

SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-01				
Midnight Sun Drilling		CSP Install, km 1842		PROJECT NO: 552-202101				
Terra Sonic		Coordinates: Z07N N6893806m E516948m		ELEVATION: m				
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED	<input type="checkbox"/> DCPT	<input type="checkbox"/> AUGER	<input type="checkbox"/> BULK			
		<input type="checkbox"/> SPT	<input type="checkbox"/> CORE					
ELEV. (m)	PLASTIC      M.C      LIQUID 0      20      40      60      80      100		★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
	0	20	40	60				
							BST	
							GRAVEL, silty with sand -Some boulders and cobbles -Hard drilling	1
							-Very hard drilling	2
							-Poorly graded, some silt -Some boulders and cobbles -Very hard drilling	3
							ORGANIC SILT, some sand, trace coarse gravel -Light brown, soft, wet, organic odour -Fibrous organic inclusions -Low plasticity -Firm (easy drilling)	4
								5
								6
							GRAVEL, silty with sand -Light brown, wet, loose	7
								8
								9
							-Subrounded	10

SUBSURFACE EXPLORATION AND TEST REPORT	Alaska Highway	SOURCE/TP#: 929-01
Midnight Sun Drilling	CSP Install, km 1842	PROJECT NO: 552-202101
Terra Sonic	Coordinates: Z07N N6893806m E516948m	ELEVATION: m

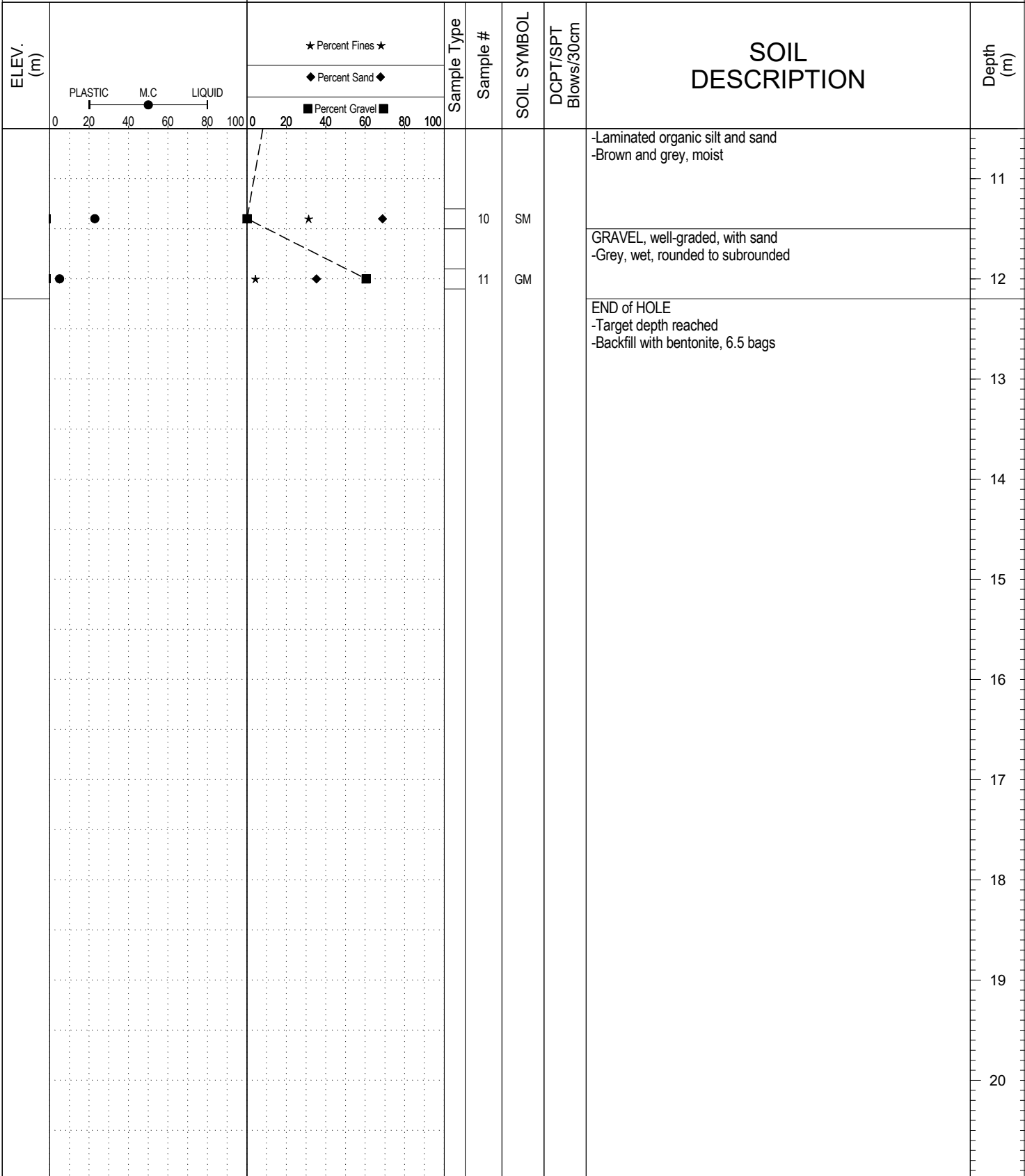
SAMPLE TYPE     UNDISTURBED     DCPT     AUGER     BULK     SPT     CORE

ELEV. (m)		★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■	Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
							-Subrounded	11
								12
							END of HOLE -Target depth reached -Backfill with bentonite, 9.5 bags	13
								14
								15
								16
								17
								18
								19
								20

SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-02				
Midnight Sun Drilling		CSP Install, km 1829		PROJECT NO: 552-202101				
Terra Sonic		Coordinates: Z07N N6881489m E518081m		ELEVATION: m				
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED <input type="checkbox"/> DCPT <input checked="" type="checkbox"/> AUGER <input type="checkbox"/> BULK <input checked="" type="checkbox"/> SPT <input type="checkbox"/> CORE						
ELEV. (m)	★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
	PLASTIC      M.C      LIQUID 0      20      40      60      80      100							
							GRAVEL (Embankment), sandy, trace silt -Brown, coarse, mixed angularity -Wet from advancing casing	1
								2
							-Poorly graded, with silt and sand -moist, rounded	3
								4
					6	GP-GM		5
							-Rock powder, possible cobbles and boulders -Washed, trace sand, wet	6
					7		ORGANIC SOIL, peaty, trace coarse gravel -Dark brown, moist	7
							PEAT, with fibrous woody inclusions, trace coarse gravel -Moist  -100mm ash mixed into peat	8
					8		ORGANIC SILT and sand -Gradual transition -Dark brown and grey, moist	9
					9			10
							SAND, medium -Grey, wet	

SUBSURFACE EXPLORATION AND TEST REPORT	Alaska Highway	SOURCE/TP#: 929-02
Midnight Sun Drilling	CSP Install, km 1829	PROJECT NO: 552-202101
Terra Sonic	Coordinates: Z07N N6881489m E518081m	ELEVATION: m

SAMPLE TYPE     UNDISTURBED     DCPT     AUGER     BULK     SPT     CORE





SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-03				
Midnight Sun Drilling		Dry Creek,		PROJECT NO: 552-202101				
Terra Sonic		Coordinates: Z07N N6892220m E516446m		ELEVATION: m				
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/> DCPT		<input type="checkbox"/> AUGER <input type="checkbox"/> BULK <input checked="" type="checkbox"/> SPT <input type="checkbox"/> CORE				
ELEV. (m)	PLASTIC      M.C      LIQUID 0      20      40      60      80      100	★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■	Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
							-Sand seem (100mm)	11
				16	SM		SAND, silty with gravel -Grey, hard, moist -Mixed angularity	12
				15			MASSIVE ICE, trace suspended gravel and sand -Easy drilling	12
				17				13
				18			-Cloudy	14
				19				14
				20				15
				21			-Gravelly	15
				22			SILT (Glacialfluvial Outwash), gravelly, sandy -Matrix supported, Nbe, dark beige, gap graded	16
				23	GM		GRAVEL, silty with sand -300mm cobble	17
								18
							END of HOLE -Target depth reached -Backfill with bentonite, 13 bags	19
								20

SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-04				
Midnight Sun Drilling		Dry Creek,		PROJECT NO: 552-202101				
Terra Sonic		Coordinates: Z07N N6892175m E516435m		ELEVATION: m				
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED	<input type="checkbox"/> DCPT	<input type="checkbox"/> AUGER	<input type="checkbox"/> BULK			
		<input type="checkbox"/> SPT	<input type="checkbox"/> CORE					
ELEV. (m)	PLASTIC      M.C      LIQUID 0      20      40      60      80      100		★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
	Sample Type	Sample #						
							-BST GRAVEL (Embankment), well-graded, with silt and sand	1
								2
								3
					24	GW-GM		4
								5
								6
								7
					25	GP	-Poorly graded, trace silt	8
								9
					26	ML	SILT with sand -Partially thawed, potentially Nbn	10
		LOGGED BY: KAE/GMK			Termination Depth: 15.2m			
		COMPILED BY: R.Stilwell			Complete: 2/14/2018			
		REVIEWED BY: K.Elmer			Pit #: _____ Page 1 of 2			

SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-04						
Midnight Sun Drilling		Dry Creek,		PROJECT NO: 552-202101						
Terra Sonic		Coordinates: Z07N N6892175m E516435m		ELEVATION: m						
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED		<input type="checkbox"/> DCPT						
		<input type="checkbox"/> AUGER		<input type="checkbox"/> BULK						
		<input checked="" type="checkbox"/> SPT		<input type="checkbox"/> CORE						
ELEV. (m)	PLASTIC      M.C      LIQUID 0      20      40      60      80      100		★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
						27	GM		GRAVEL, silty with sand -Grey, wet	11
						28	GM		SAND, silty with gravel -Grey, frozen (Nbe)	13
						29	ML		SILT (Glaciofluvial Outwash), some gravel, some sand -Matrix supported -Beige, thawed from drill (potentially Nbn)	15
									END of HOLE -Engineer satisfied -Backfill with bentonite, 11 bags	16
										17
										18
										19
										20
						LOGGED BY: KAE/GMK		Termination Depth: 15.2m		
						COMPILED BY: R.Stilwell		Complete: 2/14/2018		
						REVIEWED BY: K.Elmer		Pit #: _____ Page 2 of 2		

SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-05						
Midnight Sun Drilling		CSP Install, km 1838		PROJECT NO: 552-202101						
Terra Sonic		Coordinates: Z07N N6889945m E516527m		ELEVATION: m						
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED	<input type="checkbox"/> DCPT	<input type="checkbox"/> AUGER	<input type="checkbox"/> BULK					
		<input checked="" type="checkbox"/> SPT	<input type="checkbox"/> CORE							
ELEV. (m)	PLASTIC      M.C      LIQUID 0      20      40      60      80      100		★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
									GRAVEL, silty with some sand -Rusty brown, wet	
						30	ML		SILT -Grey/beige, saturated -Lamination -sensitive on contact, easy drilling	1
						31	ML			2
										3
									CLAY -Some plasticity -Beige, soft, wet	4
						32	CL			5
									-Frozen, Vx/Vs 40%, lenses up to 30mm thick	6
									END of HOLE -Target depth reached -Backfill with bentonite, 6 bags	7
										8
										9
										10

SUBSURFACE EXPLORATION AND TEST REPORT		Alaska Highway		SOURCE/TP#: 929-06						
Midnight Sun Drilling		CSP Install, km 1838		PROJECT NO: 552-202101						
Terra Sonic		Coordinates: Z07N N6889934m E516506m		ELEVATION: m						
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED	<input type="checkbox"/> DCPT	<input type="checkbox"/> AUGER	<input type="checkbox"/> BULK					
		<input type="checkbox"/> SPT	<input type="checkbox"/> CORE							
ELEV. (m)	PLASTIC      M.C      LIQUID 0      20      40      60      80      100		★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
						34	GM		GRAVEL, silty with sand -Rusty brown, moist	1
										2
									SILT -Greyish beige, saturated, sensitive to contact -Laminated -Easy drilling	3
						35	ML			4
						36	ML		-Sample falls out fo sample rod, very sensitive (50% Recovery)	5
										6
									END of HOLE -Target depth reached -Backfill with bentonite, 3 bags	7
										8
										9
										10
		LOGGED BY: KAE/GMK			Termination Depth: 6.1m					
		COMPILED BY: R.Stilwell			Complete: 2/15/2018					
		REVIEWED BY: K.Elmer			Pit #: _____ Page 1 of 1					



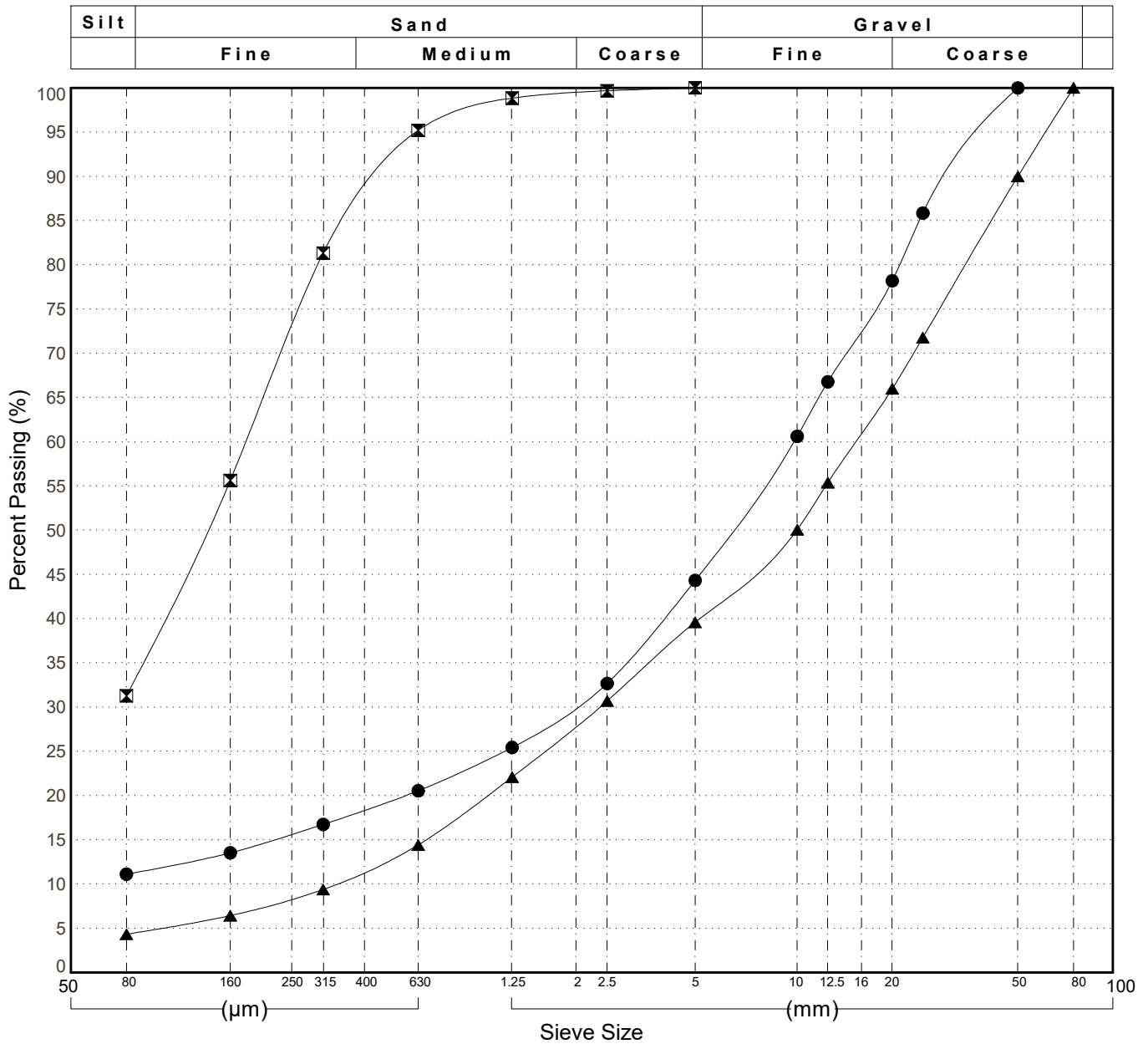
GRAIN SIZE ANALYSIS	CSP Install	SOURCE/TP#: 929-02
Midnight Sun Drilling	km 1829	PROJECT NO: 552-202101
Terra Sonic	Coordinates:Z07N N6881489m E518081m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 6	1778	5.1 to 5.3	POORLY GRADED GRAVEL with SILT and SAND(GP-GM)	3.2	NP	NP	NP	7.3	183.9	
☒ 10	1782	11.3 to 11.5	SILTY SAND(SM)	22.9	NP	NP	NP			
▲ 11	1783	11.9 to 12.1	WELL-GRADED GRAVEL with SAND(GW)	5.0	NP	NP	NP	1.1	44.7	0.34

Field #	Lab #	% PASSING	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.0	0.850	0.400	0.250	0.160	0.080	% Breakdown			
			Gravel	Sand	Silt	Clay														
● 6	1778	100.0	100.0	100.0	85.9	78.2	66.8	60.6	44.3	30.3	22.7	18.4	15.6	13.5	11.1	55.7	33.2	11.1		
☒ 10	1782	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	96.8	87.3	72.6	55.6	31.3	0.0	68.7	31.3		
▲ 11	1783	100.0	100.0	90.0	71.8	66.0	55.4	50.1	39.6	27.9	17.8	11.6	8.4	6.4	4.3	60.4	35.3	4.3		



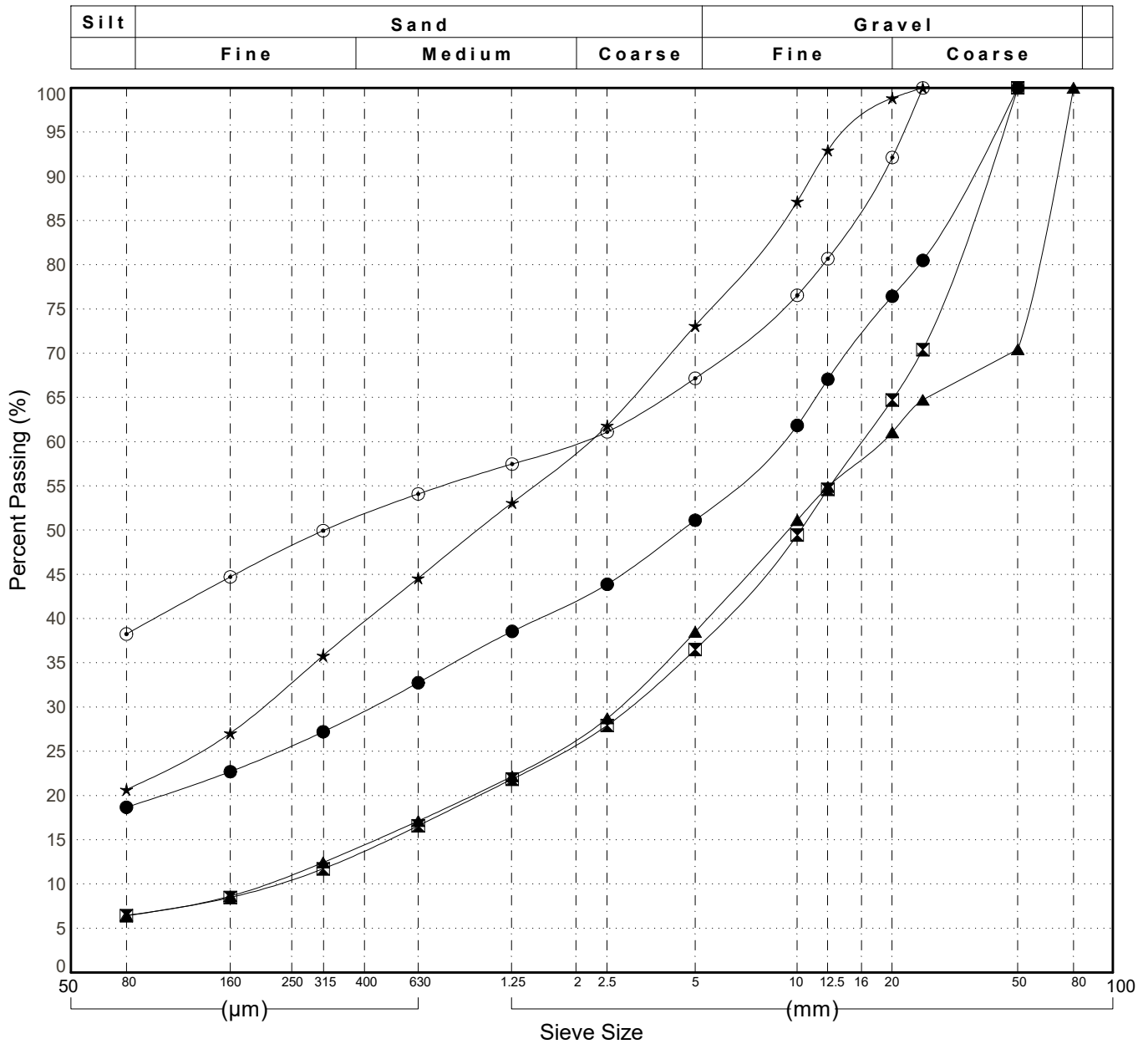
GRAIN SIZE ANALYSIS	Dry Creek	SOURCE/TP#: 929-03
Midnight Sun Drilling		PROJECT NO: 552-202101
Terra Sonic	Coordinates:Z07N N6892220m E516446m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 12	1784	0.8 to 0.9	SILTY GRAVEL with SAND(GM)	2.4	NP	NP	NP			
☒ 13	1785	1.9 to 2.1	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	1.5	NP	NP	NP	2.4	73.1	0.22
▲ 14	1786	7.9 to 8.1	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	1.8	NP	NP	NP	2.0	90.2	0.20
★ 16	1788	11.7 to 11.9	SILTY SAND with GRAVEL(SM)	6.7	NP	NP	NP			
⊙ 23	1795	17.0 to 17.2	SILTY GRAVEL with SAND(GM)	22.5	NP	NP	NP			

Field #	Lab #	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.0	0.850	0.400	0.250	0.160	0.080	% Breakdown			
		% PASSING														Gravel	Sand	Silt	Clay
● 12	1784	100.0	100.0	100.0	80.5	76.4	67.1	61.8	51.1	42.2	35.3	29.6	25.7	22.7	18.7	48.9	32.5	18.7	
☒ 13	1785	100.0	100.0	100.0	70.4	64.7	54.6	49.5	36.5	26.0	18.9	13.8	10.6	8.5	6.4	63.5	30.1	6.4	
▲ 14	1786	100.0	100.0	70.5	64.7	61.1	54.9	51.1	38.5	26.6	19.3	14.5	11.1	8.6	6.5	61.5	32.0	6.5	
★ 16	1788	100.0	100.0	100.0	100.0	98.9	93.0	87.2	73.1	59.0	48.3	39.6	32.8	27.0	20.7	26.9	52.4	20.7	
⊙ 23	1795	100.0	100.0	100.0	100.0	92.1	80.7	76.6	67.2	59.9	55.6	51.7	48.2	44.7	38.3	32.8	28.9	38.3	



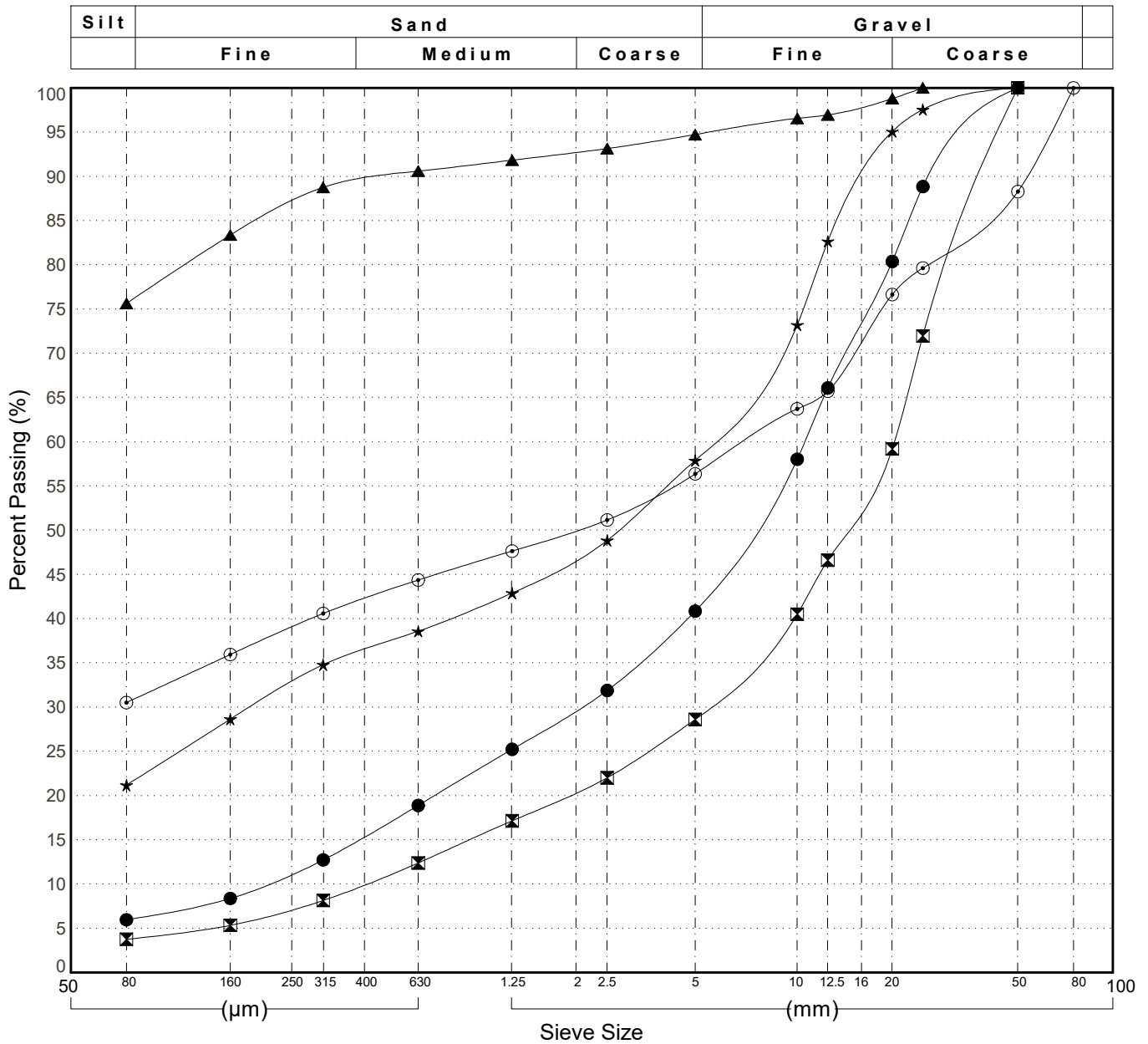
GRAIN SIZE ANALYSIS	Dry Creek	SOURCE/TP#: 929-04
Midnight Sun Drilling		PROJECT NO: 552-202101
Terra Sonic	Coordinates:Z07N N6892175m E516435m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 24	1796	4.0 to	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	1.5	NP	NP	NP	1.9	51.2	0.21
☒ 25	1797	7.6 to	POORLY GRADED GRAVEL with SAND(GP)	1.4	NP	NP	NP	3.1	47.5	0.43
▲ 26	1798	9.1 to	SILT with SAND(ML)	22.0	NP	NP	NP			
★ 27	1799	10.6 to	SILTY GRAVEL with SAND(GM)	7.3	NP	NP	NP			
⊙ 28	1800	12.4 to 12.7	SILTY GRAVEL with SAND(GM)	7.3	NP	NP	NP			

Field #	Lab #	%PASSING														% Breakdown				
			100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.0	0.850	0.400	0.250	0.160	0.080	Gravel	Sand	Silt	Clay
●	24	1796	100.0	100.0	100.0	88.8	80.4	66.1	58.0	40.9	29.7	21.7	15.4	11.2	8.4	6.0	59.1	34.9		6.0
☒	25	1797	100.0	100.0	100.0	72.0	59.2	46.6	40.5	28.6	20.4	14.5	10.0	7.2	5.3	3.8	71.4	24.9		3.8
▲	26	1798	100.0	100.0	100.0	100.0	98.8	96.9	96.6	94.7	92.7	91.1	89.6	86.9	83.4	75.6	5.3	19.1		75.6
★	27	1799	100.0	100.0	100.0	97.6	95.1	82.7	73.2	57.9	46.9	40.5	36.4	32.7	28.6	21.2	42.1	36.7		21.2
⊙	28	1800	100.0	100.0	88.3	79.6	76.6	65.7	63.7	56.4	50.0	45.8	42.2	39.0	35.9	30.5	43.6	25.9		30.5



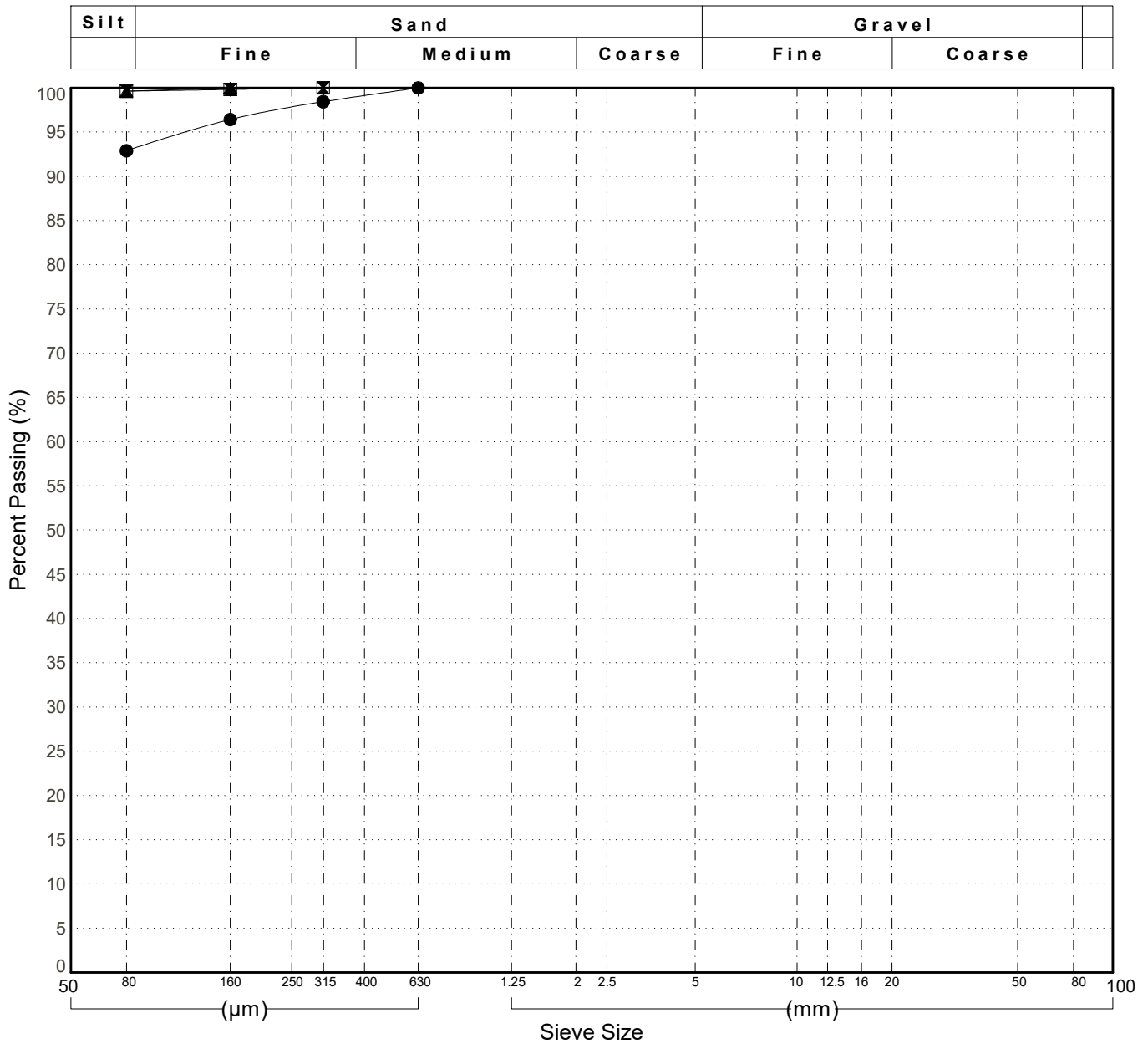
GRAIN SIZE ANALYSIS	CSP Install	SOURCE/TP#: 929-05
Midnight Sun Drilling	km 1838	PROJECT NO: 552-202101
Terra Sonic	Coordinates:Z07N N6889945m E516527m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 30	1802	0.9 to 1.1	SILT(ML)	24.8	NP	NP	NP			
☒ 31	1803	2.7 to 2.9	SILT(ML)	25.9	NP	NP	NP			
▲ 32	1804	4.5 to 4.7	SILT(ML)	30.9	NP	NP	NP			

Field #	Lab #	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.0	0.850	0.400	0.250	0.160	0.080	% Breakdown				
																Gravel	Sand	Silt	Clay	
● 30	1802	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	97.8	96.4	92.9	0.0	7.1		92.9	
☒ 31	1803	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.6	0.0	0.4		99.6	
▲ 32	1804	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	0.0	0.4		99.6	



GRAIN SIZE ANALYSIS	CSP Install	SOURCE/TP#: 929-06
Midnight Sun Drilling	km 1838	PROJECT NO: 552-202101
Terra Sonic	Coordinates:Z07N N6889934m E516506m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 34	1806	1.4 to 1.6	SILTY GRAVEL with SAND(GM)	13.7	NP	NP	NP			
☒ 35	1807	2.9 to 5.1	SILT(ML)	24.1	NP	NP	NP			
▲ 36	1808	4.3 to 4.5	SILT(ML)	20.8	NP	NP	NP			

Field #	Lab #	% PASSING	Sieve Size (mm)													% Breakdown				
			100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.0	0.850	0.400	0.250	0.160	0.080	Gravel	Sand	Silt	Clay
● 34	1806	100.0	100.0	100.0	100.0	90.0	85.1	73.4	67.7	54.6	46.3	42.1	35.8	28.9	21.8	18.3	45.4	36.3	18.3	
☒ 35	1807	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	99.1	98.3	0.0	1.7	98.3	
▲ 36	1808	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.3	98.8	97.6	97.6	0.0	2.4	97.6	

