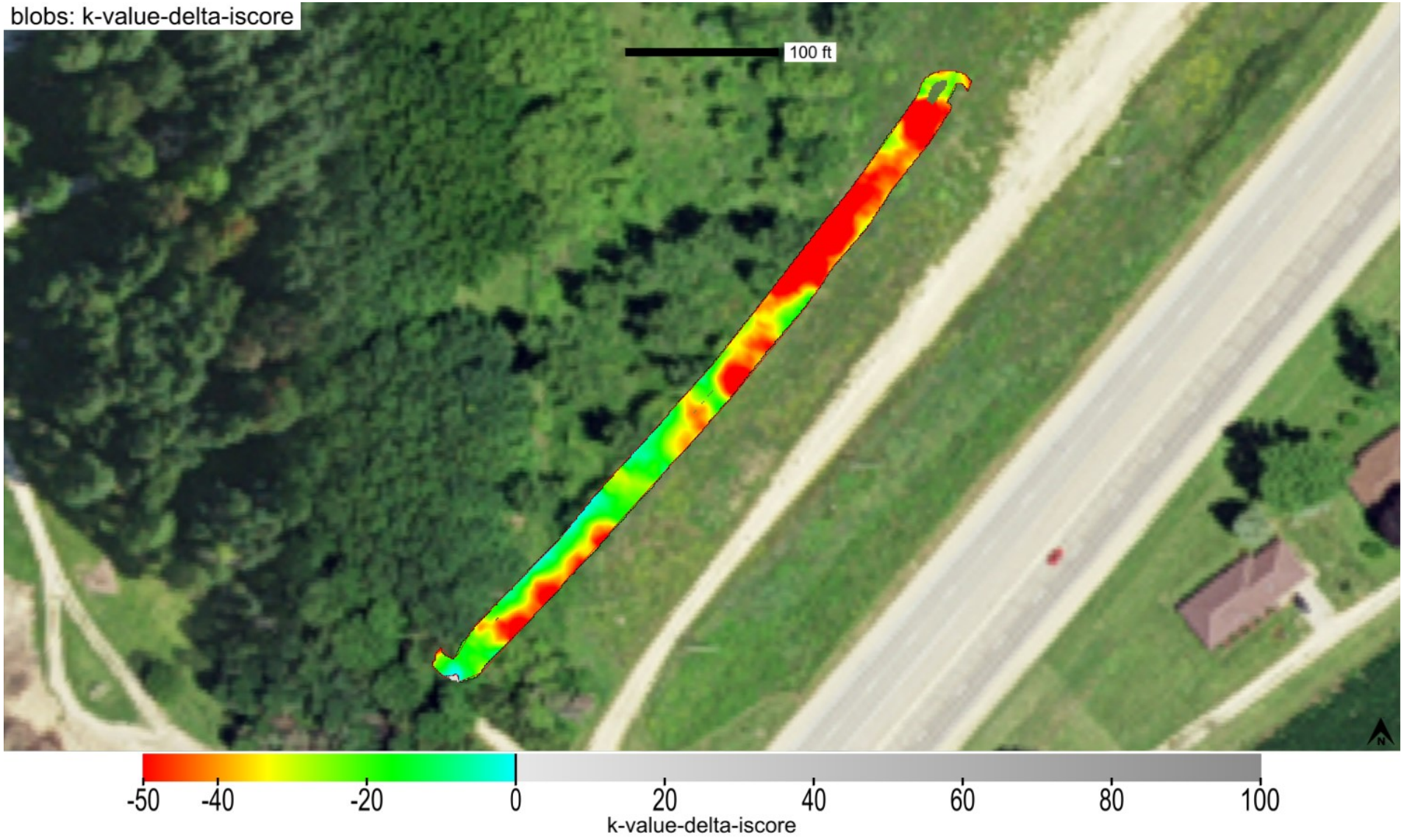
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	11748	99.81	none	0



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

minimum	average	maximum
1	1.21	4

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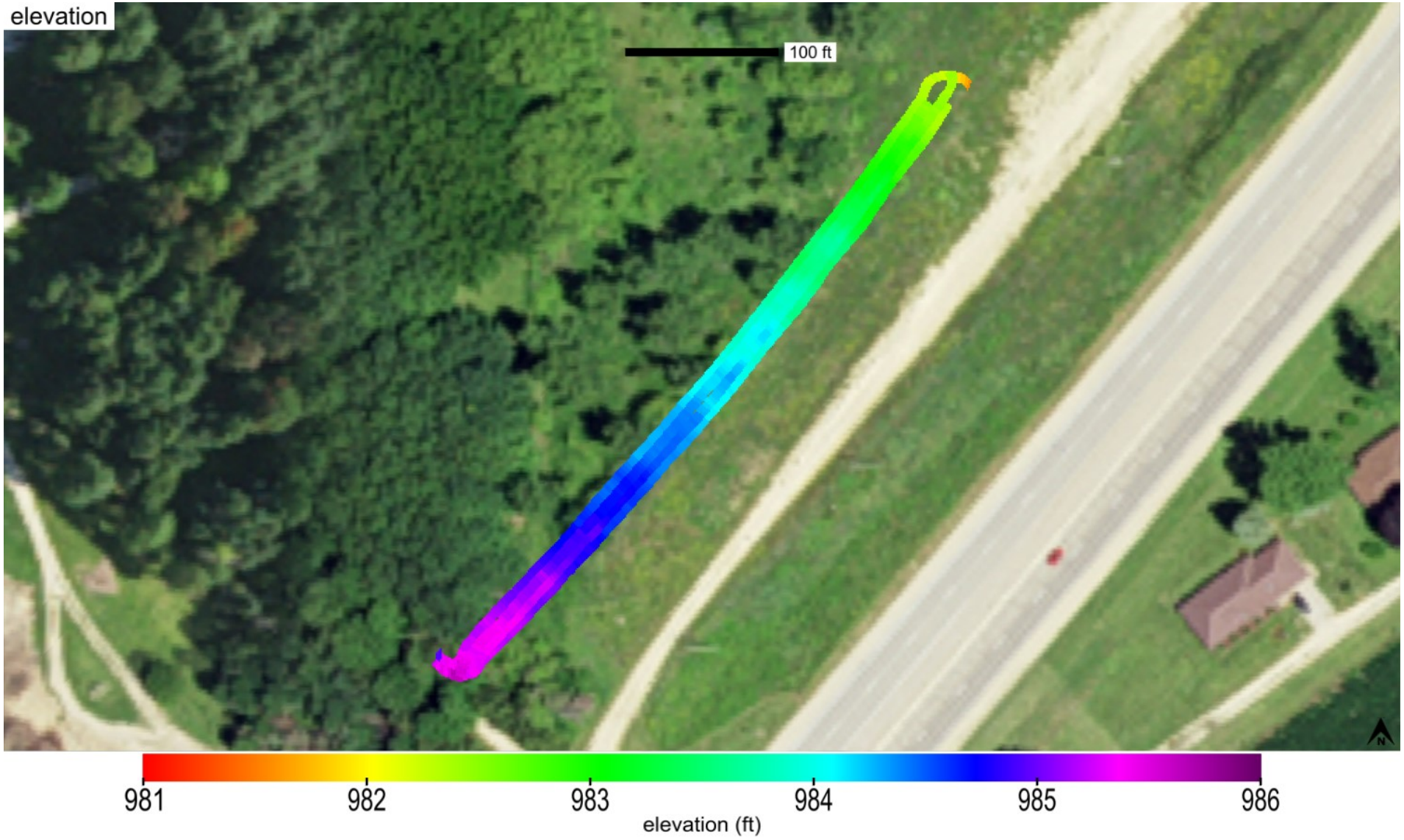
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

minimum	average	maximum
981.56	984.083	985.68



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11770	0.27	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_153607a

20200929_164126.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_154325a	No. of Measurements:	12164	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:43:25 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	97.1	110.08	0.88	9037	5643.89	18876.3	38871.68	6421.6	34.02	-3393.11	9839.3	29834.68
k-value	Yes	11.7	27.95	0.43	150	20	116.5	187.52	31.96	27.43	-130	-33.5	37.52
Moisture Content	No												

Mapped Area

square feet	acres
12164	0.28

Pass Count

min.	avg.	max.
1	1.2	4

Elevation (ft)

min.	avg.	max.
981.59	984.09	985.7

Velocity (fps)

min.	avg.	max.
0.42	5.47	6.69

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	12164	0.279	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_154325a	No. of Measurements:	12164	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:43:25 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
110.08	CQI > = 95
97.1	80% of Resilient Modulus MVs >= 9037
34.02	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_154325a	No. of Measurements:	12164	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:43:25 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
27.95	CQI > = 95
11.7	80% of k-Value MVs >= 150
27.43	COV <= 20
99.67	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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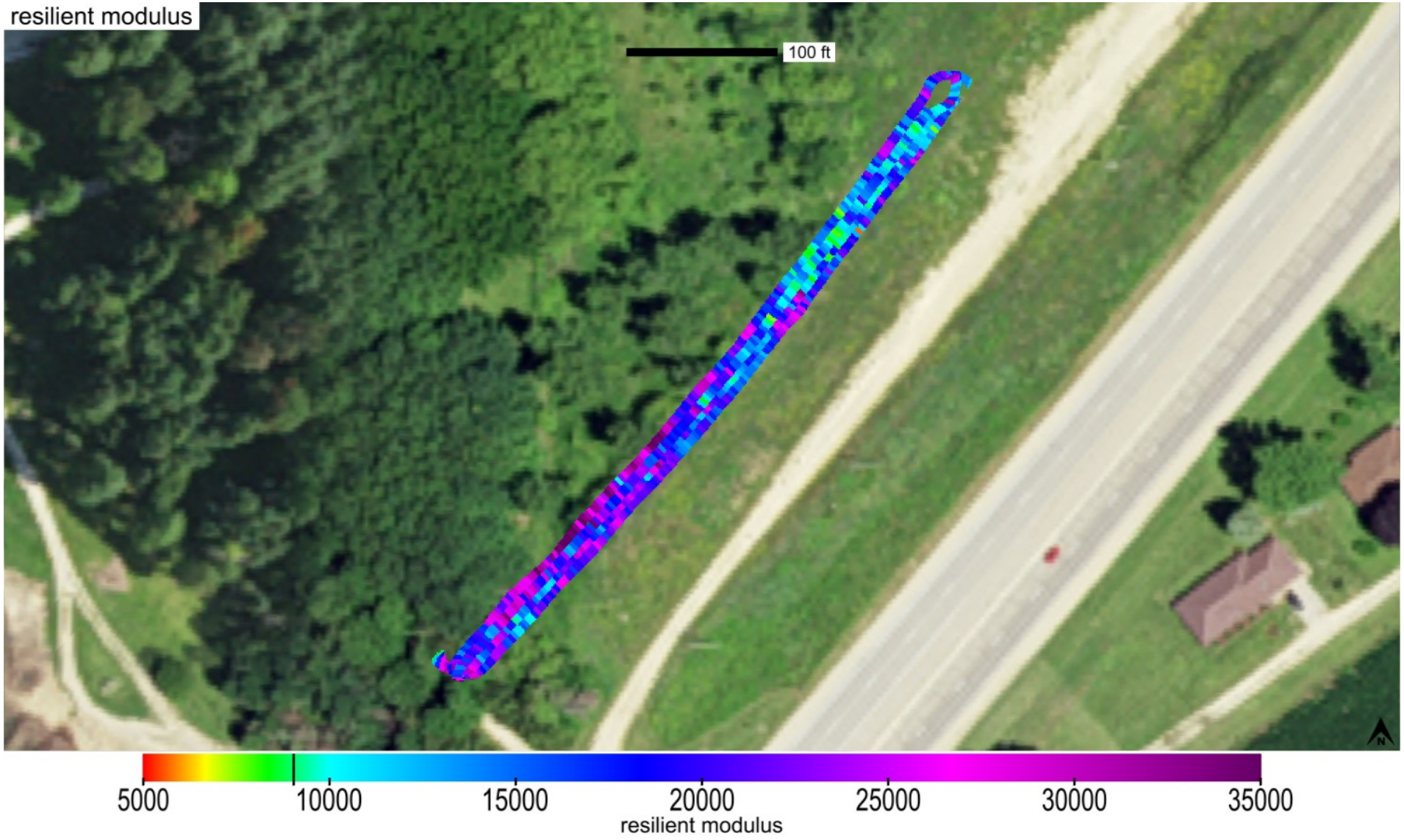
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	97.1	110.08	0.88	9037	5643.89	18876.3	38871.68	6421.6	34.02	-3393.11	9839.3	29834.68



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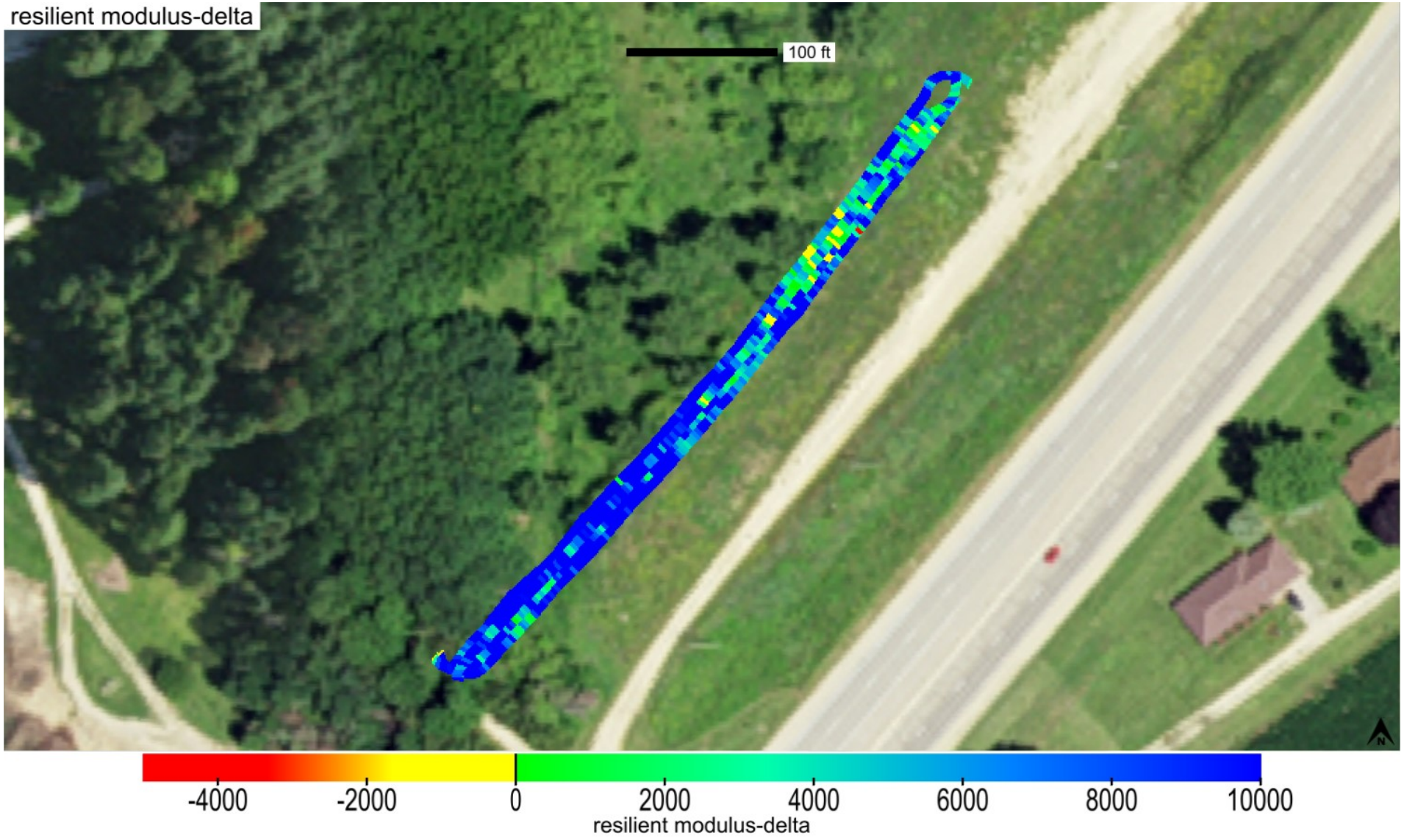
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	97.1	110.08	0.88	9037	5643.89	18876.3	38871.68	6421.6	34.02	-3393.11	9839.3	29834.68



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	97.1	9037	-3393.11	9839.3	29834.68	1785.84	9660.07	21552.39

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

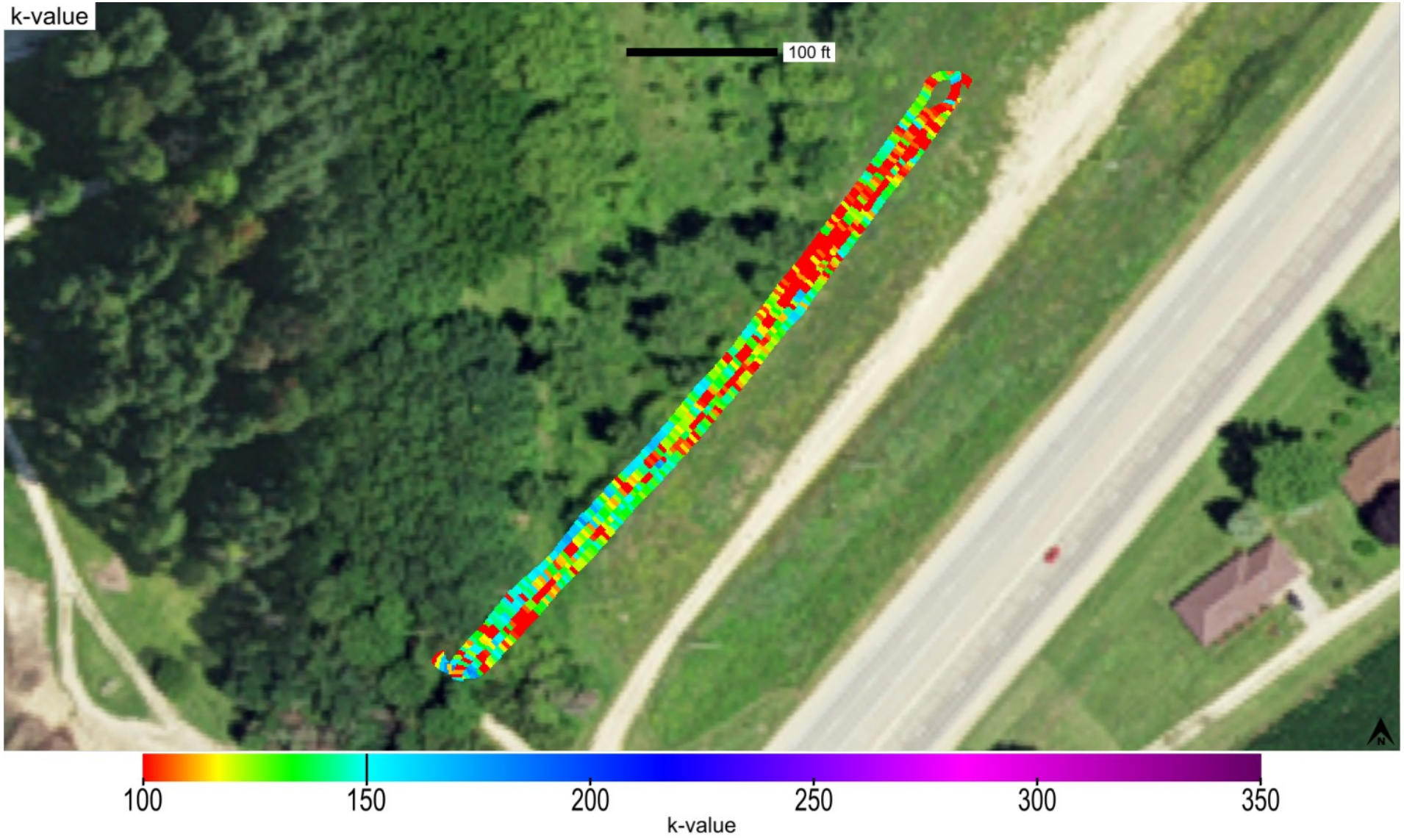
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	11.7	27.95	0.43	150	20	116.5	187.52	31.96	27.43	-130	-33.5	37.52



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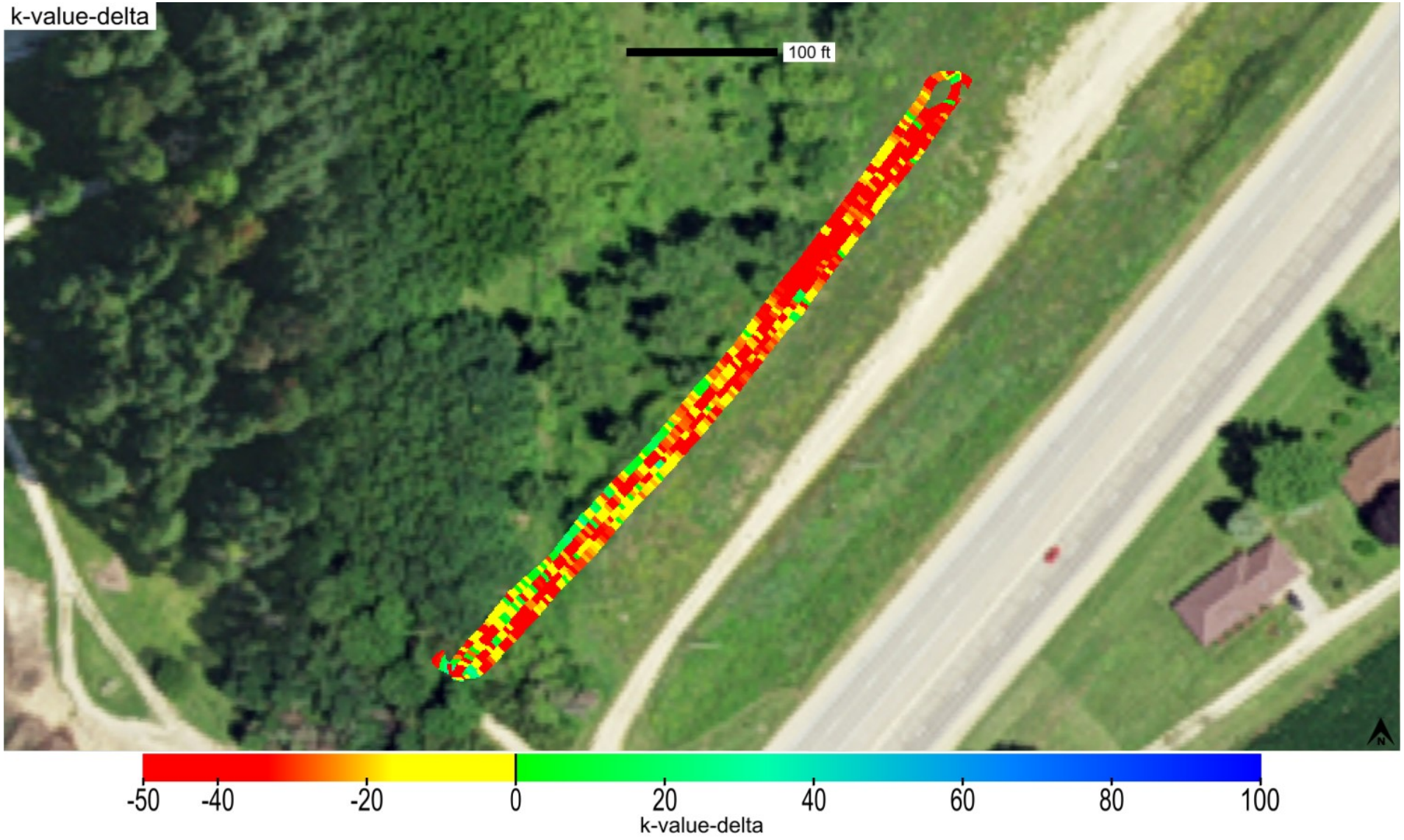
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

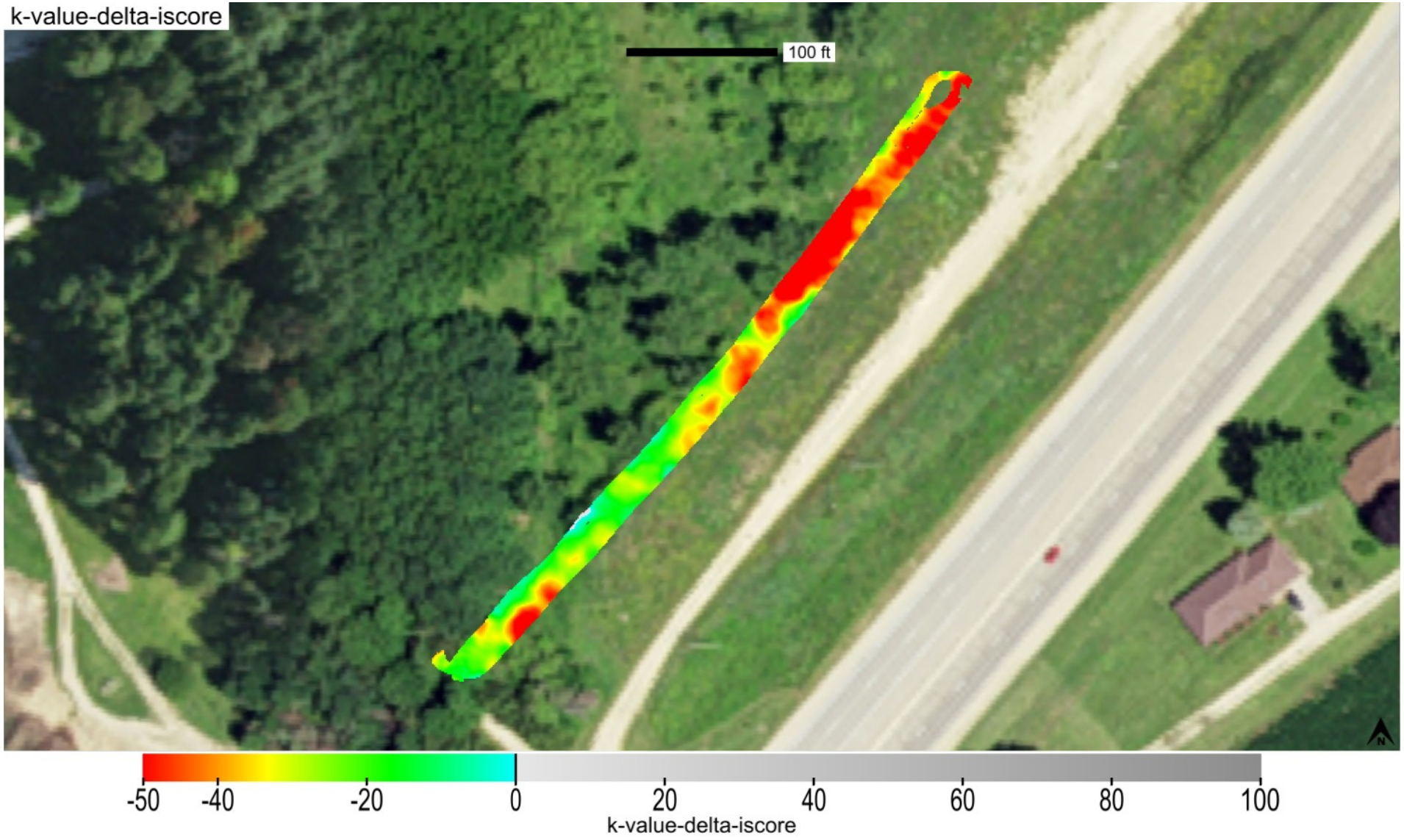
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	11.7	27.95	0.43	150	20	116.5	187.52	31.96	27.43	-130	-33.5	37.52



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	11.7	150	-130	-33.5	37.52	-83.61	-34.43	3.77



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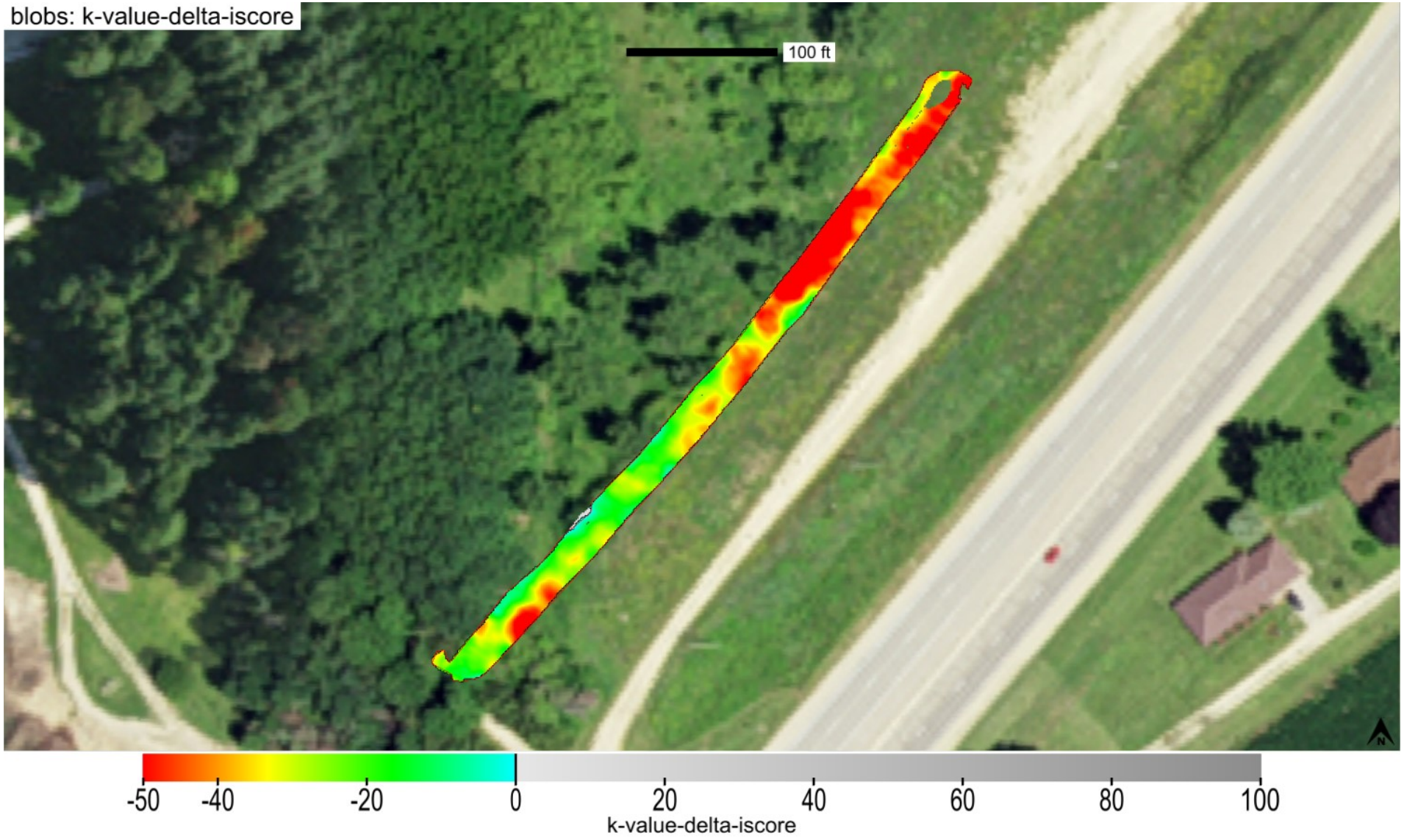
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	12124	99.67	none	0



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

minimum	average	maximum
1	1.2	4

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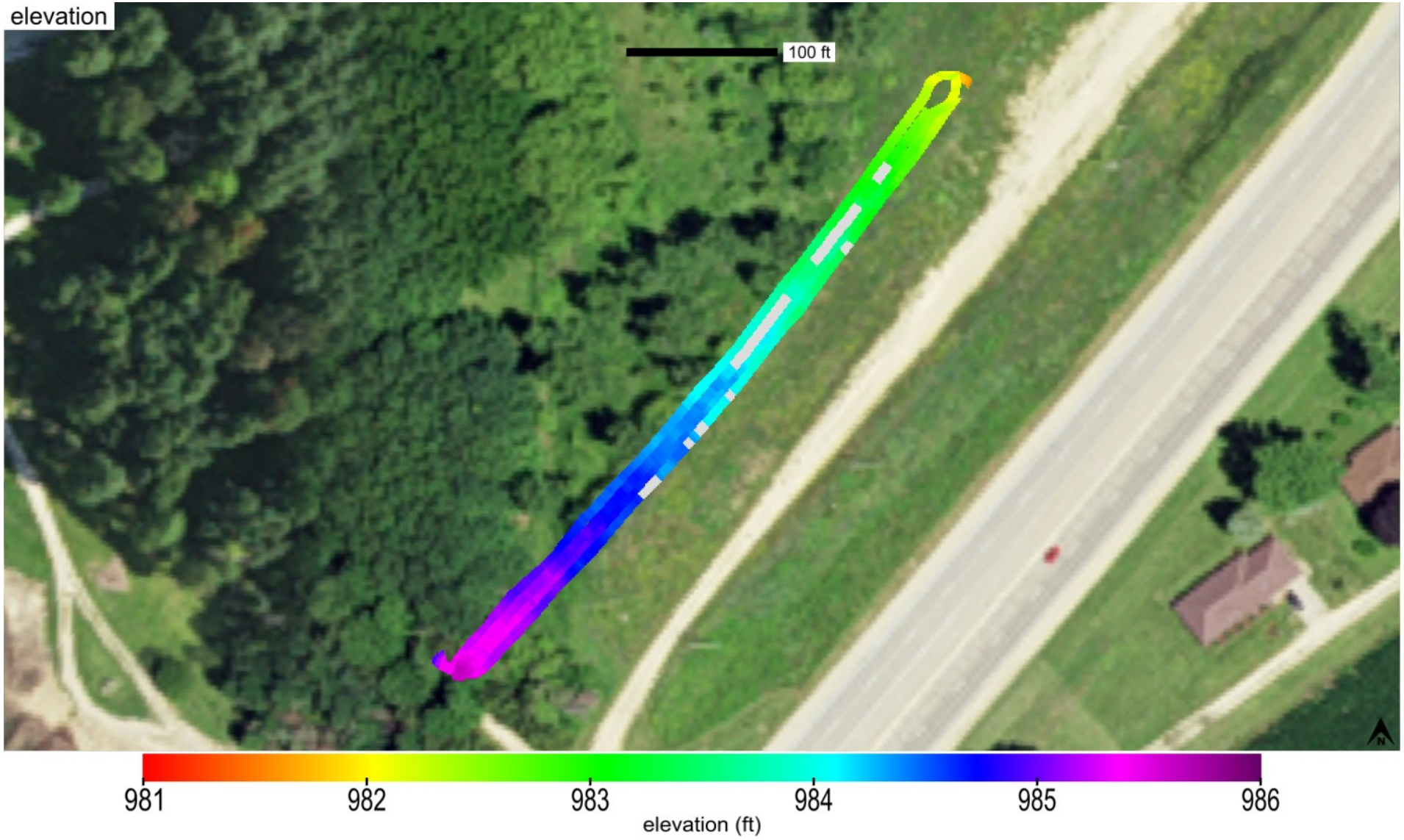
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

minimum	average	maximum
981.586	984.092	985.7



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	12164	0.279	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_154325a

20200929_164126.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_155054a	No. of Measurements:	11442	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:50:54 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	94.6	107.42	0.86	9037	6190.23	17708.6	37723.16	6083.03	34.35	-2846.77	8671.6	28686.16
k-value	Yes	7.7	23.19	0.36	150	20	109.9	186.53	31.91	29.04	-130	-40.1	36.53
Moisture Content	No												

Mapped Area

square feet	acres
11442	0.26

Pass Count

min.	avg.	max.
1	1.24	3

Elevation (ft)

min.	avg.	max.
981.76	984.07	985.67

Velocity (fps)

min.	avg.	max.
0.79	5.46	6.34

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11442	0.263	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_155054a	No. of Measurements:	11442	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:50:54 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
107.42	CQI > = 95
94.6	80% of Resilient Modulus MVs >= 9037
34.35	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_155054a	No. of Measurements:	11442	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:50:54 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
23.19	CQI > = 95
7.7	80% of k-Value MVs >= 150
29.04	COV <= 20
99.07	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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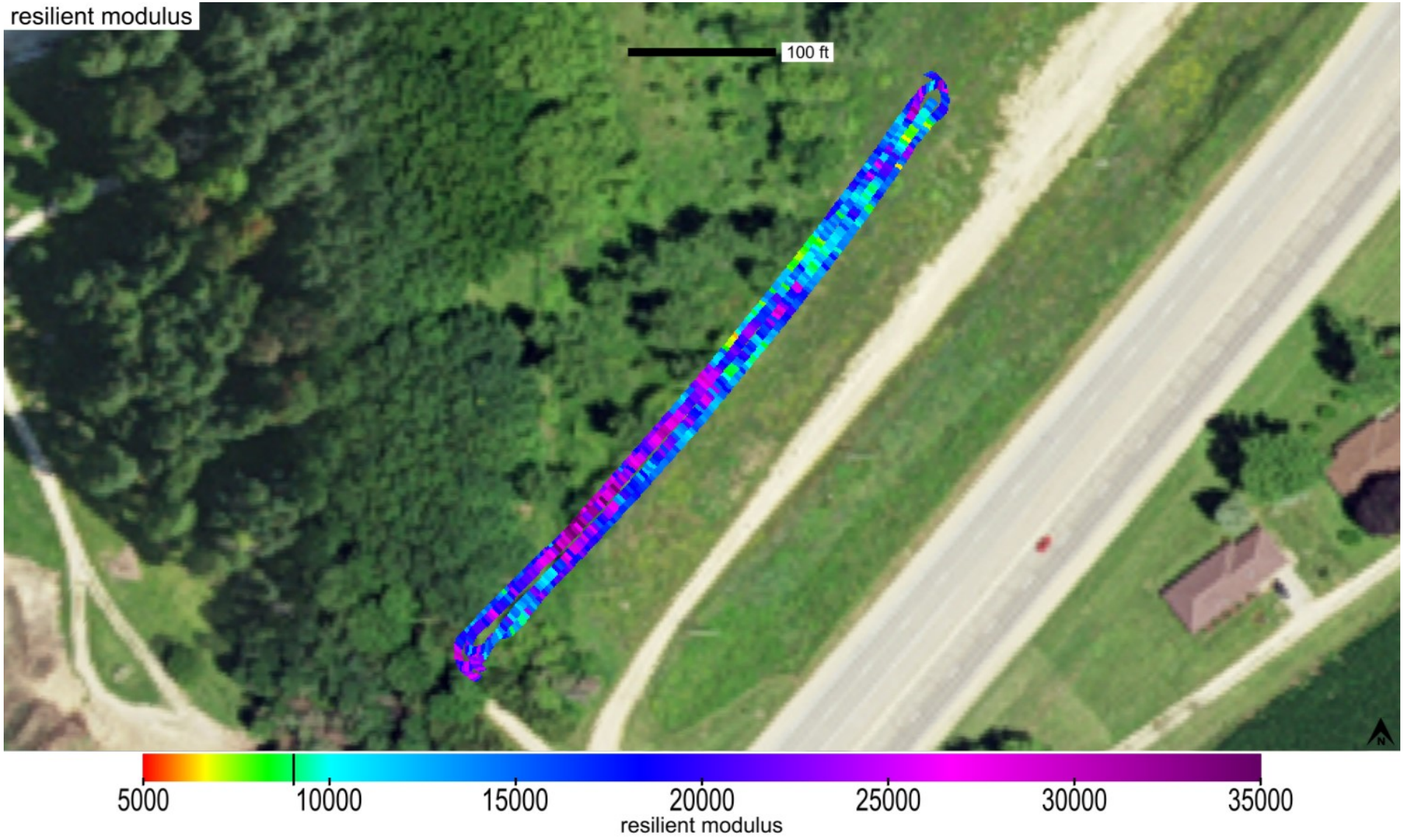
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.6	107.42	0.86	9037	6190.23	17708.6	37723.16	6083.03	34.35	-2846.77	8671.6	28686.16



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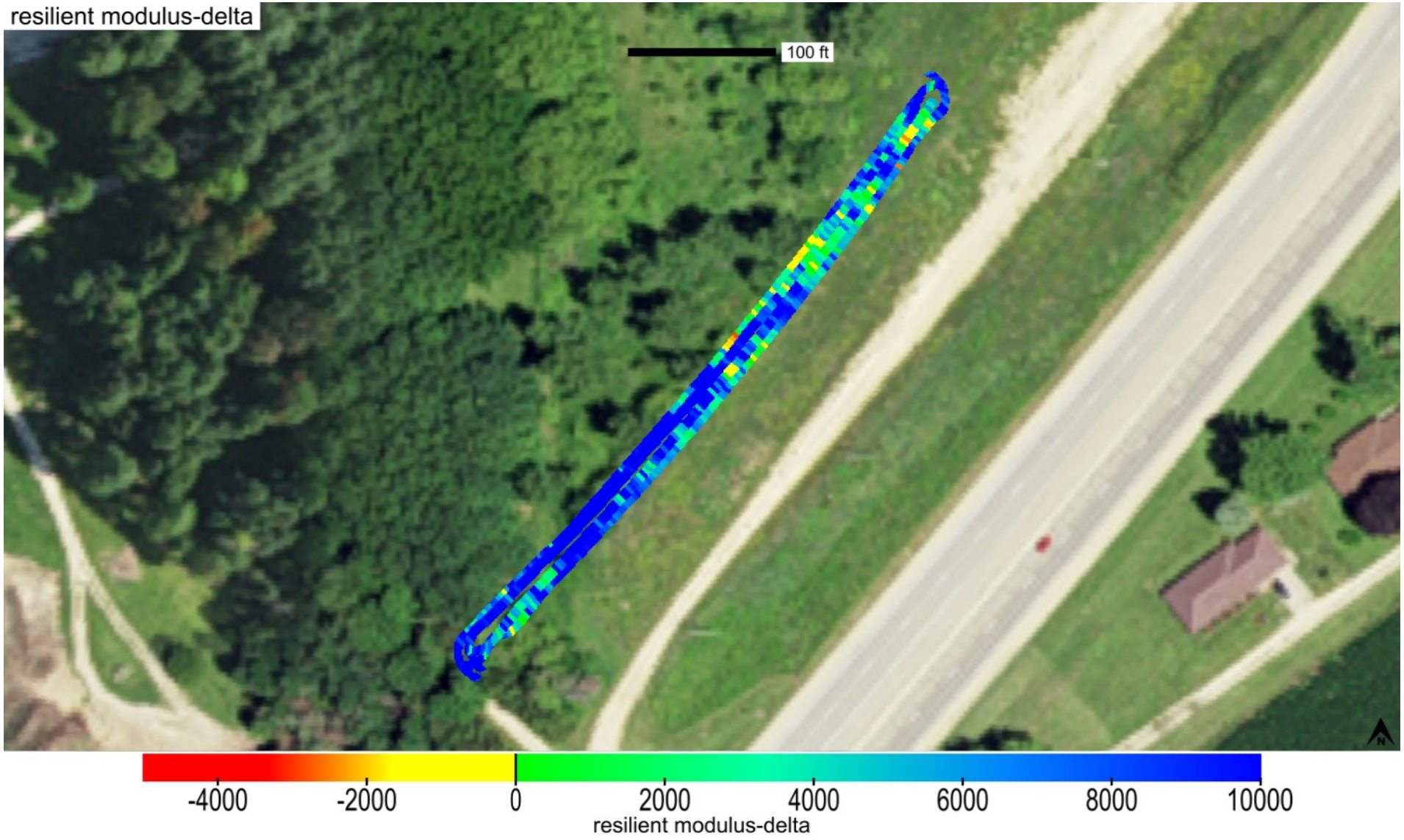
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.6	107.42	0.86	9037	6190.23	17708.6	37723.16	6083.03	34.35	-2846.77	8671.6	28686.16



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	94.6	9037	-2846.77	8671.6	28686.16	112.62	8770.62	22599.19

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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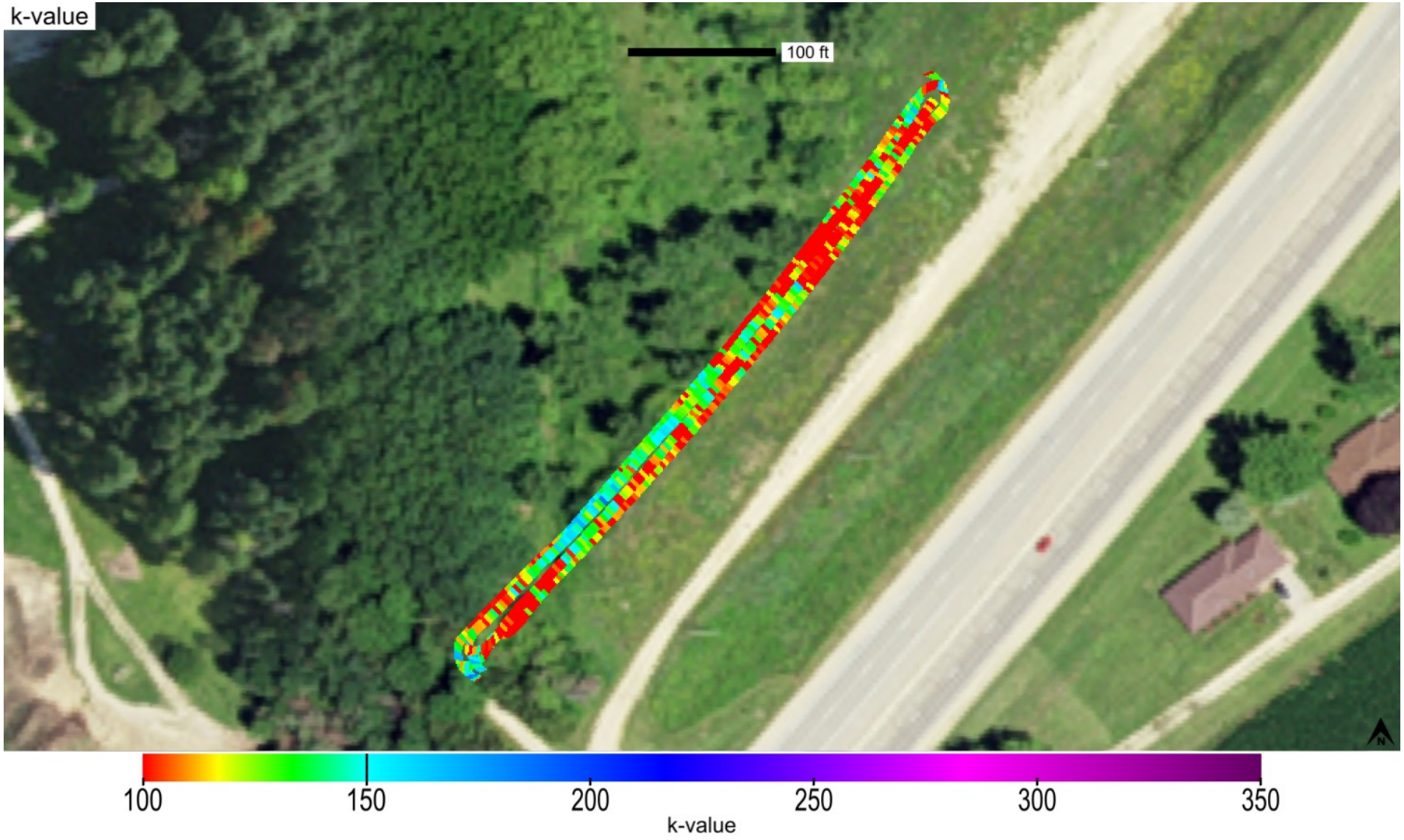
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	7.7	23.19	0.36	150	20	109.9	186.53	31.91	29.04	-130	-40.1	36.53



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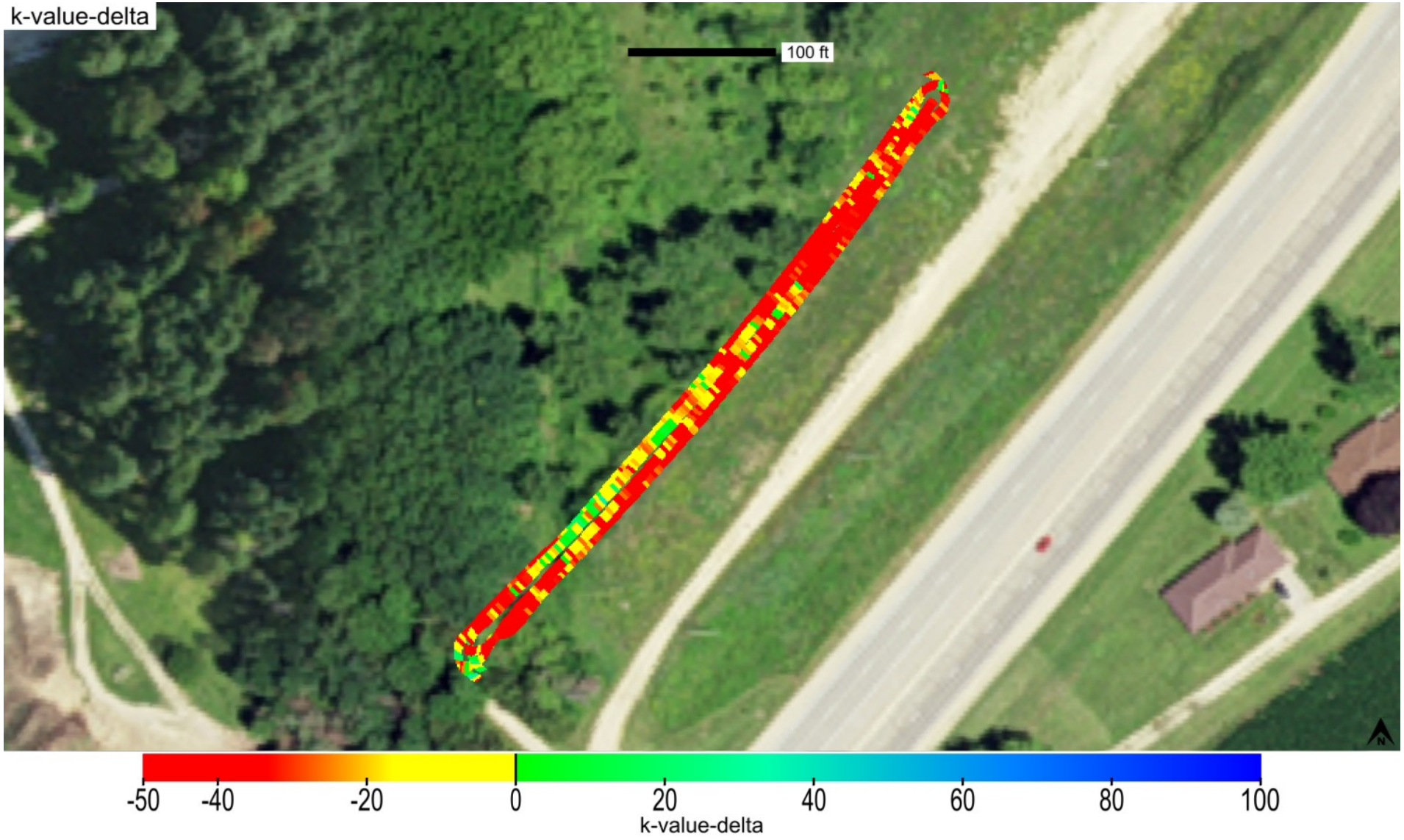
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	7.7	23.19	0.36	150	20	109.9	186.53	31.91	29.04	-130	-40.1	36.53



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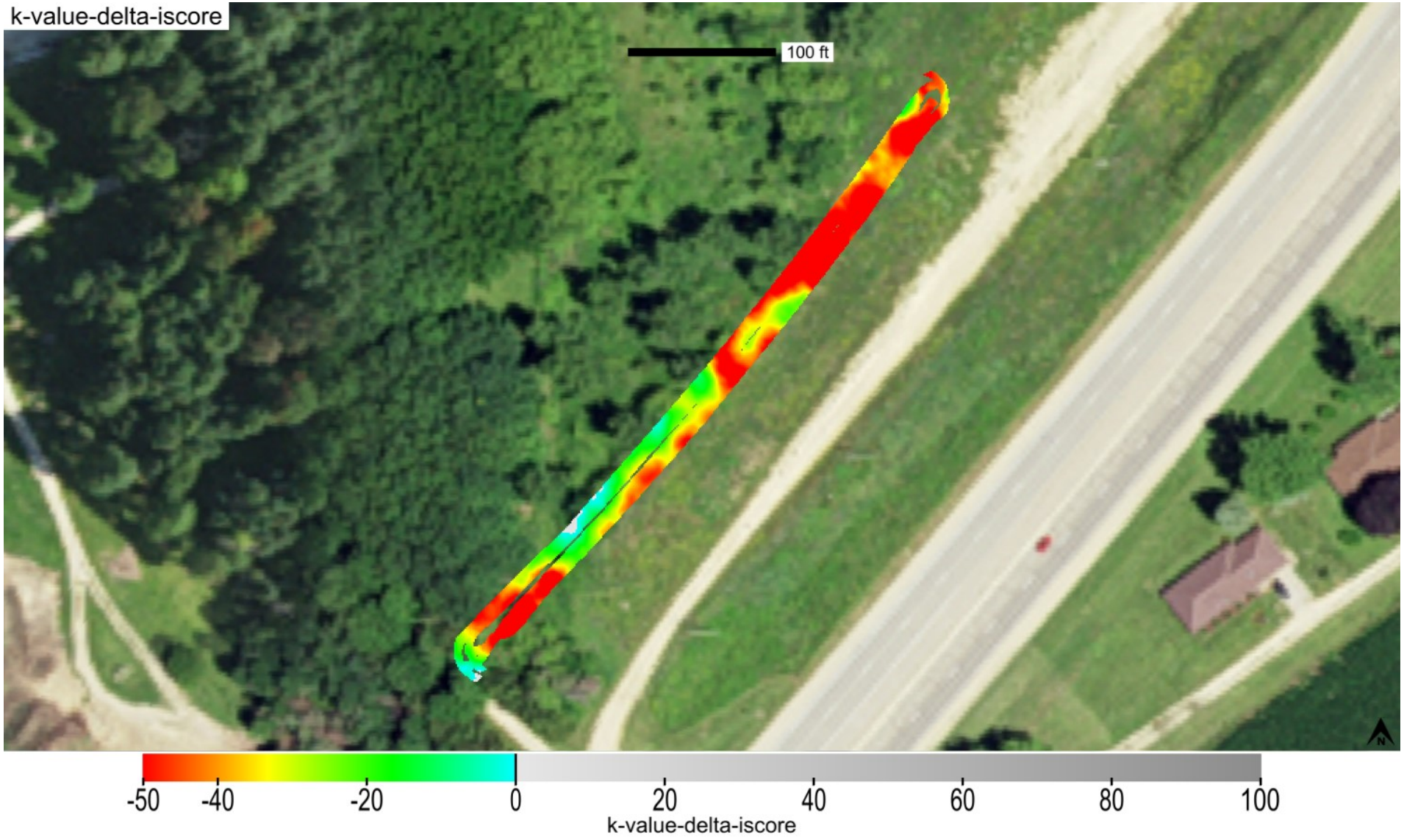
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	7.7	150	-130	-40.1	36.53	-90.6	-40.07	6.07



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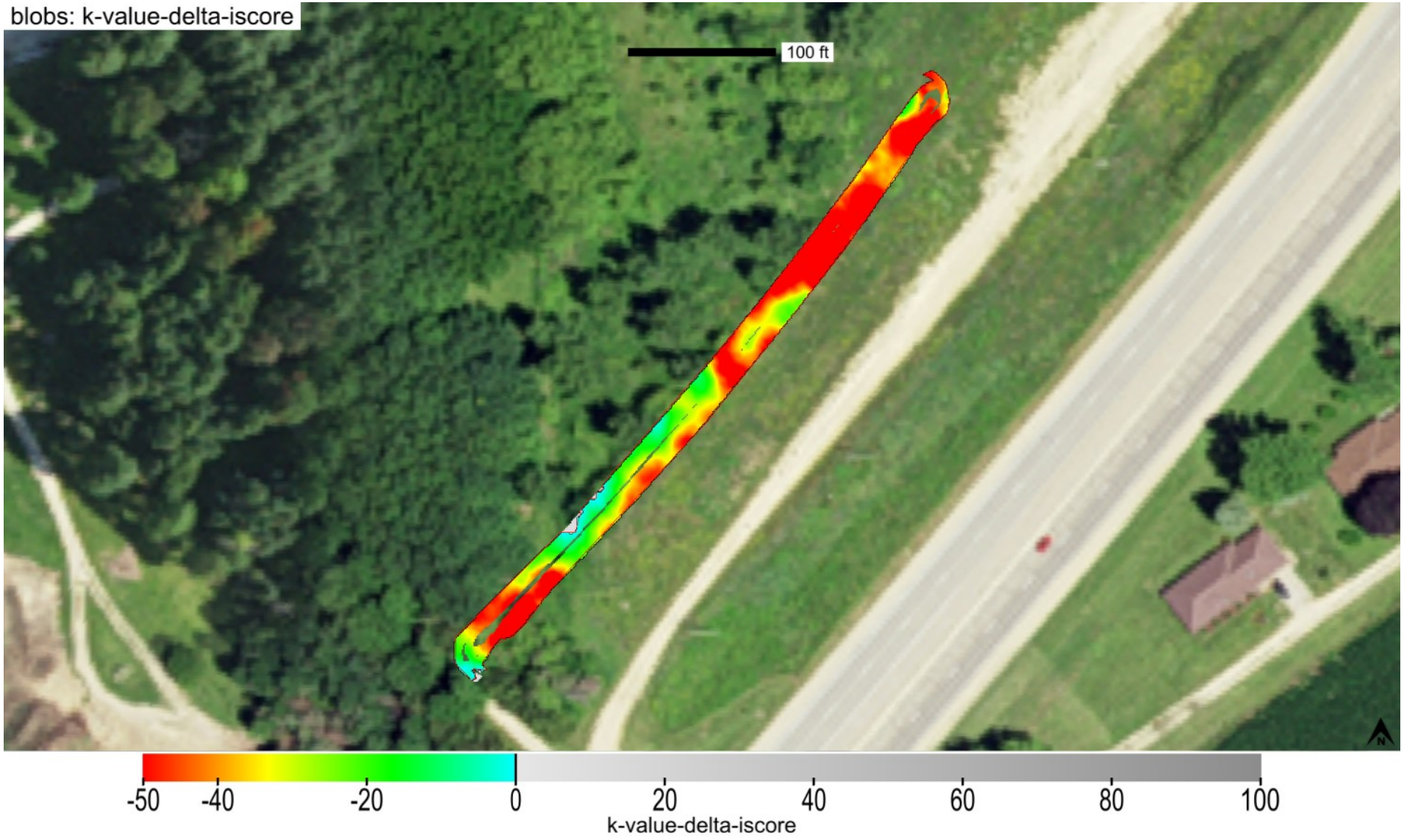
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	11336	99.07	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

minimum	average	maximum
1	1.24	3

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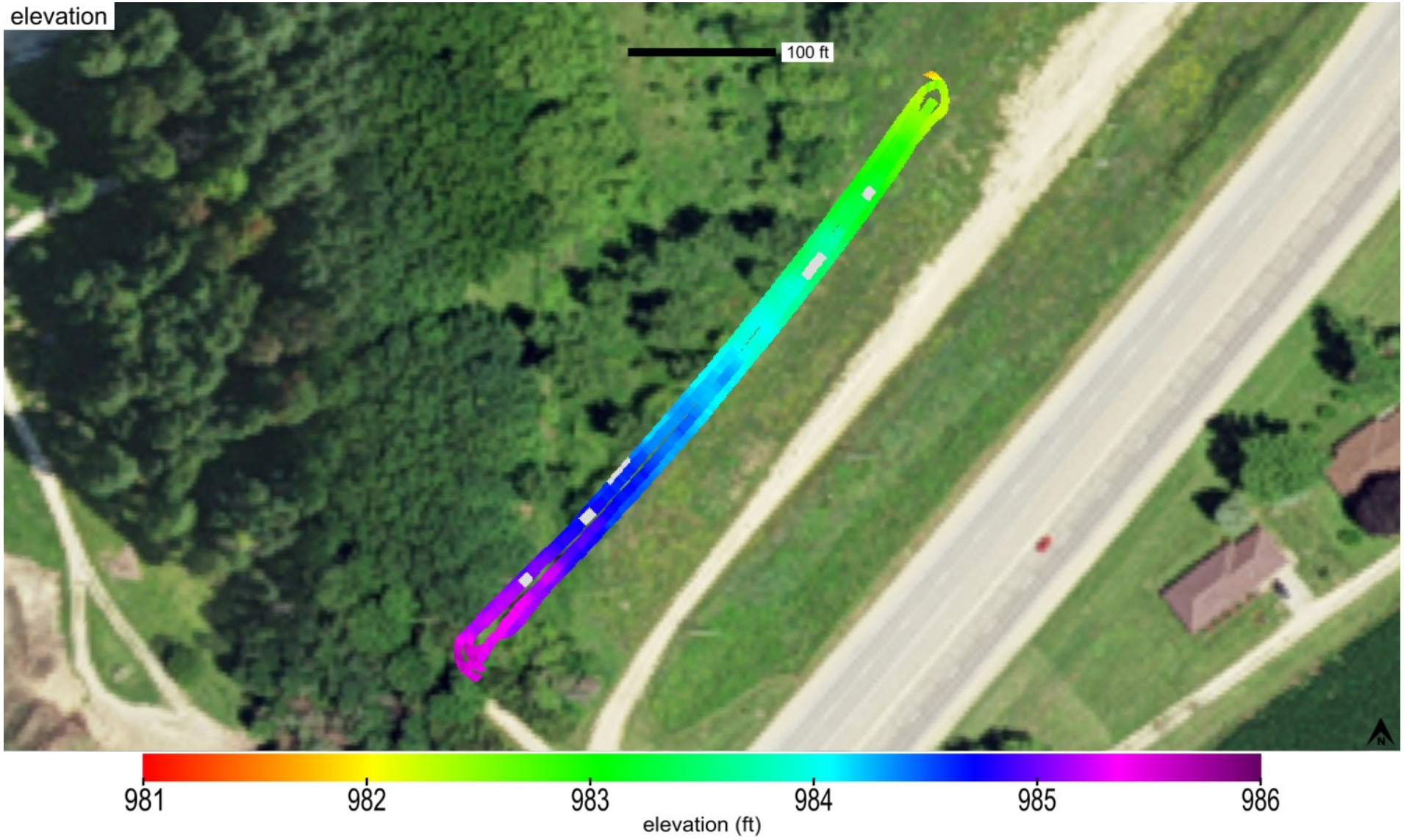
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

minimum	average	maximum
981.757	984.073	985.671



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11442	0.263	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155054a

20200929_164126.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_155811a	No. of Measurements:	11714	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:58:11 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	94.8	106.65	0.81	9037	6152.68	17179.5	37044.99	6219.75	36.2	-2884.32	8142.5	28007.99
k-value	Yes	8.4	22.94	0.33	150	20	108.5	177.19	33.51	30.89	-130	-41.5	27.19
Moisture Content	No												

Mapped Area

square feet	acres
11714	0.27

Pass Count

min.	avg.	max.
1	1.23	4

Elevation (ft)

min.	avg.	max.
981.71	984.12	985.71

Velocity (fps)

min.	avg.	max.
1.06	5.48	6.35

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11714	0.269	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_155811a	No. of Measurements:	11714	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:58:11 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
106.65	CQI > = 95
94.8	80% of Resilient Modulus MVs >= 9037
36.2	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_155811a	No. of Measurements:	11714	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:58:11 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
22.94	CQI > = 95
8.4	80% of k-Value MVs >= 150
30.89	COV <= 20
99.67	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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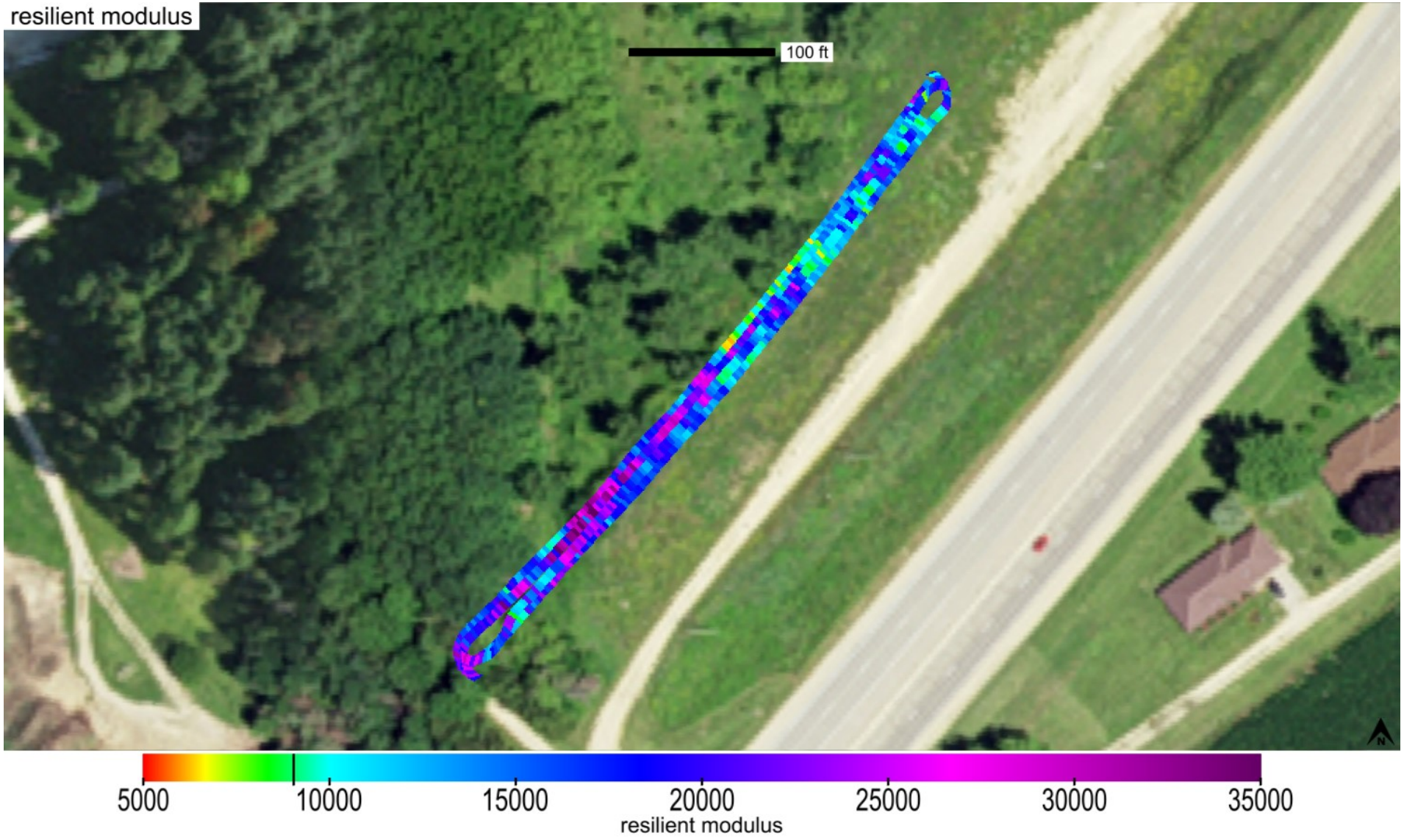
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.8	106.65	0.81	9037	6152.68	17179.5	37044.99	6219.75	36.2	-2884.32	8142.5	28007.99



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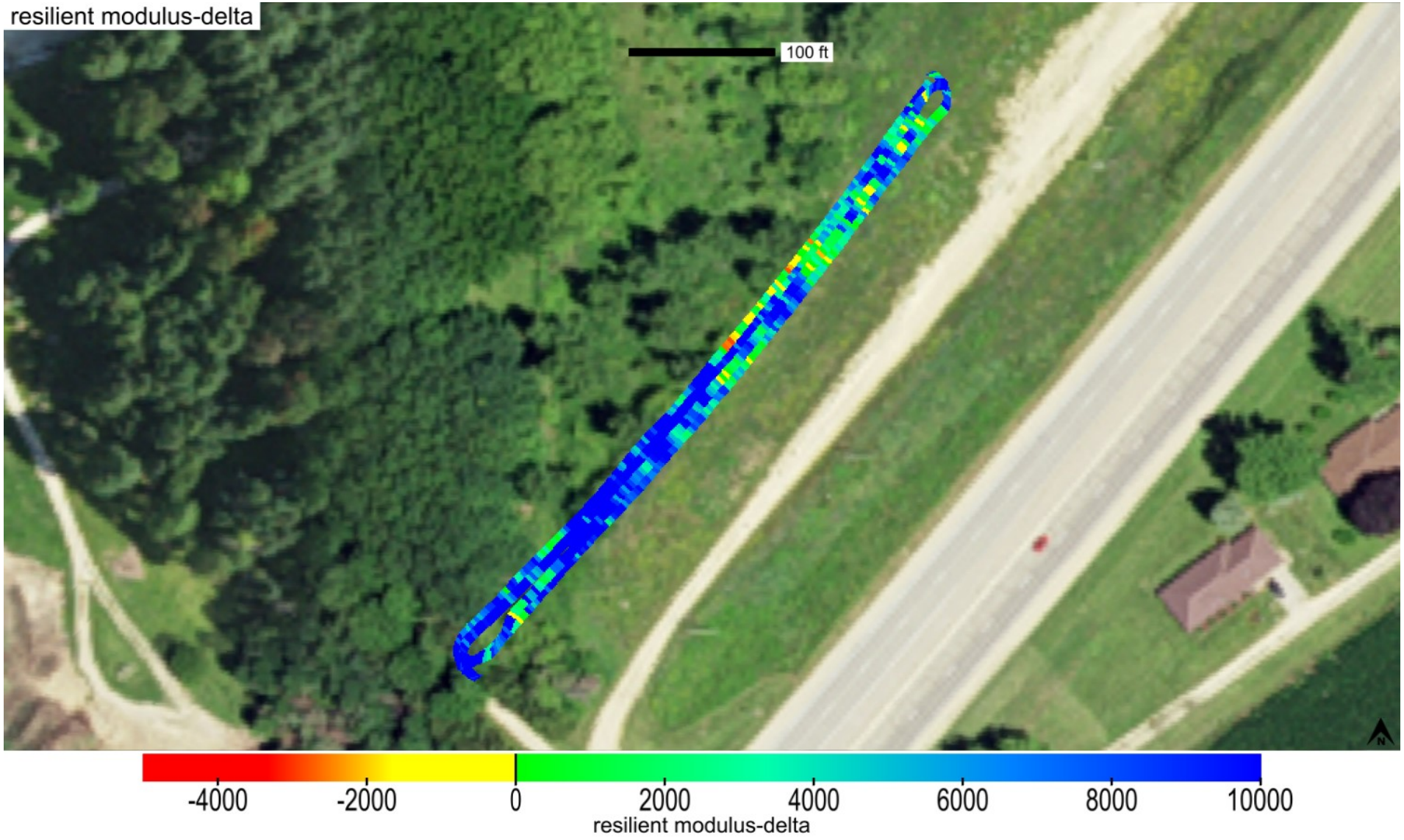
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.8	106.65	0.81	9037	6152.68	17179.5	37044.99	6219.75	36.2	-2884.32	8142.5	28007.99



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	94.8	9037	-2884.32	8142.5	28007.99	447.81	8294.6	21464.5

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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

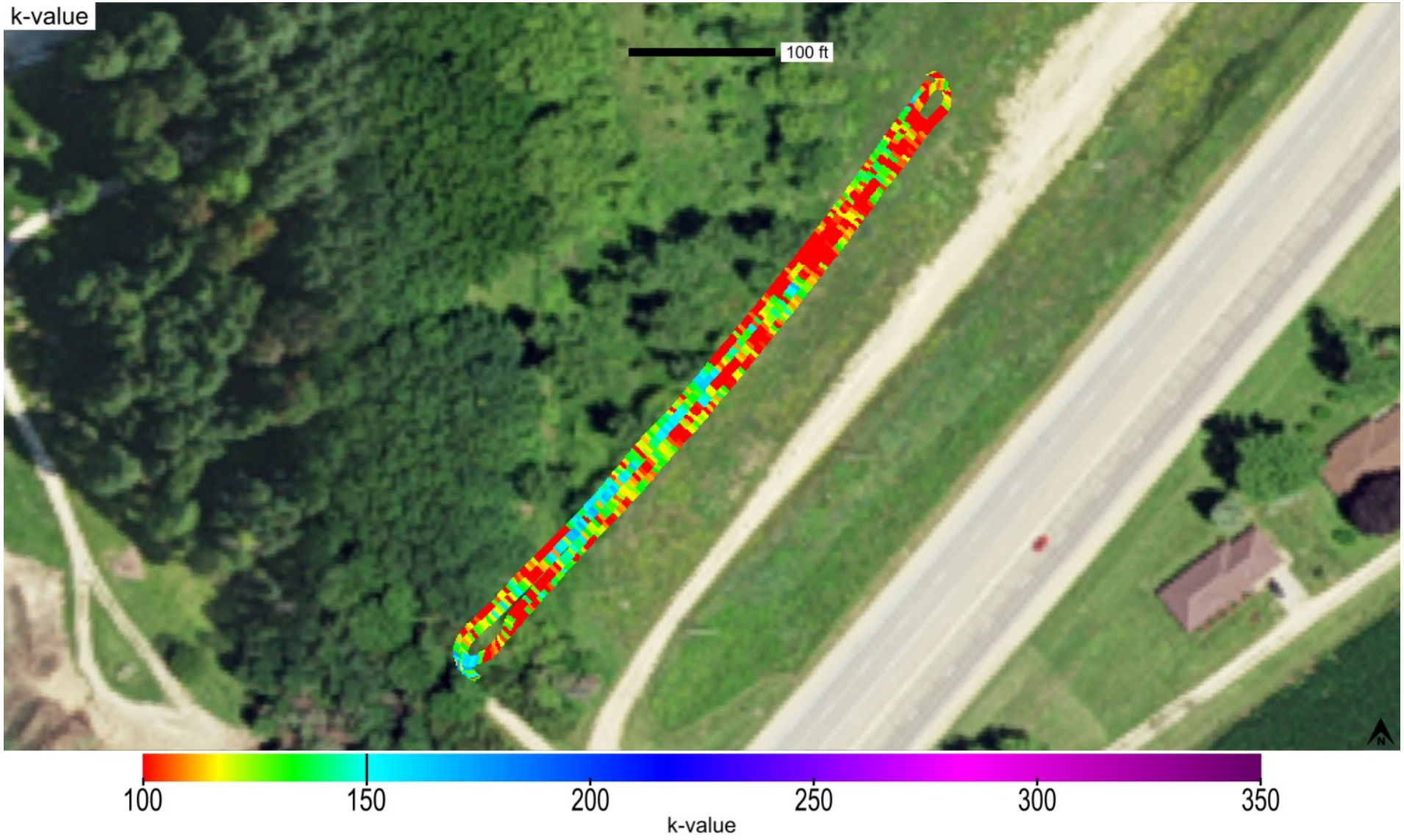
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.4	22.94	0.33	150	20	108.5	177.19	33.51	30.89	-130	-41.5	27.19



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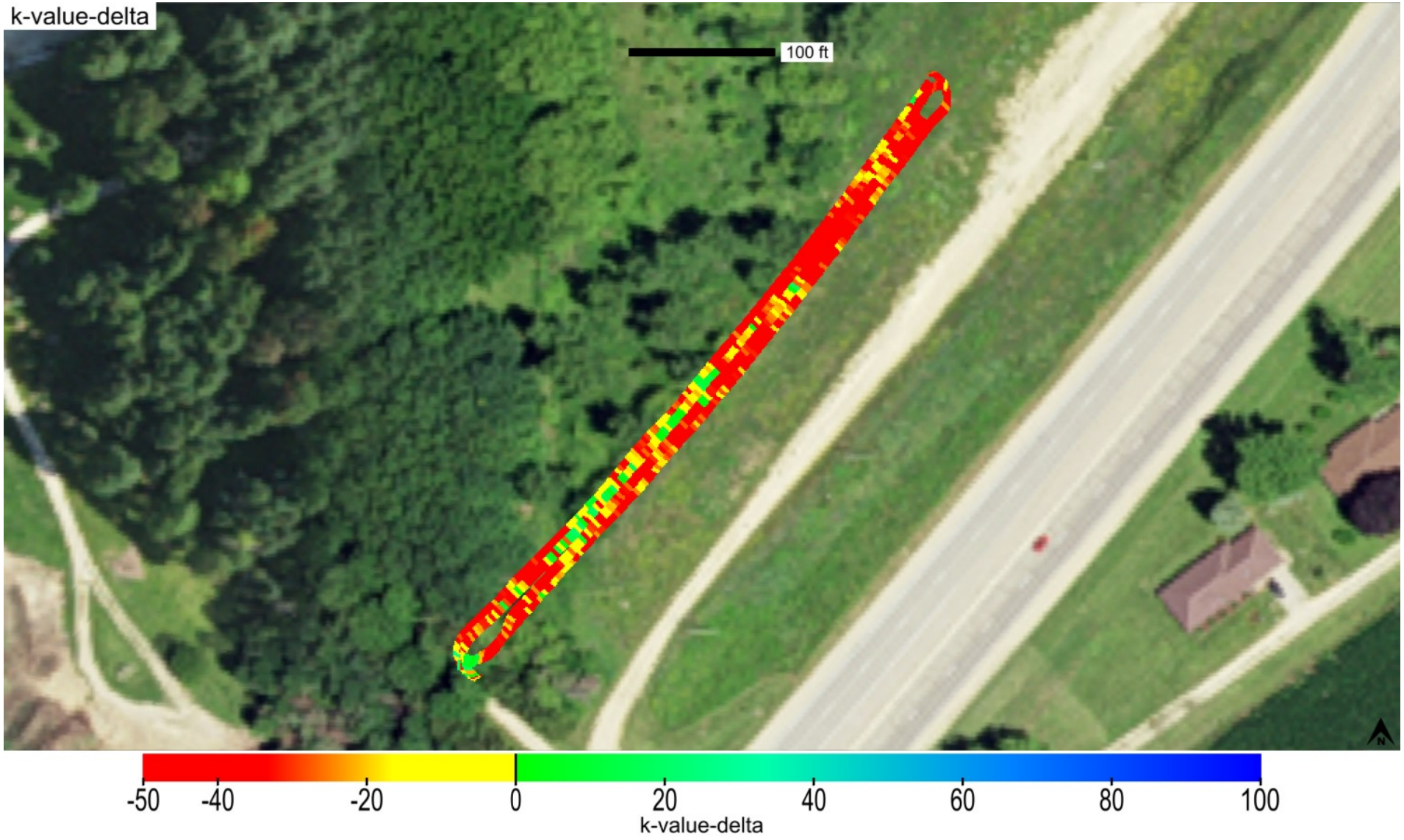
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

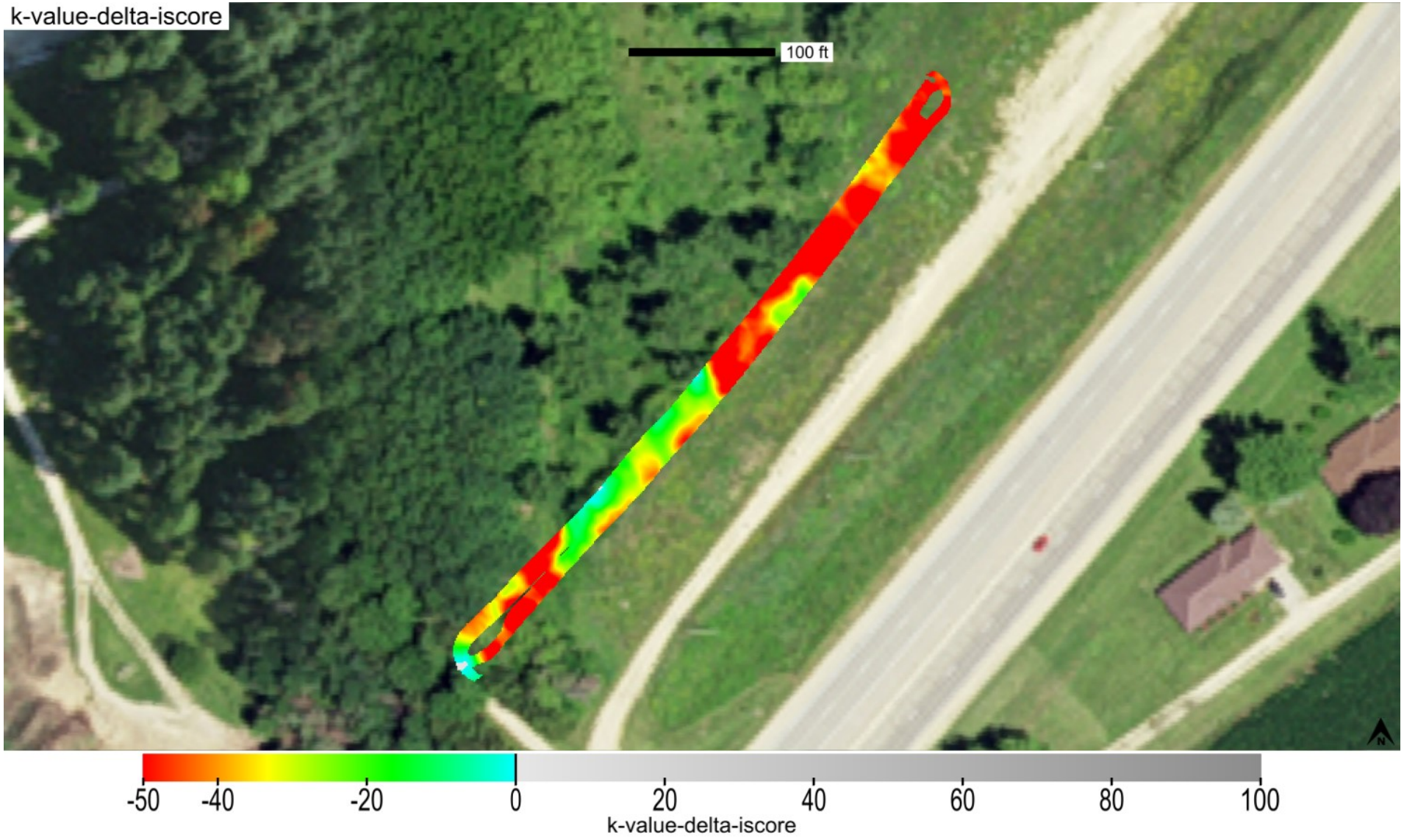
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.4	22.94	0.33	150	20	108.5	177.19	33.51	30.89	-130	-41.5	27.19



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.4	150	-130	-41.5	27.19	-96.81	-41.28	2.53



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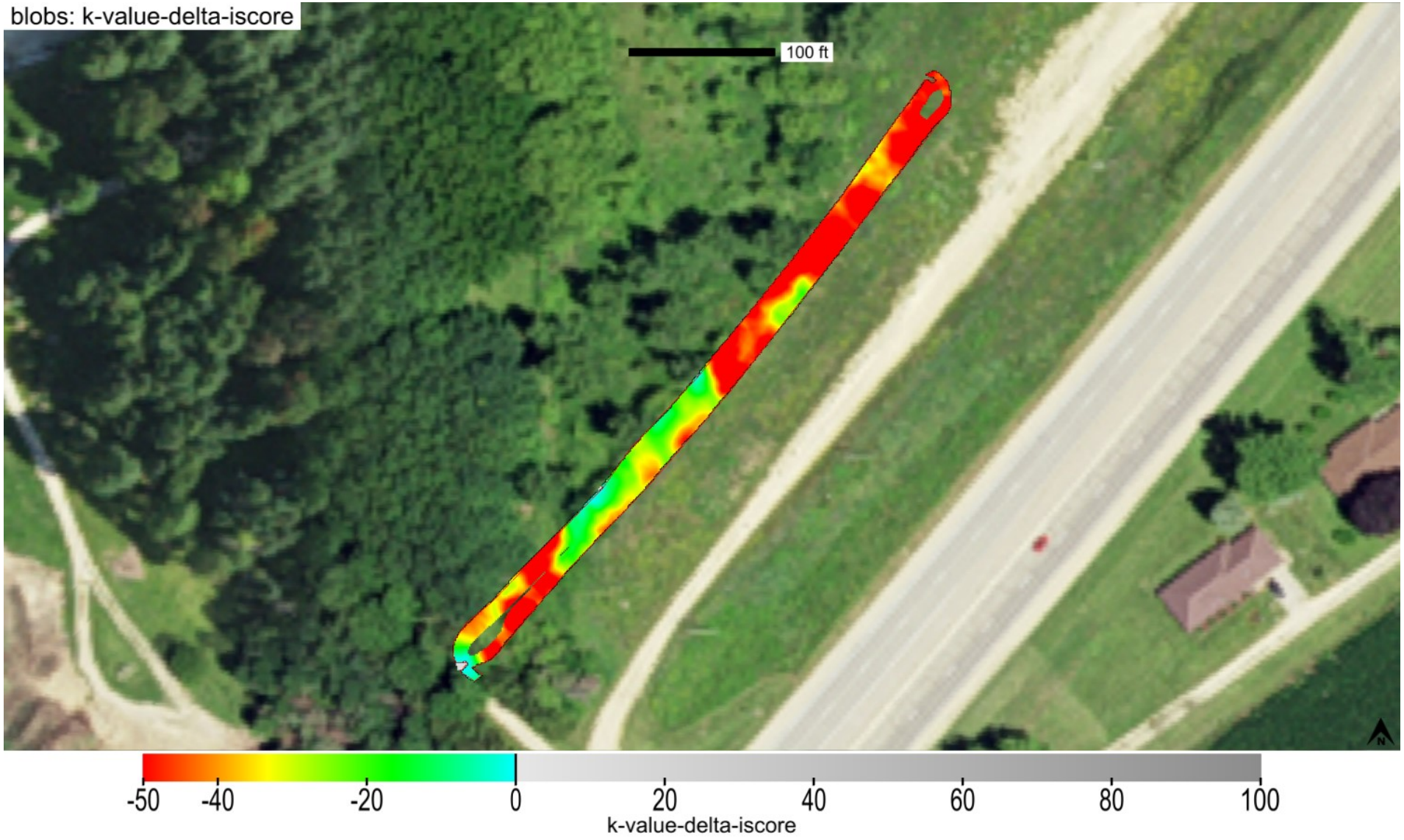
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	11675	99.67	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

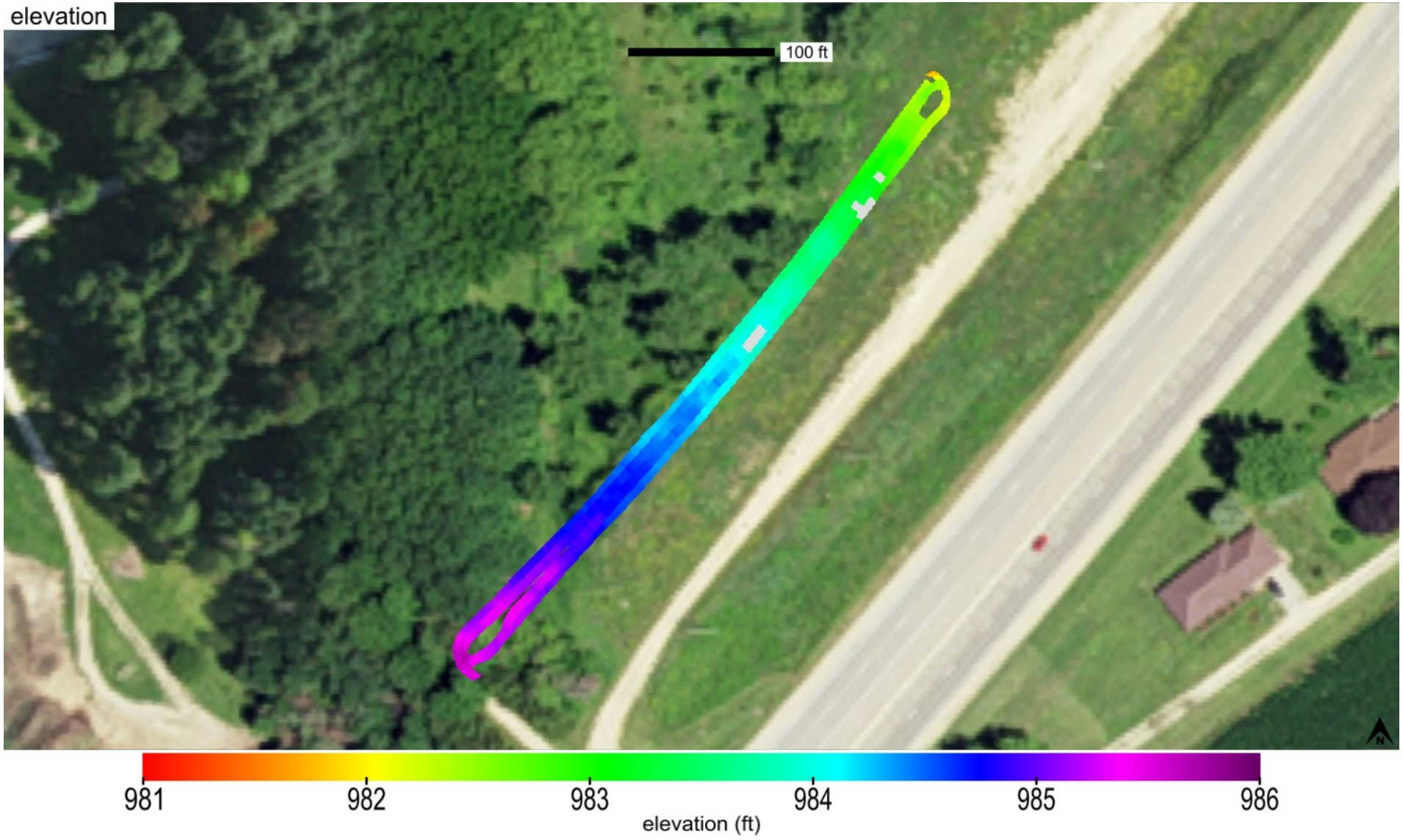
minimum	average	maximum
1	1.23	4

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

minimum	average	maximum
981.711	984.117	985.71



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11714	0.269	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_155811a

20200929_164126.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_160539a	No. of Measurements:	11871	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:05:39 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	94.7	107.54	0.86	9037	6308.16	17353.8	37159.96	5942.77	34.24	-2728.84	8316.8	28122.96
k-value	Yes	8.7	24.25	0.37	150	20	110.9	190	32.06	28.91	-130	-39.1	40
Moisture Content	No												

Mapped Area

square feet	acres
11871	0.27

Pass Count

min.	avg.	max.
1	1.23	2

Elevation (ft)

min.	avg.	max.
981.65	984.12	985.69

Velocity (fps)

min.	avg.	max.
1.04	5.47	6.43

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11871	0.273	12	9037	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_160539a	No. of Measurements:	11871	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:05:39 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
107.54	CQI > = 95
94.7	80% of Resilient Modulus MVs >= 9037
34.24	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_160539a	No. of Measurements:	11871	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:05:39 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
24.25	CQI > = 95
8.7	80% of k-Value MVs >= 150
28.91	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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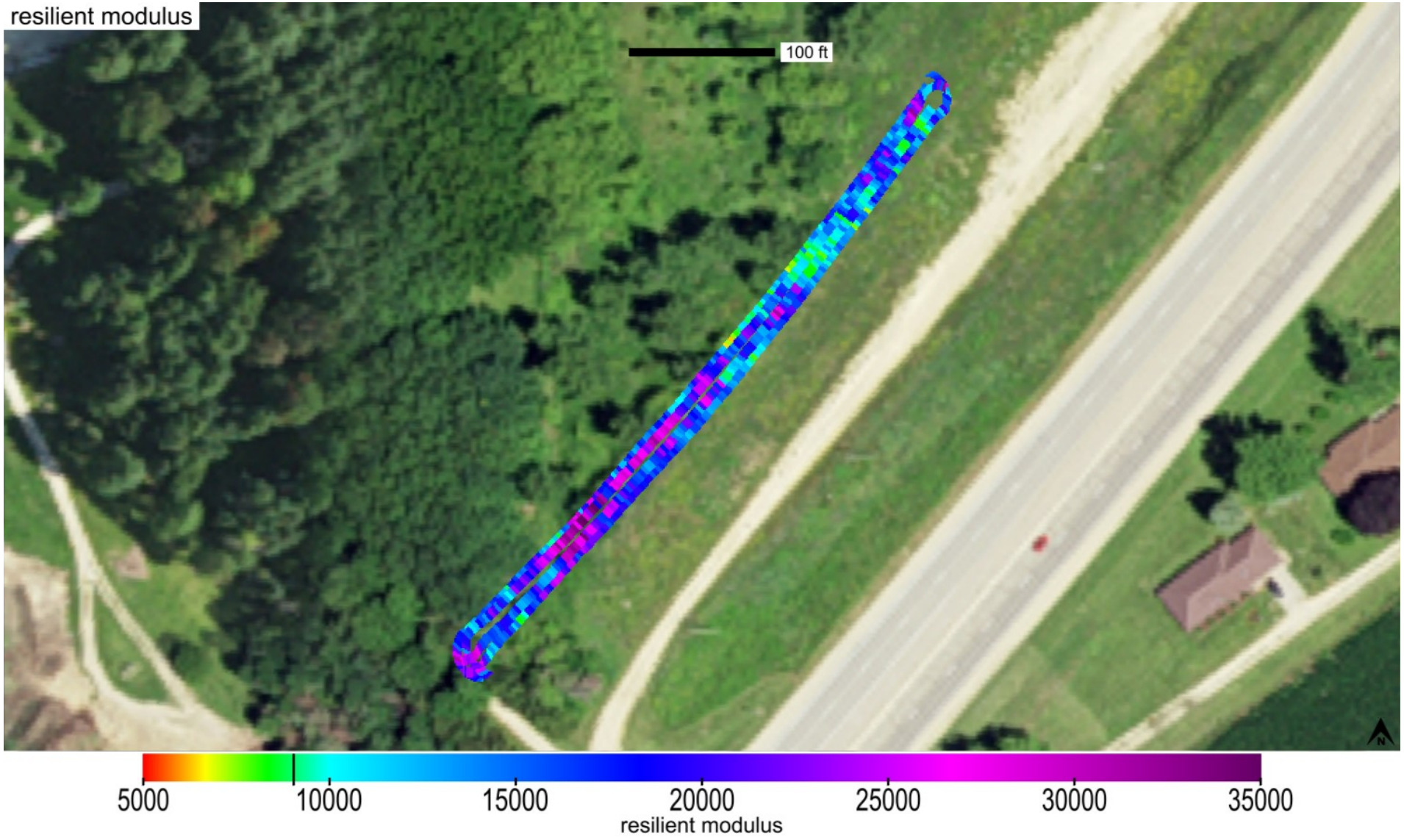
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

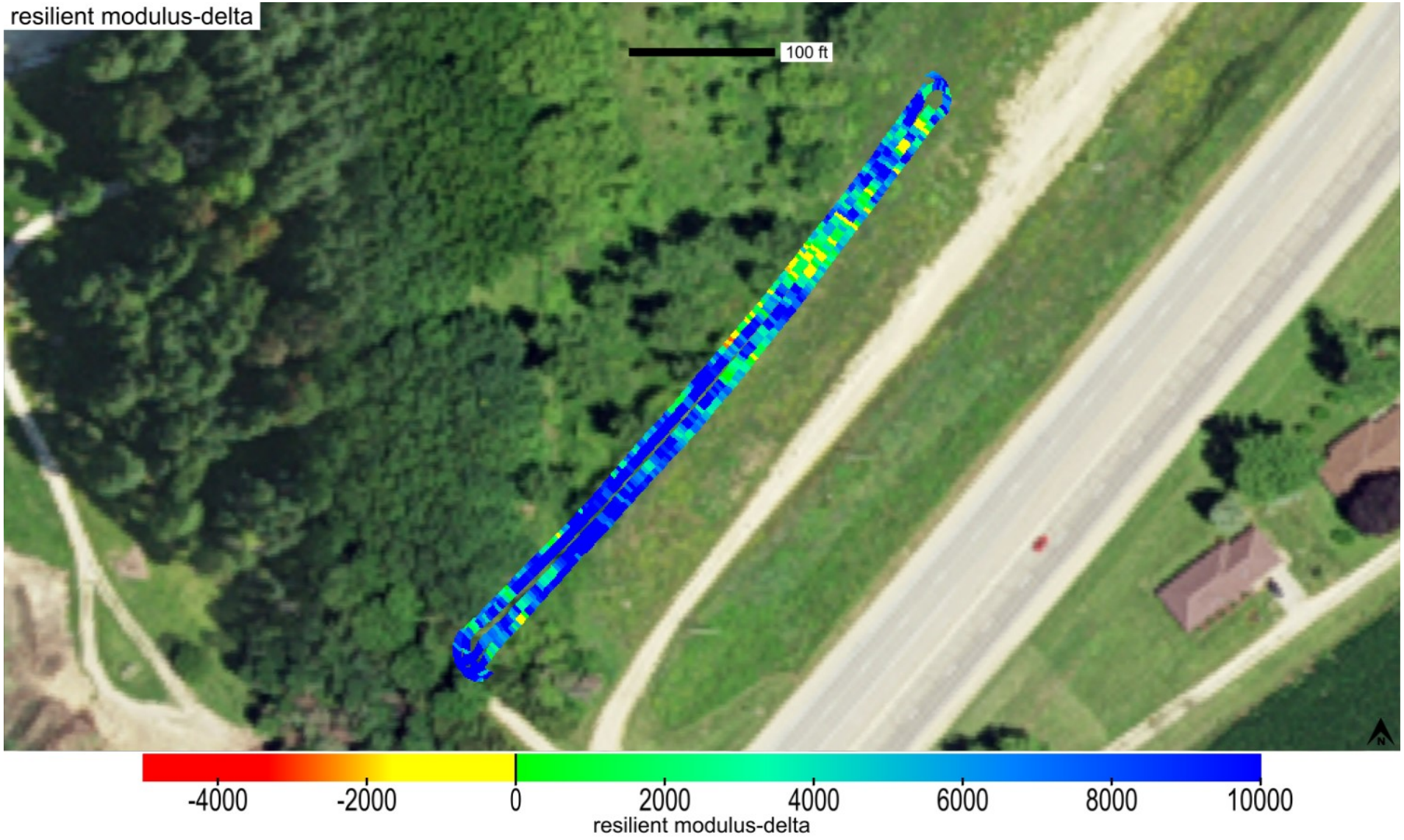
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.7	107.54	0.86	9037	6308.16	17353.8	37159.96	5942.77	34.24	-2728.84	8316.8	28122.96



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.7	107.54	0.86	9037	6308.16	17353.8	37159.96	5942.77	34.24	-2728.84	8316.8	28122.96



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	94.7	9037	-2728.84	8316.8	28122.96	373.93	8450.27	19866.99

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

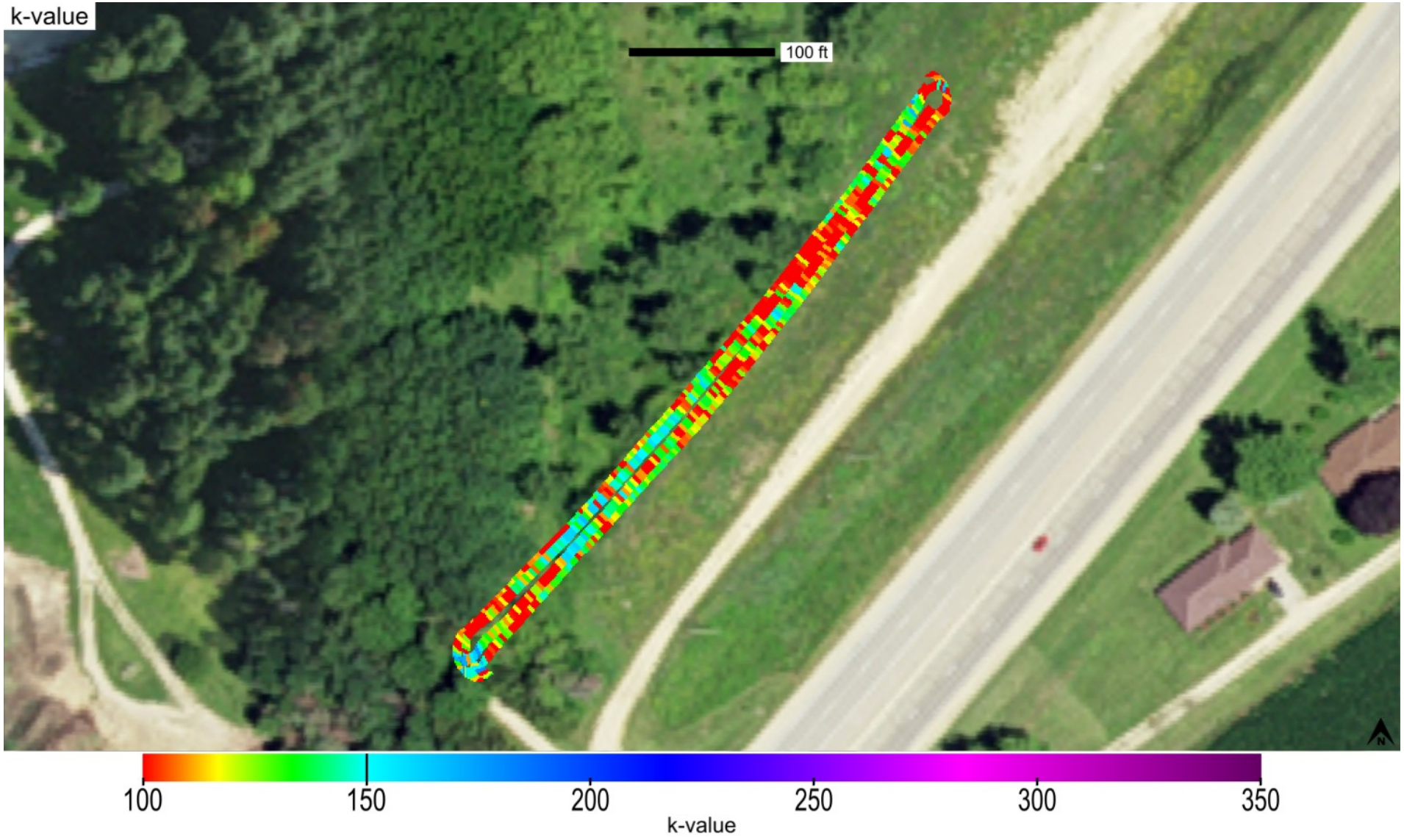
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.7	24.25	0.37	150	20	110.9	190	32.06	28.91	-130	-39.1	40



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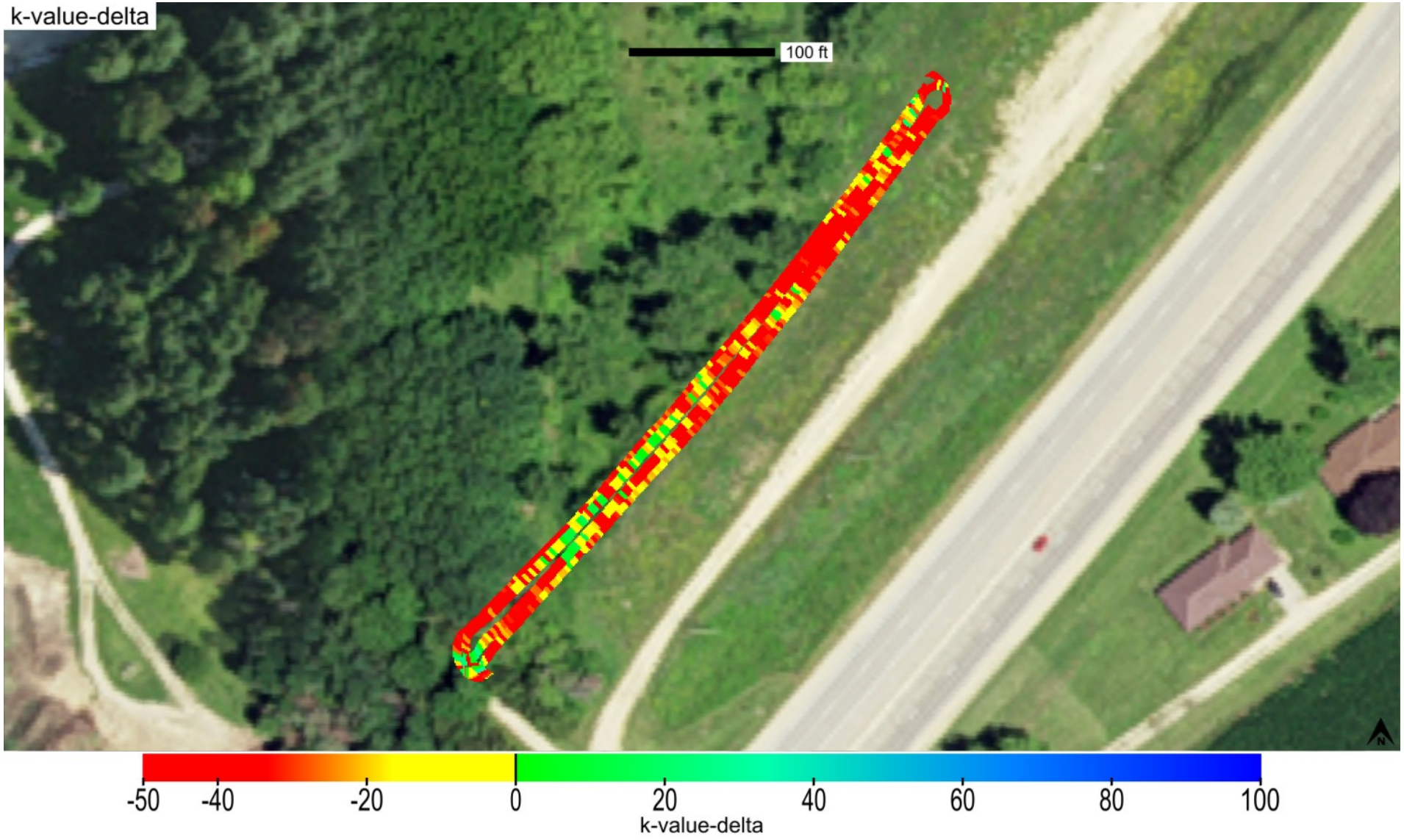
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.7	24.25	0.37	150	20	110.9	190	32.06	28.91	-130	-39.1	40



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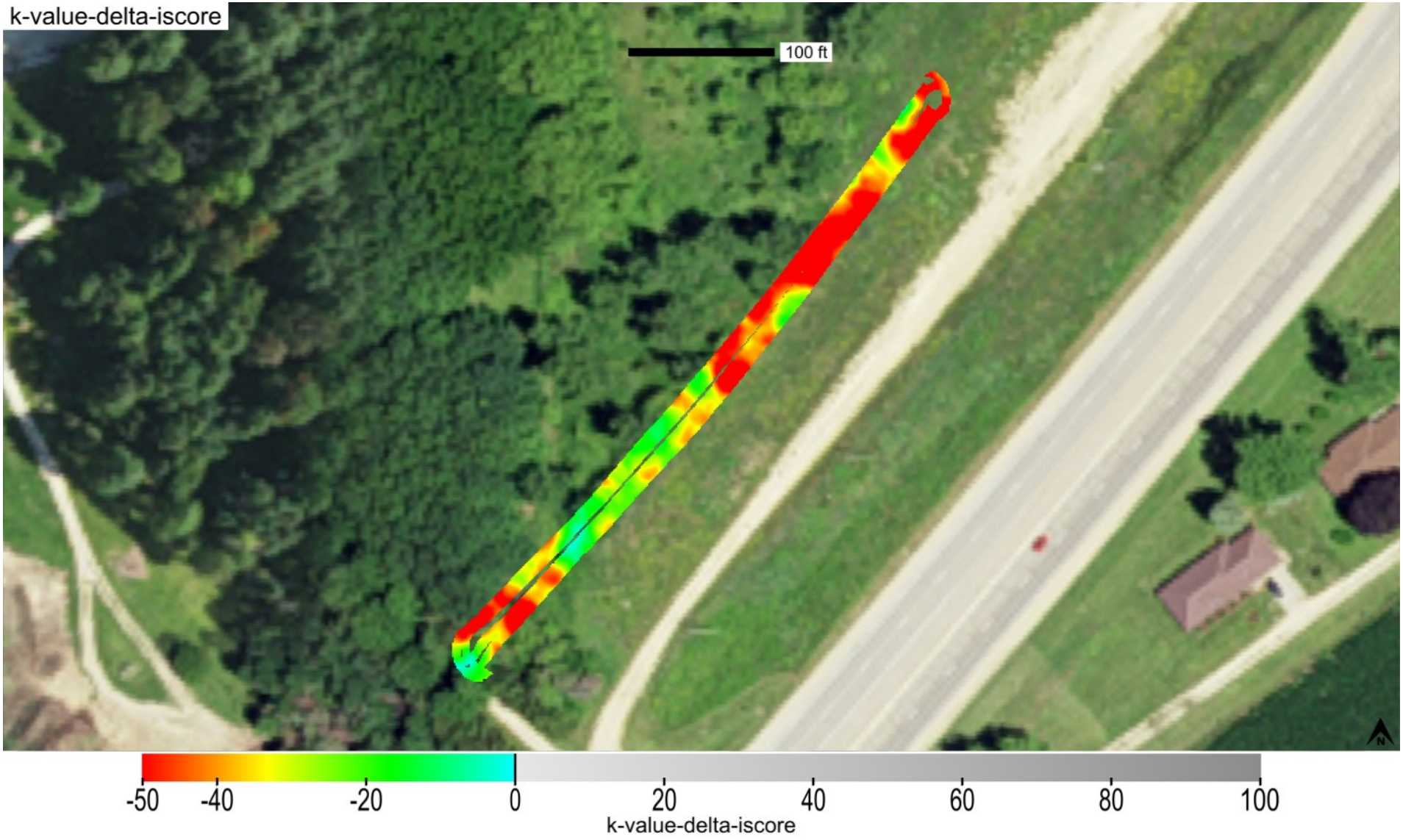
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.7	150	-130	-39.1	40	-100.39	-39	-1.78



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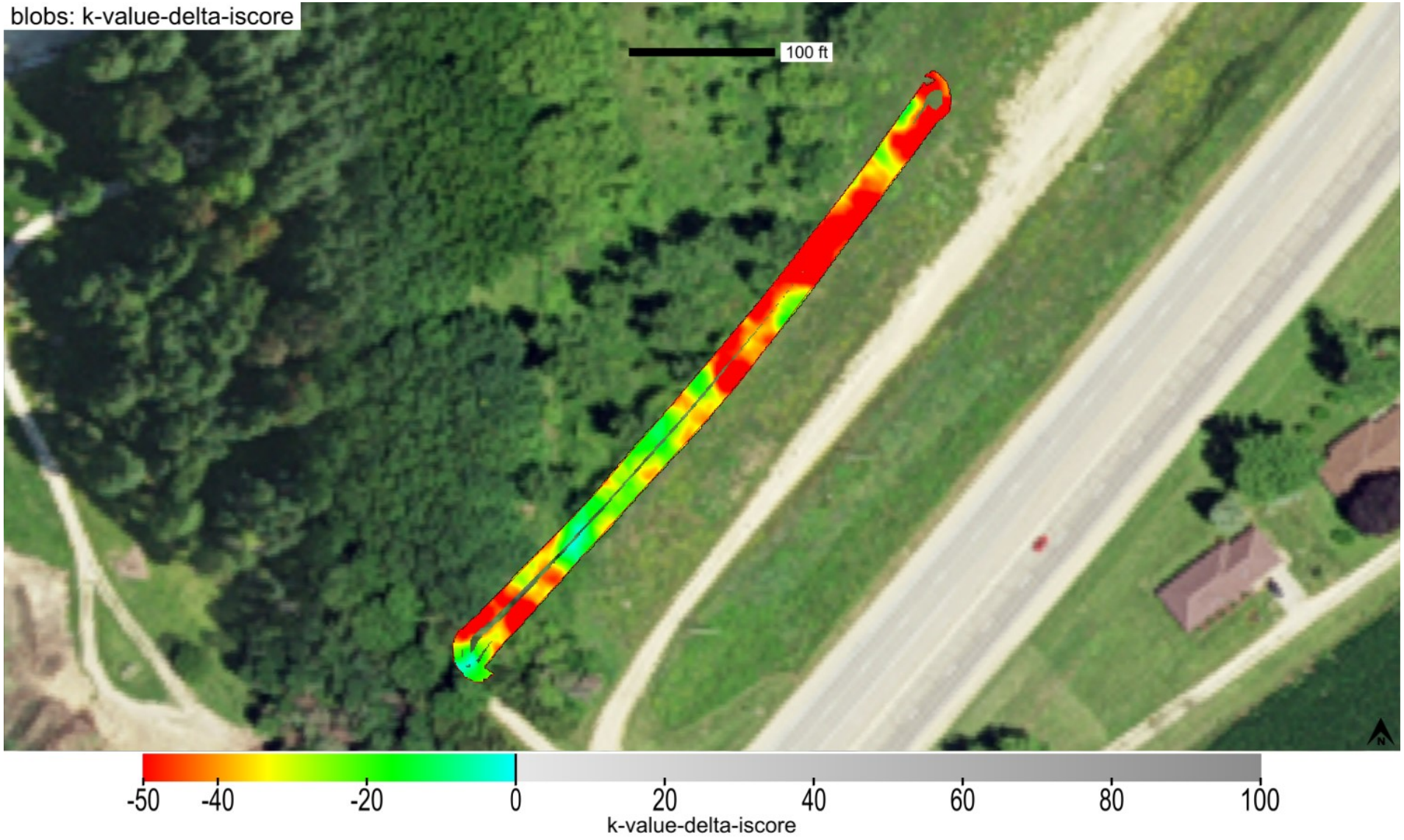
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	11871	100	none	0



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

minimum	average	maximum
1	1.23	2

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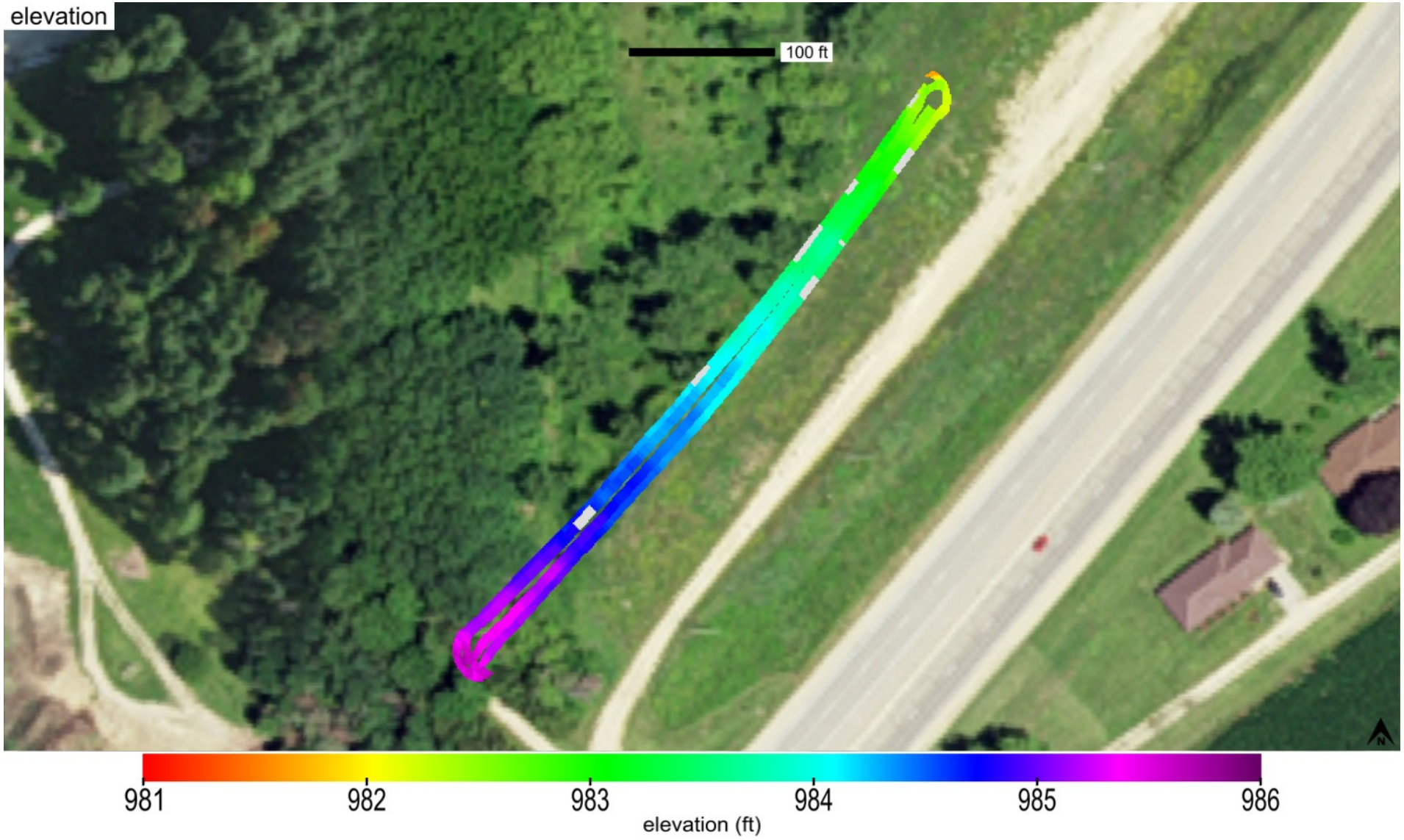
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

minimum	average	maximum
981.648	984.123	985.694



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	11871	0.273	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_160539a

20200929_164126.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_161313a	No. of Measurements:	12014	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:13:13 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	94.6	106.74	0.83	9037	6326.49	17946.7	39116.34	6422.26	35.79	-2710.51	8909.7	30079.34
k-value	Yes	12.7	29.81	0.46	150	20	117	175.32	30.2	25.82	-130	-33	25.32
Moisture Content	No												

Mapped Area

square feet	acres
12014	0.28

Pass Count

min.	avg.	max.
1	1.2	3

Elevation (ft)

min.	avg.	max.
981.75	984.12	985.74

Velocity (fps)

min.	avg.	max.
0.94	5.48	6.16

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	12014	0.276	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_161313a	No. of Measurements:	12014	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:13:13 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
106.74	CQI > = 95
94.6	80% of Resilient Modulus MVs >= 9037
35.79	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_161313a	No. of Measurements:	12014	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:13:13 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
29.81	CQI > = 95
12.7	80% of k-Value MVs >= 150
25.82	COV <= 20
99.09	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

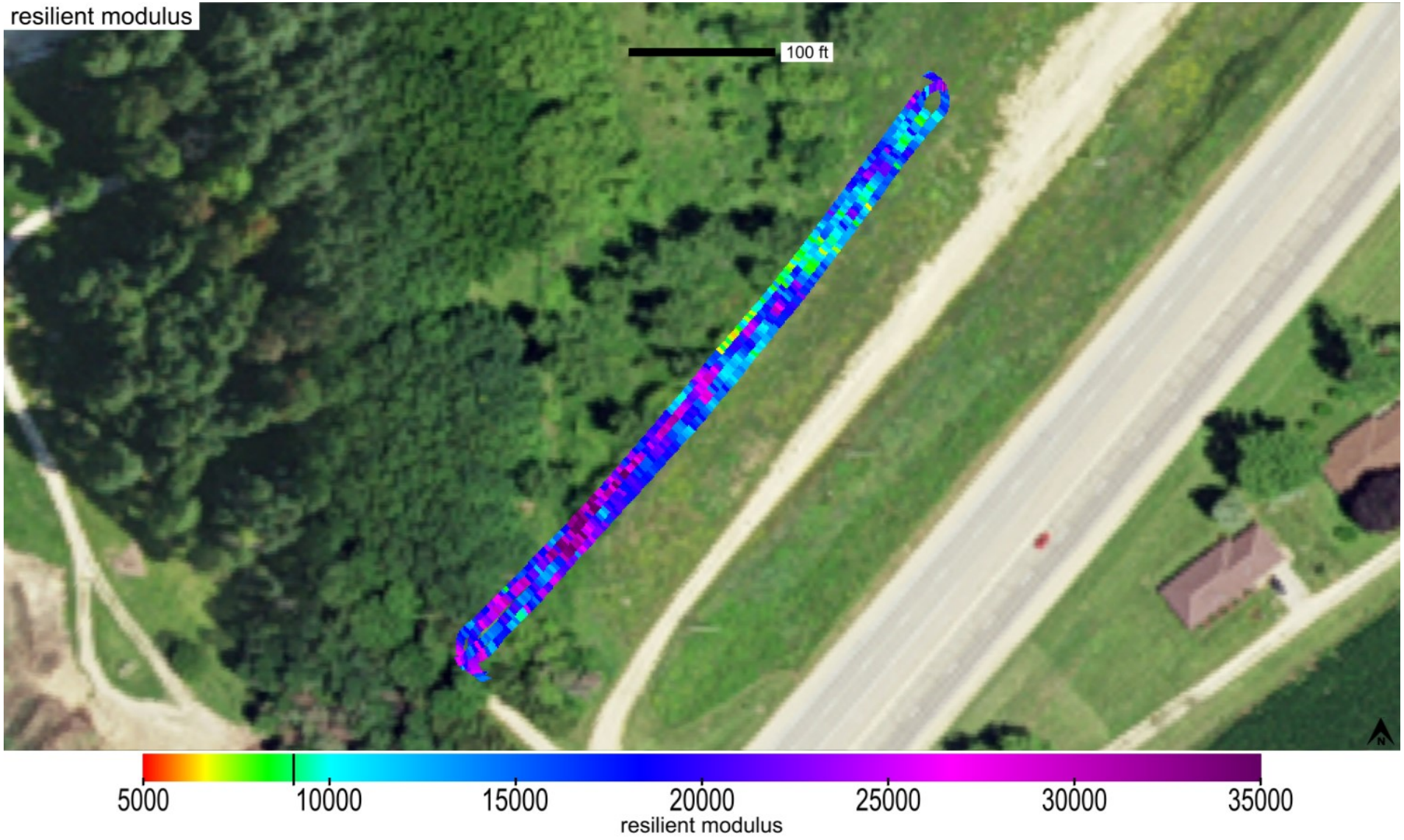
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.6	106.74	0.83	9037	6326.49	17946.7	39116.34	6422.26	35.79	-2710.51	8909.7	30079.34



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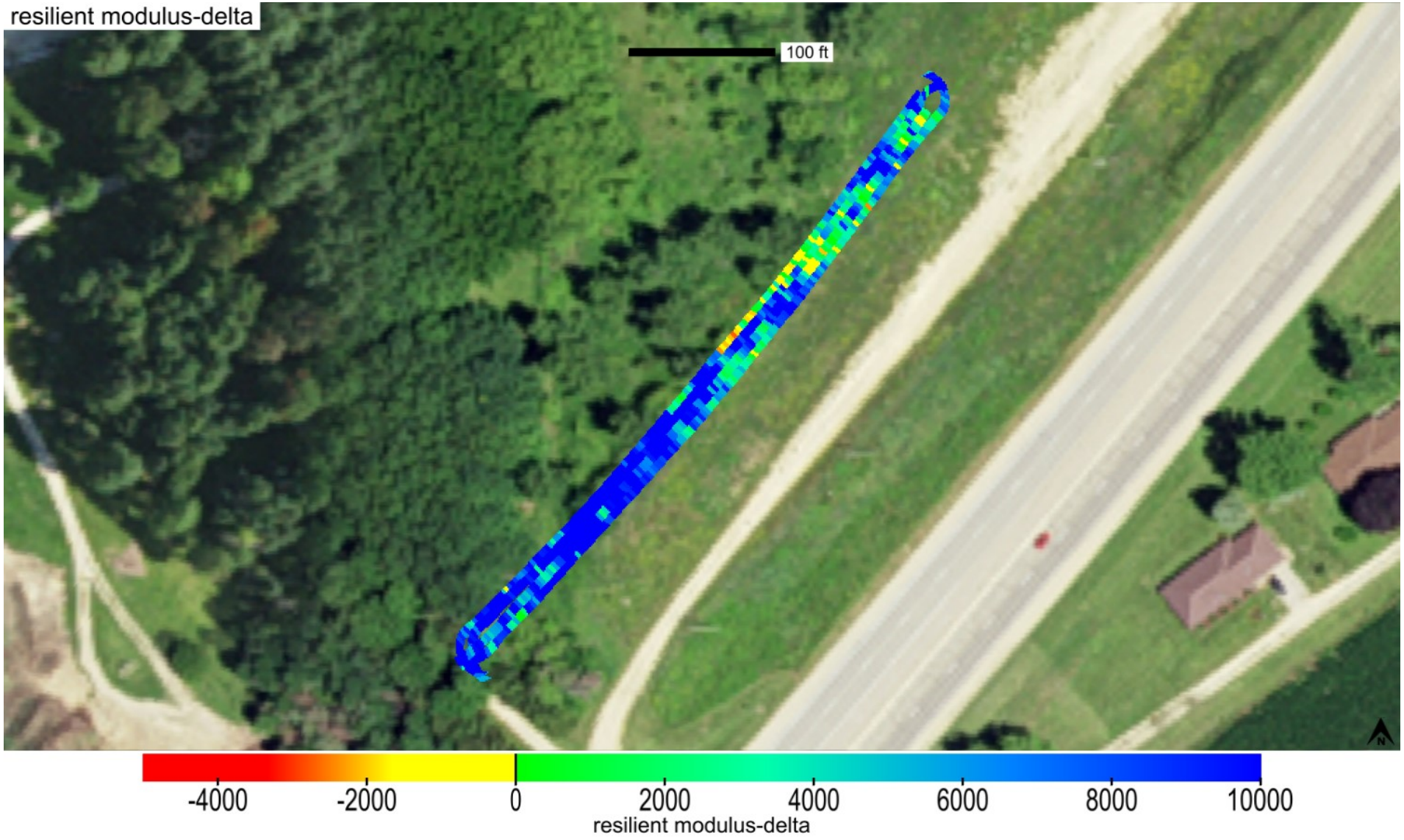
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.6	106.74	0.83	9037	6326.49	17946.7	39116.34	6422.26	35.79	-2710.51	8909.7	30079.34



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	94.6	9037	-2710.51	8909.7	30079.34	473.47	9031.74	23321.66

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

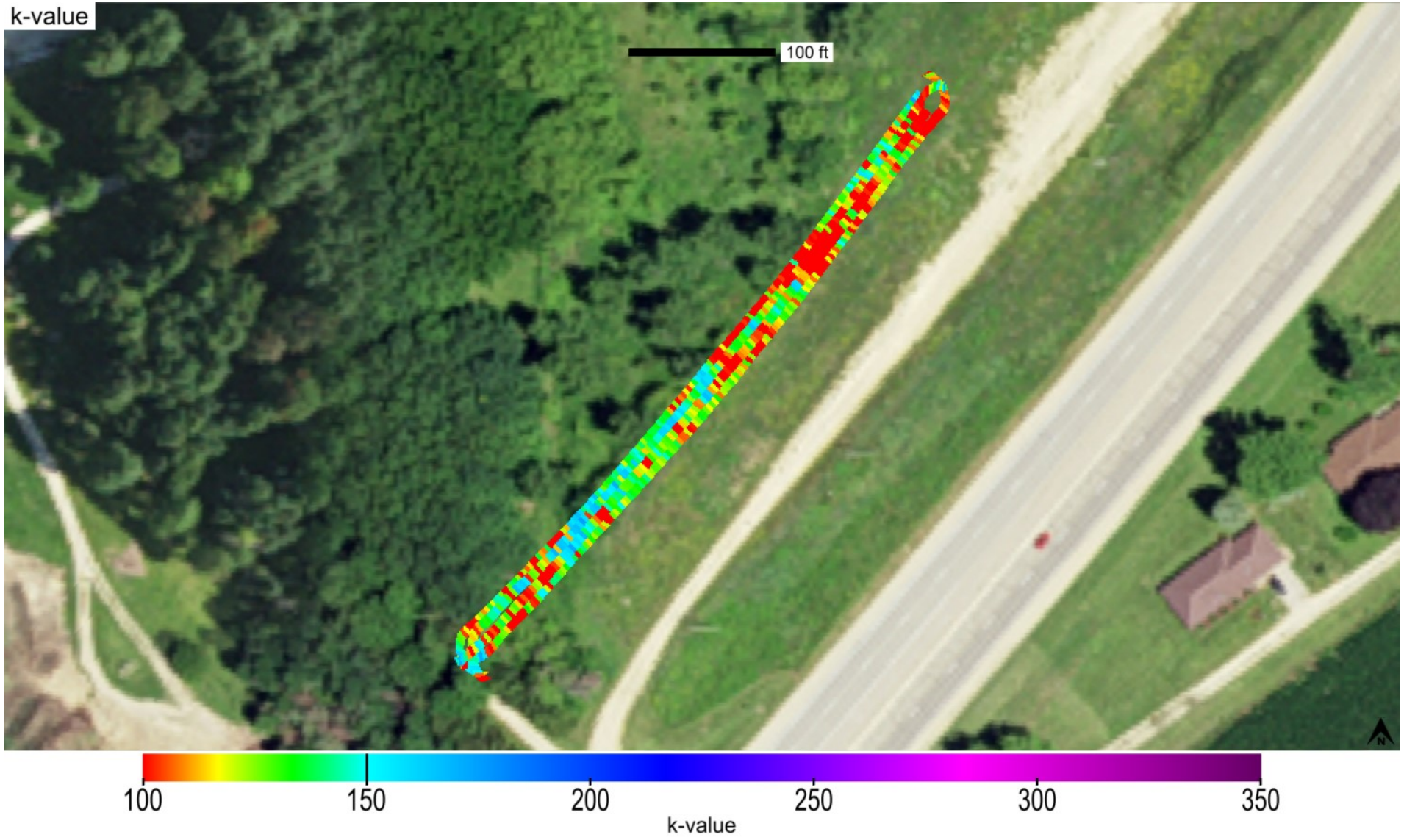
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	12.7	29.81	0.46	150	20	117	175.32	30.2	25.82	-130	-33	25.32

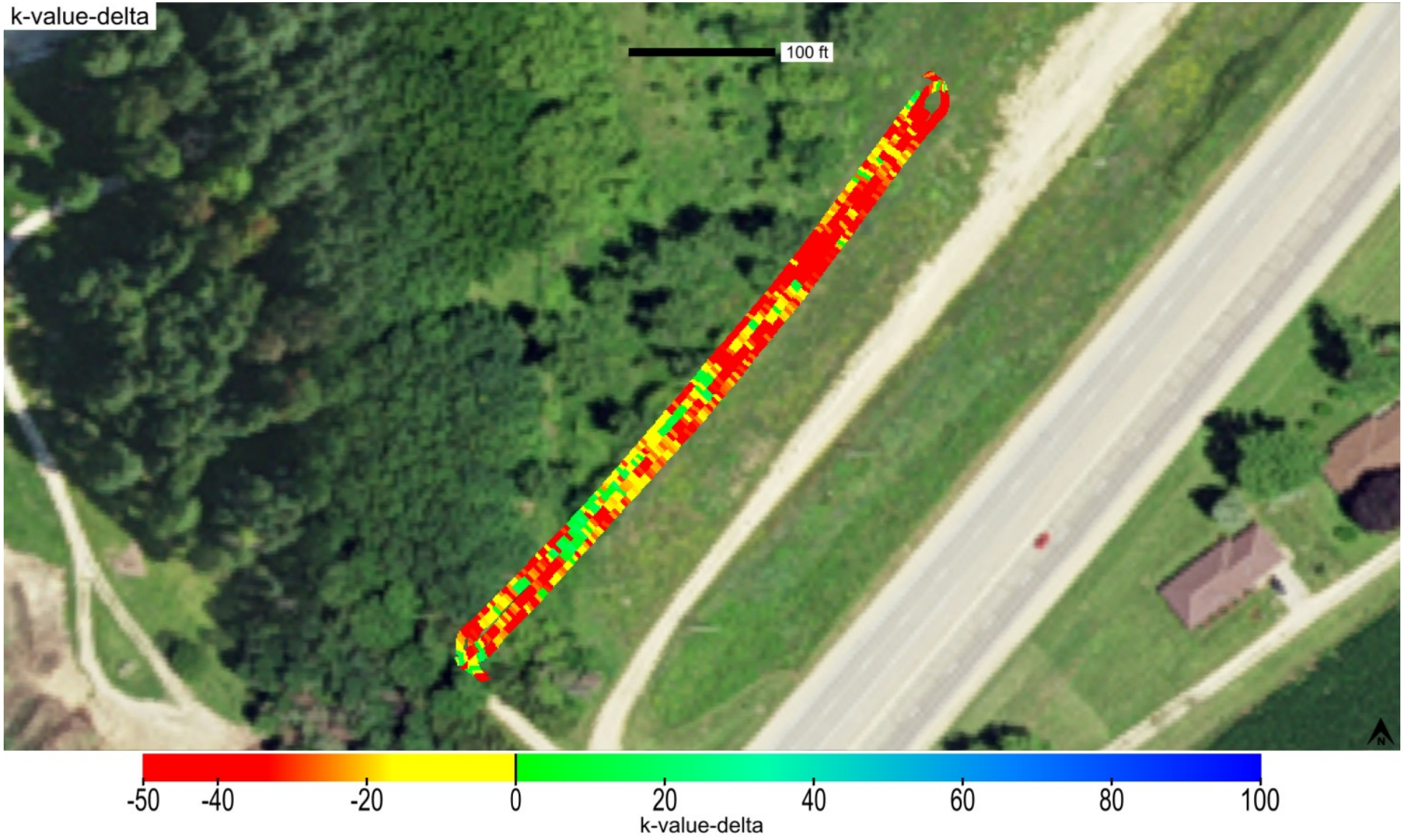


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

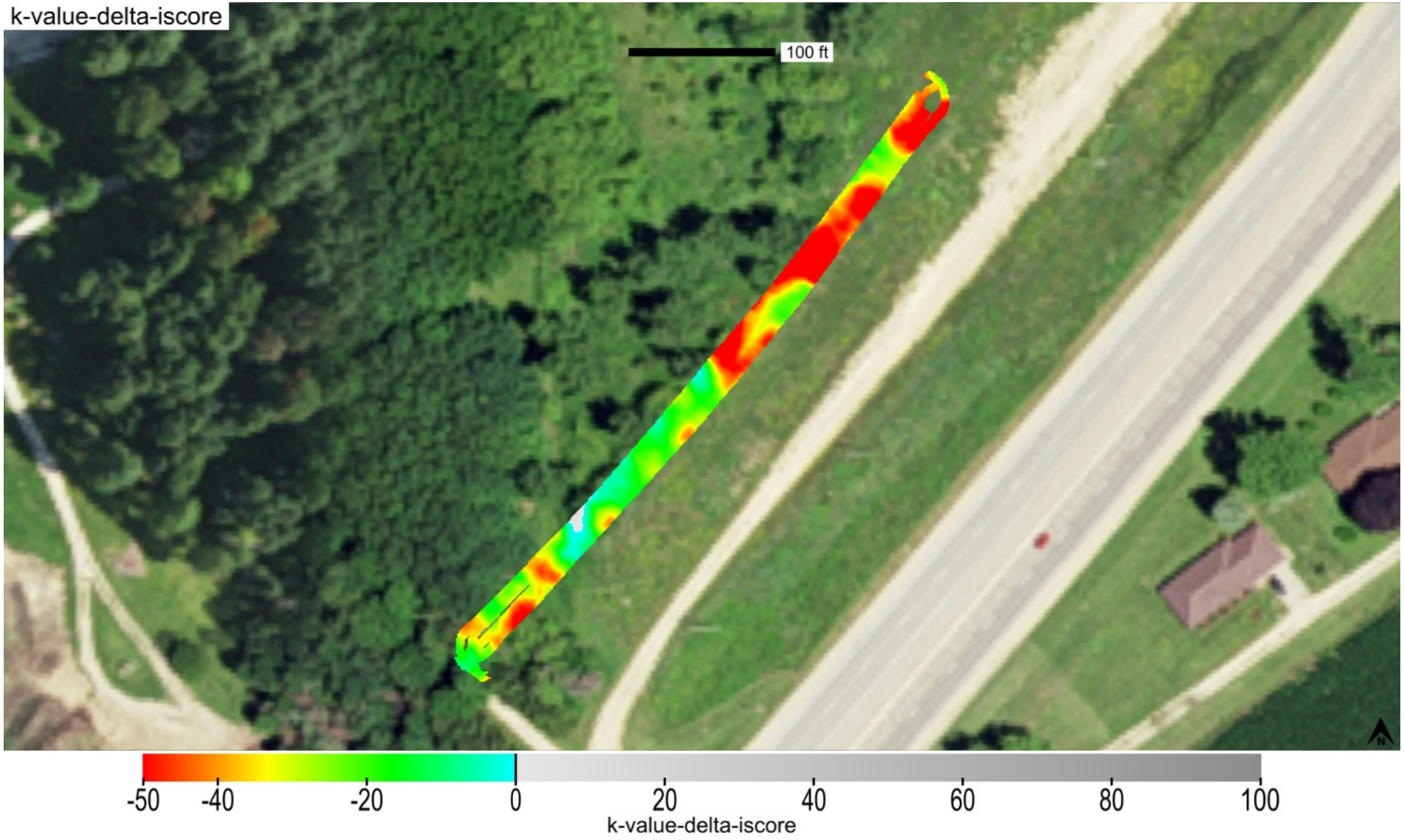
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	12.7	29.81	0.46	150	20	117	175.32	30.2	25.82	-130	-33	25.32



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	12.7	150	-130	-33	25.32	-83.96	-32.91	6.37

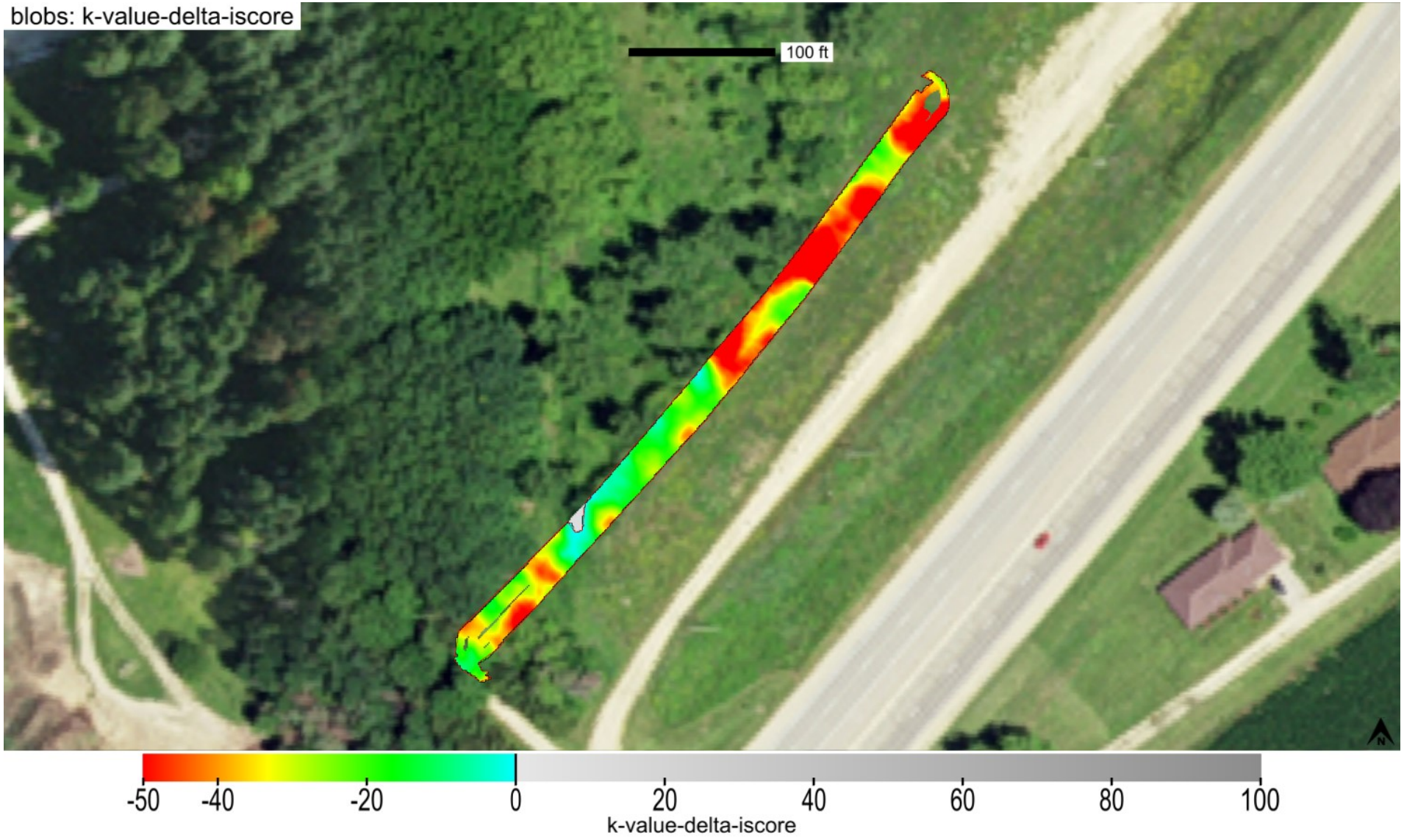


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	11905	99.09	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

minimum	average	maximum
1	1.2	3

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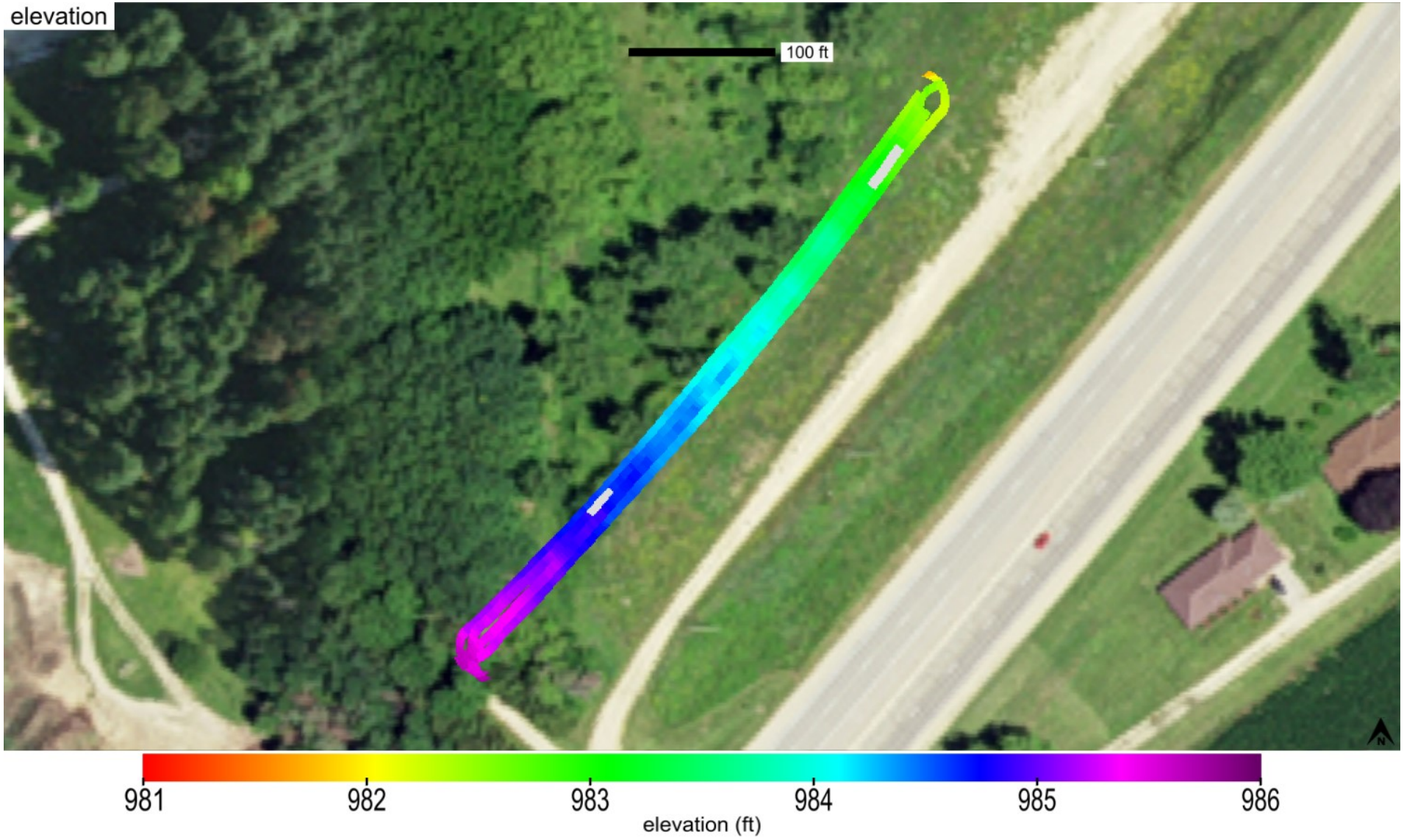
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

minimum	average	maximum
981.75	984.121	985.74



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	12014	0.276	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_161313a

20200929_164112.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_162132a	No. of Measurements:	27926	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:21:32 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	98.4	112.61	0.94	9037	7050.46	18192.4	47813.12	5740.46	31.55	-1986.54	9155.4	38776.12
k-value	Yes	13	28.27	0.39	150	20	114.2	190	33.57	29.39	-130	-35.8	40
Moisture Content	No												

Mapped Area

square feet	acres
27926	0.64

Pass Count

min.	avg.	max.
1	1.1	3

Elevation (ft)

min.	avg.	max.
985.08	988.15	992.74

Velocity (fps)

min.	avg.	max.
1.4	5.46	6.11

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	27926	0.641	12	9037	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_162132a	No. of Measurements:	27926	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:21:32 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
112.61	CQI > = 95
98.4	80% of Resilient Modulus MVs >= 9037
31.55	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_162132a	No. of Measurements:	27926	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 4:21:32 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
28.27	CQI > = 95
13	80% of k-Value MVs >= 150
29.39	COV <= 20
99.32	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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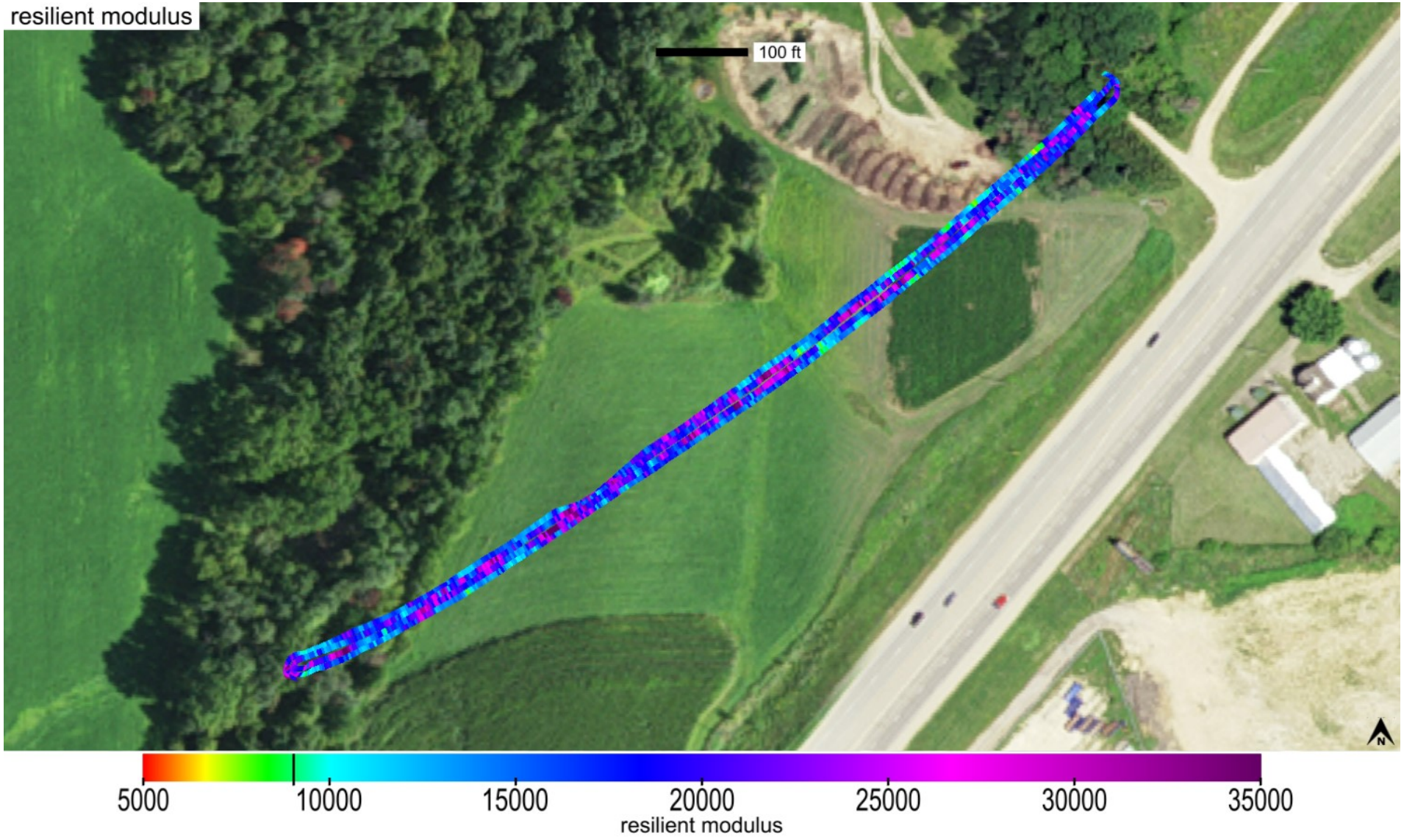
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.4	112.61	0.94	9037	7050.46	18192.4	47813.12	5740.46	31.55	-1986.54	9155.4	38776.12



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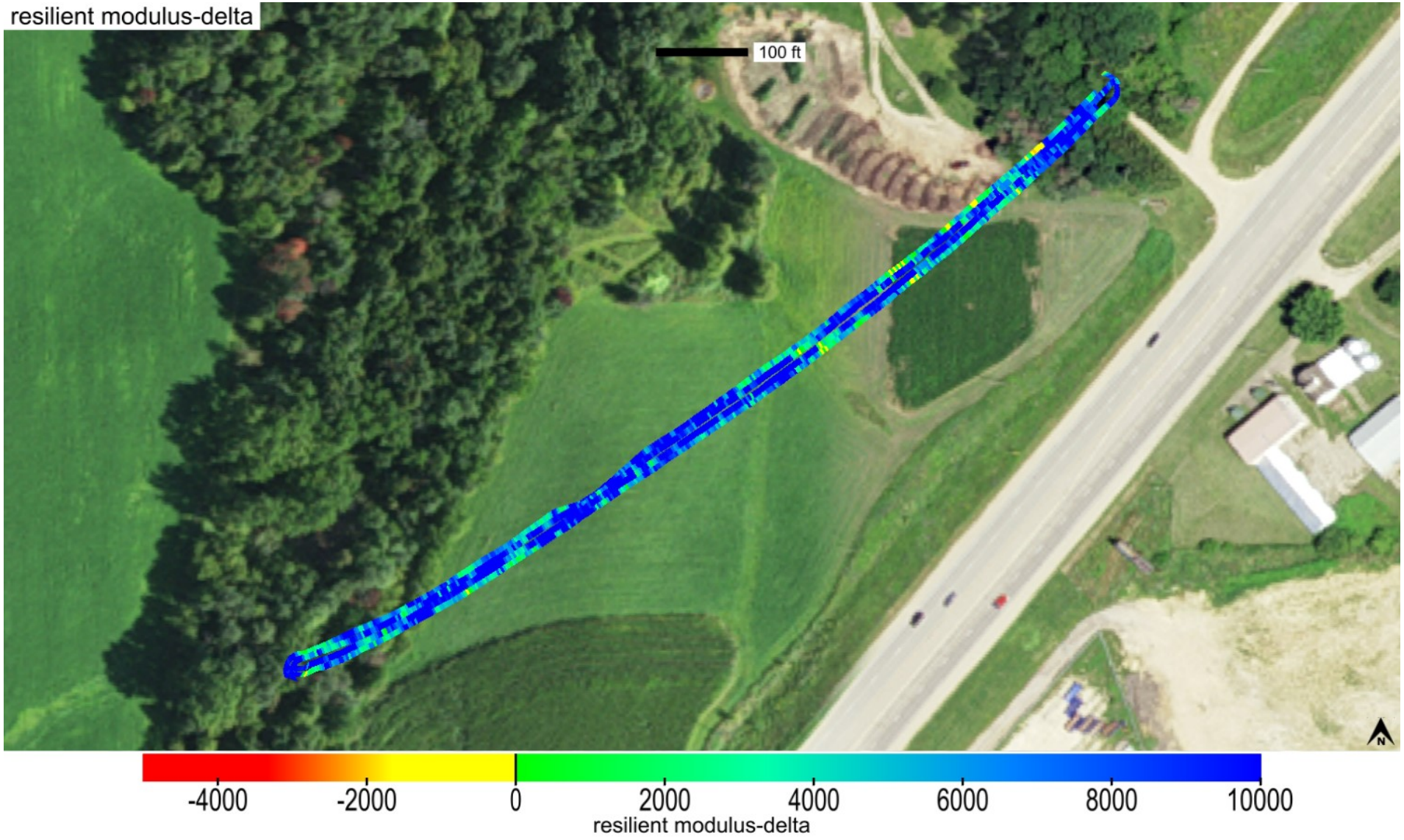
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.4	112.61	0.94	9037	7050.46	18192.4	47813.12	5740.46	31.55	-1986.54	9155.4	38776.12



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	98.4	9037	-1986.54	9155.4	38776.12	1254.38	9400.31	20075.31

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

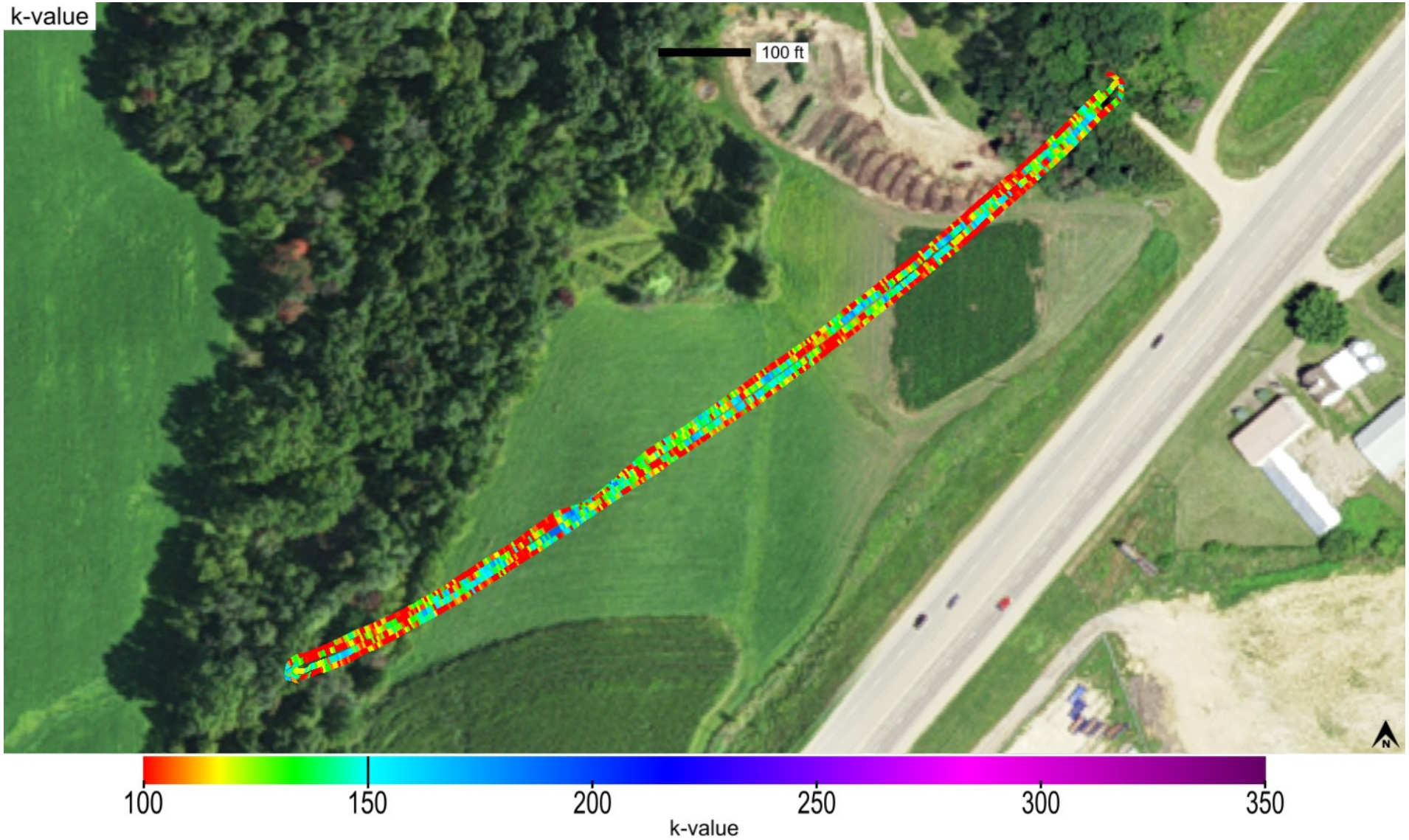
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	13	28.27	0.39	150	20	114.2	190	33.57	29.39	-130	-35.8	40



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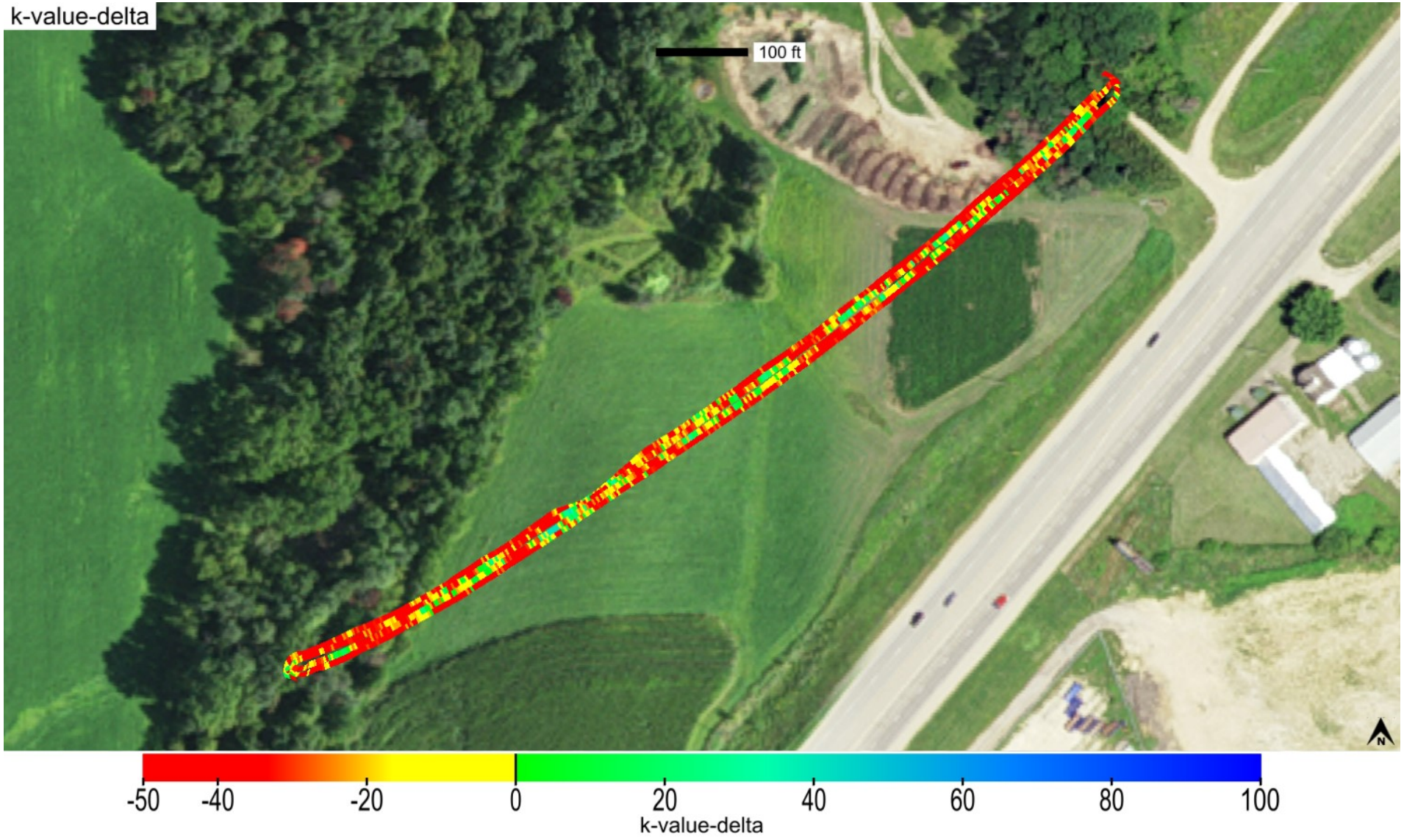
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

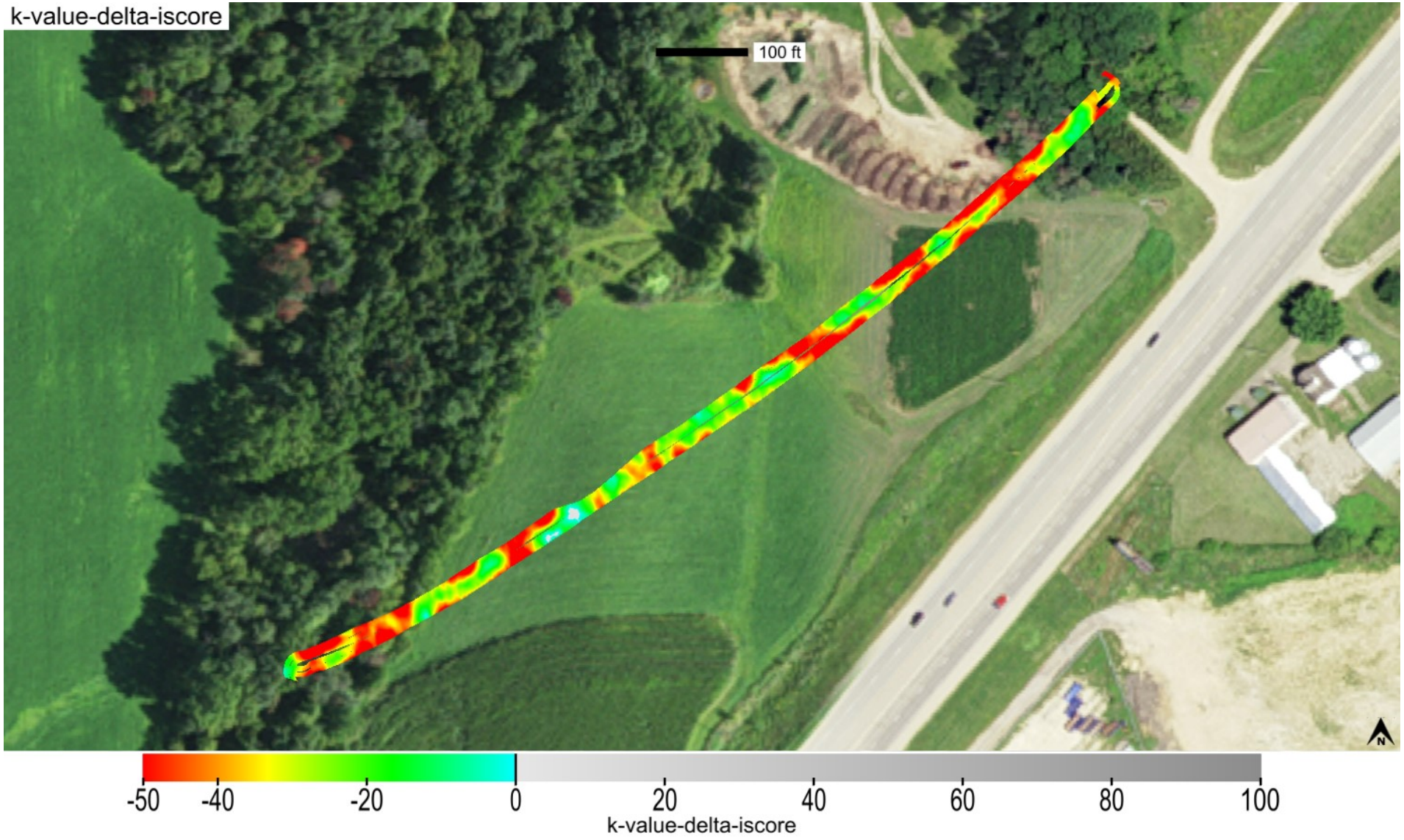
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	13	28.27	0.39	150	20	114.2	190	33.57	29.39	-130	-35.8	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	13	150	-130	-35.8	40	-93.49	-34.43	5.68



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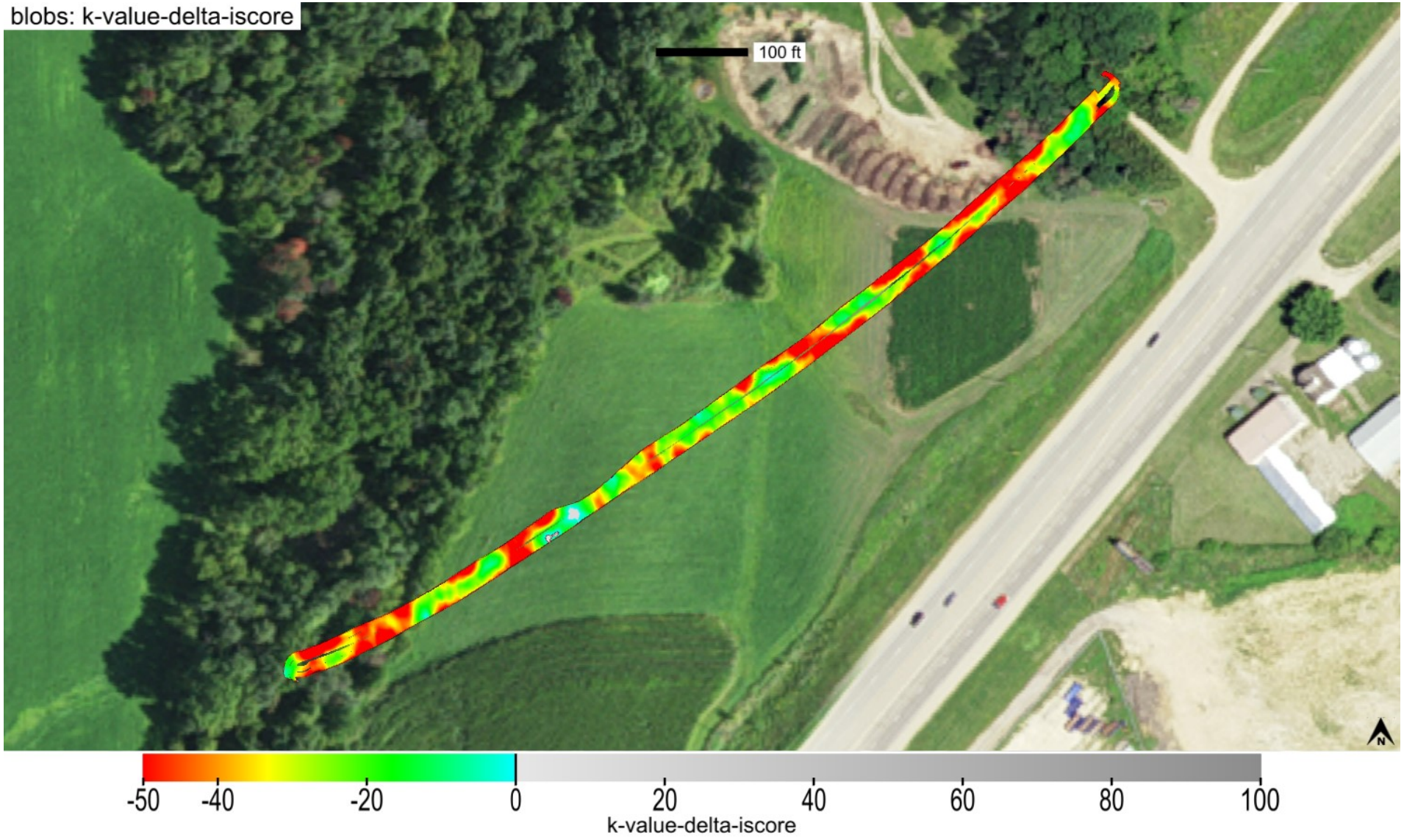
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	27737	99.32	none	0



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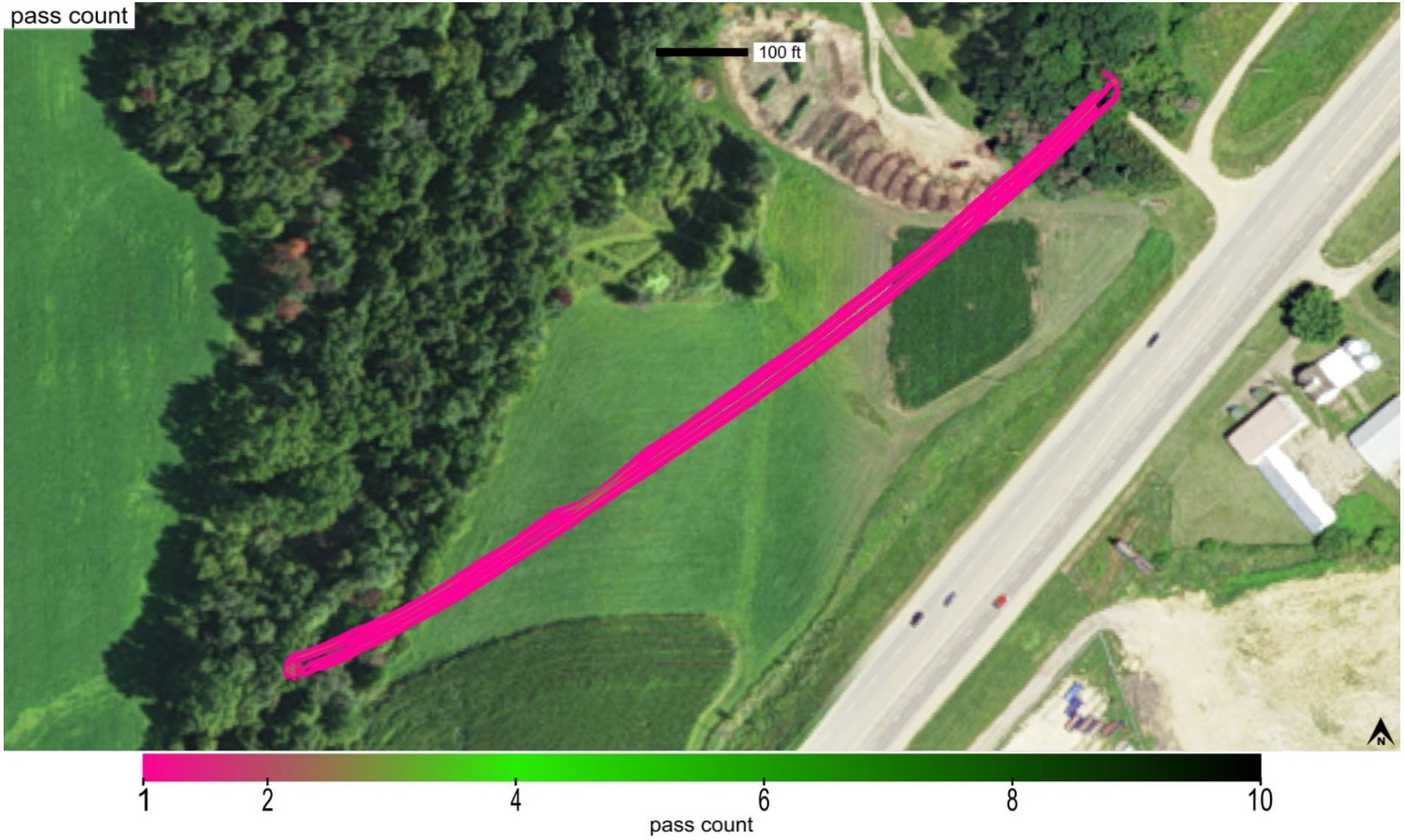
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

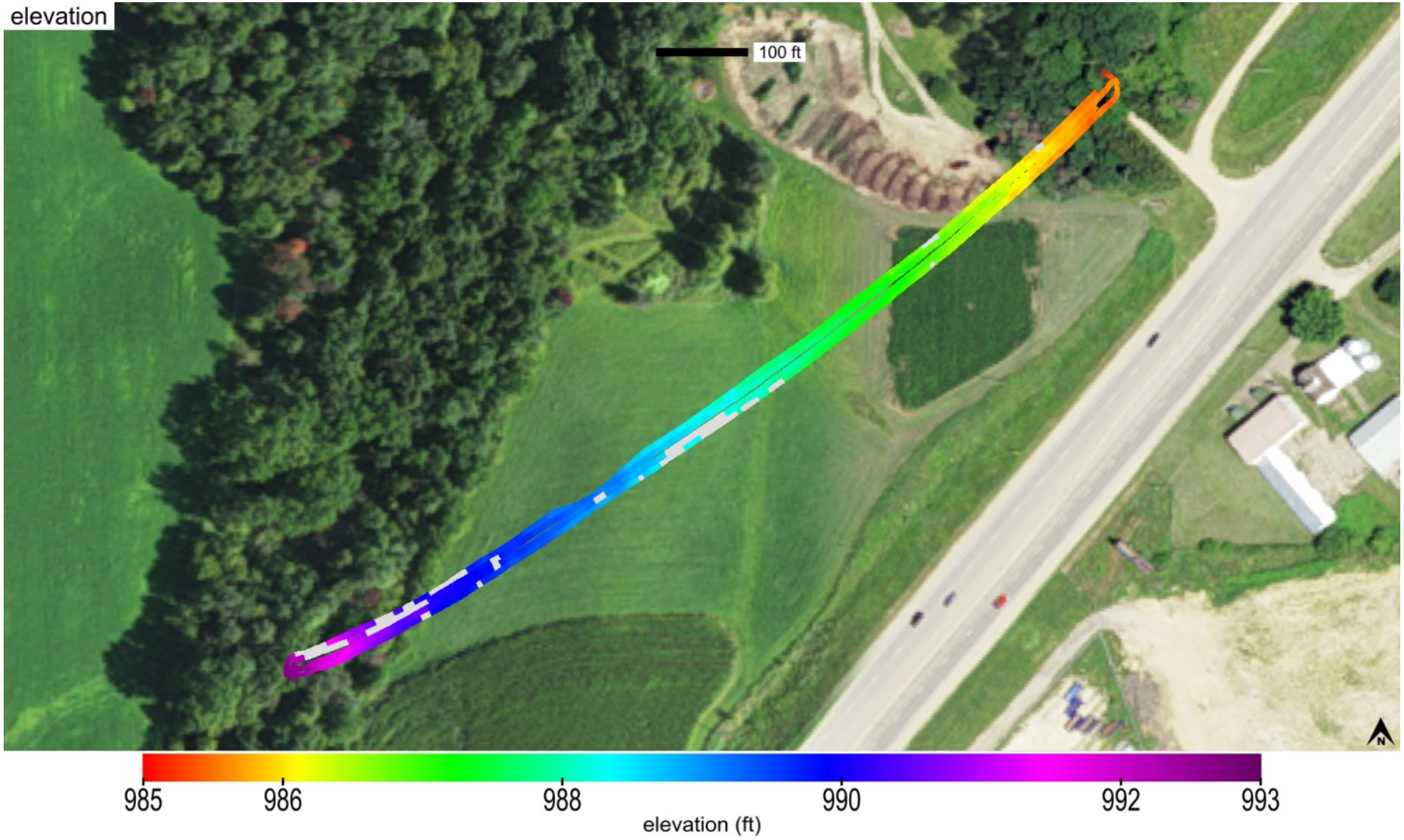
minimum	average	maximum
1	1.1	3



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

minimum	average	maximum
985.083	988.153	992.741



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	27926	0.641	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_162132a

20200930_073259.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.37	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_30_071812a	No. of Measurements:	20341	Machine ID:	Ingios_FCS00210
Date and Time:	9/30/2020 7:18:12 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	95	105.37	0.75	9037	5959.92	17844.9	43013.44	7014.58	39.31	-3077.08	8807.9	33976.44
k-value	Yes	14.8	27.25	0.3	150	20	108.8	190	38.1	35.02	-130	-41.2	40
Moisture Content	No												

Mapped Area

square feet	acres
20341	0.47

Pass Count

min.	avg.	max.
1	1.34	5

Elevation (ft)

min.	avg.	max.
961.78	966.14	968.58

Velocity (fps)

min.	avg.	max.
0.57	5.45	6.29

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	20341	0.467	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.37	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_30_071812a	No. of Measurements:	20341	Machine ID:	Ingios_FCS00210
Date and Time:	9/30/2020 7:18:12 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
105.37	CQI > = 95
95	80% of Resilient Modulus MVs >= 9037
39.31	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.37	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_30_071812a	No. of Measurements:	20341	Machine ID:	Ingios_FCS00210
Date and Time:	9/30/2020 7:18:12 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
27.25	CQI > = 95
14.8	80% of k-Value MVs >= 150
35.02	COV <= 20
99.31	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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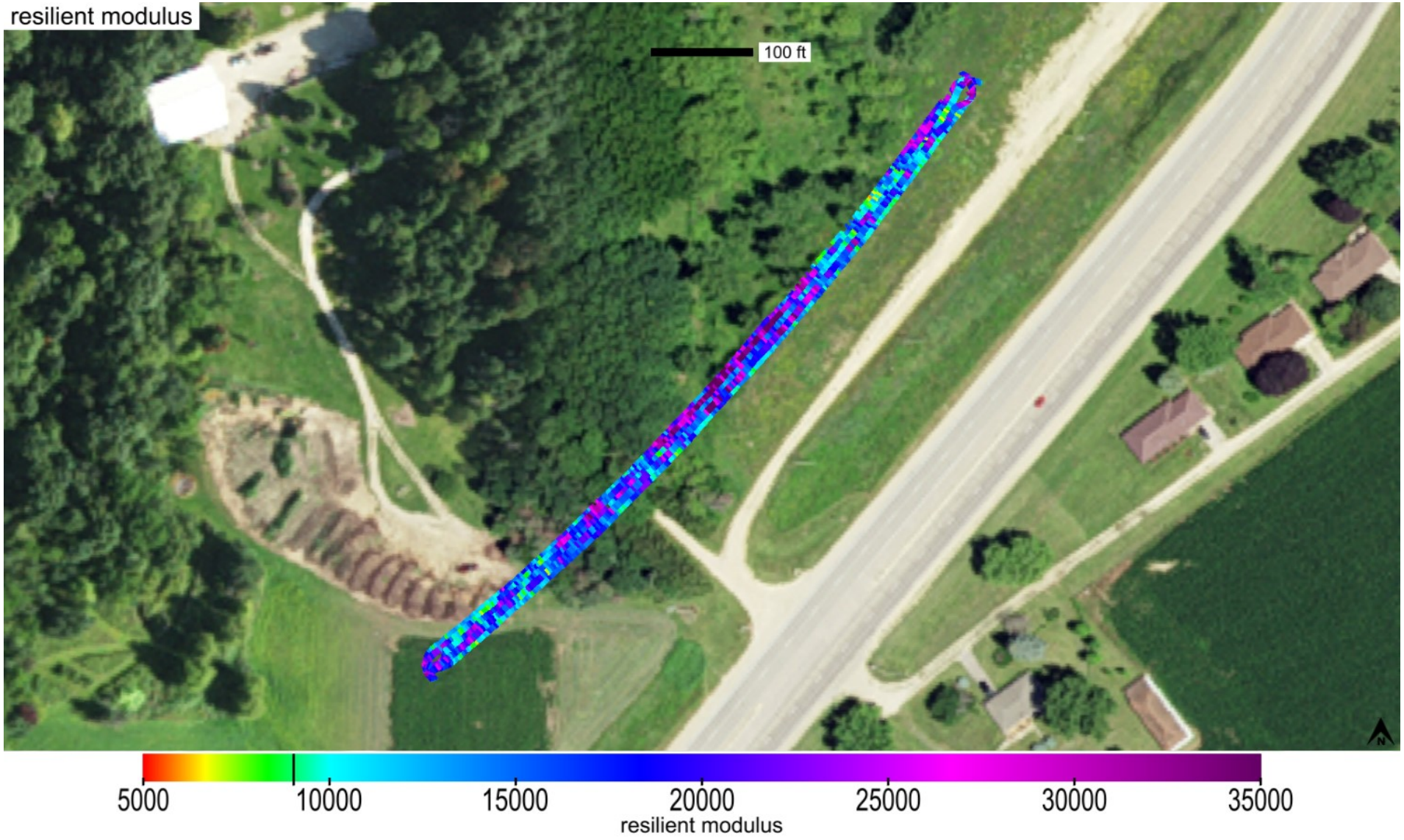
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

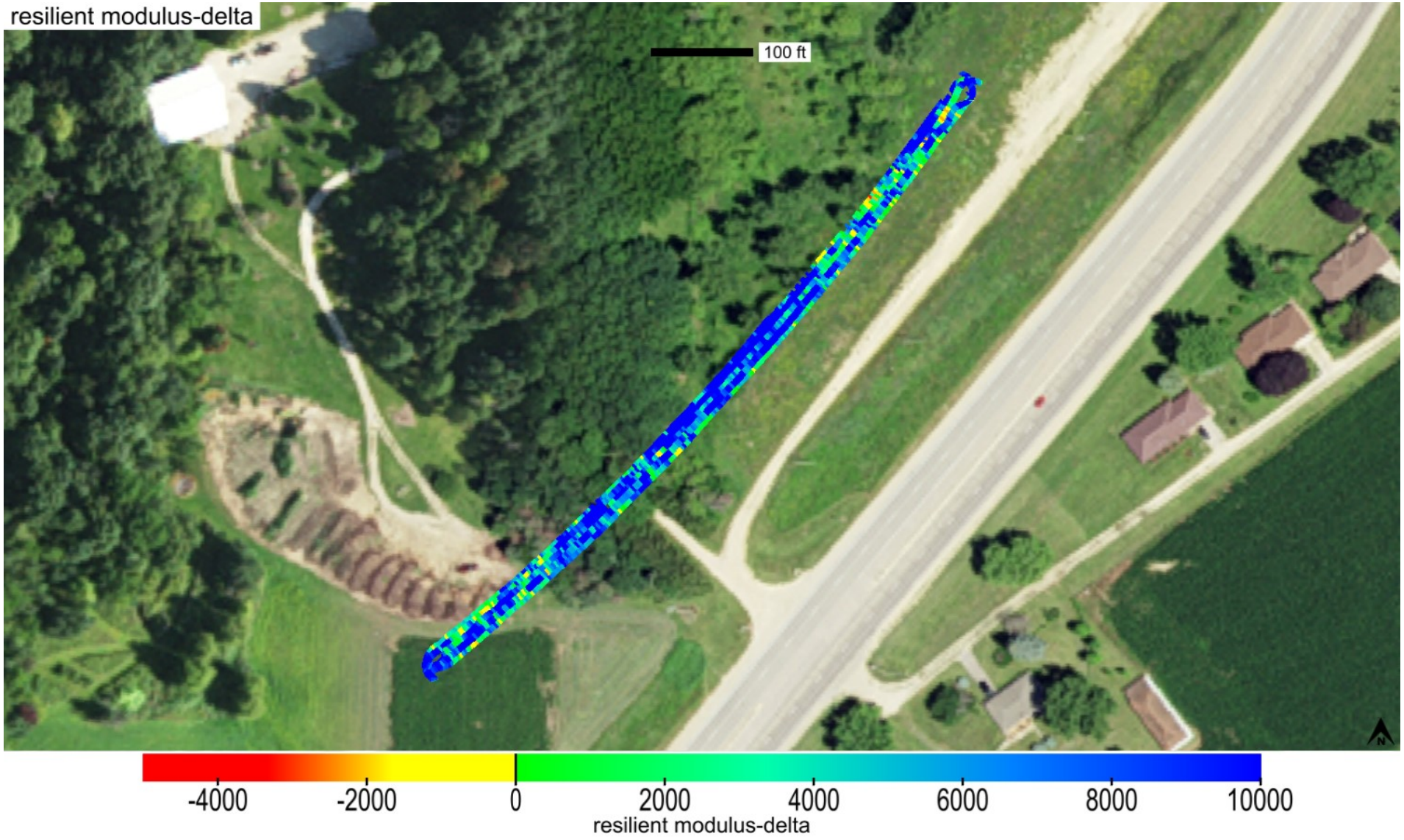
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	95	105.37	0.75	9037	5959.92	17844.9	43013.44	7014.58	39.31	-3077.08	8807.9	33976.44



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	95	105.37	0.75	9037	5959.92	17844.9	43013.44	7014.58	39.31	-3077.08	8807.9	33976.44



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	95	9037	-3077.08	8807.9	33976.44	-181.28	8965.68	25536.95

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

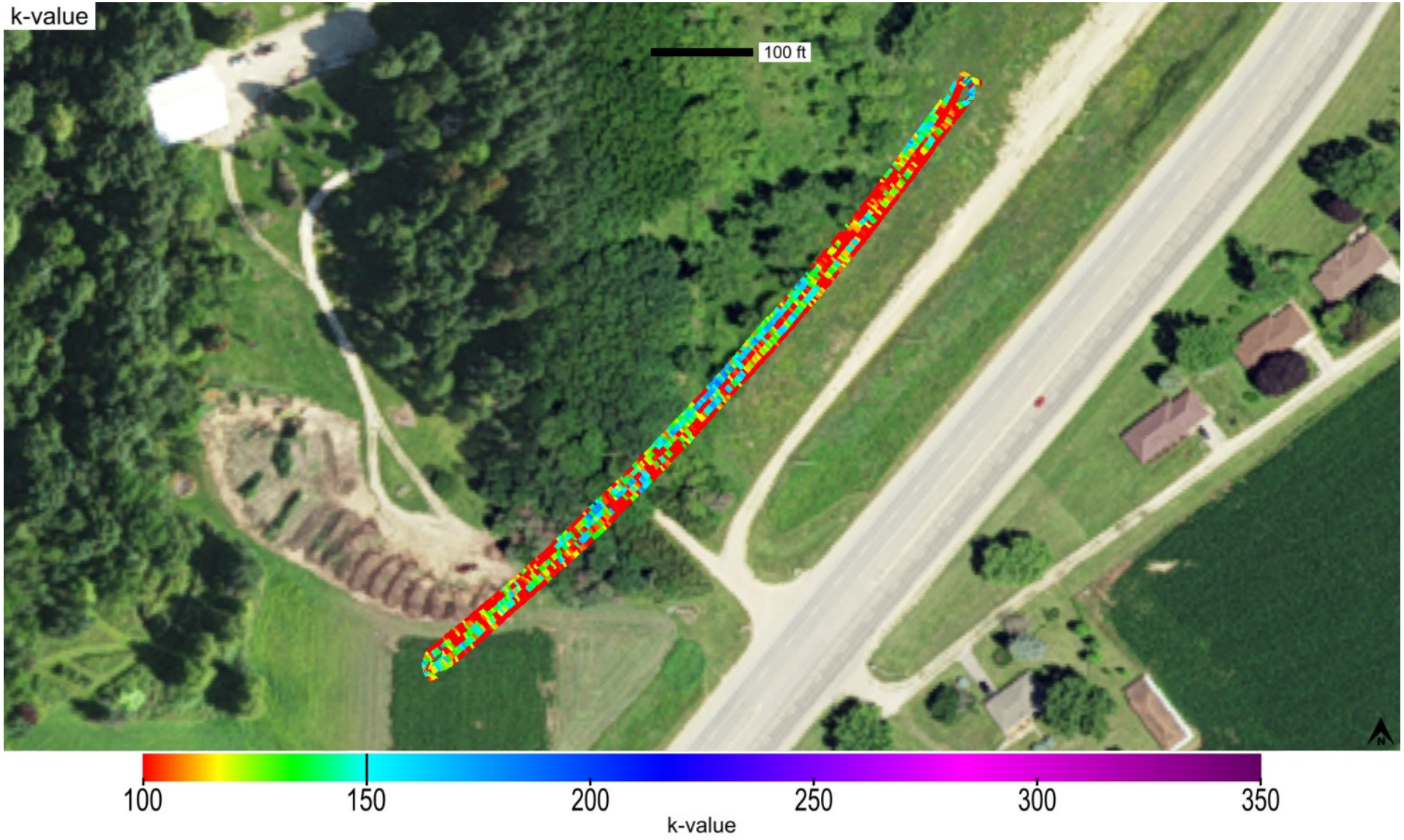
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	14.8	27.25	0.3	150	20	108.8	190	38.1	35.02	-130	-41.2	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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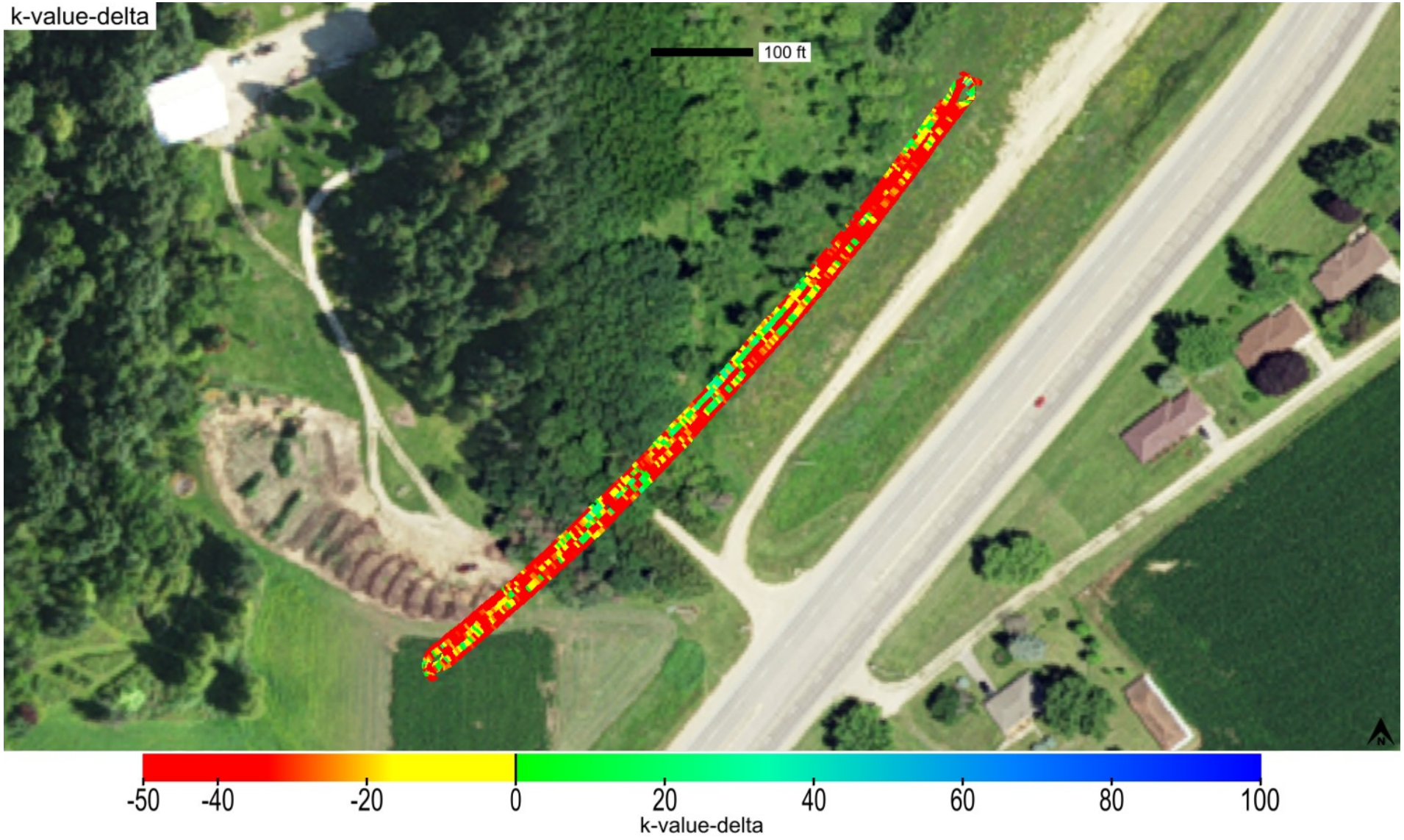
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

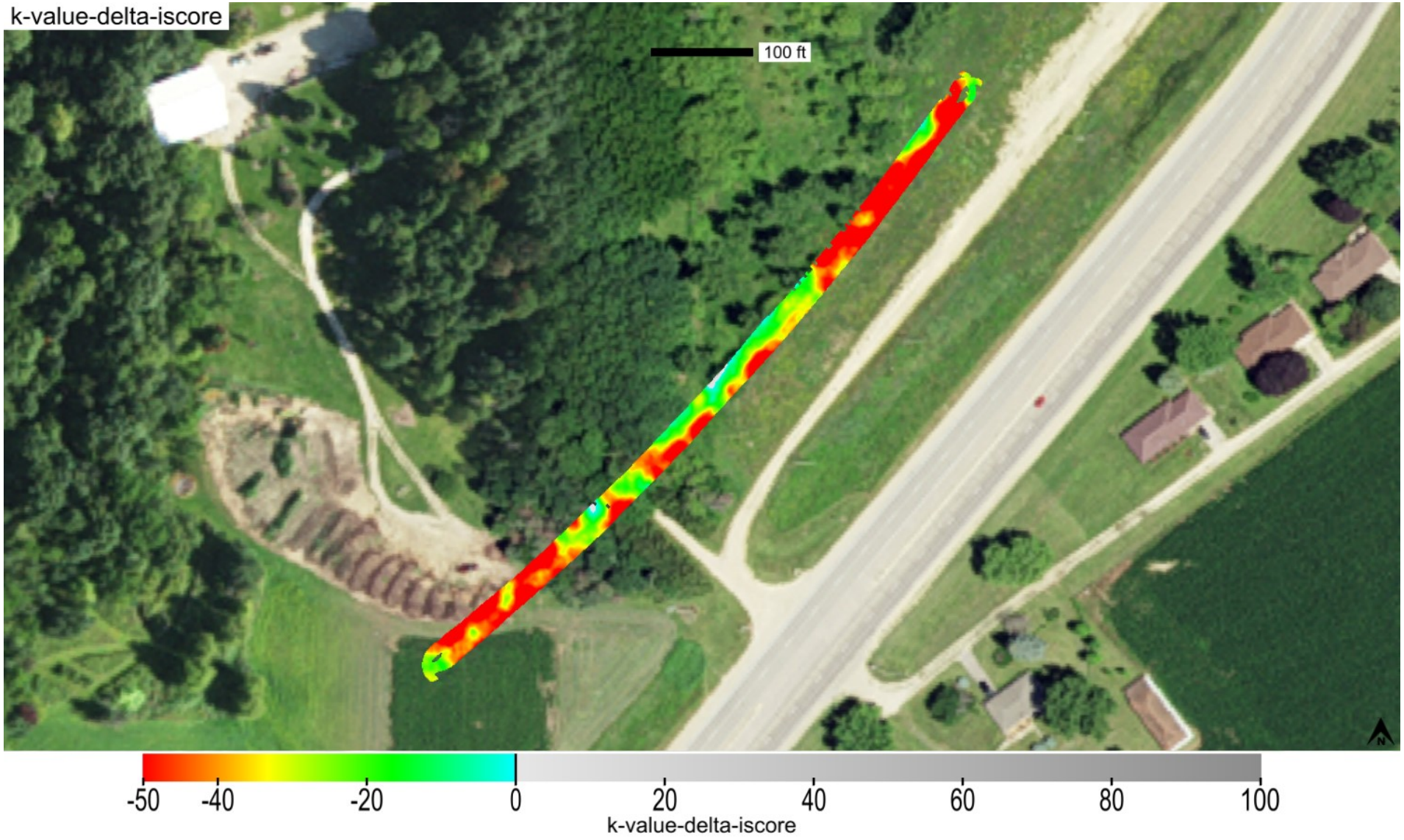
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	14.8	27.25	0.3	150	20	108.8	190	38.1	35.02	-130	-41.2	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	14.8	150	-130	-41.2	40	-100.41	-40.07	15.74



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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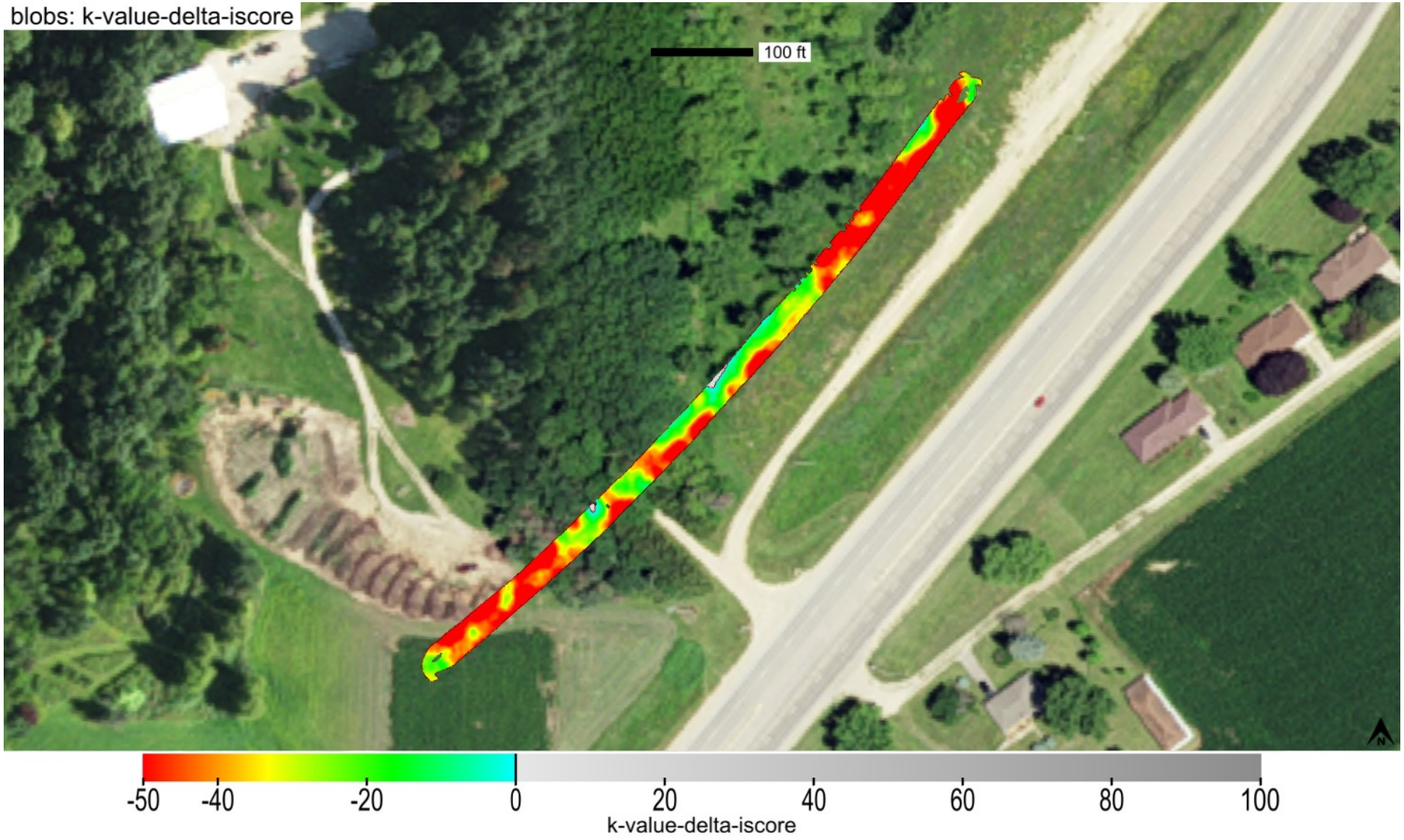
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	20201	99.31	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

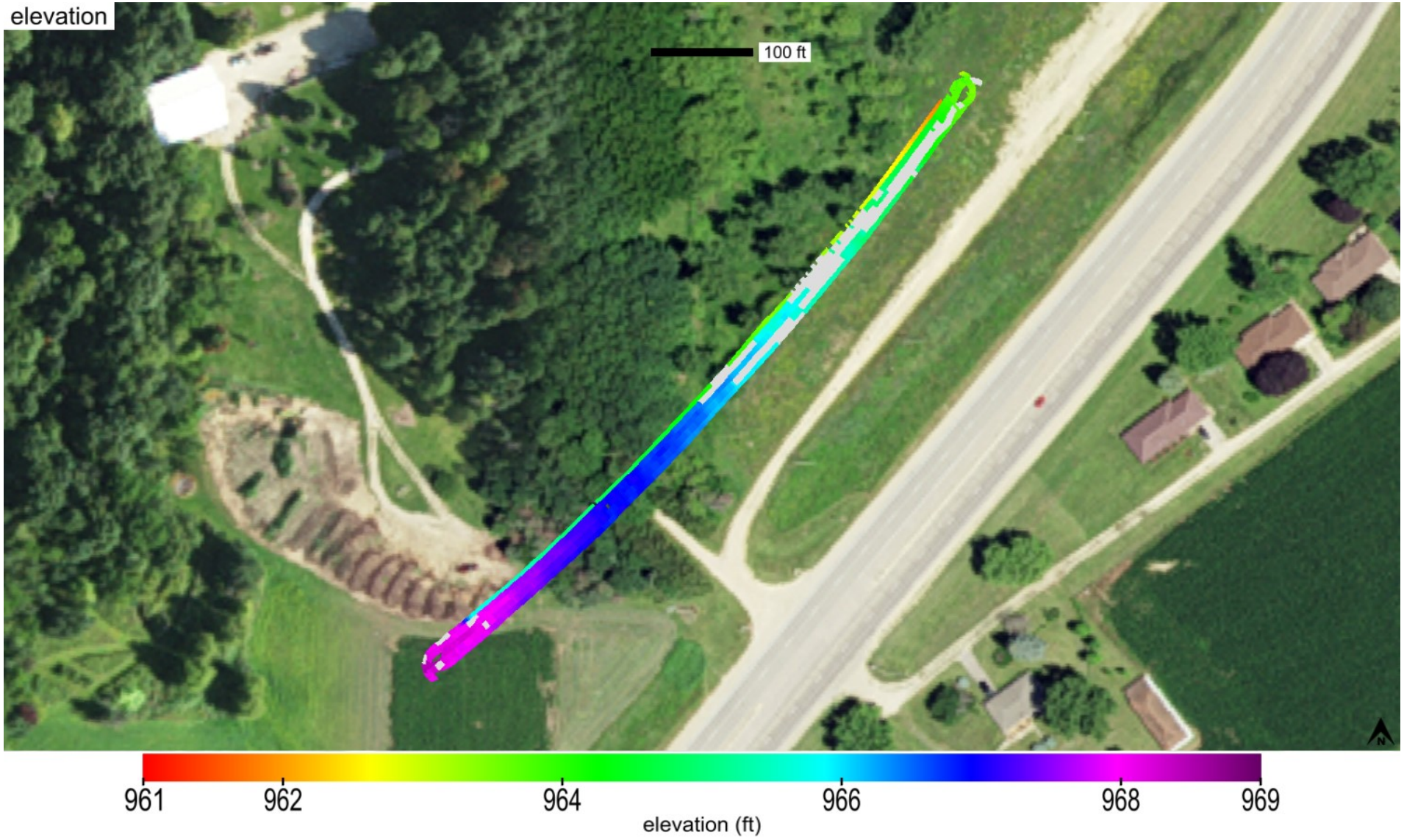
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

minimum	average	maximum
1	1.34	5

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

minimum	average	maximum
961.776	966.14	968.584



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	20341	0.467	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_071812a

20200929_164122.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.2	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_30_074733a	No. of Measurements:	14752	Machine ID:	Ingios_FCS00210
Date and Time:	9/30/2020 7:47:33 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	95.9	106.91	0.78	9037	5800.33	18356.4	44792.47	6974.64	38	-3236.67	9319.4	35755.47
k-value	Yes	15.5	30.2	0.33	150	20	114.8	190	35.03	30.53	-130	-35.2	40
Moisture Content	No												

Mapped Area

square feet	acres
14752	0.34

Pass Count

min.	avg.	max.
1	1.31	4

Elevation (ft)

min.	avg.	max.
963.37	966.14	968.46

Velocity (fps)

min.	avg.	max.
1.01	5.42	6.22

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	14752	0.339	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.2	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_30_074733a	No. of Measurements:	14752	Machine ID:	Ingios_FCS00210
Date and Time:	9/30/2020 7:47:33 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
106.91	CQI > = 95
95.9	80% of Resilient Modulus MVs >= 9037
38	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.2	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_30_074733a	No. of Measurements:	14752	Machine ID:	Ingios_FCS00210
Date and Time:	9/30/2020 7:47:33 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
30.2	CQI > = 95
15.5	80% of k-Value MVs >= 150
30.53	COV <= 20
97.17	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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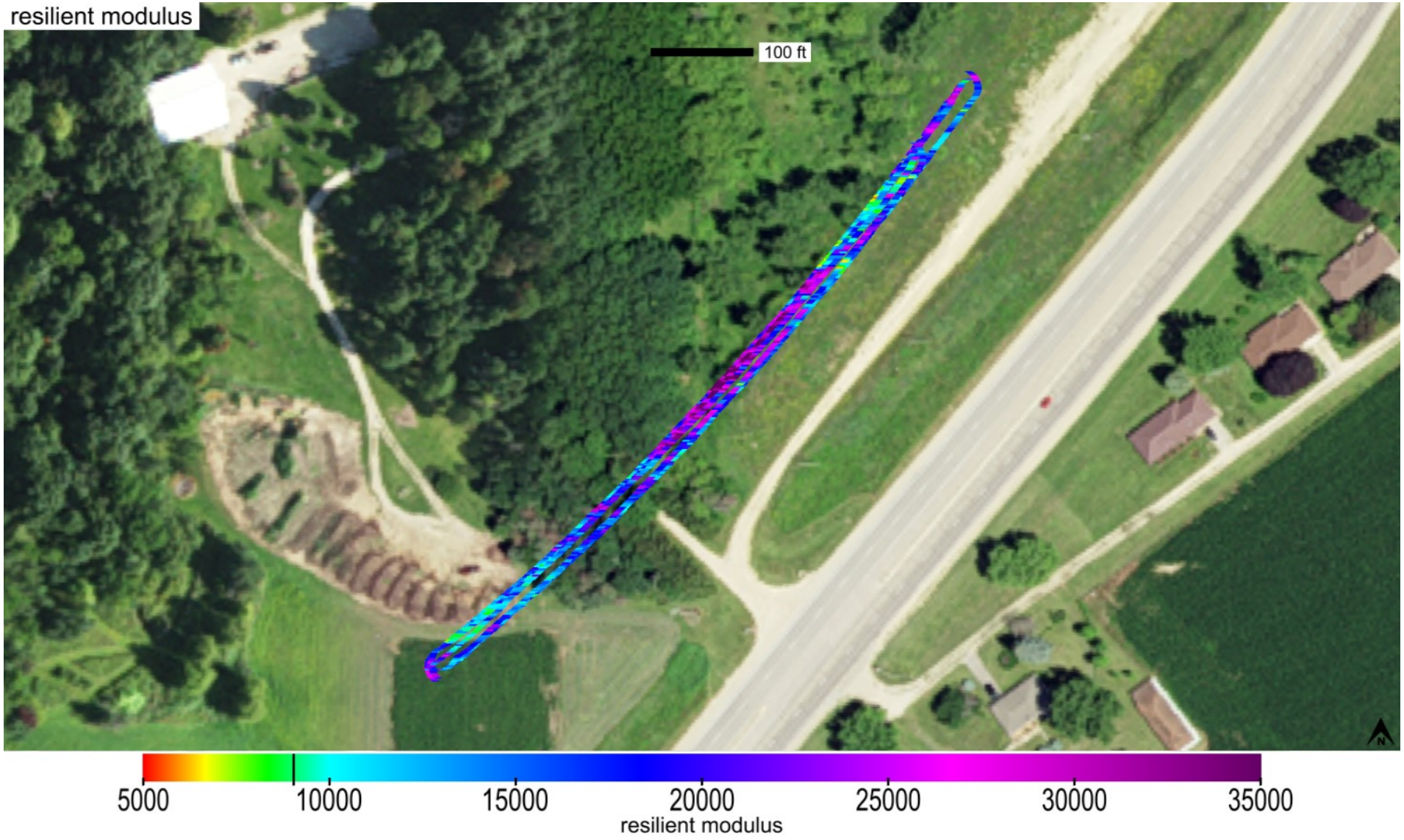
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	95.9	106.91	0.78	9037	5800.33	18356.4	44792.47	6974.64	38	-3236.67	9319.4	35755.47



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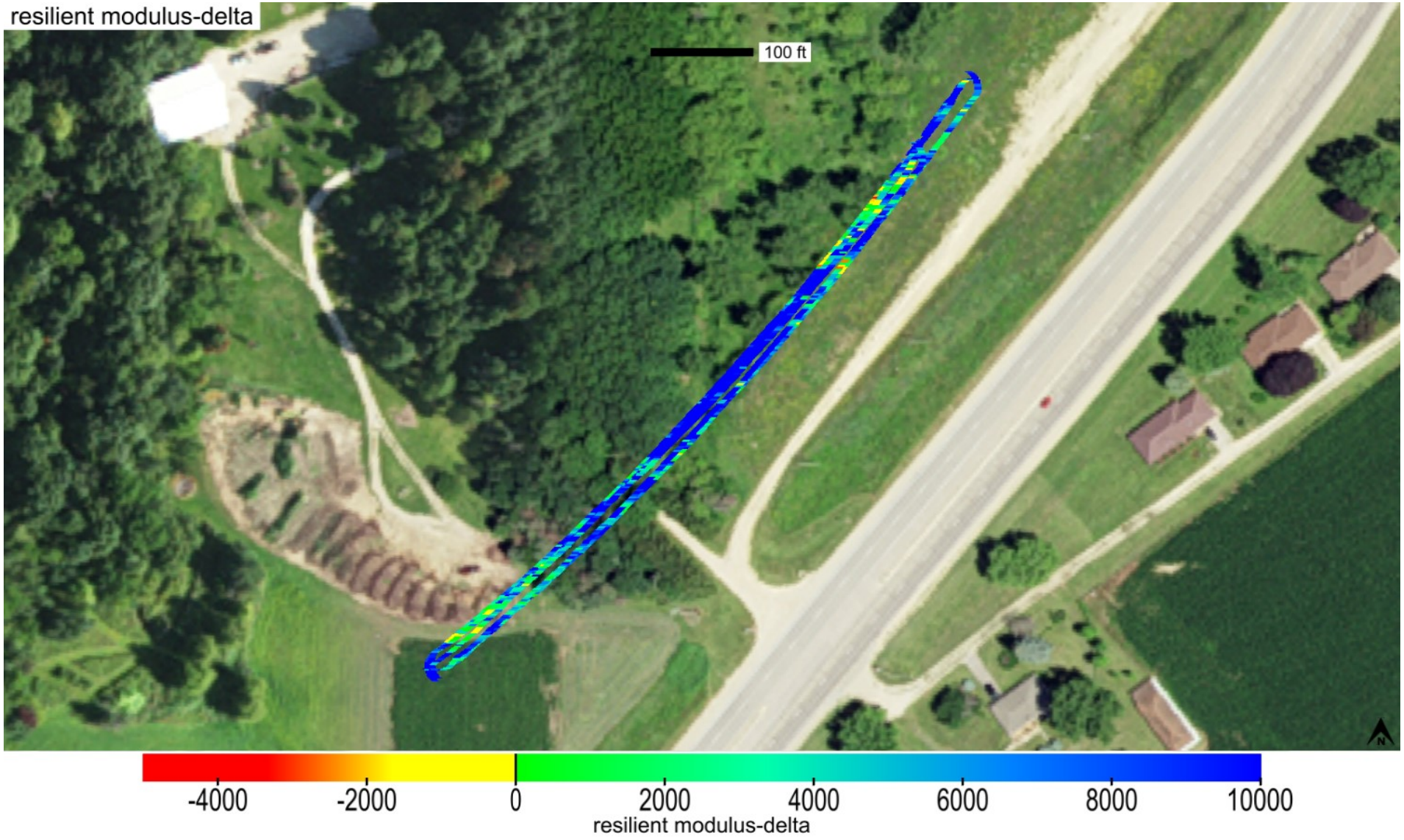
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

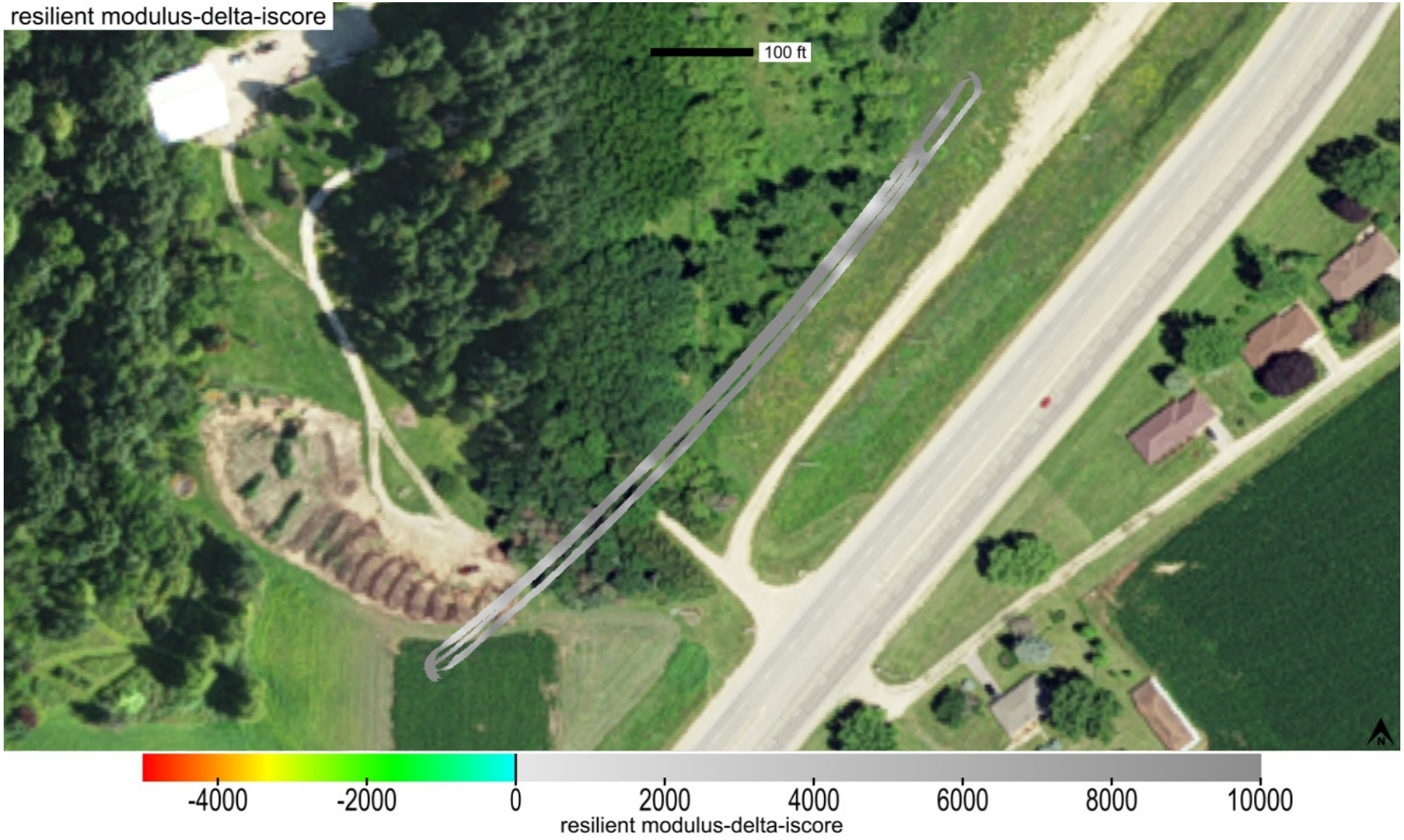
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	95.9	106.91	0.78	9037	5800.33	18356.4	44792.47	6974.64	38	-3236.67	9319.4	35755.47



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	95.9	9037	-3236.67	9319.4	35755.47	-13.29	9398.13	25251.97



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ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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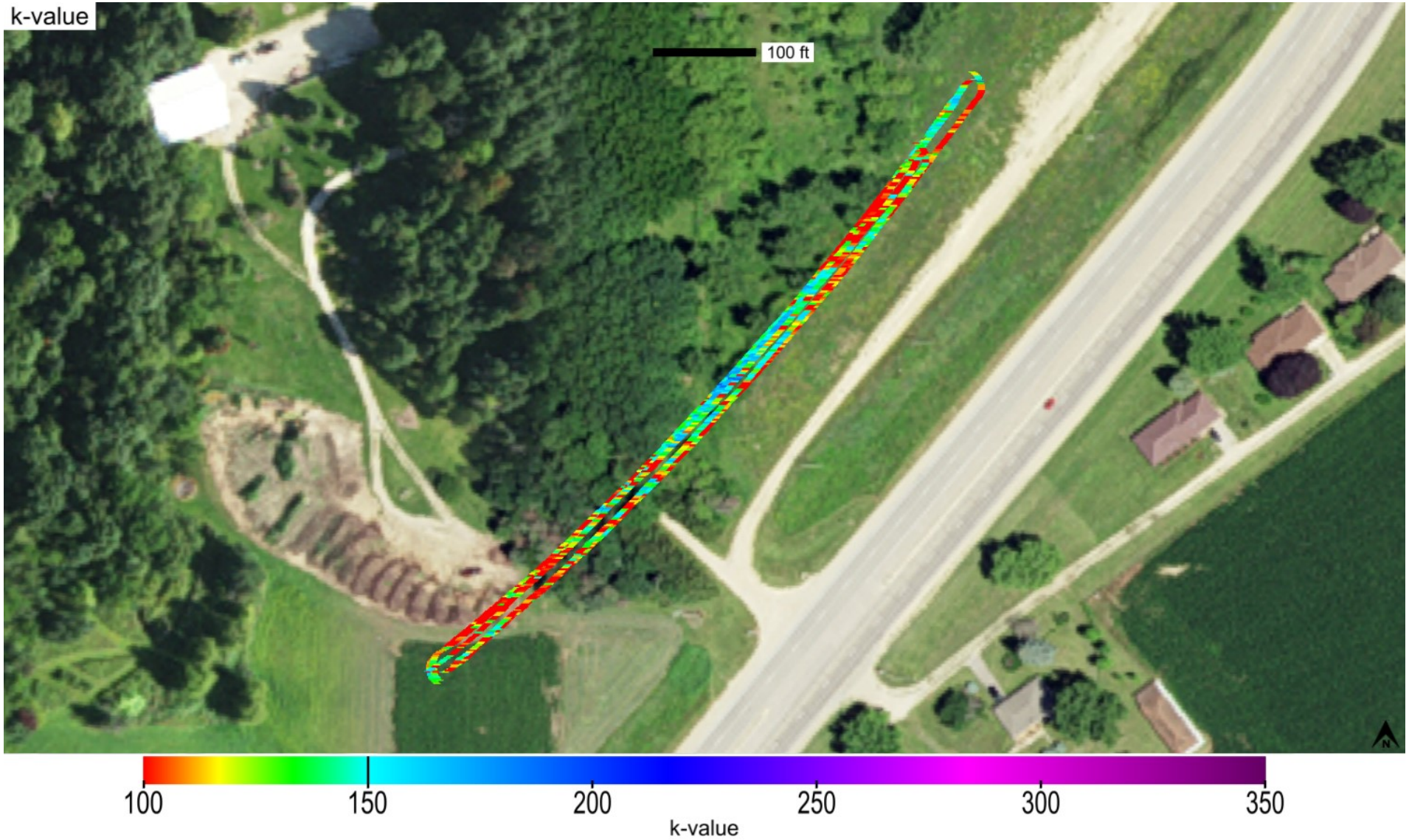
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	15.5	30.2	0.33	150	20	114.8	190	35.03	30.53	-130	-35.2	40



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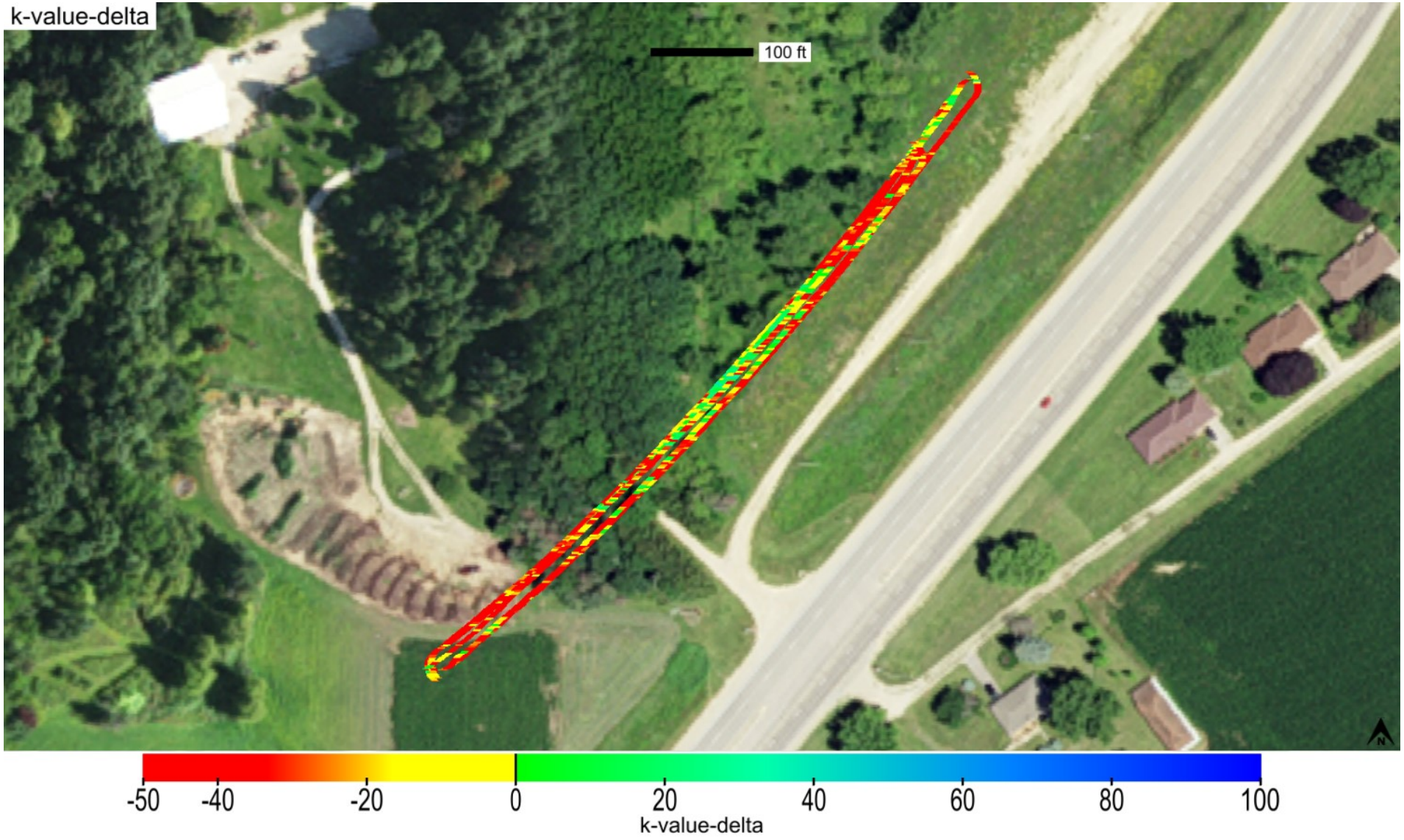
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

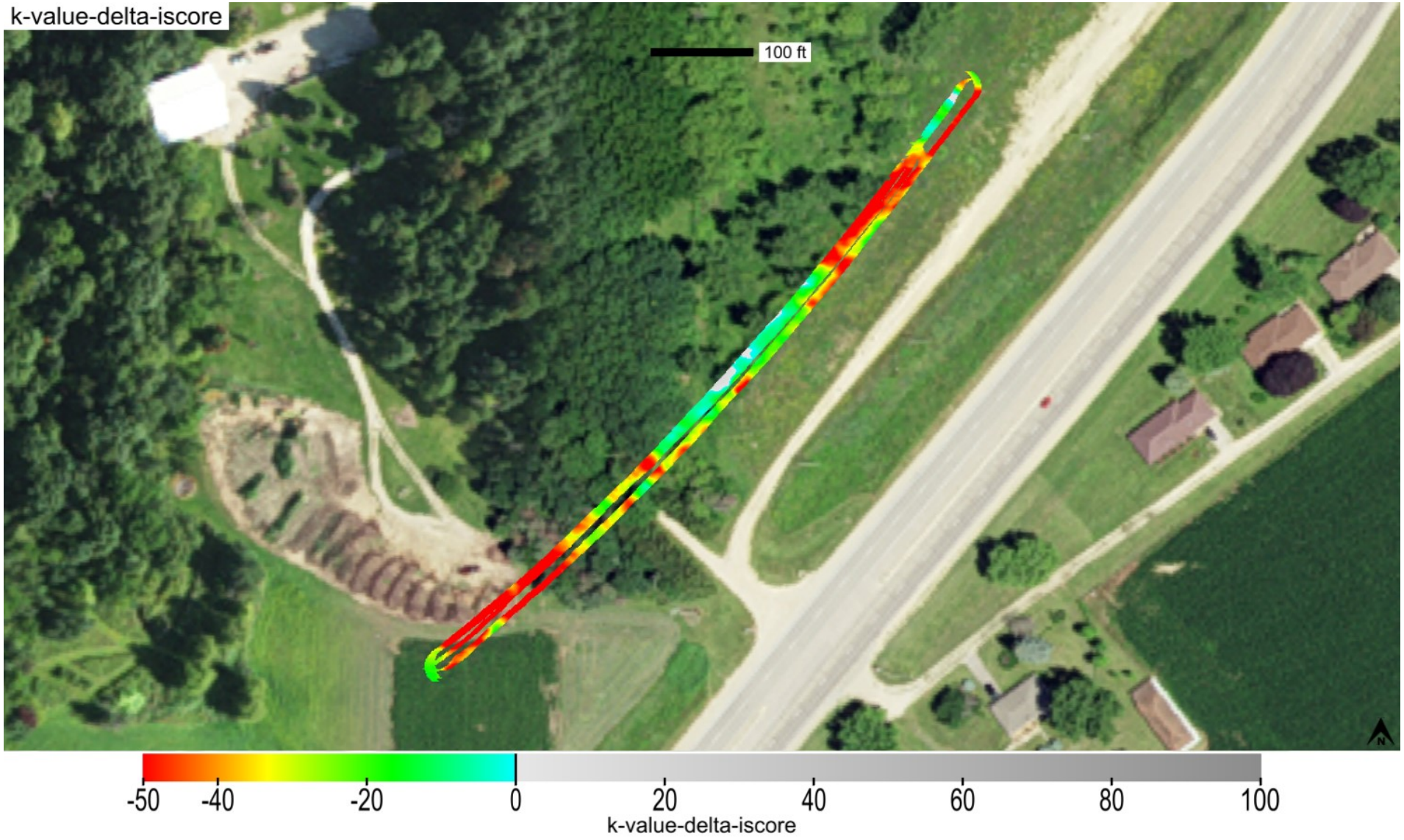
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	15.5	30.2	0.33	150	20	114.8	190	35.03	30.53	-130	-35.2	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	15.5	150	-130	-35.2	40	-107.74	-34.95	15.9



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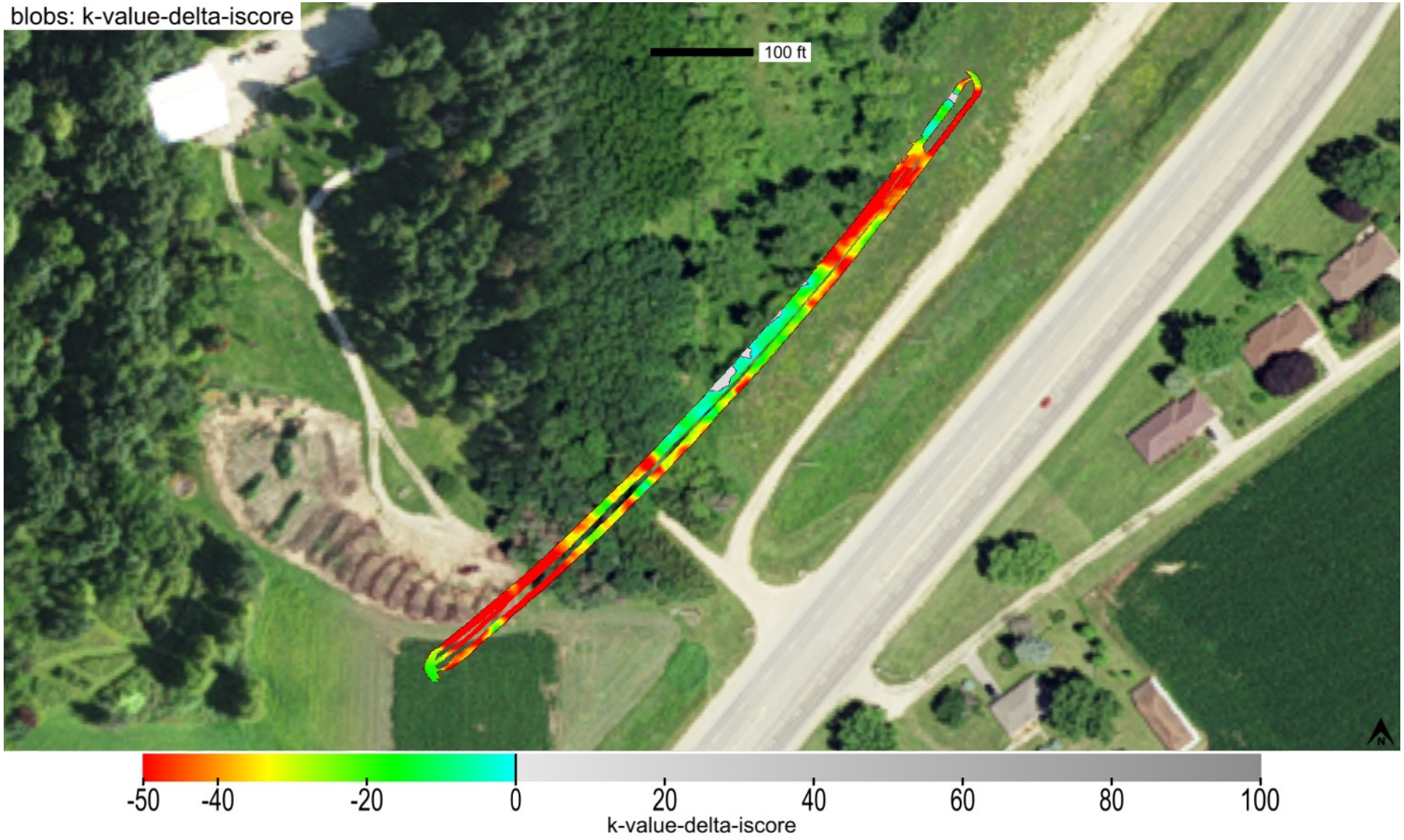
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	14334	97.17	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

minimum	average	maximum
1	1.31	4

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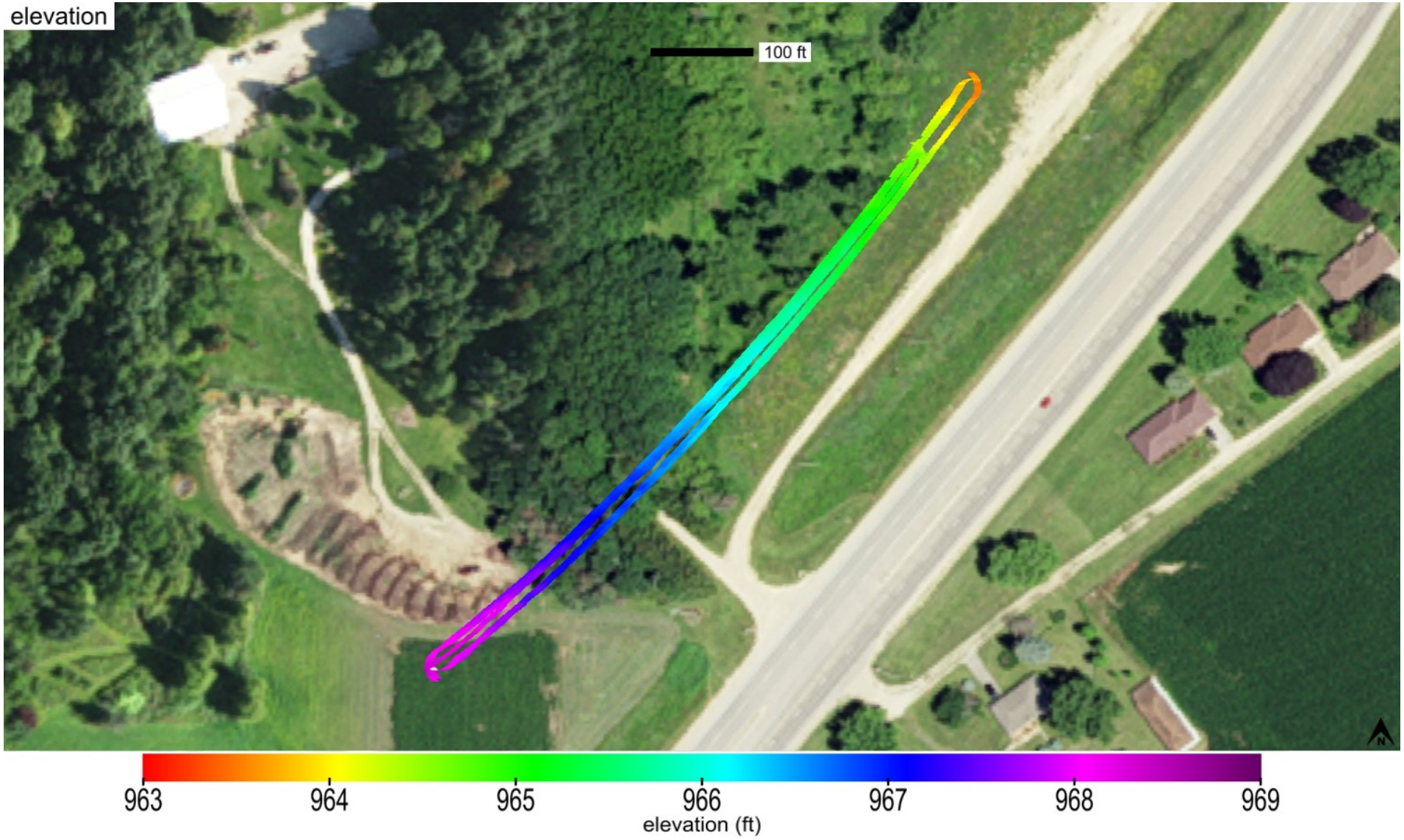
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

minimum	average	maximum
963.371	966.137	968.456



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	14752	0.339	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_30_074733a

20200929_164122.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_090328a	No. of Measurements:	27713	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 9:03:28 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.8	115.63	1.09	9037	8817.47	28104	56000	7966.5	28.35	-219.53	19067	46963
k-value	Yes	73.5	95.09	1.07	150	55.16	163.4	190	27.51	16.84	-94.84	13.4	40
Moisture Content	No												

Mapped Area

square feet	acres
27713	0.64

Pass Count

min.	avg.	max.
1	1.24	3

Elevation (ft)

min.	avg.	max.
998.97	1026.89	1049.33

Velocity (fps)

min.	avg.	max.
1.47	5.48	7.4

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	27713	0.636	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_090328a	No. of Measurements:	27713	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 9:03:28 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
115.63	CQI > = 95
99.8	80% of Resilient Modulus MVs >= 9037
28.35	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_090328a	No. of Measurements:	27713	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 9:03:28 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
95.09	CQI > = 95
73.5	80% of k-Value MVs >= 150
16.84	COV <= 20
16.84	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	115.63	1.09	9037	8817.47	28104	56000	7966.5	28.35	-219.53	19067	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	115.63	1.09	9037	8817.47	28104	56000	7966.5	28.35	-219.53	19067	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.8	9037	-219.53	19067	46963	4038.47	19094.96	39328.29

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

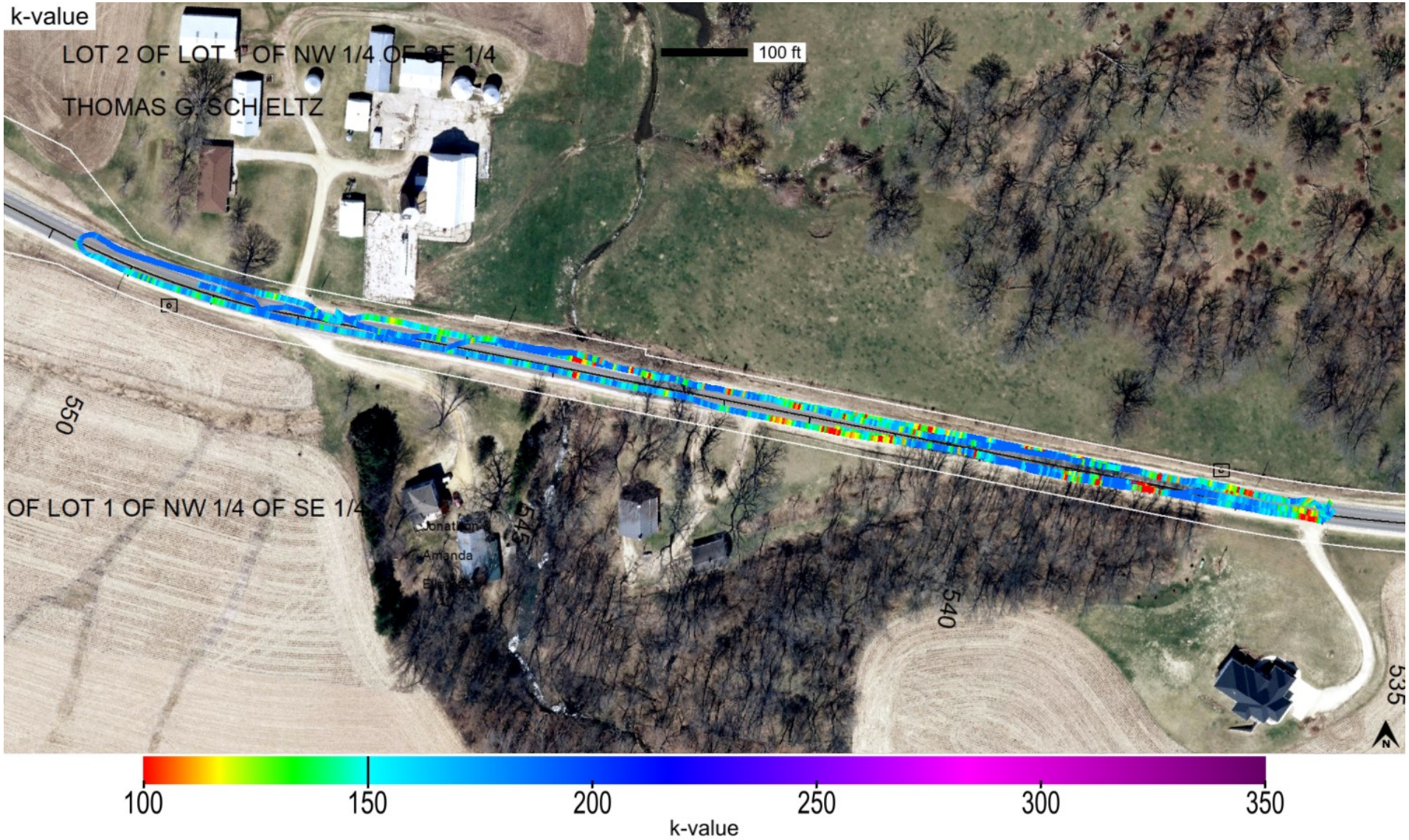
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	73.5	95.09	1.07	150	55.16	163.4	190	27.51	16.84	-94.84	13.4	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	73.5	95.09	1.07	150	55.16	163.4	190	27.51	16.84	-94.84	13.4	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	73.5	150	-94.84	13.4	40	-62.03	13.48	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	12	4668	16.84	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

minimum	average	maximum
1	1.24	3

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

minimum	average	maximum
998.971	1026.888	1049.329

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_090328a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	27713	0.636	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.9	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_094843a	No. of Measurements:	78659	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 9:48:43 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	117.22	1.21	9037	9404.52	29116.5	56000	7444.35	25.57	367.52	20079.5	46963
k-value	Yes	74.3	96.69	1.2	150	27.59	165.2	190	25.09	15.18	-122.41	15.2	40
Moisture Content	No												

Mapped Area

square feet	acres
78659	1.81

Pass Count

min.	avg.	max.
1	1.52	7

Elevation (ft)

min.	avg.	max.
1029.93	1052.26	1066.44

Velocity (fps)

min.	avg.	max.
0.47	5.46	6.72

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	78659	1.806	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.9	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_094843a	No. of Measurements:	78659	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 9:48:43 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
117.22	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
25.57	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.9	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_094843a	No. of Measurements:	78659	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 9:48:43 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
96.69	CQI > = 95
74.3	80% of k-Value MVs >= 150
15.18	COV <= 20
13.34	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.22	1.21	9037	9404.52	29116.5	56000	7444.35	25.57	367.52	20079.5	46963

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ingios GEOTECHNICS

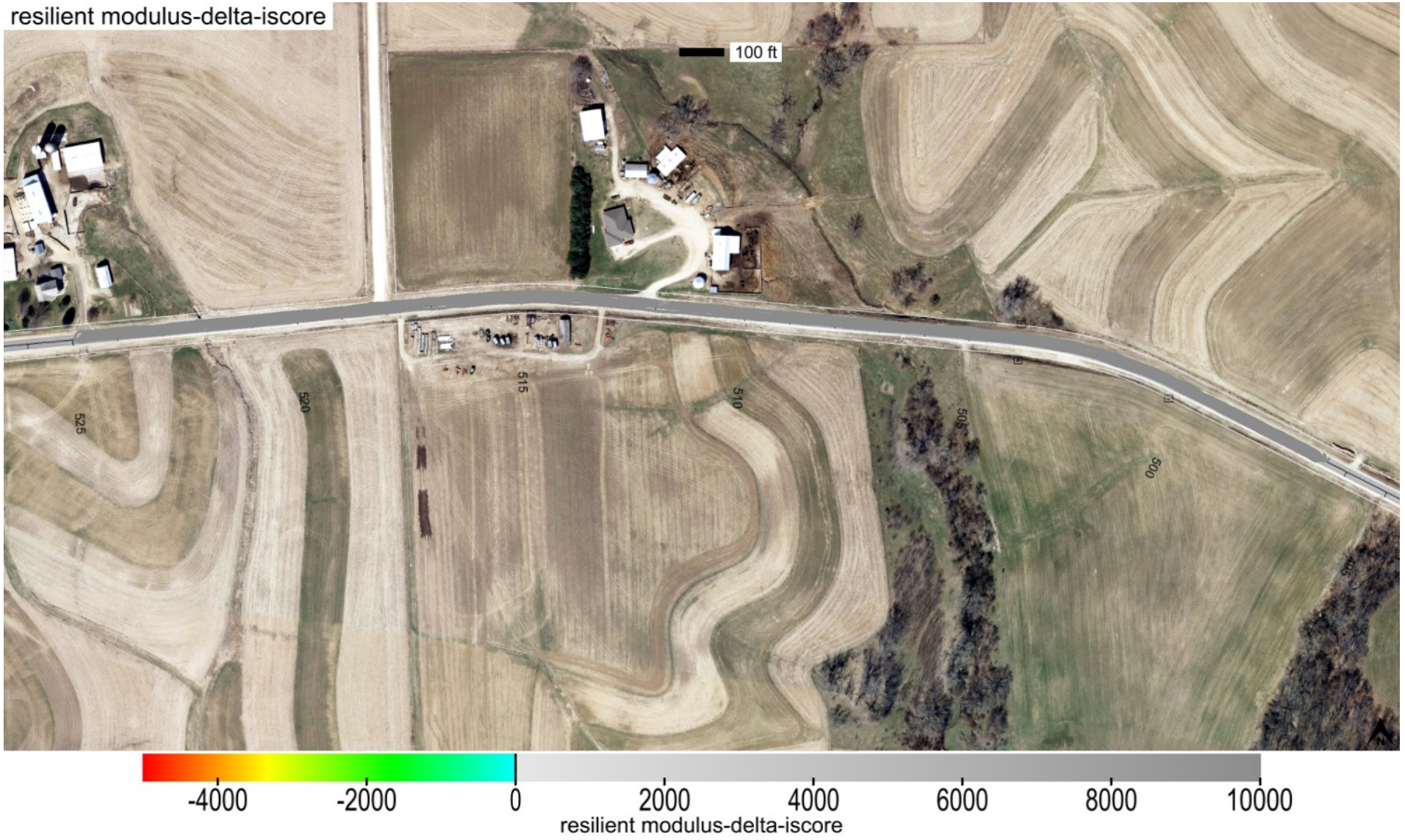
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.22	1.21	9037	9404.52	29116.5	56000	7444.35	25.57	367.52	20079.5	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	367.52	20079.5	46963	7247.08	20184.99	43255.99



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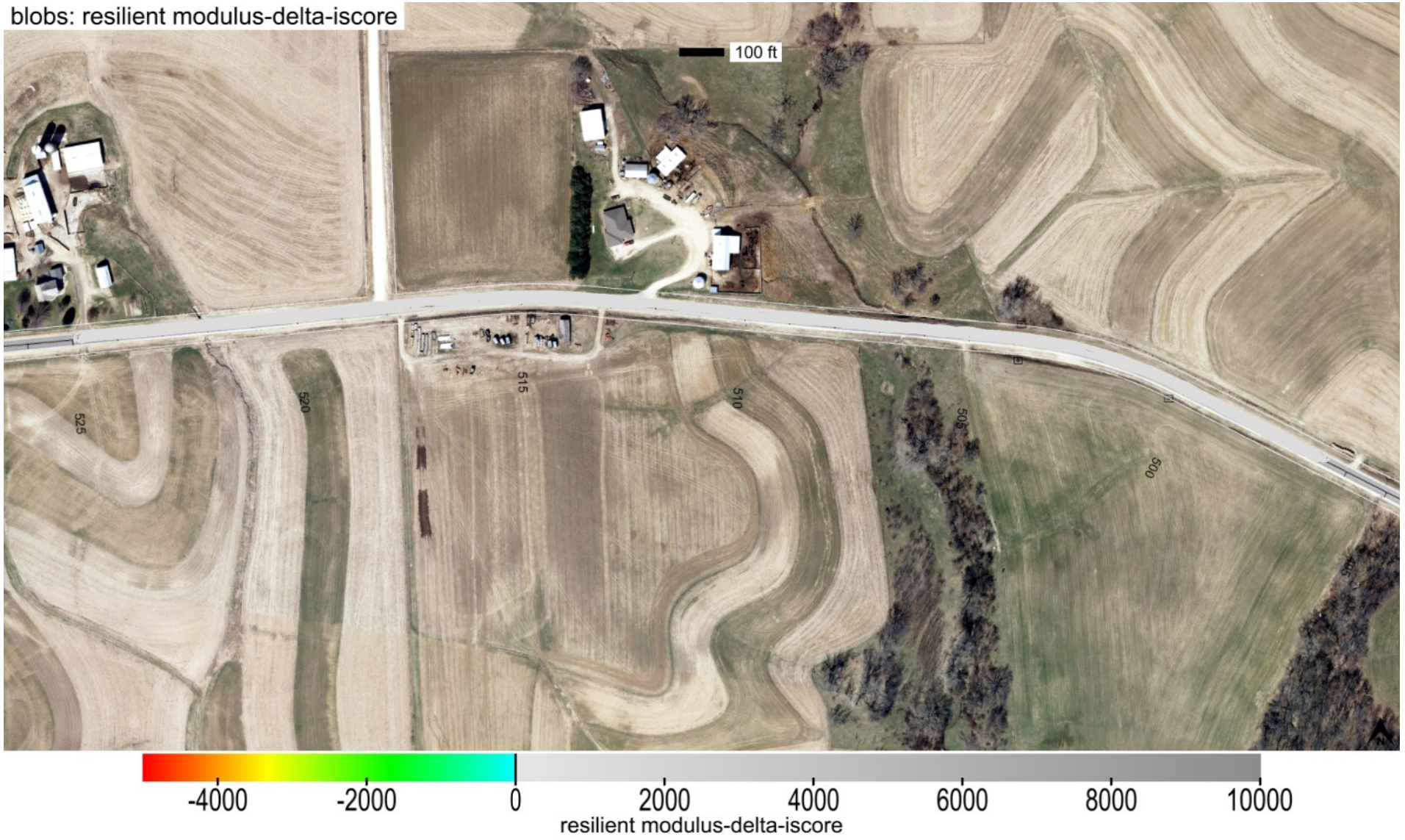
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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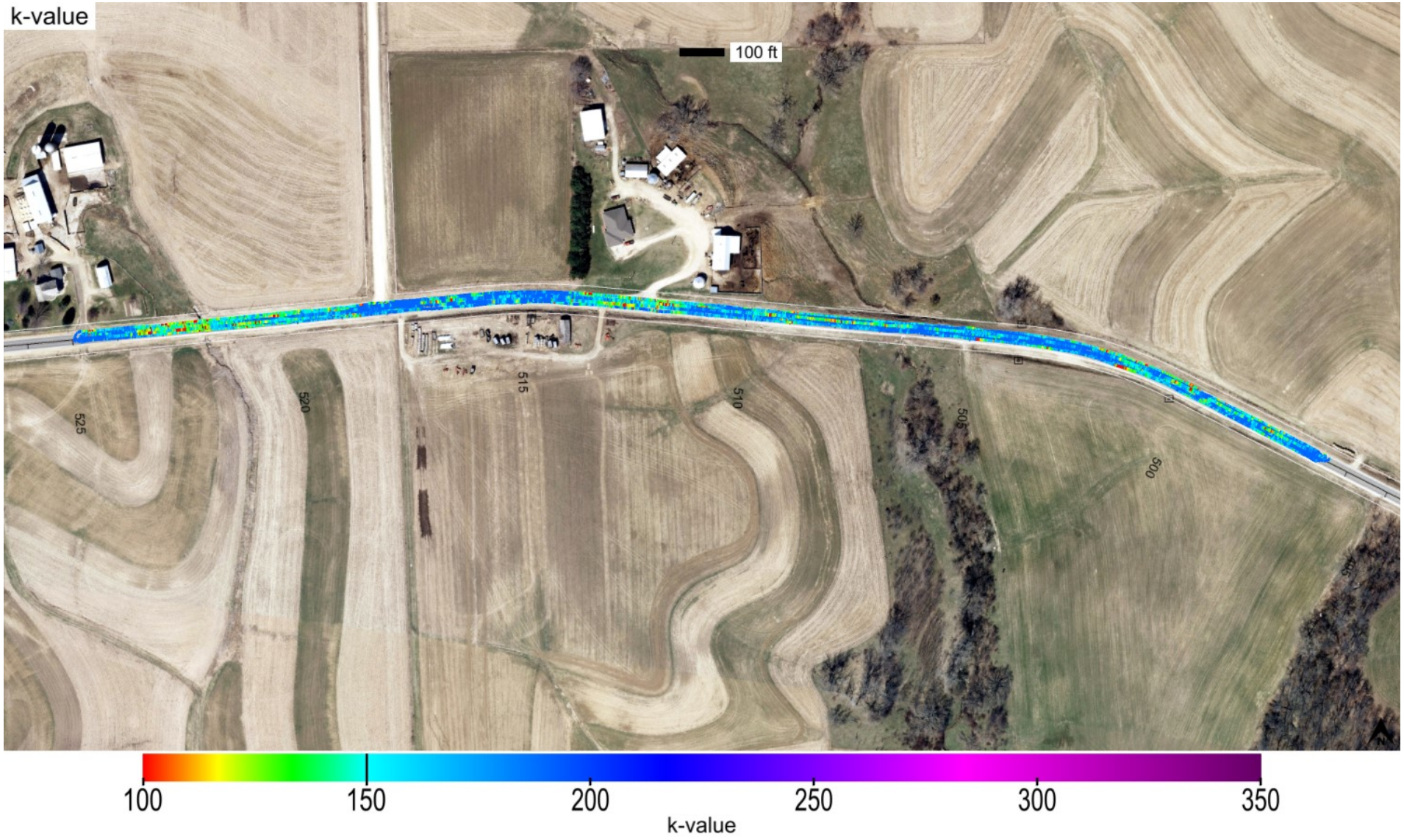
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	74.3	96.69	1.2	150	27.59	165.2	190	25.09	15.18	-122.41	15.2	40



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	74.3	96.69	1.2	150	27.59	165.2	190	25.09	15.18	-122.41	15.2	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	74.3	150	-122.41	15.2	40	-43.96	15.51	40

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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	9	10490	13.34	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

minimum	average	maximum
1	1.52	7

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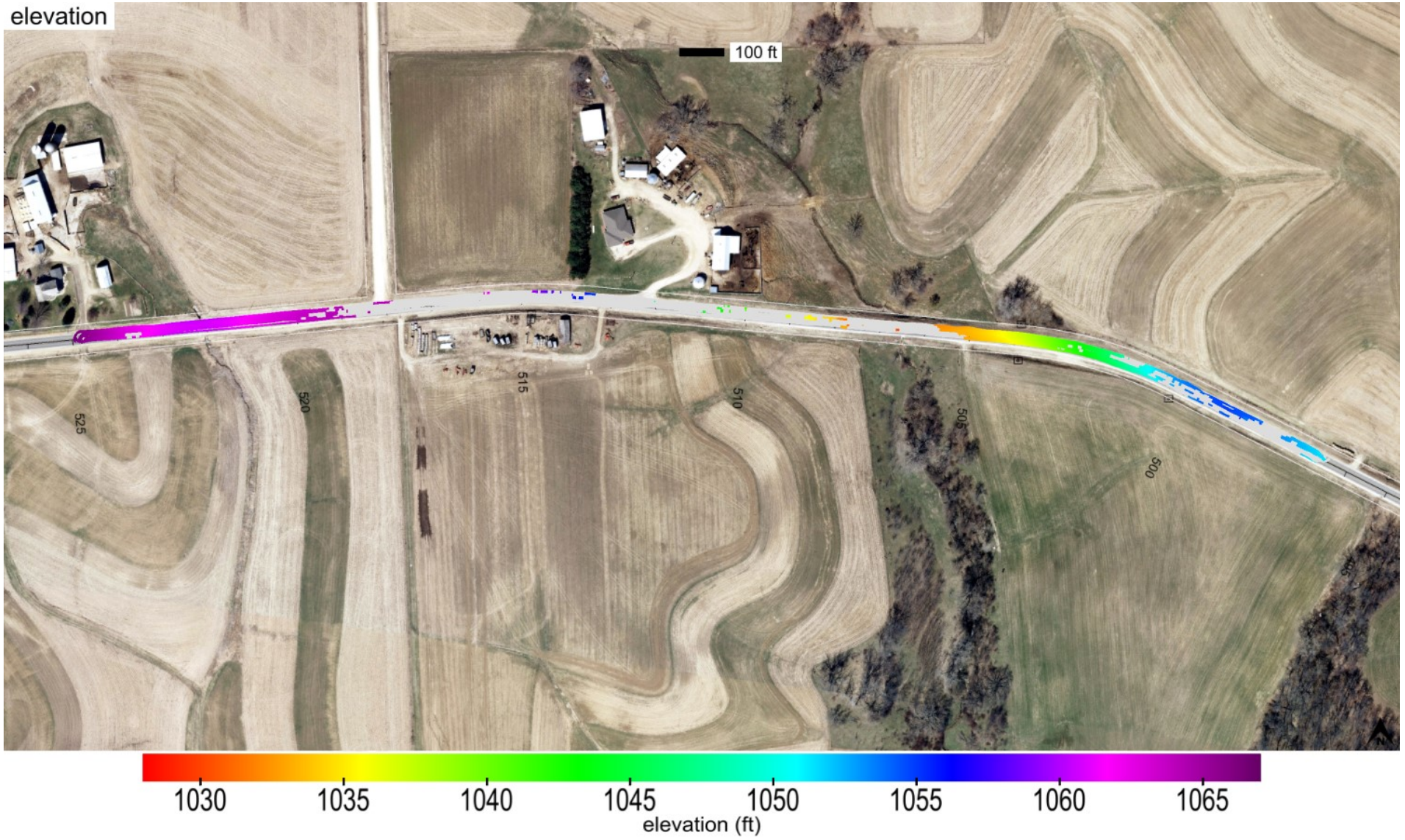
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

minimum	average	maximum
1029.932	1052.26	1066.435



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	78659	1.806	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

20190904_095007.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_094843a

20190904_100009.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_110140a	No. of Measurements:	17689	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 11:01:40 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	97.3	99.36	0.54	9037	7812.32	22737.4	56000	12723.63	55.96	-1224.68	13700.4	46963
k-value	Yes	40.1	44.4	0.24	150	20	118.1	190	60.69	51.4	-130	-31.9	40
Moisture Content	No												

Mapped Area

square feet	acres
17689	0.41

Pass Count

min.	avg.	max.
1	1.31	4

Elevation (ft)

min.	avg.	max.
1061.74	1071.87	1085.8

Velocity (fps)

min.	avg.	max.
0.31	5.38	6.29

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	17689	0.406	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_110140a	No. of Measurements:	17689	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 11:01:40 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
99.36	CQI > = 95
97.3	80% of Resilient Modulus MVs >= 9037
55.96	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_110140a	No. of Measurements:	17689	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 11:01:40 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
44.4	CQI > = 95
40.1	80% of k-Value MVs >= 150
51.4	COV <= 20
56.49	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	97.3	99.36	0.54	9037	7812.32	22737.4	56000	12723.63	55.96	-1224.68	13700.4	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	97.3	99.36	0.54	9037	7812.32	22737.4	56000	12723.63	55.96	-1224.68	13700.4	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	97.3	9037	-1224.68	13700.4	46963	-182.19	13744.88	41950.68

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

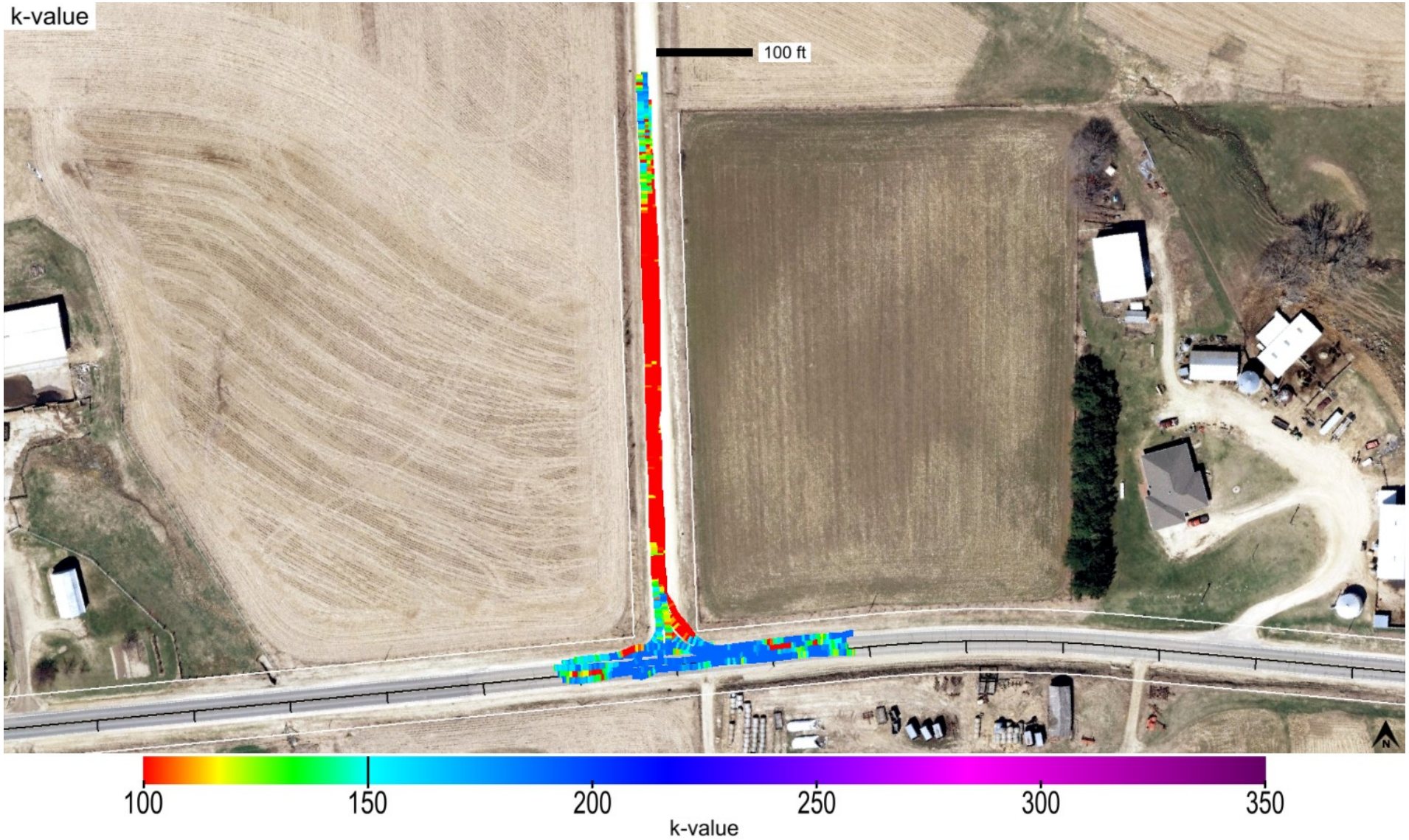
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	40.1	44.4	0.24	150	20	118.1	190	60.69	51.4	-130	-31.9	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	40.1	44.4	0.24	150	20	118.1	190	60.69	51.4	-130	-31.9	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	40.1	150	-130	-31.9	40	-126.97	-32.03	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	9993	56.49	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

minimum	average	maximum
1	1.31	4

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

minimum	average	maximum
1061.743	1071.866	1085.795

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	17689	0.406	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

20190904_110228.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

20190904_113016.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_110140a

20190904_115204.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.33	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_151513a	No. of Measurements:	33119	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 3:15:13 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	120.36	1.6	9037	12307.12	27235.1	49700.04	5254.14	19.29	3270.12	18198.1	40663.04
k-value	Yes	84.2	108.06	1.52	150	60.19	170	190	20.82	12.24	-89.81	20	40
Moisture Content	No												

Mapped Area

square feet	acres
33119	0.76

Pass Count

min.	avg.	max.
1	1.33	5

Elevation (ft)

min.	avg.	max.
1047.88	1066.68	1071.23

Velocity (fps)

min.	avg.	max.
0.9	5.47	6.44

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	33119	0.76	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.33	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_151513a	No. of Measurements:	33119	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 3:15:13 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
120.36	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
19.29	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.33	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_151513a	No. of Measurements:	33119	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 3:15:13 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
108.06	CQI > = 95
84.2	80% of k-Value MVs >= 150
12.24	COV <= 20
4.42	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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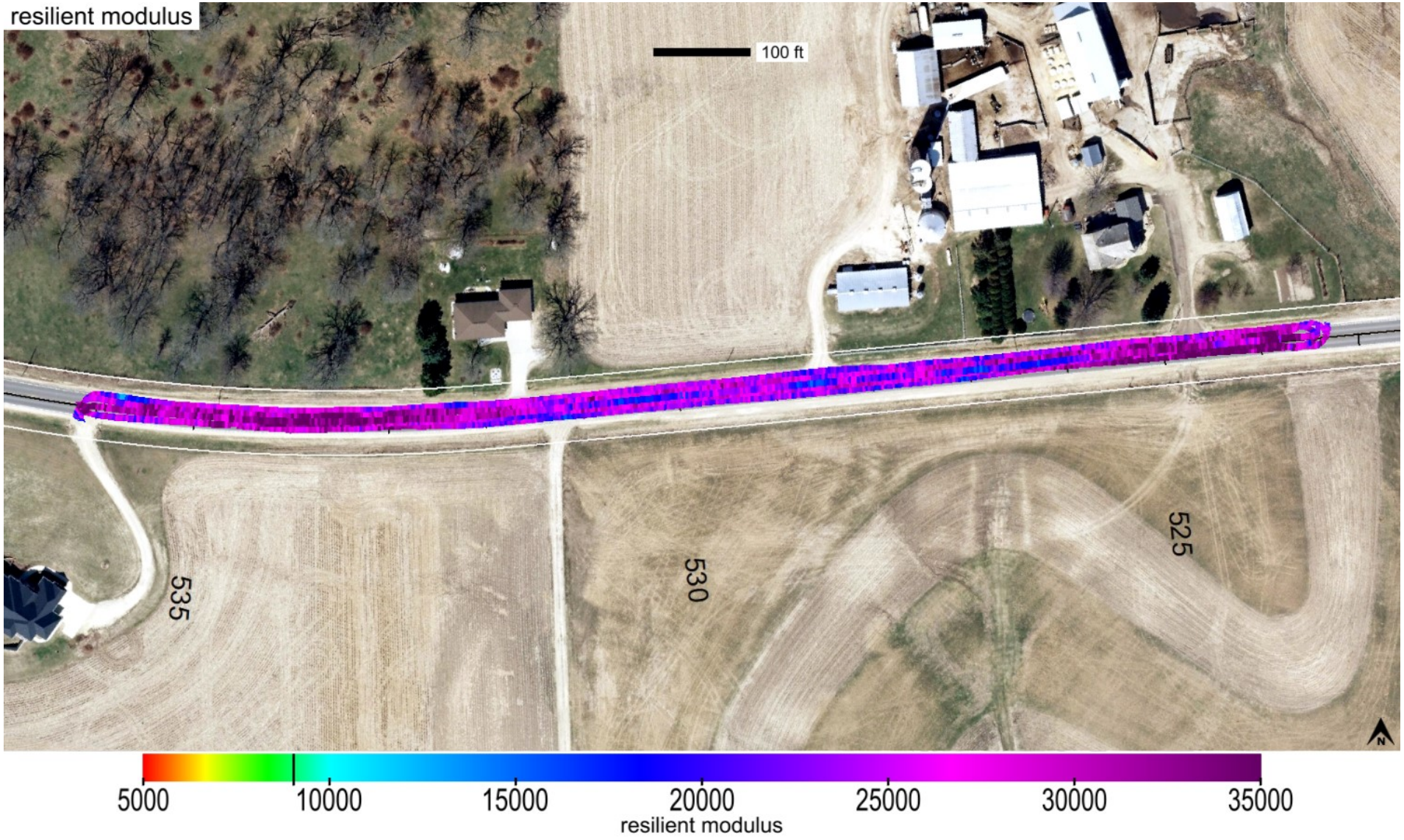
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

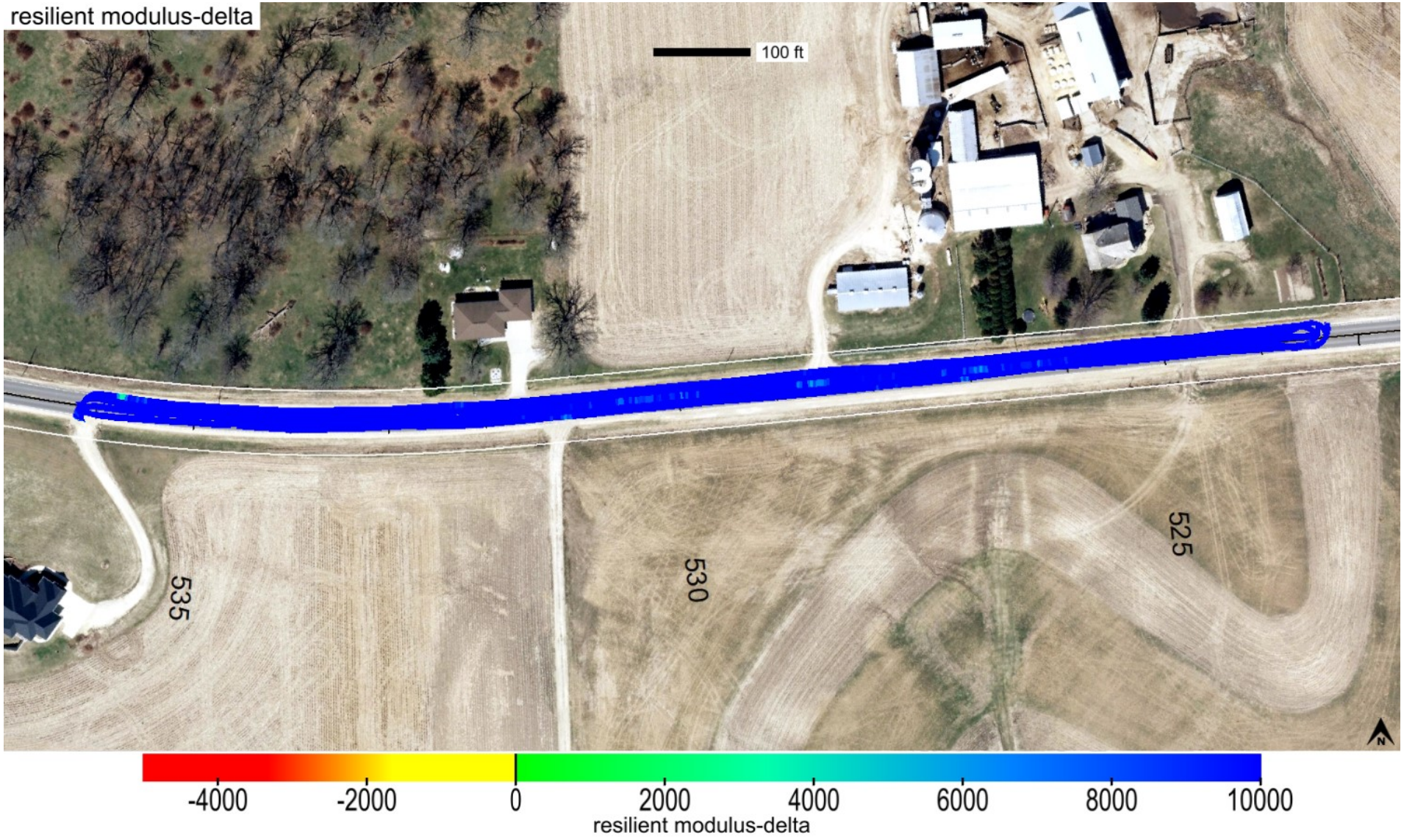
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	120.36	1.6	9037	12307.12	27235.1	49700.04	5254.14	19.29	3270.12	18198.1	40663.04



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	120.36	1.6	9037	12307.12	27235.1	49700.04	5254.14	19.29	3270.12	18198.1	40663.04



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	3270.12	18198.1	40663.04	9108.27	18339.24	28985.67

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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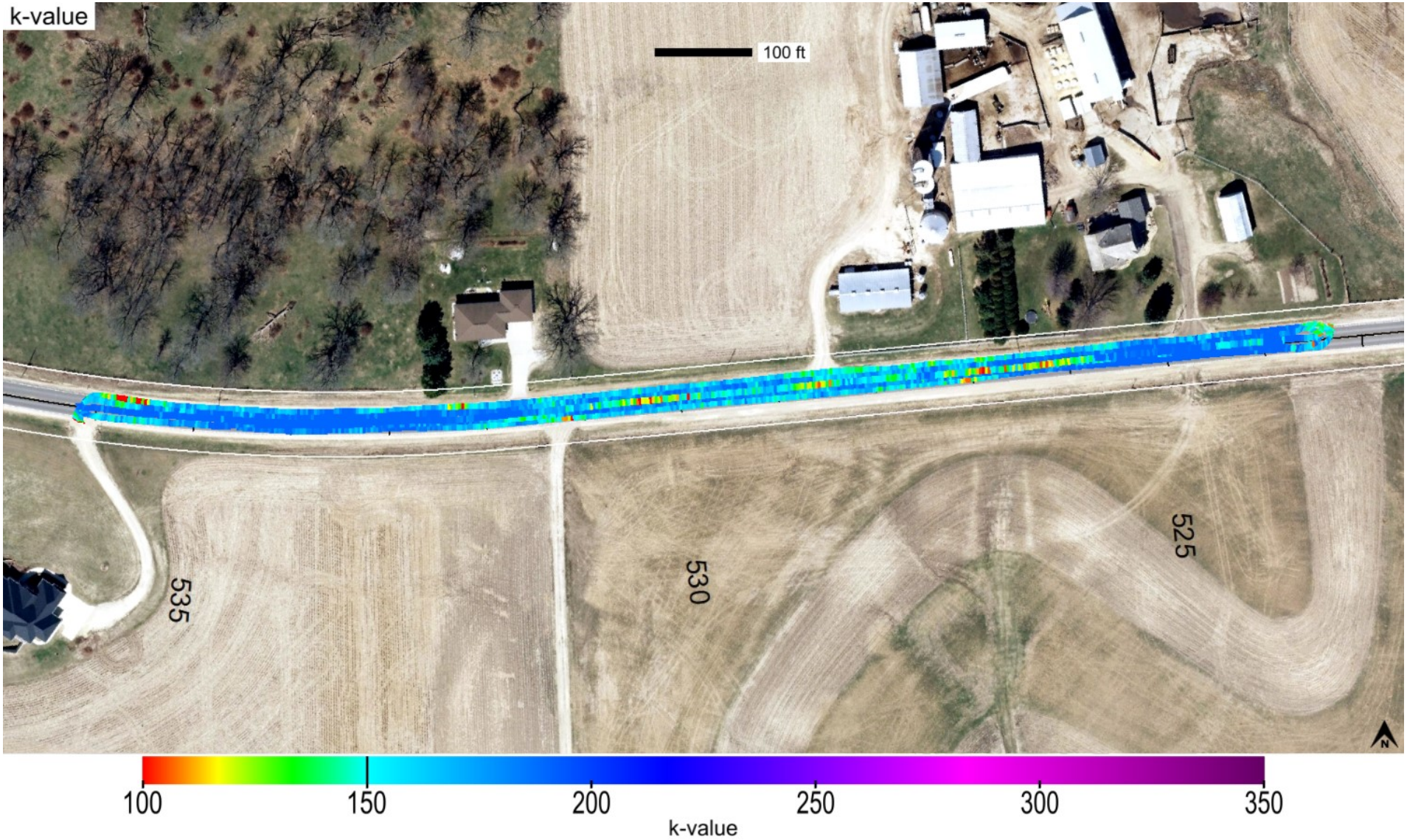
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	84.2	108.06	1.52	150	60.19	170	190	20.82	12.24	-89.81	20	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	84.2	108.06	1.52	150	60.19	170	190	20.82	12.24	-89.81	20	40

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	84.2	150	-89.81	20	40	-38.06	20.46	40

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	1465	4.42	none	0

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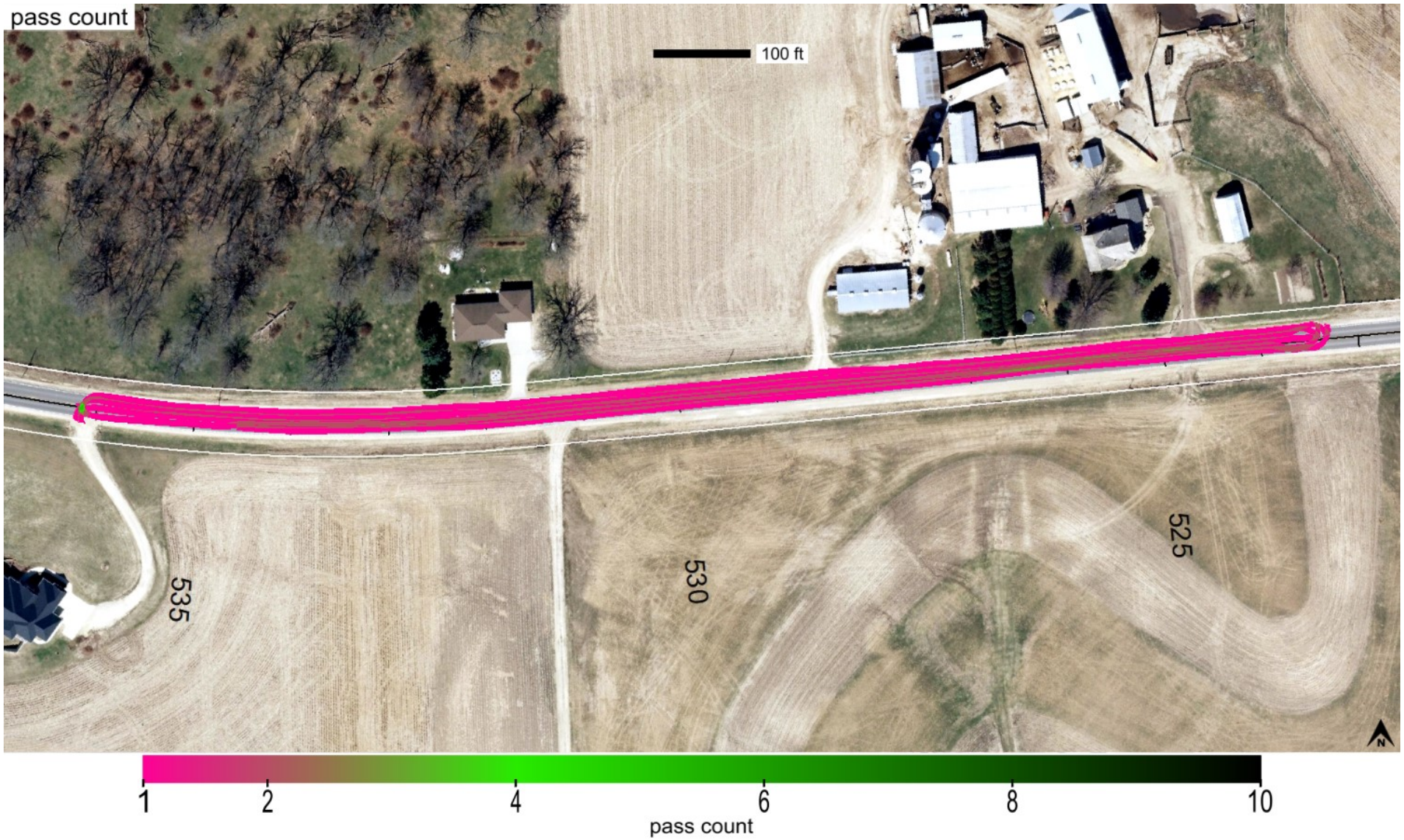
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

minimum	average	maximum
1	1.33	5



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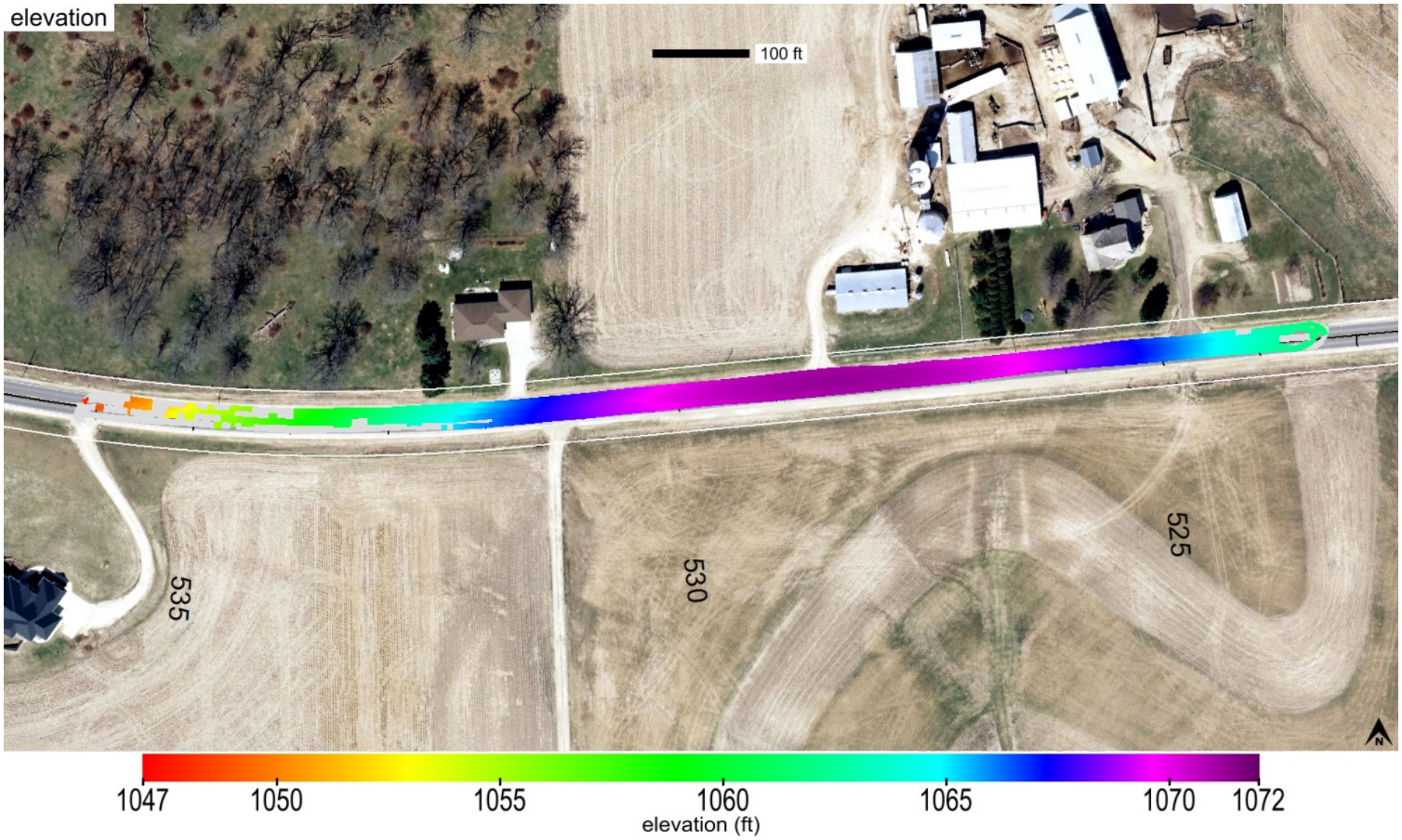
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

minimum	average	maximum
1047.885	1066.678	1071.235



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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	33119	0.76	12	9037	150	40

Modified Subbase_IADOT (2115)

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_151513a

20190904_152906.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.41	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_154036a	No. of Measurements:	40569	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 3:40:36 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	119.12	1.43	9037	10420.73	29034.9	56000	6320.2	21.77	1383.73	19997.9	46963
k-value	Yes	86.4	110.48	1.58	150	43.55	172.4	190	20.49	11.89	-106.45	22.4	40
Moisture Content	No												

Mapped Area

square feet	acres
40569	0.93

Pass Count

min.	avg.	max.
1	1.36	4

Elevation (ft)

min.	avg.	max.
991.46	1013.11	1054.61

Velocity (fps)

min.	avg.	max.
1.08	5.5	7.64

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	40569	0.931	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.41	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_154036a	No. of Measurements:	40569	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 3:40:36 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
119.12	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
21.77	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.41	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_154036a	No. of Measurements:	40569	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 3:40:36 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
110.48	CQI > = 95
86.4	80% of k-Value MVs >= 150
11.89	COV <= 20
2.63	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	119.12	1.43	9037	10420.73	29034.9	56000	6320.2	21.77	1383.73	19997.9	46963

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	119.12	1.43	9037	10420.73	29034.9	56000	6320.2	21.77	1383.73	19997.9	46963

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	1383.73	19997.9	46963	10111.42	20171.55	37293.07

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	86.4	110.48	1.58	150	43.55	172.4	190	20.49	11.89	-106.45	22.4	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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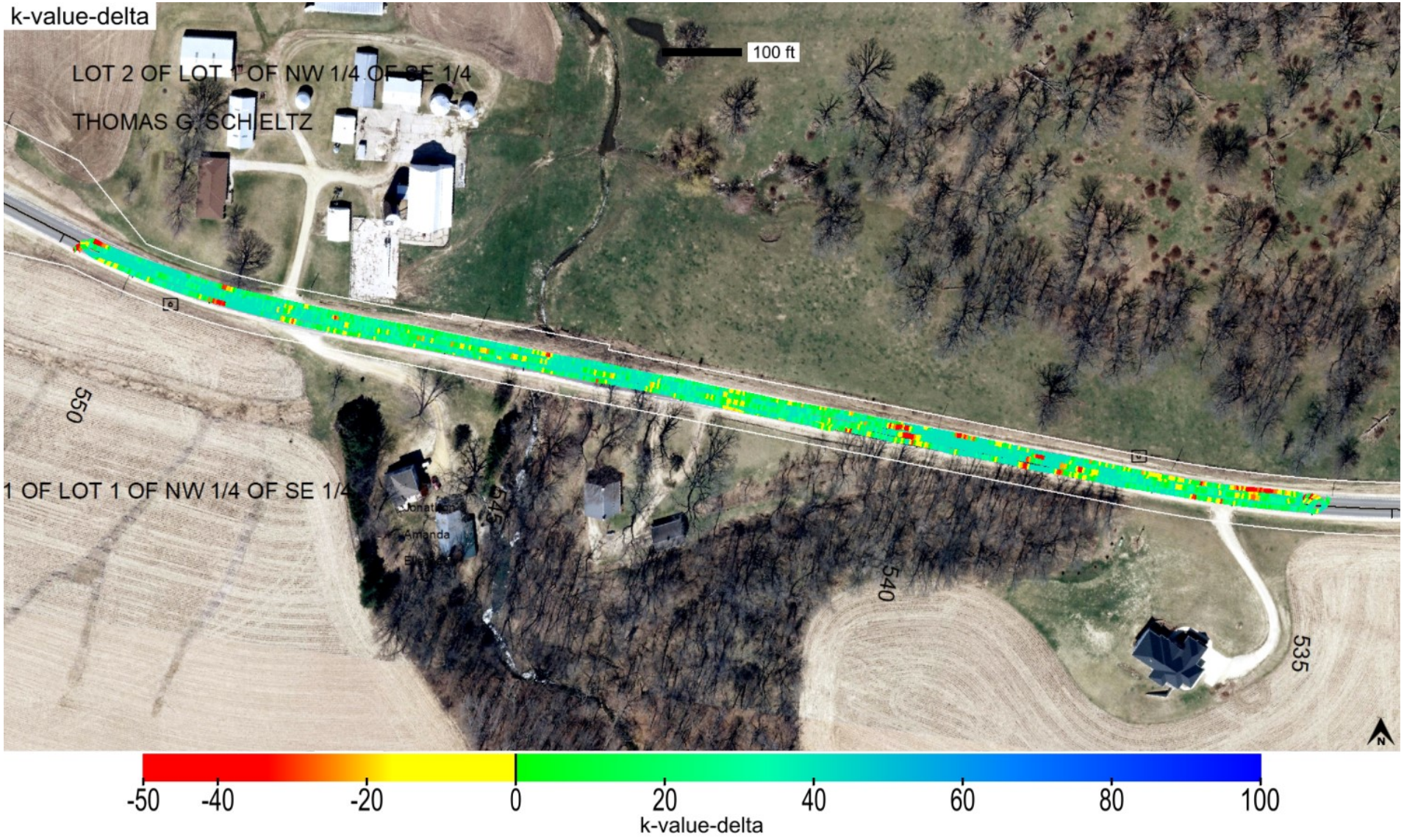
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	86.4	110.48	1.58	150	43.55	172.4	190	20.49	11.89	-106.45	22.4	40



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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	86.4	150	-106.45	22.4	40	-41.21	22.91	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	1068	2.63	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

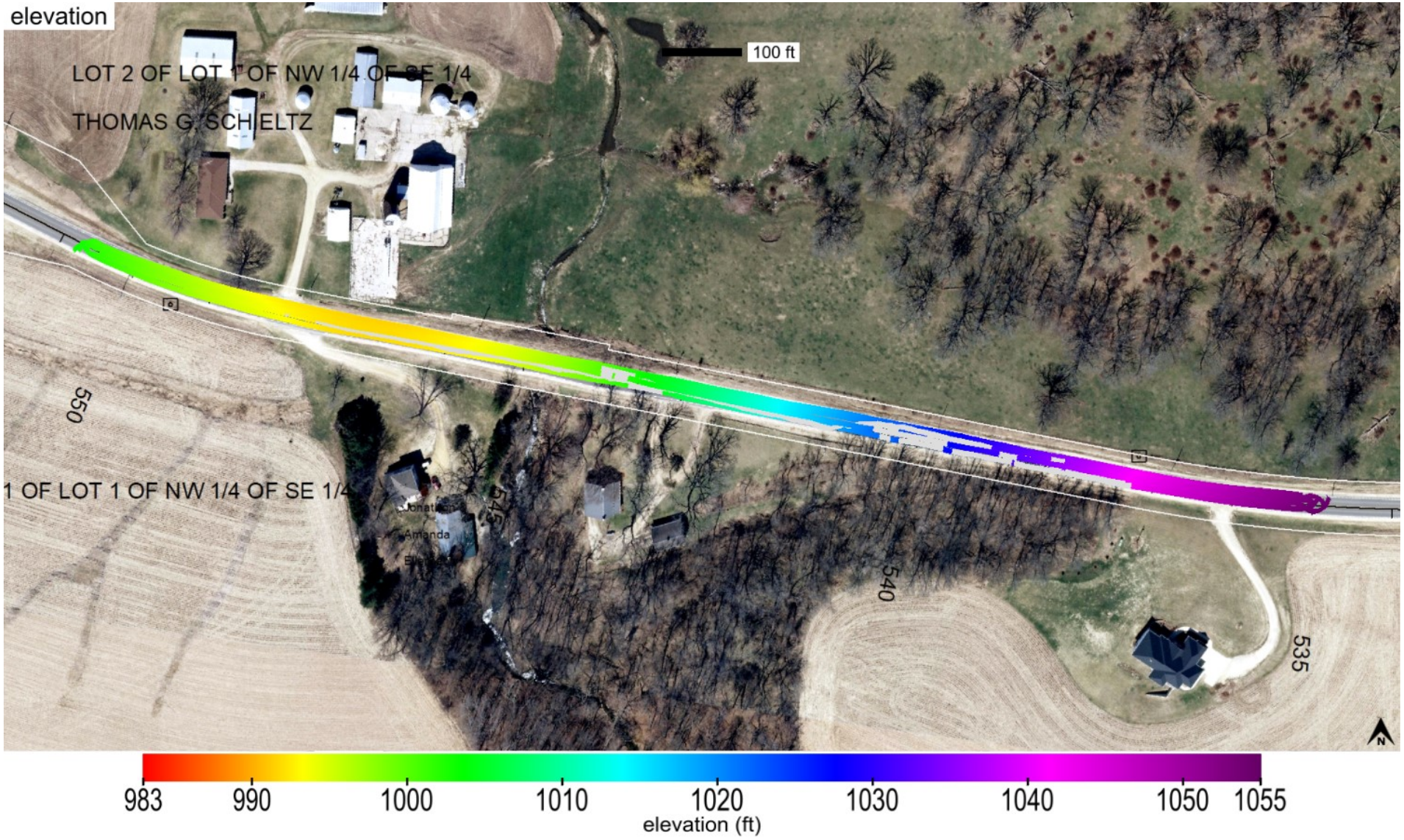
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

minimum	average	maximum
1	1.36	4

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

minimum	average	maximum
991.465	1013.109	1054.614



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	40569	0.931	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_154036a

20190904_154135.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_161651a	No. of Measurements:	76046	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 4:16:51 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	117.22	1.21	9037	9599.29	29349.9	56000	7504.69	25.57	562.29	20312.9	46963
k-value	Yes	76.4	98.75	1.2	150	23.89	166.4	190	25.49	15.32	-126.11	16.4	40
Moisture Content	No												

Mapped Area

square feet	acres
76046	1.75

Pass Count

min.	avg.	max.
1	1.4	6

Elevation (ft)

min.	avg.	max.
1031.65	1050.86	1066.09

Velocity (fps)

min.	avg.	max.
0.36	5.48	6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	76046	1.746	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_161651a	No. of Measurements:	76046	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 4:16:51 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
117.22	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
25.57	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2019_09_04_161651a	No. of Measurements:	76046	Machine ID:	Ingios_FCS00210
Date and Time:	9/4/2019 4:16:51 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
98.75	CQI > = 95
76.4	80% of k-Value MVs >= 150
15.32	COV <= 20
16.54	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.22	1.21	9037	9599.29	29349.9	56000	7504.69	25.57	562.29	20312.9	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.22	1.21	9037	9599.29	29349.9	56000	7504.69	25.57	562.29	20312.9	46963

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	562.29	20312.9	46963	4722.57	20368.76	44345.65

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

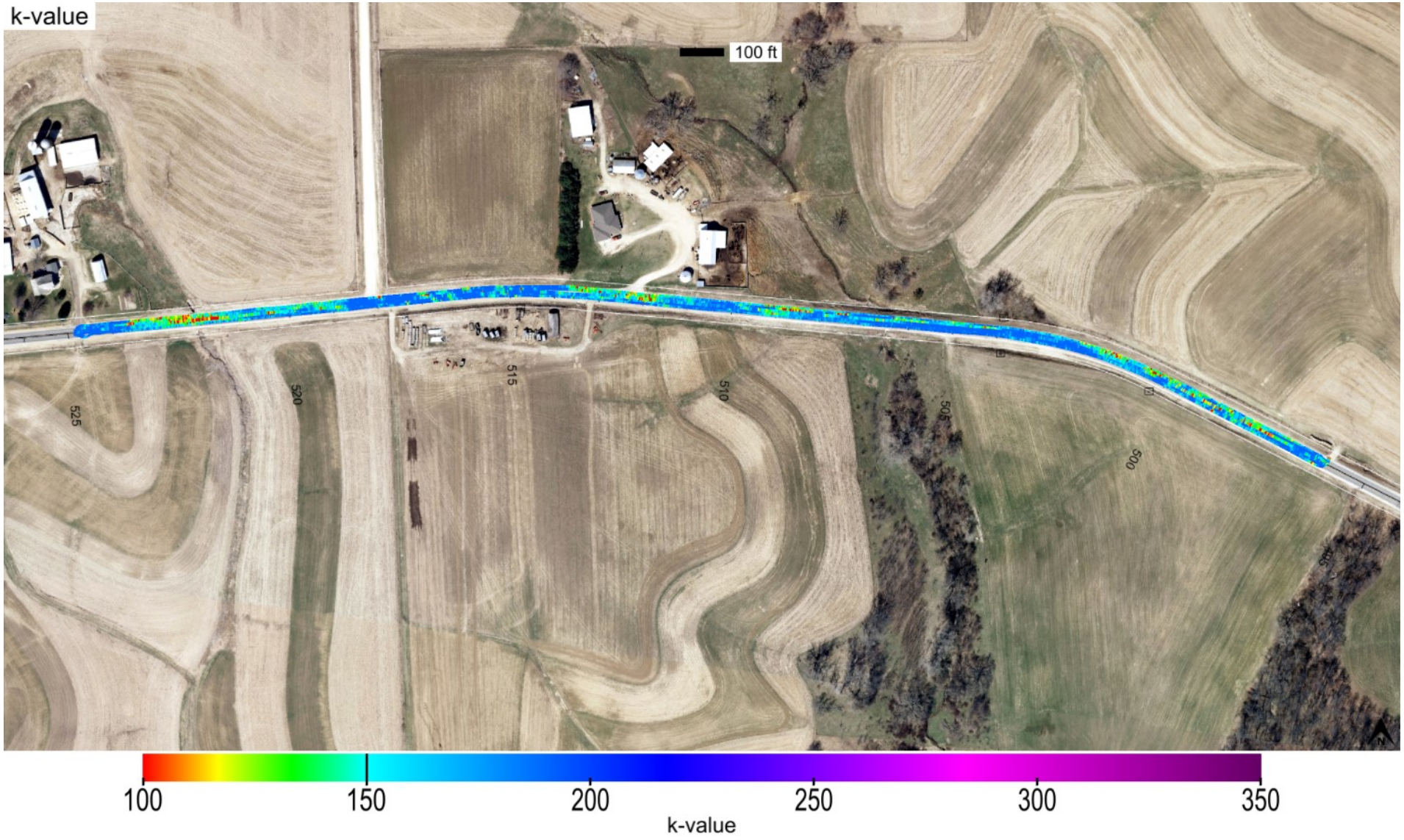
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	76.4	98.75	1.2	150	23.89	166.4	190	25.49	15.32	-126.11	16.4	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	76.4	98.75	1.2	150	23.89	166.4	190	25.49	15.32	-126.11	16.4	40

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	76.4	150	-126.11	16.4	40	-43.52	16.41	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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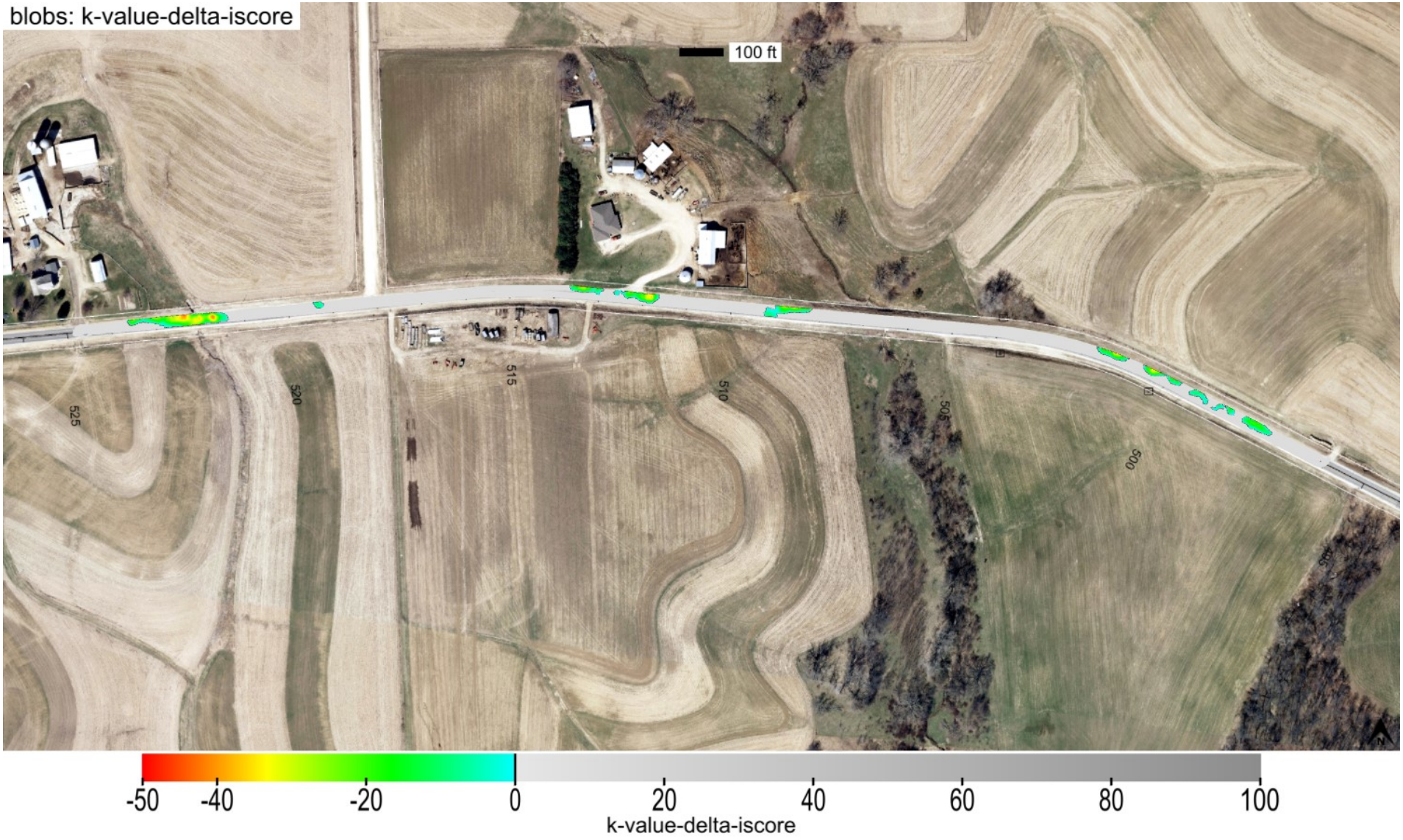
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	10	12575	16.54	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

minimum	average	maximum
1	1.4	6

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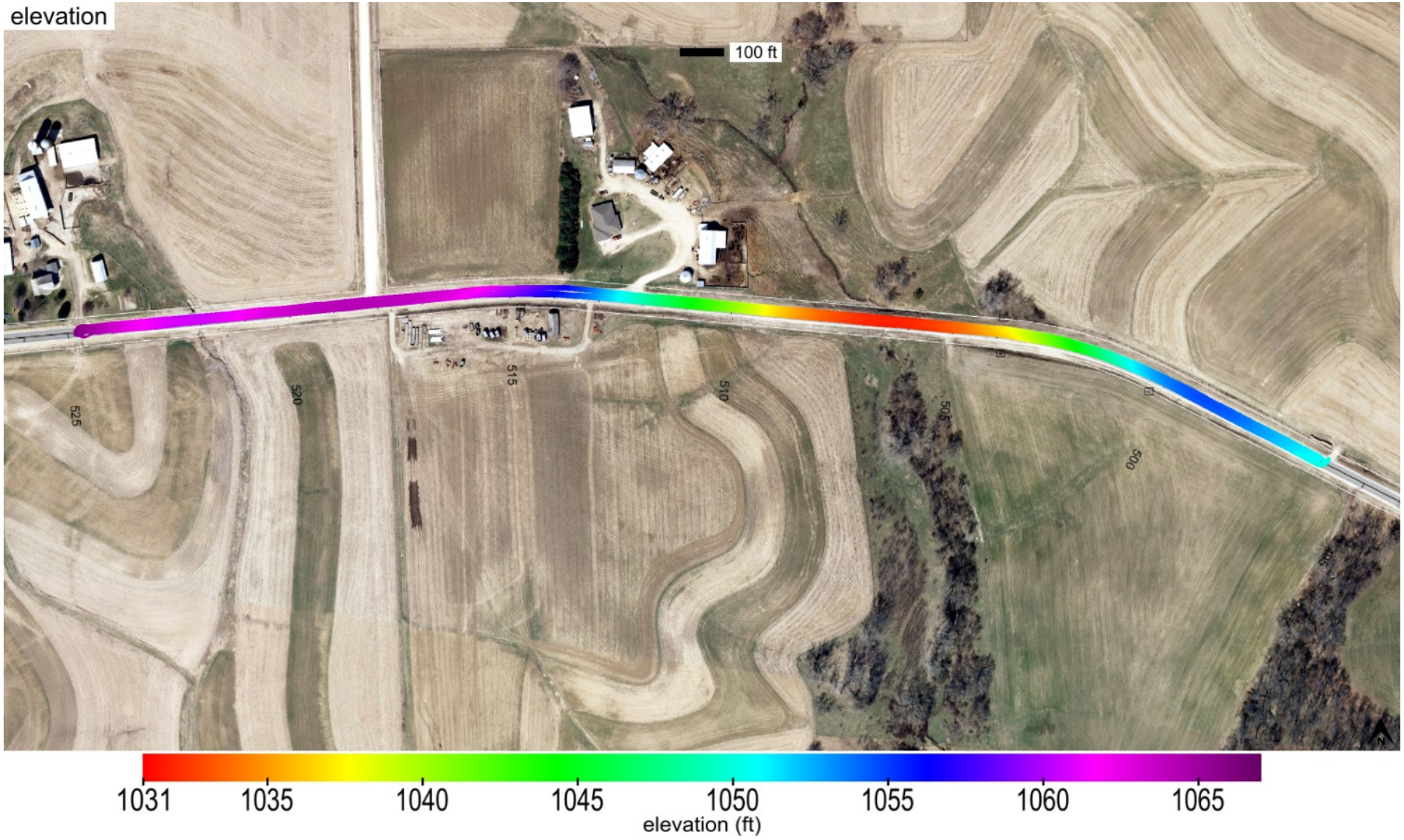
Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

minimum	average	maximum
1031.652	1050.86	1066.094



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	76046	1.746	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2019_09_04_161651a

20190904_162442.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	1.07	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_11_153733a	No. of Measurements:	91445	Machine ID:	Ingios_FCS00210
Date and Time:	8/11/2020 3:37:33 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	58	74.58	0.61	150	35	156.4	370	41.95	26.82	-115	6.4	220
Moisture Content	No												

Mapped Area

square feet	acres
91445	2.1

Pass Count

min.	avg.	max.
1	1.6	4

Elevation (ft)

min.	avg.	max.
979.54	991.42	1012.72

Velocity (fps)

min.	avg.	max.
0.34	5.5	6.27

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	91445	2.099	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	1.07	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_11_153733a	No. of Measurements:	91445	Machine ID:	Ingios_FCS00210
Date and Time:	8/11/2020 3:37:33 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
74.58	CQI > = 95
58	80% of k-Value MVs >= 150
26.82	COV <= 20
35.6	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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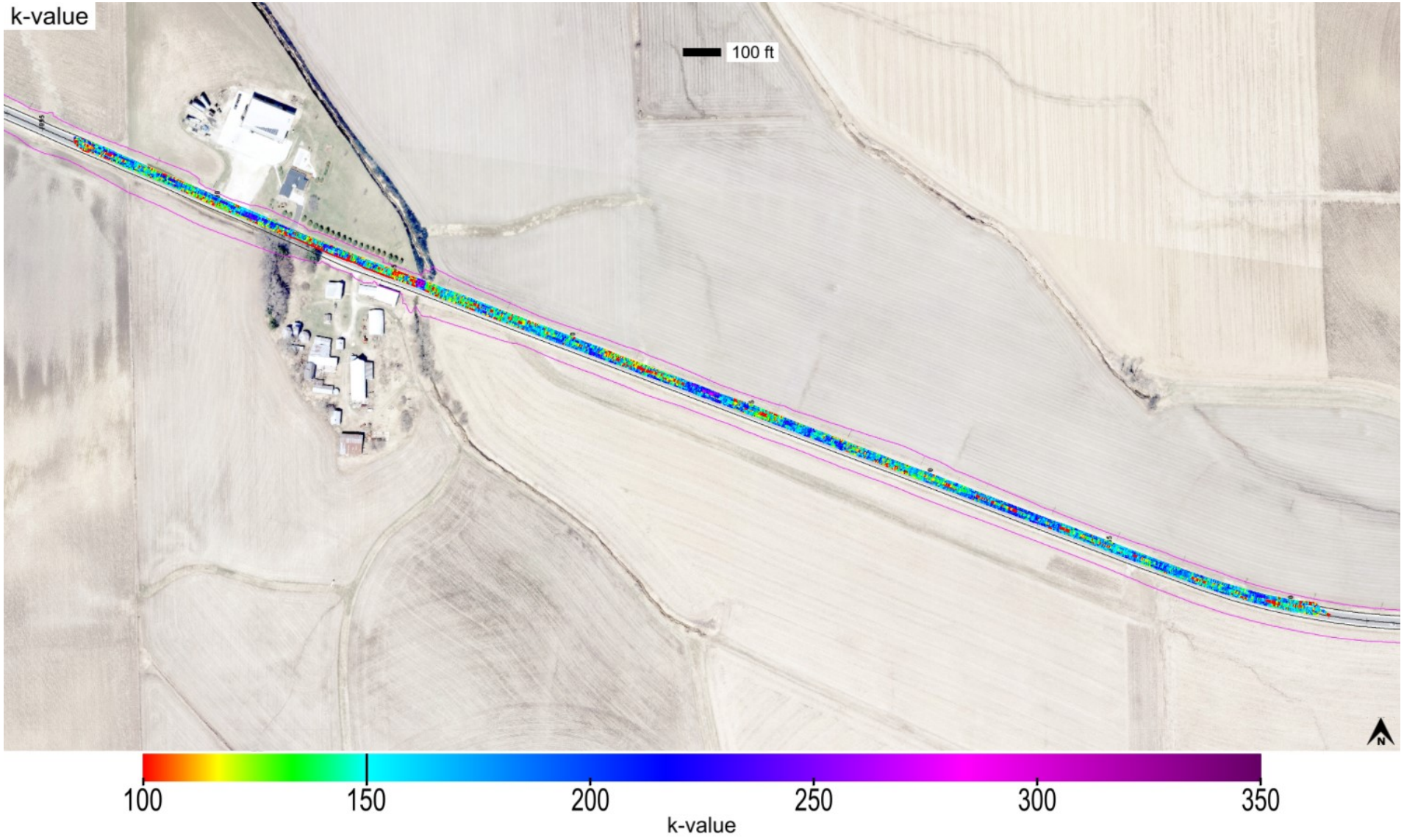
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	58	74.58	0.61	150	35	156.4	370	41.95	26.82	-115	6.4	220



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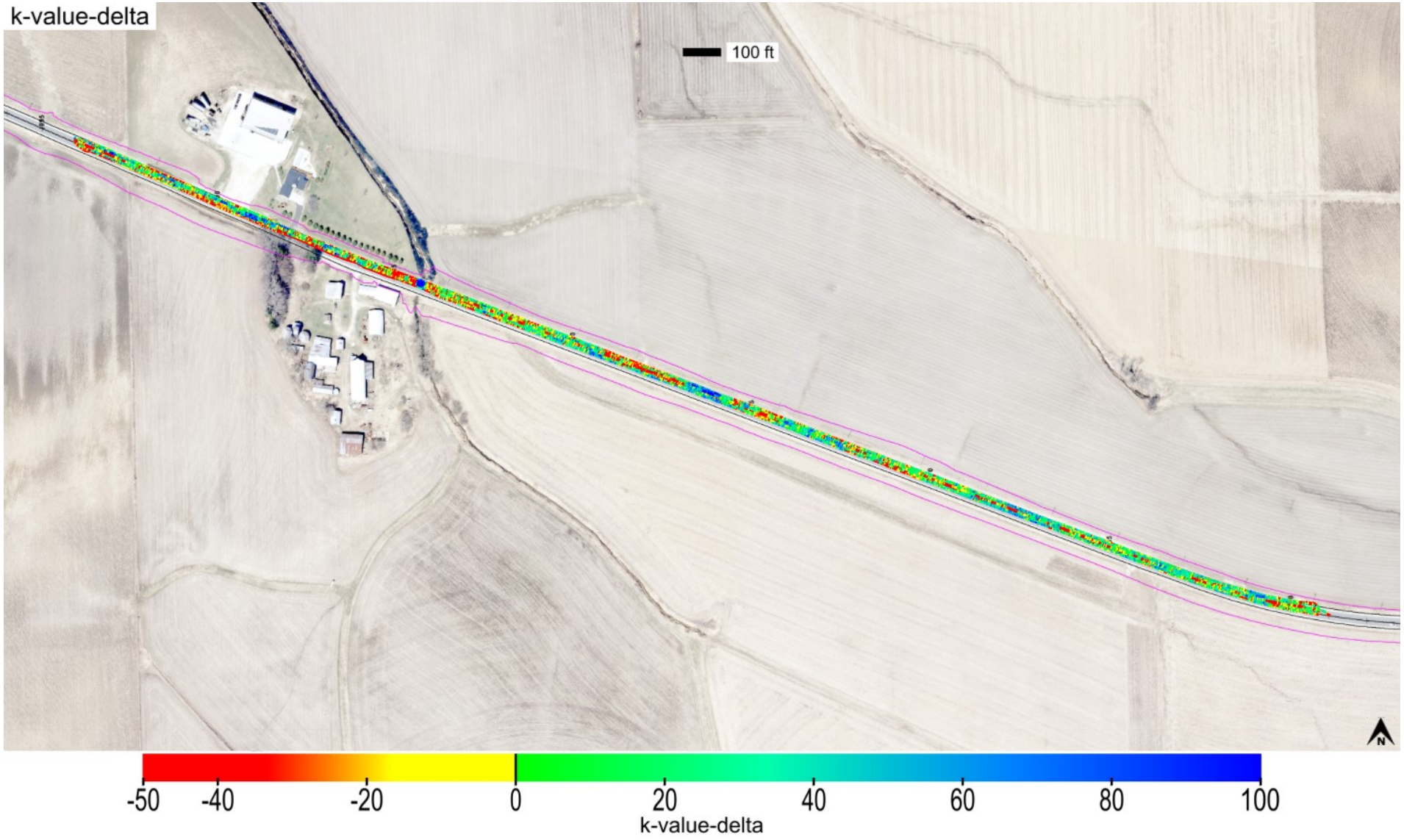
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	58	74.58	0.61	150	35	156.4	370	41.95	26.82	-115	6.4	220



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	58	150	-115	6.4	220	-83.68	6.81	147.33

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	21	32551	35.6	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

minimum	average	maximum
1	1.6	4

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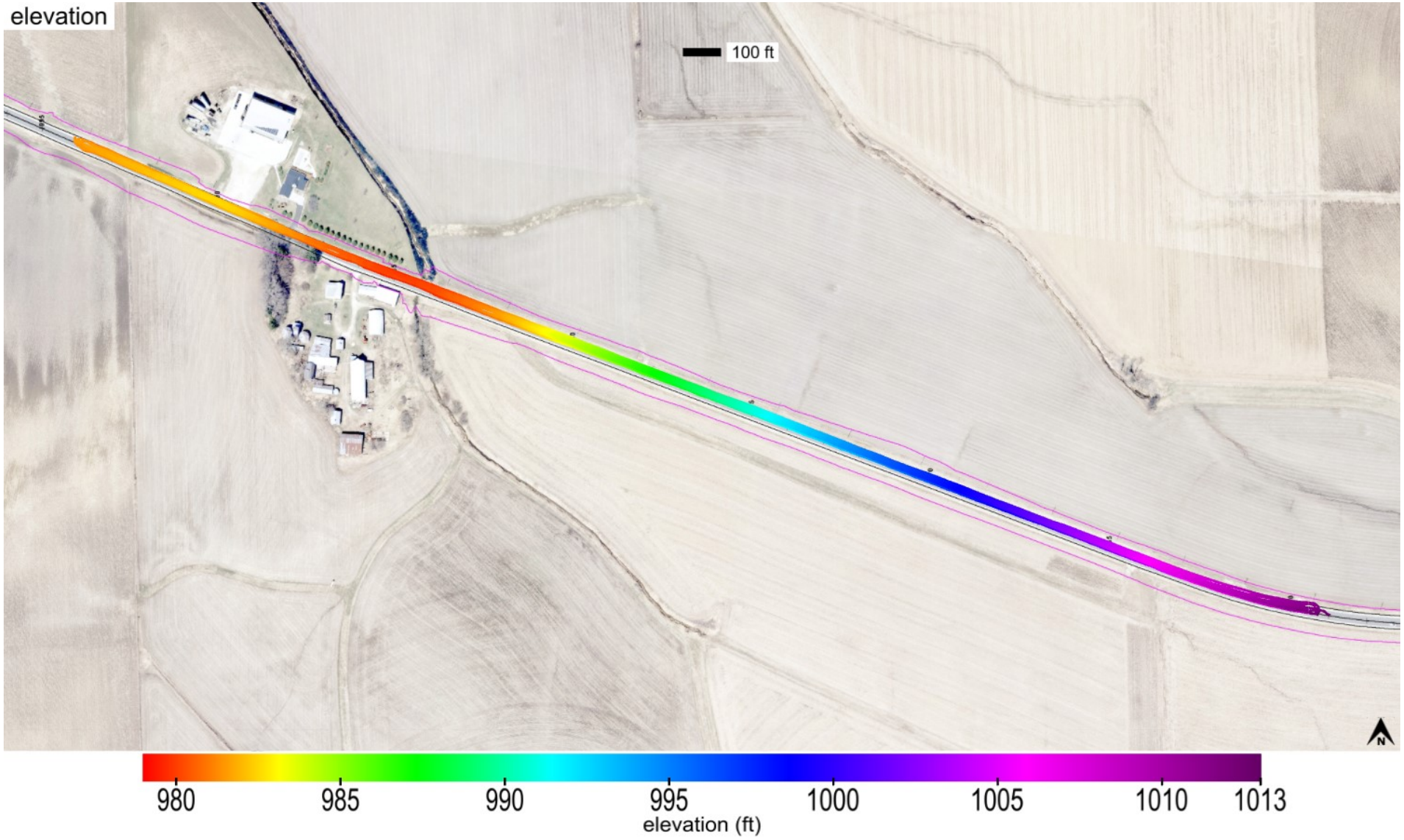
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

minimum	average	maximum
979.545	991.425	1012.718



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	91445	2.099	12	3000	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

IMG_20200811_143915730.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

IMG_20200811_175908745.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

IMG_20200812_094938534.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

IMG_20200812_103357585.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_11_153733a

IMG_20200812_103404981.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.19	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_12_112603a	No. of Measurements:	22979	Machine ID:	Ingios_FCS00210
Date and Time:	8/12/2020 11:26:03 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	60.8	74.27	0.5	150	35	160.4	308.77	53.18	33.16	-115	10.4	158.77
Moisture Content	No												

Mapped Area

square feet	acres
22979	0.53

Pass Count

min.	avg.	max.
1	1	3

Elevation (ft)

min.	avg.	max.
1018.58	1062.98	1102.43

Velocity (fps)

min.	avg.	max.
0.59	5.46	6.18

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	22979	0.528	12	3000	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.19	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_12_112603a	No. of Measurements:	22979	Machine ID:	Ingios_FCS00210
Date and Time:	8/12/2020 11:26:03 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
74.27	CQI > = 95
60.8	80% of k-Value MVs >= 150
33.16	COV <= 20
26.65	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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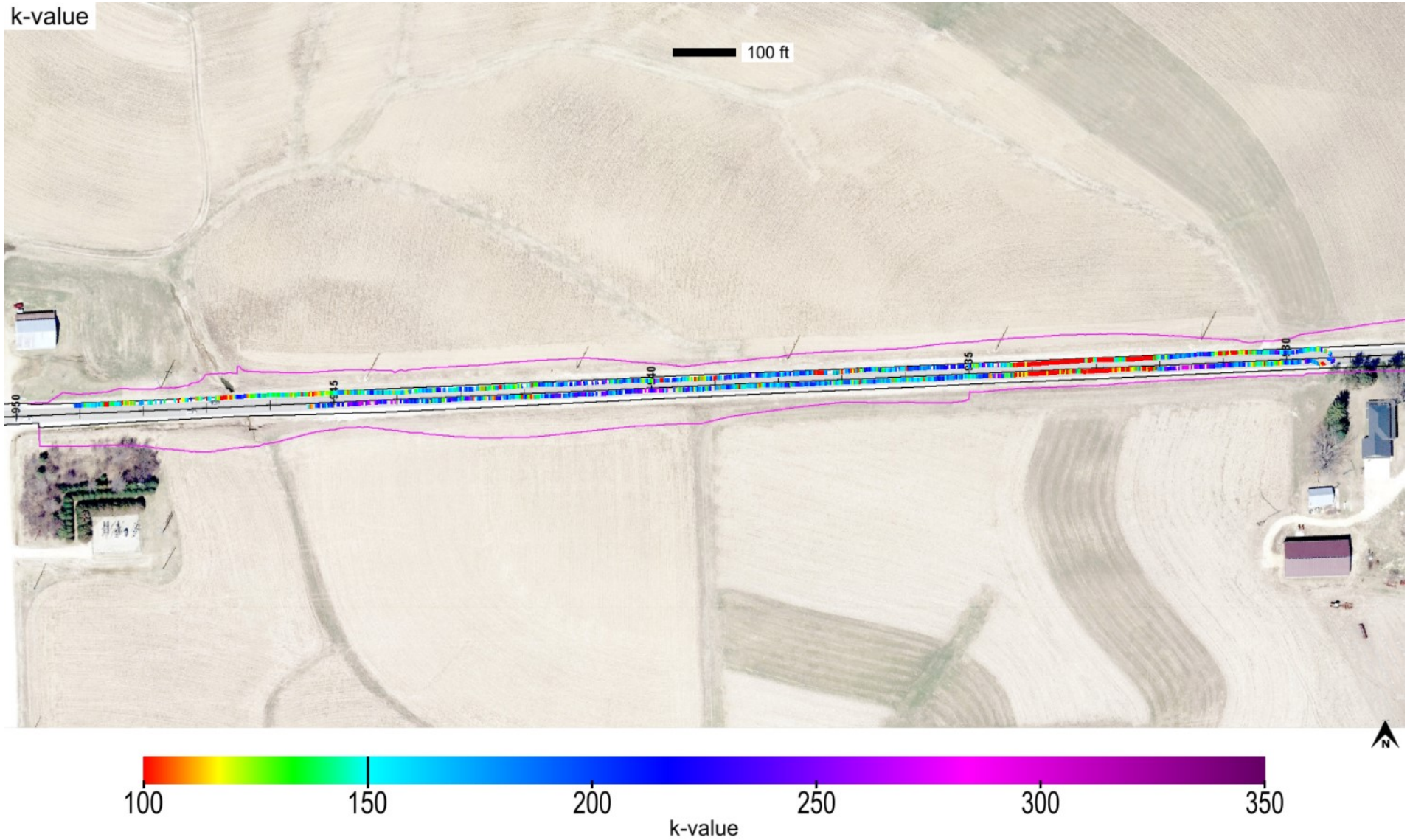
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.8	74.27	0.5	150	35	160.4	308.77	53.18	33.16	-115	10.4	158.77



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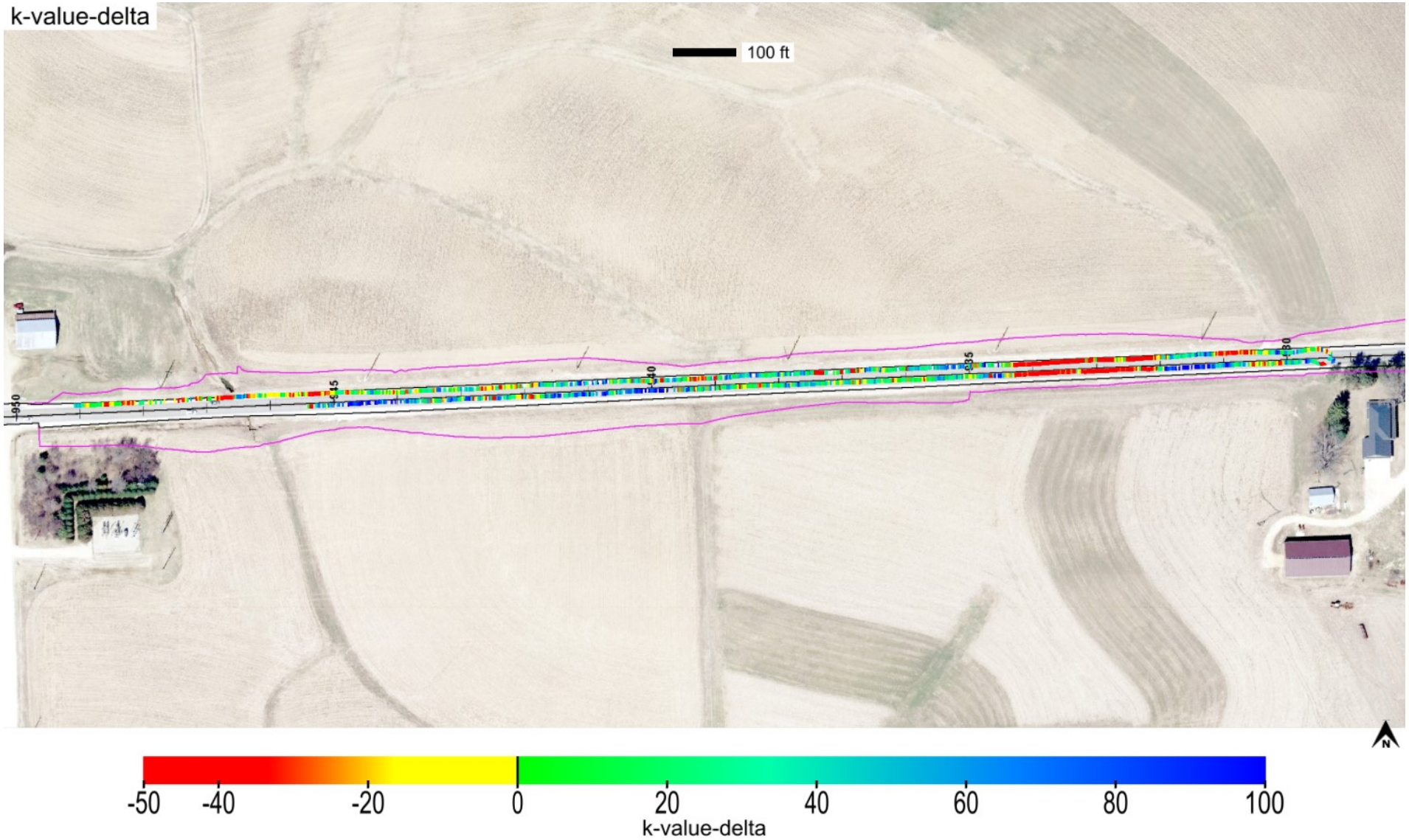
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

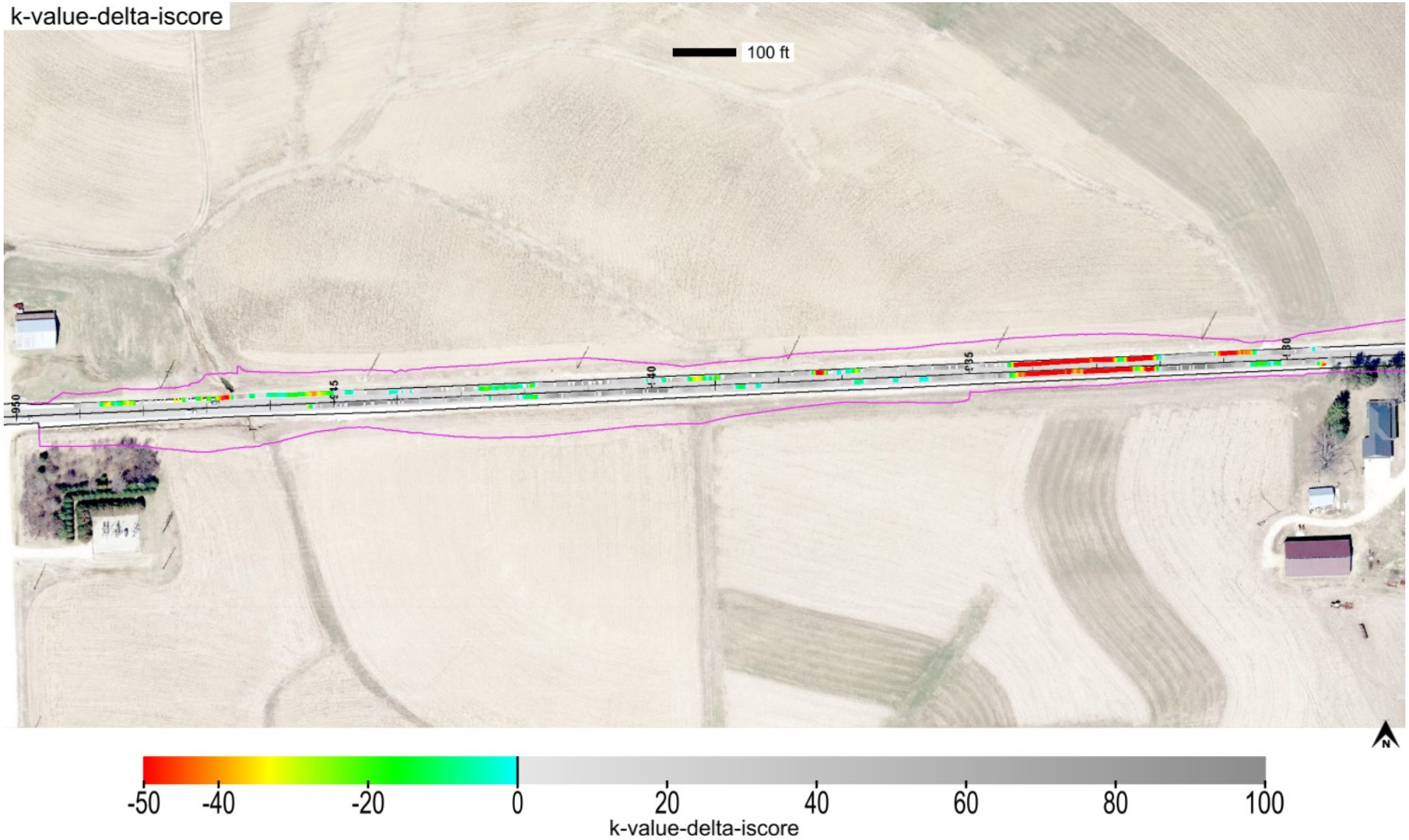
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.8	74.27	0.5	150	35	160.4	308.77	53.18	33.16	-115	10.4	158.77



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	60.8	150	-115	10.4	158.77	-114.09	10.16	136.97

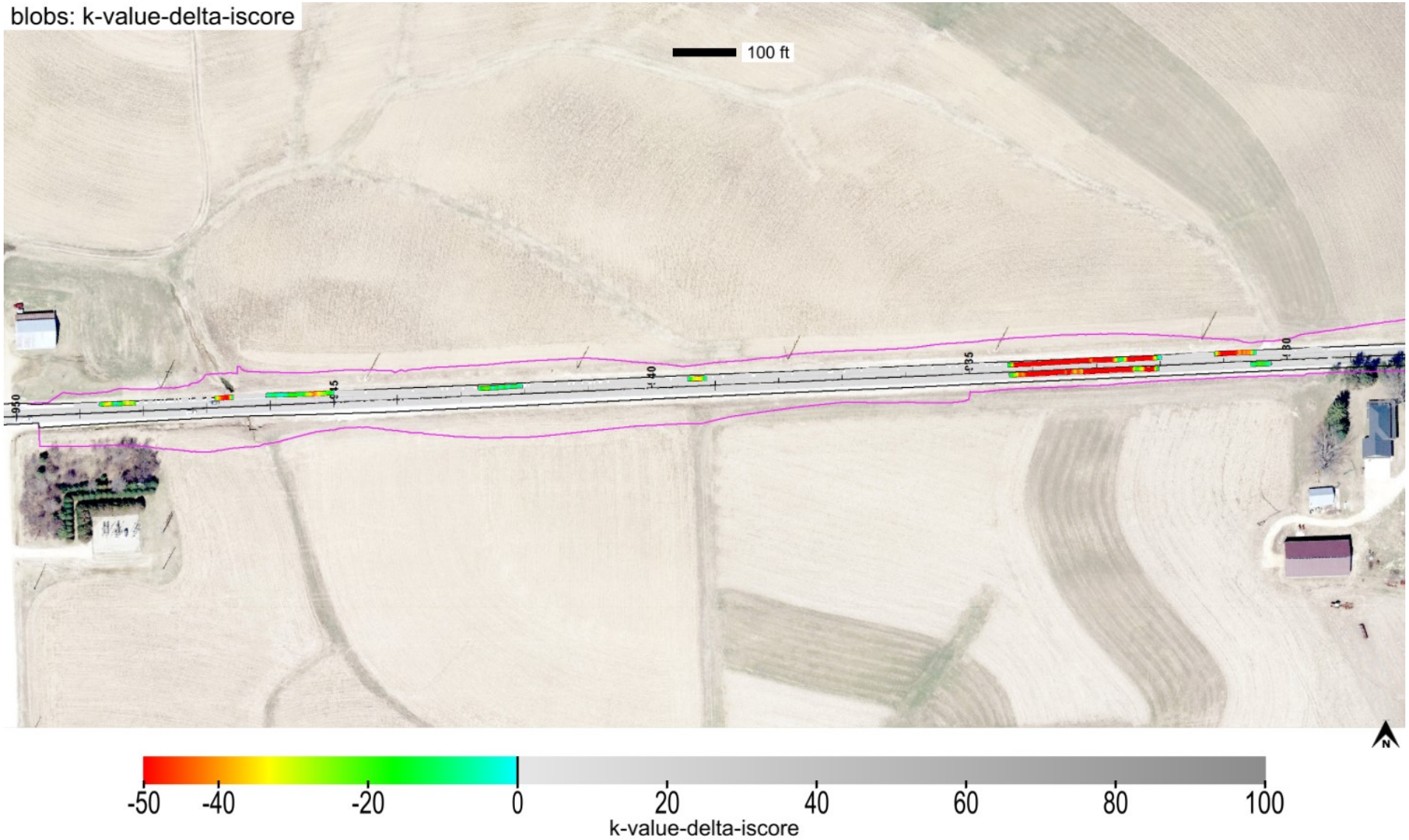


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	9	6125	26.65	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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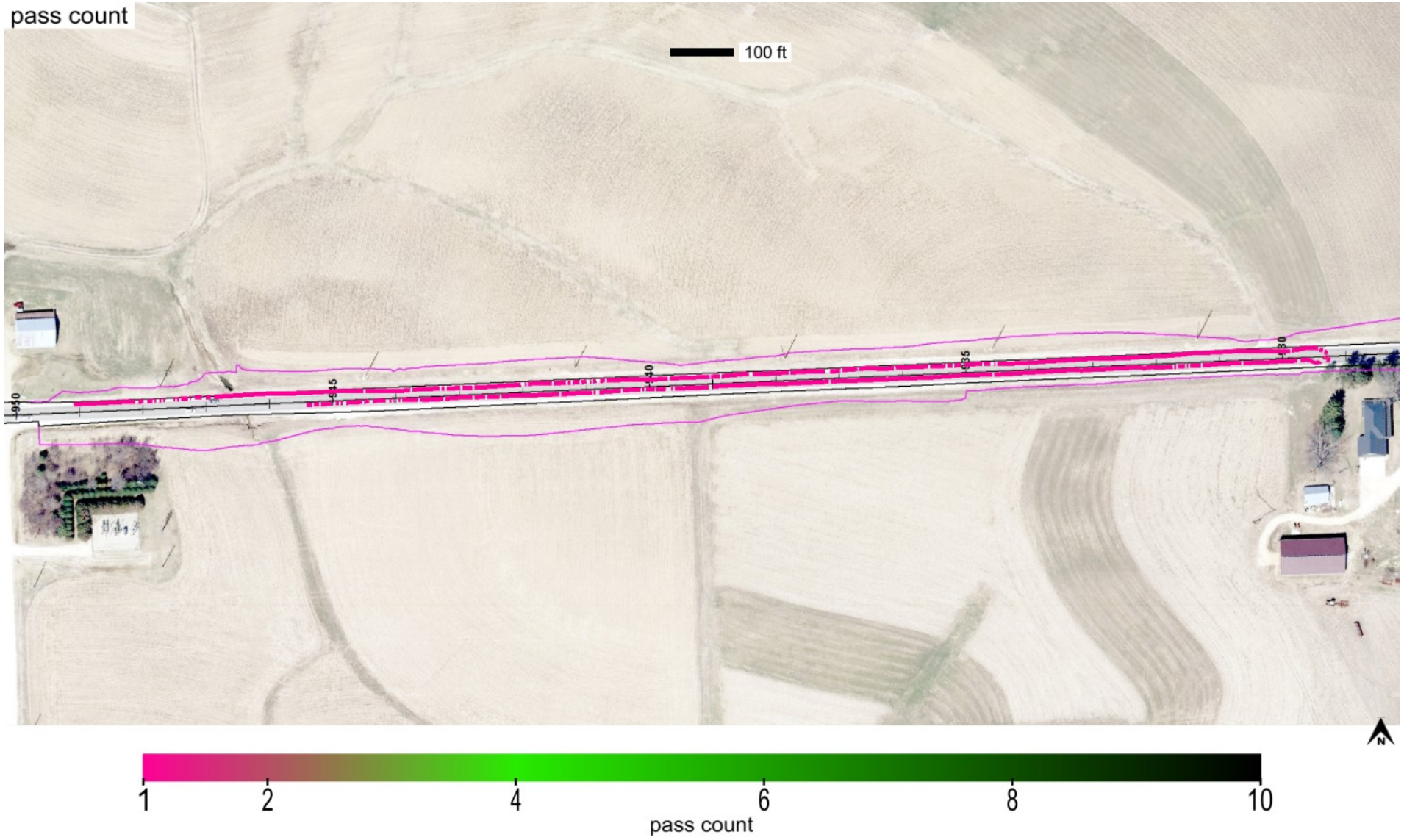
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

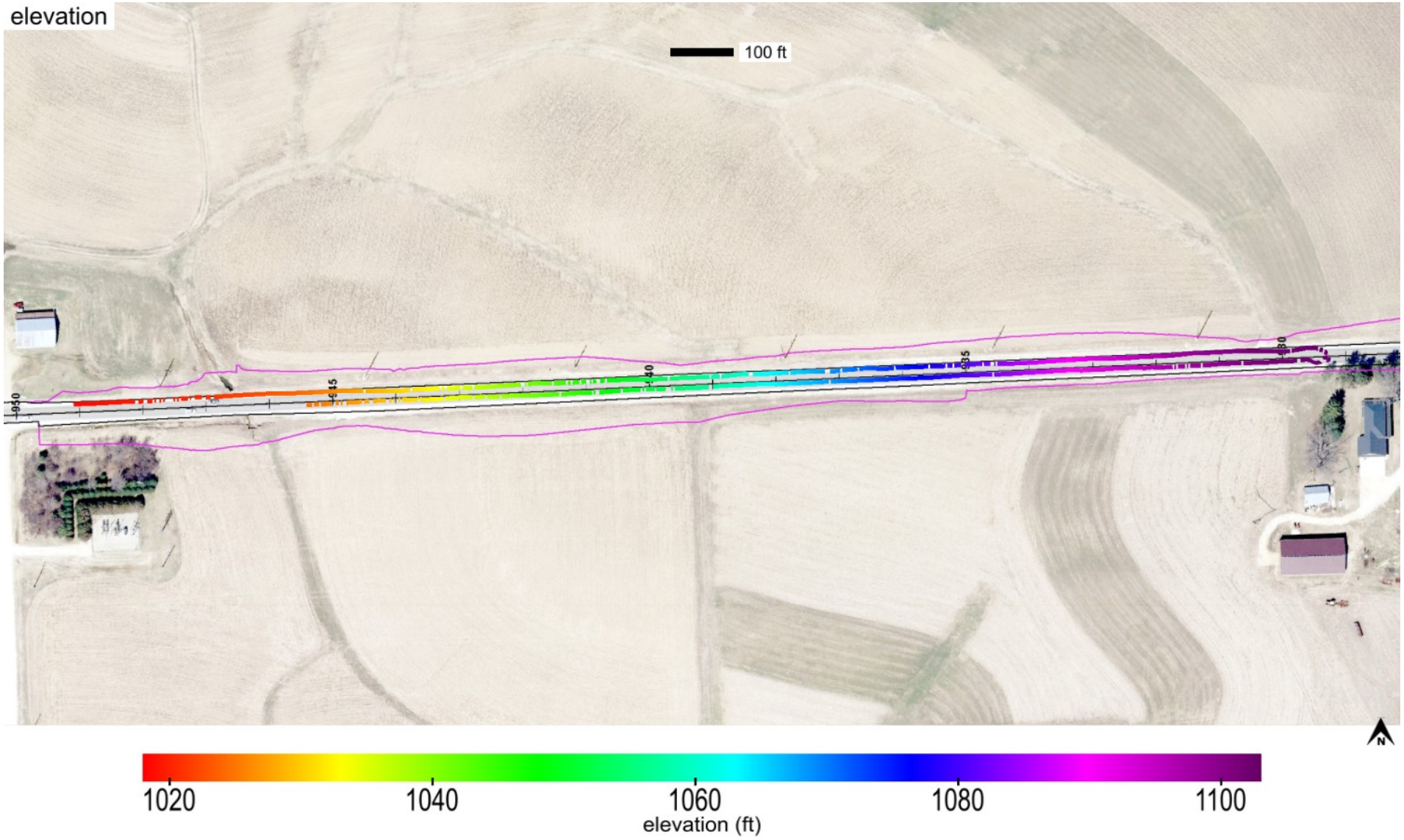
minimum	average	maximum
1	1	3



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

minimum	average	maximum
1018.581	1062.981	1102.432



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	22979	0.528	12	3000	150	40

Soil Cement_Subgrade

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

IMG_20200812_141907906.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_112603a

IMG_20200812_141919038.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.45	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_12_114345a	No. of Measurements:	46670	Machine ID:	Ingios_FCS00210
Date and Time:	8/12/2020 11:43:45 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	58	70.31	0.46	150	35	156.3	370	55.28	35.38	-115	6.3	220
Moisture Content	No												

Mapped Area

square feet	acres
46670	1.07

Pass Count

min.	avg.	max.
1	1.3	6

Elevation (ft)

min.	avg.	max.
1018.06	1056.91	1102.68

Velocity (fps)

min.	avg.	max.
0.23	5.48	6.33

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	46670	1.071	12	3000	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.45	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_12_114345a	No. of Measurements:	46670	Machine ID:	Ingios_FCS00210
Date and Time:	8/12/2020 11:43:45 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
70.31	CQI > = 95
58	80% of k-Value MVs >= 150
35.38	COV <= 20
31.92	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

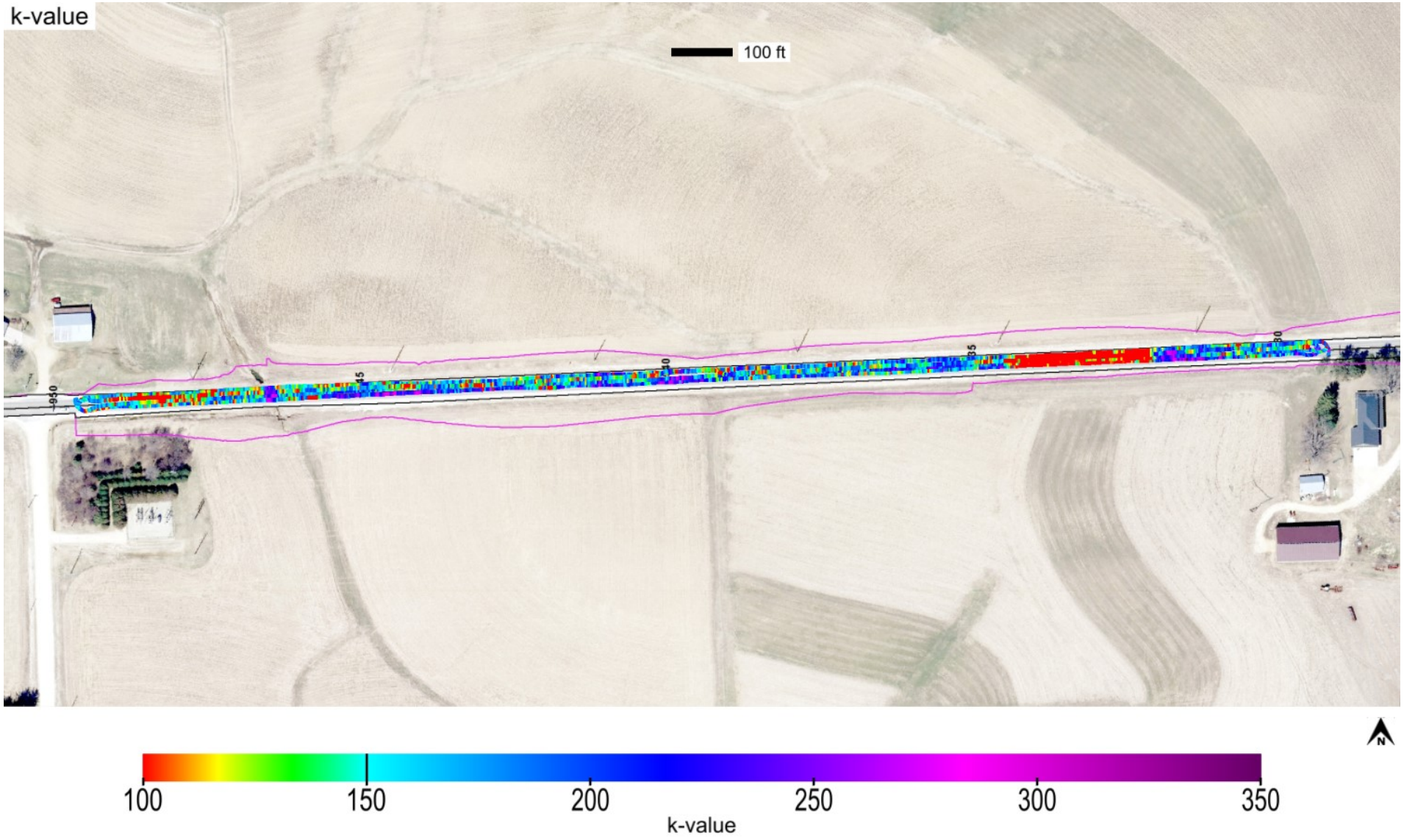
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	58	70.31	0.46	150	35	156.3	370	55.28	35.38	-115	6.3	220

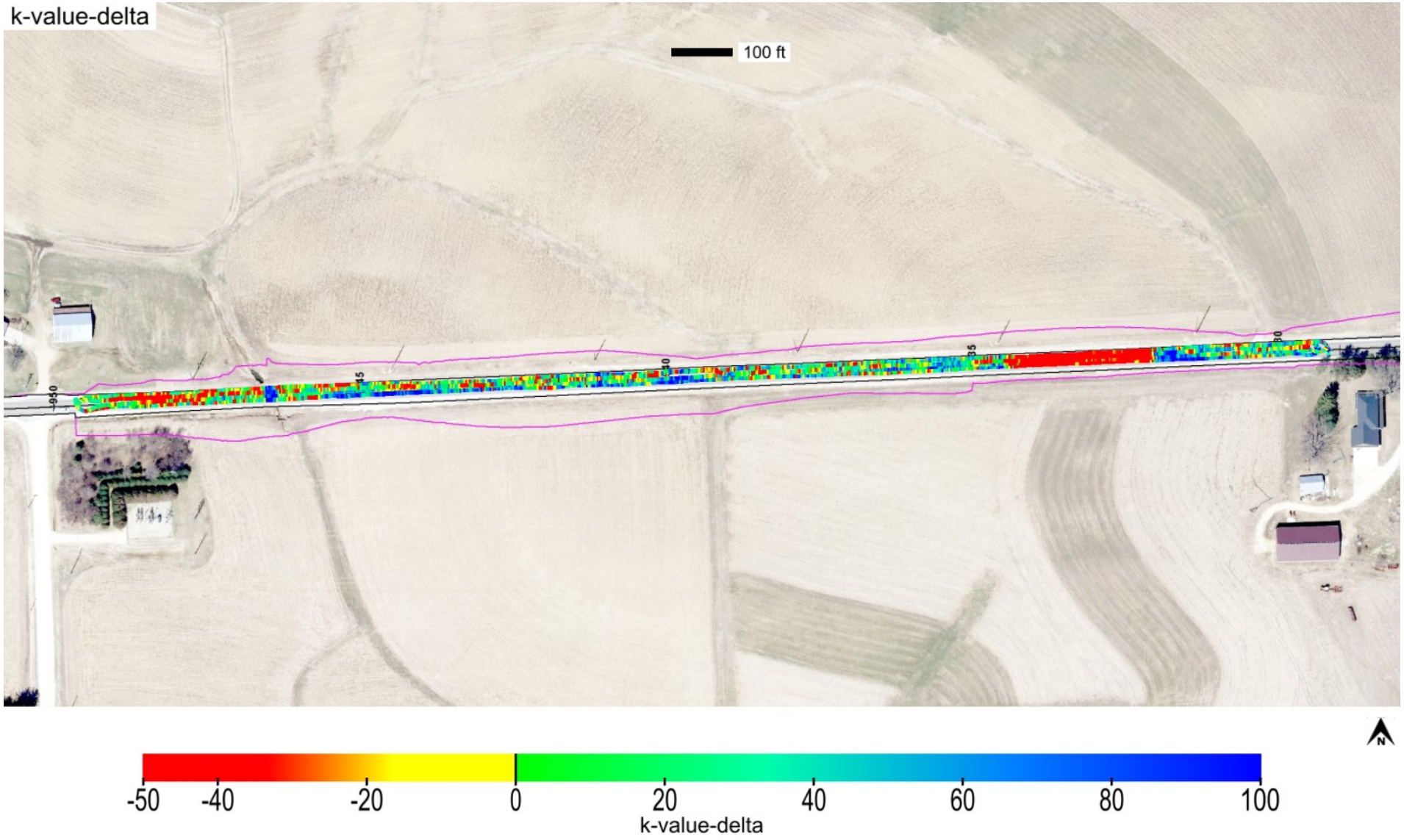


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	58	70.31	0.46	150	35	156.3	370	55.28	35.38	-115	6.3	220

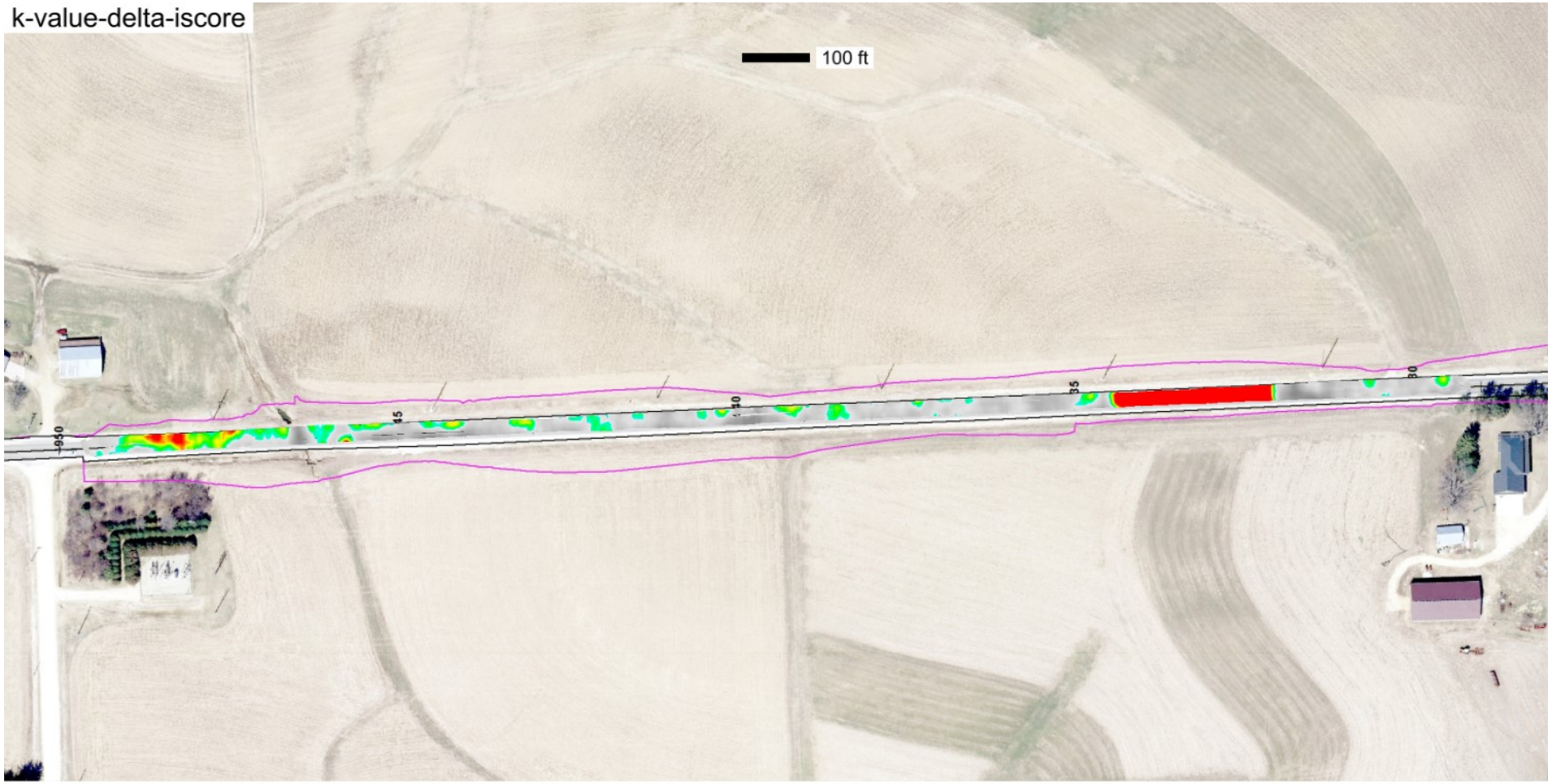


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	58	150	-115	6.3	220	-114.11	5.5	110.36

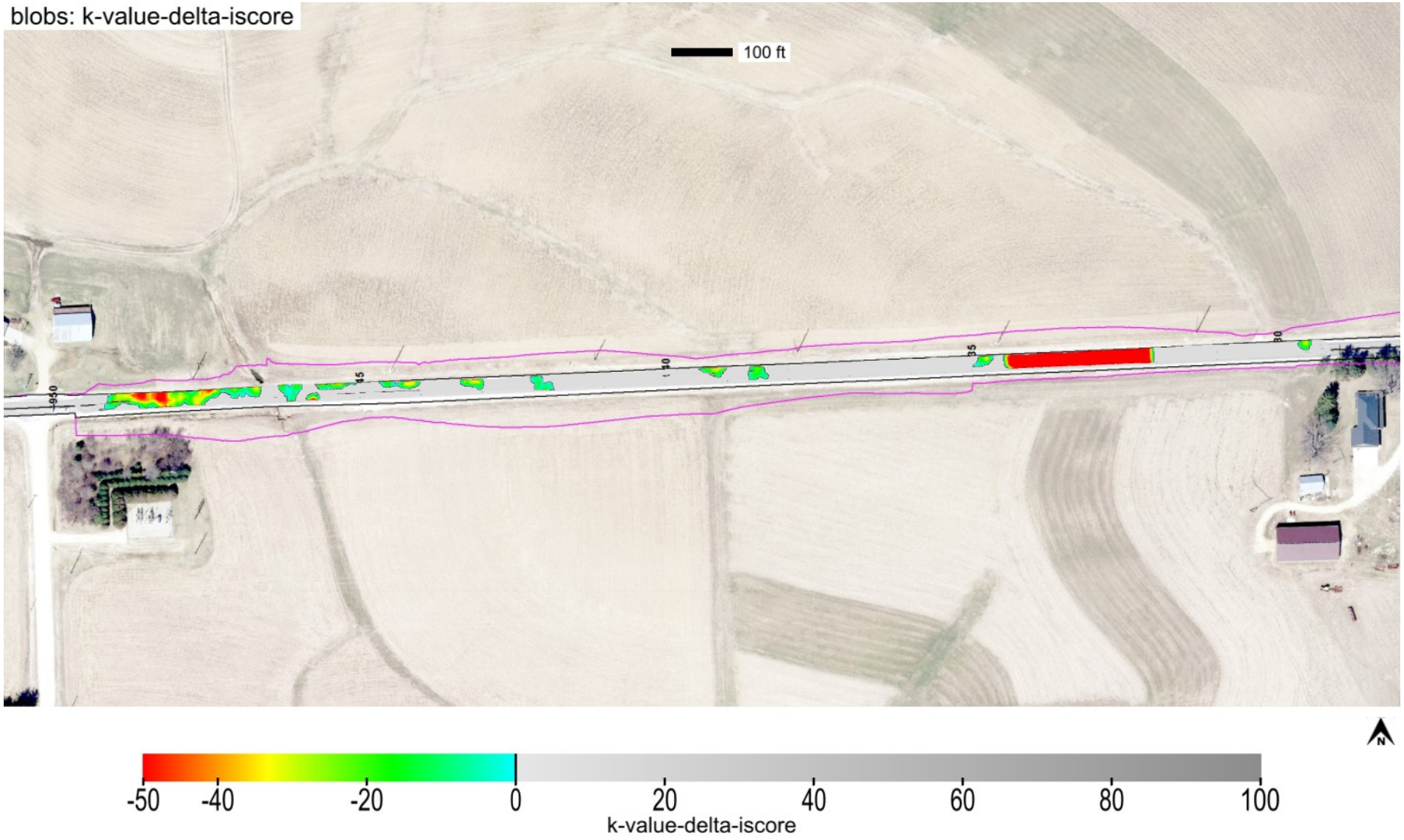


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	12	14897	31.92	none	0

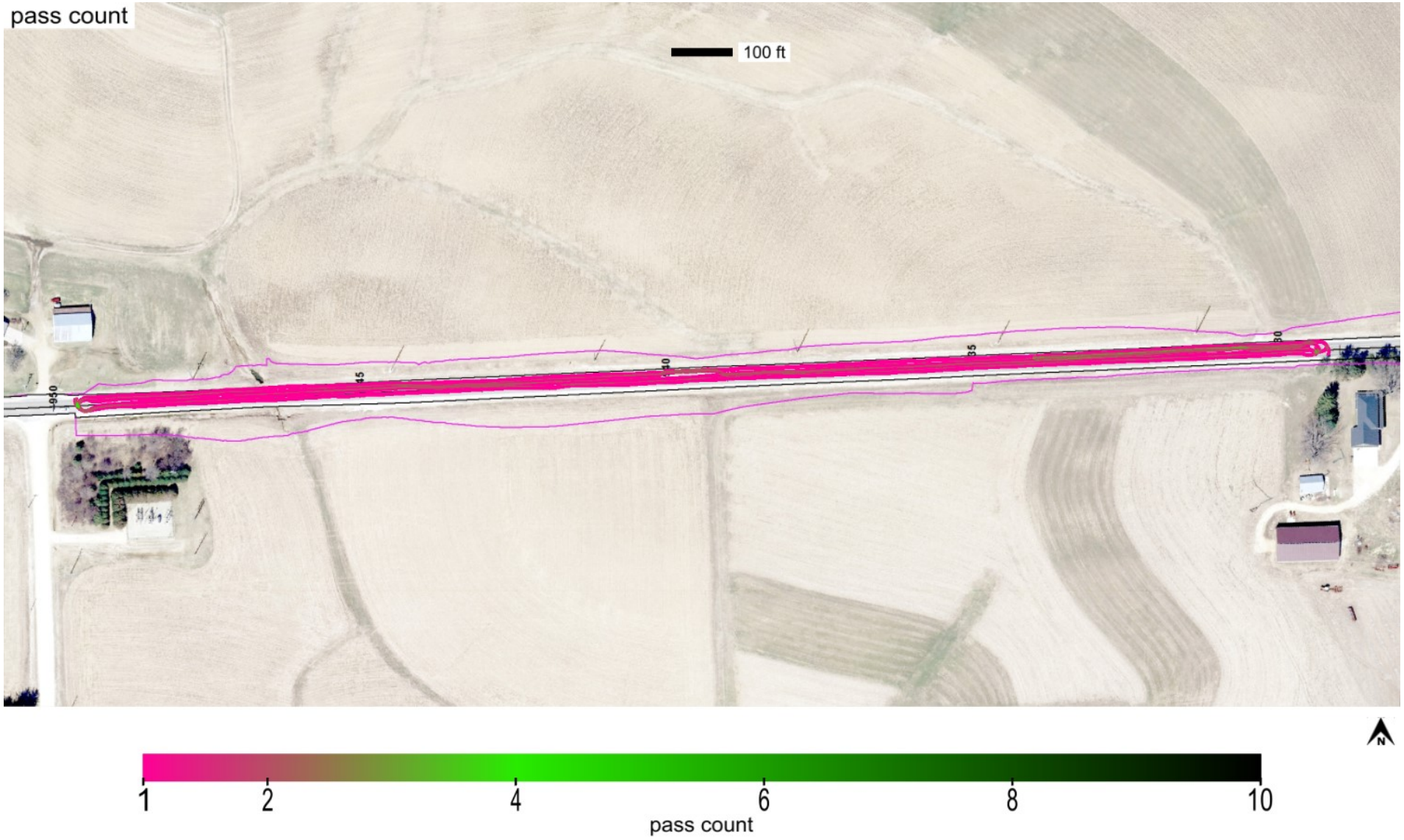


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

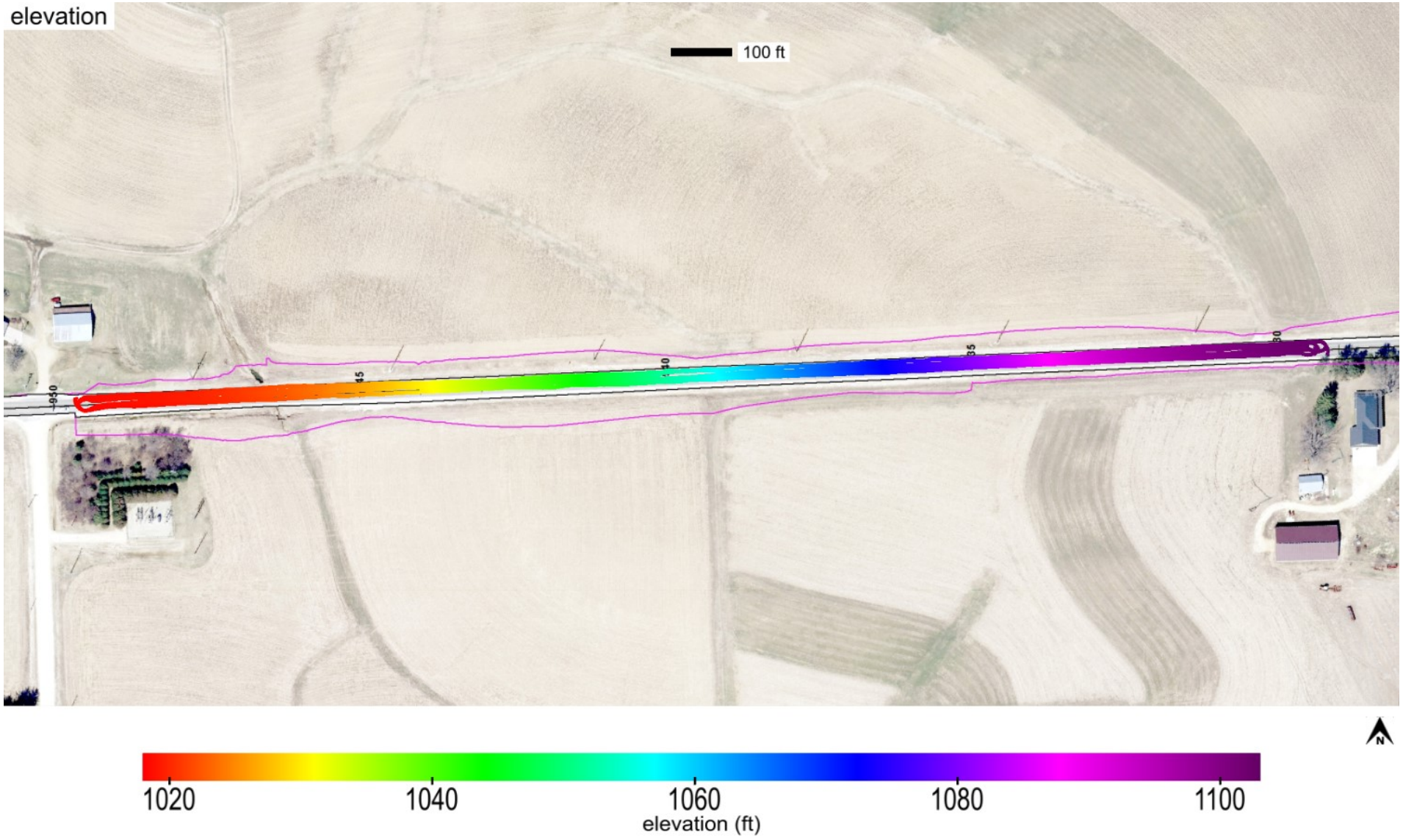
minimum	average	maximum
1	1.3	6



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

minimum	average	maximum
1018.062	1056.91	1102.675



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	46670	1.071	12	3000	150	40

Soil Cement_Subgrade

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

IMG_20200812_141907906.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_12_114345a

IMG_20200812_141919038.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_081547a	No. of Measurements:	21029	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 8:15:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	98.6	113.45	1.01	9037	7637.14	24895.2	47666.64	7544.95	30.31	-1399.86	15858.2	38629.64
k-value	Yes	58.5	74.33	0.53	150	20	146.5	190	41.51	28.34	-130	-3.5	40
Moisture Content	No												

Mapped Area

square feet	acres
21029	0.48

Pass Count

min.	avg.	max.
1	1.73	7

Elevation (ft)

min.	avg.	max.
1086.05	1097.45	1102.35

Velocity (fps)

min.	avg.	max.
0.77	5.47	6.7

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	21029	0.483	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_081547a	No. of Measurements:	21029	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 8:15:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.45	CQI > = 95
98.6	80% of Resilient Modulus MVs >= 9037
30.31	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_081547a	No. of Measurements:	21029	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 8:15:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
74.33	CQI > = 95
58.5	80% of k-Value MVs >= 150
28.34	COV <= 20
53.61	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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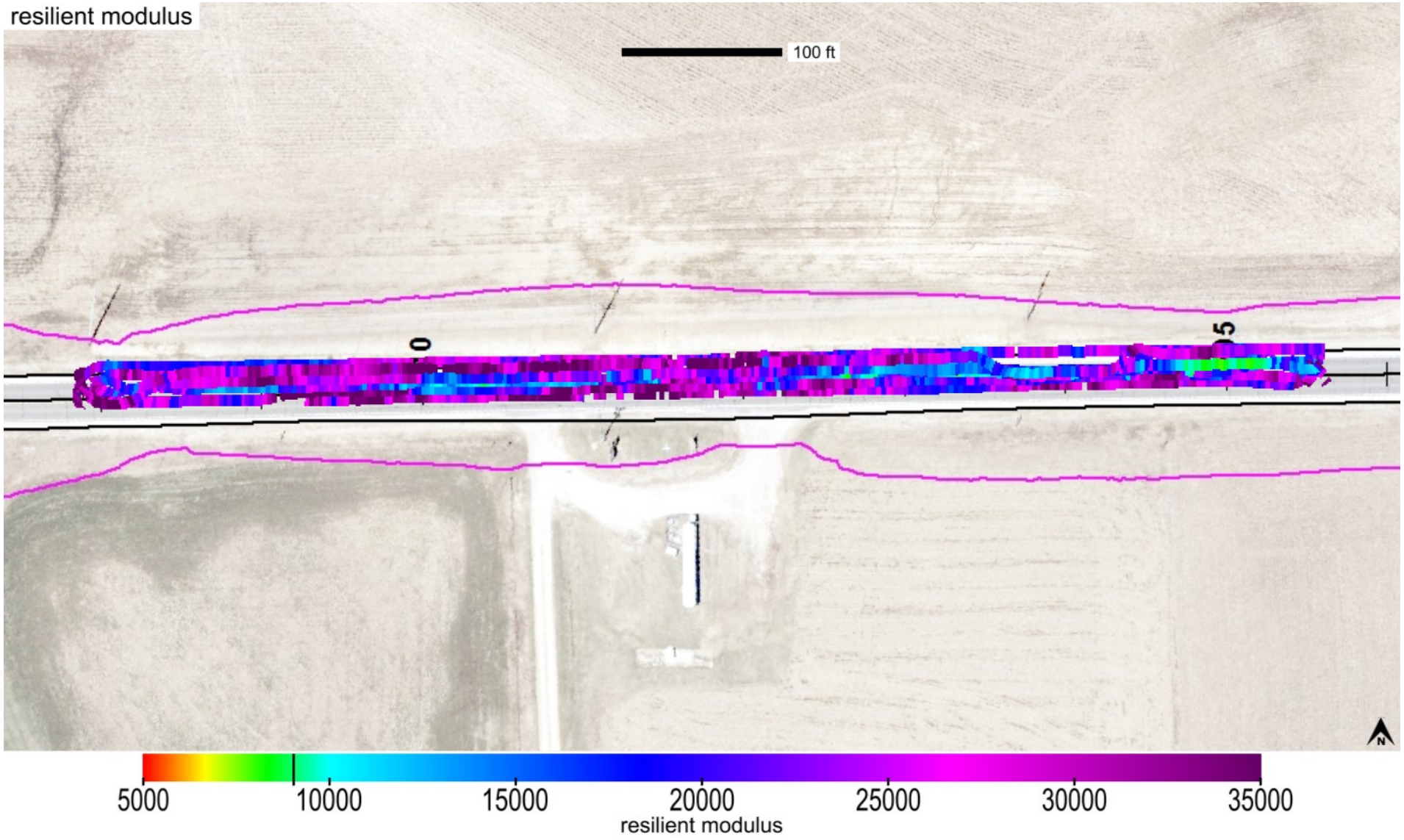
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.6	113.45	1.01	9037	7637.14	24895.2	47666.64	7544.95	30.31	-1399.86	15858.2	38629.64



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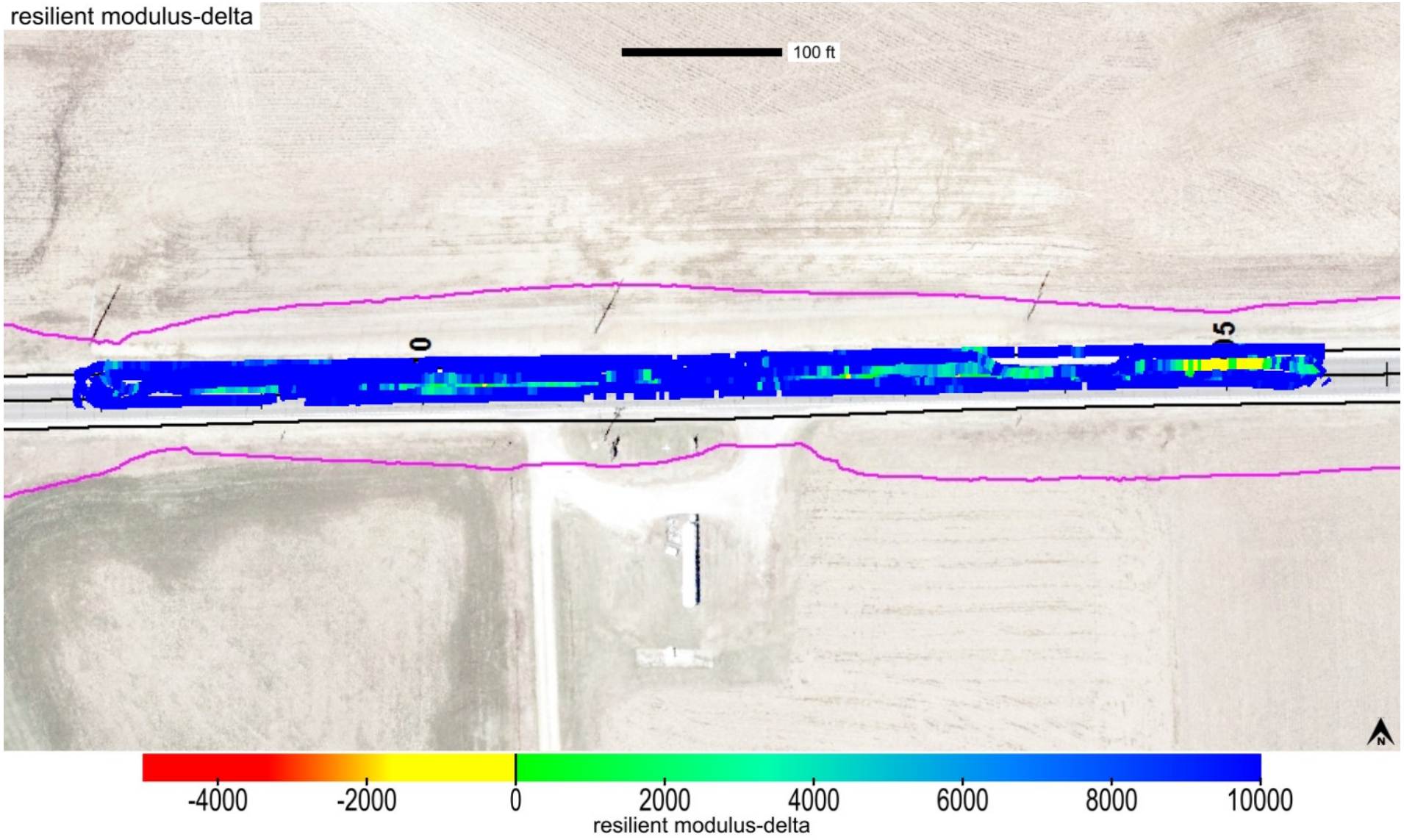
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.6	113.45	1.01	9037	7637.14	24895.2	47666.64	7544.95	30.31	-1399.86	15858.2	38629.64



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	98.6	9037	-1399.86	15858.2	38629.64	7145	15690.91	28664.65

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

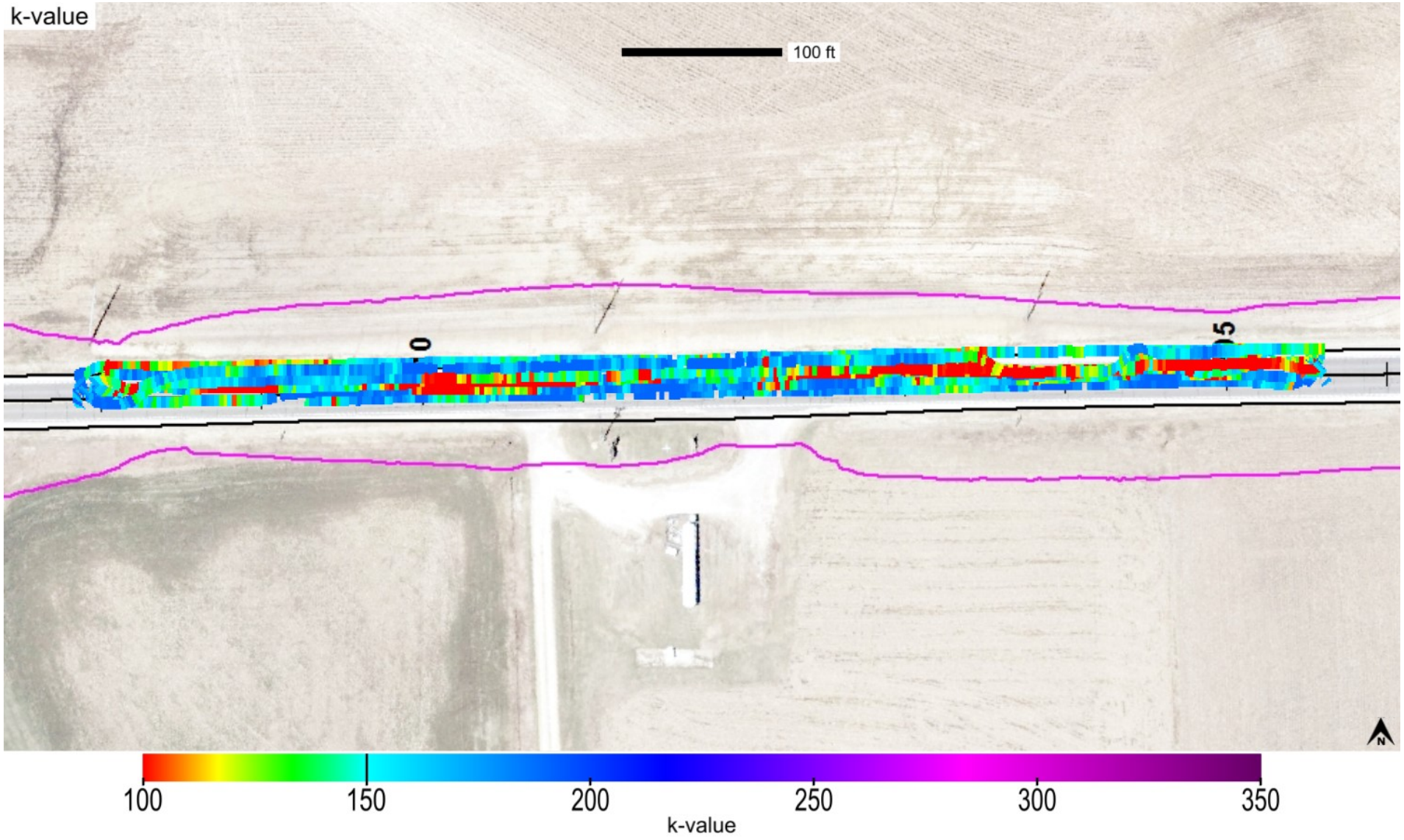
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	58.5	74.33	0.53	150	20	146.5	190	41.51	28.34	-130	-3.5	40



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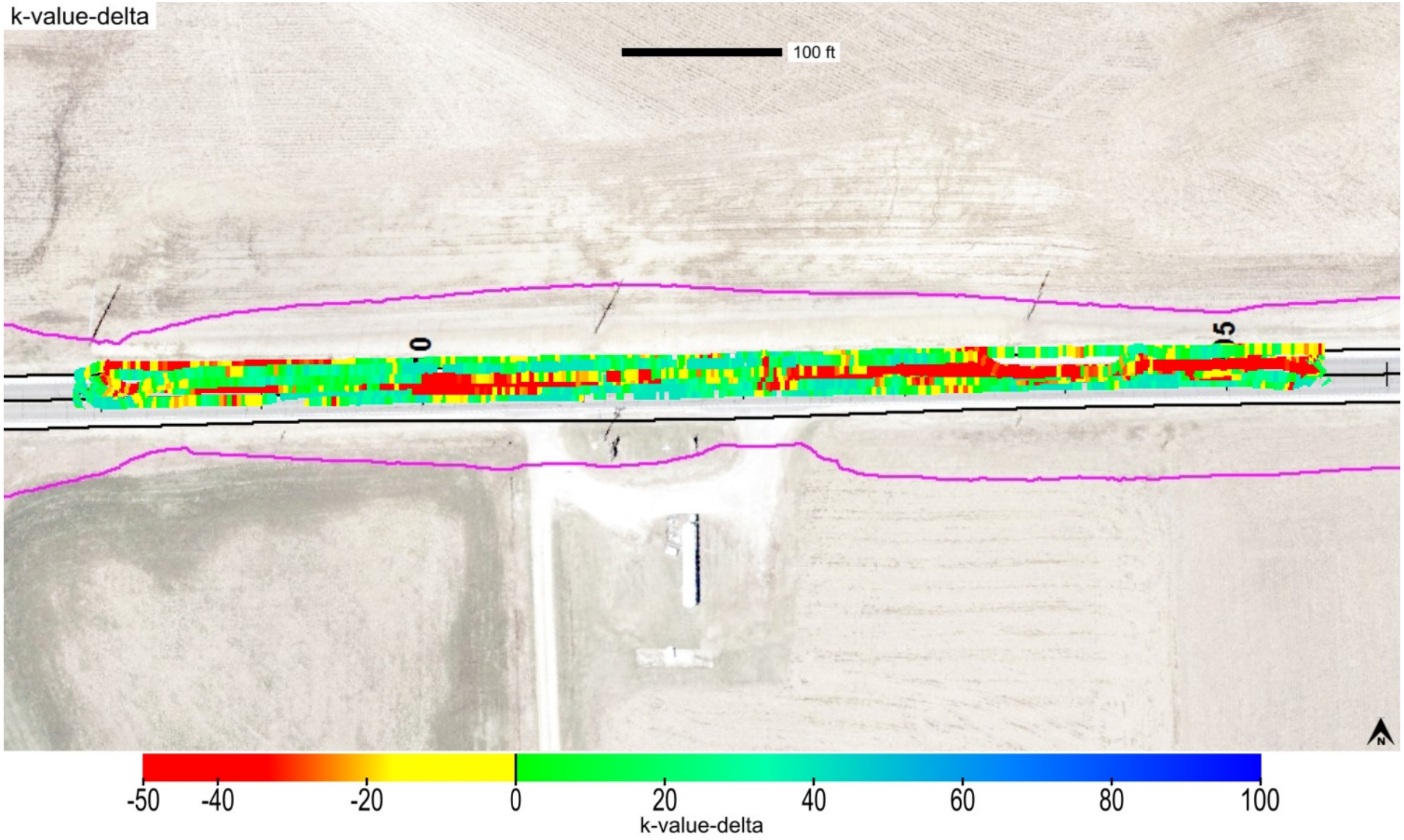
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

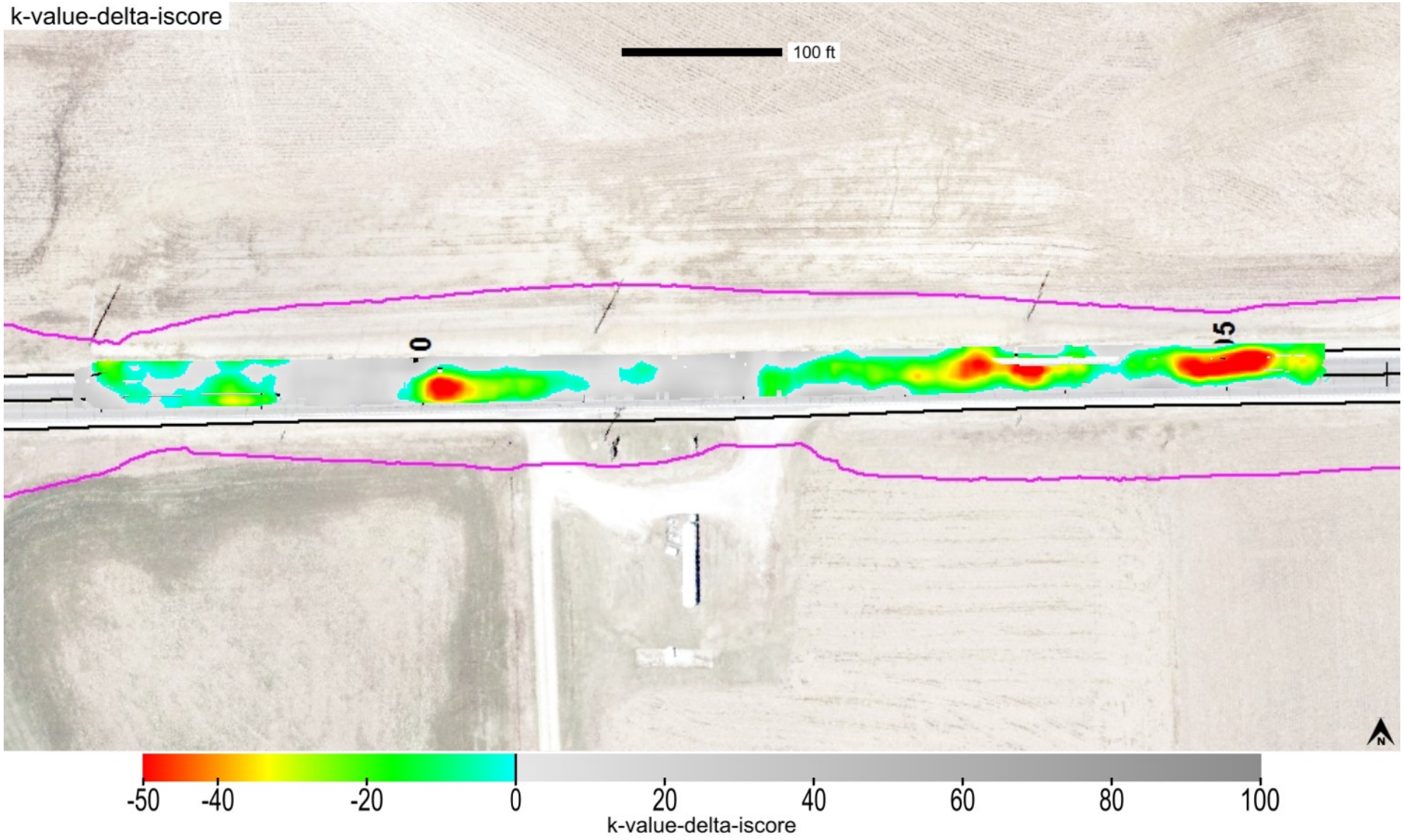
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	58.5	74.33	0.53	150	20	146.5	190	41.51	28.34	-130	-3.5	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	58.5	150	-130	-3.5	40	-61.13	-4.7	40

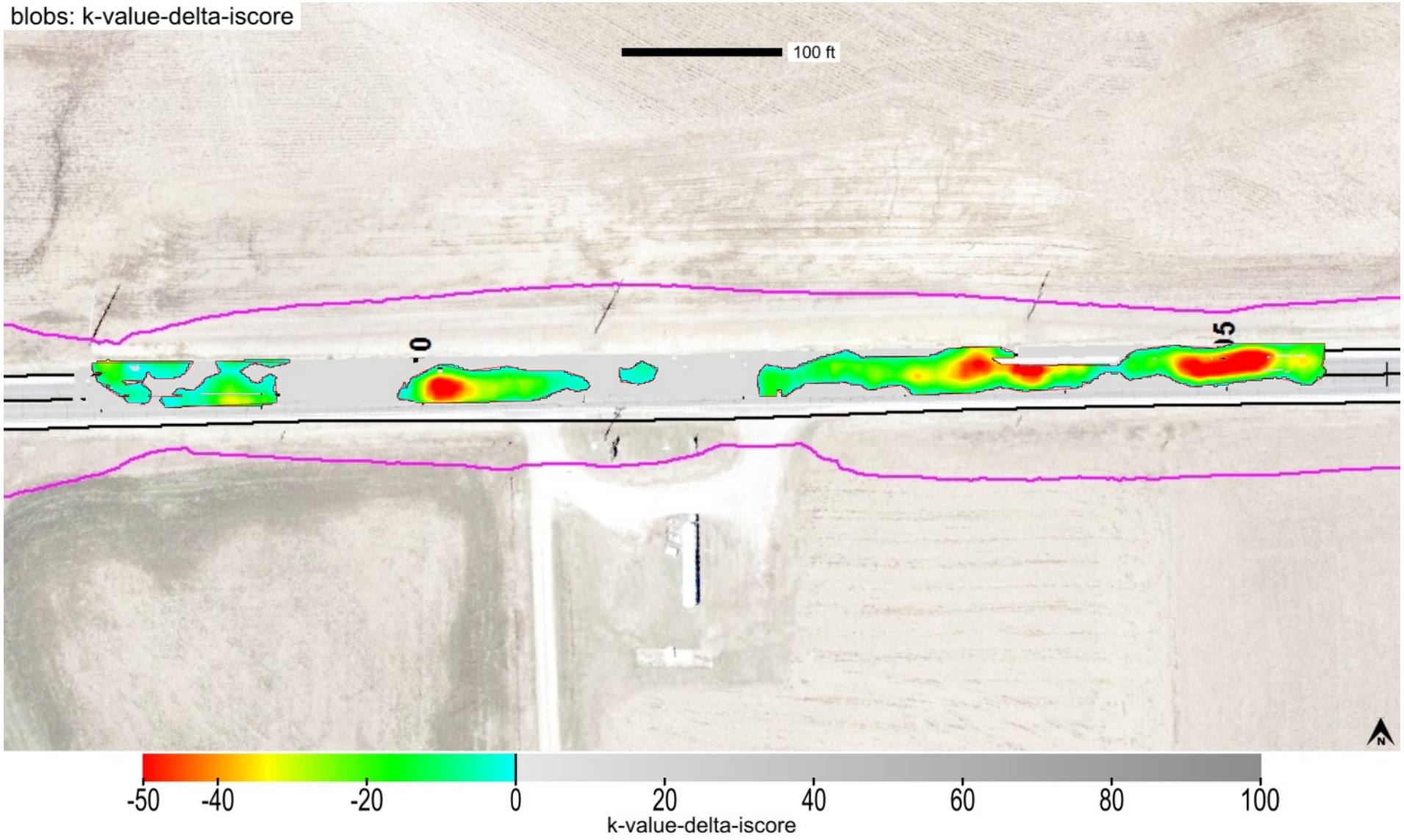


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	11274	53.61	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

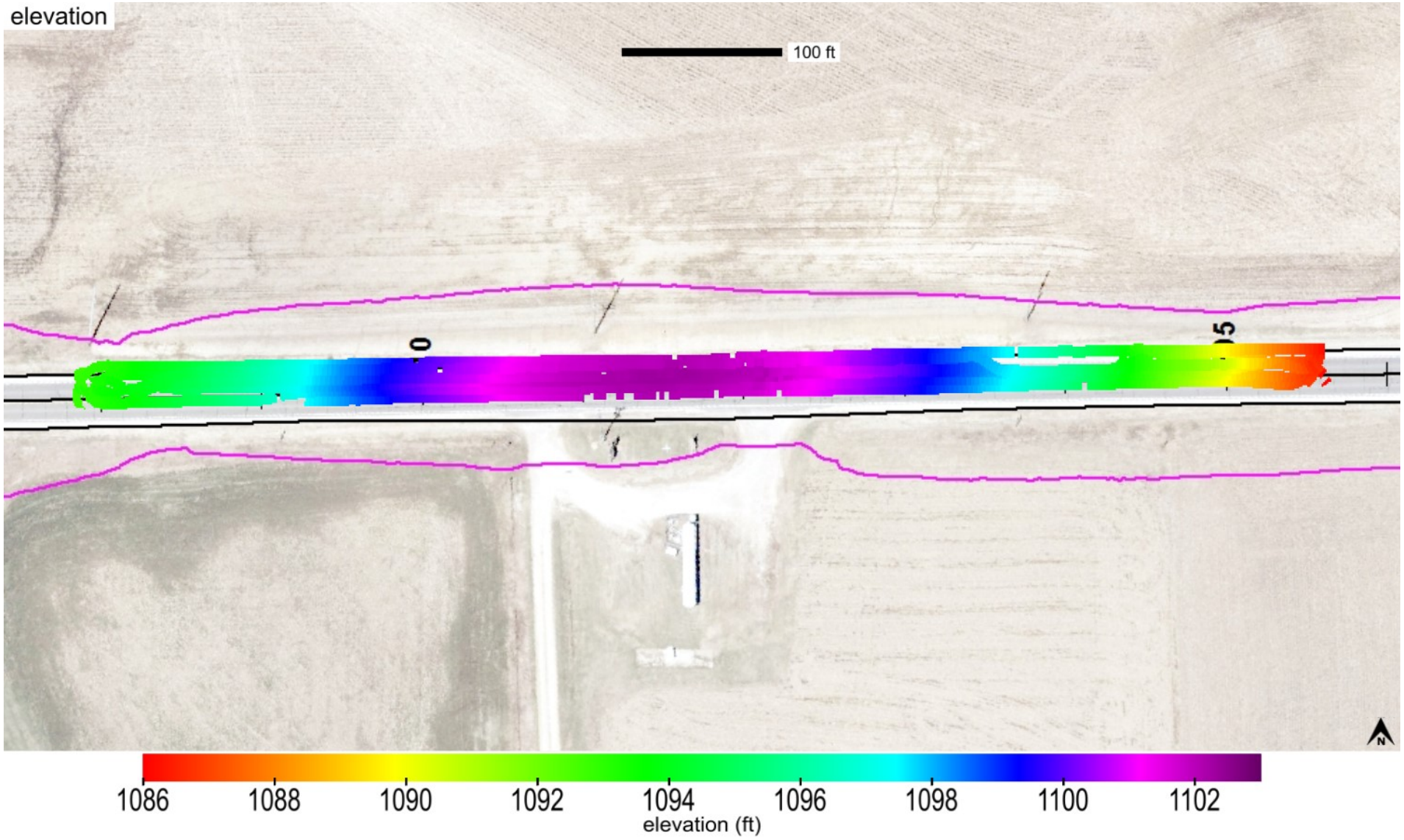
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

minimum	average	maximum
1	1.73	7

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

minimum	average	maximum
1086.054	1097.45	1102.347



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	21029	0.483	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_081547a

20200818_100444.jpg

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_113213a	No. of Measurements:	21465	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 11:32:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.9	114.6	1.02	9037	5500	28958.9	56000	8844.91	30.54	-3537	19921.9	46963
k-value	Yes	37.3	56.82	0.67	150	28.72	137.9	190	29.01	21.03	-121.28	-12.1	40
Moisture Content	No												

Mapped Area

square feet	acres
21465	0.49

Pass Count

min.	avg.	max.
1	1	3

Elevation (ft)

min.	avg.	max.
1091.95	1097.87	1106.47

Velocity (fps)

min.	avg.	max.
1.54	5.51	6.23

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	21465	0.493	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_113213a	No. of Measurements:	21465	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 11:32:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.6	CQI > = 95
99.9	80% of Resilient Modulus MVs >= 9037
30.54	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_113213a	No. of Measurements:	21465	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 11:32:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
56.82	CQI > = 95
37.3	80% of k-Value MVs >= 150
21.03	COV <= 20
60.04	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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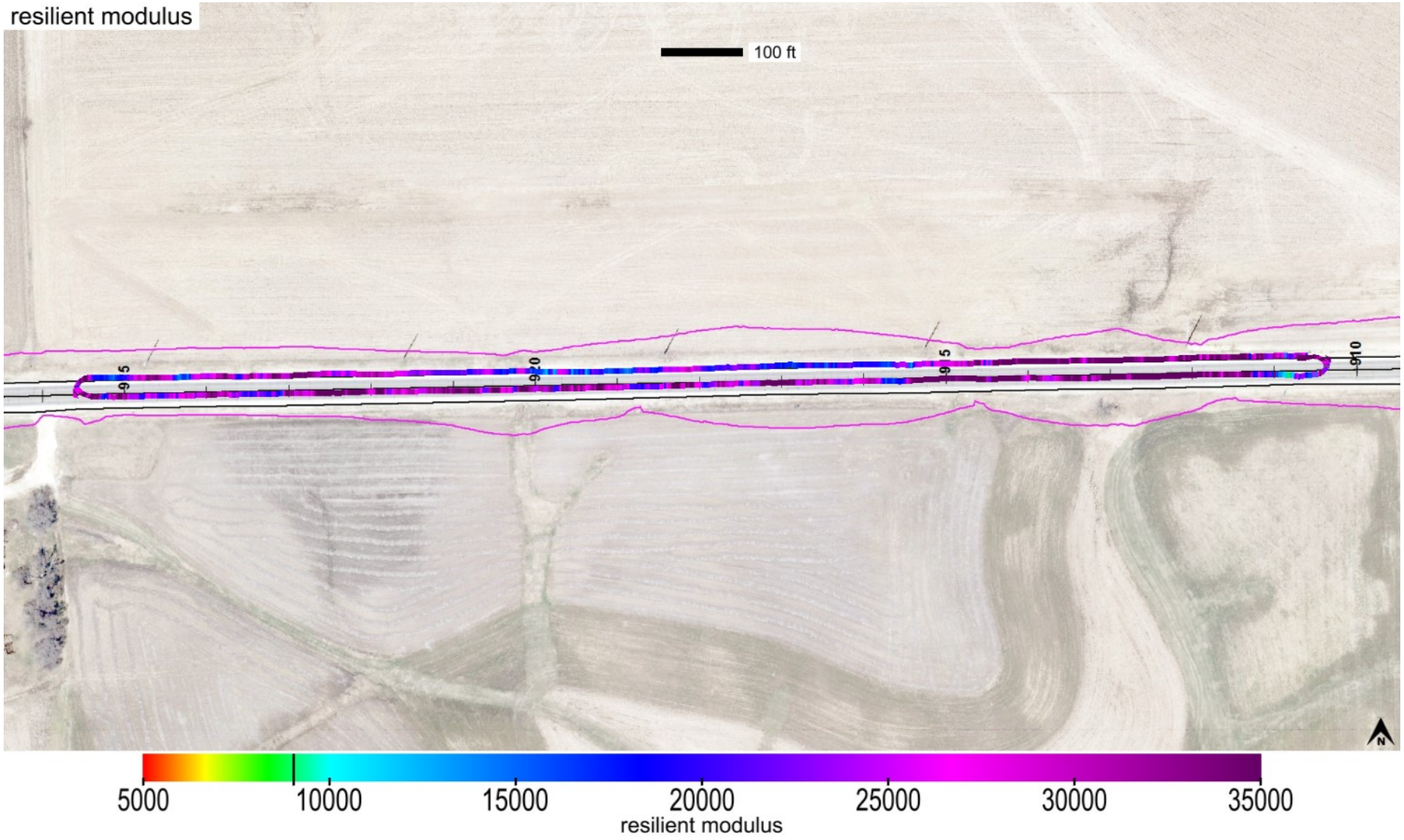
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	114.6	1.02	9037	5500	28958.9	56000	8844.91	30.54	-3537	19921.9	46963



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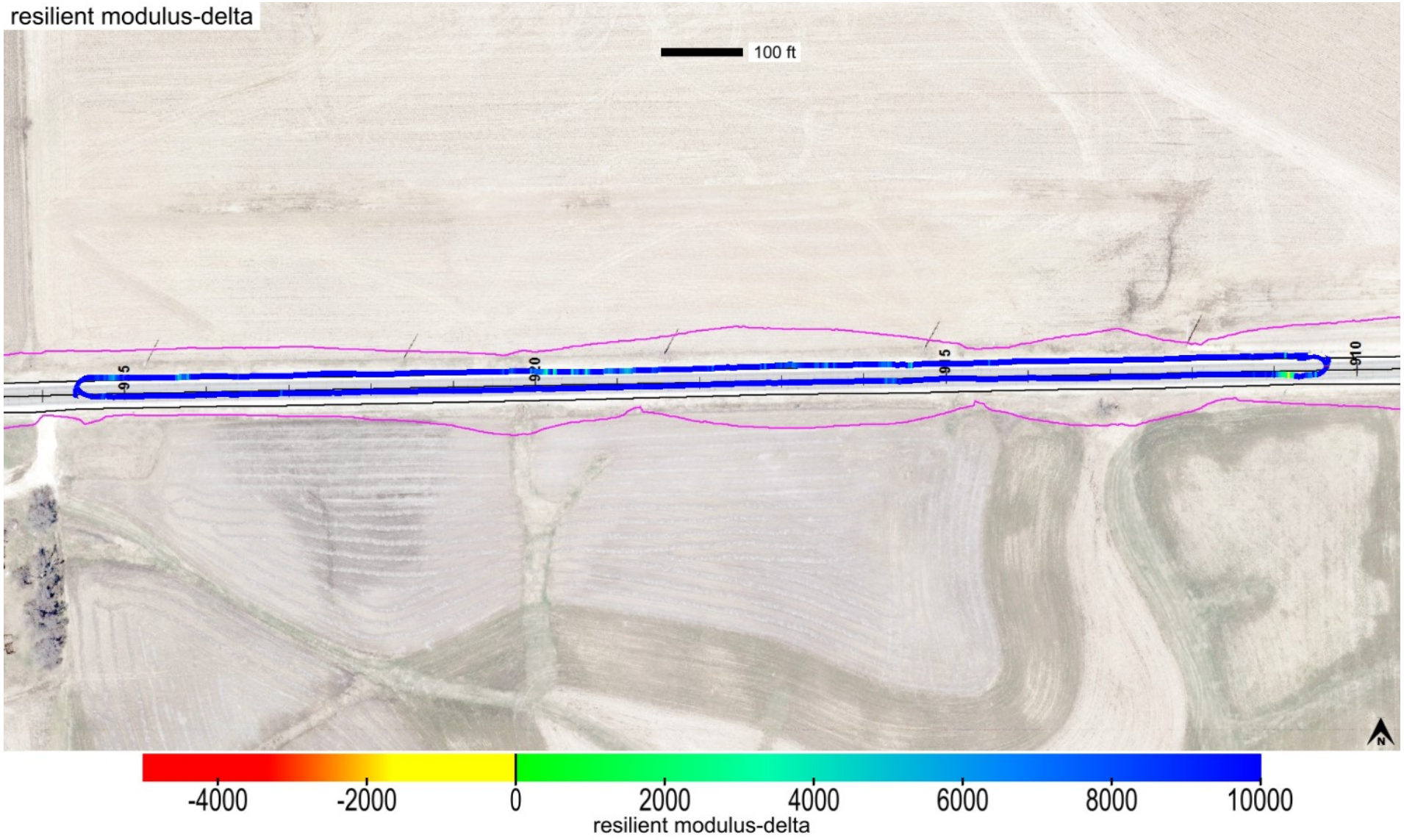
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	114.6	1.02	9037	5500	28958.9	56000	8844.91	30.54	-3537	19921.9	46963



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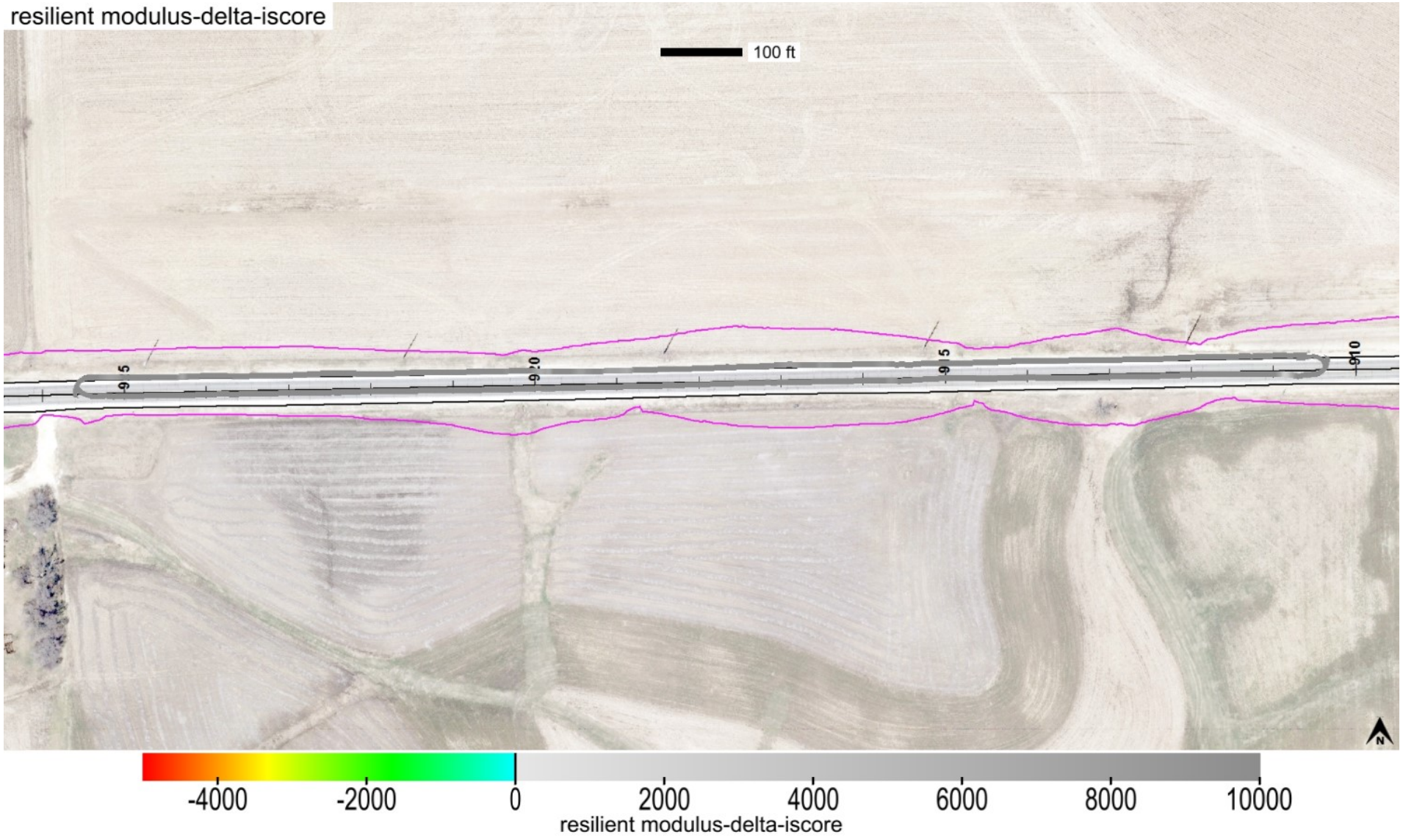
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.9	9037	-3537	19921.9	46963	2506.9	19916.21	43656.49



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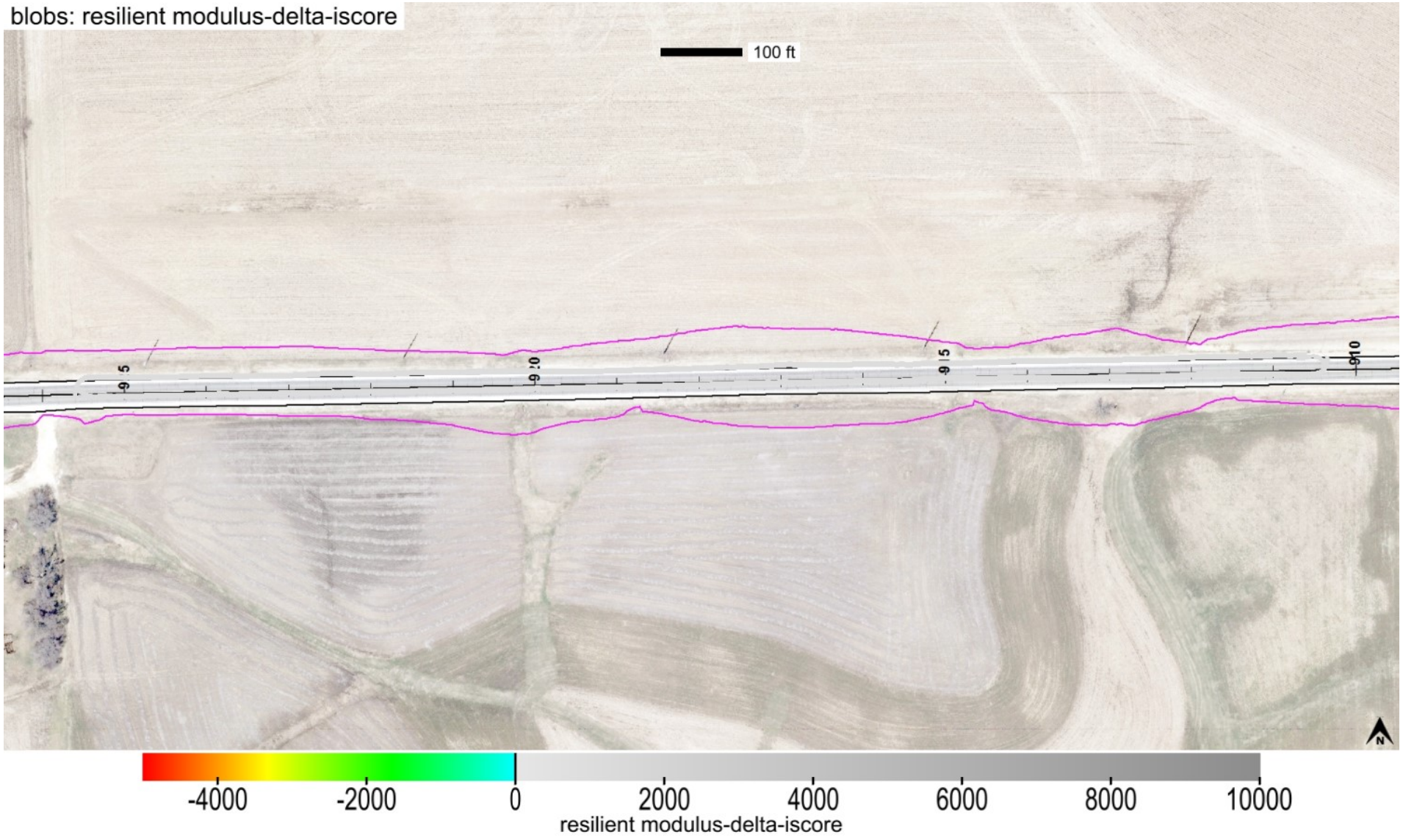
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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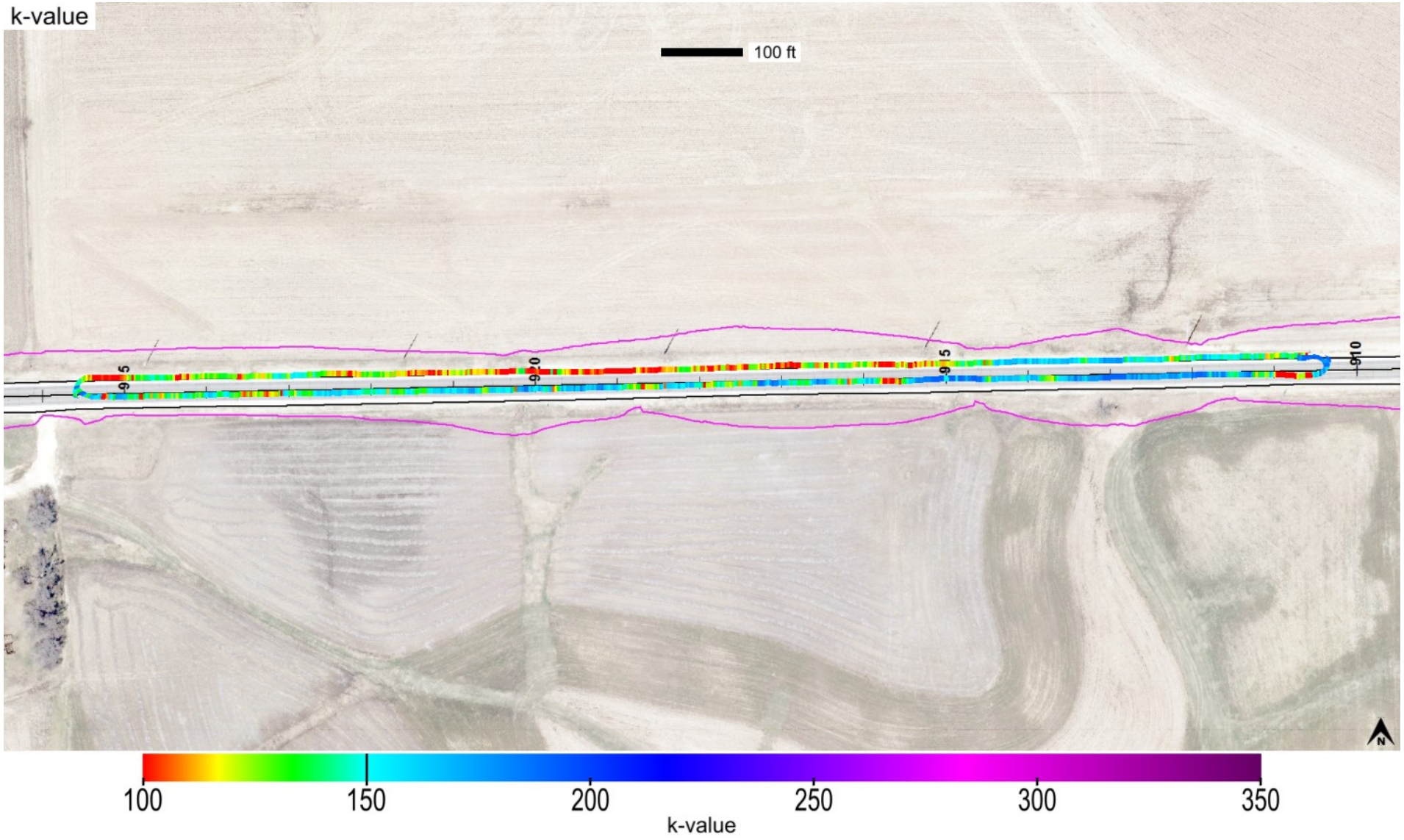
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	37.3	56.82	0.67	150	28.72	137.9	190	29.01	21.03	-121.28	-12.1	40



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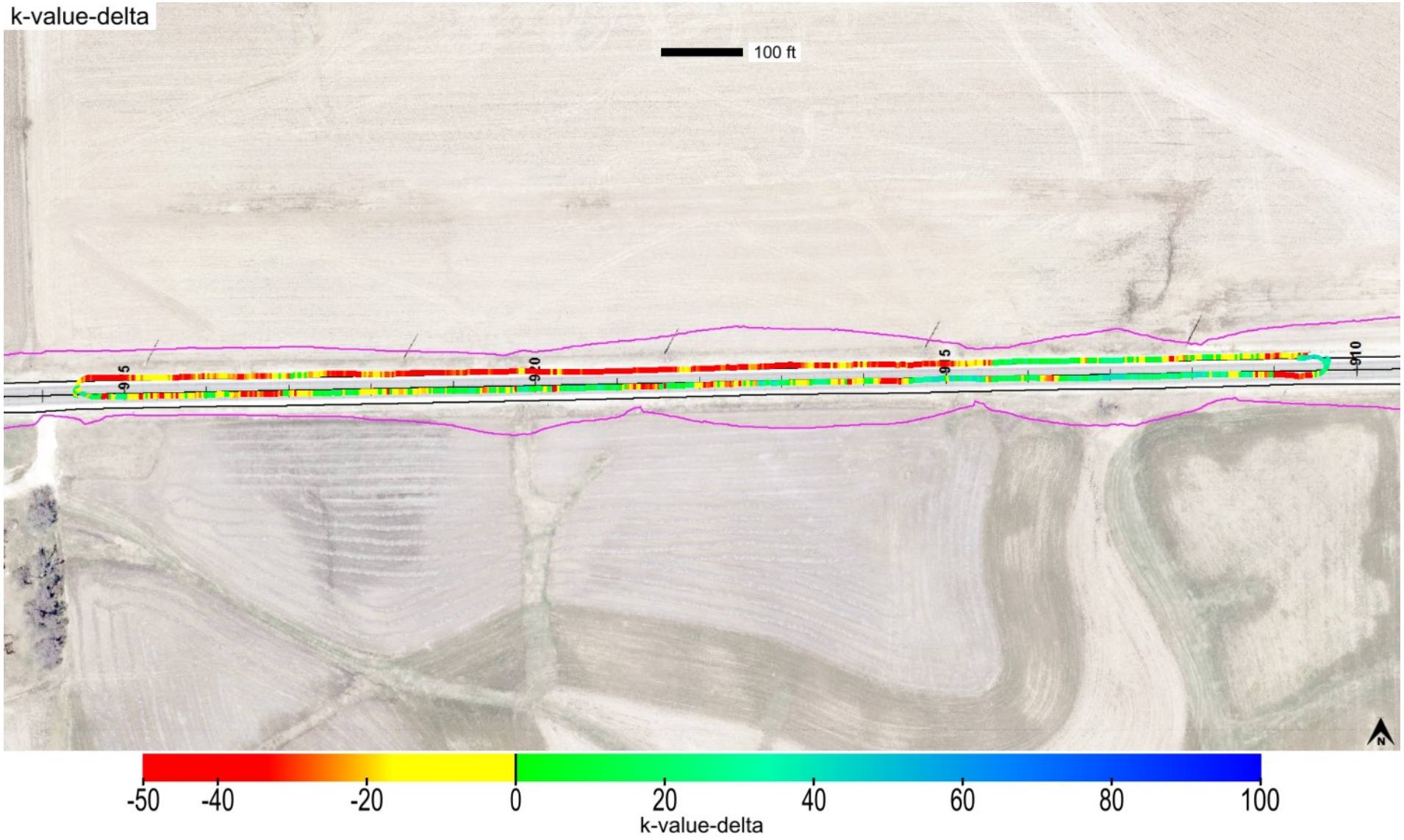
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	37.3	56.82	0.67	150	28.72	137.9	190	29.01	21.03	-121.28	-12.1	40



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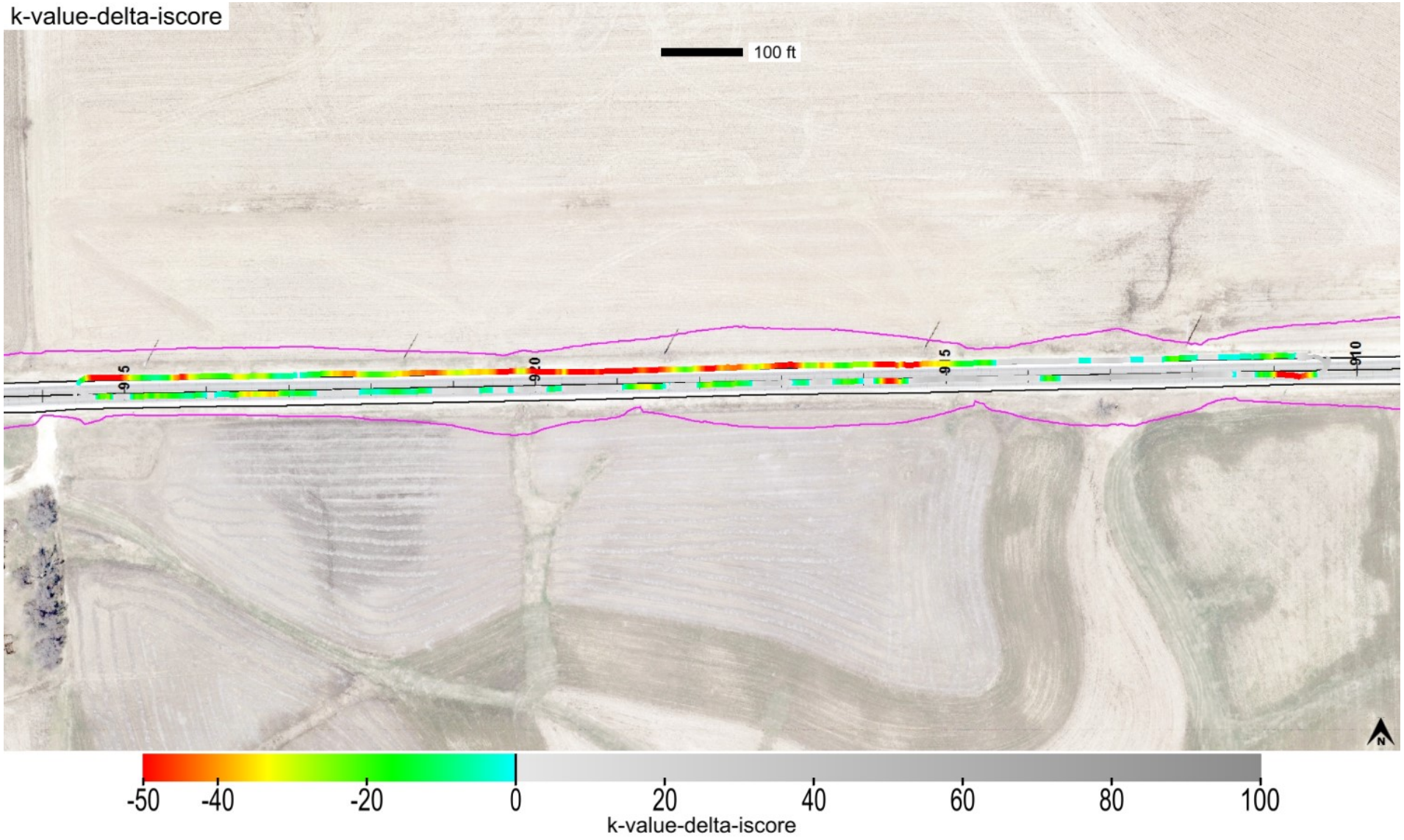
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	37.3	150	-121.28	-12.1	40	-91.74	-12.07	40



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	12	12887	60.04	none	0

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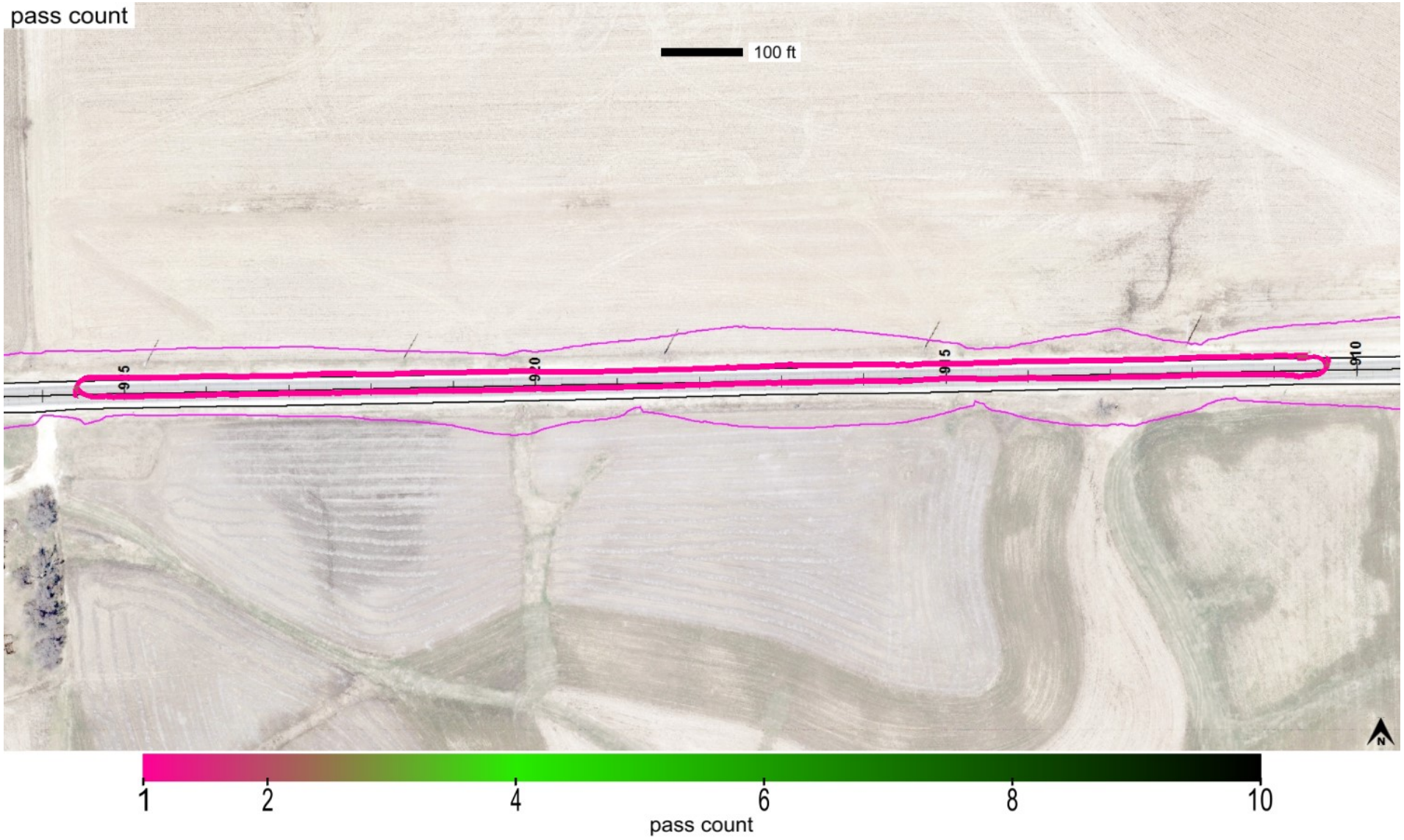
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

minimum	average	maximum
1	1	3



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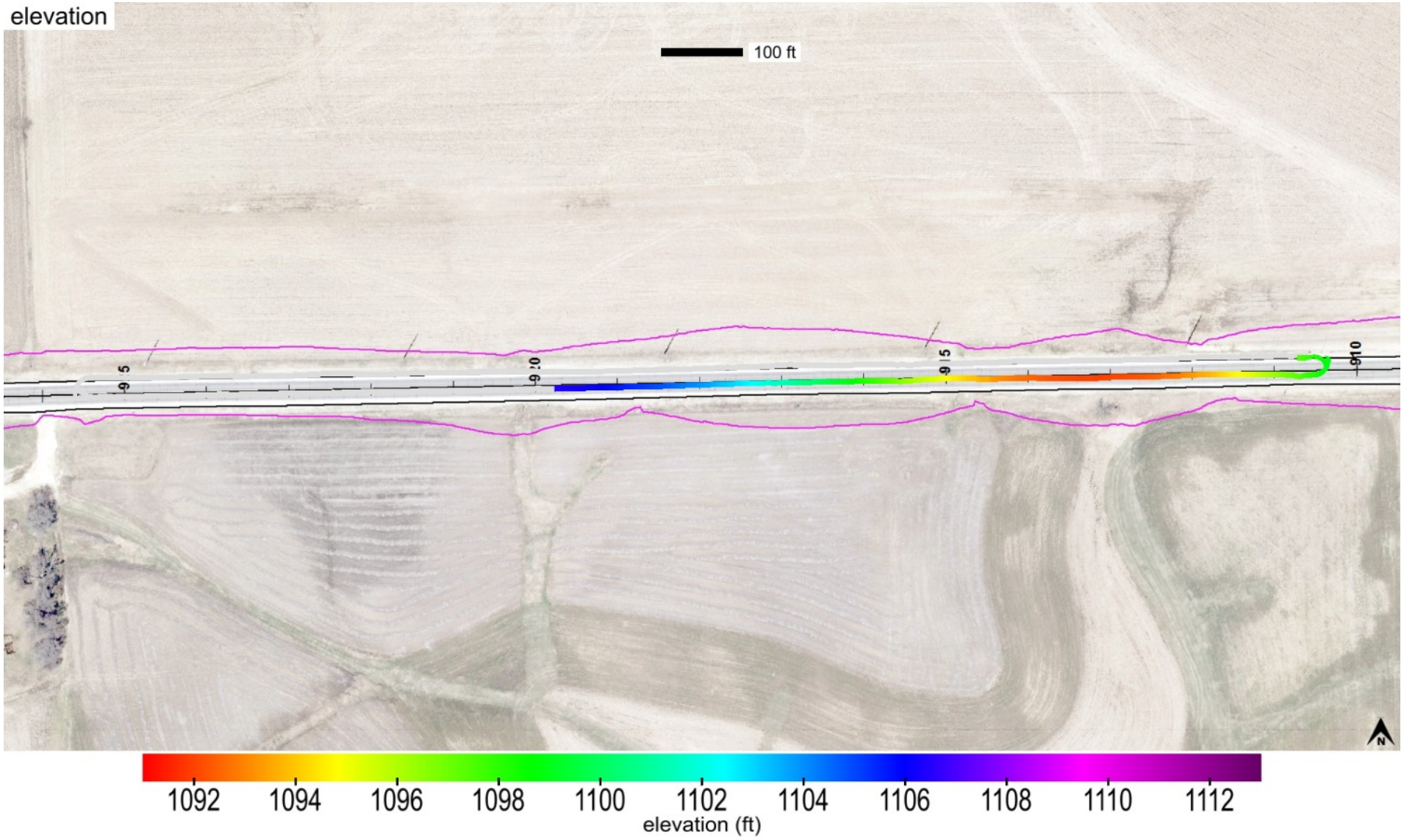
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

minimum	average	maximum
1091.947	1097.871	1106.474



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	21465	0.493	12	9037	150	40

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_113213a

IMG_20200813_131432538.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.25	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_114355a	No. of Measurements:	2946	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 11:43:55 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	121.13	0.94	9037	22122.09	40056.7	56000	7105.87	17.74	13085.09	31019.7	46963
k-value	Yes	92.8	118.52	1.95	150	111.42	180.2	190	15.33	8.51	-38.58	30.2	40
Moisture Content	No												

Mapped Area

square feet	acres
2946	0.07

Pass Count

min.	avg.	max.
1	5.71	8

Elevation (ft)

min.	avg.	max.
1108.46	1110.07	1111.01

Velocity (fps)

min.	avg.	max.
0.23	5.44	5.81

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	2946	0.068	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.25	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_114355a	No. of Measurements:	2946	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 11:43:55 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
121.13	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
17.74	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.25	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_114355a	No. of Measurements:	2946	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 11:43:55 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
118.52	CQI > = 95
92.8	80% of k-Value MVs >= 150
8.51	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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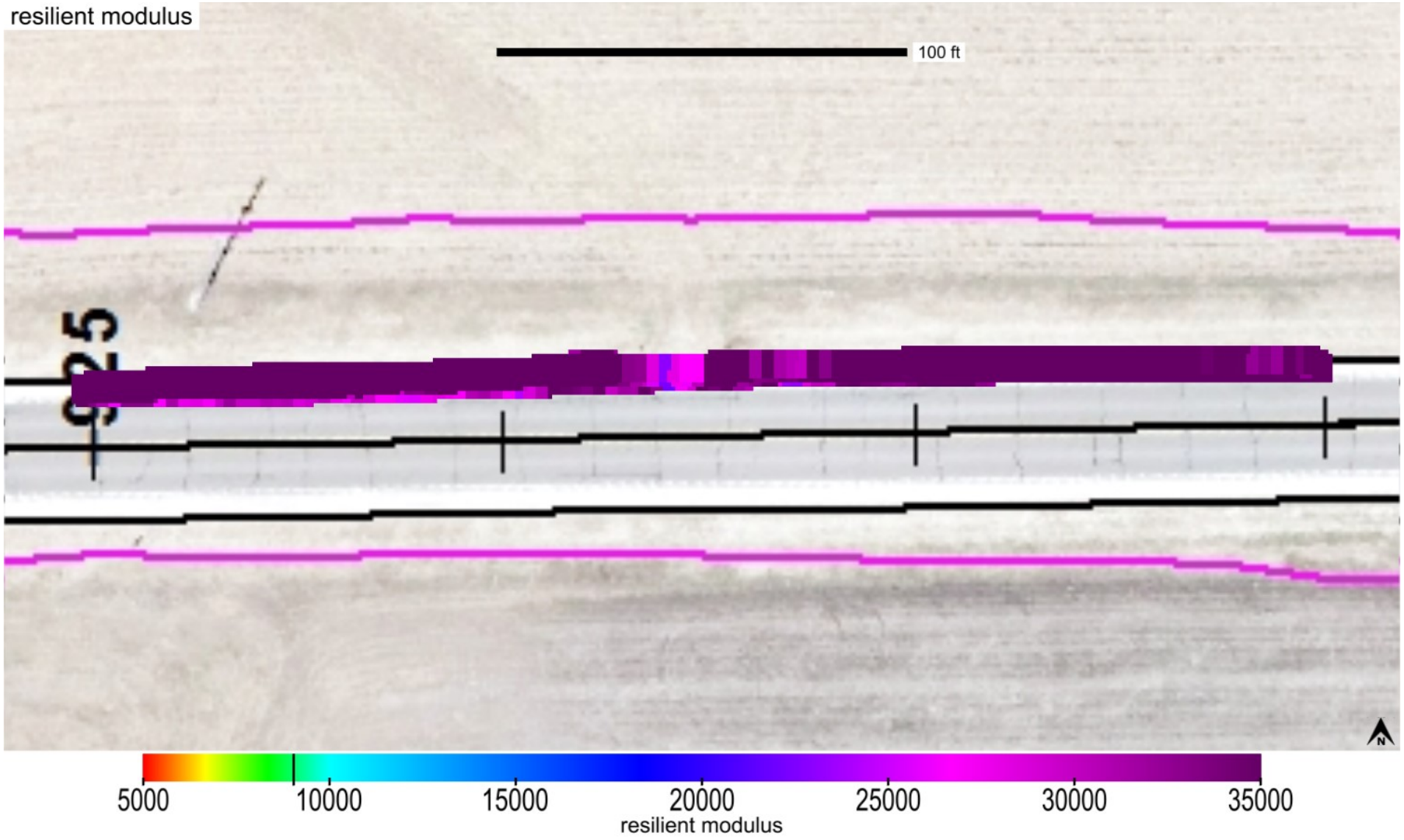
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	121.13	0.94	9037	22122.09	40056.7	56000	7105.87	17.74	13085.09	31019.7	46963



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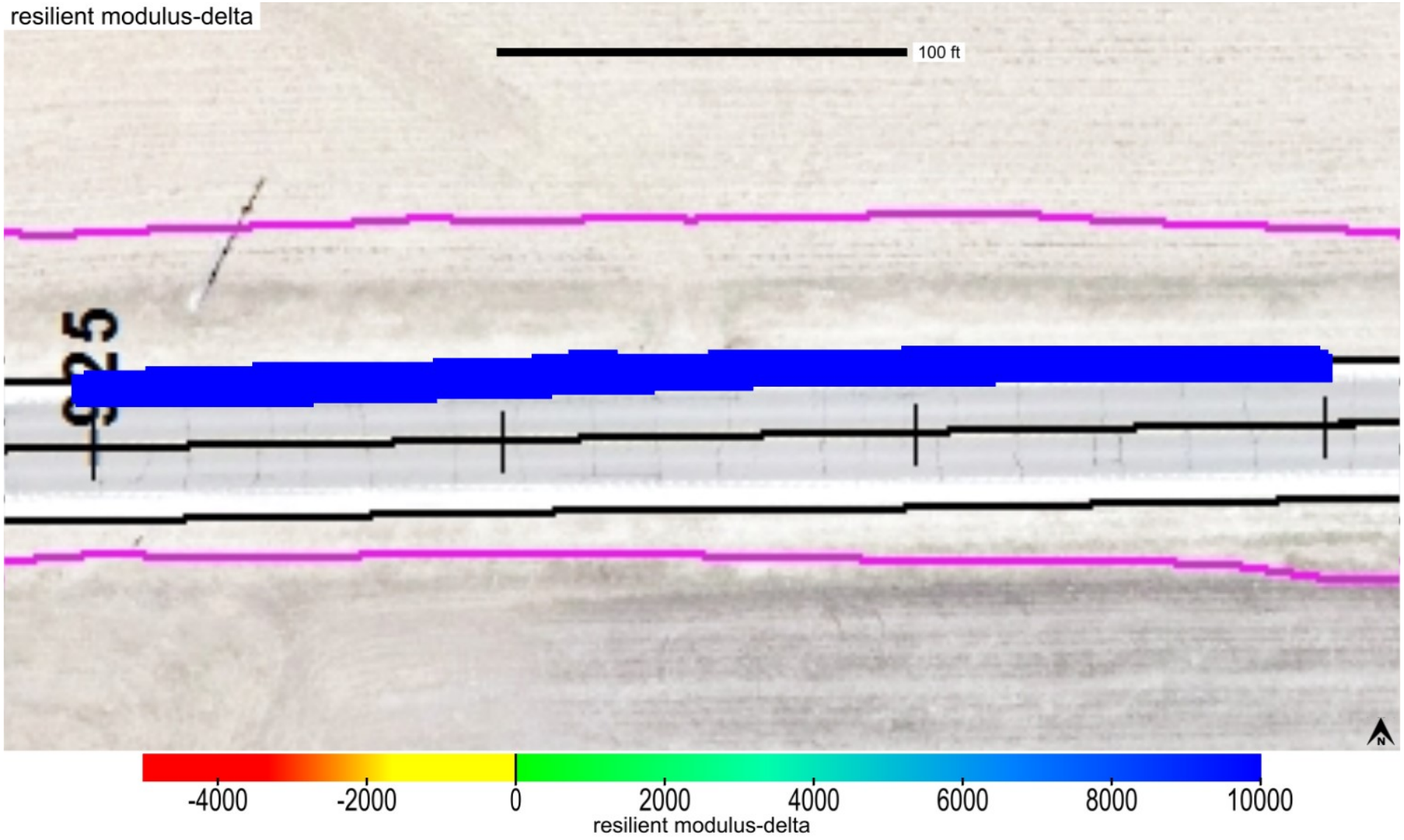
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	121.13	0.94	9037	22122.09	40056.7	56000	7105.87	17.74	13085.09	31019.7	46963



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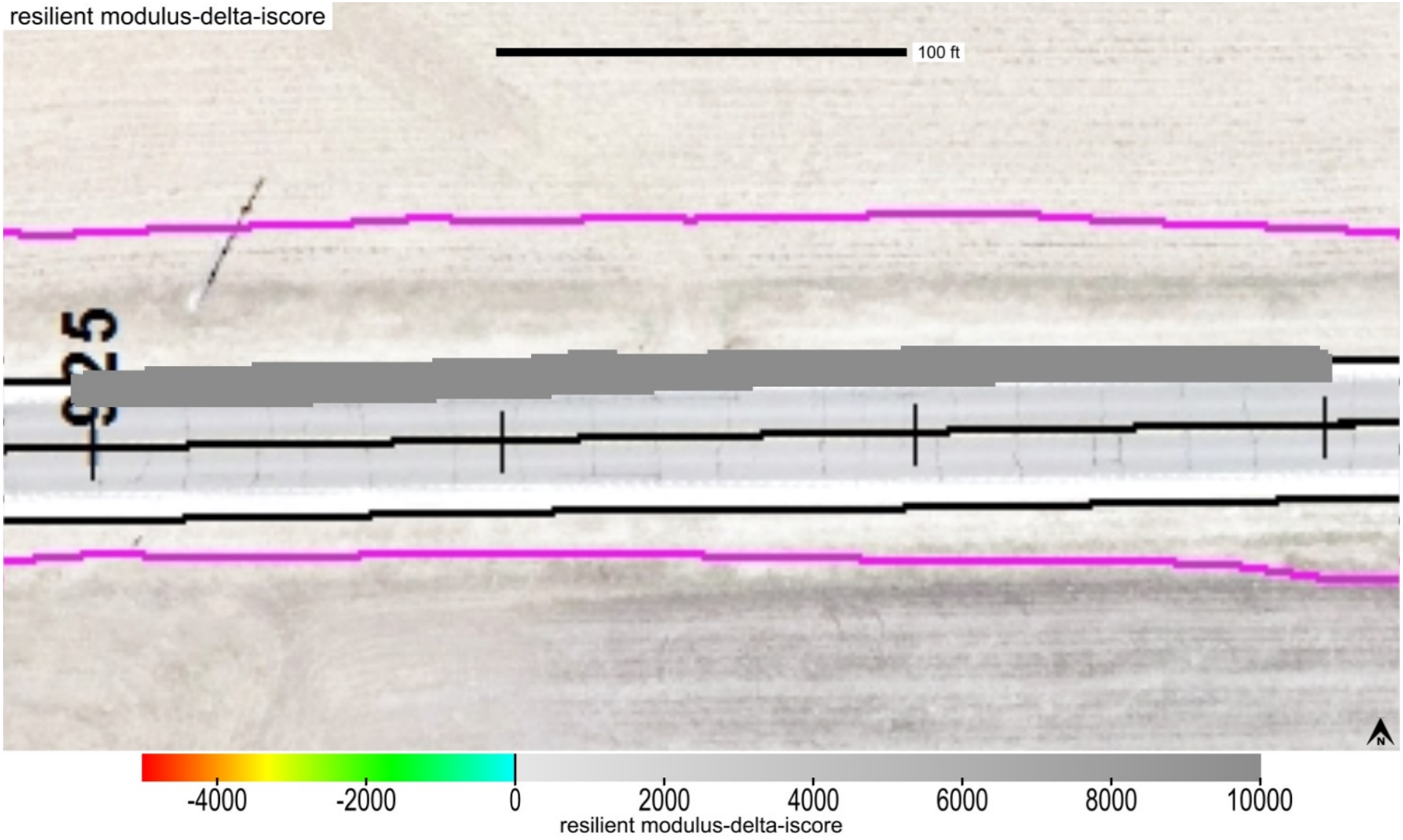
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	13085.09	31019.7	46963	19183.61	31083.97	38353.4



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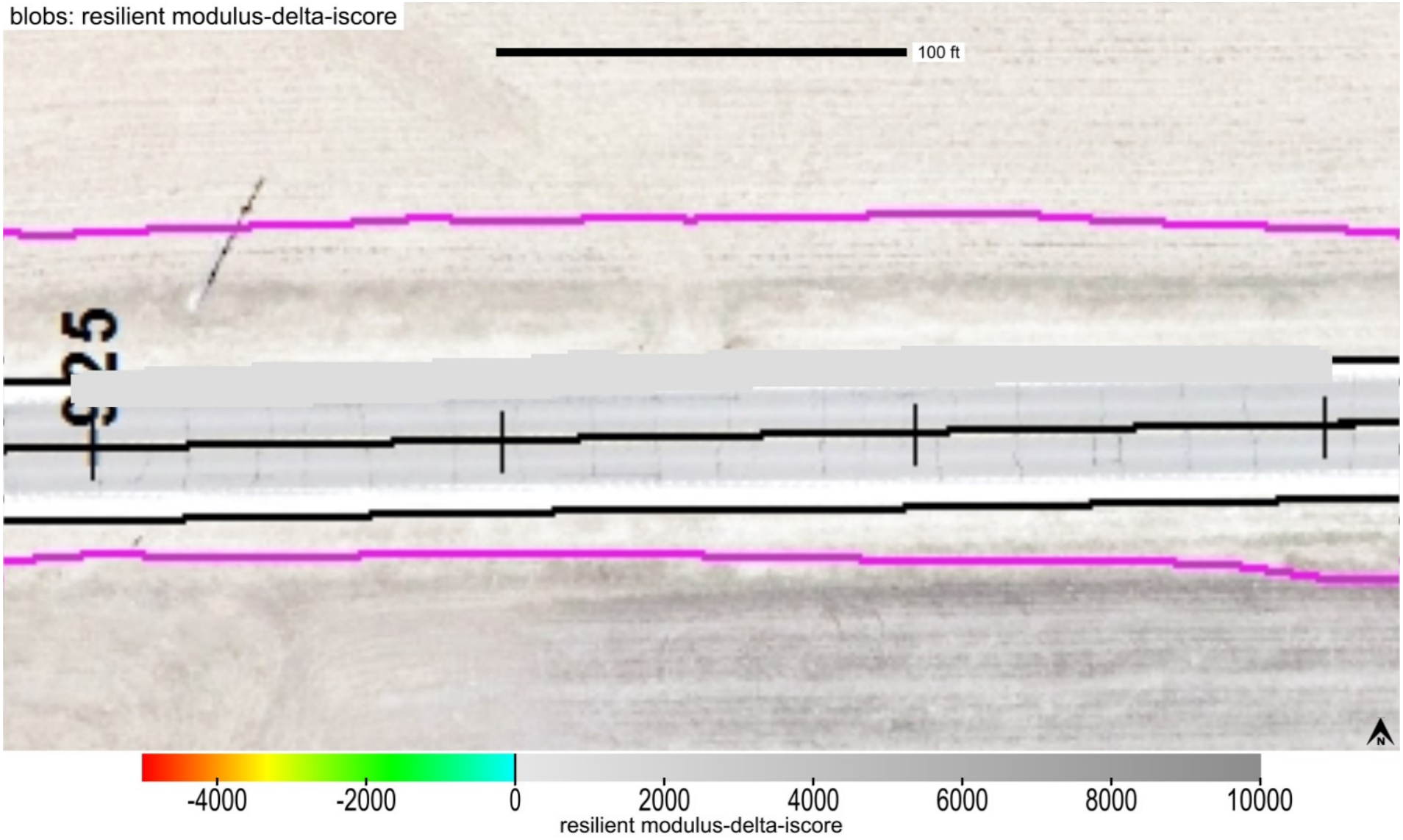
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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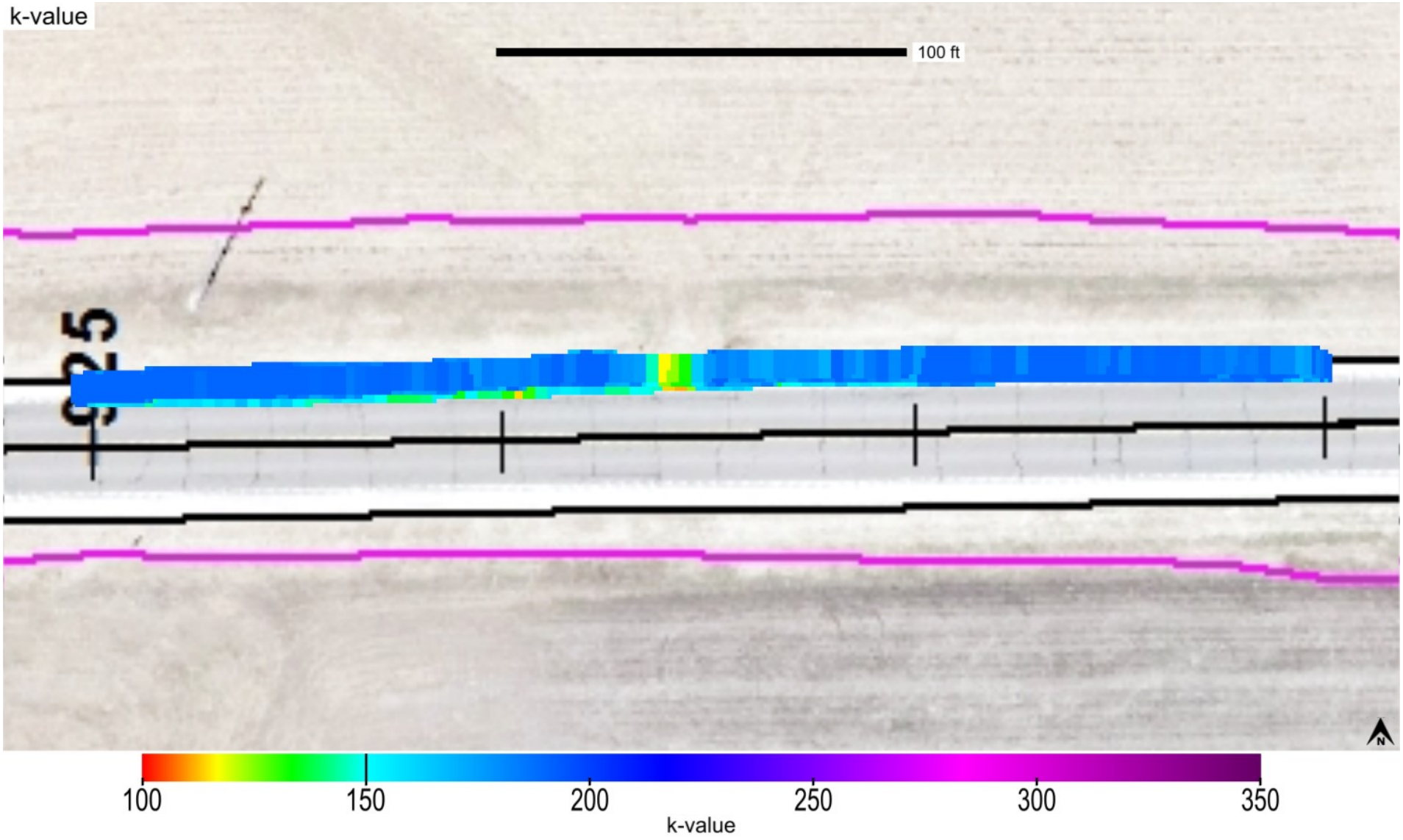
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	92.8	118.52	1.95	150	111.42	180.2	190	15.33	8.51	-38.58	30.2	40



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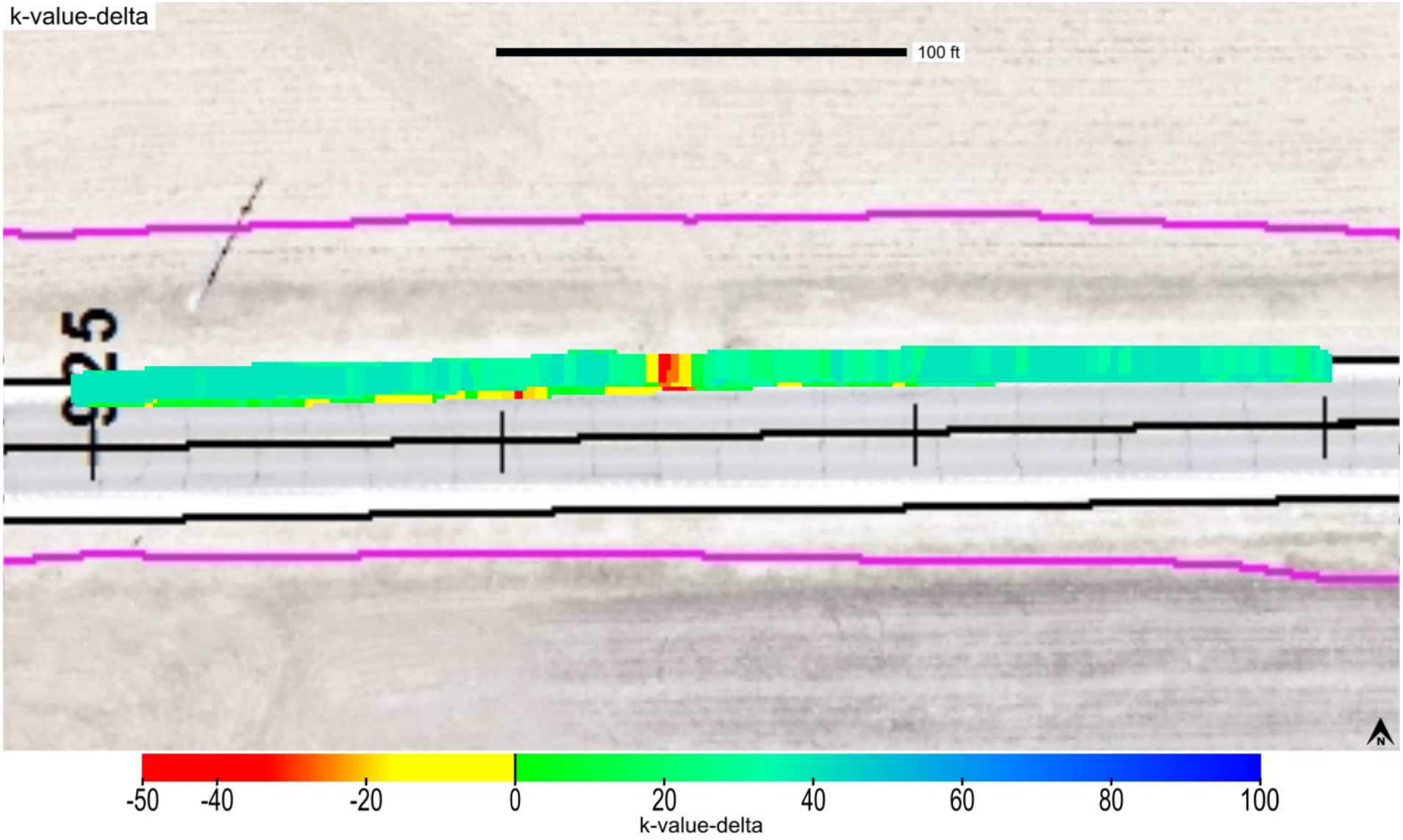
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	92.8	118.52	1.95	150	111.42	180.2	190	15.33	8.51	-38.58	30.2	40



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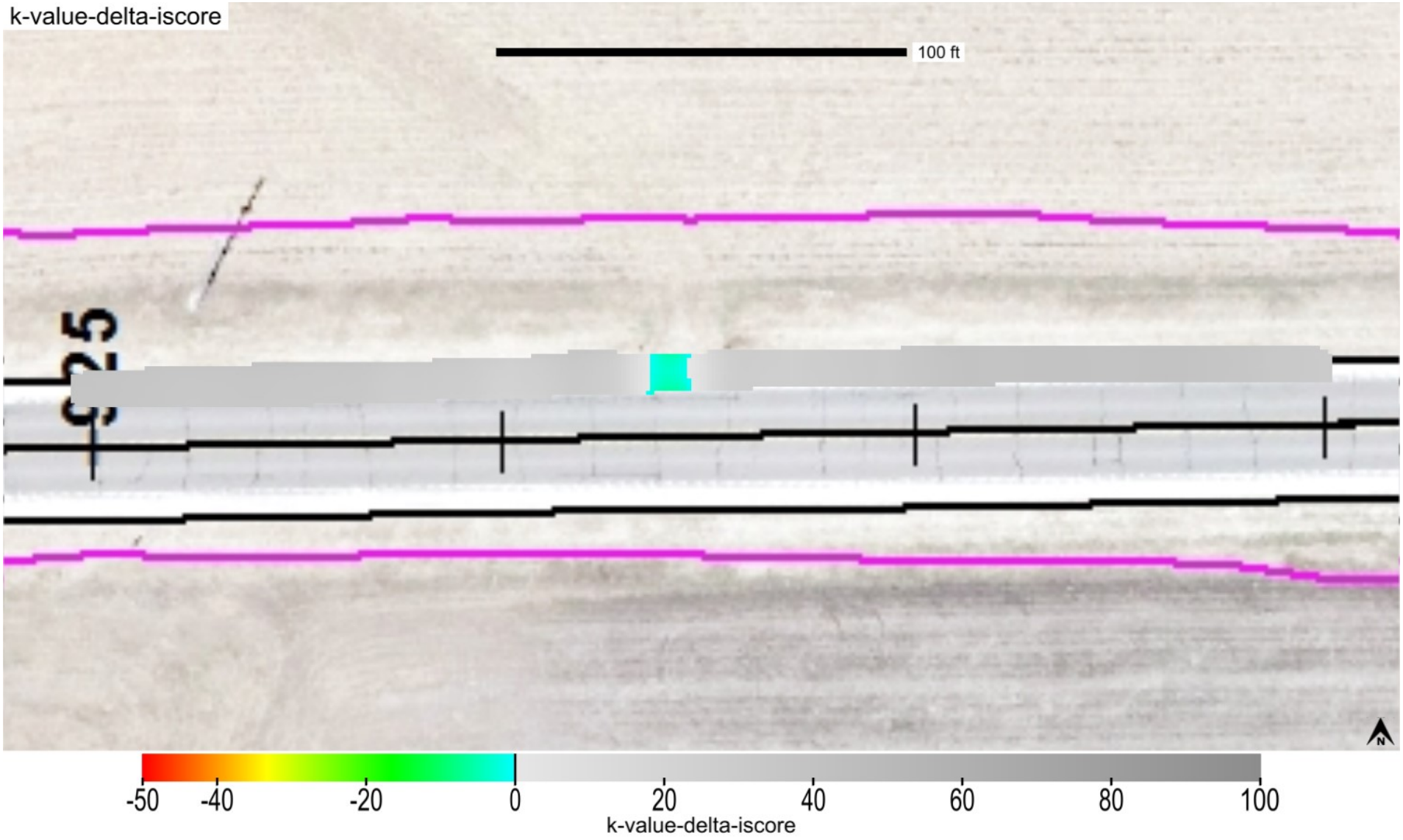
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	92.8	150	-38.58	30.2	40	-5.77	30.42	39.47



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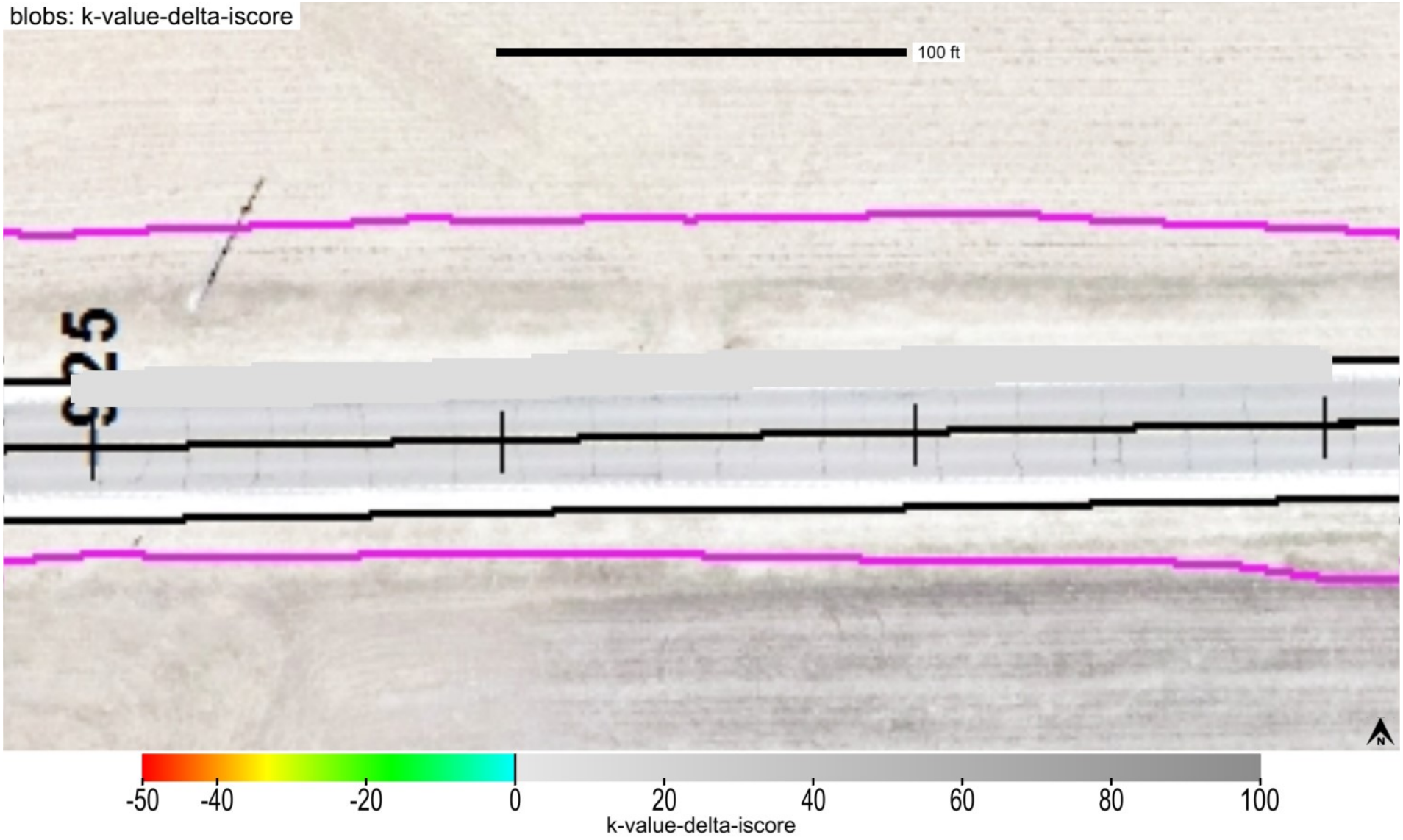
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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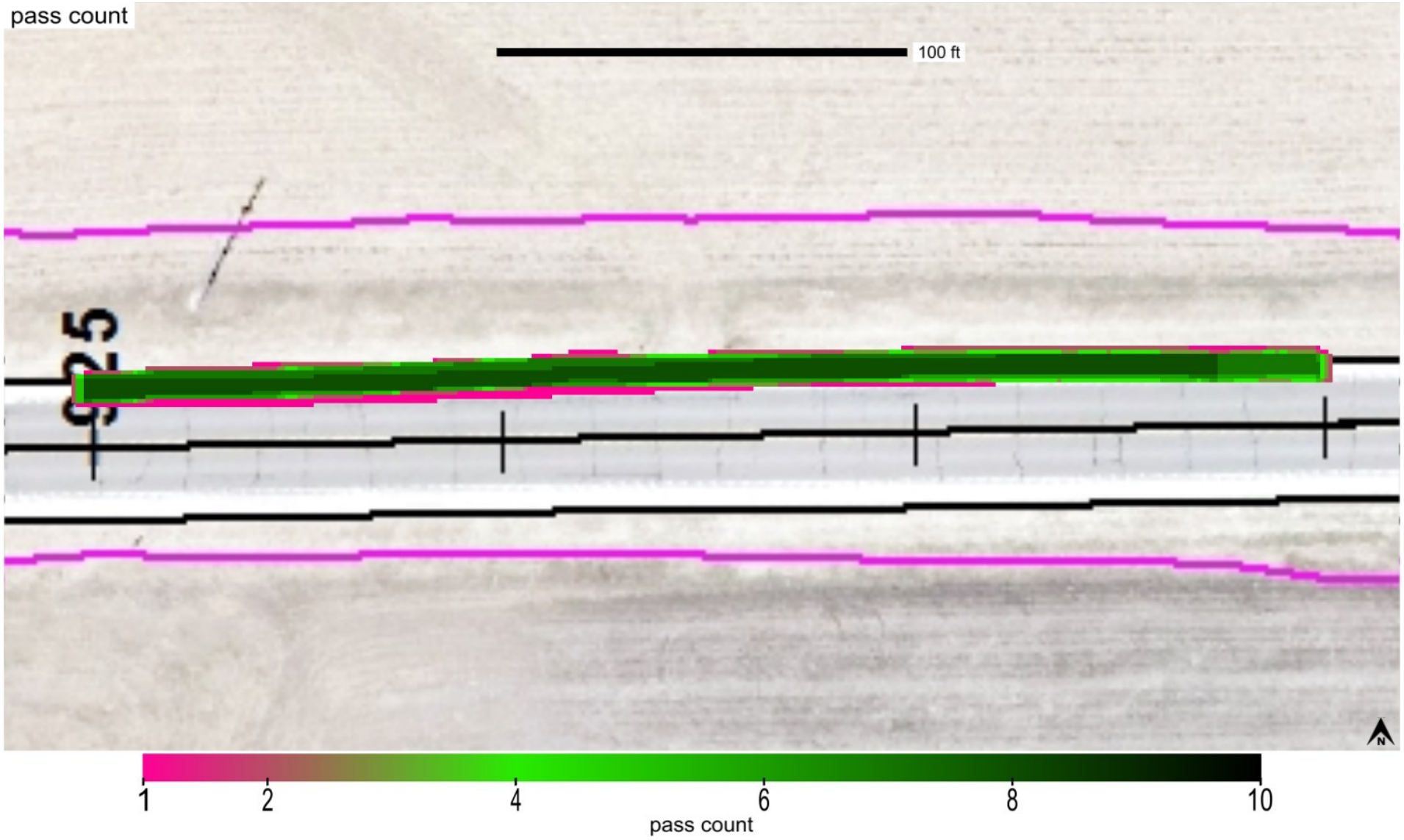
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

minimum	average	maximum
1	5.71	8



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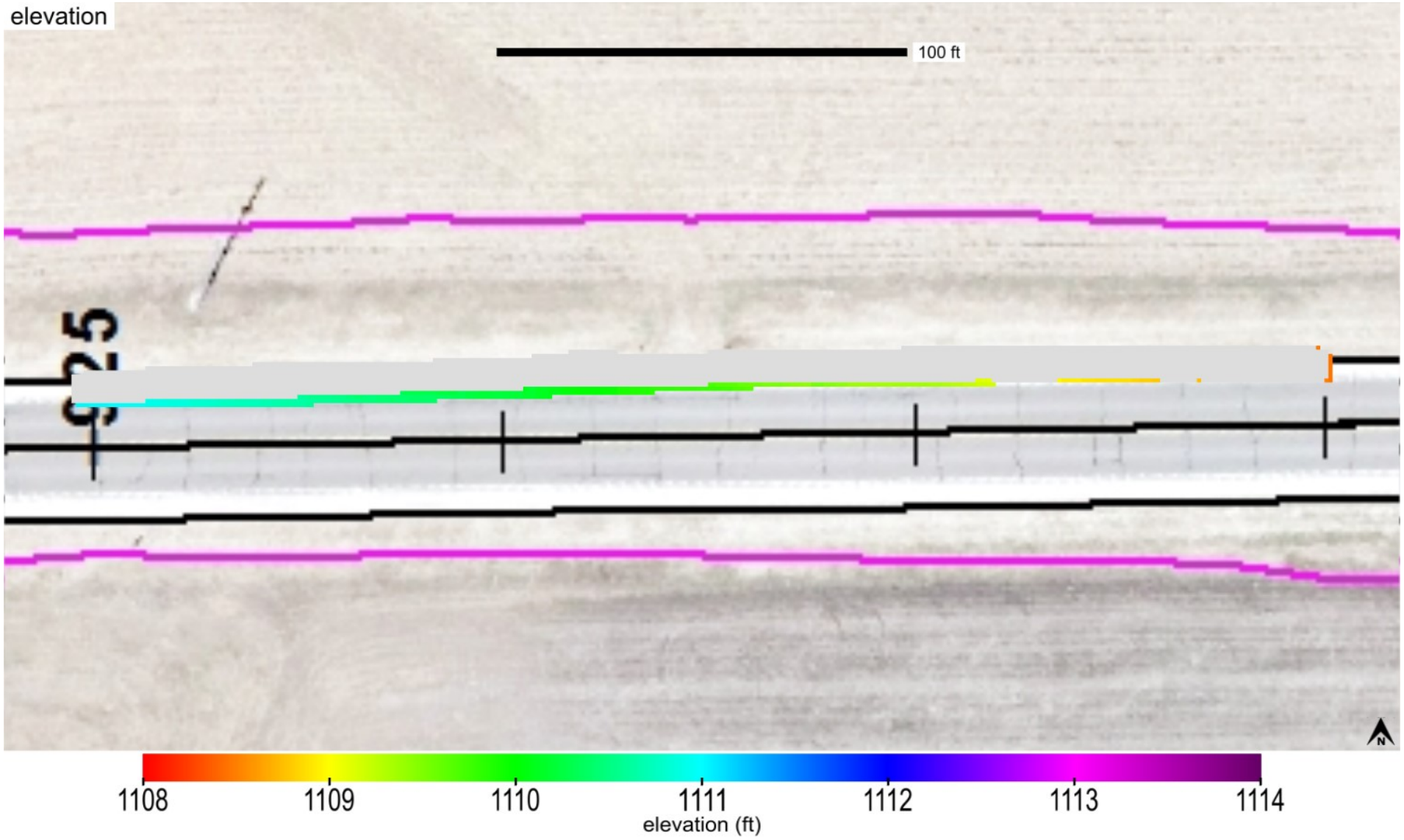
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

minimum	average	maximum
1108.459	1110.072	1111.008

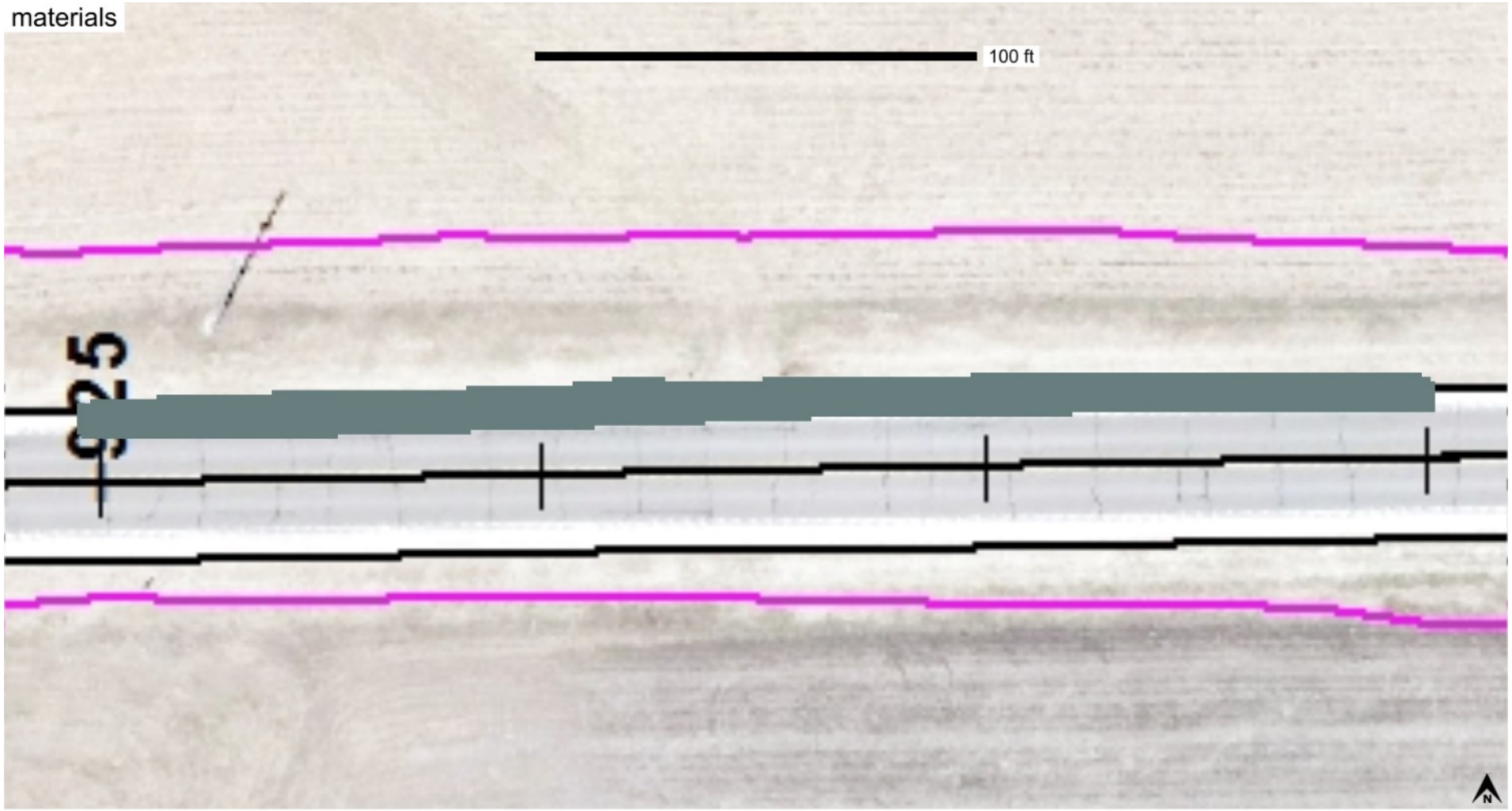


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_114355a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	2946	0.068	12	9037	150	40



Modified Subbase_IADOT (2115)

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.41	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_120402a	No. of Measurements:	42032	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 12:04:02 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.9	115.02	0.91	9037	5500	33089.7	56000	9834.41	29.72	-3537	24052.7	46963
k-value	Yes	65.1	85.85	0.89	150	20	157.7	190	29.23	18.53	-130	7.7	40
Moisture Content	No												

Mapped Area

square feet	acres
42032	0.96

Pass Count

min.	avg.	max.
1	1.31	5

Elevation (ft)

min.	avg.	max.
1091.82	1097.83	1108.68

Velocity (fps)

min.	avg.	max.
0.37	5.52	6.23

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	42032	0.965	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.41	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_120402a	No. of Measurements:	42032	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 12:04:02 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
115.02	CQI > = 95
99.9	80% of Resilient Modulus MVs >= 9037
29.72	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.41	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_120402a	No. of Measurements:	42032	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 12:04:02 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
85.85	CQI > = 95
65.1	80% of k-Value MVs >= 150
18.53	COV <= 20
29.8	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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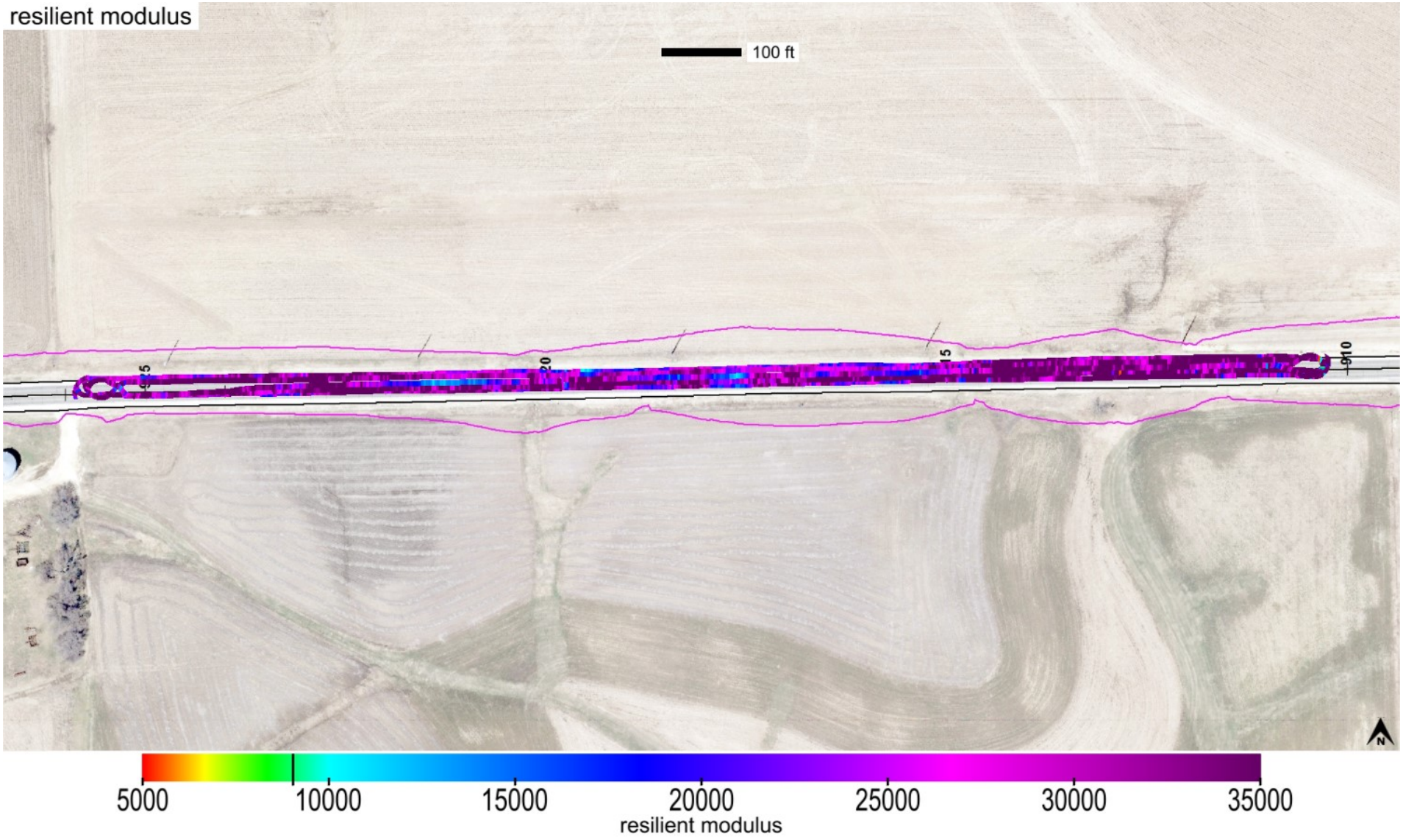
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	115.02	0.91	9037	5500	33089.7	56000	9834.41	29.72	-3537	24052.7	46963



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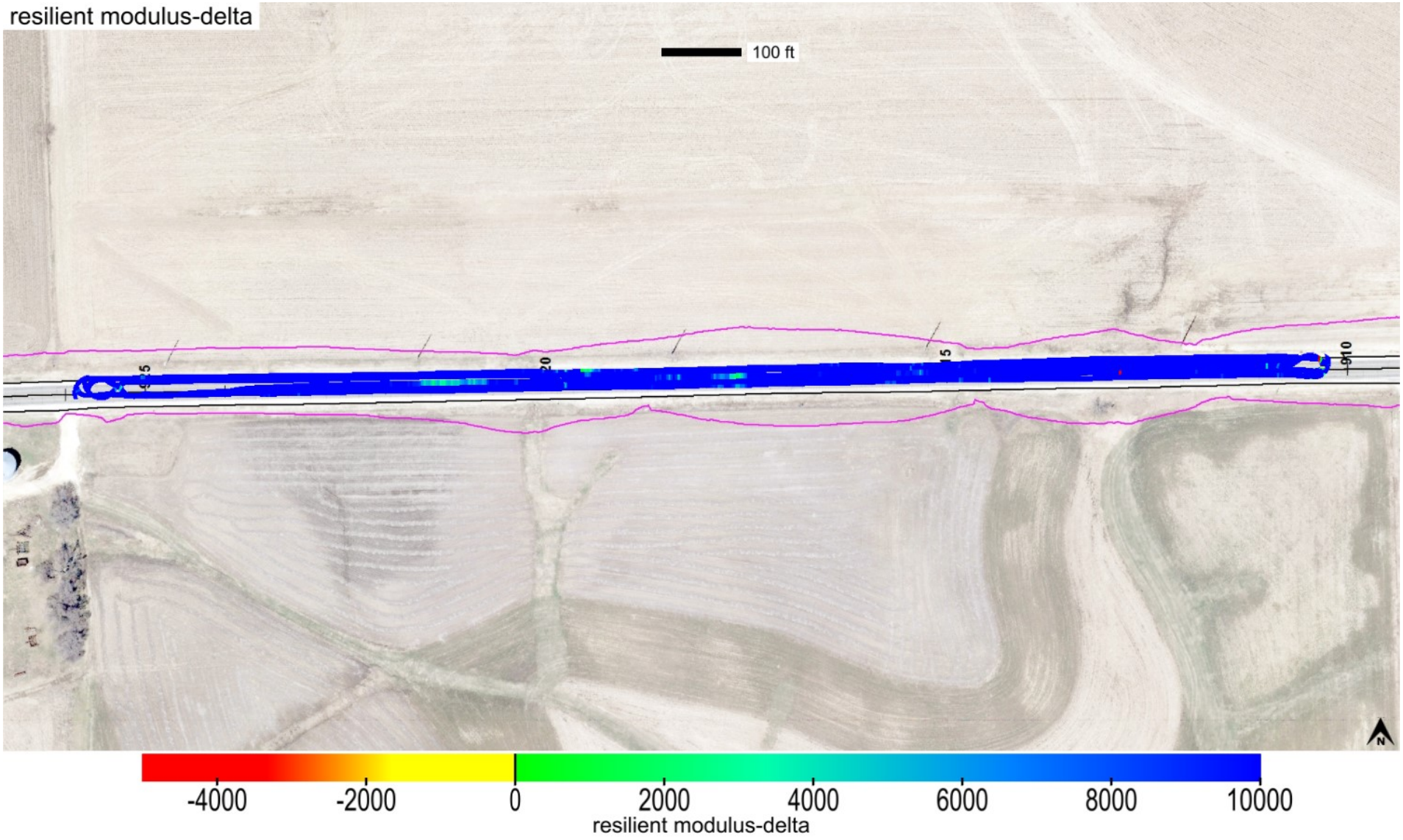
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	115.02	0.91	9037	5500	33089.7	56000	9834.41	29.72	-3537	24052.7	46963



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.9	9037	-3537	24052.7	46963	6263.53	24151.2	43225.49

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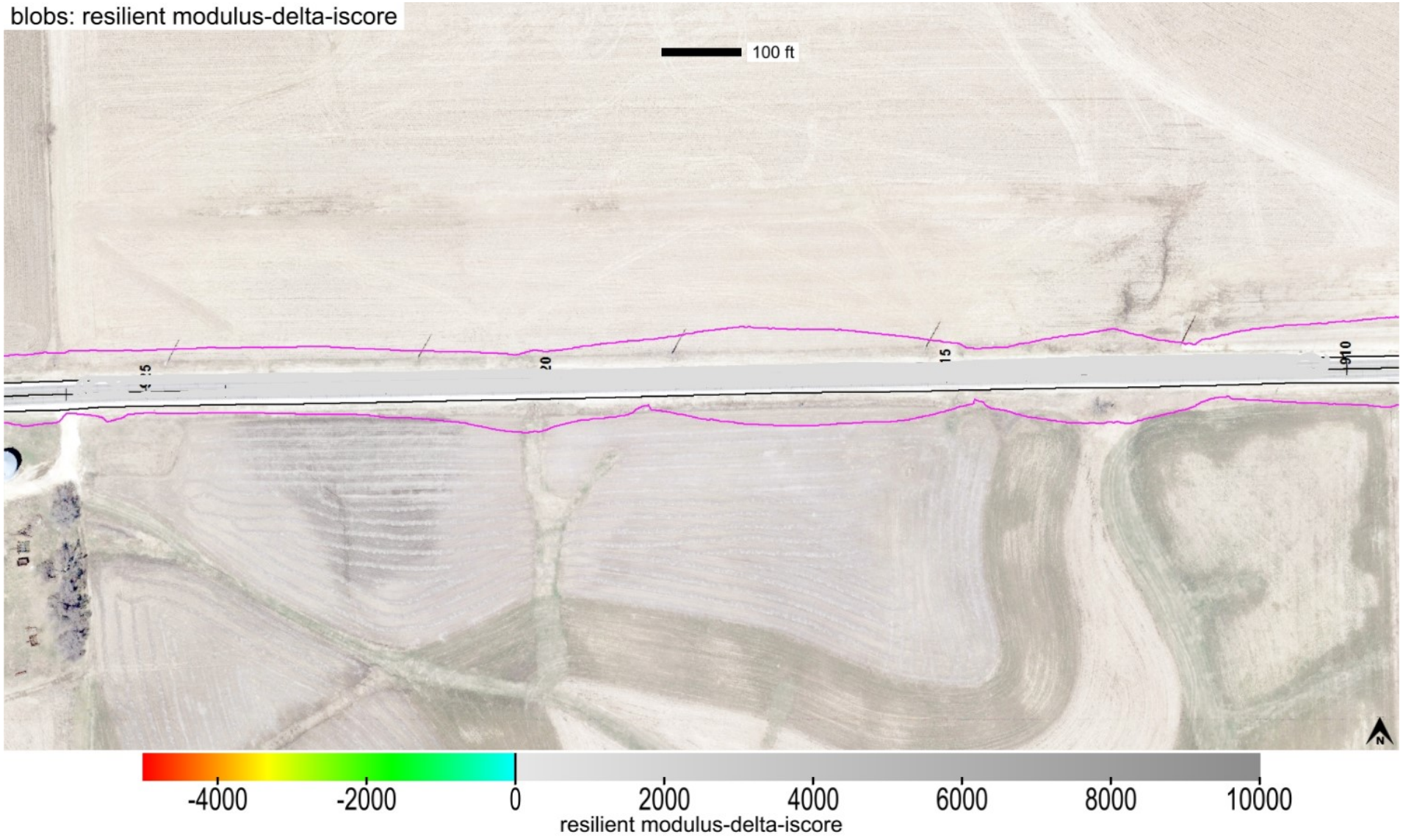
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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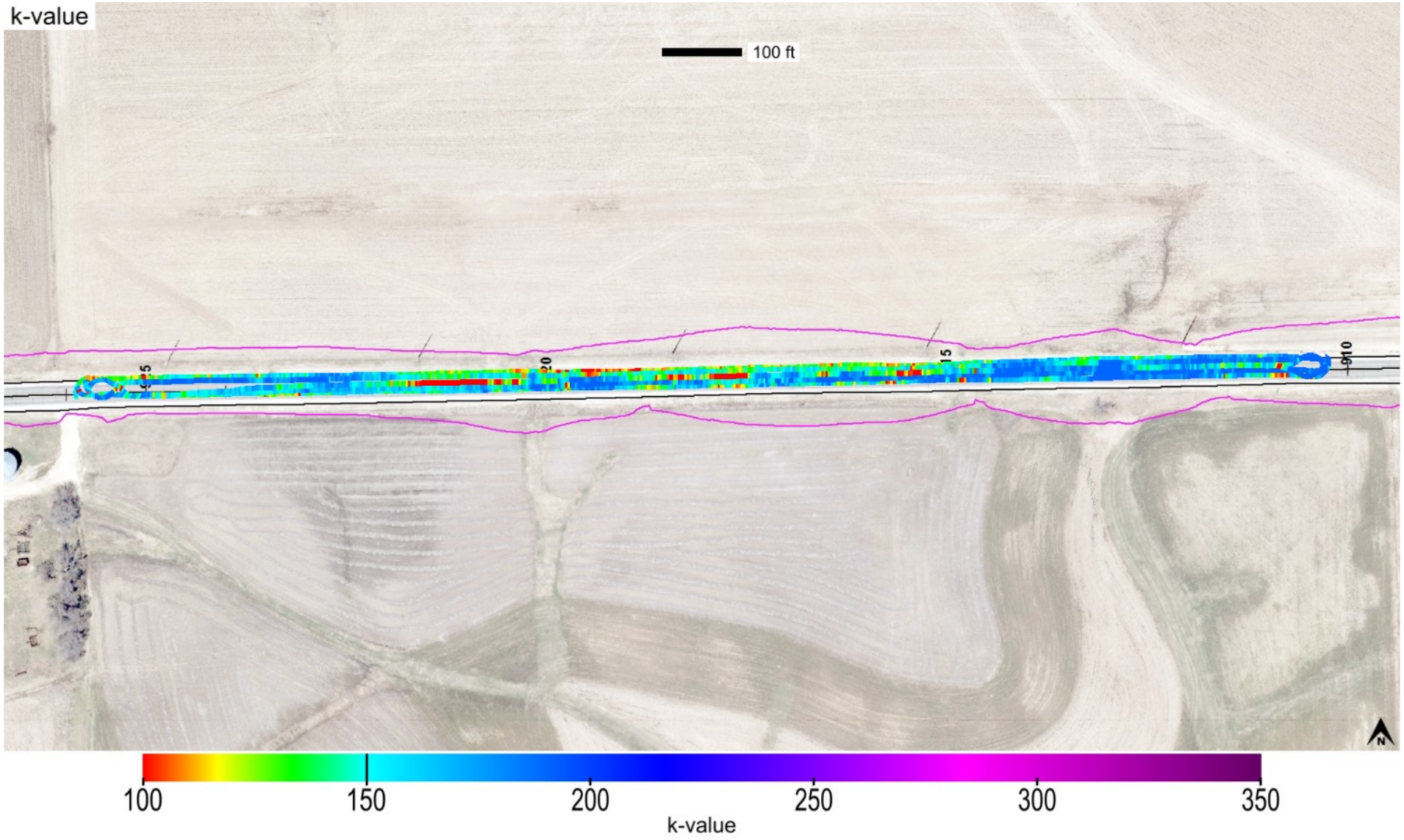
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	65.1	85.85	0.89	150	20	157.7	190	29.23	18.53	-130	7.7	40



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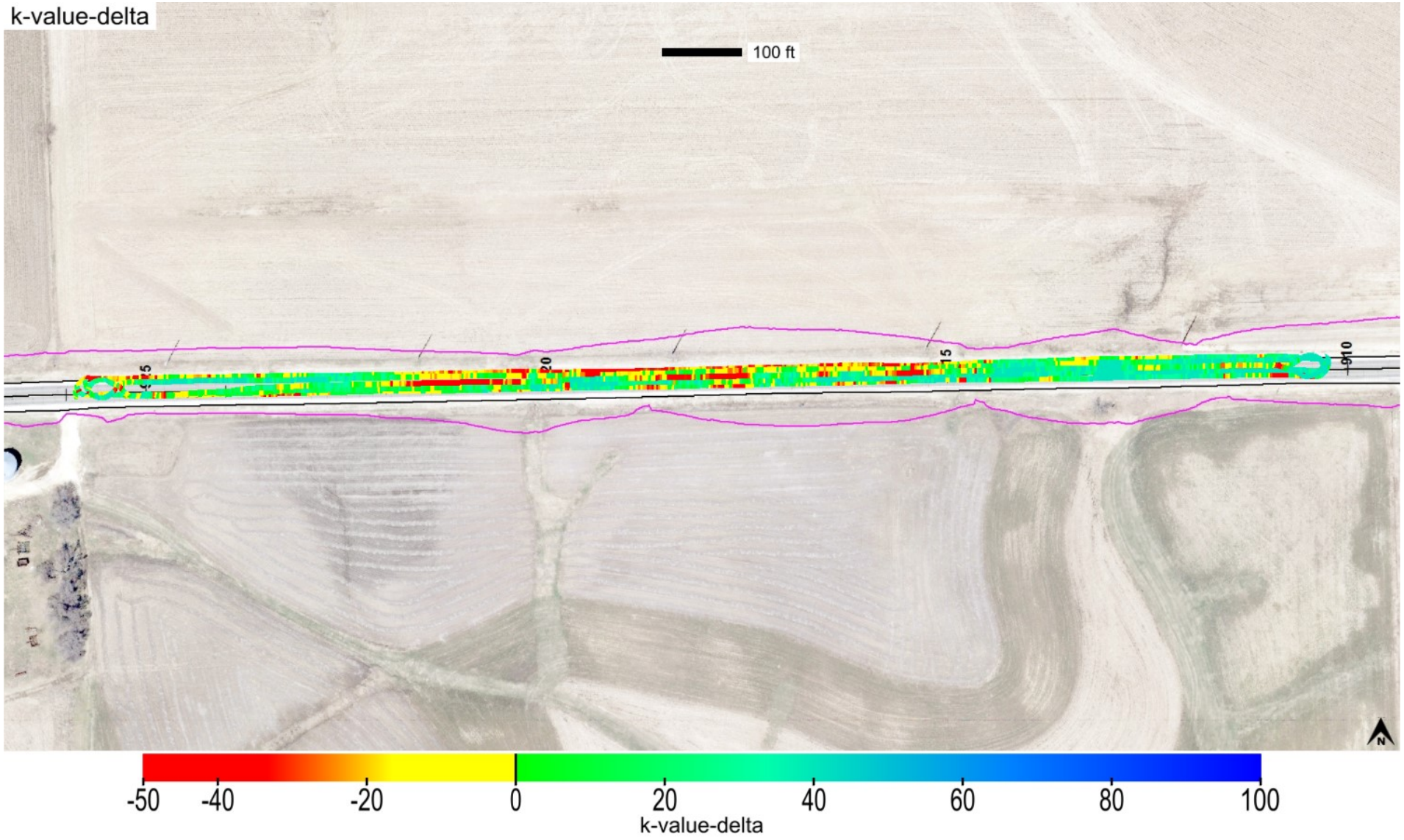
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	65.1	85.85	0.89	150	20	157.7	190	29.23	18.53	-130	7.7	40



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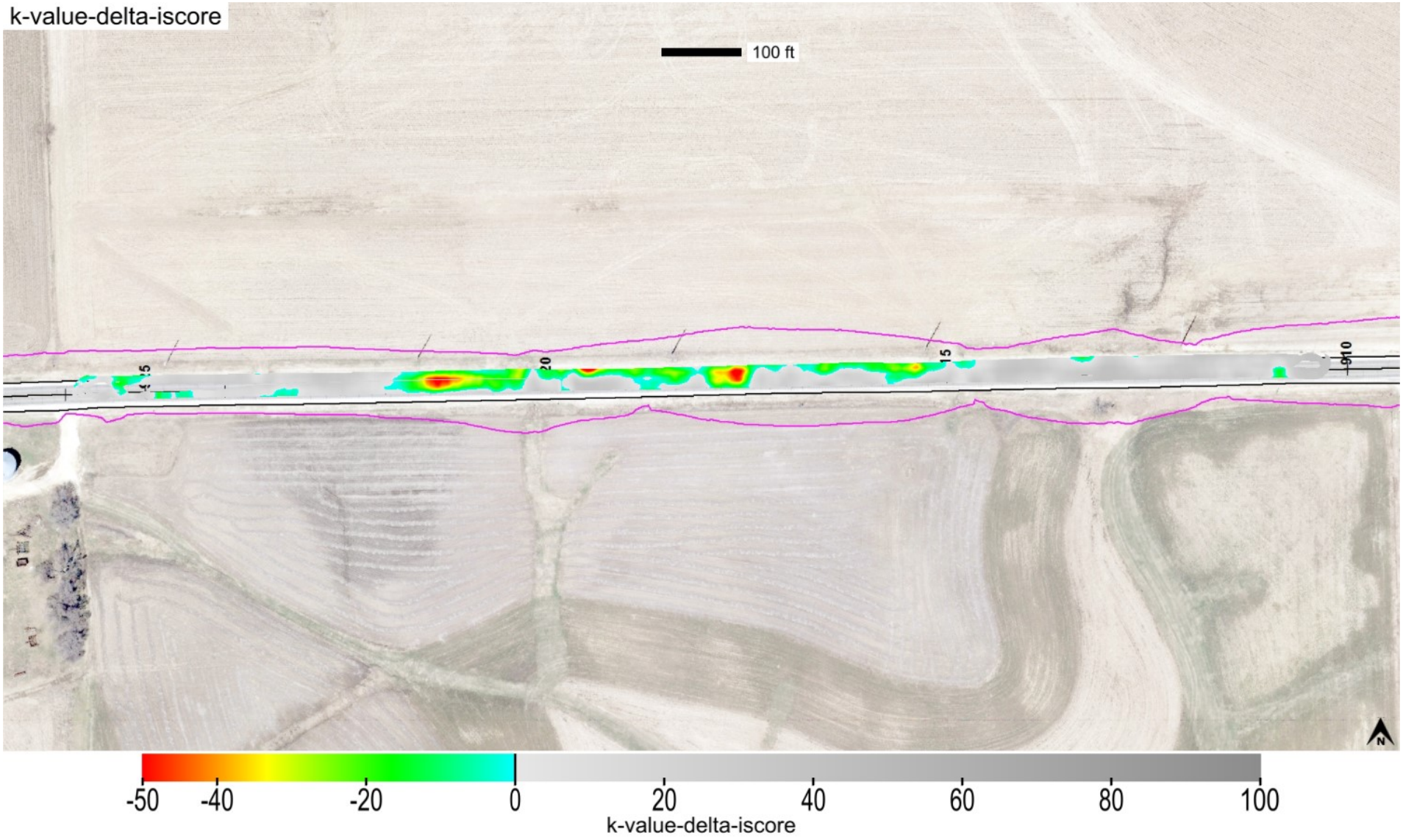
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	65.1	150	-130	7.7	40	-65.34	8.31	40



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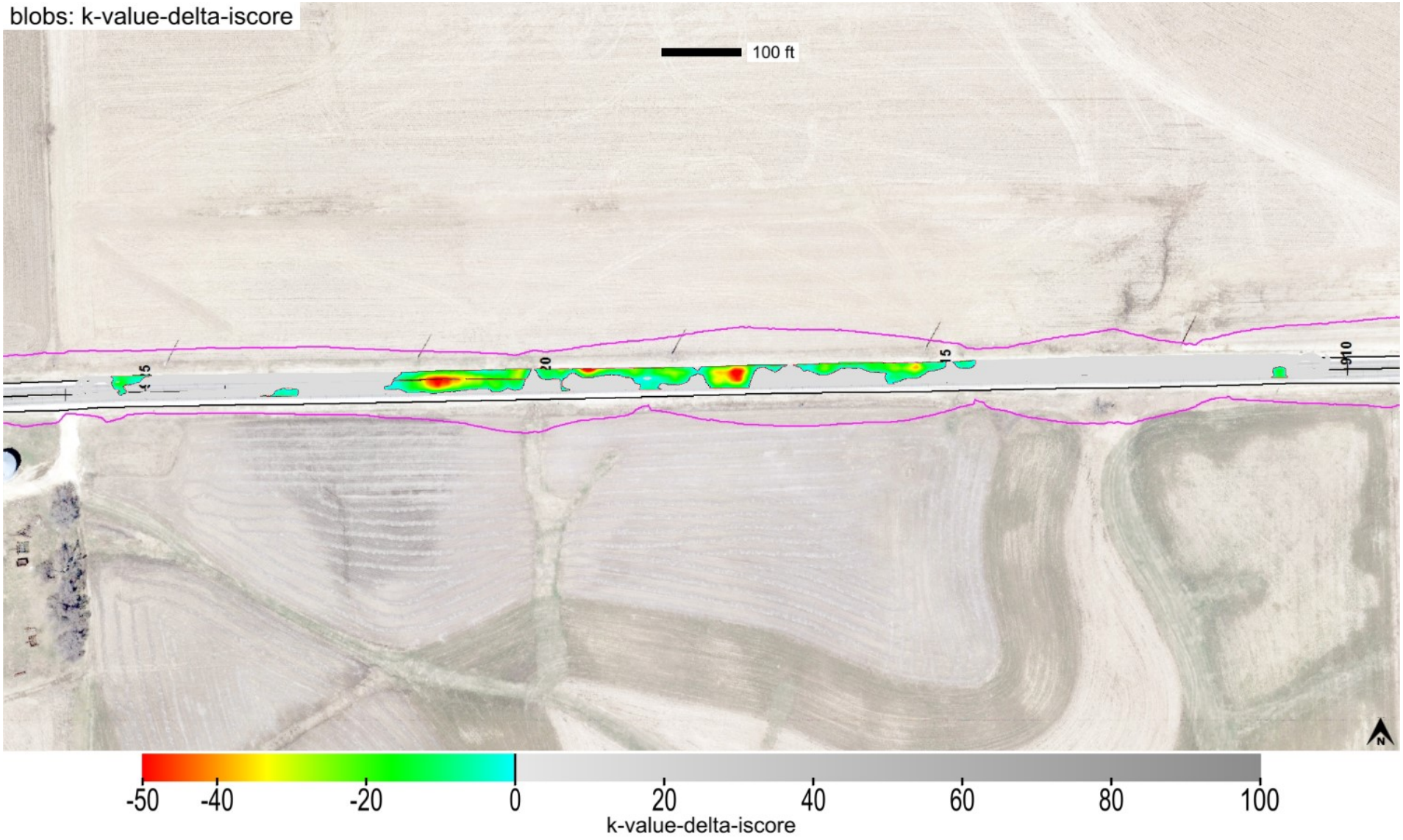
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	7	12525	29.8	none	0



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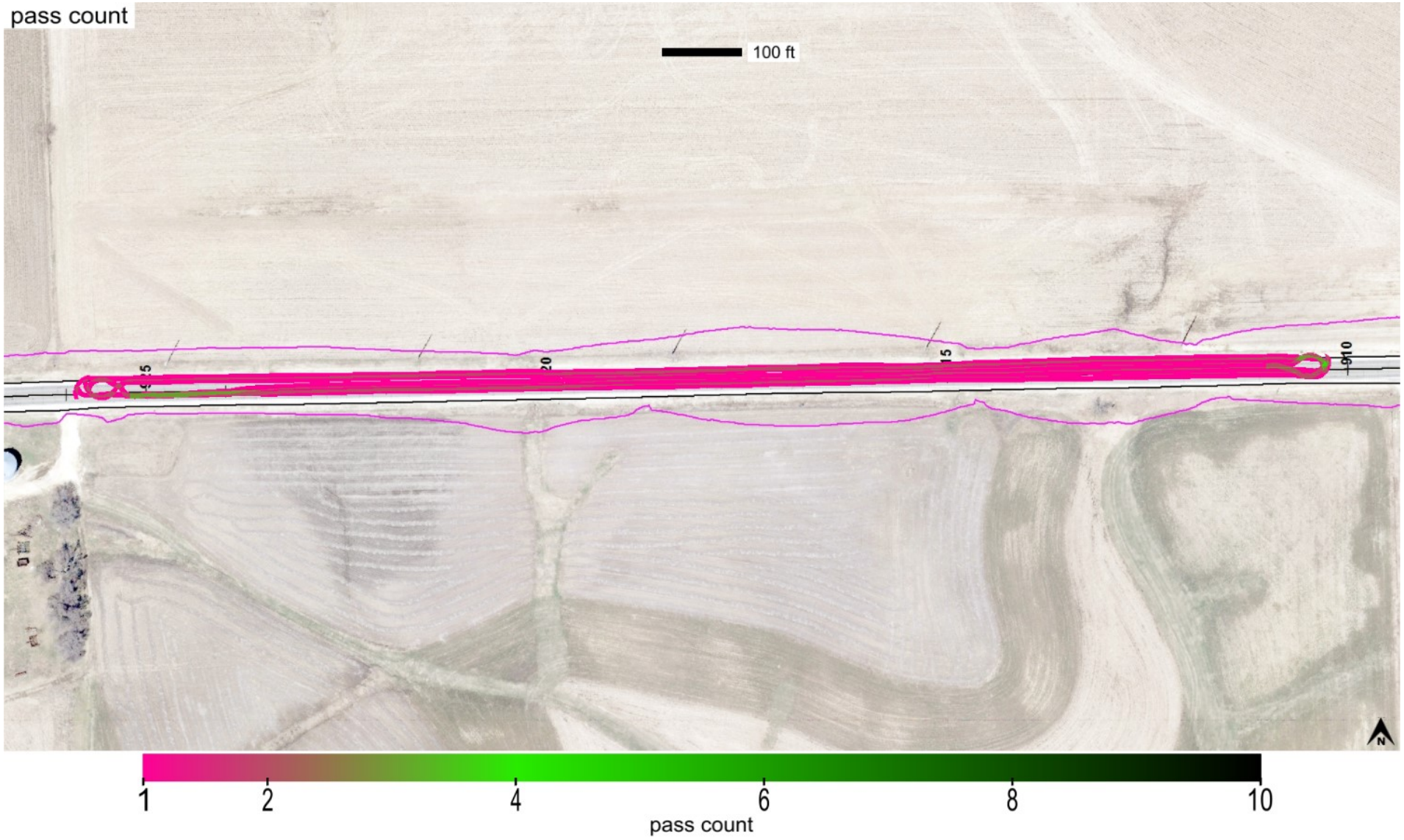
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

minimum	average	maximum
1	1.31	5



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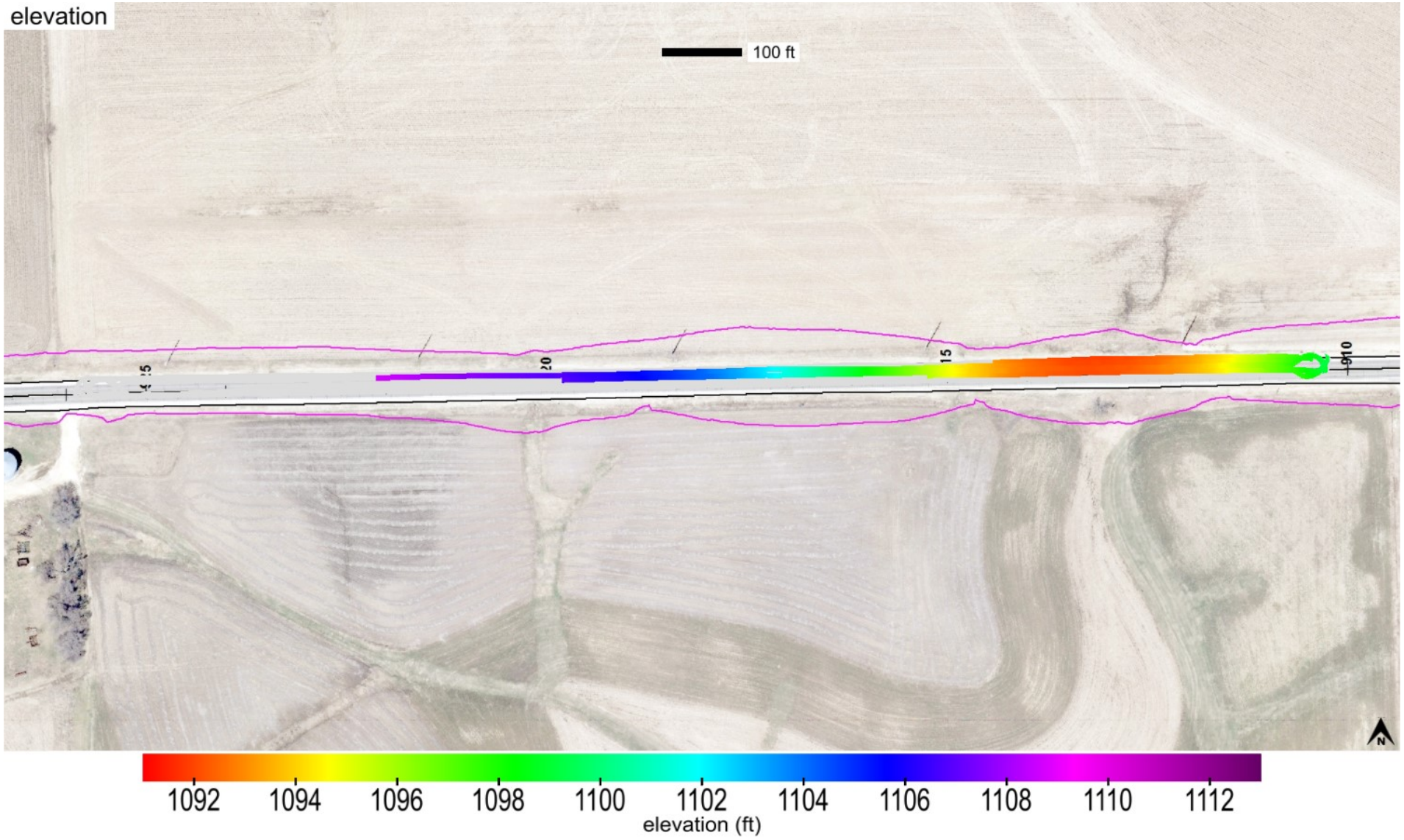
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

minimum	average	maximum
1091.822	1097.834	1108.679



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_120402a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	42032	0.965	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.81	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_134202a	No. of Measurements:	7667	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 1:42:02 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	98.3	108.03	0.75	9037	5928.4	22860	56000	9251.4	40.47	-3108.6	13823	46963
k-value	Yes	38.9	49.07	0.31	150	20	127.7	190	50.55	39.6	-130	-22.3	40
Moisture Content	No												

Mapped Area

square feet	acres
7667	0.18

Pass Count

min.	avg.	max.
1	1.28	3

Elevation (ft)

min.	avg.	max.
1088.35	1103.93	1113.12

Velocity (fps)

min.	avg.	max.
0.52	3.12	5.15

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	7667	0.176	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.81	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_134202a	No. of Measurements:	7667	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 1:42:02 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
108.03	CQI > = 95
98.3	80% of Resilient Modulus MVs >= 9037
40.47	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.81	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_134202a	No. of Measurements:	7667	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 1:42:02 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
49.07	CQI > = 95
38.9	80% of k-Value MVs >= 150
39.6	COV <= 20
63.06	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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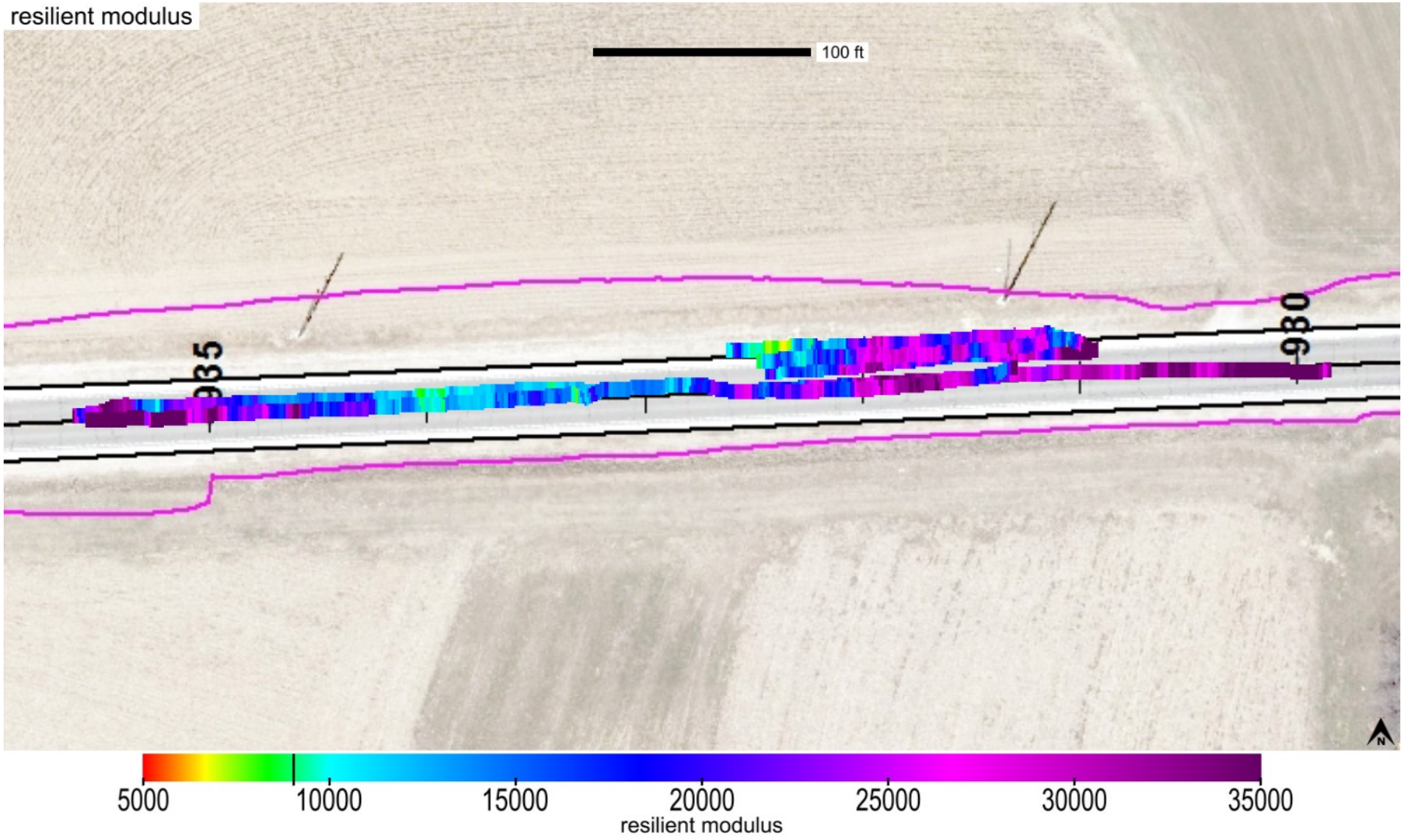
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.3	108.03	0.75	9037	5928.4	22860	56000	9251.4	40.47	-3108.6	13823	46963



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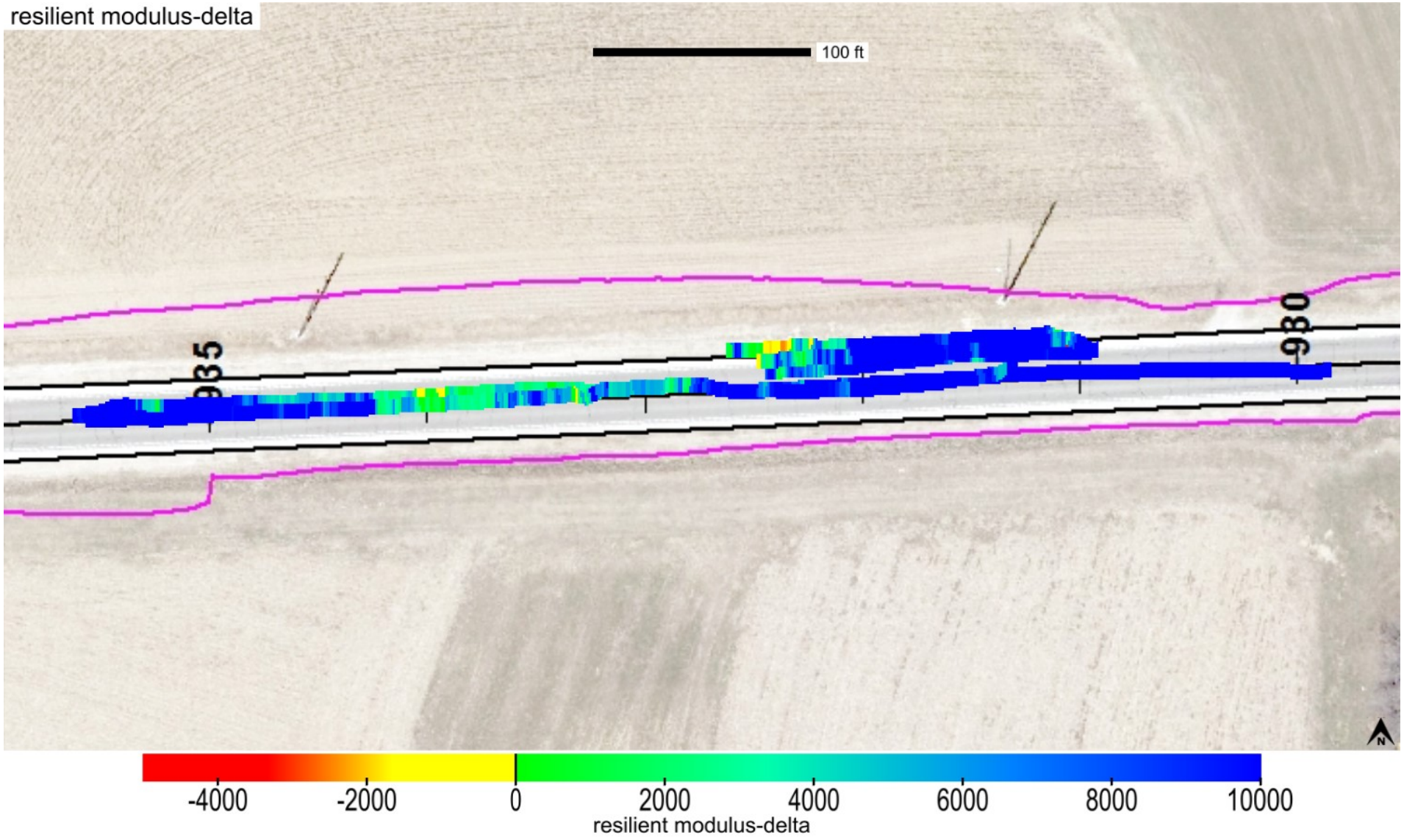
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.3	108.03	0.75	9037	5928.4	22860	56000	9251.4	40.47	-3108.6	13823	46963



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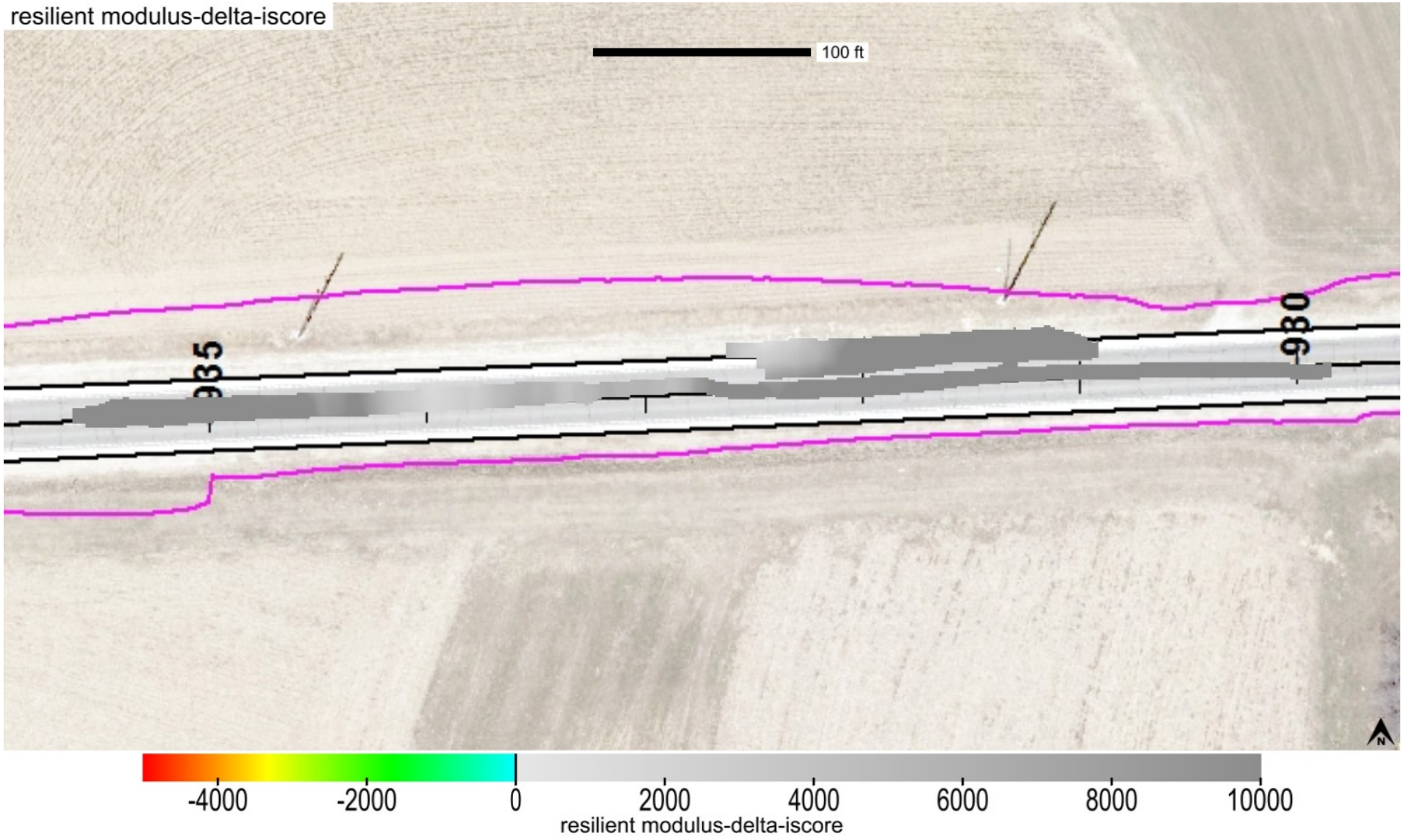
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	98.3	9037	-3108.6	13823	46963	756.08	13886.48	33197.11



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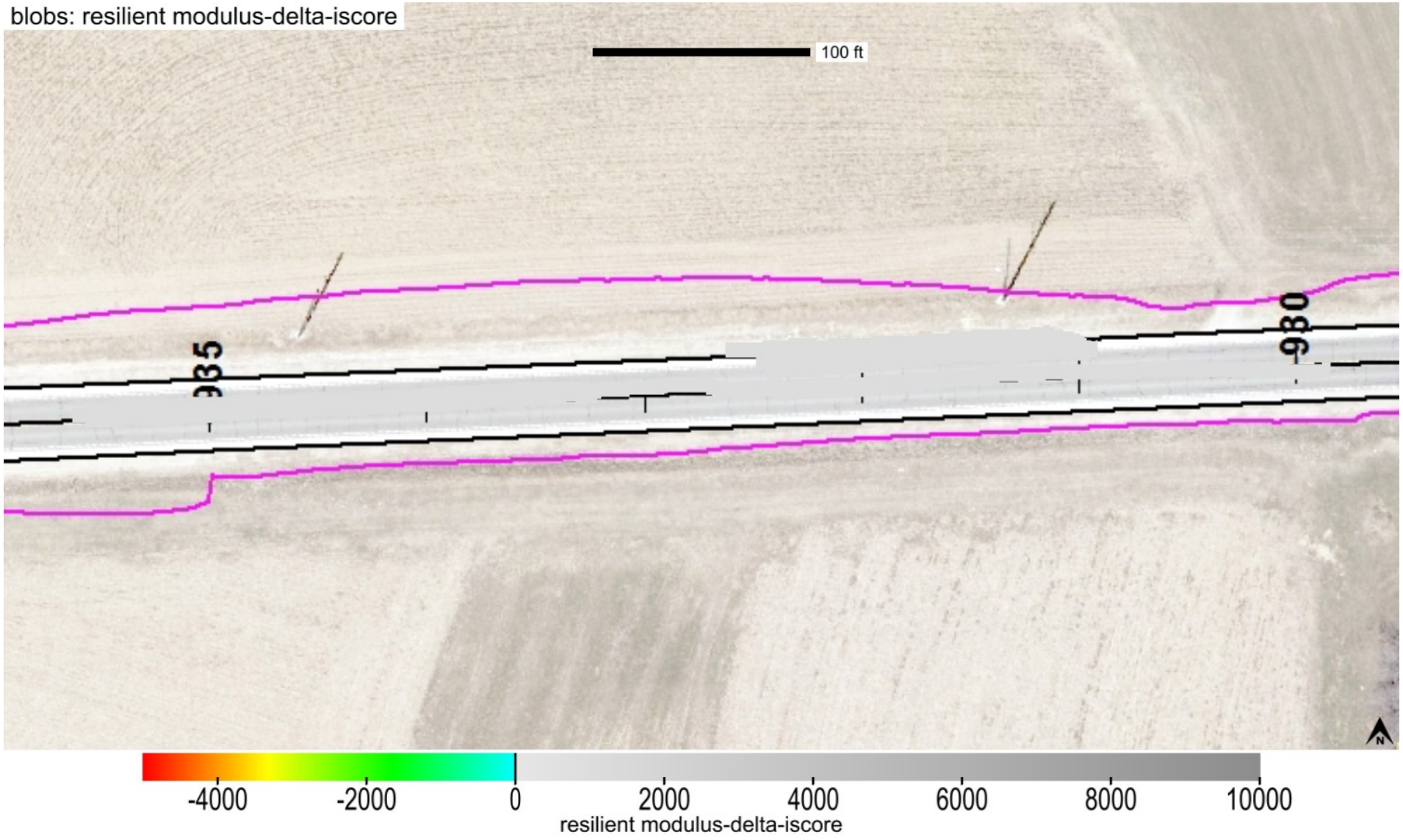
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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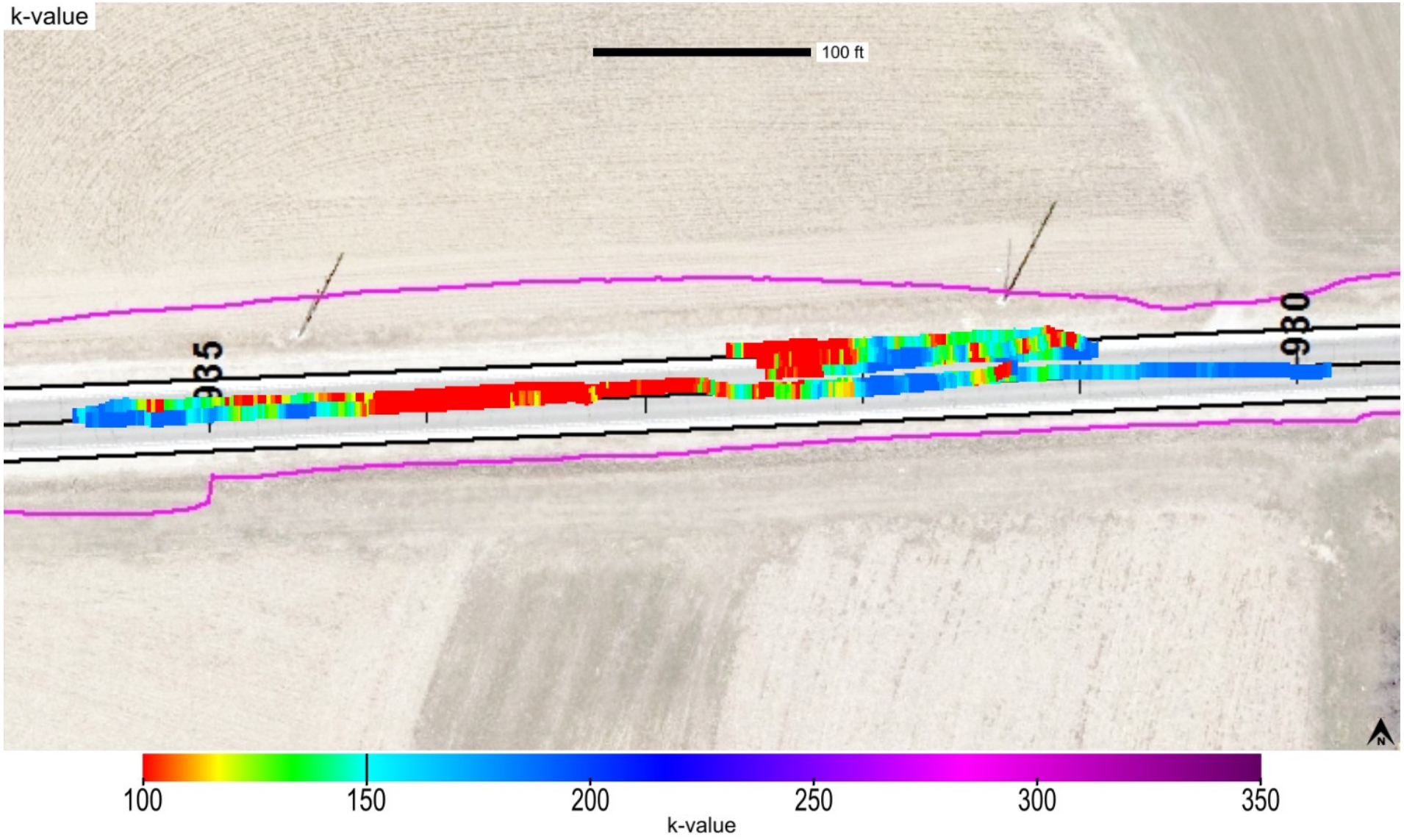
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	38.9	49.07	0.31	150	20	127.7	190	50.55	39.6	-130	-22.3	40



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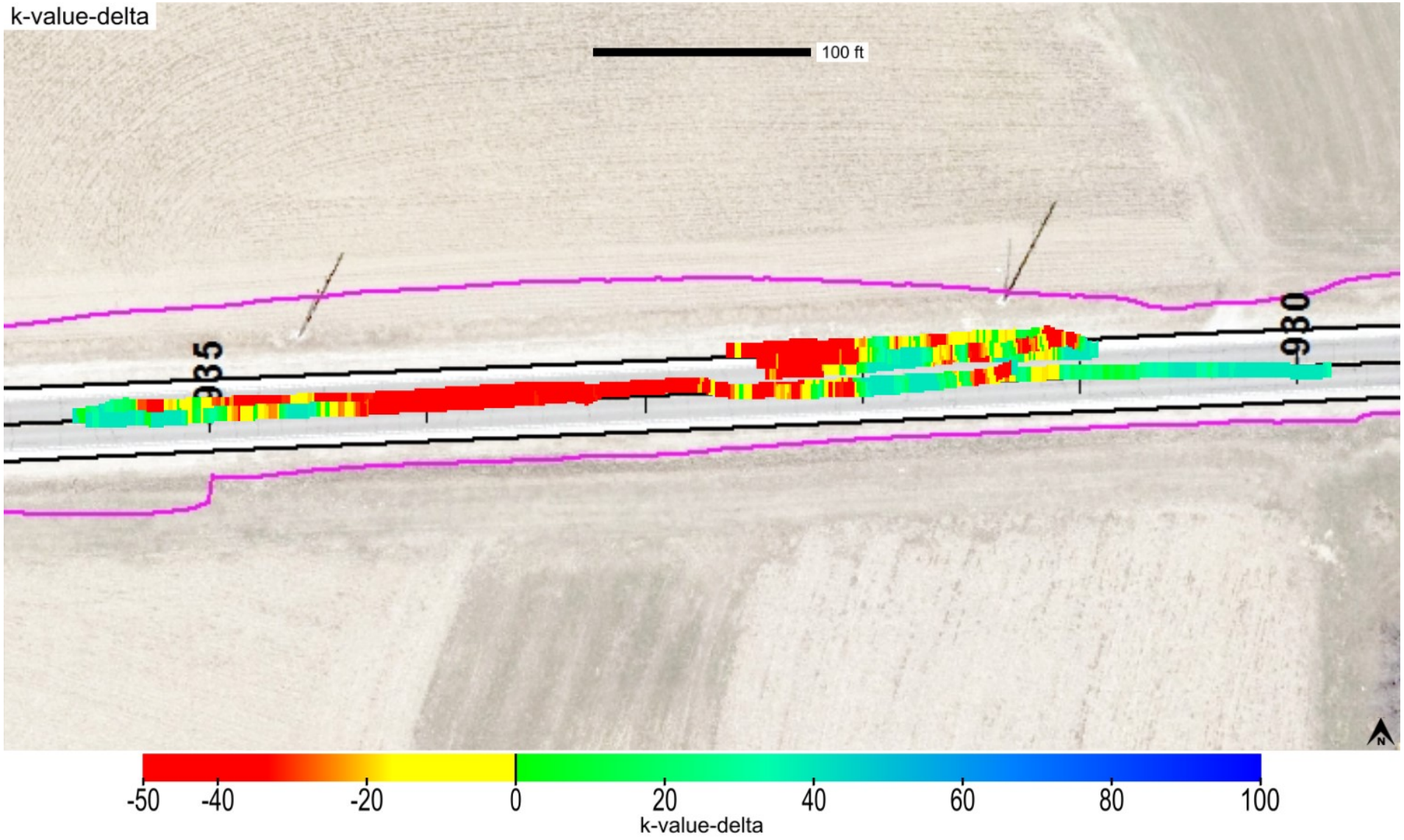
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	38.9	49.07	0.31	150	20	127.7	190	50.55	39.6	-130	-22.3	40



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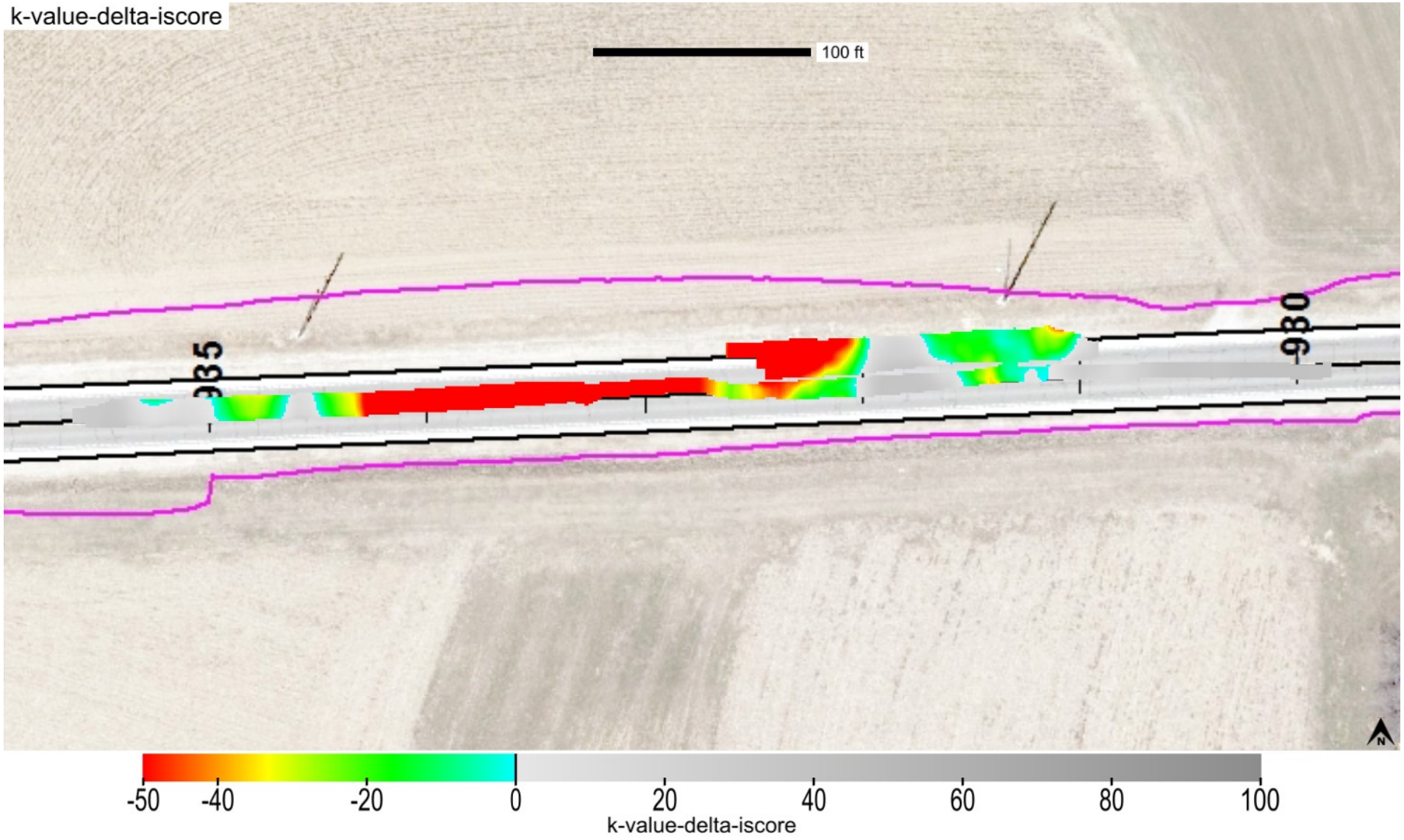
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	38.9	150	-130	-22.3	40	-121.93	-22.16	40



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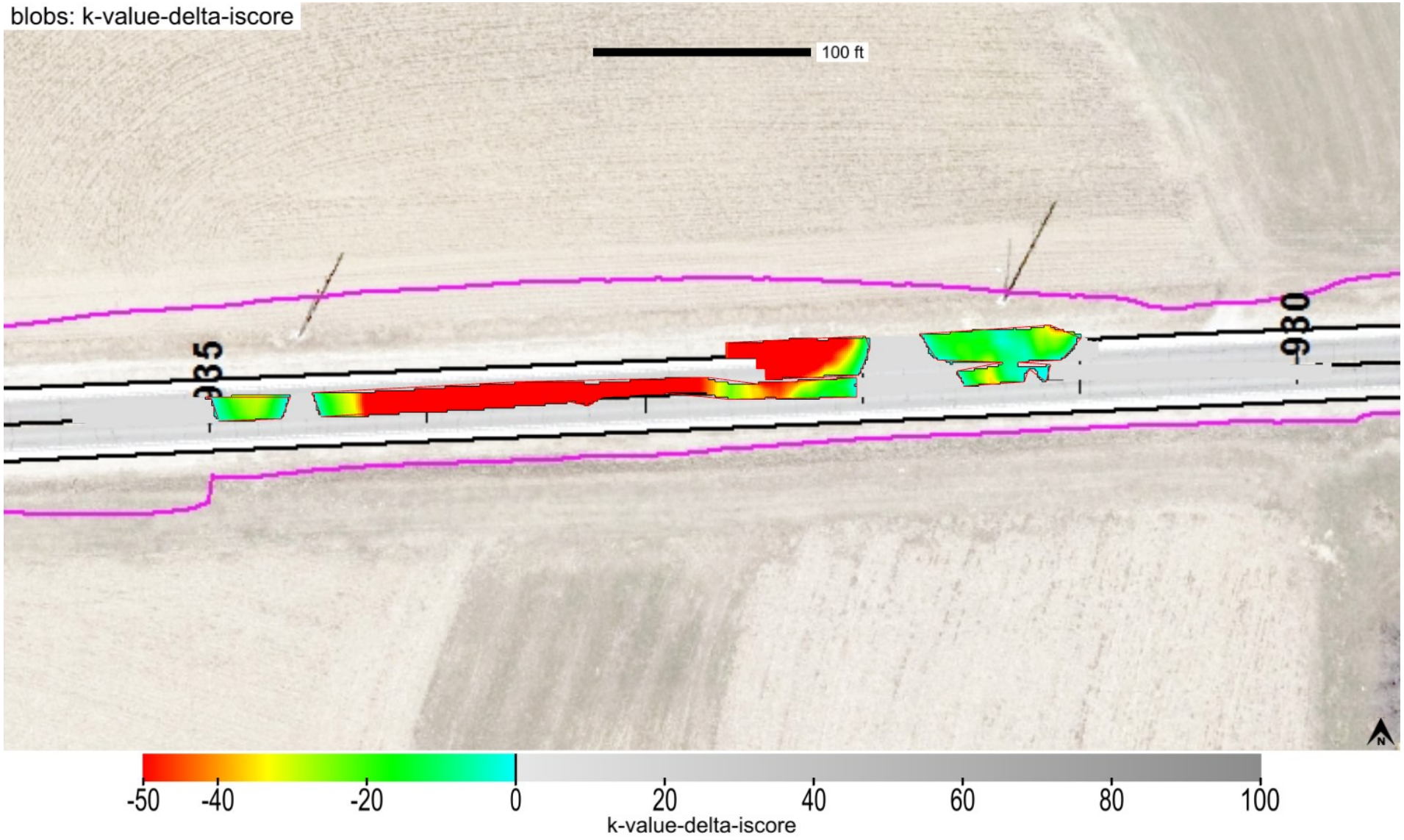
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	4835	63.06	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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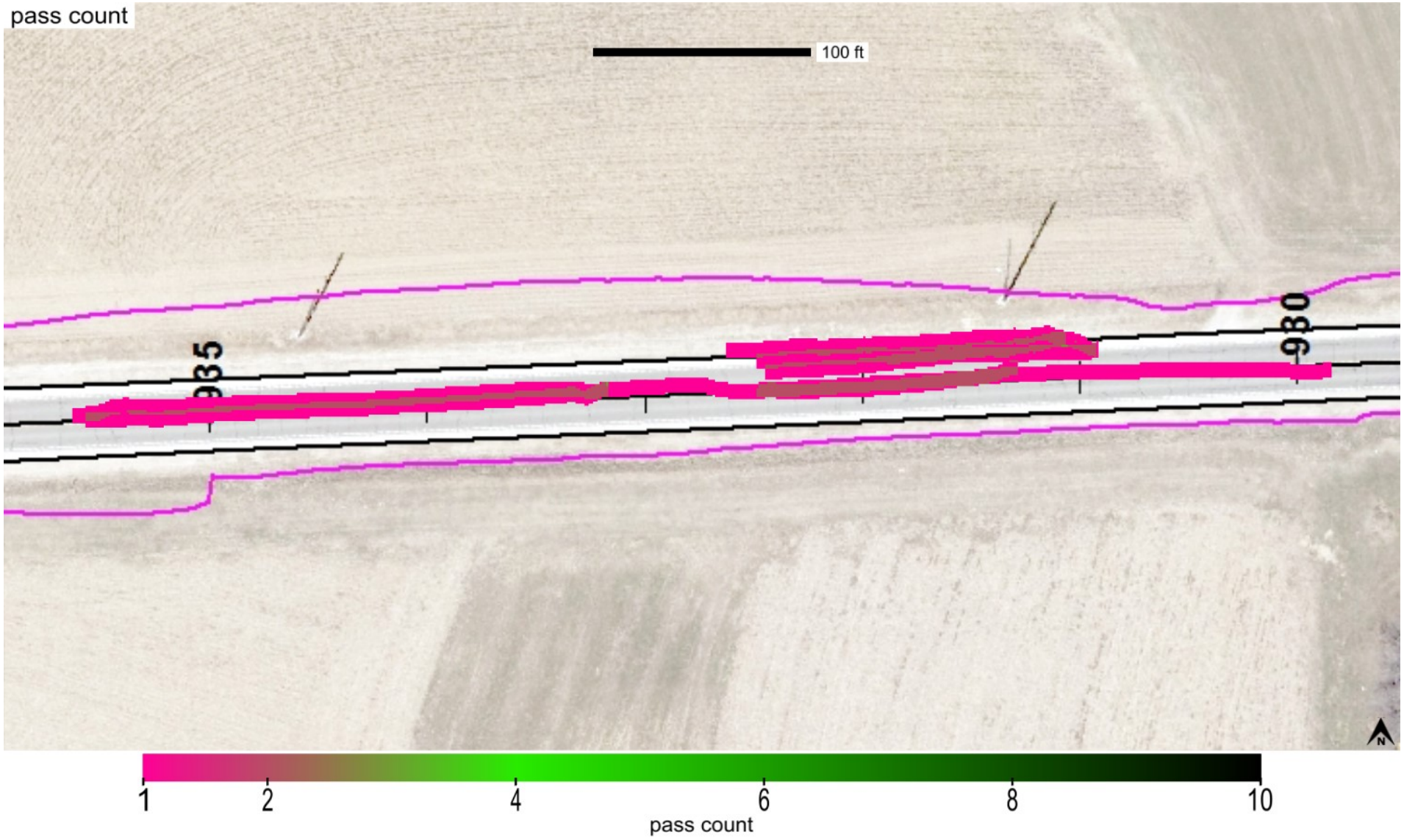
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

minimum	average	maximum
1	1.28	3



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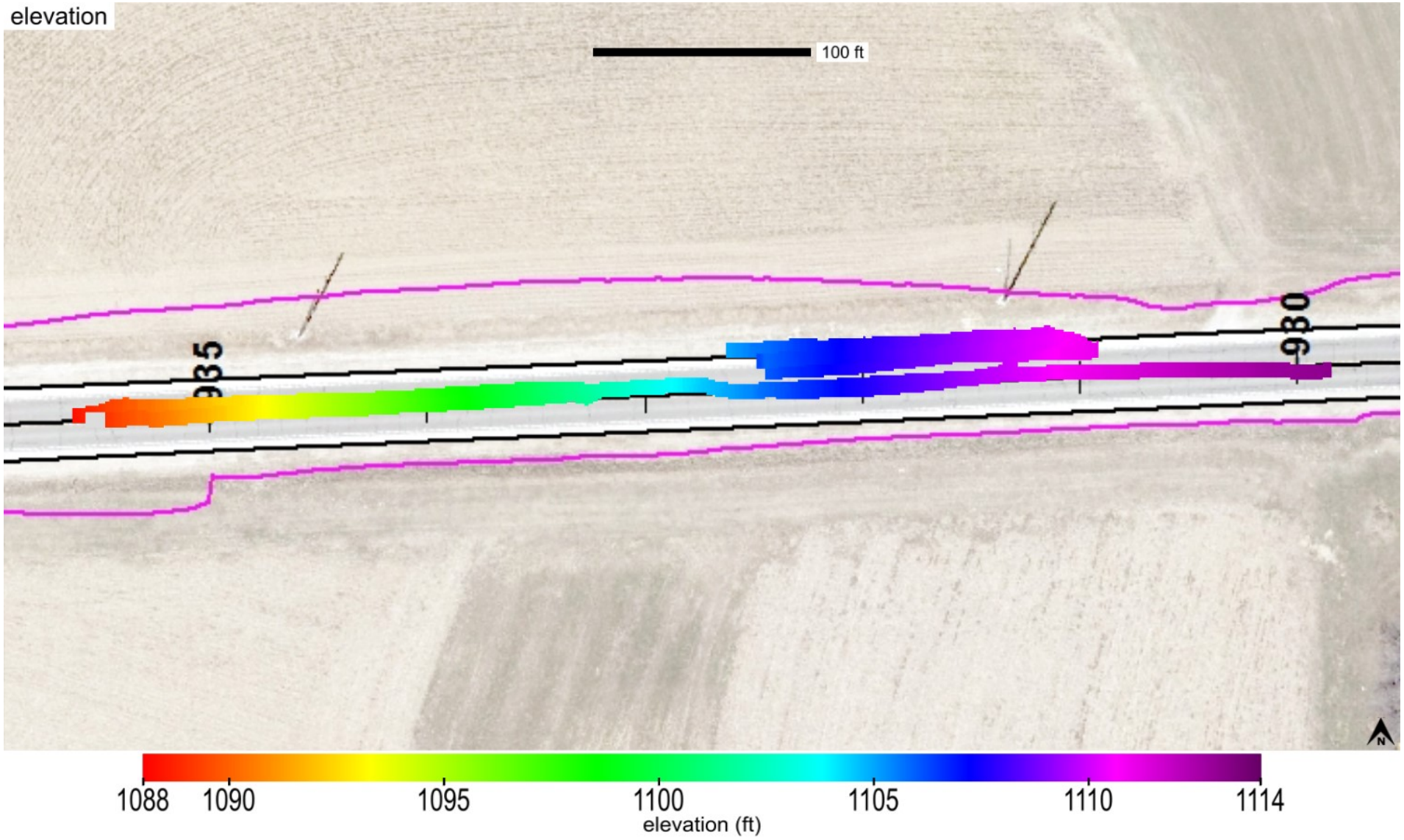
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

minimum	average	maximum
1088.354	1103.931	1113.115



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_134202a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	7667	0.176	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.28	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_150919a	No. of Measurements:	10537	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:09:19 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	113.78	0.95	9037	9934.81	27407.3	56000	8891.24	32.44	897.81	18370.3	46963
k-value	Yes	60.2	78.74	0.69	150	20	152.4	190	34.82	22.85	-130	2.4	40
Moisture Content	No												

Mapped Area

square feet	acres
10537	0.24

Pass Count

min.	avg.	max.
1	1.8	4

Elevation (ft)

min.	avg.	max.
1105.54	1111.4	1114.01

Velocity (fps)

min.	avg.	max.
0.84	5.53	6.36

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	10537	0.242	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.28	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_150919a	No. of Measurements:	10537	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:09:19 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.78	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
32.44	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.28	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_150919a	No. of Measurements:	10537	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:09:19 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
78.74	CQI > = 95
60.2	80% of k-Value MVs >= 150
22.85	COV <= 20
35.9	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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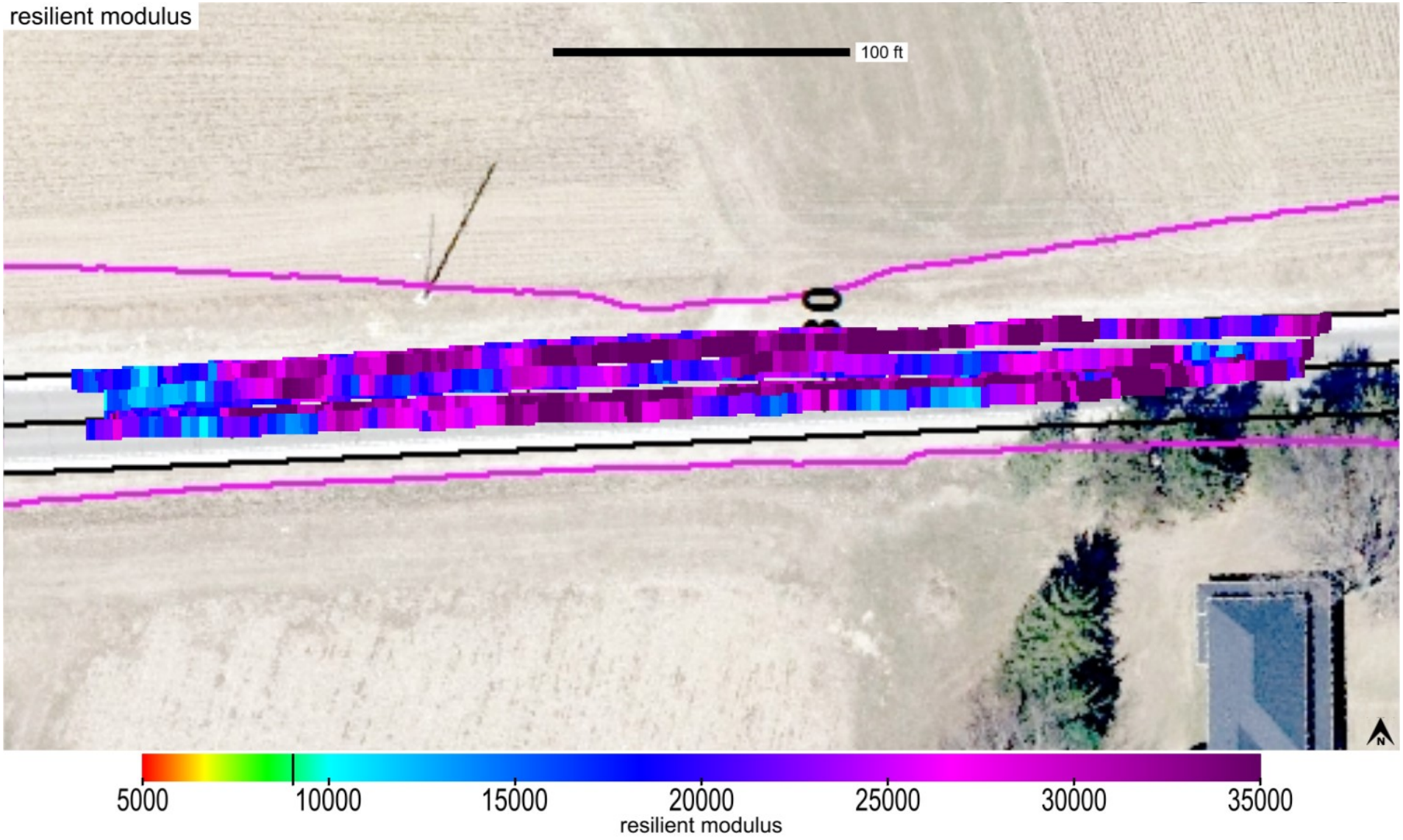
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	113.78	0.95	9037	9934.81	27407.3	56000	8891.24	32.44	897.81	18370.3	46963



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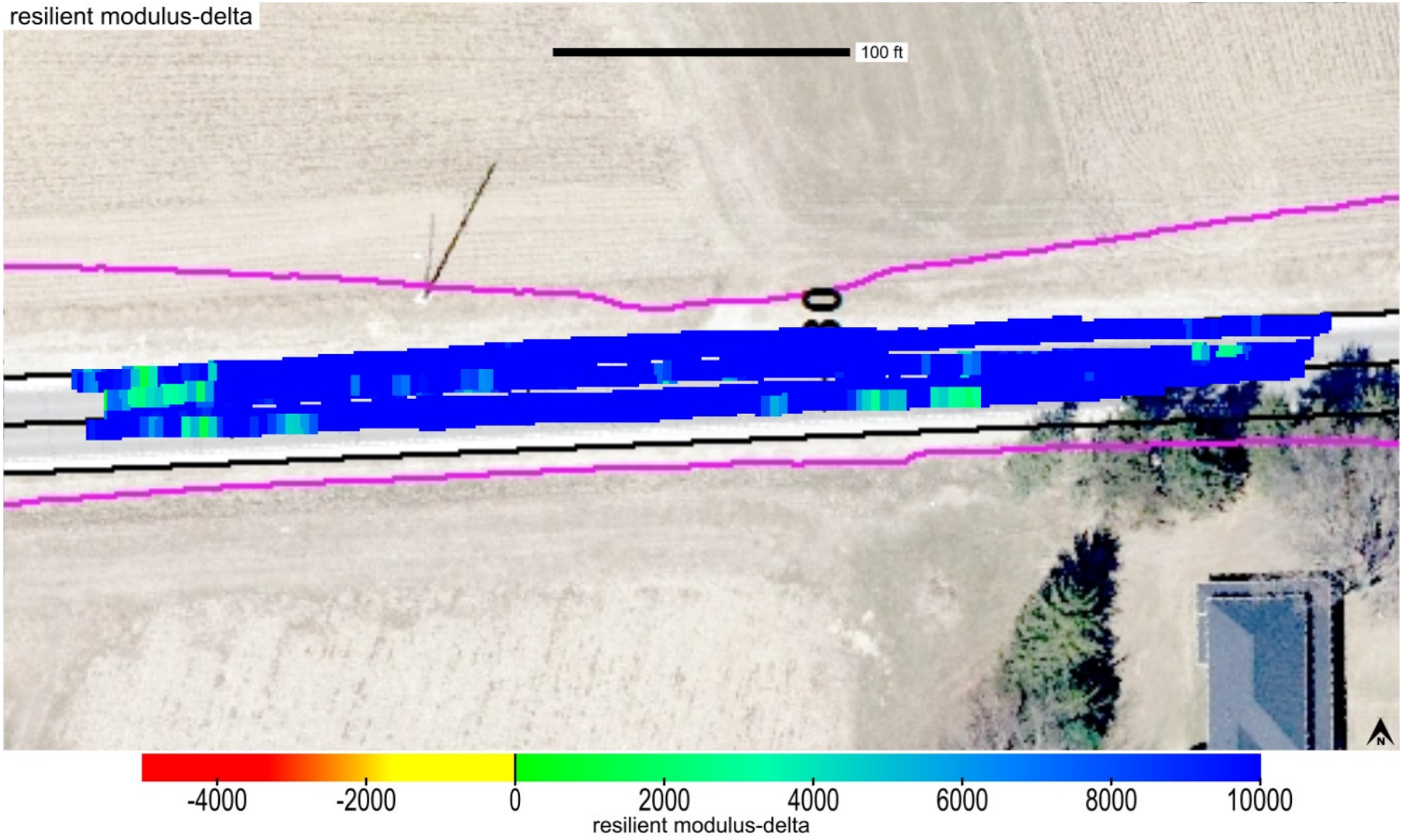
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	113.78	0.95	9037	9934.81	27407.3	56000	8891.24	32.44	897.81	18370.3	46963



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	897.81	18370.3	46963	5451.22	18396.94	43042.12

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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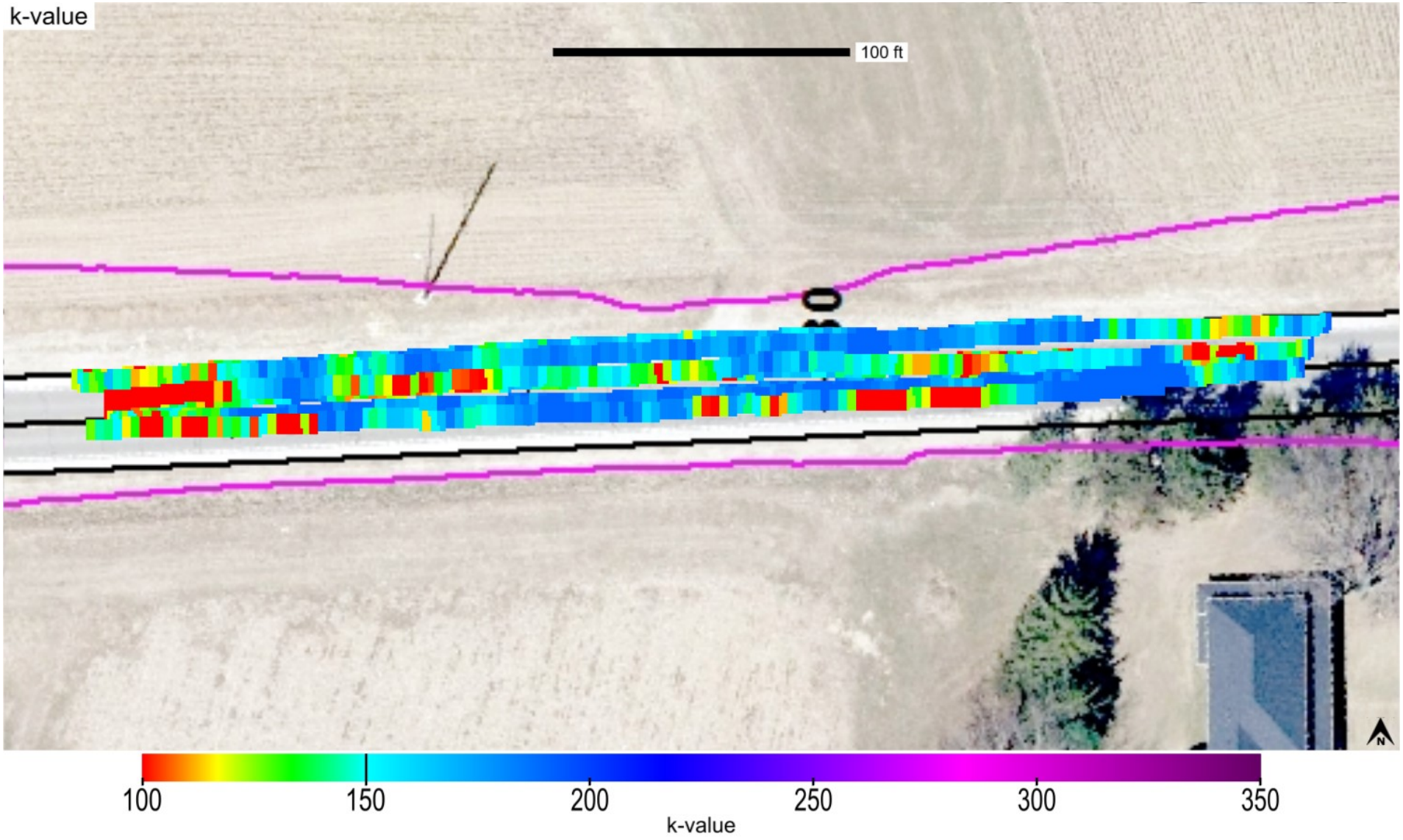
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.2	78.74	0.69	150	20	152.4	190	34.82	22.85	-130	2.4	40



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.2	78.74	0.69	150	20	152.4	190	34.82	22.85	-130	2.4	40

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	60.2	150	-130	2.4	40	-57.91	2.36	40

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	3783	35.9	none	0

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

minimum	average	maximum
1	1.8	4

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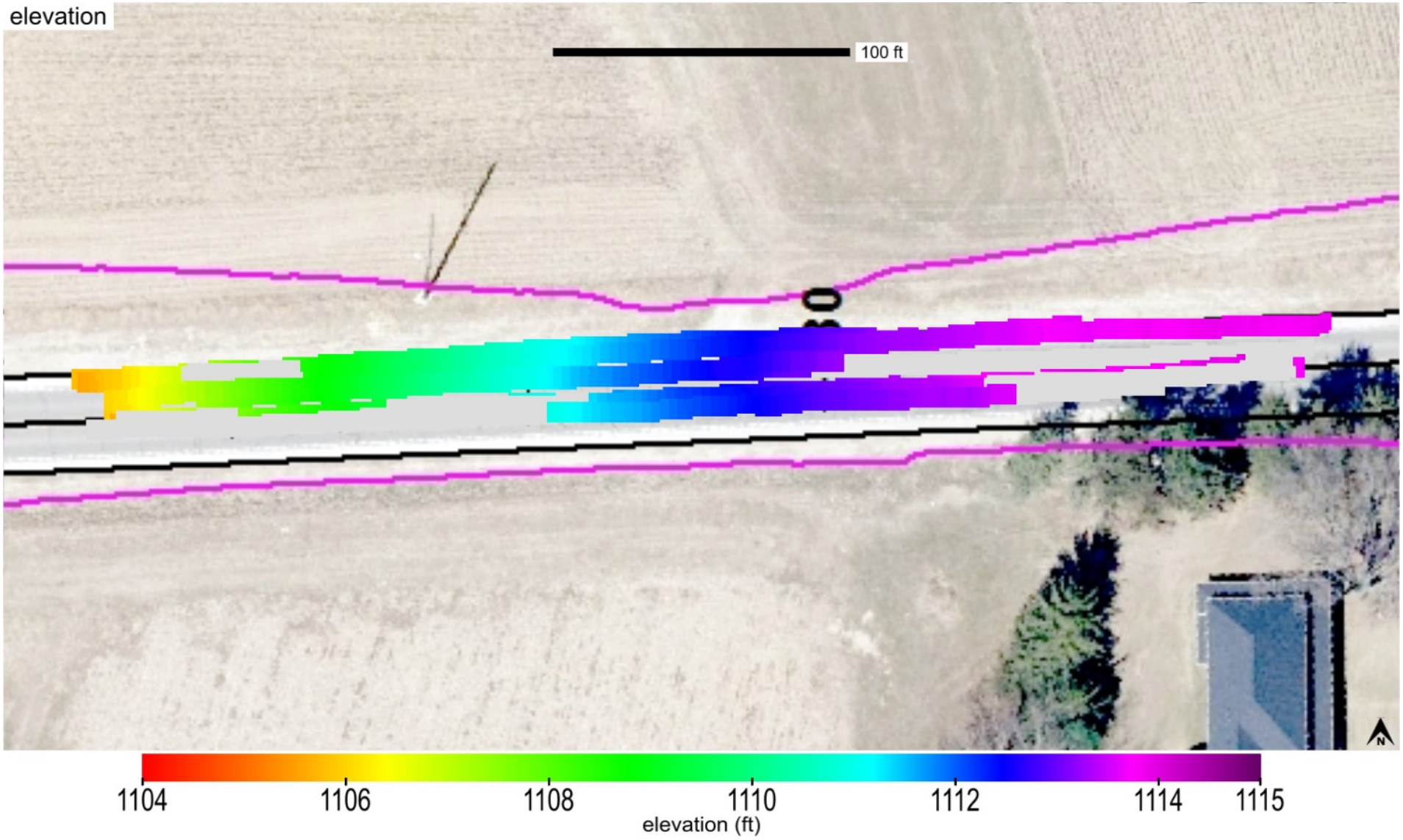
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

minimum	average	maximum
1105.539	1111.398	1114.01



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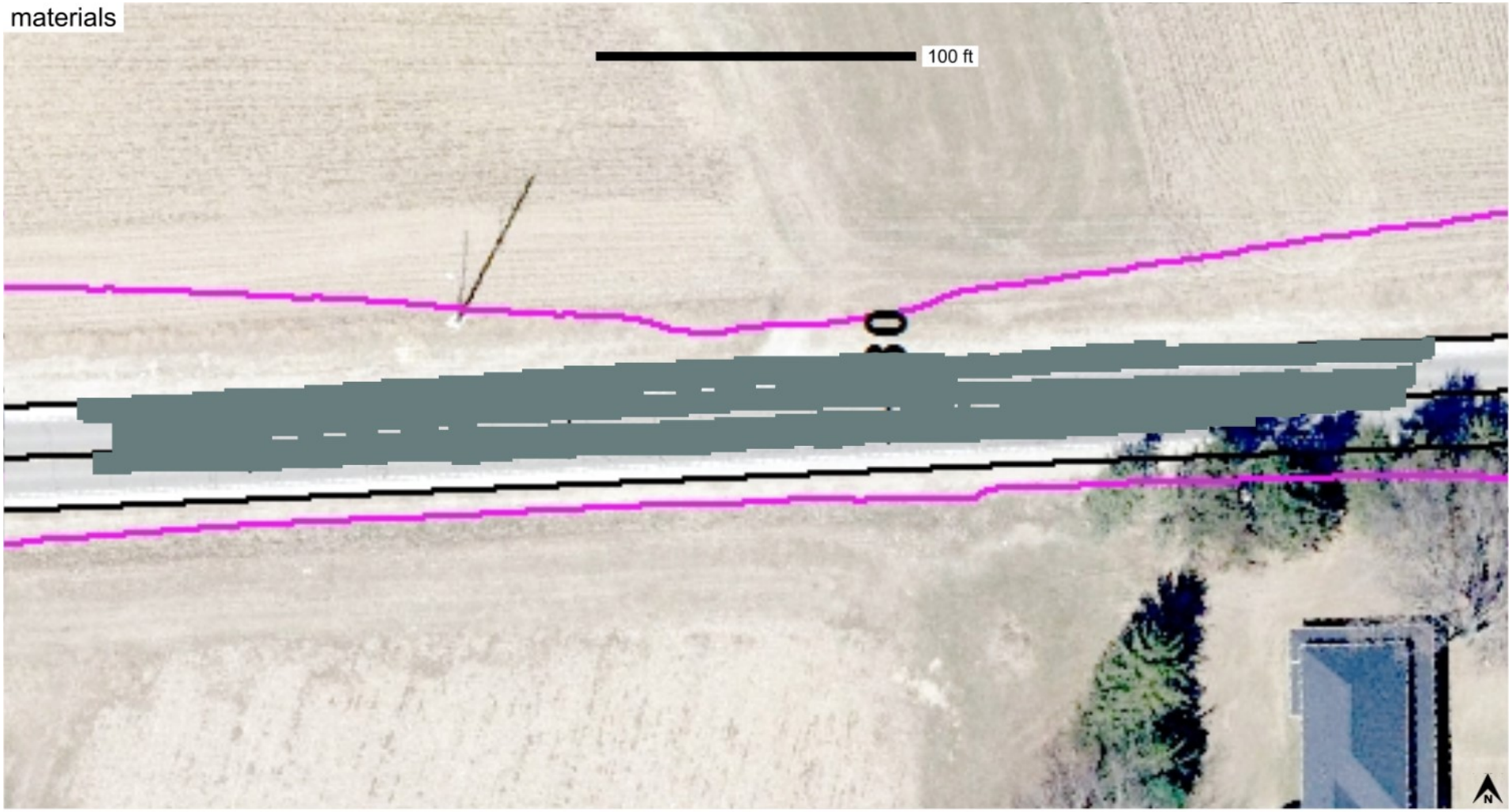
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_150919a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	10537	0.242	12	9037	150	40



Modified Subbase_IADOT (2115)

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.06	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_153740a	No. of Measurements:	2259	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:37:40 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	96.3	106.16	0.74	9037	6824.82	19296.8	52993.53	7767.75	40.25	-2212.18	10259.8	43956.53
k-value	Yes	22.4	31.65	0.22	150	20	110.6	190	45.98	41.58	-130	-39.4	40
Moisture Content	No												

Mapped Area

square feet	acres
2259	0.05

Pass Count

min.	avg.	max.
1	1.71	2

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
2.48	5.66	6.04

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	2259	0.052	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.06	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_153740a	No. of Measurements:	2259	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:37:40 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
106.16	CQI > = 95
96.3	80% of Resilient Modulus MVs >= 9037
40.25	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.06	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_153740a	No. of Measurements:	2259	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:37:40 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
31.65	CQI > = 95
22.4	80% of k-Value MVs >= 150
41.58	COV <= 20
71.58	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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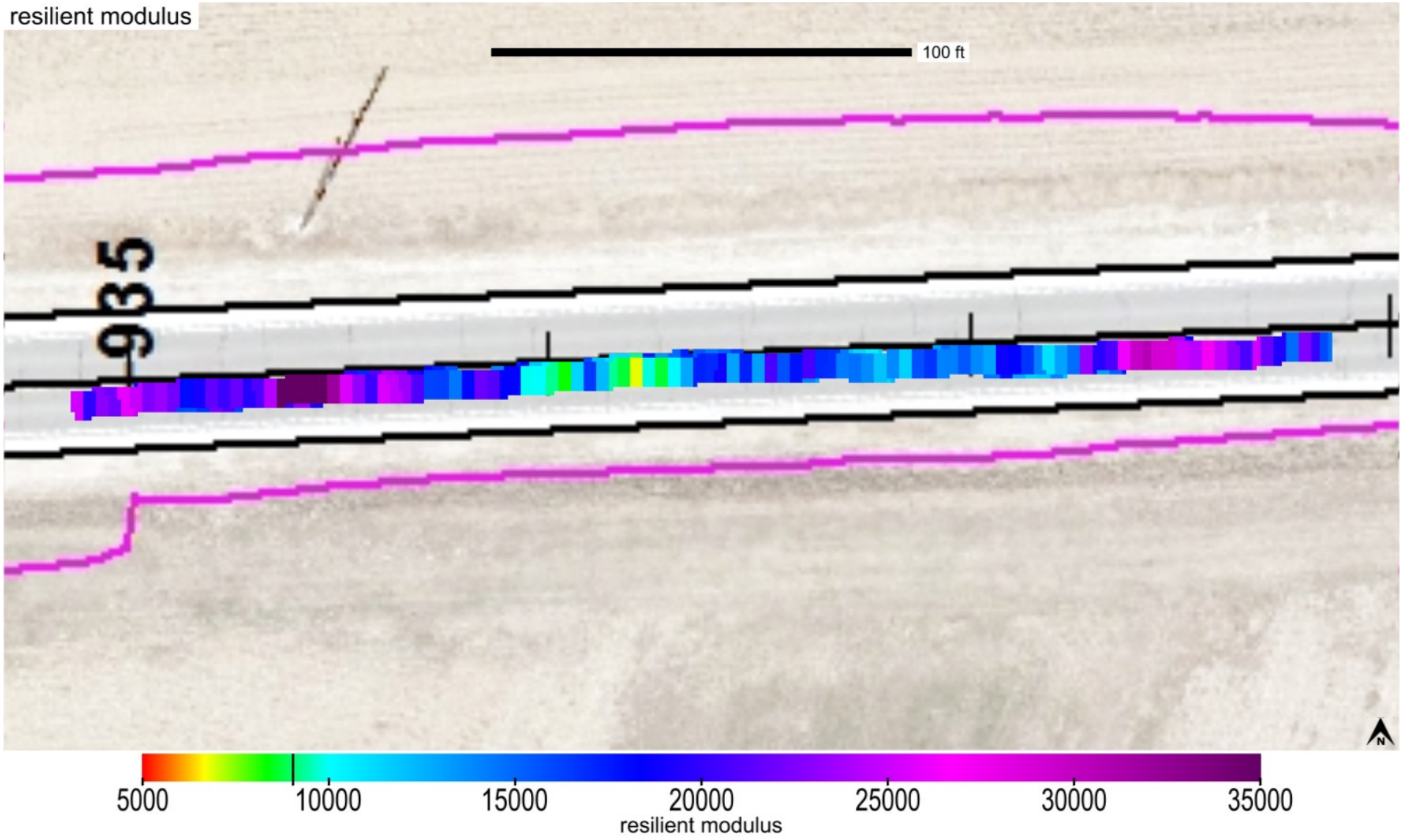
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	96.3	106.16	0.74	9037	6824.82	19296.8	52993.53	7767.75	40.25	-2212.18	10259.8	43956.53



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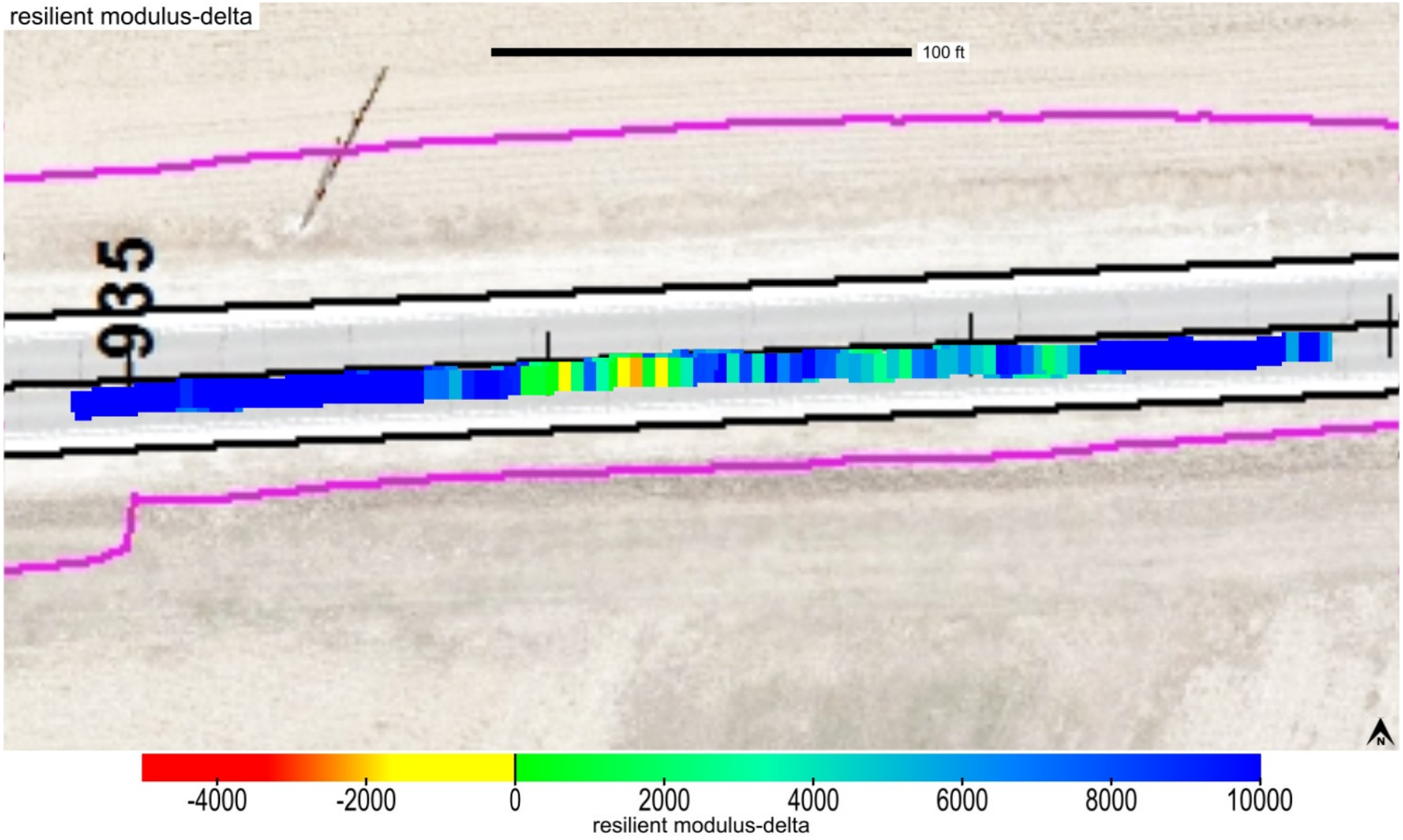
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

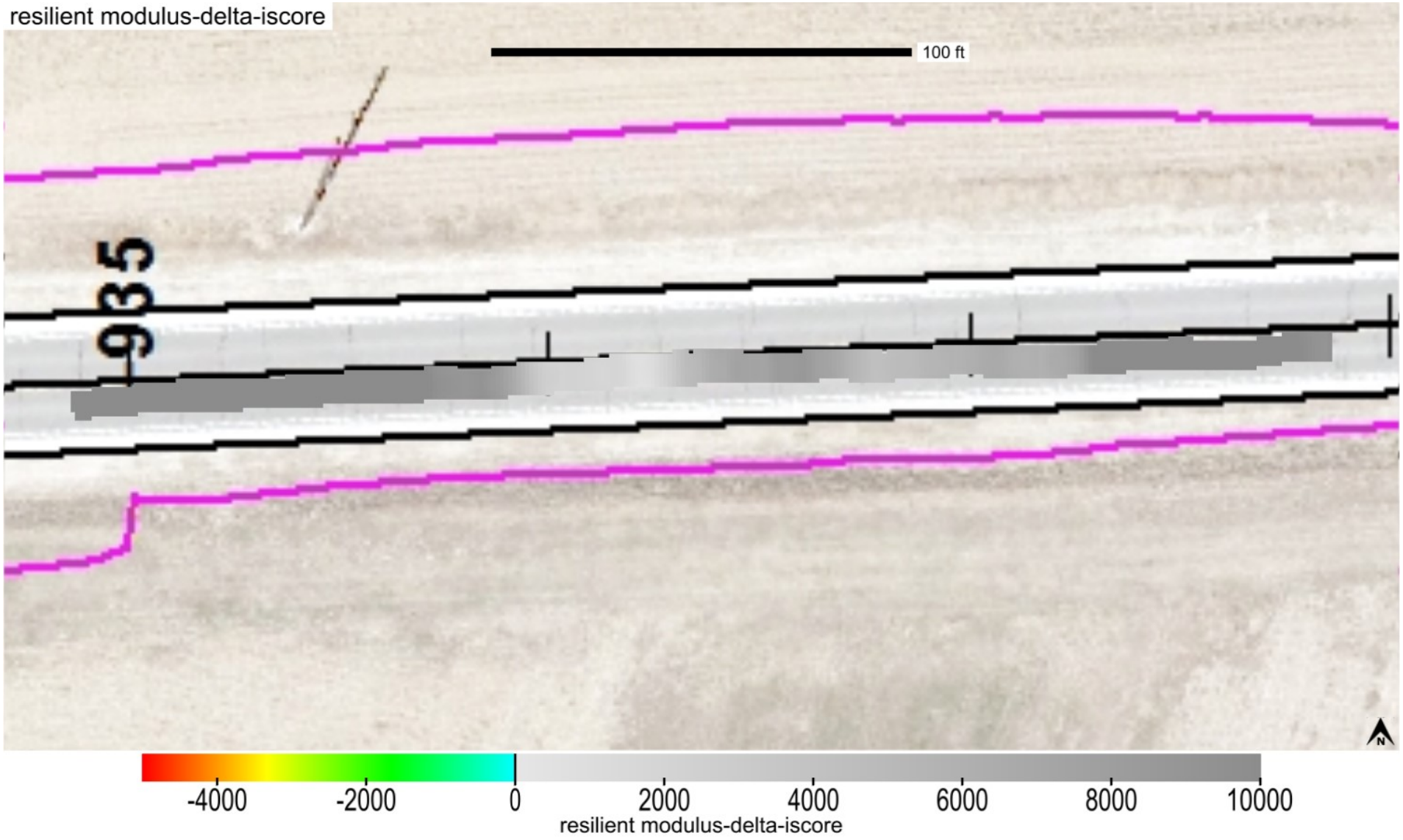
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	96.3	106.16	0.74	9037	6824.82	19296.8	52993.53	7767.75	40.25	-2212.18	10259.8	43956.53



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	96.3	9037	-2212.18	10259.8	43956.53	564.3	10264.62	30507.04



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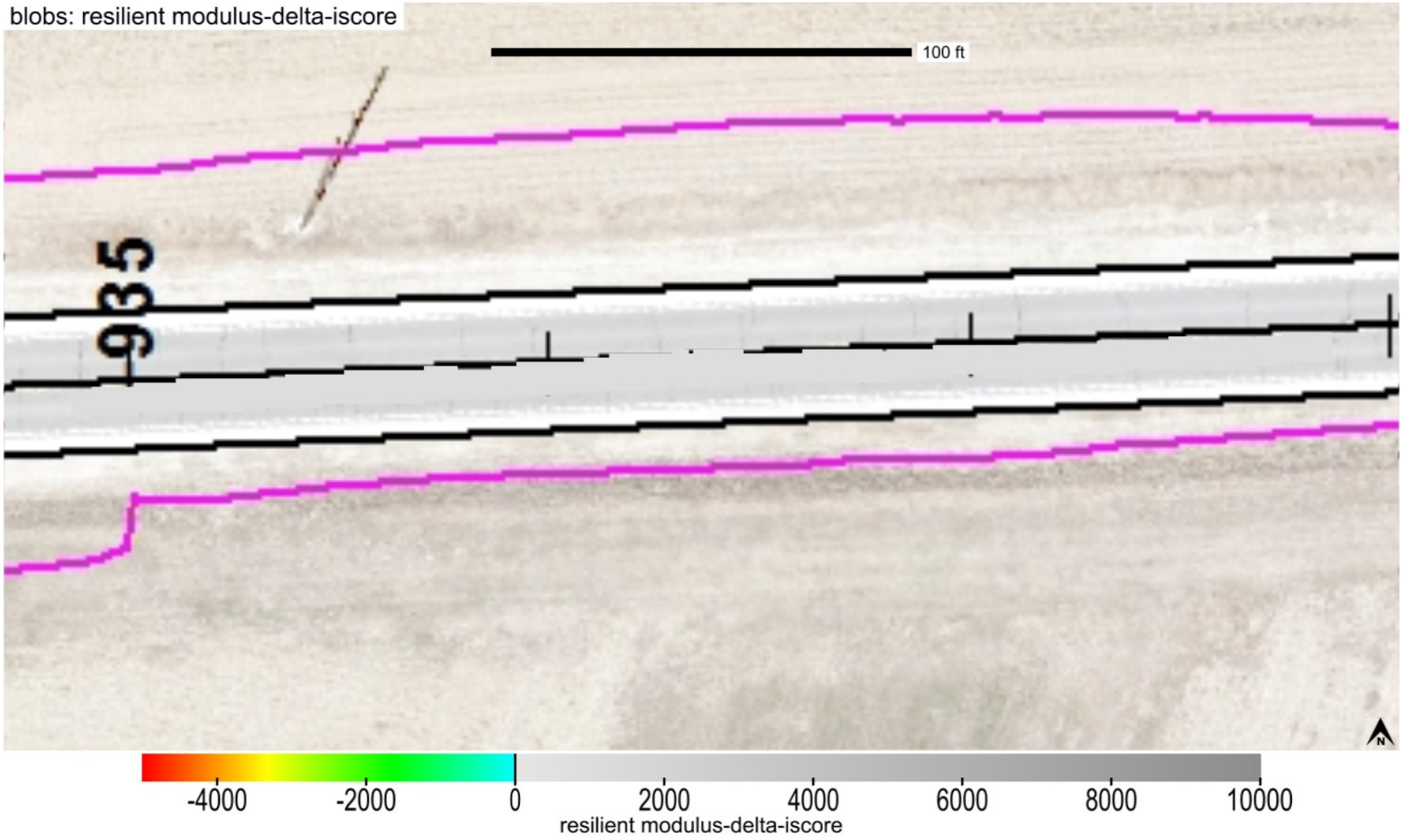
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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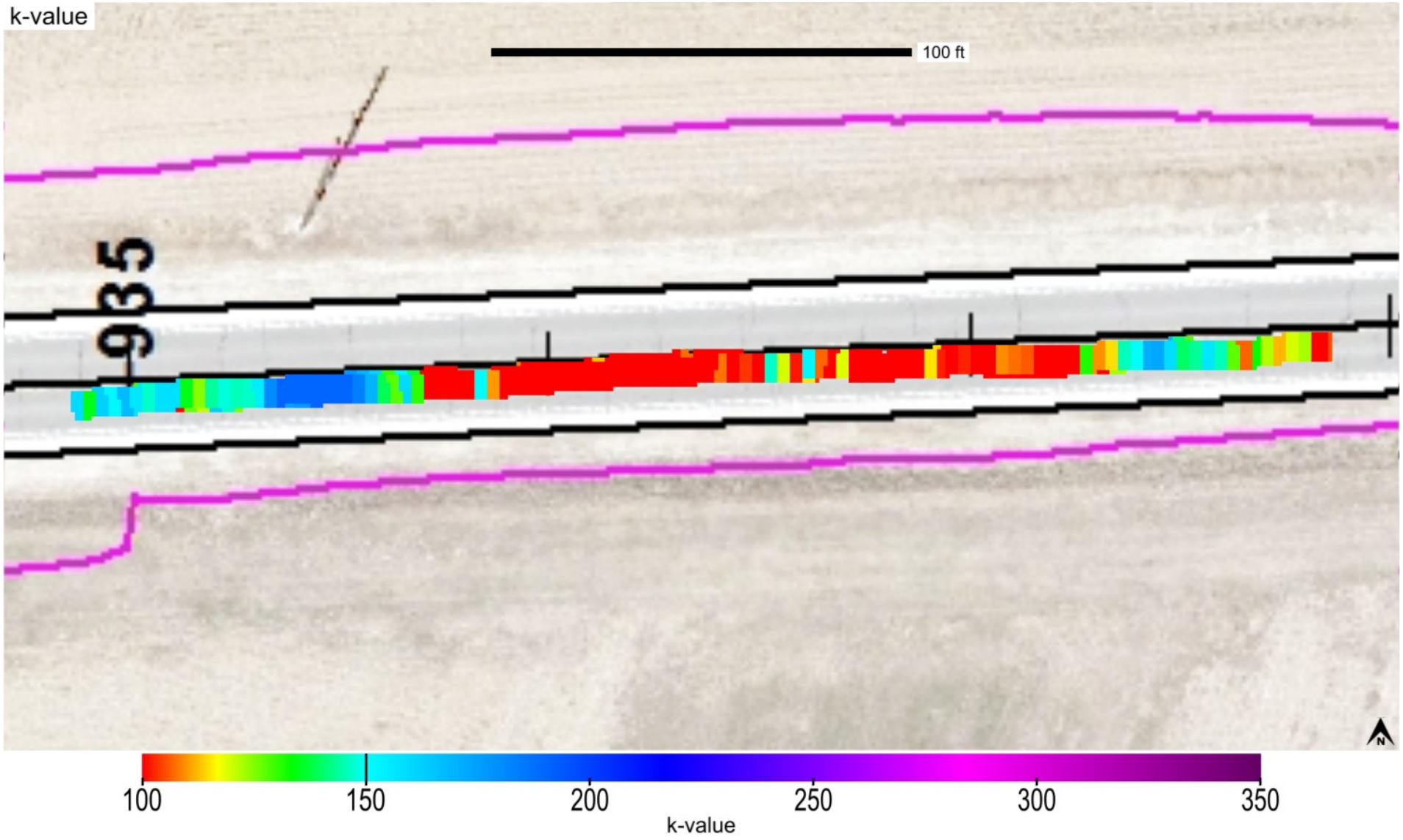
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	22.4	31.65	0.22	150	20	110.6	190	45.98	41.58	-130	-39.4	40



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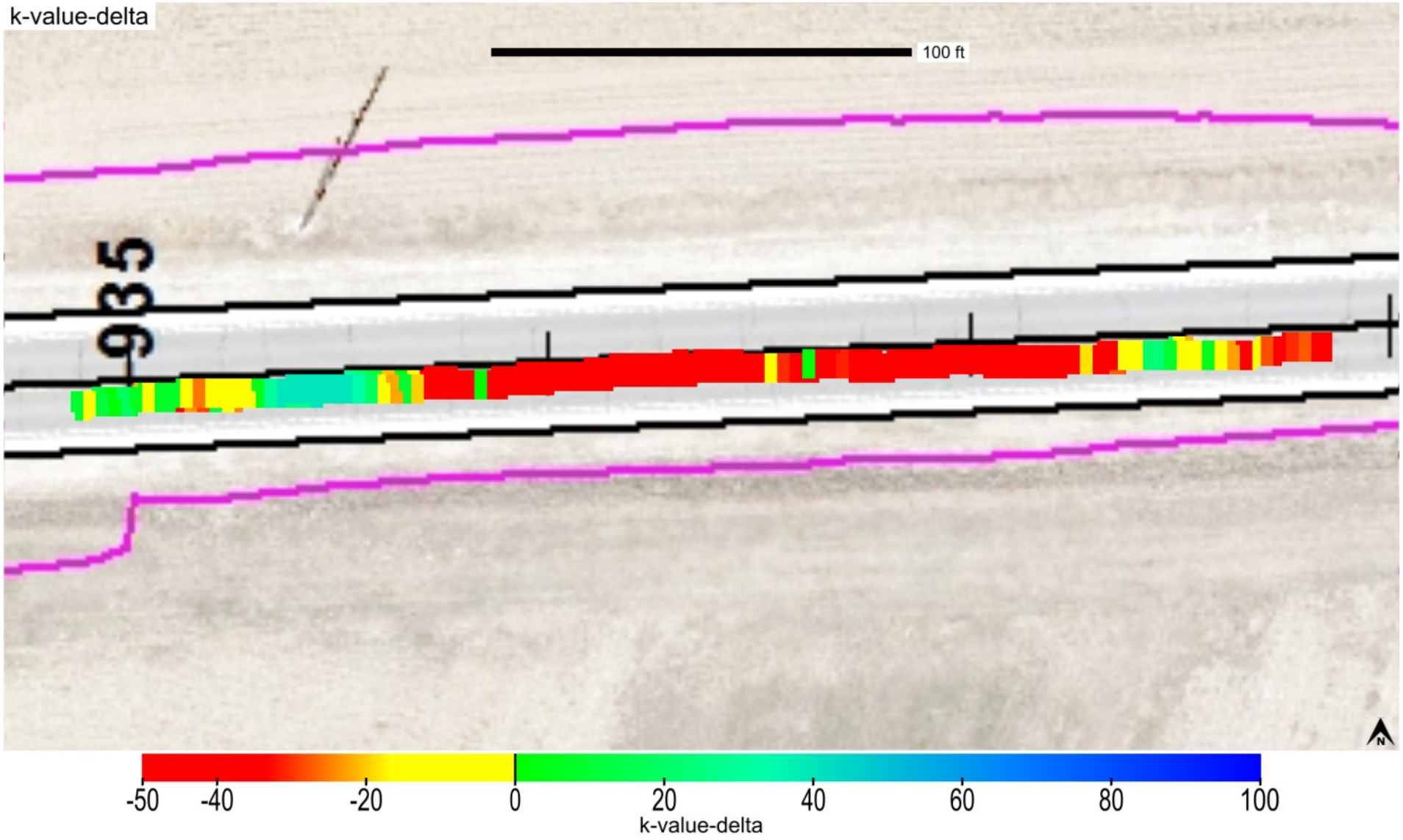
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

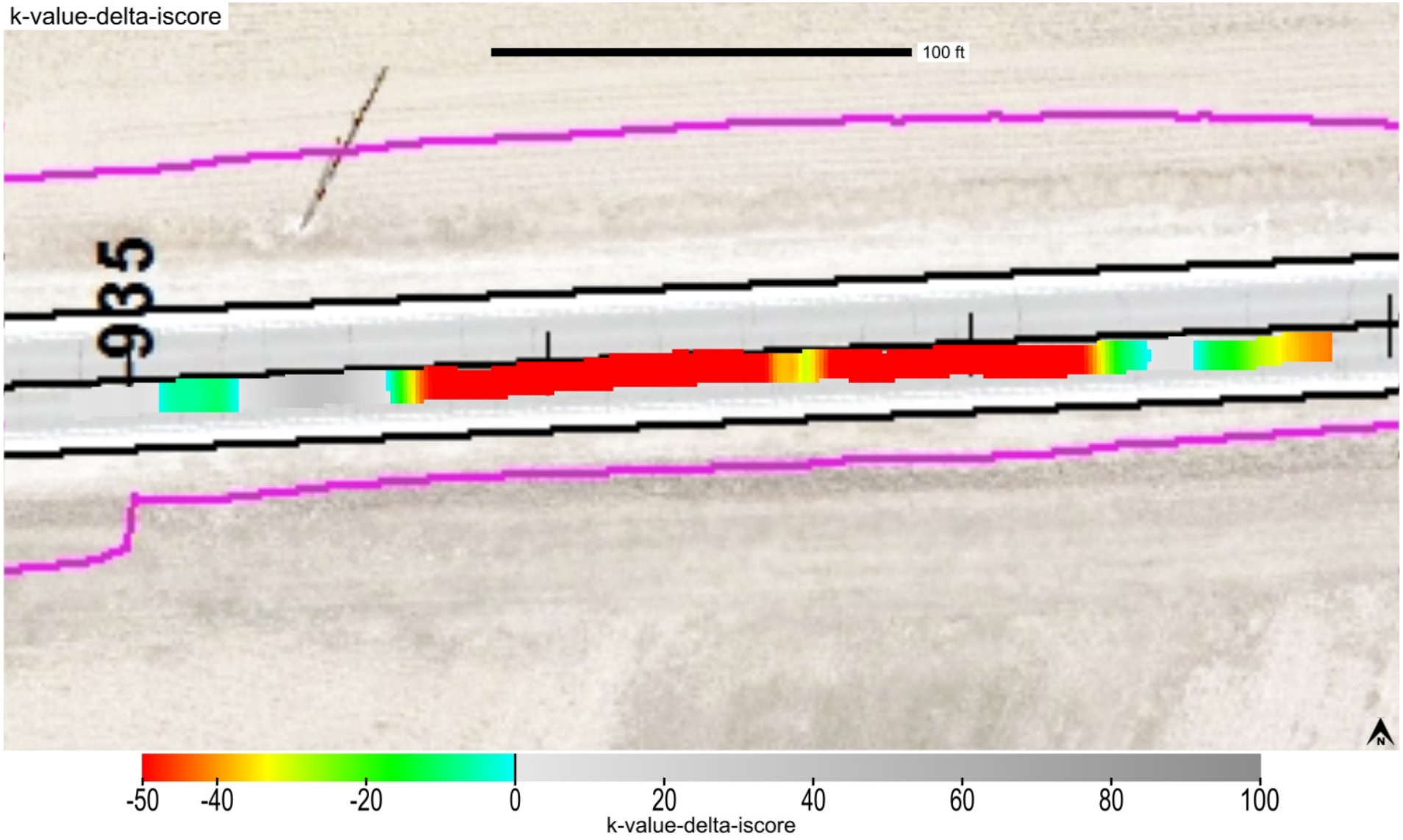
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	22.4	31.65	0.22	150	20	110.6	190	45.98	41.58	-130	-39.4	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	22.4	150	-130	-39.4	40	-110.43	-39.38	39.08



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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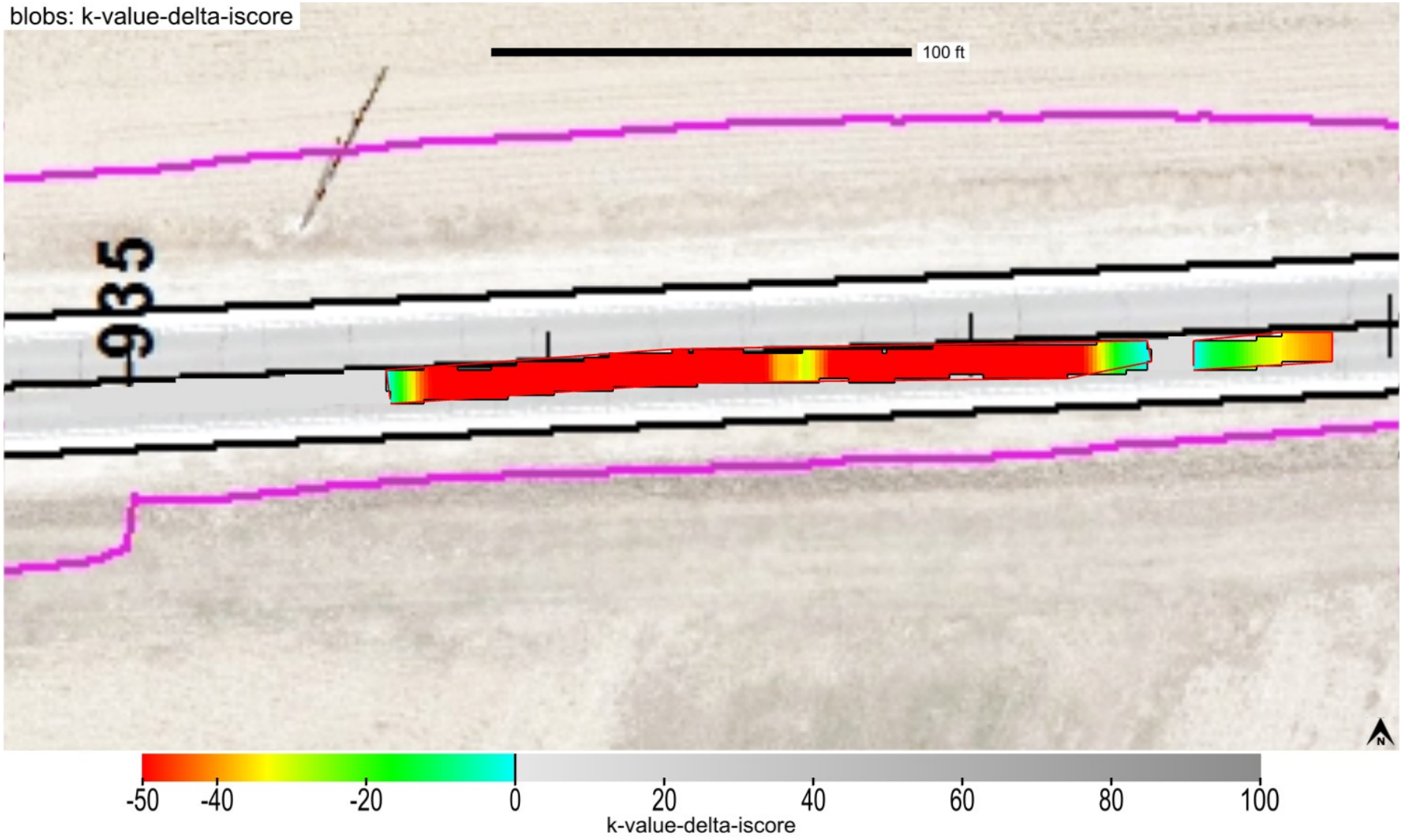
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	1617	71.58	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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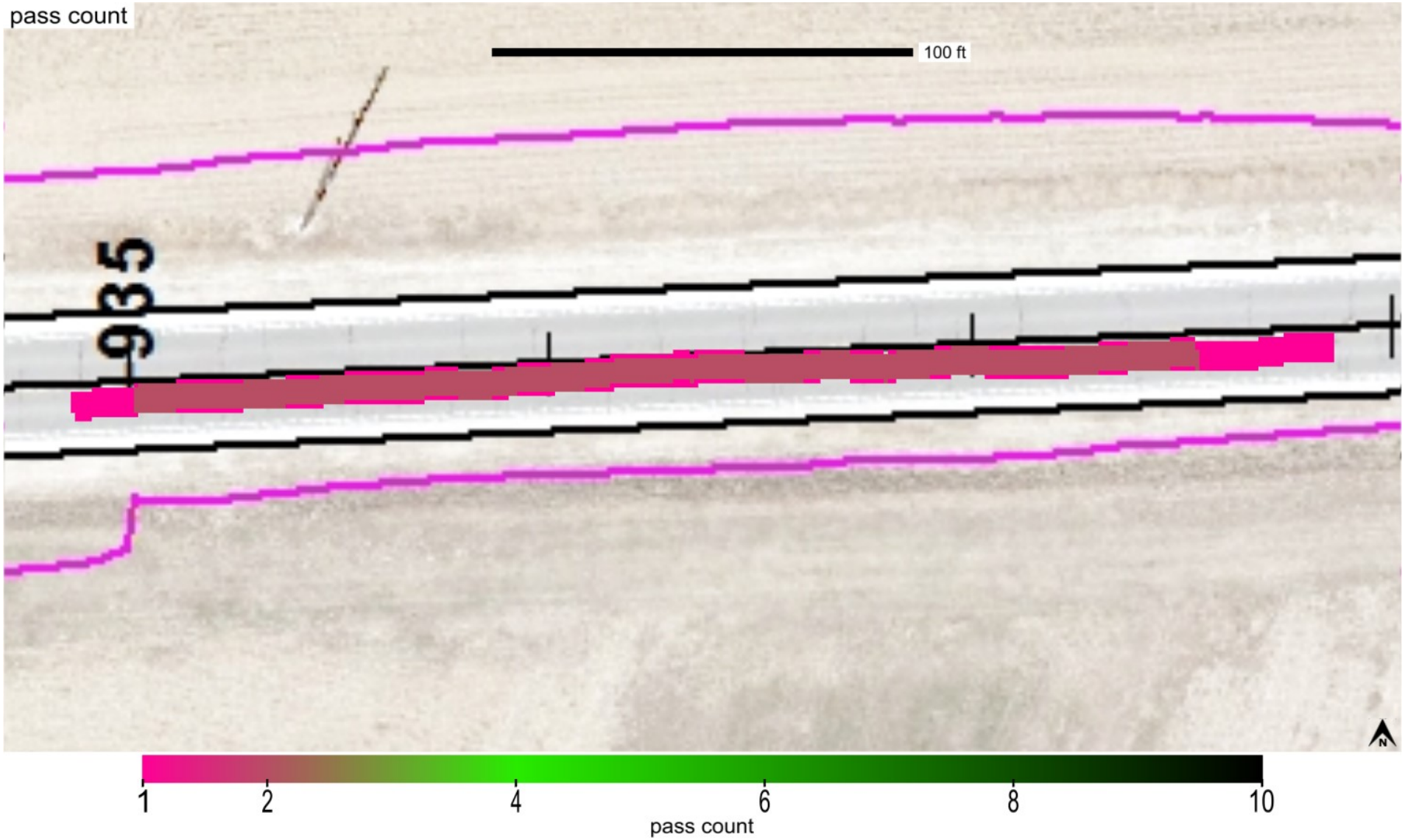
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

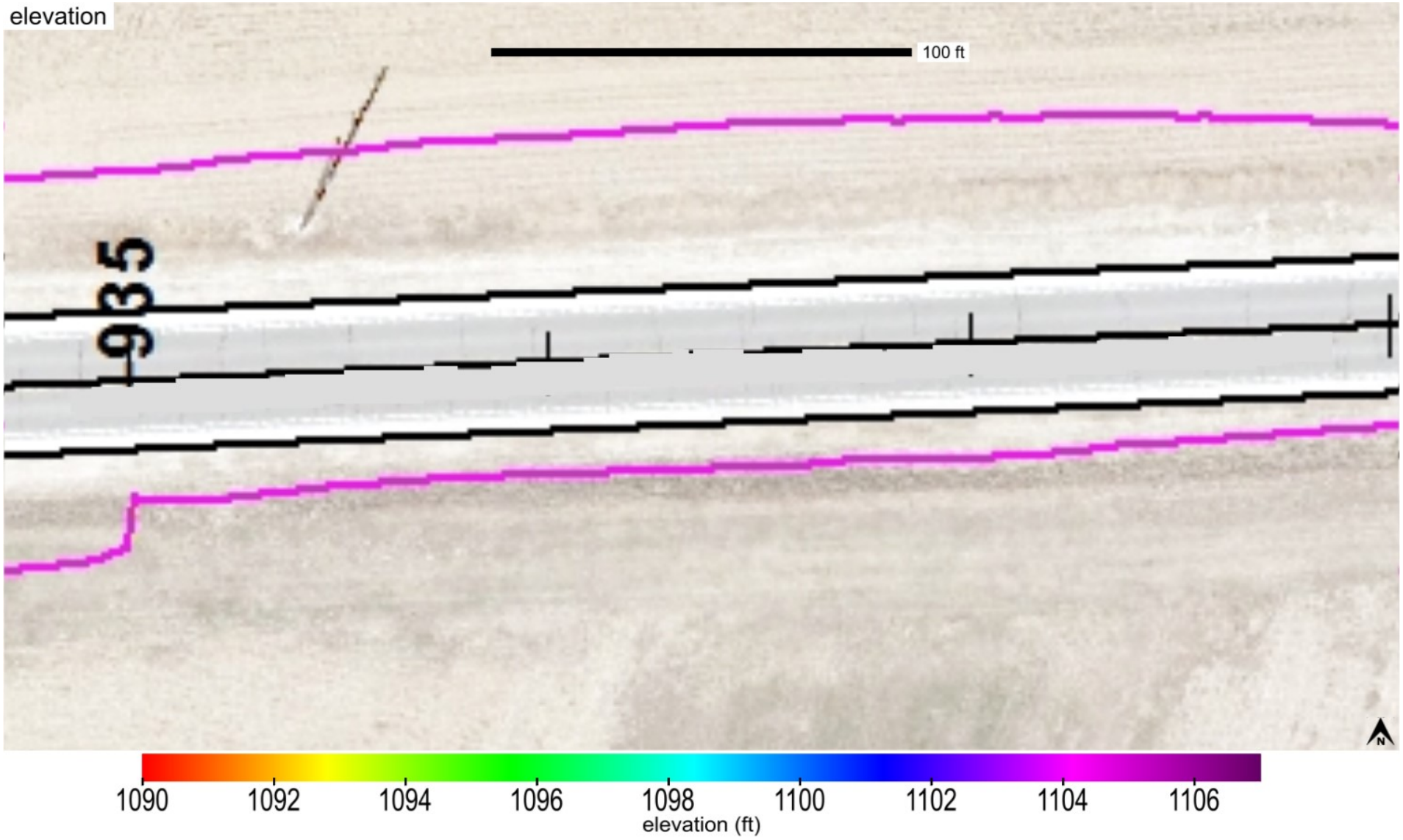
minimum	average	maximum
1	1.71	2



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

minimum	average	maximum
0	0	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_153740a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	2259	0.052	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_154156a	No. of Measurements:	6964	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:41:56 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	85.2	91.81	0.62	9037	5500	14760.5	56000	6899.64	46.74	-3537	5723.5	46963
k-value	Yes	4.2	6.98	-0.01	150	20	78.8	190	42.95	54.51	-130	-71.2	40
Moisture Content	No												

Mapped Area

square feet	acres
6964	0.16

Pass Count

min.	avg.	max.
1	2.07	4

Elevation (ft)

min.	avg.	max.
1093.59	1097.59	1101.27

Velocity (fps)

min.	avg.	max.
0.23	5.57	6.08

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	6964	0.16	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_154156a	No. of Measurements:	6964	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:41:56 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
91.81	CQI > = 95
85.2	80% of Resilient Modulus MVs >= 9037
46.74	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_154156a	No. of Measurements:	6964	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 3:41:56 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
6.98	CQI > = 95
4.2	80% of k-Value MVs >= 150
54.51	COV <= 20
98.54	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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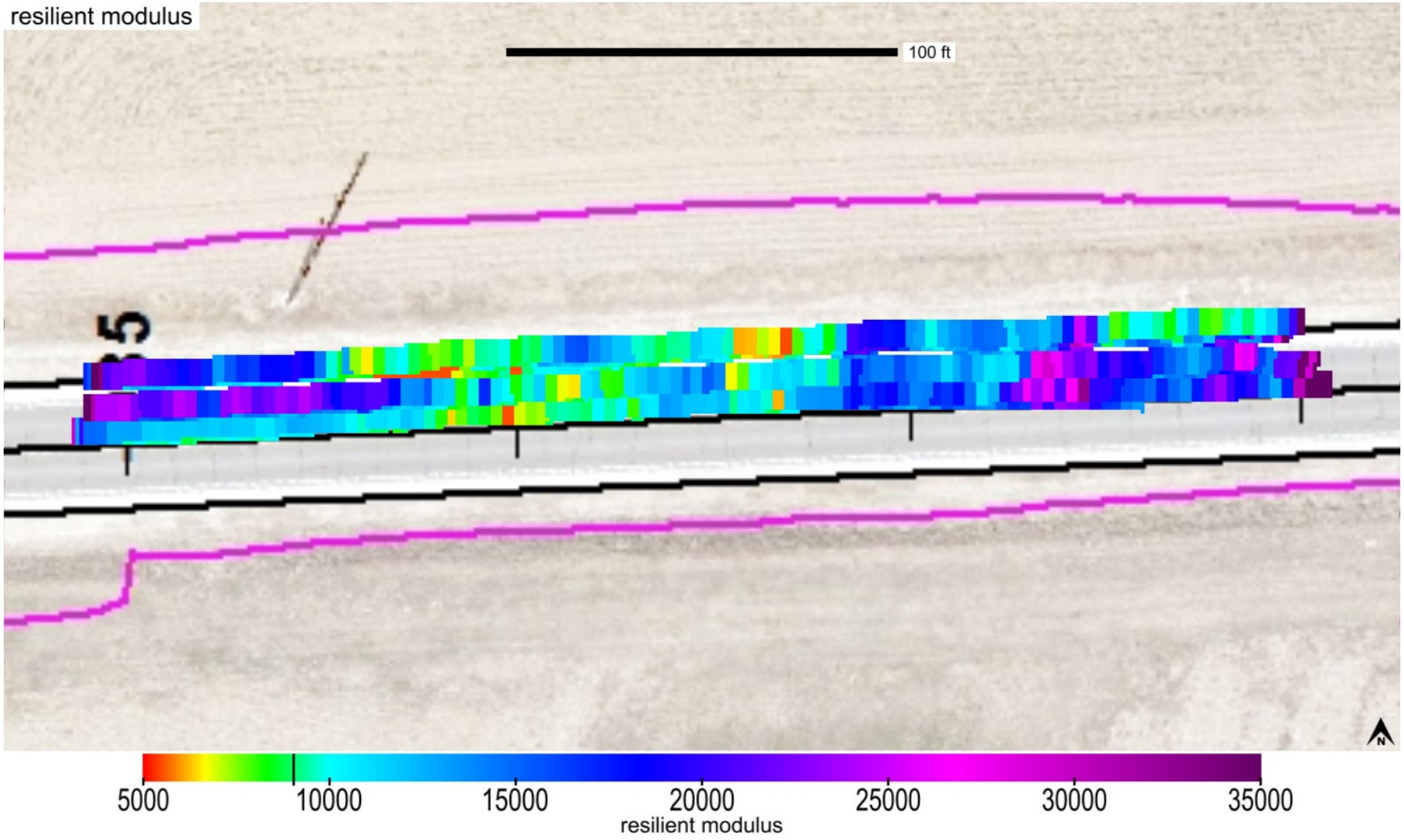
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.2	91.81	0.62	9037	5500	14760.5	56000	6899.64	46.74	-3537	5723.5	46963



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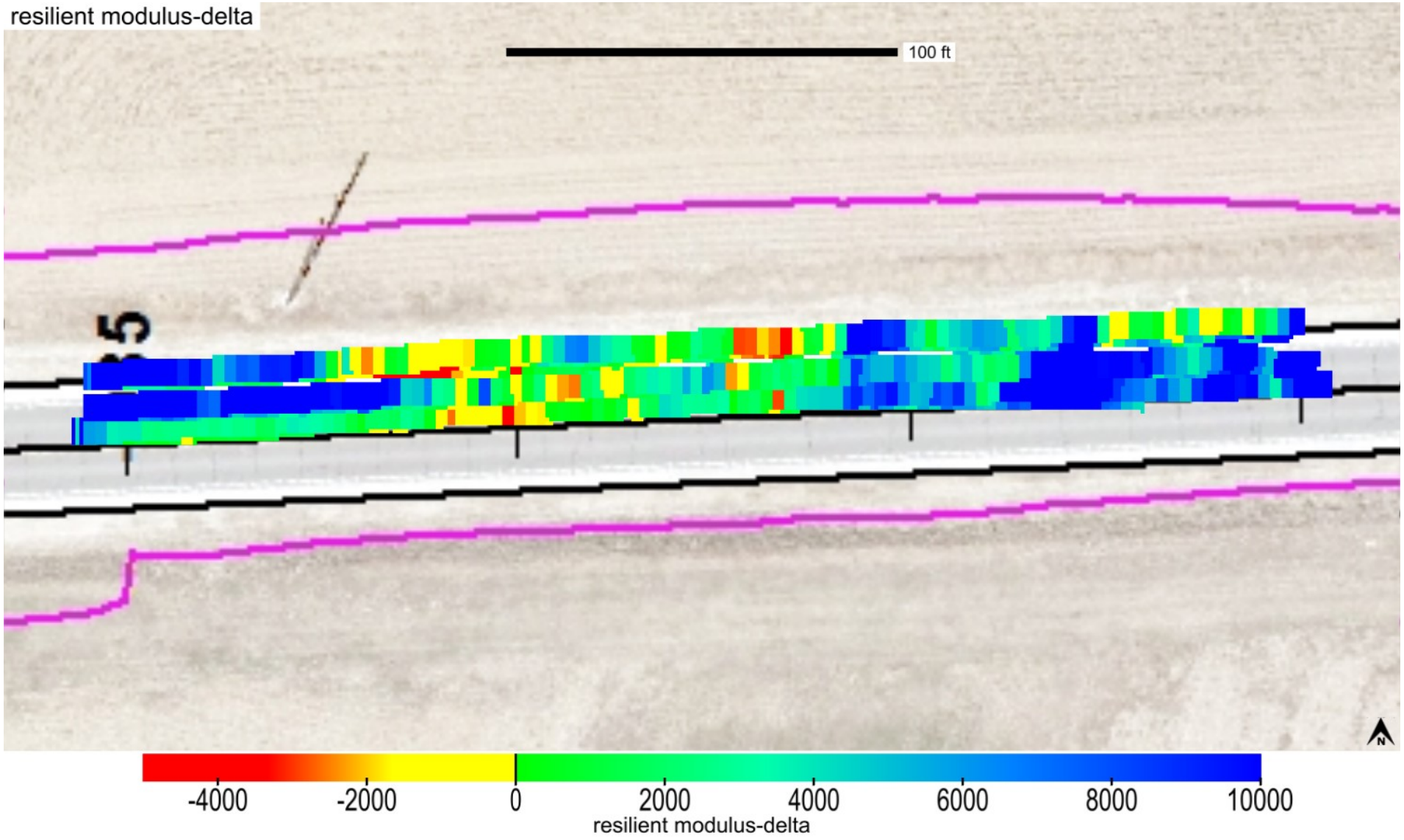
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.2	91.81	0.62	9037	5500	14760.5	56000	6899.64	46.74	-3537	5723.5	46963



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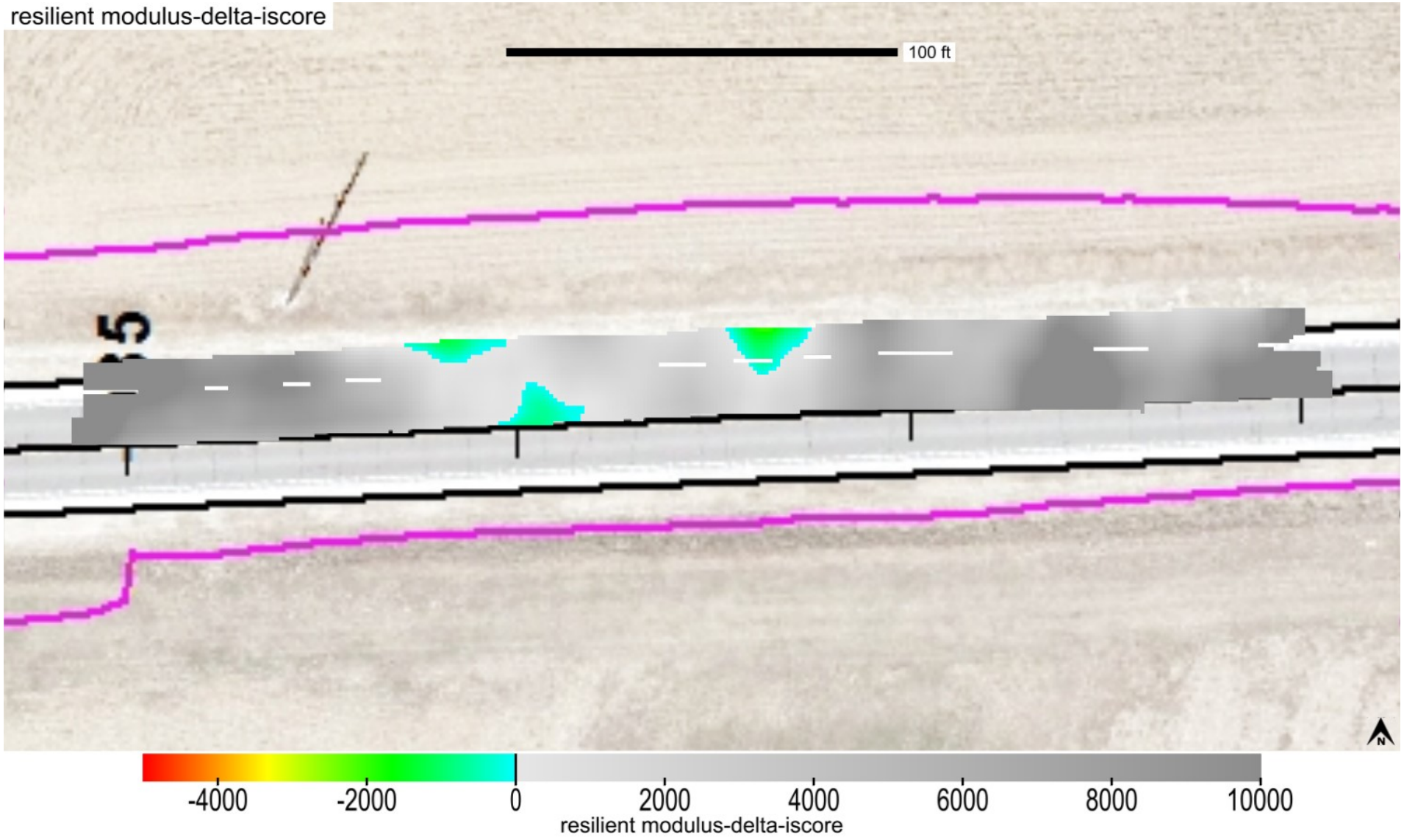
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	85.2	9037	-3537	5723.5	46963	-1920.78	5807	37257.84



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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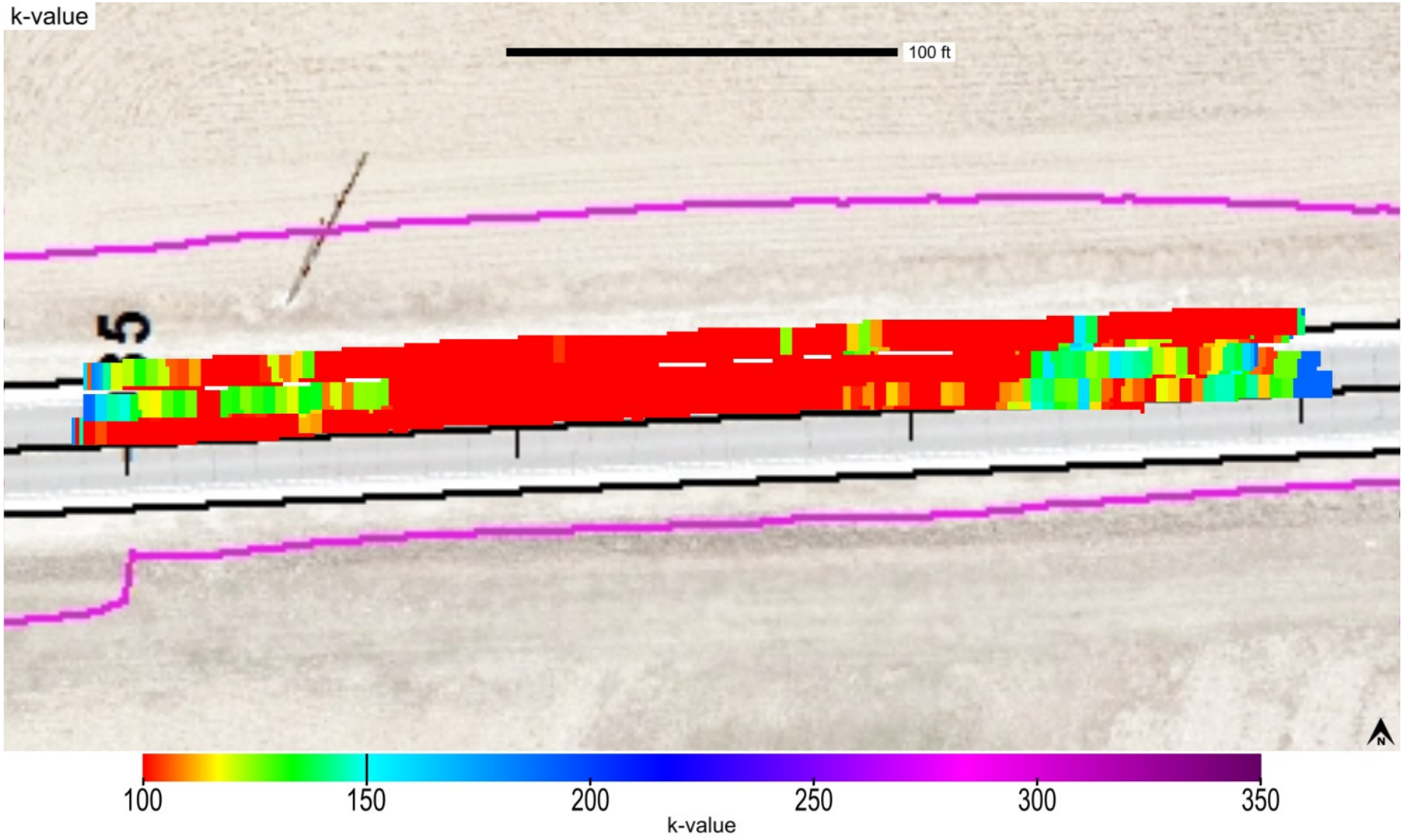
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.2	6.98	-0.01	150	20	78.8	190	42.95	54.51	-130	-71.2	40



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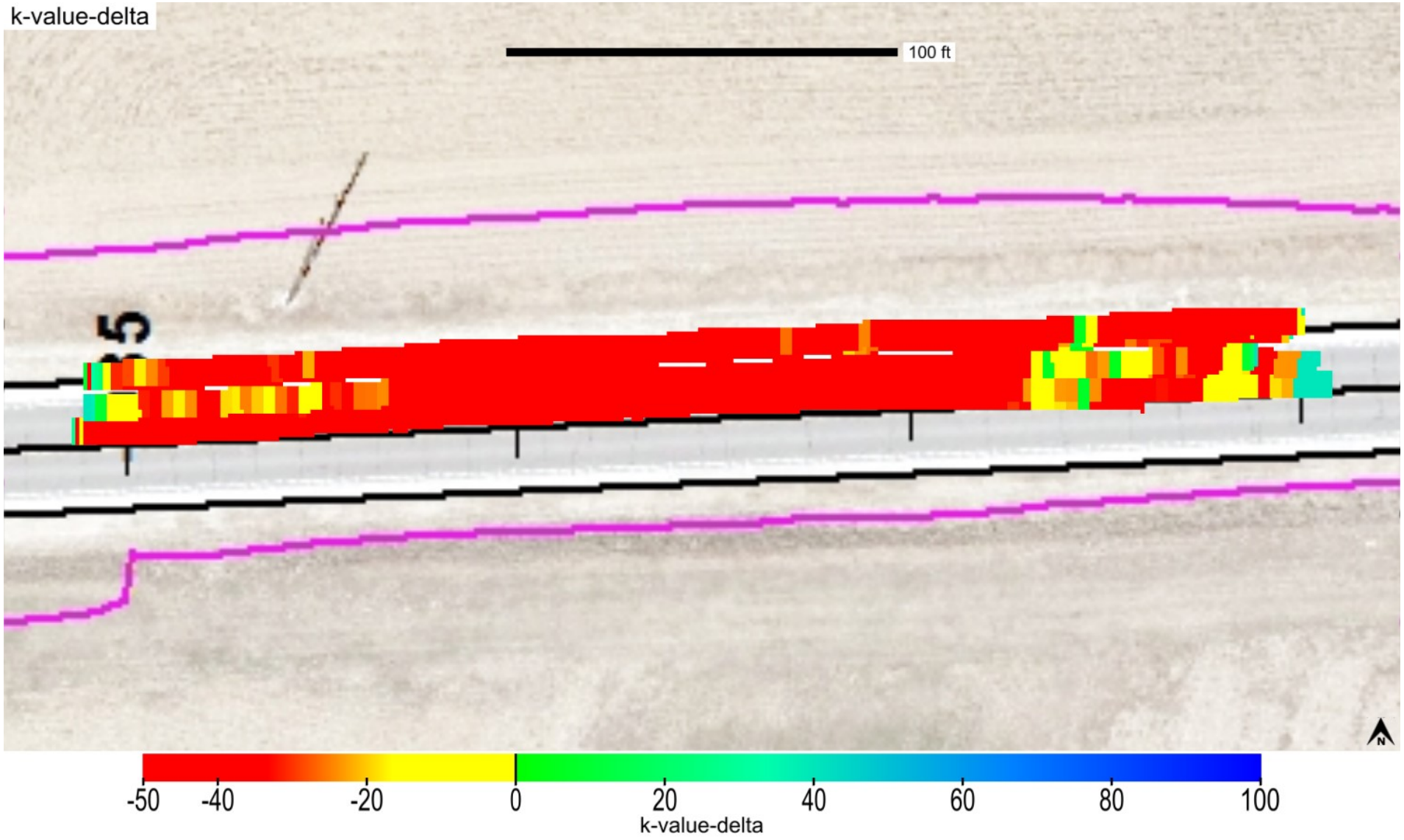
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.2	6.98	-0.01	150	20	78.8	190	42.95	54.51	-130	-71.2	40



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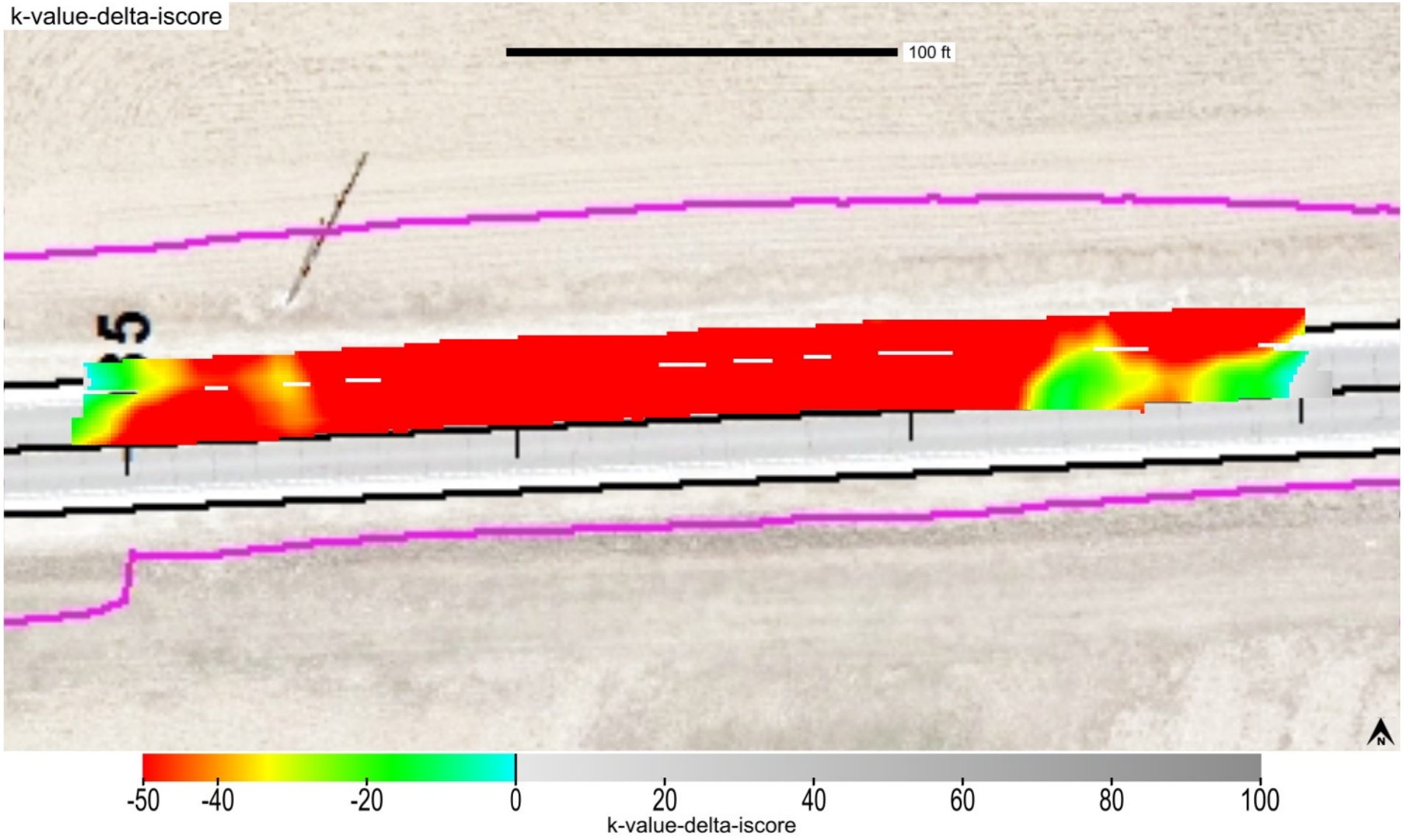
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	4.2	150	-130	-71.2	40	-122.91	-70.33	39.22



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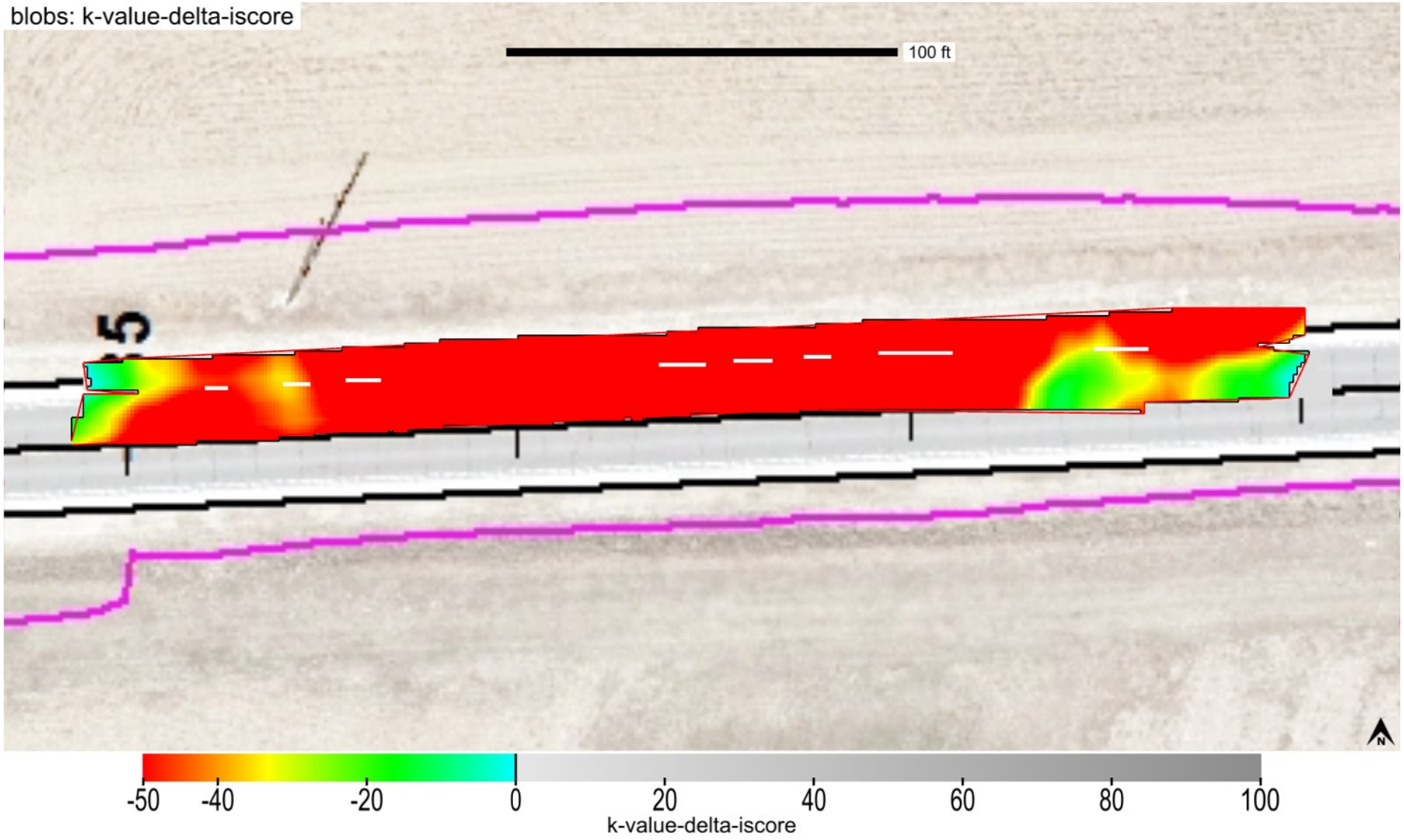
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	6862	98.54	none	0



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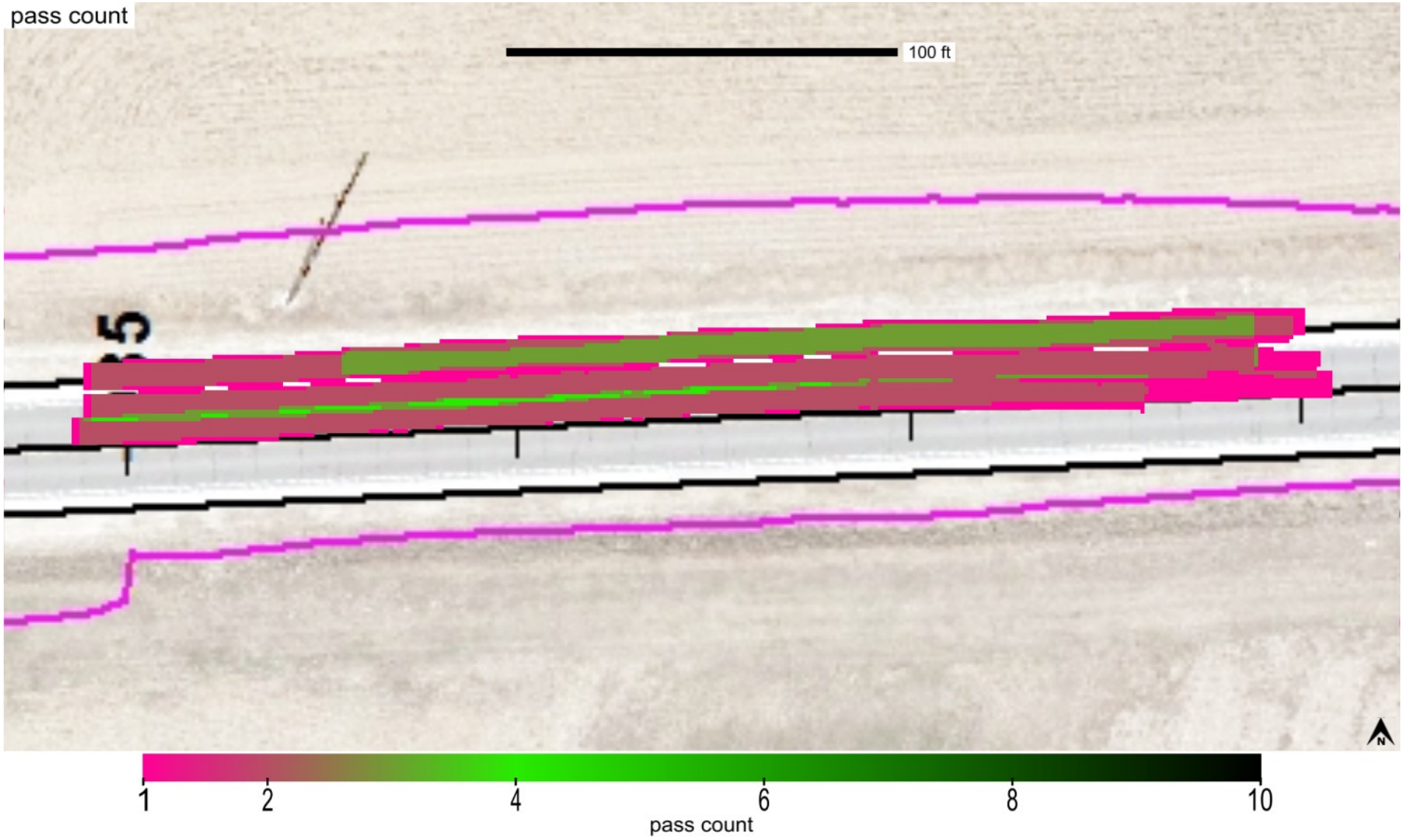
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

minimum	average	maximum
1	2.07	4



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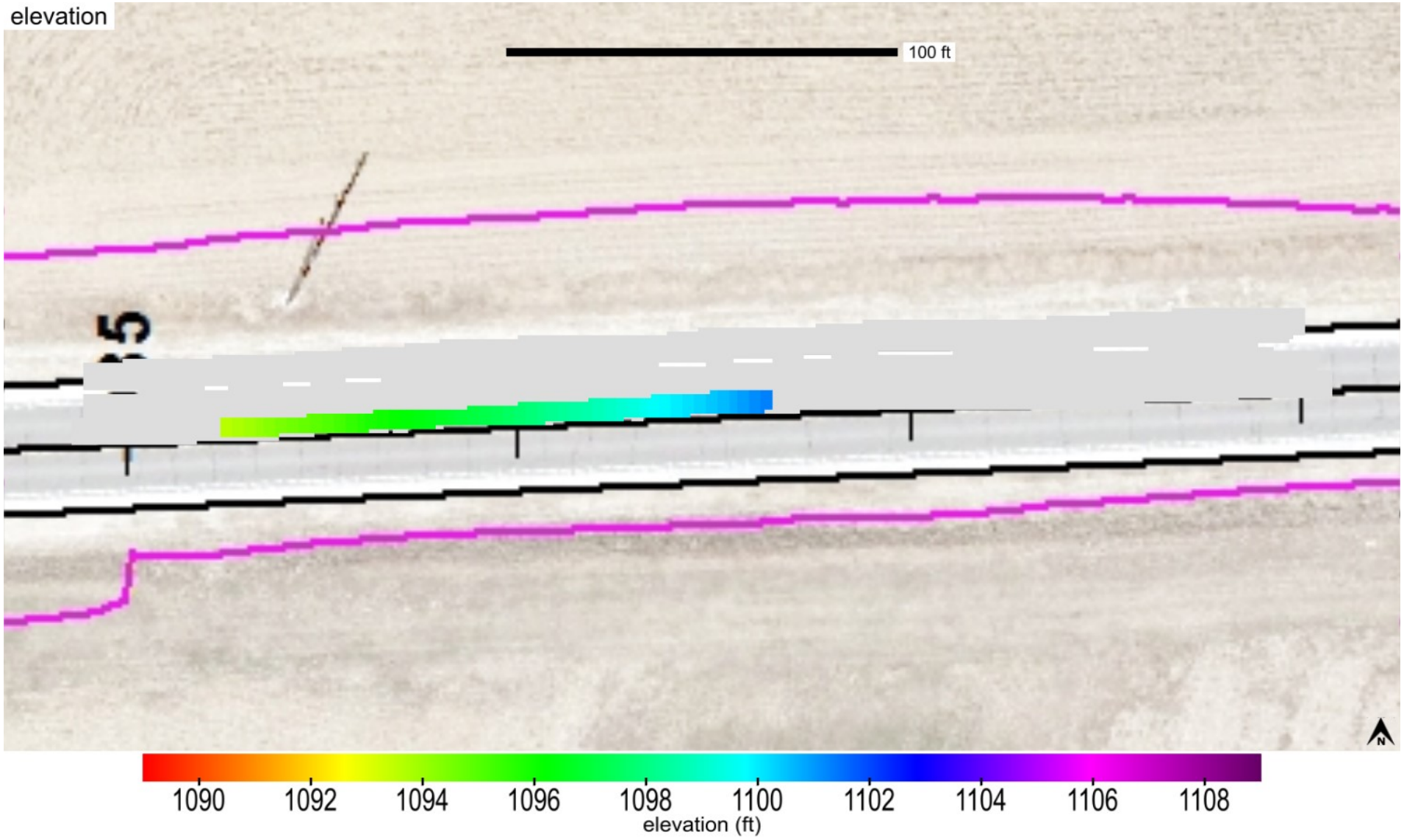
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

minimum	average	maximum
1093.594	1097.592	1101.274



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_154156a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	6964	0.16	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_161016a	No. of Measurements:	4447	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 4:10:16 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.8	112.42	0.86	9037	8757.14	19390.1	56000	6757.22	34.85	-279.86	10353.1	46963
k-value	Yes	23.5	40.38	0.46	150	20	126	190	33.07	26.24	-130	-24	40
Moisture Content	No												

Mapped Area

square feet	acres
4447	0.1

Pass Count

min.	avg.	max.
1	1.74	4

Elevation (ft)

min.	avg.	max.
1073.92	1080.23	1088.37

Velocity (fps)

min.	avg.	max.
0.3	4.89	6.14

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	4447	0.102	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_161016a	No. of Measurements:	4447	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 4:10:16 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
112.42	CQI > = 95
99.8	80% of Resilient Modulus MVs >= 9037
34.85	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_161016a	No. of Measurements:	4447	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 4:10:16 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
40.38	CQI > = 95
23.5	80% of k-Value MVs >= 150
26.24	COV <= 20
89.95	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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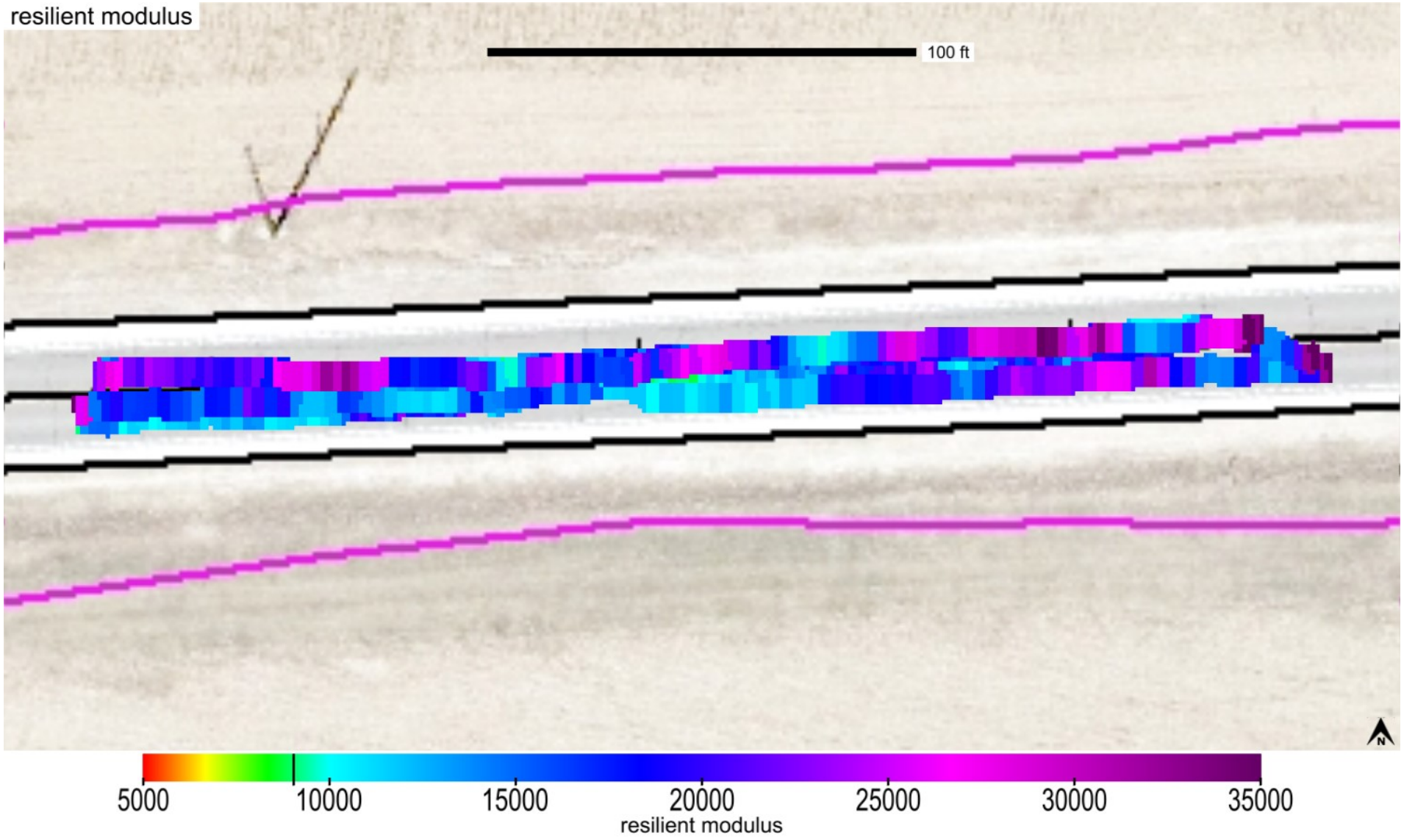
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	112.42	0.86	9037	8757.14	19390.1	56000	6757.22	34.85	-279.86	10353.1	46963



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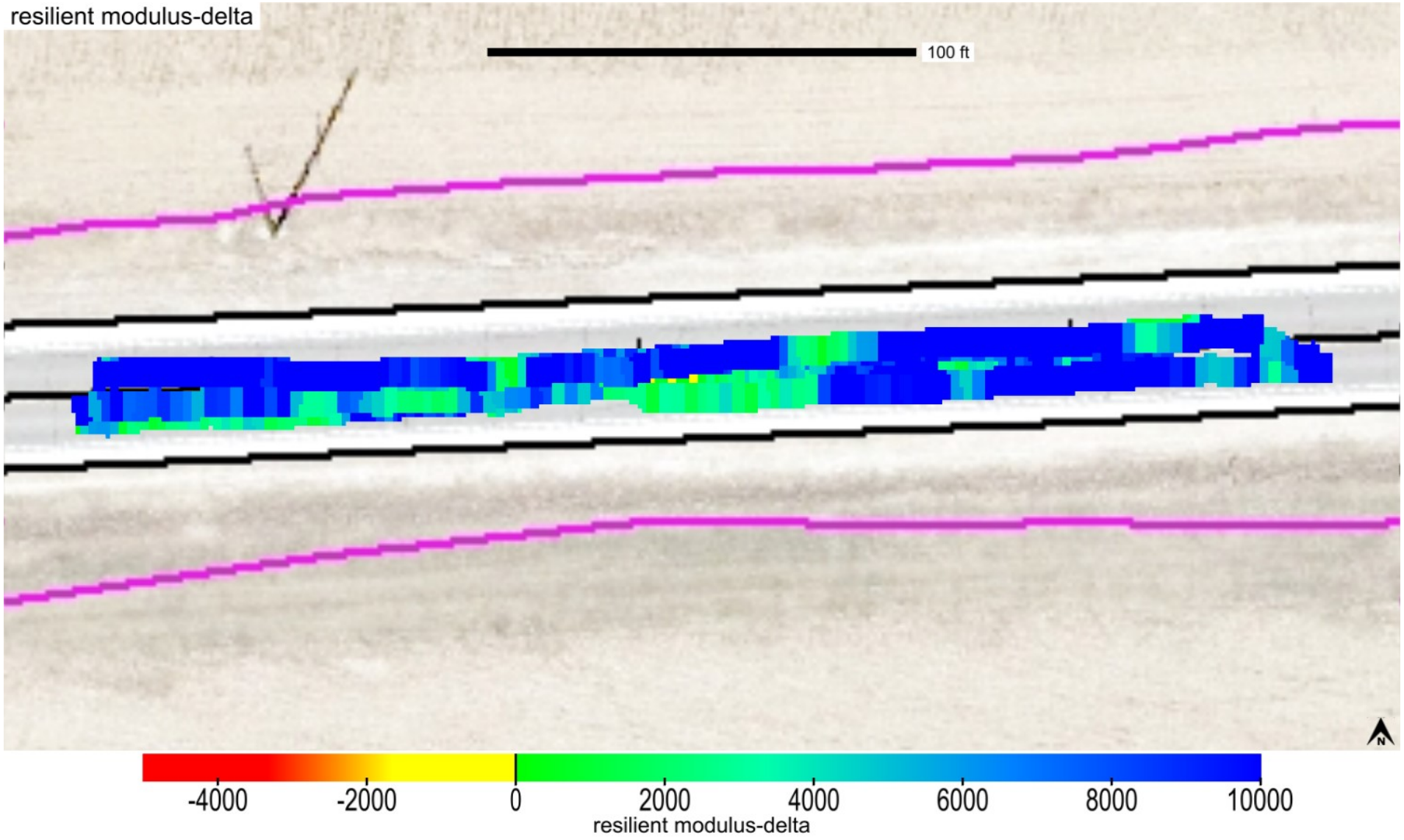
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	112.42	0.86	9037	8757.14	19390.1	56000	6757.22	34.85	-279.86	10353.1	46963



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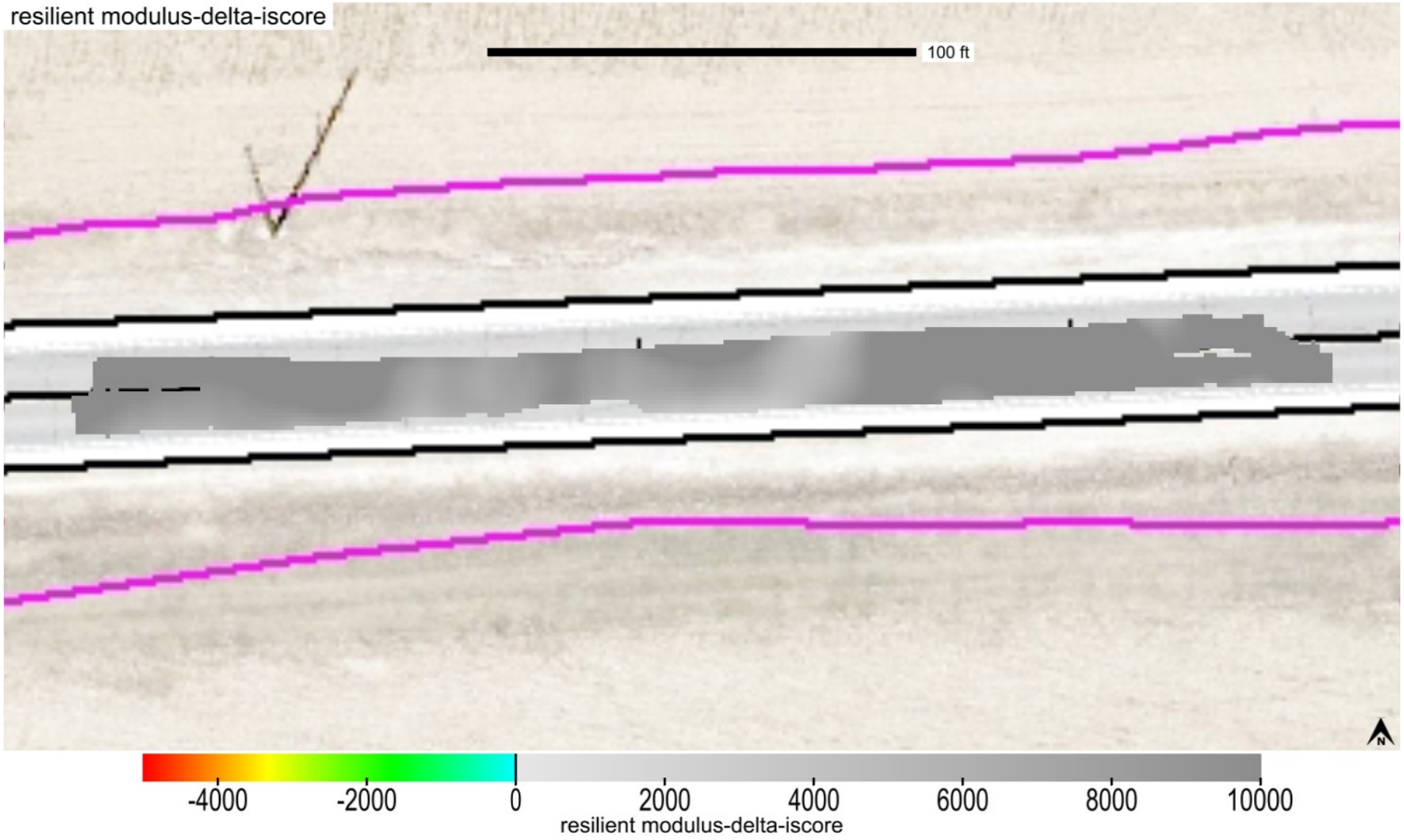
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.8	9037	-279.86	10353.1	46963	2752.9	10242.94	24538.07

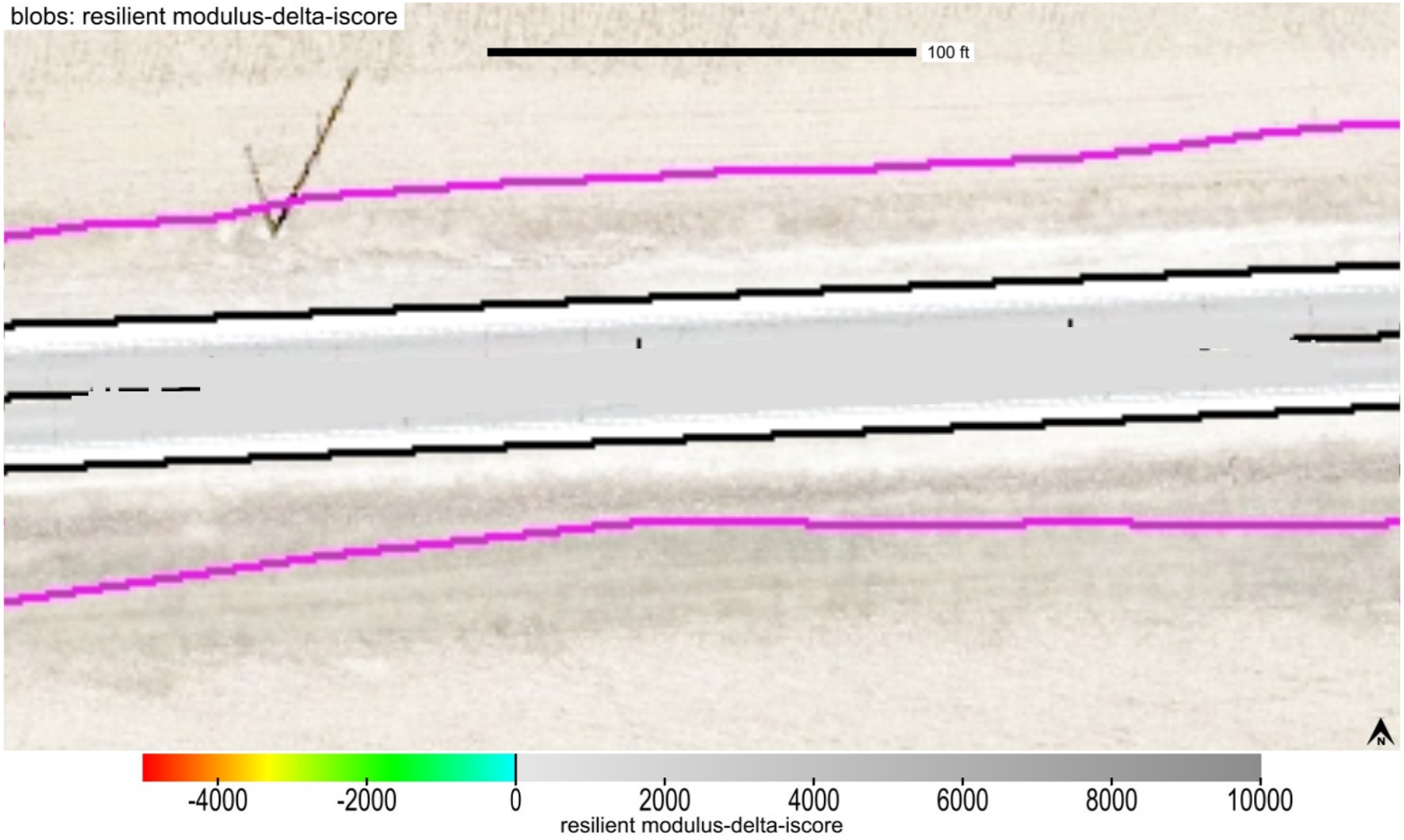


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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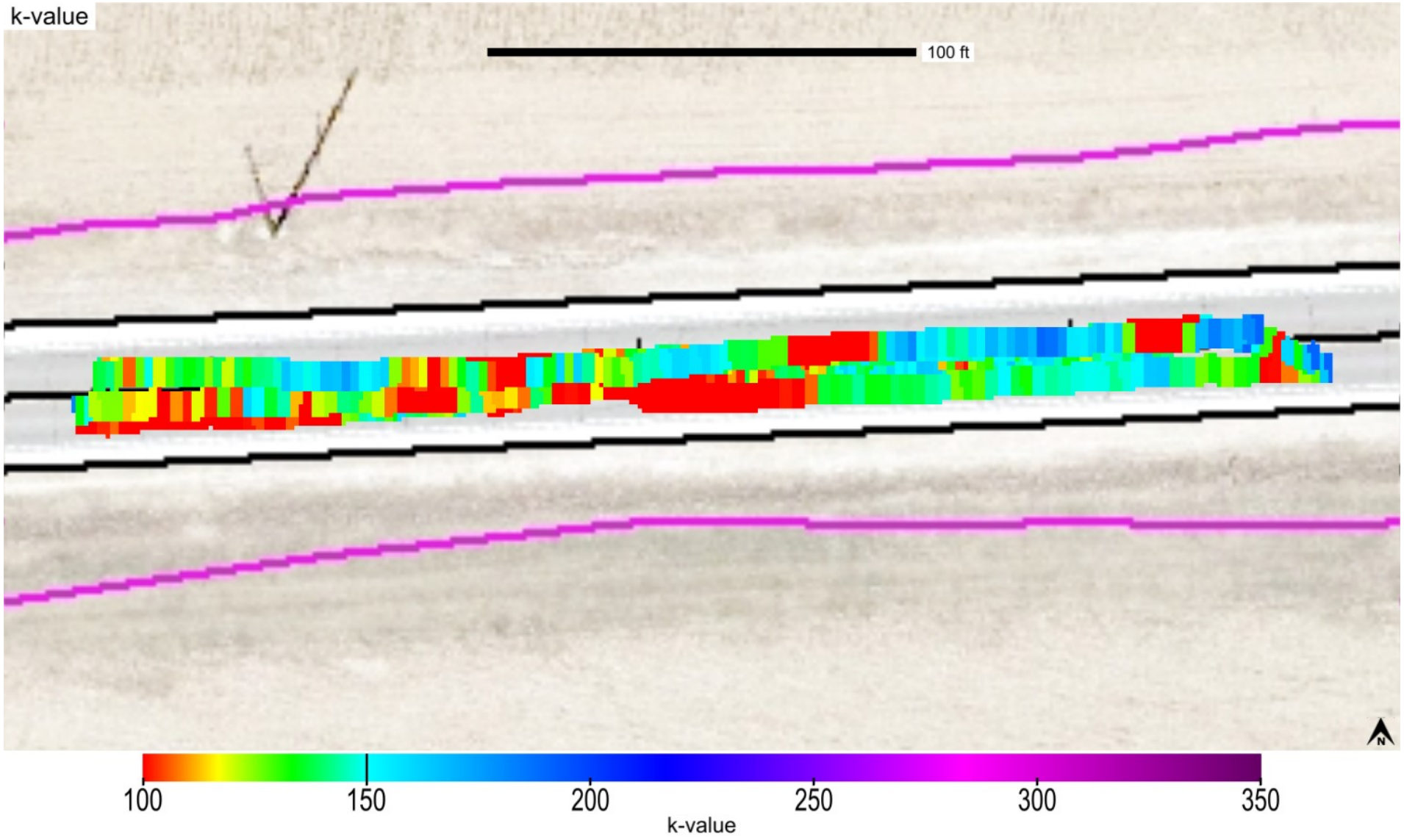
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	23.5	40.38	0.46	150	20	126	190	33.07	26.24	-130	-24	40



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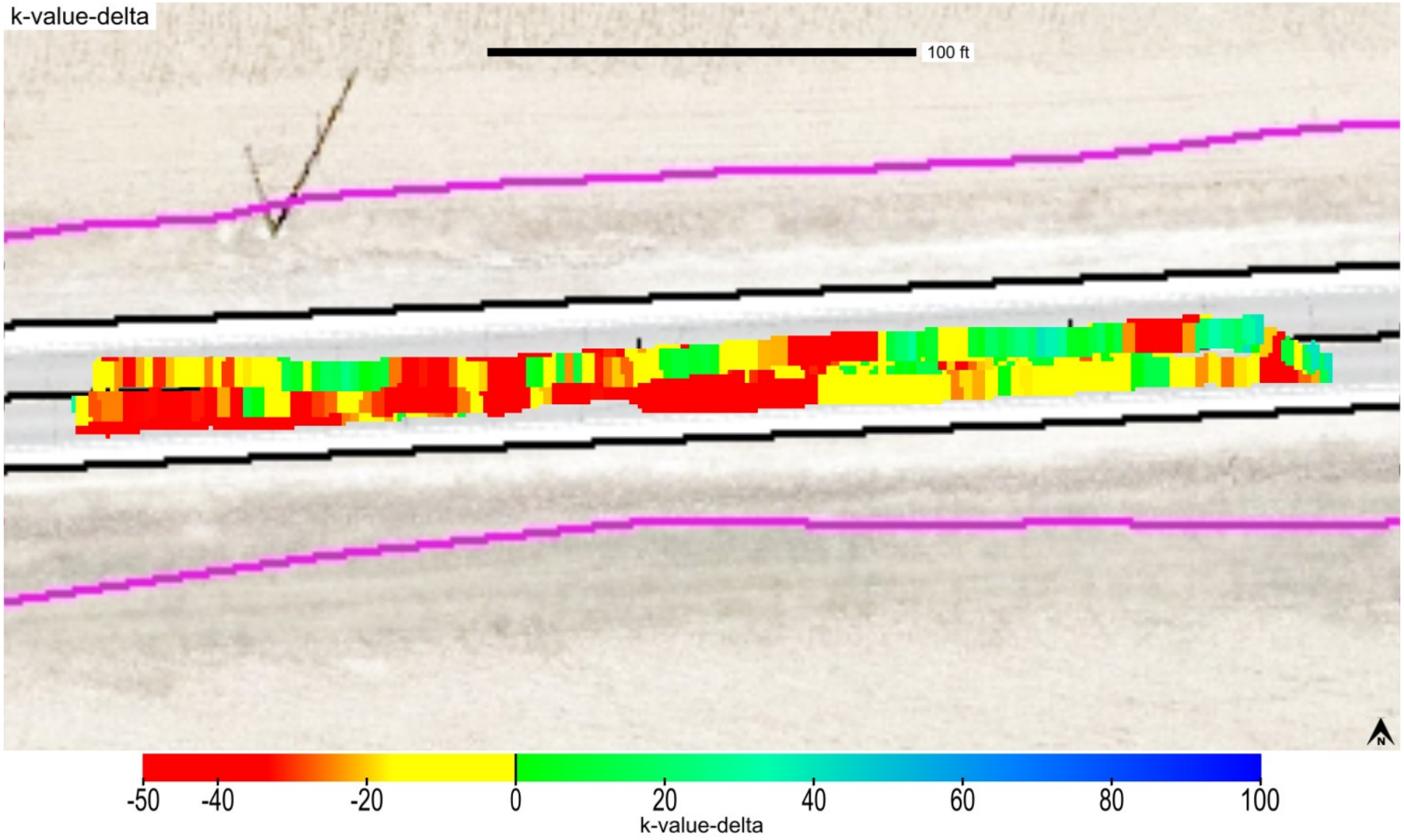
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	23.5	40.38	0.46	150	20	126	190	33.07	26.24	-130	-24	40



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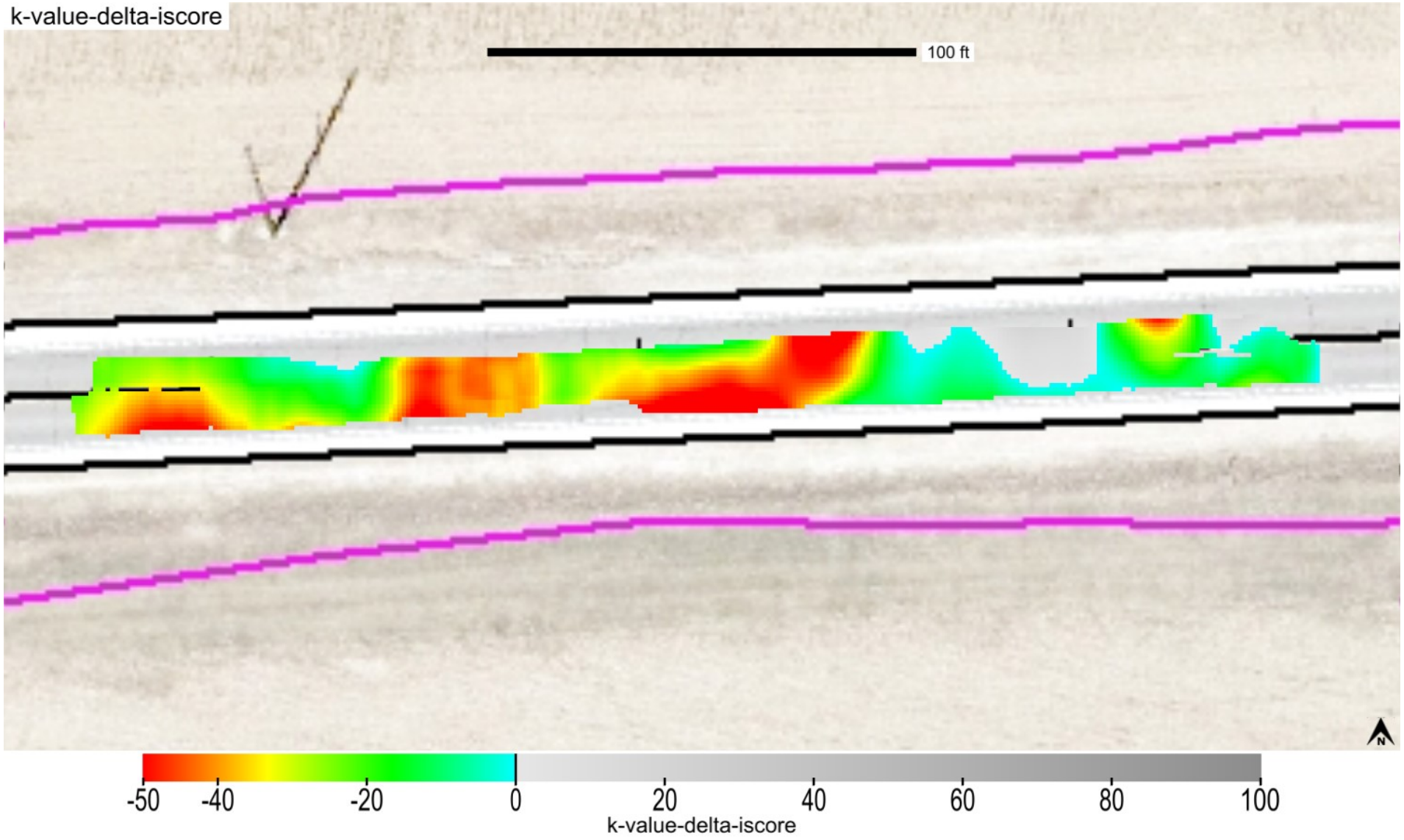
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	23.5	150	-130	-24	40	-78.49	-23.7	18.76



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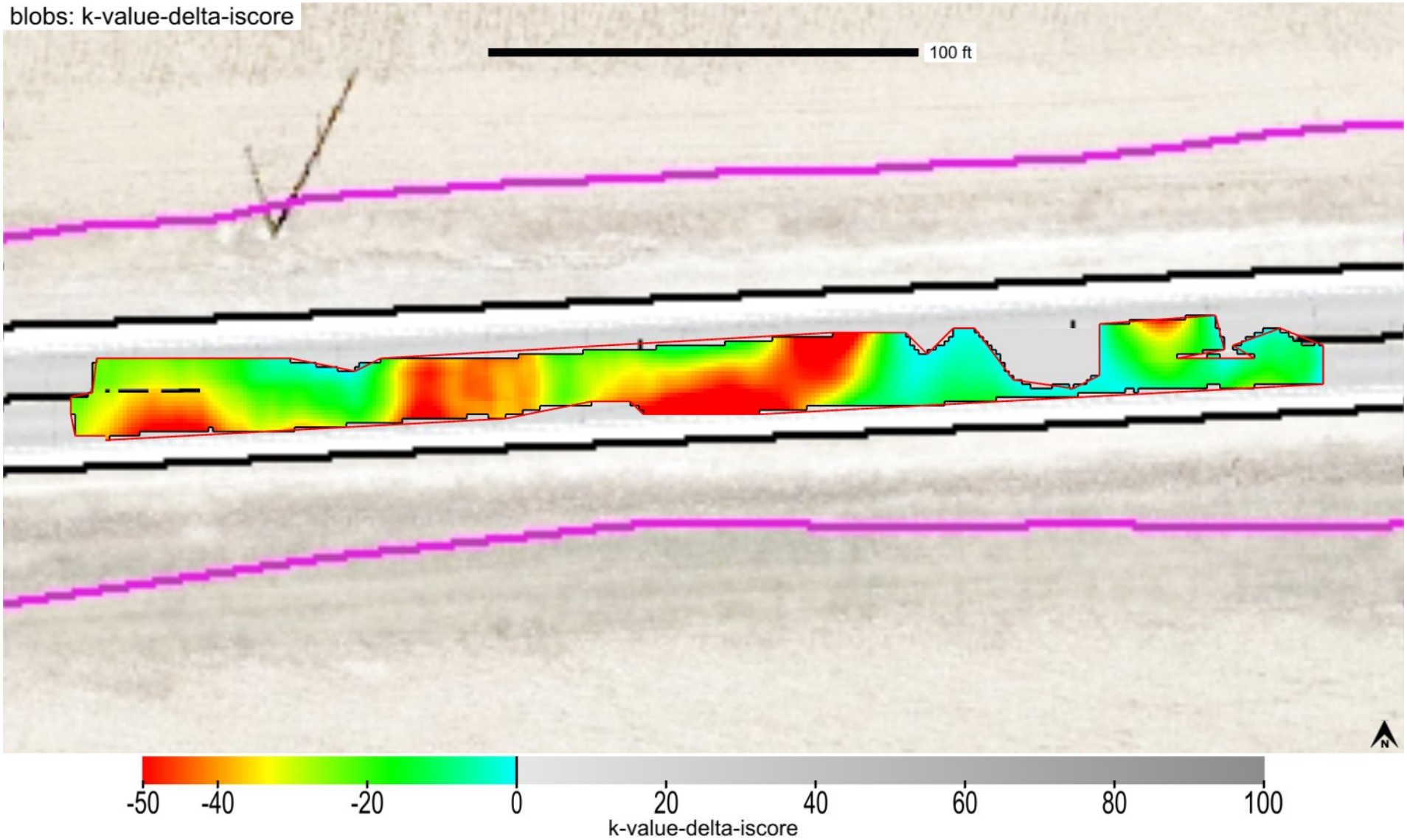
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	4000	89.95	none	0



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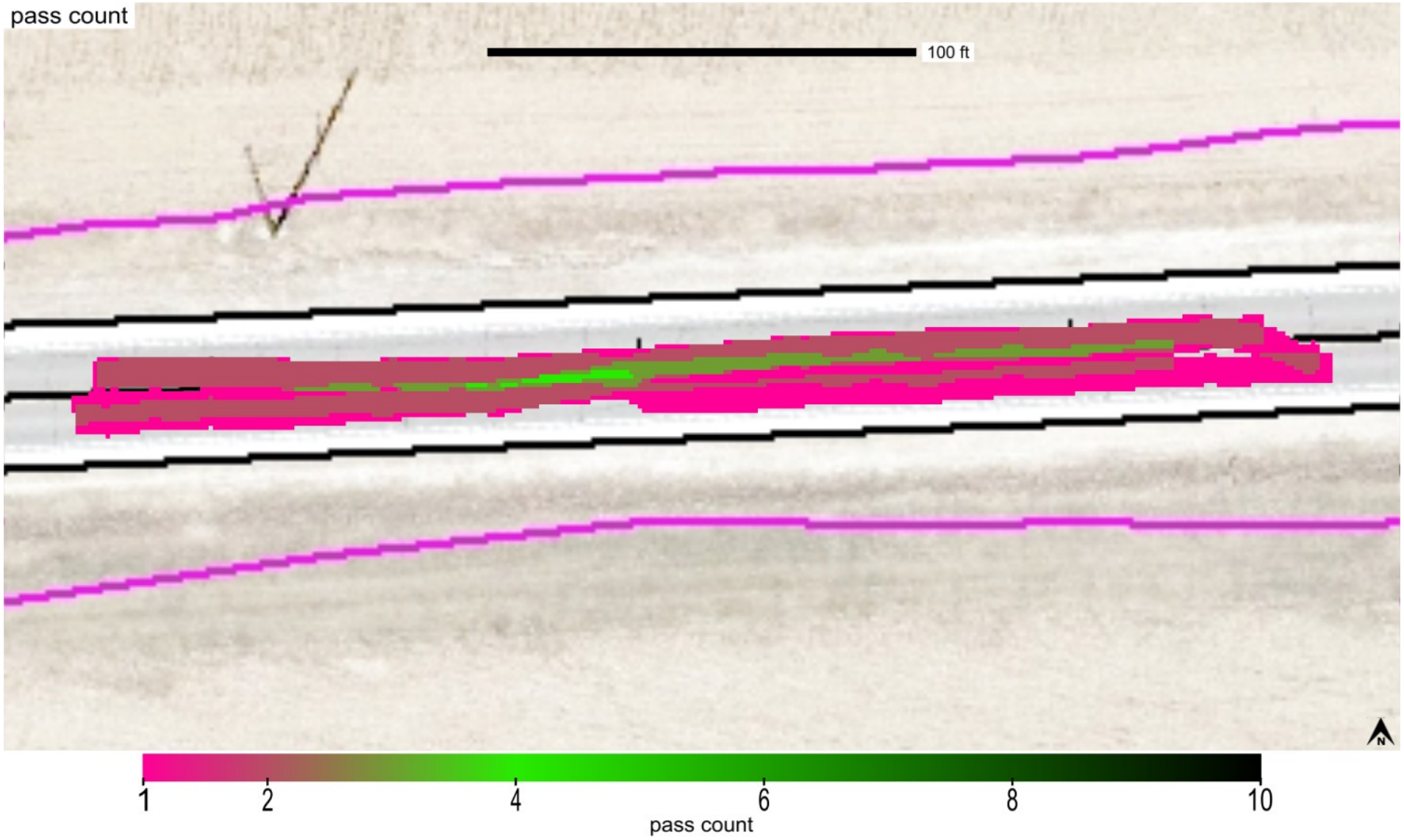
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

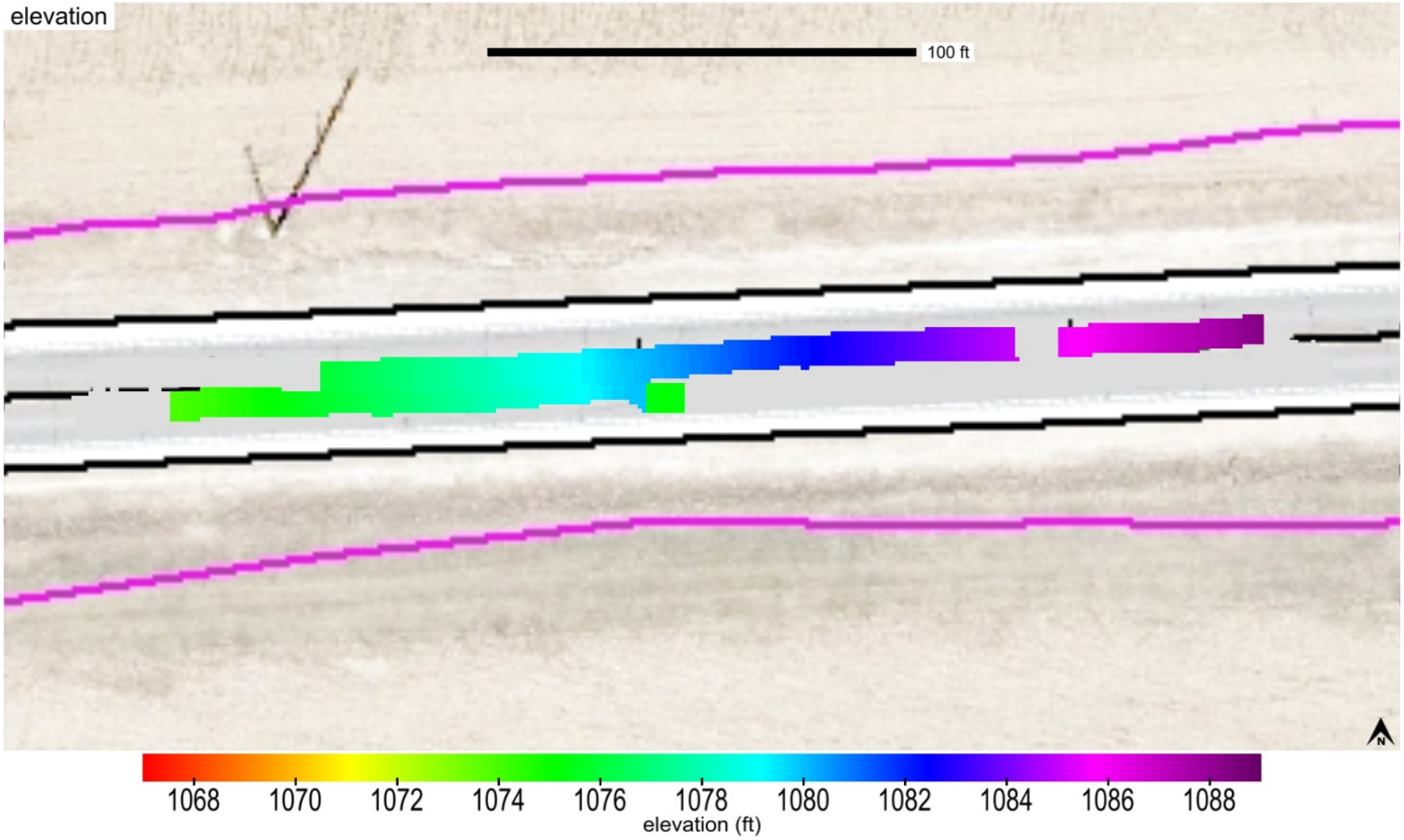
minimum	average	maximum
1	1.74	4



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

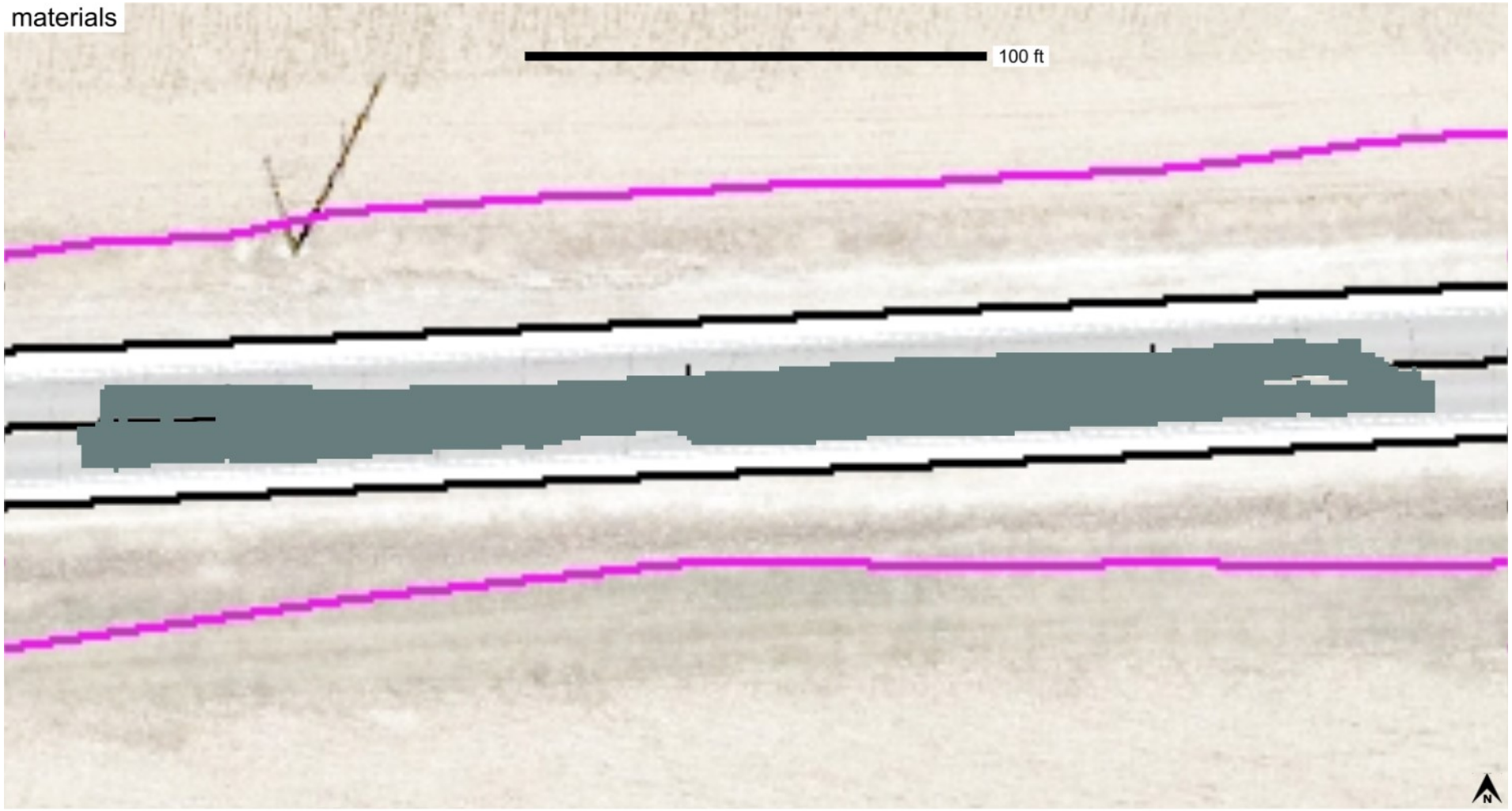
minimum	average	maximum
1073.925	1080.228	1088.37



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_161016a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	4447	0.102	12	9037	150	40



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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.2	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_163240a	No. of Measurements:	5839	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 4:32:40 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	118.62	1.36	9037	9421.75	28484.7	56000	6485.69	22.77	384.75	19447.7	46963
k-value	Yes	63.9	85.92	1.01	150	33.08	156.2	190	25.03	16.03	-116.92	6.2	40
Moisture Content	No												

Mapped Area

square feet	acres
5839	0.13

Pass Count

min.	avg.	max.
1	2.37	7

Elevation (ft)

min.	avg.	max.
1073.53	1083.38	1093.16

Velocity (fps)

min.	avg.	max.
0.08	5.59	6.32

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	5839	0.134	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.2	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_163240a	No. of Measurements:	5839	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 4:32:40 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
118.62	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
22.77	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.2	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_163240a	No. of Measurements:	5839	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 4:32:40 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
85.92	CQI > = 95
63.9	80% of k-Value MVs >= 150
16.03	COV <= 20
26.36	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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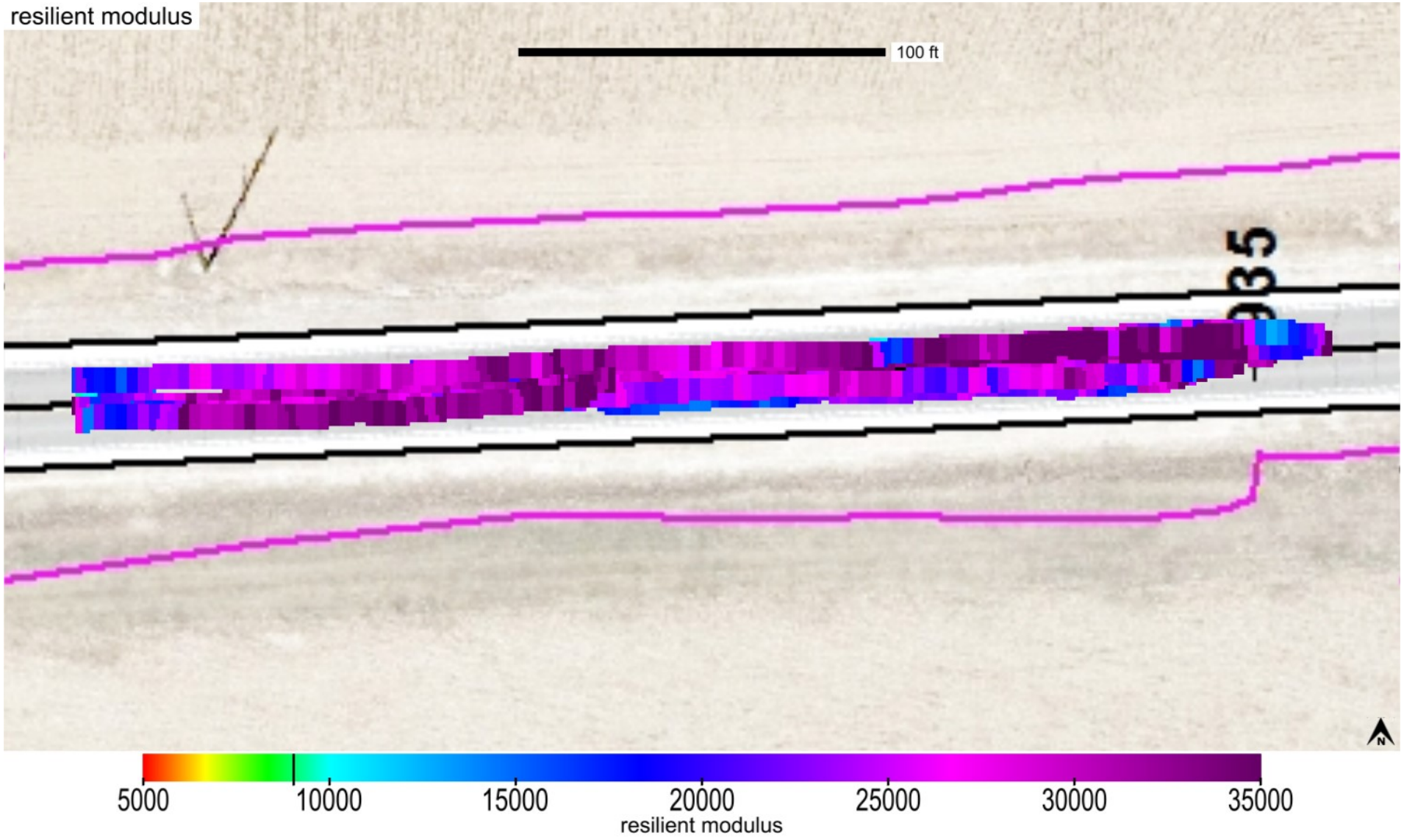
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.62	1.36	9037	9421.75	28484.7	56000	6485.69	22.77	384.75	19447.7	46963



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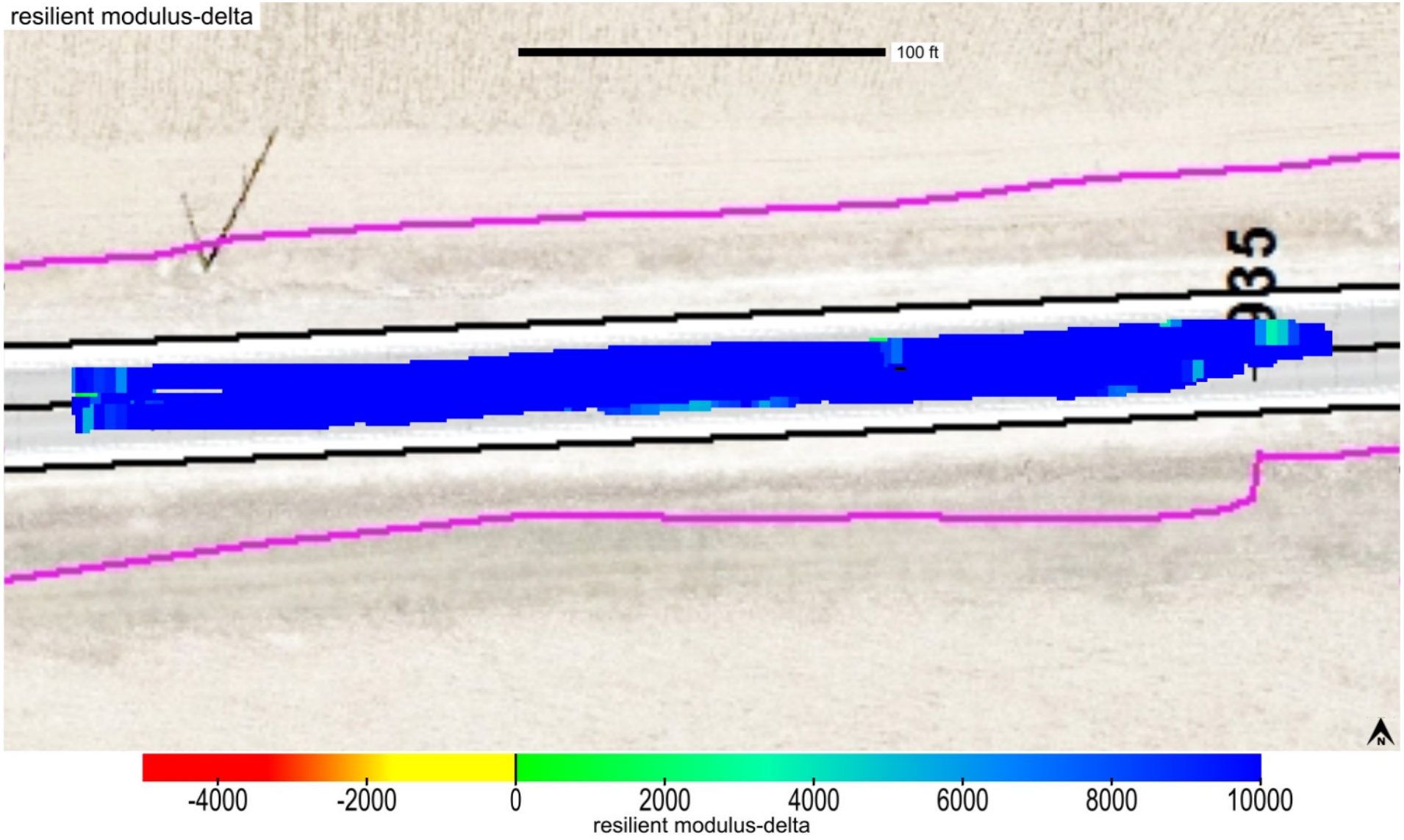
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.62	1.36	9037	9421.75	28484.7	56000	6485.69	22.77	384.75	19447.7	46963



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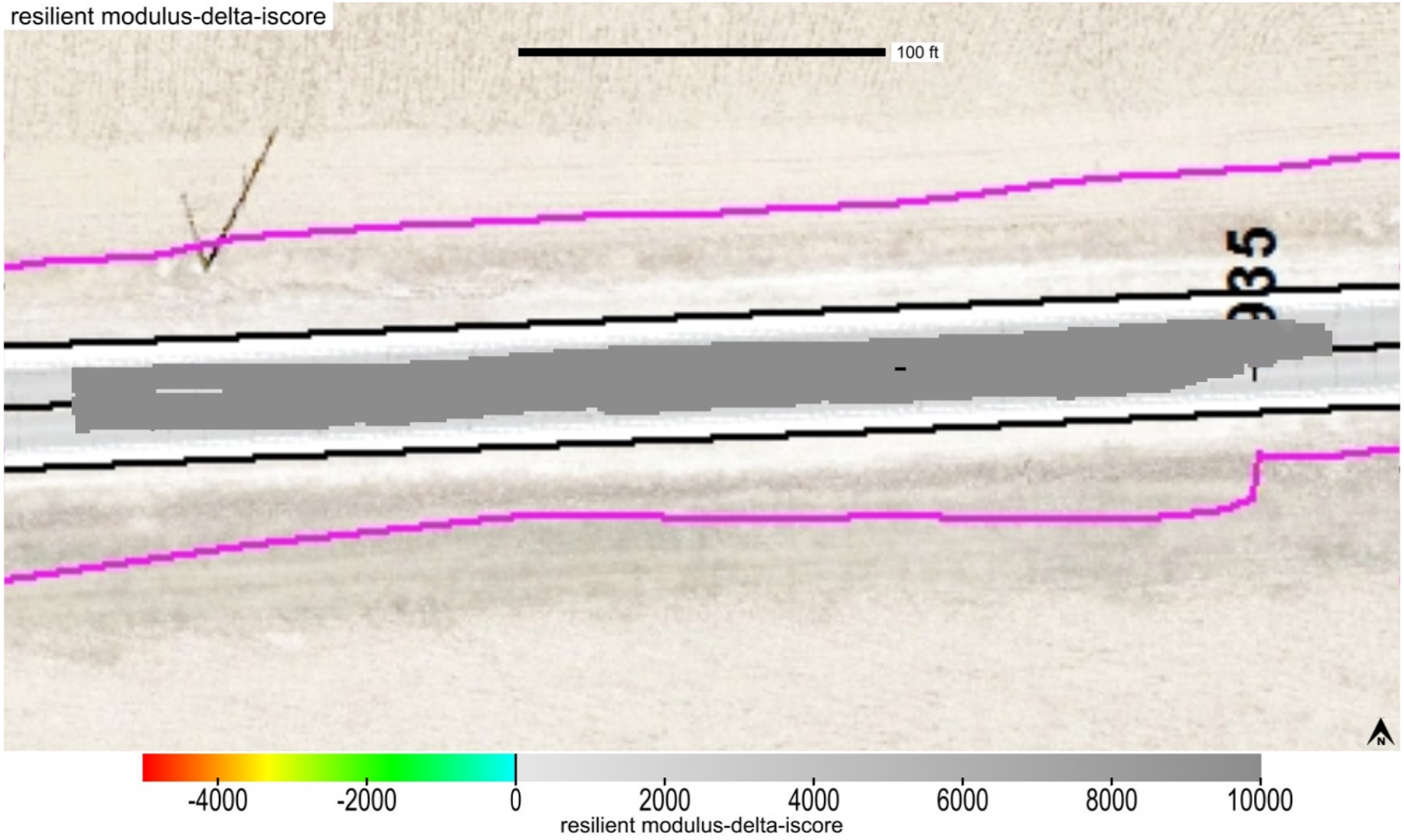
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	384.75	19447.7	46963	8762.05	19578.17	28129.93



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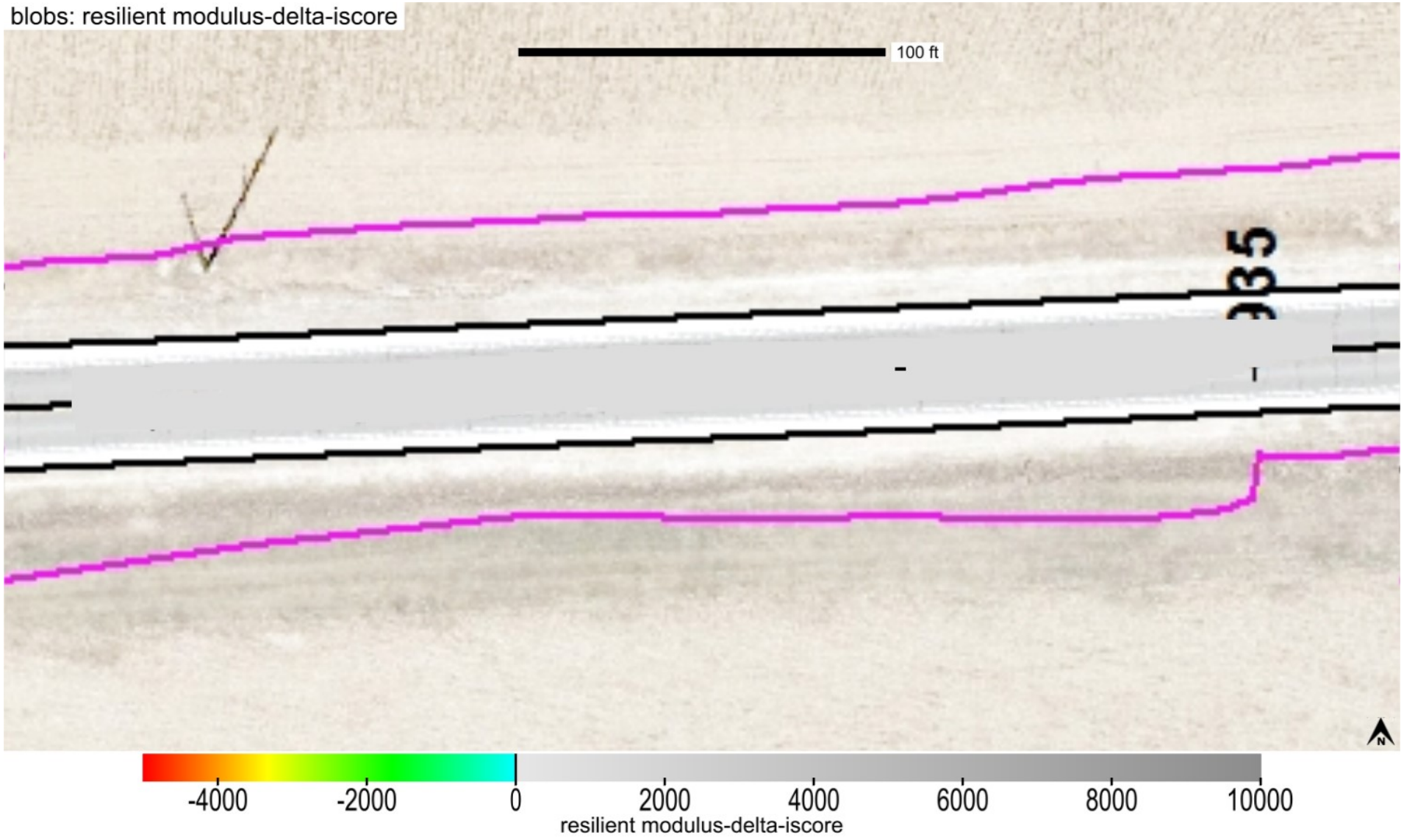
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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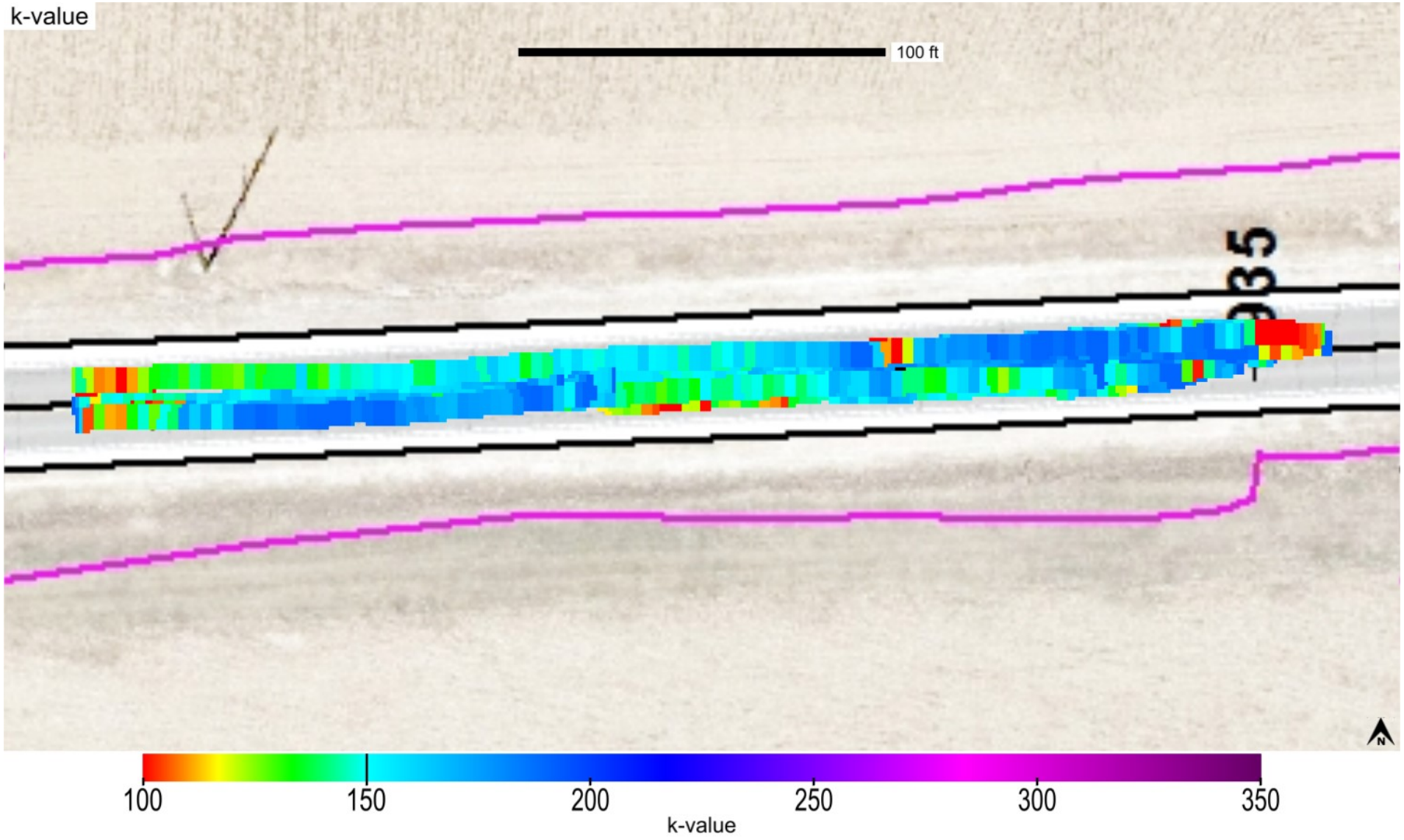
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	63.9	85.92	1.01	150	33.08	156.2	190	25.03	16.03	-116.92	6.2	40



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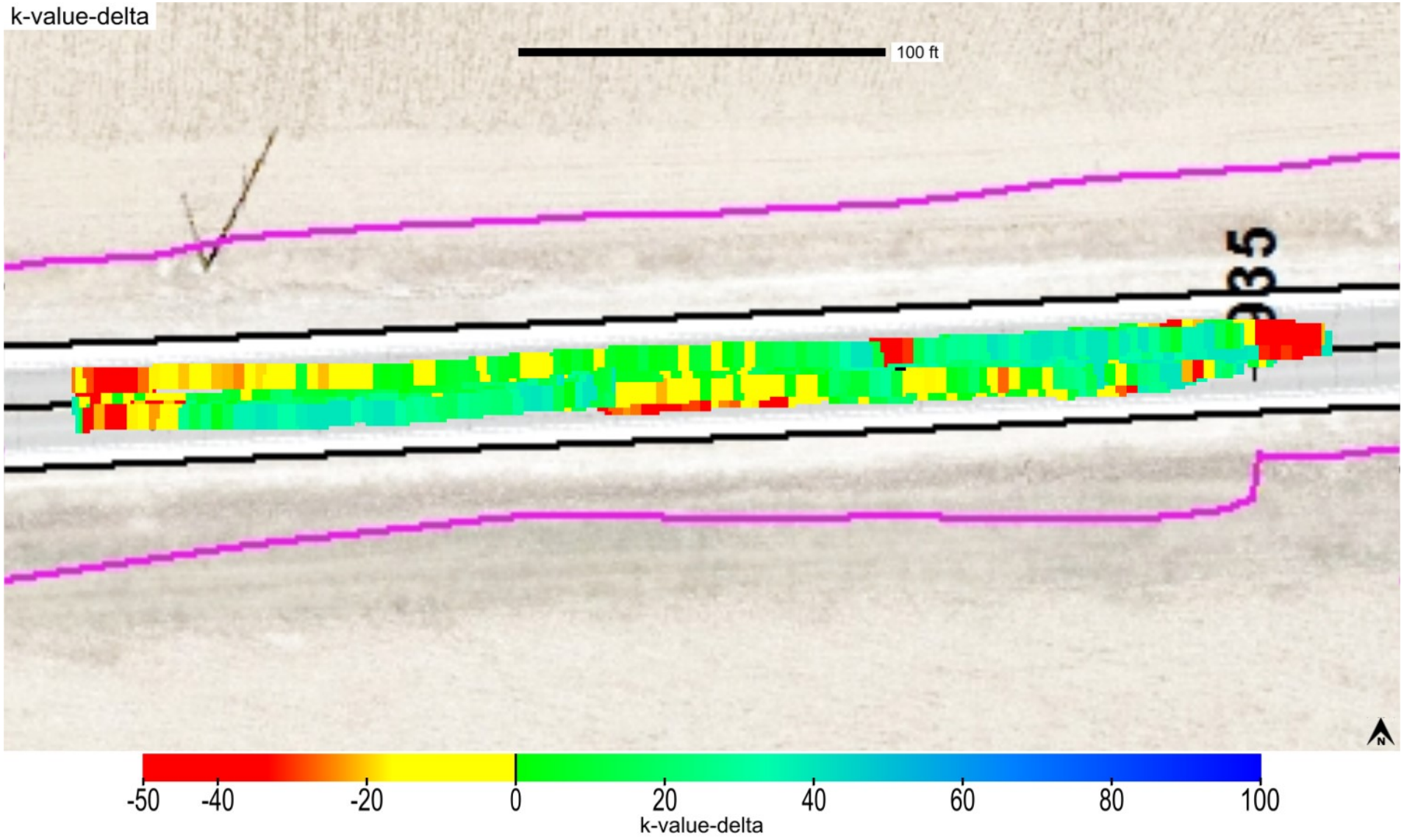
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	63.9	85.92	1.01	150	33.08	156.2	190	25.03	16.03	-116.92	6.2	40



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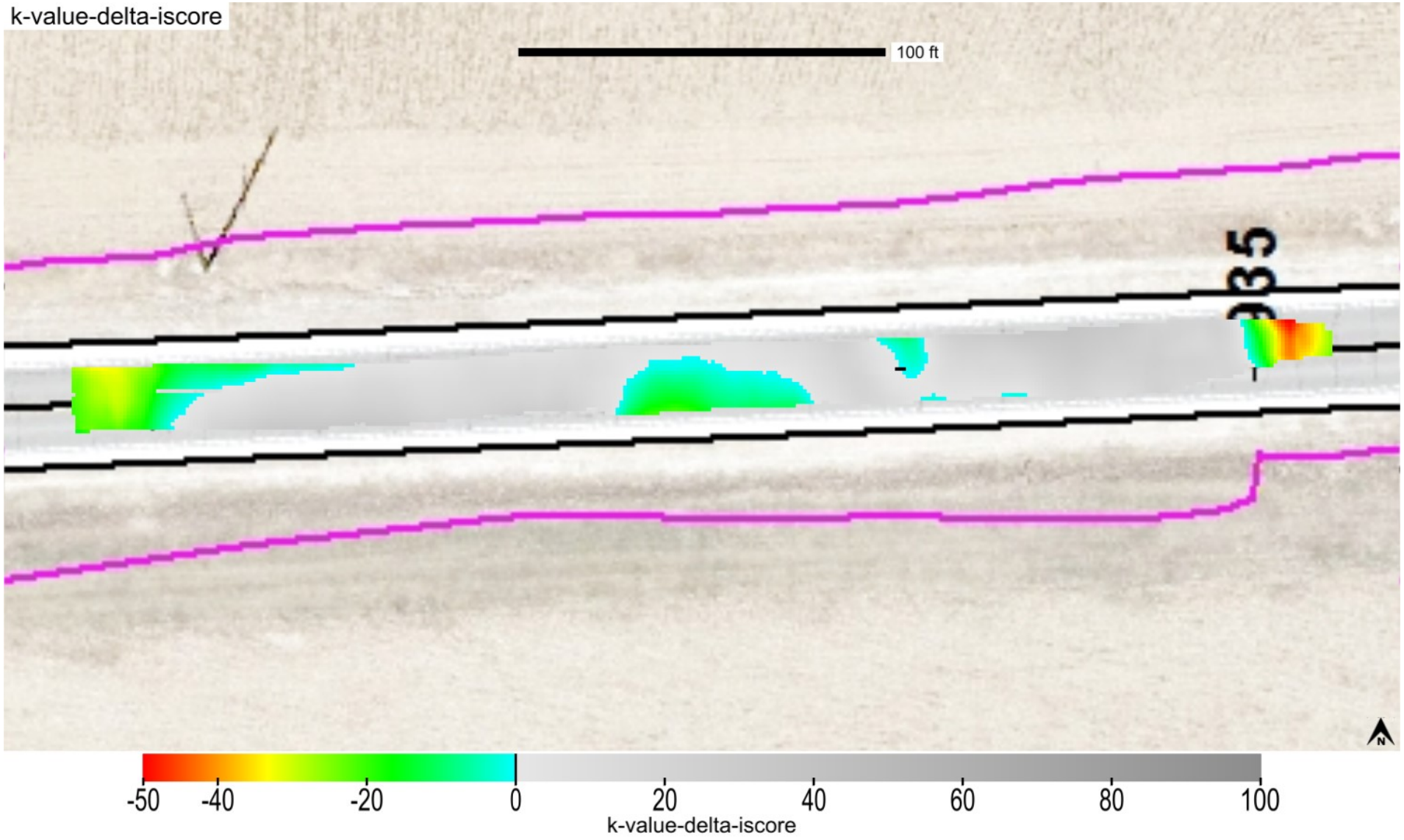
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	63.9	150	-116.92	6.2	40	-50.21	6.54	36.36



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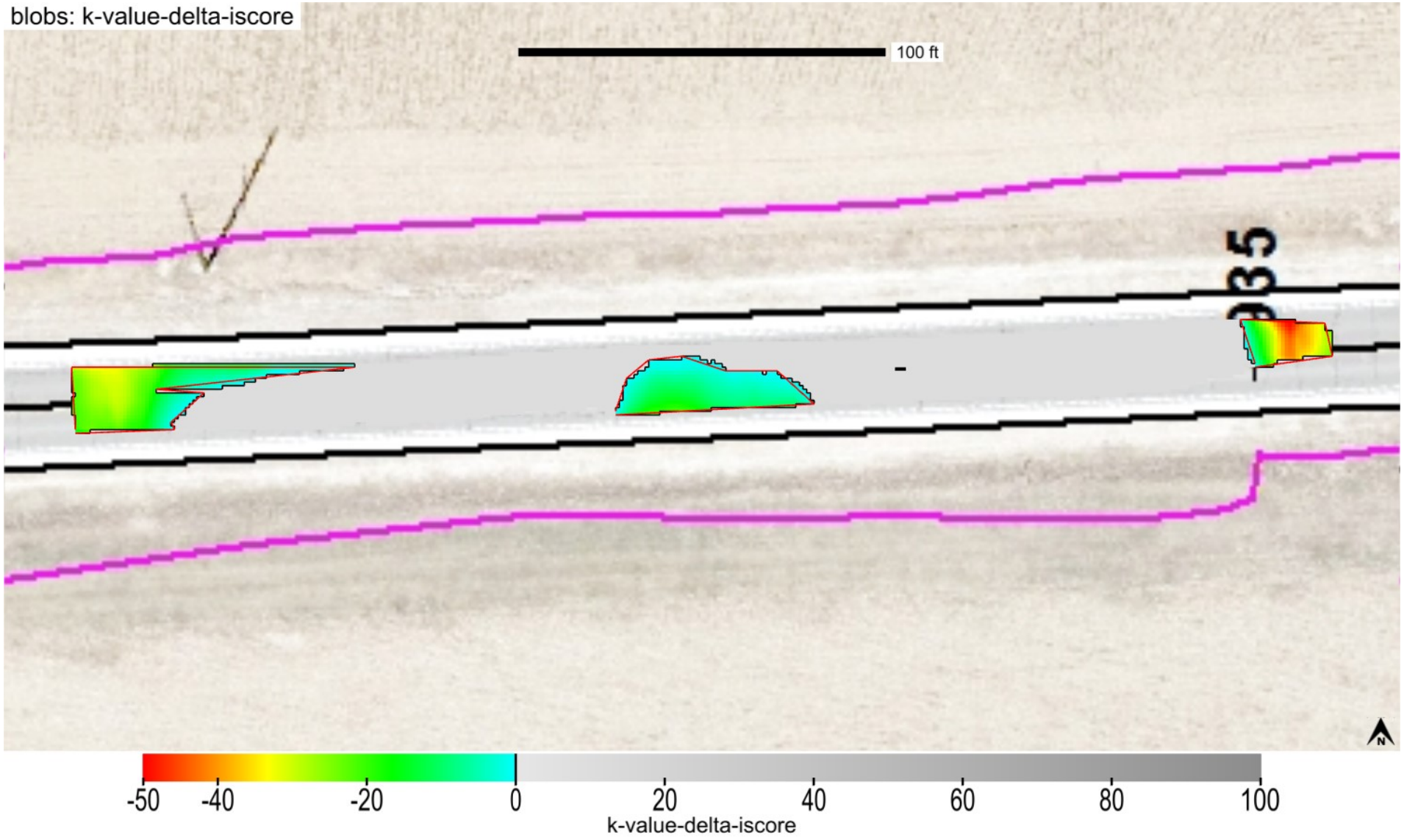
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	1539	26.36	none	0



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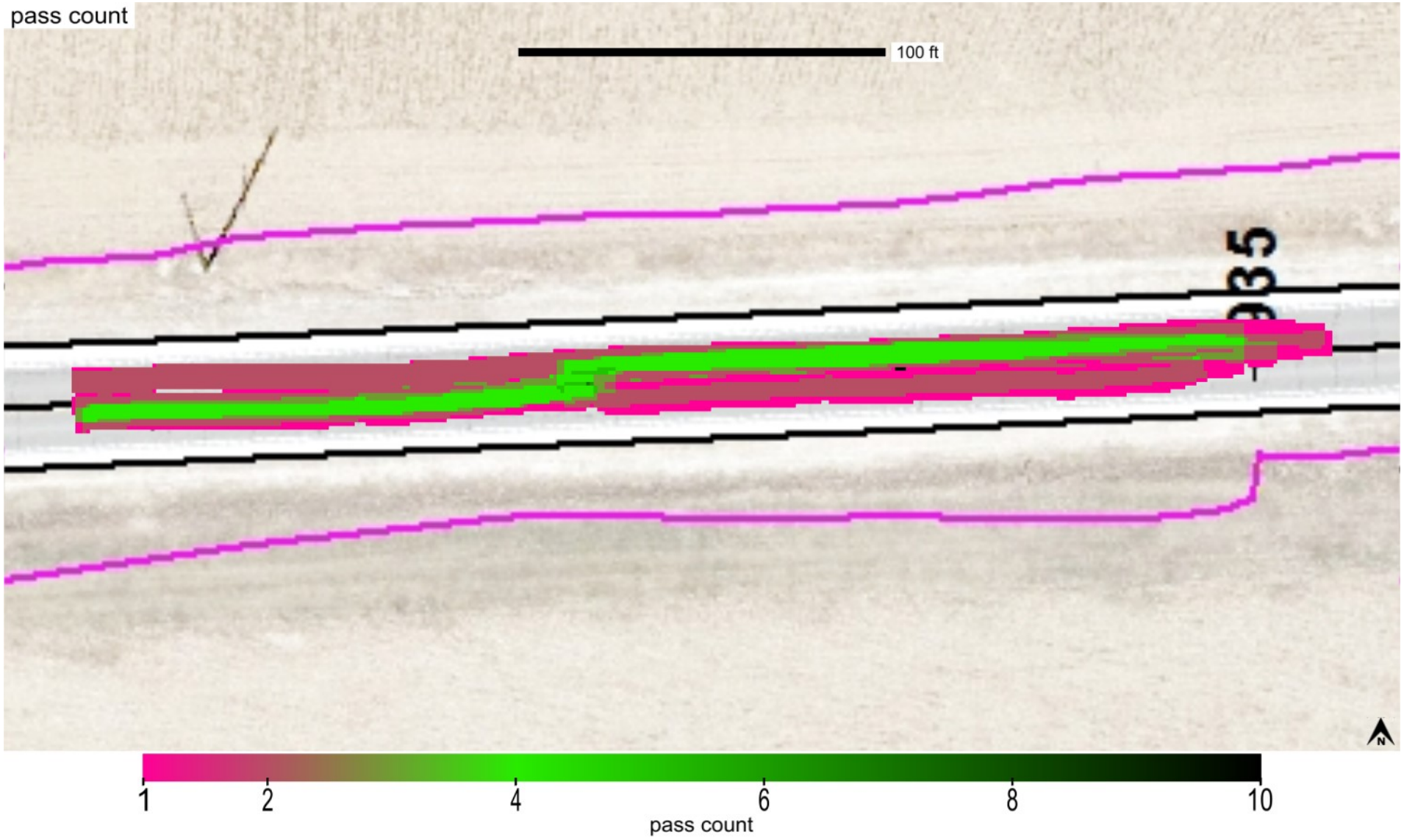
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

minimum	average	maximum
1	2.37	7



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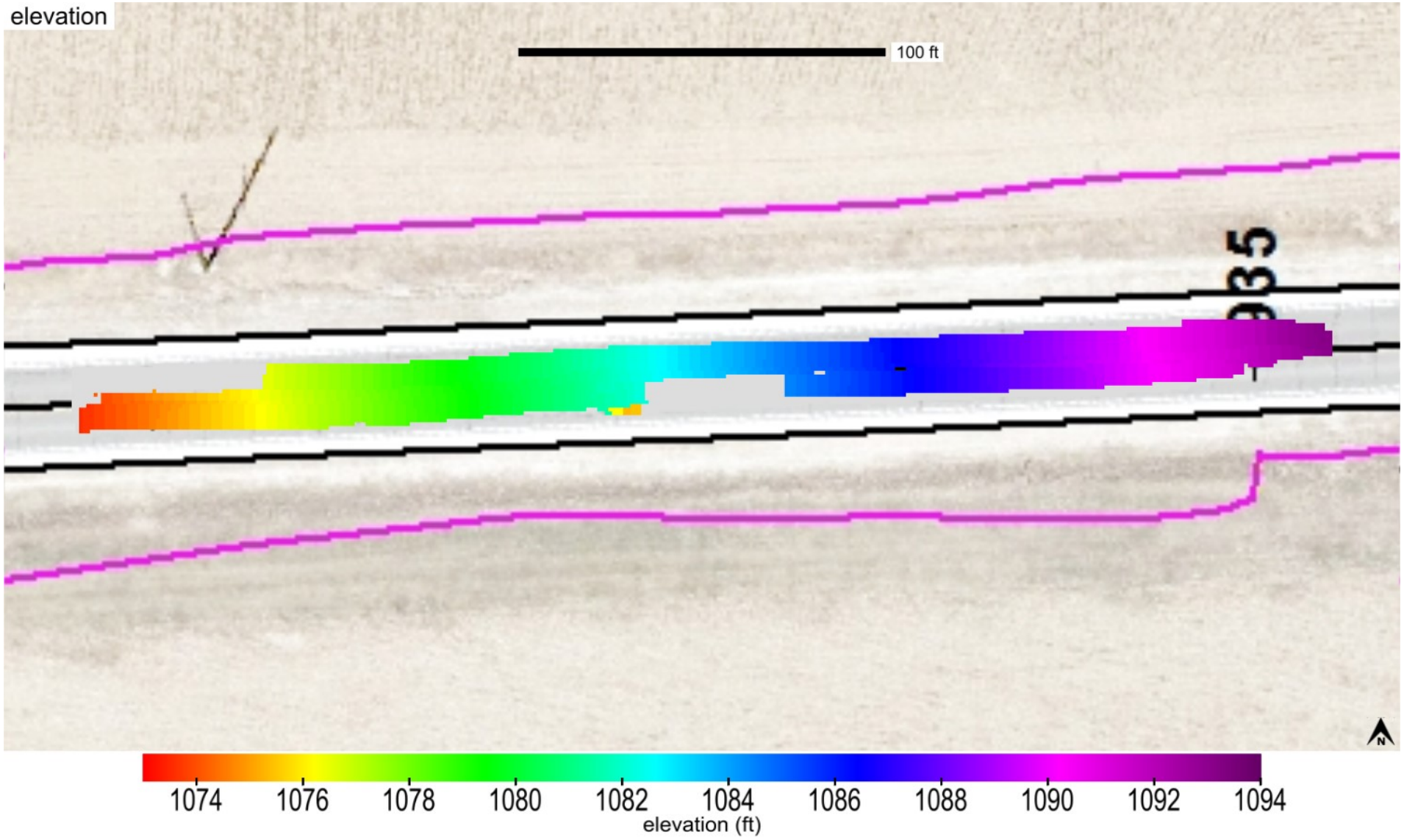
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

minimum	average	maximum
1073.531	1083.376	1093.157



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_163240a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	5839	0.134	12	9037	150	40

Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.19	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_171124a	No. of Measurements:	4454	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:11:24 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.4	114.06	0.99	9037	6766.77	22633.3	56000	6949.69	30.71	-2270.23	13596.3	46963
k-value	Yes	34.2	50.77	0.48	150	20	130.4	190	34.95	26.81	-130	-19.6	40
Moisture Content	No												

Mapped Area

square feet	acres
4454	0.1

Pass Count

min.	avg.	max.
1	2.28	5

Elevation (ft)

min.	avg.	max.
1073.01	1082.44	1093.12

Velocity (fps)

min.	avg.	max.
0.54	5.15	6.99

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	4454	0.102	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.19	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_171124a	No. of Measurements:	4454	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:11:24 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.06	CQI > = 95
99.4	80% of Resilient Modulus MVs >= 9037
30.71	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.19	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_171124a	No. of Measurements:	4454	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:11:24 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
50.77	CQI > = 95
34.2	80% of k-Value MVs >= 150
26.81	COV <= 20
96.09	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

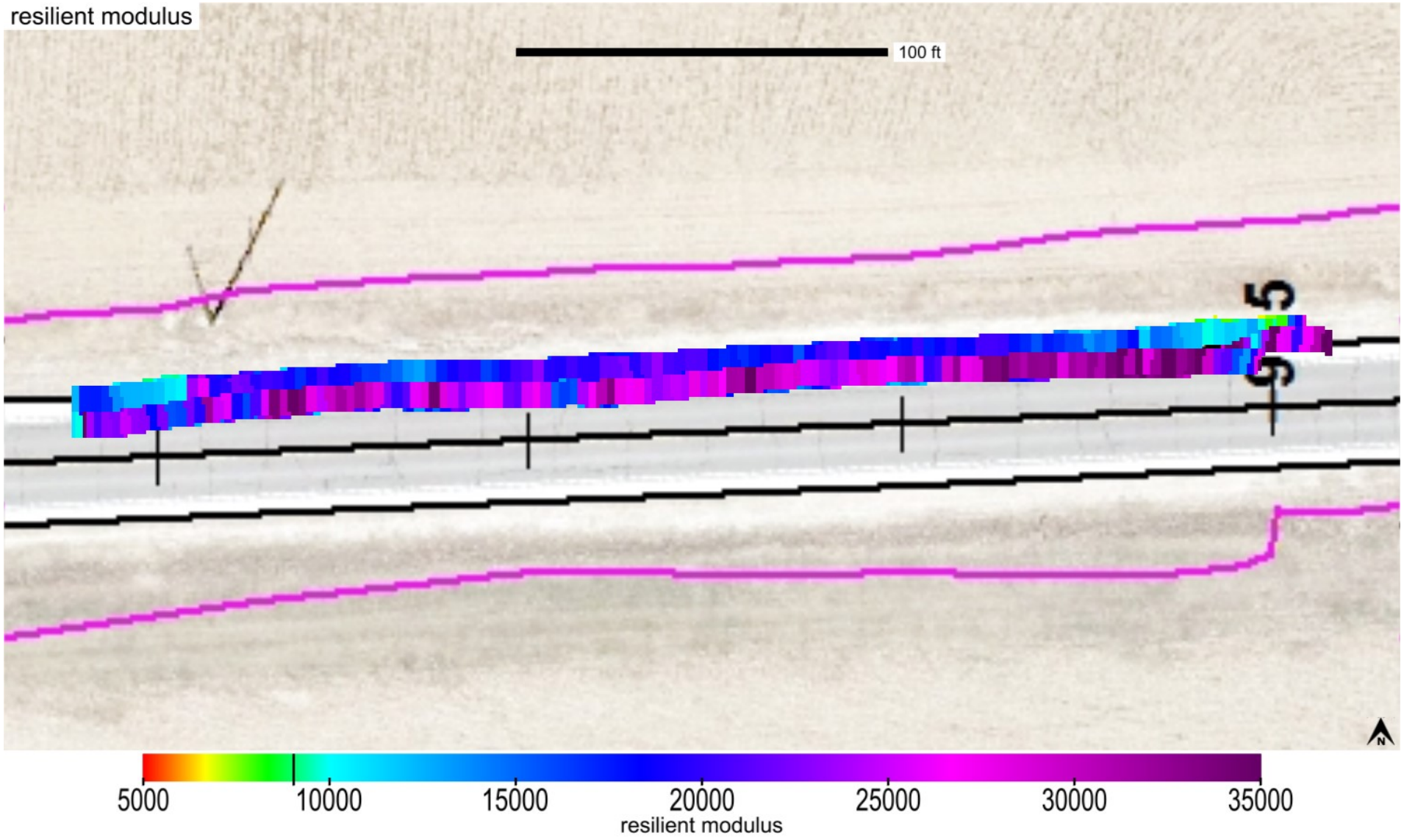
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

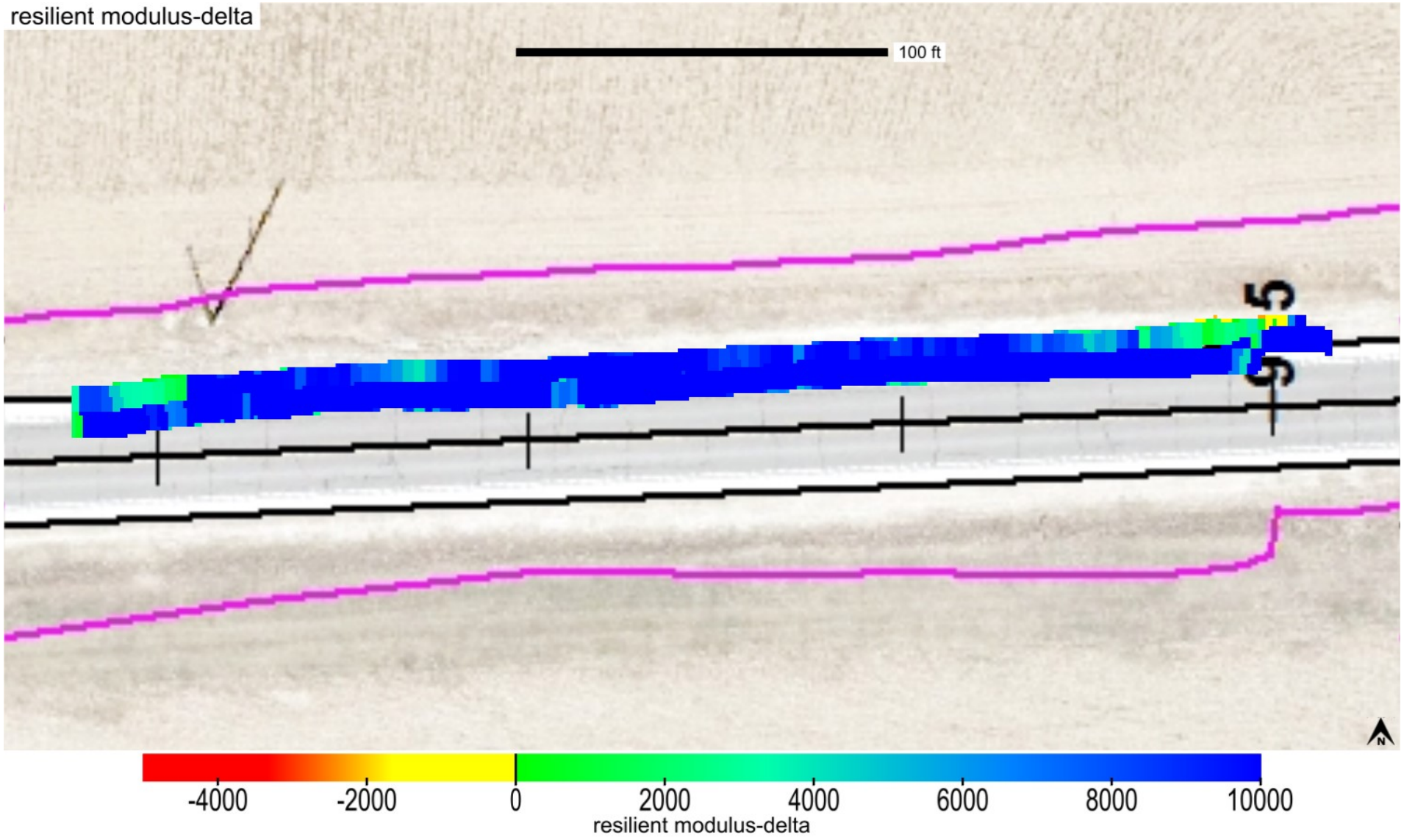
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	114.06	0.99	9037	6766.77	22633.3	56000	6949.69	30.71	-2270.23	13596.3	46963



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	114.06	0.99	9037	6766.77	22633.3	56000	6949.69	30.71	-2270.23	13596.3	46963



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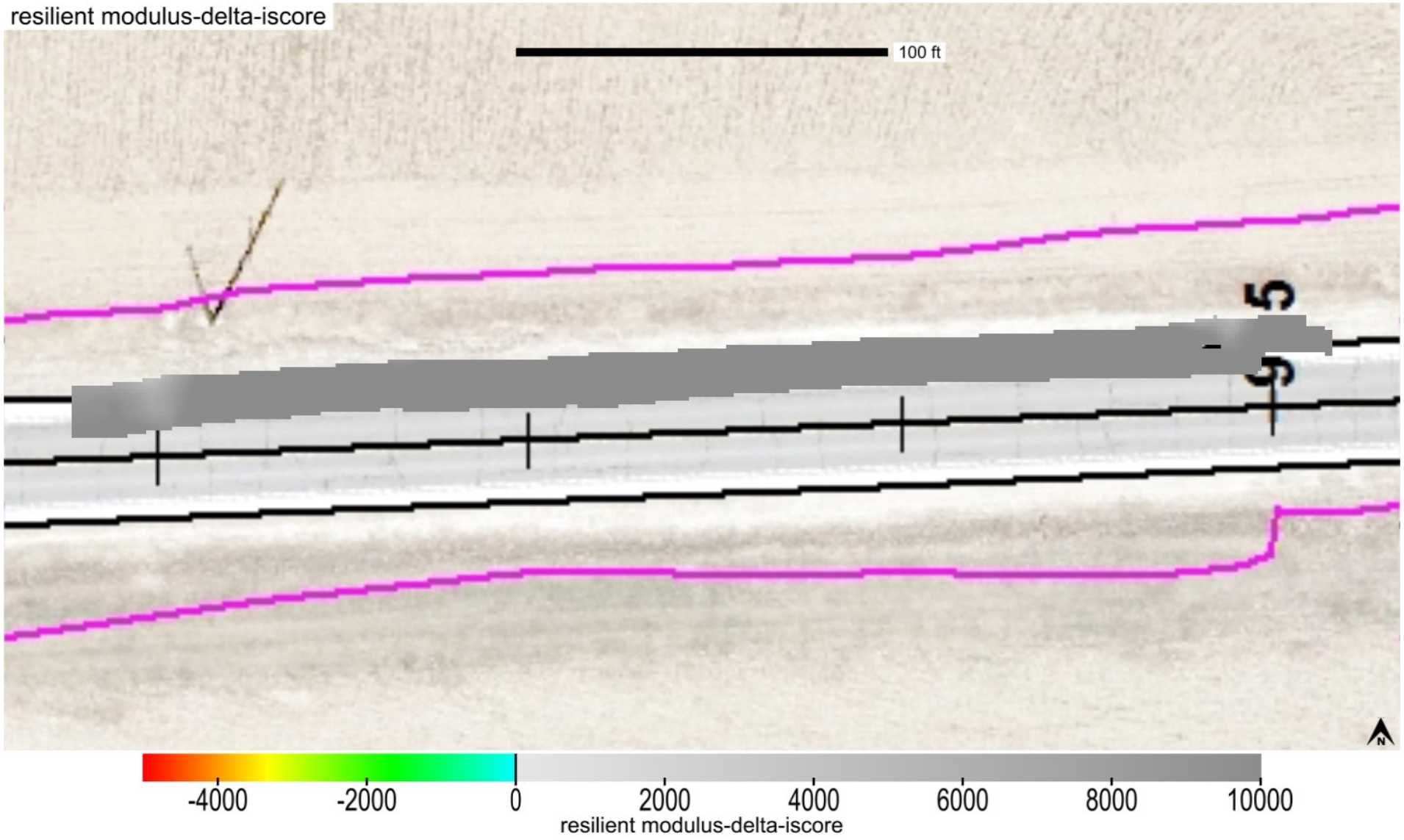
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.4	9037	-2270.23	13596.3	46963	4341.77	13736.28	22246.72



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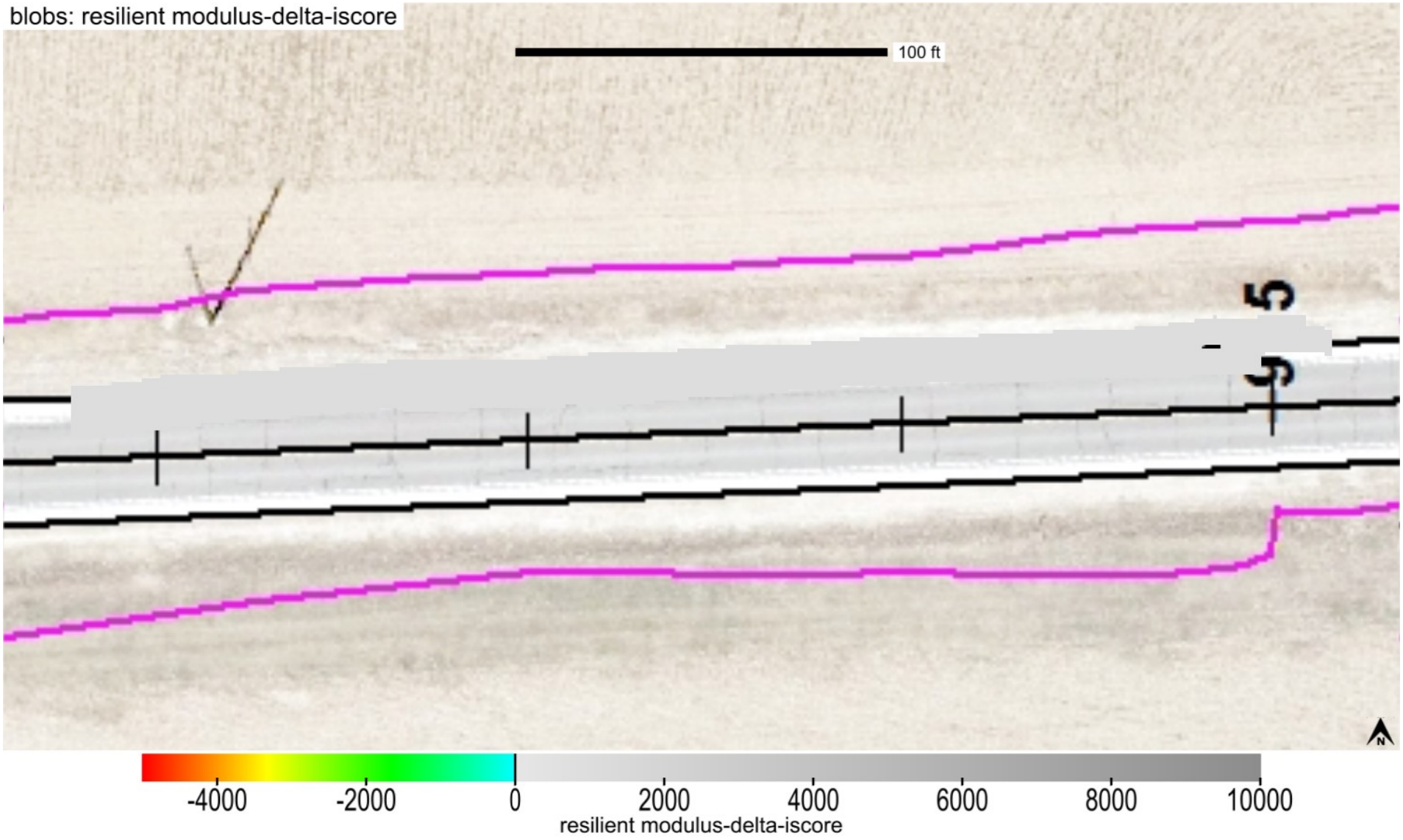
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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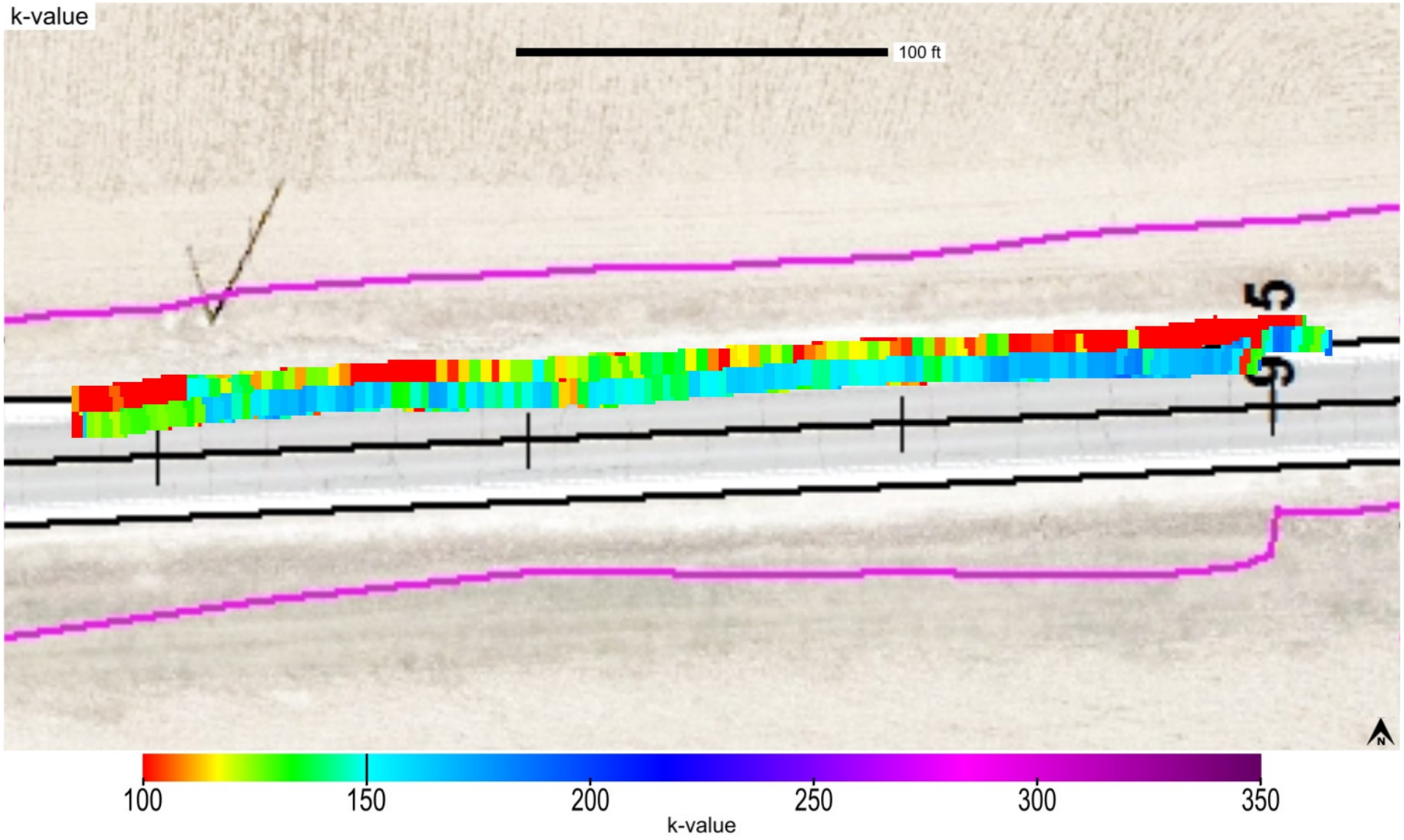
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

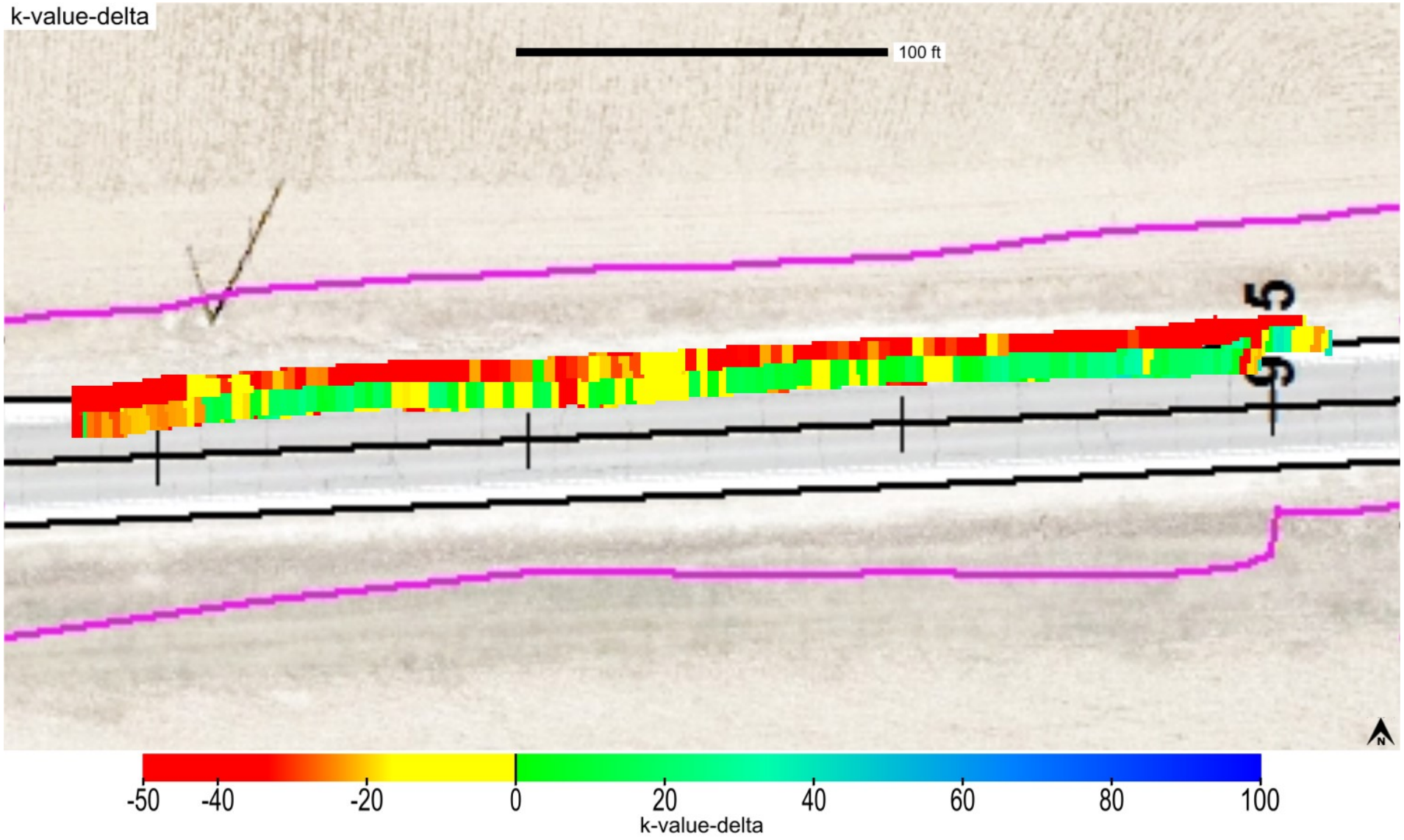
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	34.2	50.77	0.48	150	20	130.4	190	34.95	26.81	-130	-19.6	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

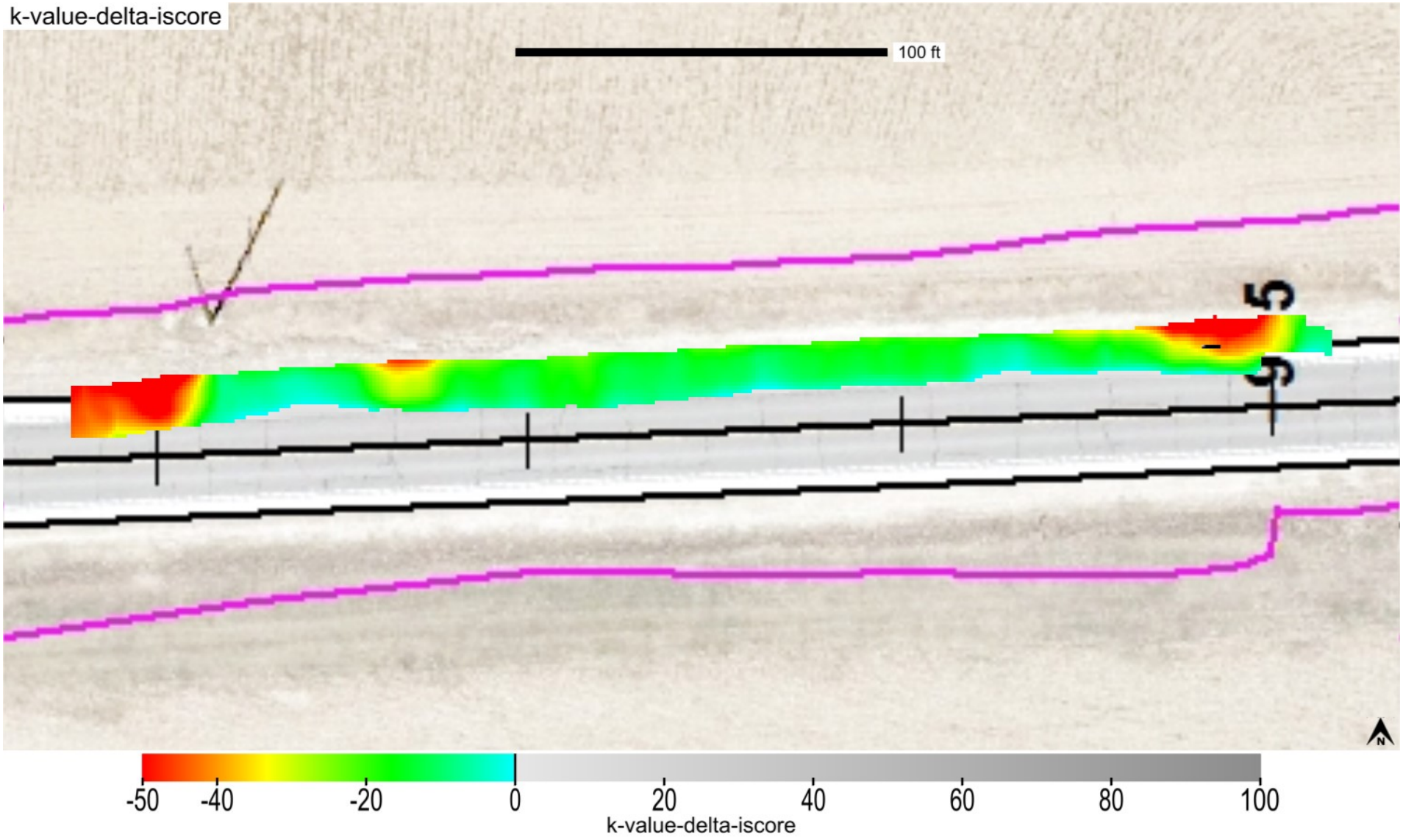
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	34.2	50.77	0.48	150	20	130.4	190	34.95	26.81	-130	-19.6	40



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	34.2	150	-130	-19.6	40	-84.63	-18.94	9.51



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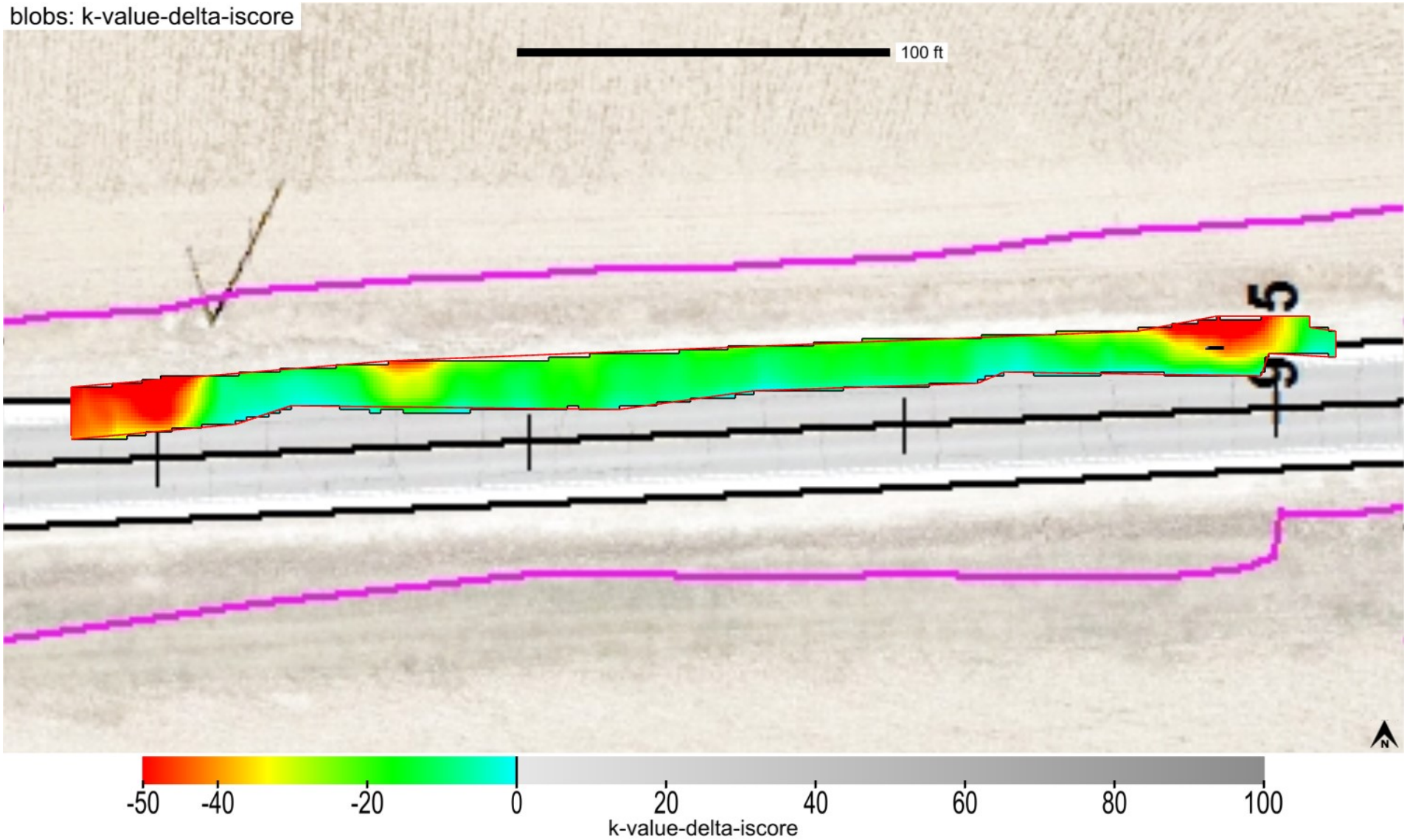
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

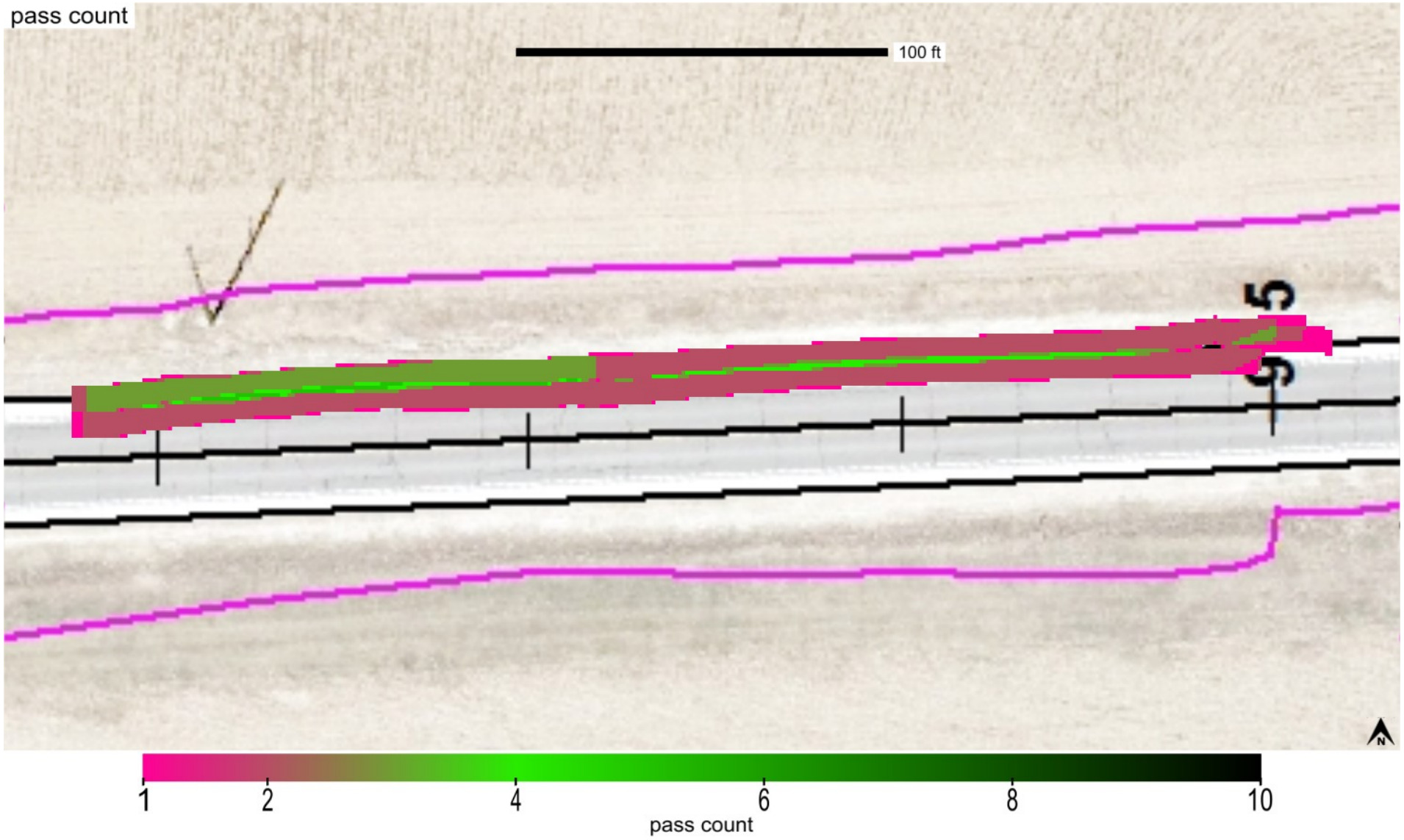
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	4280	96.09	none	0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

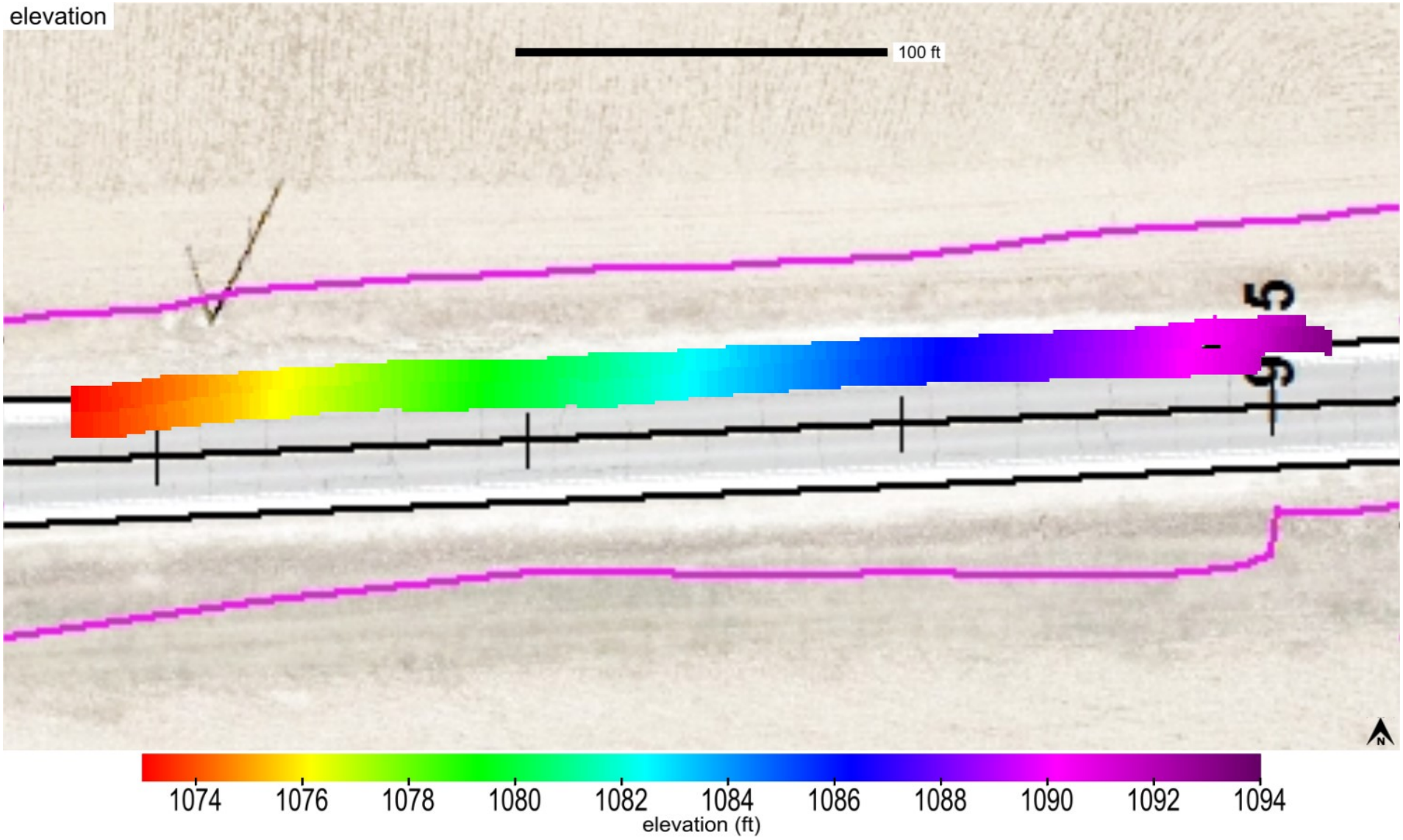
minimum	average	maximum
1	2.28	5



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

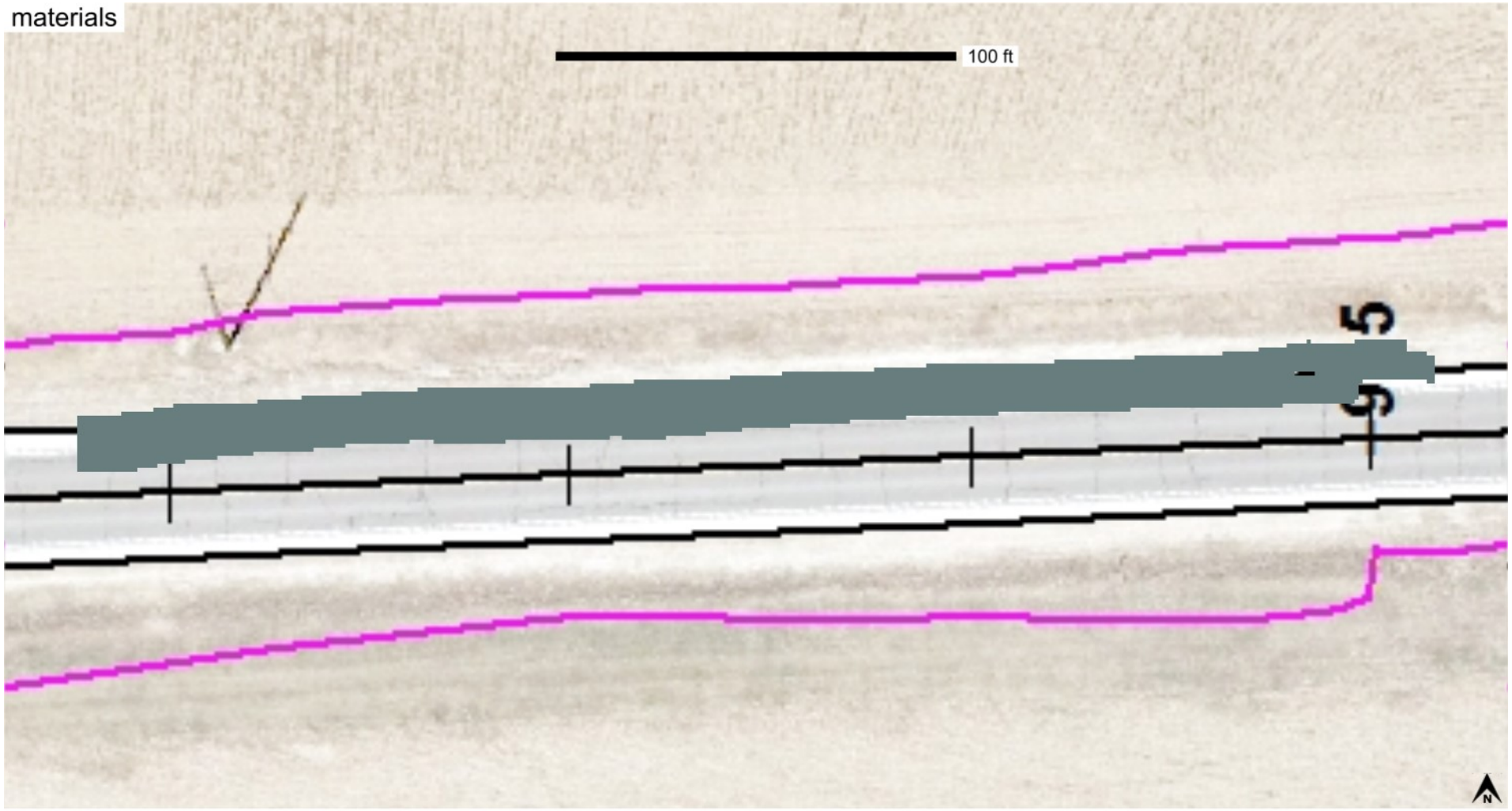
minimum	average	maximum
1073.013	1082.445	1093.121



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_171124a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	4454	0.102	12	9037	150	40



Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.18	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_173630a	No. of Measurements:	5968	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:36:30 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	98.6	115.33	1.15	9037	6787.41	24654.5	45949.31	6563.91	26.62	-2249.59	15617.5	36912.31
k-value	Yes	41.1	60.49	0.66	150	20	137.8	190	29.27	21.25	-130	-12.2	40
Moisture Content	No												

Mapped Area

square feet	acres
5968	0.14

Pass Count

min.	avg.	max.
1	2.05	4

Elevation (ft)

min.	avg.	max.
1073.48	1087.49	1101.79

Velocity (fps)

min.	avg.	max.
0.25	5.64	6.12

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	5968	0.137	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.18	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_173630a	No. of Measurements:	5968	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:36:30 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
115.33	CQI > = 95
98.6	80% of Resilient Modulus MVs >= 9037
26.62	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.18	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_173630a	No. of Measurements:	5968	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:36:30 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
60.49	CQI > = 95
41.1	80% of k-Value MVs >= 150
21.25	COV <= 20
71.18	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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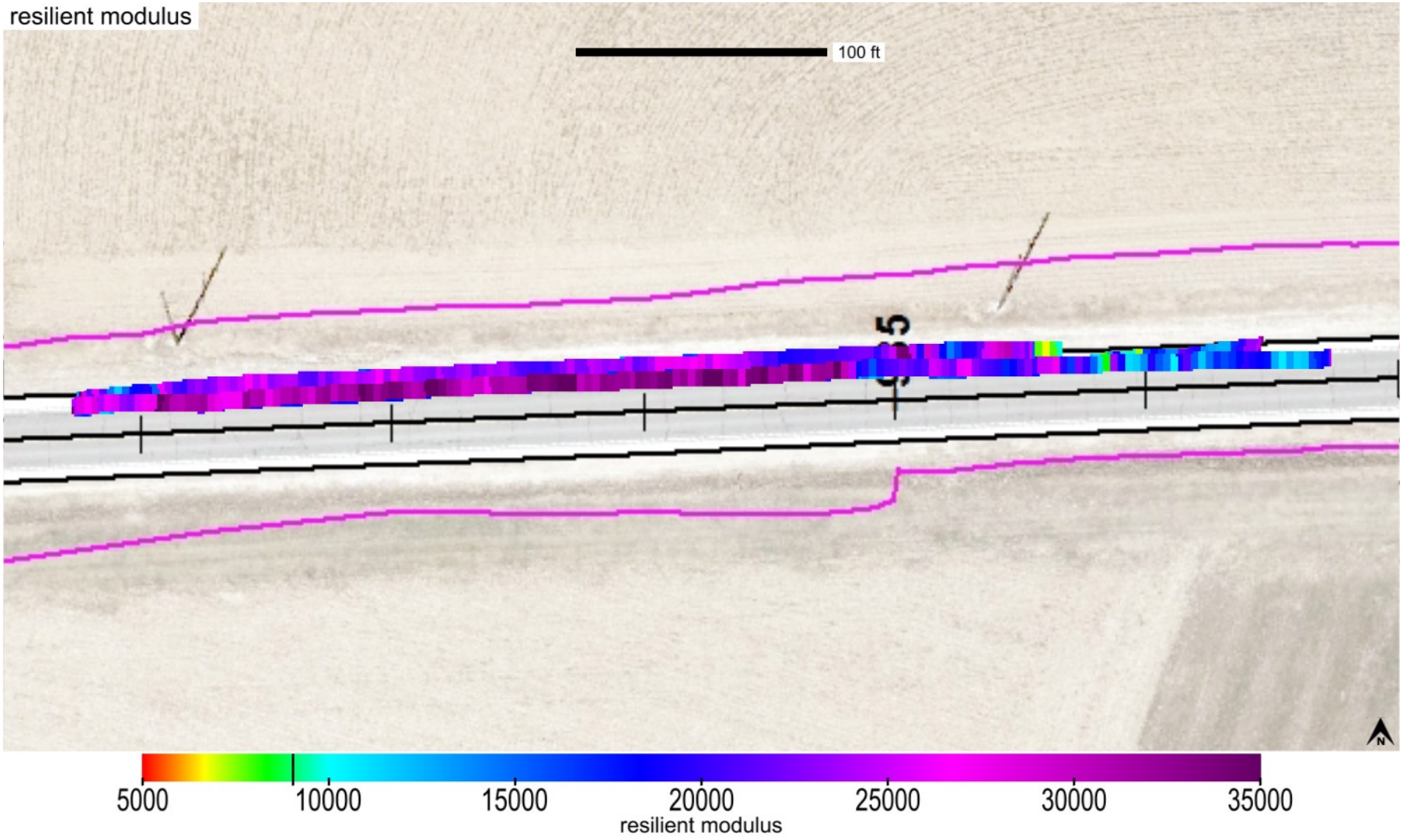
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.6	115.33	1.15	9037	6787.41	24654.5	45949.31	6563.91	26.62	-2249.59	15617.5	36912.31



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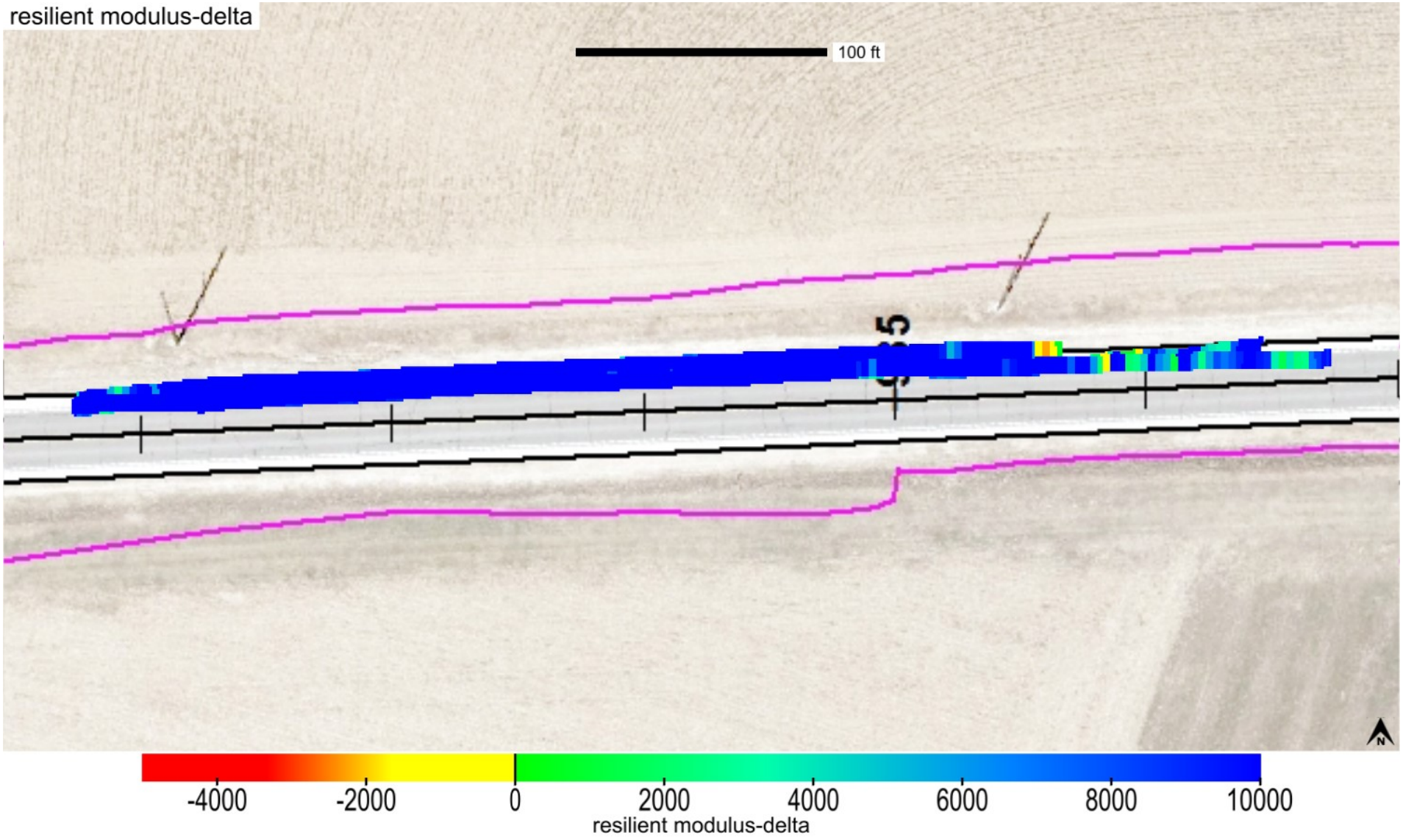
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.6	115.33	1.15	9037	6787.41	24654.5	45949.31	6563.91	26.62	-2249.59	15617.5	36912.31



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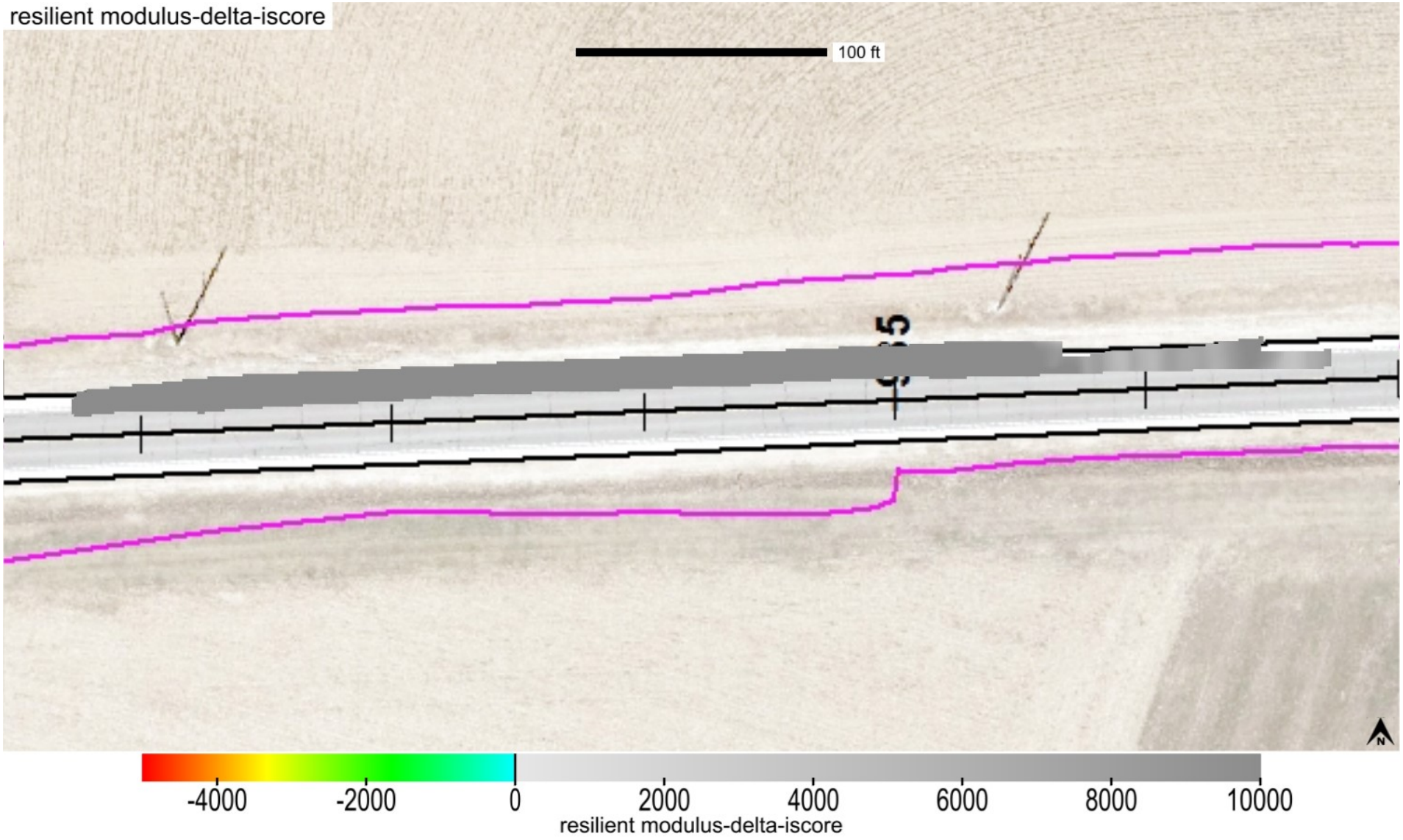
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	98.6	9037	-2249.59	15617.5	36912.31	3739.6	15699.84	23070.08



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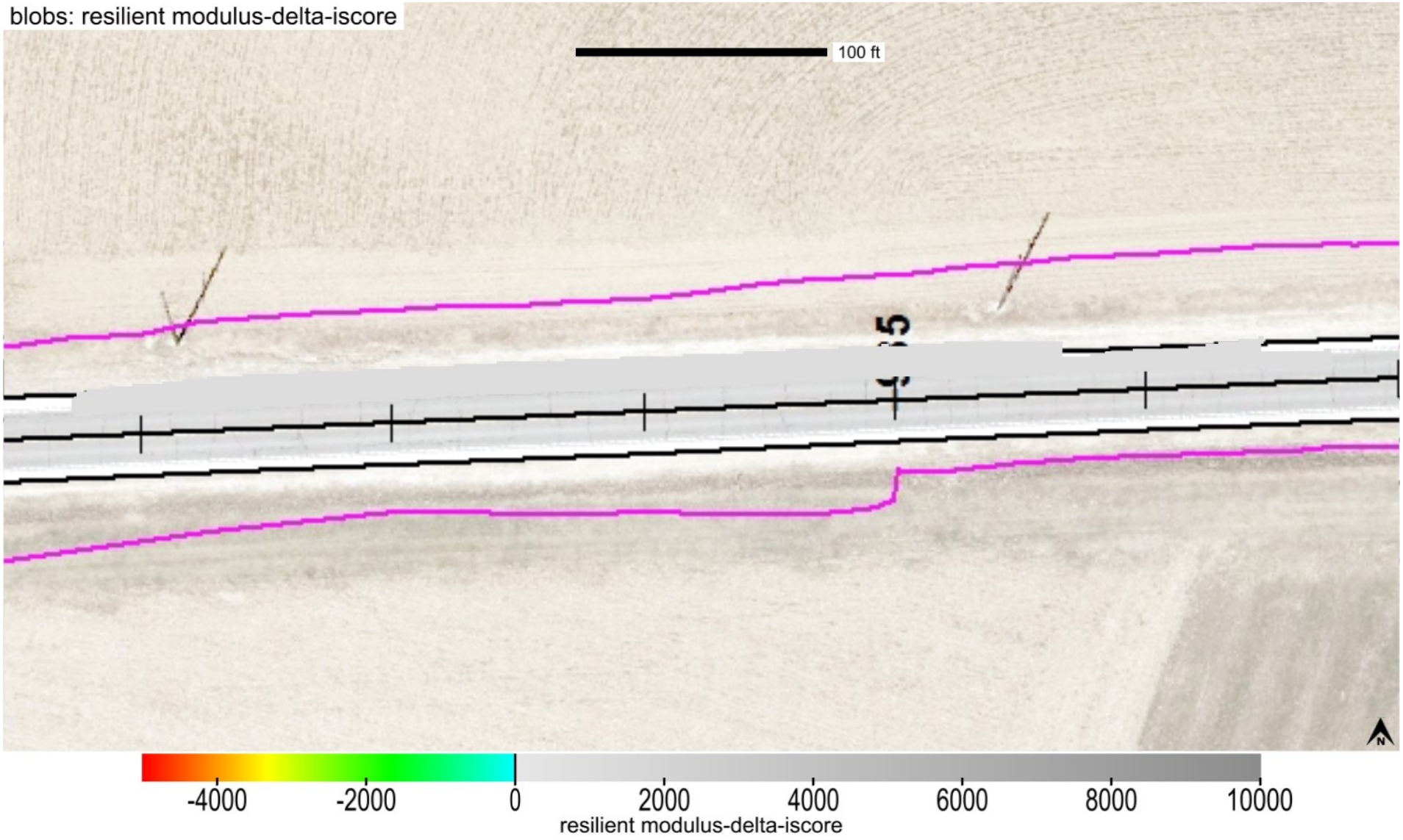
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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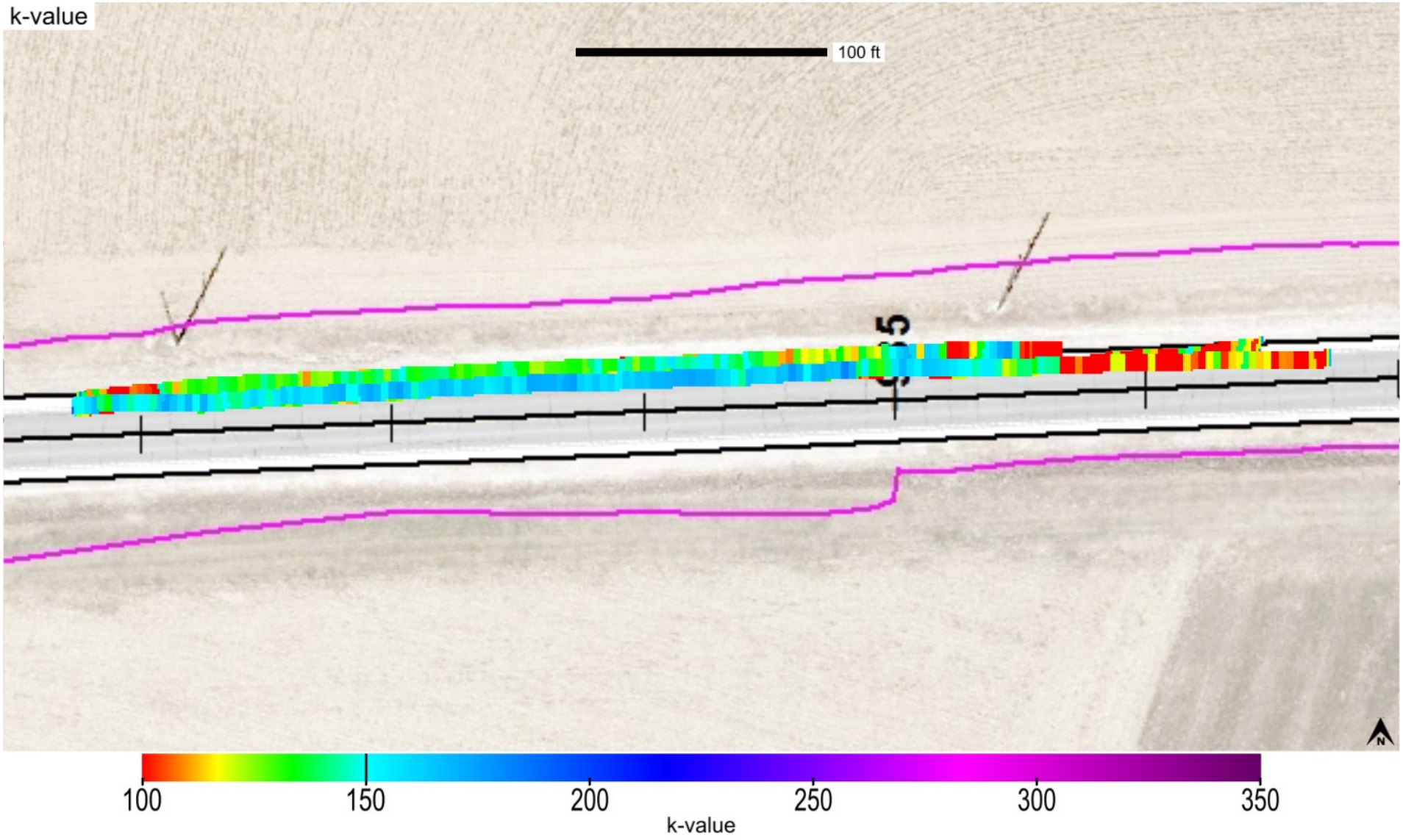
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	41.1	60.49	0.66	150	20	137.8	190	29.27	21.25	-130	-12.2	40



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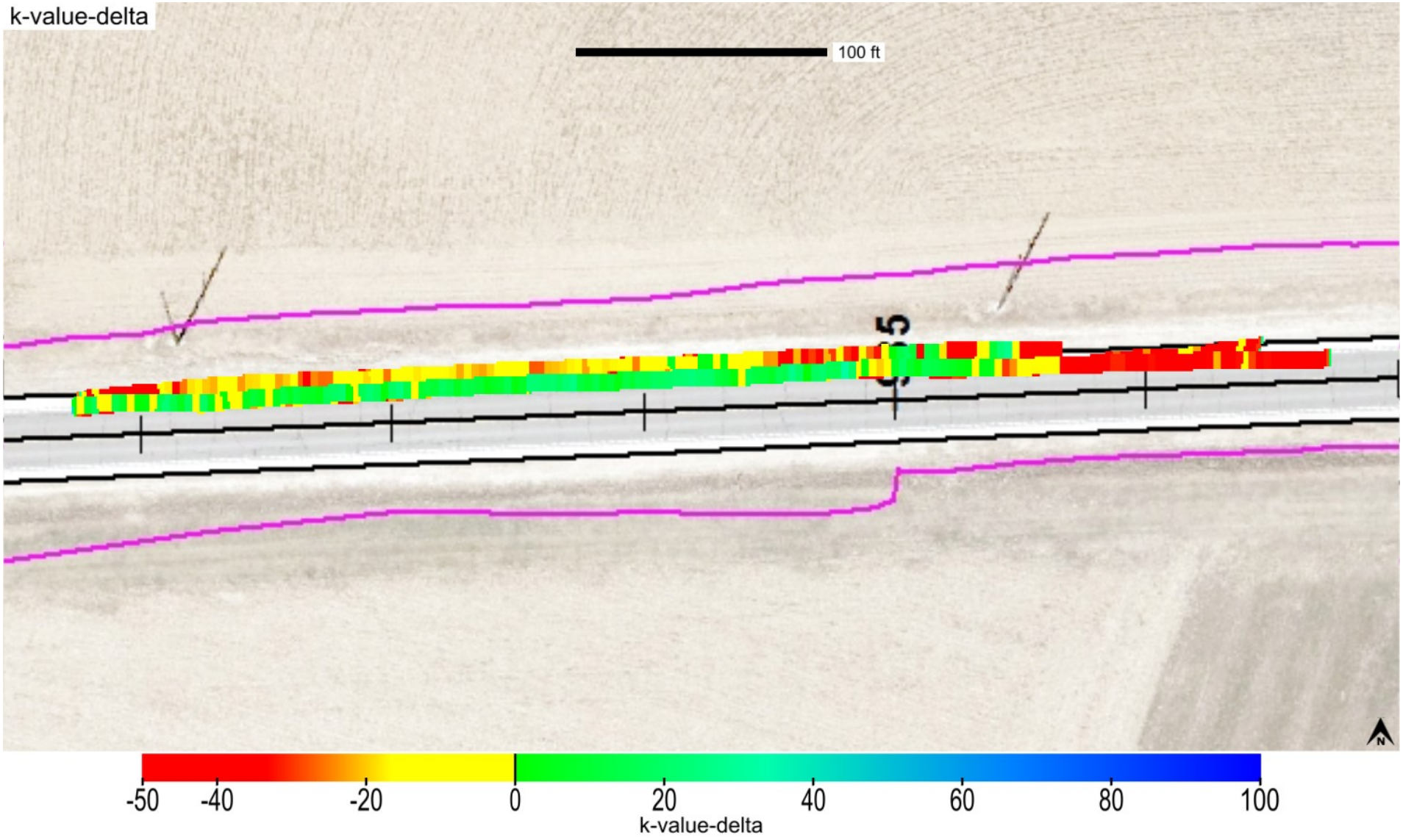
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	41.1	60.49	0.66	150	20	137.8	190	29.27	21.25	-130	-12.2	40



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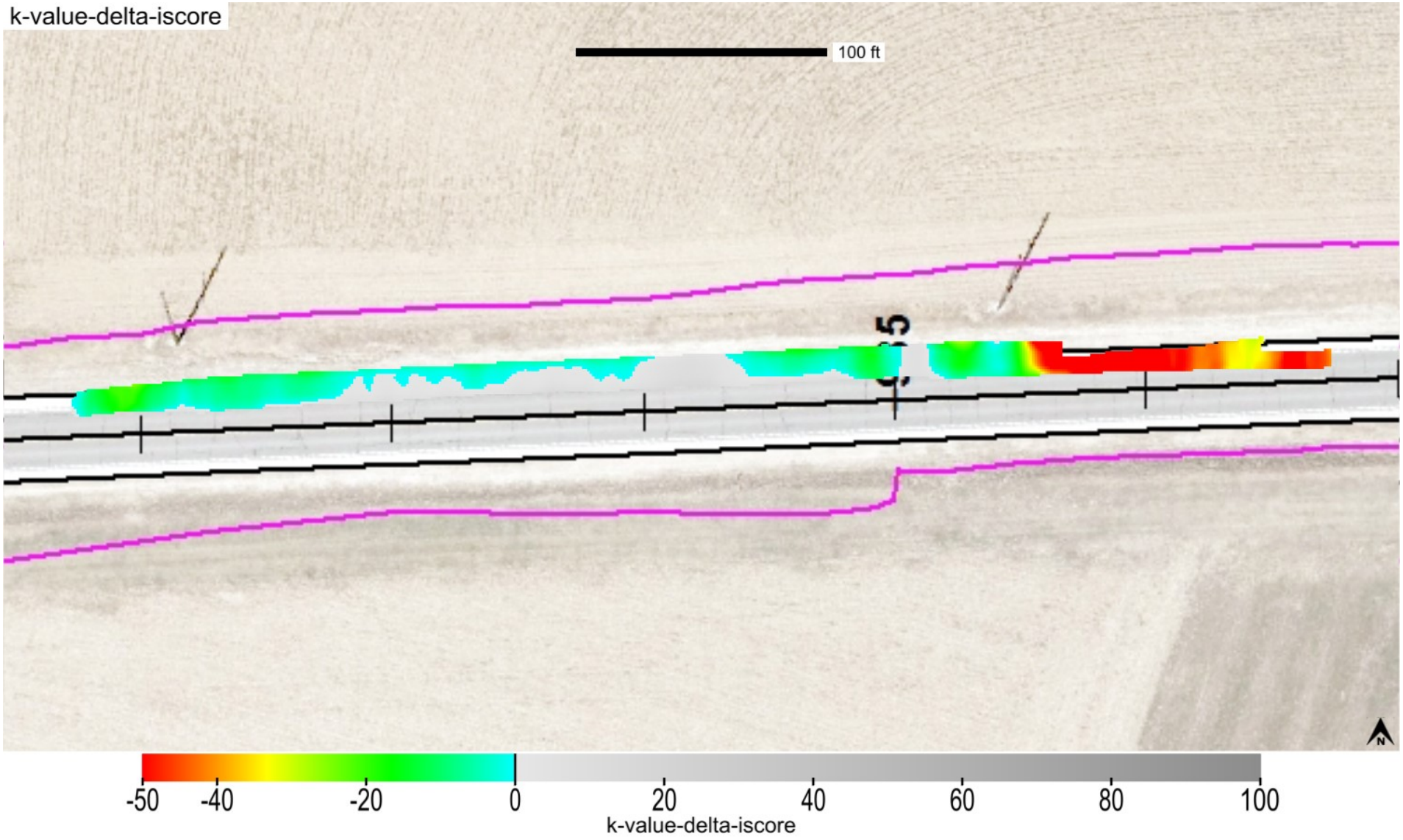
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	41.1	150	-130	-12.2	40	-79.58	-11.84	15.78



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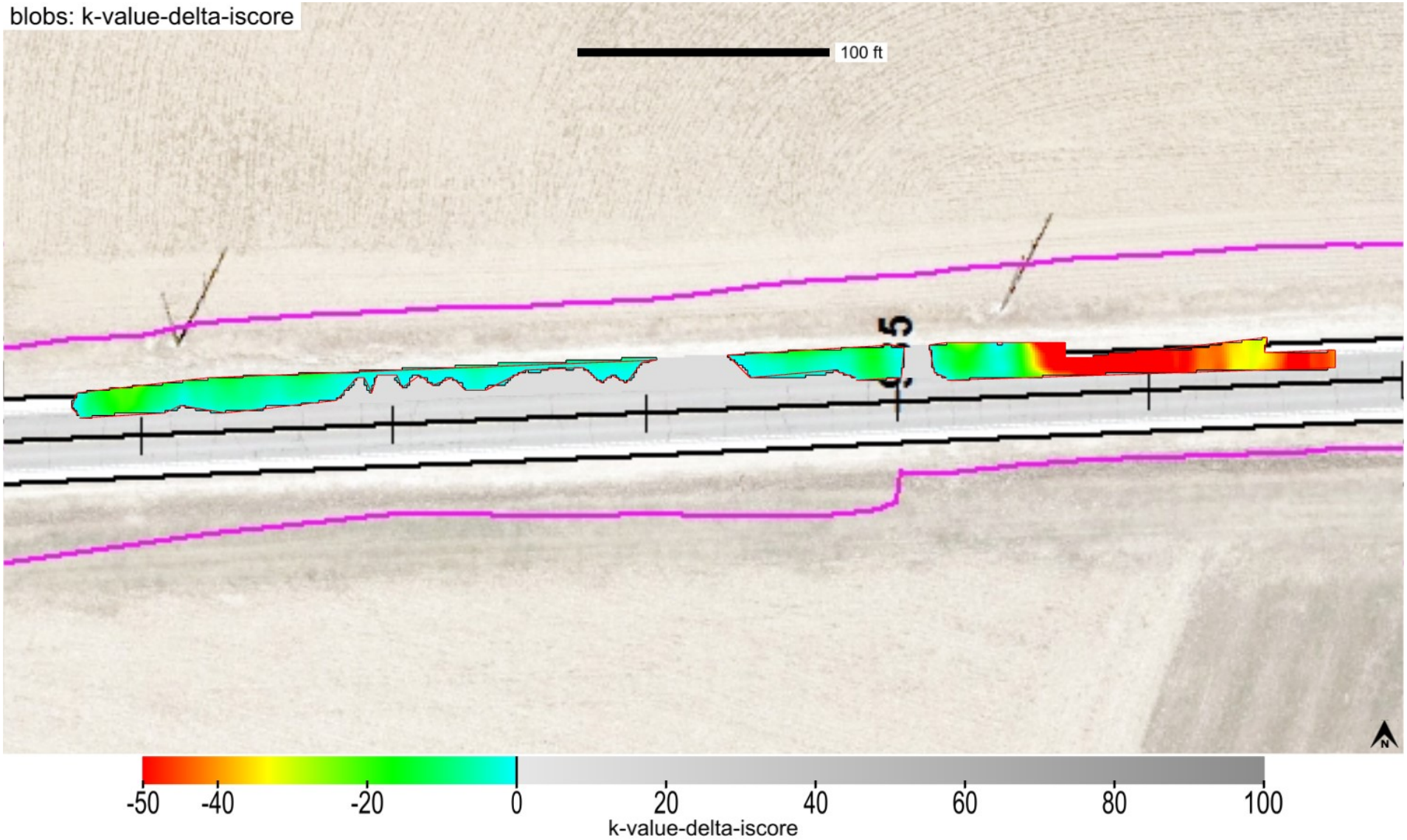
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	4248	71.18	none	0



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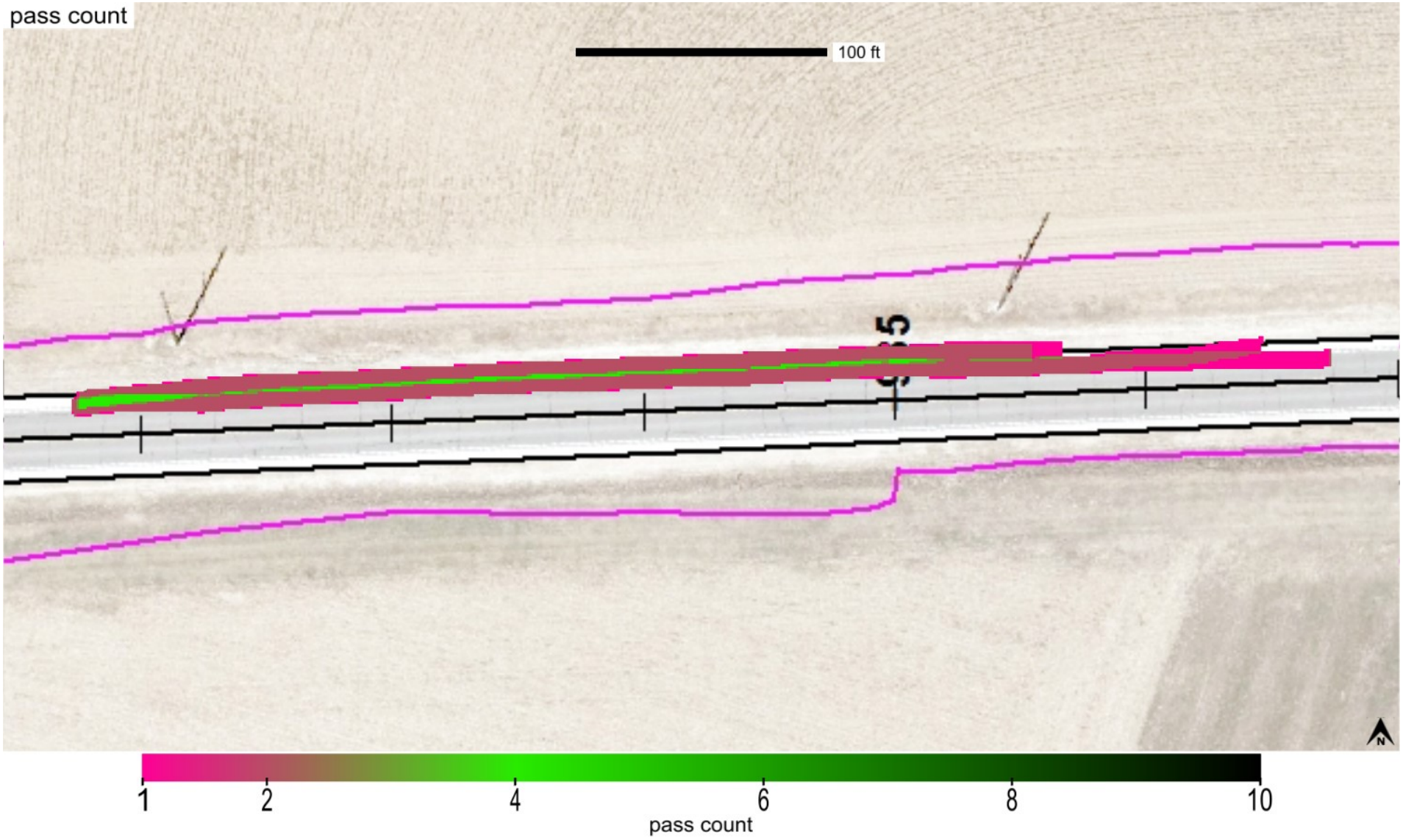
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

minimum	average	maximum
1	2.05	4



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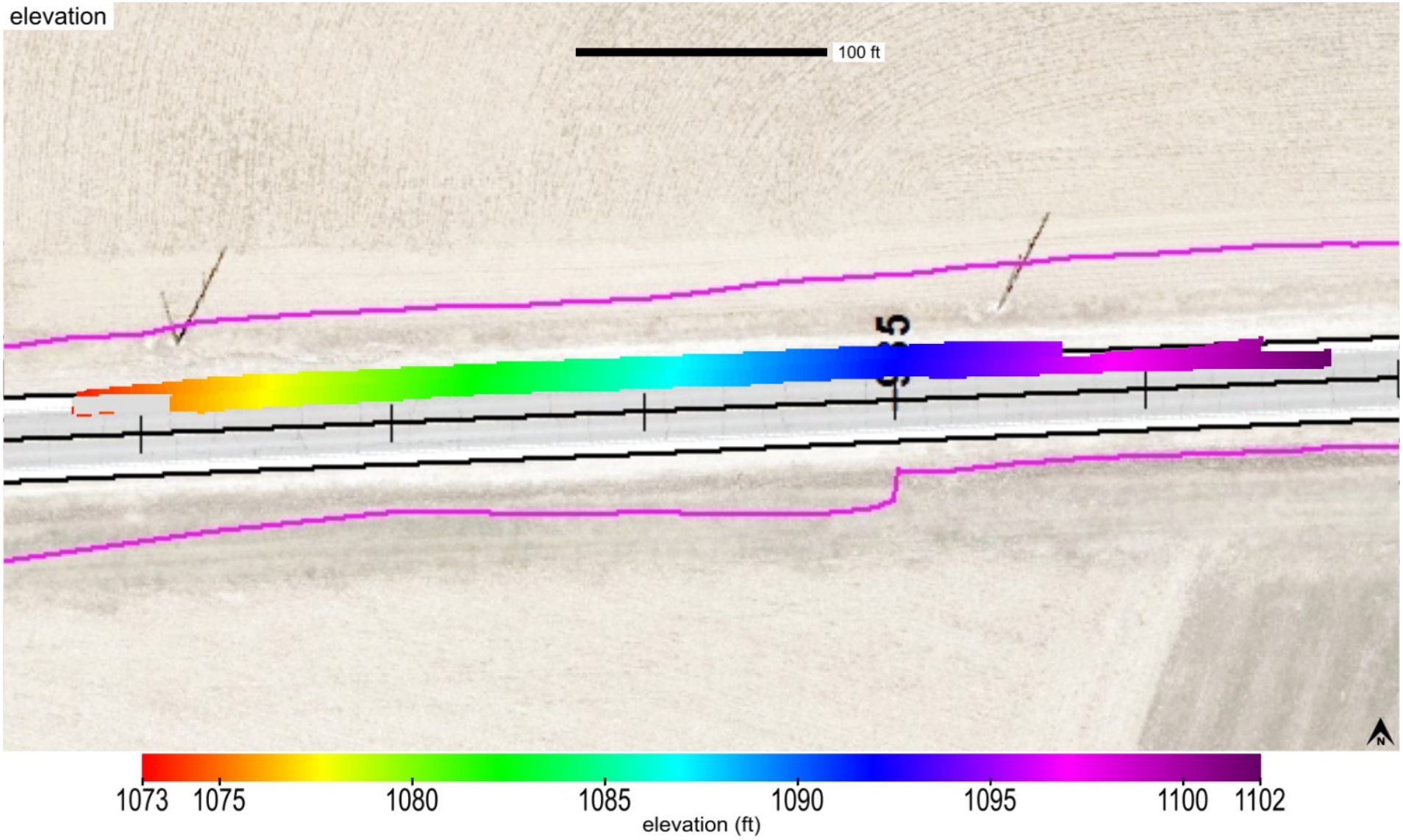
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

minimum	average	maximum
1073.485	1087.492	1101.786



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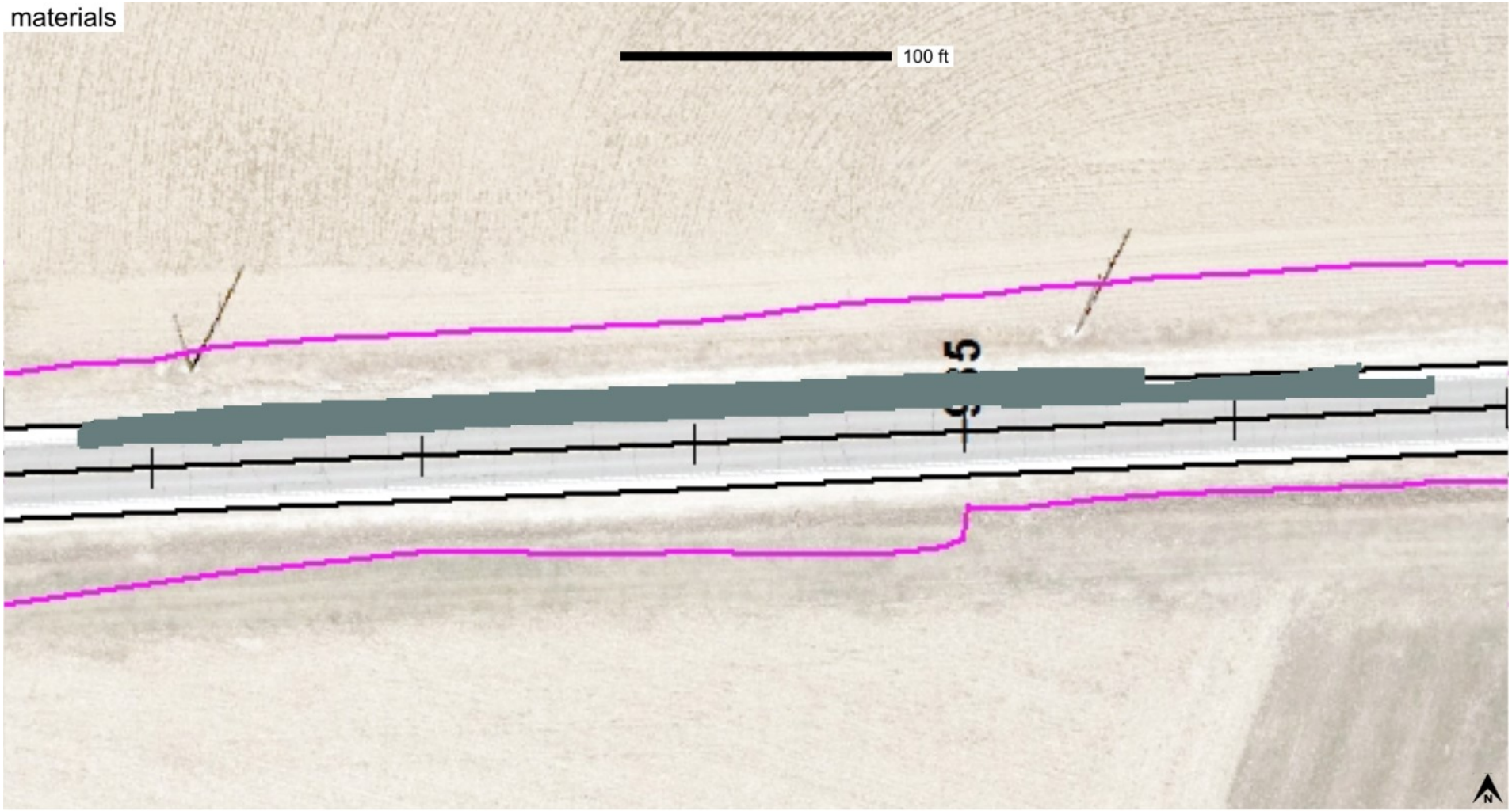
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_173630a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	5968	0.137	12	9037	150	40



Modified Subbase_IADOT (2115)

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_174812a	No. of Measurements:	5646	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:48:12 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.8	114.05	0.98	9037	9014.94	27073.1	52058.37	8512.08	31.44	-22.06	18036.1	43021.37
k-value	Yes	60.2	79.48	0.77	150	24.04	157.2	190	33.6	21.38	-125.96	7.2	40
Moisture Content	No												

Mapped Area

square feet	acres
5646	0.13

Pass Count

min.	avg.	max.
1	1.24	2

Elevation (ft)

min.	avg.	max.
1073.74	1090.01	1102.64

Velocity (fps)

min.	avg.	max.
0.48	5.71	6.37

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	5646	0.13	12	9037	150	40

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_174812a	No. of Measurements:	5646	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:48:12 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.05	CQI > = 95
99.8	80% of Resilient Modulus MVs >= 9037
31.44	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_174812a	No. of Measurements:	5646	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:48:12 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
79.48	CQI > = 95
60.2	80% of k-Value MVs >= 150
21.38	COV <= 20
32.94	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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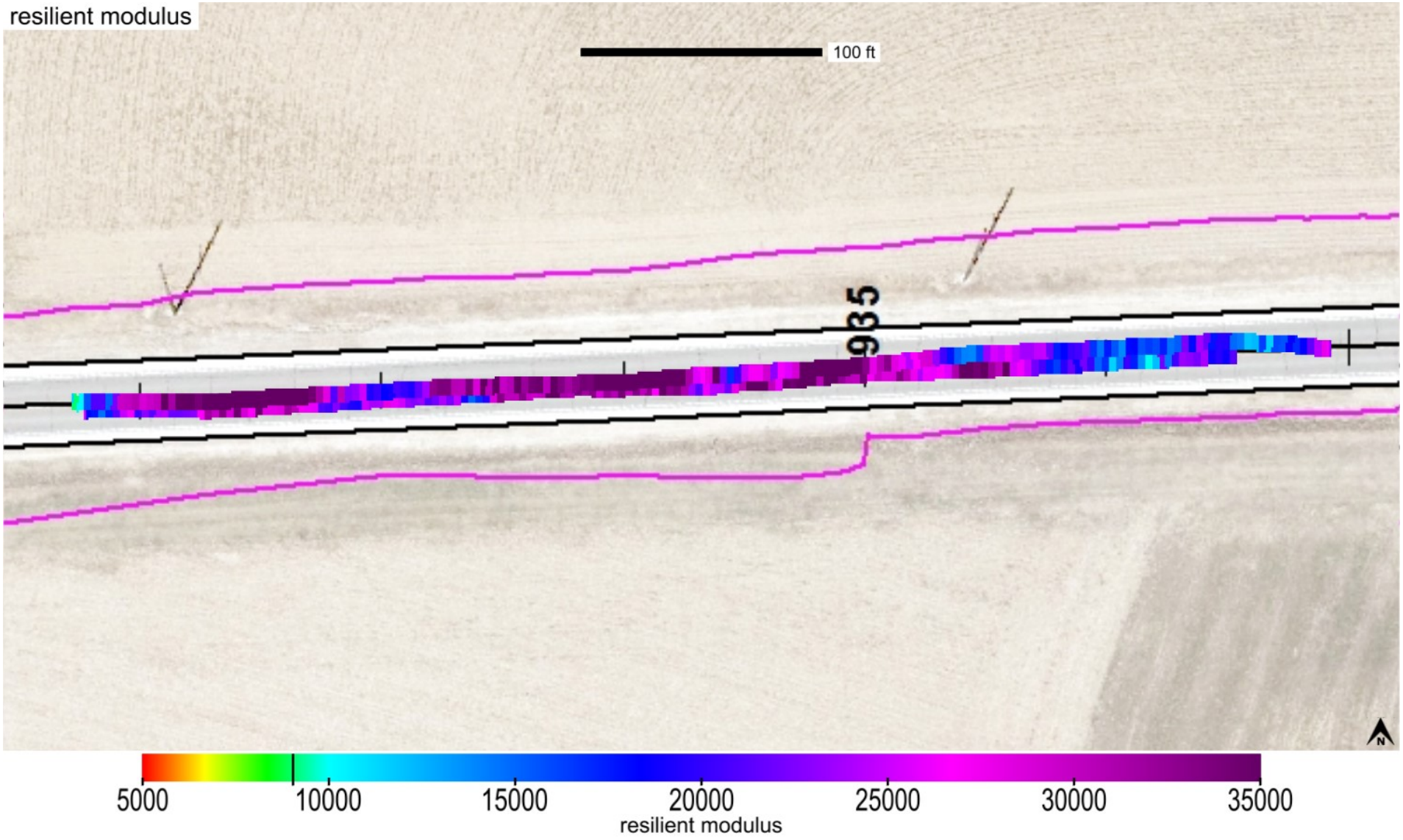
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	114.05	0.98	9037	9014.94	27073.1	52058.37	8512.08	31.44	-22.06	18036.1	43021.37



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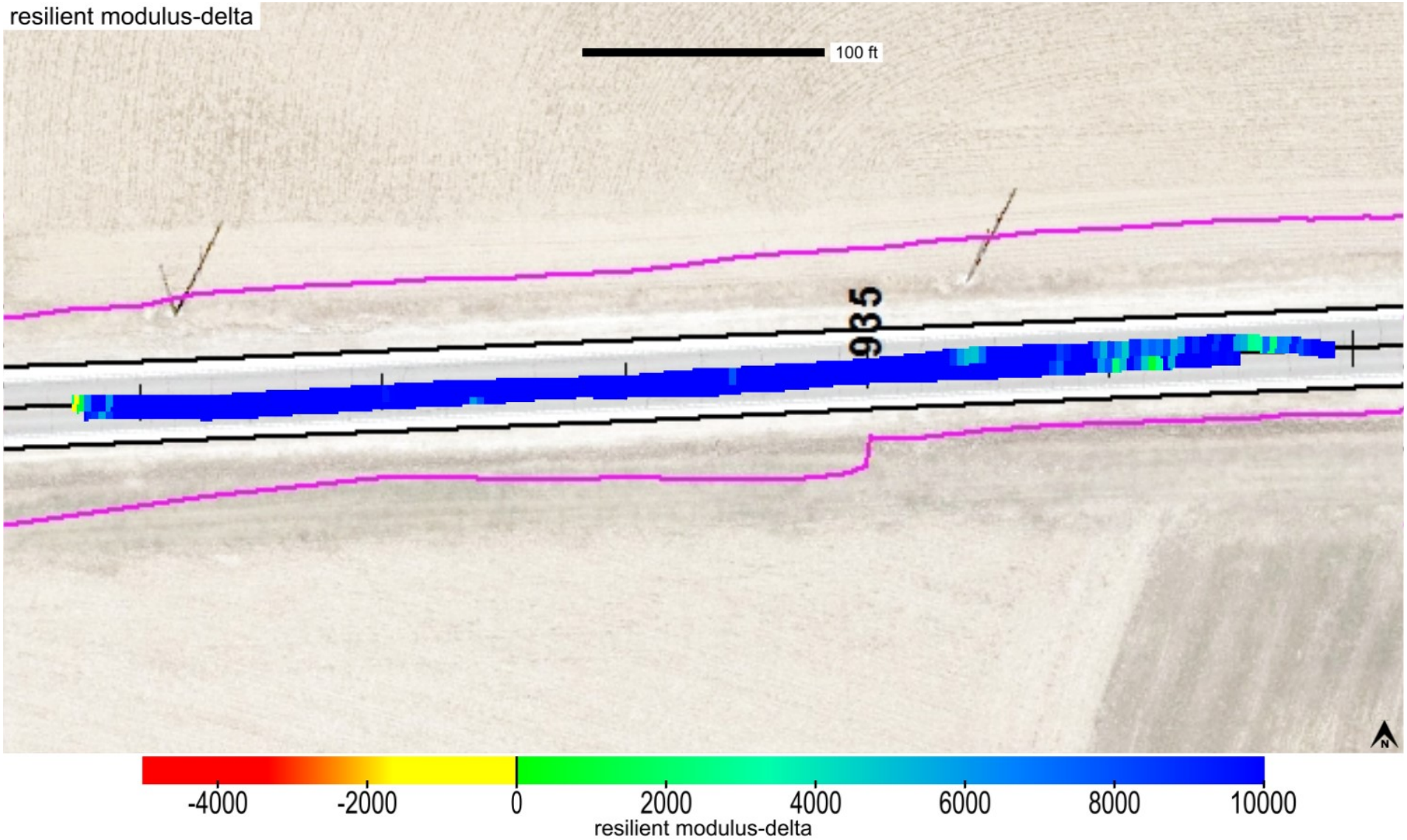
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	114.05	0.98	9037	9014.94	27073.1	52058.37	8512.08	31.44	-22.06	18036.1	43021.37



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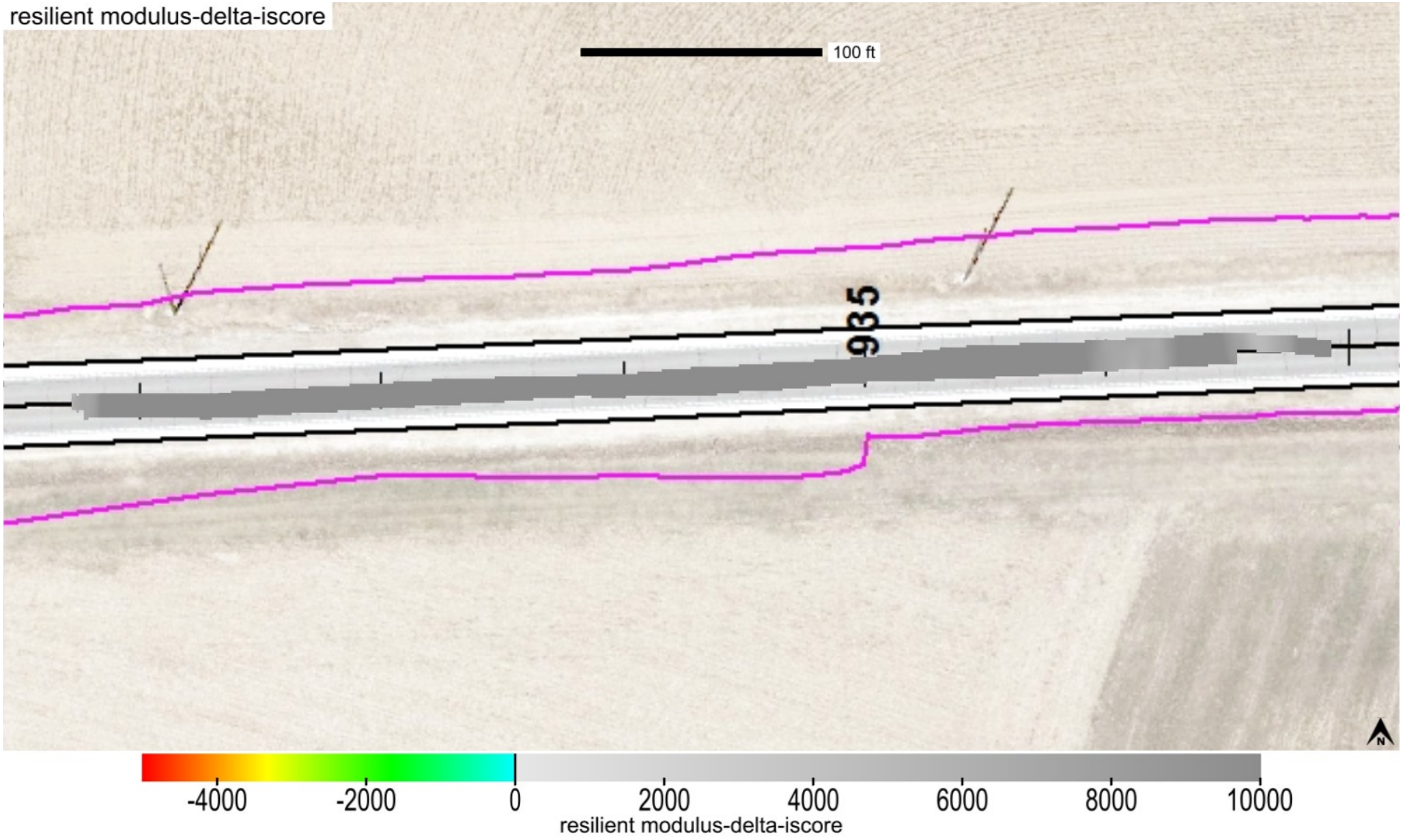
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.8	9037	-22.06	18036.1	43021.37	4673.5	18063.53	33194.24



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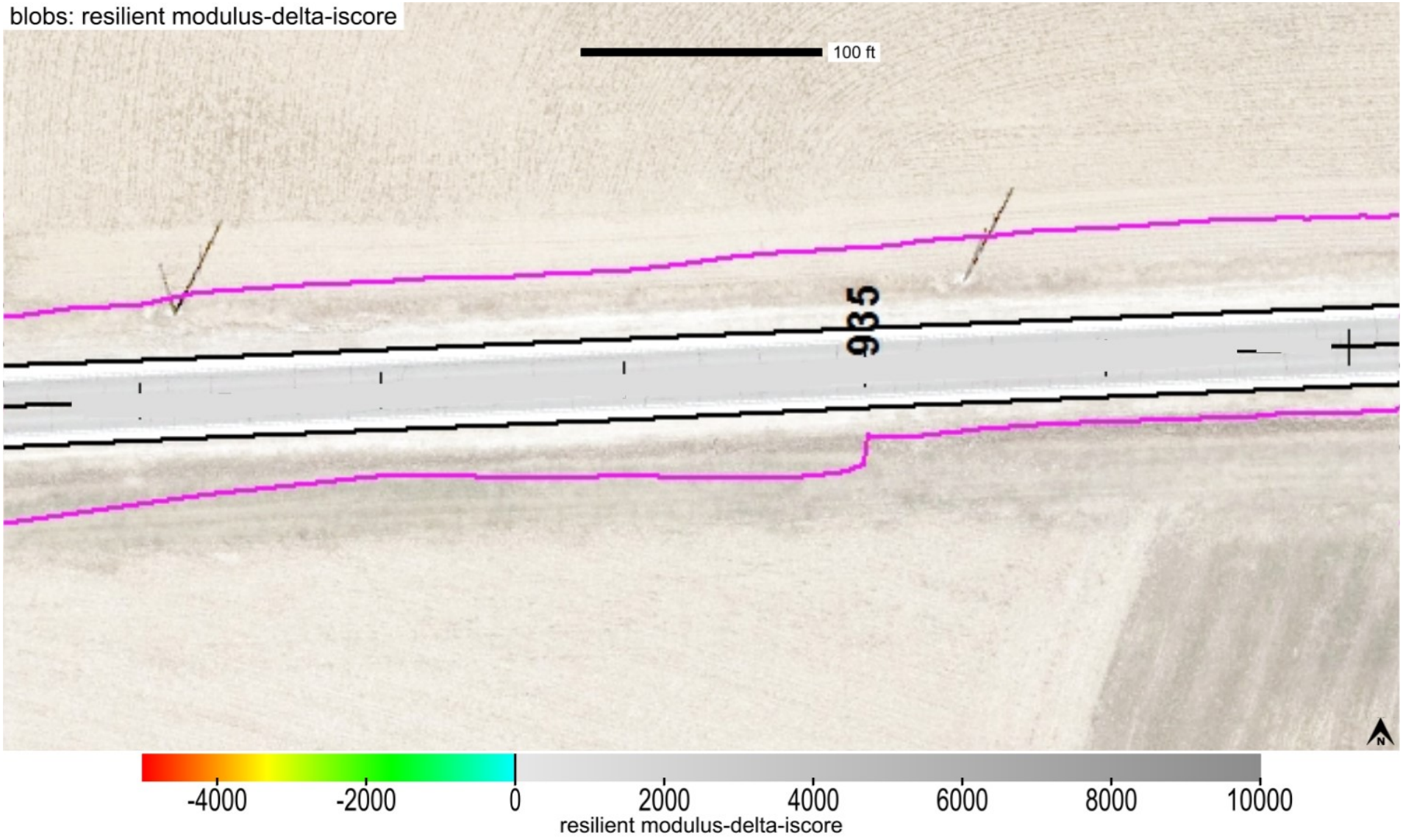
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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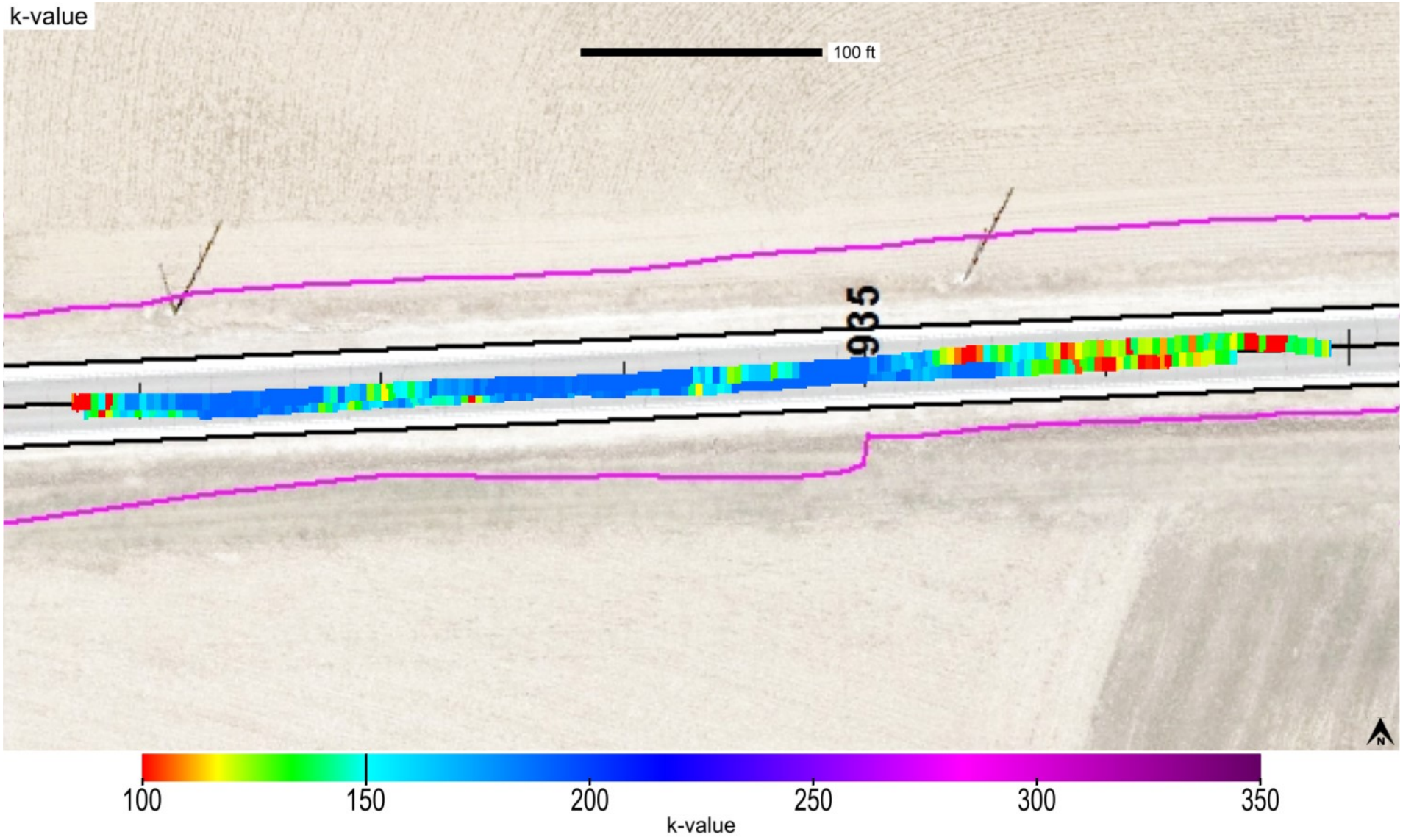
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.2	79.48	0.77	150	24.04	157.2	190	33.6	21.38	-125.96	7.2	40



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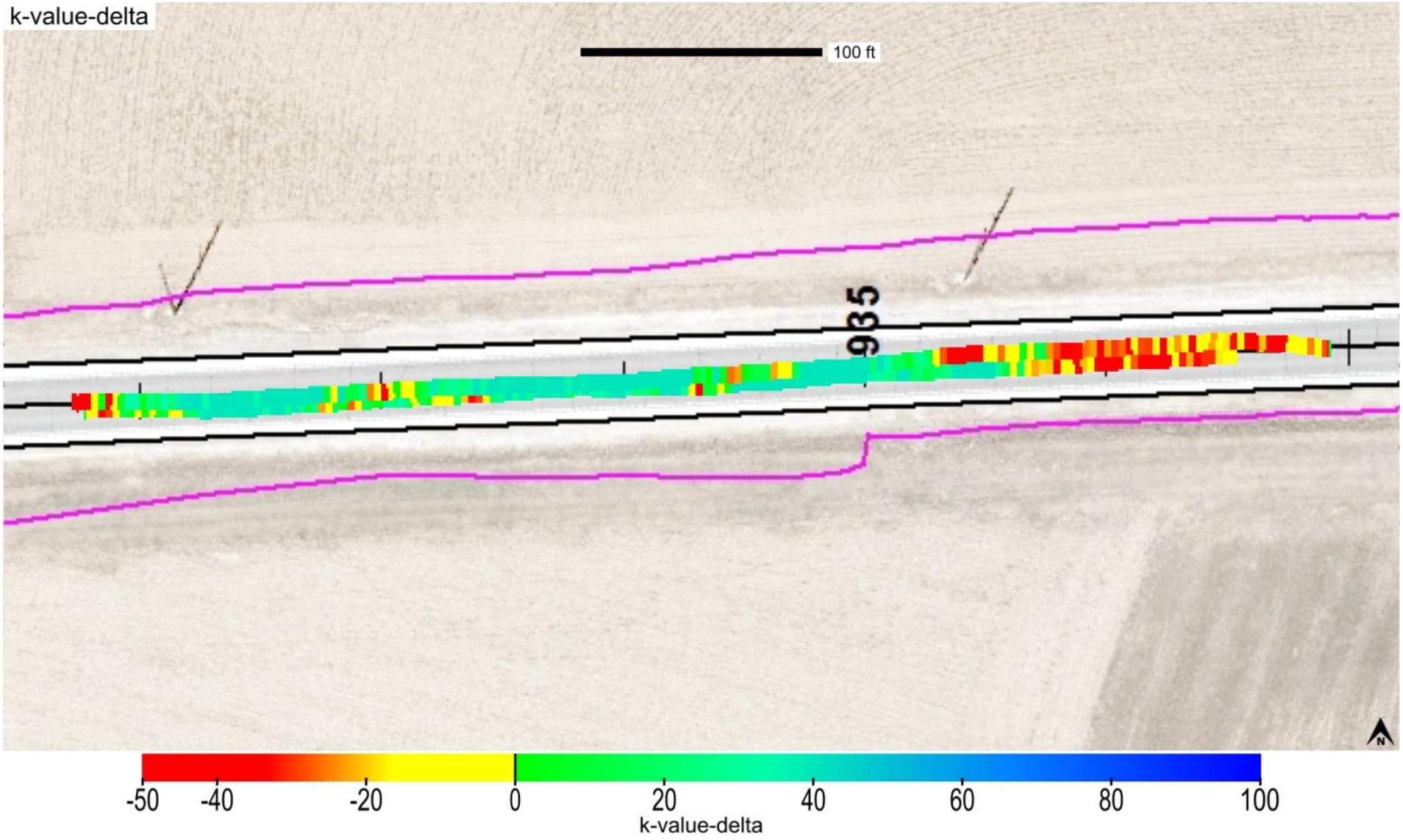
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.2	79.48	0.77	150	24.04	157.2	190	33.6	21.38	-125.96	7.2	40



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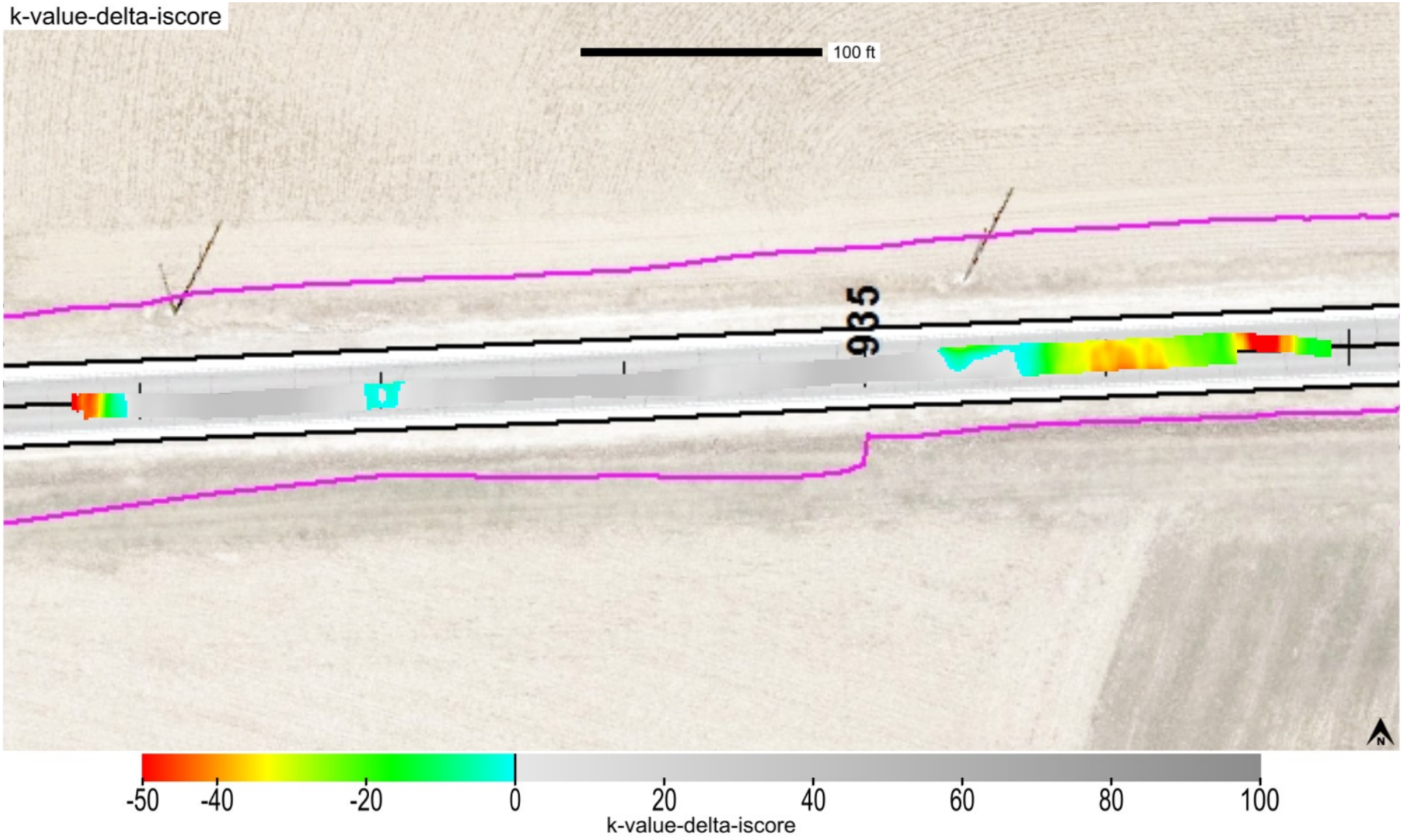
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	60.2	150	-125.96	7.2	40	-66.41	7.28	40



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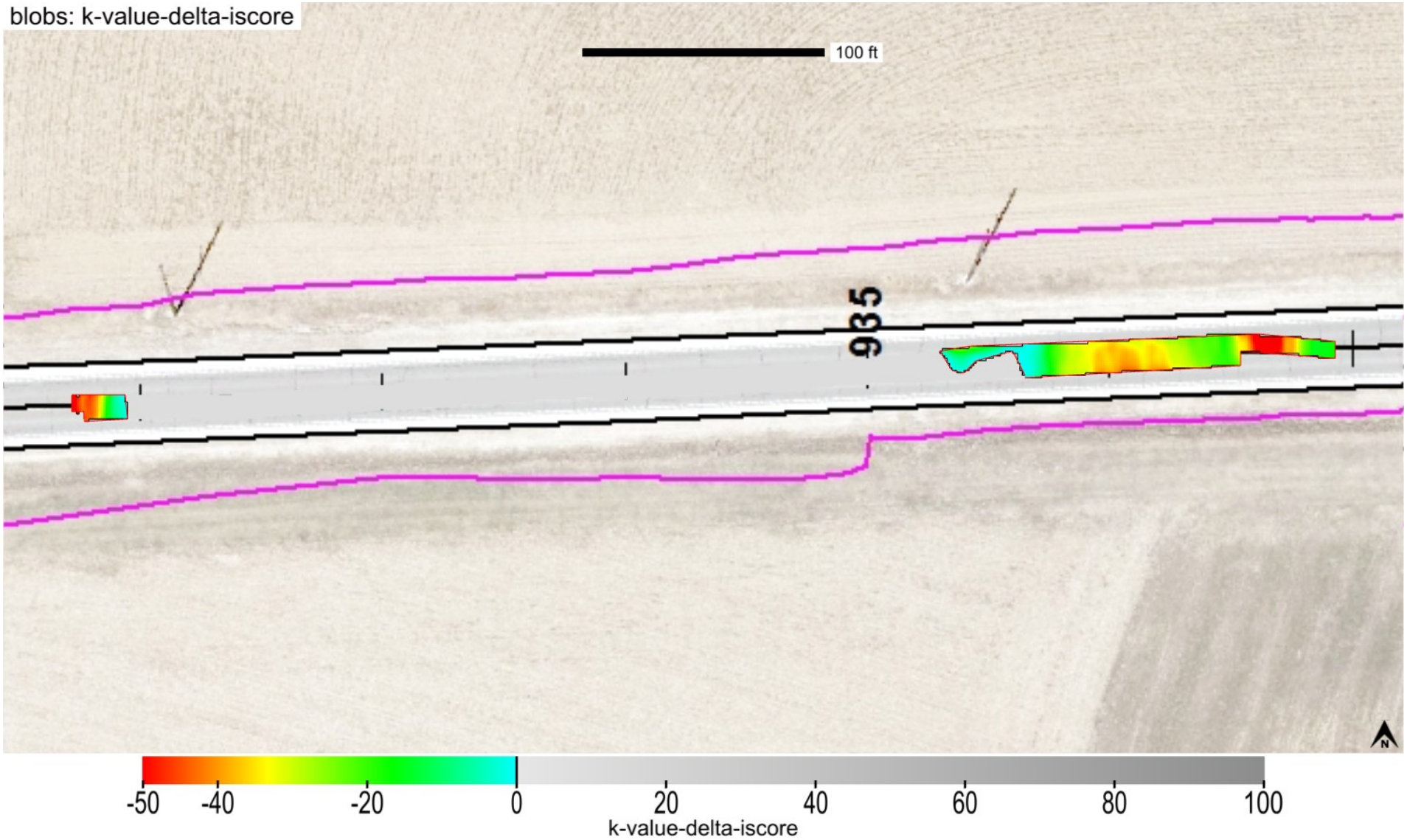
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	1860	32.94	none	0



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

minimum	average	maximum
1	1.24	2

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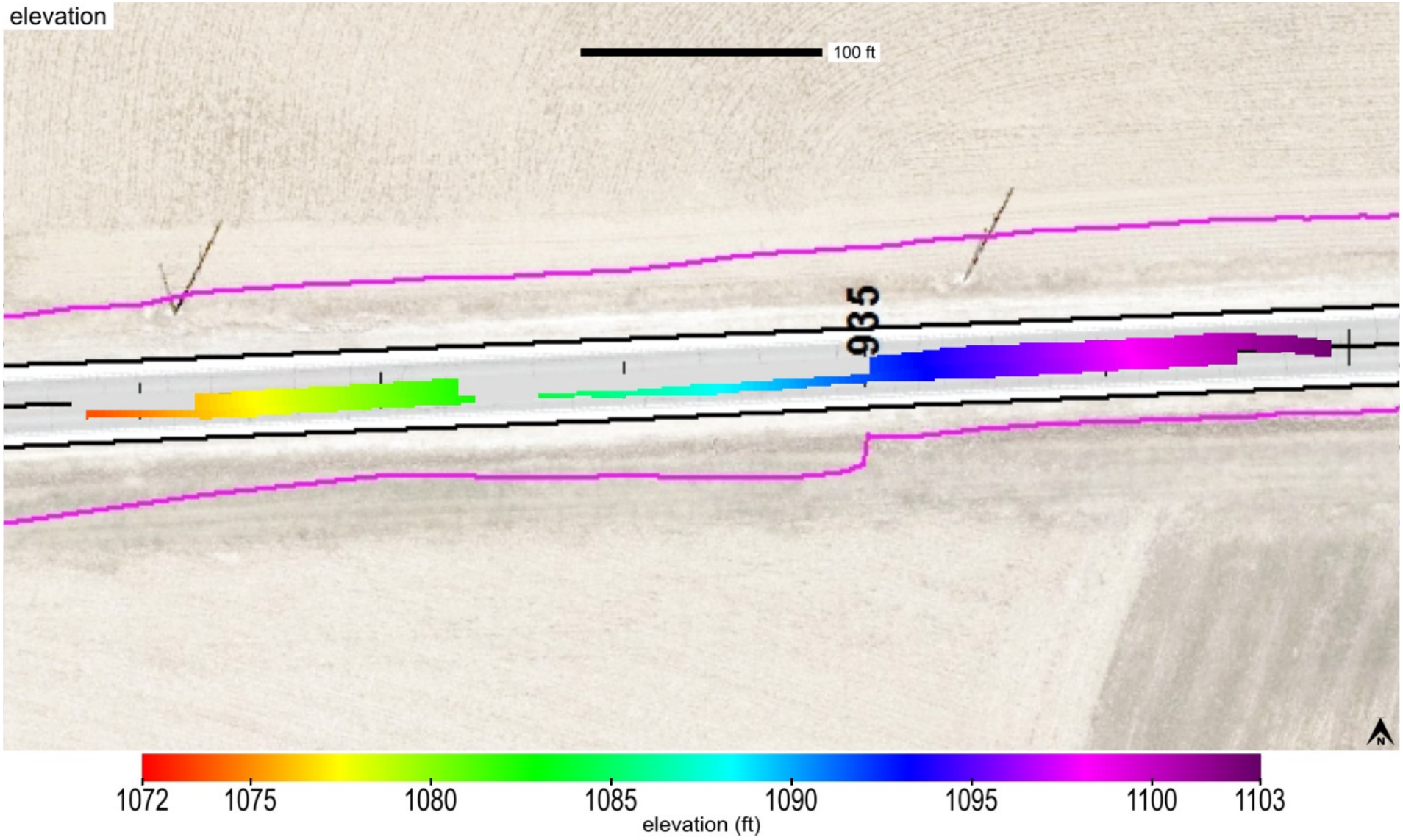
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

minimum	average	maximum
1073.738	1090.013	1102.639



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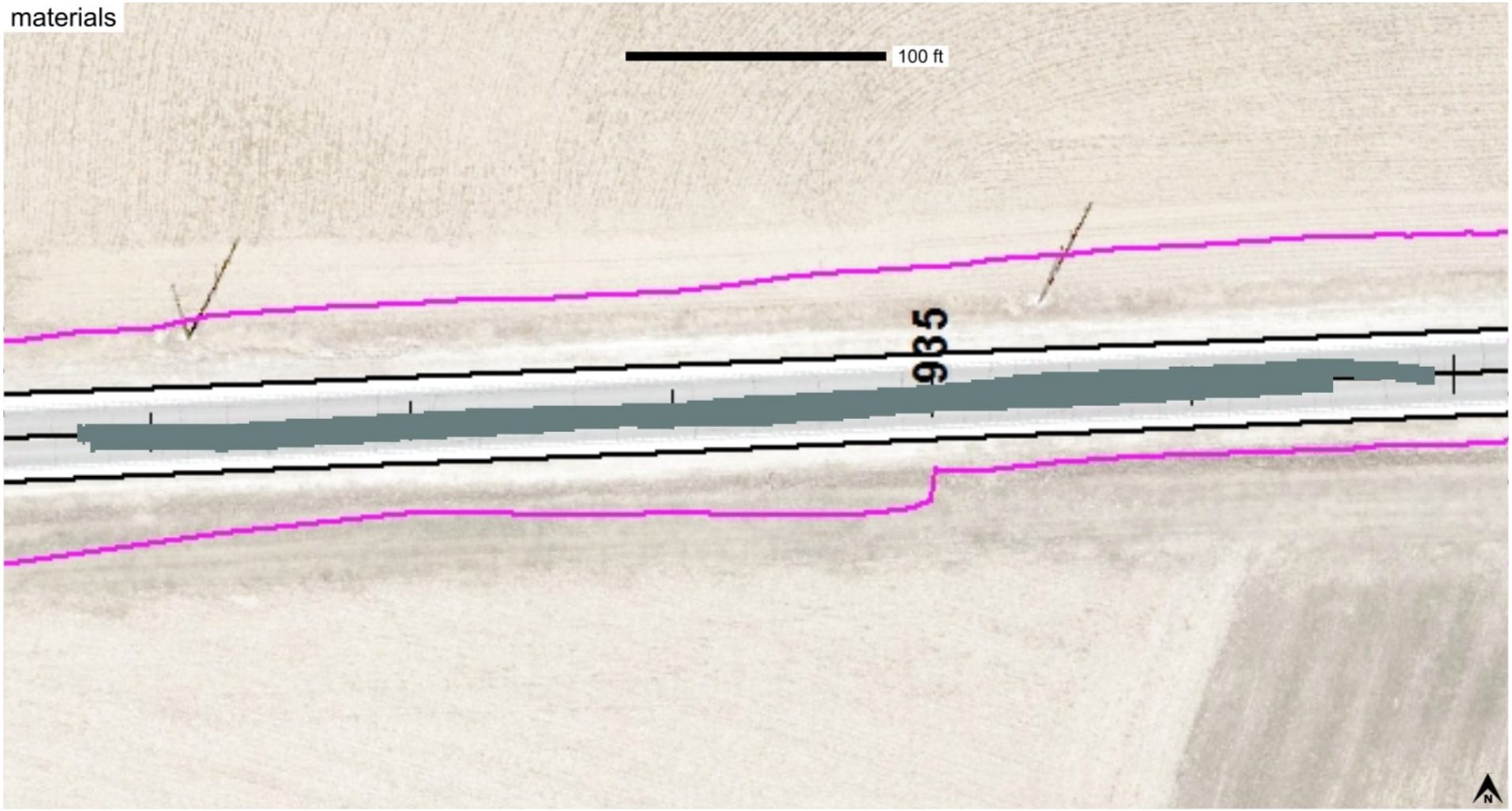
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_174812a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	5646	0.13	12	9037	150	40



Modified Subbase_IADOT (2115)

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_175528a	No. of Measurements:	3552	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:55:28 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	99.4	116.62	1.21	9037	8204.84	29036.4	48231.46	7424.97	25.57	-832.16	19999.4	39194.46
k-value	Yes	77.1	98.22	0.96	150	59.69	163.3	190	29.04	17.79	-90.31	13.3	40
Moisture Content	No												

Mapped Area

square feet	acres
3552	0.08

Pass Count

min.	avg.	max.
1	1.64	2

Elevation (ft)

min.	avg.	max.
1072.72	1087.09	1100.34

Velocity (fps)

min.	avg.	max.
0.93	5.63	5.94

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	3552	0.082	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_175528a	No. of Measurements:	3552	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:55:28 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
116.62	CQI > = 95
99.4	80% of Resilient Modulus MVs >= 9037
25.57	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_13_175528a	No. of Measurements:	3552	Machine ID:	Ingios_FCS00210
Date and Time:	8/13/2020 5:55:28 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
98.22	CQI > = 95
77.1	80% of k-Value MVs >= 150
17.79	COV <= 20
17.34	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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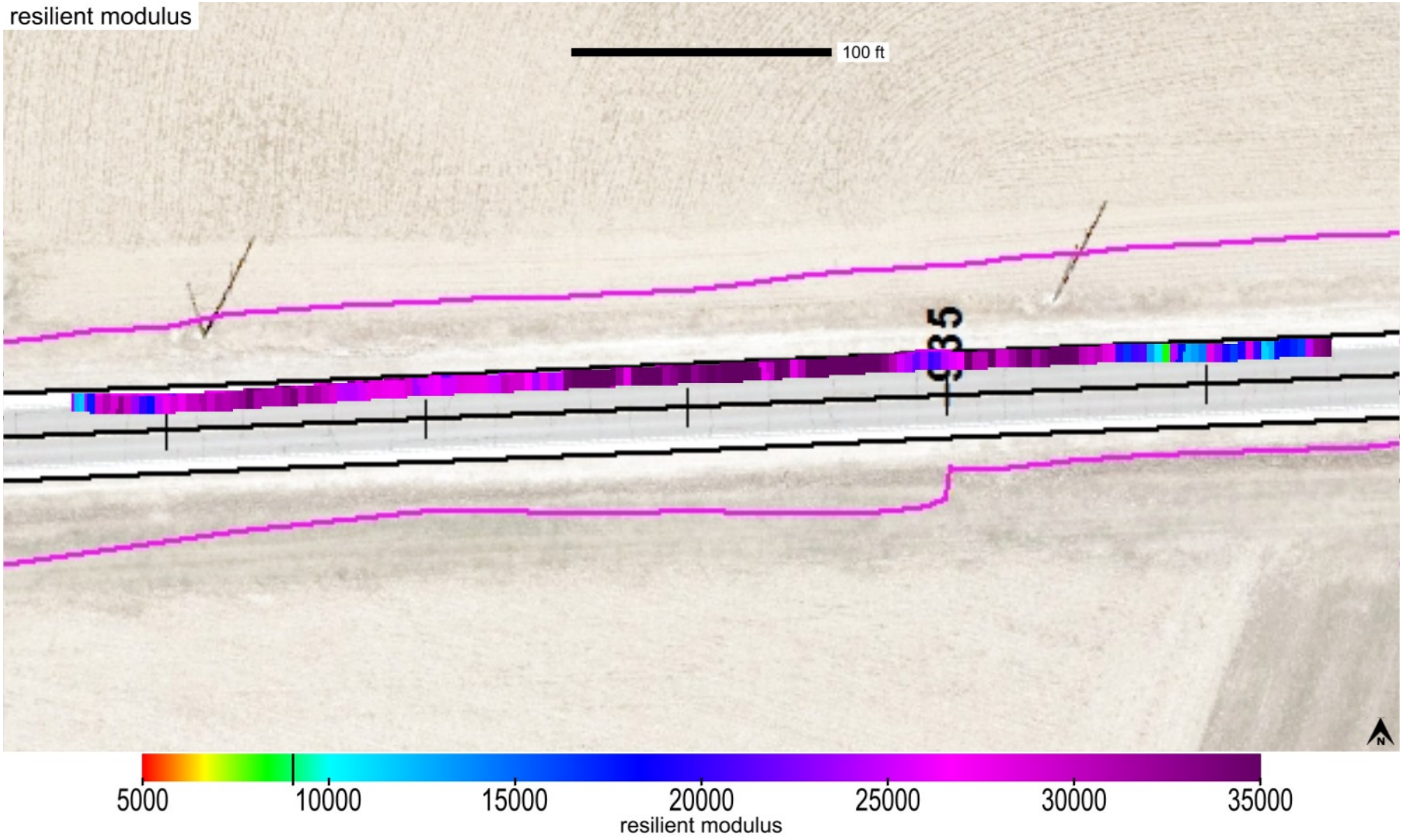
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	116.62	1.21	9037	8204.84	29036.4	48231.46	7424.97	25.57	-832.16	19999.4	39194.46



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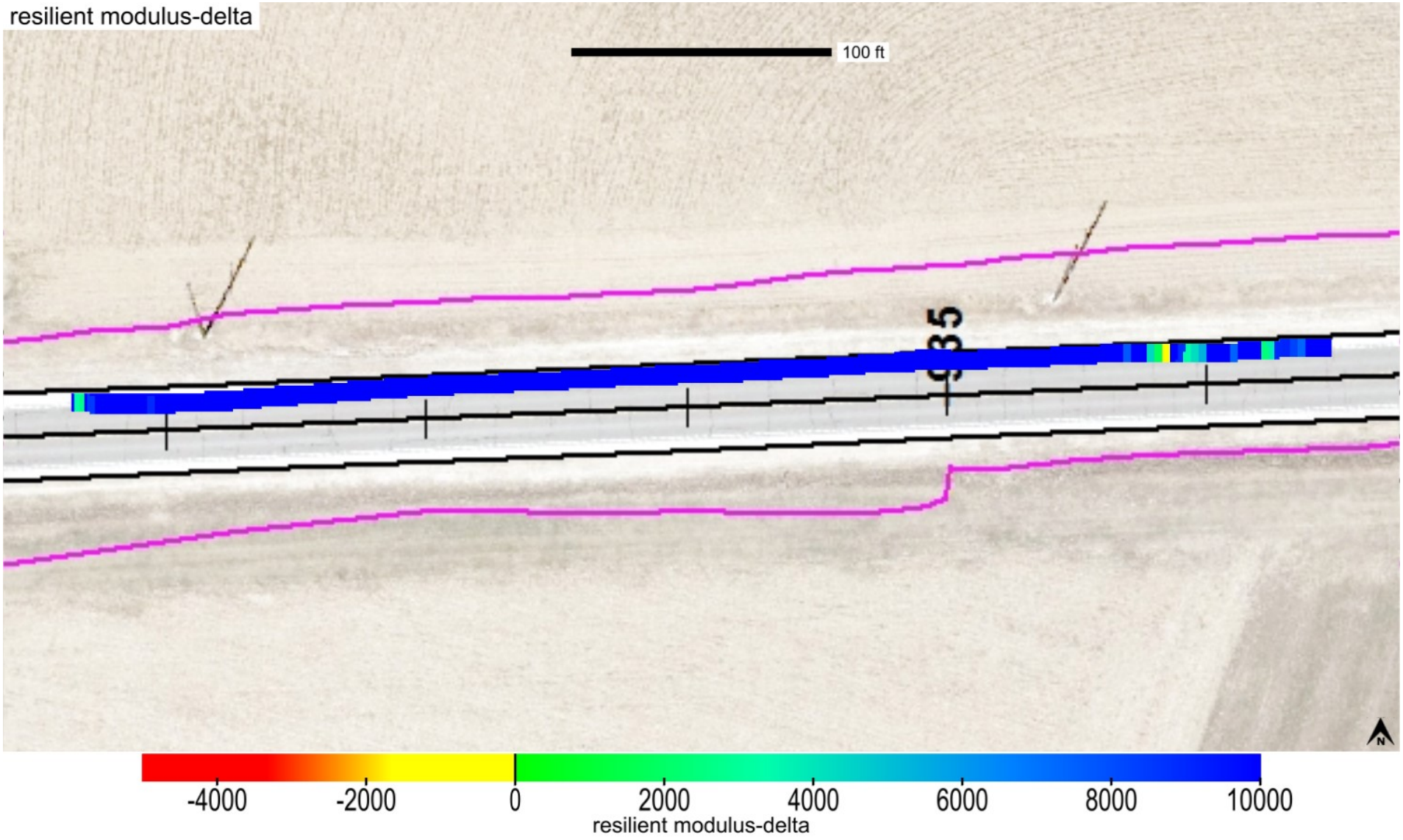
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	116.62	1.21	9037	8204.84	29036.4	48231.46	7424.97	25.57	-832.16	19999.4	39194.46



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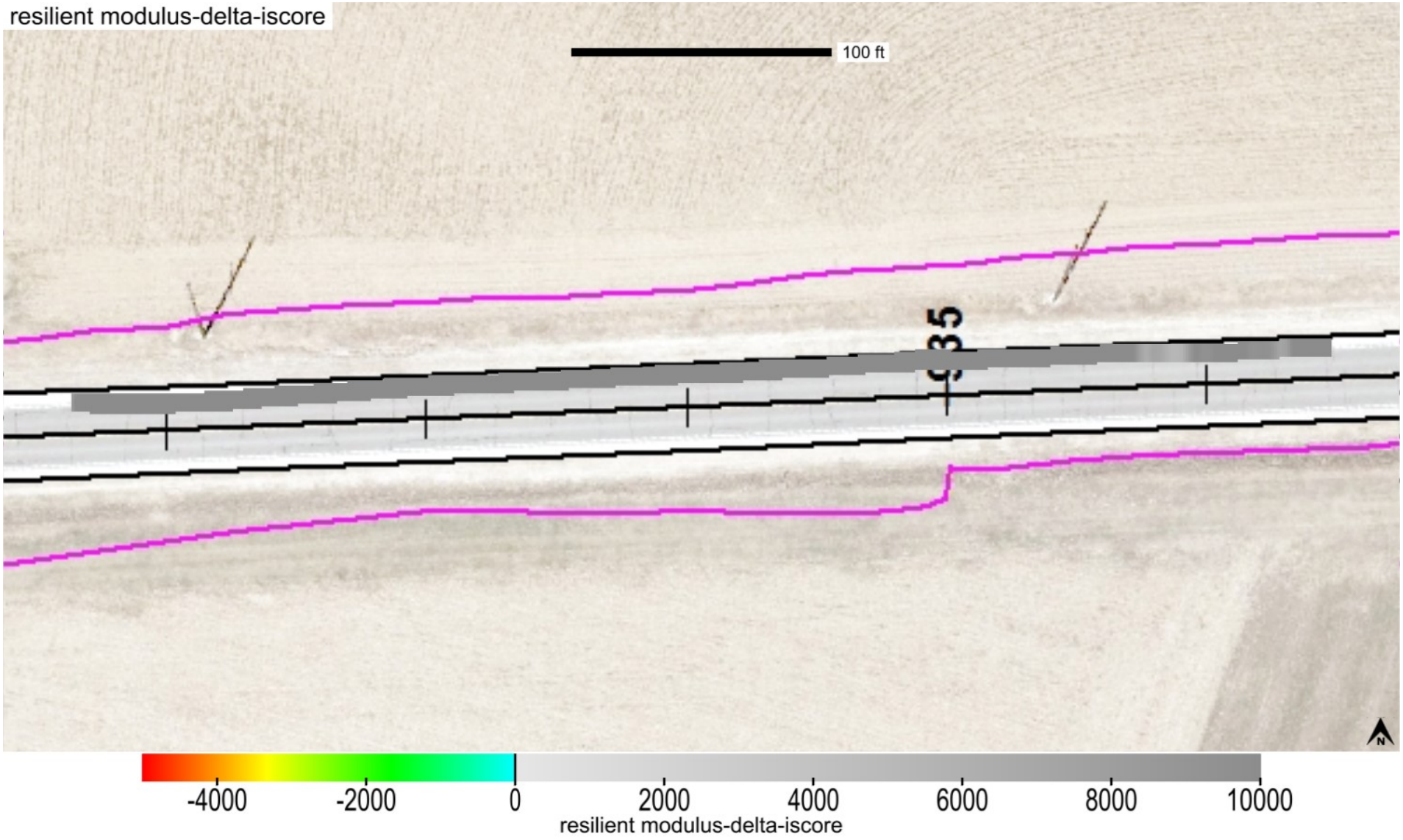
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.4	9037	-832.16	19999.4	39194.46	5265.18	19981.32	35460.79



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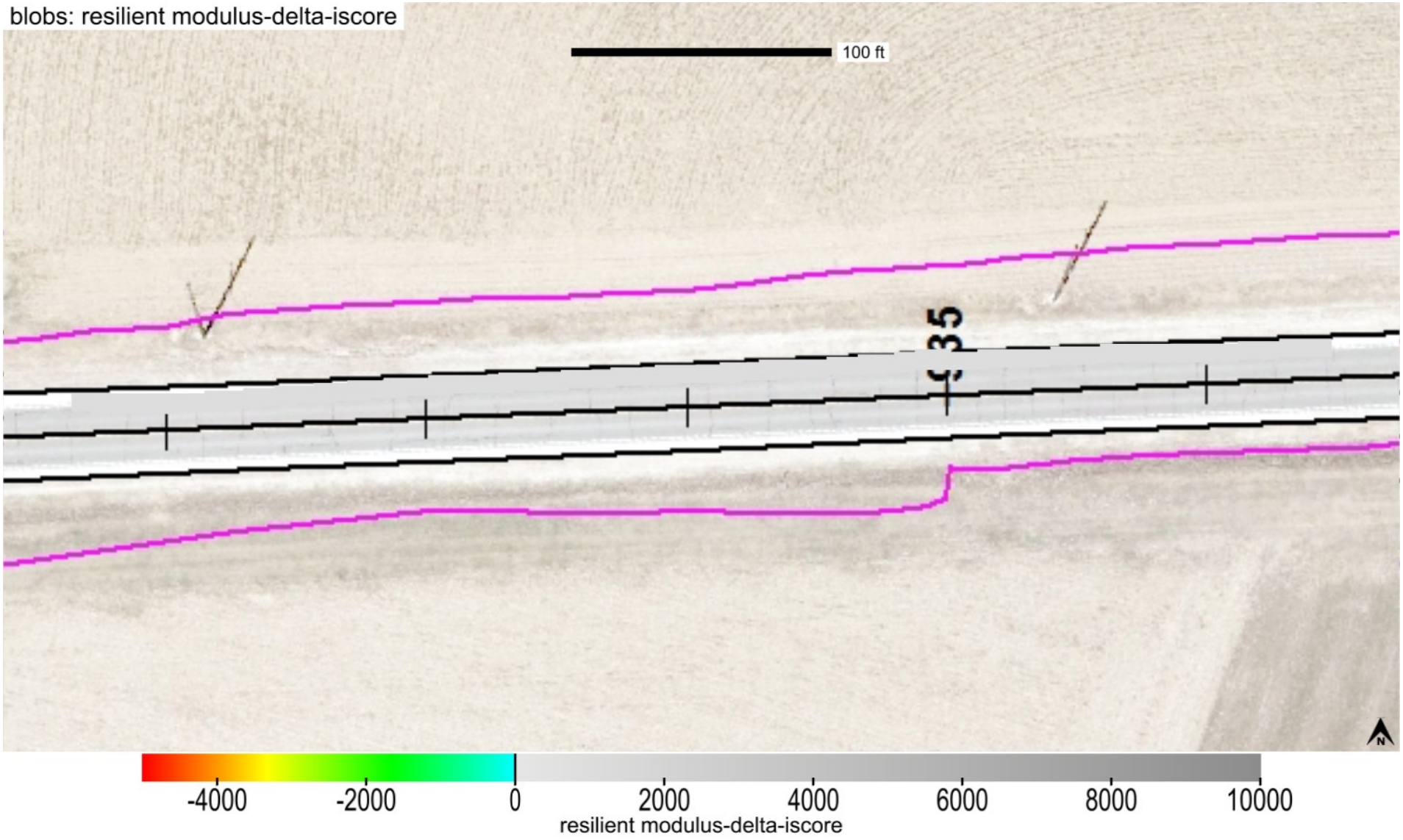
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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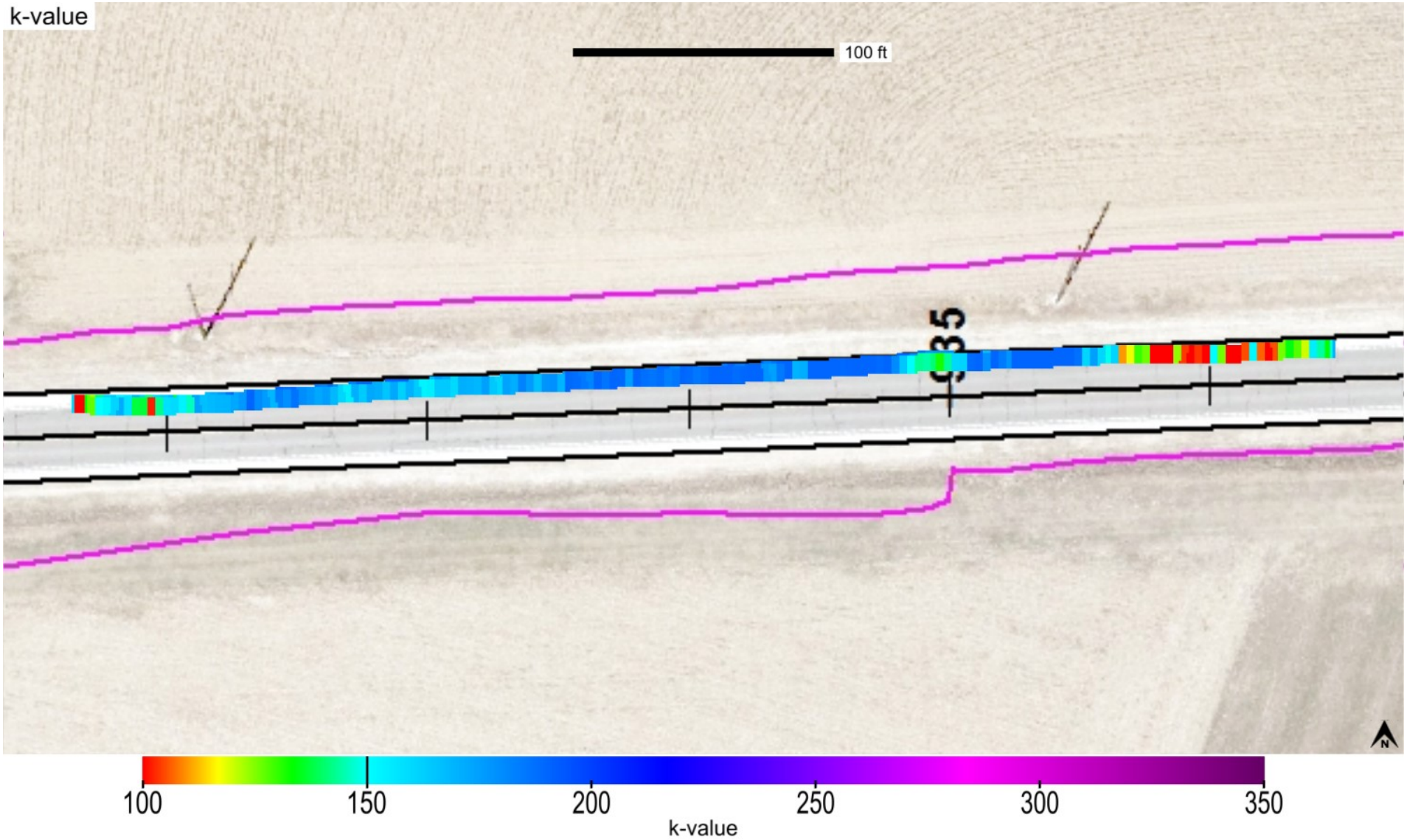
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	77.1	98.22	0.96	150	59.69	163.3	190	29.04	17.79	-90.31	13.3	40



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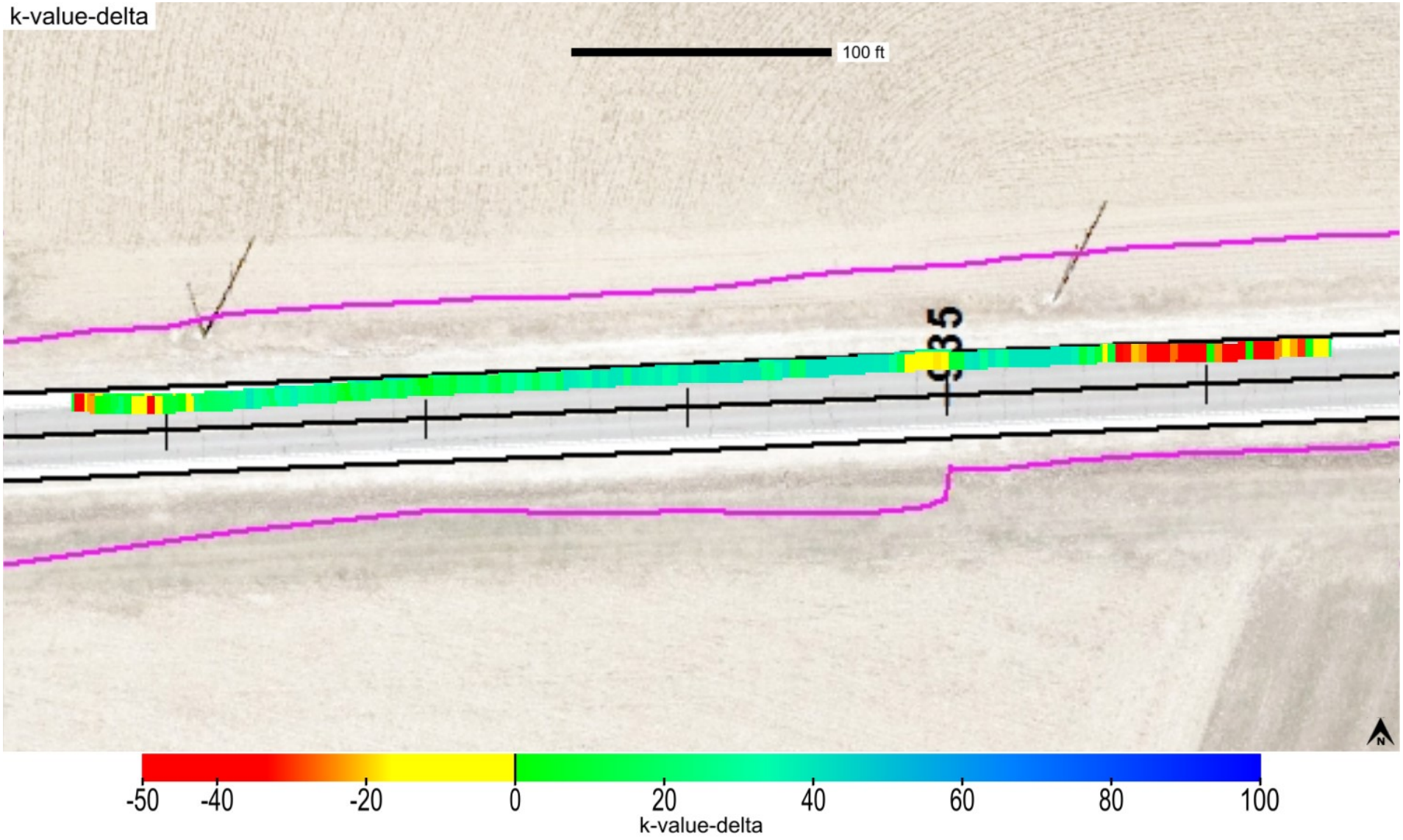
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	77.1	98.22	0.96	150	59.69	163.3	190	29.04	17.79	-90.31	13.3	40



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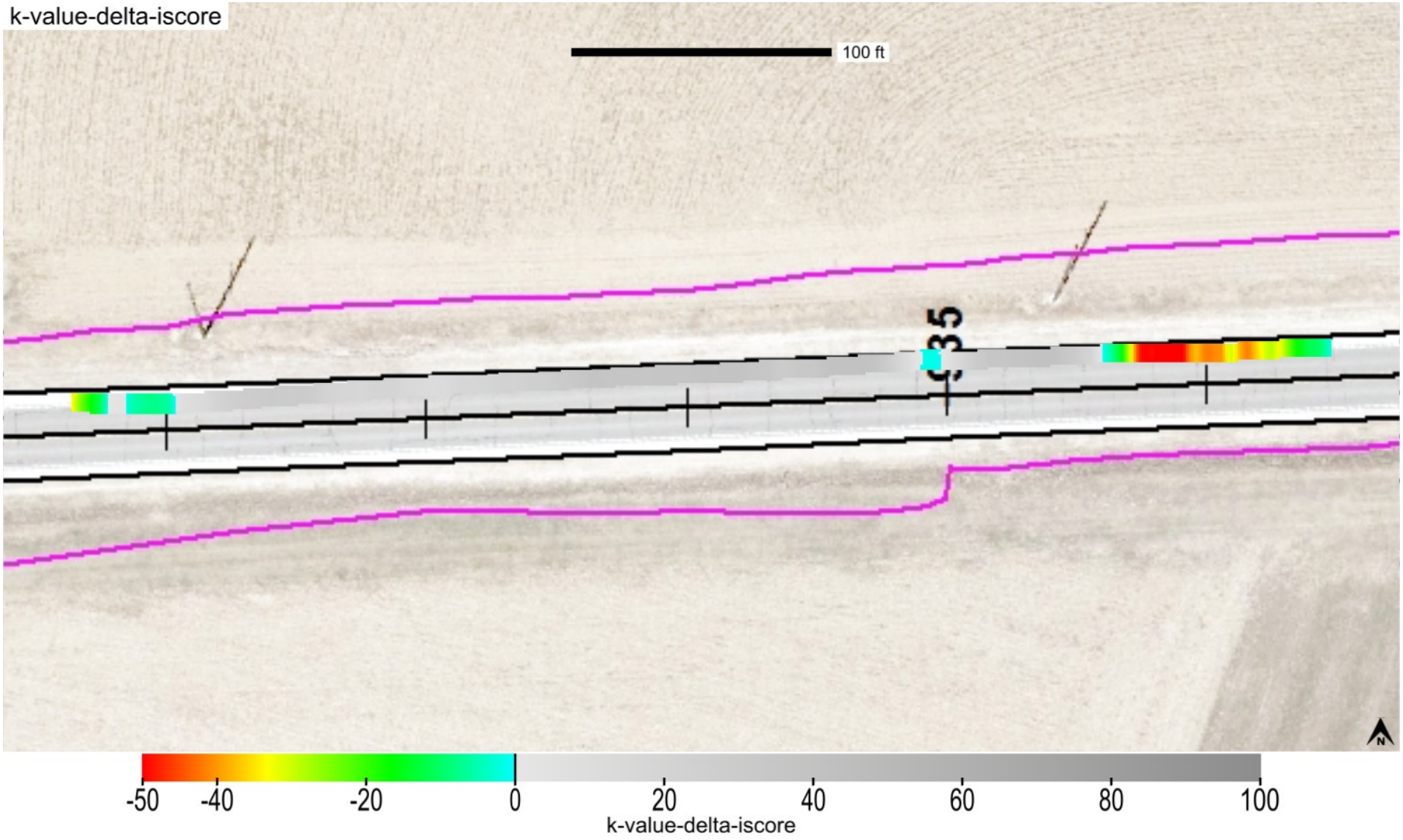
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	77.1	150	-90.31	13.3	40	-59.18	13.29	40



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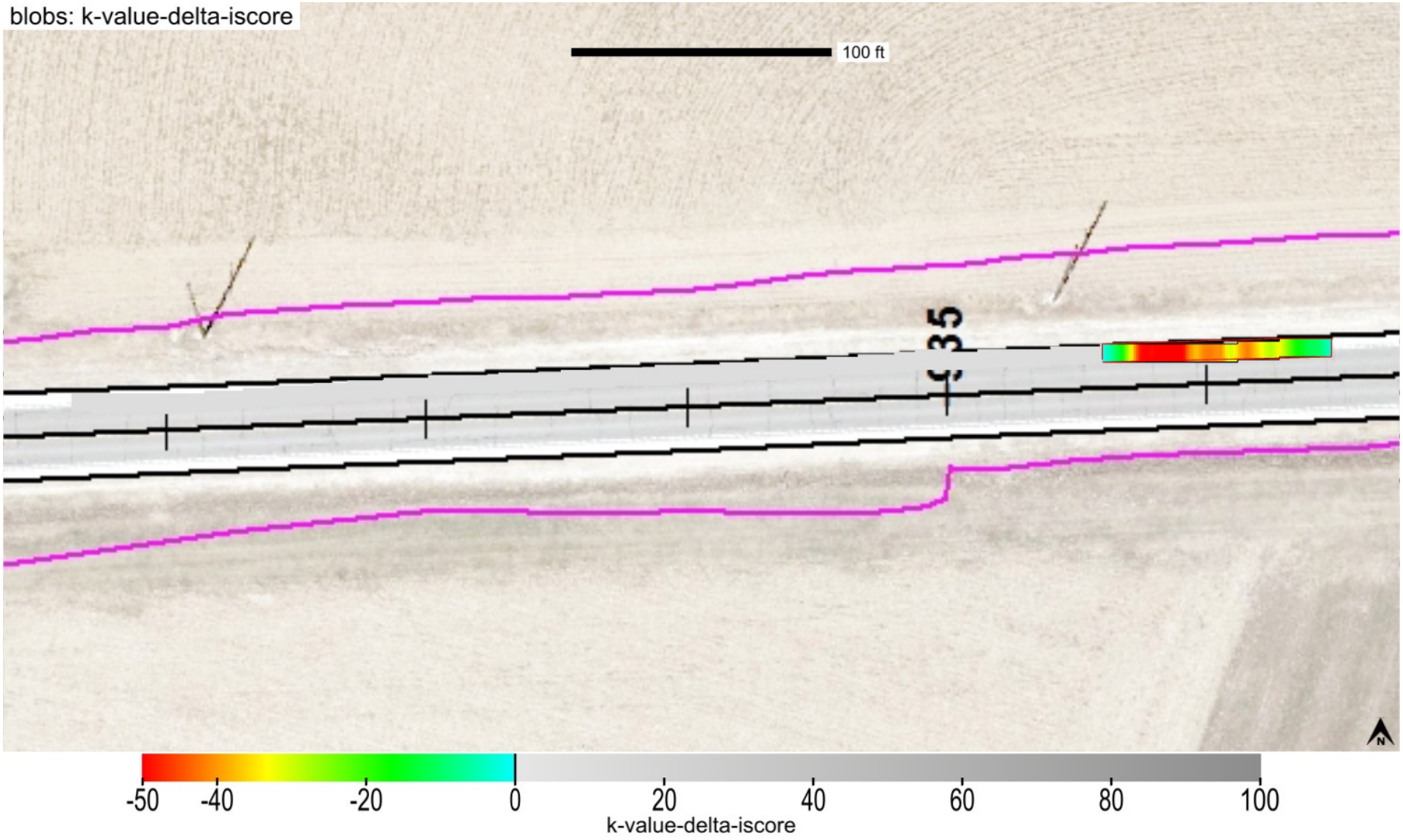
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	616	17.34	none	0



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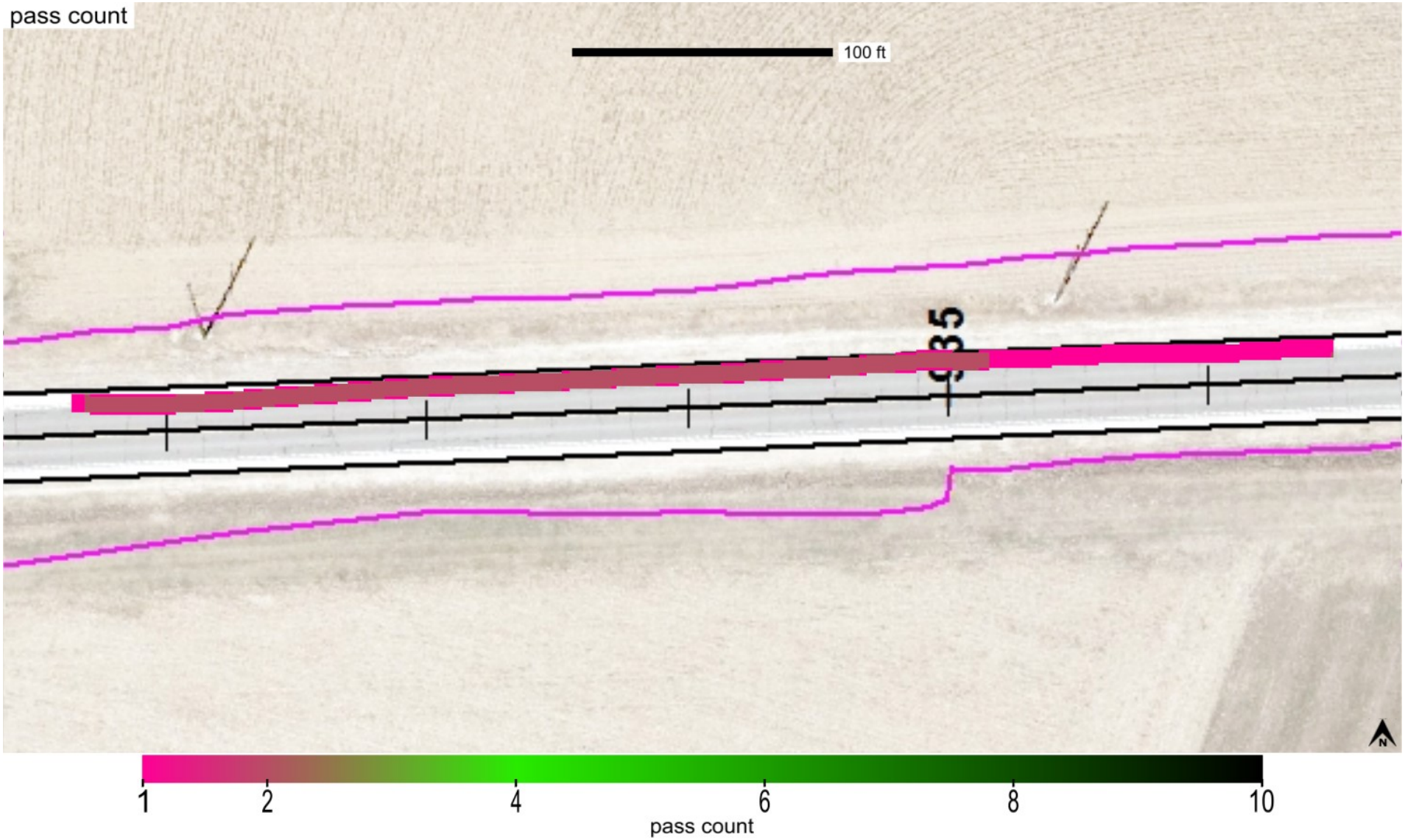
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

minimum	average	maximum
1	1.64	2



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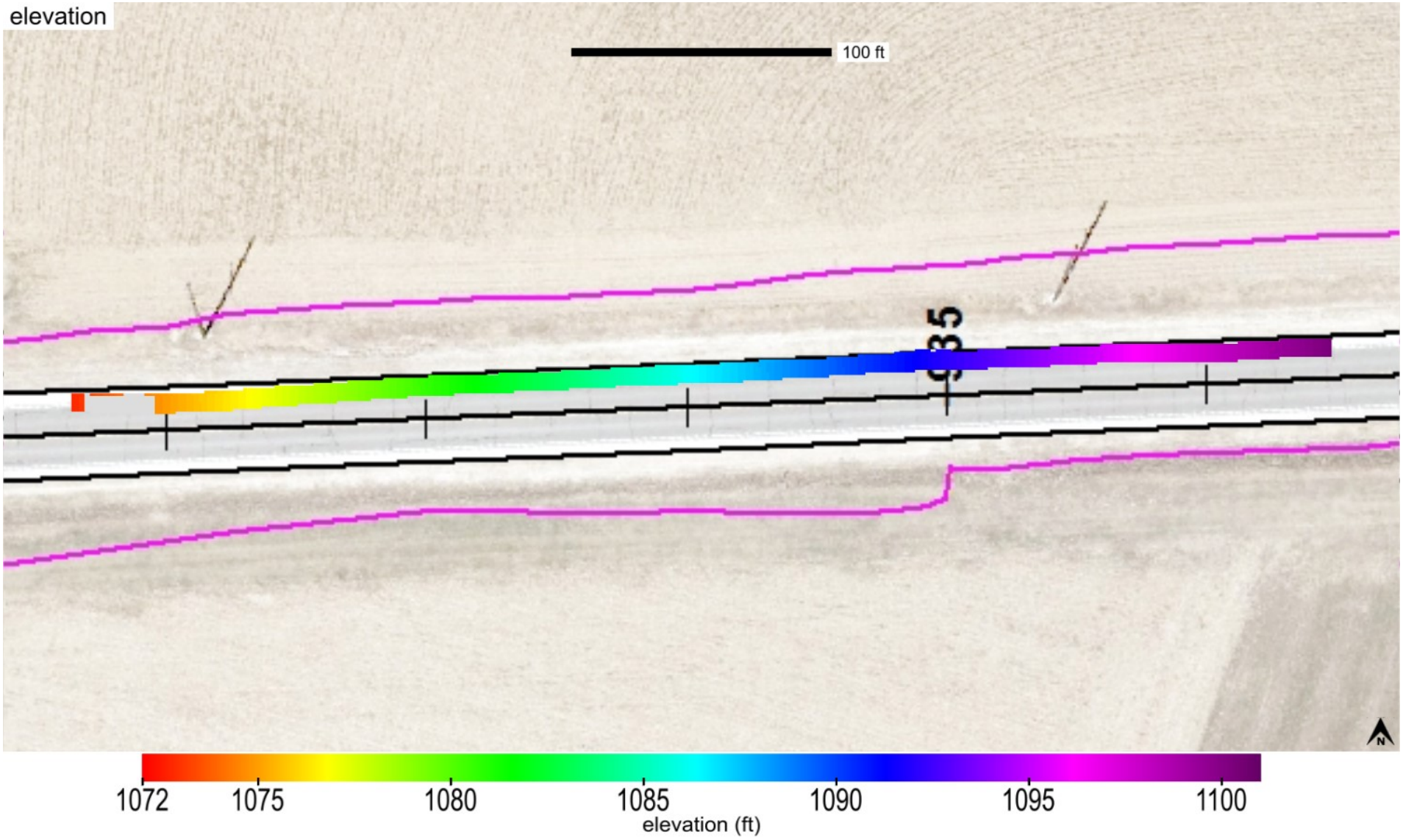
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

minimum	average	maximum
1072.724	1087.088	1100.342



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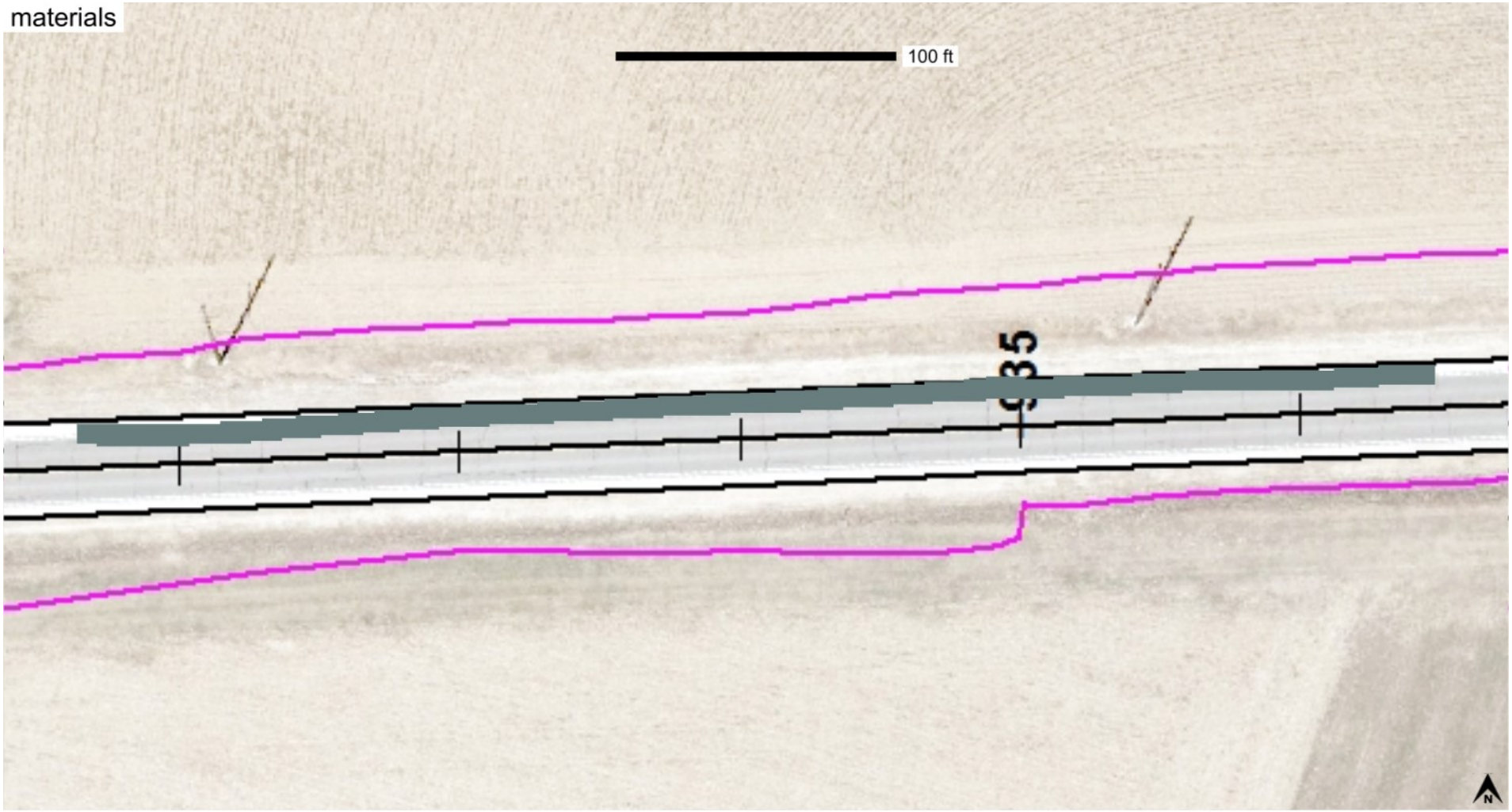
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_13_175528a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	3552	0.082	12	9037	150	40



Modified Subbase_IADOT (2115)

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_081758a	No. of Measurements:	1982	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 8:17:58 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	Yes	100	118.21	0.47	9037	5500	45187.3	56000	10607.85	23.48	-3537	36150.3	46963
k-value	Yes	98.1	125.65	3.02	150	115.1	187.5	190	9.12	4.86	-34.9	37.5	40
Moisture Content	No												

Mapped Area

square feet	acres
1982	0.05

Pass Count

min.	avg.	max.
1	7.64	10

Elevation (ft)

min.	avg.	max.
1069.54	1076.77	1083.55

Velocity (fps)

min.	avg.	max.
0.24	5.53	6.24

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	1982	0.046	12	9037	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_081758a	No. of Measurements:	1982	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 8:17:58 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
118.21	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
23.48	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_081758a	No. of Measurements:	1982	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 8:17:58 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
125.65	CQI > = 95
98.1	80% of k-Value MVs >= 150
4.86	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction.The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value for the selected material.The default target % _Passing TV 80%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the MVs reported at each grid point of the mapping area. The default target COV is 30%. Description of COV ranges: 20% = Low Variability; 20 to 40% = Moderate Variability; and greater than 40% = High Variability.

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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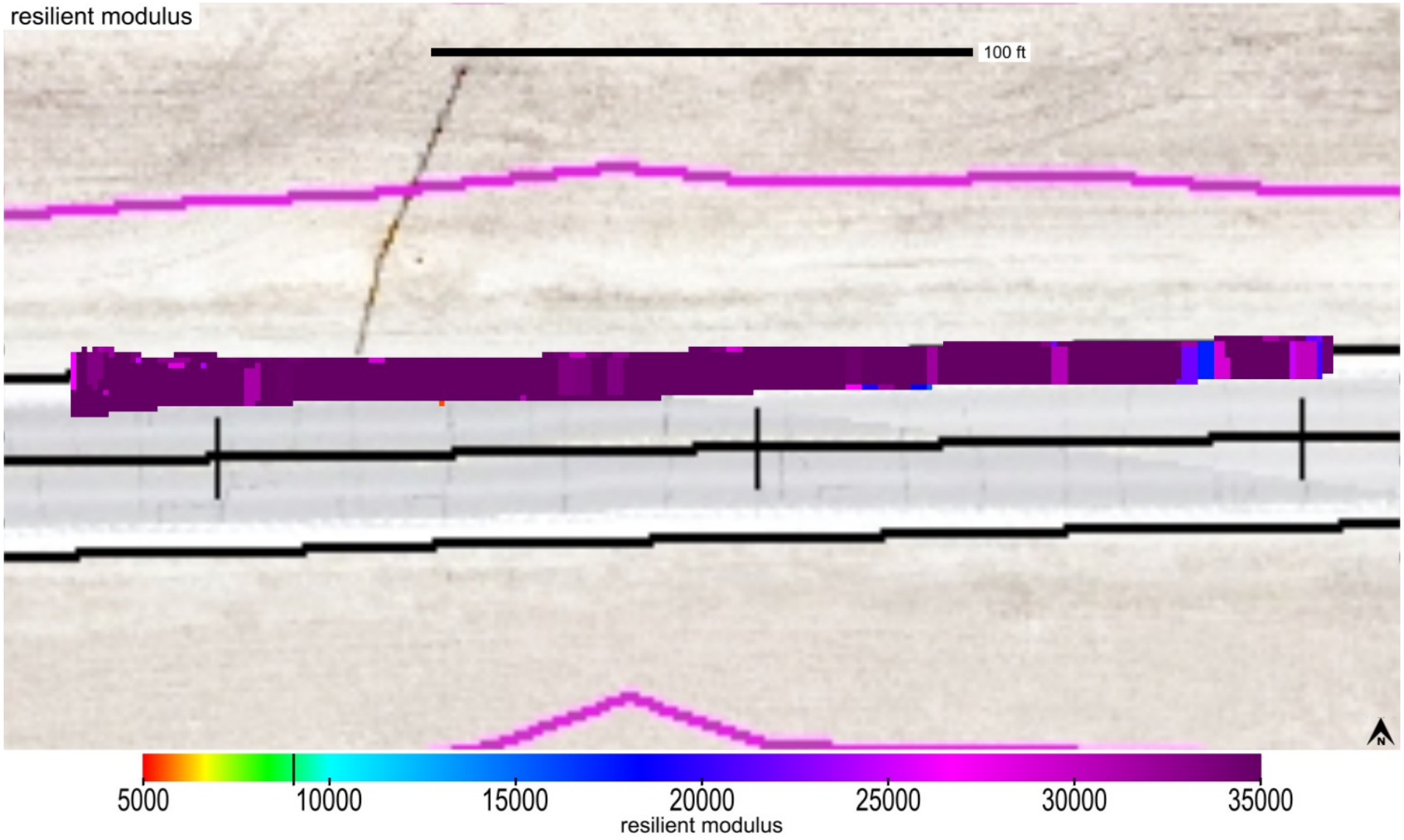
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.21	0.47	9037	5500	45187.3	56000	10607.85	23.48	-3537	36150.3	46963



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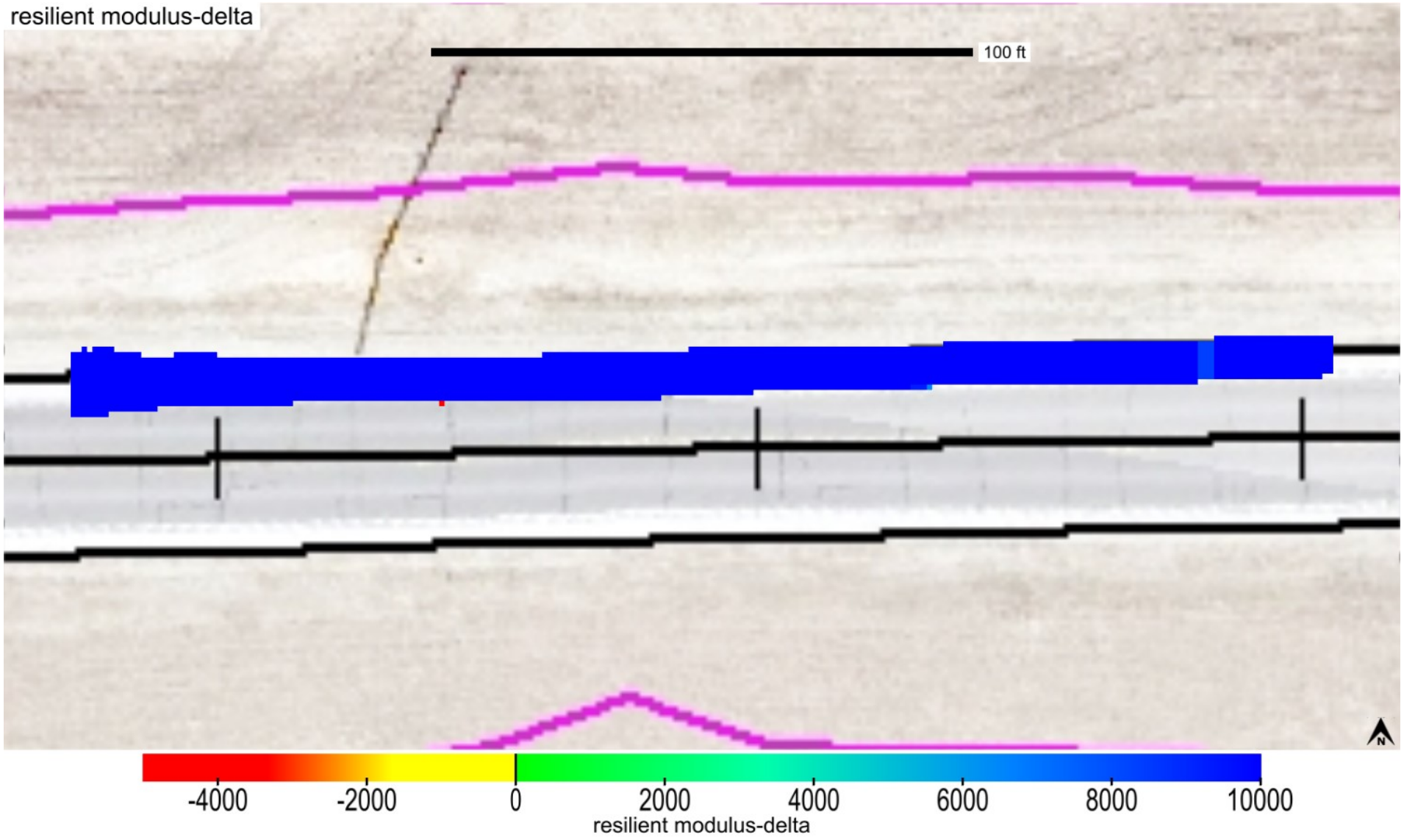
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.21	0.47	9037	5500	45187.3	56000	10607.85	23.48	-3537	36150.3	46963



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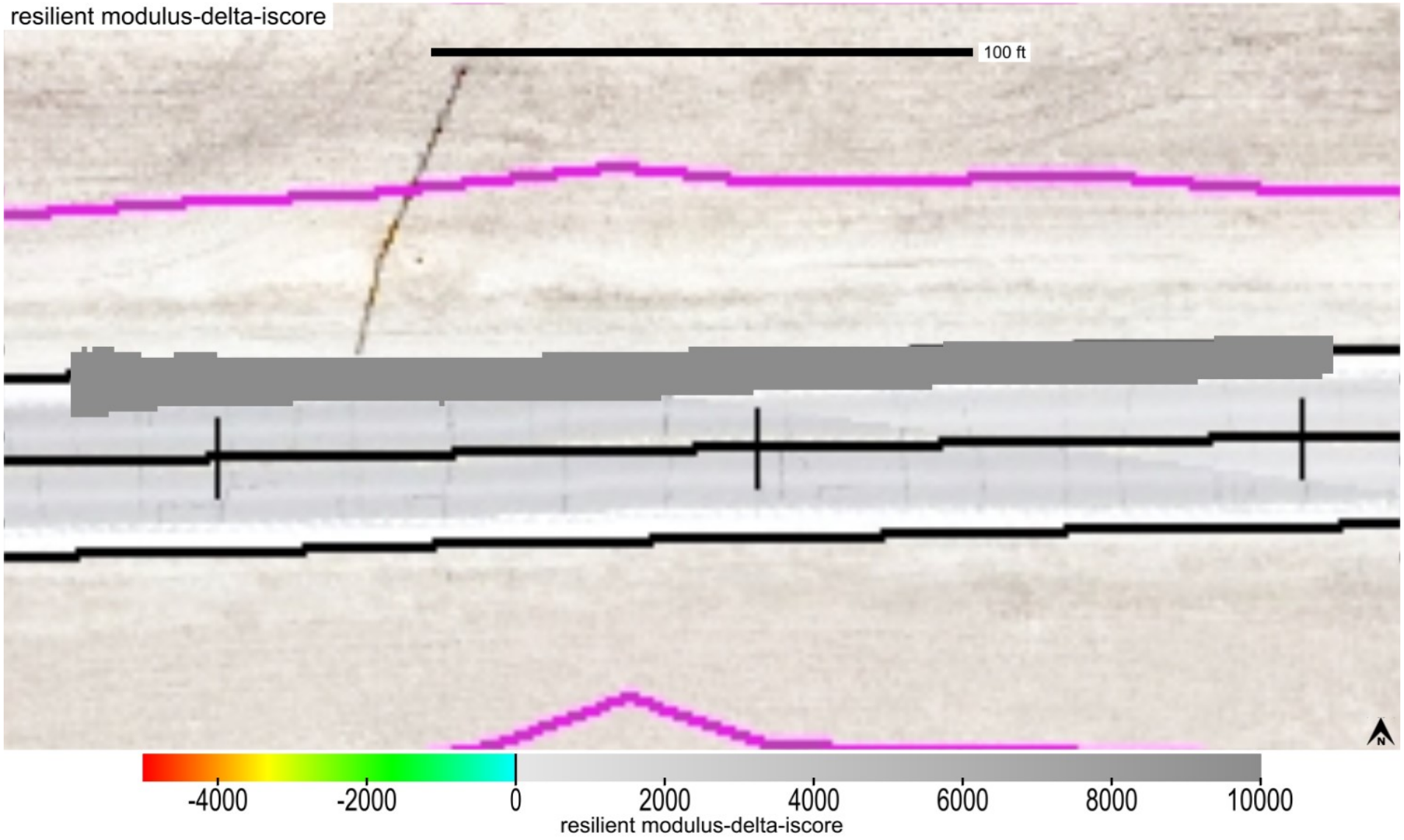
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	-3537	36150.3	46963	21865.18	36197.03	46617.11



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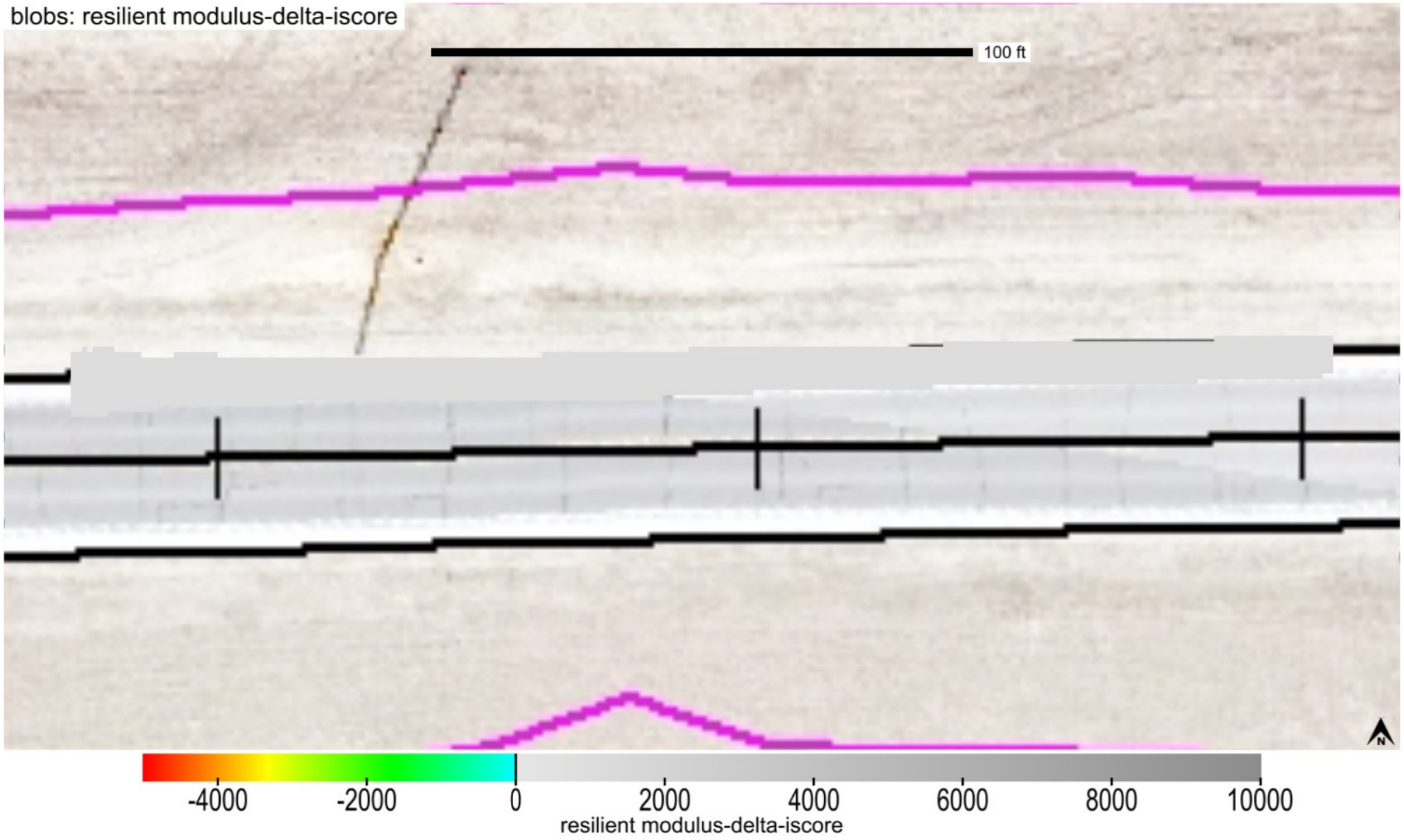
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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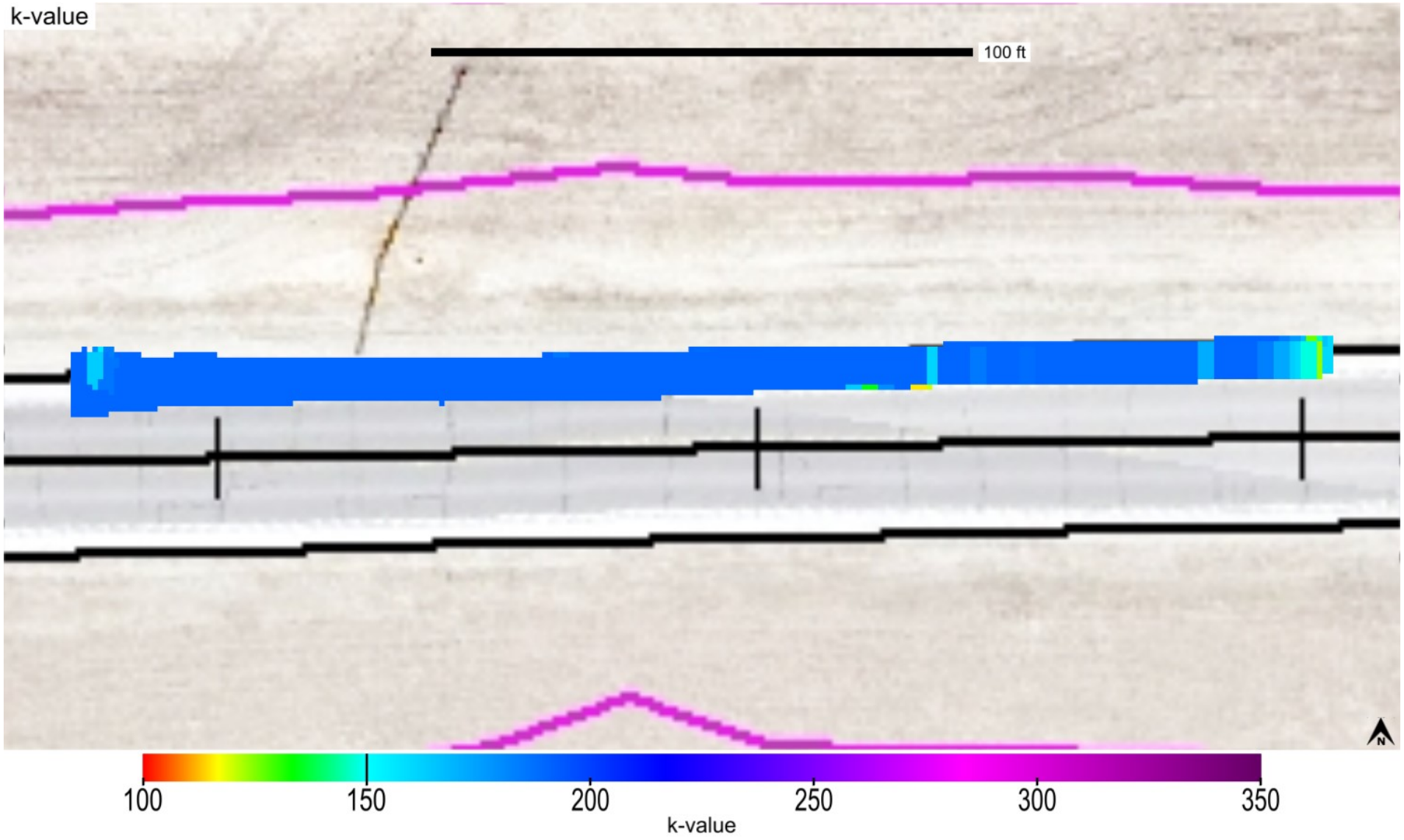
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	98.1	125.65	3.02	150	115.1	187.5	190	9.12	4.86	-34.9	37.5	40



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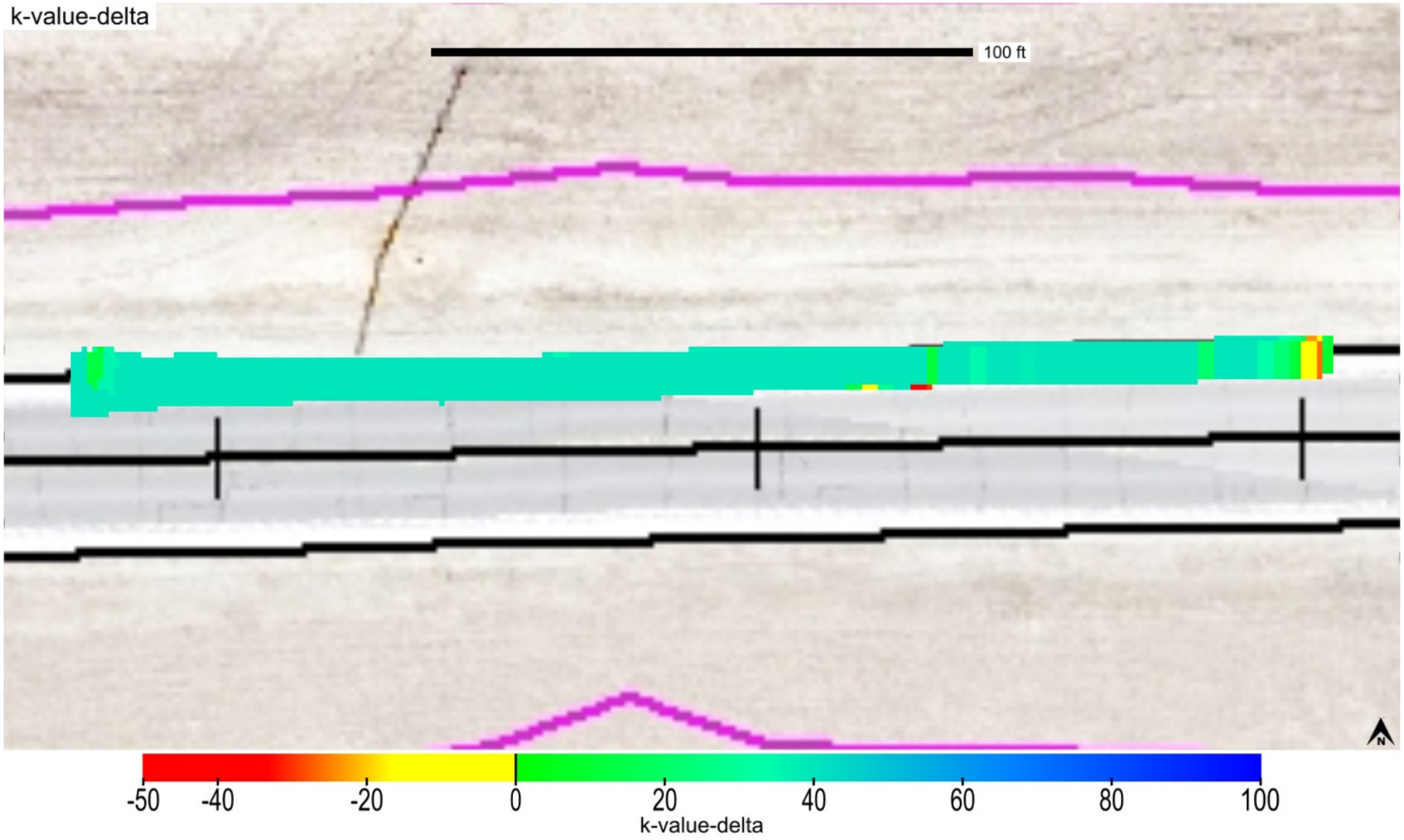
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	98.1	125.65	3.02	150	115.1	187.5	190	9.12	4.86	-34.9	37.5	40



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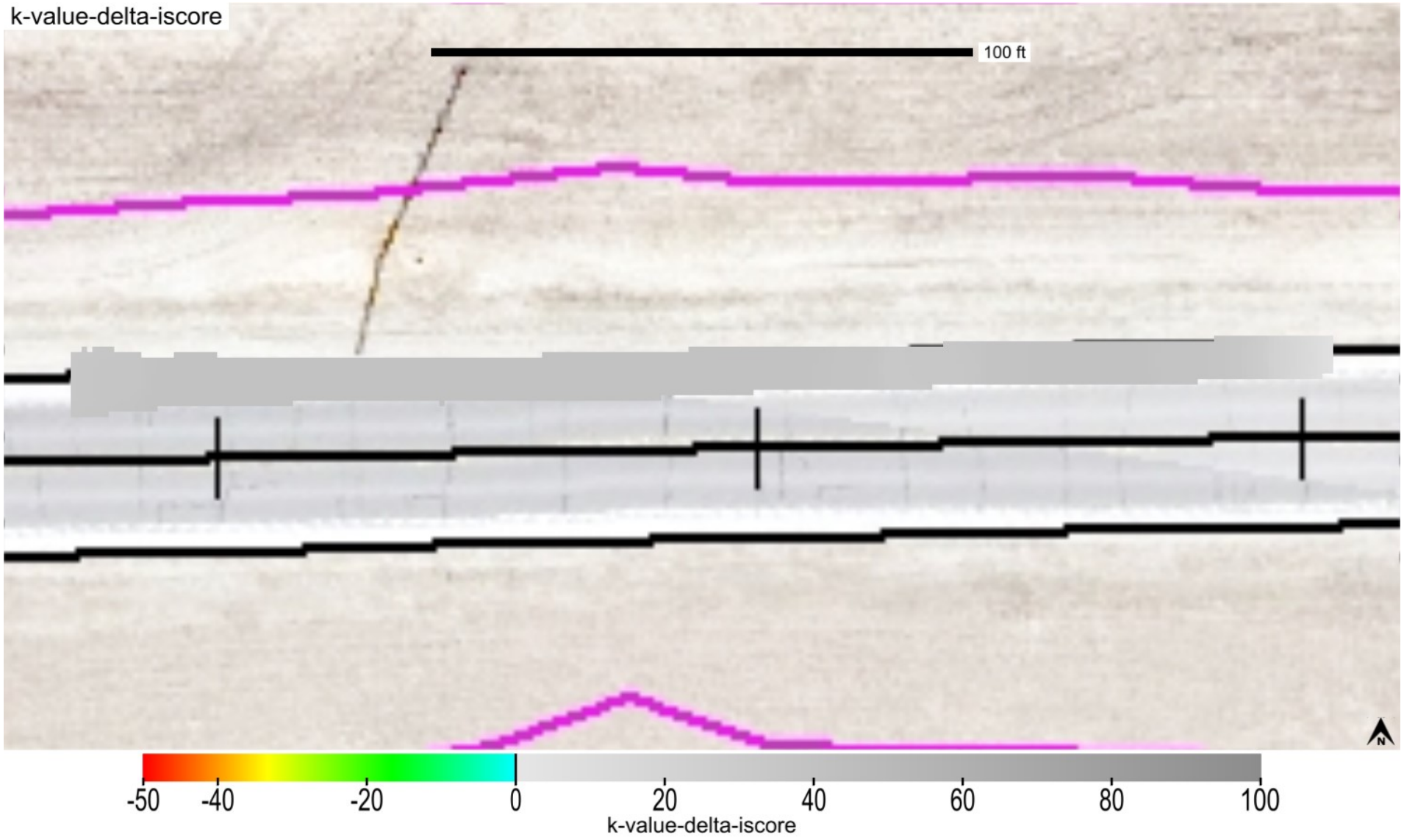
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	98.1	150	-34.9	37.5	40	5.81	37.58	40



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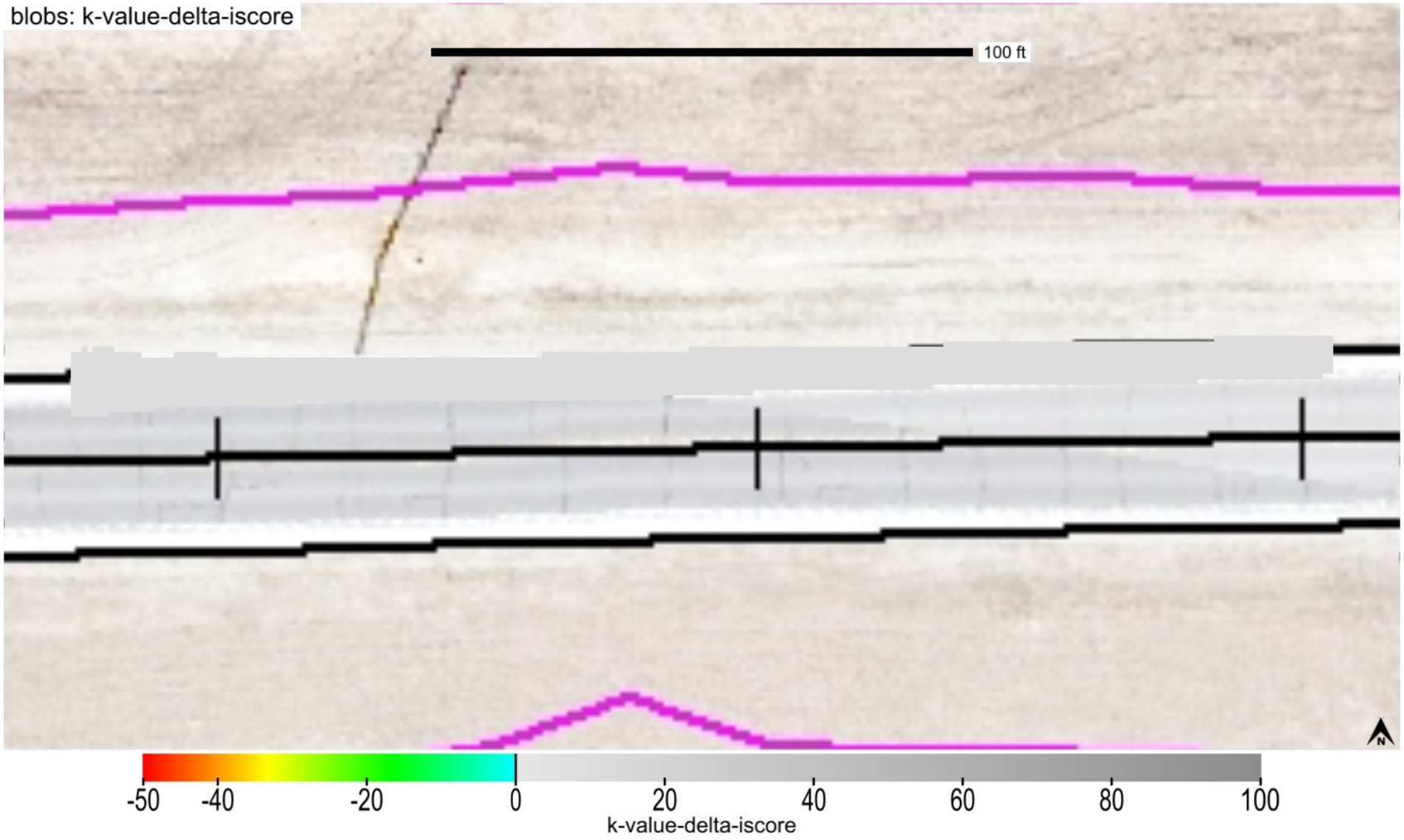
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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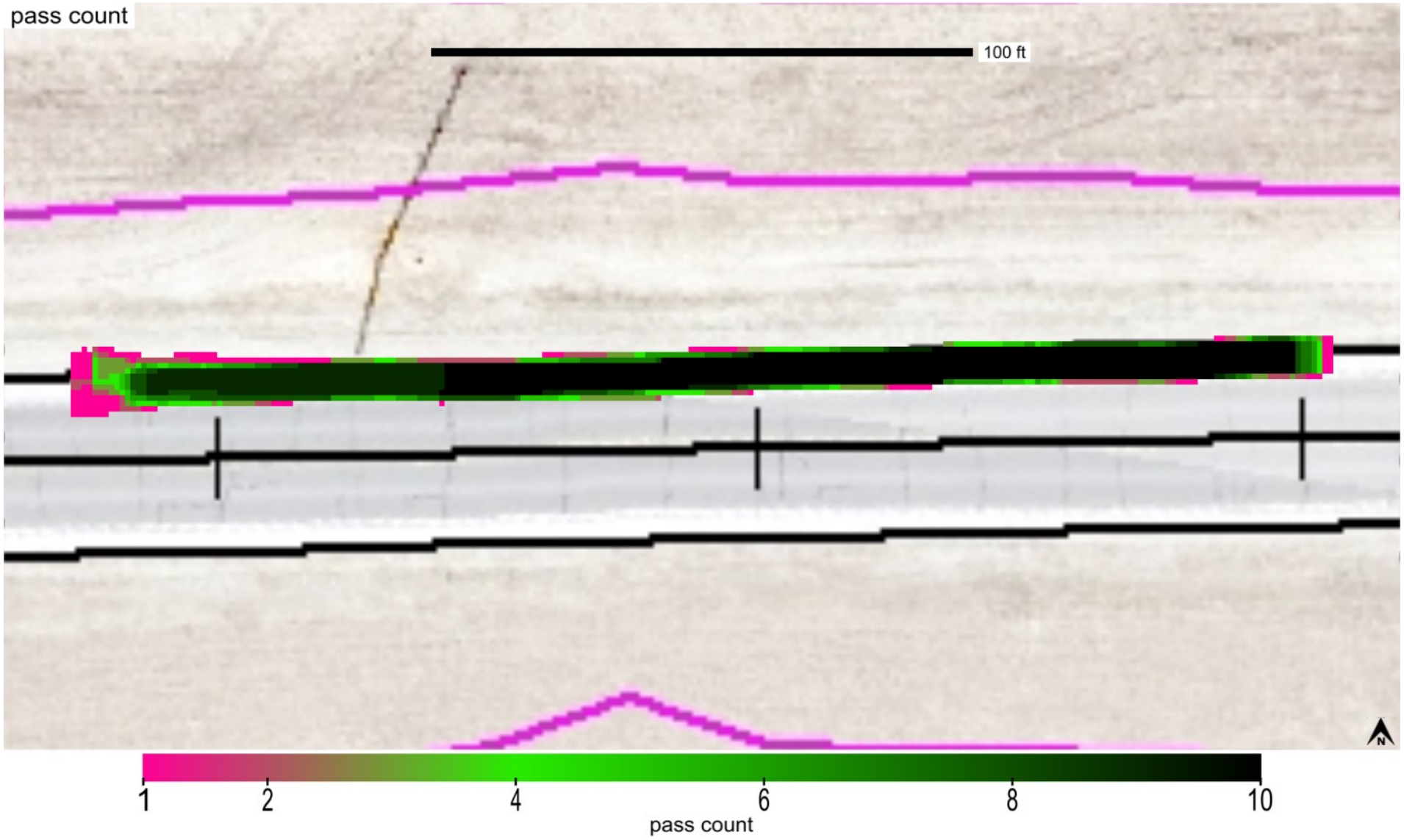
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

minimum	average	maximum
1	7.64	10



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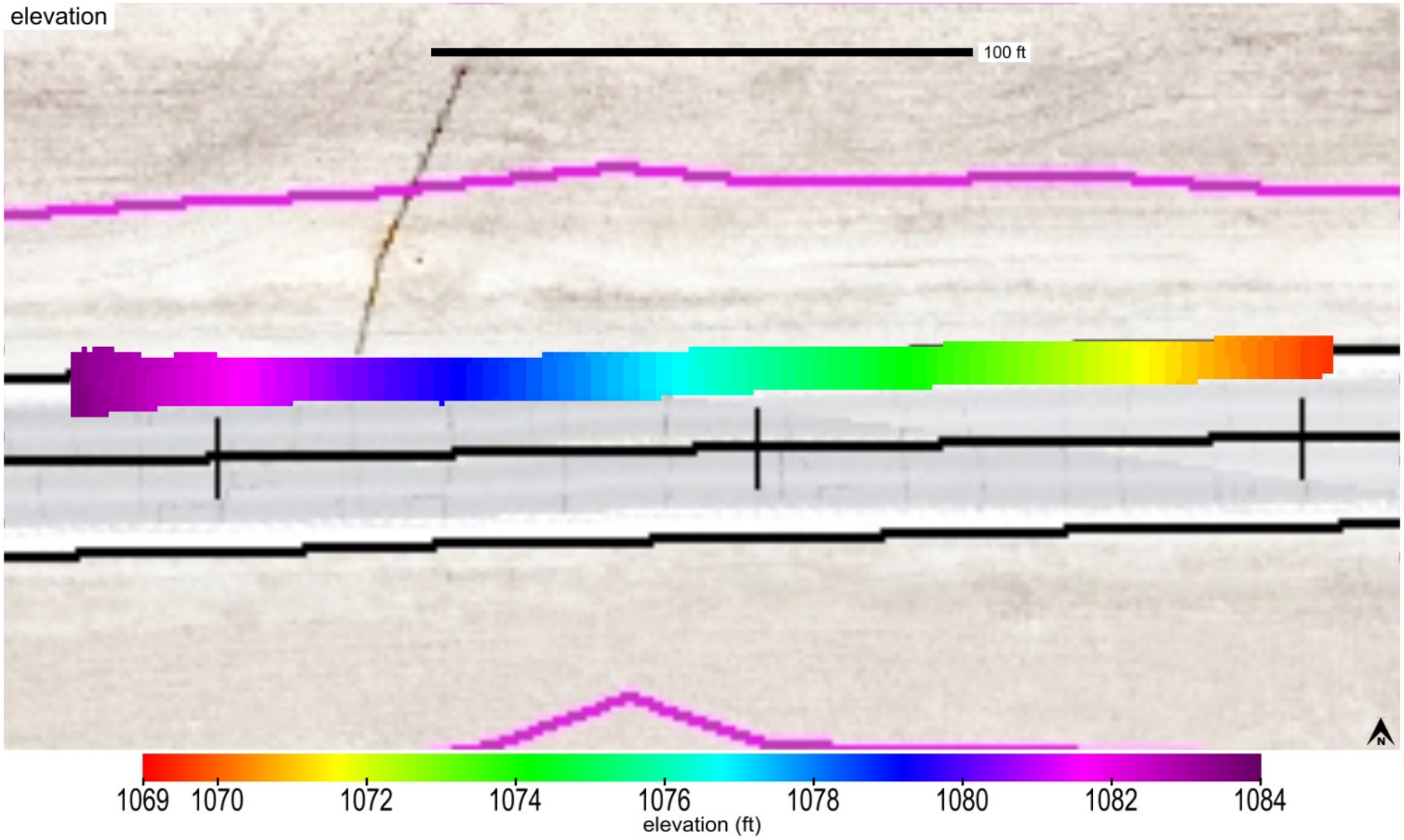
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

minimum	average	maximum
1069.542	1076.77	1083.551



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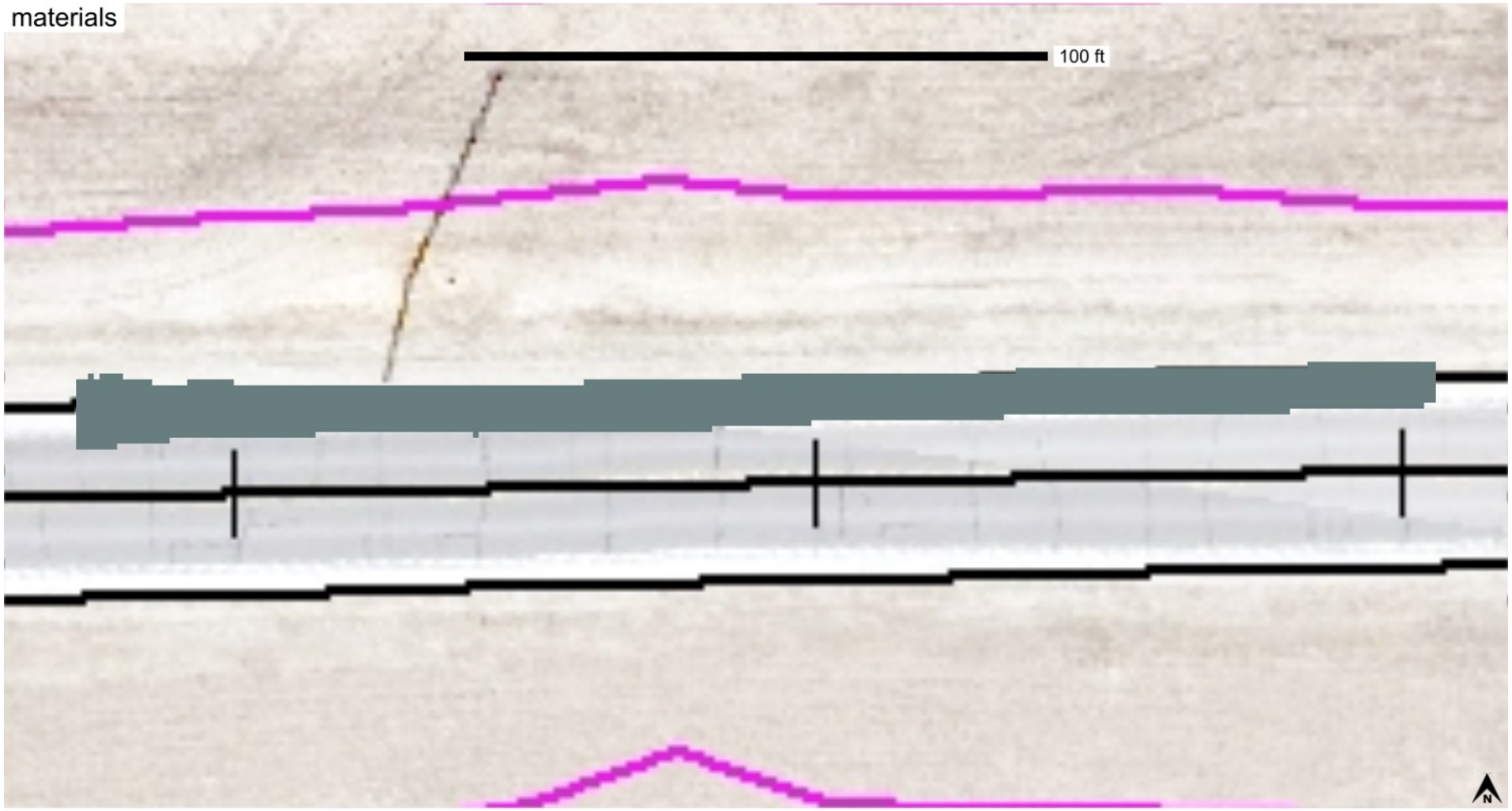
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_081758a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	1982	0.046	12	9037	150	40



Modified Subbase_IADOT (2115)

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