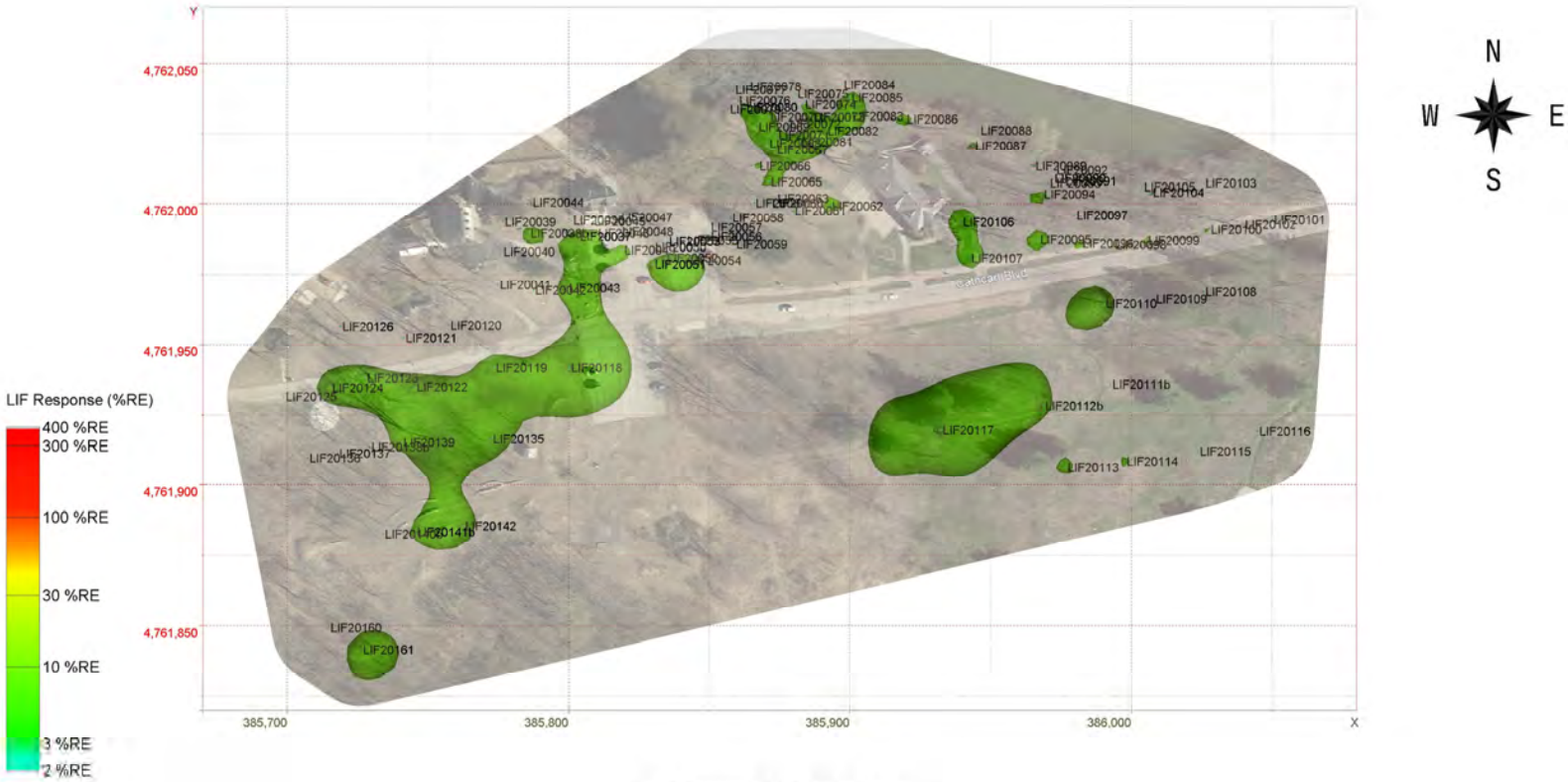
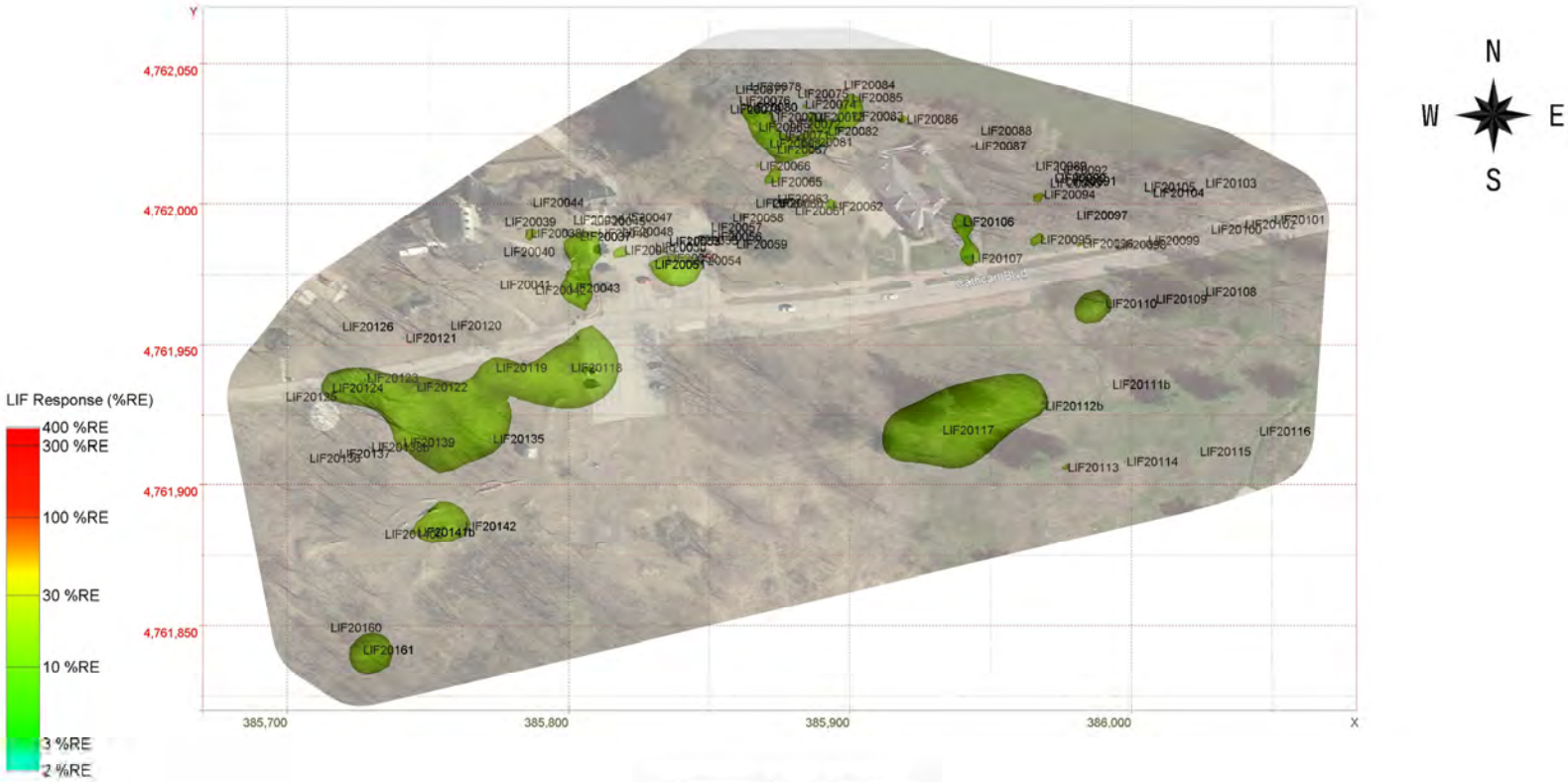
Attachment C

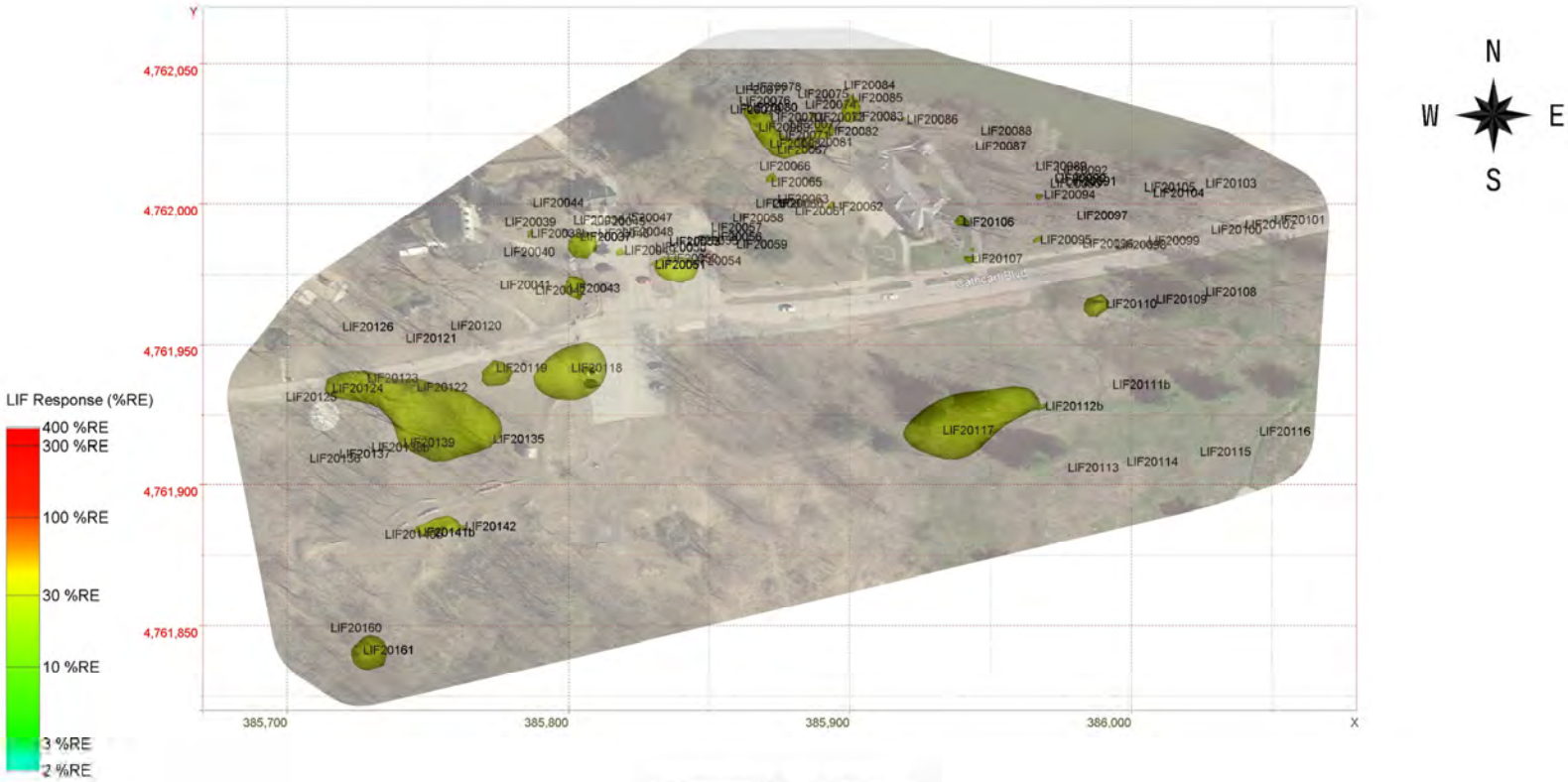
Lake Chipican Area LIF 3D Visualizations



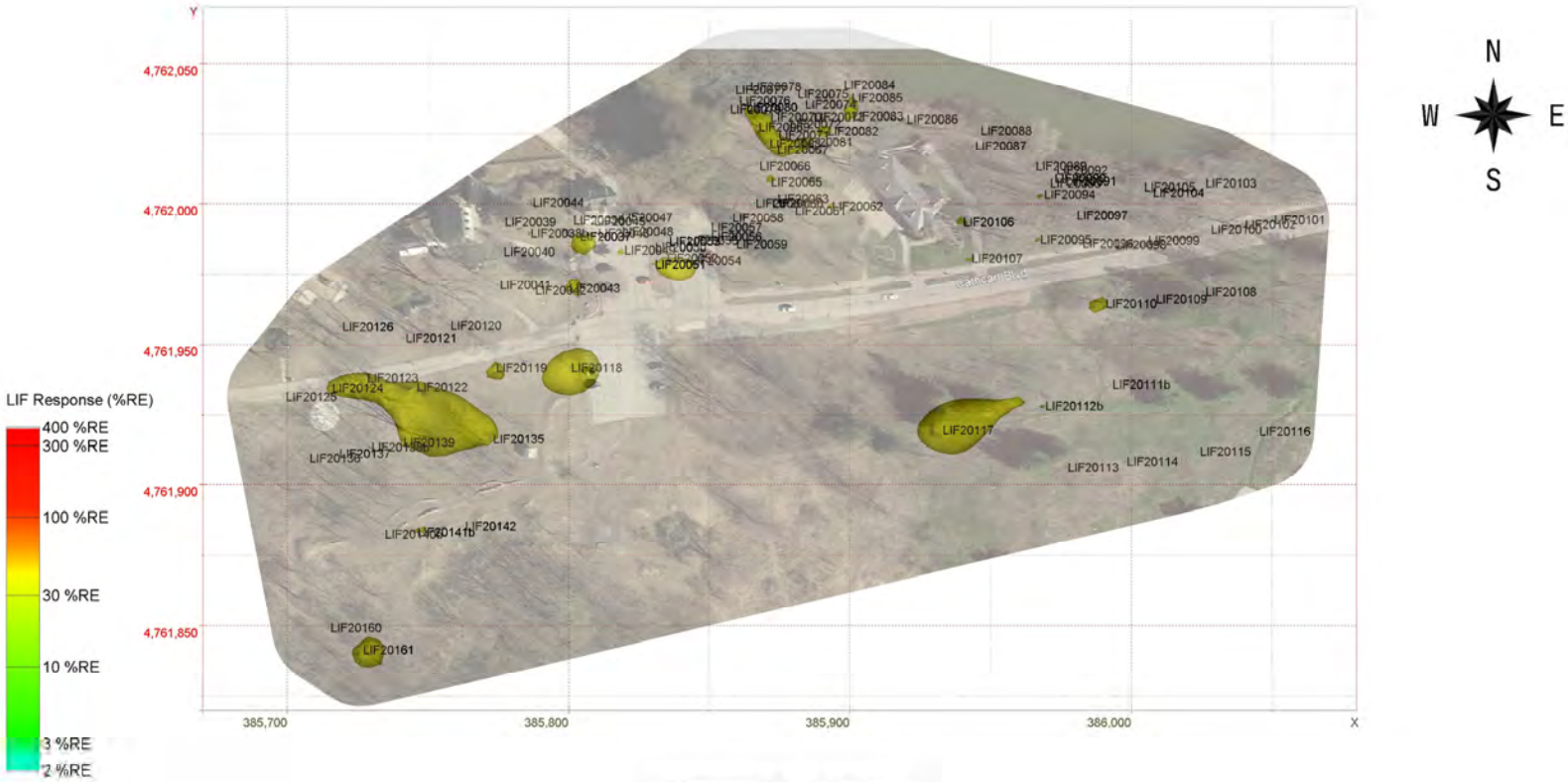
LIF Response 5 %RE and Above



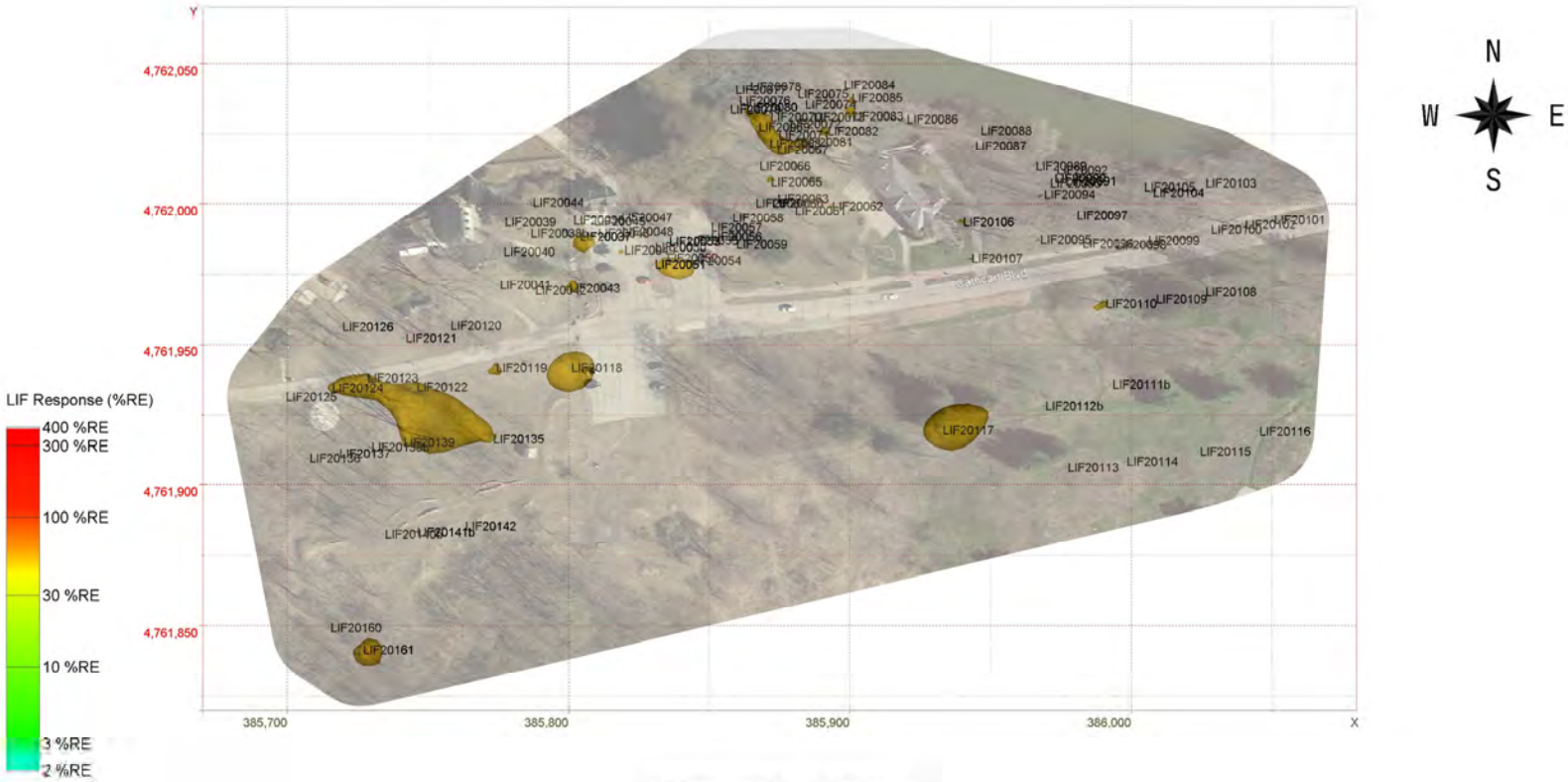
LIF Response 10 %RE and Above



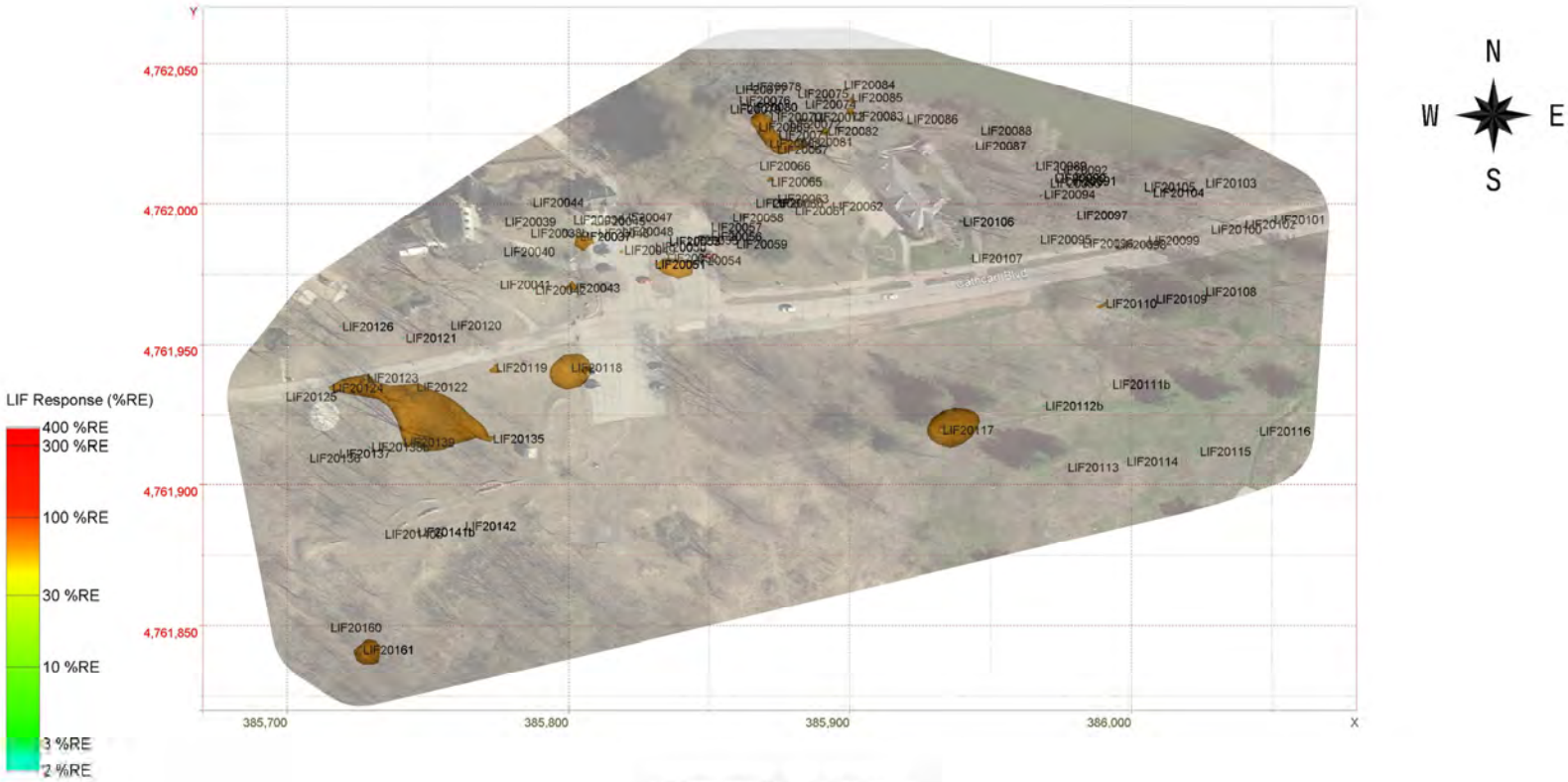
LIF Response 20 %RE and Above



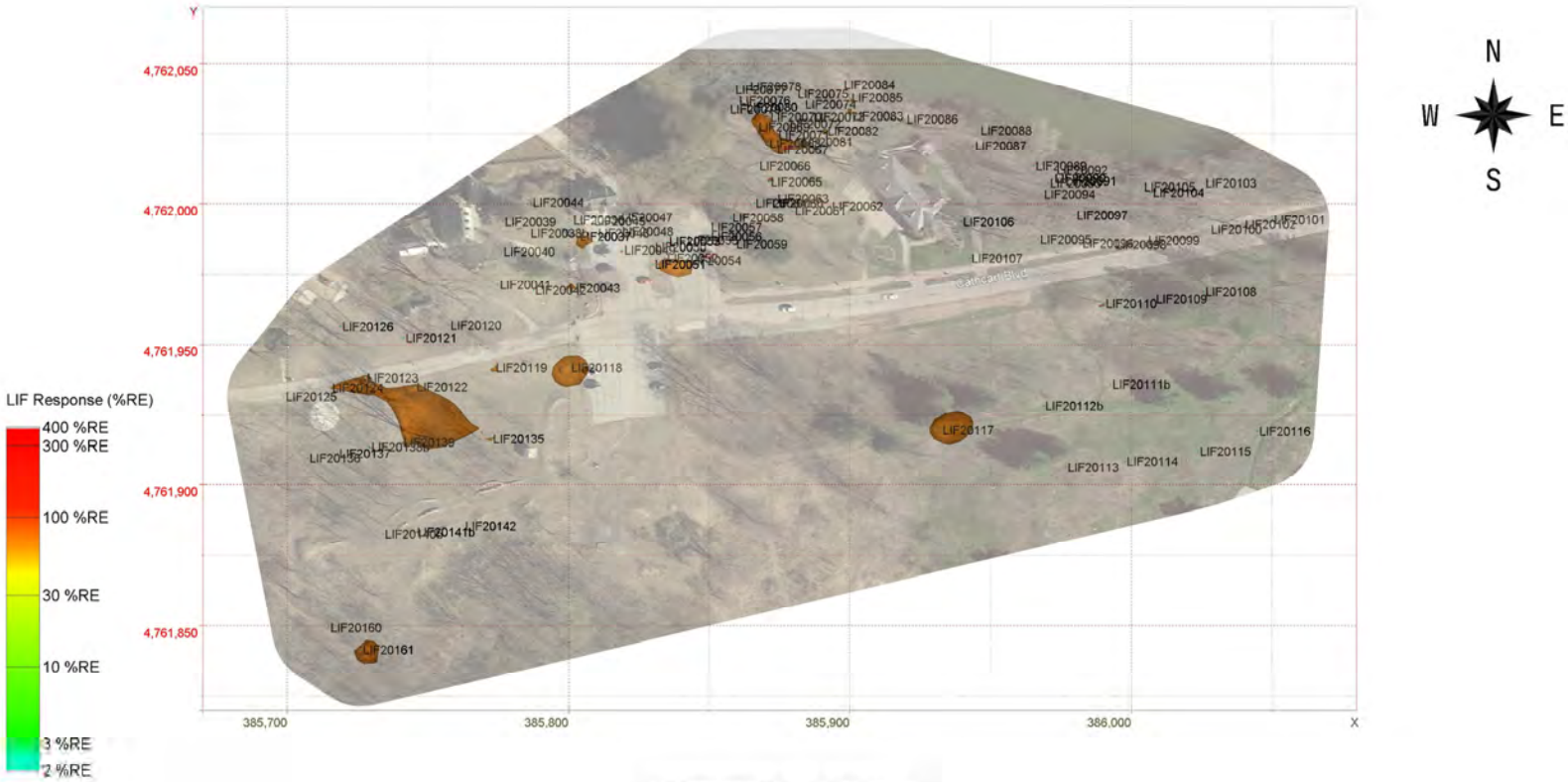
LIF Response 30 %RE and Above



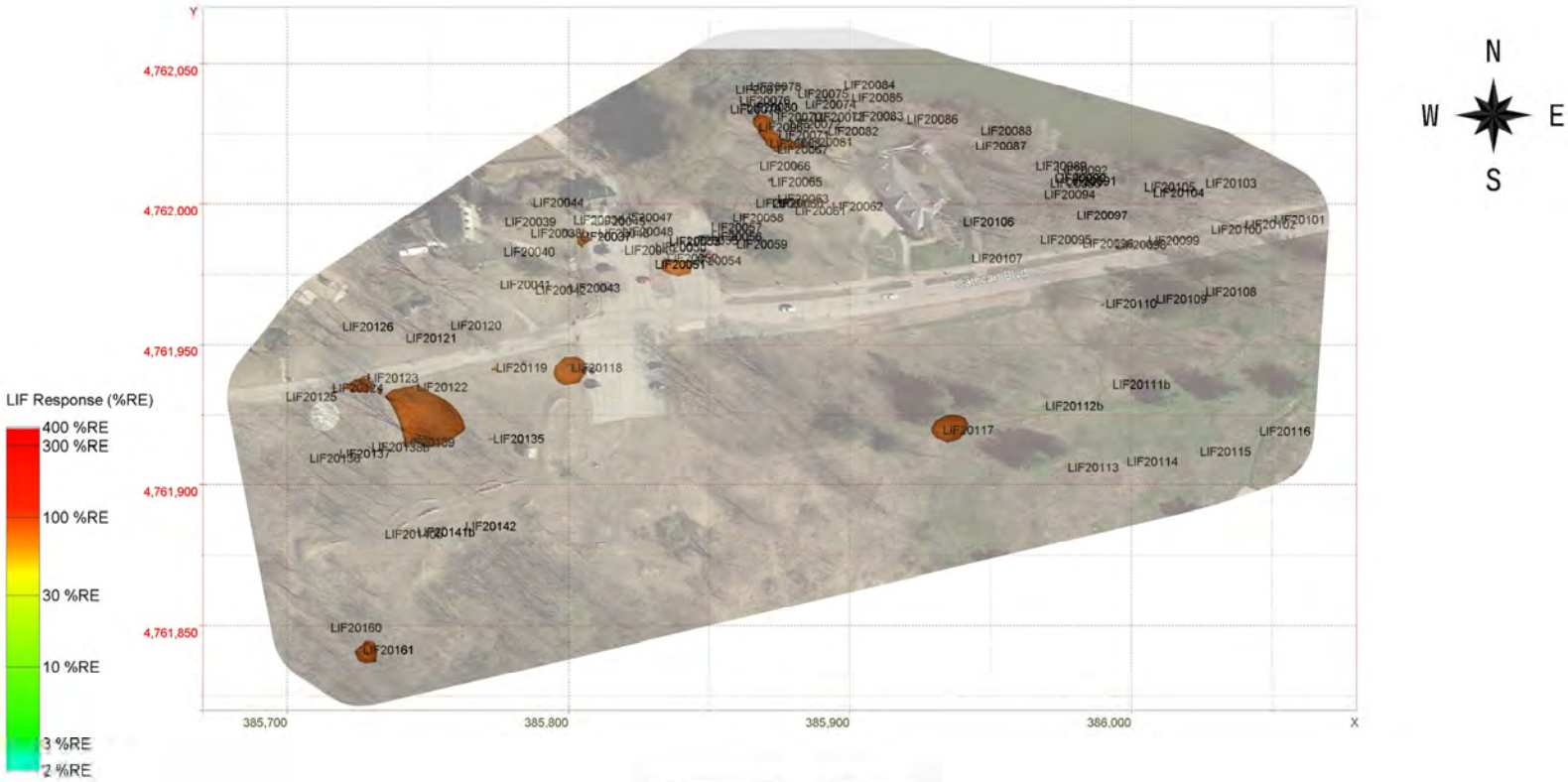
LIF Response 40 %RE and Above



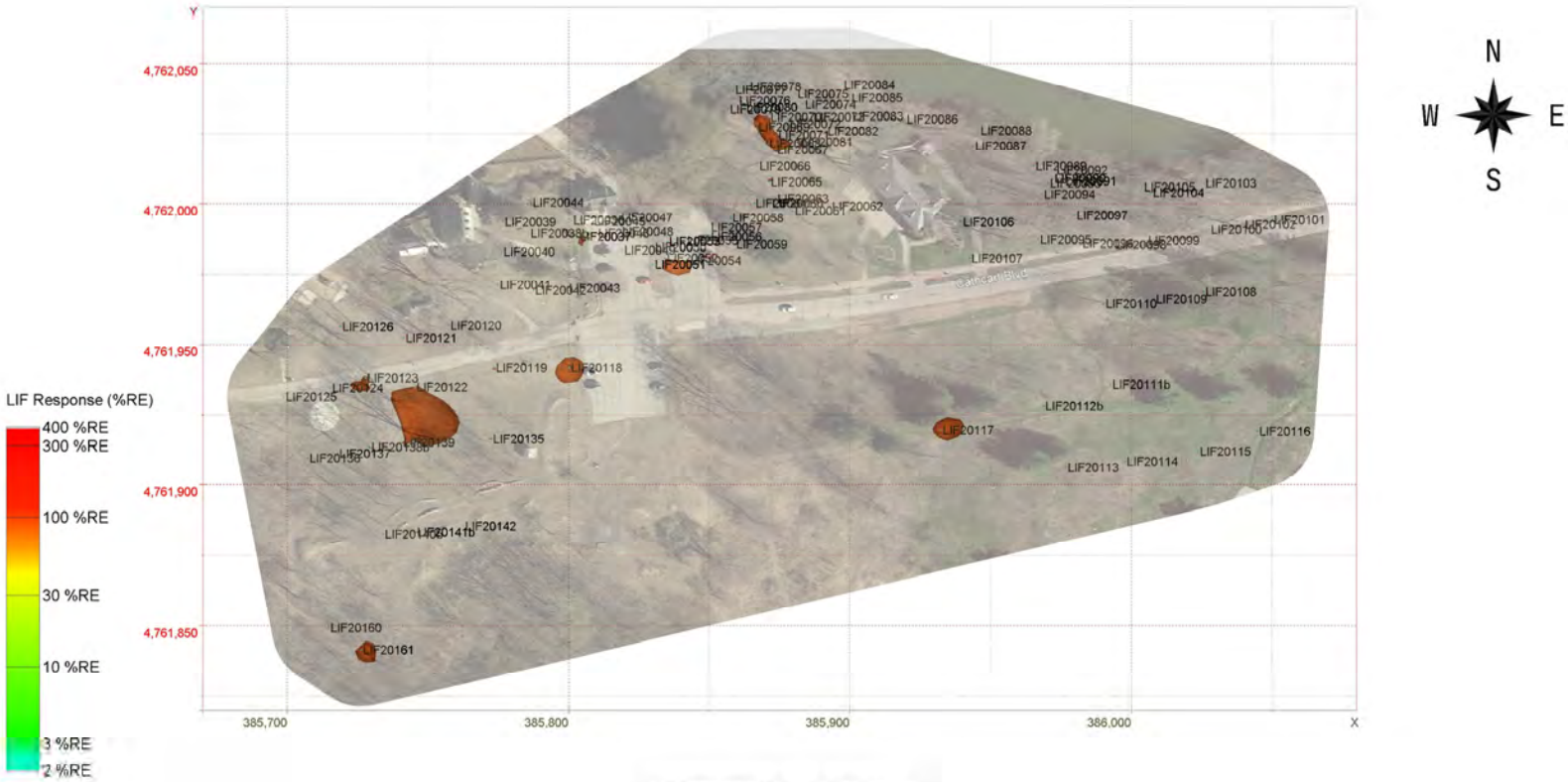
LIF Response 50 %RE and Above



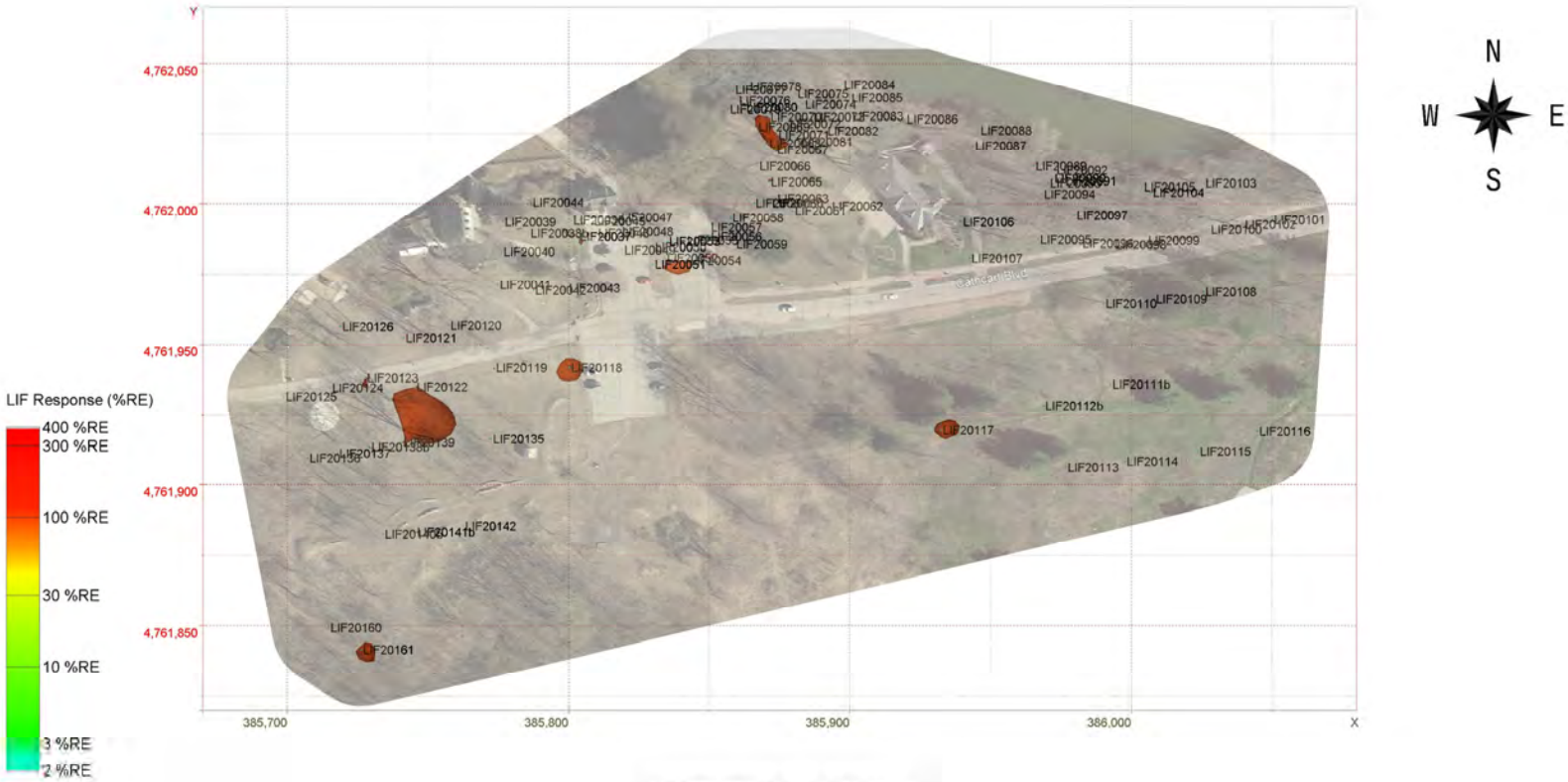
LIF Response 60 %RE and Above



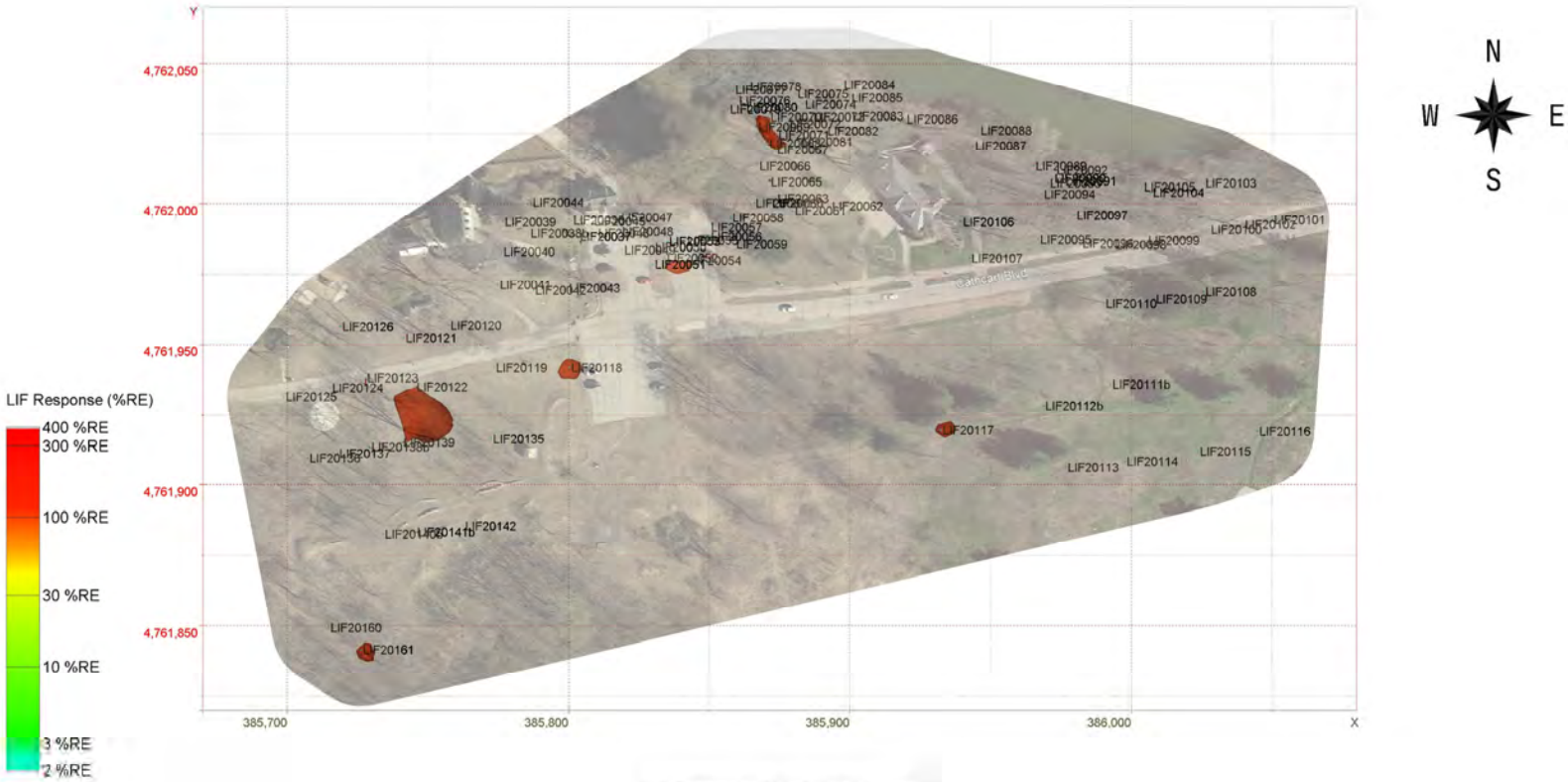
LIF Response 70 %RE and Above



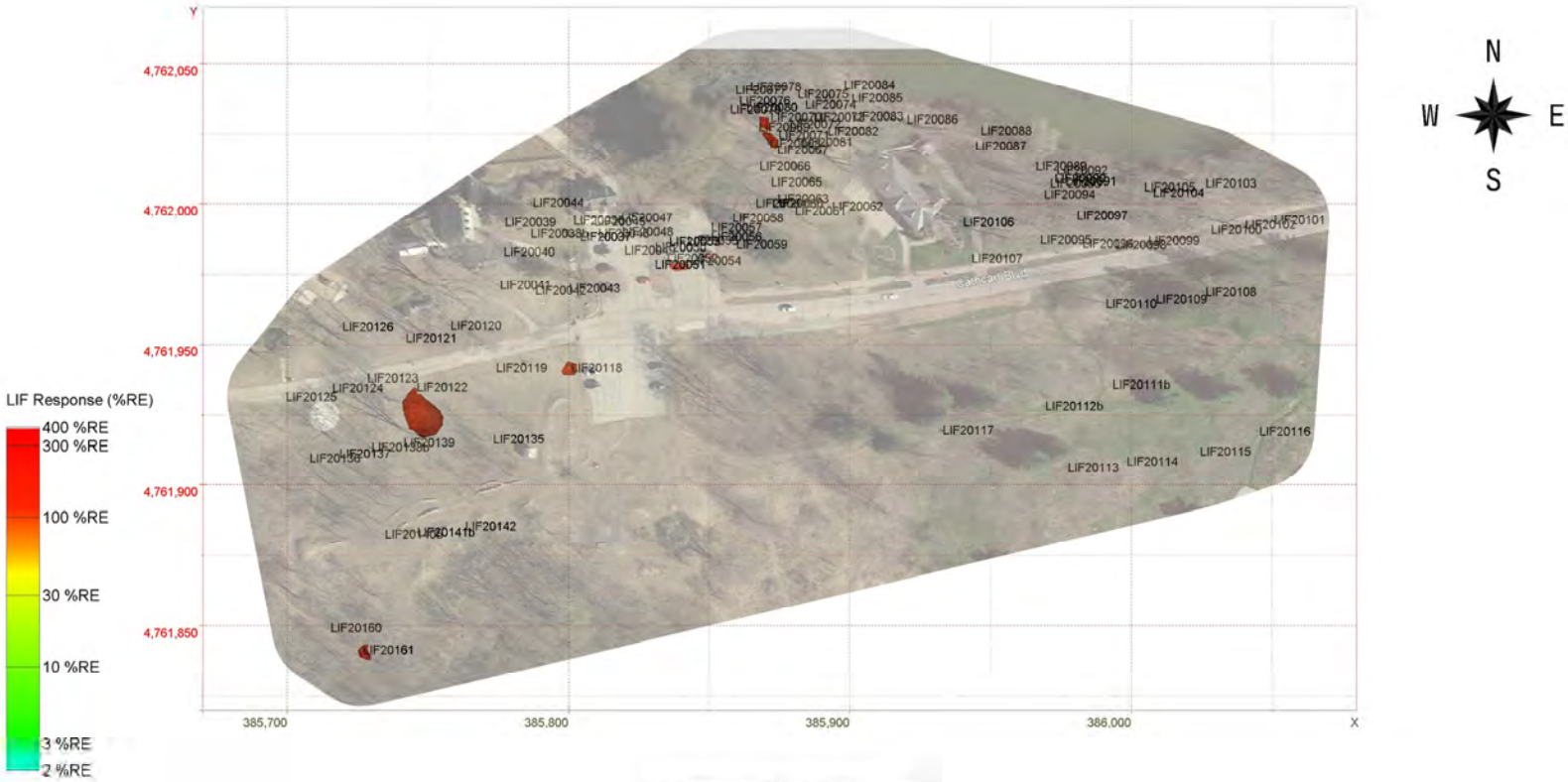
LIF Response 80 %RE and Above



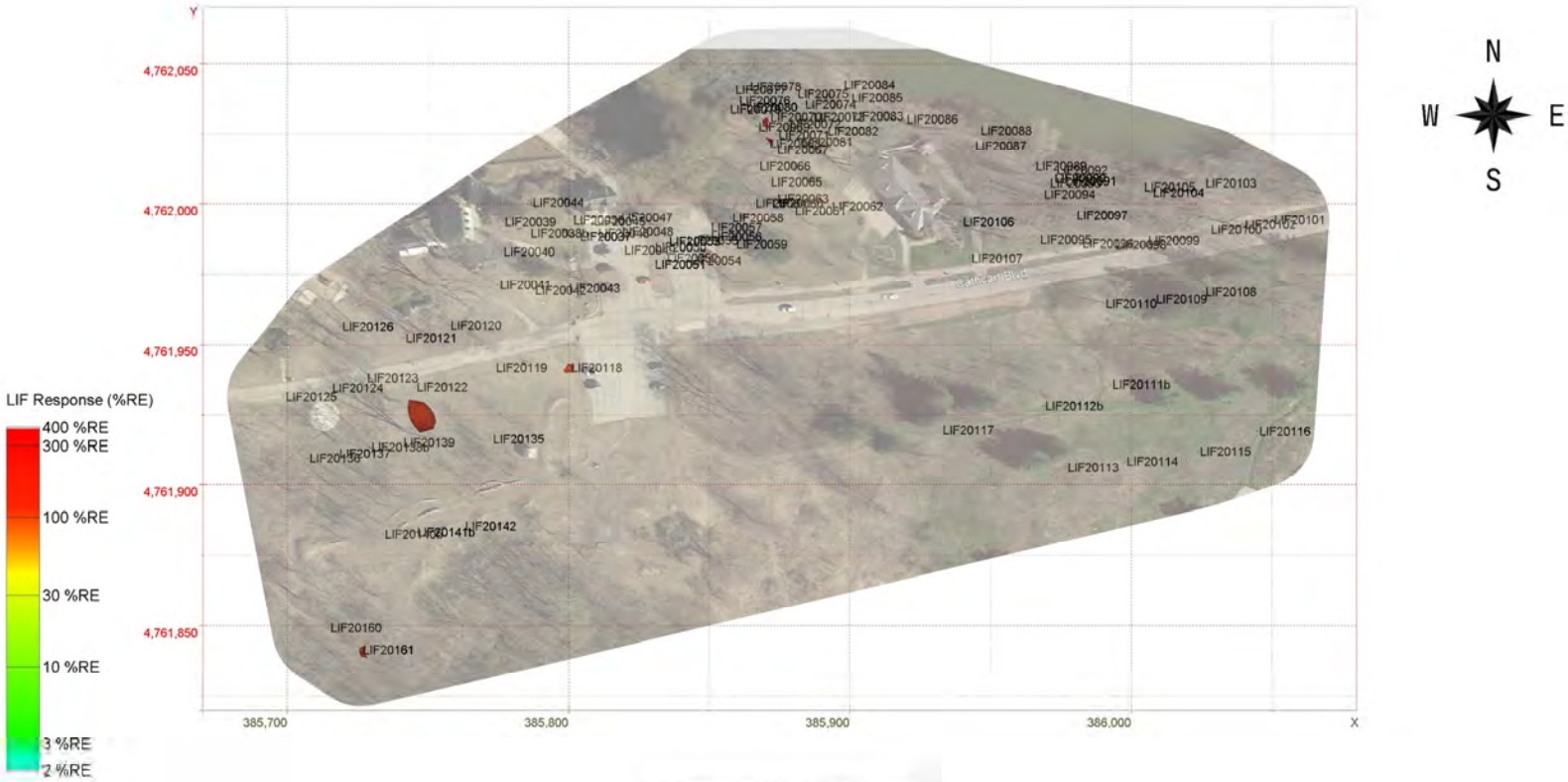
LIF Response 90 %RE and Above



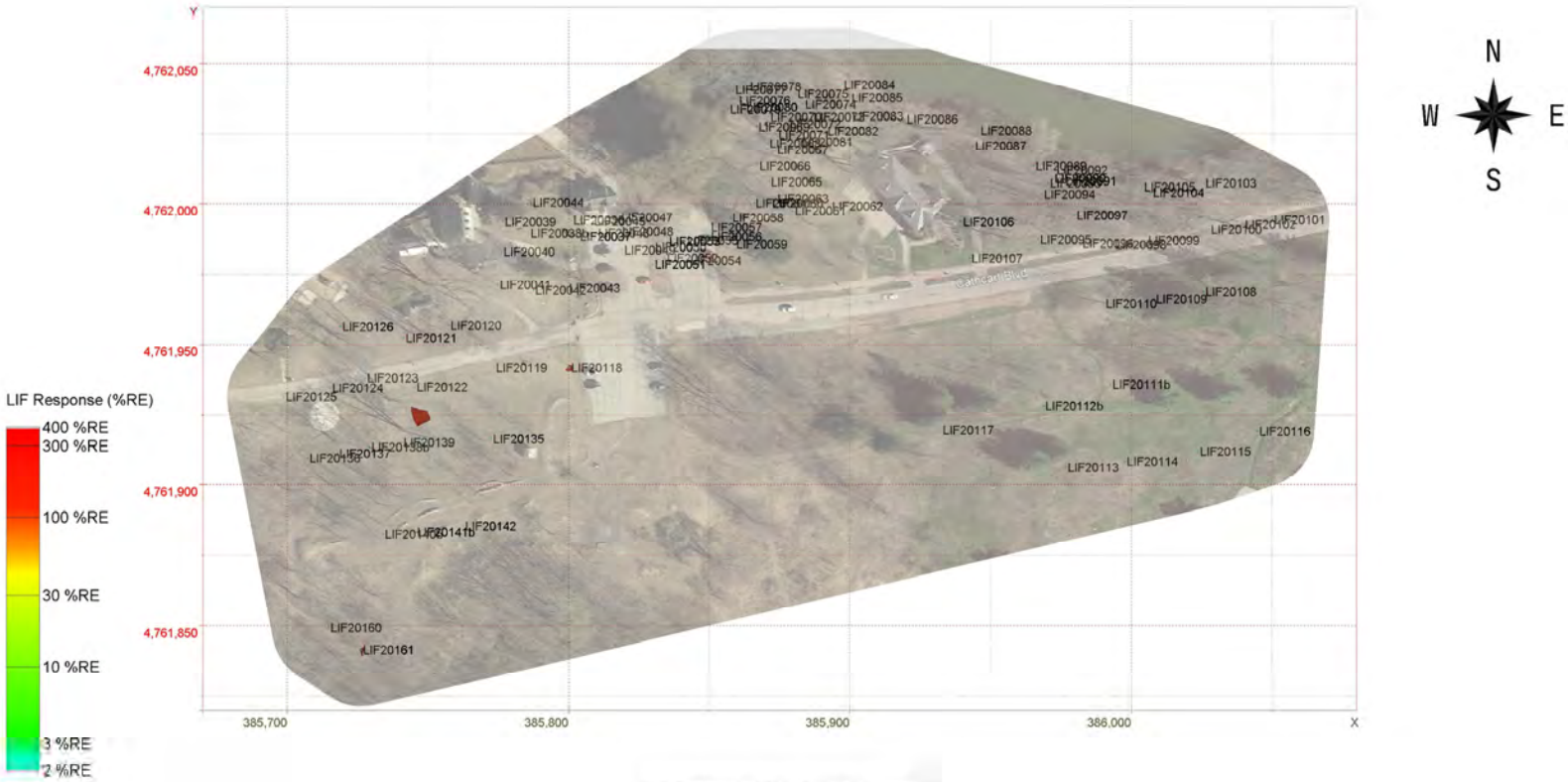
LIF Response 100 %RE and Above



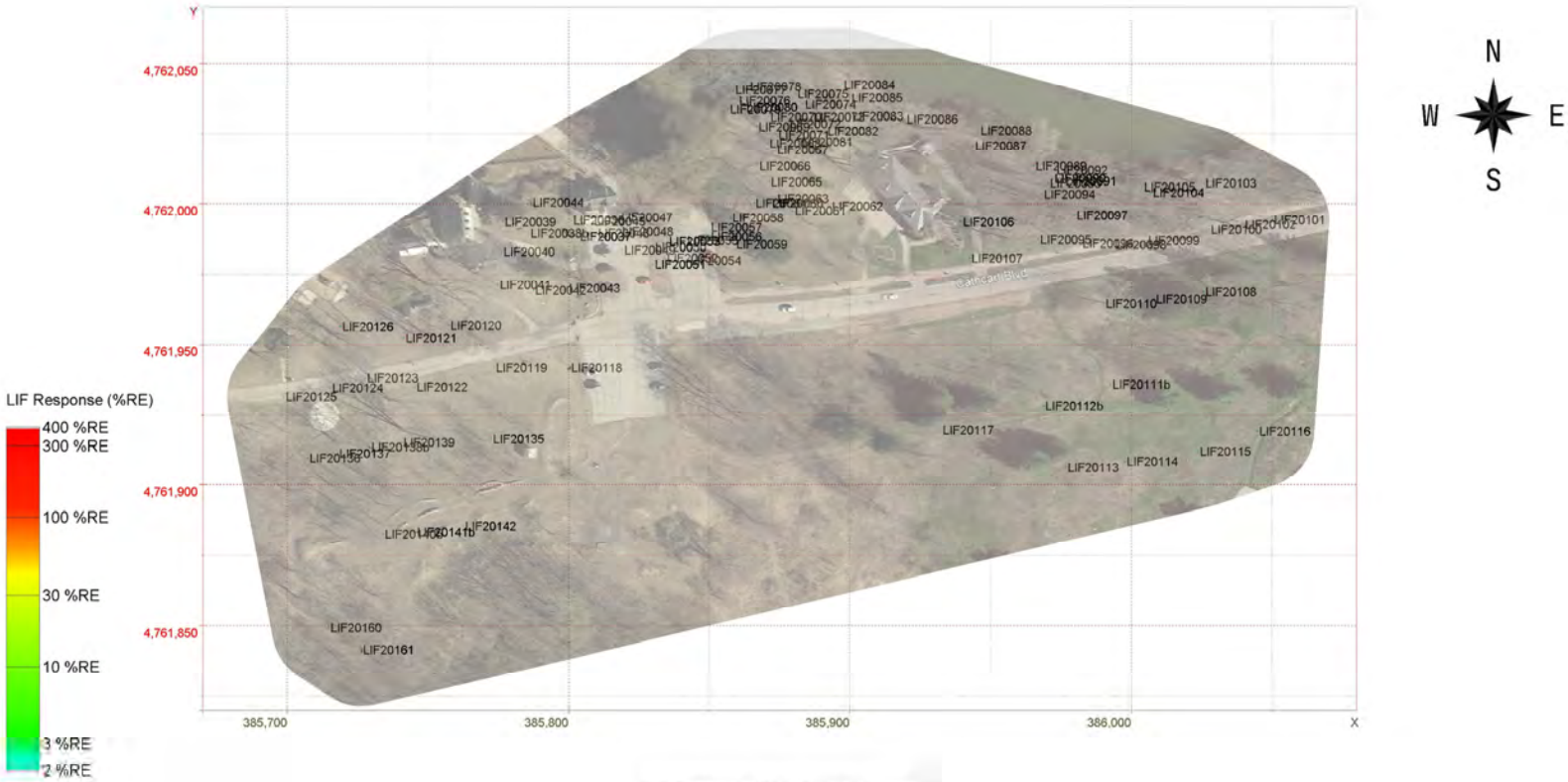
LIF Response 150 %RE and Above



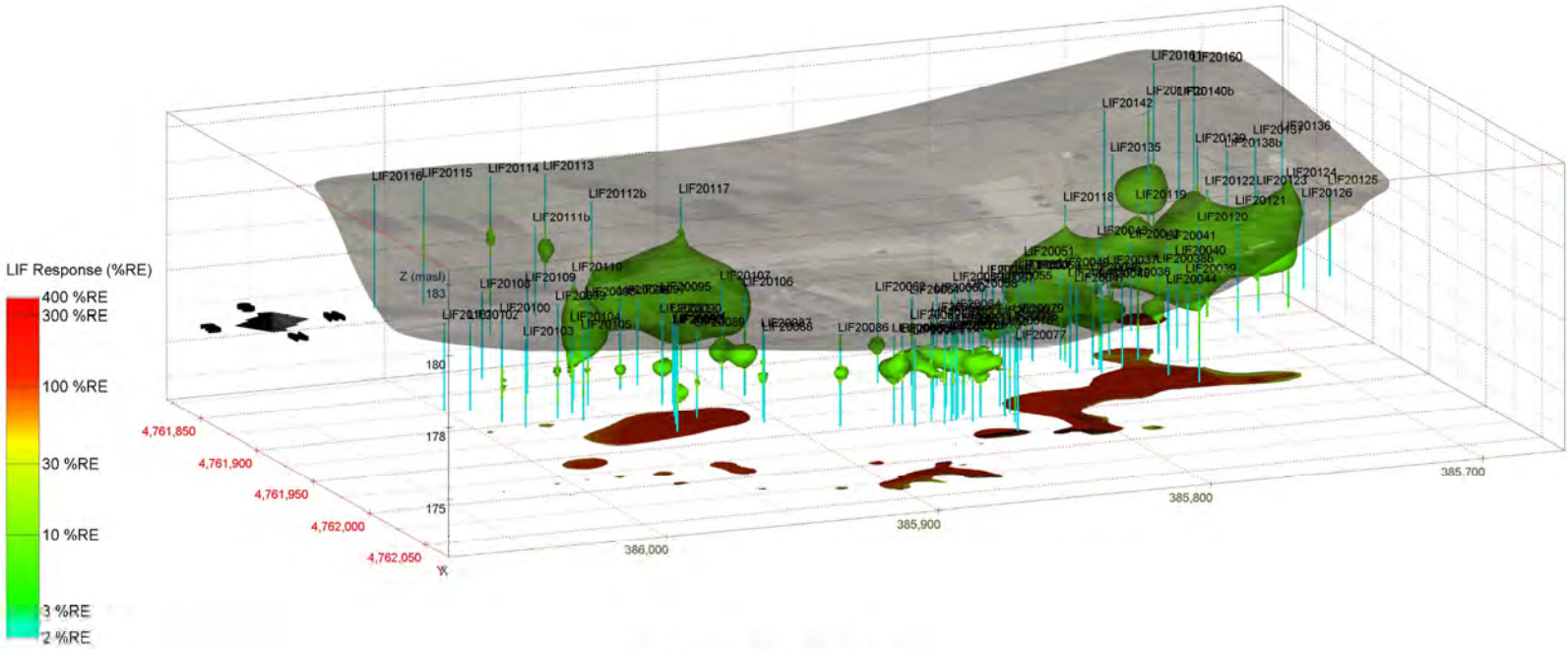
LIF Response 200 %RE and Above



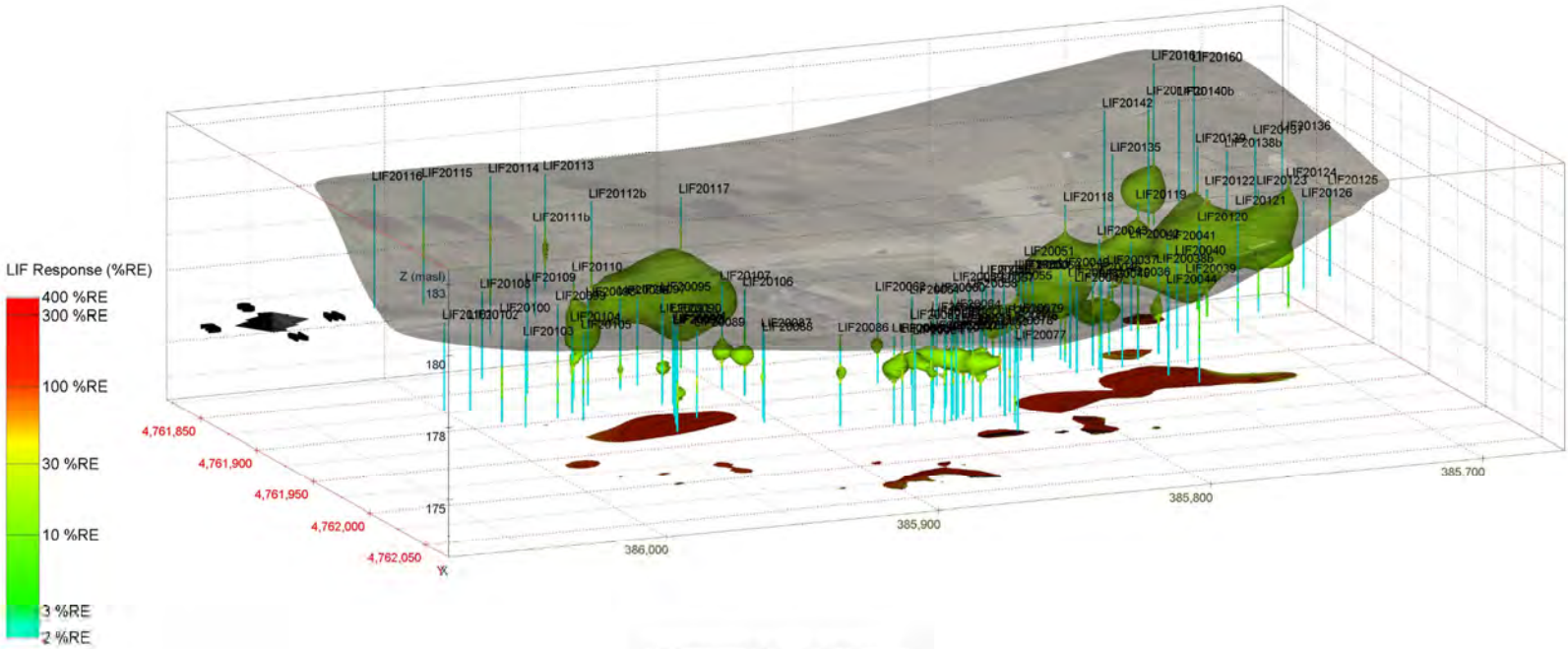
LIF Response 250 %RE and Above



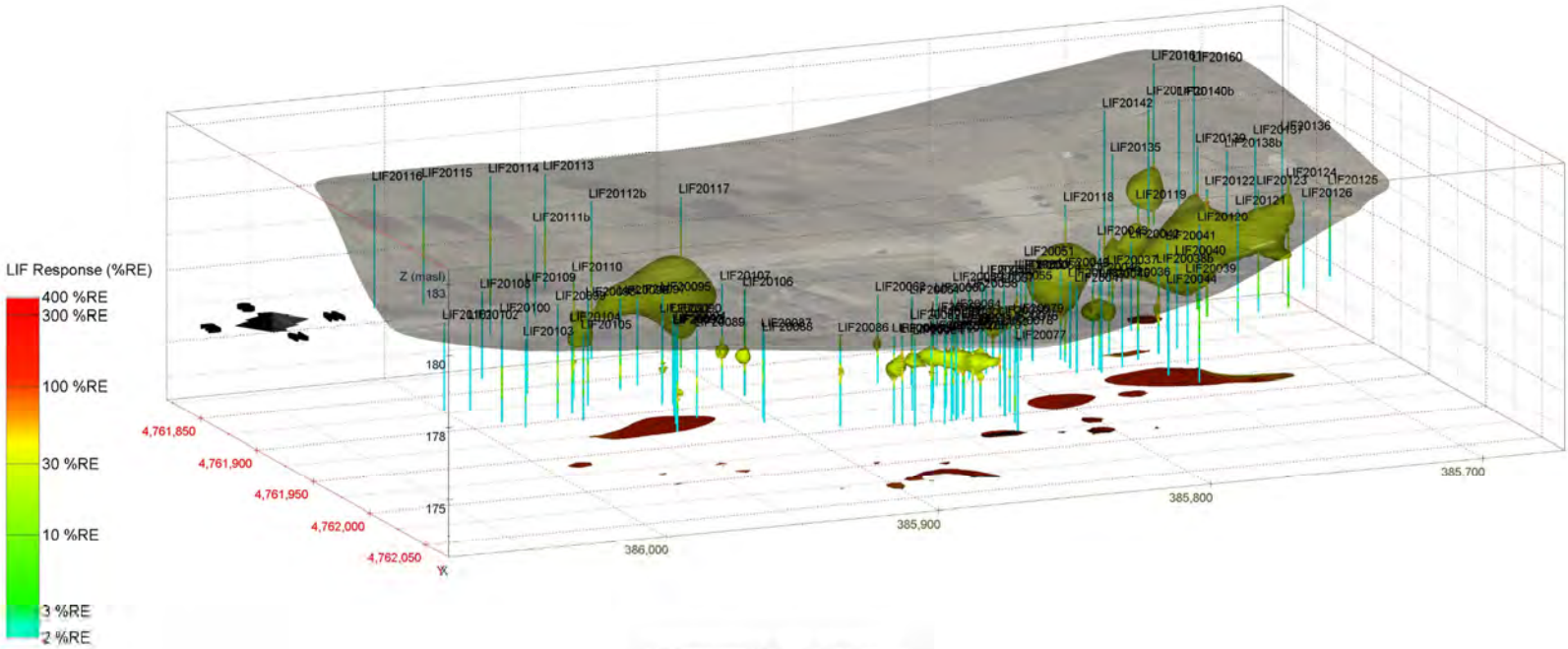
LIF Response 300 %RE and Above



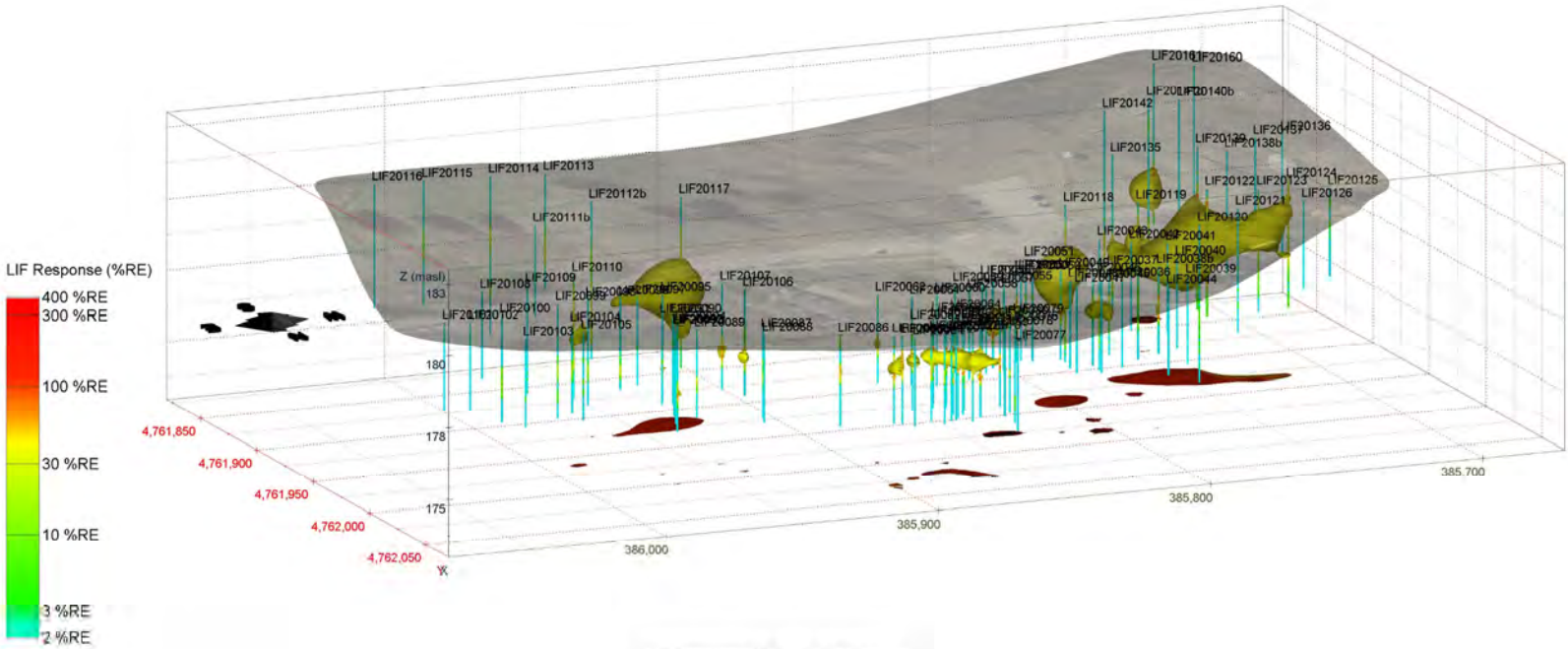
LIF Response 5 %RE and Above



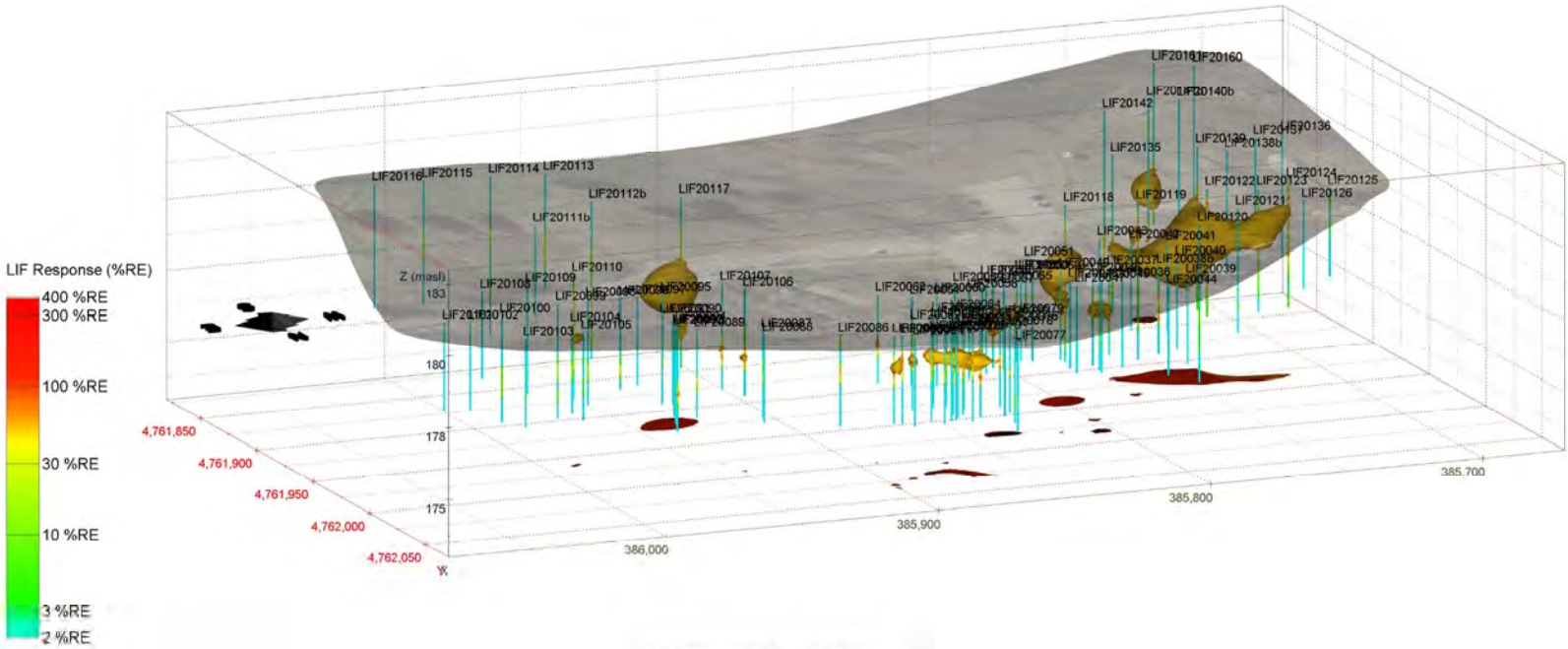
LIF Response 10 %RE and Above



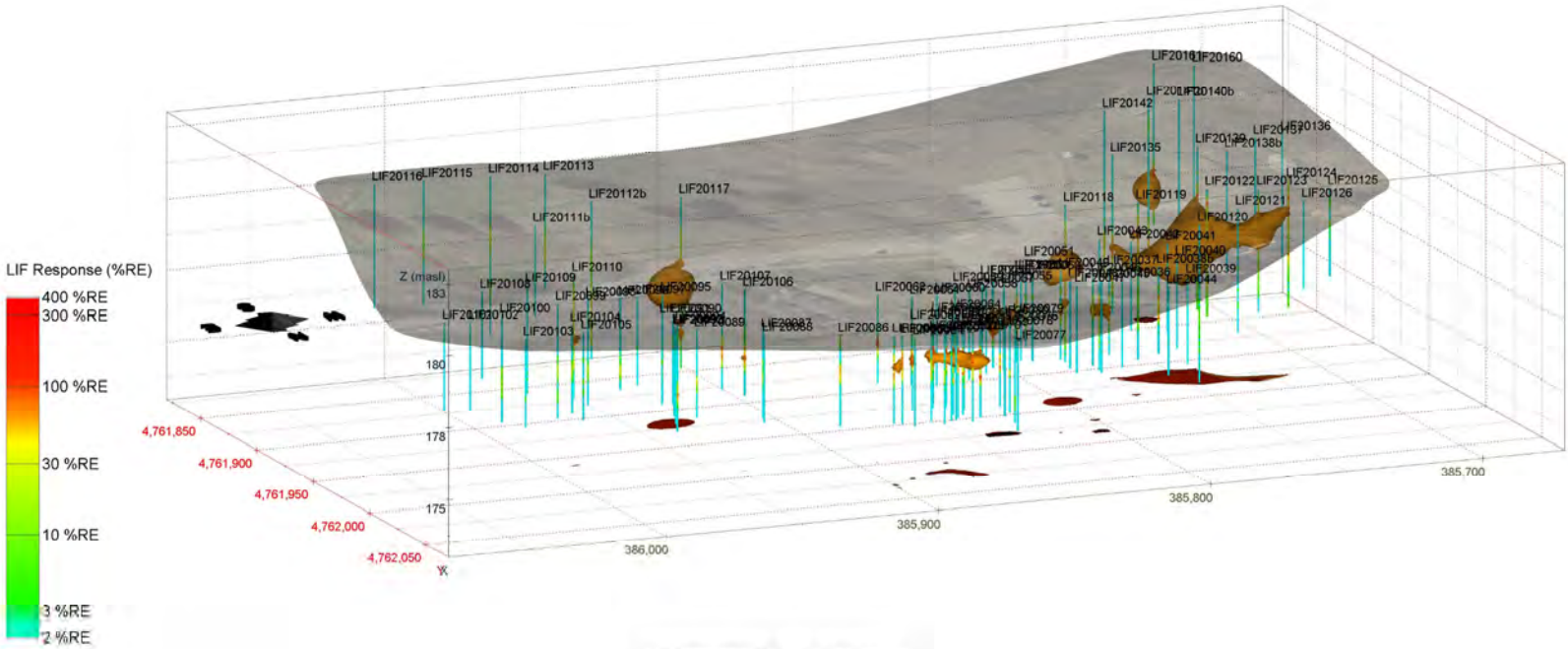
LIF Response 20 %RE and Above



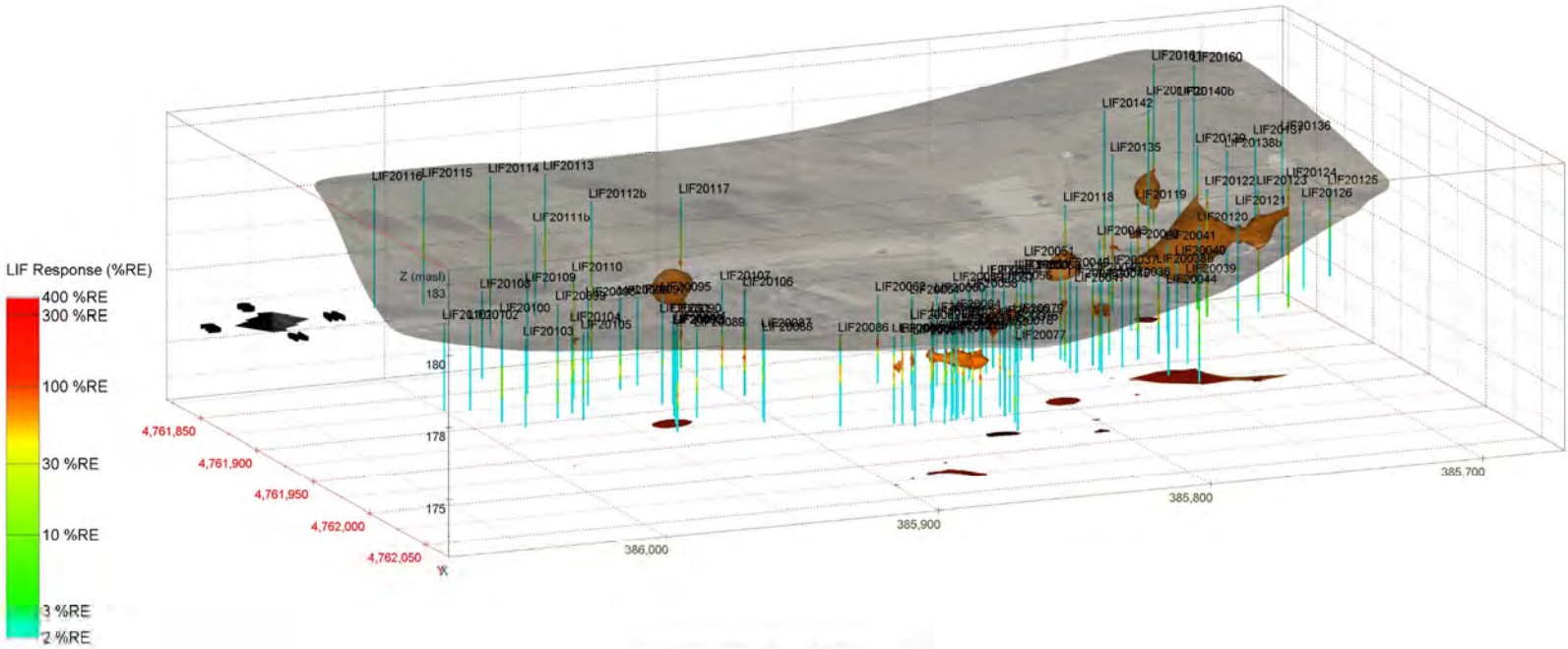
LIF Response 30 %RE and Above



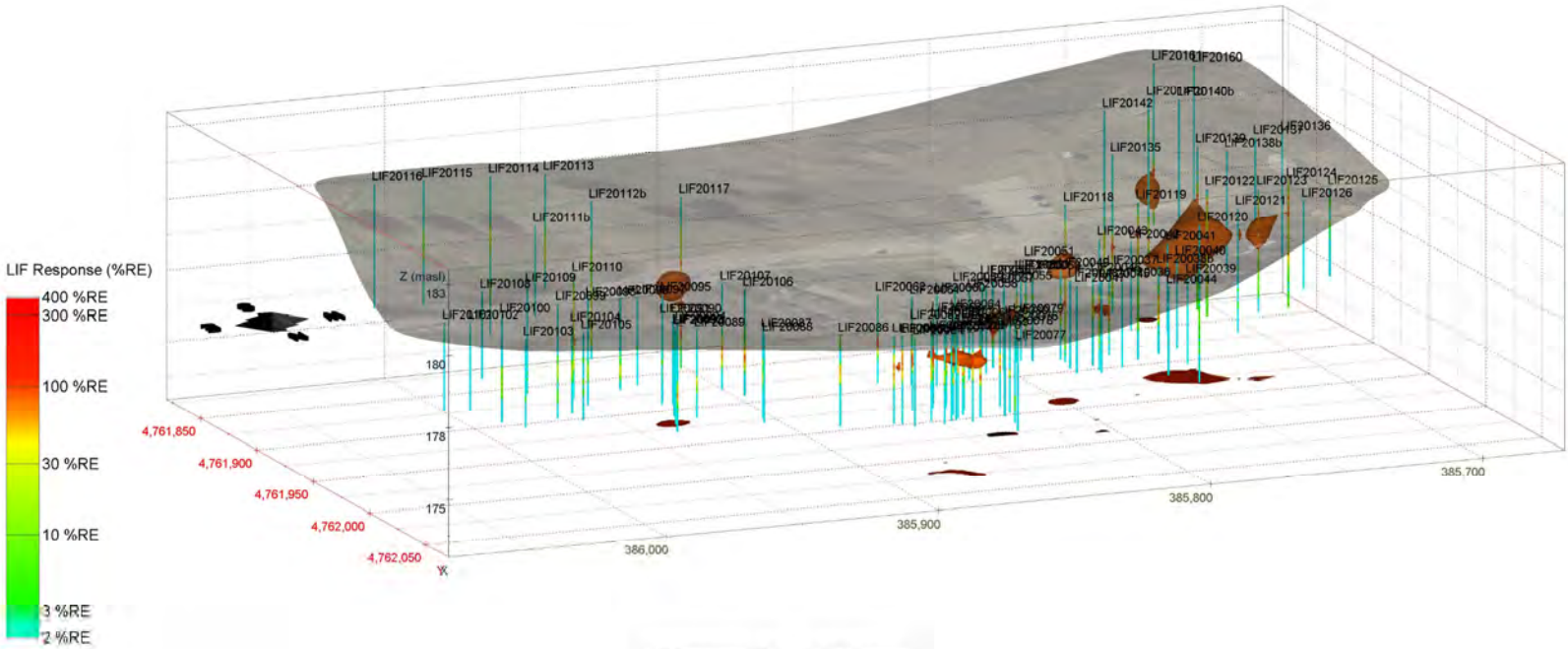
LIF Response 40 %RE and Above



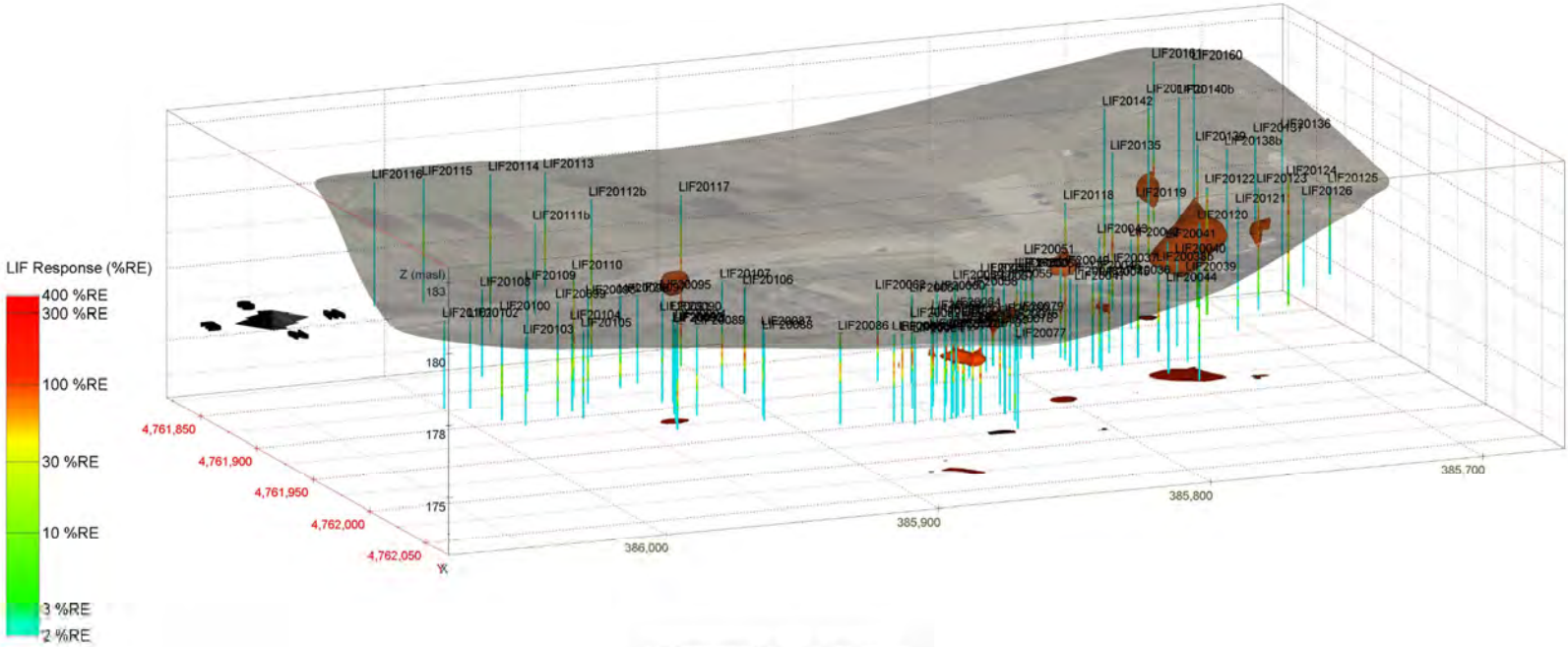
LIF Response 50 %RE and Above



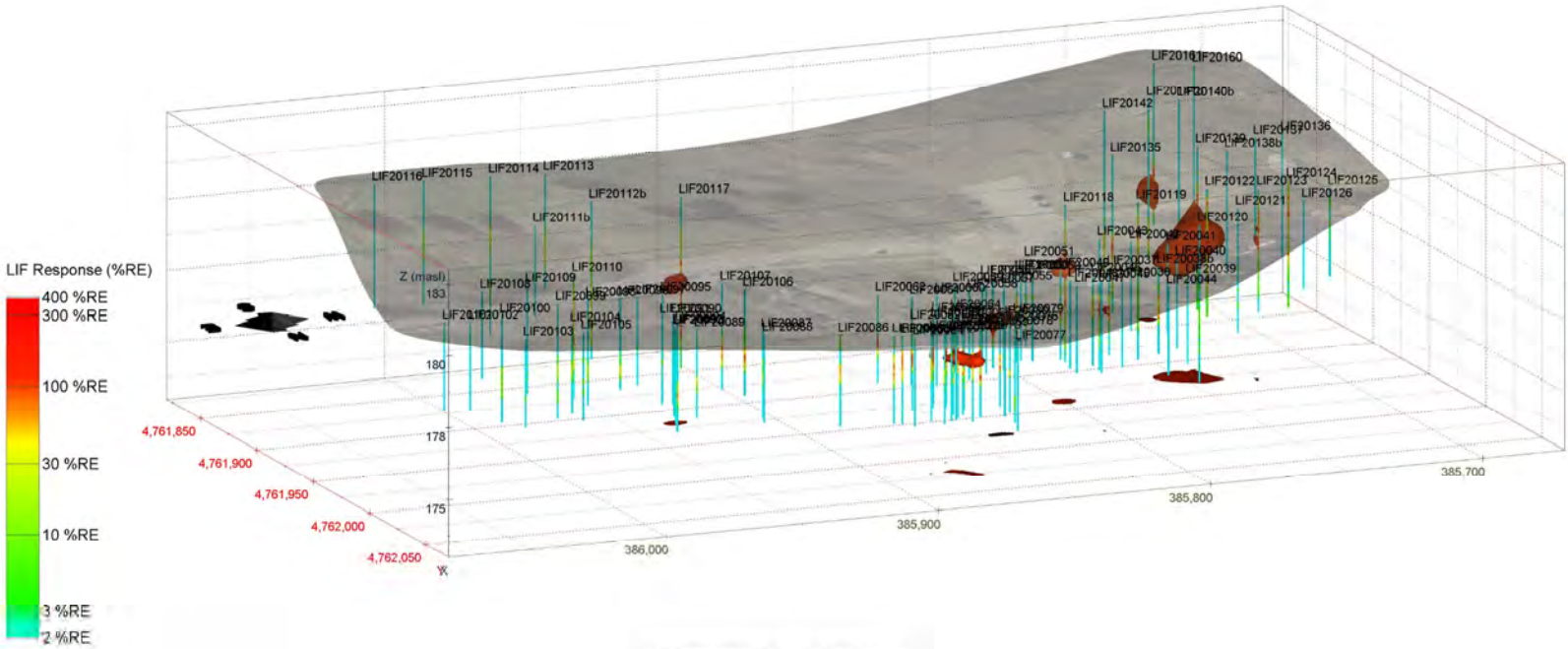
LIF Response 60 %RE and Above



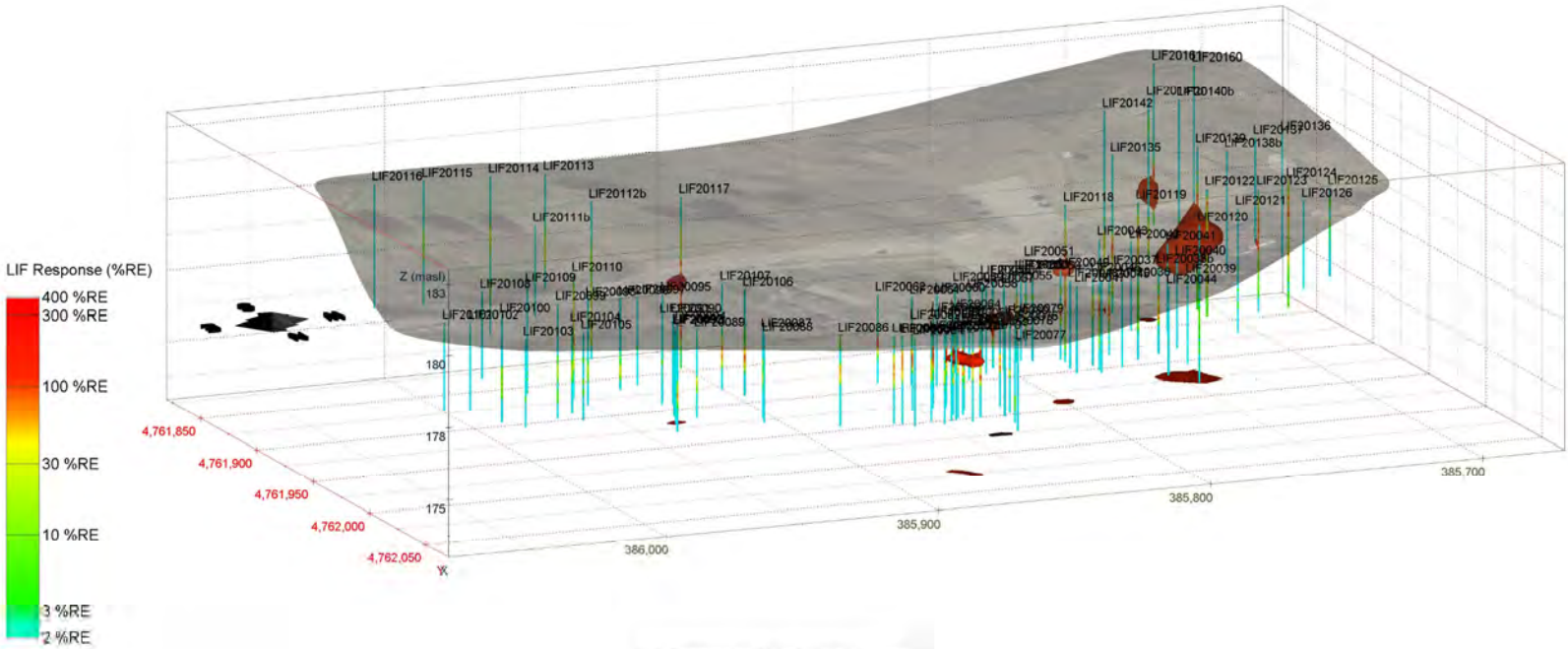
LIF Response 70 %RE and Above



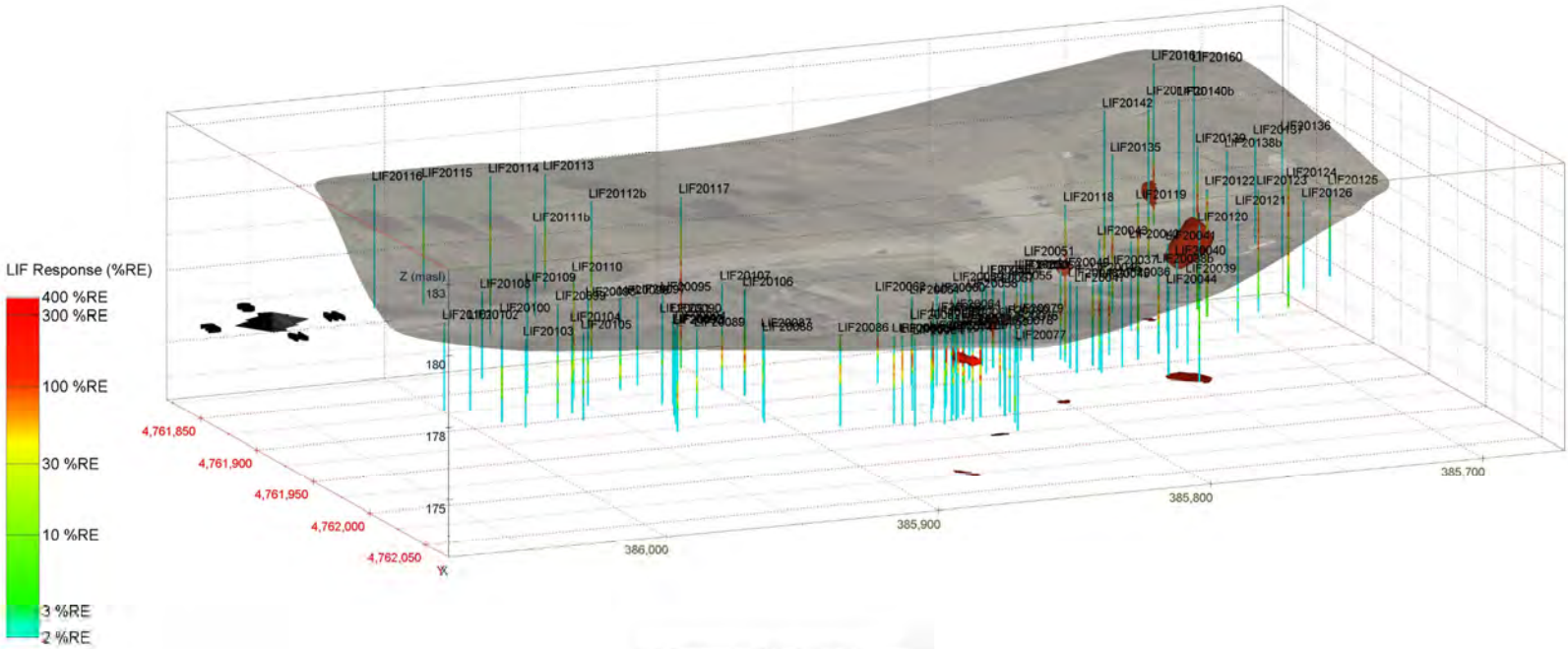
LIF Response 80 %RE and Above



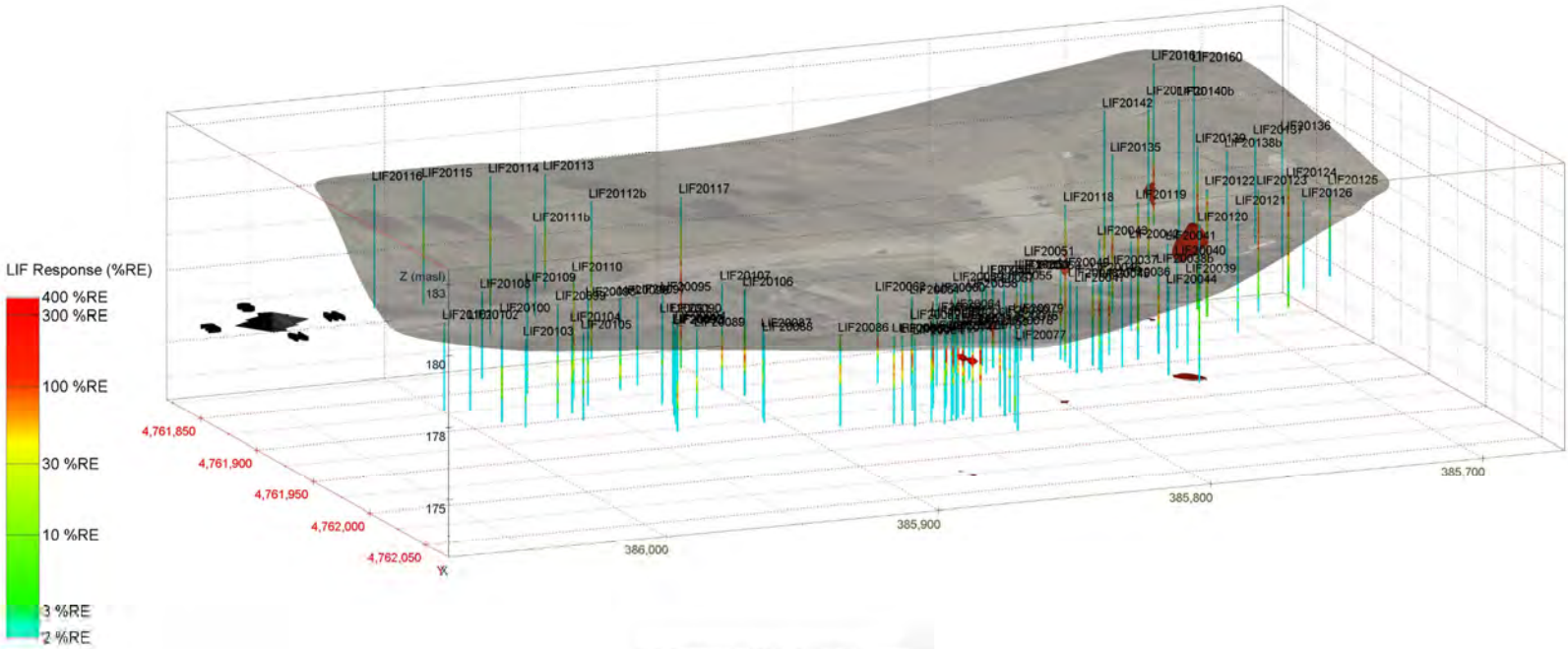
LIF Response 90 %RE and Above



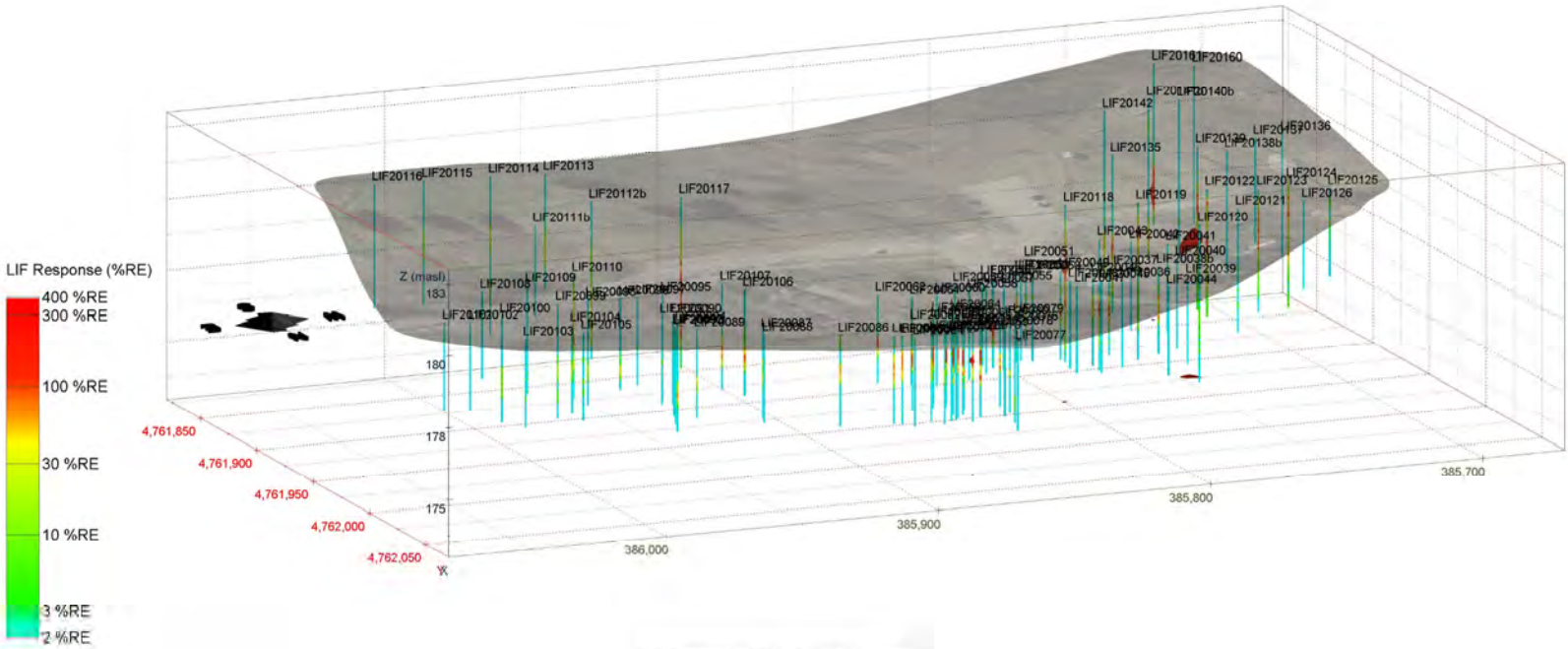
LIF Response 100 %RE and Above



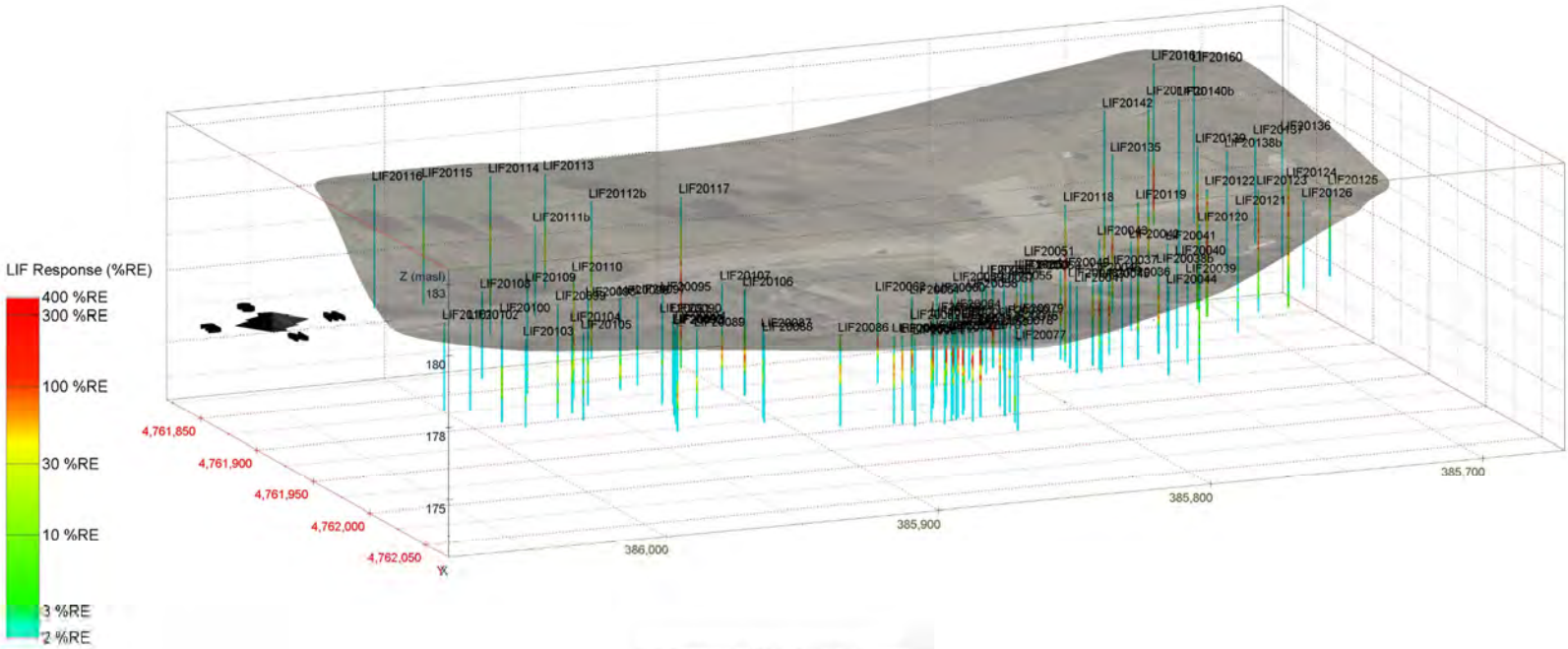
LIF Response 150 %RE and Above



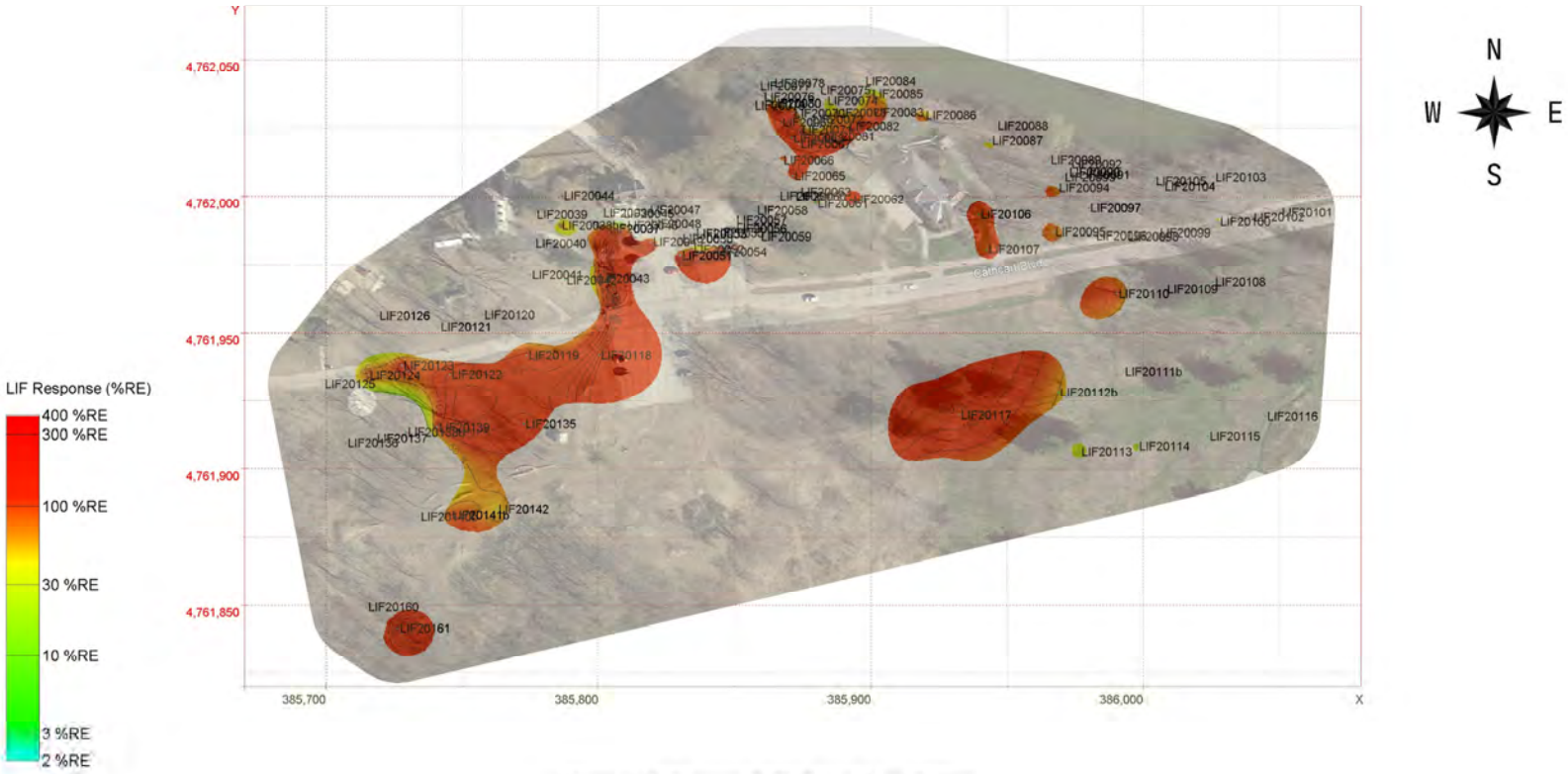
LIF Response 200 %RE and Above



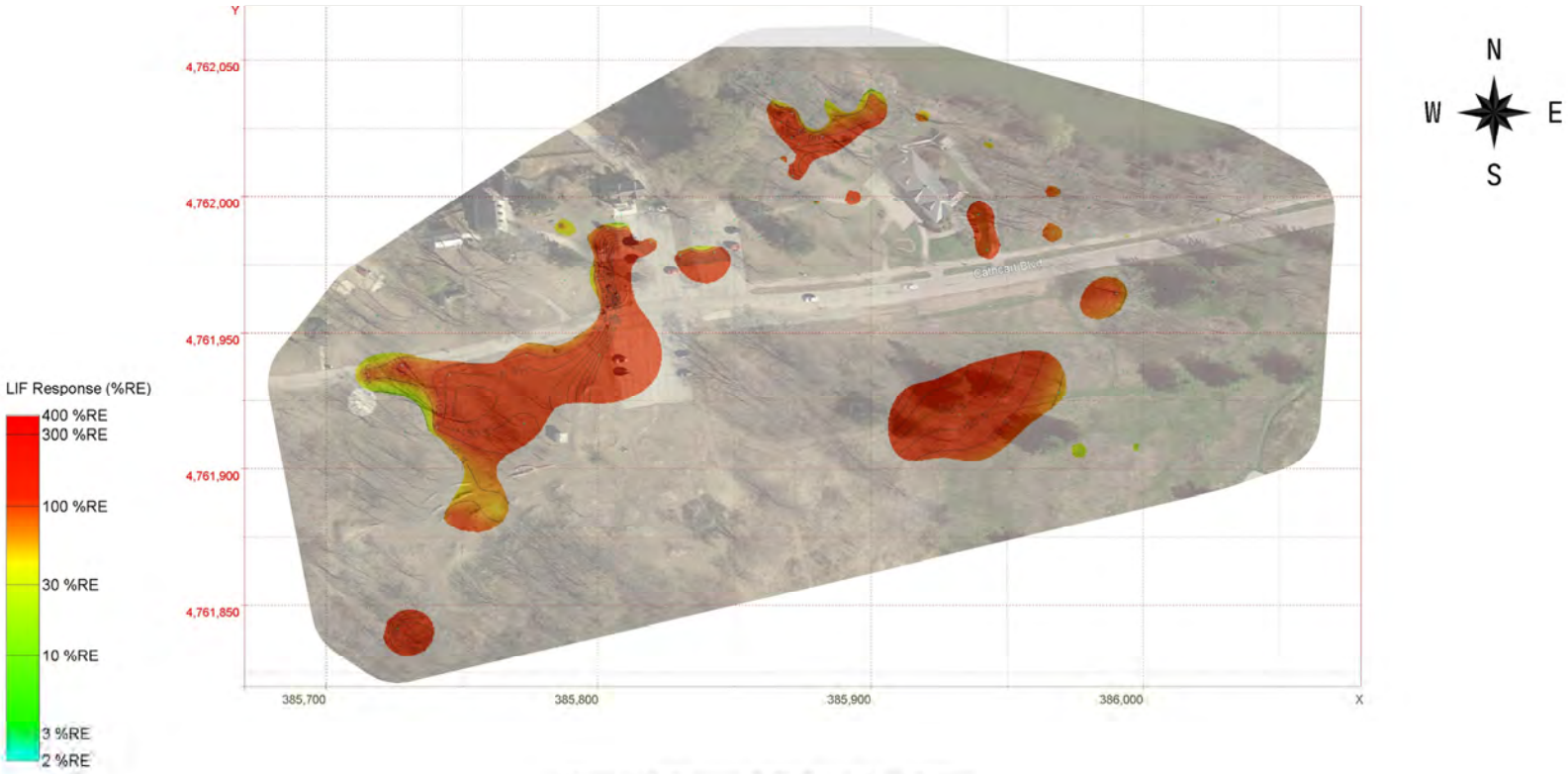
LIF Response 250 %RE and Above



LIF Response 300 %RE and Above



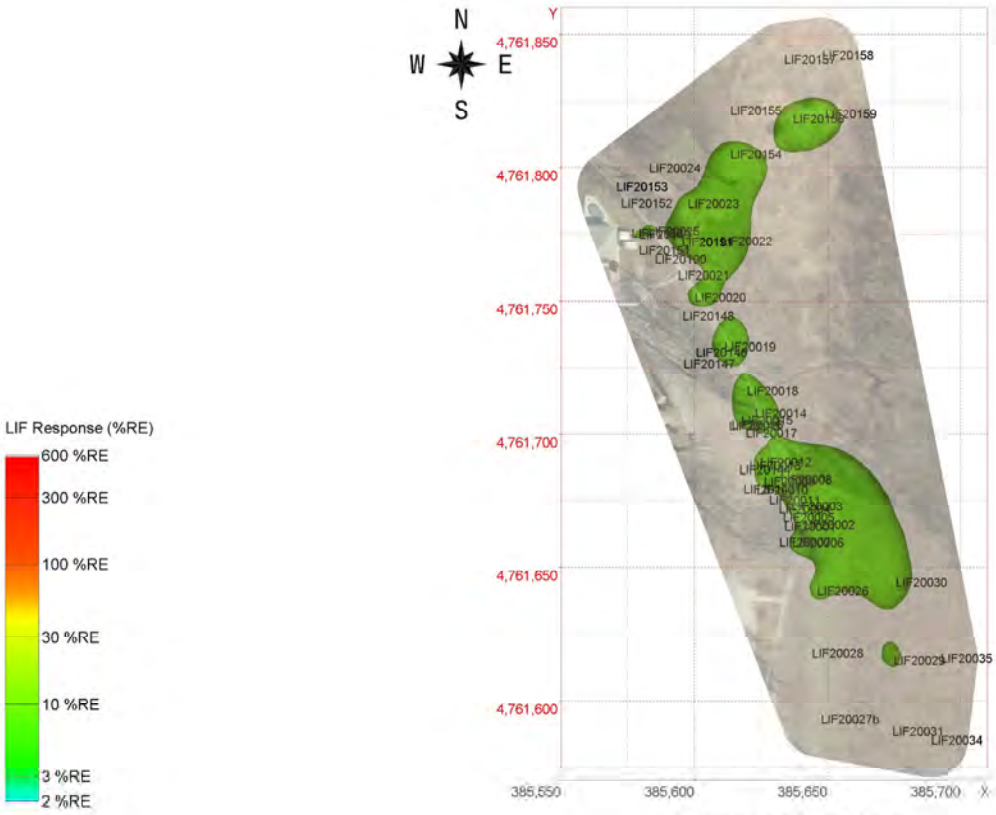
Maximum LIF Response (%RE) Projected on a 2D Plane



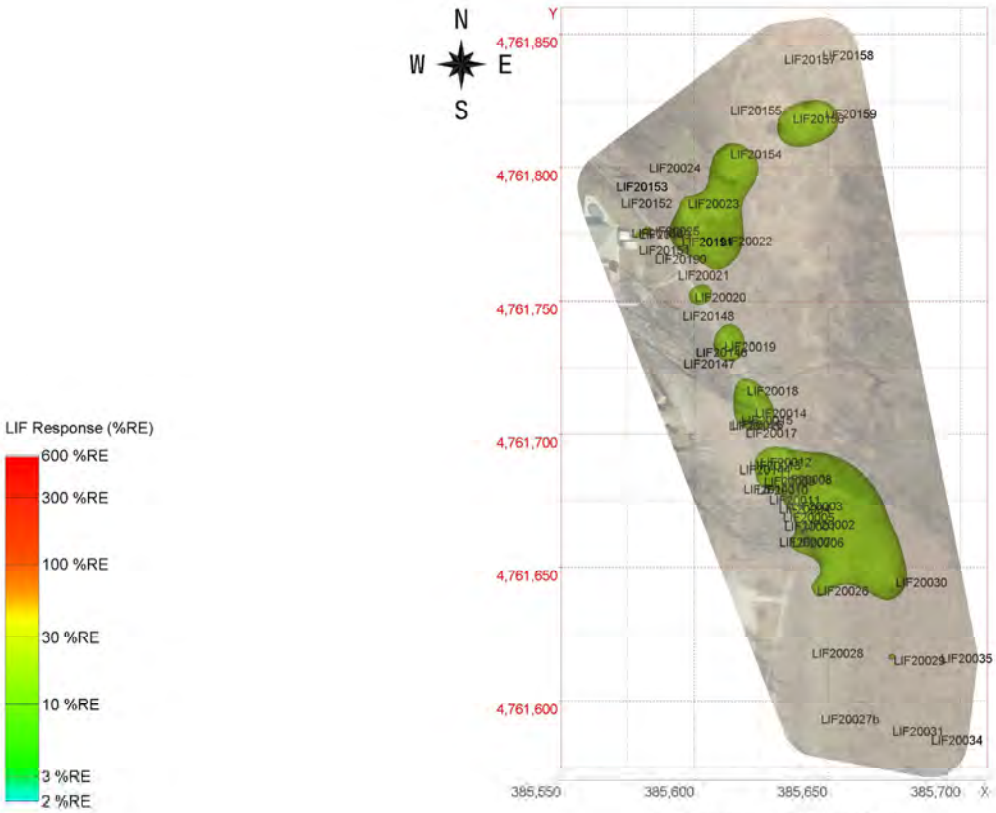
Maximum LIF Response (%RE) Projected on a 2D Plane

Attachment D

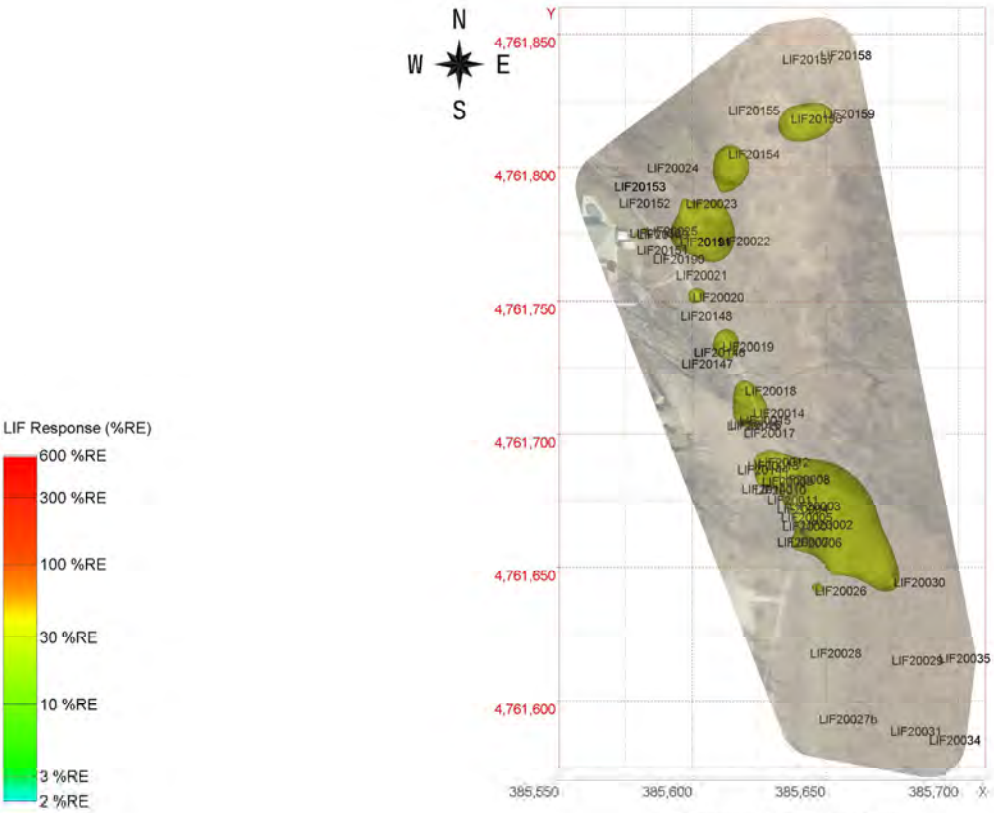
CLC Area LIF 3D Visualizations



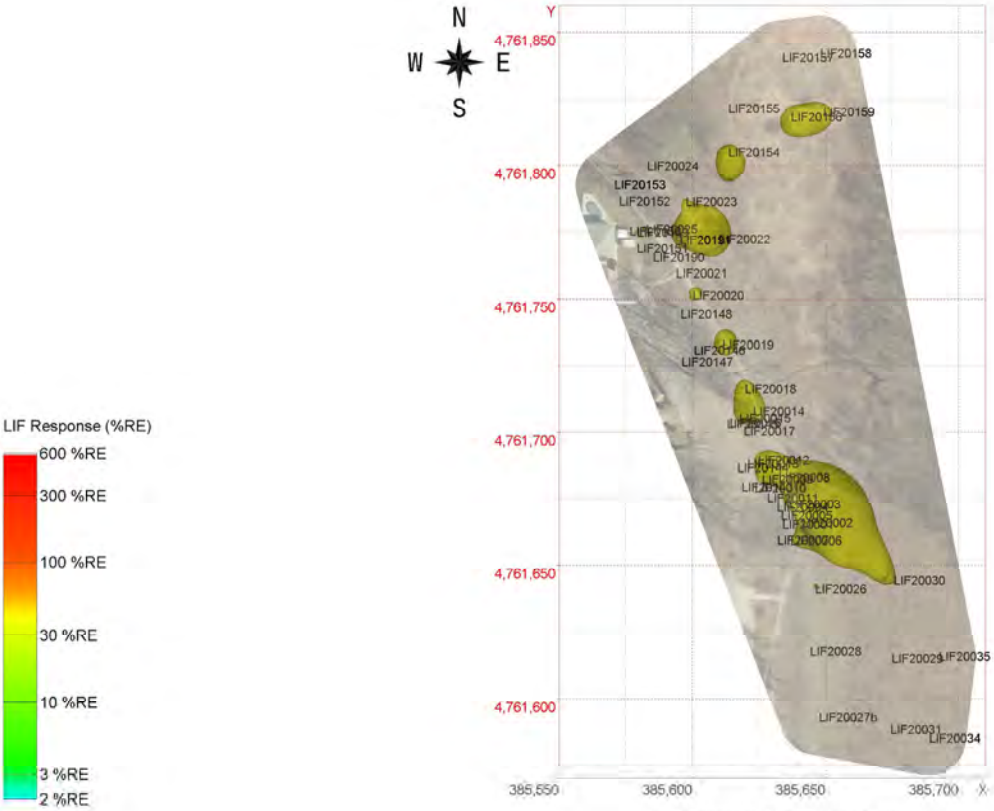
LIF Response 5 %RE and Above



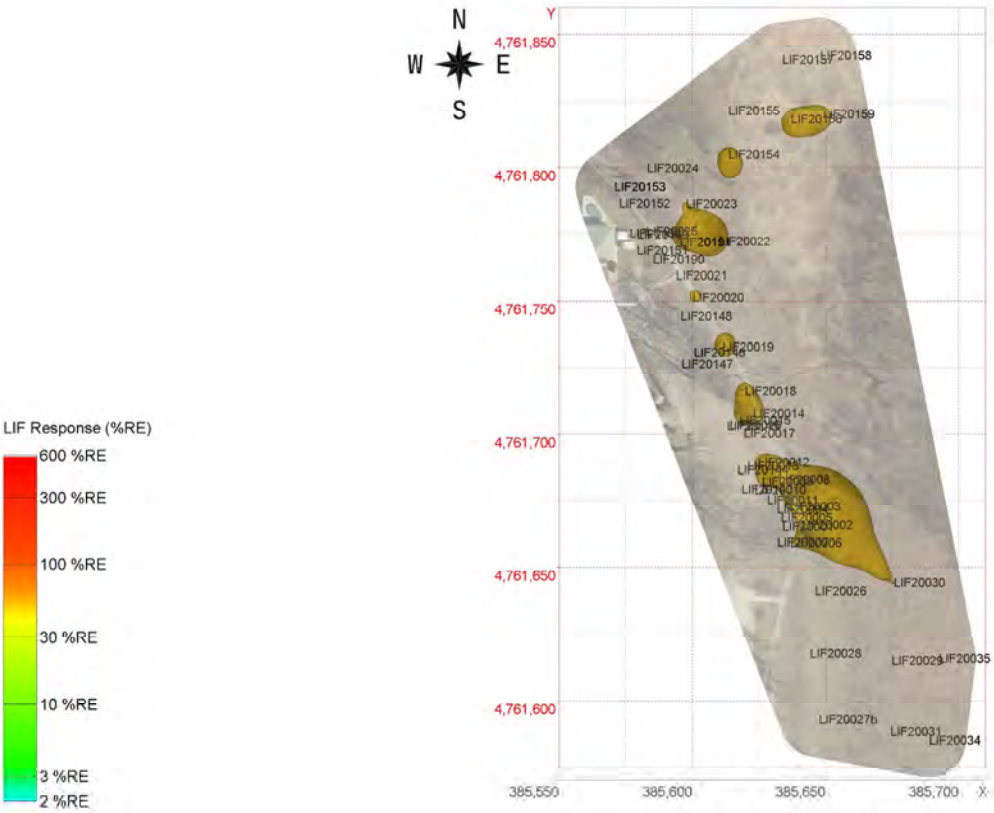
LIF Response 10 %RE and Above



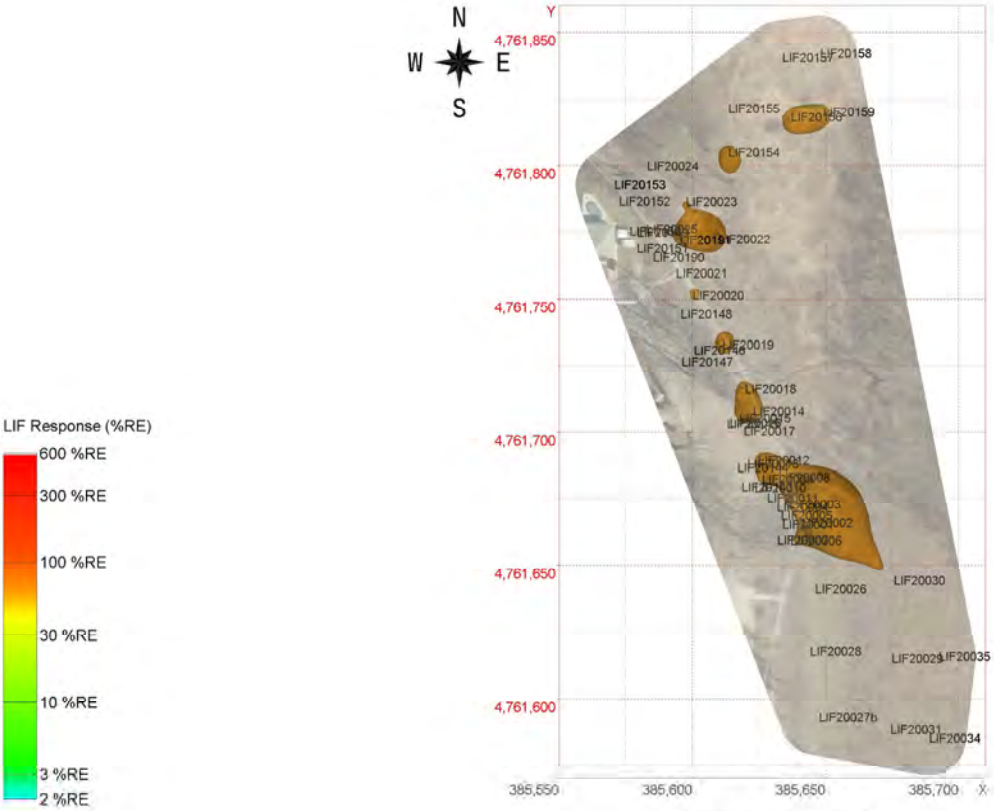
LIF Response 20 %RE and Above



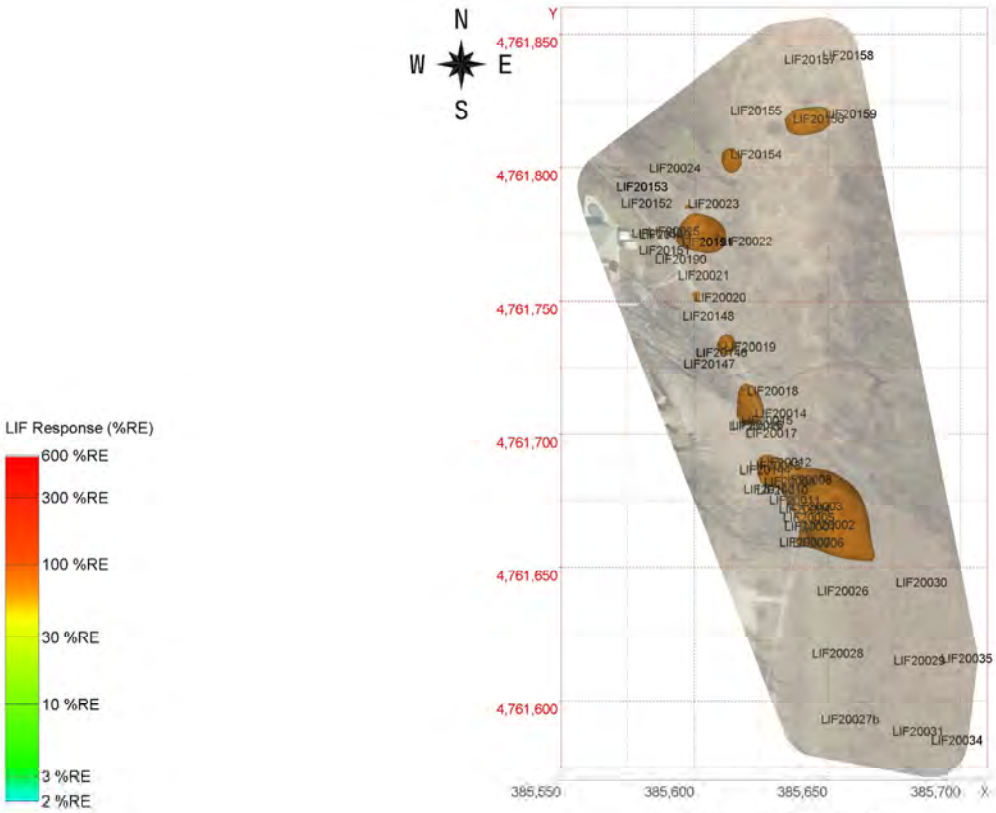
LIF Response 30 %RE and Above



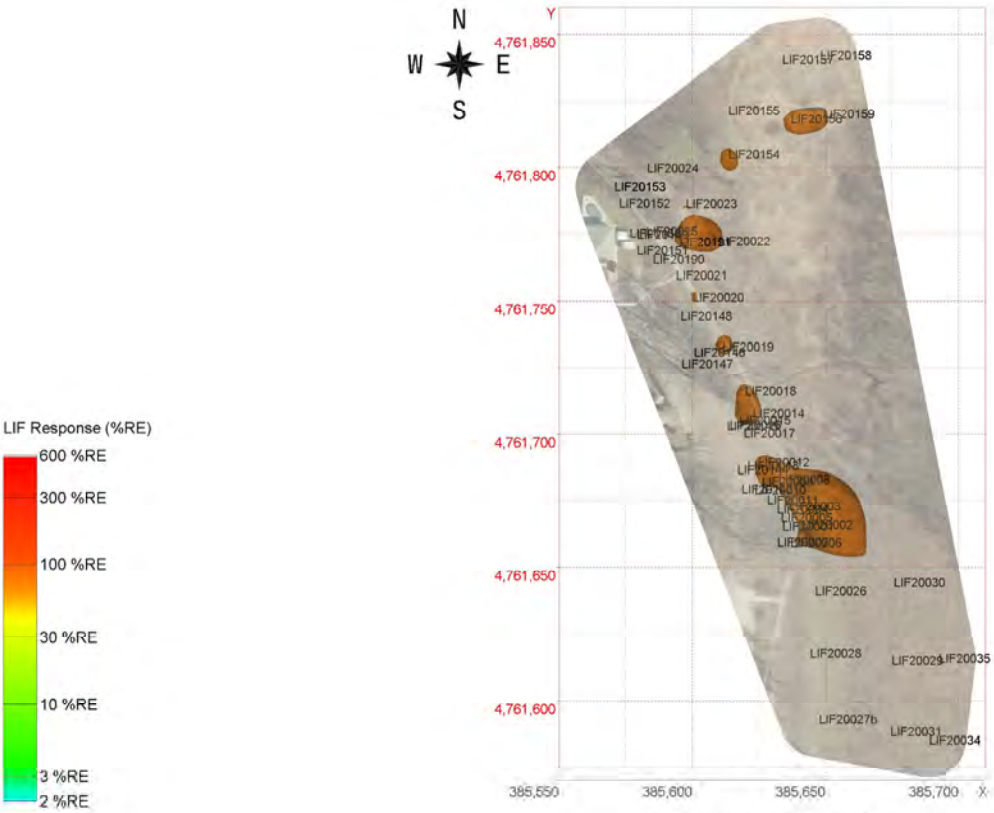
LIF Response 40 %RE and Above



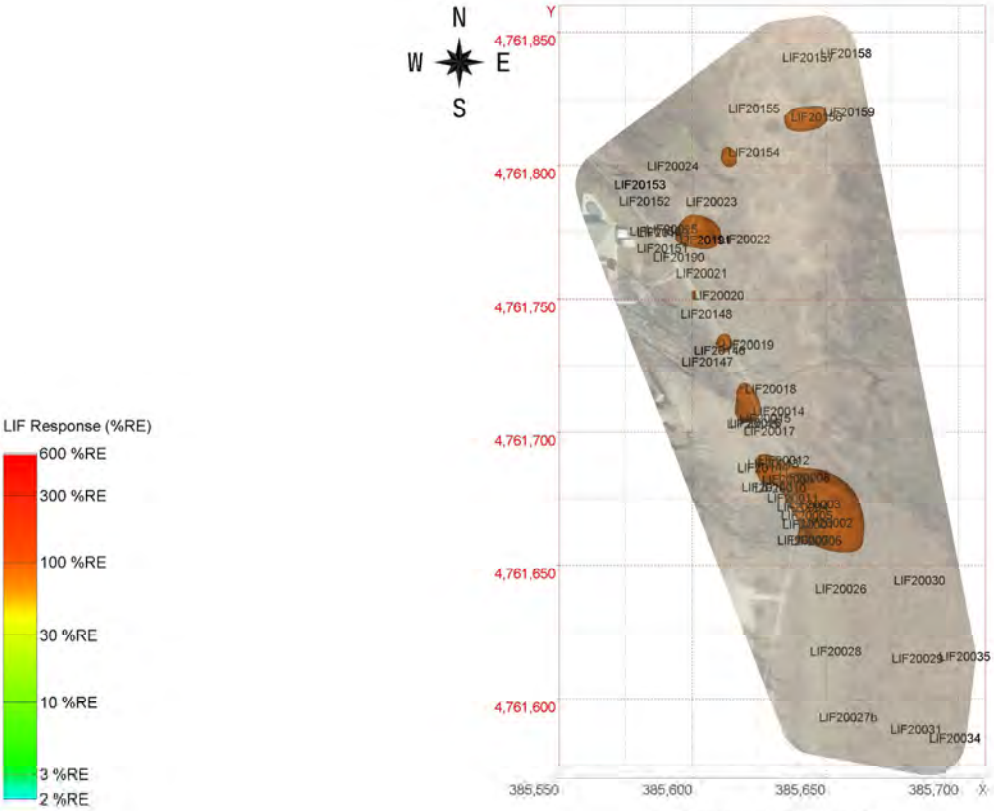
LIF Response 50 %RE and Above



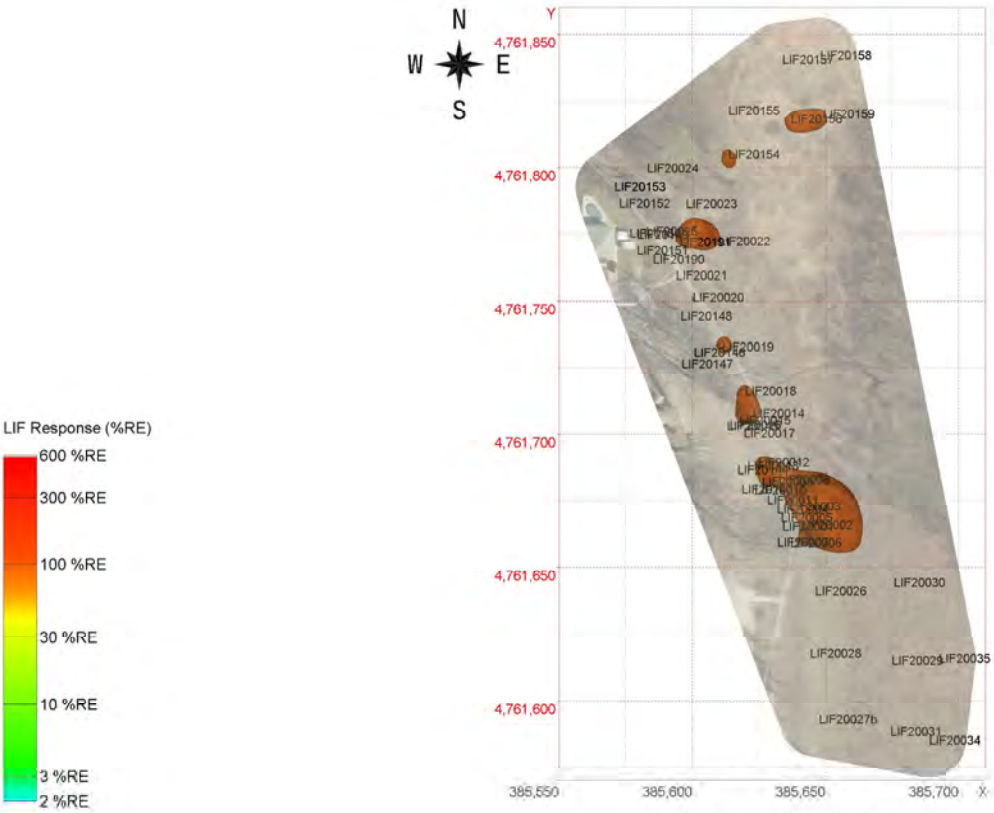
LIF Response 60 %RE and Above



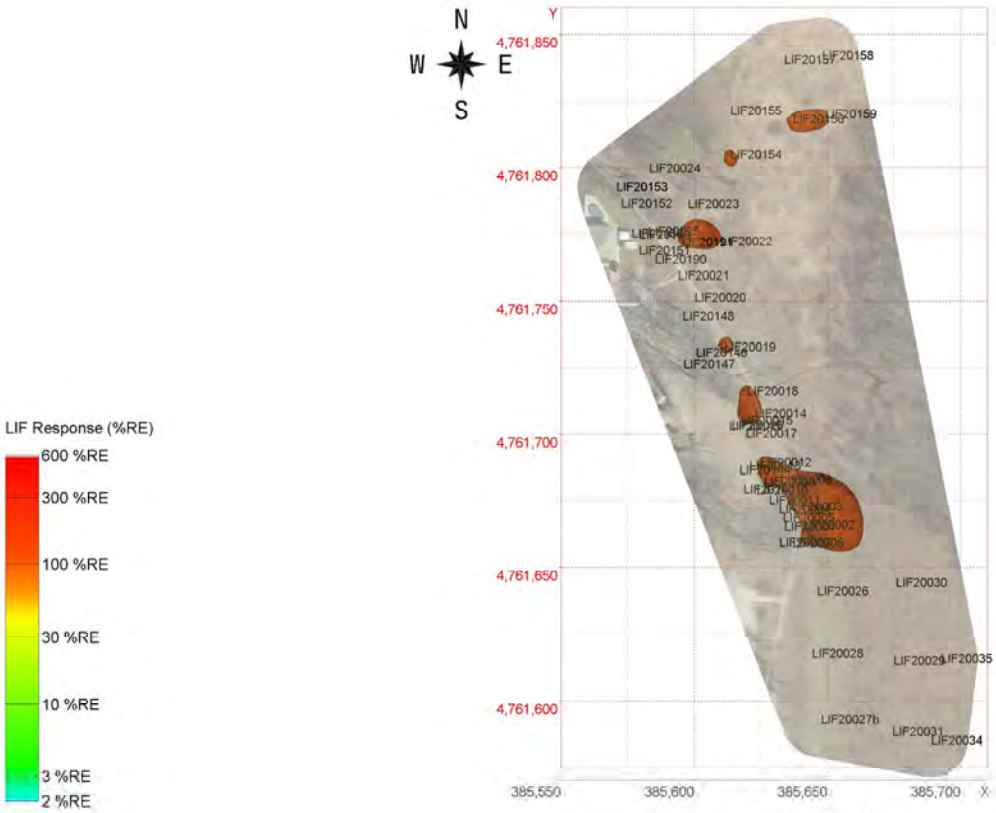
LIF Response 70 %RE and Above



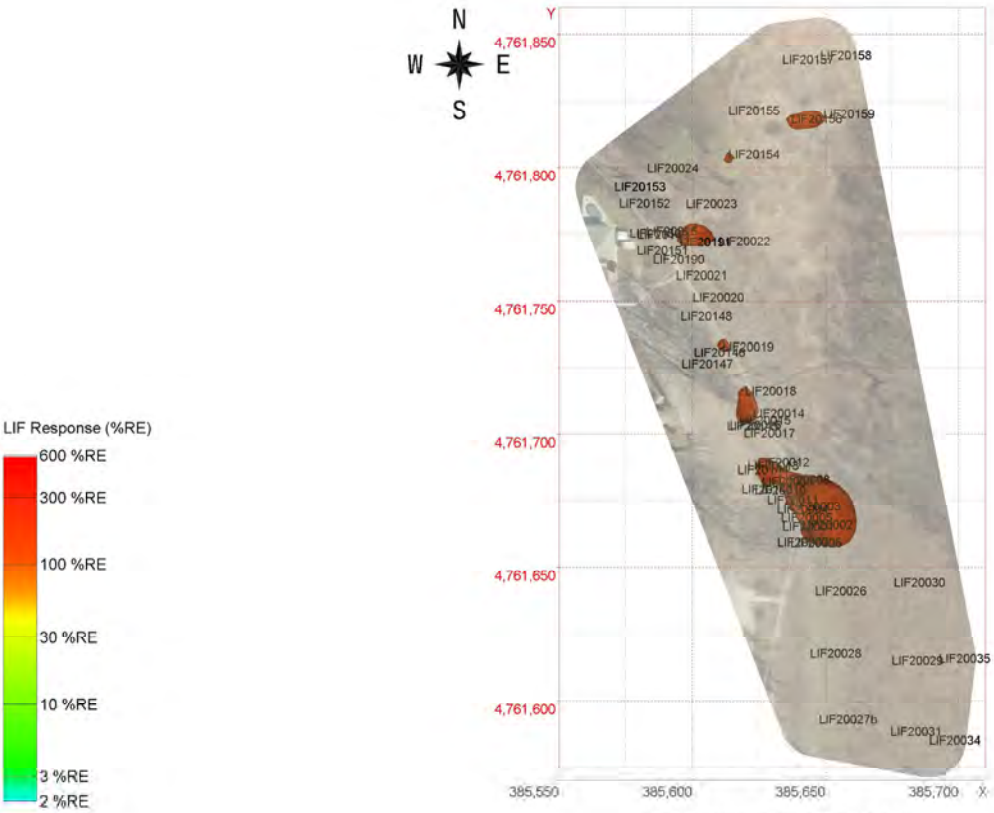
LIF Response 80 %RE and Above



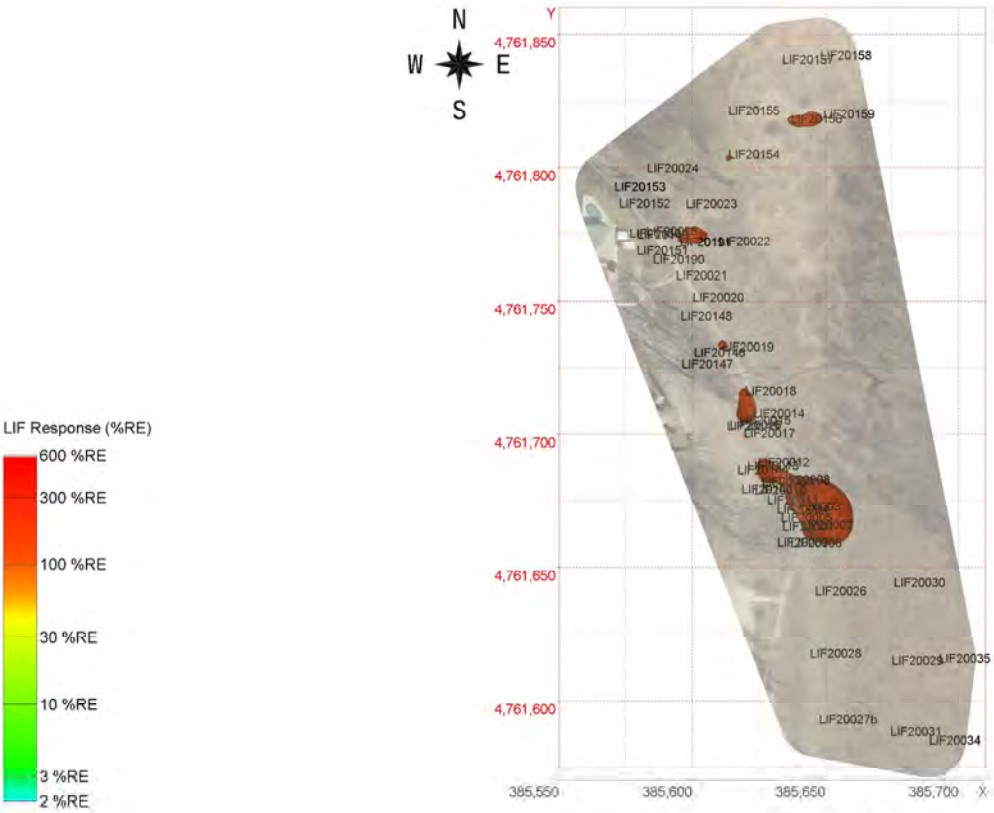
LIF Response 90 %RE and Above



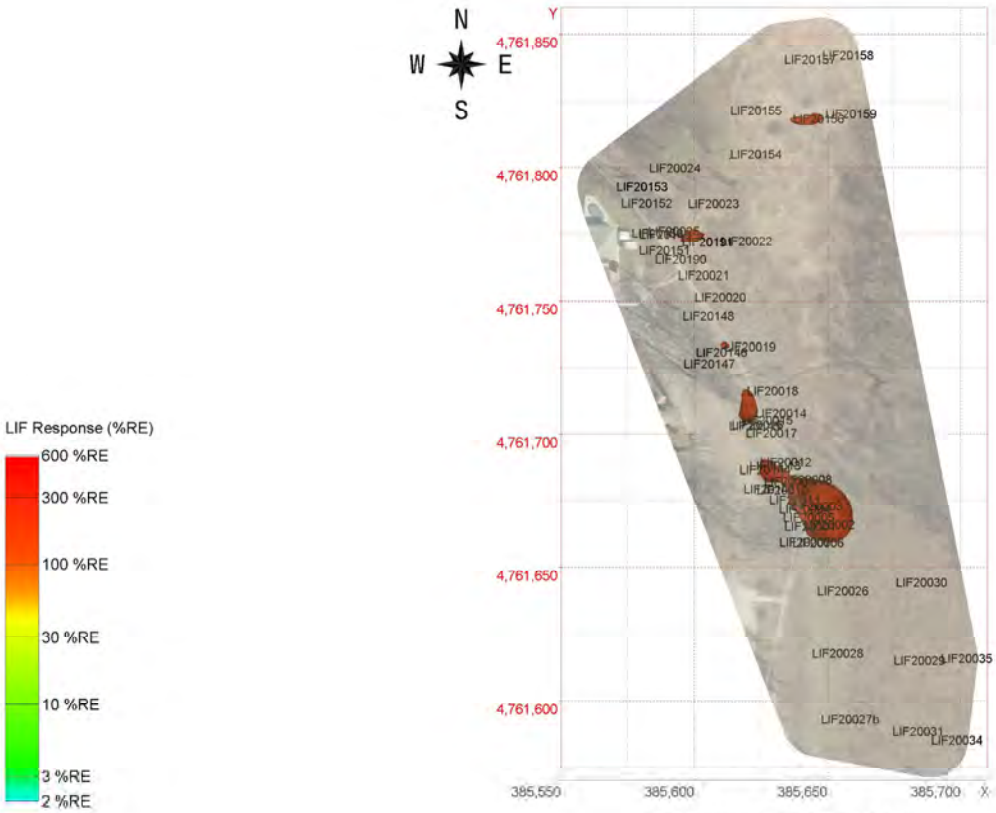
LIF Response 100 %RE and Above



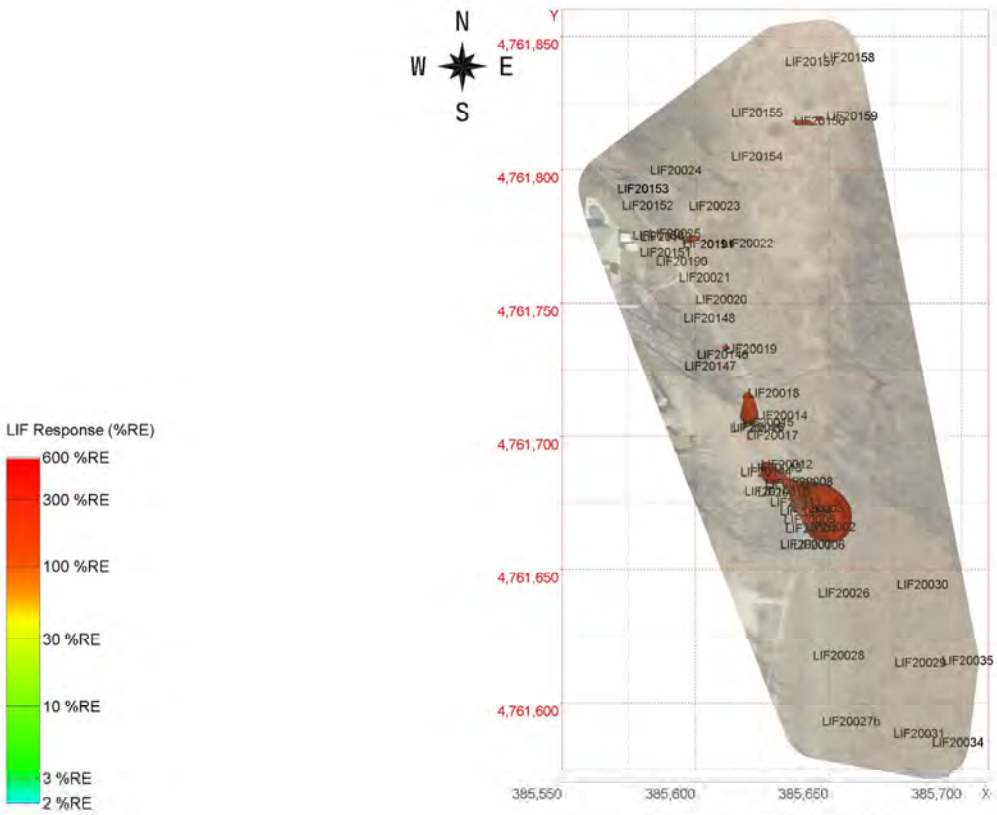
LIF Response 150 %RE and Above



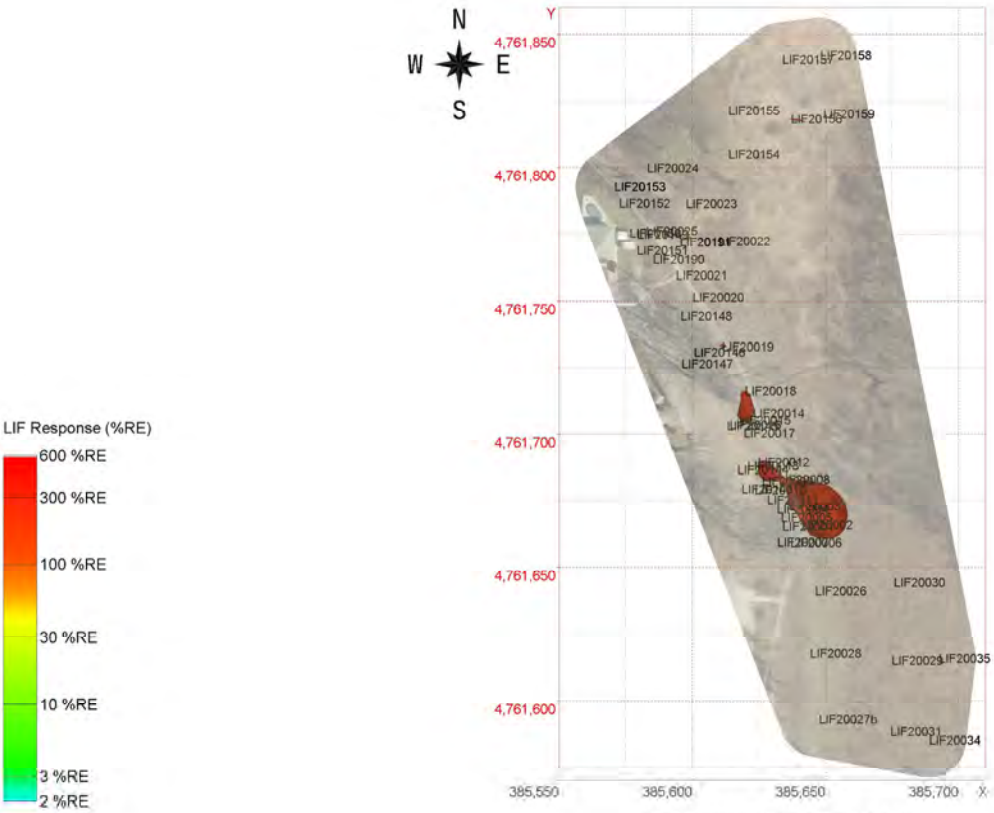
LIF Response 200 %RE and Above



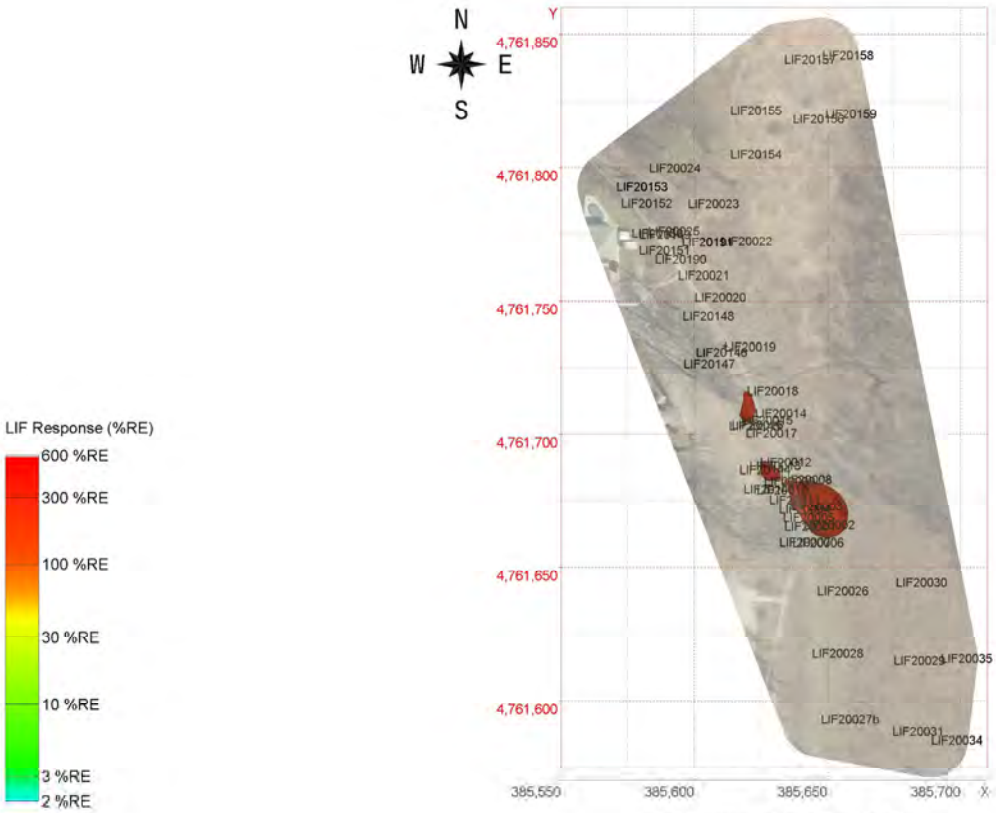
LIF Response 250 %RE and Above



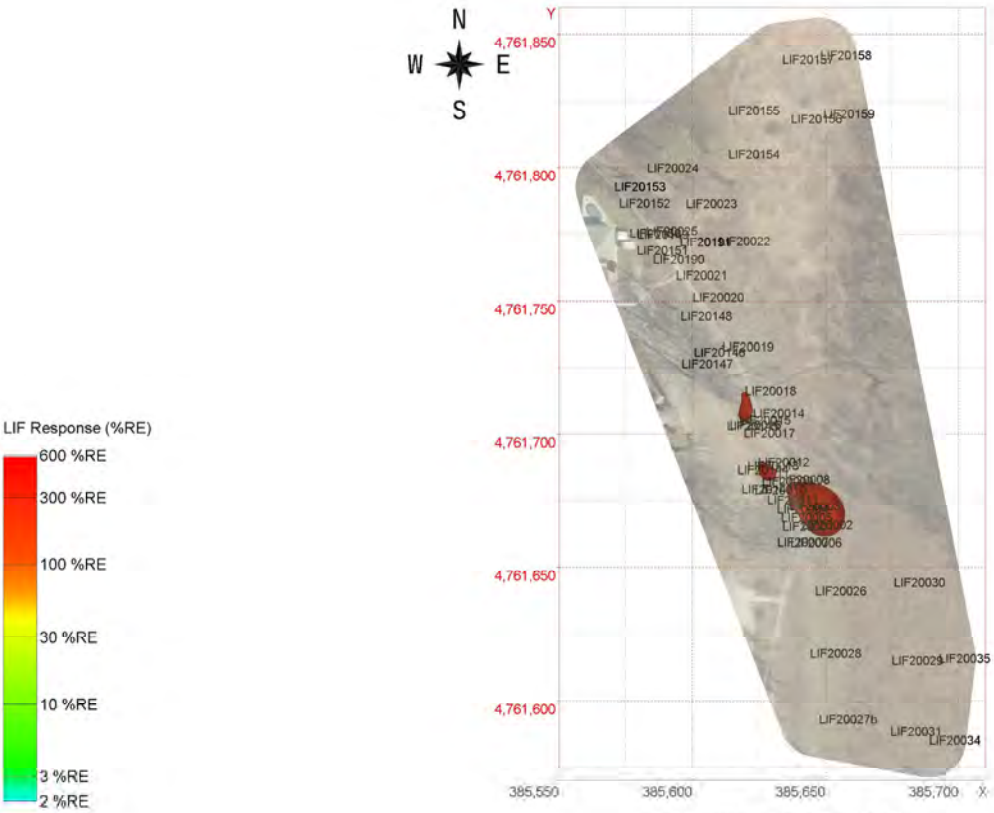
LIF Response 300 %RE and Above



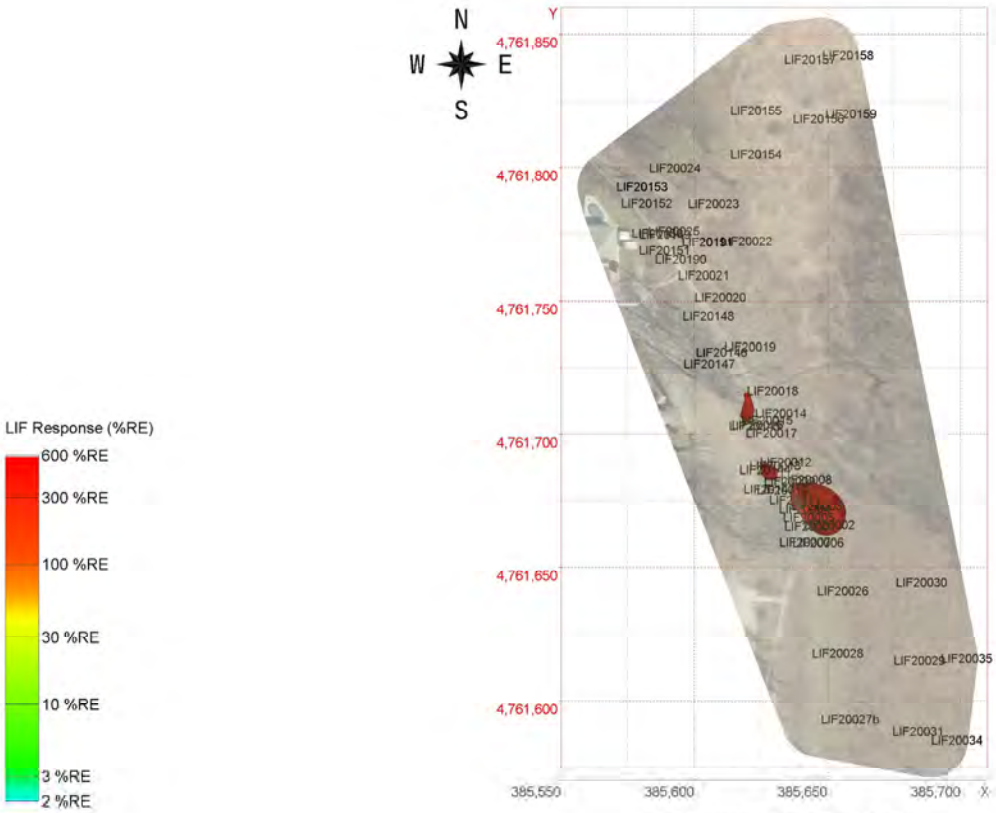
LIF Response 350 %RE and Above



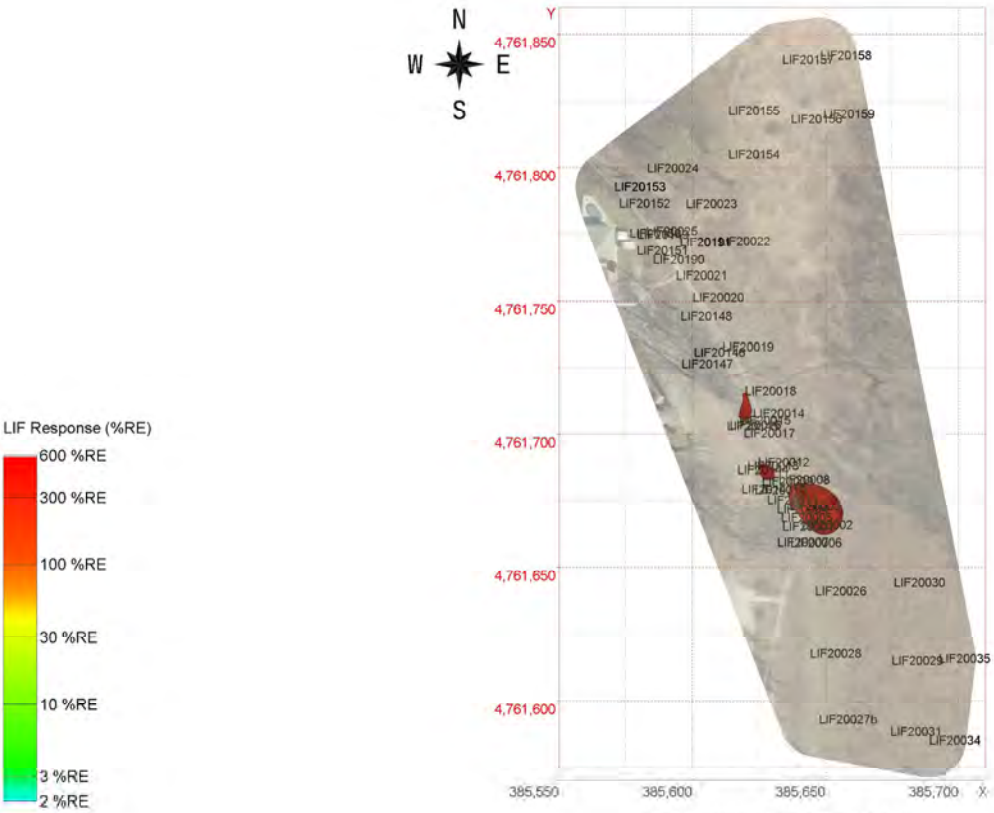
LIF Response 400 %RE and Above



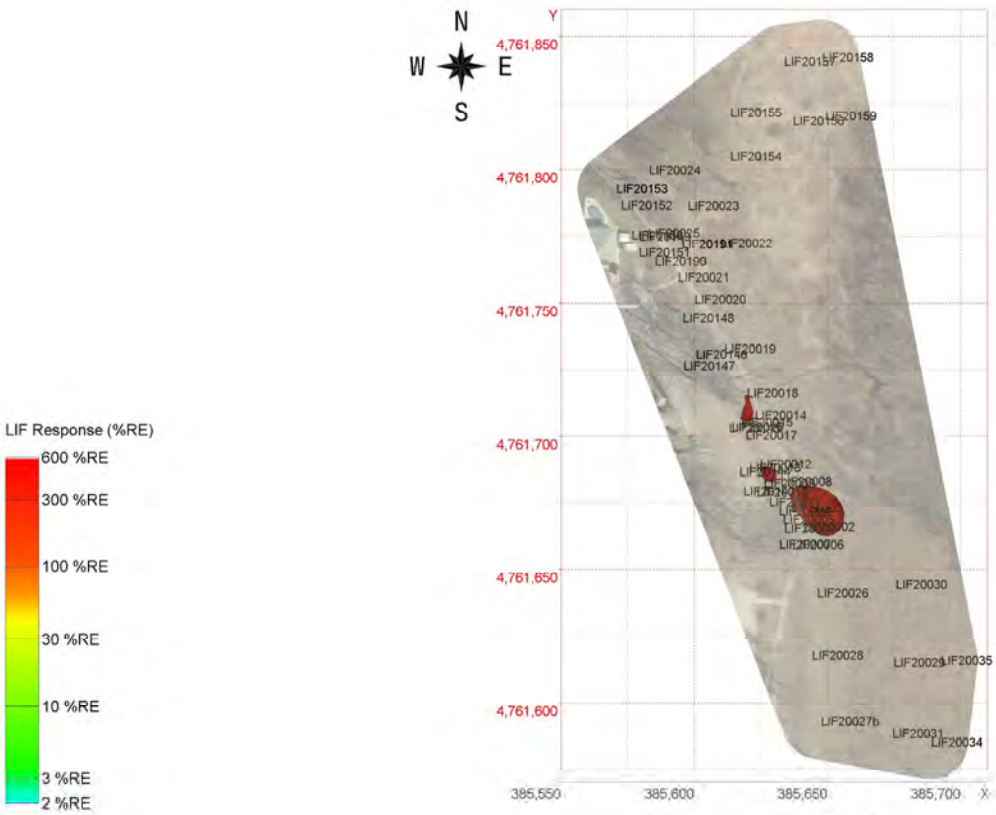
LIF Response 450 %RE and Above



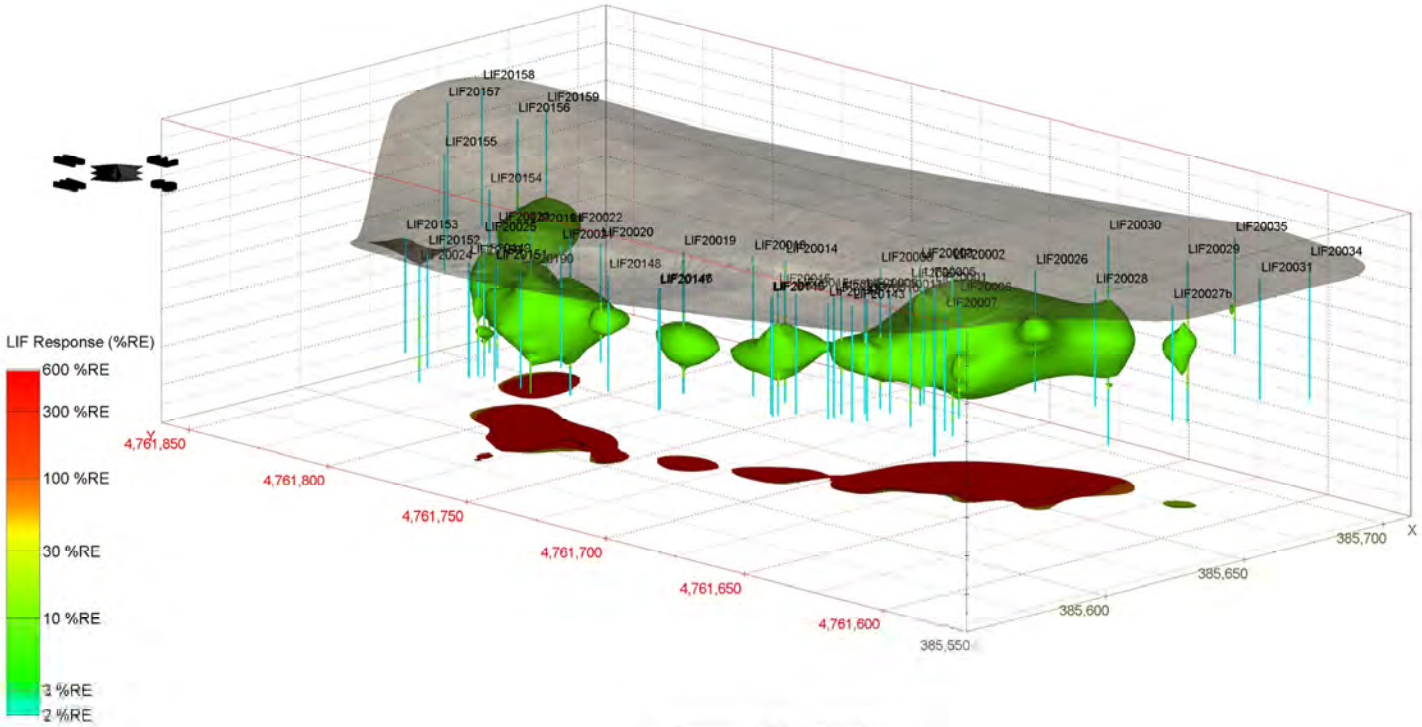
LIF Response 500 %RE and Above



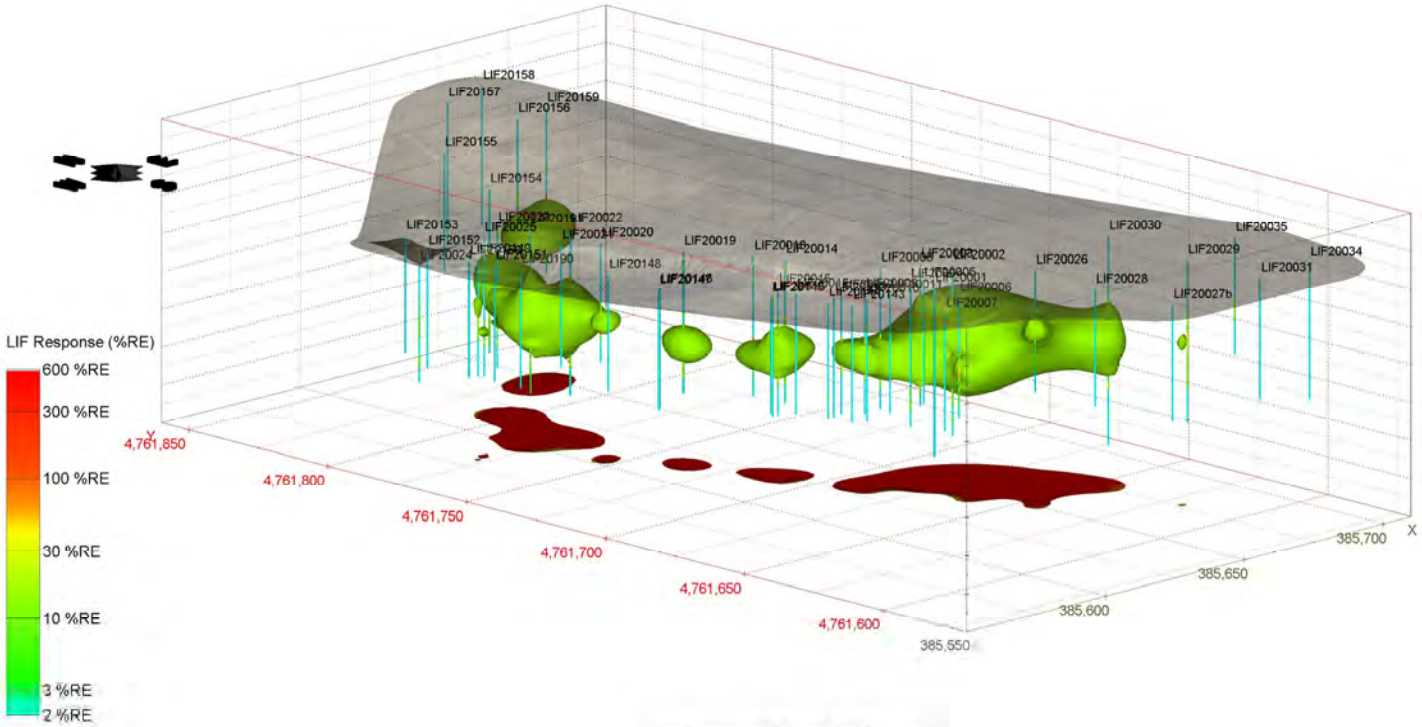
LIF Response 550 %RE and Above



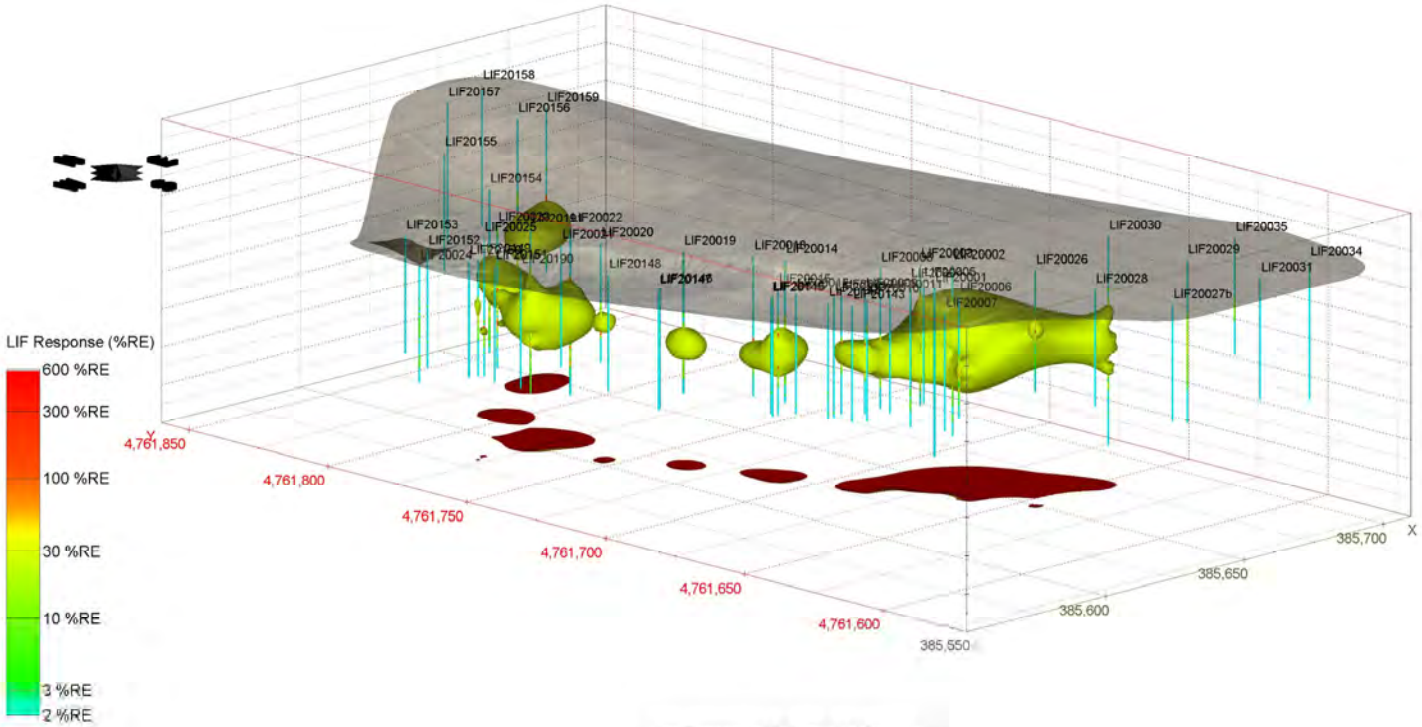
LIF Response 600 %RE and Above



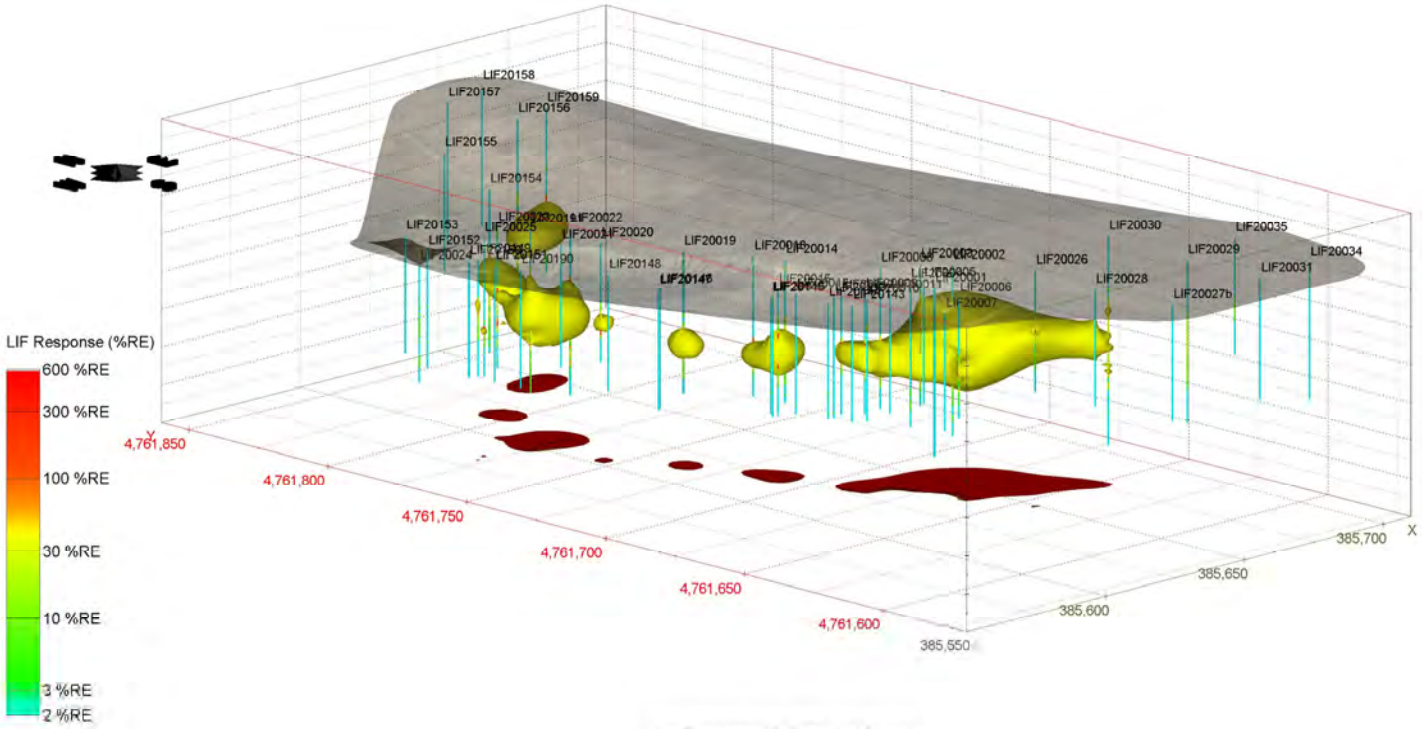
LIF Response 5 %RE and Above



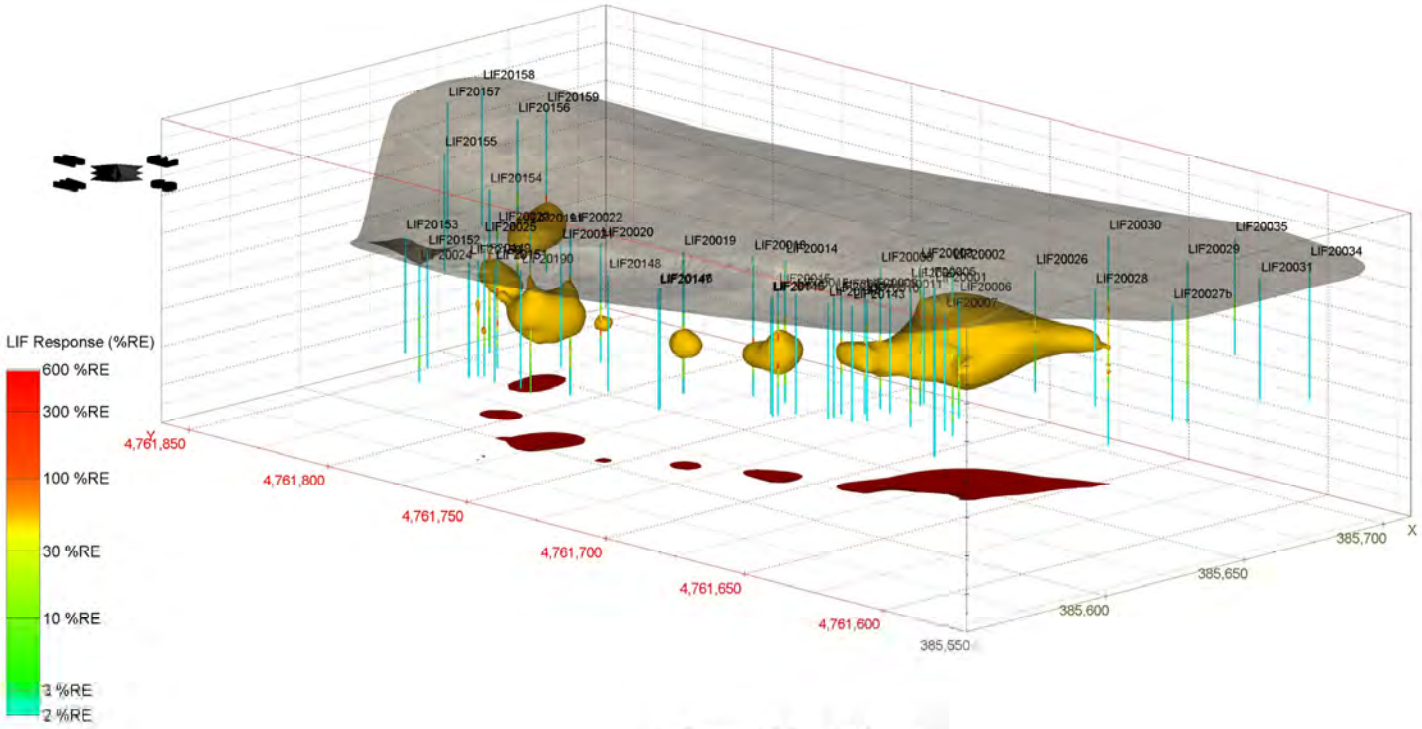
LIF Response 10 %RE and Above



LIF Response 20 %RE and Above



LIF Response 30 %RE and Above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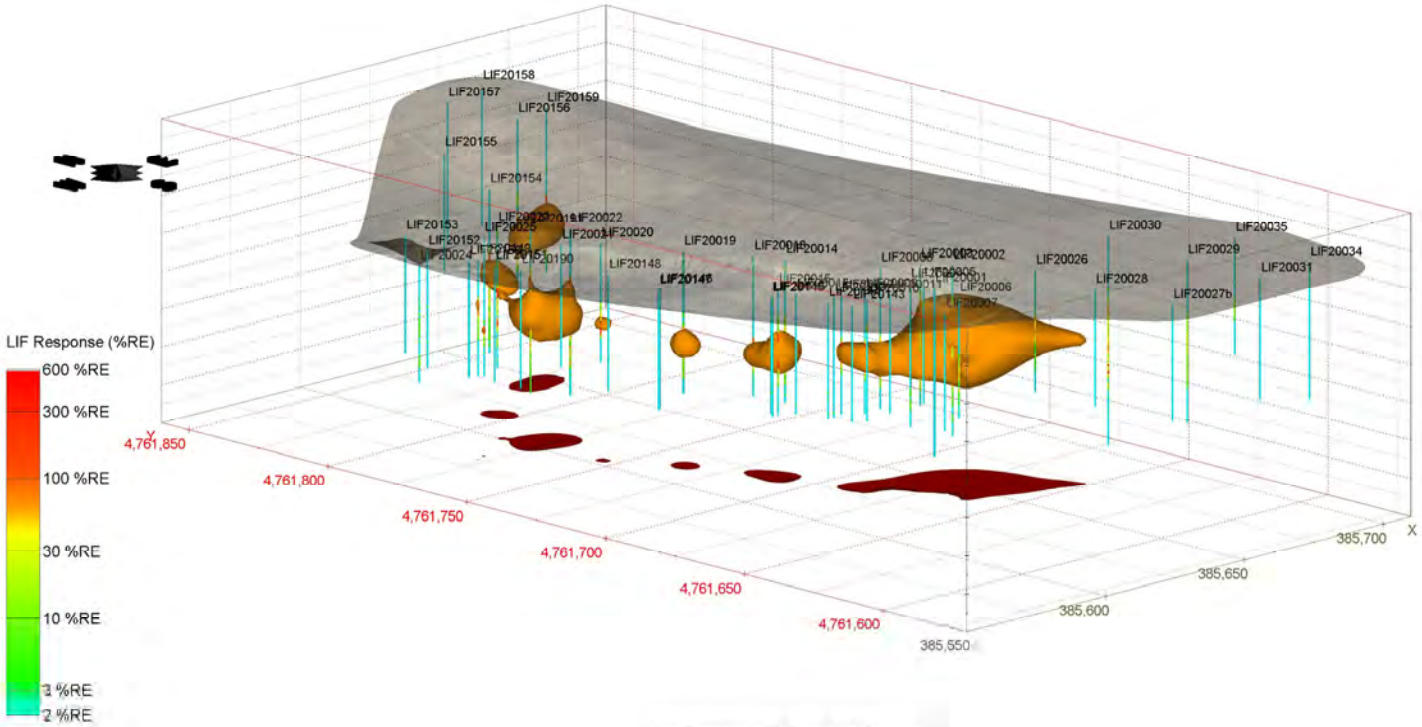
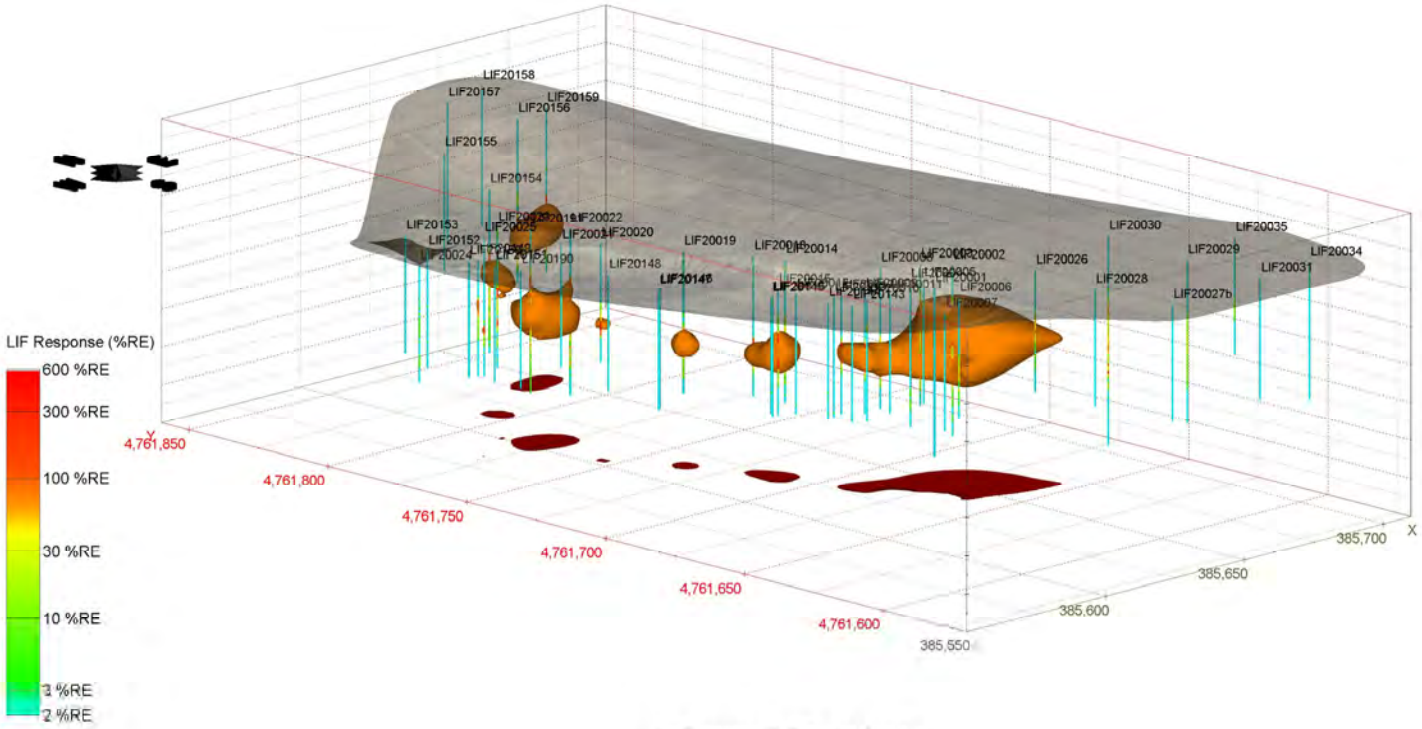
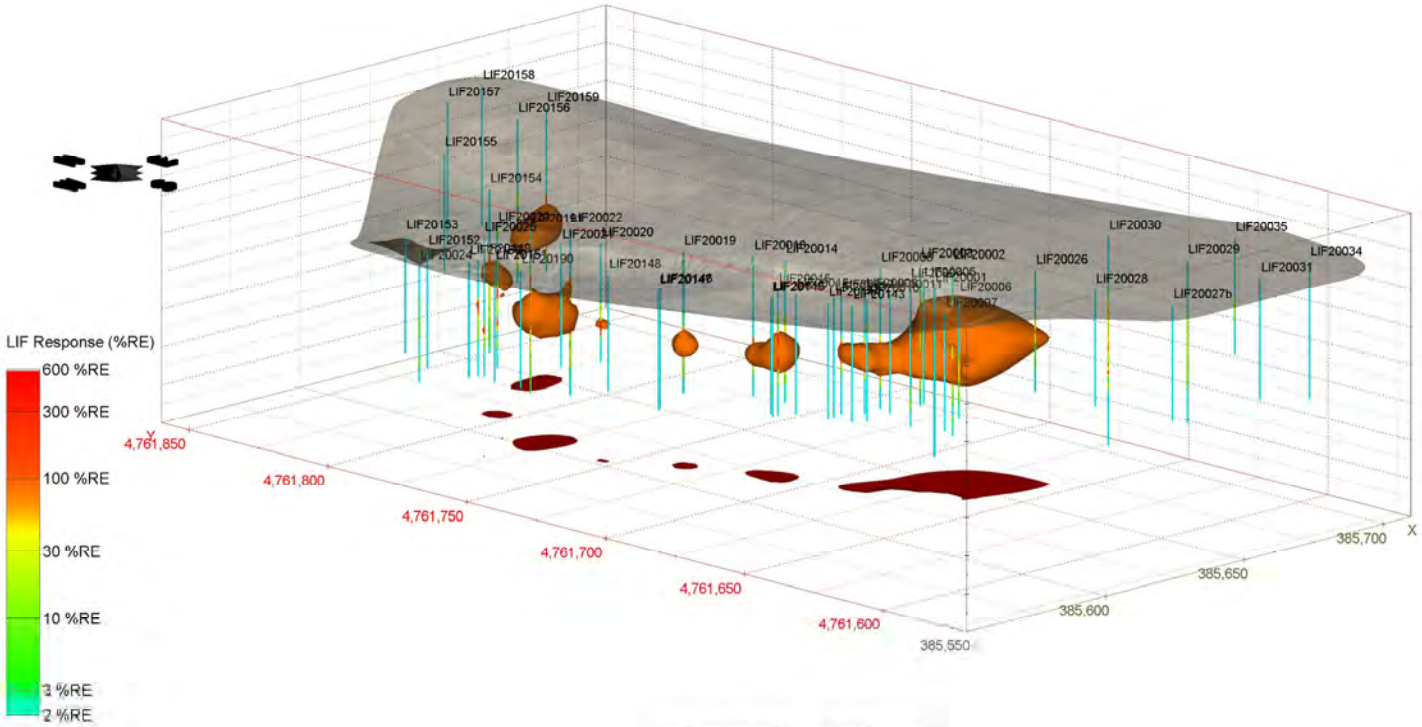


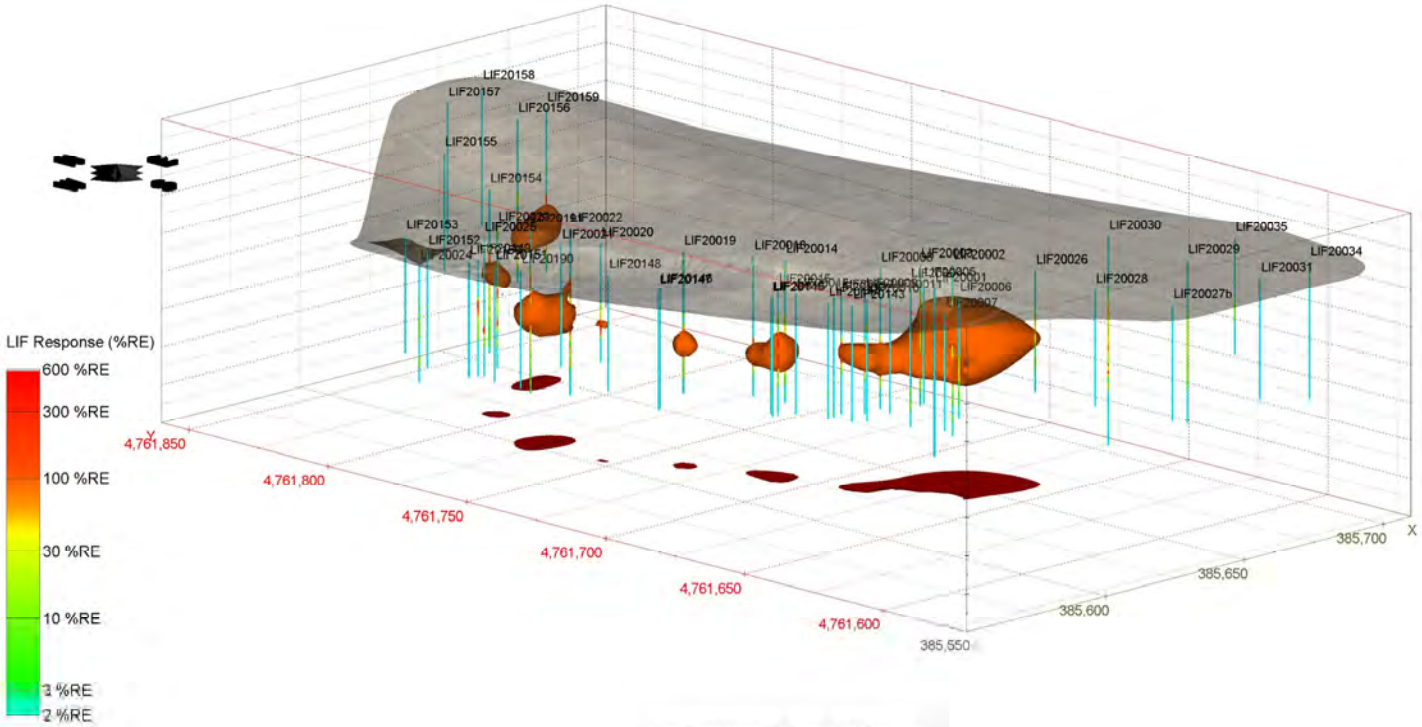
LIF Response 50 %RE and Above



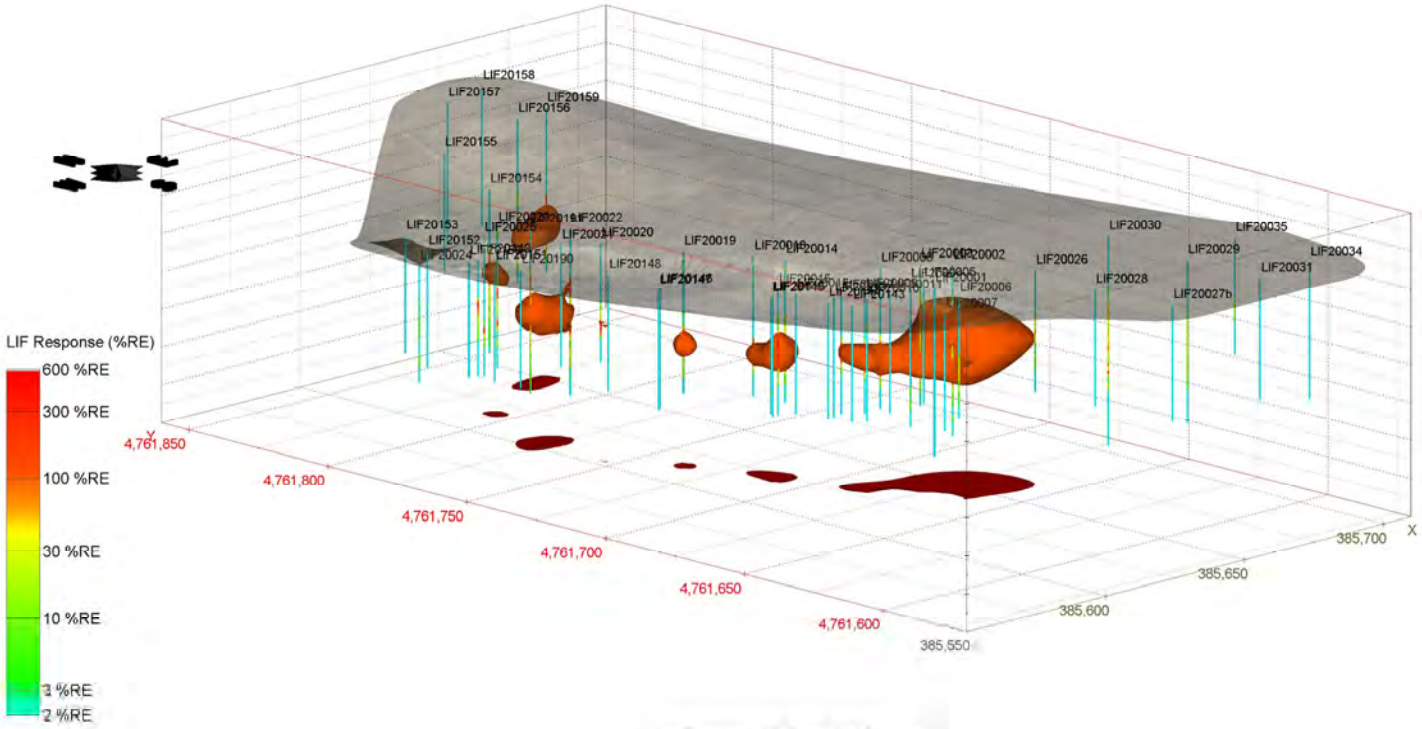
LIF Response 60 %RE and Above



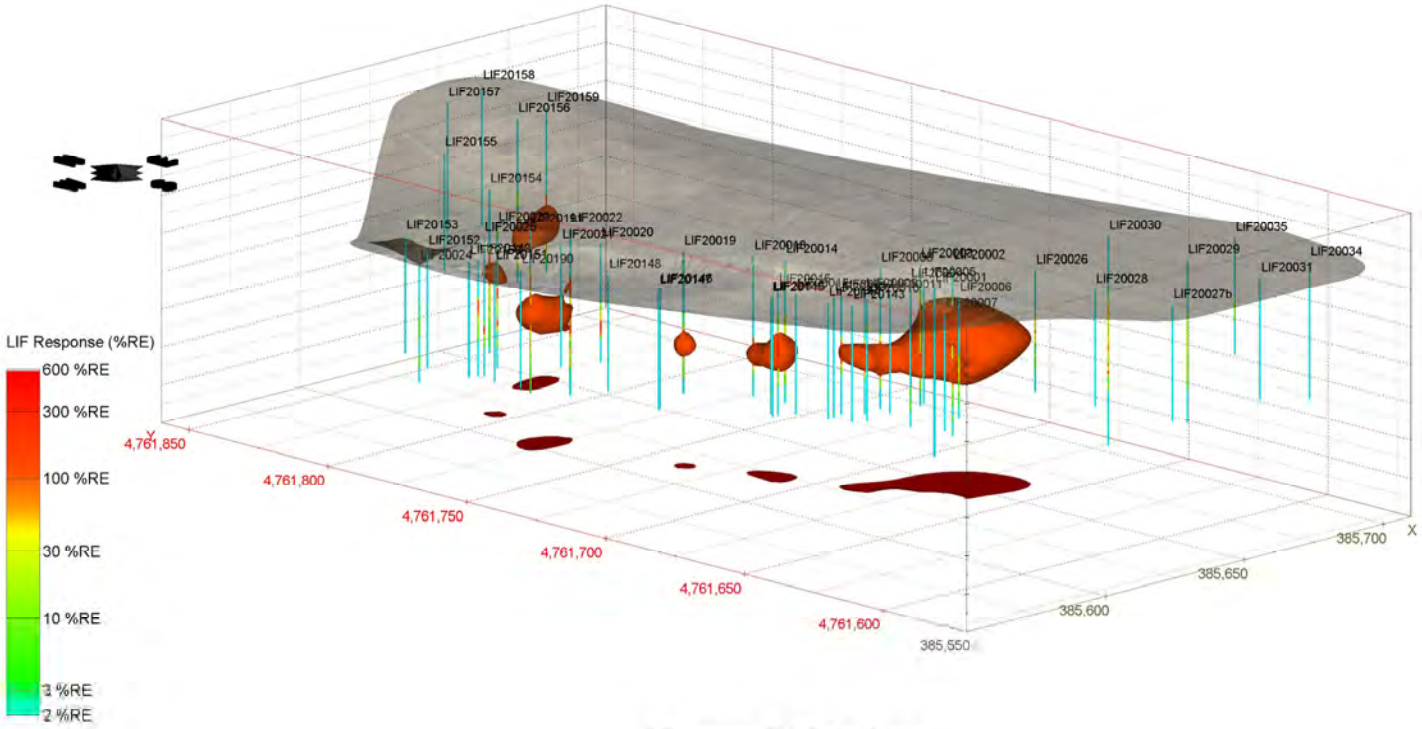
LIF Response 70 %RE and Above



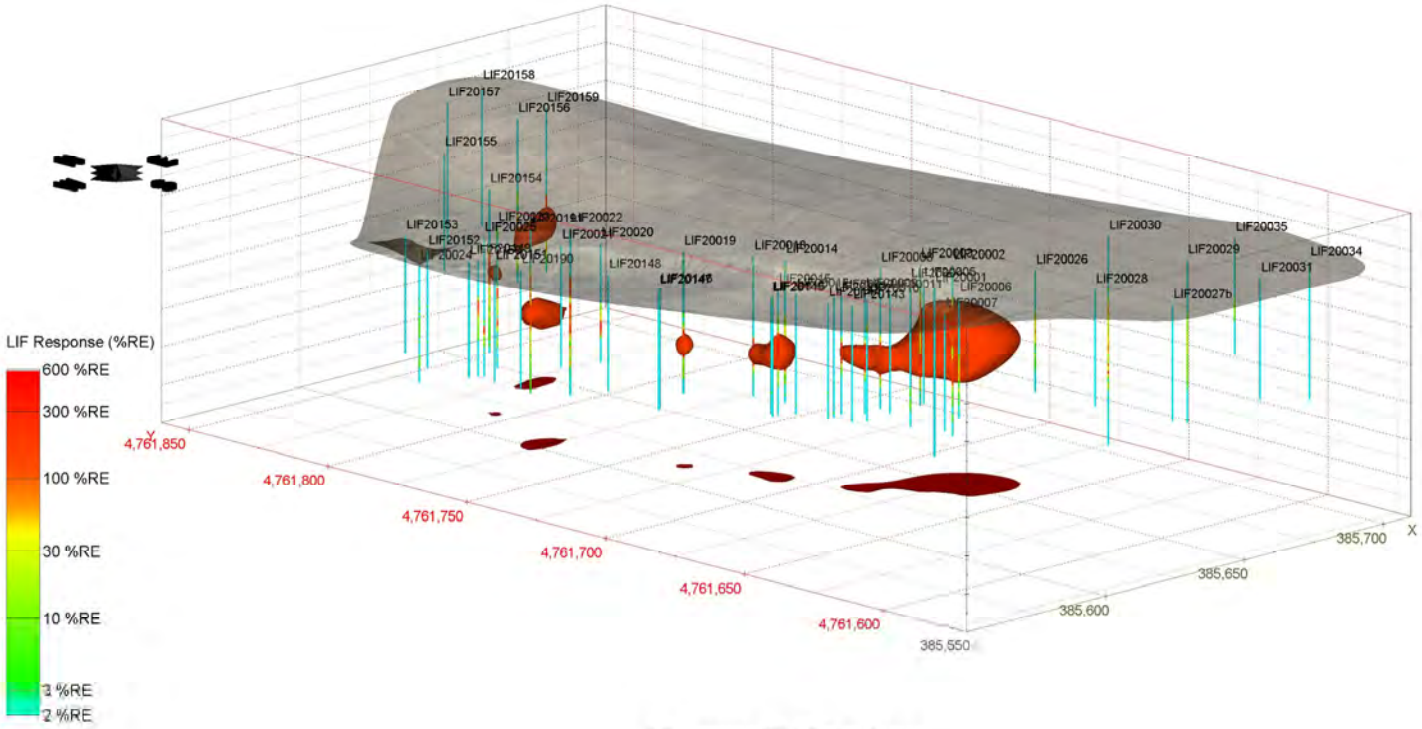
LIF Response 80 %RE and Above



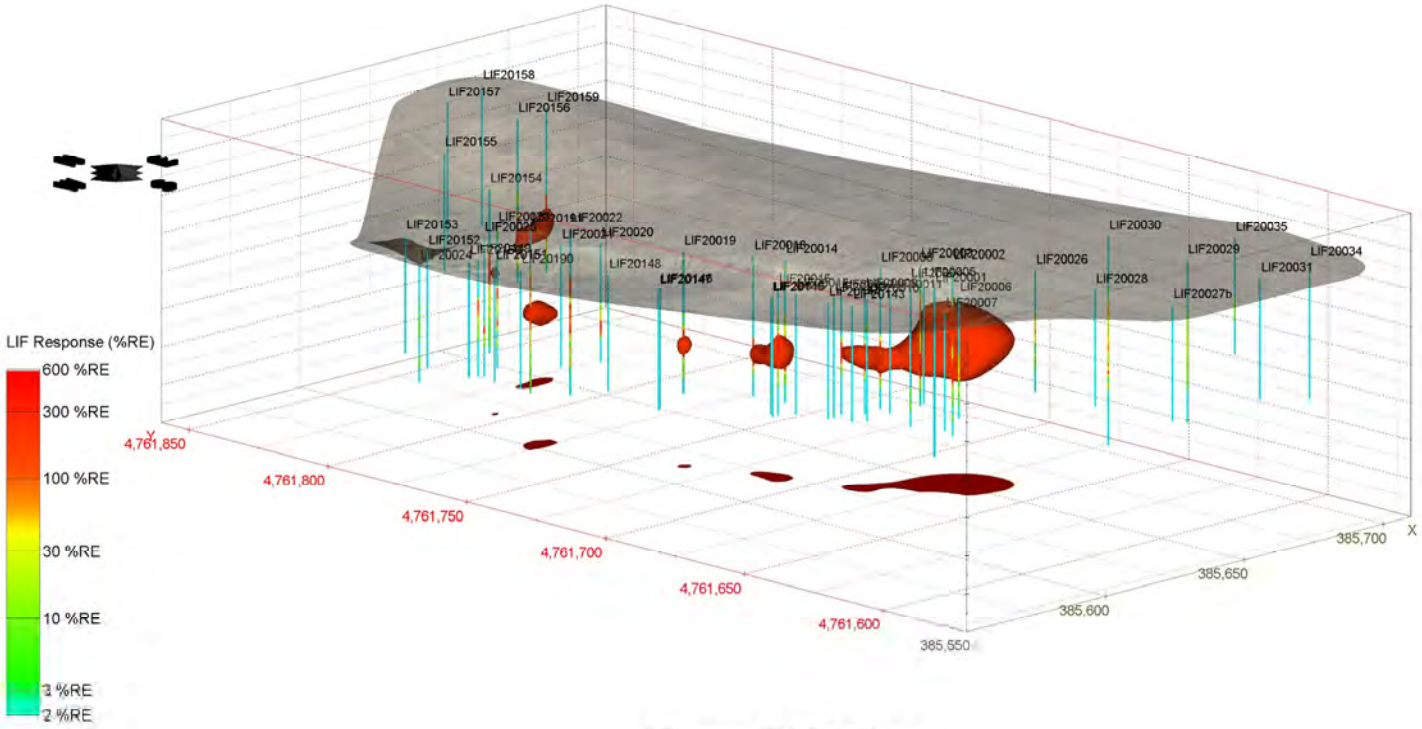
LIF Response 90 %RE and Above



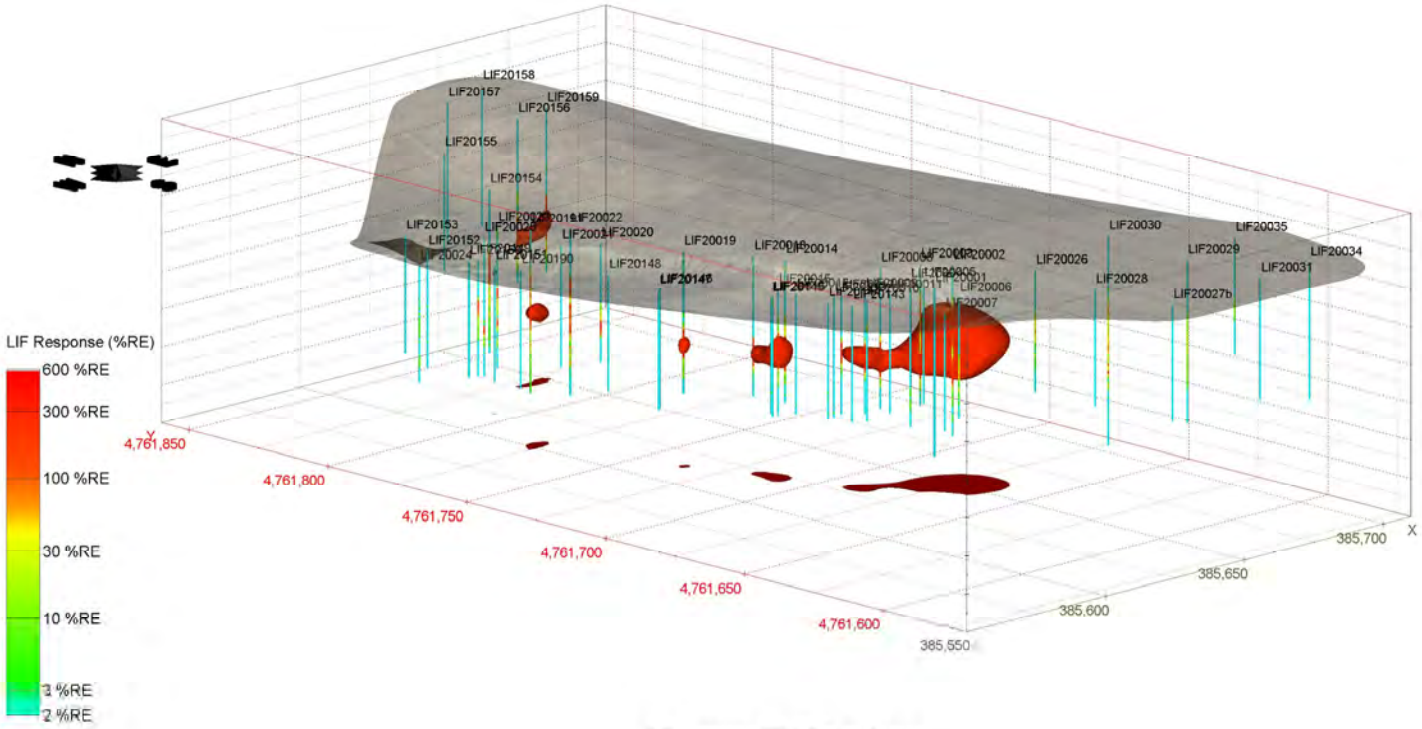
LIF Response 100 %RE and Above



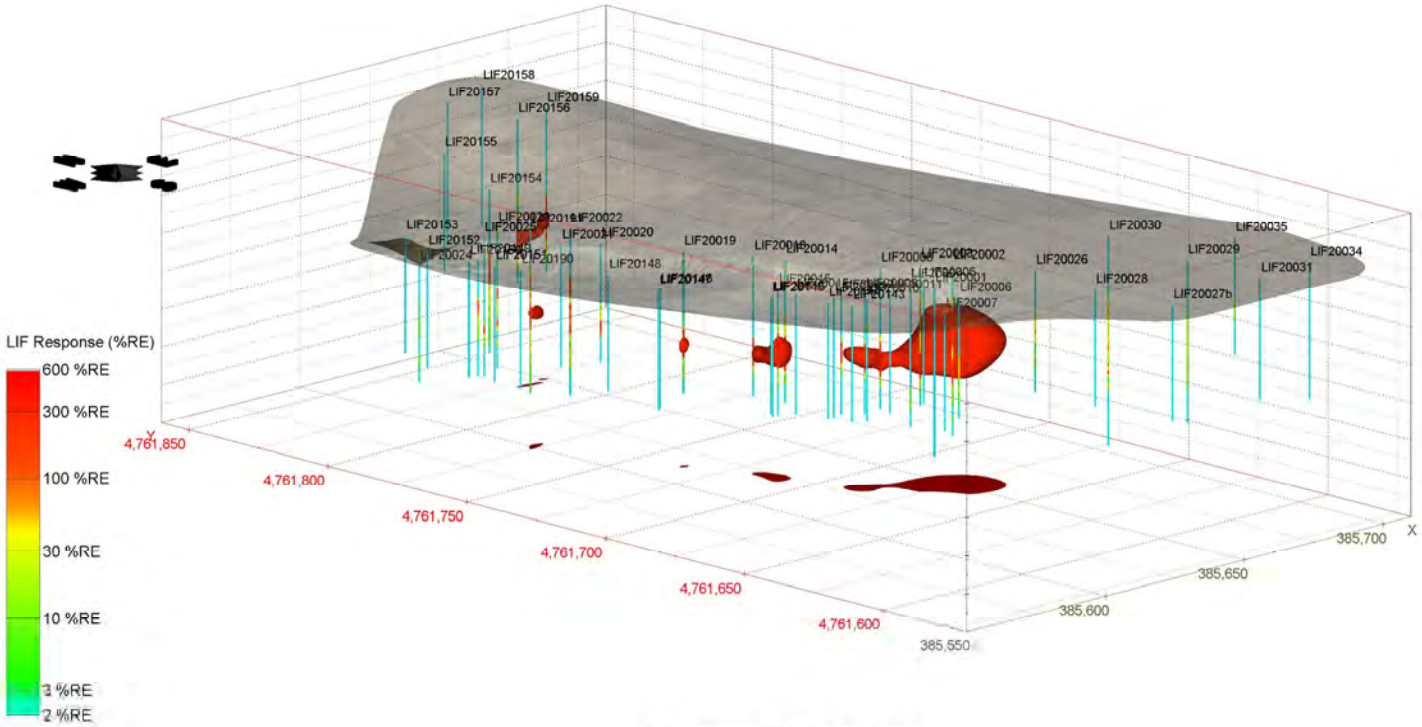
LIF Response 150 %RE and Above



LIF Response 200 %RE and Above



LIF Response 250 %RE and Above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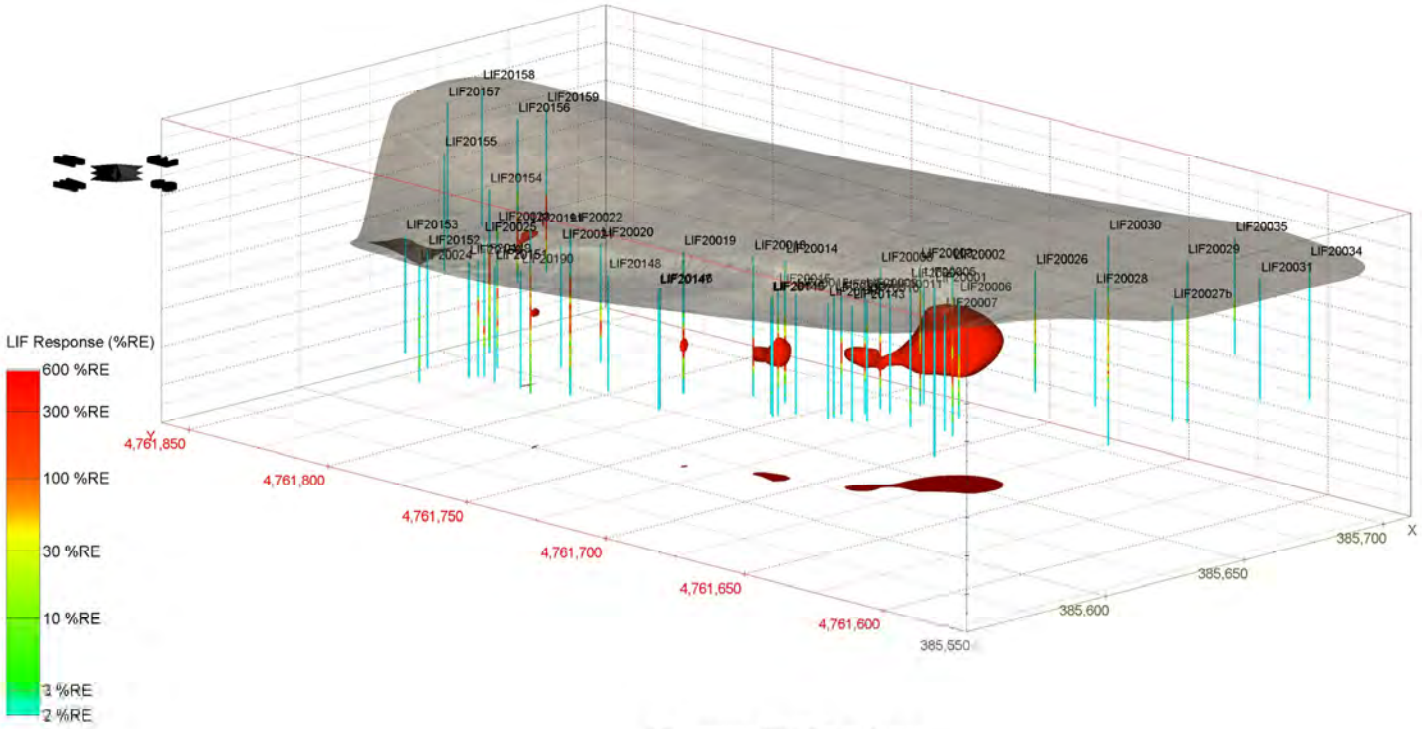
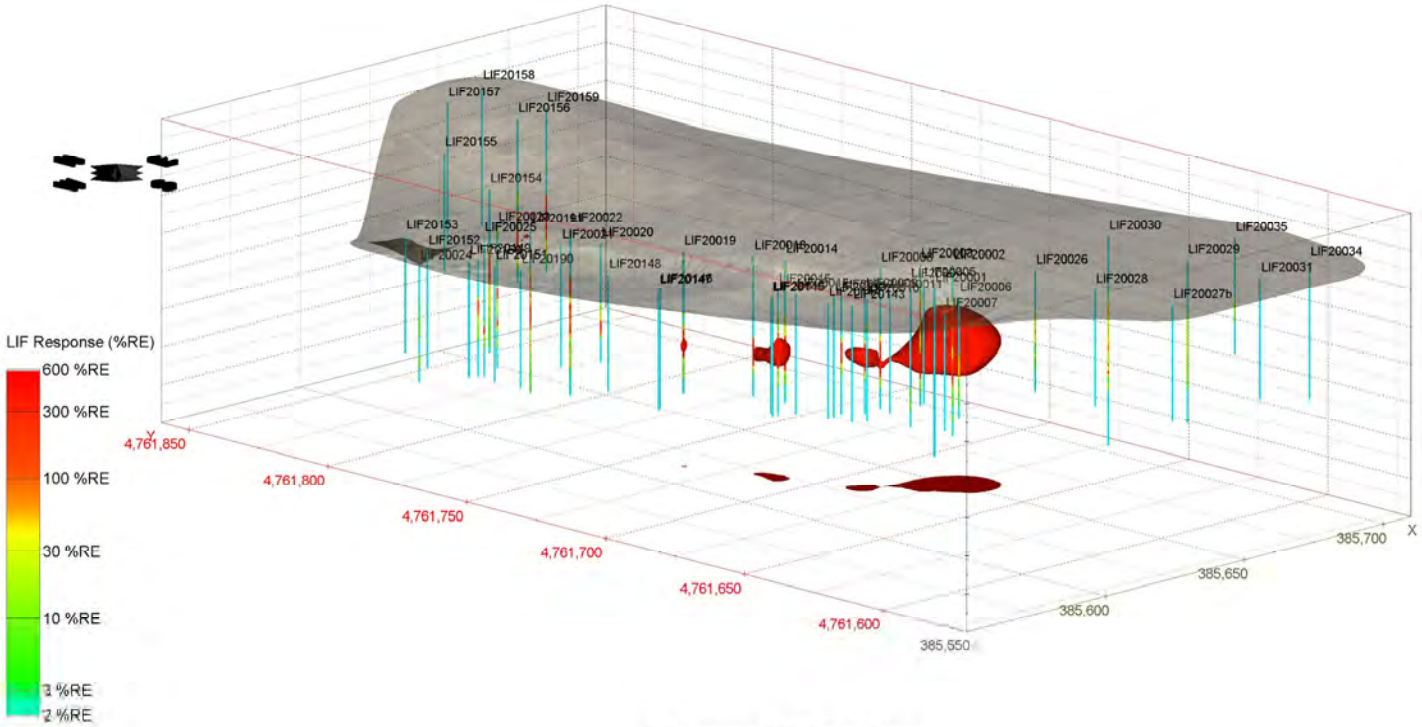
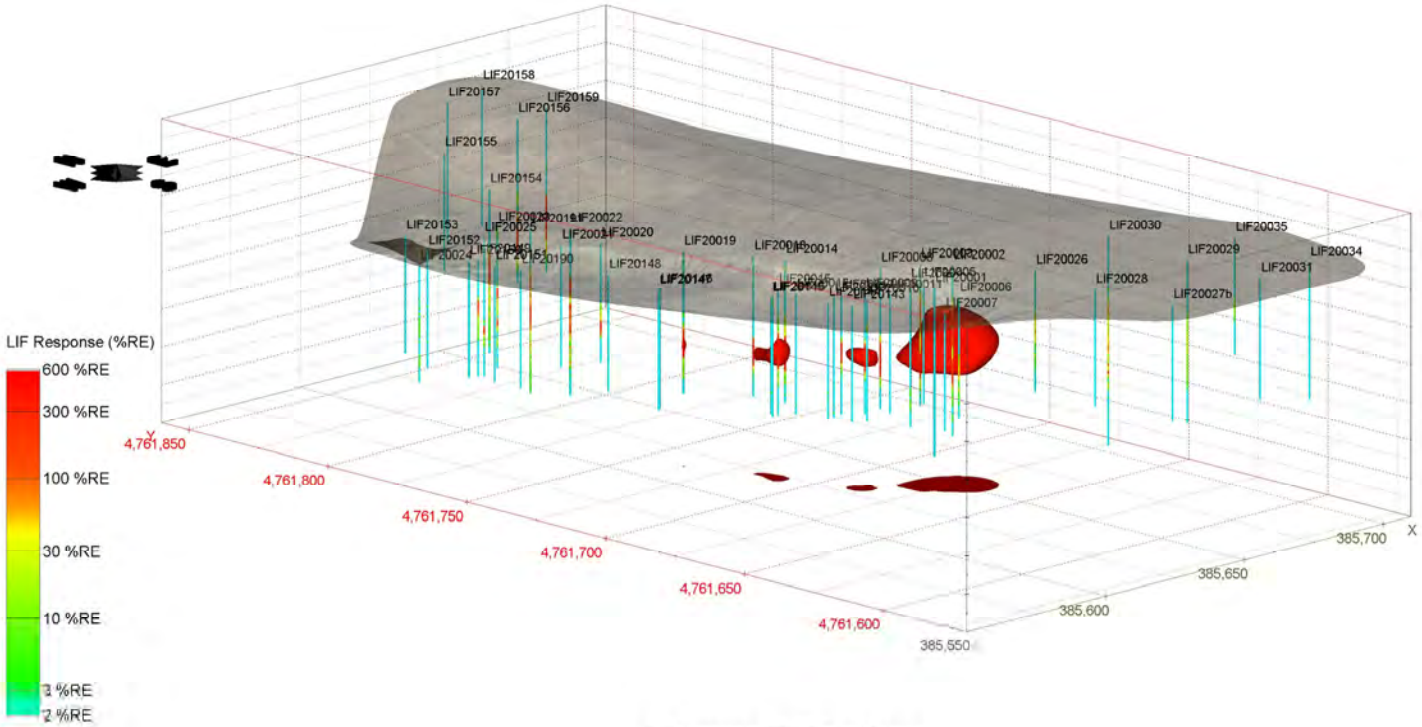


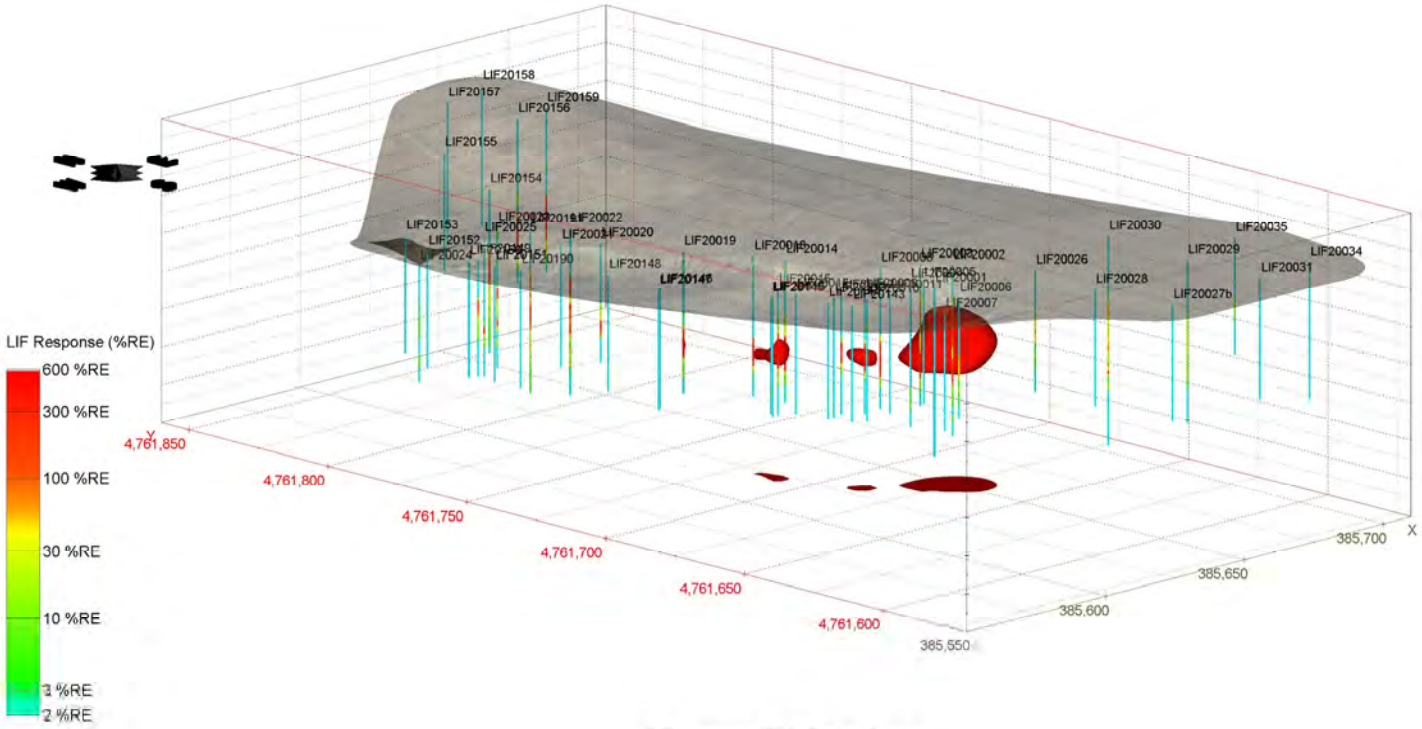
LIF Response 350 %RE and Above



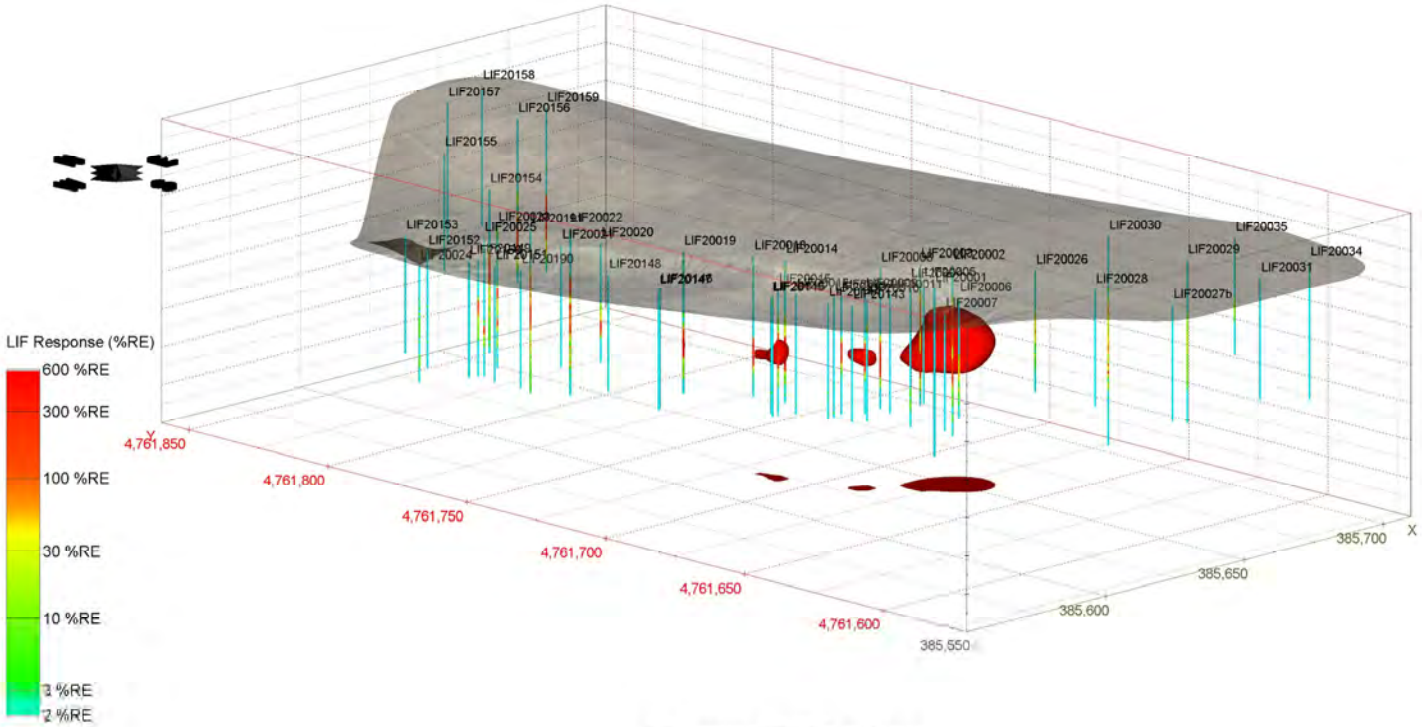
LIF Response 400 %RE and Above



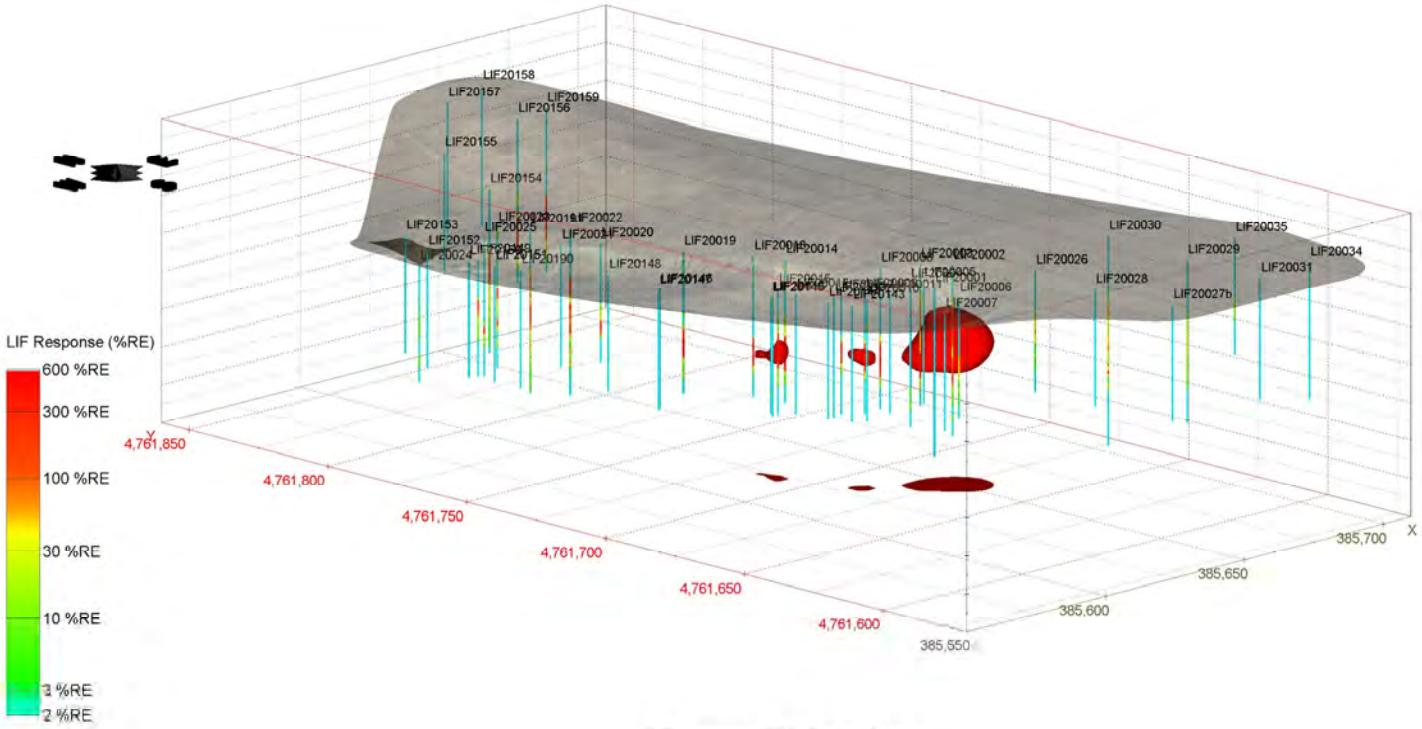
LIF Response 450 %RE and Above



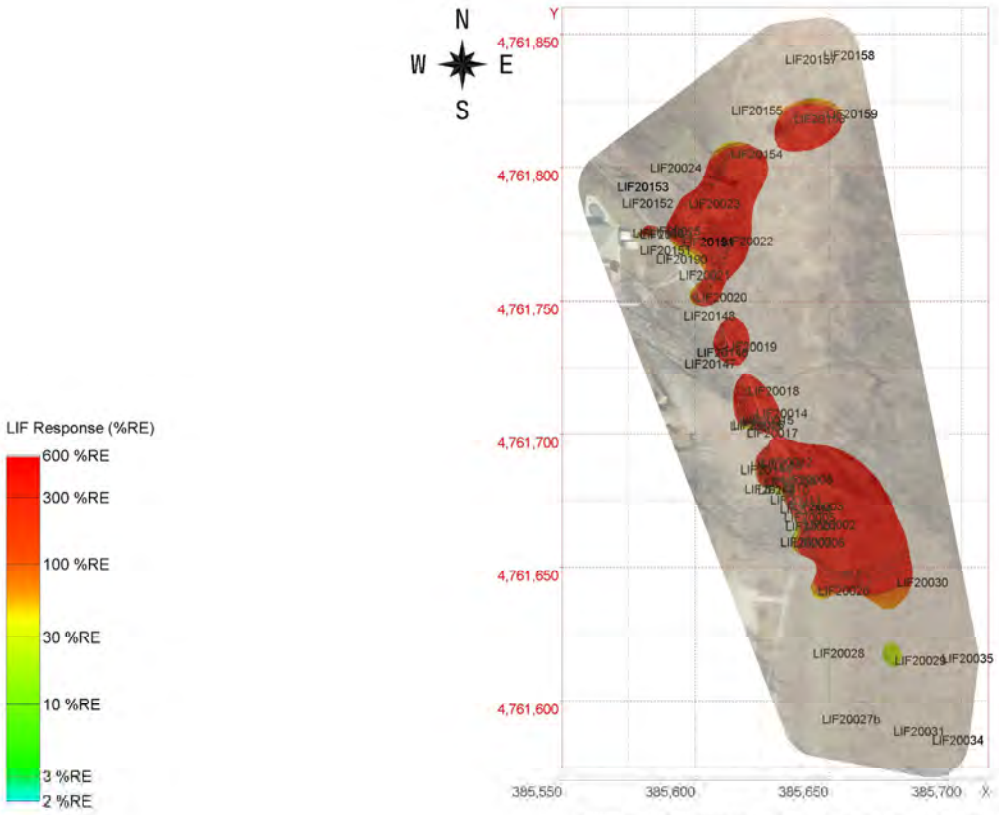
LIF Response 500 %RE and Above



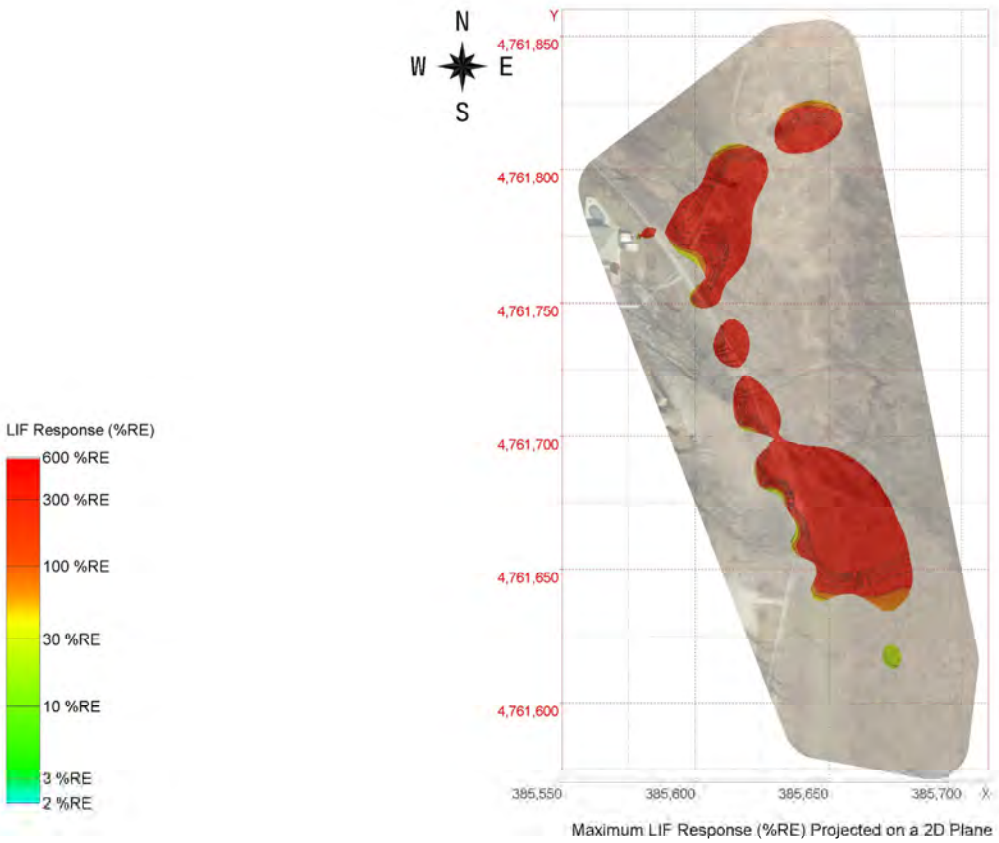
LIF Response 550 %RE and Above



LIF Response 600 %RE and Above



Maximum LIF Response (%RE) Projected on a 2D Plane

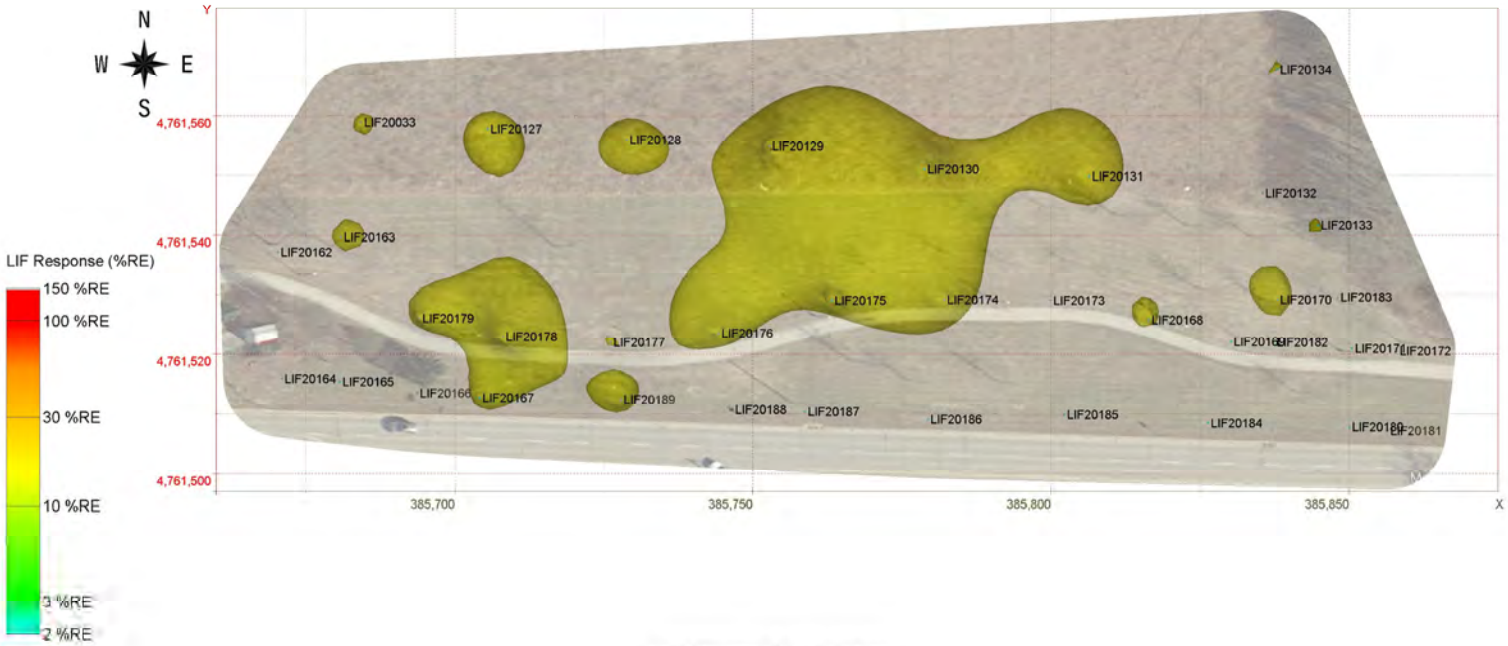


Maximum LIF Response (%RE) Projected on a 2D Plane

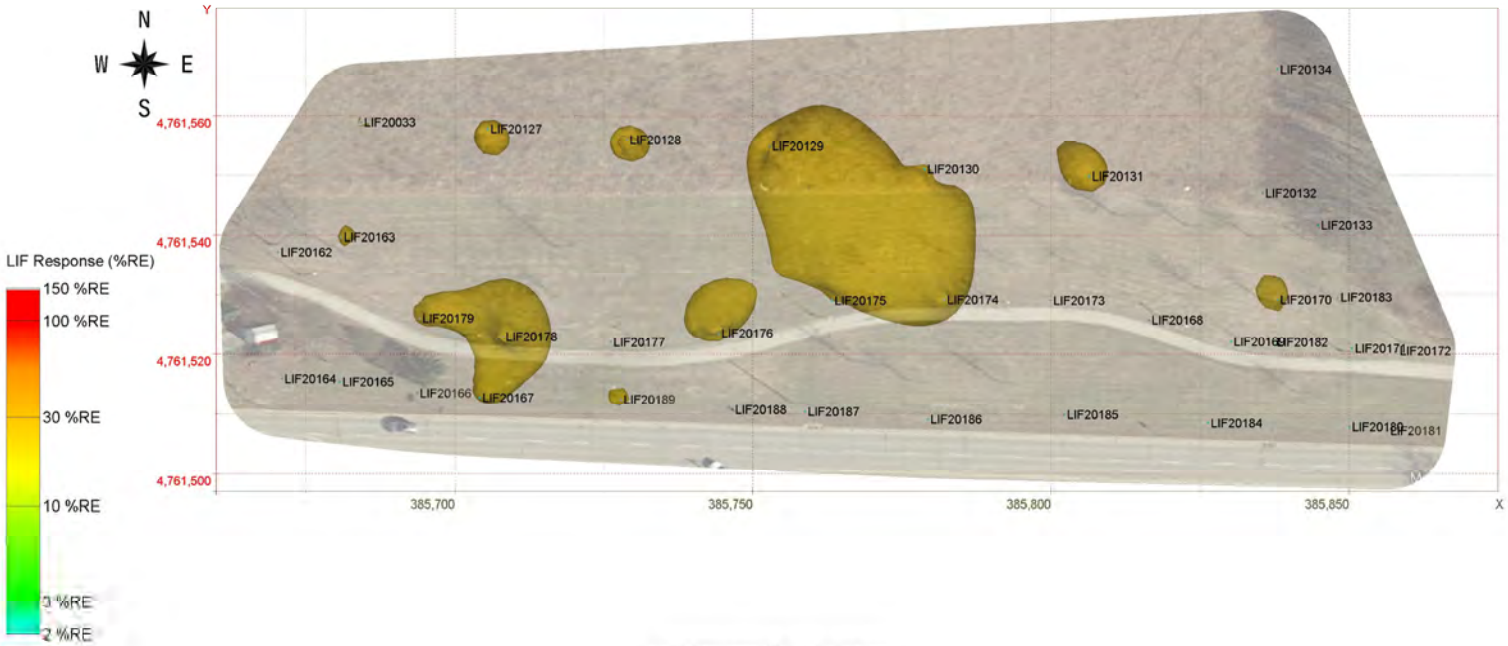
Attachment E

G2 Area LIF 3D Visualizations

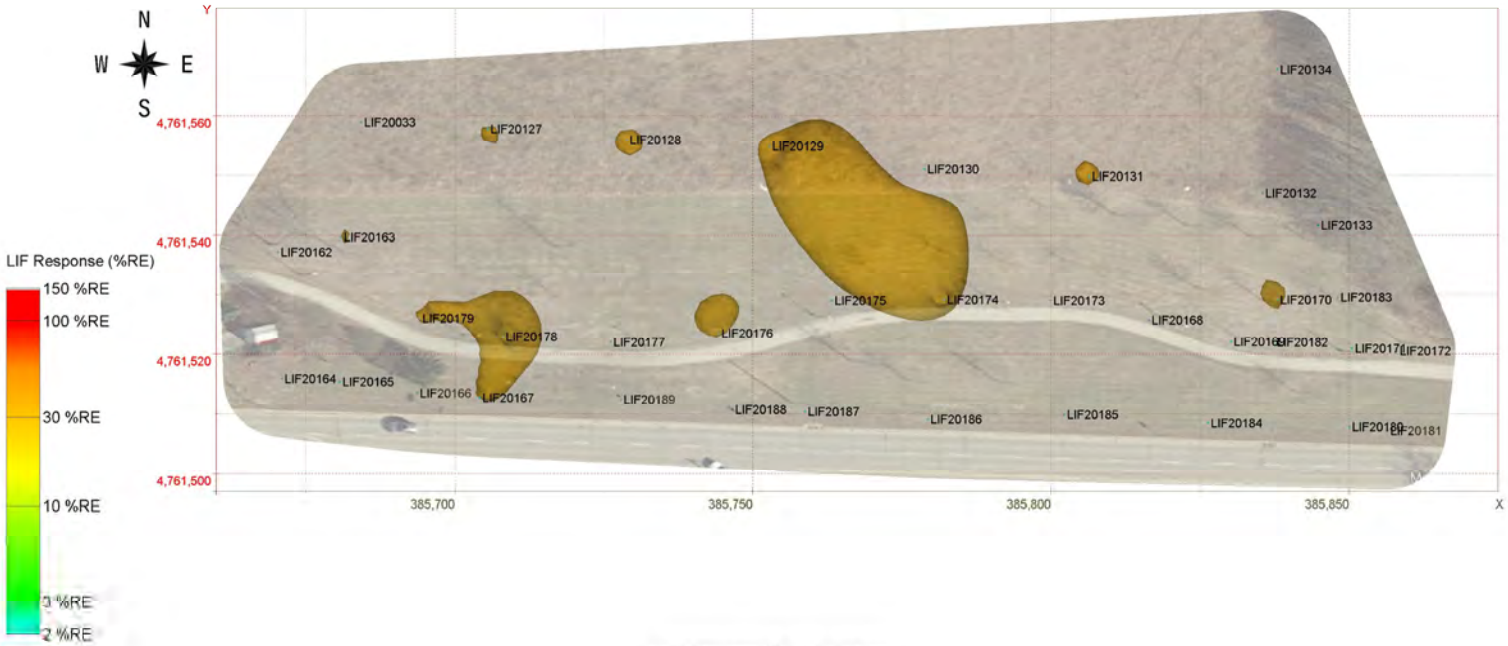
LIF Response 5 %RE and Above



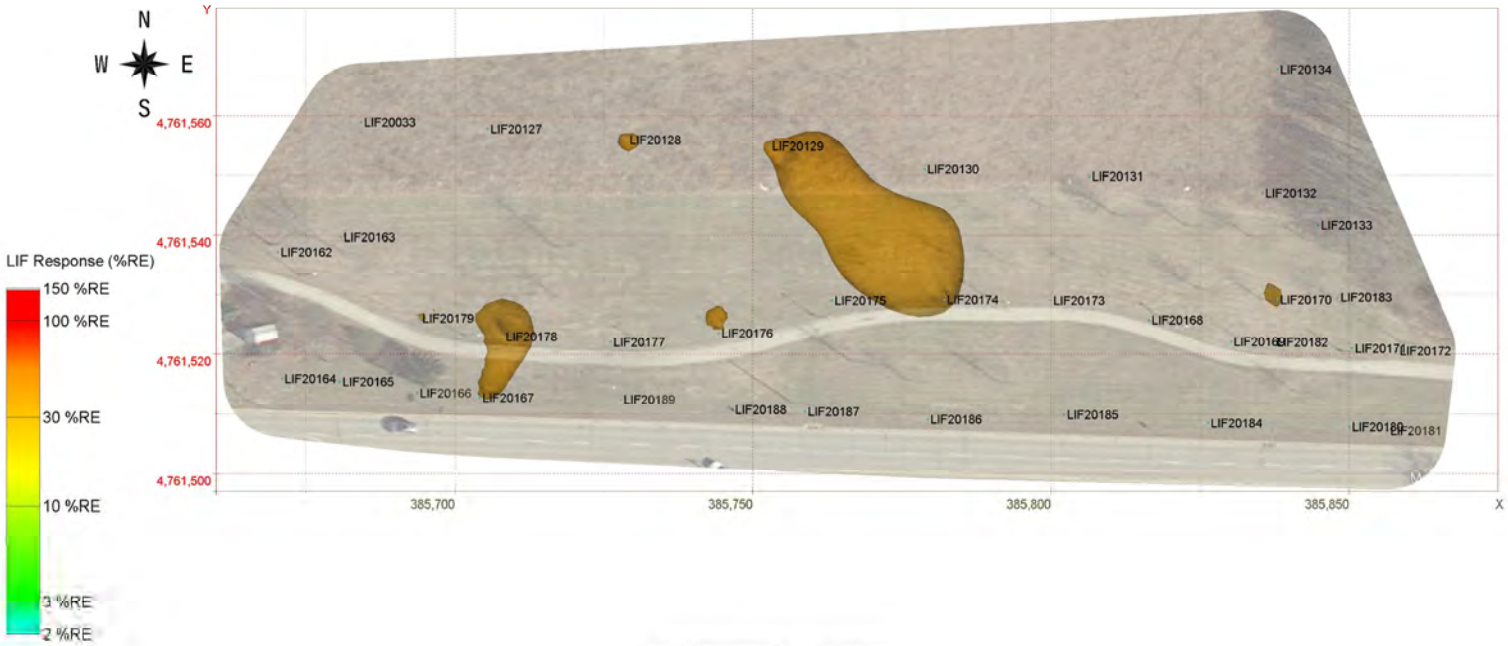
LIF Response 10 %RE and Above



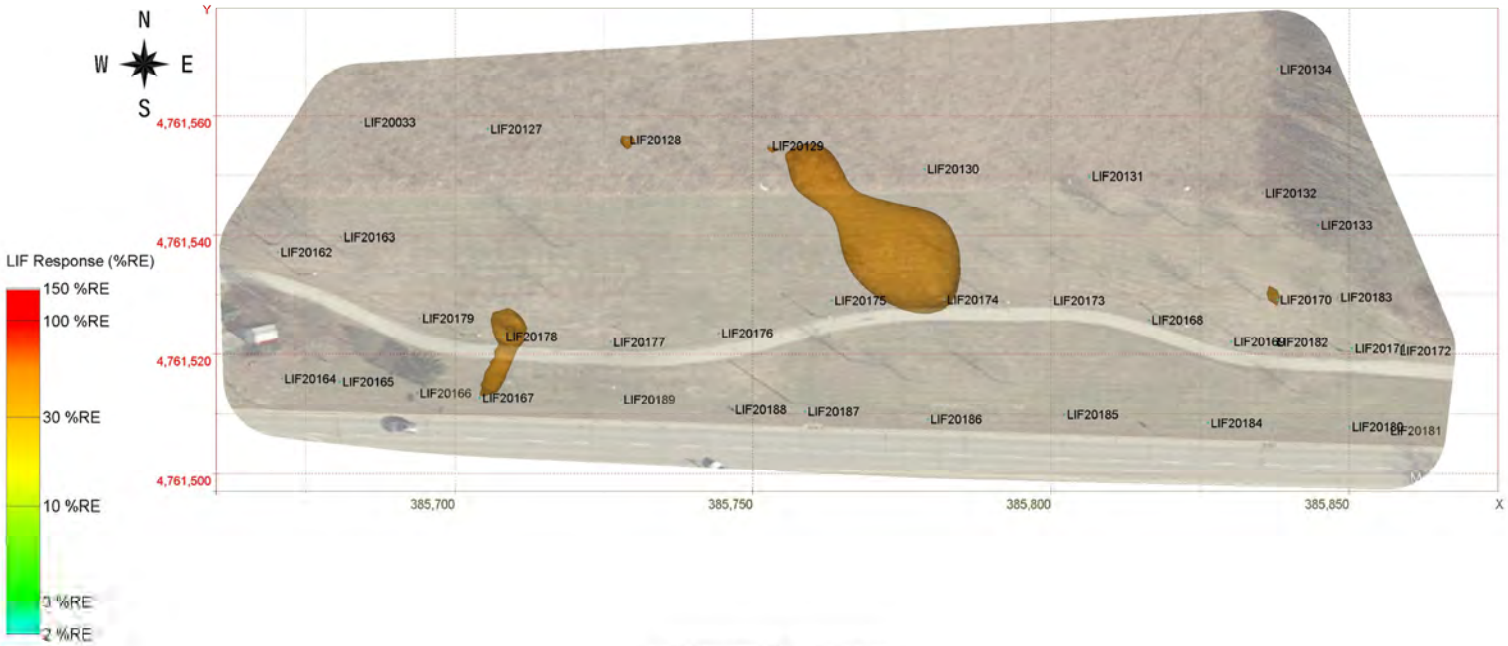
LIF Response 20 %RE and Above



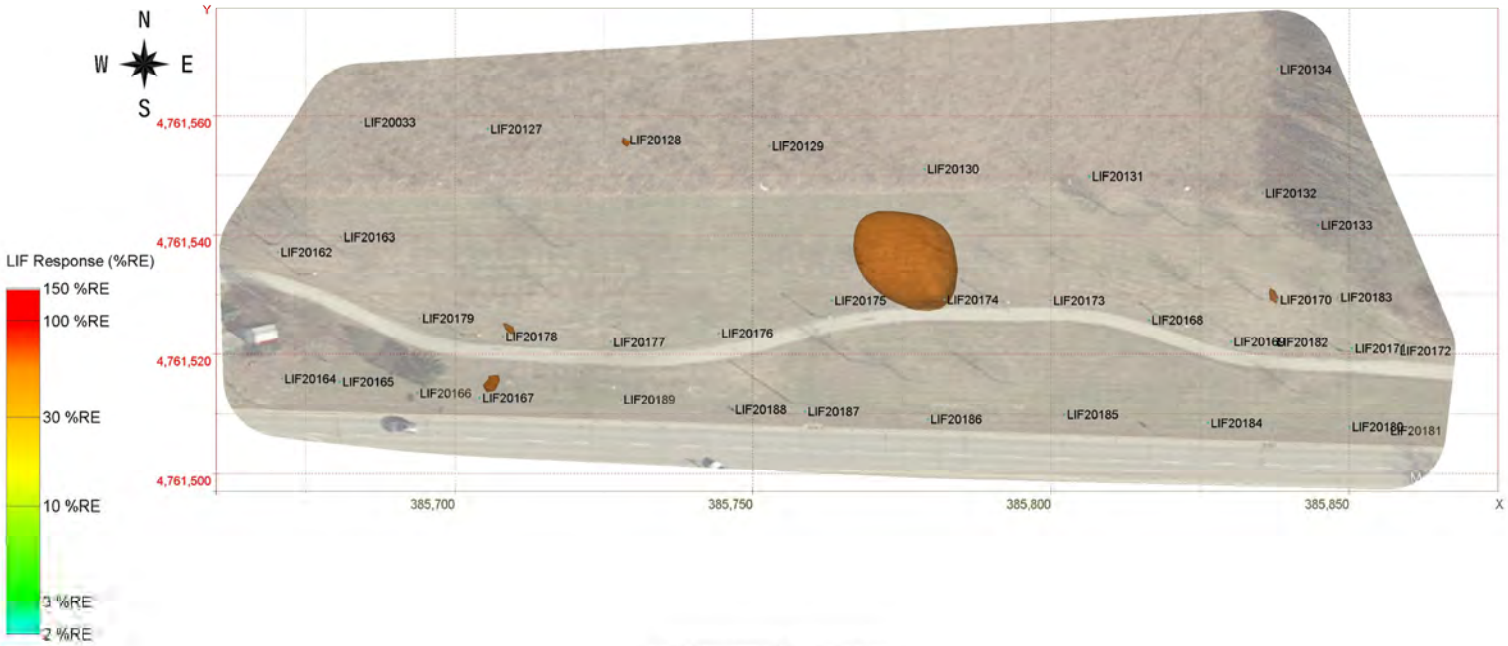
LIF Response 30 %RE and Above



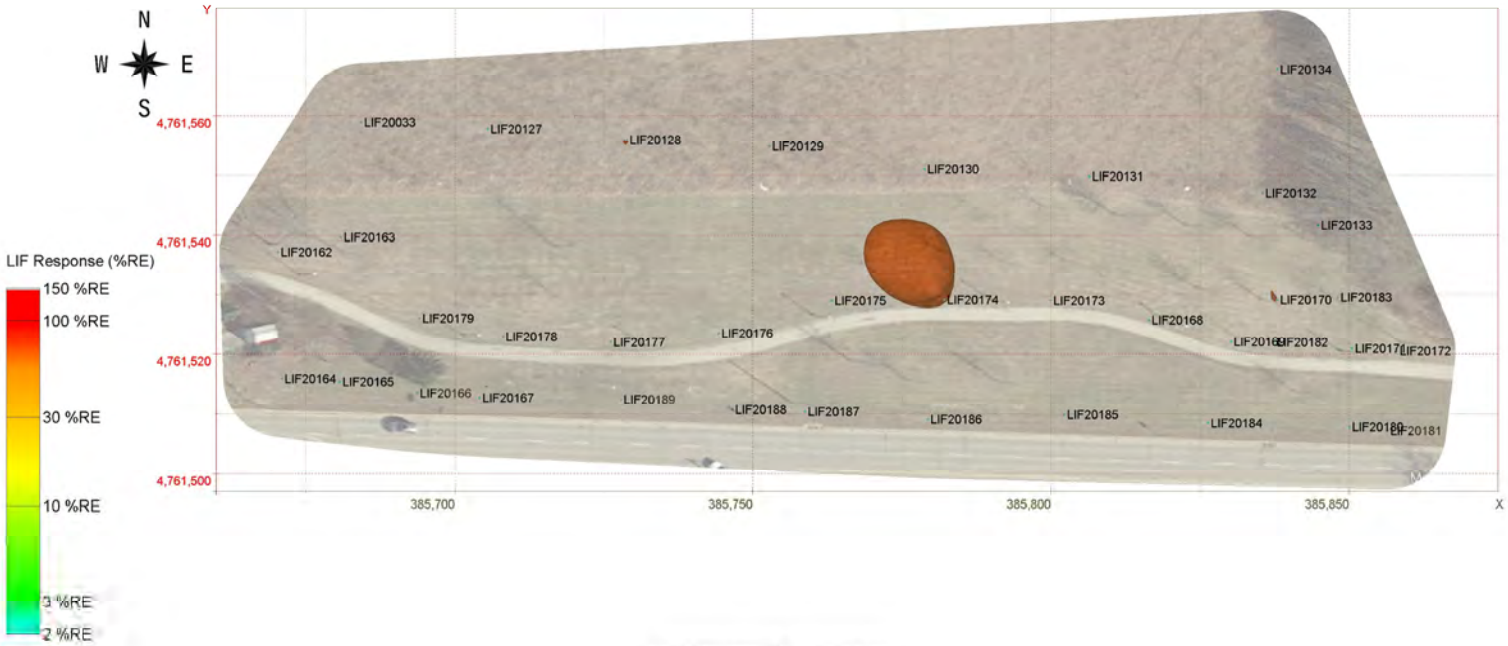
LIF Response 40 %RE and Above



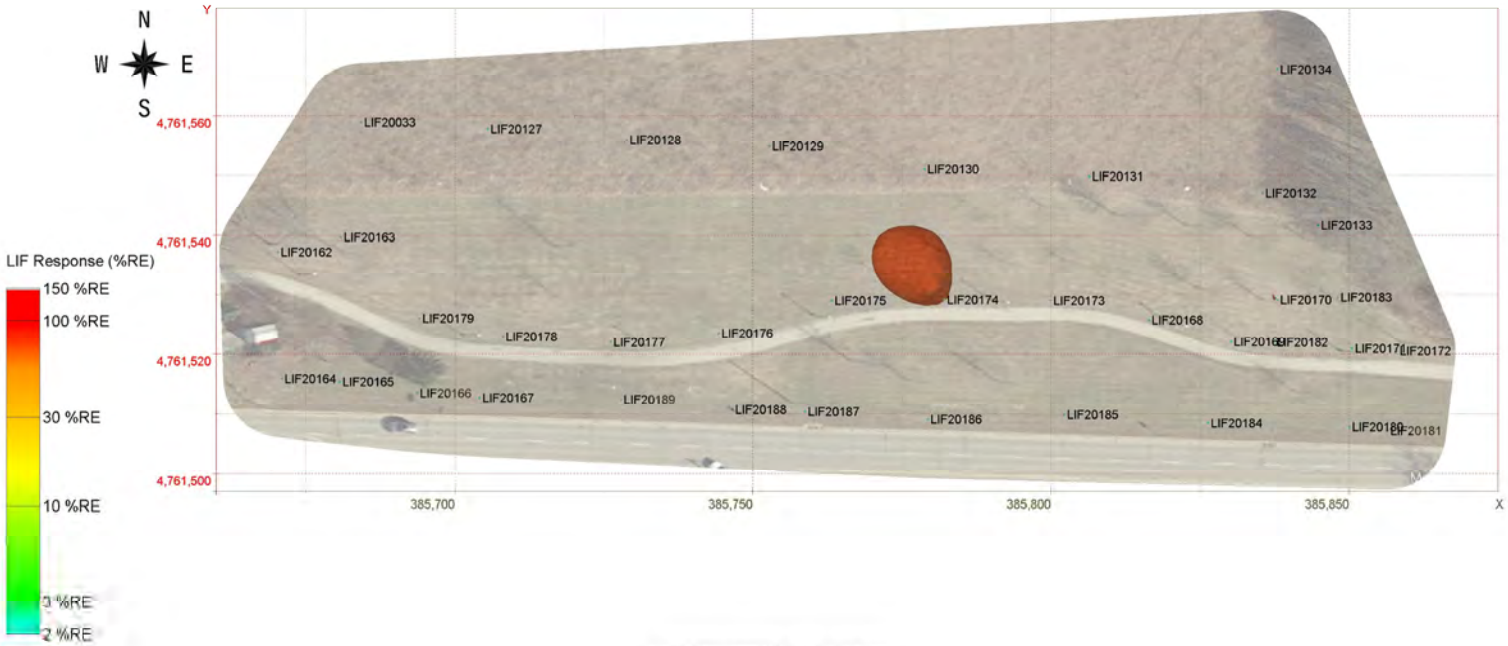
LIF Response 50 %RE and Above



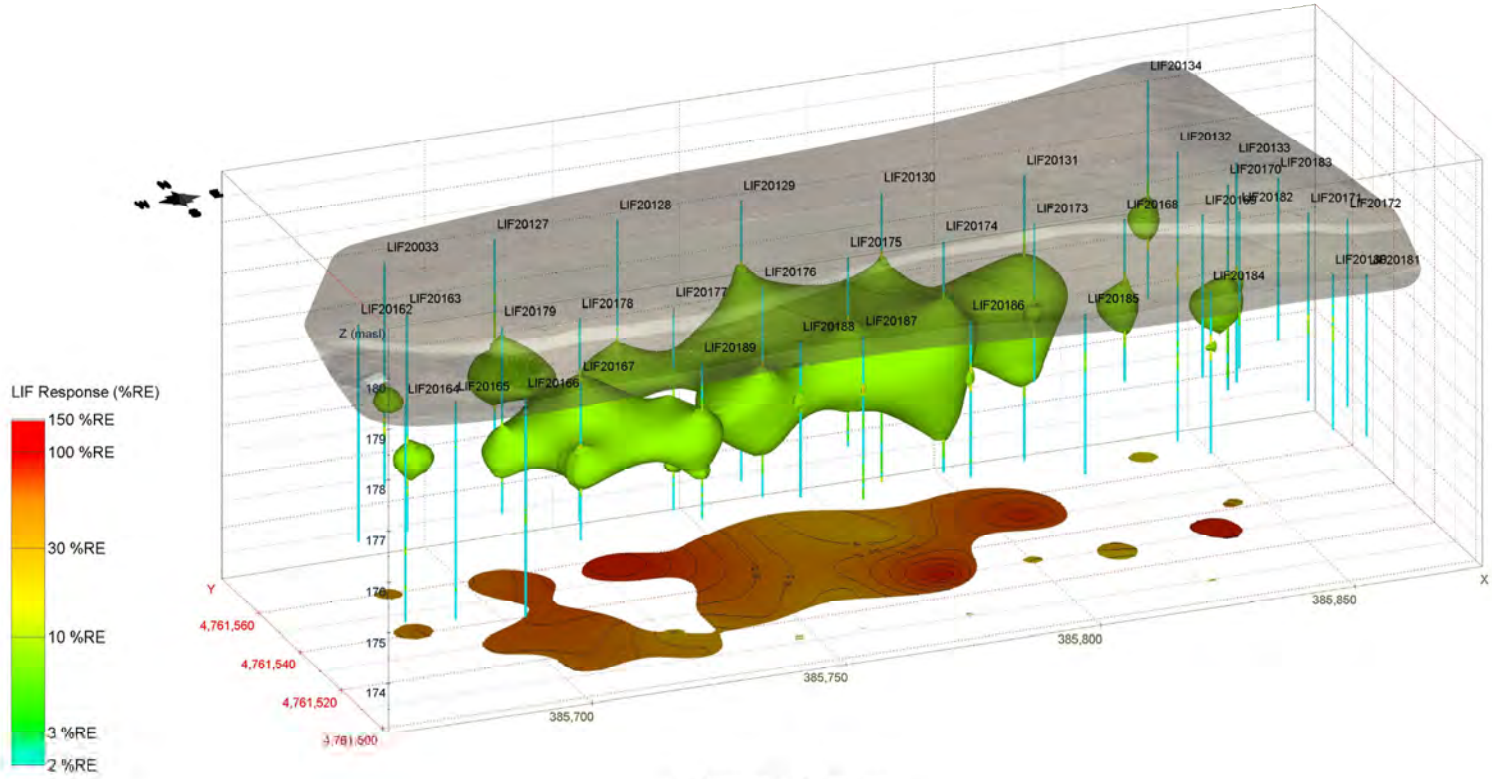
LIF Response 60 %RE and Above



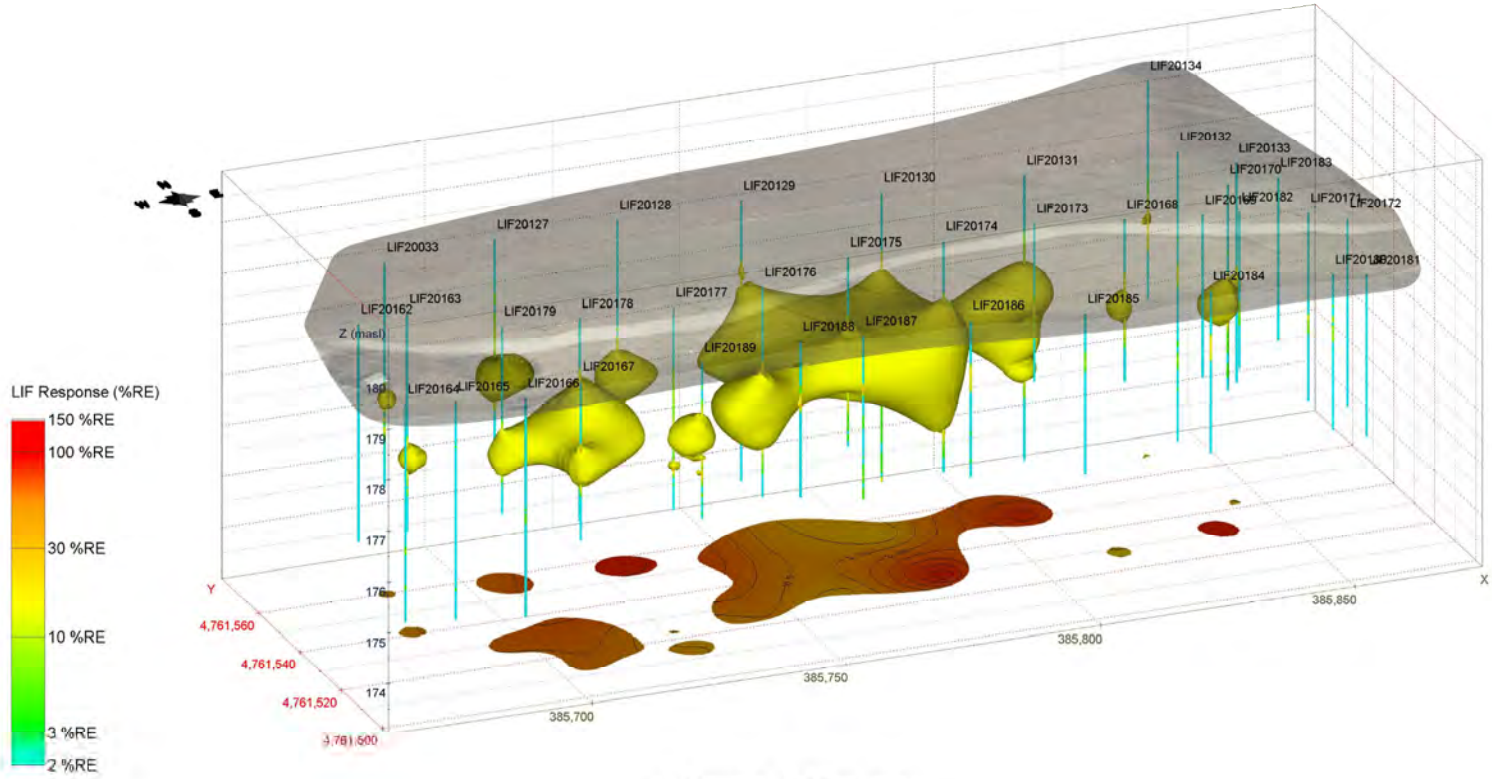
LIF Response 70 %RE and Above



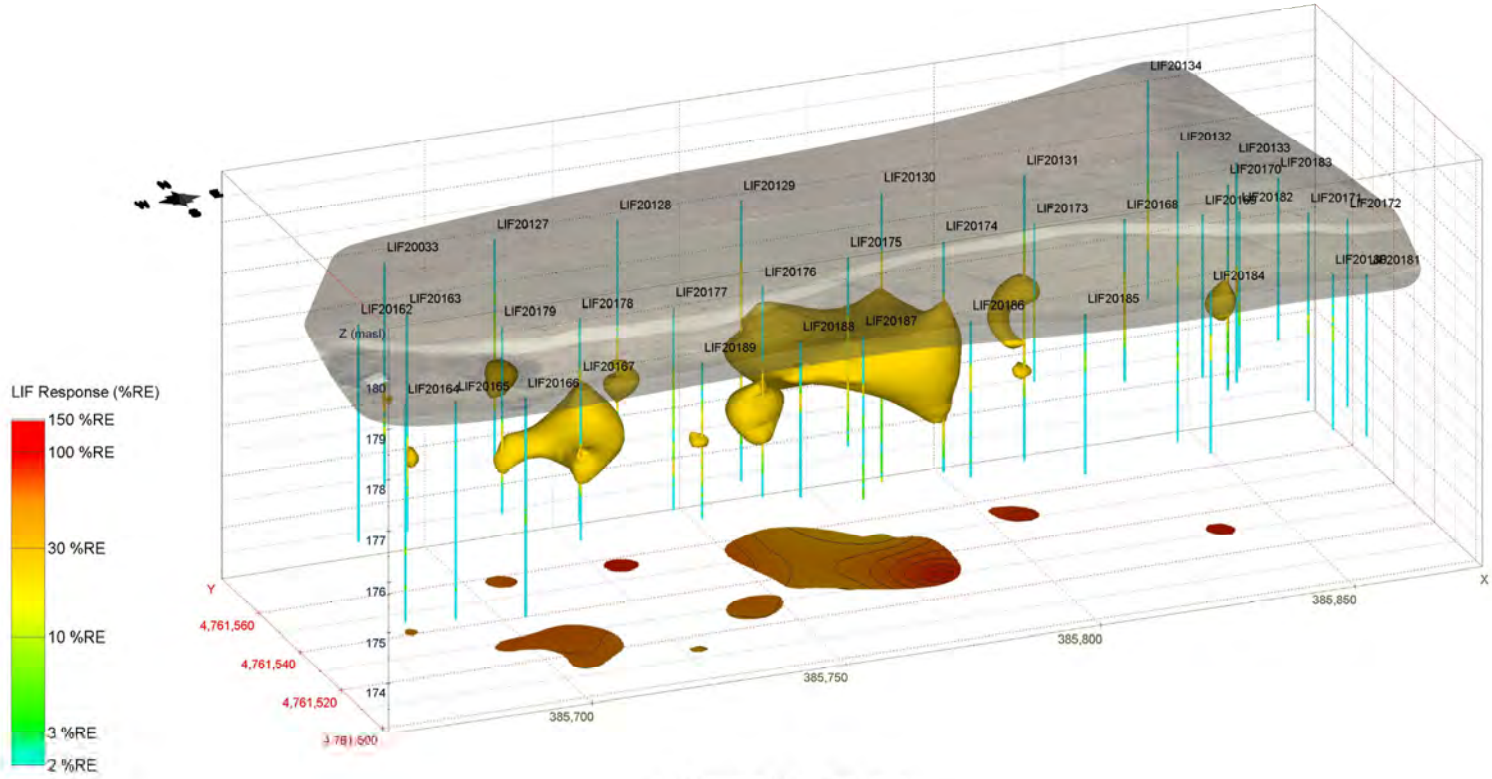
LIF Response 80 %RE and Above



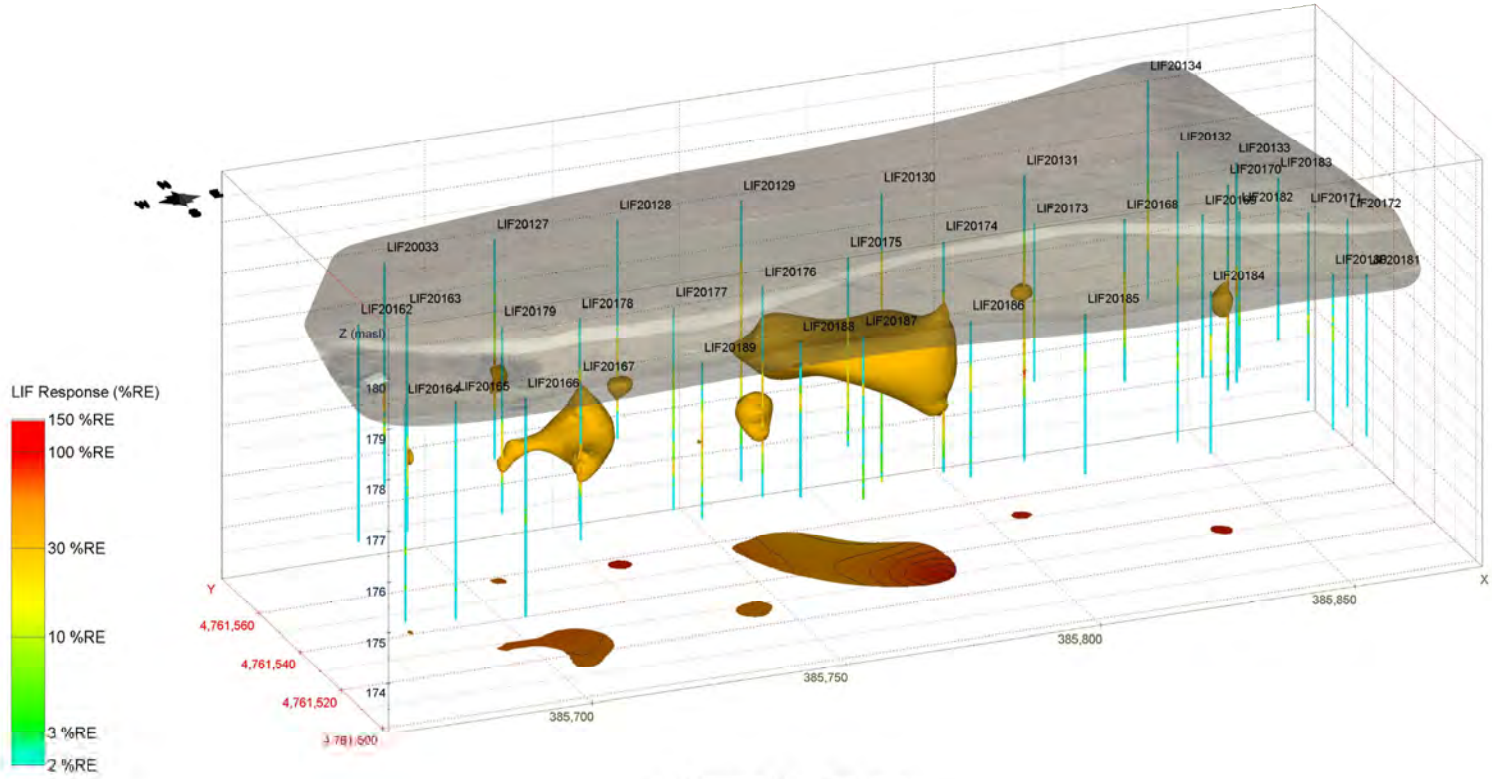
LIF Response 5 %RE and Above



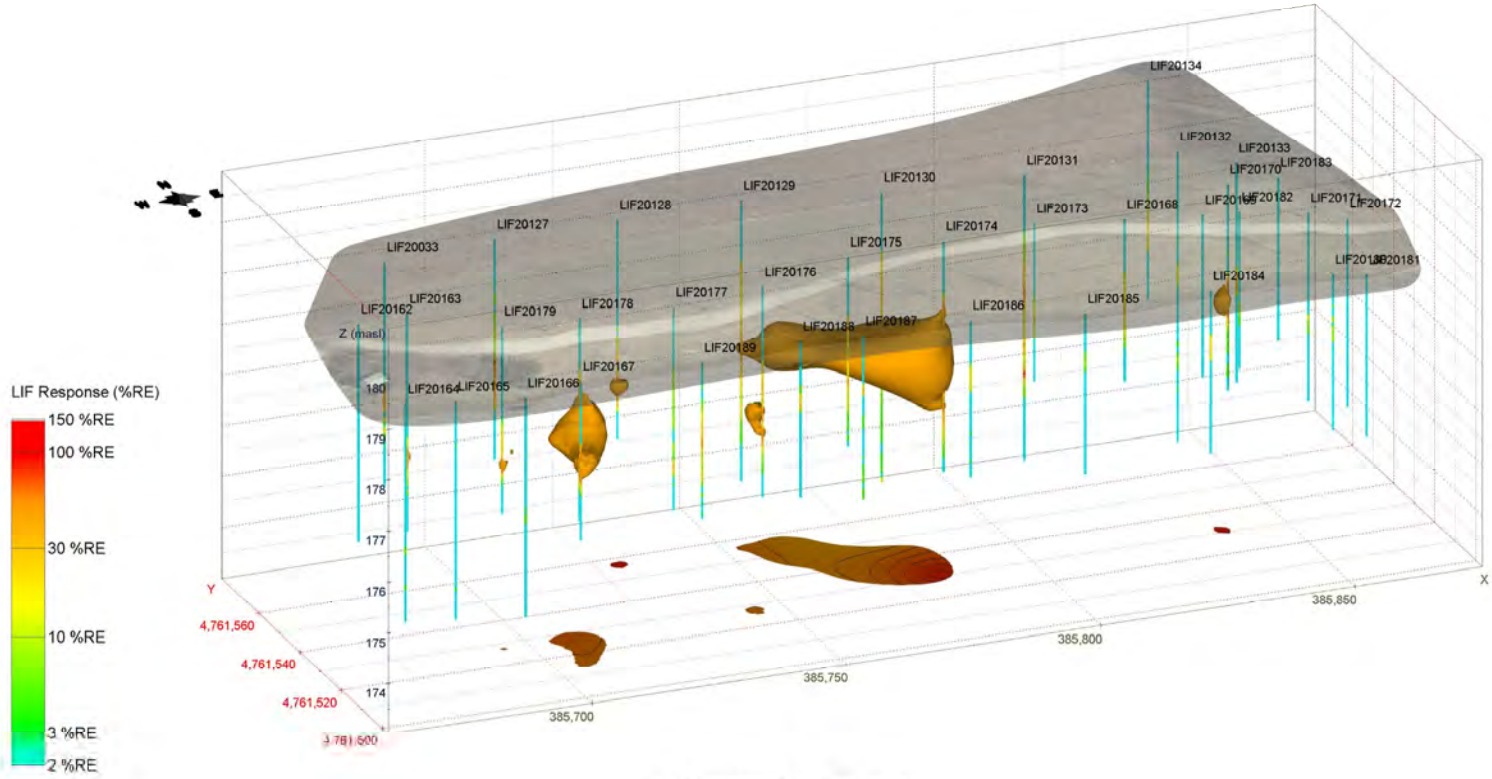
LIF Response 10 %RE and Above



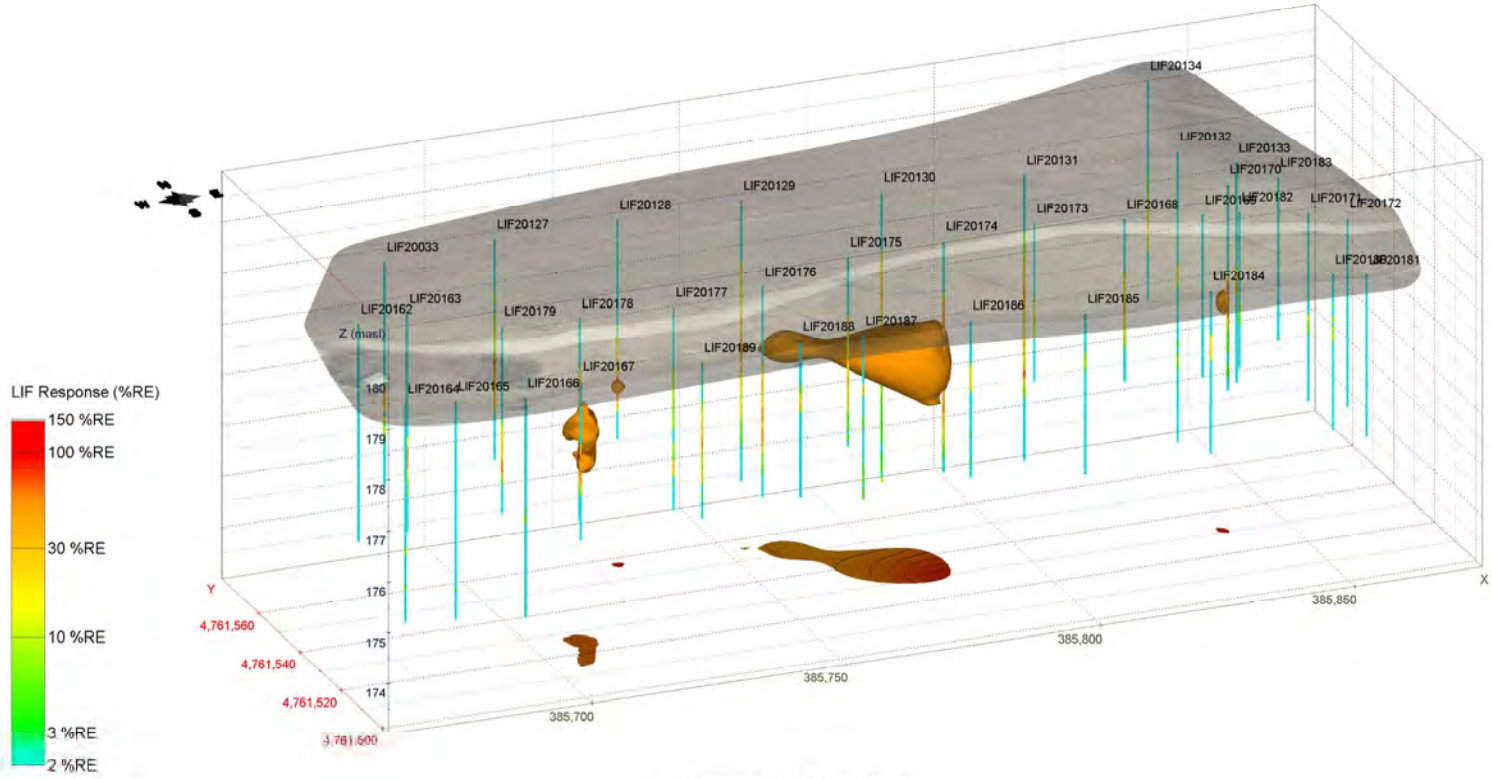
LIF Response 20 %RE and Above



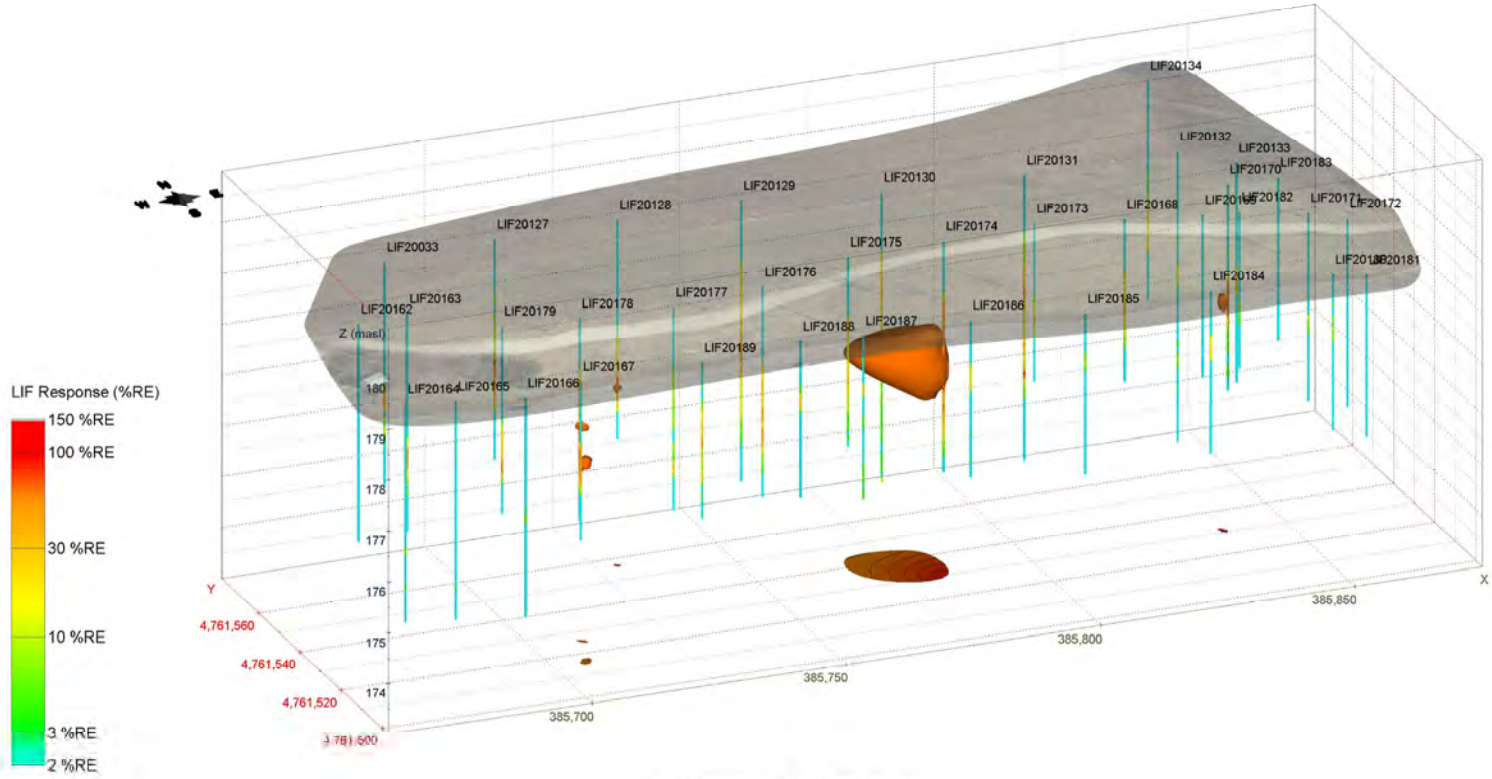
LIF Response 30 %RE and Above



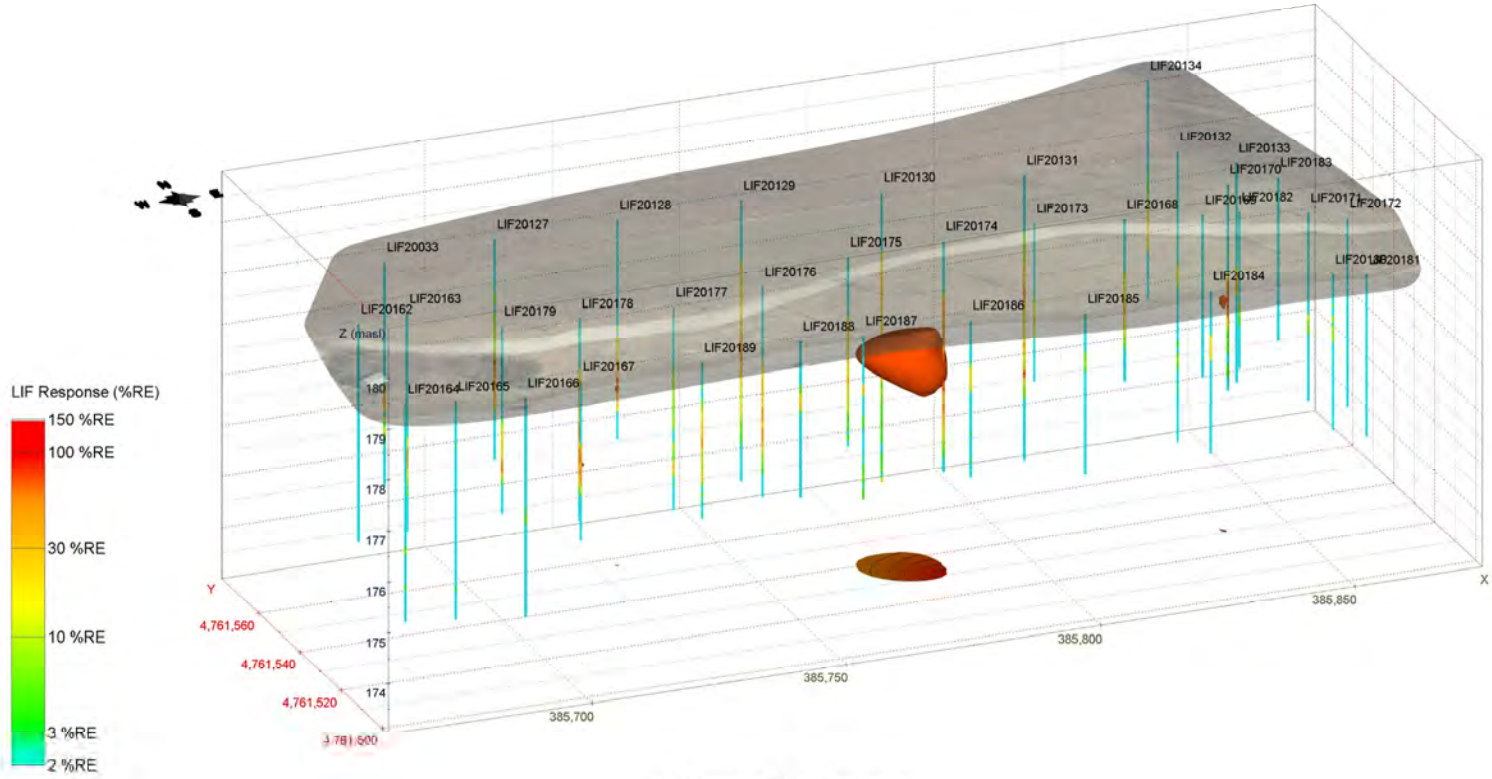
LIF Response 40 %RE and Above



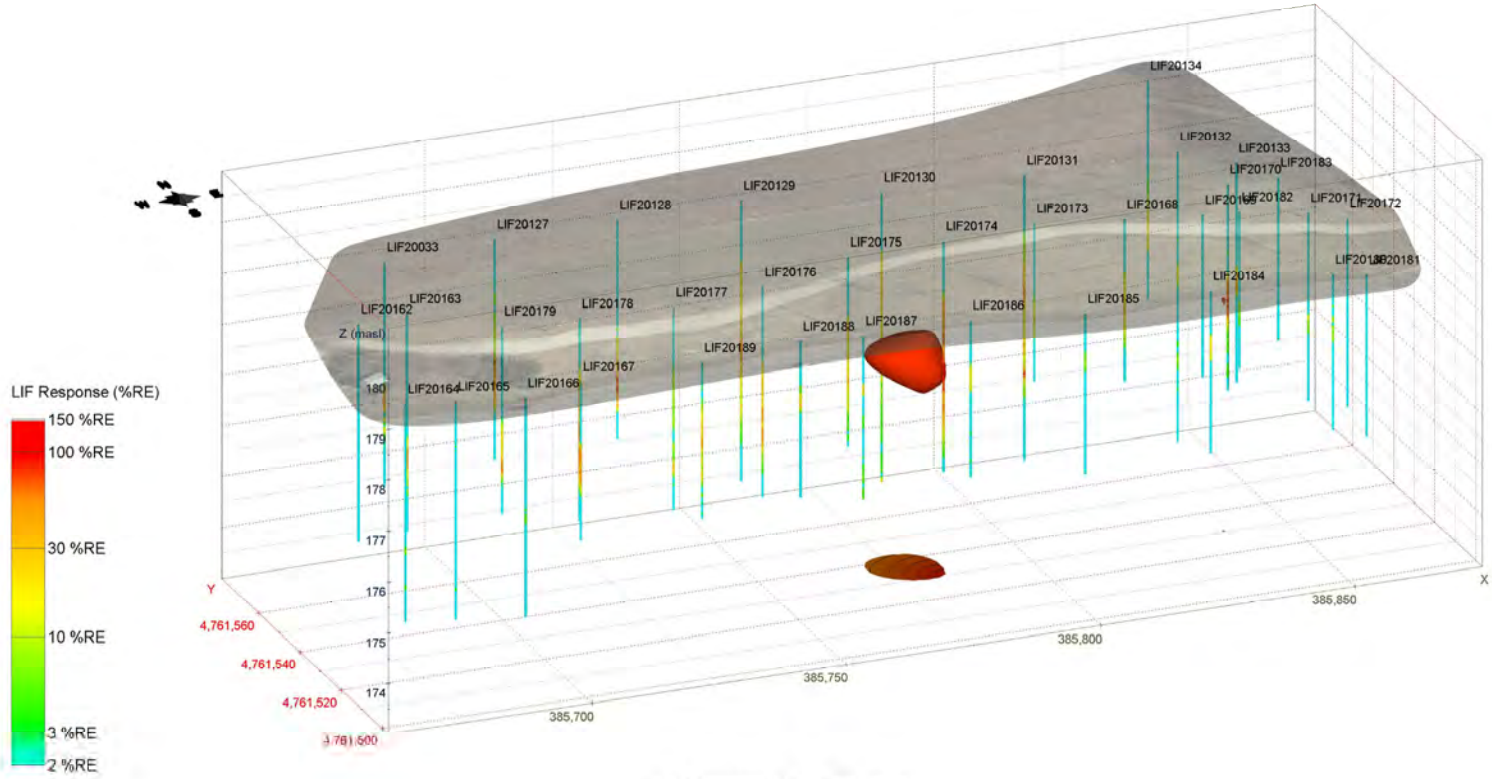
LIF Response 50 %RE and Above



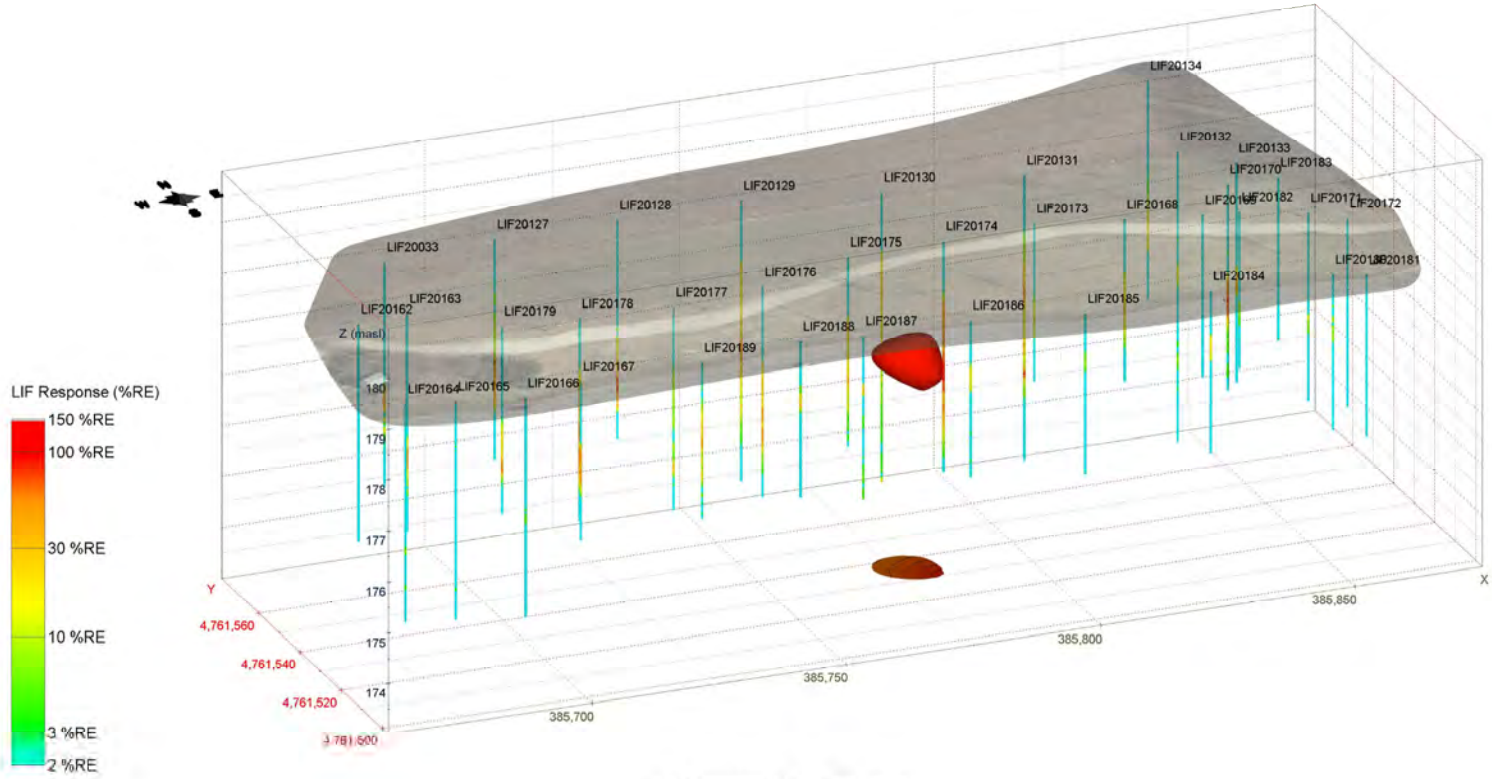
LIF Response 60 %RE and Above



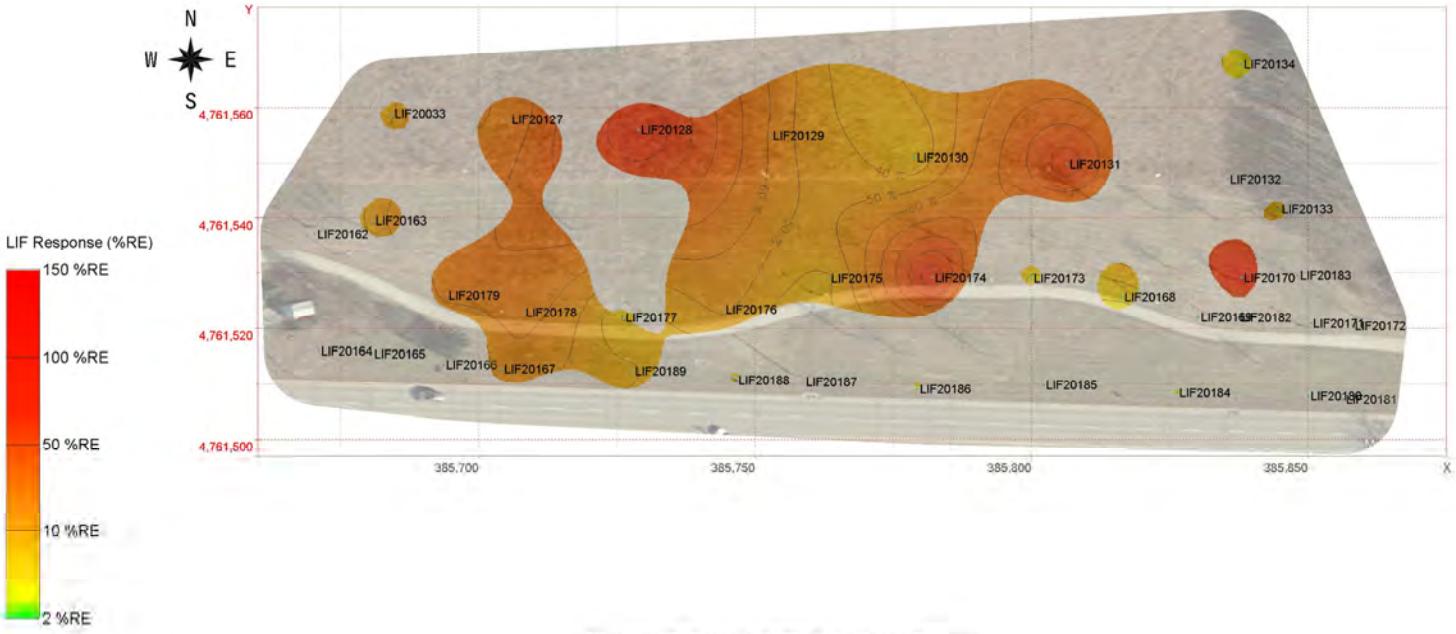
LIF Response 70 %RE and Above



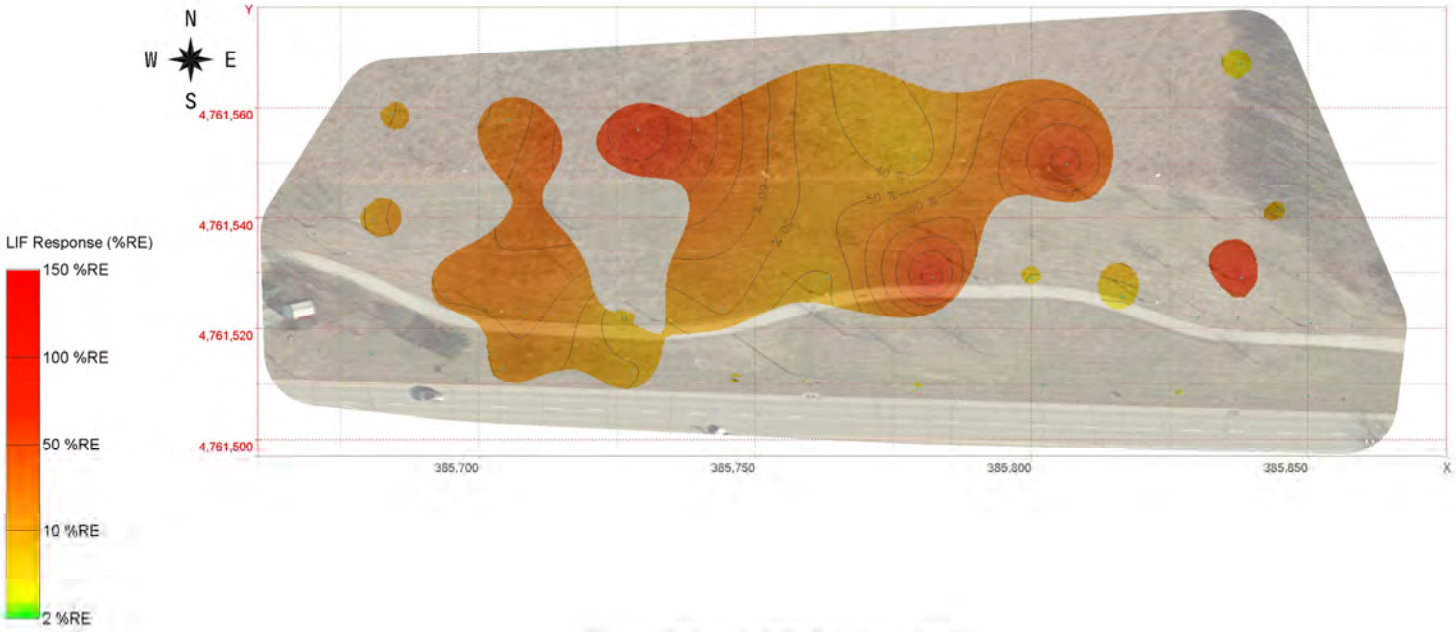
LIF Response 80 %RE and Above



LIF Response 90 %RE and Above



Maximum LIF Response (%RE) Projected on a 2D Plane



Maximum LIF Response (%RE) Projected on a 2D Plane

APPENDIX B

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

MONITORING WELL MW 20014

E: 385,662.0 **N:** 4,761,708.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 178.71 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE							SUBSURFACE PROFILE			
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
-1 / 179										Well Cap; Stickup: 0.84 m above ground surface
0 / 178	SS 1		79		0		0.0 / 0.16		**TOPSOIL** Dark brown to black organic silty clay to clayey silt topsoil, with rootlets, damp, loose, no HCO, no HC staining. **SAND FILL** Brown to reddish brown sand fill, dry, loose, no HCO, no HC staining. Presence of asphalt material from 0.46 mbgs to 0.61 mbgs. Becoming brown at 1.2 mBGS, homogeneous, dry, compact, no HCO, no HC staining.	Bentonite Seal; Filter Pack: No. 2 Silica Sand
1 / 177	SS 2		79		6	Sample collected for laboratory analyses at 2.1 mBGS.	1.52 / 1.77		**TOPSOIL** Dark brown organic topsoil with rootlets, dry, loose, slight HCO, no HC staining. **SILTY SAND** Brown to grey becoming grey at 3.0 mBGS, silty sand, with trace rootlets to 3.0 mBGS, wet becoming saturated at 3.0 mBGS, compact, HCO and sheen on water noted to 3.84 mBGS, no HC staining.	Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
2 / 176										
3 / 175	SS 3		100		2	Borehole terminated at 3.95 mBGS.	3.95			
4										

RWDI
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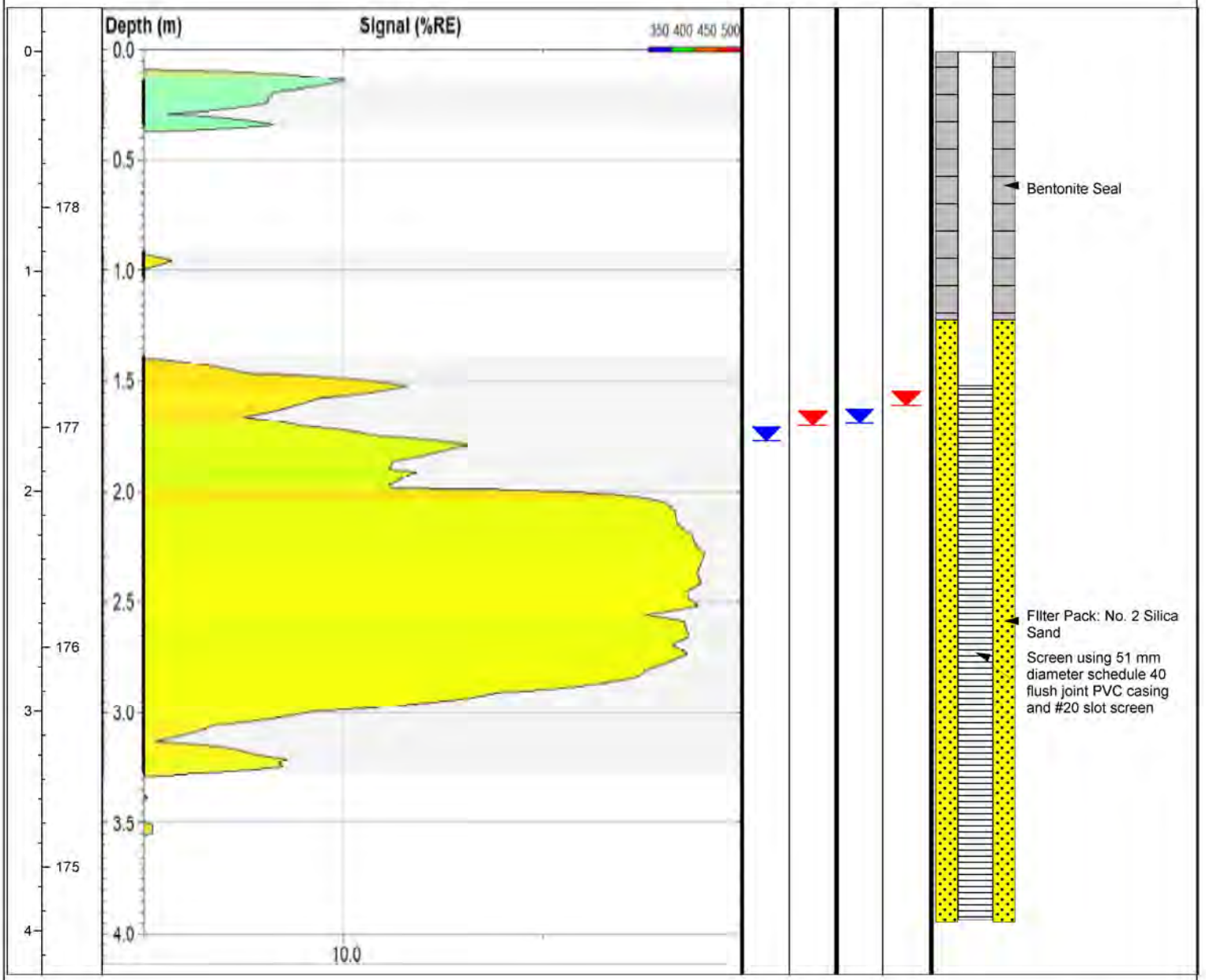
MONITORING WELL MW 20014

E: 385,662.0 **N:** 4,761,708.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 178.71 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)			PRODUCT MEASUREMENTS				
DEPTH [mbgs]	ELEV. [mASL]	**FINAL DEPTH** 3.74 mBGS **MAX SIGNAL:** 648.3% RE **MAX SIGNAL DEPTH:** 2.28 mBGS	WATER LEVEL NOV 2020	PRODUCT NOV 2020	WATER LEVEL DEC 2020	PRODUCT DEC 2020	WELL DIAGRAM



RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

MONITORING WELL MW 20025

E: 385,582.2 **N:** 4,761,776.1

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 178.84 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
179											
0						0		0.1		**SAND - FILL** Brown, fine to coarse sand fill, some coarse gravel, damp, very loose, no HCO, no HC staining.	Flushmount
						0				Becoming coarse sand and gravel fill at 0.1 mBGS, rusty and black staining, damp, loose, heavy HCO, HC staining.	Bentonite Seal
178		SS 1		67						Becoming brown fine to medium sand fill at 1.0 mBGS, occasional fine gravel, moist, very loose, no HCO, no HC staining.	Solid Well Casing
1						0					Filter Pack: No. 2 Silica Sand
								1.5		**SANDY SILT** Dark brown sandy silt and fine to medium sand, moist, loose, heavy HCO, HC staining.	
177							Sample collected for laboratory analyses at 1.97 mBGS			Becoming brown to light grey sandy silt, laminated light and dark brown to light grey, wet, compact, slight HCO, no HC staining to 3.0 mBGS.	
2		SS 2		100		10					Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
176										Becoming grey, medium to fine sandy silt, laminated dark and light grey, wet becoming saturated at 3.55 mBGS, dense, no HCO, no HC staining.	
3											
		SS 3		100		0					Caved Material
175											
4							Borehole terminated at 4.26 mBGS.	4.26			

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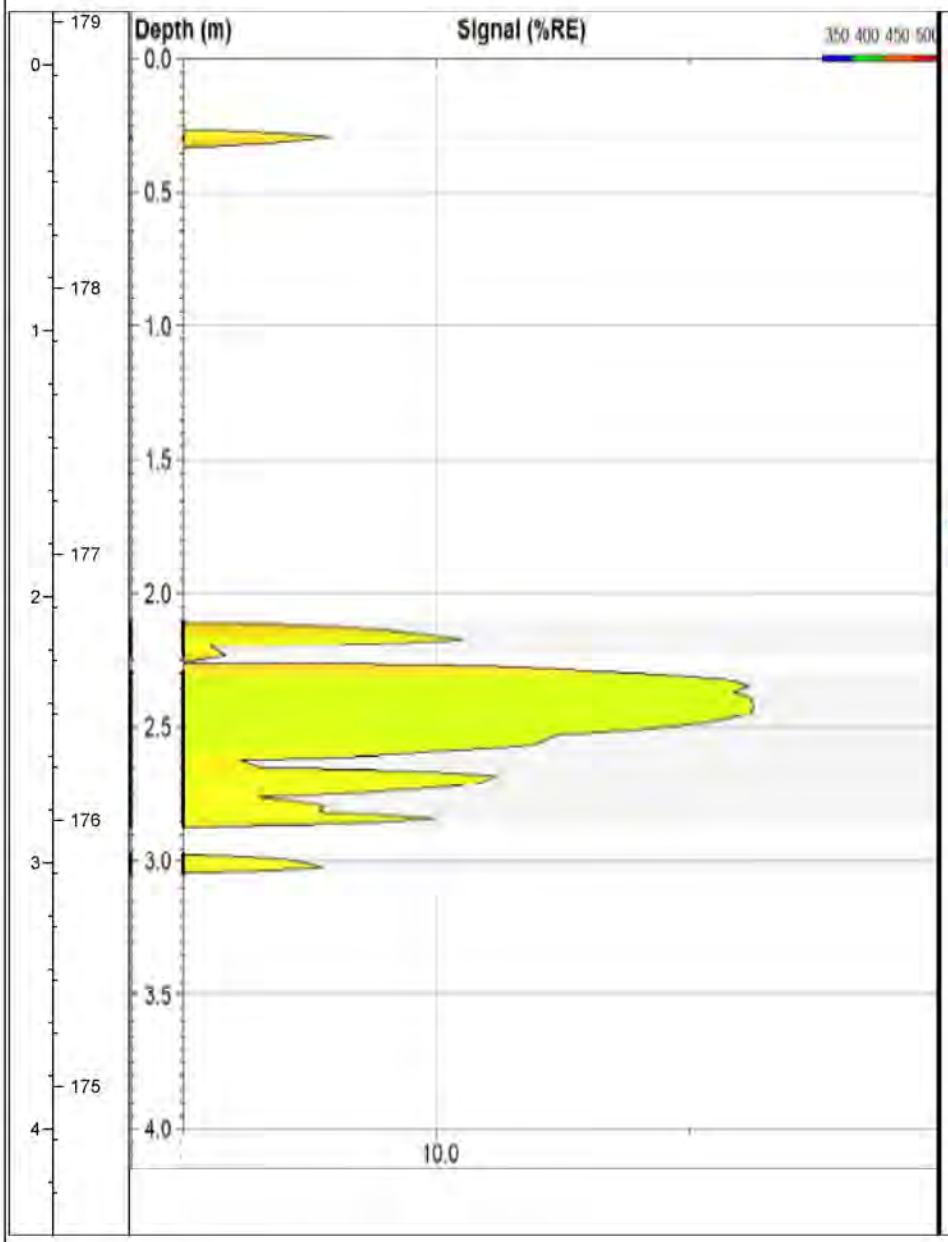
MONITORING WELL MW 20025

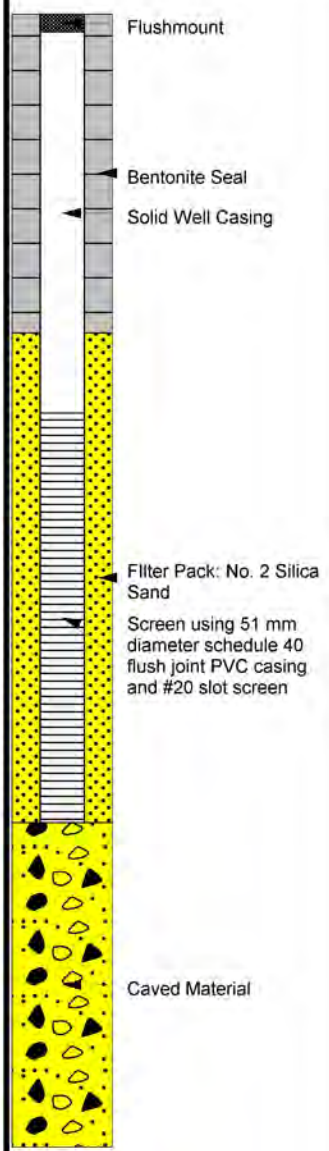
E: 385,582.2 **N:** 4,761,776.1

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 178.84 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)			PRODUCT MEASUREMENTS				
DEPTH [mbgs]	ELEV. [mASL]	**FINAL DEPTH** 3.63 mBGS **MAX SIGNAL:** 179.4%RE **MAX SIGNAL DEPTH:** 2.43 mBGS.	WATER LEVEL NOV 2020	PRODUCT NOV 2020	WATER LEVEL DEC 2020	PRODUCT DEC 2020	WELL DIAGRAM





RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

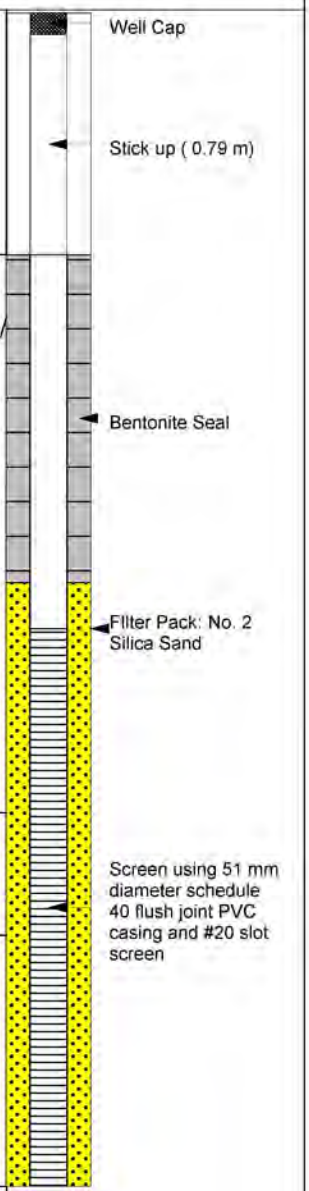
MONITORING WELL MW 20026

E: 385,646.0 **N:** 4,761,641.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 179.32 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	180										
	179	SS	1		86		0		0.0		**TOPSOIL** Brown silty sand to sandy silt topsoil, with occasional fine gravel, rootlets, dry, loose, no HCO, no HC staining.
							0		0.2		**SILTY CLAY TO CLAYEY SILT FILL** Brown becoming grey at 1.3 mBGS, silty clay to clayey silt, with disseminated fine sand and gravel, black staining from 0.8 mBGS to 1.0 mBGS, blocky, APL, stiff, heavy HCO with HC staining from 0.8 mBGS to 1.0 mBGS. Asphalt fragments noted from 1.3 mBGS to 1.8 mBGS in clay fill, heavy HCO and HC staining also noted.
1	178						8				
							0	Sample collected for laboratory analyses at 2.22 mBGS.	1.82		**TOPSOIL** Dark brown to black organic topsoil, with rootlets, damp, loose, slight HCO, no HC staining.
2	177	SS	2		86		11	Borehole terminated at 3.04 mBGS.	2.22		**SILTY SAND** Grey, silty sand, laminated dark and light grey, with rootlets, wet, compact, with HCO, HC staining, and sheening noted to 2.52 mBGS.
3									3.04		



RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

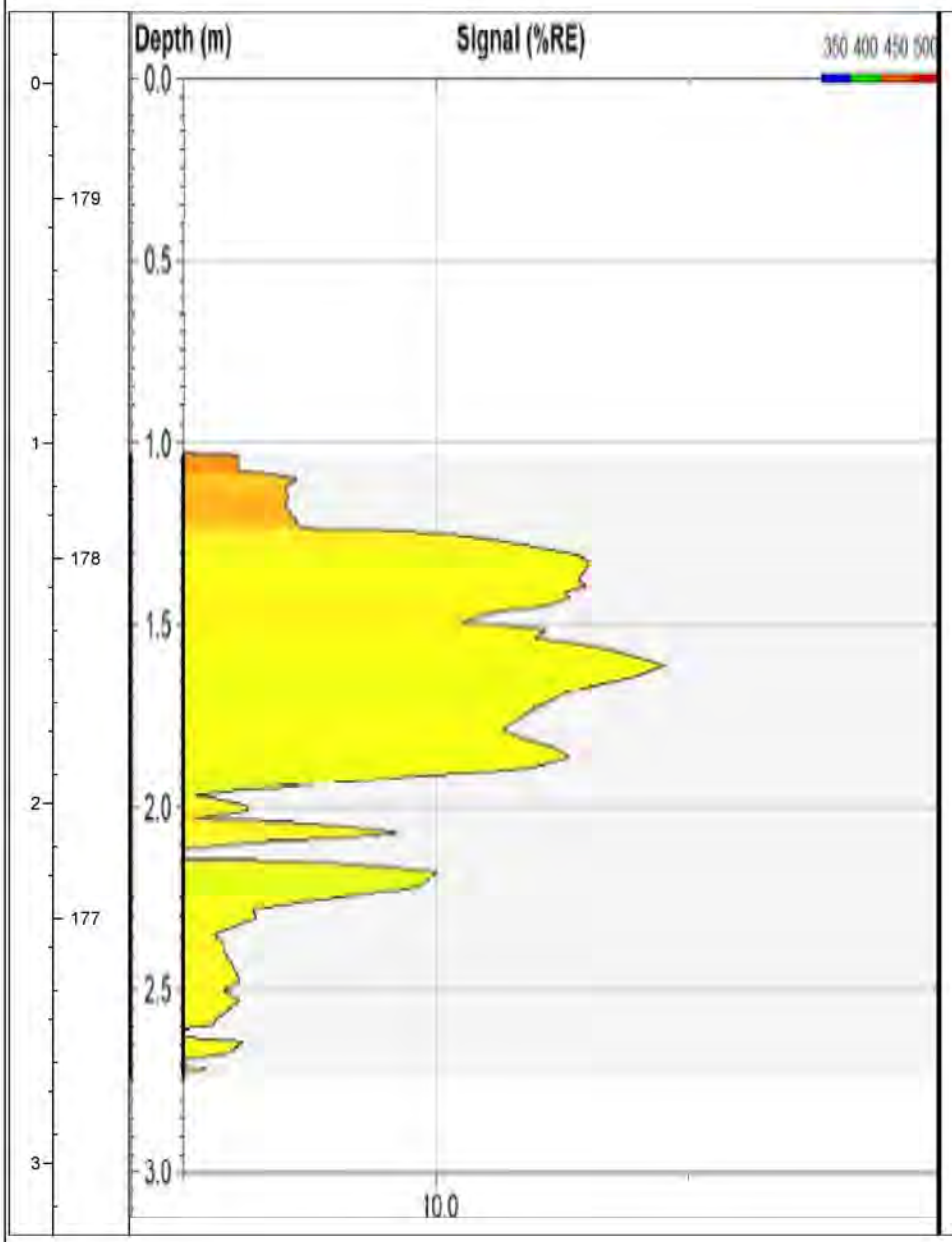
MONITORING WELL MW 20026

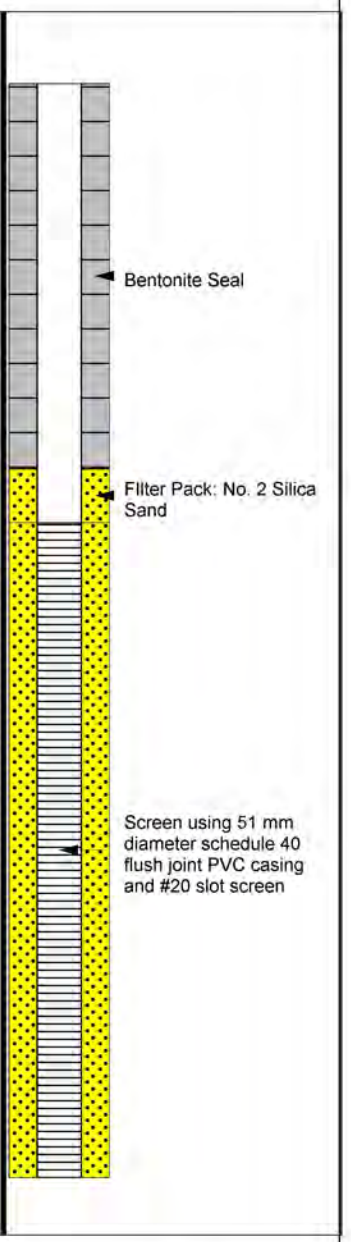
E: 385,646.0 **N:** 4,761,641.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 179.32 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)			PRODUCT MEASUREMENTS				
DEPTH [mbgs]	ELEV. [mASL]	**FINAL DEPTH** 3.19 mBGS **MAX SIGNAL:** 80.8%RE **MAX SIGNAL DEPTH:** 1.61	WATER LEVEL NOV 2020	PRODUCT NOV 2020	WATER LEVEL DEC 2020	PRODUCT DEC 2020	WELL DIAGRAM





RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

MONITORING WELL MW 20149

E: 385,579.0 **N:** 4,761,775.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 178.23 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
-1	179											Well Cap; Stickup: 0.86 m above ground surface
0	178		SS 1		49		0	Sample collected for laboratory analyses at 0.6 mBGS.	0.0		**SAND - FILL** Brown fine silty sand fill, with some rootlets, dry, loose, no HCO, no HC staining.	Bentonite Seal
									0.24		**CLAYEY SILT TO SILTY CLAY - FILL** Brown silty clay to clayey silt fill, some coarse gravel, DTPL, stiff, no HCO, no HC staining.	
									0.58		**CLAYEY SAND - FILL** Black clayey sand fill, some gravel, moist, loose, heavy HCO, HC staining.	Filter Pack: No. 2 Silica Sand
1	177								0.74		**SILTY SAND** Brown silty sand, homogeneous, wet, loose, heavy HCO, some HC staining, sheen on water noted.	
2	176		SS 2		100		0				Becoming grey silty sand, laminated dark and light grey, saturated, compact, slight HCO to 2.22 mBGS, no HC staining. Presence of sheen from 1.52 mBGS to 2.22 mBGS.	Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
								Borehole terminated at 3.04 mBGS.				
3									3.04			

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

MONITORING WELL MW 20149

E: 385,579.0 **N:** 4,761,775.0

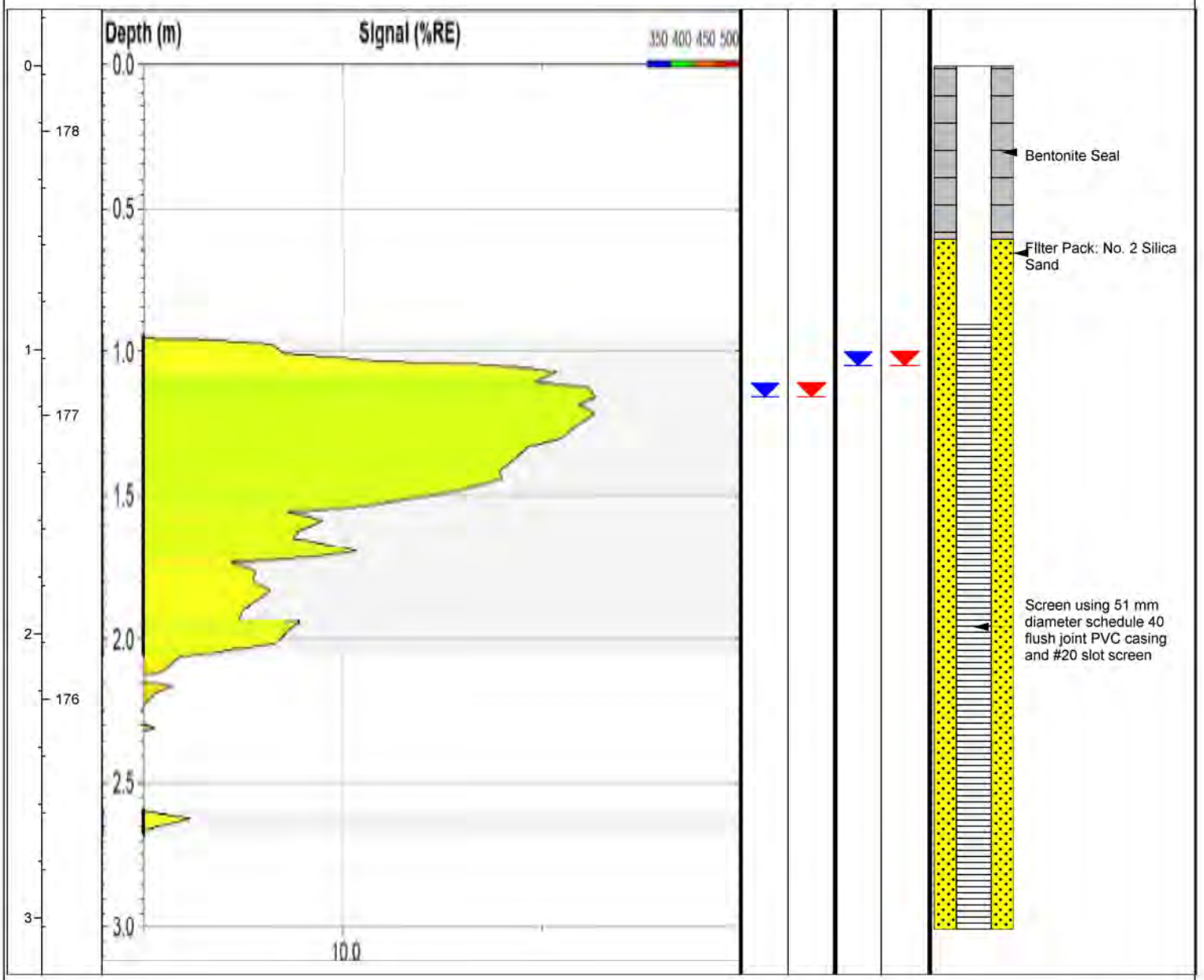
PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/27/2020 **COMPLETED:** 10/27/2020
GROUND ELEVATION: 178.23 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)

FINAL DEPTH 3.06 mBGS.
MAX SIGNAL: 187.8 %RE
MAX SIGNAL DEPTH: 1.16 mBGS

PRODUCT MEASUREMENTS



RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

BOREHOLE LOG BH20009

E: 385,625.75 **N:** 4,761,682.4

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 27/10/2020 **COMPLETED:** 27/10/2020
GROUND ELEVATION: 178.33 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**TOPSOIL** Dark brown silty sand topsoil, with rootlets, damp, loose, no HCO, no HC staining.
	178								0.2		**FILL** Brown fine sand fill with medium gravel, intermittent asphalt fragments and rootlets to 0.8 mBGS, moist, loose becoming compact at 0.9 mBGS, no HCO, no HC staining.
									0.43		**SILTY SAND** Brown fine silty sand, wet, compact, no HCO, no HC staining.
			SS 1		59		0				Becoming grey at 1.5 mBGS, saturated, with visible sheen and slight HCO from 1.7 mBGS to 2.6 mBGS, no HC staining.
1											
	177										
2								Sample collected for laboratory analysis at 2.1 mBGS.			
	176		SS 2		86		0				
3								Borehole terminated at 3.04 mBGS.	3.04		

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

BOREHOLE LOG BH20015

E: 385,617.0 **N:** 4,761,705.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 27/10/2020 **COMPLETED:** 27/10/2020
GROUND ELEVATION: 178.17 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	178	SS	1		53		0		0.0		**TOPSOIL** Brown sandy topsoil, with rootlets, dry, loose, no HCO, no HC staining.
							0		0.19		**SAND FILL** Brown sand fill, dry, loose, poorly sorted, slight HCO noted at 0.5 mBGS, intermittent asphalt fragments, no HC staining.
							0		0.8		**SILTY SAND** Grey silty sand, homogenous, wet, compact, slight HCO, no HC staining.
1	177						0				
								Sample collected for laboratory analyses at 1.5 mBGS.			
2	176	SS	2		66		4				Becoming grey, saturated, compact, HCO and sheen to 2.5 mBGS, no HC staining.
3	175							Borehole terminatet at 3.04 mBGS.	3.04		

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

BOREHOLE LOG BH20019

E: 385,611.0 **N:** 4,761,733.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 27/10/2020 **COMPLETED:** 27/10/2020
GROUND ELEVATION: 178.76 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**TOPSOIL** Dark brown fine to medium sandy topsoil, with rootlets, dry, loose, no HCO, no HC staining.
							0		0.2		**SAND FILL** Black and rusty brown sand fill with trace medium gravel, dry, loose, no HCO, no HC staining.
							0				
	178		SS 1		67		0				Becoming light brown fine to medium sand, dry, very loose at 0.5 mBGS.
1											
							0				
	177							Sample collected for laboratory analyses at 1.8 mBGS.			
2											
			SS 2		67		0		2.33		**SILTY SAND** Brown to grey silty sand, homogeneous, wet, compact, slight HCO, no HC staining.
	176										Becoming laminated dark and light grey at 3.0 mBGS, saturated, loose, no HCO, no HC staining.
3											
			SS 3		100		0				
								Borehole terminated at 3.84 mBGS.			
	175								3.84		
4											

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BOREHOLE LOG BH20023

E: 385,597.0 **N:** 4,761,786.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 27/10/2020 **COMPLETED:** 27/10/2020
GROUND ELEVATION: 178.65 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**SILTY CLAY TO CLAYEY SILT FILL** Brown silty clay to clayey silt fill, with fine gravel and rootlets, DTPL, firm, no HCO, no HC staining.
							0		0.45		**CLAYEY SAND FILL** Dark brown fine clayey sand with rootlets and organic nodules (<1 cm), some gravel, moist, loose, no HCO, no HC staining.
	178		SS 1		53		0		0.8		**SAND FILL** Dark brown medium to coarse sand fill, trace rootlets, dry, very loose, no HCO, no HC staining.
1							0		1.52		**SILTY SAND** Laminated brown and grey silty sand, wet, compact, heavy HCO to 2.2 mBGS, HC staining observed to 2.3 mBGS, sheen observed from 2.4 mBGS to 2.7 mBGS.
	177										
2			SS 2		74		12	Sample collected for laboratory analyses at 2.1 mBGS.			Becoming laminated brown and grey, saturated, compact, no HCO, no HC staining at 3.0 mBGS. Note: Presence of vegetative material or root at 3.8 mBGS.
	176										
3											
	175		SS 3		74		0				
4								Borehole terminated at 4.56 mBGS.	4.56		

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BOREHOLE LOG BH20191

E: 385,595.0 **N:** 4,761,772.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 27/10/2020 **COMPLETED:** 27/10/2020
GROUND ELEVATION: 178.91 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0 / 179								0.0		
				72		0		0.2		**TOPSOIL** Brown silty clay to clayey silt topsoil with rootlets, some fine gravel, dry, no HCO, no HC staining.
1 / 178										**SILTY CLAY TO CLAYEY SILT FILL** Brown silty clay to clayey silt fill, some gravel, DTPL, hard, no HCO, no HC staining. Becoming reddish-brown with some fine sand and gravel, occasional asphalt fragments, intermittent black HC staining and heavy HCO at 0.5 mBGS. Becoming brown, WTPL, soft, with heavy HCO and HC staining at 1.0 mBGS.
						0		1.52		**SILTY SAND** Black organic silty sand, with rootlets, moist, loose, heavy HCO, HC staining.
2 / 177				64		4				Becoming laminated light brown and grey, wet, loose at 1.8 mBGS.
3 / 176		SS		100		3	Sample collected for laboratory analyses at 3.04 mBGS.	3.04		**SAND** Light brown and grey fine sand, saturated, compact, heavy HCO to 4.2 mBGS, sheen observed, no HC staining.
4 / 175							Borehole terminated at 4.56 mBGS.	4.56		

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MONITORING WELL MW 20170

E: 385,838.0 **N:** 4,761,529.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/28/2020 **COMPLETED:** 10/28/2020
GROUND ELEVATION: 178.69 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
-1											Well Cap
179											Stickup: 0.9 m above ground surface
0								0.2		**SILTY SAND - FILL** Brown, fine silty sand, dry, loose, no HCO, no staining.	
										SILTY CLAY - CLAYEY SILT - FILL Brown silty clay to clayey silt fill, with trace gravel, blocky, rootlets, DTPL, no HCO, no HC staining.	Bentonite Seal
178		SS 1		100		0					
1								1.05		**SAND - FILL** Dark brown to black-stained, fine to coarse sand fill, heavy HCO, very loose, damp to wet.	Filter Pack: No. 2 Silica Sand
177							Sample collected for laboratory analyses at 1.8 mBGS.				
2								1.79		**SILTY CLAY - FILL** Brown to black stained silty clay to clayey silt, soft, APL, heavy HCO.	
		SS 2		60		0				Becoming brown, stiff, DTPL, no HCO, no staining at 2.32 mBGS.	Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
176											
3								3.04		**SANDY SILT** Brown sandy silt, with fine dark and light brown laminations, compact, saturated, no HCO, no HC staining.	
								3.49		**SAND** brown medium to coarse sand, poorly sorted, wet, very loose, no HCO, no HC staining.	
175		SS 3		60		0	Borehole terminated at 4.11 mBGS.				
4								4.11			

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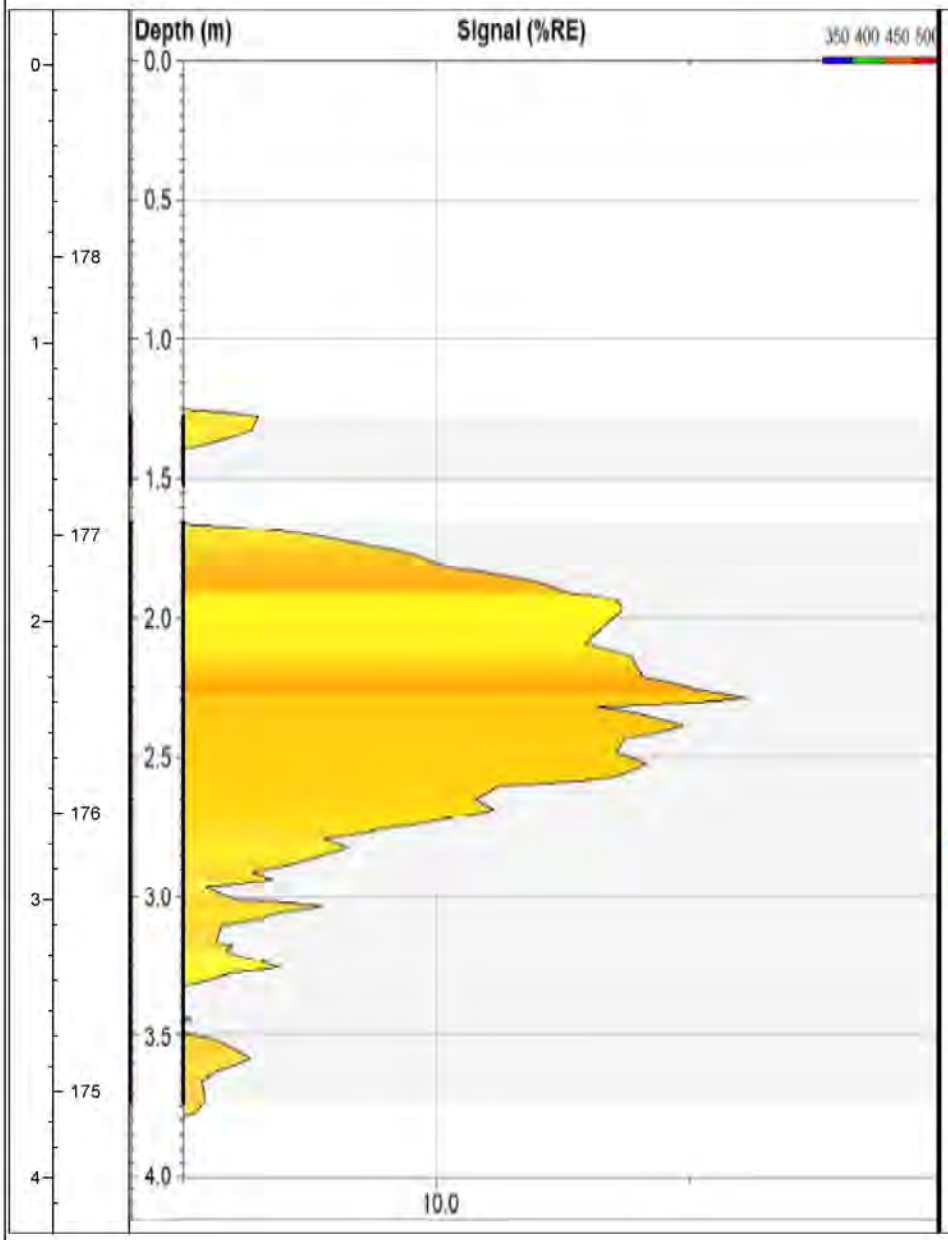
MONITORING WELL MW 20170

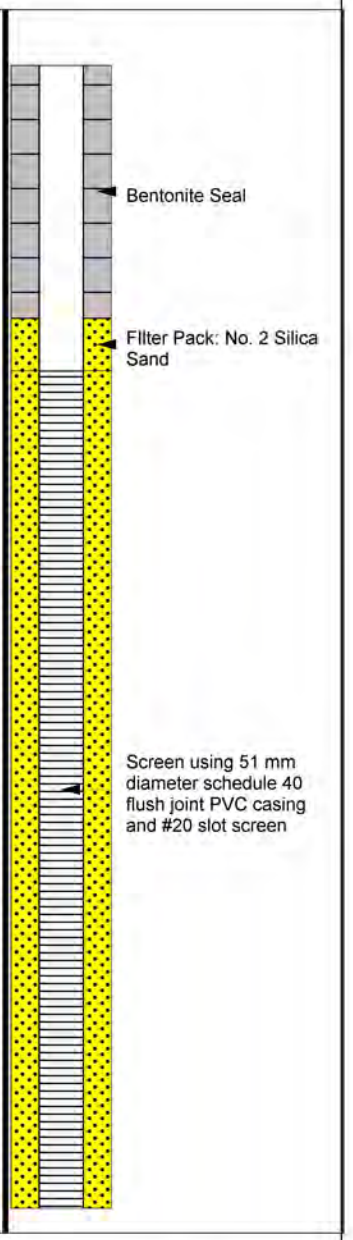
E: 385,838.0 **N:** 4,761,529.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/28/2020 **COMPLETED:** 10/28/2020
GROUND ELEVATION: 178.69 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)			PRODUCT MEASUREMENTS				
DEPTH [mbgs]	ELEV. [mASL]	**FINAL DEPTH** 4.03 **MAX SIGNAL:** 168.3 % RE **MAX SIGNAL DEPTH:** 2.29	WATER LEVEL NOV 2020	PRODUCT NOV 2020	WATER LEVEL DEC 2020	PRODUCT DEC 2020	WELL DIAGRAM





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MONITORING WELL MW 20174

E: 385,782.0 **N:** 4,761,529.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/28/2020 **COMPLETED:** 10/28/2020
GROUND ELEVATION: 178.54 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
-1 / 179											Stickup: 0.87 m above ground surface
0 / 178		SS 1		87		0		0.1		**TOPSOIL** Brown, sandy clay topsoil with rootlets, damp, no HCO, no HC staining.	Bentonite Seal
								0.71		**CLAY FILL** Brown, silty clay to clayey silt with fine disseminated silty and sand, trace gravel, blocky, DTPL, no HCO, no HC staining.	Filter Pack: No. 2 Silica Sand
1						3	Sample and its duplicate collected for laboratory analyses at 1.52 mBGS	0.96		**SILTY SAND FILL** Dark Brown, silty sand fill with some fine gravel, loose, damp, HCO noted and HC staining.	
177										**SILTY CLAY FILL** Organic dark brown to black, silty clay to clayey silt fill, with some brick rubble, stiff becoming soft at 1.52 mBGS, APL becoming WTPL at 1.52 mBGS, strong HCO, HC staining.	
2 / 176		SS 2		43		6					Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
3								3.04		**SILTY SAND** Grey, silty sand to sandy silt with dark and light laminations, HCO and intermittent HC staining noted to 3.34 mBGS, saturated, compact.	
175		SS 3		87		1					
4 / 174							Borehole terminated at 4.57 mBGS	4.57			

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MONITORING WELL MW 20174

E: 385,782.0 **N:** 4,761,529.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

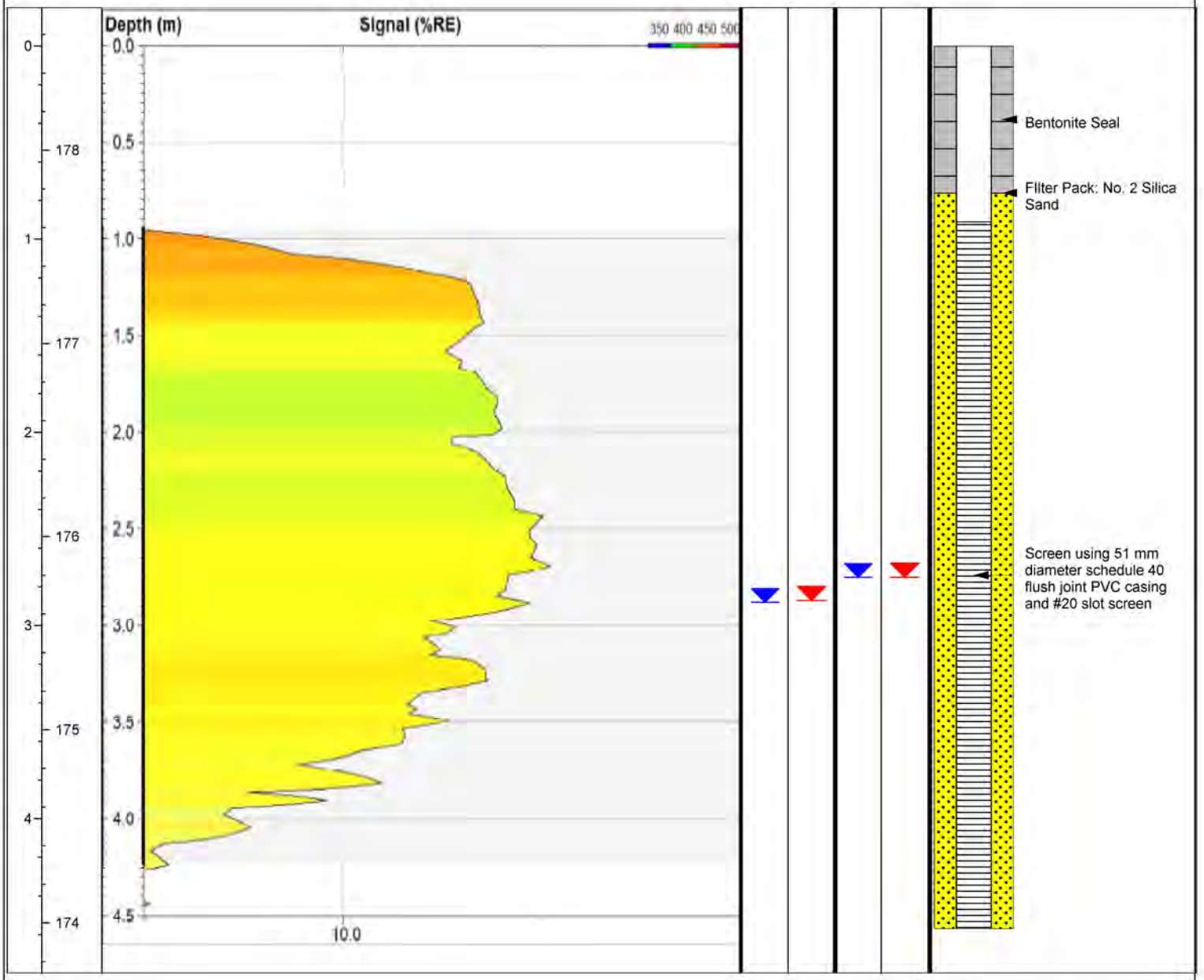
DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/28/2020 **COMPLETED:** 10/28/2020
GROUND ELEVATION: 178.54 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE) | PRODUCT MEASUREMENTS

DEPTH [mbgs] | ELEV. [mASL]

FINAL DEPTH 4.54
MAX SIGNAL: 110.1 %RE
MAX SIGNAL DEPTH: 2.69 m

WATER LEVEL NOV 2020 | PRODUCT NOV 2020 | WATER LEVEL DEC 2020 | PRODUCT DEC 2020 | WELL DIAGRAM



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BOREHOLE LOG BH20168

E: 385,816.0 **N:** 4,761,526.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 178.82 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**TOPSOIL** Brown silty sand to sandy silt topsoil, with rootlets, dry, loose, no HCO, no HC staining.
							0		0.2		**SILTY CLAY FILL** Brown silty clay to clayey silt fill with some gravel, blocky, DTPL, hard, no HCO, no HC staining.
							0				Becoming dark brown silty clay to clayey silt fill with asphalt fragments and brick rubble at 0.65 mBGS, stiff, with rootlets. HCO and HC Staining noted from 1.0 mBGS to 2.4 mBGS.
	179		SS 1		66						
1							32				
	178							Sample collected for laboratory analyses at 1.7 mBGS.			
2							44				
			SS 2		86						
									2.42		**CLAYEY SILT to SILTY CLAY** Brown clayey silt to silty clay with fine disseminated sand and silt, APL, stiff, no HCO, no HC staining.
	177						0				
3								Borehole terminated at 3.04 mBGS.	3.04		

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BOREHOLE LOG BH20187

E: 385,759.0 **N:** 4,761,510.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 178.82 mASL
LOGGED BY: MSA **CHECKED BY:** Default Listing

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
179										
0								0.0		**TOPSOIL** Light to dark brown medium to fine sandy topsoil, with rootlets, trace fine gravel from 0.7 mBGS to 0.87 mBGS, dry, loose, no HCO, no HC staining.
178		SS 1		66		10	Sample collected for laboratory analyses at 0.87 mBGS.	0.87		**CLAYEY SILT FILL** Black clayey silt to silty clay fill, blocky, stiff, APL, strong HCO and HC staining.
1								1.0		**SILTY SAND to SANDY SILT** Black silty sand to sandy silt, with rootlets to 1.2 mBGS, HCO, and HC staining to 1.5 mBGS, damp and loose at 1.0 mBGS.
177										
2		SS 2		86		0				Becoming wet and compact at 2.8 mBGS, becoming brown silty sand to sandy silt with no HCO and no HC staining at 1.5 mBGS to the depth extent of the borehole.
176										
3							Borehole terminated at 3.04 mBGS	3.04		

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MONITORING WELL MW 20070

E: 385,838.0 **N:** 4,761,529.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/29/2020 **COMPLETED:** 10/29/2020
GROUND ELEVATION: 179.77 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						0		0.0			Well Cap (Flushmount)
								0.05		**TOPSOIL** Clayey silt to silty clay topsoil with rootlets, moist, loose, no HCO, no HC staining.	
						0				**SILTY SAND FILL** Laminated brown and organic silty sand fill, with rootlets, moist, loose, no HCO, no HC staining.	Bentonite Seal
								0.66		**TOPSOIL** Silty organic topsoil, moist, loose, no HCO, no HC staining.	
179		SS 1		75		0		0.81		**SAND FILL** Grey medium to coarse sand fill, saturated, loose, no HCO, no HC staining. Becoming brown at 1.5 mBGS.	Filter Pack: No. 2 Silica Sand
1											
						0	Sample collected for laboratory analyses at 1.5 mBGS.				
178											Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
2								2.06		**SILT** Laminated light and dary grey silt with fine sand, saturated, compact, no HCO, no HC staining.	
		SS 2		68		0					
177											
3							Borehole terminated at 3.04 mBGS.	3.04			

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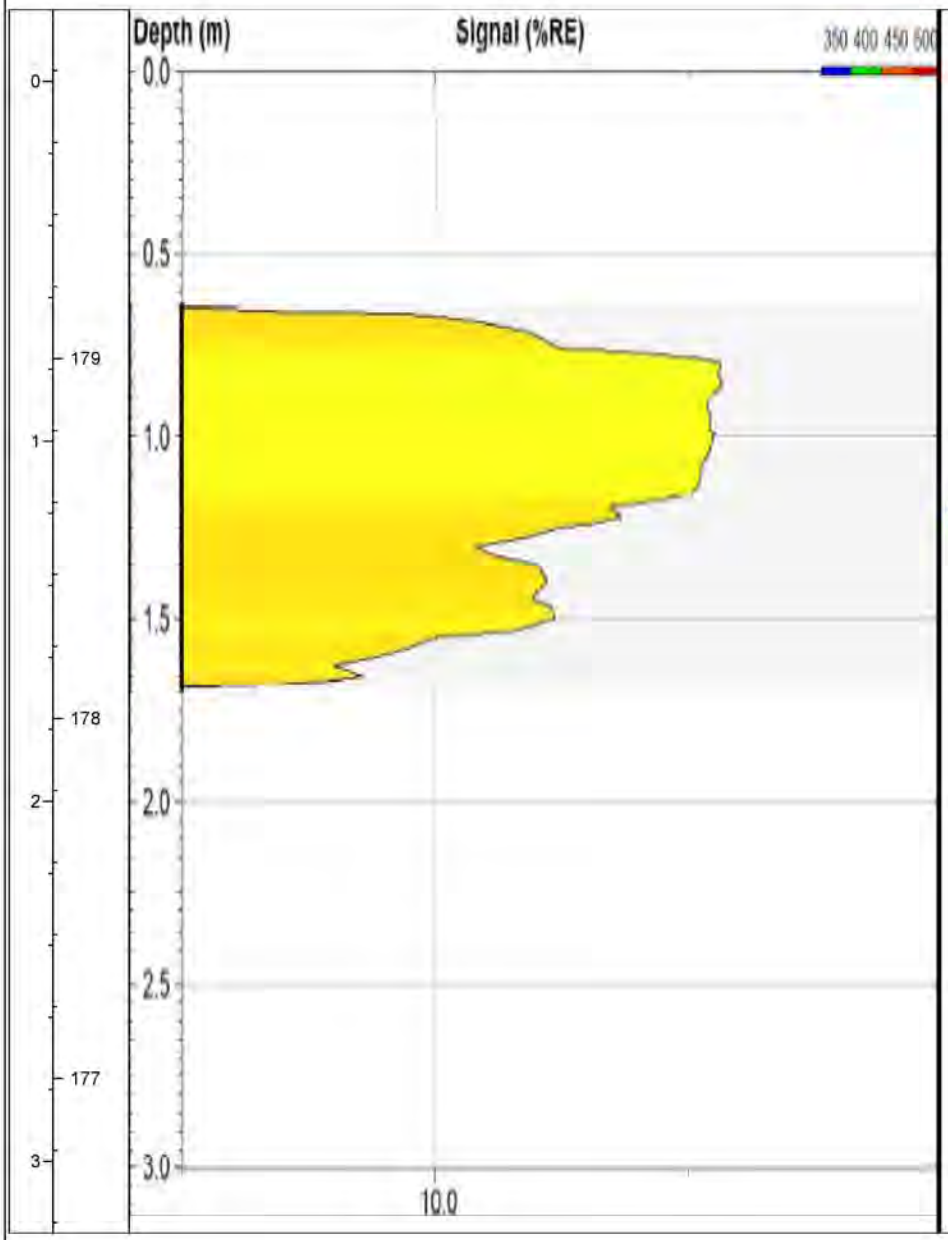
MONITORING WELL MW 20070

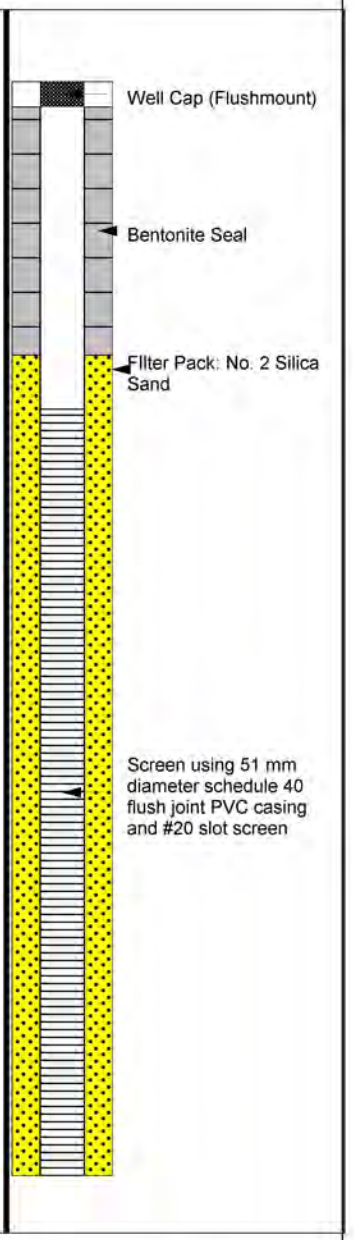
E: 385,838.0 **N:** 4,761,529.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/29/2020 **COMPLETED:** 10/29/2020
GROUND ELEVATION: 179.77 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)			PRODUCT MEASUREMENTS				
DEPTH [mbgs]	ELEV. [mASL]	**FINAL DEPTH** 3.09 mBGS **MAX SIGNAL:** 137.1% RE **MAX SIGNAL DEPTH:** 0.86 mBGS	WATER LEVEL NOV 2020	PRODUCT NOV 2020	WATER LEVEL DEC 2020	PRODUCT DEC 2020	WELL DIAGRAM





RWDI
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MONITORING WELL MW 20094

E: 385,968.0 **N:** 4,762,003.0

PROJECT NAME: LIF Characterisation
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/28/2020 **COMPLETED:** 10/28/2020
GROUND ELEVATION: 177.58 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0									0.0		**TOPSOIL** Brown fine sandy topsoil, dry, loose, no HCO, no HC staining.	Well Cap (flushmount)
									0.15		**SAND FILL** Light to dark brown fine to coarse sand fill, with coarse gravel, moist, loose, no HCO, no HC staining.	Bentonite Seal
	177		SS 1		73		0					
1												Filter Pack: No. 2 Silica Sand
	176								1.52		**SITLY CLAY TO CLAYEY SILT FILL** Brown silty clay to clayey silt fill, with occasional coarse gravel, DTPL, stiff, no HCO, no HC staining. Becoming HC stained from 1.7 mBGS to 2.0 mBGS, with slight HCO.	
2							0					
			SS 2		73							Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
	175						10	Sample collected for laboratory analyses at 2.4 mBGS.	2.42		**SAND FILL** Medium to coarse sand fill, saturated, loose, LNAPL free product noted, strong HCO, dark brown HC staining.	
							0		2.63		**SILTY SAND** Laminated brown and grey silty sand, saturated, loose becoming compact at 2.9 mBGS, no HCO, no HC staining. Becoming grey at 3.0 mBGS, no HCO, no HC staining.	
3												
			SS 3		82		0	Borehole terminated at 3.65 mBGS.				
	174								3.65			

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Tel: 519.823.1311 Fax: 519.823.1316

MONITORING WELL MW 20094

E: 385,968.0 **N:** 4,762,003.0

PROJECT NAME: LIF Characterisation
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

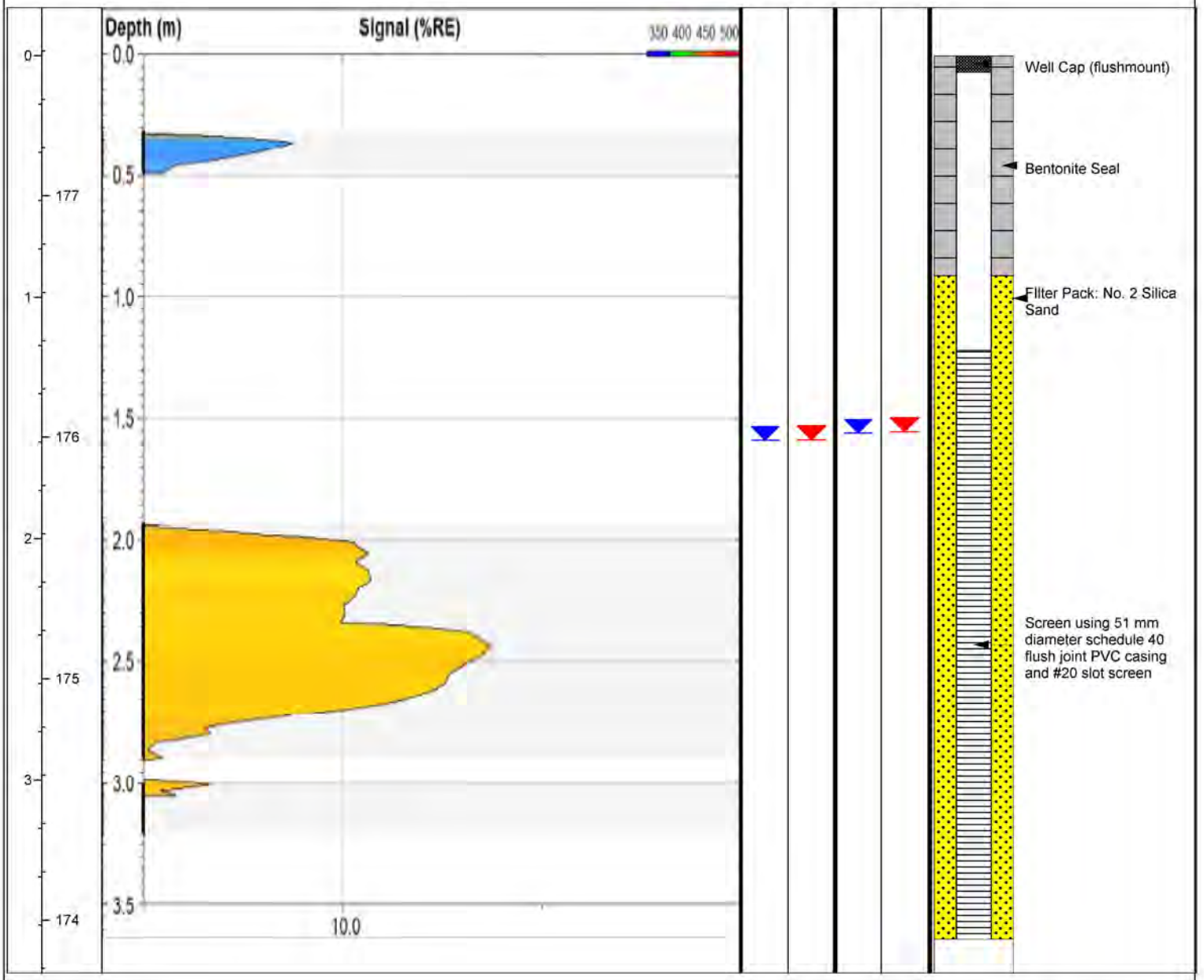
DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/28/2020 **COMPLETED:** 10/28/2020
GROUND ELEVATION: 177.58 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE) | PRODUCT MEASUREMENTS

DEPTH [mbgs] | ELEV. [mASL]

FINAL DEPTH 3.74 mBGS
MAX SIGNAL: 56.3%RE
MAX SIGNAL DEPTH: 2.43 mBGS

WATER LEVEL NOV 2020 | PRODUCT NOV 2020 | WATER LEVEL DEC 2020 | PRODUCT DEC 2020 | WELL DIAGRAM



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MONITORING WELL MW 20161

E: 385,726.0 **N:** 4,761,842.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/29/2020 **COMPLETED:** 10/29/2020
GROUND ELEVATION: 181.83 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE			
DEPTH [mbgs] ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0 / 182								0.0			Well Cap (flushmount)
0.08										**TOPSOIL** Organic silty sand topsoil, some fine gravel and rootlets, dry, loose, no HCO, no HC staining.	
1 / 181		SS 1		100		0	A sample could not be retrieved for laboratory analysis due to poor soil core recovery as a result of metal/plastic debris clogging the lead auger and soil core sampler."			**SILTY CLAY TO CLAYEY SILT FILL** Brown silty clay to clayey silt fill, occasional coarse gravel, fine brown sand nodule (1 - 3 cm in diameter), DTPL, very stiff, no HCO, no HC staining.	Bentonite Seal
1.52										**SAND FILL** Brown fine to coarse sand fill, dry, loose, some asphalt fragments and bricks rubble, occasional rusty staining, no HCO, no HC staining. Debris such as plastic and asphalt rubble noted at tip of core, which likely plugged the core sampler during advancement. Drilling conditions difficult. Presumed drilling through mix of soil and waste materials as noted with metal and plastic debris stuck at end of lead auger following sample retrieval.	
2 / 180		SS 2		34		0					
3 / 179											Filter Pack: No. 2 Silica Sand
3.04										**SILT** Black organic silt with trace fine sand, HCO noted, HC staining not evident due to poor recovery. Debris assumed to have plugged the core during advancement.	
4 / 178		SS 3		3		32					Screen using 51 mm diameter schedule 40 flush joint PVC casing and #20 slot screen
4.56										**SILTY SAND** Laminated grey and dark grey note at 4.6 mBGS. Debris assumed to have plugged the core during advancement, which reduced the soil recovery. No HCO, no HC staining evident.	
5 / 177		SS 4		6		6					
6 / 176							Borehole terminated at 6.1 mBGS.				
								6.08			

RWDI
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Tel: 519.823.1311 Fax: 519.823.1316

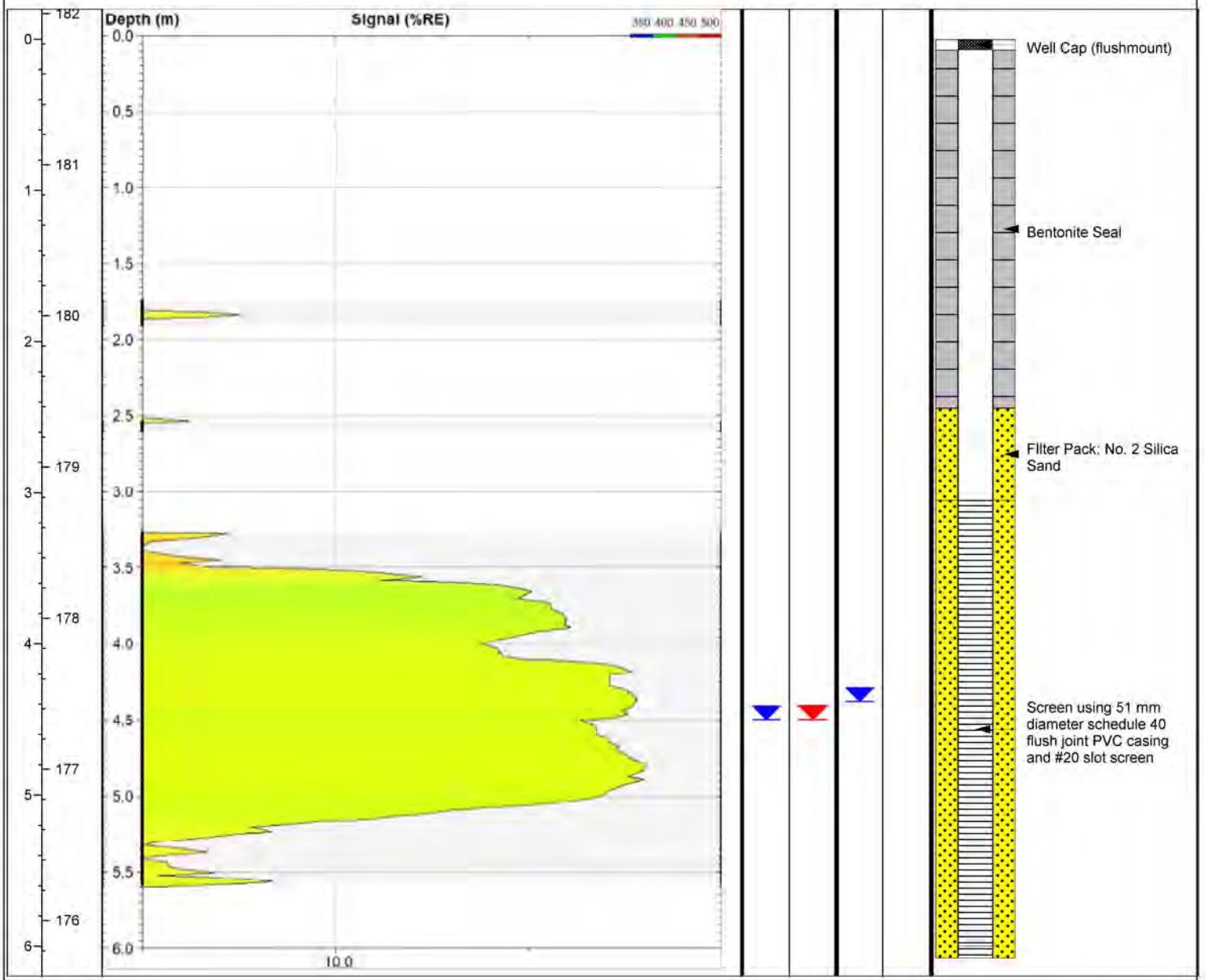
MONITORING WELL MW 20161

E: 385,726.0 **N:** 4,761,842.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 203 mm
DATE STARTED: 10/29/2020 **COMPLETED:** 10/29/2020
GROUND ELEVATION: 181.83 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SIGNAL (%RE)			PRODUCT MEASUREMENTS				
DEPTH [mbgs]	ELEV. [mASL]	**FINAL DEPTH** 5.64 mBGS **MAX SIGNAL:** 403.2%RE **MAX SIGNAL DEPTH:** 4.79 mBGS	WATER LEVEL NOV 2020	PRODUCT NOV 2020	WATER LEVEL DEC 2020	PRODUCT DEC 2020	WELL DIAGRAM



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BOREHOLE LOG BH20037

E: 385,803.0 **N:** 4,761,988.1

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 29/10/2020 **COMPLETED:** 29/10/2020
GROUND ELEVATION: 178.77 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**TOPSOIL** Clayey silt to silty clay topsoil, trace coarse gravel, some rootlets, APL, soft, no HCO, no HC staining.
							0		0.25		**SAND FILL** Brown fine to coarse sand fill, poorly sorted, wet, loose, no HCO, no HC staining. Note: Presence of glass shards, paper and plastic debries.
							0		0.51		**SILTY CLAY TO CLAYEY SILT FILL** Brown silty clay to clayey silt fill, with disseminated fine sand and gravel, APL, firm, no HCO, no HC staining.
							0		0.66		
	178		SS 1		70		0		0.81		**SAND FILL** Brown coarse sand fill, poorly sorted, wet, loose, no HCO, no HC staining. A 5 cm thick layer of glass shards, paper and plastic debris noted at 0.76 mBGS.
1							13				
									1.29		**TOPSOIL** Clayey silt to silty clay topsoil, some fine gravel and rootlets, APL, soft, slight HCO, HC staining not apparent.
								Sample collected for laboratory analysis at 1.5 mBGS.			**SILTY SAND** Laminated brown and grey silty sand, saturated, compact, HCO and sheen observed to 2.4 mBGS, no HCO from 2.4 mBGS to terminal depth of borehole.
	177										
2							22				
			SS 2		70						
	176										
3								Borehole terminated at 3.04 mBGS.	3.04		

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Tel: 519.823.1311 Fax: 519.823.1316

BOREHOLE LOG BH20066

E: 385,867.0 **N:** 4,762,013.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 29/10/2020 **COMPLETED:** 29/10/2020
GROUND ELEVATION: 178.05 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	178						0				**TOPSOIL** Organic clayey silt to silty clay topsoil, with occasional fine gravel and rootlets, APL, soft, a 8 cm thick layer of mulch encountered at 0.4 mBGS, no HCO, no HC staining.
			SS 1		77		0		0.56		**SAND FILL** Brown medium to coarse sand fill, poorly sorted, wet, loose, no HCO, no HC staining.
1	177						0		0.81		**SILT** Grey silt, laminated dark and light grey, saturated, compact, no HCO, no HC staining.
								Sample collected for laboratory analyses at 1.5 mBGS.			
2	176		SS 2		57		3				
3	175							Borehole terminated at 3.04 mBGS.	3.04		

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BOREHOLE LOG BH20069

E: 385,867.0 **N:** 4,762,027.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 178.0500 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	178	SS	1		74		0		0.0		**TOPSOIL** Dark brown sandy silt topsoil, some gravel and rootlets, damp, loose, no HCO, no HC staining.
							0		0.17		**SILTY SAND TO SANDY SILT FILL** Brown silty sand to sandy silt with occasional fine gravel, rootlets to 0.5 mBGS, moist to wet, loose to compact, no HCO, no HC staining.
							0		0.59		**CLAYEY SILT TO SILTY CLAY FILL** Brown clayey silt to silty clay fill, massive, with disseminated fine sand and gravel, WTPL, soft, no HCO, no HC staining.
1	177						21		0.82		**SAND** Brown medium to coarse sand, poorly sorted, wet, loose, slight HCO, no HC staining noted.
2	176	SS	2		86		23	Sample collected for laboratory analyses at 1.8 mBGS.	1.77		**SILT** Brown and grey silt, with occasional fine gravel, saturated, loose, HCO, no HC staining, visible sheen at 1.8 mBGS to 2.6 mBGS.
3	175							Borehole terminated at 3.04 mBGS.	3.04		

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BOREHOLE LOG BH20071

E: 385,874.0 **N:** 4,762,024.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 178.05 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	178	SS	1		69		0		0.0		**TOPSOIL** Dark brown sandy silt topsoil, some fine gravel and rootlets, dry, loose, no HCO, no HC staining.
							0		0.3		**SAND** Brown fine to coarse sand, trace fine gravel, dry, loose, no HCO, no HC staining.
									0.53		**CLAYEY SILT TO SILTY CLAY** Brown clayey silt to silty clay fill with some medium angular gravel, WTPL, soft, no HCO, no HC staining.
									0.72		**SAND** Brown medium to coarse sand, poorly sorted, wet, loose, HCO, visible product noted at 0.7 mBGS.
1	177						33				
									1.29		**SILT** Brown and grey silt, homogeneous, saturated, loose, slight HCO, no HC staining, sheen noted at 1.5 mBGS to 1.8 mBGS.
								Sample collected for laboratory analyses at 1.5 mBGS.			
2	176	SS	2		86		0				
3	175							Borehole terminated at 3.04 mBGS.	3.04		

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BOREHOLE LOG BH20080

E: 385,863.0 **N:** 4,762,034.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 178.55 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		
							0		0.09		**TOPSOIL** Dark brown silty sand topsoil, with rootlets, damp, loose, no HCO, no HC staining.
							0		0.28		**SAND** Brown fine sand with occasional black organic nodules (<1 cm), trace gravel, dry, loose, no HCO, no HC staining.
							0		0.45		**SILT** Black orgnanic silt with fine sand and rootlets, moist, loose, no HCO, no HC staining.
	178						3		0.63		**SAND** Brown medium to coarse sand, poorly sorted, moist, loose, no HCO, no HC staining.
			SS 1		66						
1							8				**SILT** Brown and grey silt, trace gravel, wet, loose, no HCO, no HC staining.
									1.26		**SAND** Brown medium to coarse sand, saturated, poorly sorted, loose, HCO, free product noted with some HC staining and sheen.
	177						24				
								Sample collected for laboratory analyses at 1.8 mBGS.	1.82		**SILT** Brown and grey silt, trace gravel, saturated, loose to compact, slight HCO, no HC staining noted, visible sheen.
2											
			SS 2		59						
							0				
	176										
3								Borehole terminated at 3.04 mBGS.	3.04		

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BOREHOLE LOG BH20095

E: 385,967.0 **N:** 4,761,987.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 179.2900 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**TOPSOIL** Brown fine to medium sandy topsoil with rootlets, dry, loose, no HCO, no HC staining.
							0		0.2		
	179						0		0.3		**CLAYEY SAND FILL** Brown clayey sand fill, trace angular gravel, moist, loose, no HCO, no HC staining.
							0				**SAND FILL** Brown fine to medium sand fill, trace angular gravel, moist, loose, no HCO, no HC staining.
			SS 1		79				0.74		**SILTY CLAY TO CLAYEY SILT FILL** Brown and rusty silty clay to clayey silt fill, some medium angular gravel, cobbles, DTPL, stiff, no HCO, no HC staining, some black organic nodules (<1 cm) noted at 1.6 mBGS.
1							0				
	178										
							0				
2								Sample collected for laboratory analyses at 1.9 mBGS.	1.93		**SAND** Brown medium to coarse sand, trace gravel and fine sand, wet, loose, slight HCO, some black HC staining.
	177		SS 2		51		115				
3									3.04		**SILT** Grey and brown silt, trace fine sand, homogeneous, saturated, compact, no HCO, no HC staining.
	176		SS 3		95		0				
								Borehole terminated at 3.7 mBGS.	3.66		

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BOREHOLE LOG BH20110

E: 385,990.0 **N:** 4,761,964.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 179.6900 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0									0.0		**TOPSOIL** Brown silty sand topsoil, with some gravel and rootlets, dry, loose, no HCO, no HC staining.
	179		SS 1		100		0				
1							68		0.92		**CLAYEY SILT TO SILTY CLAY FILL** Brown silty clay to clayey silt fill, with trace coarse gravel, WTPL, soft, HCO, intermittent HC staining noted.
	178							Sample collected for laboratory analyses at 1.5 mBGS.			
2			SS 2		73		76				
	177										
3							70		3.04		**SAND** Brown medium to coarse sand, saturated, loose, poorly sorted, HCO, free product observed from 3.0 mBGS to 3.2 mBGS, HC staining prominent.
									3.25		**SILT** Brown silt, homogeneous, saturated, compact, no HCO, no HC staining.
	176		SS 3		87		0				
4									4.56		
	175							Borehole terminated at 4.6 mBGS.			

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BOREHOLE LOG BH20112

E: 385,969.0 **N:** 4,761,928.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 178.335 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE

DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS
0								
	181							
			SS 1		72		0	
1								
	180							
2								
	179		SS 2		53		40	
3								Sample and a duplicate collected for laboratory analyses at 3.0 mBGS.
	178							
			SS 3		72		77	
4								
	177							
							38	
5								
	176		SS 4		46		0	
6								Borehole terminated at 6.1 mBGS.

SUBSURFACE PROFILE

DEPTH [mbgs]	MATERIAL DESCRIPTION
0.0	**TOPSOIL** Brown silty clay to clayey silt topsoil, with rootlets, moist, loose, no HCO, no HC staining.
0.4	**SILTY CLAY FILL** Silty clay to clayey silt fill with some fine to medium gravel, blocky structure, some rootlets, DTPL, hard, no HCO, no HC staining.
0.7	**SAND FILL** Brown medium to fine sand fill, trace gravel, dry, loose, no HCO, no HC staining.
0.81	**SILTY SAND FILL** Black organic silty sand fill, with brick rubble and coarse angular gravel, dry, loose, no HCO, no HC staining.
1.52	**SILTY CLAY TO CLAYEY SILT FILL** Stained black silty clay to clayey silt fill, with some medium to coarse angular gravel, APL, soft, strong HCO and HC staining.
4.56	**SAND** Medium to coarse sand, poorly sorted, wet, loose, strong HCO, prominent black HC staining.
4.87	**SILT** Laminated grey and brown silt with fine sand, saturated, compact, no HCO, no HC staining.
6.1	

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BOREHOLE LOG BH20117

E: 385,932.0 **N:** 4,761,920.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 28/10/2020 **COMPLETED:** 28/10/2020
GROUND ELEVATION: 180.92 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	181								0.0		
									0.1		**TOPSOIL** Brown silty clay to clayey silt topsoil, with rootlets, dry, soft, no HCO, no HC staining.
		SS	1		53		0		0.56		**SILTY CLAY FILL** Brown silty clay to clayey silt fill, some coarse angular gravel, blocky, DTPL, very stiff, no HCO, no HC staining.
1	180										**SAND FILL** Brown medium sand with some fine gravel, dry, loose, no HCO, no HC staining.
									1.57		**SILTY CLAY TO CLAYEY SILT FILL** Brown silty clay to clayey silt fill with some fine gravel and rootlets, APL, firm, HCO, significant black HC staining, some plastic debris/waste noted.
2	179	SS	2		59		16				
3	178										
		SS	3		66		15		3.85		**SANDY SILT** Brown sandy silt, homogeneous, wet, loose, slight HCO, no HC staining, occasional debris/waste material.
4	177								4.56		**SAND** Medium to coarse sand, saturated, loose, free product noted to 4.8 mBGS, prominent black HC staining.
							82		4.82		
5	176							Sample collected for laboratory analyses at 4.8 mBGS.			**SILT** Brown silt, homogeneous, saturated, dense, slight HCO, no HC staining.
		SS	4		72		7				
6	175							Borehole terminated at 6.1 mBGS.	6.08		

RWDI
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BOREHOLE LOG BH20123

E: 385,728.0 **N:** 4,761,938.0

PROJECT NAME: LIF Characterization
PROJECT NO.: 1801685
CLIENT: City of Sarnia
PROJECT LOCATION: Sarnia
DRILLING CONTRACTOR: Direct Environmental Drilling Inc.

DRILLING METHOD: Hollow Stem Auger
BOREHOLE DIAMETER: 82.5 mm
DATE STARTED: 29/10/2020 **COMPLETED:** 29/10/2020
GROUND ELEVATION: 179.73 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE								SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	RQD	VAPOR MEASUREMENT	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0							0		0.0		
									0.15		**TOPSOIL** Organic clayey silt to silty clay topsoil, occasional fine gravel, APL, firm, no HCO, no HC staining.
	179	SS	1		50		0				**SILTY CLAY TO CLAYEY SILT FILL** Black organic silty clay to clayey silt fill, with rusty fissures and disseminated fine sand and gravel, no HCO, no HC staining. A 2 cm layer of glass shards noted at 0.6 mBGS, followed by soft silty clay to clayey silt fill with heavy HCO and HC staining.
1											
									1.52		**SILTY SAND** Black stained fine silty sand, saturated, loose, strong HCO with visible product and black product staining from 1.7 mBGS to 1.9 mBGS (8 ppm vapour screening), becoming laminated grey and brown silty sand, with slight HCO, wet, compact at 2.0 mBGS, then laminated brown and black organic layers from 3.0 mBGS to 3.3 mBGS with visible sheen, but no HCO or HC staining, then grey silt at 3.3 mBGS to the terminal depth of the borehole.
	178							Sample collected for laboratory analyses at 1.7 mBGS.			
2		SS	2		50		17				
	177										
3											
	176	SS	3		67		22				
4											
								Borehole terminated at 4.6 mBGS.	4.56		
	175										

APPENDIX C

4510 Rhodes Dr., Unit 530
Windsor ON Canada
N8W 5K5

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TECHNICAL MEMORANDUM

DATE:	2020-07-13	**RWDI Reference No.:** 1801685
TO:	Joe Boothe – City of Sarnia Superintendent, Environmental Services	**EMAIL:** joe.boothe@sarnia.ca
CC:	Claire Finoro Steve Davies Brent Langille	**EMAIL: Claire.Finoro@rwdi.com** **EMAIL: Steve.Davies@rwdi.com** **EMAIL: Brent.Langille@rwdi.com**
FROM:	Phil Janisse	**EMAIL:** Philippe.Janisse@rwdi.com
RE:	**Subsurface Investigation and Gas Probe Installations** **Former Michigan Avenue Landfill (FMAL)** **Near 720 Ernest Street, Village of Point Edward, ON**	

Dear Mr. Boothe,

In response to the Ministry of the Environment, Conservation and Parks' (MECP) comments received in an email, dated June 2, 2020, as well as within a component of its Review of the 2019 Annual Monitoring Report Memorandum dated June 17, 2020, with respect to addressing soil vapour concerns near a resident located at 720 Ernest Street, in Point Edward, ON, RWDI has compiled relevant information with the intent to address these concerns within this Technical Memorandum.

Existing Monitoring Well and Gas Probe Inspection

As proposed in a prior Memorandum dated June 4, 2020, RWDI was retained by the City of Sarnia (City) to complete down-hole camera inspections for monitoring wells/gas probes 702 and 902 to visually identify and measure the depth of the top of the screened interval for each location as there are no borehole logs available to interpret the screened interval installation details. The results of the downhole camera inspection are summarized below.

Monitoring Location	Top of Screen (mBTOP)	Total Depth (mBTOP)	Screened Interval (mBTOP)	Length of Screen (m)	Stick-Up (m)
702	1.55	3.88	1.55 to 3.88	2.33	0.83
902	1.15	1.52	1.15 to 1.52	0.37	0.61

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Given the above field observations, the below summaries for the previous gas monitoring events completed in the CLC Area near the residential property at 720 Ernest Street were updated.

May 21, 2020 – Monitoring Well and Gas Probe Field Measurements

Monitoring Location	VOC (ppm)	LEL (%)	O_2 (%)	Liquid Level (mBTOP)	Top of Screen (mBTOP)	Screened Interval (mBGS)	Stick-Up (m)
702	0.0	0	20.9	1.47	1.55	0.72 to 3.05	0.83
G6	0.0	0	20.9	1.47	1.55	~0.7 to 3.8	0.85
LL3	0.0	0	20.9	2.29	1.65	~1.4 to 3.8	0.25
902	0.0	0	20.9	1.20	1.15	0.54 to 0.91	0.61
MW23	1.0	0	20.9	1.74	2.24	~1.5 to 4.9	0.74

May 28, 2020 – Monitoring Well and Gas Probe Field Measurements

Monitoring Location	VOC (ppm)	LEL (%)	O_2 (%)	Liquid Level (mBTOP)	Top of Screen (mBTOP)	Screened Interval (mBGS)	Stick-Up (m)
702	0.0	0	20.9	1.59	1.55	0.72 to 3.05	0.83
G6	0.0	0	20.9	1.64	1.55	~0.7 to 3.8	0.85
LL3	3.0	0	20.9	2.36	1.65	~1.4 to 3.8	0.25
902	0.0	0	20.7	1.36	1.15	0.54 to 0.91	0.61
MW23	0.0	0	20.9	2.15	2.24	~1.5 to 4.9	0.74

Notes: ppm = parts per million; mBTOP = metres below top of pipe; mBGS indicates metres below ground surface

As noted above, the screened interval for monitoring wells/gas probes 702 and 902 were not fully submerged for the May 28, 2020 gas monitoring event. However, the screened interval of monitoring well 702 was fully submerged for the May 21, 2020 monitoring event.

Of note, the camera inspection for gas probe 902 indicated that there may be some sediment build-up at the bottom of the probe, though the sediment buildup appeared to be limited to the sump of the probe, and was interpreted to be less than 5 cm. Notwithstanding, without a borehole log to compare, it is difficult to interpret whether there could be a significant or minor buildup of sediment within gas probe 902.

Subsurface Investigation

Gas Probe Installations

As discussed in RWDI's memorandum of June 4, 2020, the City retained RWDI to install two (2) gas monitoring probes within the CLC Area of the FMAL just east of the residential property located at 720 Ernest Street. One of the gas monitoring probes was installed within the inferred location of the product plume to evaluate off-gassing concentrations that may be present directly from the product plume. The second gas monitoring probe was installed closer to the residence and outside the area of the inferred location of the product plume to evaluate for the presence of potential vapours in the vadose zone beyond the product plume front.

The placement depth of the screened interval considered the field observations from the laser-induced fluorescent (LIF) study completed in May 2020, such that the upper portion of the screened interval does not become submerged either by groundwater or floating product. The targeted screened interval installation depth was approximately 0.5 metre (m) above the inferred product elevation (based on the LIF field study observations) and at least 0.5 m below the bottom of the inferred product plume thickness. Each of the gas probes were completed with a threaded steel cap equipped with a barbed gas monitoring check valve.

Subsurface Borehole Investigation

In addition to the installation of two (2) gas probes, supplemental boreholes were also completed to assess the shallow subsurface conditions and to delineate the edge of the inferred product plume. The subsurface advancement of the boreholes was completed using a handheld auger. Boreholes were advanced to approximately 1.5 mBGS in consideration of the LIF field-measured %RE of approximately 1.0 mBGS at the location of LIF BH20149.

With the objective of installing one of the gas probes within an interpreted area to be free of product (LIF BH20150) and one within the location of the inferred product plume (LIF BH20149), two (2) supplemental boreholes were completed to more accurately refine the approximate distance of the product plume front with respect to the adjacent residential property located at 720 Ernest Street. The lateral distances were measured in the field from the residential property boundary.

The following summary depicts the approximate distance of the borehole and gas probes compared to the adjacent residential property located at 720 Ernest Street. A **Figure** depicting the borehole and gas probe locations is also provided in **Attachment 1** for reference.

Borehole and/or Gas Probe Location	Distances from Residential Property Boundary (m)	Product and/or Hydrocarbon Odour Impacts
GP20150	3.1	No
BH20149A	5.7	No
BH20149B	7.5	No
GP20149	9.3	Yes – sheen and heavy oil odours at 1.1 m
LIF BH20149	6.7	Yes (Based on field-measured %RE)
LIF BH20150	3.2	No (Based on field-measured %RE)

GP20150 was advanced at the inferred location of LIF BH20150 based on GPS coordinates provided by Vertex Environmental (Vertex). Based on the LIF investigation, at the location of LIF BH20149, a product-like signature was identified approximately 1.0 mBGS. However, there was no evidence of product-like impacts in the soil at BH20149B, which was located 0.8 m further east.

It is noted that the GPS coordinates collected by Vertex have inherent accuracy limitations (approximately ± 3 to 5 m) and satellite positioning is also subject to drifting. Thus, the exact positioning of LIF BH20149 may not be accurate and its location for the June 18, 2020 investigation was determined in the field based on GPS coordinates from the May LIF investigation. Based on the June 18, 2020 field observations, the product plume appears to be located approximately 8 m east of the residential property boundary.

Field Soil Observations

In general, the subsurface soil encountered during the completion of the hand augured boreholes consisted mainly of a surficial layer of topsoil between 0.3 m and 0.6 m thick underlain by gravelly silty sand (0.1 to 0.3 m thick) then by an organic sandy loam or fine silty sand to the depth extent of approximately 1.5 mBGS. Of note, the soil sample collected for laboratory analysis at the location of GP20149 (sample ID 20149C) exhibited visual and olfactory evidence of a heavy oil hydrocarbon impact. The soil exhibited a distinct sheen and appeared oily.

Borehole logs and construction details for gas probes GP20149 and GP20150 are provided in **Attachment 2**. Of note, a Well Record was not required for the gas probe installations in accordance with the Shallow Works exemptions of O. Reg. 903.

Soil Quality Assessment

During the June 18, 2020 subsurface investigation, soil samples were collected within the inferred stratigraphic range of the product plume (identified to be approximately 1.0 to 2.1 mBGS in the field during the LIF investigation) at three (3) of the borehole locations.

Soil samples were collected from a depth of approximately 1.1 to 1.3 mBGS in consideration of the LIF field measured %RE depth at the location of LIF BH20149. Soil samples were collected from the locations of GP20149 (Sample ID 20149C), BH20149A (sample ID 20149), and GP20150 (Sample ID 20150). The soil samples were submitted to Eurofins Scientific, a Canadian Association of Laboratory Accreditation (CALA)-certified laboratory, for analytical testing. The analytical testing considered the known characteristics of the product plume and thus included testing for polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and petroleum hydrocarbons (PHCs) Fractions F1 to F4.

In general, the soil quality typically showed values that were below the laboratory detection limit for the tested parameters except for PHC Fraction F2 at the location of GP20149, and PHC Fraction F3 at the locations of BH20149A and GP20150. Each of the detected constituent concentrations were less than 5 times the laboratory reportable detection limit (RDL), thus, the detected concentrations can be considered negligible. There were no other detectable parameters noted in the soil samples submitted for analysis.

When comparing the analytical results to the *Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (MECP Standards), the PHC F2 concentration of 20 milligrams per litre (mg/L) noted at the location of GP20149 (sample ID 20149C) exceeds the Generic Background Site Condition Table 1 criteria of the MECP Standards of 10 mg/L. No other soil parameters tested exceeded the Table 1 criteria of the MECP Standards. The relevant laboratory certificate of analysis is provided in **Attachment 3**.

Trigger and Contingency Plan Considerations

The current *Trigger and Contingency Plan* (Golder and Associates, 2015) for the CLC Area at the FMAL states that "*if floating oil migrates to within 5 metres of the western property boundary, and is considered to be actively migrating, an active containment and recovery system will be installed in the CLC Area within 12 months.*" As a result of the above investigation, there is no requirement to implement remedial measures within a 12-month period as migrating product was not identified within 5 m of the western property boundary.

Inspection of MW-205

On July 2, 2020, RWDI completed a downhole inspection of monitoring well 205 while on-site to complete other field tasks. The camera inspection revealed that the monitoring well was not compromised and that there was a length of polyethylene tubing that had fallen into the well with its top at approximately 1.80 mBGS. The length of tubing could not be determined, however, based on the borehole log information, if the length of tubing is sitting at the bottom of the well, then an inferred tubing length could be approximately 0.94 m. RWDI will attempt to remove the length of tubing during the next monitoring event scheduled for the week of July 20, 2020.

Gas Monitoring Results – New Gas Probes

The combustible gas field screening was completed using a MultiRAE Plus 4 gas meter with PID (photoionization detector) sensor. The PID sensor is calibrated to an isobutylene standard calibration gas and measures the ambient volatile organic compound (VOC) concentration. The PID readings are expressed in parts per million (ppm) to an accuracy of 0.1 ppm. The gas meter can also measure methane concentrations within the methane's lower explosive limit (LEL) in air (0 to 5% methane in air, where 5% in air = 100% LEL). As such, LEL field measurements were also completed during this follow-up field investigation. Measurements were also recorded for percent oxygen (O_2) in air to evaluate if there was the potential for other gases to be displacing the normal percentage of O_2 for safe breathing levels.

June 18, 2020 – New Gas Probe Field Measurements

Monitoring Well/Gas Probe Location	VOC (ppm)	LEL (%)	O_2 (%)
GP20149	0.0	0	19.8
GP20150	0.0	0	18.3

July 2, 2020 – New Gas Probe Field Measurements

Gas Probe Location	VOC (ppm)	LEL (%)	O_2 (%)	Liquid Level (mBTOP)	Top of Screen (mBTOP)	Top of Probe (mASL)
GP20149	0.0	0	20.9	1.79	1.22	178.88
GP20150	0.0	0	20.3	2.05	1.22	179.14

July 9, 2020 – New Gas Probe Field Measurements

Gas Probe Location	VOC (ppm)	LEL (%)	O_2 (%)	Liquid Level (mBTOP)	Top of Screen (mBTOP)	Top of Probe (mASL)
GP20149	0.0	0	20.9	1.89	1.22	178.88
GP20150	0.0	0	20.9	2.14	1.22	179.14

As noted above, there were no combustible gas readings detected at the location of new gas monitoring probes GP20149 and GP20150 for either the June 18th, July 2nd, or July 9, 2020 gas monitoring events.

Visual observations of product were observed within the soil at GP20149. The lack of combustible gas readings from a location with visual indications of product suggests that the existing product in the area does not readily volatilize.

Proposed Next Steps

Given the above-noted low to no combustible gas readings within nearby monitoring wells and gas probes, as well as within the newly installed gas probes GP20149 and GP20150, it is proposed that until the Trigger and Contingency Plan is revised, soil vapour monitoring continues to be completed at newly installed gas probes GP20149 and GP20150 on a monthly basis. The soil vapour monitoring is proposed to include the assessment of methane, volatile organic compounds (VOCs), and oxygen concentrations in air. In addition to soil vapour monitoring, liquid levels should also be measured such that an assessment can be made whether the screened interval within the newly installed gas probes are submerged.

If the probes' screened intervals are noted to be fully submerged during a routine monthly monitoring event, then gas monitoring at that location should be repeated approximately one (1) week later. If the probes' screened intervals remain submerged after a week, then the routine gas monitoring will simply resume on the following month. As such, gas monitoring at GP20149 and GP20150 should be completed earlier in the month to allow for the one-week re-check buffer, if necessary.

Following a six-month period, if soil vapour readings remain very low (1% LEL or less for methane and <5 ppm for VOCs) to non-detect, the gas monitoring frequency at gas probes GP20149 and GP20150 may be reduced from monthly to quarterly.

Closure

We trust the above is satisfactory for your current requirements. Please contact us with any questions you may have.

ATTACHMENT 1

Site Plan
Soil Sampling/Gas Probe Installation

True North

Notes: Orthoimagery obtained from First Base Solutions (2017)

Map Projection: NAD 1983 UTM Zone 17N

The Corporation of the City of Sarnia - Former Michigan Avenue Landfill

Project #: 1801685

Drawn by: JVV	Figure:	1	
Approx. Scale:	1:250		
Date Revised:	Jul 6, 2020		

Map Document: K:\1801685\6. Deliverables\Gas Probe Installation\Figures\Working File\1801685_F01_SitePlan_GasProbe.aprx

ATTACHMENT 2

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

BOREHOLE LOG BH20149A

E: 385,577.83 **N:** 4,761,775.3

PROJECT NAME: Soil Sampling/Gas Probe Installation
PROJECT NO.: 1801685
CLIENT: The Corporation of the City of Sarnia
PROJECT LOCATION: Former Michigan Avenue Landfill
DRILLING CONTRACTOR: RWDI

DRILLING METHOD: Handheld Augers
BOREHOLE DIAMETER: 57 mm
DATE STARTED: 18-June-2020 **COMPLETED:** 18-June-2020
GROUND ELEVATION: 178.08 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE							SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	PID (ppm)	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	178		1		100					**TOPSOIL** Light to dark brown sandy topsoil, trace gravel, trace cobble, trace rootlets, dry, very loose, no HCO.
			2		100			0.3		**SILTY SAND** Dark brown fine to medium silty sand, trace gravel, moist, very loose, no HCO.
			3		100			0.5		**SILTY-CLAY TO CLAYEY-SILT** Brown silty-clay to clayey-silt, APL, very stiff, no HCO.
			4		100			0.7		**SANDY SILT TO SANDY LOAM** Dark brown to black sandy silt to sandy loam, trace to some roots, moist to saturated, no HCO. - Tree root encountered at 0.84 m depth.
			5		100					
			6		0					
1	177		7		100					
			8		100	0.0				
			9		100	0.0	Borehole terminated at 1.6 m depth.			
2	176									
3	175									
4										

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

BOREHOLE LOG BH20149B

E: 385,577.83 **N:** 4,761,775.3

PROJECT NAME: Soil Sampling/Gas Probe Installation
PROJECT NO.: 1801685
CLIENT: The Corporation of the City of Sarnia
PROJECT LOCATION: Former Michigan Avenue Landfill
DRILLING CONTRACTOR: RWDI

DRILLING METHOD: Handheld Augers
BOREHOLE DIAMETER: 57 mm
DATE STARTED: 18-June-2020 **COMPLETED:** 18-June-2020
GROUND ELEVATION: 178.08 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE							SUBSURFACE PROFILE		
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	PID (ppm)	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
0	178		1		100					**TOPSOIL** Brown sandy topsoil, some gravel, dry, very loose, no HCO.
			2		100			0.3		**SILTY-CLAY TO CLAYEY-SILT** Brown silty-clay to clayey-silt, APL, very stiff, no HCO.
			3		54			0.4		**SAND** Light to dark brown fine to medium sand, poorly sorted, some silty-clay to clayey-silt nodules (<1 cm), some cobble, moist to saturated, loose to compact, no HCO.
			4		100					
1	177		5		100					
			6		100	0.0				
			7		100		Soil sample ('20149') collected for laboratory analysis of PHCs, PAHs, VOCs. Borehole terminated at 1.5 m depth.			
2	176									
3	175									
4										

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

GAS PROBE GP20149

E: 385,577.83 **N:** 4,761,775.3

PROJECT NAME: Soil Sampling/Gas Probe Installation
PROJECT NO.: 1801685
CLIENT: The Corporation of the City of Sarnia
PROJECT LOCATION: Former Michigan Avenue Landfill
DRILLING CONTRACTOR: RWDI

DRILLING METHOD: Handheld Augers
BOREHOLE DIAMETER: 57 mm
DATE STARTED: 18-June-2020 **COMPLETED:** 18-June-2020
GROUND ELEVATION: 178.08 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

SAMPLE							SUBSURFACE PROFILE			
DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	PID (ppm)	REMARKS	DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0	178		1		100					**TOPSOIL** Dark brown sandy topsoil, trace to some cobbles, trace rootlets, dry, very loose, no HCO.	Gas probe has a stick-up of 0.80 m.
			2		100					**SAND (FILL)** Brown sand fill with coarse cobbles and/or rail ballast, trace rootlets, dry, loose, no HCO.	Seal: bentonite from 0.3 m depth to surface and mounded with soil placed on top.
			3		100			0.6			
			4		100			0.7		**SAND** Light to dark brown fine to medium sand, well sorted, moist, loose, becoming dark brown to grey fine silty sand, saturated, compact, at 0.9 m depth. - Black oil staining and sheen including a heavy oil HCO encountered at 0.95 m depth.	Stainless steel 50 mesh cylindrical filter-screen containing No. 2 silica sand.
			5		100	0.0					
			6		100	0.0					
1	177		7		100	0.0					
			8		100		Soil sample '20149C' collected for laboratory analysis of PHCs, PAHs, VOCs.				
			9		100		Borehole terminated at 1.5 m depth.				Gas probe constructed using 20 mm inside diameter stainless steel drive-point body. Gas probe driven to 2.8 m depth.
2	176										
3	175										
4											

RWDI
600 Southgate Drive, Guelph, ON N1G 4P6
Tel: 519.823.1311 Fax: 519.823.1316

GAS PROBE GP20150

E: 385,583.1 **N:** 4,761,776.5

PROJECT NAME: Soil Sampling/Gas Probe Installation
PROJECT NO.: 1801685
CLIENT: The Corporation of the City of Sarnia
PROJECT LOCATION: Former Michigan Avenue Landfill
DRILLING CONTRACTOR: RWDI

DRILLING METHOD: Handheld Augers
BOREHOLE DIAMETER: 57 mm
DATE STARTED: 18-June-2020 **COMPLETED:** 18-June-2020
GROUND ELEVATION: 178.35 mASL
LOGGED BY: MSA **CHECKED BY:** PEJ

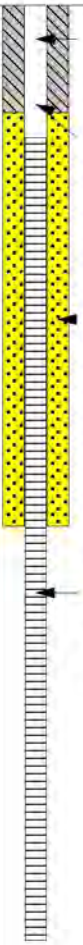
SAMPLE

DEPTH [mbgs]	ELEV. [mASL]	SAMPLE TYPE	NUMBER	"N" VALUE	RECOVERY (%)	PID (ppm)	REMARKS
0			1		100		
			2		100		
	178		3		100		
			4		100		
			5		100		
			6		100		
			7		100	0.0	
1			8		100		
			9		100		
	177		10		100		Soil sample '20150' collected for laboratory analysis of PHCs, PAHs, VOCs Borehole terminated at 1.6 m depth.
2							
	176						
3							
	175						
4							

SUBSURFACE PROFILE

DEPTH [mbgs]	GRAPHIC LOG	MATERIAL DESCRIPTION
		TOPSOIL Dark brown sandy topsoil, some silt, trace clay, some rootlets, dry, very loose, no HCO.
0.3		**SILTY SAND (FILL)** Light brown silty sand, trace cobbles, moist, no HCO.
0.4		**SAND (FILL)** Black medium to fine well sorted sand, some silt, trace to some gravel, trace brown sand, moist, no HCO.
0.6		**SILTY-CLAY TO CLAYEY-SILT** Mottled brown and grey silty-clay to clayey-silt, trace black sand, APL, firm to very stiff, no HCO.
1.1		**SANDY SILY TO SANDY LOAM** Dark brown to black sandy silt to sandy loam, trace gravel, saturated, no HCO.

WELL DIAGRAM



Gas probe has a stick-up of 0.80 m.

Seal: bentonite from 0.3 m depth to surface and mounded with soil placed on top.

Stainless steel 50 mesh cylindrical filter-screen containing No. 2 silica sand.

Gas probe constructed using 20 mm inside diameter stainless steel drive-point body. Gas probe driven to 2.9 m depth.

ATTACHMENT 3

Certificate of Analysis

eurofins | Environment Testing

Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1932729
Attention:	Mr. Claire Finoro	Date Submitted:	2020-06-23
Invoice to:	RWDI Air Inc.	Date Reported:	2020-06-30
PO#:	1801685-5002	Project:	1801685
		COC #:	858942
		Temperature (C):	11
		Custody Seal:	

Dear Claire Finoro:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

eurofins | Environment Testing

Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1932729
Attention:	Mr. Claire Finoro	Date Submitted:	2020-06-23
PO#:	1801685-5002	Date Reported:	2020-06-30
Invoice to:	RWDI Air Inc.	Project:	1801685
		COC #:	858942

O.Reg 153-T1-All Other Soils

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
20149C	Petroleum Hydrocarbons F2	20	ug/g	STD 10

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Claire Finoro
PO#: 1801685-5002
Invoice to: RWDI Air Inc.

Report Number: 1932729
Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Guideline = O.Reg 153-T1-All Other Soils

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
PHC's F1	385487	10	ug/g	STD 25	<10	<10	<10
PHC's F2	385519	10	ug/g	STD 10	<10	<10	20*
PHC's F3	385519	20	ug/g	STD 240	40	<20	60
PHC's F4	385519	20	ug/g	STD 120	<20	<20	<20

PAH

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
1+2-methylnaphthalene	208523	0.05	ug/g		<0.05	<0.05	<0.05
Acenaphthene	385094	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	385094	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	385094	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	385094	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	385094	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	385094	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05
Benzo[ghi]perylene	385094	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	385094	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05
Chrysene	385094	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	385094	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	385094	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	385094	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Claire Finoro
PO#: 1801685-5002
Invoice to: RWDI Air Inc.

Report Number: 1932729
Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Guideline = O.Reg 153-T1-All Other Soils

PAH

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
Indeno[1 2 3-cd]pyrene	385094	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	385094	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	385094	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Naphthalene	385094	0.05	ug/g	STD 0.09	<0.05	<0.05	<0.05
Phenanthrene	385094	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	385094	0.05	ug/g	STD 1	<0.05	<0.05	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
Acetone	385487	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	385484	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Bromodichloromethane	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

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Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Claire Finoro
PO#: 1801685-5002
Invoice to: RWDI Air Inc.

Report Number: 1932729
Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Guideline = O.Reg 153-T1-All Other Soils

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
Dichloroethane, 1,1-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	385487	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	385484	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	385484	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Ethylene dibromide	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	385487	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	385487	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	385487	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Styrene	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Toluene	385484	0.20	ug/g	STD 0.2	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethylene	385484	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

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Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Claire Finoro
PO#: 1801685-5002
Invoice to: RWDI Air Inc.

Report Number: 1932729
Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Guideline = O.Reg 153-T1-All Other Soils

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
Trichlorofluoromethane	385484	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05
Vinyl Chloride	385484	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Xylene Mixture	385485	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Xylene, m/p-	385484	0.05	ug/g		<0.05	<0.05	<0.05
Xylene, o-	385484	0.05	ug/g		<0.05	<0.05	<0.05

Moisture

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
Moisture-Humidite	385519	0.1	%		35.2	25.6	44.1

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PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
Alpha-androstrane	385519	0	%		97	73	94

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	1500341	1500342	1500343
Lab I.D.					1500341	1500342	1500343
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-06-18	2020-06-18	2020-06-18
Sampling Time							
Sample I.D.					20150	20149	20149C
1,2-dichloroethane-d4	385484	0	%		104	116	110
4-bromofluorobenzene	385484	0	%		105	104	103
Toluene-d8	385484	0	%		102	100	101

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Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
385094	Methlynaphthalene, 1-	<0.05 ug/g	62	50-140	62	50-140	0	0-40
385094	Methlynaphthalene, 2-	<0.05 ug/g	64	50-140	64	50-140	0	0-40
385094	Acenaphthene	<0.05 ug/g	71	50-140	69	50-140	0	0-40
385094	Acenaphthylene	<0.05 ug/g	71	50-140	72	50-140	0	0-40
385094	Anthracene	<0.05 ug/g	71	50-140	70	50-140	0	0-40
385094	Benz[a]anthracene	<0.05 ug/g	70	50-140	69	50-140	0	0-40
385094	Benzo[a]pyrene	<0.05 ug/g	71	50-140	70	50-140	0	0-40
385094	Benzo[b]fluoranthene	<0.05 ug/g	56	50-140	69	50-140	0	0-40
385094	Benzo[ghi]perylene	<0.05 ug/g	82	50-140	79	50-140	0	0-40
385094	Benzo[k]fluoranthene	<0.05 ug/g	83	50-140	83		0	0-40
385094	Chrysene	<0.05 ug/g	82	50-140	76	50-140	0	0-40
385094	Dibenz[a h]anthracene	<0.05 ug/g	71	50-140	70	50-140	0	0-40
385094	Fluoranthene	<0.05 ug/g	69	50-140	70	50-140	0	0-40
385094	Fluorene	<0.05 ug/g	70	50-140	69	50-140	0	0-40
385094	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	76	50-140	68	50-140	0	0-40
385094	Naphthalene	<0.05 ug/g	73	50-140	75	50-140	0	0-40
385094	Phenanthrene	<0.05 ug/g	72	50-140	70	50-140	0	0-40
385094	Pyrene	<0.05 ug/g	70	50-140	70	50-140	0	0-40
385484	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	93	60-130	123	50-140	0	0-50
385484	Trichloroethane, 1,1,1-	<0.05 ug/g	102	60-130	98	50-140	0	0-50
385484	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	104	60-130	113	50-140	0	0-30
385484	Trichloroethane, 1,1,2-	<0.05 ug/g	103	60-130	125	50-140	0	0-50
385484	Dichloroethane, 1,1-	<0.05 ug/g	103	60-130	93	50-140	0	0-50
385484	Dichloroethylene, 1,1-	<0.05 ug/g	95	60-130	115	50-140	0	0-50
385484	Dichlorobenzene, 1,2-	<0.05 ug/g	98	60-130	128	50-140	0	0-50
385484	Dichloroethane, 1,2-	<0.05 ug/g	115	60-130	123	50-140	0	0-50
385484	Dichloropropane, 1,2-	<0.05 ug/g	112	60-130	109	50-140	0	0-50
385484	Dichlorobenzene, 1,3-	<0.05 ug/g	116	60-130	96	50-140	0	0-50
385484	Dichlorobenzene, 1,4-	<0.05 ug/g	120	60-130	121	50-140	0	0-50
385484	Benzene	<0.02 ug/g	100	60-130	129	50-140	0	0-50
385484	Bromodichloromethane	<0.05 ug/g	111	60-130	108	50-140	0	0-50
385484	Bromoform	<0.05 ug/g	104	60-130	109	50-140	0	0-50

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Certificate of Analysis

eurofins | Environment Testing

Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Claire Finoro
PO#: 1801685-5002
Invoice to: RWDI Air Inc.

Report Number: 1932729
Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
385484	Bromomethane	<0.05 ug/g	82	60-130	88	50-140	0	0-50
385484	Dichloroethylene, 1,2-cis-	<0.05 ug/g	102	60-130	125	50-140	0	0-50
385484	Dichloropropene,1,3-cis-	<0.05 ug/g	102	60-130	70	50-140	0	0-50
385484	Carbon Tetrachloride	<0.05 ug/g	103	60-130	113	50-140	0	0-50
385484	Chloroform	<0.05 ug/g	101	60-130	120	50-140	0	0-50
385484	Dibromochloromethane	<0.05 ug/g	104	60-130	123	50-140	0	0-50
385484	Dichlorodifluoromethane	<0.05 ug/g	94	60-130	92	50-140	0	0-50
385484	Methylene Chloride	<0.05 ug/g	107	60-130	118	50-140	0	0-50
385484	Ethylbenzene	<0.05 ug/g	103	60-130	109	50-140	0	0-50
385484	Ethylene dibromide	<0.05 ug/g	109	60-130		50-140		0-50
385484	Hexane (n)	<0.05 ug/g	88	60-130	103	50-140	0	0-50
385484	Xylene, m/p-	<0.05 ug/g	99	60-130	117	50-140	0	0-50
385484	Chlorobenzene	<0.05 ug/g	109	60-130	120	50-140	0	0-50
385484	Xylene, o-	<0.05 ug/g	99	60-130	120	50-140	0	0-50
385484	Styrene	<0.05 ug/g	95	60-130	115	50-140	0	0-50
385484	Dichloroethylene, 1,2-trans-	<0.05 ug/g	96	60-130	115	50-140	0	0-50
385484	Dichloropropene,1,3-trans-	<0.05 ug/g	102	60-130	97	50-140	0	0-50
385484	Tetrachloroethylene	<0.05 ug/g	100	60-130	106	50-140	0	0-50
385484	Toluene	<0.20 ug/g	102	60-130	103	50-140	0	0-50
385484	Trichloroethylene	<0.05 ug/g	110	60-130	92	50-140	0	0-50
385484	Trichlorofluoromethane	<0.05 ug/g	95	60-130	85	50-140	0	0-50
385484	Vinyl Chloride	<0.02 ug/g	103	60-130	108	50-140	0	0-50
385485	Xylene Mixture							
385487	Dichloropropene,1,3-							
385487	Acetone	<0.50 ug/g	105	60-130	89	50-140	0	0-50
385487	PHC's F1	<10 ug/g	90	80-120	93	60-140	0	0-30
385487	Methyl Ethyl Ketone	<0.50 ug/g	80	60-130	83	50-140	0	0-50
385487	Methyl Isobutyl Ketone	<0.50 ug/g	102	60-130	86	50-140	0	0-50
385487	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	95	60-130	90	50-140	0	0-50
385519	PHC's F2	<10 ug/g	88	80-120	126	60-140	0	0-30
385519	PHC's F3	<20 ug/g	88	80-120	126	60-140	0	0-30
385519	PHC's F4	<20 ug/g	88	80-120	126	60-140	0	0-30
385519	Moisture-Humidite		100	80-120			4	

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Certificate of Analysis

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N8W 5K5
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Invoice to: RWDI Air Inc.

Report Number: 1932729
Date Submitted: 2020-06-23
Date Reported: 2020-06-30
Project: 1801685
COC #: 858942

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-06-29	2020-06-29	C_M	P 8270
385094	Methlynaphthalene, 1-	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Methlynaphthalene, 2-	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Acenaphthene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Acenaphthylene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Anthracene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Benz[a]anthracene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Benzo[a]pyrene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Benzo[b]fluoranthene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Benzo[ghi]perylene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Benzo[k]fluoranthene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Chrysene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Dibenz[a h]anthracene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Fluoranthene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Fluorene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Indeno[1 2 3-cd]pyrene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Naphthalene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Phenanthrene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385094	Pyrene	GC-MS	2020-06-24	2020-06-24	C_M	P 8270
385484	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Trichloroethane, 1,1,1-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Trichloroethane, 1,1,2-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloroethane, 1,1-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloroethylene, 1,1-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichlorobenzene, 1,2-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloroethane, 1,2-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloropropane, 1,2-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichlorobenzene, 1,3-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichlorobenzene, 1,4-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Benzene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Bromodichloromethane	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Bromoform	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
385484	Bromomethane	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloroethylene, 1,2-cis-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloropropene,1,3-cis-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Carbon Tetrachloride	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Chloroform	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dibromochloromethane	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichlorodifluoromethane	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Methylene Chloride	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Ethylbenzene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Ethylene dibromide	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Hexane (n)	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Xylene, m/p-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Chlorobenzene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Xylene, o-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Styrene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloroethylene, 1,2-trans-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Dichloropropene,1,3-trans-	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Tetrachloroethylene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Toluene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Trichloroethylene	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Trichlorofluoromethane	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385484	Vinyl Chloride	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385485	Xylene Mixture	GC-MS	2020-06-28	2020-06-28	TJB	V 8260B
385487	Dichloropropene,1,3-	GC-MS	2020-06-28	2020-06-28	TJB	V 8260B
385487	Acetone	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385487	PHC's F1	GC/FID	2020-06-28	2020-06-28	TJB	CCME
385487	Methyl Ethyl Ketone	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385487	Methyl Isobutyl Ketone	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385487	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-06-24	2020-06-24	TJB	V 8260B
385519	PHC's F2	GC/FID	2020-06-29	2020-06-29	A_A	CCME
385519	PHC's F3	GC/FID	2020-06-29	2020-06-29	A_A	CCME
385519	PHC's F4	GC/FID	2020-06-29	2020-06-29	A_A	CCME
385519	Moisture-Humidite	Oven	2020-06-29	2020-06-29	A_A	ASTM 2216

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APPENDIX D

Certificate of Analysis

eurofins | Environment Testing

Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1941973
Attention:	Mr. Phil Janisse	Date Submitted:	2020-10-29
Invoice to:	RWDI Air Inc.	Date Reported:	2020-11-05
PO#:		Project:	1801685-8000
		COC #:	211758
		Temperature (C):	10.1
		Custody Seal:	

Dear Phil Janisse:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1525427	20015	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525428	20014	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50). PAH MRL elevated due to matrix interference (dilution was done).
Sample ID: 1525429	20009	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525430	20019	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525431	20149	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525432	20026	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525433	20023	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525434	200191	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525435	SDUP1	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525436	20025	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).

Report Comments:

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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4510 Rhodes Drive, Unit 530
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N8W 5K5
Attention: Mr. Phil Janisse
PO#:
Invoice to: RWDI Air Inc.

Report Number: 1941973
Date Submitted: 2020-10-29
Date Reported: 2020-11-05
Project: 1801685-8000
COC #: 211758

O.Reg 153-T2-Res/Park-Coarse

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
20014	Petroleum Hydrocarbons F1	80	ug/g	STD 55
20014	Petroleum Hydrocarbons F2	1470	ug/g	STD 98
20014	Petroleum Hydrocarbons F3	29200	ug/g	STD 300
20014	Petroleum Hydrocarbons F4	17000	ug/g	STD 2800
20014	Petroleum Hydrocarbons F4g	49700	ug/g	STD 2800
20019	Petroleum Hydrocarbons F1	60	ug/g	STD 55
20019	Petroleum Hydrocarbons F2	920	ug/g	STD 98
20019	Petroleum Hydrocarbons F3	16100	ug/g	STD 300
20019	Petroleum Hydrocarbons F4	5280	ug/g	STD 2800
20019	Petroleum Hydrocarbons F4g	24800	ug/g	STD 2800
20023	Petroleum Hydrocarbons F2	290	ug/g	STD 98
20023	Petroleum Hydrocarbons F3	1240	ug/g	STD 300
20025	Petroleum Hydrocarbons F2	400	ug/g	STD 98
20025	Petroleum Hydrocarbons F3	790	ug/g	STD 300
20026	Petroleum Hydrocarbons F1	90	ug/g	STD 55
20026	Petroleum Hydrocarbons F2	110	ug/g	STD 98
20026	Petroleum Hydrocarbons F3	2970	ug/g	STD 300
20149	Petroleum Hydrocarbons F1	70	ug/g	STD 55
SDUP1	Petroleum Hydrocarbons F2	340	ug/g	STD 98
SDUP1	Petroleum Hydrocarbons F3	610	ug/g	STD 300
PAH				
20014	Methlynaphthalene, 1-	5.0	ug/g	STD 0.99
20014	Methlynaphthalene, 2-	6.8	ug/g	STD 0.99
20014	Acenaphthylene	<0.5	ug/g	STD 0.15
20014	Benzo[a]pyrene	<0.5	ug/g	STD 0.3
20014	Dibenz[a h]anthracene	<0.5	ug/g	STD 0.1
20014	Indeno[1 2 3-cd]pyrene	<0.5	ug/g	STD 0.38
20014	Naphthalene	2.0	ug/g	STD 0.6
20019	Methlynaphthalene, 1-	2.18	ug/g	STD 0.99
20019	Methlynaphthalene, 2-	2.11	ug/g	STD 0.99
20019	Naphthalene	0.77	ug/g	STD 0.6
20023	Methlynaphthalene, 1-	3.76	ug/g	STD 0.99
20025	Methlynaphthalene, 1-	5.34	ug/g	STD 0.99
20025	Methlynaphthalene, 2-	4.75	ug/g	STD 0.99
20025	Naphthalene	1.47	ug/g	STD 0.6
SDUP1	Methlynaphthalene, 1-	6.85	ug/g	STD 0.99
SDUP1	Methlynaphthalene, 2-	6.38	ug/g	STD 0.99
SDUP1	Naphthalene	1.94	ug/g	STD 0.6
Volatiles				

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Certificate of Analysis

eurofins | Environment Testing

Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1941973
Attention:	Mr. Phil Janisse	Date Submitted:	2020-10-29
PO#:		Date Reported:	2020-11-05
Invoice to:	RWDI Air Inc.	Project:	1801685-8000
		COC #:	211758

O.Reg 153-T2-Res/Park-Coarse

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
20014	Xylene Mixture	3.70	ug/g	STD 3.1

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Invoice to: RWDI Air Inc.

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Date Submitted: 2020-10-29
Date Reported: 2020-11-05
Project: 1801685-8000
COC #: 211758

Guideline = O.Reg 153-T2-Res/Park-Coarse

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1525427	1525428	1525429	1525430	1525431
Lab I.D.					1525427	1525428	1525429	1525430	1525431
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20015	20014	20009	20019	20149
PHC's F1	391881	10	ug/g	STD 55	<10	80*	50	60*	70*
PHC's F1-BTEX	391888	10	ug/g		<10	80	50	60	70
PHC's F2	391775	10	ug/g	STD 98	20	1470*	70	920*	20
PHC's F3	391775	20	ug/g	STD 300	120	29200*	250	16100*	70
PHC's F4	391775	20	ug/g	STD 2800	40	17000*	90	5280*	30
PHC's F4g	391840	100	ug/g	STD 2800	100	49700*	200	24800*	200

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1525432	1525433	1525434	1525435	1525436
Lab I.D.					1525432	1525433	1525434	1525435	1525436
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20026	20023	200191	SDUP1	20025
PHC's F1	391881	10	ug/g	STD 55	90*	30	<10	<10	<10
PHC's F1-BTEX	391888	10	ug/g		90	30	<10	-<10	<10
PHC's F2	391775	10	ug/g	STD 98	110*	290*	20	340*	400*
PHC's F3	391775	20	ug/g	STD 300	2970*	1240*	180	610*	790*
PHC's F4	391775	20	ug/g	STD 2800	1550	170	40	150	190
PHC's F4g	391840	100	ug/g	STD 2800	2800	800	300	600	1100

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Date Reported: 2020-11-05
Project: 1801685-8000
COC #: 211758

Guideline = O.Reg 153-T2-Res/Park-Coarse

PAH

Analyte	Batch No	MRL	Units	Guideline	1525427 Soil153 2020-10-27 20015	1525428 Soil153 2020-10-27 20014	1525429 Soil153 2020-10-27 20009	1525430 Soil153 2020-10-27 20019	1525431 Soil153 2020-10-27 20149
1+2-methylnaphthalene	208523	0.05	ug/g		<0.05	11.8	4.29	<0.05	<0.05
Acenaphthene	391385	0.05	ug/g	STD 7.9	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 7.9		<0.5			
Acenaphthylene	391385	0.05	ug/g	STD 0.15	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.15		<0.5*			
Anthracene	391385	0.05	ug/g	STD 0.67	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.67		<0.5			
Benz[a]anthracene	391385	0.05	ug/g	STD 0.5	<0.05		<0.05	0.20	<0.05
		0.5	ug/g	STD 0.5		<0.5			
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.3		<0.5*			
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.78		<0.5			
Benzo[ghi]perylene	391385	0.05	ug/g	STD 6.6	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 6.6		<0.5			
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.78		<0.5			
Chrysene	391385	0.05	ug/g	STD 7	<0.05		<0.05	0.40	<0.05
		0.5	ug/g	STD 7		0.6			
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.1		<0.5*			
Fluoranthene	391385	0.05	ug/g	STD 0.69	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.69		<0.5			

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Certificate of Analysis

eurofins | Environment Testing

Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
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Invoice to: RWDI Air Inc.

Report Number: 1941973
Date Submitted: 2020-10-29
Date Reported: 2020-11-05
Project: 1801685-8000
COC #: 211758

Guideline = O.Reg 153-T2-Res/Park-Coarse

PAH

				Lab I.D.	1525427	1525428	1525429	1525430	1525431
				Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153
				Sample Type					
				Sample Date	2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
				Sampling Time					
				Sample I.D.	20015	20014	20009	20019	20149
Analyte	**Batch No**	**MRL**	**Units**	**Guideline**					
Fluorene	391385	0.05	ug/g	STD 62	<0.05		<0.05	0.05	<0.05
		0.5	ug/g	STD 62		<0.5			
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.38	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 0.38		<0.5*			
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.99	<0.05		0.20	2.18*	<0.05
		0.5	ug/g	STD 0.99		5.0*			
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.99	<0.05		0.22	2.11*	<0.05
		0.5	ug/g	STD 0.99		6.8*			
Naphthalene	391385	0.05	ug/g	STD 0.6	<0.05		0.07	0.77*	<0.05
		0.5	ug/g	STD 0.6		2.0*			
Phenanthrene	391385	0.05	ug/g	STD 6.2	<0.05		<0.05	0.23	<0.05
		0.5	ug/g	STD 6.2		1.1			
Pyrene	391385	0.05	ug/g	STD 78	<0.05		<0.05	<0.05	<0.05
		0.5	ug/g	STD 78		<0.5			

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PAH

Analyte	Batch No	MRL	Units	Guideline	1525432 Soil153 2020-10-27 20026	1525433 Soil153 2020-10-27 20023	1525434 Soil153 2020-10-27 200191	1525435 Soil153 2020-10-27 SDUP1	1525436 Soil153 2020-10-27 20025
				Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.					
1+2-methylnaphthalene	208523	0.05	ug/g		0.99	3.76	0.20	13.2	10.1
Acenaphthene	391385	0.05	ug/g	STD 7.9	<0.05	0.10	<0.05	0.16	0.11
Acenaphthylene	391385	0.05	ug/g	STD 0.15	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.67	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	391385	0.05	ug/g	STD 0.5	<0.05	<0.05	<0.05	0.07	<0.05
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 6.6	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	391385	0.05	ug/g	STD 7	<0.05	<0.05	0.06	0.13	0.09
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	391385	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	391385	0.05	ug/g	STD 62	<0.05	0.10	<0.05	0.09	0.06
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.38	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.99	0.87	3.76*	0.10	6.85*	5.34*
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.99	0.12	<0.05	0.10	6.38*	4.75*
Naphthalene	391385	0.05	ug/g	STD 0.6	0.06	0.38	0.06	1.94*	1.47*
Phenanthrene	391385	0.05	ug/g	STD 6.2	0.18	0.35	<0.05	0.11	0.07
Pyrene	391385	0.05	ug/g	STD 78	<0.05	0.30	<0.05	0.09	<0.05

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Guideline = O.Reg 153-T2-Res/Park-Coarse

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1525427	1525428	1525429	1525430	1525431
Lab I.D.					1525427	1525428	1525429	1525430	1525431
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20015	20014	20009	20019	20149
Benzene	391879	0.02	ug/g	STD 0.21	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	391879	0.05	ug/g	STD 1.1	<0.05	0.7	<0.05	0.5	<0.05
Toluene	391879	0.20	ug/g	STD 2.3	<0.20	<0.2	<0.20	<0.20	<0.20
Xylene Mixture	391887	0.05	ug/g	STD 3.1	<0.05	3.70*	<0.05	1.30	<0.05
Xylene, m/p-	391879	0.05	ug/g		<0.05	2.1	<0.05	1.0	<0.05
Xylene, o-	391879	0.05	ug/g		<0.05	1.6	<0.05	0.3	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1525432	1525433	1525434	1525435	1525436
Lab I.D.					1525432	1525433	1525434	1525435	1525436
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20026	20023	200191	SDUP1	20025
Benzene	391879	0.02	ug/g	STD 0.21	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	391879	0.05	ug/g	STD 1.1	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	391879	0.20	ug/g	STD 2.3	<0.20	<0.20	<0.20	<0.20	<0.20
Xylene Mixture	391887	0.05	ug/g	STD 3.1	<0.05	<0.05	<0.05	0.30	<0.05
Xylene, m/p-	391879	0.05	ug/g		<0.05	<0.05	<0.05	0.3	<0.05
Xylene, o-	391879	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

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Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
PO#:
Invoice to: RWDI Air Inc.

Report Number: 1941973
Date Submitted: 2020-10-29
Date Reported: 2020-11-05
Project: 1801685-8000
COC #: 211758

Guideline = O.Reg 153-T2-Res/Park-Coarse

Moisture

Analyte	Batch No	MRL	Units	Guideline	1525427	1525428	1525429	1525430	1525431
Lab I.D.					1525427	1525428	1525429	1525430	1525431
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20015	20014	20009	20019	20149
Moisture-Humidite	391775	0.1	%		22.4	13.6	25.0	16.0	23.5

Moisture

Analyte	Batch No	MRL	Units	Guideline	1525432	1525433	1525434	1525435	1525436
Lab I.D.					1525432	1525433	1525434	1525435	1525436
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20026	20023	200191	SDUP1	20025
Moisture-Humidite	391775	0.1	%		19.5	21.3	24.8	21.1	22.6

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PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1525427	1525428	1525429	1525430	1525431
Lab I.D.					1525427	1525428	1525429	1525430	1525431
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20015	20014	20009	20019	20149
Alpha-androstrane	208523	1	%			NA			NA
	391775	0	%		105		76	67	

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1525432	1525433	1525434	1525435	1525436
Lab I.D.					1525432	1525433	1525434	1525435	1525436
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20026	20023	200191	SDUP1	20025
Alpha-androstrane	208523	1	%		NA	NA			NA
	391775	0	%				77	71	

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	1525427	1525428	1525429	1525430	1525431
Lab I.D.					1525427	1525428	1525429	1525430	1525431
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20015	20014	20009	20019	20149
Toluene-d8	391879	0	%		90	86	90	90	93

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	1525432	1525433	1525434	1525435	1525436
Lab I.D.					1525432	1525433	1525434	1525435	1525436
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-27	2020-10-27	2020-10-27	2020-10-27	2020-10-27
Sampling Time									
Sample I.D.					20026	20023	200191	SDUP1	20025
Toluene-d8	391879	0	%		93	94	90	90	89

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Date Submitted: 2020-10-29
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COC #: 211758

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
391385	Methlynaphthalene, 1-	<0.05 ug/g	83	50-140	68	50-140	0	0-40
391385	Methlynaphthalene, 2-	<0.05 ug/g	82	50-140	67	50-140	0	0-40
391385	Acenaphthene	<0.05 ug/g	78	50-140	63	50-140	0	0-40
391385	Acenaphthylene	<0.05 ug/g	66	50-140	63	50-140	0	0-40
391385	Anthracene	<0.05 ug/g	82	50-140	63	50-140	0	0-40
391385	Benz[a]anthracene	<0.05 ug/g	72	50-140	61	50-140	0	0-40
391385	Benzo[a]pyrene	<0.05 ug/g	56	50-140	55	50-140	0	0-40
391385	Benzo[b]fluoranthene	<0.05 ug/g	70	50-140	48	50-140	0	0-40
391385	Benzo[ghi]perylene	<0.05 ug/g	65	50-140	60	50-140	0	0-40
391385	Benzo[k]fluoranthene	<0.05 ug/g	92	50-140	81		0	0-40
391385	Chrysene	<0.05 ug/g	92	50-140	73	50-140	0	0-40
391385	Dibenz[a h]anthracene	<0.05 ug/g	65	50-140	54	50-140	0	0-40
391385	Fluoranthene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391385	Fluorene	<0.05 ug/g	78	50-140	60	50-140	0	0-40
391385	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	58	50-140	61	50-140	0	0-40
391385	Naphthalene	<0.05 ug/g	79	50-140	66	50-140	0	0-40
391385	Phenanthrene	<0.05 ug/g	81	50-140	62	50-140	0	0-40
391385	Pyrene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391775	PHC's F2	<10 ug/g	108	80-120	126	60-140	0	0-30
391775	PHC's F3	<20 ug/g	108	80-120	126	60-140	0	0-30
391775	PHC's F4	<20 ug/g	108	80-120	126	60-140	0	0-30
391775	Moisture-Humidite		100	80-120			5	
391840	PHC's F4g	<100 ug/g		80-120		60-140		0-30
391879	Benzene	<0.02 ug/g	117	60-130	101	50-140	0	0-50
391879	Ethylbenzene	<0.05 ug/g	96	60-130	96	50-140	0	0-50
391879	Xylene, m/p-	<0.05 ug/g	99	60-130	98	50-140	0	0-50
391879	Xylene, o-	<0.05 ug/g	101	60-130	100	50-140	0	0-50
391879	Toluene	<0.20 ug/g	115	60-130	104	50-140	0	0-50
391881	PHC's F1	<10 ug/g	112	80-120	106	60-140		0-30
391887	Xylene Mixture							
391888	PHC's F1-BTEX							

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Certificate of Analysis

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Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
PO#:
Invoice to: RWDI Air Inc.

Report Number: 1941973
Date Submitted: 2020-10-29
Date Reported: 2020-11-05
Project: 1801685-8000
COC #: 211758

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-11-04	2020-11-04	C_M	P 8270
391385	Methlynaphthalene, 1-	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Methlynaphthalene, 2-	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Acenaphthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Acenaphthylene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Anthracene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benz[a]anthracene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[a]pyrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[b]fluoranthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[ghi]perylene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[k]fluoranthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Chrysene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Dibenz[a h]anthracene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Fluoranthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Fluorene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Indeno[1 2 3-cd]pyrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Naphthalene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Phenanthrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Pyrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391775	PHC's F2	GC/FID	2020-11-02	2020-11-03	C_M	CCME
391775	PHC's F3	GC/FID	2020-11-02	2020-11-03	C_M	CCME
391775	PHC's F4	GC/FID	2020-11-02	2020-11-03	C_M	CCME
391775	Moisture-Humidite	Oven	2020-11-02	2020-11-03	C_M	ASTM 2216
391840	PHC's F4g	GC/FID	2020-11-04	2020-11-04	A_A	CCME
391879	Benzene	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Ethylbenzene	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Xylene, m/p-	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Xylene, o-	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Toluene	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391881	PHC's F1	GC/FID	2020-10-30	2020-10-31	YH	CCME
391887	Xylene Mixture	GC-MS	2020-11-05	2020-11-05	YH	V 8260B
391888	PHC's F1-BTEX	GC/FID	2020-11-05	2020-11-05	YH	CCME

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Certificate of Analysis

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Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1942104
Attention:	Mr. Phil Janisse	Date Submitted:	2020-10-30
Invoice to:	RWDI Air Inc.	Date Reported:	2020-11-06
PO#:		Project:	1801685-8000
		COC #:	211769
		Temperature (C):	12.1
		Custody Seal:	

Dear Phil Janisse:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Report Comments:

Sample ID: 1525794	20187	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525795	20174	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525797	20080	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525798	20094	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525799	20071	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525800	20112	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525801	20110	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525802	SDUP2	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525803	SDUP3	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525804	20117	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525805	20168	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525806	20095	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1525807	20170	Surrogate recoveries are not within acceptable limits due to matrix interferences. The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

O.Reg 153-T2-Res/Park-Coarse

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
20069	Petroleum Hydrocarbons F1	110	ug/g	STD 55
20071	Petroleum Hydrocarbons F1	180	ug/g	STD 55
20071	Petroleum Hydrocarbons F2	1410	ug/g	STD 98
20071	Petroleum Hydrocarbons F3	5410	ug/g	STD 300
20071	Petroleum Hydrocarbons F4g	11000	ug/g	STD 2800
20094	Petroleum Hydrocarbons F1	380	ug/g	STD 55
20094	Petroleum Hydrocarbons F2	1830	ug/g	STD 98
20094	Petroleum Hydrocarbons F3	4030	ug/g	STD 300
20094	Petroleum Hydrocarbons F4g	6900	ug/g	STD 2800
20095	Petroleum Hydrocarbons F2	270	ug/g	STD 98
20095	Petroleum Hydrocarbons F3	520	ug/g	STD 300
20095	Petroleum Hydrocarbons F4g	4500	ug/g	STD 2800
20110	Petroleum Hydrocarbons F1	410	ug/g	STD 55
20110	Petroleum Hydrocarbons F2	7220	ug/g	STD 98
20110	Petroleum Hydrocarbons F3	24400	ug/g	STD 300
20110	Petroleum Hydrocarbons F4	11000	ug/g	STD 2800
20110	Petroleum Hydrocarbons F4g	14300	ug/g	STD 2800
20112	Petroleum Hydrocarbons F1	360	ug/g	STD 55
20112	Petroleum Hydrocarbons F2	10200	ug/g	STD 98
20112	Petroleum Hydrocarbons F3	24900	ug/g	STD 300
20112	Petroleum Hydrocarbons F4	10100	ug/g	STD 2800
20112	Petroleum Hydrocarbons F4g	56400	ug/g	STD 2800
20117	Petroleum Hydrocarbons F1	600	ug/g	STD 55
20117	Petroleum Hydrocarbons F2	2300	ug/g	STD 98
20117	Petroleum Hydrocarbons F3	3460	ug/g	STD 300
20117	Petroleum Hydrocarbons F4g	5500	ug/g	STD 2800
20168	Petroleum Hydrocarbons F1	240	ug/g	STD 55
20168	Petroleum Hydrocarbons F2	1770	ug/g	STD 98
20168	Petroleum Hydrocarbons F3	11000	ug/g	STD 300
20168	Petroleum Hydrocarbons F4	6480	ug/g	STD 2800
20168	Petroleum Hydrocarbons F4g	21800	ug/g	STD 2800
20170	Petroleum Hydrocarbons F2	830	ug/g	STD 98
20170	Petroleum Hydrocarbons F3	19600	ug/g	STD 300
20170	Petroleum Hydrocarbons F4	13000	ug/g	STD 2800
20170	Petroleum Hydrocarbons F4g	48500	ug/g	STD 2800
20174	Petroleum Hydrocarbons F2	980	ug/g	STD 98
20174	Petroleum Hydrocarbons F3	28600	ug/g	STD 300
20174	Petroleum Hydrocarbons F4	15100	ug/g	STD 2800
20174	Petroleum Hydrocarbons F4g	71700	ug/g	STD 2800

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Invoice to: RWDI Air Inc.

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Date Submitted: 2020-10-30
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

O.Reg 153-T2-Res/Park-Coarse

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
20187	Petroleum Hydrocarbons F2	910	ug/g	STD 98
20187	Petroleum Hydrocarbons F3	10300	ug/g	STD 300
20187	Petroleum Hydrocarbons F4	5020	ug/g	STD 2800
20187	Petroleum Hydrocarbons F4g	23400	ug/g	STD 2800
SDUP2	Petroleum Hydrocarbons F2	960	ug/g	STD 98
SDUP2	Petroleum Hydrocarbons F3	26500	ug/g	STD 300
SDUP2	Petroleum Hydrocarbons F4	16700	ug/g	STD 2800
SDUP2	Petroleum Hydrocarbons F4g	67400	ug/g	STD 2800
SDUP3	Petroleum Hydrocarbons F1	430	ug/g	STD 55
SDUP3	Petroleum Hydrocarbons F2	5170	ug/g	STD 98
SDUP3	Petroleum Hydrocarbons F3	9550	ug/g	STD 300
SDUP3	Petroleum Hydrocarbons F4	4090	ug/g	STD 2800
SDUP3	Petroleum Hydrocarbons F4g	19900	ug/g	STD 2800
PAH				
20095	Methlynaphthalene, 1-	1.01	ug/g	STD 0.99
20112	Methlynaphthalene, 1-	3.32	ug/g	STD 0.99
20112	Methlynaphthalene, 2-	4.89	ug/g	STD 0.99
20112	Naphthalene	42.9	ug/g	STD 0.6
20117	Methlynaphthalene, 1-	1.00	ug/g	STD 0.99
20117	Methlynaphthalene, 2-	1.75	ug/g	STD 0.99
20117	Naphthalene	25.9	ug/g	STD 0.6
Volatiles				
20110	Benzene	0.25	ug/g	STD 0.21
20110	Ethylbenzene	5.28	ug/g	STD 1.1
20110	Toluene	3.40	ug/g	STD 2.3
20110	Xylene Mixture	28.7	ug/g	STD 3.1
20112	Ethylbenzene	4.1	ug/g	STD 1.1
20112	Xylene Mixture	26.2	ug/g	STD 3.1
20117	Ethylbenzene	5.0	ug/g	STD 1.1
20117	Xylene Mixture	23.3	ug/g	STD 3.1
20168	Ethylbenzene	3.4	ug/g	STD 1.1
20168	Xylene Mixture	9.40	ug/g	STD 3.1
SDUP2	Benzene	0.22	ug/g	STD 0.21
SDUP3	Benzene	0.24	ug/g	STD 0.21
SDUP3	Ethylbenzene	6.2	ug/g	STD 1.1
SDUP3	Toluene	4.1	ug/g	STD 2.3
SDUP3	Xylene Mixture	35.6	ug/g	STD 3.1

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Certificate of Analysis

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Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
PO#:
Invoice to: RWDI Air Inc.

Report Number: 1942104
Date Submitted: 2020-10-30
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

Guideline = O.Reg 153-T2-Res/Park-Coarse

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
PHC's F1	391976	10	ug/g	STD 55	<10	20	10	<10	380*
PHC's F1-BTEX	391978	10	ug/g		<10	20	10	<10	380
PHC's F2	391775	10	ug/g	STD 98	910*	980*	<10	20	1830*
PHC's F3	391775	20	ug/g	STD 300	10300*	28600*	<20	120	4030*
PHC's F4	391775	20	ug/g	STD 2800	5020*	15100*	<20	50	1620
PHC's F4g	391840	100	ug/g	STD 2800	23400*	71700*		500	6900*

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800	1525801	1525802	1525803
Lab I.D.					1525799	1525800	1525801	1525802	1525803
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20071	20112	20110	SDUP2	SDUP3
PHC's F1	391976	10	ug/g	STD 55	180*	360*	410*	40	430*
PHC's F1-BTEX	391978	10	ug/g		180	330	370	40	380
PHC's F2	391775	10	ug/g	STD 98	1410*	10200*	7220*	960*	5170*
PHC's F3	391775	20	ug/g	STD 300	5410*	24900*	24400*	26500*	9550*
PHC's F4	391775	20	ug/g	STD 2800	2510	10100*	11000*	16700*	4090*
PHC's F4g	391840	100	ug/g	STD 2800	11000*	56400*	14300*	67400*	19900*

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Guideline = O.Reg 153-T2-Res/Park-Coarse

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1525804	1525805	1525806	1525807	1525808
Lab I.D.					1525804	1525805	1525806	1525807	1525808
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20117	20168	20095	20170	20069
PHC's F1	391976	10	ug/g	STD 55	600*	240*	50	30	110*
PHC's F1-BTEX	391978	10	ug/g		570	230	50	30	110
PHC's F2	391775	10	ug/g	STD 98	2300*	1770*	270*	830*	20
PHC's F3	391775	20	ug/g	STD 300	3460*	11000*	520*	19600*	60
PHC's F4	391775	20	ug/g	STD 2800	1310	6480*	210	13000*	<20
PHC's F4g	391840	100	ug/g	STD 2800	5500*	21800*	4500*	48500*	

PAH

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
1+2-methylnaphthalene	208523	0.05	ug/g		<0.05	0.25	<0.05	<0.05	0.93
Acenaphthene	391385	0.05	ug/g	STD 7.9	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	391385	0.05	ug/g	STD 0.15	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.67	<0.05	<0.05	<0.05	<0.05	0.13
Benz[a]anthracene	391385	0.05	ug/g	STD 0.5	<0.05	<0.05	<0.05	<0.05	0.44
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05	0.29	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	0.10	<0.05	<0.05	<0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 6.6	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05	<0.05	<0.05	0.14
Chrysene	391385	0.05	ug/g	STD 7	<0.05	<0.05	<0.05	<0.05	0.42
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	391385	0.05	ug/g	STD 0.69	0.17	<0.05	<0.05	<0.05	<0.05
Fluorene	391385	0.05	ug/g	STD 62	<0.05	<0.05	<0.05	<0.05	<0.05

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Invoice to: RWDI Air Inc.

Report Number: 1942104
Date Submitted: 2020-10-30
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

Guideline = O.Reg 153-T2-Res/Park-Coarse

PAH

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.38	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.99	<0.05	0.13	<0.05	<0.05	0.93
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.99	<0.05	0.12	<0.05	<0.05	<0.05
Naphthalene	391385	0.05	ug/g	STD 0.6	<0.05	0.06	<0.05	<0.05	<0.05
Phenanthrene	391385	0.05	ug/g	STD 6.2	<0.05	<0.05	<0.05	<0.05	0.60
Pyrene	391385	0.05	ug/g	STD 78	0.17	<0.05	<0.05	<0.05	0.48

PAH

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800
Lab I.D.					1525799	1525800
Sample Matrix					Soil153	Soil153
Sample Type						
Sample Date					2020-10-28	2020-10-28
Sampling Time						
Sample I.D.					20071	20112
1+2-methylnaphthalene	208523	0.05	ug/g		0.65	
	391875	0.05	ug/g			8.21
Acenaphthene	391385	0.05	ug/g	STD 7.9	<0.05	<0.05
Acenaphthylene	391385	0.05	ug/g	STD 0.15	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.67	<0.05	<0.05
Benz[a]anthracene	391385	0.05	ug/g	STD 0.5	<0.05	0.42
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 6.6	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05
Chrysene	391385	0.05	ug/g	STD 7	<0.05	0.38
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05
Fluoranthene	391385	0.05	ug/g	STD 0.69	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
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PAH

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800
Lab I.D.					1525799	1525800
Sample Matrix					Soil153	Soil153
Sample Type						
Sample Date					2020-10-28	2020-10-28
Sampling Time						
Sample I.D.					20071	20112
Fluorene	391385	0.05	ug/g	STD 62	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.38	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.99	0.65	3.32*
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.99	<0.05	4.89*
Naphthalene	391385	0.05	ug/g	STD 0.6	0.40	42.9*
Phenanthrene	391385	0.05	ug/g	STD 6.2	<0.05	1.45
Pyrene	391385	0.05	ug/g	STD 78	<0.05	0.72

PAH

Analyte	Batch No	MRL	Units	Guideline	1525804	1525806	1525808
Lab I.D.					1525804	1525806	1525808
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-10-28	2020-10-28	2020-10-28
Sampling Time							
Sample I.D.					20117	20095	20069
1+2-methylnaphthalene	208523	0.05	ug/g		2.75	1.07	<0.05
Acenaphthene	391385	0.05	ug/g	STD 7.9	<0.05	<0.05	<0.05
Acenaphthylene	391385	0.05	ug/g	STD 0.15	<0.05	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.67	<0.05	0.13	<0.05
Benz[a]anthracene	391385	0.05	ug/g	STD 0.5	<0.05	0.27	<0.05
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05	<0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 6.6	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	0.07	<0.05
Chrysene	391385	0.05	ug/g	STD 7	<0.05	0.36	<0.05
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	391385	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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PAH

Analyte	Batch No	MRL	Units	Guideline	1525804	1525806	1525808
Lab I.D.					1525804	1525806	1525808
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-10-28	2020-10-28	2020-10-28
Sampling Time							
Sample I.D.					20117	20095	20069
Fluorene	391385	0.05	ug/g	STD 62	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.38	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.99	1.00*	1.01*	<0.05
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.99	1.75*	0.06	<0.05
Naphthalene	391385	0.05	ug/g	STD 0.6	25.9*	<0.05	<0.05
Phenanthrene	391385	0.05	ug/g	STD 6.2	<0.05	0.52	<0.05
Pyrene	391385	0.05	ug/g	STD 78	<0.05	0.39	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
Benzene	391879	0.02	ug/g	STD 0.21	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	391879	0.05	ug/g	STD 1.1	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	391879	0.20	ug/g	STD 2.3	<0.20	0.21	<0.20	<0.20	<0.20
Xylene Mixture	391977	0.05	ug/g	STD 3.1	<0.05	0.73	<0.05	<0.05	<0.05
Xylene, m/p-	391879	0.05	ug/g		<0.05	0.46	<0.05	<0.05	<0.05
Xylene, o-	391879	0.05	ug/g		<0.05	0.27	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800	1525801	1525802	1525803
Lab I.D.					1525799	1525800	1525801	1525802	1525803
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20071	20112	20110	SDUP2	SDUP3
Benzene	391879	0.02	ug/g	STD 0.21	<0.02	0.12	0.25*	0.22*	0.24*
Ethylbenzene	391879	0.05	ug/g	STD 1.1	<0.05	4.1*	5.28*	0.21	6.2*
Toluene	391879	0.20	ug/g	STD 2.3	<0.20	1.9	3.40*	0.52	4.1*
Xylene Mixture	391977	0.05	ug/g	STD 3.1	<0.05	26.2*	28.7*	1.83	35.6*
Xylene, m/p-	391879	0.05	ug/g		<0.05	15.4	17.1	1.16	20.6
Xylene, o-	391879	0.05	ug/g		<0.05	10.8	11.6	0.67	15.0

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1525804	1525805	1525806	1525807	1525808
Lab I.D.					1525804	1525805	1525806	1525807	1525808
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20117	20168	20095	20170	20069
Benzene	391879	0.02	ug/g	STD 0.21	<0.02	0.19	<0.02	0.16	<0.02
Ethylbenzene	391879	0.05	ug/g	STD 1.1	5.0*	3.4*	<0.05	0.62	<0.05
Toluene	391879	0.20	ug/g	STD 2.3	1.3	0.34	<0.20	0.30	<0.20
Xylene Mixture	391977	0.05	ug/g	STD 3.1	23.3*	9.40*	<0.05	2.80	<0.05
Xylene, m/p-	391879	0.05	ug/g		14.0	6.7	<0.05	1.1	<0.05
Xylene, o-	391879	0.05	ug/g		9.3	2.7	<0.05	1.7	<0.05

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Moisture

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
Moisture-Humidite	391775	0.1	%		33.9	30.1	20.4	19.0	12.6

Moisture

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800	1525801	1525802	1525803
Lab I.D.					1525799	1525800	1525801	1525802	1525803
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20071	20112	20110	SDUP2	SDUP3
Moisture-Humidite	391775	0.1	%		8.2	34.4	72.4	28.9	36.3

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Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
PO#:
Invoice to: RWDI Air Inc.

Report Number: 1942104
Date Submitted: 2020-10-30
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

Guideline = O.Reg 153-T2-Res/Park-Coarse

Moisture

Analyte	Batch No	MRL	Units	Guideline	1525804	1525805	1525806	1525807	1525808
Lab I.D.					1525804	1525805	1525806	1525807	1525808
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20117	20168	20095	20170	20069
Moisture-Humidite	391775	0.1	%		10.4	45.4	14.4	35.9	20.8

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
Alpha-androstrane	208523	1	%		NA	NA			NA
	391775	0	%				62	63	

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Guideline = O.Reg 153-T2-Res/Park-Coarse

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800	1525801	1525802	1525803
Lab I.D.					1525799	1525800	1525801	1525802	1525803
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20071	20112	20110	SDUP2	SDUP3
Alpha-androstrane	208523	1	%		NA	NA	NA	NA	NA

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1525804	1525805	1525806	1525807	1525808
Lab I.D.					1525804	1525805	1525806	1525807	1525808
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20117	20168	20095	20170	20069
Alpha-androstrane	208523	1	%		NA	NA	NA	NA	
	391775	0	%						61

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Project: 1801685-8000
COC #: 211769

Guideline = O.Reg 153-T2-Res/Park-Coarse

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	1525794	1525795	1525796	1525797	1525798
Lab I.D.					1525794	1525795	1525796	1525797	1525798
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20187	20174	1201A	20080	20094
Toluene-d8	391879	0	%		90	89	90	90	98

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	1525799	1525800	1525801	1525802	1525803
Lab I.D.					1525799	1525800	1525801	1525802	1525803
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20071	20112	20110	SDUP2	SDUP3
Toluene-d8	391879	0	%		92	93	97	91	95

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	1525804	1525805	1525806	1525807	1525808
Lab I.D.					1525804	1525805	1525806	1525807	1525808
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2020-10-28	2020-10-28	2020-10-28	2020-10-28	2020-10-28
Sampling Time									
Sample I.D.					20117	20168	20095	20170	20069
Toluene-d8	391879	0	%		98	99	89	92	84

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Report Number: 1942104
Date Submitted: 2020-10-30
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
391385	Methlynaphthalene, 1-	<0.05 ug/g	83	50-140	68	50-140	0	0-40
391385	Methlynaphthalene, 2-	<0.05 ug/g	82	50-140	67	50-140	0	0-40
391385	Acenaphthene	<0.05 ug/g	78	50-140	63	50-140	0	0-40
391385	Acenaphthylene	<0.05 ug/g	66	50-140	63	50-140	0	0-40
391385	Anthracene	<0.05 ug/g	82	50-140	63	50-140	0	0-40
391385	Benz[a]anthracene	<0.05 ug/g	72	50-140	61	50-140	0	0-40
391385	Benzo[a]pyrene	<0.05 ug/g	56	50-140	55	50-140	0	0-40
391385	Benzo[b]fluoranthene	<0.05 ug/g	70	50-140	48	50-140	0	0-40
391385	Benzo[ghi]perylene	<0.05 ug/g	65	50-140	60	50-140	0	0-40
391385	Benzo[k]fluoranthene	<0.05 ug/g	92	50-140	81		0	0-40
391385	Chrysene	<0.05 ug/g	92	50-140	73	50-140	0	0-40
391385	Dibenz[a h]anthracene	<0.05 ug/g	65	50-140	54	50-140	0	0-40
391385	Fluoranthene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391385	Fluorene	<0.05 ug/g	78	50-140	60	50-140	0	0-40
391385	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	58	50-140	61	50-140	0	0-40
391385	Naphthalene	<0.05 ug/g	79	50-140	66	50-140	0	0-40
391385	Phenanthrene	<0.05 ug/g	81	50-140	62	50-140	0	0-40
391385	Pyrene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391775	PHC's F2	<10 ug/g	108	80-120	126	60-140	0	0-30
391775	PHC's F3	<20 ug/g	108	80-120	126	60-140	0	0-30
391775	PHC's F4	<20 ug/g	108	80-120	126	60-140	0	0-30
391775	Moisture-Humidite		100	80-120			5	
391840	PHC's F4g	<100 ug/g		80-120		60-140		0-30
391875	1+2-methylnaphthalene							
391879	Benzene	<0.02 ug/g	117	60-130	101	50-140	0	0-50
391879	Ethylbenzene	<0.05 ug/g	96	60-130	96	50-140	0	0-50
391879	Xylene, m/p-	<0.05 ug/g	99	60-130	98	50-140	0	0-50
391879	Xylene, o-	<0.05 ug/g	101	60-130	100	50-140	0	0-50
391879	Toluene	<0.20 ug/g	115	60-130	104	50-140	0	0-50
391976	PHC's F1	<10 ug/g	112	80-120	106	60-140		0-30
391977	Xylene Mixture							
391978	PHC's F1-BTEX							

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Certificate of Analysis

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Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
PO#:
Invoice to: RWDI Air Inc.

Report Number: 1942104
Date Submitted: 2020-10-30
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 211769

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-11-04	2020-11-04	C_M	P 8270
391385	Methlynaphthalene, 1-	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Methlynaphthalene, 2-	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Acenaphthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Acenaphthylene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Anthracene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benz[a]anthracene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[a]pyrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[b]fluoranthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[ghi]perylene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Benzo[k]fluoranthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Chrysene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Dibenz[a h]anthracene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Fluoranthene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Fluorene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Indeno[1 2 3-cd]pyrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Naphthalene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Phenanthrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391385	Pyrene	GC-MS	2020-11-02	2020-11-03	C_M	P 8270
391775	PHC's F2	GC/FID	2020-11-02	2020-11-03	C_M	CCME
391775	PHC's F3	GC/FID	2020-11-02	2020-11-03	C_M	CCME
391775	PHC's F4	GC/FID	2020-11-02	2020-11-03	C_M	CCME
391775	Moisture-Humidite	Oven	2020-11-02	2020-11-03	C_M	ASTM 2216
391840	PHC's F4g	GC/FID	2020-11-04	2020-11-04	A_A	CCME
391875	1+2-methylnaphthalene	GC-MS	2020-11-06	2020-11-06	AET	P 8270
391879	Benzene	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Ethylbenzene	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Xylene, m/p-	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Xylene, o-	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391879	Toluene	GC-MS	2020-10-30	2020-10-31	YH	V 8260B
391976	PHC's F1	GC/FID	2020-10-30	2020-10-31	YH	CCME
391977	Xylene Mixture	GC-MS	2020-11-06	2020-11-06	YH	V 8260B
391978	PHC's F1-BTEX	GC/FID	2020-11-06	2020-11-06	YH	CCME

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Certificate of Analysis

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Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1942165
Attention:	Mr. Phil Janisse	Date Submitted:	2020-11-02
Invoice to:	RWDI Air Inc.	Date Reported:	2020-11-06
PO#:	1801685	Project:	1801685-8000
		COC #:	191453
		Temperature (C):	6
		Custody Seal:	

Dear Phil Janisse:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1526048 20123-2 CCME recoveries are not within acceptable limits due to matrix interferences.The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).

Report Comments:

Long Qu, Organics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Client:	RWDI Air Inc 4510 Rhodes Drive, Unit 530 Windsor, ON N8W 5K5	Report Number:	1942165
Attention:	Mr. Phil Janisse	Date Submitted:	2020-11-02
PO#:	1801685	Date Reported:	2020-11-06
Invoice to:	RWDI Air Inc.	Project:	1801685-8000
		COC #:	191453

O.Reg 153-T2-Res/Park-Coarse

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
20123-2	Petroleum Hydrocarbons F3	1330	ug/g	STD 300

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Report Number: 1942165
Date Submitted: 2020-11-02
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Project: 1801685-8000
COC #: 191453

Guideline = O.Reg 153-T2-Res/Park-Coarse

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1526045	1526046	1526047	1526048
Lab I.D.					1526045	1526046	1526047	1526048
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-10-29	2020-10-29	2020-10-29	2020-10-29
Sampling Time								
Sample I.D.					20037-2	20066-2	20070-2	20123-2
PHC's F1	391976	10	ug/g	STD 55	<10	<10	<10	<10
PHC's F1-BTEX	392008	10	ug/g		<10	<10	<10	<10
PHC's F2	391878	10	ug/g	STD 98	10	<10	<10	
	391981	10	ug/g	STD 98				90
PHC's F3	391878	20	ug/g	STD 300	70	<20	<20	
	391981	20	ug/g	STD 300				1330*
PHC's F4	391878	20	ug/g	STD 2800	30	<20	<20	
	391981	20	ug/g	STD 2800				680
PHC's F4g	391996	100	ug/g	STD 2800				1400

PAH

Analyte	Batch No	MRL	Units	Guideline	1526045	1526046	1526047
Lab I.D.					1526045	1526046	1526047
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-10-29	2020-10-29	2020-10-29
Sampling Time							
Sample I.D.					20037-2	20066-2	20070-2
1+2-methylnaphthalene	208523	0.05	ug/g		<0.05	<0.05	<0.05
Acenaphthene	391385	0.05	ug/g	STD 7.9	<0.05	<0.05	<0.05
Acenaphthylene	391385	0.05	ug/g	STD 0.15	<0.05	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.67	<0.05	<0.05	<0.05
Benz[a]anthracene	391385	0.05	ug/g	STD 0.5	<0.05	<0.05	<0.05
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05	0.07	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05	<0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 6.6	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.78	<0.05	<0.05	<0.05
Chrysene	391385	0.05	ug/g	STD 7	<0.05	<0.05	<0.05

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Invoice to: RWDI Air Inc.

Report Number: 1942165
Date Submitted: 2020-11-02
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 191453

Guideline = O.Reg 153-T2-Res/Park-Coarse

PAH

Analyte	Batch No	MRL	Units	Guideline	1526045	1526046	1526047
Lab I.D.					1526045	1526046	1526047
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-10-29	2020-10-29	2020-10-29
Sampling Time							
Sample I.D.					20037-2	20066-2	20070-2
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	391385	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Fluorene	391385	0.05	ug/g	STD 62	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.38	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.99	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.99	<0.05	<0.05	<0.05
Naphthalene	391385	0.05	ug/g	STD 0.6	0.12	0.07	<0.05
Phenanthrene	391385	0.05	ug/g	STD 6.2	<0.05	<0.05	<0.05
Pyrene	391385	0.05	ug/g	STD 78	<0.05	<0.05	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1526045	1526046	1526047	1526048
Lab I.D.					1526045	1526046	1526047	1526048
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-10-29	2020-10-29	2020-10-29	2020-10-29
Sampling Time								
Sample I.D.					20037-2	20066-2	20070-2	20123-2
Benzene	392000	0.02	ug/g	STD 0.21	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	392000	0.05	ug/g	STD 1.1	<0.05	<0.05	<0.05	<0.05
Toluene	392000	0.20	ug/g	STD 2.3	<0.20	<0.20	<0.20	<0.20
Xylene Mixture	392007	0.05	ug/g	STD 3.1	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	392000	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Xylene, o-	392000	0.05	ug/g		<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

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Client: RWDI Air Inc
4510 Rhodes Drive, Unit 530
Windsor, ON
N8W 5K5
Attention: Mr. Phil Janisse
PO#: 1801685
Invoice to: RWDI Air Inc.

Report Number: 1942165
Date Submitted: 2020-11-02
Date Reported: 2020-11-06
Project: 1801685-8000
COC #: 191453

Guideline = O.Reg 153-T2-Res/Park-Coarse

Moisture

Analyte	Batch No	MRL	Units	Guideline	1526045	1526046	1526047	1526048
Lab I.D.					1526045	1526046	1526047	1526048
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-10-29	2020-10-29	2020-10-29	2020-10-29
Sampling Time								
Sample I.D.					20037-2	20066-2	20070-2	20123-2
Moisture-Humidite	391878	0.1	%		19.6	22.3	18.6	
	391981	0.1	%					39.2

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	1526045	1526046	1526047	1526048
Lab I.D.					1526045	1526046	1526047	1526048
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-10-29	2020-10-29	2020-10-29	2020-10-29
Sampling Time								
Sample I.D.					20037-2	20066-2	20070-2	20123-2
Alpha-androstrane	208523	1	%					NA
	391878	0	%		70	60	64	

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Guideline = O.Reg 153-T2-Res/Park-Coarse

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline				
				Lab I.D.	1526045	1526046	1526047	1526048
				Sample Matrix	Soil153	Soil153	Soil153	Soil153
				Sample Type				
				Sample Date	2020-10-29	2020-10-29	2020-10-29	2020-10-29
				Sampling Time				
				Sample I.D.	20037-2	20066-2	20070-2	20123-2
Toluene-d8	392000	0	%		104	105	103	107

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
391385	Methlynaphthalene, 1-	<0.05 ug/g	83	50-140	68	50-140	0	0-40
391385	Methlynaphthalene, 2-	<0.05 ug/g	82	50-140	67	50-140	0	0-40
391385	Acenaphthene	<0.05 ug/g	78	50-140	63	50-140	0	0-40
391385	Acenaphthylene	<0.05 ug/g	66	50-140	63	50-140	0	0-40
391385	Anthracene	<0.05 ug/g	82	50-140	63	50-140	0	0-40
391385	Benz[a]anthracene	<0.05 ug/g	72	50-140	61	50-140	0	0-40
391385	Benzo[a]pyrene	<0.05 ug/g	56	50-140	55	50-140	0	0-40
391385	Benzo[b]fluoranthene	<0.05 ug/g	70	50-140	48	50-140	0	0-40
391385	Benzo[ghi]perylene	<0.05 ug/g	65	50-140	60	50-140	0	0-40
391385	Benzo[k]fluoranthene	<0.05 ug/g	92	50-140	81		0	0-40
391385	Chrysene	<0.05 ug/g	92	50-140	73	50-140	0	0-40
391385	Dibenz[a h]anthracene	<0.05 ug/g	65	50-140	54	50-140	0	0-40
391385	Fluoranthene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391385	Fluorene	<0.05 ug/g	78	50-140	60	50-140	0	0-40
391385	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	58	50-140	61	50-140	0	0-40
391385	Naphthalene	<0.05 ug/g	79	50-140	66	50-140	0	0-40
391385	Phenanthrene	<0.05 ug/g	81	50-140	62	50-140	0	0-40
391385	Pyrene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391878	PHC's F2	<10 ug/g	120	80-120	92	60-140	0	0-30
391878	PHC's F3	<20 ug/g	120	80-120	92	60-140	0	0-30
391878	PHC's F4	<20 ug/g	120	80-120	92	60-140	0	0-30
391878	Moisture-Humidite		100	80-120			5	
391976	PHC's F1	<10 ug/g	112	80-120	106	60-140		0-30
391981	PHC's F2	<10 ug/g	120	80-120	92	60-140	0	0-30
391981	PHC's F3	<20 ug/g	120	80-120	92	60-140	0	0-30
391981	PHC's F4	<20 ug/g	120	80-120	92	60-140	0	0-30
391981	Moisture-Humidite		100	80-120			5	
391996	PHC's F4g	<100 ug/g		80-120		60-140		0-30
392000	Benzene	<0.02 ug/g	97	60-130	87	50-140	0	0-50
392000	Ethylbenzene	<0.05 ug/g	104	60-130	95	50-140	0	0-50
392000	Xylene, m/p-	<0.05 ug/g	107	60-130	99	50-140	0	0-50
392000	Xylene, o-	<0.05 ug/g	100	60-130	93	50-140	0	0-50

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Project: 1801685-8000
COC #: 191453

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
392000	Toluene	<0.20 ug/g	100	60-130	93	50-140	0	0-50
392007	Xylene Mixture							
392008	PHC's F1-BTEX							

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-11-04	2020-11-04	C_M	P 8270
391385	Methlynaphthalene, 1-	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Methlynaphthalene, 2-	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Acenaphthene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Acenaphthylene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Anthracene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Benz[a]anthracene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Benzo[a]pyrene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Benzo[b]fluoranthene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Benzo[ghi]perylene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Benzo[k]fluoranthene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Chrysene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Dibenz[a h]anthracene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Fluoranthene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Fluorene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Indeno[1 2 3-cd]pyrene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Naphthalene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Phenanthrene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391385	Pyrene	GC-MS	2020-11-02	2020-11-04	C_M	P 8270
391878	PHC's F2	GC/FID	2020-11-04	2020-11-05	C_M	CCME
391878	PHC's F3	GC/FID	2020-11-04	2020-11-05	C_M	CCME
391878	PHC's F4	GC/FID	2020-11-04	2020-11-05	C_M	CCME
391878	Moisture-Humidite	Oven	2020-11-04	2020-11-05	C_M	ASTM 2216
391976	PHC's F1	GC/FID	2020-11-04	2020-11-05	YH	CCME
391981	PHC's F2	GC/FID	2020-11-05	2020-11-06	C_M	CCME
391981	PHC's F3	GC/FID	2020-11-05	2020-11-06	C_M	CCME
391981	PHC's F4	GC/FID	2020-11-05	2020-11-06	C_M	CCME
391981	Moisture-Humidite	Oven	2020-11-05	2020-11-06	C_M	ASTM 2216
391996	PHC's F4g	GC/FID	2020-11-06	2020-11-06	A_A	CCME
392000	Benzene	GC-MS	2020-11-04	2020-11-06	YH	V 8260B
392000	Ethylbenzene	GC-MS	2020-11-04	2020-11-06	YH	V 8260B
392000	Xylene, m/p-	GC-MS	2020-11-04	2020-11-06	YH	V 8260B
392000	Xylene, o-	GC-MS	2020-11-04	2020-11-06	YH	V 8260B

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
392000	Toluene	GC-MS	2020-11-04	2020-11-06	YH	V 8260B
392007	Xylene Mixture	GC-MS	2020-11-06	2020-11-06	YH	V 8260B
392008	PHC's F1-BTEX	GC/FID	2020-11-06	2020-11-06	YH	CCME

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