

TEST HOLE LOGS

EXPLANATION OF SYMBOLS AND TERMS

The symbols and terms used on the test hole logs to summarize the results of the field investigation and the laboratory testing are described on the following sheets.

Soils are classified and described according to their engineering properties and behaviour. The descriptions applied to the various soil units as shown on the logs follow the Unified Soil Classification system with slight modification to recognize inorganic clays to medium plasticity (CI). Such descriptions are judgmental in nature and may differ in detail from that actually encountered in the field. The descriptions noted in the logs from test holes are based solely on inspections of soil and rock samples recovered or cuttings observed. The actual nature of the materials between samples may vary.

Laboratory tests have been performed on the various samples noted, following standard testing procedures or protocol unless otherwise noted. The test results are intended to provide a general indication of some of the engineering properties of the material.

ABBREVIATIONS

w or MC	Moisture content (ASTM D2216)	PP	Pocket Penetrometer
W _p or PL	Plastic limit (ASTM D4318)	γ	Unit weight
W _L or LL	Liquid limit (ASTM D4318)	γ_d	Dry unit weight
I _p or PI	Plasticity Index	ρ	Density
NP	Non-plastic soil	ρ_d	Dry density
SH	Shelby tube sample	q _u	Unconfined compressive strength
AU	Auger sample	C _u	Undrained shear strength
B	Bulk Sample	SO ₄	Concentration of water-soluble sulphates
UD	Undisturbed Sample	TCR	Total Core Recovery
RC	Rock Core Sample	RQD	Rock Quality Index
SPT	Standard Penetration Test	SCR	Solid Core Recovery
VST	Vane Shear Test	FI	Fracture Index

SIZE RANGES OF SOIL COMPONENTS	
Component	Size Range mm (US Sieve)
Boulders	Over 300 (12 inch)
Cobbles	75 (3 inch) to 300 (12 inch)
Gravel:	
Coarse	19 (3/4 inch) to 75 (3 inch)
Fine	5 (#4) to 19 (3/4 inch)
Sand:	
Coarse	2 (#10) to 5 (#4)
Medium	0.4 (#40) to 2 (#10)
Fine	0.08 (#200) to 0.4 (#40)
Clay and Silt	Less than 0.08 (#200)

SECONDARY CONSTITUENTS	
Term	Percentage
and	35% - 50%
y/ey	20% - 35%
some	10% - 20%
trace	0 - 10%

CONSISTENCY OF FINE GRAINED SOILS			
Term	Undrained Shear Strength (kPa)	SPT N	Description
Very soft	< 12	< 2	Easily penetrated with fist
Soft	12 - 25	2 - 4	Easily penetrated with thumb
Firm	25 - 50	4 - 8	Moderate effort to penetrate with thumb
Stiff	50 - 100	8 - 15	Great effort to indent with thumb
Very Stiff	100 - 200	15 - 30	Easily indented with thumbnail
Hard	> 200	> 30	Effort required to indent with thumbnail

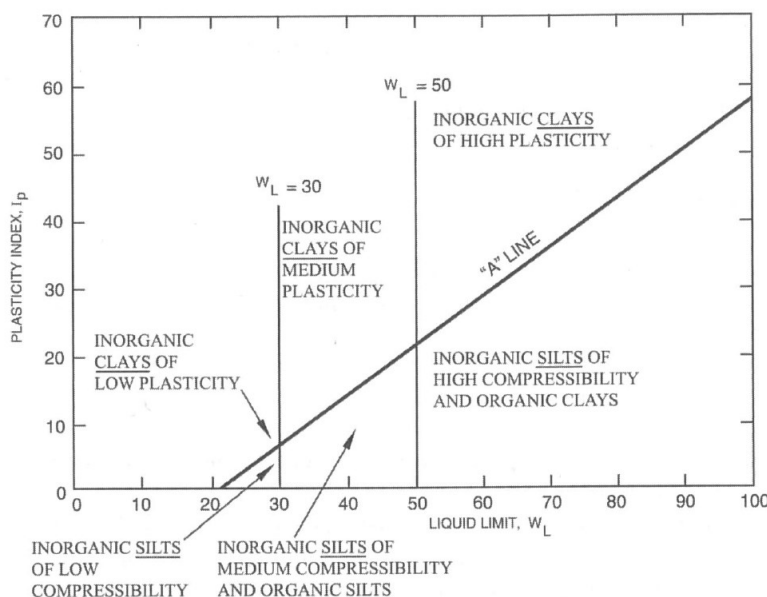
DENSITY OF COARSE GRAINED SOILS		
Term	SPT N	Approx. Relative Density (%)
Very loose	0 - 4	0 - 15
Loose	4 - 10	15 - 35
Compact	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	> 50	85 - 100

TEST HOLE LOGS

EXPLANATION OF SYMBOLS AND TERMS

UNIFIED SOIL CLASSIFICATION SYSTEM (MODIFIED)

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils	Strong colour or odor and fibrous texture	
COARSE-GRAINED SOILS MORE THAN HALF BY WEIGHT LARGER THAN 75 µm	GRAVELS MORE THAN HALF THE COARSE FRACTION LARGER THAN 4.75 mm	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well-graded gravels, gravel-sand mixtures	$C_u = D_{60}/D_{10} > 4$	$C_c = (D_{30})^2 / D_{10} \times D_{60}$ 1 to 3
			GP	Poorly graded gravels, gravel-sand mixtures	Not meeting all above requirements	
		GRAVELS WITH FINES (MORE THAN 12% FINES)	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or $PI < 4$	
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line or $PI > 7$	
	SANDS MORE THAN HALF THE COARSE FRACTION LARGER THAN 4.75 mm	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well-graded sands, gravelly sands	$C_u = D_{60}/D_{10} > 6$	$C_c = (D_{30})^2 / D_{10} \times D_{60}$ 1 to 3
			SP	Poorly graded sands or gravelly sands	Not meeting all above requirements	
		SANDS WITH FINES (MORE THAN 12% FINES)	SM	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or $PI < 4$	
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line or $PI > 7$	
FINE-GRAINED SOILS MORE THAN HALF BY WEIGHT SMALLER THAN 75 µm	SILTS BELOW "A" LINE ON PLASTICITY CHART; NEGLIGIBLE ORGANIC CONTENT		ML	Inorganic silts and very fine sands, rock flour, silty sands of slight plasticity	$LL < 50$	SEE PLASTICITY CHART BELOW
			MH	Inorganic silts, micaceous or diatomaceous, fine sandy or silty soils	$LL > 50$	
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART; NEGLIGIBLE ORGANIC CONTENT		CL	Inorganic clays of low plasticity, gravelly, sandy, or silty clays	$LL < 30$	
			CI	Inorganic clays of medium plasticity, silty clays	$30 < LL < 50$	
			CH	Inorganic clays of high plasticity	$LL > 50$	
	ORGANIC SILTS AND CLAYS BELOW "A" LINE ON PLASTICITY CHART		OL	Organic silts and organic silty clays of low plasticity	$LL < 50$	
			OH	Organic clays of high plasticity	$LL > 50$	



CORE CONDITION

Total Core Recovery (TCR)

Percentage of drill core recovered, regardless of quality or length, measured relative to the total length of core run

Solid Core Recovery (SCR)

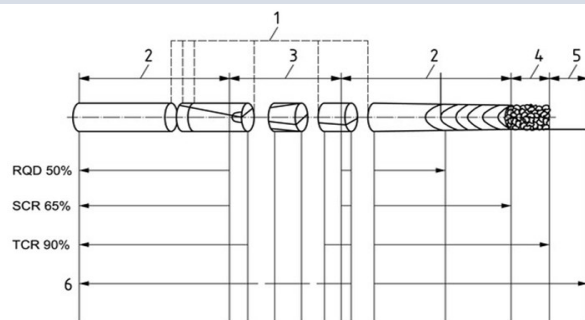
Percentage of drill core recovered at full diameter, regardless of length, measured relative to the total length of the core run.

Rock Quality Designation (RQD)

Percentage of solid drill core greater than 100 mm in length, measured relative to total core run

FRACTURE INDEX (FI)

The number of naturally occurring, discontinuities (physical separation) per metre of rock core. Mechanically induced breaks caused by drilling are not included.



Key

- 1 drilling-induced fractures at least one full diameter
- 2 no single full diameter
- 3 non-intact
- 4 no recovery
- 5 core run
- 6

Description of fracture state of rock cores:
RQD rock quality designation
SCR solid core recovery
TCR total core recovery

WEATHERING

TERM	DESCRIPTION
Fresh	No visible signs of decomposition.
Slightly	Slight discoloration inwards from open fracture.
Moderately	Discoloration throughout. Strength somewhat less than fresh, but cannot be broken by hand or scraped with knife. Texture observed.
Highly	Most minerals somewhat decomposed. Specimens can be broken with hand with effort or shaved with knife. Texture becomes indistinct, fabric preserved
Completely	Minerals decomposed to soil but fabric and structure preserved. Specimens easily crumbles or penetrated
Residual Soil	Advanced state of decomposition resulting in plastic soil. Rock fabric and structure completely destroyed

ROCK STRENGTH

TERM	DESCRIPTION
Extremely Strong	Can only be chipped with hammer, rings when struck
Very Strong	Many hammer blows to fracture
Strong	More than one hammer blow to fracture
Medium strong	Single firm hammer blow to fracture, cannot be cut or peeled by knife
Weak	Shallow indentations can be made with firm hammer blow
Very Weak	Crumbles under firm blows with hammer, can be peeled with knife
Extremely weak	Indented with thumbnail

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Extremely weak	Indented with thumbnail

DISCONTINUITY DATA

TYPE	DESCRIPTION	INFILL	DESCRIPTION
Joint	Stress induced, planar, one or more sub-parallel sets	Clean	Clean, unaltered, unstained discontinuity surface
Vein	Mineral infill or healed discontinuity	Partially coated	Partially thin coverage of infill material across the core diameter
Fault	Discontinuity with signs of significant movement	Completely coated	Complete thin coverage of infill material across the core diameter
Bedding	The surface that separates one stratum, layer or bed from another	Filled	Infill material is thick enough to fill the discontinuity surface roughness
Contact	The surface along which one rock type touches another	Stained	Chemical alteration of the discontinuity surface through oxidation, carbonation, and solution and has no coatings or infilling



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COREHOLE No : **22CH105**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16
DATE STARTED	04/19/2022	COMPLETED	04/19/2022
GROUND ELEVATION	778.10m	N	5612597.100
E	414225.000		
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH	
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75
DATE GROUND WATER RECORDED			

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		CLAY TILL, sandy, some gravel, trace silt, moist, stiff, medium plastic, brown, some oxidation staining, coal specks, suspect white sulphate inclusions		SH1								778
2												777
3		SHALE (Weathered), clay and silt, highly weathered, dark grey with yellowish brown inclusions, some oxidation staining, moist, high plastic, very weak, extremely closely spaced fractures, blocky		RC1	3.17 - 4.42	1	95 95 100					776
4				RC2	4.42 - 6.10	2	92 92 100					775
5												774
6				RC3	6.10 - 7.49	3	100 100 100					773
7		SHALE, clay and silt, highly weathered, grey, some oxidation staining, moist, high plastic, very weak, medium spaced fractures, fissured, gypsum crystals										772
8		...6.9 m - 4 mm layer of gypsum crystals		RC4	7.46 - 9.15	4	100 100 100					771
9		...7.5 m - 100 mm layer of siltstone, slightly weathered, very strong										770
				RC5	9.15 - 10.70	5	98 98 100					769

Notes:

Target depth of 12 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH105**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/19/2022 COMPLETED 04/19/2022 GROUND ELEVATION 778.10m N 5612597.100 E 414225.000
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - 300 mm layer: sandstone, fine grained, finely stratified, extremely weak, moist, grey		RC6	10.70 - 12.30	6	100 100 100			10 m - LL = 84.0% PL = 18.4% PI = 65.6%		768
12												767
13												766
14												765
15												764
16												763
17												762
18												761
19												760
												759

Notes:

Target depth of 12 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH109**

PAGE 1 OF 1

CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/20/2022 COMPLETED 04/20/2022 GROUND ELEVATION 778.60m N 5612595.500 E 414623.900
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		CLAY TILL, sandy, some subrounded gravel up to 15 mm, trace silt, Sand is fine to medium grained, damp, stiff, low to medium plastic, brown, some oxidation staining		SH1								778
2		SHALE (Weathered), clay and silt, completely weathered, dark brown with oxidation staining, moist, medium to high plastic, extremely weak, blocky, medium spaced fractures, finely stratified, suspect white sulphate inclusions										777
3		...3.5 m - becoming extremely closely spaced fractures (oxidized blocky discontinuities)		RC1	3.00 - 4.30	1	77 100 80			3 m - No fracture index or fracture analysis completed		776
4		...4.0 m - becoming medium to high plastic		RC2	4.30 - 5.10	2	75 95 97			4 m - LL = 49.1% PL = 17.5% PI = 31.6%		775
5				RC3	5.10 - 5.70	3	85 100 80			4.6 m - Circulation lost, short core run		774
6				RC5	5.70 - 7.50	4	77 100 100			4.8 m - Sand = 4.1% Silt = 57.8% Clay = 38.1%		773
7										5.3 m - Circulation lost; short core run		772
8		...7.3 m - widely spaced gypsum crystals layers up to 5 mm		RC6	7.50 - 9.34	5	84 100 100			7.5 m - EC: 10.3 dS/m		771
9		...7.6 m - becoming high plastic								7.5 m - SAR: 21.5 7.5 m - pH: 4.8 7.7 m - LL = 58.8% PL = 19.2% PI = 39.6%		770
										8 m - Slow drilling due to potential loss in circulation. Some drilling water loss.		769

Notes:

Target depth of 9 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH111**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16
DATE STARTED	07/20/2022	COMPLETED	07/20/2022
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	779.60m N 5612601.800 E 414759.400
CORING TYPE	HQ3	DIAMETER (mm)	61
		DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH111 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												779
2												778
3												777
4												776
5		SHALE (Weathered), clay and silt, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak to weak, blocky, very closely spaced fracture, finely stratified, coal staining, oxide staining, gypsum crystals ...4.8 m - 110 mm crumbled core ...5.0 m - becoming medium weathered	RC1		4.52 - 6.04	1	42 100 50	8				775
6		SHALE, clay and silt, trace sand, medium to highly weathered, grey, damp, high plastic, weak, closely spaced fractures, finely stratified, oxide staining, gypsum crystals ...5.6 m - 60 mm crumbled core ...6.0 m - becoming weak to moderately strong	RC2		6.04 - 7.56	2	88 100 92	6		5.4 m - Sand = 1.1% Silt = 59.6% Clay = 39.3% 6.04 m - EC: 8.4 dS/m 6.04 m - SAR: 18.2 6.04 m - pH: 4.6		774
7		...6.2 m - 60 mm crumbled core ...6.3 m - 76° fracture ...6.5 m - 86° fracture ...6.8 m - horizontal fracture ...7.0 m - becoming moderately strong ...7.0 m - 88° fracture ...7.3 m - 35 mm crumbled core ...7.8 m - 67° fracture ...7.8 m - 90 mm crumbled core ...8.0 m - 170 mm crumbled core ...8.4 m - 5 mm gypsum crystal vein ...8.6 m - becoming slightly weathered, moderately strong to strong ...8.9 m - 82° fracture	RC3		7.56 - 9.08	3	76 99 80	6		7 m - LL = 46.0% PL = 14.8% PI = 31.2%		773
8												772
9										8.6 m - LL = 71.9% PL = 20.1% PI = 51.8%		771
												770

Notes:

Target depth of 9 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH112**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	04/27/2022	COMPLETED	04/28/2022	GROUND ELEVATION	779.52m N 5612589.000 E 414897.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 3.0 m. REFER TO 22BH112 LOG							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												779
2												778
3												777
4		SHALE (Weathered), clay and silt, trace sand, completely weathered, dark brown, moist, high plastic, extremely weak, blocky, extremely closely spaced oxidized fractures, trace suspect white sulphate inclusions	RC1		3.00 - 4.50	1	65 68 62	20				776
5			RC2		4.50 - 5.65	2	0 100 95	20				775
6		...5.6 m - interbedded shale fragments	RC3		5.65 - 7.60	3	0 87 83	20			5 m - LL = 52.7% PL = 20.2% PI = 32.5% 5 m - Sand = 3.3% Silt = 57.5% Clay = 39.2% 5.6 m - Loss of circulation 6.2 m - EC: 7.1 dS/m 6.2 m - SAR: 15.9 6.2 m - pH: 4.6	774
7		...6.0 m - becoming very weak										773
8		SHALE, clay and silt, trace sand, medium weathered, grey, with oxidation specks, moist, high plastic, very weak, finely fissured, closely spaced oxidized fractures	RC4		7.60 - 8.90	4	10 100 92	7			7.6 m - EC: 8.6 dS/m 7.6 m - SAR: 22.3 7.6 m - pH: 6.7 7.8 m - LL = 69.2% PL = 21.2% PI = 48.0%	772
9		...8.4 m - steeply inclined fracture ...8.5 m - becoming moderately widely spaced fractures	RC5		8.90 - 10.50	5	84 100 86	3			9.1 m - Sand = 44.6% Silt = 37.7% Clay = 17.7%	771
												770

Notes:

Target depth of 12 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH112**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/27/2022 COMPLETED 04/28/2022 GROUND ELEVATION 779.52m N 5612589.000 E 414897.700
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...11.2 m - becoming weak to moderately strong	RC6		10.50	6	88	2				769
12			D1		12.20		88			11.2 m - Sand = 0.8% Silt = 69.5% Clay = 29.7% 11.2 m - UCS = 682 kPa		768
13												767
14												766
15												765
16												764
17												763
18												762
19												761
												760

Notes:

Target depth of 12 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH114**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	05/30/2022	COMPLETED	05/31/2022	GROUND ELEVATION
				777.13m N 5612589.000 E 415114.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, Drilled by 6" SSA to 5.6 m. REFER TO 22BH114 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												777
2												776
3												775
4												774
5												773
6		SHALE (Weathered), clay and silt, completely weathered, greyish brown, damp, medium plastic, extremely weak, very closely spaced fractures	RC1		5.64 - 7.54	1	0 24 5					772
7		...6.0 m - gypsum crystals										771
8		...6.1 m - no recovery, extremely weathered mudstone was washed away by coring			7.54 - 9.14	2	0 0 0			5.64 m - First two runs were air cored, but extremely weak and weathered mudstone was washed away and there was no recovery for Run 2. Switched to mud coring for Run 3 at 9.14 m.		770
9		...9.1 m - becoming slightly weathered, high plastic, closely spaced fractures, oxide staining	RC3		9.14 - 10.21	3	9 102 100					769
												768

Notes:

Target depth of 12 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH114**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/30/2022 COMPLETED 05/31/2022 GROUND ELEVATION 777.13m N 5612589.000 E 415114.700
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		SHALE, clay and silt, unweathered, grey, trace oxidation staining, dry, high plastic, weak to moderately strong, closely spaced fractures ... 10.3 m - strong layer, hard drilling		RC4	10.21 - 12.34	4	70 100 98					767
12				UD1						11.2 m - LL = 91.6% PL = 19% PI = 72.6% 11.2 m - Sand = 1.0% Silt = 59.3% Clay = 39.7%		766 765
13												764
14												763
15												762
16												761
17												760
18												759
19												758

Notes:

Target depth of 12 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH115**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	05/30/2022	COMPLETED	05/30/2022	GROUND ELEVATION	775.84m N 5612579.400 E 415213.500
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN, odexed to 5.64 m. REFER TO 22BH115 LOG								0 m - odex to 5.64m before coring		775
2												774
3												773
4												772
5												771
6		SHALE (Weathered), clay and silt, highly weathered, grey, some oxidation staining, damp, high plastic, extremely weak, very closely spaced fractures	RC1		5.64 - 6.40	1	0 92 61					770
7			RC2		6.40 - 7.72	2	0 100 98					769
8			RC3		7.72 - 9.24	3	20 99 93			7 m - LL = 57.7% PL = 21.9% PI = 35.8% 7 m - EC: 8.8 dS/m 7 m - SAR: 19.2 7 m - pH: 4.2		768
9		8.5 m - large slanted fracture, oxidation staining										767
		SHALE, clay and silt, trace sand, medium weathered, grey, some oxidation staining, damp, high plastic, very weak, medium spaced fractures	RC4		9.24 - 10.77	4	78 100 90					766

Notes:

Target depth of 15 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH115**

PAGE 2 OF 2

CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/30/2022 COMPLETED 05/30/2022 GROUND ELEVATION 775.84m N 5612579.400 E 415213.500
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		SILTSTONE, clay and silt, trace sand, unweathered, light grey, with oxidation specks, dry, high plastic, weak, widely spaced fractures, thinly bedded	UD1	RC5	10.77 - 12.32	5	65 87 86			10.4 m - LL = 75.6% PL = 18% PI = 57.6%		765
12												764
13		...12.7 m - moderately strong to strong pocket	RC6		12.32 - 13.87	6	77 95 94					763
14		SHALE, silty, unweathered, grey, dry, medium plastic, weak, medium spaced fracture, sand pockets	UD2	RC7	13.87 - 15.34	7	74 100 90			13.5 m - Sand = 9.1% Silt = 56.7% Clay = 34.2%		762
15			UD3							14.22 m - LL = 117.7% PL = 17.9% PI = 99.8%		761
16												760
17												759
18												758
19												757
												756

Notes:

Target depth of 15 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH116**

PAGE 1 OF 2

CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	04/20/2022	COMPLETED	04/21/2022	GROUND ELEVATION	774.90m N 5612560.300 E 415326.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		CLAY, silty, some sand, damp, stiff, low to medium plastic, brown										774
2		SHALE (Weathered), clay and silt, completely weathered, dark brown with mottled oxidation staining, moist, high plastic, extremely weak, very closely spaced fractures, blocky, finely stratified, gypsum crystals, suspect white sulphate inclusions, marine										773
3		...3.3 m - some yellowish deposits within fractures										772
4		...3.4 m - 60 mm layer of claystone, moderately weathered, very weak, finely fissured										771
5			RC1		4.60 - 6.40	1	77 91 100			4.6 m - 6" SS augered to 4.6 m before commencing rock coring		770
6			RC2		6.40 - 7.55	2	86 100 100			5.3 m - LL = 55.3% PL = 26.6% PI = 28.7%		769
7			RC3		7.55 - 8.40	3	93 98 100			5.3 m - EC: 8.5 dS/m 5.3 m - SAR: 19.8 5.3 m - pH: 7.7 6.7 m - losing water during coring process		768
8			RC4		8.40 - 9.35	5	67 100 95			8.3 m - loss of circulation at 8.3 m		767
9		SHALE, clay and silt, sandy, medium weathered, grey, moist, high plastic, moderately strong, closely spaced fractures, finely stratified	RC5		9.35 - 10.70	5	96 96 100					766
										10 m - LL = 118.9%		765

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH116**

PAGE 2 OF 2

CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	04/20/2022	COMPLETED	04/21/2022	GROUND ELEVATION	774.90m N 5612560.300 E 415326.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11				RC6	10.80	6	84			PL = 15.4% PI = 103.5%		764
					-		100			10 m - Sand = 23.1%		
					11.70		93			Silt = 42.4%		
										Clay = 34.5%		
12		...11.8 m - 100 mm layer of strong sandstone		RC7	11.70	7	16			10 m - Dispersivity		
					-		66			Classification = ND3		
					12.65		57			11.1 m - Sand = 5.7%		763
										Silt = 53.0%		
										Clay = 41.3%		
13				RC8	12.65	8	80					762
					-		100			13 m - LL = 121.1%		
					11.70		80			PL = 16.4%		
										PI = 104.7%		
14				RC9	13.70	9	83					761
					-		100					
					15.50		95					
15		...14.5 m - becoming trace sand								14.5 m - Sand = 1.1%		760
		...15.0 m - suspect hydrocarbons, multicolored Freewater								Silt = 59.1%		
										Clay = 39.8%		
16				RC10	15.50	10	80					759
					-		100					
					16.90		92			16 m - LL = 81.8%		
										PL = 30.8%		
										PI = 51.0%		
17		...16.2 m - moderately widely spaced fractures, moderately to steeply inclined		RC11	16.90	11	80					758
					-		100					
					18.65		89					
18										17.8 m - loss of circulation at 17.5 m		757
19												756
												755

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH117**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/28/2022 COMPLETED 04/28/2022 GROUND ELEVATION 774.01m N 5612559.600 E 415427.800
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 9.1 m. REFER TO 22BH117 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												773
2												772
3												771
4												770
5												769
6												768
7												767
8		SHALE (Weathered), clay and silt, highly weathered, light brown to dark grey mottling, moist, high plastic, extremely weak, extremely closely spaced oxidized fractures										766
9		BENTONITE (9.7 m), 60 mm layer, clayey, silty, moist, stiff, high plastic, greyish brown	RC1		9.10 - 10.06	1	26 88 67	10				765
		SILTSTONE, clayey, sandy, slightly weathered, grey, damp, high plastic, very strong, massive								9.7 m - LL = 218.8% PL = 43.3%		

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH117**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	04/28/2022	COMPLETED	04/28/2022	GROUND ELEVATION
				774.01m N 5612559.600 E 415427.800
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - No recovery	RC2	10.06	2	24	15			PI = 175.5%		
			UD1	-		37				10 m - Hard drilling		
			RC3	10.52	3	22	4			10.4 m - LL = 105.9%		
				10.52		87				PL = 13.7%		
		...11.0 m - Becoming finely fissured, moderately strong		-		87				PI = 92.2%		763
				12.35		86				10.4 m - Sand = 21.1%		
12		SHALE, clay and silt, unweathered, grey to dark grey, damp, high plastic, weak, finely fissured, closely spaced to medium spaced fractures	RC4	12.35	4	100	3			Silt = 52.4%		762
				-		100				Clay = 26.5%		
				13.70		100						761
13			RC5	13.70	5	100	3					760
				-		100						
				15.20		100						
14			UD2	-		97				14.7 m - LL = 76.9%		759
			RC6	15.20	6	100	3			PL = 18.4%		
				-		100				PI = 58.5%		
				16.70		97				14.7 m - EC: 1.7 dS/m		758
15			UD3	-		94				14.7 m - SAR: 18.7		
			RC7	16.70	7	100	4			14.7 m - pH: 8.9		757
		...17.0 m - Becoming moderately strong		-		97				14.7 m - UCS = 1465 kPa		
				18.30								756
17			RC8	18.30	8	100	4					755
		...18.5 m - gently inclined fracture		-		100						
				19.80		93						
18			RC9	19.80	9	92	4			20 m - LL = 105.9%		
		...19.3 m - gently inclined fracture										

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH117**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 04/28/2022 COMPLETED 04/28/2022 GROUND ELEVATION 774.01m N 5612559.600 E 415427.800
DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21					- 21.50		92 90			PL = 13.7% PI = 92.2%		753
22												752
23												751
24												750
25												749
26												748
27												747
28												746
29												745

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH118**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/10/2022 COMPLETED 06/11/2022 GROUND ELEVATION 772.37m N 5612553.698 E 415512.170
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 769.91 m 2.46 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 3.1 m. REFER TO 22BH118 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1											772
2											771
3											770
4		SHALE (Weathered), clay and silt, trace sand, highly weathered, dark banded brown, some oxidation staining, moist, high plastic, very weak, blocky, finely stratified, medium spaced oxidized fractures, some gypsum crystal inclusions	RC1 UD1	3.10 - 4.62	1	58 69 58	20			3.3 m - LL = 73.2% PL = 17.7% PI = 55.5%	769
5			UD2							3.8 m - Dispersivity Classification = D2 3.8 m - EC: 1.8 dS/m 3.8 m - SAR: 29.9 3.8 m - pH: 8.4	768
6			RC2	4.62 - 6.14	2	53 67 48	4				767
7		BENTONITE (6.2 m), 50 mm layer of bentonitic shale, high plastic, clay and silt, trace sand	RC3 UD4	6.14 - 7.66	3	86 100 80	6			6 m - LL = 160.2% PL = 16.4% PI = 143.8%	766
8		SHALE (Weathered), "..." ...6.3 m - 20 mm layer of strong sandstone	UD3							6.2 m - Sand = 3.0% Silt = 45.0% Clay = 52.0%	765
9			RC4	7.66 - 9.18	4	90 100 91	4			6.6 m - Sand = 20.3% Silt = 53.8% Clay = 25.9%	764
		SHALE, clay and silt, trace sand, unweathered, grey, moist, high plastic, moderately strong, finely fissured	UD5 UD6							6.6 m - EC: 5.5 dS/m 6.6 m - SAR: 22.4 6.6 m - pH: 7.9	763
		...9.2 m - becoming very strong ...9.3 m - 43° fracture ...9.6 m - 55° fracture	RC5	9.18 - 10.70	5	84 100 91	1			8.6 m - Dispersivity Classification = ND3	

Notes:

Target depth of 24 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.30	PLAIN
6.30	7.80	SLOTTED

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH118**

PAGE 2 OF 3

CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/10/2022	COMPLETED	06/11/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	772.37m	N 5612553.698 E 415512.170
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	769.91 m	2.46 m
		DATE GROUND WATER RECORDED	08/10/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11				RC6	10.70	6	93	3				762
				UD7	12.22		100					761
12		...11.7 m - 69° fracture								11.3 m - LL = 102.0% PL = 17.2% PI = 84.8%		
		...12.0 m - 57° fracture										
13		...12.5 m - 76° fracture		RC7	12.22	7	97	5				760
		...12.9 m - 55° fracture					100					
		...13.4 m - 47° fracture			13.74		87					759
14		...14.0 m - 65° fracture		RC8	13.74	8	95	3				758
		...14.4 m - 53° fracture			15.26		100					
15		...14.9 m - 75 mm layer of suspect calcified shale, very strong, some ammonites		UD8			91			14.6 m - Sand = 7.8% Silt = 59.9% Clay = 32.3%		757
		...15.6 m - 31° fracture		RC9	15.26	9	93	3				
16		...16.1 m - 56° fracture			16.78		100					756
		...16.6 m - 55° fracture					86					
17		...17.7 m - 52° fracture		RC10	16.78	10	100	1				755
		...18.5 m - 52° fracture			18.30		100					
18				RC11	18.30	11	100	1				754
					19.82		100					
19				RC12	19.82	12	93	2				753
				UD9						20 m - LL = 92.7%		

Notes:

Target depth of 24 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.30	PLAIN
6.30	7.80	SLOTTED

Logged By: C. Braun / J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH118**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/10/2022 COMPLETED 06/11/2022 GROUND ELEVATION 772.37m N 5612553.698 E 415512.170
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 769.91 m 2.46 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.7 m - 50mm weak section of seam infill material starting with an 80° fracture		RC13	21.34	13	93 86	2		PL = 16.4% PI = 76.3%		752
		...20.9 m - 69° fracture			-		100					751
		...21.6 m - 65° fracture			22.86		100 90					750
22		...22.3 m - 24° fracture										749
23				RC14	22.86	14	99 99 97	1				748
		...24.2 m - 90° fracture, bentonite fragment			24.38							747
24												746
25												745
26												744
27												743
28												
29												

Notes:

Target depth of 24 m achieved. Corehole completed as
a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	6.30	PLAIN
6.30	7.80	SLOTTED

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH119**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	05/26/2022	COMPLETED	05/27/2022	GROUND ELEVATION
				770.91m N 5612542.000 E 415620.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 4.6 m. REFER TO 22BH119 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												770
2												769
3												768
4												767
5		SHALE (Weathered), clay and silt, trace sand, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, finely fissured, very thinly laminated oxidation layers, trace quartz crystals	RC1		4.60 - 6.20	1	0 101 95			4.6 m - EC: 9.7 dS/m 4.6 m - SAR: 35.2 4.6 m - pH: 8.0		766
6		...5.2 m - moderately thin oxidation laminations	RC2		6.20 - 7.77	2	7 99 60			5.4 m - LL = 119.1% PL = 16.2% PI = 102.9%		765
7		...5.5 m - weak										764
8		...7.4 m - 10 mm grey sandstone layer	RC3		7.77 - 9.27	3	8 99 47			7.8 m - Complete loss of drilling mud circulation, took 700 L until circulation returned		763
9		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, weak, very closely to closely spaced fractures, thinly laminated oxidation layers, finely stratified										762
		...9.1 m - unweathered	RC4		9.27 - 10.82	4	64 100 82					761

Notes:

Wetland area: Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH119**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	05/26/2022	COMPLETED	05/27/2022	GROUND ELEVATION
				770.91m N 5612542.000 E 415620.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - transition to moderately widely spaced discontinuities ...10.5 m - moderately strong		RC5	10.82	5	96					760
				UD1	12.30		100					
12		...11.6 m - 80° fracture					90			11.5 m - LL = 78.7% PL = 14.1% PI = 64.6%		759
				RC6	12.30	6	99					
		...12.6 m - 75° fracture					99					
13		...13.0 m - 60° fracture			13.82		91					758
				RC7	13.82	7	101					
14		...14.1 m - 65° fracture					101					757
					15.34		92					
15				RC8	15.34	8	95					756
		...16.0 m - 55° fracture					100					
					16.84		93					755
16				RC9	16.84	9	95					754
		...16.8 m - moderately inclined fracturing					99					
					18.36		92					753
17				RC10	18.36	10	77					
							77					
18				UD2	19.92		74					752
		...19.6 m - 0.5m severely fractured section producing incomplete/sloppy core sections, resulted in inconsistent TCR values for runs 10 and 11								18.7 m - Sand = 0.2% Silt = 58.6% Clay = 41.2%		
19				RC11		11						751

Notes:

Wetland area: Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH119**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	05/26/2022	COMPLETED	05/27/2022	GROUND ELEVATION
				770.91m N 5612542.000 E 415620.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.4 m - moderately fractured, weak	UD3		19.92 - 21.44		85 124 84			21.05 m - LL = 63.2% PL = 16.1% PI = 47.1%		750
22			RC12		21.44 - 22.97	12	78 100 69			21.05 m - EC: 1.9 dS/m 21.05 m - SAR: 20.5 21.05 m - pH: 8.9		749
23		...23.0 m - moderately inclined fracturing	RC13		22.97 - 24.49	13	100 100 91					748
24		...24.5 m - moderately strong to strong	UD4							23.96 m - UCS = 1702 kPa 24 m - Sand = 0.0% Silt = 55.8% Clay = 44.2%		747
25			RC14		24.49 - 26.02	14	100 100 97					746
26		...26.0 m - moderately strong	RC15		26.02 - 26.40	15	103 103 49			26.02 m - LL = 55.4% PL = 21% PI = 34.4%		745
27		...26.4 m - strong, light grey	UD5 RC16		26.40 - 27.01	16	103 103 49			26.02 m - Sand = 0.4% Silt = 57.0% Clay = 42.6%		744
28												743
29												742
												741

Notes:

Wetland area: Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH120**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/24/2022 COMPLETED 05/25/2022 GROUND ELEVATION 770.78m N 5612544.800 E 415712.400
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 6.1 m. REFER TO 22BH120 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												770
2												769
3												768
4												767
5												766
6												765
7												764
8												763
9												762
												761

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH120**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/24/2022 COMPLETED 05/25/2022 GROUND ELEVATION 770.78m N 5612544.800 E 415712.400
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - 62° fracture ...10.4 m - 28° fracture ...10.6 m - 84° fracture ...11.0 m - 34° fracture		RC5	10.40 - 11.60	5	87 100 87					760
12		...12.0 m - 41° fracture		RC6	11.60 - 13.00	6	92 92 88					759
13				RC7 UD1 UD2	13.00 - 14.05	7	108 108 98			13.27 m - LL = 59.0% PL = 22% PI = 37.0%		758
14		...14.0 m - 45° fracture		RC8	14.05 - 14.60	8	100 100 100			13.27 m - Sand = 1.3% Silt = 67.6% Clay = 31.1%		757
15				RC9	14.60 - 15.48	9	75 93 82					756
16		...15.5 m - sub horizontally oriented fracture ...15.9 m - 38° fracture		RC10	15.48 - 16.60	11	108 120 112					755
17				RC11 UD3	16.60 - 17.86	11	88 100 87					754
18		...17.4 m - 66° fracture ...17.6 m - very weak ...17.7 m - 100mm indurated zone (through suspect calcification) ...17.8 m - 60° fracture ...17.9 m - very steeply inclined fractures		UD4 RC12	17.86 - 19.26	12	77 99 64			17.7 m - LL = 66.3% PL = 17.7% PI = 48.6% 17.7 m - EC: 3.8 dS/m 17.7 m - SAR: 32.5 17.7 m - SO4-S: 511.6 mg/kg 17.7 m - pH: 8.6		753
19				UD5 RC13	19.26 - 20.42	13	100 100 94					752
												751

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH120**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/24/2022 COMPLETED 05/25/2022 GROUND ELEVATION 770.78m N 5612544.800 E 415712.400
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.2 m - 30° fracture		RC14	20.42	14	99					750
					-		102					
					21.49		94					
22		...21.9 m - moderately to steeply inclined fractures		RC15	21.49	15	94					749
					-		98					
				UD6	23.02		82			21.94 m - UCS = 2304 kPa		
23				RC16	23.02	16	99					748
					-		99					
					24.24		95					747
24				RC17	24.24	17	96					
					-		96					
					25.46		96					746
25				RC18	25.46	18	109					
					-		109			25.71 m - LL = 65.0% PL = 17.7% PI = 47.3%		745
				UD7	26.66		109					
26				RC19	26.66	19	72					744
					-		100					
					27.86		80					743
27												
28												742
29												741

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH121**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/31/2022 COMPLETED 05/31/2022 GROUND ELEVATION 769.99m N 5612538.600 E 415818.200
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 5.95 m. REFER TO 22BH121 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												769
2												768
3												767
4												766
5												765
6												764
7												763
8												762
9												761
		SHALE (Weathered), clay and silt, trace sand, highly weathered, brown with oxidation staining, damp, high plastic, very weak, very closely spaced fractures, oxide staining, quartz crystals in each fracture ...7.0 m - moderately inclined fractures		RC1	5.95 - 7.72	1	0 90 56	27				
				RC2	7.72 - 9.34	2	0 100 58	21				
				UD1 RC3	9.34 - 10.87	3	20 104 72					
										8.1 m - EC: 7.9 dS/m 8.1 m - SAR: 22.4 8.1 m - pH: 7.8		

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH121**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	05/31/2022	COMPLETED	05/31/2022	
		GROUND ELEVATION	769.99m	N 5612538.600 E 415818.200
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		SHALE, clay and silt, trace sand, unweathered, grey, dry, high plastic, weak, closely spaced fractures		RC4	10.87	4	61					759
		...11.0 m - becoming some sand, bentonic shale		UD2	-		100			11.6 m - LL = 135.4% PL = 16.7% PI = 118.7%		758
				RC5	12.37	5	54					757
					-		100					
					13.95		75					
14				RC6	13.95	6	53					756
					-		101			13.3 m - Sand = 18.1% Silt = 45.5% Clay = 36.4% 13.33 m - EC: 2.3 dS/m 13.33 m - SAR: 30.1 13.33 m - pH: 9.0		
					15.45		73					
15				UD3								755
				RC7	15.45	7	45	8				
					-		100			15.48 m - LL = 142.3% PL = 28.8% PI = 113.5%		
					16.56		67					754
17		...16.5 m - becoming moderately widely spaced fractures		RC8	16.56	8	93	2				753
					-		100					
					18.45		88					
18												752
				RC9	18.45	9	69	7				
					-		100					
19		...18.8 m - becoming moderately strong		UD5	19.97		96					751
				RC10		10						

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH121**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 05/31/2022 COMPLETED 05/31/2022 GROUND ELEVATION 769.99m N 5612538.600 E 415818.200
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.2 m - large fracture			19.97 - 21.49	79 100 80						749
22		...21.4 m - large fractured area		RC11 UD6	21.49 - 23.02	11 46 99 84				21.49 m - Sand = 0.3% Silt = 62.0% Clay = 37.7%		748
23				RC12	23.02 - 24.54	12 56 100 67		8				747
24												746
25				RC13	24.54 - 26.09	13 61 99 77		9				745
26		...25.9 m - horizontal fracture		UD7								744
27				RC14	26.09 - 27.43	14 85 100 93		6				743
28												742
29												741

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH122**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/25/2022 COMPLETED 04/26/2022 GROUND ELEVATION 769.32m N 5612530.200 E 415927.000
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8" DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 4.5 m. REFER TO 22BH122 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												769
2												768
3												767
4												766
5		SHALE (Weathered), clay and silt, trace sand, highly weathered, brown, some oxidation staining, moist, high plastic, extremely weak, blocky, closely spaced fractures, gypsum crystals, fractures oxidized and magnesium stained	RC1		4.50 - 6.60	1	79 90 100	5				765
6		...5.5 m - steeply inclined oxidized fracture with gypsum crystals								5.1 m - LL = 87.9% PL = 18.4% PI = 69.5%		764
7		...6.2 m - becoming finely fissured	RC2		6.60 - 7.30	2	29 100 94	20		5.1 m - Sand = 0.3% Silt = 60.6% Clay = 39.1%		763
		...6.9 m - sub-vertical oxidized fracture	RC3		7.30 - 8.90	3	18 100 100	20		5.1 m - EC: 7.3 dS/m 5.1 m - SAR: 34.8 5.1 m - pH: 7.9		762
8		SILT SHALE, and clay, trace sand, medium weathered, grey, damp, high plastic, weak to moderately strong										761
9			RC4		8.90 - 10.60	4	70 97 82	6		8.5 m - LL = 82.4% PL = 26.6% PI = 55.8%		760
										8.5 m - Sand = 0.5% Silt = 62.4% Clay = 37.1%		
										8.9 m - UCS = 1206 kPa		

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH122**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	04/25/2022	COMPLETED	04/26/2022	GROUND ELEVATION
				769.32m N 5612530.200 E 415927.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.8 m - becoming unweathered		RC5	10.60 - 12.30	5	88 100 97					759
12				RC6	12.30 - 13.80	6	93 100 97			11.5 m - EC: 4.0 dS/m 11.5 m - SAR: 41.9 11.5 m - pH: 8.4		758
13				RC7	13.80 - 15.30	7	83 100 83					757
14				RC8	15.30 - 16.80	8	83 100 90					756
15		...16.5 m - clay content increasing		RC9	16.80 - 17.80	9	0 33 19					755
16				RC10	17.80 - 18.40	10	17 58 35					754
17		...18.2 m - Unweathered, moderately strong, closely spaced fractures		UD1	18.40 - 19.90	11	91 100 97			17.8 m - No sample recovery from 17.8 m to 18.2 m 18.3 m - LL = 69.3% PL = 14.5% PI = 54.8% 18.3 m - Sand = 0.2% Silt = 71.4% Clay = 28.4%		753
18				RC11								752
19				RC12		12		4				751
												750

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH122**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	04/25/2022	COMPLETED	04/26/2022	GROUND ELEVATION	769.32m N 5612530.200 E 415927.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21				RC13	19.90 - 21.20	13	78 100 74	5				749
22				RC14	21.20 - 22.70	14	85 100 85					748
23				RC15	22.70 - 24.50	15	85 100 93					747
24				UD2	24.50 - 25.90	16	95 96 93	5				746
25				RC16	25.90 - 27.60	17	80 92 80	3				745
26				RC17	27.60 - 28.80	18	98 100 98	2				744
27		...27.0 m - becoming moderately widely spaced fractures		RC18	28.80 - 30.70	19	90 94 71	4				743
28		...28.0 m - becoming and clay ...28.2 m - gently inclined fracture 15° from horizontal								24.5 m - LL = 68.1% PL = 18.5% PI = 49.6% 24.5 m - UCS = 1604 kPa		742
29										28 m - LL = 63.2% PL = 17.7% PI = 45.5% 28 m - Sand = 3.3% Silt = 54.7% Clay = 42.0%		741
												740

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH122**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 04/25/2022 COMPLETED 04/26/2022 GROUND ELEVATION 769.32m N 5612530.200 E 415927.000
DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31												739
32												738
33												737
34												736
35												735
36												734
37												733
38												732
39												731
												730

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH123**

PAGE 1 OF 3

CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/26/2022 COMPLETED 04/27/2022 GROUND ELEVATION 769.61m N 5612537.100 E 416015.100
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8" DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 6.1 m. REFER TO 22BH123 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												769
2												768
3												767
4												766
5												765
6		SHALE (Weathered), clay and silt, trace sand, highly weathered, dark brown with oxidation staining, moist, high plastic, extremely weak, blocky oxidized extremely closely spaced fractures with interbedded finely fissured layers, trace suspect white sulphate inclusions and gypsum crystals, some black oxidized magnesium staining	RC1		6.10 - 7.70	1	16 92 79	20		6.1 m - EC: 12.1 dS/m 6.1 m - SAR: 33.8 6.1 m - pH: 7.2 6.9 m - LL = 63.0% PL = 25.2% PI = 37.8% 6.9 m - Sand = 0.2% Silt = 64.2% Clay = 35.6%		763
7		...7.0 m - fractures mainly sub-horizontal										762
8		...7.7 m - becoming brownish grey with closely spaced, mainly sub-horizontal fractures	RC2		7.70 - 8.90	2	44 100 88	14		7.5 m - Drilling using abundant amount of water, loss of circulation 8 m - Using ~1100L of drilling water 9.1 m - Gell-stabilizer added to regain circulation.		761
9		SHALE, clay and silt, trace sand, grey with oxidized fractures, moist, high plastic, weak to moderately strong, finely fissured, very closely spaced oxidized fractures, trace gypsum crystals within fractures	RC3		8.90 - 10.70	3	78 90 80	8				760
		...8.3 m - moderately to steeply inclined (30-35°) oxidized fractures with some gypsum crystals										

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH123**

PAGE 2 OF 3

CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	04/26/2022	COMPLETED	04/27/2022	GROUND ELEVATION	769.61m N 5612537.100 E 416015.100
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8"	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - becoming unweathered		RC4	10.70	4	96	4		9.9 m - LL = 68.1% PL = 27.2% PI = 40.9%		759
		...10.5 m - no oxidation staining within fractures		B1	- 12.34		99 99					
12				RC5	12.34	5	88	11		11.3 m - Sand = 0.6% Silt = 65.2% Clay = 34.2%		758
					- 13.70		100 93			11.3 m - Dispersivity Classification = ND3 11.3 m - EC: 4.0 dS/m		757
13				RC6	13.70	6	94	16		11.3 m - SAR: 41.3 11.3 m - pH: 8.4		756
					- 15.30		100 96					755
14				RC7	15.30	7	63	11				754
					- 16.80		100 91					753
15				RC8	16.80	8	93	6				752
					- 18.40		98 97					751
16				RC9	18.40	9	92	4		17.5 m - LL = 113.7% PL = 17.7% PI = 96.0%		750
					- 19.87		96 92			17.5 m - Sand = 0.1% Silt = 29.8% Clay = 70.1%		
17				RC10	19.87	10	53	20		18.08 m - LL = 81.0% PL = 18% PI = 63.0%		
										18.08 m - Sand = 0.1%		

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH123**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 04/26/2022 COMPLETED 04/27/2022 GROUND ELEVATION 769.61m N 5612537.100 E 416015.100
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.0 m - gently inclined fracture			-		100					
					21.50		84					
			RC11		21.50	11	11	20				
		...21.7 m - reflective amonite, 1 mm thick within gently inclined fracture (see photo)			-		100					
22					22.40		68					
		...22.2 m - 125 mm layer of strong siltstone	RC12		22.40	12	93	6				
			UD1		-		100					
23			UD2		24.50		88					
			UD3									
24												
		...24.5 m - steeply inclined fracture	RC13		24.50	13	92	5				
25		...24.7 m - steeply inclined fracture			-		100					
					25.70		83					
26			RC14		25.70	14	89	8				
					-		100					
27		...26.2 m - becoming very strong	UD4		27.20		97			26.3 m - UCS = 2136 kPa		
28												
29												

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH124**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/01/2022 COMPLETED 06/01/2022 GROUND ELEVATION 770.57m N 5612527.600 E 416115.700
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 6.1 m. REFER TO 22BH124 LOG							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												770
2												769
3												768
4												767
5												766
6												765
7		SHALE (Weathered), clay and silt, trace sand, highly weathered, greyish brown, damp, high plastic, extremely weak, very closely spaced fractures, oxide staining throughout ...7.2 m - trace quartz crystals	RC1		6.07 - 7.64	1	0 66 25			5 m - Plenty of water lost during drilling / poor circulation for first ~20 m of hole		764
8		...7.6 m - quartz crystals and oxide staining at each fracture	RC2		7.64 - 8.79	2	37 100 62			6.07 m - Run 1 was done using smaller bit. Sample completely broken up due to improper core barrel. Switched back to 75 mm bit for subsequent runs		763
9			UD1							7.64 m - 7.64 - 1000 L of water used in first 2 runs; losing lots of water through fractures		762
			RC3		8.79 - 10.01	3	18 103 75			8.1 m - LL = 66.0% PL = 15.7% PI = 50.3%		761
			UD2							8.1 m - Dispersivity Classification = D2		

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH124**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/01/2022	COMPLETED	06/01/2022	GROUND ELEVATION	770.57m N 5612527.600 E 416115.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		SHALE, trace sand, slightly weathered, grey, dry, nonplastic, very weak, closely spaced fractures, trace oxide staining	RC4		10.01 - 11.26	4	42 100 81			9.55 m - UCS = 582 kPa 10.01 m - Lost circulation		760
12		...12.1 m - strong layer for .04 m	RC5		11.26 - 12.32	5	57 108 85			11.1 m - LL = 76.3% PL = 18.1% PI = 58.2%		759
13		...13.4 m - steeply inclined fracture ...13.6 m - becoming weak with moderately strong pockets	UD3 RC6		12.32 - 13.84	6	43 99 72			11.1 m - EC: 5.0 dS/m 11.1 m - SAR: 46.5 11.1 m - pH: 8.9		758
14			RC7		13.84 - 15.37	7	69 101 86					757
15		...15.4 m - extremely fractured core, broke apart while drilling; only 0.8 m recovery	RC8		15.37 - 16.87	8	0 53 24			15.6 m - Sand = 0.7%		755
16		...15.4 m - areas with extremely closely spaced fractures								Silt = 65.8% Clay = 33.5%		754
17			RC9		16.87 - 18.39	9	63 101 82					753
18			RC10		18.39 - 19.67	10	28 100 71			18.7 m - LL = 74.3% PL = 19.6% PI = 54.7%		752
19		...19.5 m - very weak layer ...19.8 m - moderately to steeply inclined fractures	UD4 RC11		19.67 -	11	36 99			18.7 m - EC: 6.0 dS/m 18.7 m - SAR: 44.7 18.7 m - pH: 8.2		751

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH124**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/01/2022 COMPLETED 06/01/2022 GROUND ELEVATION 770.57m N 5612527.600 E 416115.700
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21					21.49	70						750
22		...21.7 m - moderately strong to strong layer	RC12		21.49 - 23.02	12	77 101 91					749
23		...22.7 m - steeply inclined fracture	UD5							22.46 m - Sand = 0.6% Silt = 70.2% Clay = 29.2%		748
24		...24.3 m - hit hard strong layer, lost core above it	RC13		23.02 - 24.34	13	0 23 5			23.02 m - 23.02 - core loss; only recovered 0.3 m		747
25		...25.0 m - clay and silt, trace sand, high plastic	RC14		24.34 - 25.88	14	83 100 94					746
26			UD6							25.35 m - LL = 76.8% PL = 16.8% PI = 60.0%		745
27		...27.3 m - strong layer	RC15		25.88 - 27.36	15	64 80 68			25.35 m - Sand = 0.1% Silt = 50.8% Clay = 49.1%		744
28										25.35 m - EC: 3.7 dS/m 25.35 m - SAR: 36.9 25.35 m - pH: 8.3 25.88 m - Core loss due to strong layer; recovered 1.18 m		743
29												742
												741

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH125**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/02/2022 COMPLETED 06/02/2022 GROUND ELEVATION 770.05m N 5612525.600 E 416217.800
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 6.0 m. REFER TO 22BH125 LOG							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												769
2												768
3												767
4												766
5				SH1								765
6				RC1	6.00 - 7.70	1	0 100 45	7		6 m - 6.0 m- fracture angles measured from horizontal		764
7		SHALE (Weathered), clay and silt, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, extremely closely spaced oxidized fractures, thinly laminated, marine										763
8		...8.7 m - becoming greyish		RC2	7.70 - 9.20	2	37 84 72	6				762
9		SHALE, clay and silt, trace sand, medium weathered, grey, moist, medium to high plastic, weak, closely spaced oxidized fractures, finely stratified, gypsum crystals within fractures										761
		...9.0 m - 150 mm layer of calcified shale, strong		RC3	9.20 - 10.80	3	46 100 88	10		9.5 m - LL = 70.1% PL = 18.1% PI = 52.0%		
		...9.3 m - 4° fracture										
		...9.7 m - 44° fracture										

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH125**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/02/2022	COMPLETED	06/02/2022	GROUND ELEVATION	770.05m N 5612525.600 E 416217.800
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11			UD1	RC4	10.80	4	90	4				759
					-		97					
					12.30		80					
12			UD2	RC5	12.30	5	99	3				758
					-		100					
			UD3		13.80		93					
13												757
14			RC6		13.80	6	73	4				756
					-		100					
					14.90		85					
15			RC7		14.90	7	77					755
					-		85					
					16.87		72	6				
16												754
17			RC8		16.87	8	22	20				753
					-		120					
					18.36		55					
18												752
19			RC9		18.36	9	50	5				751
					-		100					
					19.90		56					
			RC10			10		9				

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH125**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/02/2022	COMPLETED	06/02/2022	GROUND ELEVATION	770.05m N 5612525.600 E 416217.800
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.		GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.0 m - 30 mm layer of strong siltstone, 40° inclined	UD4		19.90	26						
		...21.2 m - 59° fracture	RC11		21.50	11	75	5				
		...21.4 m - 53° fracture			-	100						
22		...21.8 m - 66° fracture			23.00	82						
		...22.5 m - 51° fracture	UD5									
		...22.7 m - 33° fracture										
23		...23.6 m - 52° fracture	RC12		23.00	12	90	5				
		...24.2 m - 49° fracture			-	100						
		SANDSTONE, trace silt, trace clay, unweathered, grey, damp, high plastic, extremely strong	RC13		24.50	13	0	9				
25		...24.9 m - 100 mm layer, extremely strong, suspect calcification, 81° fracture	RC14		24.90	15	80	5				
		...25.7 m - 15° fracture	UD6		25.00		98	1				
		...25.9 m - 43° fracture	RC15		-	100						
		...26.2 m - 6° fracture	UD7		26.00	85						
26		...27.0 m - 22° fracture	RC16		26.00	16	94	6				
		...27.3 m - 19° fracture	UD8		-	100						
			UD9		27.50	90						
27												
28												
29												

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH126**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/03/2022	COMPLETED	06/03/2022	GROUND ELEVATION	770.17m N 5612519.800 E 416328.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH	764.36 m	5.81 m	
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 4.5 m. REFER TO 22BH126 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												770
2												769
3												768
4												767
5		SHALE (Weathered), clay and silt, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, very closely spaced oxidation laminations, thinly laminated, highly fractured	RC1		4.47 - 6.22	1	0 100 0					766
6		...4.8 m - weak to moderately strong										765
7		...7.2 m - weak, closely spaced oxidation laminations	RC2		6.22 - 7.77	2	0 98 34			7 m - EC: 9.9 dS/m 7 m - SAR: 29.0 7 m - pH: 7.2		764
8			RC3		7.77 - 9.26	3	76 98 78					763
9		SHALE, clay and silt, trace sand, medium weathered, grey, damp, high plastic, weak, finely stratified, marine ...9.3 m - shallowly inclined fractures	UD1							8.61 m - Dispersivity Classification = ND4 8.61 m - Jar Slake Index: 1.0 9.3 m - Loss of drilling fluid		762
			RC4		9.26 - 10.85	4	80 100 81					761

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	16.70	PLAIN
16.70	18.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH126**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/03/2022	COMPLETED	06/03/2022	
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND ELEVATION	770.17m	N 5612519.800 E 416328.000
CORING TYPE	3" x 4 5/8"	DIAMETER (mm)	76	
		DATE GROUND WATER RECORDED	08/10/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11				RC5	10.85 - 12.32	5	90 100 82			circulation, loss of 500L of fluid		760
12		...12.3 m - slightly inclined fracturing		RC6	12.32 - 13.87	6	87 101 91					759
13				RC7	13.87 - 15.37	7	97 101 89					758
14				UD2								757
15				RC8	15.37 - 16.92	8	94 102 95					756
16				RC9	16.92	9	61			16.6 m - LL = 141.4% PL = 23.7% PI = 117.7%		755
17		BENTONITE (16.6 m), 300 mm layer ...16.6 m - clay and silt, high plastic SILTSTONE, clayey, trace sand, unweathered, light grey, damp, high plastic, very strong, finely fissured		RC10	17.15 - 17.15	10	83 93 100			16.6 m - Sand = 0.0% Silt = 44.4% Clay = 55.6%		754
18		...17.0 m - strong ...17.2 m - very fractured, weak to moderately strong, slightly inclined fracturing		RC11	18.42 - 19.98	11	84 102 94			17.2 m - Sand = 0.3% Silt = 69.0% Clay = 30.7%		753
19		BENTONITE (18.1 m), 5 mm layer SHALE, clay and silt, unweathered, light grey, damp, high plastic, very strong, finely fissured, finely stratified		RC12		12				18 m - LL = 102.5% PL = 17.1% PI = 85.4%		752

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	16.70	PLAIN
16.70	18.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH126**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/03/2022	COMPLETED	06/03/2022	GROUND ELEVATION	770.17m N 5612519.800 E 416328.000
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		764.36 m	5.81 m
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.5 m - strong to very strong, calcified shale (suspect)	UD3		19.98 - 21.44	95 100 88						750
22		...21.8 m - weak to moderately strong	RC13		21.44 - 21.80	13 14 92 86						749
			RC14		21.80 - 23.02	14 98 98 88				21.99 m - LL = 80.0% PL = 20.3% PI = 59.7% 21.99 m - UCS = 1702 kPa		748
23		...23.0 m - strong	RC15		23.02 - 24.49	15 105 114 103						747
		...23.4 m - weak										746
24		...24.3 m - strong	RC16		24.49 - 27.24	16 93 101 91						745
25		...24.6 m - weak to moderately strong										744
26												743
27												742
28												741
29												

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	16.70	PLAIN
16.70	18.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH135**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/10/2022	COMPLETED	06/13/2022	
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND ELEVATION	770.05m	N 5612521.800 E 416417.600
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	75	
		DATE GROUND WATER RECORDED	10/12/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument Elevation (m)
		OVERBURDEN, drilled by 6" SSA to 4.4 m. REFER TO 22BH134 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1											769
2											768
3											767
4											766
5		SHALE (Weathered), silty, clayey, medium weathered, light brown to dark grey mottling, moist, high plastic, very weak, thinly laminated	RC1		4.47 - 6.25	1	0 71 17	20			765
6		...4.6 m - crumbled core ...5.2 m - crumbled core ...5.3 m - crumbled core									764
7		...6.2 m - crumbled core	RC2		6.25 - 7.76	2	0 81 32	20			763
8		...7.0 m - 60° fracture ...7.4 m - 67° fracture ...7.8 m - weak to moderately strong ...7.8 m - crumbled core ...8.0 m - bentonite inclusions ...8.1 m - and silt, clayey, sandy, medium plastic, very oxidized orange layer	RC3 UD1		7.76 - 9.28	3	32 100 47	20		8.1 m - LL = 46.6% PL = 17% PI = 29.6% 8.1 m - Sand = 29.7%	762
9		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, weak, finely stratified, marine ...8.8 m - 58° fracture ...9.2 m - 83° fracture	RC4		9.28 - 10.90	4	0 35 6	4		Silt = 49.8% Clay = 20.5% 9.3 m - Core loss due improper bit sizing.	761

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: J. Boyd / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH135**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/10/2022	COMPLETED	06/13/2022	
		GROUND ELEVATION	770.05m	N 5612521.800 E 416417.600
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH	767.21 m	2.84 m
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	75	
		DATE GROUND WATER RECORDED	10/12/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - 7° fracture approximately 200mm long		RC5	10.90	5	100	3		Bit size changed for subsequent runs.		759
		...10.9 m - moderately strong to strong			-		100					
					12.30		89					
12				RC6	12.30	6	100	2				758
					-		100					
					13.85		93					
13										13 m - LL = 84.4% PL = 15.8% PI = 68.6%		757
										13 m - Sand = 0.8% Silt = 57.8% Clay = 41.4%		756
14				RC7	13.85	7	97	3				
					-		100					
					15.35		92					
15				RC8	15.35	8	65	7				755
					-		100			15.35 m - Switched to 3" core bit at 15.35 m		
					16.89		92					754
17				UD4								
		...17.1 m - 26° fracture		RC9	16.89	9	66	6		16.5 m - Dispersivity Classification = ND3		753
					-		100			16.65 m - EC: 1.7 dS/m		
					18.34		92			16.65 m - SAR: 19.2		
18		...17.8 m - 23° fracture								16.65 m - pH: 8.7		752
				RC10	18.34	10	75	5				
					-		100					
					19.89		90					751
19		...19.3 m - near vertical fractures										
				RC11	19.89	11	88	5				

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: J. Boyd / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH135**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/10/2022	COMPLETED	06/13/2022	GROUND ELEVATION	770.05m N 5612521.800 E 416417.600
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		767.21 m	2.84 m
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21				UD5	- 21.44		100 92					
22				RC12	21.44 - 22.71	12	72 100 87	5		20.93 m - LL = 69.3% PL = 18.5% PI = 50.8%		749 748
23		...22.5 m - 31° fracture ...22.6 m - 24° fracture		RC13 UD6	22.71 - 24.49	13	87 100 97	3				747
24				RC14	24.49 - 26.02	14	89 100 96	3				746
25		...25.0 m - becoming moderately strong		UD7								745
26				RC15	26.02 - 27.56	15	82 100 95	3		25.7 m - Sand = 0.1% Silt = 47.7% Clay = 52.2%		744 743
27												
28												742
29												741

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: J. Boyd / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH136**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/08/2022 COMPLETED 06/09/2022 GROUND ELEVATION 768.82m N 5612520.000 E 416517.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH136 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												768
2												767
3												766
4		SHALE (Weathered), clayey, silty, highly weathered, dark brown, moist, medium plastic, very weak, extremely closely spaced fractures, finely stratified, oxide staining within fractures	RC1		3.10 - 4.60	1	51 90 81	18				765
5		...4.4 m - 45° fracture	RC2		4.60 - 6.10	2	2 86 39	7				764
6		...5.8 m - 38° fracture	RC3		6.10 - 7.70	3	66 100 74	6				763
7		...6.6 m - becoming weak ...6.7 m - 57° fracture	UD1									762
8		...7.4 m - trace gypsum crystals inclusions within fracture	RC4		7.70 - 9.20	4	61 100 82	6				761
9		SHALE, clay and silt, slightly weathered, grey, moist, high plastic, moderately strong, widely spaced fractures, finely fissured	UD2									760
		...8.1 m - 21° fracture										
		...8.1 m - 80° fracture	RC5		9.20 - 10.70	5	72 100 83	2				759
		...9.6 m - 72° fracture										
		...9.8 m - 34° fracture										

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH136**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/08/2022 COMPLETED 06/09/2022 GROUND ELEVATION 768.82m N 5612520.000 E 416517.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11			UD3									
			RC6		10.70	6	95	1				758
					-		100					
					12.22		97					
12		...12.0 m - 57° fracture										
		...12.5 m - 62° fracture	RC7		12.22	7	81	3				757
		...12.8 m - 73° fracture			-		100					
		...13.3 m - 23° fracture			13.74		84					756
13												
		...13.9 m - 52° fracture	RC8		13.74	8	82	3				755
		...14.1 m - 70° fracture			-		100					
		...14.5 m - 72° fracture			15.26		91					
14			UD4									754
		...15.4 m - 53° fracture	RC9		15.26	9	86	3				
					-		100					
					16.78		76					753
16		...16.3 m - 20° fracture										
		BENTONITE (16.6 m), 70 mm layer										
		SILTSTONE, silty, some clay,										
		unweathered, light grey, damp, high										
		plastic, strong	RC10		16.78	10	90	2				752
		...16.7 m - becoming very strong,	UD5		-		100					
		suspect calcified shale to 17.4 m	RC10		18.30		91					
		SHALE, clay and silt, unweathered,	UD									
		grey, damp, high plastic, very strong,										
		medium spaced fractures, finely										
		stratified										
18		...17.6 m - horizontally oriented	RC11		18.30	11	100	3				751
		fracture			-		100					
		...18.0 m - horizontally oriented			19.82		91					750
		fracture										
19		...18.1 m - becoming strong below 18.1										
		...19.4 m - 47° fracture										
		...19.5 m - 62° fracture										
		...19.6 m - 38° fracture	RC12		19.82	12	74	3				749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH136**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/08/2022 COMPLETED 06/09/2022 GROUND ELEVATION 768.82m N 5612520.000 E 416517.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.2 m - 40° fracture		RC13	21.30	13	100	3				748
		...21.8 m - 55° fracture		UD6	-		100					
		...22.0 m - 70 mm layer of calcified shale			22.86		89					747
22		...22.4 m - 62° fracture										
		...22.8 m - 39° fracture		RC14	22.86	14	82	4				746
23		...23.0 m - 72° fracture			-		100					
		...23.5 m - 78° fracture			24.38		86					
24		...23.8 m - 80° fracture										745
		...24.1 m - 73° fracture		RC15	24.38	15	84	4				
		...24.6 m - 70° fracture			-		100					744
25		...24.8 m - 62° fracture			25.90		90					
		...25.4 m - parallel 72° fractures 60 mm apart										743
26		...26.4 m - 60° fracture		RC16	25.90	16	92	2				
		...27.0 m - 43° fracture			-		100					742
27		...27.1 m - 18° fracture		UD7	27.42		83					
		...27.28 m - Sand = 0.1%								27.28 m - Sand = 0.1%		
		...27.3 m - Silt = 48.2%								Silt = 48.2%		
28		...28.3 m - 58° fracture			27.42	17	86	2				741
		...28.8 m - 74° fracture		RC17	-		100					
		...29.0 m - 55° fracture			28.94		92					740
29		...29.1 m - 37° fracture										
		...29.8 m - 48° fracture		RC18	28.94	18	92	3				739
		...29.9 m - 37° fracture			30.46		84					

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH136**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 06/08/2022 COMPLETED 06/09/2022 GROUND ELEVATION 768.82m N 5612520.000 E 416517.600
DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		30.4 m - 30° fracture										738
32												737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH137**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/09/2022 GROUND ELEVATION 767.93m N 5612519.200 E 416628.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN, REFER TO 22BH137 LOG							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3		SHALE (Weathered), clay and silt, trace sand, highly weathered, brown to grey, some oxidation staining, moist, high plastic, weak, blocky, extremely closely spaced fractures, finely stratified	RC1		3.10 - 4.62	1	0 76 20	20		3 m - All fracture angles relative to core axis.		765
4		...3.6 m - 200 mm layer of orangish fractured sandstone	RC2		4.62 - 6.14	2	39 80 32	9		3.1 m - EC: 7.5 dS/m		764
5		...5.6 m - 54° fracture								3.1 m - SAR: 27.6		763
6			RC3		6.14 - 7.66	3	66 92 82	3		3.1 m - pH: 7.9		762
7		...6.9 m - 58° fracture								3.6 m - Sand = 0.6% Silt = 58.0% Clay = 41.4%		761
8		SHALE, clay and silt, trace sand, unweathered, grey, damp, high plastic, strong, finely fissured, widely spaced fractures	RC4		7.66 - 9.20	4	82 100 74	4				760
		...7.5 m - 54° fracture	UD1							7.9 m - Dispersivity Classification = ND4		
		...7.9 m - 78° fracture	UD2							8.1 m - LL = 76.7% PL = 18.5% PI = 58.2%		
9		...8.9 m - 37° fracture								8.1 m - EC: 3.0 dS/m		759
		...9.1 m - 67° fracture	RC5		9.20 - 10.70	5	93 100 86	2		8.1 m - SAR: 26.7 8.1 m - pH: 8.7 8.5 m - LL = 113.9% PL = 17.9% PI = 96.0%		

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH137**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/09/2022 GROUND ELEVATION 767.93m N 5612519.200 E 416628.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 61° fracture ...10.3 m - 80° fracture ...11.0 m - 58° fracture		RC6	10.70 - 12.22	6	100 100 94	2		8.5 m - Dispersivity Classification = ND4 8.5 m - EC: 5.2 dS/m 8.5 m - Jar Slake Index: 1.0 8.5 m - SAR: 42.4 8.5 m - pH: 8.6		757
12		...11.9 m - 49° fracture ...12.3 m - 48° fracture		UD3 RC7	12.22 - 13.74	7	87 100 84	4		12 m - LL = 96.0% PL = 21% PI = 75.0% 12 m - Sand = 0.1% Silt = 65.3% Clay = 34.6%		756
13		...12.8 m - 58° fracture		UD5						13.2 m - LL = 268.9% PL = 26% PI = 242.9%		755
14		BENTONITE (13.2 m), 100 mm layer SHALES, clay and silt, trace sand, unweathered, grey, moist, high plastic, very strong, widely spaced fractures, finely fissured ...13.3 m - becoming strong, suspect calcified shale to 14.5		UD4 RC8	13.74 - 15.26	8	100 100 99	1		13.3 m - Sand = 1.7% Silt = 26.9% Clay = 71.4%		754
15		...15.5 m - 46° fracture ...15.7 m - 67° fracture		RC9	15.26 - 16.78	9	100 100 93	2		14 m - Sand = 0.8% Silt = 79.1% Clay = 20.1%		753
16												752
17		...17.3 m - 63° fracture		RC10	16.78 - 18.30	10	100 100 95	3				751
18		...18.0 m - 76° fracture ...18.1 m - 78° fracture ...18.2 m - 300 mm layer of suspect calcified shale		UD6 RC11	18.30 - 19.82	11	100 100 100	2				750
19		...19.5 m - 100 mm soft layer, core washed away		RC12	19.82	12	98	2				749

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH137**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/09/2022 GROUND ELEVATION 767.93m N 5612519.200 E 416628.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.6 m - 25 mm sandstone layer		UD7	-		100					747
		...21.0 m - becoming very strong, widely spaced fractures		RC13	21.34	13	100	0				746
22					-		100					
				RC14	22.86	14	100	0				745
23					-		100					
					24.38		100			22.4 m - LL = 77.7% PL = 20.2% PI = 57.5% 22.4 m - EC: 3.5 dS/m 22.4 m - SAR: 29.0 22.4 m - pH: 8.1		744
24				UD8	24.38	15	98	1				743
		...24.9 m - 82° fracture, 110 mm layer of suspect calcified shale		RC15	-		100					
25					25.90		98					742
26				RC16	25.90	16	100	0				741
		...26.4 m - 125 mm layer of siltstone			-		100					
					27.42		100					740
27		...27.0 m - 250 mm layer of siltstone		UD9						27 m - LL = 60.6% PL = 14.8% PI = 45.8%		739
				RC17	27.42	17	91	1				
28					-		91					
					28.94		89					
29				RC18	28.94	18	108	2				
					-		108					
					30.46		108					

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH137**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/09/2022 GROUND ELEVATION 767.93m N 5612519.200 E 416628.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31				RC19	30.46 - 31.98	19	100 100 100	1				737
32		...31.7 m - horizontally oriented fracture		RC20	31.98 - 33.50	20	100 100 98	2				736
33		...32.4 m - 74° fracture ...32.8 m - 84° fracture										735
34												734
35												733
36												732
37												731
38												730
39												729

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH138**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	08/29/2022	COMPLETED	08/29/2022	GROUND ELEVATION	779.13m N 5612608.840 E 414518.970
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	774.25 m 4.88 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1		OVERBURDEN									779
2		...1.5 m - 60 mm of core loss		SH1							778
3		SHALE (Weathered), clay and silt, highly weathered, grey, some oxidation staining, damp, high plastic, extremely weak, extremely closely spaced fractures, blocky, some gypsum crystals		RC1	3.00 - 4.52	1	0 100 80	20		3.1 m - LL = 58.0% PL = 15.9% PI = 42.1% 3.1 m - Sand = 3.5% Silt = 45.1% Clay = 51.4%	776
4				RC2	4.52 - 6.04	2	0 100 91	20			775
5		...5.2 m - 39° fracture BENTONITE (5.4 m), 30 mm layer ...5.4 m - 120 mm layer of cemented shale		RC3	6.04 - 7.56	3	0 100 74	20		5.4 m - LL = 43.0% PL = 15.8% PI = 27.2% 5.4 m - Sand = 11.1% Silt = 55.5% Clay = 33.4%	774
6		SHALE (Weathered), "..." ...5.7 m - 68° oxidized fracture SHALE, clay and silt, trace sand, highly weathered, grey, some oxidation staining, damp, high plastic, extremely weak, extremely closely spaced fractures, weakly cemented layers, thinly laminated, trace gypsum crystals		RC4	7.56 - 9.08	4	0 100 65	11		6.2 m - LL = 45.5% PL = 16.7% PI = 28.8% 6.2 m - Sand = 10.9% Silt = 55.3% Clay = 33.8%	773
7		...7.6 m - clay rubble in fractures for 200 mm ...7.7 m - becoming dark grey ...8.4 m - becoming unoxidized fractures ...8.7 m - 5 mm quartz lense ...9.0 m - becoming unweathered		RC5	9.08 - 10.60	5	39 96 76	7			772
8											771
9											770

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	5.80	PLAIN
5.80	7.30	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH138**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	08/29/2022	COMPLETED	08/29/2022	GROUND ELEVATION	779.13m N 5612608.840 E 414518.970
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		774.25 m	4.88 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...11.0 m - becoming moderately widely spaced fractures		RC6	10.60 - 12.12	6	59 98 79	5				769
12		...11.1 m - becoming very weak layers for 100 mm		RC7	12.12 - 13.64	7	87 100 95	4		11.3 m - LL = 149.2% PL = 19.3% PI = 129.9%		768
13		...11.1 m - some thin calcified shale layers for 100 mm										767
14		...11.3 m - becoming very silty										766
15		...11.6 m - 120 mm calcified shale layer		RC8	13.64 - 15.16	8	59 100 86	7		14.1 m - LL = 78.0% PL = 20.0% PI = 58.0%		765
16		...12.3 m - becoming weak										764
17		...13.6 m - 470 mm extremely weak layer										763
18		...14.1 m - becoming some thinly laminated calcified shale layers for 110 mm										762
19		...14.5 m - 200 mm mechanically fractured area										761
												760

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	5.80	PLAIN
5.80	7.30	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis

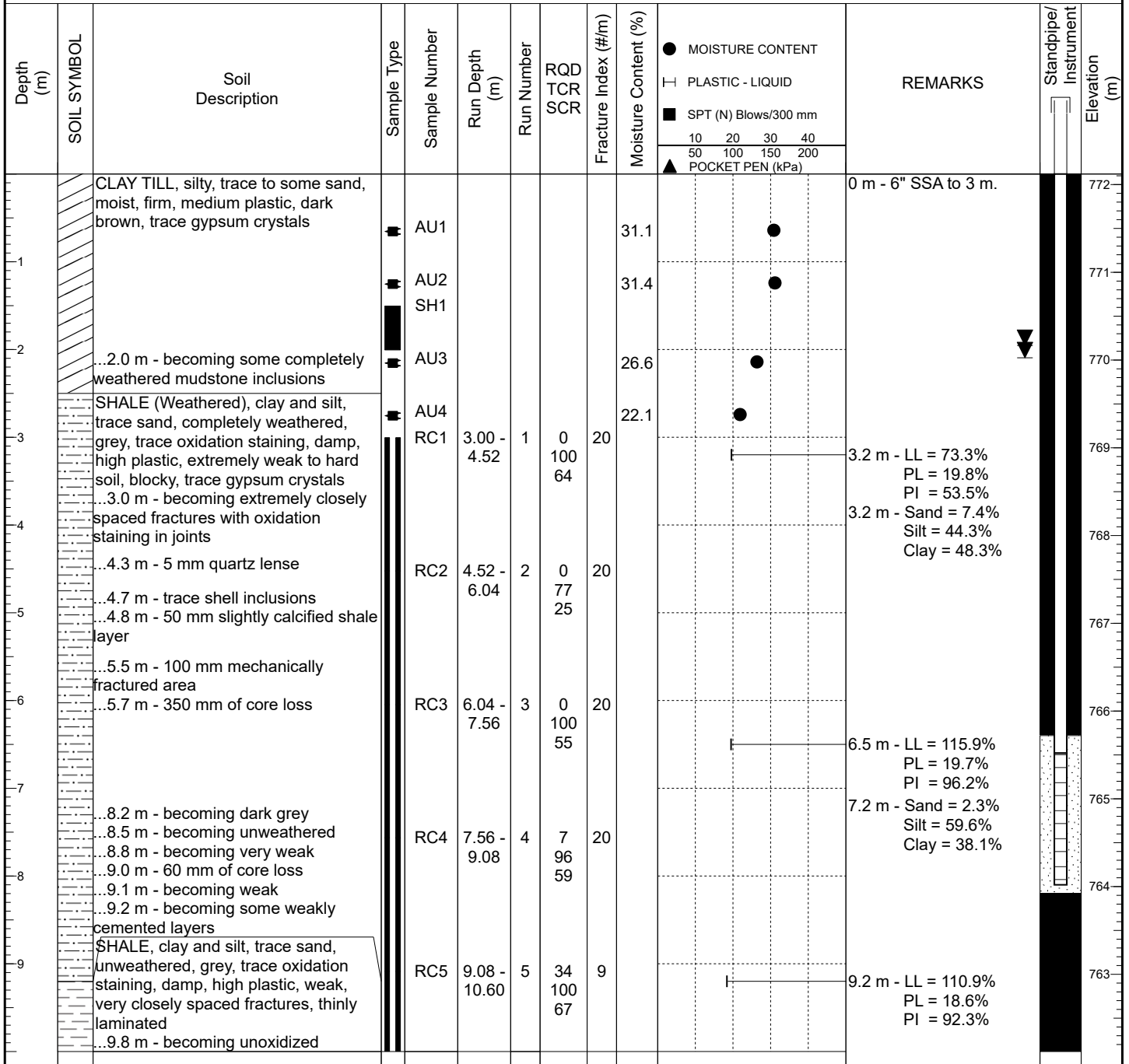


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COREHOLE No : **22CH139**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	08/29/2022	COMPLETED	08/30/2022	GROUND ELEVATION	772.12m N 5612587.880 E 415502.981
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		770.11 m	2.01 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022



Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.60	PLAIN
6.60	8.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH139**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	08/29/2022	COMPLETED	08/30/2022	GROUND ELEVATION	772.12m N 5612587.880 E 415502.981
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		770.11 m	2.01 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.5 m - 54° fracture ...10.6 m - 300 mm of mechanical rubble ...11.0 m - becoming moderately widely spaced fractures		RC6	10.60 - 12.12	6	52 91 63	5				762
12		...12.0 m - 140 mm of core loss		RC7	12.12 - 13.64	7	92 100 84	3				761
13		...12.6 m - 180 mm strong layer ...12.6 m - some thinly laminated calcified shale ...13.1 m - 59° fracture		RC8	13.64 - 15.16	8	91 100 91	3		12.6 m - LL = 38.3% PL = 15.1% PI = 23.2% 12.6 m - Sand = 47.5% Silt = 38.2% Clay = 14.3%		760
14		...14.4 m - large shell inclusion										759
15												758
16												757
17												756
18												755
19												754
												753

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.60	PLAIN
6.60	8.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis

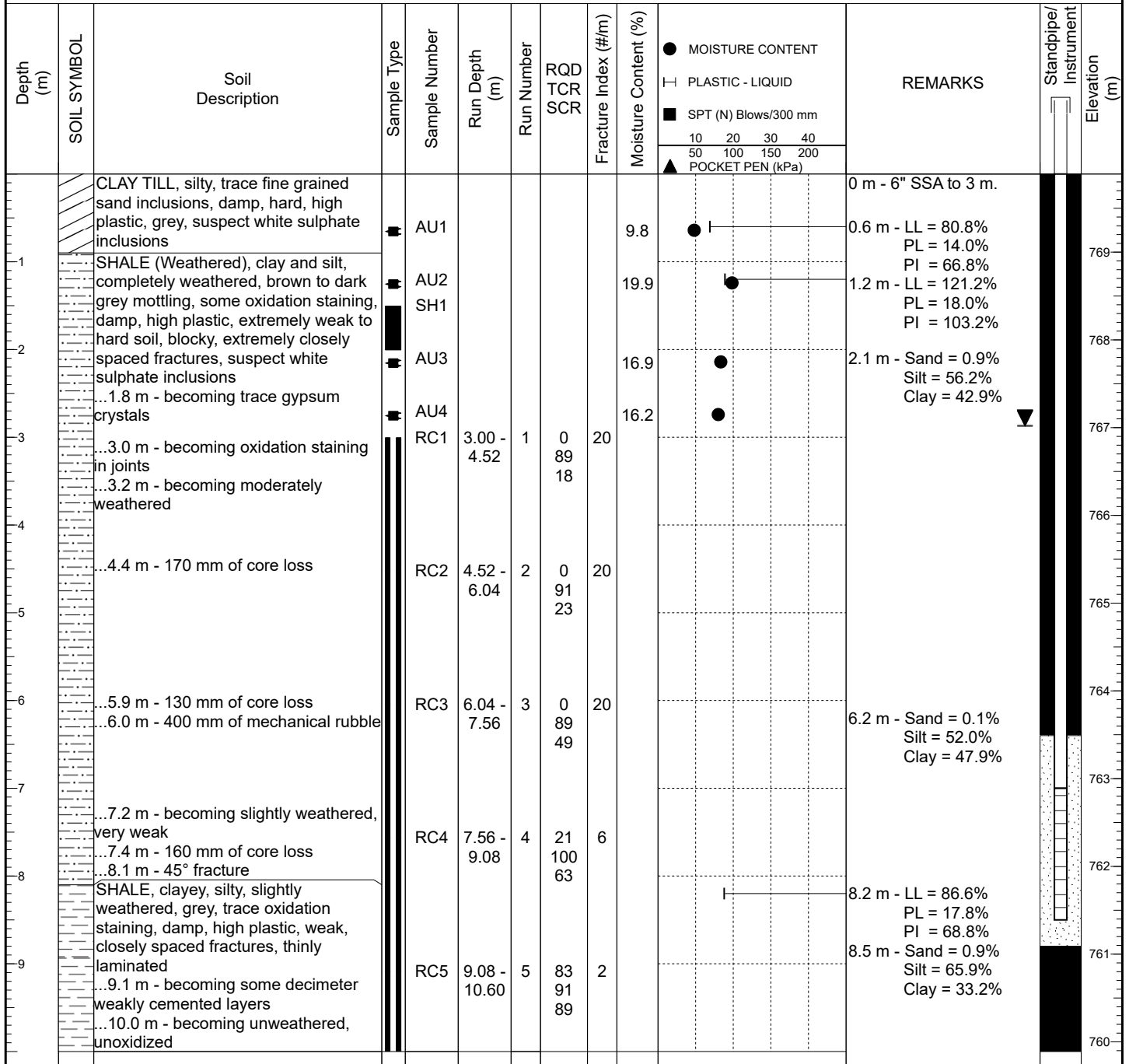


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COREHOLE No : **22CH140**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	08/30/2022	COMPLETED	08/30/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	769.89m	N 5612575.001 E 416113.373
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	767.11 m	2.78 m
		DATE GROUND WATER RECORDED	10/12/2022	



Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.00	PLAIN
7.00	8.50	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH140**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	08/30/2022	COMPLETED	08/30/2022	GROUND ELEVATION	769.89m N 5612575.001 E 416113.373
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		767.11 m	2.78 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.5 m - 130 mm of core loss ...10.6 m - becoming moderately widely spaced fractures		RC6	10.60 - 12.12	6	88 100 98	3		10.2 m - LL = 70.3% PL = 21.4% PI = 48.9%		759
12				RC7	12.12 - 13.64	7	95 100 95	2				758
13		...13.2 m - 35° fracture										757
14		...14.3 m - 29° fracture		RC8	13.64 - 15.16	8	105 106 102	3				756
15		...14.8 m - becoming moderately strong										755
16												754
17												753
18												752
19												751
												750

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.00	PLAIN
7.00	8.50	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH200**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/10/2022 GROUND ELEVATION 767.37m N 5612474.700 E 416720.200
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH200 LOG.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5												763
6												762
7		SHALE, silt and clay, highly weathered, grey, moist, medium plastic, very weak, finely fissured, medium spaced fractures	RC1		6.15 - 7.67	1	57 100 86	5				761
8		...6.6 m - 61° fracture ...6.7 m - 70° fracture ...7.0 m - 42° fracture	RC2		7.67 - 9.19	2	84 100 78	3				760
9		...9.6 m - 70° fracture	RC3		9.19 - 10.71	3	20 54 39	2				759
										8.1 m - Sand = 1.4% Silt = 54.7% Clay = 43.9% 8.1 m - EC: 2.2 dS/m 8.1 m - SAR: 20.8 8.1 m - pH: 8.5		758

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH200**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/09/2022	COMPLETED	06/10/2022	GROUND ELEVATION	767.37m N 5612474.700 E 416720.200
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.9 m - parallel 49° fractures 80 mm apart		RC4	10.71 - 12.23	4	94 100 84	2				757
		BENTONITE (11.4 m), 125 mm layer								11.4 m - See Photo		756
12		SHALE, silt and clay, highly weathered, grey, moist, medium plastic, very weak, finely fissured, medium spaced fractures		RC5	12.23 - 13.75	5	100 100 95	4		11.4 m - LL = 149.0% PL = 30.3% PI = 118.7%		755
13		...11.7 m - becoming silty, strong		UD1								754
		...11.8 m - 57° fracture										
14		...14.2 m - 46° fracture		RC6	13.75 - 15.27	6	95 100 83	4				753
		...14.5 m - inclined fracture								14.4 m - Sand = 0.2%		
15		...15.0 m - 58° fracture		RC7	15.27 - 16.79	7	94 100 84	3		Silt = 60.2% Clay = 39.6%		752
16		...15.6 m - 42° fracture										751
		...15.7 m - 57° fracture		UD2								
17				RC8	16.79 - 18.31	8	78 100 84	2				750
18												
19				RC9	18.31 - 19.83	9	92 100 92	3				749
		...19.6 m - parallel 44° fractures 90 mm apart		RC10	19.83	10	100	1				748

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH200**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/10/2022 GROUND ELEVATION 767.37m N 5612474.700 E 416720.200
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.1 m - 40° Fracture		UD3	- 21.35		100 97					747
22		...21.4 m - moderately strong to strong		RC11	21.35 - 22.87	11	100 100 95	1		21.4 m - LL = 64.6% PL = 19.7% PI = 44.9%		746
23				RC12	22.87 - 24.39	12	100 100 100	0				745
24		...23.8 m - 44° Fracture										744
25		...24.5 m - 74° Fracture		RC13	24.39 - 25.91	13	100 100 97	2				743
26		...24.8 m - 82° Fracture										742
27		...25.9 m - strong		RC14	25.91 - 27.43	14	100 100 100	0				741
28				UD4								740
29		...28.0 m - two parallel 49° fractures 110 mm apart		RC15	27.43 - 28.95	15	97 97 90	2				739
29		...29.4 m - 74° fracture		RC16	28.95 - 30.47	16	103 103 101	1				738

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH200**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/09/2022 COMPLETED 06/10/2022 GROUND ELEVATION 767.37m N 5612474.700 E 416720.200
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31				RC17	30.47 - 31.99	17	100 100 96	1		31 m - LL = 64.2% PL = 20.8% PI = 43.4%		737
32		...31.8 m - 46° fracture ...32.0 m - 20mm weak zone above fracture ...32.0 m - 55° fracture ...32.7 m - 70° fracture		UD5 RC18	31.99 - 33.51	18	93 99 96	2				736
33												735
34												734
35												733
36												732
37												731
38												730
39												729
												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH201**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/12/2022 COMPLETED 06/12/2022 GROUND ELEVATION 767.67m N 5612418.468 E 416810.383
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 765.58 m 2.09 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1		OVERBURDEN. REFER TO 22BH201 LOG.									767
2											766
3		SHALE (Weathered), clay and silt, trace sand, highly weathered, brown, mottled, moist, medium plastic, very weak, blocky, oxidized fractures	RC1		3.00 - 4.52	1	0 79 13	20		3 m - All fracture angles relative to core axis.	765
4		...3.2 m - extremely closely spaced fractures								3.5 m - LL = 48.3% PL = 15.5% PI = 32.8%	764
5		...5.0 m - 150 mm layer of very strong fractured siltstone, black magnesium oxide staining	RC2		4.52 - 6.04	2	70 100 76	8			763
6		...5.2 m - becoming less fractured, greyish brown, trace gypsum crystal inclusions	UD1								762
7		...6.5 m - 63° fracture ...6.6 m - 73° fracture	RC3		6.04 - 7.56	3	67 92 86	3		7 m - LL = 56.7% PL = 18.4% PI = 38.3%	761
8		SHALE, silt and clay, unweathered, grey, moist, medium plastic, moderately strong, finely fissured, widely spaced fractures, marine	RC4 UD2		7.56 - 9.08	4	94 100 93	2		7 m - Sand = 0.6% Silt = 60.7% Clay = 38.7%	760
9		...8.3 m - 68° fracture ...8.6 m - 42° fracture								7.3 m - Sand = 0.1% Silt = 66.2% Clay = 33.7%	759
		...9.0 m - 69° fracture	RC5		9.08 - 10.60	5	100 100 92	3			758
		...9.5 m - 66° fracture ...9.7 m - 56° fracture									

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	11.80	PLAIN
11.80	13.30	SLOTTED

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH201**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/12/2022	COMPLETED	06/12/2022	GROUND ELEVATION	767.67m N 5612418.468 E 416810.383
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		765.58 m	2.09 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - becoming very strong ...10.3 m - 79° fracture		RC6	10.60	6	88 100	3				757
		...10.8 m - 57° fracture ...10.9 m - 35° fracture ...11.3 m - 57° fracture			12.12		77					
12		...11.7 m - 36° fracture		RC7	12.12	7	93 100	3				756
		...12.5 m - 53° fracture ...12.7 m - 71° fracture ...13.0 m - 71° fracture ...13.3 m - 68° fracture		UD3	13.64		92					755
13										12.7 m - Sand = 0.2%		
14		BENTONITE (13.7 m), 150 mm layer SHALE, silt and clay, unweathered, grey, moist, medium plastic, moderately strong, finely fissured, widely spaced fractures, marine		RC8	13.64	8	95 95	1		13.7 m - LL = 125.8% PL = 24.4% PI = 101.4%		754
		...14.0 m - becoming extremely strong, suspect calcification, becoming widely spaced fractures		UD4	15.16		95			14.3 m - Sand = 0.1%		753
15		...14.0 m - becoming extremely strong, suspect calcification, becoming widely spaced fractures		RC9	15.16	9	94 94	1		Silt = 67.3% Clay = 32.6%		752
		...15.6 m - 90 mm weak layer ...15.8 m - 22° fracture ...15.9 m - 200 mm weak layer ...16.3 m - becoming strong			16.68		91					751
16				RC10	16.68	10	106 106	2				750
		...17.2 m - 63° fracture ...17.6 m - becoming very strong ...17.9 m - 74° fracture			18.20		100					749
17				RC11	18.20	11	100 100	1				748
		...18.4 m - 19 4 - many gypsum crystal inclusions			19.72		97					
18		...19.3 m - 60° fracture		RC12	19.72	12	87	3				

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	11.80	PLAIN
11.80	13.30	SLOTTED

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH201**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/12/2022	COMPLETED	06/12/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	767.67m	N 5612418.468 E 416810.383
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	765.58 m	2.09 m
		DATE GROUND WATER RECORDED	08/10/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT □ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.1 m - 48° fracture			-		100					
		...20.6 m - becoming weak			21.24		92					747
		...20.7 m - parallel 81° fractures 100 mm apart	RC13		21.24	13	83	3				
		...21.5 m - 73° fracture, becoming strong			-		100			21.5 m - LL = 65.6% PL = 20.0% PI = 45.6%		746
22		...21.8 m - 16° fracture			22.76		89					
		...21.9 m - 74° fracture										
		...22.2 m - 77° fracture										
23		...22.8 m - 78° fracture	RC14		22.76	14	98	1				745
					-		100					
			UD5		24.28		95					744
24		...23.9 m - 300 mm weaker layer										
		...24.2 m - 72° fracture	RC15		24.28	15	90	1				
					-		92					743
25					25.80		84					
		...25.1 m - 83° fracture										
26			RC16		25.80	16	74	3				742
					-		91					
		...26.3 m - 57° fracture			27.32		64					
		...26.5 m - 26° fracture										741
27		...26.9 m - becoming weak										
		...27.0 m - 7° fracture	RC17		27.32	17	84	1				
		...27.3 m - 27.8 m - strong layer			-		94					740
					28.84		84					
28		...27.8 m - 28.7 m - weak layer										
		...28.2 m - 29° fracture										
29			RC18		28.84	18	100	1				739
		...29.0 m - becoming very strong			-		100					
		...29.1 m - 83° fracture			30.36		84					
		...29.6 m - 82° fracture, 100 mm moderately strong layer										738

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	11.80	PLAIN
11.80	13.30	SLOTTED

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH201**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/12/2022 COMPLETED 06/12/2022 GROUND ELEVATION 767.67m N 5612418.468 E 416810.383
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 765.58 m 2.09 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...31.0 m - 53° fracture		RC19	30.36	19	100	2		30.4 m - LL = 61.8% PL = 17.3% PI = 44.5%		737
				UD6	31.88		100			30.4 m - Sand = 0.6% Silt = 59.7% Clay = 39.7%		736
32				RC20	31.88	20	100	1				735
					33.40		100					734
33							95					733
34												732
35												731
36												730
37												729
38												728
39												

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	11.80	PLAIN
11.80	13.30	SLOTTED

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH202**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/11/2022 COMPLETED 06/11/2022 GROUND ELEVATION 767.07m N 5612322.200 E 416851.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH202 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												766
2												765
3		SHALE (Weathered), clay and silt, highly weathered, light brown to dark grey mottling, moist, very weak, thinly laminated	RC1		3.00 - 4.52	1	40 100 34	20				764
4		...3.0 m - crumbled core								3.3 m - LL = 60.9% PL = 20.8% PI = 40.1%		
		...3.7 m - weak								3.8 m - EC: 2.6 dS/m		763
		...4.0 m - 10mm seam filled with very weak material	RC2		4.52 - 6.04	2	0 93 12	20		3.8 m - SAR: 21.8 3.8 m - pH: 7.7		
5		...4.1 m - 10mm seam filled with very weak material starting under 58° fracture										762
		...4.4 m - 10mm seam filled with very weak material								5.3 m - LL = 77.7% PL = 18.3% PI = 59.4%		
6		...4.5 m - fractured	RC3		6.04 - 7.56	3	99 105 97	3				761
		SHALE, silt and clay, medium weathered, grey, moist, moderately strong, moderately fractured, thinly laminated	UD1							6.4 m - Sand = 9.2% Silt = 65.5% Clay = 25.3%		
7		...6.1 m - strong								6.41 m - LL = 76.0% PL = 21% PI = 55.0%		760
		...7.7 m - 74° fracture	RC4		7.56 - 9.08	4	91 100 94	4		6.41 m - Sand = 2.1% Silt = 80.8% Clay = 17.1%		759
8										6.41 m - Dispersivity Classification = ND4		
		...9.0 m - 83° fracture								6.41 m - Jar Slake Index: 1.0		758
9		...9.3 m - 66° fracture	RC5		9.08 - 10.60	5	78 90 84	5		6.41 m - UCS = 547 kPa		
		...9.6 m - 12mm seam filled with weak material								9.88 m - Dispersivity		
		...9.8 m - parallel 82° fractures 20mm apart										
		...9.9 m - 67° fracture	UD2									

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH202**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/11/2022 COMPLETED 06/11/2022 GROUND ELEVATION 767.07m N 5612322.200 E 416851.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.6 m - moderately fractured section		RC6	10.60	6	99	4				
		...10.9 m - 100mm fractured/crumbled zone			-		110					
					12.12		97					756
12		...11.7 m - 60° fracture		RC7	12.12	7	95	3				755
		...11.7 m - moderately fractured section			-		100					
		...11.9 m - 80° fracture			13.64		91					
13												754
14		...14.2 m - 40mm fractured/crumbled zone with very weak infill		RC8	13.64	8	87	2				753
					-		94					
					15.16		84					
15				UD3								
				RC9	15.16	9	100	2				752
					-		100					
					16.68		82					
16		...15.9 m - 7° fracture										751
		...16.1 m - 53° fracture										
17		...16.7 m - moderately strong to strong		RC10	16.68	10	93	1				750
				UD4	-		93					
					18.20		91					
18		...17.4 m - 65° fracture										
		...18.2 m - 100mm fractured zone		RC11	18.20	11	102	2				749
		...18.4 m - strong			-		108					
					19.72		84					
19		...19.4 m - 30° fracture		RC12	19.72	12	91	1				748

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH202**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/11/2022 COMPLETED 06/11/2022 GROUND ELEVATION 767.07m N 5612322.200 E 416851.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.7 m - 76° fracture	UD5		- 21.24		91 90					
22		...22.3 m - 60° fracture	RC13		21.24 - 22.76	13	85 85 82	2		21 m - Sand = 0.2% Silt = 57.1% Clay = 42.7%		746
23			RC14		22.76 - 24.28	14	104 104 104	0				745
24		...24.4 m - 60° fracture	UD6									744
25			RC15		24.28 - 25.80	15	101 101 93	2				743
26		...25.6 m - 30° fracture	RC16		25.80 - 27.32	16	100 100 95	2				742
27		...26.6 m - 60° fracture	UD7									741
28		...27.1 m - 60° fracture	RC17		27.32 - 28.84	17	99 100 96	2				740
29		...27.8 m - 72° fracture										739
		...28.3 m - 20mm seam with very weak infill	RC18		28.84 - 30.36	18	100 100 99	1		28.3 m - LL = 64.3% PL = 16.1% PI = 48.2%		738
		...29.4 m - 82° fracture										

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH202**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/11/2022 COMPLETED 06/11/2022 GROUND ELEVATION 767.07m N 5612322.200 E 416851.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.5 m - 65° fracture		RC19	30.36 - 31.88	19	100 100 98	1				736
32		...32.1 m - 57° fracture		UD8 RC20	31.88 - 33.40	20	105 105 102	1				735
33												734
34												733
35												732
36												731
37												730
38												729
39												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH203**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/13/2022 COMPLETED 06/13/2022 GROUND ELEVATION 767.96m N 5612206.400 E 416888.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH203 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5												763
6												762
7		SHALE, clay and silt, trace sand, unweathered, grey, moist, high plastic, moderately strong, finely fissured, widely spaced fractures ...6.7 m - 62° fracture	RC1		6.10 - 7.62	1	92 99 86	2		6 m - All fracture angles relative to core axis.		761
8		...8.3 m - 46° fracture	RC2 UD1		7.62 - 9.14	2	98 100 94	2		7.8 m - Dispersivity Classification = ND4 7.8 m - EC: 1.6 dS/m 7.8 m - SAR: 18.3 7.8 m - pH: 8.7		760
9		...9.0 m - 71° fracture	RC3		9.14 - 10.68	3	100 100 97	1				759

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH203**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/13/2022	COMPLETED	06/13/2022	GROUND ELEVATION	767.96m N 5612206.400 E 416888.300
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.6 m - 63° fracture		RC4	10.68	4	82	4				757
		...10.9 m - 67° fracture			-		97					
		...11.0 m - 69° fracture			12.18		90					
12		...11.5 m - 65° fracture with soft infill		UD2						11.5 m - Sand = 2.1%		
		...11.7 m - 61° fracture								Silt = 54.6%		756
										Clay = 43.3%		
13		...12.7 m - 75° fracture		RC5	12.18	5	92	3				755
					-		100					
					13.70		94					
14		...13.2 m - 73° fracture		RC6	13.70	6	100	2				754
		...13.4 m - 60° fracture			-		100					
		...13.8 m - 78° fracture			15.22		93					
		...14.0 m - 72° fracture, becoming very strong										
15		...14.8 m - 58° fracture		RC7	15.22	7	87	5				753
					-		100					
					16.74		66					
16		...15.6 m - becoming moderately strong, 100 mm very fractured zone		UD3						16.3 m - LL = 60.3%		752
		...15.8 m - 16.1 - near vertical, 20° fracture								PL = 14.5%		
		BENTONITE (16.1 m), 120 mm layer								PI = 45.8%		
17		SHALE, clay and silt, trace sand, unweathered, grey, moist, high plastic, moderately strong, finely fissured, widely spaced fractures		RC8	16.74	8	84	5				751
		...16.3 m - becoming very strong, suspect calcified shale			-		96					
					18.26		90					
18		...17.0 m - 77° fracture		RC9	18.26	9	80	8				750
		...17.5 m - 40 mm soft layer			-		94					
		...18.1 m - 77° fracture			19.78		76					
19		...18.6 m - 67° fracture										749
		...18.9 m - 48° fracture										
		...19.1 m - 100 mm layer of very fractured core		UD4								
		...19.3 m - 66° fracture										
		...19.5 m - 52° fracture		RC10	19.78	10	97	4				

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH203**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/13/2022	COMPLETED	06/13/2022	GROUND ELEVATION	767.96m N 5612206.400 E 416888.300
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.3 m - 56° fracture ...20.4 m - 57° fracture ...20.7 m - 52° fracture			- 21.30		100 93					747
			RC11 UD5		21.30 - 22.82	11	100 100 98	1		21 m - Losing ~20% of drilling water 21.5 m - Sand = 0.5% Silt = 53.9% Clay = 45.6%		746
22												
23		...23.2 m - 63° fracture ...23.3 m - 60° fracture	RC12		22.82 - 24.34	12	105 105 99	2				745
24		...23.9 m - becoming moderately strong										744
			RC13		24.34 - 25.86	13	100 100 93	3				743
25										25 m - LL = 73.8% PL = 19.8% PI = 54.0% 25 m - Sand = 0.1% Silt = 54.2% Clay = 45.7%		742
26		...26.0 m - 66° fracture	RC14		25.86 - 27.38	14	100 100 99	1				741
27												
			RC15		27.38 - 28.90	15	97 100 93	2				740
28			UD6							28 m - LL = 71.0% PL = 19.1% PI = 51.9% 28 m - UCS = 1337 kPa		739
29			RC16		28.90 - 30.42	16	99 100 95	2		28.36 m - LL = 65.0% PL = 21% PI = 44.0% 28.36 m - Sand = 0.6%		

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH203**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/13/2022 COMPLETED 06/13/2022 GROUND ELEVATION 767.96m N 5612206.400 E 416888.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.6 m - 44° fracture		RC17	30.42 - 31.94	17	100 100 95	1		Silt = 54.0% Clay = 45.4%		737
32				RC18	31.94 - 33.46	18	100 100 100	0		32.3 m - LL = 61.5% PL = 15.9% PI = 45.6%		736
33												735
34												734
35												733
36												732
37												731
38												730
39												729

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH204**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/14/2022 COMPLETED 06/16/2022 GROUND ELEVATION 767.57m N 5612120.500 E 416888.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH204 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5		SHALE (Weathered), clay and silt, trace sand, medium weathered, light brown to dark grey mottling, moist, high plastic, weak, closely spaced fracture, finely stratified	RC1		4.60 - 6.12	1	6 86 26	20		4.6 m - EC: 3.2 dS/m 4.6 m - SAR: 23.8 4.6 m - SO4-S: 805.8 mg/kg 4.6 m - pH: 7.6		763
6		4.6 m - crumbled core 4.6 m - inclined fracturing								5.2 m - LL = 89.5% PL = 20.1% PI = 69.4%		762
7		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, moderately strong, very widely spaced fracture, finely stratified	RC2		6.12 - 7.64	2	37 99 53	20		5.2 m - Sand = 0.1% Silt = 50.7% Clay = 49.2%		761
8		7.6 m - moderately strong to strong 7.8 m - 85° fracture 7.9 m - 77° fracture	UD1 RC3		7.64 - 9.16	3	89 100 97	3		5.2 m - Dispersivity Classification = D2 5.2 m - EC: 2.5 dS/m 5.2 m - SAR: 19.3 5.2 m - pH: 8.1		760
9		9.3 m - 50° fracture 9.6 m - 33° fracture	RC4		9.16 - 10.68	4	100 100 88	3				759
												758

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH204**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/14/2022 COMPLETED 06/16/2022 GROUND ELEVATION 767.57m N 5612120.500 E 416888.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.6 m - 76° fracture		RC5	10.68	5	99	1				757
		...10.9 m - 86° fracture		UD2	12.20		99					
							98					
12				RC6	12.20	6	101	0				
							101					
					13.72		101					
13				RC6								
										13 m - Sand = 0.3%		
										Silt = 62.5%		
										Clay = 37.2%		
										13 m - UCS = 79 kPa		
14				RC7	13.72	7	76	3				
							89					
					15.24		79					
15		...15.0 m - 40mm seam with very weak infill		RC8	15.24	8	76	2				
		...15.2 m - fracture section with weak infill		UD3			100					
		...15.3 m - 72° fracture			16.76		90					
16		BENTONITE (15.4 m), 70 mm layer		UD4								
		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, moderately strong, very widely spaced fracture, finely stratified								15.43 m - MBI: 68.7 meq/100g		
		...15.5 m - strong										
17				RC9	16.76	9	86	2				
							100			16.1 m - LL = 81.4%		
							74			PL = 15.3%		
										PI = 66.1%		
18				UD5	18.28					16.1 m - Sand = 0.1%		
										Silt = 64.4%		
										Clay = 35.5%		
19		...18.9 m - trace orange shells (suspect)		RC10	18.28	10	95	5				
							104					
					19.80		99					
		...19.6 m - 3 parallel 83° fractures 90 mm and 30 mm apart		UD6	19.80	11	101	0				
				RC11								

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH204**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/14/2022 COMPLETED 06/16/2022 GROUND ELEVATION 767.57m N 5612120.500 E 416888.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21					- 21.32		101 101					747
22		...21.8 m - 87° fracture with slight weak infill ...22.3 m - slightly crumbled section of core	RC12	21.32	12	93 97 95	3			22.1 m - Dispersivity Classification = D2 22.2 m - EC: 7.7 dS/m 22.2 m - SAR: 40.5 22.2 m - pH: 7.8		746
23			UD7									745
24		...24.0 m - 82° fracture followed by 10mm weak infill ...24.5 m - 83° fracture	RC13	22.84	13	100 100 98	1					744
25												743
26		...25.8 m - 82° fracture	RC14	24.36	14	101 101 99	2					742
27		...26.6 m - slightly crumbled section	UD8	25.88	15	100 100 97	1					741
28		...28.0 m - 88° fracture	RC15	27.40	16	100 100 99	1					740
29		...28.9 m - 70 mm very weak infill seam ...29.2 m - 57° fracture	UD9	27.40	16	100 100 99	1					739
			RC16	28.92	17	101 105 99	2					738

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH204**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/14/2022 COMPLETED 06/16/2022 GROUND ELEVATION 767.57m N 5612120.500 E 416888.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.4 m - interbedded shell ...30.8 m - 82° fracture	UD10 RC18	30.44 - 31.96	18	97 97 96	1			30.33 m - LL = 63.3% PL = 16.6% PI = 46.7% 30.33 m - Sand = 2.0% Silt = 35.1% Clay = 62.9%		737
32		...32.0 m - 88° fracture and interbedded shell	RC19	31.96 - 33.48	19	101 103 102	1					736
33			UD11									735
34												734
35												733
36												732
37												731
38												730
39												729
												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH205**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/16/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.53m N 5612008.100 E 416881.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH205 LOG.										768
2												767
3												766
4		SHALE (Weathered), clay and silt, trace sand, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak to weak, closely spaced fracture, finely stratified	RC1		3.00 - 4.52	1	0 99 62	20				765
5		...3.4 m - crumbled core ...3.8 m - horizontal fracturing ...4.5 m - slightly inclined fracturing	UD1									764
6		SHALE, and silt, clayey, trace sand, slightly weathered, grey, damp, high plastic, weak, closely spaced fracture, finely stratified	RC2		4.52 - 6.04	2	36 100 93	20				763
7		...6.0 m - moderately strong	RC3		6.04 - 7.56	3	88 101 93	4				762
8			UD2									761
9		...7.7 m - strong	RC4		7.56 - 9.08	4	69 98 72	8				760
												759
		...9.8 m - 73° fracture	RC5		9.08 - 10.60	5	102 102 99	2				

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH205**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/16/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.53m N 5612008.100 E 416881.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.5 m - 77° fracture with slight weak infill	UD3	10.60	6	100	3					758
		...10.7 m - 120mm section of calcified shale, very strong	RC6	-		100						
		...11.0 m - 30° fracture	UD4	12.12		88						
12		...11.2 m - 56° fracture followed by 40mm weak infill seam										757
		...11.7 m - 59° fracture	RC7	12.12	7	96	2					
		...12.2 m - 72° fracture		-		96						
				13.64		88						756
13												
		...13.4 m - 65° fracture	RC8	13.64	8	93	4					755
14		...14.0 m - 70° fracture		-		99						
				15.16		91						754
15		...14.6 m - 51° fracture										
		...14.7 m - 89° fracture followed by 10mm of weak infill	UD5	15.16	9	81	4			15.1 m - LL = 197.1% PL = 27.3% PI = 169.8%		753
		BENTONITE (15.0 m), 130 mm layer	RC9	-		95				15.2 m - LL = 131.7% PL = 30.7% PI = 101.0%		
		...15.0 m - 71° fracture		16.68		88						
16		SHALE, and silt, clayey, "..."										
		...15.3 m - three parallel horizontal fractures, each spaced 15mm apart										
		...15.9 m - 80° fracture	RC10	16.68	10	98	0					752
17		...16.7 m - moderately strong		-		98						
			UD6	18.20		98						751
18												
			RC11	18.20	11	98	0					750
				-		98						
				19.72		98						
19		...19.2 m - strong										
		...19.9 m - 74° fracture	RC12	19.72	12	104	1					749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH205**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/16/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.53m N 5612008.100 E 416881.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.4 m - 74° fracture	UD7	RC13	21.24	13	89	3				748
22		...22.1 m - 100mm fractured section			22.76		95					747
23		...22.6 m - 40° fracture	RC14		22.76	14	97	2				746
24		...23.0 m - 86° fracture			24.28		103					745
25		...24.2 m - 15° fracture	RC15		24.28	15	90	2				744
26		...25.1 m - clay and silt, trace sand	UD8		25.80		103					743
27		...25.4 m - 200mm fractured section	RC16		25.80	16	103	2				742
28		...26.3 m - horizontal fracture			27.32		101					741
29		...26.8 m - horizontal fracture	RC17		27.32	17	100	1				740
		...28.7 m - horizontal fracture	UD9		28.84		100					739
		...29.3 m - horizontal fracture	RC18		30.36	18	100	2				
		...29.9 m - horizontal fracture					99					

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH205**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/16/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.53m N 5612008.100 E 416881.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	Legend				REMARKS	Standpipe/ Instrument	Elevation (m)
										● MOISTURE CONTENT	— PLASTIC - LIQUID	■ SPT (N) Blows/300 mm	▲ POCKET PEN (kPa)			
31																738
32																737
33																736
34																735
35																734
36																733
37																732
38																731
39																730
																729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH206**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	03/14/2022	COMPLETED	03/15/2022	GROUND ELEVATION	768.35m N 5611906.000 E 416880.500
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	HQ3	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH205 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												768
2												767
3		SHAILE, clay and silt, trace sand, medium weathered, grey, moist, high plastic, very weak, medium spaced fractures, finely stratified	RC1		2.70 - 3.40	1	23 57 0			2.5 m - SCR and FI not recorded.		766
4			RC2		3.40 - 4.90	2	80 80 0					765
5		...5.0 m - hard drilling	RC3		4.90 - 6.50	3	100 100 0					764
6		...5.5 m - becoming softer drilling										763
7			RC4		6.50 - 8.00	4	80 100 0			6.5 m - Dispersivity Classification = D2		762
8		...7.8 m - moderately inclined fracture	RC5		8.00 - 9.60	5	94 94 0			7 m - UCS = 3832 kPa		761
9		...9.2 m - moderately inclined fracture								8.8 m - LL = 80.1% PL = 15.7% PI = 64.4%		760
			RC6		9.60 - 10.80	6	125 125 0					759

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH206**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 03/14/2022 COMPLETED 03/15/2022 GROUND ELEVATION 768.35m N 5611906.000 E 416880.500
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...12.3 m - widely spaced, highly inclined fractures		RC7	10.80 - 12.30	7	100 100 0			11.1 m - LL = 65.6% PL = 19.3% PI = 46.3% 11.1 m - EC: 4.1 dS/m 11.1 m - SAR: 32.3 11.1 m - pH: 8.6		758
12				RC8	12.30 - 13.80	8	100 100 0					757
13				RC9	13.80 - 15.20	9	100 100 0					756
14		...17.0 m - becoming hard, fractured, loss of circulation (hard drilling)		RC10	15.20 - 16.80	10	100 100 0					755
15				RC11	16.80 - 18.40	11	100 100 0					754
16				RC12	18.40 - 20.10	12	100 100 0			17.8 m - Sand = 0.1% Silt = 62.9% Clay = 37.0%		753
17												752
18												751
19												750
												749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH206**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	03/14/2022	COMPLETED	03/15/2022	GROUND ELEVATION	768.35m N 5611906.000 E 416880.500
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	HQ3	DIAMETER (mm)	75	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21				RC13	20.10 - 21.50	13	100 100 0			21 m - LL = 68.4% PL = 20.9% PI = 47.5%		748
22				RC14	21.50 - 22.90	14	100 100 0					747
23				RC15	22.90 - 24.40	15	100 100 0					746
24												745
25		...24.4 m - minimal loss of water in hole/formation when left overnight		RC16	24.40 - 25.90	16	93 93 0					744
26				RC17	25.90 - 27.60	17	97 97 0					743
27												742
28				RC18	27.60 - 28.50	18	94 94 0					741
29		SANDSTONE, fine to medium grained, silty, clayey, unweathered, light brown, damp, moderately strong		RC19	28.50 - 30.70	19	16 16 0			28.2 m - LL = 50.5% PL = 18.8% PI = 31.7% 29 m - Sand = 42.6% Silt = 30.7% Clay = 26.7%		740 739

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH206**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 03/14/2022 COMPLETED 03/15/2022 GROUND ELEVATION 768.35m N 5611906.000 E 416880.500
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 75 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		SHALE, clay and silt, trace sand, medium weathered, grey, moist, high plastic, very weak, medium spaced fractures, finely stratified										738
32												737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH207**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/17/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.79m N 5611824.700 E 416883.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN, 6" SSA to 4.5 m. Drove casing to 6 m due to gravel. REFER TO 22BH207 LOG.										768
2												767
3												766
4												765
5		SHALE (Weathered), some gravel, some clay, some silt, highly weathered, greyish brown, moist, low to medium plastic, extremely weak, very closely spaced fractures	RC1		4.50 - 6.05	1	0 34 11	20				764
6		...4.5 m - core loss: mudstone was washed away										763
7		...6.0 m - extremely fractured SHALE, clay and silt, trace sand, moderately weathered, grey, damp, high plastic, very weak to weak, moderately widely spaced fractures, finely stratified	RC2		6.05 - 7.54	2	31 100 51	3				762
8		...7.5 m - becoming unweathered	RC3		7.54 - 9.06	3	82 100 86	3		7 m - LL = 78.4% PL = 16.7% PI = 61.7% 7 m - EC: 2.5 dS/m 7 m - SAR: 21.5 7 m - pH: 8.5 8.2 m - Dispersivity Classification = ND4 8.56 m - EC: 1.5 dS/m 8.56 m - SAR: 16.1 8.56 m - pH: 8.8		761
9		...8.6 m - 35° fracture	UD1									760
			RC4		9.06 - 10.58	4	77 100 89	5				759

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH207**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/17/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.79m N 5611824.700 E 416883.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - 43° fracture	UD2	RC5	10.58	5	88	3		10.32 m - Dispersivity Classification = ND4		758
					-		100			10.32 m - Jar Slake Index: 1.0		
					12.10		98					757
12		...12.1 m - becoming weak	RC6		12.10	6	92	5		12.1 m - Peak Friction Angle: 45.0°		
					-		100			Apparent Cohesion: 110.0kPa		756
					13.62		93			12.4 m - LL = 85.9% PL = 14.7% PI = 71.2%		
13			RC7		13.62	7	100	2				755
		...13.8 m - 27° fracture			-		100					
					15.14		99					754
14			RC8		15.14	8	86	3				
			UD3		-		100					753
					16.66		97					
15												
16		...16.4 m - 61° line, not fractured through	RC9		16.66	9	72	4		16.66 m - LL = 279.4%		752
		BENTONITE (16.7 m), 50 mm layer	UD4		-		100			PL = 27% PI = 252.4%		
		...16.6 m - very weak, highly fractured area 60mm wide			18.18		85					751
17		SHALE, clay and silt, trace sand, moderately weathered, grey, damp, high plastic, very weak to weak, moderately widely spaced fractures, finely stratified	RC10		18.18	10	84	5				
		...18.5 m - vertical fractures (90°)			-		100					750
					19.70		80					
18		...19.1 m - vertical fracture	RC11		19.70	11	89	3				749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH207**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/17/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.79m N 5611824.700 E 416883.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.2 m - high plastic clay slough for 50mm	UD5		- 21.22		100 93					748
22		...21.4 m - moderately strong layer 500mm wide	RC12		21.22 - 22.74	12	89 100 89	3		21.4 m - Sand = 0.2% Silt = 66.0% Clay = 33.8% 21.4 m - EC: 2.3 dS/m 21.4 m - SAR: 21.8 21.4 m - pH: 8.8		747
23		...22.5 m - highly fractured ...22.6 m - 22° fracture	RC13		22.74 - 24.26	13	99 100 97	3				746
24		...23.7 m - 21° fracture	RC14		24.26 - 25.78	14	96 100 99	3				745
25			UD6									744
26			RC15		25.78 - 27.30	15	90 100 97	2				743
27		...27.0 m - very strong layer 240mm wide ...27.3 m - extremely fractured	RC16		27.30 - 28.82	16	70 100 87	7		27 m - Gravel = 28.6% 27 m - Sand = 51.4% Silt = 16.6% Clay = 3.4%		742
28		...28.3 m - 32° fracture	RC17		28.82 - 30.34	17	99 100 99	2				741
29		...29.4 m - becoming moderately strong	UD7									740
												739

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH207**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 06/17/2022 COMPLETED 06/17/2022 GROUND ELEVATION 768.79m N 5611824.700 E 416883.600
DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31												738
32												737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH208**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/18/2022 COMPLETED 06/18/2022 GROUND ELEVATION 769.94m N 5611710.600 E 416876.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH208 LOG. ...0.0 m - used 8" HSA to drive casing past gravel								0 m - Drilled to 6.1 m, too much gravel. Drilled 8" HSA to 7.6 m after Run 1 to provide casing.		769
2												768
3												767
4												766
5												765
6												764
7		GRAVEL, silty, some clay, well graded, coarse grained up to 40 mm, rounded, moist, loose, brown ...6.1 m - core loss; gravel	RC1		6.10 - 7.62	1	41 53 38	2				763
8		SHALE, clay and silt, slightly weathered, grey, damp, medium plastic, extremely weak to weak, medium spaced fractures, finely stratified ...7.6 m - becoming very weak ...7.9 m - 48° fracture ...8.4 m - 37° fracture	RC2		7.62 - 9.14	2	64 100 73	7				762
9		...9.1 m - 44° fracture ...9.1 m - becoming unweathered, less clayey	UD1 RC3		9.14 - 10.66	3	90 100 91	5			8.7 m - Dispersivity Classification = ND4 8.9 m - UCS = 387 kPa	761

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH208**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/18/2022 COMPLETED 06/18/2022 GROUND ELEVATION 769.94m N 5611710.600 E 416876.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - 32° fracture		RC4	10.66 - 12.18	4	83 100 94	3				759
12		...12.2 m - becoming weak		RC5	12.18 -	5	95 100	4				758
13		...12.6 m - becoming high plastic		UD2	13.70		95			12.65 m - LL = 95.5% PL = 15% PI = 80.5%		757
14				RC6	13.70 - 15.22	6	64 100 76	8				756
15		...14.8 m - highly fractured broken up area		RC7	15.22 -	7	83 100	5				755
16		BENTONITE (15.6 m), 50 mm layer ...15.6 m - moderately strong layer		UD6	16.74		88					754
17		SHALE, clay and silt, slightly weathered, grey, damp, high plastic, extremely weak to weak, high spaced fractures, finely stratified		RC8	16.74 - 18.26	8	97 100 98	3				753
18				UD3								752
19		...18.4 m - 25° fracture		RC9	18.26 - 19.78	9	96 100 96	3				751
		...19.8 m - highly fractured		RC10	19.78	10	66	7				

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH208**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/18/2022 COMPLETED 06/18/2022 GROUND ELEVATION 769.94m N 5611710.600 E 416876.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.2 m - moderately strong layer 100 mm wide, vertically fractured		RC11	21.30	11	88	2				749
22				UD4	-		100					748
23				RC12	22.82	12	98	2				747
24		...24.0 m - 28° fracture			-		100					746
25				RC13	24.34	13	88	3				745
26				UD5	-		100					744
27				RC14	25.86	14	100	1		25.57 m - LL = 65.2% PL = 16.1% PI = 49.1%		743
28					-		100					742
29					27.38		100					741

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH209**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/20/2022	COMPLETED	06/20/2022	GROUND ELEVATION	769.53m N 5611608.000 E 416912.600
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		767.98 m	1.55 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument Elevation (m)
		OVERBURDEN. REFER TO 22BH209 LOG.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1											769
2											768
3											767
4											766
5		SHALE, clay and silt, trace sand, slightly weathered, grey, moist, high plastic, moderately strong, closely spaced fracture, finely stratified ...4.5 m - inclined fracturing	RC1		4.50 - 6.02	1	57 95 53	10			765
6		...5.8 m - 120 mm fractured section	RC2		6.02 - 7.54	2	83 98 82	7			764
7		...6.7 m - 50 mm fractured section	RC3		7.54 - 9.06	3	105 105 100	3		6.3 m - LL = 92.4% PL = 20.8% PI = 71.6% 6.3 m - EC: 2.6 dS/m 6.3 m - SAR: 22.4 6.3 m - pH: 8.5	763
8		...7.8 m - 88° fracture ...7.9 m - 81° fracture ...8.1 m - 76° fracture	UD1								762
9		...9.1 m - strong	RC4		9.06 - 10.58	4	101 101 97	3			761
		...9.8 m - 68° fracture ...9.9 m - 75° fracture									760

Notes:

Target depth of 27 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	5.00	PLAIN
5.00	6.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH209**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/20/2022	COMPLETED	06/20/2022	GROUND ELEVATION	769.53m N 5611608.000 E 416912.600
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		767.98 m	1.55 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - 85° fracture		RC5	10.58 - 12.10	5	95 95 92	2				759
		...11.4 m - 85° fracture		UD2						11.45 m - LL = 83.7% PL = 17.1% PI = 66.6%		758
12		...12.0 m - 85° fracture		RC6	12.10 - 13.62	6	92 96 88	2				757
13		...12.7 m - 63° fracture ...12.9 m - 50 mm section with slight fractured		RC7	13.62 - 15.14	7	101 101 96	3				756
14		...14.0 m - 83° fracture ...14.3 m - 60° fracture		UD3								755
15		...14.8 m - 82° fracture ...15.2 m - crumbled core		RC8	15.14 - 16.66	8	24 60 24	0				754
16		...16.0 m - core loss from 16.0 m to 16.66 m		RC9	16.66 - 18.18	9	46 74 45	1			15.6 m - Sand = 0.5% Silt = 62.4% Clay = 37.1%	753
17		...17.0 m - crumbled core with weak infill ...17.0 m - weak, slightly bentonitic ...17.2 m - core loss from 17.2 m to 17.55 m		UD4	18.18 - 19.70	10	103 103 101	1				752
18		...17.8 m - moderately strong to strong ...18.0 m - 83° fracture ...18.2 m - strong		RC10						18.2 m - Dispersivity Classification = ND3 18.2 m - EC: 1.1 dS/m		751
19		...18.7 m - 83° fracture ...18.8 m - trace shells and sandstone pockets to 10mm		UD5 RC11	19.70	11	101	1		18.2 m - SAR: 16.5 18.2 m - pH: 8.6		750

Notes:

Target depth of 27 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	5.00	PLAIN
5.00	6.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH209**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/20/2022	COMPLETED	06/20/2022	GROUND ELEVATION	769.53m N 5611608.000 E 416912.600
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		767.98 m	1.55 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.4 m - 79° fracture			-		101					
					21.22		99					
			RC12		21.22	12	100	0		20.5 m - LL = 85.2% PL = 19.9% PI = 65.3%		749
					-		100					
22			UD6		22.74		100					748
23		...23.2 m - 83° fracture	RC13		22.74	13	97	2				747
					-		97					
					24.26		95					746
24		...23.9 m - horizontal fracture with slight weak infill										
		...24.5 m - 60° fracture	RC14		24.26	14	100	2				
		...24.5 m - 220 mm Siltstone layer	UD7		-		100			24.45 m - Sand = 28.8% Silt = 44.6% Clay = 26.6%		745
25		...24.7 m - horizontal fracture followed by 10 mm of weak infill			25.78		95					
26		...26.1 m - 81° fracture	UD8		25.78	15	104	2				744
			RC15		-		104					
					27.30		101					743
27		...27.1 m - 79° fracture										
			UD9									742
28												
												741
29												740

Notes:

Target depth of 27 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	5.00	PLAIN
5.00	6.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH210**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/20/2022 COMPLETED 06/21/2022 GROUND ELEVATION 767.95m N 5611517.600 E 416868.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH210 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1				SH1								767
2												766
3		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, weak, widely spaced fracture, finely stratified		RC1 UD1	3.10 - 4.62	1	100 100 90	3				765
4		...4.2 m - 87° fracture										764
5		...4.3 m - 60 mm section of crumbled core		RC2	4.62 - 6.14	2	86 99 74	7		4.6 m - LL = 77.1% PL = 20.8% PI = 56.3%		763
6		...4.5 m - some clay										762
7		...4.6 m - 65° fracture										761
8		...5.2 m - 90 mm section of crumbled core		RC3	6.14 - 7.66	3	58 97 57	10		6.4 m - Sand = 0.1% Silt = 58.3% Clay = 41.6% 6.4 m - EC: 4.3 dS/m 6.4 m - SAR: 38.3 6.4 m - pH: 8.5		760
9		...5.4 m - 70 mm section of crumbled core										759
		...5.8 m - 70° fracture										
		...6.0 m - 79° fracture		RC4	7.66 - 9.18	4	100 100 93	4				
		...6.0 m - 80° fracture										
		...6.2 m - 550 mm moderately fractured section										
		...6.9 m - moderately strong		UD2								
		...8.1 m - 74° fracture										
		...8.3 m - 67° fracture										
		...8.9 m - 78° fracture		RC5	9.18 - 10.70	5	99 99 93	3				

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH210**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/20/2022 COMPLETED 06/21/2022 GROUND ELEVATION 767.95m N 5611517.600 E 416868.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - 76° fracture ...10.2 m - 49° fracture ...10.5 m - horizontal fracture	RC6	10.70	6	98	4			10.4 m - Slight loss in water circulation that worsened a little with depth. Water was seen coming up out of the well at 22BH210 shortly after loss of circulation was discovered. Refer to video.		757
12		...11.0 m - 65° fracture ...11.2 m - moderately strong to strong ...11.3 m - 75° fracture ...11.6 m - 61° fracture	UD3	12.22	7	101	1			11.6 m - UCS = 1164 kPa		756
13		...13.2 m - 85° fracture	RC7	12.22	7	101	1					755
14		...14.0 m - 70° fracture ...14.3 m - parallel 61° fractures 90 mm apart	RC8	13.74	8	90	5					754
15		...14.8 m - 48° fracture ...14.8 m - 80 mm fractured zone	UD4	15.26	9	103				14.9 m - Sand = 0.5%		753
16		...15.4 m - strong ...15.8 m - horizontal fracture with 10 mm of crumbled core pieces and weak infill	RC9	15.26	9	95	3			Silt = 67.1% Clay = 32.4%		752
17		...16.3 m - 54° fracture ...16.4 m - 57° fracture	UD5	16.78	10	100	2					751
18		...17.6 m - horizontal fracture	RC10	16.78	10	94	2					750
19		...18.2 m - 87° fracture with shell inclusions	RC11	18.30	11	92	4					749
			RC12	19.82	12	97	4			19.8 m - Water		

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH210**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/20/2022 COMPLETED 06/21/2022 GROUND ELEVATION 767.95m N 5611517.600 E 416868.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.0 m - 76° fracture ...20.1 m - 40° fracture ...20.6 m - 18° fracture ...20.9 m - 74° fracture	UD6		- 21.34		103 81			stopped flowing from well at 22BH210		747
22			RC13		21.34 - 22.86	13	95 95 95	0		21.5 m - LL = 73.2% PL = 16.9% PI = 56.3%		746
23			RC14		22.86 - 24.38	14	99 103 95	3		21.8 m - EC: 1.8 dS/m 21.8 m - SAR: 19.3 21.8 m - pH: 9.1		745
24		...23.0 m - 83° fracture ...23.0 m - 24° fracture ...23.5 m - 60° fracture	UD7									744
25		...24.6 m - parallel 87° fractures 50 mm apart	RC15		24.38 - 25.90	15	89 99 98	3				743
26		...25.7 m - 210 mm section of calcified (suspect) shale ...25.9 m - moderately strong	RC16		25.90 - 27.42	16	90 90 82	2		25.7 m - LL = 61.9% PL = 15.9% PI = 46.0%		742
27		...26.4 m - 78° fracture ...26.6 m - 30° fracture										741
28		...27.2 m - 180 mm of core loss	RC17		27.42 - 28.94	17	96 96 93	1				740
29		...28.3 m - 50° fracture ...28.9 m - strong	UD8									739
			RC18		28.94 - 30.46	18	101 101 101	0		29 m - Sand = 3.0% Silt = 57.0% Clay = 40.0%		

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH210**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/20/2022 COMPLETED 06/21/2022 GROUND ELEVATION 767.95m N 5611517.600 E 416868.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...31.2 m - 50° fracture		RC19	30.46 - 31.98	19	100 100 94	1		31 m - LL = 60.2% PL = 15.0% PI = 45.2%		737
32				UD9 RC20	31.98 - 33.50	20	100 100 99	1				736
33		...33.4 m - 70° fracture										735
34												734
35												733
36												732
37												731
38												730
39												729

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH211**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/21/2022 COMPLETED 06/22/2022 GROUND ELEVATION 768.16m N 5611432.800 E 416867.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH211 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												768
2												767
3												766
4		SHALE (Weathered), clay and silt, trace sand, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak to weak, extremely closely spaced fracture, finely stratified, suspect trace quartz crystals, interbedded oxidation layers within fractures	RC1		3.00 - 4.52	1	76 100 80	8		3.7 m - Dispersivity Classification = ND4		765
5		...3.0 m - 120 mm crumbled core section ...3.9 m - 100 mm fractured section	RC2		4.52 - 6.04	2	62 97 76	7		5.3 m - EC: 8.6 dS/m 5.3 m - SAR: 21.9 5.3 m - pH: 6.1		764
6		SHALE, silt and clay, trace sand, medium weathered, grey with some oxidation staining, moist, high plastic, weak, closely spaced fracture, finely stratified	RC3 UD1		6.04 - 7.56	3	93 100 88	3		6.04 m - UCS = 844 kPa		763
7		...4.5 m - inclined fracturing ...6.3 m - 110 mm crumbled core section ...6.6 m - 42° fracture										762
8		...7.5 m - widely spaced fracturing	RC4		7.56 - 9.08	4	103 103 95	3		7.6 m - LL = 66.7% PL = 16.4% PI = 50.3%		761
9		...8.2 m - 50° fracture ...8.8 m - 70° fracture ...8.9 m - 130 mm section of suspect calcified shale ...9.0 m - horizontal fracture followed by 15 mm section of weak infill ...9.1 m - moderately strong ...9.2 m - 56° fracture ...9.3 m - 74° fracture	RC5		9.08 - 10.60	5	99 99 94	3		9 m - LL = 80.0% PL = 26% PI = 54.0% 9 m - Sand = 2.8% Silt = 77.4% Clay = 19.8%		760 759

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH211**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/21/2022 COMPLETED 06/22/2022 GROUND ELEVATION 768.16m N 5611432.800 E 416867.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.7 m - becoming no to trace fine grained sand	UD2	RC6	10.60	6	101	2				758
					-		101					
					12.12		93					757
		...11.5 m - 61° fracture										
12		...12.0 m - 39° fracture	RC7		12.12	7	84	5				756
					-		97					
		...12.4 m - moderately strong to strong			13.64		88					
13		...13.0 m - 130 mm moderately fractured section										755
		...13.6 m - strong	RC8		13.64	8	99	3				
		...13.8 m - 76° fracture			-		100					
14		...13.9 m - 67° fracture	UD3		15.16		95					754
		...14.7 m - 66° fracture followed by 10 mm of weak infill										
15			RC9		15.16	9	95	4				753
					-		100					
		...15.7 m - 80° fracture			16.68		95					
16		...16.0 m - 75° fracture										752
		...16.3 m - 58° fracture										
17		...16.9 m - parallel 75° fractures 60 mm apart	RC10		16.68	10	86	3				751
					-		99					
					18.20		86					
18		...17.7 m - 120 mm fracture section										
		...18.3 m - 45° fracture	RC11		18.20	11	89	5				750
			UD4		-		100					
					19.72		65					
19		...18.9 m - 27° fracture										
		...19.0 m - 50° fracture										
		...19.2 m - 65° fracture										
		...19.3 m - 15° fracture	RC12		19.72	12	100	2				749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH211**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/21/2022 COMPLETED 06/22/2022 GROUND ELEVATION 768.16m N 5611432.800 E 416867.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.1 m - 85° fracture			-		100					748
		...20.5 m - 88° fracture			21.24		99					
			RC13		21.24	13	99	3		20.8 m - LL = 85.8% PL = 17.3% PI = 68.5%		747
		...21.3 m - 47° fracture			-		99					
		...21.5 m - 29° fracture			22.76		89					
22			UD5									746
		...22.4 m - 34° fracture										
23			RC14		22.76	14	99	2				745
					-		99			23.2 m - Sand = 0.2% Silt = 51.3% Clay = 48.5%		744
		...23.8 m - 44° fracture										
24		...24.0 m - horizontal fracture										743
			RC15		24.28	15	96	3				
					-		102					
25		...24.8 m - 30° fracture			25.80		90					742
		...24.9 m - 76° fracture										
			UD6									
26		...25.7 m - 51° fracture										741
			RC16		25.80	16	99	1				
					-		99					
					27.32		97					
27												740
		...27.2 m - 73° fracture										
		...27.5 m - 73° fracture										
28			RC17		27.32	17	101	2				739
					-		101					
					28.84		95			28 m - LL = 68.1% PL = 14.1% PI = 54.0%		
		...28.2 m - 47° fracture										
			UD7									
29			RC18		28.84	18	96	2				
					-		100					
					30.36		94					
		...29.6 m - 65 mm fractured section										

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH211**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/21/2022 COMPLETED 06/22/2022 GROUND ELEVATION 768.16m N 5611432.800 E 416867.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		30.2 m - 72° fracture										738
32												737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH212**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/01/2022 COMPLETED 09/01/2022 GROUND ELEVATION 764.39m N 5611305.369 E 416861.193
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH212 LOG.								0 m - 4" SSA to 4.7 m.		764
2												763
3												762
4												761
5		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, extremely weak, closely spaced fractures, thinly laminated, unoxidized	RC1		4.70 - 6.22	1	49 99 61	6		4.8 m - LL = 74.8% PL = 18.2% PI = 56.6%		760
6		...4.9 m - 250 mm mechanically fractured area								5.3 m - Sand = 0.4% Silt = 67.5% Clay = 32.1%		759
7		...5.0 m - becoming centimeter to decimeter weakly cemented layers	RC2		6.22 - 7.74	2	65 99 47	7		5.3 m - EC: 2.6 dS/m 5.3 m - SAR: 31.8 5.3 m - SO4-S: 332.0 mg/kg 5.3 m - pH: 8.5		758
8		...5.5 m - 71° fracture										757
9		...6.2 m - 20 mm of core loss										756
		...6.2 m - very mechanically fractured run										755
		...7.7 m - 20 mm of core loss	RC3		7.74 - 9.26	3	90 100 90	3		7.9 m - LL = 84.4% PL = 23.4% PI = 61.0%		
		...7.9 m - becoming unweathered, very weak, moderately widely spaced fractures										
		...8.7 m - 48° fracture										
		...8.9 m - 94° fracture										
		...9.5 m - 63° fracture	RC4		9.26 - 10.78	4	86 100 87	3				
		...9.7 m - 76° fracture										

Notes:

Target depth of 39 m achieved. Corehole backfilled with cement grout.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH212**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/01/2022 COMPLETED 09/01/2022 GROUND ELEVATION 764.39m N 5611305.369 E 416861.193
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - vertical fracture ...10.5 m - crumbled core		RC5	10.78 - 12.30	5	89 100 89	5		11.1 m - LL = 95.5% PL = 22.1% PI = 73.4%		754
12		...11.0 m - 58° fracture ...11.0 m - 125° fracture										753
13		...11.9 m - 113° fracture ...12.5 m - 125° fracture ...12.6 m - large ammonite inclusion		RC6	12.30 - 13.82	6	74 100 84	3				752
14		...13.6 m - crumbled core ...13.9 m - becoming weak ...14.3 m - vertical fracture		RC7	13.82 - 15.34	7	91 100 91	3				751
15		...15.2 m - vertical fracture		RC8	15.34 - 16.86	8	93 100 91	3				750
16		...15.7 m - vertical fracture										749
17		...16.4 m - 110° fracture ...16.6 m - 63° fracture		RC9	16.86 - 18.38	9	89 101 91	3		17.2 m - Sand = 0.6%		748
18		...17.1 m - 72° fracture ...17.2 m - 142° fracture ...17.5 m - vertical fracture ...17.6 m - 400 mm of suspect white sulphate inclusions								Silt = 65.2% Clay = 34.2%		747
19		...18.1 m - vertical fracture ...18.9 m - vertical fracture ...19.3 m - 106° fracture ...19.4 m - crumbled core ...19.5 m - 150 mm of strong calcified shale		RC10	18.38 - 19.90	10	75 92 98	3				746
		...19.6 m - horizontal fracture ...19.8 m - 120 mm of core loss		RC11		11		3				745

Notes:

Target depth of 39 m achieved. Corehole backfilled with cement grout.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH212**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/01/2022 COMPLETED 09/01/2022 GROUND ELEVATION 764.39m N 5611305.369 E 416861.193
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.7 m - 98° fracture			19.90 - 21.42		86 100 87					744
22		...22.0 m - 42° fracture ...22.2 m - 64° fracture, crumbled core	RC12		21.42 - 22.94	12	91 97 89	2		22 m - Sand = 0.4% Silt = 51.4% Clay = 48.2%		743
23		...22.8 m - 69° fracture ...22.9 m - 40 mm of core loss	RC13		22.94 - 24.46	13	100 100 97	1				742
24		...24.1 m - 56° fracture ...24.2 m - suspect white sulphate inclusions	RC14		24.46 - 25.98	14	88 89 86	1				741
25		...25.5 m - vertical fracture with weak clay infill										740
26		...25.8 m - 160 mm of core loss ...26.0 m - recovered lost core from previous run	RC15		25.98 - 27.50	15	93 100 89	2				739
27		...26.2 m - crumbled core ...26.3 m - horizontal fracture ...26.6 m - trace shell inclusion										738
28		...27.5 m - 260 mm of horizontal fractures	RC16		27.50 - 29.02	16	85 104 84	3				737
29		...28.4 m - vertical fracture ...28.5 m - 108° fracture ...29.0 m - becoming some thin moderately strong layers ...29.4 m - 80° fracture	RC17		29.02 - 30.54	17	101 101 101	1		28.6 m - LL = 58.6% PL = 17.1% PI = 41.5% 28.6 m - EC: 3.0 dS/m 28.6 m - SAR: 28.1 28.6 m - pH: 8.5		736
												735

Notes:

Target depth of 39 m achieved. Corehole backfilled with cement grout.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH212**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/01/2022 COMPLETED 09/01/2022 GROUND ELEVATION 764.39m N 5611305.369 E 416861.193
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.5 m - becoming widely spaced fractures		RC18	30.54 - 32.06	18	101 101 99	1				734
		...31.4 m - 118° fracture										733
32				RC19	32.06 - 33.58	19	97 100 95	1		32 m - LL = 67.6% PL = 18.4% PI = 49.2%		732
33		...32.8 m - 58° fracture										731
		...33.3 m - 56° fracture										731
34				RC20	33.58 - 35.10	20	97 97 97	1				730
		...34.2 m - vertical fracture										730
35		...34.9 m - vertical fracture with weak clay infill		RC21	35.10 - 36.62	21	99 100 97	1				729
		...35.1 m - 40 mm of core loss										729
36		...35.7 m - becoming moderately strong								35.7 m - Sand = 0.3% Silt = 66.5% Clay = 33.2%		728
		...36.2 m - 42° fracture										728
37		...36.6 m - trace shell inclusion		RC22	36.62 - 38.14	22	89 100 91	1				727
		...37.3 m - 140 mm of suspect white sulphate inclusions										727
38		...38.0 m - 140 mm of mechanical rubble		RC23	38.14 - 39.66	23	105 111 100	1				726
		...38.5 m - weak clay infill								38.5 m - LL = 144.7% PL = 26.3% PI = 118.4%		726
39												725

Notes:

Target depth of 39 m achieved. Corehole backfilled with cement grout.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH213**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/19/2022	COMPLETED	07/20/2022	GROUND ELEVATION	765.04m N 5611187.600 E 416863.900
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	764.21 m 0.83 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT □ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm ▲ POCKET PEN (kPa)		
1		OVERBURDEN. REFER TO 22BH213 LOG.									
2		SHALE (Weathered), clay and silt, trace sand, highly weathered, light brown to dark grey mottling, damp, high plastic, extremely weak, blocky, finely stratified, oxide staining, gypsum crystals									
3		...3.6 m - becoming shale									
4		SHALE, clay and silt, trace sand, medium weathered, grey, damp, high plastic, very weak to weak, very closely spaced fracture, finely stratified, slight oxide staining	RC1		3.00 - 4.52	1	14 100 33	20			
5		...4.3 m - becoming weak									
6		...4.5 m - 200 mm crumbled core									
7		...4.8 m - becoming slightly weathered, weak to moderately strong	RC2		4.52 - 6.04	2	76 100 68	7			
8		...4.8 m - 85° fracture									
9		...5.2 m - 100 mm crumbled core	UD1								
10		...5.4 m - becoming unweathered, moderately strong, unoxidized									
11		...5.4 m - 68° fracture									
12		...5.6 m - 55° fracture									
13		...6.0 m - becoming moderately strong to strong	RC3		6.04 - 7.56	3	100 100 98	2			
14		...6.1 m - 62° fracture									
15		...6.3 m - 88° fracture									
16		...6.8 m - 76° fracture									
17		...7.0 m - becoming weak to moderately strong									
18		...7.8 m - 70° fracture	RC4		7.56 - 9.08	4	95 100 88	3			
19		...8.0 m - 87° fracture									
20		...8.2 m - becoming moderately strong									
21		...8.7 m - 40° fracture									
22		...9.0 m - 82° fracture									
23		...9.0 m - 18° fracture									
24		...9.1 m - severe mechanical fracturing to 9.7 m									
25		...9.4 m - 19° fracture	RC5		9.08 - 10.60	5	100 100 89	2			
26		...9.8 m - 77° fracture									
27		...9.8 m - becoming moderately strong to strong									

Notes:

Target depth of 39 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.50	PLAIN
7.50	9.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH213**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/19/2022	COMPLETED	07/20/2022	GROUND ELEVATION	765.04m N 5611187.600 E 416863.900
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		764.21 m	0.83 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 74° fracture	UD2									
		...10.7 m - becoming strong	RC6		10.60	6	100	2		10.3 m - LL = 92.5% PL = 17.3% PI = 75.2%		754
		...10.7 m - 55° fracture			-		100					
		...11.2 m - 79° fracture			12.12		96					
12		...11.7 m - 89° fracture	RC7		12.12	7	93	3				753
					-		99					
					13.64		93					
13		...12.8 m - 79° fracture										752
		...13.1 m - 85° fracture										
		...13.2 m - 50° fracture										
		...13.3 m - 86° fracture	RC8		13.64	8	100	3				751
14		...13.4 m - interbedded shells			-		100					
		...13.4 m - 50° fracture			15.16		98					
		...13.8 m - 70° fracture										
		...14.4 m - 88° fracture	UD3							14.65 m - EC: 3.8 dS/m		
15		...14.6 m - 89° fracture	RC9		15.16	9	97	3		14.65 m - SAR: 33.2		750
		...15.0 m - 87° fracture			-		100			14.65 m - pH: 8.2		
		...15.3 m - 84° fracture			16.68		93			14.65 m - UCS = 1459 kPa		
16		...15.6 m - 86° fracture										749
		...16.1 m - 68° fracture										
		...16.4 m - 84° fracture										
		...16.4 m - 41° fracture	RC10		16.68	10	103	2				748
17		...16.7 m - moderately strong to strong			-		103					
		...17.1 m - 70 mm calcified shale			18.20		101					
18		...17.6 m - 83° fracture	UD4							17.77 m - LL = 71.3% PL = 15.9% PI = 55.4%		747
		...18.0 m - 77° fracture	RC11		18.20	11	96	2				
		...18.4 m - 89° fracture			-		96					
		...18.5 m - becoming strong			19.72		95					
19		...19.0 m - 84° fracture										746
		...19.2 m - 85° fracture	RC12		19.72	12	100	2				

Notes:

Target depth of 39 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.50	PLAIN
7.50	9.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH213**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/19/2022	COMPLETED	07/20/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	765.04m	N 5611187.600 E 416863.900
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	764.21 m	0.83 m
		DATE GROUND WATER RECORDED	10/12/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.2 m - 87° fracture ...20.6 m - horizontal fracture			- 21.24		100 99					
				RC13	21.24 - 22.76	13	103 103 100	2				744
22		...21.7 m - 86° fracture ...22.0 m - 65° fracture		UD5								743
				RC14	22.76 - 24.28	14	90 90 88	2				742
23		...23.0 m - 86° fracture ...23.4 m - 88° fracture										741
24		...24.0 m - 72° fracture		RC15	24.28 - 25.80	15	104 104 103	1				740
25		...24.7 m - 89° fracture										739
				UD6 RC16	25.80 - 27.32	16	100 100 97	2				738
26		...26.9 m - 54° fracture ...27.0 m - 81° fracture										737
				RC17	27.32 - 28.84	17	107 107 106	1				736
27		...27.9 m - 75° fracture		UD7								
28				RC18	28.84 - 30.36	18	101 101 101	0				
29												

Notes:

Target depth of 39 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.50	PLAIN
7.50	9.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH213**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/19/2022	COMPLETED	07/20/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	765.04m	N 5611187.600 E 416863.900
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	764.21 m	0.83 m
		DATE GROUND WATER RECORDED	10/12/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31				RC19	30.36 - 31.88	19	100 100 99	1				734
32		...31.9 m - becoming moderately strong to strong		RC20	31.88 - 33.40	20	103 103 103	1				733
33		...32.8 m - 87° fracture		UD8						32.75 m - LL = 65.6% PL = 14.3% PI = 51.3%		732
34		...33.2 m - becoming strong		RC21	33.40 - 34.92	21	101 101 99	1				731
35		...33.8 m - 72° fracture		RC22	34.92 - 36.44	22	93 93 91	1				730
36		...36.1 m - 46° fracture		UD9						35.75 m - Sand = 0.3% Silt = 57.9% Clay = 41.8%		729
37		...36.5 m - becoming strong to very strong		RC23	36.44 - 37.96	23	100 100 100	0				728
38				RC24	37.96 - 39.48	24	100 100 98	1				727
39		...39.0 m - 45° fracture		UD10						39.26 m - LL = 67.9% PL = 13.4% PI = 54.5%		726

Notes:

Target depth of 39 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.50	PLAIN
7.50	9.00	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH213**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/19/2022 COMPLETED 07/20/2022 GROUND ELEVATION 765.04m N 5611187.600 E 416863.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 764.21 m 0.83 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
41										39.26 m - UCS = 3179 kPa		724
42												723
43												722
44												721
45												720
46												719
47												718
48												717
49												716

Notes:

Target depth of 39 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.50	PLAIN
7.50	9.00	SLOTTED

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH214**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/12/2022	COMPLETED	07/12/2022	GROUND ELEVATION	767.63m N 5611105.500 E 416858.240
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH	765.02 m	2.61 m	
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1		OVERBURDEN. REFER TO 22BH214 LOG.									767
2											766
3											765
4											764
5											763
6											762
7		SHALE, clay and silt, trace sand, medium weathered, grey, some oxidation staining, damp, high plastic, extremely weak, closely spaced fractures, thinly laminated	RC1		6.10 - 7.62	1	17 81 22	20			761
8		...7.3 m - 290 mm of core loss								7 m - LL = 59.4% PL = 14% PI = 45.4%	760
		...7.9 m - 1.36 m of core loss	RC2		7.62 - 9.32	2	0 11 5	1		7.62 m - Sideways piece of core in coring bit. 1.36 m of the run was ground up and washed away	759
9		...9.3 m - no recovery	RC3		9.32 - 10.06	3	0 0 0			9.32 m - entire run was lost	758

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	10.10	PLAIN
10.10	11.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH214**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/12/2022	COMPLETED	07/12/2022	
GROUND ELEVATION	767.63m	N	5611105.500	E 416858.240
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH	765.02 m	2.61 m
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	76	
DATE GROUND WATER RECORDED	08/10/2022			

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - becoming unweathered, no oxidation staining ...10.1 m - 200 mm of slough recovered from Run 3 ...10.8 m - 50° fracture	RC4	10.06	4	100	4			10.1 m - LL = 71.7% PL = 18.4% PI = 53.3%		757
			RC5	10.85	5	96	4			10.1 m - Sand = 0.7% Silt = 59.8% Clay = 39.5%		756
12		...12.0 m - 50° fracture	RC6	12.42	6	100	2					755
13						100						
14		...13.9 m - becoming very weak to weak	RC7	13.95	7	89	3			14 m - LL = 77.9% PL = 17.9% PI = 60.0%		754
		...14.7 m - 40° fracture				102						753
15		...15.2 m - 35° fracture	RC8	15.42	8	90	1					752
16						121						
17		BENTONITE (16.3 m), 100 mm layer SHALE, clay and silt, trace sand, medium weathered, grey, some oxidation staining, damp, high plastic, extremely weak, closely spaced fractures, thinly laminated	RC9	16.41	9	80	2			16.3 m - LL = 55.1% PL = 18.6% PI = 36.5%		751
						86				16.3 m - Sand = 0.2% Silt = 64.2% Clay = 35.6%		750
18						75				16.3 m - EC: 2.5 dS/m 16.3 m - SAR: 26.4 16.3 m - pH: 8.3 18.06 m - Switched to 76.2 mm core		749
19		...19.9 m - becoming weak	RC10	18.50	10	100	1					748
						100						
			RC11	19.94	11	98	1					

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	10.10	PLAIN
10.10	11.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH214**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/12/2022	COMPLETED	07/12/2022	GROUND ELEVATION	767.63m N 5611105.500 E 416858.240
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		765.02 m	2.61 m
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.6 m - 70° fracture			19.94 - 21.52	98 - 98						747
22		...21.5 m - 20 mm moderately strong layer	RC12		21.52 - 23.07	12 - 99	97 - 100	1				746
23			RC13		23.07 - 24.59	13 - 76	77 - 78	2				745
24		...24.0 m - 55° fracture										744
25		...24.6 m - 180 mm mechanically fractured area	RC14		24.59 - 26.04	14 - 83	77 - 100	3				743
26		...25.2 m - 45° fracture ...25.4 m - 60° fracture	RC15		26.04 - 27.59	15 - 97	97 - 100	1				742
27		...26.8 m - 60° fracture								26.8 m - LL = 58.2% PL = 14.6% PI = 43.6%		741
28			RC16		27.59 - 29.12	16 - 99	100 - 100	1				740
29		...28.8 m - 75° fracture	RC17		29.12 - 30.69	17 - 98	100 - 100	1				739
		...29.7 m - 70° fracture										738

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	10.10	PLAIN
10.10	11.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH214**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/12/2022	COMPLETED	07/12/2022	GROUND ELEVATION	767.63m N 5611105.500 E 416858.240
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		765.02 m	2.61 m
CORING TYPE	2 3/4" x 4 5/8"	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.1 m - 60° fracture		RC18	30.69 - 33.13	18	100 100 97	1				737
32												736
33		...32.6 m - 45° fracture										735
34												734
35												733
36												732
37												731
38												730
39												729
												728

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	10.10	PLAIN
10.10	11.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH215**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/13/2022 GROUND ELEVATION 766.80m N 5611015.000 E 416849.900
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH215 LOG.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												766
2												765
3												764
4												763
5												762
6												761
7		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, very weak, moderately widely spaced fractures, thinly laminated ...6.6 m - 50° fracture ...7.2 m - 55° fracture ...7.3 m - 300 mm of crumbled core ...7.6 m - 65° fracture ...7.9 m - 45° fracture	RC1		6.00 - 7.60	1	98 100 84	2		6 m - EC: 1.7 dS/m 6 m - SAR: 18.9 6 m - pH: 8.7 6.5 m - LL = 74.0% PL = 14.4% PI = 59.6% 6.5 m - EC: 1.8 dS/m 6.5 m - SAR: 21.0 6.5 m - pH: 8.2		760
8			RC2		7.60 - 9.32	2	100 100 88	2				759
9		...8.9 m - 62° fracture ...9.3 m - becoming unweathered	UD1 RC3		9.32 - 10.72	3	100 100 99	1				758
												757

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH215**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/13/2022	COMPLETED	07/13/2022	GROUND ELEVATION
				766.80m N 5611015.000 E 416849.900
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - 35° fracture ...10.3 m - some shell inclusions		RC4	10.72 - 12.35	4	100 100 100	1				756
12		...11.8 m - 90° fracture								11.1 m - LL = 92.9% PL = 16.3% PI = 76.6%		755
13		...12.4 m - becoming widely spaced fractures ...12.7 m - 50° fracture		RC5	12.35 - 13.74	5	101 102 100	1				754
14		...13.7 m - 60° fracture ...13.8 m - becoming weak		RC6	13.74 - 15.40	6	100 100 98	1				753
15												752
16		...15.4 m - 45° fracture ...15.6 m - 55° fracture		RC7	15.40 - 16.90	7	93 100 87	3			15.6 m - Sand = 0.9% Silt = 56.3% Clay = 42.8%	751
17		BENTONITE (16.2 m), 20 mm layer SHAPE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, very weak, moderately widely spaced fractures, thinly laminated		RC8	16.90 - 18.45	8	100 100 98	1			17.2 m - LL = 91.0% PL = 20.2% PI = 70.8%	750
18		...16.8 m - 65° fracture ...17.2 m - shell inclusion								17.2 m - Sand = 0.2% Silt = 60.9% Clay = 38.9%		749
19		...18.1 m - 50° fracture ...18.6 m - 80° fracture		RC9	18.45 - 19.92	9	24 37 31	1				748
		...19.7 m - 180 mm of slough recovered from Run 9 ...19.9 m - mechanical fractures and crumbled core throughout run		RC10		10		2		18.99 m - Sideways piece of core in coring bit. 930 mm of core loss		747

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH215**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/13/2022 GROUND ELEVATION 766.80m N 5611015.000 E 416849.900
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21					19.92 - 21.50		71 108 71					746
22		...22.3 m - 35° fracture		RC11	21.50 - 23.04	11	92 97 88	1		22 m - EC: 4.7 dS/m 22 m - SAR: 32.0 22 m - pH: 8.3 22.3 m - LL = 65.8% PL = 15.4% PI = 50.4%		745
23		...22.8 m - 54° fracture ...23.2 m - 75° fracture		RC12	23.04 - 24.54	12	88 100 88	3				744
24		...23.9 m - mechanical fractures ...24.2 m - 75° fracture										743
25				RC13	24.54 - 26.09	13	86 94 84	2				742
26		...25.6 m - 45° fracture ...25.9 m - 70° fracture ...26.0 m - 100 mm of core loss		RC14	26.09 - 27.57	14	99 102 95	2				741
27		...26.6 m - 46° fracture ...26.8 m - 57° fracture										740
28				RC15	27.57 - 29.12	15	100 100 98	1		28 m - Sand = 2.2% Silt = 53.2% Clay = 44.6%		739
29				RC16	29.12 - 29.67	16	100 100 92	0				738
		...29.6 m - strong calcified shale layer 100 mm wide		RC17	29.67 29.67	17	100 100 92	1				737

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH215**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/13/2022 GROUND ELEVATION 766.80m N 5611015.000 E 416849.900
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.4 m - 72° fracture		RC18	- 30.64 - 33.08	18	95 92 100 100 98	1		31 m - LL = 61.2% PL = 14.8% PI = 46.4%		736
32												735
33												734
34												733
35												732
36												731
37												730
38												729
39												728
												727

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH216**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/14/2022 COMPLETED 07/14/2022 GROUND ELEVATION 765.88m N 5610901.300 E 416856.100
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH216 LOG.										765
2												764
3												763
4												762
5												761
6												760
7		SHALE, and clay, silty, trace sand, slightly weathered, grey, trace oxidation staining, damp, high plastic, very weak, moderately widely spaced fractures, thinly laminated	RC1		6.05 - 7.83	1	90 96 83	2				759
8			UD1									758
			RC2		7.83 - 9.38	2	100 100 98	3				758
9												757
			RC3		9.38 - 10.87	3	100 101 100	2				756

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH216**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/14/2022	COMPLETED	07/14/2022	
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND ELEVATION	765.88m	N 5610901.300 E 416856.100
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.7 m - vertical fracture		RC4	10.87	4	39	3				755
		...10.9 m - horizontal fracture			-		100					
		...11.0 m - becoming unweathered, no oxidation staining		RC5	11.48	5	39	2				
		...11.2 m - 240 mm of crumbled core			11.48		82					
12		...11.5 m - hit strong layer. ended run early		D1	12.40		100					754
		BENTONITE (12.1 m), 50 mm layer		RC6	12.40	6	100	2			12.1 m - LL = 295.7% PL = 26.5% PI = 269.2%	
		...12.2 m - 230 mm of moderately strong shale			-		102				12.1 m - Sand = 0.6%	753
13		SHALE, and clay, silty, trace sand, slightly weathered, grey, trace oxidation staining, damp, high plastic, very weak, moderately widely spaced fractures, thinly laminated			13.92		100				Silt = 25.4% Clay = 74.0%	
14		...13.1 m - 70° fracture		RC7	13.92	7	100	1				752
		...13.8 m - vertical fracture			-		100					
		...13.9 m - some weakly cemented layers			15.45		99					
15		...14.3 m - 85° fracture										751
		...14.6 m - 80° fracture		RC8	15.45	8	102	1				
					-		102					750
16					17.02		99					
17				RC9	17.02	9	97	1				749
					-		97					
					18.50		95				17.6 m - LL = 63.6% PL = 17.3% PI = 46.3%	748
18												
		...18.5 m - 65° fracture		RC10	18.50	10	95	1				747
		...18.8 m - 75° fracture			-		101					
19				UD2	19.98		97				19 m - Sand = 2.5% Silt = 51.8% Clay = 45.7%	
		...19.6 m - 50 mm mechanically fractured area										
		...19.9 m - horizontal fracture		RC11		11		1				746

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH216**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/14/2022 COMPLETED 07/14/2022 GROUND ELEVATION 765.88m N 5610901.300 E 416856.100
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.5 m - 70° fracture			19.98 - 21.54	100 100 98						745
22		...21.5 m - becoming weak ...22.0 m - 65° fracture		RC12	21.54 - 23.11	12 96 100 98		2		21.54 m - EC: 2.4 dS/m 21.54 m - SAR: 21.4 21.54 m - pH: 8.6 22.2 m - LL = 68.8% PL = 19% PI = 49.8%		744
23				RC13	23.11 - 24.56	13 100 100 99		1				743
24				RC14	24.56 - 26.13	14 96 100 98		1				742
25		...25.0 m - vertical fracture ...25.0 m - 50° fracture										741
26				RC15	26.13 - 27.64	15 97 97 93		1				740
27		...27.0 m - 45° fracture										739
28		...27.9 m - clay and silt, trace sand, trace shell inclusion		RC16	27.64 - 29.01	16 96 102 97		1				738
29		...28.9 m - 70° fracture ...29.0 m - 140 mm strong layer, possible calcified shale ...29.5 m - 60° fracture		RC17	29.01 - 30.69	17 95 100 95		2		28.3 m - Sand = 0.6% Silt = 56.2% Clay = 43.2% 29.2 m - LL = 61.3% PL = 14.3% PI = 47.0%		737
												736

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH216**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/14/2022 COMPLETED 07/14/2022 GROUND ELEVATION 765.88m N 5610901.300 E 416856.100
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.8 m - vertical fracture ...31.0 m - vertical fractures		RC18	30.69 - 32.24	18	95 100 97	2				735
32				RC19	32.24 - 33.71	19	93 100 100	1				734
33		...33.3 m - vertical fracture, trace shell inclusion								33 m - LL = 61.1% PL = 18.7% PI = 42.4%		733
34		...33.6 m - vertical fracture		RC20	33.71 - 35.82	20	99 99 99	1				732
35												731
36		...35.6 m - vertical fracture ...35.7 m - becoming moderately strong ...35.8 m - 160 mm of strong calcified shale ...35.9 m - horizontal fracture		RC21	35.82 - 36.30	21	94 120 94	2				730
37												729
38												728
39												727
												726

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH217**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/15/2022 COMPLETED 07/15/2022 GROUND ELEVATION 766.98m N 5610811.500 E 416860.700
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH217 LOG.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												766
2												765
3												764
4												763
5												762
6												761
7		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, extremely weak, moderately widely spaced fractures, thinly laminated	RC1	6.15 - 7.81	1	98 98 98	2			6.15 m - SO4-S: 355.1 mg/kg		760
8		...7.9 m - mechanical fractures	RC2	7.81 - 9.35	2	101 101 99	1			7 m - EC: 1.8 dS/m 7 m - SAR: 20.4 7 m - SO4-S: 229.7 mg/kg 7 m - pH: 8.1		759
9		...8.8 m - 60° fracture	RC3	9.35 - 10.86	3	100 100 93	1					758

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH217**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/15/2022	COMPLETED	07/15/2022	GROUND ELEVATION
				766.98m N 5610811.500 E 416860.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - 40° fracture										
		...10.9 m - becoming very weak and unweathered		RC4	10.86 - 12.40	4	101 101 99	1				756
12		...12.1 m - 75° fracture		RC5	12.40 - 13.95	5	100 100 99	1		11.5 m - LL = 77.1% PL = 15.5% PI = 61.6%		755
13		...12.9 m - 65° undulating fracture										754
14		...14.2 m - 60° fracture		RC6	13.95 - 15.42	6	99 103 99	2				753
15		...14.3 m - 76° fracture		D1						14.6 m - LL = 234.2% PL = 27.5% PI = 206.7%		752
		BENTONITE (14.6 m), 80 mm layer										
		SHAPE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, extremely weak, moderately widely spaced fractures, thinly laminated		RC7	15.42 - 16.91	7	101 101 101	1		14.6 m - Sand = 0.3% Silt = 27.5% Clay = 72.2%		751
16		...15.4 m - becoming weak										
17		...16.9 m - mechanically damaged piece		RC8	16.91 - 18.50	8	100 100 94	1				750
18		...17.5 m - 34° fracture										749
		...17.9 m - 74° fracture										
19		...19.0 m - 960 mm of slough recovered		RC9	18.50 - 19.98	9	9 95 20	10		18.5 m - Run 9: core left in barrel, had to trip out to retrieve core.		748
				RC10		10		2				

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH217**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/15/2022	COMPLETED	07/15/2022	GROUND ELEVATION	766.98m N 5610811.500 E 416860.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.6 m - 57° fracture ...20.8 m - 70° fracture		RC11	19.98 - 21.24	11	100 100 96	1				746
22		...21.6 m - 80° fracture			21.24 - 23.07		96 96 98			21.24 m - UCS = 1899 kPa		745
23				RC12	23.07 - 24.59	12	100 100 97	3		22 m - LL = 62.1% PL = 15.7% PI = 46.4%		744
24				UD1								743
25		...24.8 m - some moderately strong layers ...25.3 m - 83° fracture		RC13	24.59 - 26.12	13	100 100 100	1				742
26				RC14	26.12 - 27.62	14	102 102 102	1				741
27		...27.2 m - vertical fracture										740
28		...28.1 m - undulating fracture		RC15	27.62 - 29.19	15	103 103 103	1		28.1 m - Sand = 4.3% Silt = 44.8% Clay = 50.9%		739
29				RC16	29.19 - 30.70	16	100 100 100	1				738

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis

CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/15/2022	COMPLETED	07/15/2022	GROUND ELEVATION	766.98m N 5610811.500 E 416860.700
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.		GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

[illegible]

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH218**

PAGE 1 OF 4

CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/19/2022	COMPLETED	07/19/2022	
		GROUND ELEVATION	767.45m	N 5610697.500 E 416849.100
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH		
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		CLAY and SILT, trace sand, trace gravel, damp, soft, low to medium plastic, light brown, trace root hairs										767
2		SAND, clayey, some silt, well graded, fine grained, moist, loose, brown, some oxidation staining										766
3		SHALE (Weathered), clay and silt, trace sand, completely weathered, light brown to dark grey mottling, moist, high plastic, extremely weak, blocky	SH1									765
4		SHALE, clayey, silty, highly weathered, grey, moist, high plastic, extremely weak, fissured										764
5		OVERBURDEN. REFER TO 22BH218 LOG.										763
6												762
7		SHALE, clay and silt, trace silt, slightly weathered, grey, damp, high plastic, extremely weak, moderately widely spaced fractures, thinly laminated	RC1		6.10 - 7.80	1	91 100 91	4				761
8		...7.8 m - 100 mm moderately strong layer	UD1									760
9		...8.6 m - 74° fracture	RC2		7.80 - 9.30	2	94 100 93	2				759
		...9.3 m - becoming unweathered	RC3		9.30 - 10.82	3	95 100 91	3				758

Notes:

Target depth of 33 m not achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

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COREHOLE No : **22CH218**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/19/2022	COMPLETED	07/19/2022	GROUND ELEVATION	767.45m N 5610697.500 E 416849.100
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8"	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.4 m - 66° fracture		RC4	10.82	4	100	3				757
		...10.8 m - becoming very weak			-		100					
					12.35		95					
		...11.4 m - 74° fracture										756
12		...11.7 m - 66° fracture										
				RC5	12.35	5	102	1				755
					-		102					
					13.85		101					
13		...13.2 m - 67° fracture								13.1 m - LL = 82.6% PL = 18.8% PI = 63.8%		754
				RC6	13.85	6	100	1				753
					-		100					
					15.40		95					
15		...14.8 m - 56° fracture										
				RC7	15.40	7	101	1				752
					-		101					
				D1	16.90		101			15.9 m - LL = 247.1% PL = 24.7% PI = 222.4% 15.9 m - Sand = 0.4% Silt = 38.2% Clay = 61.4%		751
17		BENTONITE (15.9 m), 60 mm layer with shell fragments										
		SHALE, clay and silt, trace silt, slightly weathered, grey, damp, high plastic, extremely weak, moderately widely spaced fractures, thinly laminated		RC8	16.90	8	97	1				750
		...16.0 m - becoming weak			-		100					
		...16.9 m - vertical fracture			18.42		97					
18		...17.2 m - mechanically fractured area										
		...17.5 m - 60° fracture										
		...18.2 m - trace shell inclusions		RC9	18.42	9	92	3				749
		...18.6 m - vertical fracture			-		102					
					19.99		95					
19		...19.5 m - 66° fracture								19.2 m - LL = 84.0% PL = 21.3% PI = 62.7%		748
		...19.6 m - 30 mm highly fractured area		RC10		10		3		19.2 m - EC: 2.0 dS/m		

Notes:

Target depth of 33 m not achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH218**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/19/2022 COMPLETED 07/19/2022 GROUND ELEVATION 767.45m N 5610697.500 E 416849.100
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.2 m - moderately strong layer	RC11	11	19.99 - 21.19	88 108 91	2			19.2 m - SAR: 32.3 19.2 m - pH: 8.3		747
22		...21.6 m - 72° fracture			21.19 - 22.99	100 100 100						746
23		...24.0 m - 67° fracture	UD2									745
24		...24.1 m - vertical fracture	RC12	12	22.99 - 24.52	88 95 91	2					744
25		...24.5 m - some weakly cemented layers										743
26		...25.1 m - 68° fracture	RC13	13	24.52 - 26.07	101 105 104	1					742
27		...26.2 m - 180 mm strong calcified shale layer, crumbled up	RC14	14	26.07 - 27.59	69 82 66	1					741
28		...26.4 m - 260 mm of core loss										740
29		...26.6 m - 67° fracture	RC15	15	27.59 - 29.12	100 100 99	1			28 m - LL = 59.8% PL = 13.8% PI = 46.0%		739
		...26.7 m - 42° fracture										738
		...28.9 m - 70° fracture	RC16	16	29.12 - 30.61	15 30 19	1					
		...29.4 m - becoming strong to very strong calcified shale										
		...29.6 m - 1.04 m of core loss										

Notes:

Target depth of 33 m not achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH218**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 07/19/2022 COMPLETED 07/19/2022 GROUND ELEVATION 767.45m N 5610697.500 E 416849.100
DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
31										30.61 m - Left 1.04 m of core in bottom of core barrel. Ended hole at 30.61 m.	737
32											736
33											735
34											734
35											733
36											732
37											731
38											730
39											729
											728

Notes:

Target depth of 33 m not achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH219**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/20/2022 COMPLETED 07/20/2022 GROUND ELEVATION 767.74m N 5610626.100 E 416849.500
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH219 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5												763
6												762
7		SHALE, clayey, silty, trace sand, slightly weathered, grey, damp, high plastic, very weak, moderately widely spaced fractures, thinly laminated	RC1		6.05 - 7.72	1	94 99 93	2				761
8		...7.7 m - becoming unweathered	UD1									760
		...8.3 m - 52° fracture	RC2		7.72 - 9.29	2	83 98 91	3				759
9		...9.1 m - horizontal fracture										
		...9.8 m - 42° fracture	RC3		9.29 - 10.85	3	92 99 90	2				758

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH219**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/20/2022	COMPLETED	07/20/2022	GROUND ELEVATION	767.74m N 5610626.100 E 416849.500
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - 25° fracture		RC4	10.85	4	88	2				757
		...11.3 m - 54° fracture			-		103					
					12.32		88					756
12		...12.1 m - 36° fracture		RC5	12.32	5	93	1				
		...12.3 m - becoming weak			-		96					
					13.85		84					755
13		...12.8 m - 50° fracture							19.6			
		...13.5 m - 69° fracture		RC6	13.85	6	0	2				754
					-		22					
		...14.2 m - 1.19 m of core loss			15.37		7					753
15		...15.4 m - mechanically crumbled core		RC7	15.37	7	50	3				
		...15.7 m - 180 mm strong calcified shale layer			-		100					
					16.90		56					752
17		BENTONITE (16.3 m), 70 mm laminated seams		RC8	16.90	8	83	2				751
		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, very weak, moderately widely spaced fractures, thinly laminated			-		98					
		...16.7 m - mechanically fractured area			18.39		92					750
18		...17.8 m - 75° fracture										
		...18.1 m - 60° fracture		RC9	18.39	9	92	3				749
		...18.3 m - 80° fracture			-		100					
		...18.5 m - 76° fracture			19.92		97					
19		...18.6 m - 79° fracture										
		...19.8 m - parallel 85° fractures		RC10		10		3				748

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

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COREHOLE No : **22CH219**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/20/2022	COMPLETED	07/20/2022	GROUND ELEVATION	767.74m N 5610626.100 E 416849.500
DRILLING CONTRACTOR	Chilako Drilling Services Ltd.	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	3" x 4 5/8'	DIAMETER (mm)	76	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.4 m - 66° fracture ...20.6 m - 80° fracture ...20.8 m - vertical fracture ...20.9 m - 83° fracture			19.92 - 21.39		94 103 100					747
22		...22.0 m - 53° fracture ...22.1 m - 46° fracture ...22.4 m - 47° fracture	RC11		21.39 - 23.02	11	100 100 91	2				746
23		...23.3 m - 140 mm strong calcified shale layer	RC12		23.02 - 24.54	12	53 91 64	1				745
24										23.3 m - LL = 117.0% PL = 25.4% PI = 91.6%		744
25		...24.5 m - becoming moderately strong ...24.8 m - 45° fracture ...24.9 m - parallel 73° fractures	RC13		24.54 - 26.07	13	95 100 92	3		23.3 m - Sand = 0.1% Silt = 50.1% Clay = 49.8%		743
26		...25.9 m - parallel 74° fractures ...26.2 m - 65° fracture ...26.5 m - 70° fracture	RC14		26.07 - 27.03	14	96 109 94	4				742
27		...26.9 m - 64° fracture ...27.0 m - 140 mm strong calcified shale layer	RC15		27.03 - 28.76	15	100 100 100	2		26.5 m - EC: 2.7 dS/m 26.5 m - SAR: 24.1 26.5 m - pH: 8.4 26.51 m - SAR: 29.8 26.51 m - pH: 8.5 26.6 m - LL = 66.7% PL = 15.1% PI = 51.6%		741
28												740
29			RC16		28.76 - 30.61	16	86 100 95	3				739
												738

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

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COREHOLE No : **22CH219**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/20/2022 COMPLETED 07/20/2022 GROUND ELEVATION 767.74m N 5610626.100 E 416849.500
 DRILLING CONTRACTOR Chilako Drilling Services Ltd. GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE 3" x 4 5/8' DIAMETER (mm) 76 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31				RC17	30.61 - 32.95	17	97 99 97	2		31.5 m - LL = 60.9% PL = 14.3% PI = 46.6%		737
32												736
33										32.95 m - End of Run 17 was 0.05 m short of target depth of 33 m, ended hole there.		735
34												734
35												733
36												732
37												731
38												730
39												729
												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH220**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/22/2022 COMPLETED 06/23/2022 GROUND ELEVATION 767.70m N 5610514.800 E 416850.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH220 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5		SHALE, clayey, silty, trace sand, slightly weathered, grey, moist, high plastic, weak, medium spaced fracture, finely stratified ...4.8 m - 75° fracture ...5.0 m - 150 mm fractured section	RC1		4.60 - 6.12	1	90 100 87	6				763
6		...6.2 m - 20 mm fractured section ...6.3 m - 71° fracture	RC2		6.12 - 7.64	2	89 101 93	4				762
7		...6.9 m - 76° fracture ...7.0 m - 20 mm fractured section ...7.0 m - moderately strong	UD1									761
8		...7.9 m - 72° fracture	RC3		7.64 - 9.16	3	96 102 92	4				760
9		...8.4 m - 40 mm fractured section ...8.7 m - 30 mm fractured section ...9.0 m - 73° fracture ...9.5 m - parallel 73° fractures 100 mm apart ...9.9 m - 86° fracture	RC4		9.16 - 10.68	4	101 101 98	3				759
										7.3 m - UCS = 1573 kPa 8.2 m - EC: 2.3 dS/m 8.2 m - SAR: 26.2 8.2 m - pH: 8.1 9.2 m - LL = 63.7% PL = 18.6% PI = 45.1%		758

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH220**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/22/2022 COMPLETED 06/23/2022 GROUND ELEVATION 767.70m N 5610514.800 E 416850.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...11.0 m - silt and clay, moderately strong to strong	RC5	10.68	5	99	2					757
		...11.5 m - horizontal fracture followed by 10 mm of weak infill	UD2	12.20		99				11 m - LL = 78.8% PL = 15.1% PI = 63.7%		
12		...11.9 m - horizontal fracture	RC6	12.20	6	88	5			11 m - Sand = 0.6% Silt = 63.2% Clay = 36.2%		756
						100						755
						82						
13		...12.8 m - 66° fracture										
		...13.0 m - 27° fracture										
		...13.1 m - 31° fracture										
		...13.2 m - 61° fracture										
14		...13.4 m - 73° fracture	RC7	13.72	7	99	2					754
		...13.8 m - 46° fracture				99						
		...13.9 m - strong				94						
		...14.0 m - 76° fracture	UD3									753
15			RC8	15.24	8	93	2					
		...15.4 m - 70 mm fractured section				98						752
						89						
16		...16.2 m - 56° fracture										
		...16.8 m - 75° fracture	RC9	16.76	9	101	3					751
17						101						
		...17.5 m - horizontal fracture followed by 10 mm of weak infill				99						
		...18.0 m - horizontal fracture	UD4							17.95 m - EC: 1.9 dS/m		750
18			RC10	18.28	10	100	3			17.95 m - SAR: 26.5		
		...18.7 m - horizontal fracture				100				17.95 m - pH: 8.7		749
		...18.9 m - 80° fracture				96						
19		...19.4 m - 63° fracture	RC11	19.80	11	100	1					748

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH220**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/22/2022 COMPLETED 06/23/2022 GROUND ELEVATION 767.70m N 5610514.800 E 416850.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.3 m - 74° fracture			- 21.32		100 99					747
22		...21.4 m - 78° fracture		RC12 UD5	21.32 - 22.84	12	100 100 98	3		21.45 m - LL = 74.6% PL = 13.9% PI = 60.7%		746
23		...22.5 m - 77° fracture ...22.6 m - 72° fracture		RC13	22.84 - 24.36	13	99 99 98	3		22.28 m - LL = 72.0% PL = 23% PI = 49.0%		745
24		...23.2 m - 86° fracture ...23.5 m - 80° fracture ...23.8 m - horizontal fracture		RC14	24.36 - 25.88	14	100 100 98	3				744
25		...25.3 m - 80° fracture ...25.4 m - horizontal fracture ...25.6 m - 88° fracture		RC15	25.88 - 27.40	15	100 100 97	2		26.2 m - LL = 67.1% PL = 14.5% PI = 52.6%		743
26		...26.1 m - 67° fracture		UD6								742
27		...27.3 m - 55° fracture ...27.4 m - moderately strong to strong ...27.4 m - 86° fracture		RC16	27.40 - 28.92	16	101 101 100	1				741
28												740
29		...29.4 m - parallel 83° fractures 70 mm apart		RC17 UD7	28.92 - 30.44	17	93 97 95	2				739
												738

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH220**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/22/2022 COMPLETED 06/23/2022 GROUND ELEVATION 767.70m N 5610514.800 E 416850.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...31.0 m - 72° fracture		RC18	30.44 - 31.96	18	99 99 98	1				737
32				RC19	31.96 - 33.48	19	103 103 101	1				736
33		...32.6 m - 75° fracture		UD8						32.7 m - LL = 59.6% PL = 13.9% PI = 45.7%		735
34												734
35												733
36												732
37												731
38												730
39												729
												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH221**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/23/2022 COMPLETED 06/24/2022 GROUND ELEVATION 767.62m N 5610418.200 E 416851.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH221 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5				SH1								763
6				RC1	6.00 - 7.52	1	95 101 92	5				762
7		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, weak, medium spaced fracture, finely stratified		UD1								761
8		...6.2 m - 100 slight fractured section										
		...6.7 m - horizontal fracture										
		...6.9 m - 87° fracture		RC2	7.52 - 9.04	2	101 102 92	3				760
		...7.1 m - 15 mm fractured section										
		...8.6 m - 45° fracture										
		...8.7 m - horizontal fracture followed by 10 mm of very weak crumbled infill										759
9		...8.9 m - horizontal fracture with slight very weak infill		RC3	9.04 - 10.56	3	99 99 95	4				758
		...9.4 m - 87° fracture										
		...9.6 m - 82° fracture										
		...9.8 m - 78° fracture		UD2								

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH221**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/23/2022 COMPLETED 06/24/2022 GROUND ELEVATION 767.62m N 5610418.200 E 416851.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - weak to moderately strong		RC4	10.56	4	93	3		10 m - Peak Friction		757
		...10.4 m - 72° fracture			-		99			Angle: 46.0°		
		...10.8 m - 70° fracture			12.08		91			Apparent Cohesion:		
		...10.8 m - 3° fracture transitions to 15° fracture, ends at 10.95 m								400.0kPa		
12		...11.6 m - 74° fracture										756
		...12.4 m - 60 mm fractured section		RC5 UD3	12.08	5	87	6				755
					-		104					
					13.60		88					
13		...13.2 m - possible 200 mm fracture section										
		...13.8 m - horizontal fracture		RC6	13.60	6	100	4				754
		...13.9 m - horizontal fracture			-		100					
		...14.2 m - 65° fracture			15.12		97					
14		...14.3 m - moderately strong										753
		...14.6 m - 88° fracture										
15		...15.1 m - moderately strong to strong		RC7	15.12	7	100	3				752
		...15.3 m - 87° fracture			-		100					
					16.64		99					
16		...15.9 m - 85° fracture										
		...16.0 m - strong		UD4	16.64	8	101	2		16.35 m - LL = 71.5%		751
		...16.4 m - horizontal fracture		RC8	-		101			PL = 17.8%		
					18.16		97			PI = 53.7%		
17		...17.0 m - 74° fracture										750
		...17.6 m - 50° fracture										
18		...18.2 m - 82° fracture		RC9	18.16	9	101	2				749
		...18.6 m - 40° fracture			-		101					
					19.68		96					
19		...19.8 m - 83° fracture		UD5								748
				RC10	19.68	10	101	3				

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH221**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/23/2022 COMPLETED 06/24/2022 GROUND ELEVATION 767.62m N 5610418.200 E 416851.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.1 m - 85° fracture ...20.2 m - 84° fracture			- 21.20		101 99					747
			RC11		21.20 - 22.72	11	99 99 97	2				746
22		...21.4 m - 85° fracture ...21.8 m - 76° fracture										745
			RC12		22.72 - 24.24	12	99 99 98	2				744
23												743
		...23.7 m - 72° fracture ...24.0 m - horizontal fracture	UD6 RC13		24.24 - 25.76	13	99 99 99	1				742
24												741
		...24.8 m - horizontal fracture										740
25			RC14		25.76 - 27.28	14	95 95 95	0				739
26										26.2 m - Sand = 1.1%		738
			UD7 RC15		27.28 - 28.80	15	99 99 98	1		Silt = 53.5% Clay = 45.4% 27 m - EC: 2.5 dS/m 27 m - SAR: 25.2 27 m - pH: 8.4		
27												
		...28.3 m - horizontal fracture										
28			RC16		28.80 - 30.32	16	99 99 99	1				
29		...29.1 m - 87° fracture										

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH221**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/23/2022 COMPLETED 06/24/2022 GROUND ELEVATION 767.62m N 5610418.200 E 416851.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31				UD8 RC17	30.32 - 31.84	17	103 103 102	1				737
32		...31.7 m - 87° fracture ...31.9 m - 50° fracture		RC18	31.84 - 33.36	18	101 101 101	2				736
33		...32.5 m - horizontal fracture		UD9								735
34												734
35												733
36												732
37												731
38												730
39												729
												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH222**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/24/2022 COMPLETED 06/25/2022 GROUND ELEVATION 767.99m N 5610303.452 E 416849.554
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 766.92 m 1.07 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
		OVERBURDEN. REFER TO 22BH222 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1											767
2											766
3											765
4											764
5											763
6											762
7		SHALE, silt and clay, slightly weathered, grey, damp, high plastic, weak, medium spaced fractures, finely stratified	RC1	6.20 - 7.72	1	95 99 96	4				761
		...6.5 m - horizontal fracture	UD1							7.2 m - LL = 61.1% PL = 26.2% PI = 34.9%	
		...6.5 m - horizontal fracture									
		...6.8 m - 60° fracture	RC2	7.72 - 9.24	2	90 90 88	2			8.1 m - Sand = 0.5% Silt = 68.2% Clay = 31.3%	760
		...7.6 m - horizontal fracture								8.1 m - EC: 2.0 dS/m	
		...7.6 m - weak to moderately strong								8.1 m - SAR: 22.6	
		...8.0 m - 89° fracture								8.1 m - SO4-S: 220.7 mg/kg	759
		...8.2 m - 76° fracture								8.1 m - pH: 8.5	
		...8.7 m - horizontal fracture	RC3	9.24 - 10.76	3	99 99 95	3				
		...9.5 m - 85° fracture									
		...9.7 m - 71° fracture									

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	11.90	PLAIN
11.90	13.10	SLOTTED

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH222**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/24/2022	COMPLETED	06/25/2022	GROUND ELEVATION	767.99m N 5610303.452 E 416849.554
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		766.92 m	1.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.5 m - 80° fracture	UD2									
		...10.8 m - moderately strong	RC4		10.76	4	93	3				757
		...10.9 m - horizontal fracture			-		99					
		...11.2 m - 70 mm slightly fracture section			12.28		92					
12			RC5		12.28	5	103	3				756
		...12.4 m - moderately strong to strong			-		103					
		...12.5 m - 67° fracture			13.80		101					
13		...12.7 m - 88° fracture	UD3									755
		...13.2 m - 200 mm section of calcified shale										
		...13.4 m - horizontal fracture	RC6		13.80	6	101	1				754
14					-		101					
					15.32		98					
15			RC7		15.32	7	78	1				753
		...15.3 m - 55° fracture followed by 10 mm of weak infill, trace interbedded shell fragments			-		78					
		...15.7 m - horizontal fracture			16.84		77					752
16												
		...16.5 m - 340 mm of core loss	RC8		16.84	8	92	3				751
		...17.0 m - 48° fracture			-		92					
		...17.3 m - 68° fracture			18.36		84					
18		...17.7 m - 54° fracture	UD4									750
		...18.2 m - 120 mm of core loss	RC9		18.36	9	96	2				
		...18.4 m - 100 mm fractured section			-		103					
					19.88		94					749
19		...19.3 m - horizontal fracture	RC10		19.88	10	99	2				

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	11.90	PLAIN
11.90	13.10	SLOTTED

Logged By: J. Boyd / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH222**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	06/24/2022	COMPLETED	06/25/2022	GROUND ELEVATION	767.99m N 5610303.452 E 416849.554
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	766.92 m 1.07 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.4 m - 63° fracture ...20.6 m - horizontal fracture			- 21.40		99 97					747
22			RC11		21.40	11	99 105	2				746
			UD5		- 22.92		93			22 m - UCS = 1781 kPa		
23		...22.4 m - 55° fracture ...22.6 m - possible sandstone inclusion	RC12		22.92	12	76 80	2				745
					- 24.44		72					744
24			RC13		24.44	13	76 100	3				743
		...24.1 m - 300 mm core loss ...24.6 m - horizontal fracture			- 25.96		70					
25			RC14		25.96	14	98 100	2				742
		...25.5 m - horizontal fracture	UD6		- 27.48		100			26 m - LL = 64.2% PL = 15% PI = 49.2%		741
26		...26.6 m - moderately strong layer										740
		...27.2 m - becoming sandy, fine grained	RC15		27.48	15	87 87	1				739
27					- 29.00		87					
28			RC16		29.00	16	96 99	1		28.3 m - Gravel = 0.1% 28.3 m - Sand = 18.4% Silt = 49.4% Clay = 32.1% 28.3 m - EC: 3.0 dS/m 28.3 m - SAR: 24.9		
29		...28.8 m - 200 mm core loss			- 30.52		80					

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	11.90	PLAIN
11.90	13.10	SLOTTED

Logged By: J. Boyd / C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH222**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/24/2022 COMPLETED 06/25/2022 GROUND ELEVATION 767.99m N 5610303.452 E 416849.554
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 766.92 m 1.07 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.3 m - 55° fracture ...30.5 m - horizontal fracture ...30.6 m - horizontal fracture		UD7 RC17	30.52 - 32.04	17	82 96 66	3		28.3 m - pH: 8.6		737
32		...31.6 m - 78° fracture ...31.8 m - 48° fracture		RC18	32.04 - 33.56	18	93 100 95	3				736
33		...32.8 m - 51° fracture										735
34												734
35												733
36												732
37												731
38												730
39												729

Notes:

Target depth of 33 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	11.90	PLAIN
11.90	13.10	SLOTTED

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH223**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/27/2022 GROUND ELEVATION 765.44m N 5610215.100 E 416841.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, REFER TO 22BH223 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												765
2												764
3		SHALE, and silt, clayey, trace sand, slightly weathered, dark grey, moist, high plastic, weak, closely spaced fractures, finely fissured	RC1		3.00 - 4.52	1	25 57 27	10		3 m - Corehole augered to 3.0 m on July 25th. Groundwater saturated top 300 mm of core thus poor core recovery		762
4			RC2		4.52 - 6.04	2	20 84 42	20				761
5		...4.9 m - 45° fracture ...5.0 m - extremely fractured core								5 m - LL = 69.7% PL = 14.2% PI = 55.5%		760
6		...6.1 m - extremely fractured, infilled with very soft material	RC3		6.04 - 7.56	3	33 88 58	20		5 m - Sand = 0.2% Silt = 66.7% Clay = 33.1%		759
7		...7.1 m - becoming moderately strong										758
8		...7.7 m - becoming weak	RC4		7.56 - 9.08	4	72 100 82	7				757
9		...9.0 m - very mechanically fractured	RC5		9.08 - 10.60	5	64 100 94	3				756

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH223**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/27/2022 GROUND ELEVATION 765.44m N 5610215.100 E 416841.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...11.0 m - 40° fracture		RC6	10.60 - 12.12	6	64 100 94	5				755
12		...12.3 m - becoming moderately strong		RC7 UD1	12.12 - 13.64	7	83 100 75	2				754
13		...12.4 m - 81° fracture ...12.9 m - 24° fracture ...13.2 m - 30° fracture ...13.4 m - 50 mm of fracture core		RC8	13.64	8	98 100 79	3				753
14		...13.7 m - 32° fracture BENTONIC SHALE (13.8 m), 150 mm SHALE, clay and silt, trace sand, slightly weathered, dark grey, moist, high plastic, weak, closely spaced fractures, finely fissured		UD2	- 15.16					13.9 m - LL = 231.7% PL = 31.3% PI = 200.4%		752
15		...14.1 m - becoming moderately strong, suspect calcified shale		RC9	15.16	9	90 93 83	4				751
16		...14.7 m - 23° fracture ...15.3 m - 40 mm of soft infill ...15.6 m - 32° fracture ...16.1 m - 77° fracture			- 16.68							750
17		...16.9 m - 19° fracture		RC10 UD3	16.68 - 18.20	10	100 100 86	3		17.1 m - LL = 76.8% PL = 19.9% PI = 56.9%		749
18		...17.5 m - 39° fracture								17.3 m - EC: 3.9 dS/m		748
19				RC11	18.20 - 19.72	11	98 100 95	3		17.3 m - SAR: 38.5 17.3 m - pH: 8.5		747
		...19.9 m - 70° fracture		RC12	19.72	12	88	3				746

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH223**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/27/2022 GROUND ELEVATION 765.44m N 5610215.100 E 416841.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.3 m - 75° fracture ...20.5 m - 125 mm layer of calcified shale ...20.9 m - 34° fracture		RC13	21.24	13	89 100	5				745
22		...21.6 m - parallel 52° fractures 70 mm apart ...21.8 m - 32° fracture ...21.9 m - 25 mm calcified shale layer			22.76		83					744
23		...22.8 m - 120 mm fractured core		RC14	22.76	14	80 92	2				743
24				UD4	24.28		84			23.5 m - LL = 72.3% PL = 15.2% PI = 57.1%		742
25		...24.4 m - 170 mm layer of strong siltstone ...25.0 m - becoming widely spaced fractures ...25.4 m - 58° fracture		RC15 UD5	24.28 25.80	15	91 100 90	3				741
26		...25.8 m - shell fragments		RC16	25.80	16	100 100 98	1				740
27		...26.7 m - 71° fracture			27.32							739
28		...27.5 m - 200 mm layer of siltstone, low plastic		RC17	27.32	17	100 100 98	1		27.5 m - LL = 26.8% PL = 12% PI = 14.8%		738
29				RC18	28.84	18	100 100 100	1				737
				UD6	30.36							736

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH223**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/27/2022 GROUND ELEVATION 765.44m N 5610215.100 E 416841.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT □ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.6 m - 100 mm layer of suspect calcified shale		RC19	30.36 - 31.88	19	100 100 100	0				735
32				RC20	31.88	20	91	1				734
				UD7	33.40		91 91					733
33				RC21	33.40	21	100 100 97	1				732
34												731
35				RC22	34.92	22	100 100 100	1				730
36												729
37												728
38												727
39												726

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH224**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/16/2022 COMPLETED 07/16/2022 GROUND ELEVATION 765.44m N 5610112.900 E 416850.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH224 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1				SH1								765
2												764
3		SHALE (Weathered), clay and silt, trace sand, completely weathered, grey, with brown mottling, some oxidation staining, damp, high plastic, extremely weak, extremely closely spaced fractures		RC1	3.00 - 4.52	1	53 97 56	20				763
4		...3.0 m - 40 mm of core loss										762
5		SHALE, clay and silt, trace sand, medium weathered, grey, damp, high plastic, extremely weak, moderately widely spaced fractures, thinly laminated		RC2	4.52 - 6.04	2	30 100 48	3			5 m - EC: 2.6 dS/m 5 m - SAR: 28.3 5 m - SO4-S: 281.5 5 m - pH: 8.5	761
6		...4.5 m - mechanically fractured for 900 mm										760
7		...5.0 m - becoming some weakly cemented layers		RC3	6.04 - 7.56	3	72 100 84	2				759
8		...6.1 m - mechanically fractured for 500 mm										758
9		...6.4 m - becoming unweathered and very weak										757
		...7.6 m - becoming weak		RC4	7.56 - 9.08	4	91 100 87	2				756
		...7.9 m - 64° fracture										
		...8.2 m - 50° fracture										
		...9.2 m - becoming weak to moderately strong		RC5	9.08 - 10.60	5	100 100 96	3			8.5 m - LL = 97.5% PL = 18.9% PI = 78.6% 8.5 m - Sand = 0.1% Silt = 56.7% Clay = 43.2% 8.6 m - EC: 1.9 dS/m 8.6 m - SAR: 21.5	
		...9.5 m - 65° fracture										
		...9.7 m - 87° fracture										

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH224**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/16/2022 COMPLETED 07/16/2022 GROUND ELEVATION 765.44m N 5610112.900 E 416850.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - 60° fracture ...10.3 m - becoming moderately strong to strong ...10.4 m - 80° fracture ...11.0 m - 85° fracture		RC6	10.60 - 12.12	6	97 97 95	2		8.6 m - pH: 8.6		755
12		...11.7 m - 86° fracture ...11.9 m - 87° fracture ...12.3 m - 89° fracture ...12.4 m - becoming weak to moderately strong		RC7	12.12 - 13.64	7	91 91 90	2		12.2 m - LL = 87.8% PL = 20.2% PI = 67.6%		754 753
13		...12.8 m - 88° fracture ...13.0 m - becoming moderately strong to strong										752
14		...13.3 m - 71° fracture ...13.5 m - 130 mm of core loss ...14.0 m - 81° fracture ...14.3 m - 85° fracture		RC8	13.64 - 15.16	8	98 98 93	3				751
15		...14.6 m - becoming strong ...14.8 m - 68° fracture ...15.0 m - 49° fracture ...15.2 m - severe mechanical fracturing to 16.2 m		RC9	15.16 - 16.68	9	107 107 105	1				750
16												749
17		...16.4 m - 57° fracture ...16.6 m - becoming moderately strong to strong ...17.1 m - 72° fracture ...17.4 m - 78° fracture		RC10	16.68 - 18.20	10	97 97 95	2				748
18		...17.7 m - becoming strong ...18.0 m - 83° fracture ...18.4 m - 89° fracture		RC11	18.20 - 19.72	11	100 100 99	2		17.7 m - LL = 87.3% PL = 21.2% PI = 66.1%		747
19		...19.0 m - 86° fracture ...19.8 m - 80° fracture		RC12	19.72	12	100	2				746

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH224**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/16/2022 COMPLETED 07/16/2022 GROUND ELEVATION 765.44m N 5610112.900 E 416850.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.0 m - 77° fracture		RC13	21.24	13	100	1				745
		...21.4 m - becoming moderately strong to strong			-		100					744
22					22.76		98					743
		...22.6 m - 60° fracture		RC14	22.76	14	95	2				742
23		...23.0 m - horizontal fracture			-		95					741
		...23.4 m - 79° fracture			24.28		94					740
24				RC15	24.28	15	100	1				739
					-		100					738
25					25.80		99					737
		...25.5 m - 76° fracture		RC16	25.80	16	100	0				736
26		...26.3 m - becoming strong			-		100			25.8 m - LL = 61.9% PL = 16.2% PI = 45.7% 26.3 m - Sand = 3.1% Silt = 57.4% Clay = 39.5%		735
					27.32		100					734
27				RC17	27.32	17	99	1				733
					-		99					732
28					28.84		99					731
				RC18	28.84	18	101	0				730
29					-		101					729
		...29.8 m - becoming strong			30.36		101					728

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH224**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/16/2022 COMPLETED 07/16/2022 GROUND ELEVATION 765.44m N 5610112.900 E 416850.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...31.1 m - 84° fracture		RC19	30.36 - 31.88	19	100 100 99	1		31 m - Sand = 0.1% Silt = 58.8% Clay = 41.1%		735
32				RC20	31.88 - 33.40	20	90 90 90	0				734
33		...33.2 m - 160 mm of core loss		RC21	33.40 - 34.92	21	100 100 100	0				733
34										34.2 m - LL = 67.3% PL = 22.9% PI = 44.4%		732
35				RC22	34.92 - 36.44	22	100 100 99	1				731
36		...35.8 m - 76° fracture										730
37												729
38												728
39												727
												726

Notes:

Target depth of 36 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH225**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/28/2022 GROUND ELEVATION 768.63m N 5610010.000 E 416834.400
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN, REFER TO 22BH225 LOG.										768
2												767
3												766
4		SHALE (Weathered), clay and silt, highly weathered, dark mottled brown, moist, high plastic, extremely weak, blocky, extremely closely spaced fractures, oxide staining	RC1		3.52 - 4.52	1	0 79 22	20		3.52 m - LL = 92.8% PL = 16.2% PI = 76.6%		765
5		SHALE, clayey, silty, trace sand, medium weathered, grey, moist, medium plastic, weak, blocky to finely fissured, gypsum crystals	RC2		4.52 - 6.04	2	65 100 78	20		3.52 m - EC: 0.6 dS/m 3.52 m - SAR: 12.1 3.52 m - pH: 8.4		764
6		...4.7 m - horizontally oriented fracture with soft infill								3.7 m - Dispersivity Classification = D2		763
7		...5.0 m - becoming very closely spaced fractures	RC3		6.04 - 7.56	3	98 100 96			5 m - LL = 72.6% PL = 17.4% PI = 55.2%		762
8		...5.2 m - interbedded moderately strong layers up to 75 mm	UD1									761
9		...5.7 m - becoming wider spaced fractures										760
		...6.1 m - 400 mm strong layer	RC4		7.56 - 9.08	4	97 100 98	2				759
		SHALE, clay and silt, slightly weathered, grey, damp, high plastic, very weak to weak, finely fissured										
		...8.3 m - 35° fracture										
		...9.1 m - 100 mm strong layer	RC5		9.08 - 10.60	5	86 100 90	3		9.74 m - Dispersivity Classification = ND4		
			UD2									

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH225**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/28/2022 GROUND ELEVATION 768.63m N 5610010.000 E 416834.400
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11				RC6	10.60 - 12.12	6	99 100 99	3		9.74 m - Jar Slake Index: 2.0		758
12				RC7	12.12 - 13.64	7	88 100 93	3		11.4 m - EC: 2.0 dS/m 11.4 m - SAR: 24.5 11.4 m - pH: 8.5 12.12 m - Sand = 0.4% Silt = 60.5% Clay = 39.1%		757
13		...12.6 m - 80 mm highly fractured layer										756
14				RC8	13.64 - 15.16	8	65 79 53	20				755
15		...14.6 m - highly fractured layer 200 mm wide ...14.8 m - 320 mm of core loss ...15.3 m - 31° fracture		RC9 UD3	15.16 - 16.68	9	96 100 92	2				754
16												753
17		...17.0 m - 100 mm highly fractured area with extremely weak infill ...17.2 m - moderately strong layer		RC10	16.68 - 18.20	10	81 100 89	4				752
18				RC11 UD4	18.20 - 19.72	11	81 100 84	5		18.2 m - LL = 88.9% PL = 12% PI = 76.9%		751
19												750
				RC12	19.72	12	92	2				749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH225**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/28/2022 GROUND ELEVATION 768.63m N 5610010.000 E 416834.400
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21				RC13	21.24	13	91	2				748
					-		95					
					22.76		90					747
22												
		...22.7 m - 70 mm of core loss		RC14	22.76	14	100	2				746
23					-		100					
					24.28		96					745
24				UD5						24 m - Sand = 0.1%		
				RC15	24.28	15	100	2		Silt = 55.7%		
					-		100			Clay = 44.2%		
		...24.9 m - strong layer 180 mm wide			25.80		97					744
25												
				RC16	25.80	16	86	4				743
26					-		100					
		...26.1 m - 70 mm highly fractured layer			27.32		84					742
27												
		...27.1 m - near horizontal fracture		RC17	27.32	17	71	4				
		...27.6 m - 75° fracture			-		95					741
28				UD6	28.84		50					
				RC18	28.84	18	98	3				740
29					-		100					
		...29.3 m - horizontal fracture			30.36		88					739
		...29.7 m - horizontally fractured										

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH225**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/27/2022 COMPLETED 06/28/2022 GROUND ELEVATION 768.63m N 5610010.000 E 416834.400
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31				RC19 UD7	30.36 - 31.88	19	100 100 100	1		30.36 m - LL = 61.7% PL = 17.4% PI = 44.3%		738
32		...32.0 m - 27° fracture		RC20	31.88 - 33.40	20	100 100 97	1				737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Braun / C. TamsReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH226**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/28/2022 COMPLETED 06/29/2022 GROUND ELEVATION 767.27m N 5609910.200 E 416835.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN, drilled with 6" SSA to 6.0 m. Refer to 22BH226 for Log Report.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												767
2												766
3												765
4												764
5												763
6												762
6		SHALE, clay and silt, trace sand, medium weathered, grey, damp, high plastic, extremely weak to very weak, finely fissured, closely spaced fractures	RC1		6.00 - 7.52	1	63 100 64	6				761
7										6.5 m - LL = 71.5% PL = 26.9% PI = 44.6% 6.5 m - Sand = 0.1% Silt = 60.7% Clay = 39.2%		760
8			RC2		7.52 - 9.04	2	57 86 60	6				759
9		...8.8 m - 210 mm of core loss	RC3		9.04 - 10.56	3	78 100 82	6		9 m - Dispersivity Classification = D2 9 m - EC: 2.9 dS/m 9 m - SAR: 32.2 9 m - pH: 8.2		758
			UD1									

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH226**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/28/2022 COMPLETED 06/29/2022 GROUND ELEVATION 767.27m N 5609910.200 E 416835.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.6 m - becoming very weak, slightly weathered		RC4	10.56 - 12.08	4	79 100 82	6				757
12		...12.1 m - 80 mm soft clayey layer		RC5 UD2	12.08 - 13.60	5	74 100 88	4		12.32 m - LL = 82.2% PL = 17.5% PI = 64.7%		755
13		...12.9 m - 31° fracture										754
14		...13.6 m - extremely weak infill ...13.6 m - extremely fractured area		RC6	13.60 - 15.12	6	61 100 57	5				753
15		...14.2 m - horizontal fracture ...14.4 m - 58° fracture										752
16		...15.1 m - very closely spaced fractures		RC7	15.12 - 16.64	7	34 86 43	7				751
17		...16.4 m - 220 mm of core loss		RC8 UD3	16.64 - 18.16	8	68 100 53	5		16.64 m - LL = 93.0% PL = 34.9% PI = 58.1%		750
18		BENTONITE (17.6 m), 100 mm layer SHALE, clay and silt, trace sand, medium weathered, grey, damp, high plastic, extremely weak to very weak, finely fissured, closely spaced fractures		RC9	18.16 - 19.68	9	52 100 72	4				749
19		...18.8 m - shell inclusion ...19.0 m - 90 mm moderately strong layer		RC10	19.68	10	77	5				748

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH226**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/28/2022 COMPLETED 06/29/2022 GROUND ELEVATION 767.27m N 5609910.200 E 416835.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.4 m - 71° fracture			- 21.20		100 78					747
				RC11 UD4	21.20 - 22.72	11	100 100 100	2		21.2 m - Sand = 0.5% Silt = 63.4% Clay = 36.1%		746
22												745
23		...22.9 m - 41° fracture		RC12	22.72 - 24.24	12	94 100 88	4				744
24												743
25		...24.2 m - shell inclusion ...24.2 m - 200 mm highly fractured area ...24.4 m - becoming widely spaced fractures		RC13	24.24 - 25.76	13	84 100 84	2				742
26				RC14 UD5	25.76 - 27.28	14	93 100 97	3		25.76 m - LL = 71.0% PL = 26.8% PI = 44.2%		741
27												740
28		...27.3 m - horizontal fracture		RC15	27.28 - 28.80	15	94 100 92	3				739
29		...28.4 m - becoming weak		RC16	28.80 - 30.32	16	93 100 98	3				738

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH226**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/28/2022 COMPLETED 06/29/2022 GROUND ELEVATION 767.27m N 5609910.200 E 416835.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.0 m - 220 mm strong layer		UD6	30.32	17	89	3		30.05 m - LL = 25.7%		737
		...30.5 m - horizontal fracture		RC17	-		100			PL = 11.2%		
					31.84		89			PI = 14.5%		
32				RC18	31.84	18	83	3		30.05 m - Sand = 60.6%		736
					-		95			Silt = 28.7%		735
		...32.4 m - 83° fracture with 2 vertical fractures through it			33.36		68			Clay = 10.7%		734
33												
		...33.3 m - core run ends in a 44° fracture, 70 mm of core loss										
34												733
35												732
36												731
37												730
38												729
39												728

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH227**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/29/2022	COMPLETED	06/30/2022	GROUND ELEVATION	766.71m N 5609808.700 E 416835.400
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		765.00 m	1.71 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN, REFER TO 22BH227 LOG.										766
2												765
3												764
4												763
5		SHALE (Weathered), clay and silt, trace sand, highly weathered, brownish brown, some oxidation staining, moist, high plastic, extremely weak, blocky	RC1		4.53 - 6.05	1	55 100 57	7				762
6		SHALE, clay and silt, trace sand, medium weathered, grey, damp, high plastic, extremely weak, very closely spaced fractures, finely fissured	RC2		6.05 - 7.57	2	0 72 28	20			5.5 m - LL = 89.3% PL = 24.7% PI = 64.6% 5.5 m - Sand = 0.2% Silt = 63.1% Clay = 36.7%	761
7		...7.2 m - 420 mm of core loss	RC3		7.57 - 9.09	3	48 100 64	10				760
8			UD1								8.4 m - LL = 78.7% PL = 15.9% PI = 62.8% 8.4 m - Sand = 3.0% Silt = 60.8% Clay = 36.2%	759
9		...9.0 m - becoming slightly weathered ...9.1 m - becoming very weak with closely spaced fractures	RC4		9.09 - 10.61	4	81 100 89	5				758
												757

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	20.50	PLAIN
20.50	22.00	SLOTTED

Logged By: C. Tams / C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH227**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/29/2022	COMPLETED	06/30/2022	GROUND ELEVATION	766.71m N 5609808.700 E 416835.400
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		765.00 m	1.71 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.6 m - becoming moderately widely spaced fractures	RC5	10.61	5	97	3					756
		...11.0 m - becoming unweathered/fresh rock	UD2	12.13		100						
						96						
12		...12.1 m - becoming weak	RC6	12.13	6	90	4					755
						100						
						95						
13												754
14		...13.9 m - 100 mm highly fractured area with weak infill	RC7	13.65	7	70	3					753
						100						
						86						
15			RC8	15.17	8	95	3			14.5 m - LL = 73.6% PL = 17% PI = 56.6%		752
						100						
						99						
16												751
17			RC9	16.69	9	91	2					750
			UD3	18.21		100				17 m - LL = 72.2% PL = 17.9% PI = 54.3%		
						97						
18		...18.0 m - 35° fracture	RC10	18.21	10	84	3					749
						96						
						86						
19		...19.1 m - highly fractured area										748
		...19.7 m - 60 mm of core loss	RC11	19.73	11	73	6					747
			UD4									

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	20.50	PLAIN
20.50	22.00	SLOTTED

Logged By: C. Tams / C. Braun

Reviewed By: T. Curtis



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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	06/29/2022	COMPLETED	06/30/2022	GROUND ELEVATION	766.71m N 5609808.700	E 416835.400
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	765.00 m		1.71 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022	

[illegible]

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	20.50	PLAIN
20.50	22.00	SLOTTED

Logged By: C. Tams / C. Braun

Reviewed By: T. Curtis



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COREHOLE No : **22CH227**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 06/29/2022 COMPLETED 06/30/2022 GROUND ELEVATION 766.71m N 5609808.700 E 416835.400
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 765.00 m 1.71 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.4 m - 20° fracture ...30.7 m - 225 mm layer of weak shale		RC18	30.37 - 31.89	18	101 107 80	2				736
32		...31.2 m - 35° with weak infill ...31.4 m - horizontally oriented fracture with soft infill		RC19	31.89 - 33.41	19	93 93 93	1				735
33												734
34												733
35												732
36												731
37												730
38												729
39												728
												727

Notes:

Target depth of 33 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	20.50	PLAIN
20.50	22.00	SLOTTED

Logged By: C. Tams / C. BraunReviewed By: T. Curtis



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COREHOLE No : **22CH228**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/04/2022 COMPLETED 07/04/2022 GROUND ELEVATION 768.58m N 5609690.600 E 416831.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH228 LOG.										768
2			SH1							1.7 m - LL = 74.5% PL = 20.7% PI = 53.8%		767
3			RC1		3.05 - 4.57	1	33 70 40	20				766
4		SHALE (Weathered), clay and silt, trace sand, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, very closely spaced fracture, finely stratified										765
5		...3.2 m - core loss from 3.05 m to 3.5 m	RC2		4.57 - 6.09	2	9 87 20	20				764
6		...3.5 m - crumbled core from 3.5 m to 3.9 m										763
7		...4.6 m - 200mm of core loss	RC3		6.09 - 7.61	3	50 103 66	20				762
8		...4.8 m - crumbled core from 4.77 m to 5.80 m										761
9		...6.8 m - fracture and crumbled core from 6.76 m to 7.34 m	RC4		7.61 - 9.13	4	84 100 76	7				760
		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, weak, medium spaced fracture, finely stratified										759
		...7.6 m - slight inclined fracturing	UD1									
		...9.1 m - weak to moderately strong	RC5		9.13 - 10.65	5	96 96 89	5		8.7 m - Sand = 0.4% Silt = 60.6% Clay = 39.0% 8.7 m - EC: 2.0 dS/m 8.7 m - SAR: 19.6 8.7 m - pH: 9.4		
		...9.2 m - 83° fracture										
		...9.8 m - 84° fracture										

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH228**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/04/2022 COMPLETED 07/04/2022 GROUND ELEVATION 768.58m N 5609690.600 E 416831.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 88° fracture ...10.2 m - 81° fracture ...10.4 m - 88° fracture	RC6	10.65	6	97	3					758
		...11.1 m - 72° fracture ...11.4 m - 84° fracture ...11.6 m - 88° fracture	UD2	12.17		97 91				11.2 m - LL = 68.9% PL = 16.7% PI = 52.2%		757
12			RC7	12.17	7	93 96 93	4			11.2 m - Dispersivity Classification = D2 11.2 m - EC: 2.3 dS/ m 11.2 m - SAR: 23.2 11.2 m - pH: 8.4		756
13		...12.7 m - horizontal fracture ...12.9 m - horizontal fracture ...13.2 m - 72° fracture ...13.2 m - 89° fracture										
14		...14.3 m - 89° fracture	RC8	13.69	8	86 104 93	3					755
			UD3									754
15		...14.9 m - 19° fracture from 14.88 m to 15.11 m ...15.2 m - moderately strong to strong ...15.2 m - 58° fracture ...15.6 m - horizontal fracture	RC9	15.21	9	105 105 105	2					753
16												
17		...16.6 m - horizontal fracture	UD4 RC10	16.73	10	93 95 89	3			16.58 m - LL = 96.8% PL = 18.2% PI = 78.6%		752
		...17.7 m - 45° fracture ...17.9 m - horizontal fracture										751
18		BENTONITE (17.9 m), 5 mm layer ...17.9 m - 30 mm weak slightly bentonitic section ...17.9 m - horizontal fracture	RC11	18.25	11	97 100 99	3					750
19		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, weak, medium spaced fracture, finely stratified ...18.9 m - 89° fracture ...18.9 m - horizontal fracture ...19.4 m - horizontal fracture	RC12	19.77	12	85	7					749

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH228**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/04/2022 COMPLETED 07/04/2022 GROUND ELEVATION 768.58m N 5609690.600 E 416831.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm ▲ POCKET PEN (kPa)			
21		...20.1 m - 87° fracture ...20.3 m - 88° fracture ...20.6 m - 220 mm section of crumbled core (possible mechanical cause)			- 21.29	99 84						748
			RC13		21.29	13	95	2				
			UD5		- 22.81	95 94						747
22		...22.3 m - 88° fracture ...22.6 m - horizontal fracture										746
			RC14		22.81	14	100	1				
23		...23.4 m - 82° fracture			- 24.33	100 99						745
			RC15		24.33	15	96	4				
24					- 25.85	101 97						744
			UD6									743
25			RC16		25.85	16	97	3				
26		...26.3 m - 65° fracture ...26.5 m - 85° fracture			- 27.37	97 94						742
			RC17		27.37	17	101	0				
27		...27.0 m - 72° fracture			- 28.89	101 101						741
			UD7									740
28			RC18		28.89	18	100	1				
29		...29.8 m - 79° fracture			- 30.41	100 99						739

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH228**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 07/04/2022 COMPLETED 07/04/2022 GROUND ELEVATION 768.58m N 5609690.600 E 416831.300
DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31												738
32												737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH229**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	08/30/2022	COMPLETED	08/31/2022	GROUND ELEVATION	767.30m N 5612179.983 E 416937.836
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	765.43 m 1.87 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm ▲ POCKET PEN (kPa)		
1		CLAY TILL, silty, trace to some sand, damp, stiff, medium plastic, brown, suspect white sulphate inclusions	AU1						17.6		0 m - 6" SSA to 3 m.
2		...1.0 m - becoming very silty, firm, dark brown	AU2						21.4		
3		...2.0 m - becoming trace gypsum crystals	AU3						26.4		
4		SHALE (Weathered), clay and silt, trace sand, completely weathered, brown to dark grey mottling, some oxidation staining, damp, high plastic, extremely weak, blocky, trace gypsum crystals	AU4						23.0		
5		...3.0 m - becoming extremely closely spaced fractures	RC1		3.00 - 4.52	1	7 82 17	20			3.2 m - LL = 72.2% PL = 20.5% PI = 51.7%
6		...4.2 m - becoming highly weathered	RC2		4.52 - 6.04	2	7 100 33	20			3.2 m - Sand = 0.4% Silt = 55.5% Clay = 44.1%
7		...4.2 m - 270 mm of core loss									
8		SHALE, clay and silt, trace sand, slightly weathered, grey, dry, high plastic, very weak, closely spaced fractures, thinly laminated, unoxidized	RC3		6.04 - 7.56	3	86 96 79	3			5.7 m - LL = 83.9% PL = 19.5% PI = 64.4%
9		...5.8 m - 160 mm of crumbled core									5.9 m - Sand = 0.3% Silt = 69.1% Clay = 30.6%
10		...6.0 m - becoming weak, unweathered									
11		...6.1 m - becoming some decimeter weakly cemented layers	RC4		7.56 - 9.08	4	83 100 84	3			7.8 m - LL = 71.9% PL = 20.0% PI = 51.9%
12		...7.5 m - 60 mm of core loss									
13		...7.6 m - mechanically fractured run									
14		...7.8 m - 40 mm of strong calcified shale									
15		...8.5 m - 76° fracture									
16		...9.0 m - 120 mm of crumbled core	RC5		9.08 - 10.60	5	77 99 74	3			

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.10	PLAIN
6.10	7.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH229**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	08/30/2022	COMPLETED	08/31/2022	GROUND ELEVATION	767.30m N 5612179.983 E 416937.836
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		765.43 m	1.87 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - 47° fracture		RC6	10.60	6	95	3				757
		...10.6 m - 20 mm of core loss			-		101					
		...10.6 m - becoming moderately widely spaced fractures			12.12		88			10.9 m - LL = 125.4% PL = 21.0% PI = 104.4%		756
		...10.8 m - 74° fracture										
		...11.0 m - 65° fracture										
12		...11.8 m - 81° fracture		RC7	12.12	7	93	3				755
					-		102					
					13.64		94					
13		...12.8 m - 50° fracture										
		...12.9 m - 65° fracture										
		...13.0 m - 109° fracture										
		...13.3 m - trace shell inclusions		RC8	13.64	8	89	2				754
14		...13.9 m - 27° fracture			-		94					
					15.16		92					753
		...14.6 m - 67° fracture										
15		...15.1 m - 90 mm of core loss		RC9	15.16	9	80	3				752
		BENTONITE (15.4 m), 170 mm thin bentonite seams			-		100					
		...15.5 m - becoming moderately strong			16.68		84					751
		...15.6 m - 71° fracture										
17		SILTSTONE, and Clay, unweathered, light grey, damp, high plastic, moderately strong, medium spaced fractures, thinly laminated		RC10	16.68	10	89	1				750
		...16.5 m - mechanically fractured area			-		180					
		...16.7 m - mechanically fractured area			18.20		96			17.4 m - Sand = 0.0% Silt = 63.0% Clay = 37.0%		749
18		...17.2 m - 74° fracture										
		...17.3 m - becoming widely spaced fractures		RC11	18.20	11	98	1				
		...18.5 m - vertical fracture			-		98					
					19.72		98					748
19		...19.7 m - 30 mm of core loss		RC12	19.72	12	53	1				

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.10	PLAIN
6.10	7.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH229**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 08/30/2022 COMPLETED 08/31/2022 GROUND ELEVATION 767.30m N 5612179.983 E 416937.836
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 765.43 m 1.87 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		20.5 m - 350 mm of crumbled core 20.9 m - 310 mm of core loss			21.24		80 55			20.4 m - LL = 66.1% PL = 15.8% PI = 50.3%		747
22												746
23												745
24												744
25												743
26												742
27												741
28												740
29												739
												738

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	6.10	PLAIN
6.10	7.60	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH230**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	08/31/2022	COMPLETED	08/31/2022	GROUND ELEVATION	768.39m N 5611459.935 E 416940.874
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	765.90 m 2.49 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm ▲ POCKET PEN (kPa)			
1		GRAVEL, silty, some clay infill, trace cobbles, well graded up to 50 mm, coarse grained, sub-angular, dry, compact, brown	AU1						6.1		0 m - 6" SSA to 3 m.	768
			AU2						7.0		0.6 m - Gravel = 56.6% 0.6 m - Sand = 27.7% Silt = 9.2% Clay = 6.5%	767
2		CLAY TILL, silty, some gravel up to 15 mm, trace sand, damp, stiff, medium plastic, dark brown, suspect white sulphate inclusions, trace gypsum crystals	AU3						17.0		2.1 m - LL = 63.1% PL = 16.8% PI = 46.3%	766
3		SHALE (Weathered), clayey, silty, completely weathered, brown to grey mottling, some oxidation staining, damp, high plastic, extremely weak to hard soil, blocky, trace gypsum crystals	AU4						18.8			
4		...3.3 m - becoming extremely closely spaced fractures	SH1		3.30 - 4.82	1	0 58 9	20			3.6 m - LL = 69.2% PL = 22.6% PI = 46.6%	765
5		SHALE, clay and silt, slightly weathered, grey, damp, high plastic, very weak, very closely spaced fractures, thinly laminated, trace oxidation staining	RC2		4.82 - 6.34	2	16 86 28	20			3.6 m - Sand = 0.2% Silt = 51.5% Clay = 48.3%	764
6		...4.2 m - 640 mm of core loss ...4.8 m - very crumbled core throughout run									4.9 m - LL = 76.0% PL = 20.0% PI = 56.0%	763
7		...5.9 m - becoming unoxidized ...6.1 m - 220 mm of core loss ...6.3 m - becoming unweathered	RC3		6.34 - 7.86	3	61 100 62	5			5.3 m - Sand = 0.1% Silt = 57.2% Clay = 42.7%	762
8		...7.5 m - 38° fracture ...7.9 m - becoming moderately widely spaced fractures ...8.2 m - 47° fracture	RC4		7.86 - 9.38	4	82 88 81	1			8.1 m - LL = 78.4% PL = 16.2% PI = 62.2%	761
9		...9.2 m - 180 mm of core loss	RC5		9.38 - 10.90	5	76 100 64	3				760

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	4.90	PLAIN
4.90	6.40	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH230**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 08/31/2022 COMPLETED 08/31/2022 GROUND ELEVATION 768.39m N 5611459.935 E 416940.874
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 765.90 m 2.49 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ▬ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 100 mm of crumbled core ...10.1 m - becoming weak ...10.2 m - 39° fracture ...10.5 m - 28° fracture ...10.9 m - becoming centimeter to decimeter weakly cemented layers ...11.0 m - crumbled core		RC6	10.90 - 12.42	6	66 100 66	3				758
12		...12.1 m - 36° fracture		RC7	12.42 - 13.94	7	75 100 70	3				757
13		...12.9 m - horizontal fracture ...13.2 m - 48° fracture										756
14		...13.9 m - trace bentonite seam ...14.3 m - becoming some thin moderately strong layers ...14.6 m - 21° fracture		RC8	13.94 - 15.46	8	73 103 78	3		13.9 m - LL = 91.2% PL = 20.9% PI = 70.3%		755
15												754
16												753
17												752
18												751
19												750
												749

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	4.90	PLAIN
4.90	6.40	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH231**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	09/01/2022	COMPLETED	09/02/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	766.75m	N 5610778.957 E 416912.982
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	764.77 m	1.98 m
		DATE GROUND WATER RECORDED	10/12/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		SAND, silty, poorly graded, fine grained, sub-rounded, damp, compact, light brown	AU1						3.5	0 m - 6" SSA to 3.3 m.		766
			AU2						3.1	0.6 m - Sand = 71.9%		
2		CLAY TILL, silty, trace gravel up to 20 mm, trace sand lenses, damp, stiff, medium plastic, dark brown, some oxidation staining, suspect white sulphate inclusions	AU3						16.9	Silt = 16.3% Clay = 11.8%		765
3		SHALE (Weathered), clay and silt, completely weathered, brown to dark grey mottling, some oxidation staining, damp, high plastic, extremely weak to hard soil, blocky	AU4						23.0	2.1 m - LL = 57.4% PL = 16.2% PI = 41.2%		764
4		...3.3 m - 560 mm of core loss ...3.9 m - 130 mm of residual soil	SH1		3.30 - 4.82	1	0 63 9	20		3.6 m - LL = 67.0% PL = 22.3% PI = 44.7%		763
5		SHALE, silt, clayey to and clay, medium weathered, grey, damp, high plastic, extremely weak, extremely closely spaced fractures, thinly laminated, unoxidized	RC2		4.82 - 6.34	2	39 100 57	20		3.6 m - Sand = 1.5% Silt = 60.6% Clay = 37.9%		762
6		...4.0 m - crumbled core ...4.8 m - 150 mm of slough ...5.0 m - 200 mm of mechanical rubble								4.1 m - LL = 58.3% PL = 21.2% PI = 37.1%		761
7		...5.9 m - 160 mm of strong calcified shale	RC3		6.34 - 7.86	3	86 100 86	3		5.9 m - Sand = 3.8% Silt = 64.1% Clay = 32.1%		760
8		...6.1 m - suspect white sulphate inclusions										
9		...6.5 m - becoming unweathered, very weak, closely spaced fractures	RC4		7.86 - 9.38	4	73 100 76	4		7.9 m - Sand = 0.3% Silt = 69.2% Clay = 30.5%		759
		...6.6 m - 112° fracture										
		...7.4 m - vertical fracture with weak clay infill										
		...7.7 m - vertical fracture										
		...7.9 m - becoming some centimeter to decimeter weakly cemented layers										
		...8.1 m - 63° fracture										
		...8.9 m - 39° fracture										
		...9.1 m - mechanical rubble	RC5		9.38 - 10.90	5	89 100 89	3				758
		...9.9 m - 104° fracture										757

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH231**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/01/2022 COMPLETED 09/02/2022 GROUND ELEVATION 766.75m N 5610778.957 E 416912.982
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 764.77 m 1.98 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 122° fracture										
		...10.6 m - 118° fracture										
		...10.9 m - 160 mm of mechanical rubble		RC6	10.90 - 12.42	6	84 101 86	2				756
12		...11.7 m - 79° fracture										
		...11.8 m - 74° fracture										
		...11.9 m - 107° fracture		RC7	12.42 - 13.94	7	90 100 84	3				755
13		...12.5 m - 135° fracture										
		...12.9 m - 122° fracture										
		...13.3 m - 118° fracture										
14		...14.2 m - 156° fracture		RC8	13.94 - 15.46	8	82 100 81	3				753
15		...14.7 m - vertical fracture followed by crumbled core										
		...14.8 m - 80 mm moderately strong layer										
		...15.0 m - 42° fracture		RC9	15.46 - 16.98	9	82 101 93	3		15.5 m - LL = 296.0% PL = 36.9% PI = 259.1%		751
16		BENTONITE (15.4 m), 140 mm seam, weak layer										
		SHALE, silt, clayey, unweathered, light grey, damp, high plastic, moderately strong, finely fissured										
17		...15.8 m - vertical fracture		RC10	16.98 - 18.50	10	82 100 82	4				750
		...16.6 m - vertical fracture with trace shell inclusions										
		...16.8 m - vertical fracture with trace shell inclusions										
18		...17.0 m - 70 mm of slough										749
		...17.6 m - 106° fracture										
		...17.8 m - 76° fracture										
		...17.9 m - 50 mm of crumbled core		RC11	18.50 - 20.02	11	93 107 89	3				748
19		...18.4 m - 73° fracture										
		...19.2 m - 132° fracture										
		...19.6 m - vertical fracture with weak clay infill										
		...19.7 m - 162° fracture										
		...19.8 m - 151° fracture										747

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH231**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/01/2022 COMPLETED 09/02/2022 GROUND ELEVATION 766.75m N 5610778.957 E 416912.982
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 764.77 m 1.98 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21												746
22												745
23												744
24												743
25												742
26												741
27												740
28												739
29												738
												737

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis

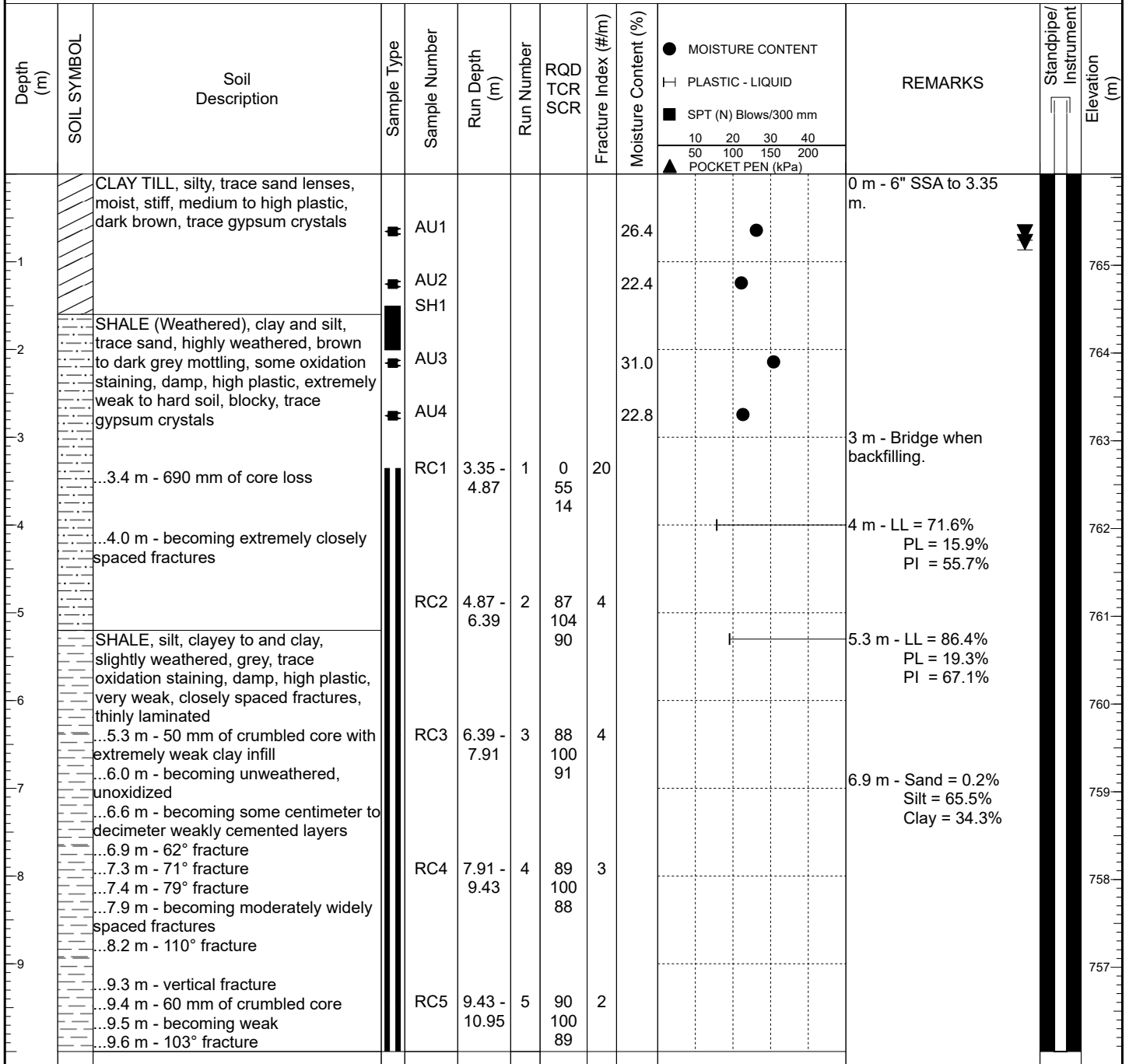


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COREHOLE No : **22CH232**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/06/2022	COMPLETED	09/06/2022	GROUND ELEVATION	766.04m N 5609873.977 E 416899.490
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		765.37 m	0.67 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022



Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	15.20	PLAIN
15.20	16.80	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH232**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/06/2022	COMPLETED	09/06/2022	GROUND ELEVATION	766.04m N 5609873.977 E 416899.490
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		765.37 m	0.67 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - 70° fracture		RC6	10.95 - 12.47	6	89 96 86	2				755
12		...11.5 m - vertical fracture										754
13		...12.0 m - 46° fracture		RC7	12.47 - 13.99	7	93 103 95	3				753
14		...12.4 m - 60 mm of core loss										
15		...12.9 m - vertical fracture										752
16		...13.5 m - 70° fracture		RC8	13.99 - 15.51	8	85 100 86	4		14.2 m - LL = 236.0% PL = 34.3% PI = 201.7%		751
17		...13.6 m - 30 mm of slightly calcified shale followed by 40 mm of crumbled core		D1								750
18		...14.1 m - mechanical rubble										749
19		BENTONITE (14.2 m), 40 mm laminated seams										748
20		...14.3 m - 70 mm moderately strong layer		RC9	15.51 - 17.03	9	58 86 66	3		16.5 m - Sand = 0.1% Silt = 62.6% Clay = 37.3%		747
21		SHALE, "..."										
22		...15.0 m - vertical fracture										
23		...15.4 m - mechanically damaged core										
24		...15.5 m - 210 mm of core loss										
25		...15.9 m - 120 mm of mechanical rubble										
26		...16.7 m - 121° fracture		RC10	17.03 - 18.55	10	90 100 83	3				
27		...17.4 m - 100° fracture										
28		...17.8 m - 110° fracture										
29		...18.3 m - mechanically fractured area		RC11	18.55 - 20.07	11	95 100 92	2		19.3 m - LL = 60.0% PL = 16.4% PI = 43.6%		
30		...19.3 m - becoming some thin moderately strong layers										
31		...19.4 m - 57° fracture										
32		...19.6 m - 66° fracture										

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	15.20	PLAIN
15.20	16.80	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH232**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/06/2022 COMPLETED 09/06/2022 GROUND ELEVATION 766.04m N 5609873.977 E 416899.490
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 765.37 m 0.67 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21												745
22												744
23												743
24												742
25												741
26												740
27												739
28												738
29												737

Notes:

Target depth of 20 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	15.20	PLAIN
15.20	16.80	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH300**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/05/2022 COMPLETED 07/05/2022 GROUND ELEVATION 768.30m N 5609576.900 E 416763.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH300 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												768
2												767
3												766
4												765
5		SHALE (Weathered), clay and silt, trace sand, completely weathered, brown, some oxidation staining, damp, high plastic, extremely weak, blocky, very closely spaced fractures, trace gypsum crystals	RC1		4.50 - 6.02	1	24 96 41	11				764
6		...6.0 m - becoming grey	RC2		6.02 - 7.54	2	23 100 65	9			5.2 m - Dispersivity Classification = D2 5.2 m - EC: 8.9 dS/m 5.2 m - SAR: 34.2 5.2 m - pH: 6.3	763
7										6.6 m - LL = 71.0% PL = 15.3% PI = 55.7%		762
8			RC3		7.54 - 9.06	3	35 100 55	8		6.6 m - Sand = 0.2% Silt = 61.4% Clay = 38.4%		761
9		SHALE, clay and silt, trace sand, medium weathered, grey, some oxidation staining, damp, medium plastic, extremely weak, finely laminated, very closely spaced fractures	RC4		9.06 - 10.58	4	34 99 61	7		6.6 m - EC: 3.8 dS/m 6.6 m - SAR: 31.8 6.6 m - pH: 7.9		760
												759

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH300**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/05/2022 COMPLETED 07/05/2022 GROUND ELEVATION 768.30m N 5609576.900 E 416763.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.5 m - becoming very weak ...10.6 m - becoming slightly weathered to unweathered ...10.7 m - becoming moderately widely to widely spaced fractures ...11.0 m - becoming trace oxidation staining		RC5	10.58 - 12.10	5	83 100 84	2				758
12				RC6	12.10 - 13.62	6	90 100 97	2		11.1 m - LL = 73.9% PL = 19.1% PI = 54.8%		757
13												756
14		...14.2 m - 32° fracture		RC7	13.62 - 15.14	7	88 100 95	3				755
15												754
16				RC8	15.14 - 16.66	8	88 100 92	5				753
17		BENTONITE (16.0 m), 75 mm layer SHALE, clayey, silty, medium weathered, grey, some oxidation staining, damp, medium plastic, extremely weak, finely laminated, very closely spaced fractures ...16.4 m - becoming weak ...17.2 m - closely spaced fractures ...17.3 m - shell inclusion		D1						16 m - LL = 232.7% PL = 28.5% PI = 204.2% 16 m - Sand = 0.2% Silt = 37.4% Clay = 62.4%		752
18				RC9	16.66 - 18.18	9	68 100 93	7				751
19												750
				RC10	18.18 - 19.70	10	92 93 88	3				749
				RC11	19.70	11	78	5		19 m - EC: 1.2 dS/m 19 m - SAR: 22.7 19 m - pH: 8.8		

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH300**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/05/2022 COMPLETED 07/05/2022 GROUND ELEVATION 768.30m N 5609576.900 E 416763.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.2 m - 41° fracture		RC12	21.22	12	82	4				748
22					22.74		100					747
23		...22.9 m - some centimeter to decimeter weakly cemented layers		RC13	22.74	13	84	4				746
24					24.26		100					745
25					25.78		88					744
26		...25.9 m - mechanically induced fractures		RC14	24.26	14	92	3				743
27		...26.5 m - mechanically induced fractures			27.30		100					742
28		...27.2 m - 100 mm of core loss		RC15	25.78	15	57	5				741
29		...27.6 m - becoming moderately strong			27.30		93					740
		...28.7 m - 39° fracture		RC16	27.30	16	100	1				739
					28.82		100					
					30.34		95					
				RC17	28.82	17	100	1				
							100					
							94					

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH300**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 07/05/2022 COMPLETED 07/05/2022 GROUND ELEVATION 768.30m N 5609576.900 E 416763.500
DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31		...30.0 m - 50° fracture										738
32												737
33												736
34												735
35												734
36												733
37												732
38												731
39												730
												729

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH301**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/05/2022	COMPLETED	07/06/2022	GROUND ELEVATION	769.34m N 5609512.400 E 416686.400
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		766.27 m	3.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH301 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												769
2												768
3												767
4												766
5												765
6												764
7												763
8		SHALE (Weathered), clay and silt, trace sand, highly weathered, brownish grey, some oxidation staining, damp, high plastic, extremely weak to hard soil, blocky	RC1		7.60 - 9.12	1	40 93 53	7		8 m - LL = 76.7% PL = 15.8% PI = 60.9% 8 m - EC: 4.3 dS/m 8 m - SAR: 30.1 8 m - pH: 7.9 8.6 m - Dispersivity Classification = D2		762
9		...8.0 m - 35° fracture ...9.0 m - 100 mm of core loss ...9.1 m - becoming some very weak shale	RC2		9.12 - 10.64	2	32 100 57	9				761
												760

Notes:

Target depth of 30 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	15.35	PLAIN
15.35	16.85	SLOTTED

Logged By: C. Tams / J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH301**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/05/2022	COMPLETED	07/06/2022	GROUND ELEVATION	769.34m N 5609512.400 E 416686.400
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		766.27 m	3.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.9 m - 150 mm mechanically fractured area		RC3	10.64	3	48	5				759
					-		100					
					12.16		57					
12		SHALE, clay and silt, trace sand, medium weathered, grey, some oxidation staining, damp, high plastic, very weak, thinly laminated, medium spaced fractures, trace gypsum crystals		RC4	12.16	4	99	3				758
				UD1	-		100					757
					13.68		92					
13		...12.1 m - becoming slightly weathered to unweathered										
		...12.2 m - becoming widely spaced fractures										756
14		...13.6 m - becoming no oxidation staining		RC5	13.68	5	88	4				
					-		100					
		...13.7 m - some centimeter to decimeter weakly cemented layers		UD2	15.20		97					755
		...13.8 m - becoming unweathered, weak								14.37 m - Sand = 0.2%		
15				RC6	15.20	6	81	4		Silt = 60.8%		
					-		100			Clay = 39.0%		754
					16.72		91					
16		BENTONITE (16.1 m), 140 mm layer		UD3						16.1 m - LL = 128.5%		
		...16.2 m - 60 mm moderately strong layer								PL = 20.9%		753
				RC7	16.72	7	103	2		PI = 107.6%		
17		SHALE, clay and silt, trace sand, medium weathered, grey, some oxidation staining, damp, high plastic, very weak, thinly laminated, medium spaced fractures, trace gypsum crystals			-		103			16.1 m - EC: 1.5 dS/m		
					18.24		101			16.1 m - SAR: 21.6		752
18		...17.2 m - 81° fracture		UD4		8	101	2		16.1 m - pH: 9.3		
		...17.6 m - 87° fracture		RC8	-		101					751
		...18.2 m - horizontal fracture			19.76		99			18.2 m - Sand = 0.1%		
		...18.6 m - 76° fracture								Silt = 59.1%		
19										Clay = 40.8%		
		...19.4 m - 81° fracture										750
				RC9	19.76	9	99	2		19.76 m - Sand = 0.8%		

Notes:

Target depth of 30 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	15.35	PLAIN
15.35	16.85	SLOTTED

Logged By: C. Tams / J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH301**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/05/2022	COMPLETED	07/06/2022	GROUND ELEVATION	769.34m N 5609512.400 E 416686.400
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		766.27 m	3.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.6 m - 85° fracture ...20.7 m - horizontal fracture ...20.9 m - 25 mm sandy shale section ...21.0 m - horizontal fracture	RC10		21.28	10	103 103 102	1		Silt = 64.6% Clay = 34.6%		749
22			UD5							20.9 m - LL = 63.5% PL = 14.5% PI = 49.0% 20.9 m - Sand = 0.8%		748
23		...22.4 m - interbedded shells ...22.5 m - moderately strong ...22.7 m - horizontal fracture ...23.0 m - horizontal fracture	RC11		22.80	11	101 101 98	2		Silt = 64.6% Clay = 34.6%		747
24		...23.7 m - 66° fracture ...24.1 m - horizontal fracture	RC12		24.32	12	103 103 101	2				746
25		...24.6 m - horizontal fracture ...24.8 m - horizontal fracture	UD6									745
26			RC13		25.84	13	100 100 99	1				744
27					27.36							743
28			RC14		27.36	14	100 100 99	1				742
29		...29.3 m - horizontal fracture	RC15		28.88	15	104 104 103	1		28 m - LL = 62.0% PL = 18.2% PI = 43.8%		741
			UD7		30.40							740

Notes:

Target depth of 30 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	15.35	PLAIN
15.35	16.85	SLOTTED

Logged By: C. Tams / J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH301**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/05/2022	COMPLETED	07/06/2022	GROUND ELEVATION	769.34m N 5609512.400 E 416686.400
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		766.27 m	3.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31												739
32												738
33												737
34												736
35												735
36												734
37												733
38												732
39												731
												730

Notes:

Target depth of 30 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	15.35	PLAIN
15.35	16.85	SLOTTED

Logged By: C. Tams / J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH302**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/06/2022 COMPLETED 07/07/2022 GROUND ELEVATION 769.21m N 5609477.900 E 416590.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH302 LOG.										
1												769
2		GRAVEL, some sand, some silt, trace clay, well graded, sub-rounded, moist, loose, brown	RC1		1.53 - 3.05	1	92	N/A				768
		CLAY TILL, and silt, trace sand, moist, firm to stiff, high plastic, brown, gypsum crystals, coal staining	D2				92					767
3		SHALE (Weathered), clay and silt, trace sand, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, extremely closely spaced fracture, finely stratified, trace oxide specks, coal staining	RC2		3.05 - 4.57	2	10	20				766
4		3.0 m - oxidation staining					95					765
5		3.2 m - 150 mm crumbled core	RC3		4.57 - 6.09	3	14	20				764
		3.3 m - extremely fractured core					100					
		3.7 m - 200 mm crumbled core					47					
6		4.1 m - 60 mm crumbled core										
		4.8 m - becoming weak										
		5.5 m - becoming very closely spaced fracturing	RC4		6.09 - 7.61	4	64	10				763
7		5.6 m - weak					99					
		6.0 m - trace gypsum crystals					61					
		6.2 m - 60 mm crumbled core										
		6.9 m - 50 mm crumbled core	UD1									762
		6.9 m - becoming closely spaced fracturing										
8		8.0 m - 69° fracture	RC5		7.61 - 9.13	5	92	5				761
		8.4 m - 90 mm crumbled core					104					
		8.5 m - becoming less oxidation stained					86					
9		8.7 m - horizontal fracture										
		9.0 m - 87° fracture										
		9.4 m - 80 mm crumbled core	UD2		9.13 - 10.65	6	82	4				760
		9.7 m - 100 mm crumbled core	RC6				95					
							81					

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



an Englobe company

COREHOLE No : **22CH302**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/06/2022 COMPLETED 07/07/2022 GROUND ELEVATION 769.21m N 5609477.900 E 416590.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - horizontal fracture ...10.3 m - becoming weak shale ...10.5 m - 87° fracture SHALE, clay and silt, trace sand, moderately weathered, grey, damp, high plastic, weak, medium spaced fracture, finely stratified, oxide staining	UD3	RC7	10.65 - 12.17	7	89 100 88	4				759
12		...10.7 m - varying layer of weak to strong shale fracturing along interbedded oxidation layers ...10.8 m - 54° fracture ...10.8 m - 50 mm crumbled core ...11.1 m - 90 mm crumbled core ...11.2 m - slightly weathered ...11.4 m - parallel horizontal fractures 70 mm apart	RC8		12.17 - 13.69	8	95 100 93	3				758 757
13		...12.2 m - weak to moderately strong ...12.7 m - 86° fracture ...13.0 m - 60 mm weak crumbled section	RC9		13.69 - 15.21	9	97 97 95	2				756 755
14		...13.1 m - horizontal fracture ...13.4 m - 72° fracture ...13.8 m - unweathered ...14.0 m - 88° fracture ...14.6 m - horizontal fracture	UD4	RC10	15.21 - 16.73	10	99 99 97	2				754
15		BENTONIC SHALE (15.8 m), 70 mm very weak to weak bentonitic section SHALE, clay and silt, "..."	D1									753
16		...15.9 m - 70 mm very weak to weak slightly bentonitic section ...16.3 m - 88° fracture ...16.9 m - moderately strong ...17.1 m - horizontal fracture	RC11		16.73 - 18.25	11	105 105 101	2		15.9 m - LL = 190.4% PL = 49.5% PI = 140.9% 15.9 m - Sand = 0.1% Silt = 41.9% Clay = 58.0%		752
17		...17.7 m - horizontal fracture ...17.9 m - 55° fracture	UD5	RC12	18.25 - 19.77	12	103 103 99	3				751
18		...18.4 m - moderately strong to strong ...18.5 m - 82° fracture ...18.8 m - horizontal fracture	UD6	RC13	19.77	13	94	2				750

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH302**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/06/2022 COMPLETED 07/07/2022 GROUND ELEVATION 769.21m N 5609477.900 E 416590.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.9 m - 85° fracture ...21.1 m - 78° fracture	RC14	21.29	14	99 99	2					749
22		...21.6 m - 82° fracture ...21.7 m - 21° fracture from 21.74 m to 21.99 m ...22.0 m - 300 mm mechanical fractured section	RC15	22.81	15	102 102 97	2					748
23			UD7									747
24		...24.4 m - 90 mm mechanical fractured section	RC16	24.33	16	100 100 99	1					746
25		...25.4 m - 68° fracture	RC17	25.85	17	100 100 100	0			25 m - Sand = 0.1% Silt = 56.0% Clay = 43.9%		745
26		...25.9 m - 300 mm mechanical fractured section	RC18	27.37	18	103 103 100	1					744
27		...26.8 m - 220 mm mechanical fractured section	UD8									743
28		...28.4 m - 76° fracture	RC19	28.89	19	101 101 101	0			28.34 m - LL = 61.8% PL = 16.7% PI = 45.1%		742
29		...29.0 m - multiple mechanical fractures from 28.96 m to 29.46 m		30.41						28.34 m - EC: 2.1 dS/m 28.34 m - SAR: 29.8 28.34 m - pH: 8.5		741

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH302**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/06/2022 COMPLETED 07/07/2022 GROUND ELEVATION 769.21m N 5609477.900 E 416590.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
31												739
32												738
33												737
34												736
35												735
36												734
37												733
38												732
39												731
												730

Notes:

Target depth of 30 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH303**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/07/2022 COMPLETED 07/07/2022 GROUND ELEVATION 771.35m N 5609476.600 E 416484.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH303 LOG.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												771
2												770
3												769
4												768
5				SH1								767
6												766
7												765
8				RC1	7.60 - 9.12	1	46 101 59	10		8 m - LL = 80.0% PL = 17.4% PI = 62.6%		764
9		SHALE (Weathered), clay and silt, trace sand, highly weathered, brown, moist, high plastic, extremely weak very to very weak, very closely spaced fracture, finely stratified, gypsum crystals, oxide staining, coal staining ...7.6 m - slightly inclined fracturing ...7.9 m - 120 mm crumbled core ...8.1 m - 70 mm crumbled core ...9.1 m - very weak ...9.5 m - 70 mm crumbled core		RC2	9.12 - 10.64	2	66 99 59	5				763
												762

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis

CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/07/2022	COMPLETED	07/07/2022	GROUND ELEVATION	771.35m N 5609476.600 E 416484.600
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH		
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	

[illegible]

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH303**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/07/2022 COMPLETED 07/07/2022 GROUND ELEVATION 771.35m N 5609476.600 E 416484.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...19.4 m - 84° fracture ...20.2 m - 60° fracture ...20.9 m - 67° fracture	UD5 RC10		- 21.28 21.28	10	102 99 100	3		Clay = 38.6% 21.15 m - LL = 79.9% PL = 15.4% PI = 64.5%		751 750
22		...21.8 m - interbedded shells ...21.9 m - 82° fracture ...22.1 m - 46° fracture ...22.2 m - 42° fracture ...22.4 m - 61° fracture	RC11		22.80 - 22.80	11	102 102 101	1				749 748
23		...23.0 m - 170 mm mechanical fractured section filled in with slough										
24		...24.0 m - 76° fracture ...24.4 m - weak to moderately strong	RC12 UD6		24.32 - 25.84	12	103 103 95	2		24.6 m - LL = 67.5% PL = 18.5% PI = 49.0%		747 746
25		...24.9 m - 36° fracture ...25.1 m - 63° fracture								24.6 m - EC: 2.4 dS/m 24.6 m - SAR: 26.3 24.6 m - pH: 8.2 24.61 m - EC: 1.9 dS/m 24.61 m - SAR: 27.1 24.61 m - pH: 8.2		745 744
26		...26.4 m - 65° fracture ...26.6 m - 33° fracture from 26.5 m to 26.7 m ...27.2 m - 140 mm of core loss	RC13		25.84 - 27.36	13	91 91 79	2				
27												
28												
29												

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH304**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/07/2022 COMPLETED 07/08/2022 GROUND ELEVATION 770.34m N 5609471.600 E 416395.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH304 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												770
2												769
3												768
4				SH1								767
5												766
6												765
7		SHALE, clay and silt, trace sand, medium weathered, grey with some oxidation staining, damp, high plastic, weak, extremely closely spaced fracture, finely stratified, trace gypsum crystals										764
8		...8.2 m - 100 mm crumbled core ...8.8 m - becoming slightly weathered, closely spaced fracture		RC1	7.60 - 9.12	1	21 84 35	15				763
9		...9.1 m - no gypsum crystals ...9.2 m - slightly inclined to inclined fracturing ...9.3 m - 40 mm crumbled core ...9.4 m - 50 mm crumbled core ...9.8 m - 34° fracture ...9.8 m - weak to moderately strong, widely spaced to very widely spaced fracturing, no oxide staining, slightly weathered to unweathered		UD1 RC2	9.12 - 10.64	2	84 100 86	5				762
												761

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH304**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/07/2022 COMPLETED 07/08/2022 GROUND ELEVATION 770.34m N 5609471.600 E 416395.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.8 m - parallel horizontal fractures 180 mm apart		RC3	10.64 - 12.16	3	100 100 99	3				760
12		...11.9 m - parallel horizontal fractures 110 mm apart		RC4	12.16 - 13.68	4	100 100 97	2				759
13		...12.2 m - unweathered ...12.5 m - horizontal fracture ...12.7 m - 88° fracture		UD2								758
14		...13.1 m - 57° fracture ...13.7 m - moderately strong ...13.8 m - 85° fracture ...14.1 m - horizontal fracture		RC5	13.68 - 15.20	5	104 104 103	2				757
15		...15.0 m - horizontal fracture		UD3 RC6	15.20 - 16.72	6	95 95 92	3		15.07 m - LL = 89.2% PL = 16.6% PI = 72.6%		756
16		...15.6 m - 87° fracture ...15.9 m - parallel 79° fractures 150 mm apart ...16.4 m - horizontal fracture										755
17		...17.1 m - 83° fracture ...17.1 m - 140 mm mechanical fracturing		RC7	16.72 - 18.24	7	103 103 101	2				754
18		...17.4 m - moderately strong to strong, high plastic ...17.6 m - 72° fracture ...18.2 m - 95 mm calcified shale ...18.3 m - 45° fracture		UD4 RC8 UD5	18.24 - 19.76	8	104 104 99	2		18.4 m - Sand = 0.3% Silt = 62.2% Clay = 37.5%		753
19		...19.1 m - 88° fracture ...19.6 m - 86° fracture		RC9	19.76	9	95	1				752
												751

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH304**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/07/2022 COMPLETED 07/08/2022 GROUND ELEVATION 770.34m N 5609471.600 E 416395.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.1 m - horizontal fracture			- 21.28		95 94			20.4 m - LL = 116.0% PL = 19.1% PI = 96.9%		750
22		...21.5 m - 80° fracture		RC10	21.28 - 22.80	10	102 102 101	2				749
23		...22.6 m - horizontal fracture		RC11	22.80 - 24.32	11	105 105 101	2				748
24		...23.8 m - horizontal fracture		UD6						23.64 m - LL = 74.7% PL = 15.5% PI = 59.2%		747
25		...25.5 m - 170 mm moderately strong to strong layer		RC12	24.32 - 25.84	12	95 98 87	2		23.64 m - Sand = 5.3% Silt = 63.5% Clay = 31.2%		746
26		...25.6 m - 20 mm crumbled core		RC13	25.84 - 27.36	13	93 100 88	2		26 m - LL = 64.4% PL = 18.5% PI = 45.9%		745
27		...25.8 m - 40 mm of weak infill										744
28		...26.0 m - centimeter to decimeter weakly cemented layers from 25.99										743
29												742
												741

Notes:

Target depth of 27 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH305**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/08/2022 COMPLETED 07/08/2022 GROUND ELEVATION 771.35m N 5609472.900 E 416292.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH305 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												771
2												770
3			SH1							3 m - LL = 119.0% PL = 24% PI = 95.0%		769
4										3 m - Sand = 1.2% Silt = 63.3% Clay = 35.5%		768
5		SHALE (Weathered), and silt, clayey, trace sand, highly weathered, grey with oxidation staining, moist, high plastic, extremely weak, very closely spaced fractures, thinly laminated, trace gypsum crystals	RC1		4.54 - 6.06	1	14 100 53	17				767
6		...6.1 m - extremely fractured run	RC2		6.06 - 7.58	2	0 76 13	7				766
7		...7.2 m - 370 mm of core loss										765
8		...7.6 m - highly fractured run ...7.8 m - 55° fracture	RC3		7.58 - 9.10	3	31 92 30	7				764
9		...9.0 m - 120 mm of core loss	RC4 UD1		9.10 - 10.62	4	58 100 68	4				763
										9.46 m - LL = 52.0% PL = 20% PI = 32.0%		762

Notes:

Target depth of 24 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	18.20	PLAIN
18.20	19.70	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH305**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/08/2022 COMPLETED 07/08/2022 GROUND ELEVATION 771.35m N 5609472.900 E 416292.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		10.2 m - 43° fracture SHALE, clay and silt, trace sand, slightly weathered, grey, some oxidation staining, damp, high plastic, extremely weak, thinly laminated, closely spaced fractures ...11.1 m - 72° fracture	RC5		10.62 - 12.14	5	63 100 72	5		9.46 m - Sand = 6.9% Silt = 63.5% Clay = 29.6%		761
12		...12.1 m - 240 mm of completely weathered clay infill ...12.5 m - becoming very weak and unweathered	RC6		12.14 - 13.66	6	82 100 88	5				760
13		...12.6 m - becoming centimeter to decimeter weakly cemented layers ...12.9 m - quartz crystals ...13.6 m - becoming no oxidation staining	UD2							12.95 m - LL = 89.0% PL = 15.3% PI = 73.7%		758
14		...13.7 m - becoming weak with moderately widely spaced fractures	RC7		13.66 - 15.18	7	104 104 101	3		12.95 m - EC: 2.8 dS/m 12.95 m - SAR: 35.0 12.95 m - pH: 8.8 12.96 m - EC: 3.0 dS/m		757
15			UD3							12.96 m - pH: 8.5		756
16			RC8		15.18 - 16.70	8	86 100 89	4		14.96 m - LL = 85.9% PL = 15.4% PI = 70.5%		755
17		...16.7 m - becoming widely spaced fractures	RC9		16.70 - 18.22	9	88 100 88	3				754
18		BENTONITE (18.2 m), 160 mm layer	RC10		18.22 - 19.74	10	86 100 93	2		18.22 m - LL = 302.0% PL = 27.4% PI = 274.6%		753
19		SHALE, and silt, clayey, trace sand, slightly weathered, grey, some oxidation staining, damp, high plastic, extremely weak, thinly laminated, closely spaced fractures ...19.7 m - becoming moderately strong	UD4							18.22 m - Sand = 0.2% Silt = 20.5% Clay = 79.3%		752
			RC11		19.74	11	100	1				

Notes:

Target depth of 24 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	18.20	PLAIN
18.20	19.70	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH305**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/08/2022 COMPLETED 07/08/2022 GROUND ELEVATION 771.35m N 5609472.900 E 416292.500
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.9 m - 50° fracture, some crumbled core		RC12	21.26	12	93	1		21 m - LL = 69.5%		751
		...21.4 m - 54° fracture, some crumbled core			21.26		93			PL = 20.6%		750
					22.78		84			PI = 48.9%		
22										21 m - Sand = 0.2%		749
										Silt = 76.1%		
										Clay = 23.7%		
23		...22.7 m - 100 mm of core loss		RC13 UD5	22.78	13	96	1				748
					24.30		100					747
24							98					746
25												745
26												744
27												743
28												742
29												

Notes:

Target depth of 24 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	18.20	PLAIN
18.20	19.70	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH306**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/15/2022 COMPLETED 07/16/2022 GROUND ELEVATION 771.22m N 5609474.100 E 416212.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH306 LOG.										771
2		SHALE (Weathered), clay and silt, trace to some sand, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, blocky, finely stratified, coal staining, oxide staining, gypsum crystals										770
3		...3.0 m - 230 mm crumbled core										769
4		...3.3 m - 90 mm crumbled core										768
5		...3.5 m - becoming moderately weathered, weak, medium space fracture	RC1		3.04 - 4.56	1	62 99 66	8		3.04 m - LL = 73.6% PL = 18.5% PI = 55.1%		767
6		...4.3 m - possible 120 mm siltstone or sandstone layer										766
7		...4.6 m - trace thin sandstone layers to 5.6 m										765
8		...4.6 m - slight inclined fracturing	RC2		4.56 - 6.08	2	95 97 92	4		4.3 m - EC: 4.1 dS/m 4.3 m - SAR: 27.4 4.3 m - pH: 7.8		764
9		...6.4 m - 40 mm crumbled core										763
10		...6.6 m - becoming unoxidized										762
11		...6.8 m - 60 mm crumbled core										
12		...7.0 m - 50 mm crumbled core										
13		...7.1 m - alternating mudstone and shale layers and fragments										
14		...7.4 m - 100 mm crumbled core	RC3		6.08 - 7.60	3	89 100 89	5				
15		...7.4 m - 120 mm crumbled core										
16		SHALE, clay and silt, trace sand, highly weathered, grey with brown mottling, damp, high plastic, weak, very closely spaced fractures, finely stratified, oxide staining, coal staining, gypsum crystals										
17		...8.1 m - becoming moderately weathered, weak to moderately strong, less oxidized, closely spaced fractures, no coal staining, no gypsum crystals	RC4		7.60 - 9.12	4	59 99 66	12				
18		...9.1 m - 130 mm of core loss										
19		...9.5 m - moderately strong										
20		...9.6 m - 77° fracture										
21		...9.6 m - 15 mm crumbled core	RC5		9.12 - 10.64	5	87 91 85	5		8.8 m - LL = 83.6% PL = 28.2% PI = 55.4% 8.8 m - Sand = 0.6% Silt = 55.3% Clay = 44.1%		
22		...9.8 m - 50 mm crumbled core										
23		...9.9 m - becoming slightly weathered, moderately strong to strong										

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH306**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/15/2022 COMPLETED 07/16/2022 GROUND ELEVATION 771.22m N 5609474.100 E 416212.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - 76° fracture ...10.4 m - 84° fracture ...10.5 m - becoming strong ...10.8 m - 89° fracture ...10.9 m - becoming unweathered, unoxidized, medium spaced fracture ...11.5 m - 79° fracture		RC6	10.64 - 12.16	6	100 100 97	4		10.9 m - LL = 87.2% PL = 15.6% PI = 71.6%		761
12		...11.8 m - 81° fracture ...11.9 m - 88° fracture ...12.1 m - 69° fracture ...12.3 m - 89° fracture		RC7	12.16 - 13.68	7	100 100 99	2				759
13		...12.8 m - 77° fracture ...13.2 m - 83° fracture		RC8	13.68 - 15.20	8	100 100 99	2		14.2 m - LL = 67.0% PL = 17.1% PI = 49.9%		758
14		...13.8 m - 89° fracture ...14.0 m - 88° fracture		RC9	15.20 - 16.72	9	95 100 99	2				757
15		...15.2 m - becoming some centimeter to decimeter weakly cemented layers ...15.6 m - 75° fracture		RC10	16.72 - 18.24	10	100 100 98	1				756
16		...16.4 m - 75° fracture		RC11	18.24 - 19.76	11	86 97 90	2		18.24 m - LL = 99.5% PL = 21.7% PI = 77.8%		755
17		...17.0 m - 55° fracture		RC12	19.76	12	100	2		19 m - Sand = 0.9% Silt = 61.1% Clay = 38.0% 19 m - EC: 1.1 dS/m 19 m - SAR: 31.9		754
18		...19.5 m - 60 mm of calcified shale ...19.6 m - 50 mm mechanically fractured area ...19.7 m - 50 mm of core loss										753
19												752

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH306**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/15/2022 COMPLETED 07/16/2022 GROUND ELEVATION 771.22m N 5609474.100 E 416212.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.0 m - clay and silt, trace sand, trace gravel BENTONITE (20.2 m), 110 mm layer SHALE, "..."			- 21.28		100 100			19 m - SO ₄ -S: 123.8 mg/kg 19 m - pH: 8.1 19.1 m - EC: 1.1 dS/ m		751
22		...20.4 m - becoming strong ...21.0 m - 330 mm of core loss, recovered on next run ...21.5 m - vertical fracture ...21.6 m - 83° fracture		RC13	21.28 - 22.80	13	95 95 92	1		19.1 m - SAR: 22.0 19.1 m - pH: 8.5 20.2 m - LL = 106.7% PL = 20.5% PI = 86.2%		750
23				RC14	22.80 - 24.32	14	111 111 111	1		20.2 m - Gravel = 1.6% 20.2 m - Sand = 2.1% Silt = 35.3% Clay = 47.0%		749
24		...23.8 m - vertical fracture										748
25												747
26												746
27												745
28												744
29												743
												742

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd / C. TamsReviewed By: T. Curtis



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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/08/2022	COMPLETED	07/09/2022	GROUND ELEVATION	771.74m N 5609477.900 E 416066.600
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH		
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	

[illegible]

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH307**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/08/2022 COMPLETED 07/09/2022 GROUND ELEVATION 771.74m N 5609477.900 E 416066.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.6 m - becoming very weak and unweathered		RC5	10.58 - 12.10	5	65 98 88	5				761
12		...12.1 m - becoming centimeter to decimeter weakly cemented layers		RC6	12.10 - 13.62	6	100 103 98	3				760
13		...12.2 m - becoming moderately widely spaced fractures		UD1								759
14		...12.8 m - 34° fracture		RC7 UD2	13.62 - 15.14	7	89 100 80	3		13.81 m - LL = 69.8% PL = 29.1% PI = 40.7%		758
15		...13.6 m - becoming trace to no oxidation staining		RC8	15.14 - 16.66	8	94 105 76	2				757
16		...15.0 m - horizontal fracture		RC9 UD3	16.66 - 18.18	9	89 101 93	4				756
17		...15.1 m - 240 mm of crumbled core										755
18		...15.3 m - 32° fracture		RC10	18.18 - 19.70	10	71 100 73	3				754
19		...15.6 m - horizontal fracture		UD4						18.8 m - Sand = 0.1%		753
		...16.2 m - horizontal fracture		D1 RC11	19.70	11	72	4		Silt = 59.7% Clay = 40.2% 19.5 m - LL = 147.2% PL = 33.4%		752
		...16.6 m - becoming weak										
		...17.5 m - horizontal fracture										
		...18.8 m - 80 mm of calcified shale										
		BENTONITE (19.5 m), 20 mm layer										
		SHALE, "..."										
		...19.7 m - 250 mm moderately strong layer										

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH307**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/08/2022 COMPLETED 07/09/2022 GROUND ELEVATION 771.74m N 5609477.900 E 416066.600
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...21.2 m - 90 mm of extremely weak clay infill		RC12	21.22	12	76	4		PI = 113.8%		751
22		...21.3 m - 350 mm highly fractured area			22.74		100					750
23		...22.8 m - 60 mm moderately strong layer		RC13	22.74	13	95	3				749
24		...22.9 m - 29° fracture		UD5	24.26		103			23.1 m - Sand = 0.0%		748
25							93			Silt = 60.6%		747
26										Clay = 39.4%		746
27												745
28												744
29												743
												742

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. TamsReviewed By: T. Curtis



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COREHOLE No : **22CH308**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/09/2022 COMPLETED 07/11/2022 GROUND ELEVATION 772.10m N 5609471.700 E 415993.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH308 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			772
1												771
2												770
3		...2.8 m - suspect bentonic shale	SH1									769
4												768
5		SHALE (Weathered), clay and silt, trace sand, highly weathered, grey with oxidation staining, moist, high plastic, extremely weak, very closely spaced fractures, thinly laminated, trace gypsum crystals	RC1	4.53 - 6.05	1	28 100 88	20			4.53 m - EC: 2.5 dS/m 4.53 m - SAR: 24.0 4.53 m - pH: 8.5 5.1 m - LL = 102.1% PL = 18.8% PI = 83.3%		767
6			RC2	6.05 - 7.57	2	0 100 35	20			6 m - LL = 62.0% PL = 18.7% PI = 43.3%		766
7										6.05 m - Sand = 0.3%		765
8			RC3	7.57 - 9.09	3	49 100 55	9			Silt = 56.0% Clay = 43.7%		764
9		...8.8 m - trace white precipitates ...9.2 m - horizontal fracture SHALE, clay and silt, medium weathered, grey, some oxidation staining, damp, high plastic, extremely weak, very closely spaced fractures, thinly laminated	RC4	9.09 - 10.61	4	30 100 76	10					763

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams and J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH308**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/09/2022 COMPLETED 07/11/2022 GROUND ELEVATION 772.10m N 5609471.700 E 415993.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.4 m - horizontal fracture		RC5	10.61	5	80	5				762
		...10.9 m - becoming very weak and unweathered		UD1	12.13		103					761
12		...12.0 m - becoming trace to no oxidation staining		RC6	12.13	6	92	2				760
		...12.1 m - becoming moderately widely spaced fractures			13.65		100					
13		...12.2 m - becoming weak					95					759
14		...13.8 m - 80° fracture		RC7	13.65	7	98	2				758
		...14.1 m - 84° fracture			15.17		98					
		...14.2 m - weak to moderately strong					96					
15		...14.8 m - 73° fracture		UD2	15.17	8	97	2		14.95 m - LL = 85.5% PL = 18.7% PI = 66.8%		757
		...15.0 m - moderately to very widely spaced fracturing		RC8	16.69		97					
16		...15.8 m - 84° fracture					97					756
		...16.2 m - 72° fracture					97					
17		...16.7 m - very widely spaced fracturing		RC9	16.69	9	97	1				755
		...17.5 m - moderately strong			18.21		96					
18		...18.2 m - 82° fracture		RC10	18.21	10	102	1				754
		...18.2 m - moderately strong to strong			19.73		102					
19		...18.6 m - 85° fracture		UD3			101			18.8 m - LL = 120.0% PL = 20.3% PI = 99.7%		753
		...18.9 m - moderately strong								18.8 m - EC: 1.0 dS/m		
		...19.1 m - closely to very closely spaced mechanical fractures from 19.06 m to 19.73 m								18.8 m - SAR: 24.2		
		...19.4 m - weak		RC11	19.73	11	102	1				
		...19.8 m - moderately strong										

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams and J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH308**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/09/2022 COMPLETED 07/11/2022 GROUND ELEVATION 772.10m N 5609471.700 E 415993.800
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.6 m - weak to moderately strong			-		102			18.8 m - pH: 9.0		752
		...20.7 m - 87° fracture			21.25		101					
		...20.8 m - moderately strong										
		...20.9 m - interbedded shells			21.25	12	98	1				751
		...21.2 m - interbedded shells			-		98					
		...21.4 m - weak to moderately strong			22.77		98					
22		...21.9 m - horizontal fracture										750
23		...23.2 m - horizontal fracture			22.77	13	93	1		23 m - Sand = 0.1% Silt = 59.3% Clay = 40.6%		749
		...24.2 m - 100 mm core loss			24.29		93					748
24												747
25												746
26												745
27												744
28												743
29												

Notes:

Target depth of 24 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: C. Tams and J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH309**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/11/2022 COMPLETED 07/11/2022 GROUND ELEVATION 773.89m N 5609476.500 E 415901.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH309 LOG.										773
2		SHALE (Weathered), clay and silt, highly weathered to completely weathered, brown, moist, high plastic, extremely weak, extremely closely spaced fractures, finely stratified oxide staining, coal staining, gypsum crystals	SH1									772
3		...3.6 m - 200 mm crumbled core ...4.0 m - 40 mm crumbled core ...4.1 m - highly weathered ...4.2 m - light brown, slightly bentonitic (suspect), 0.5 mm thick oxide layers	RC1		3.00 - 4.52	1	68 89 67	10				771
4		...4.5 m - brown ...4.8 m - 150 mm crumbled core ...5.0 m - 70 mm crumbled core ...5.2 m - becoming weak ...5.7 m - 38° fracture ...6.2 m - becoming closely to very closely spaced fracturing	RC2		4.52 - 6.04	2	55 104 60	8		4.2 m - LL = 69.6% PL = 19.2% PI = 50.4% 4.2 m - Dispersivity Classification = D2		770
5		...6.3 m - brown with grey mottling, 84° fracture ...6.3 m - 100 mm crumbled core ...6.6 m - 35 mm crumbled core ...6.9 m - horizontal fracture ...7.0 m - 270 mm severe mechanical fracturing	UD1 RC3		6.04 - 7.56	3	69 87 66	5		6 m - Dispersivity Classification = ND4 6 m - Jar Slake Index: 1.0		769
6		...7.4 m - 200 mm core loss ...7.6 m - becoming grey with brown mottling and oxide staining ...7.8 m - 480 mm crumbled core										768
7		SHALE, clay and silt, trace sand, highly weathered, grey, damp, very weak, high plastic, closely spaced to medium spaced fractures, finely stratified, oxide staining	RC4		7.56 - 9.08	4	64 96 62	8				767
8		...8.4 m - becoming weak ...9.0 m - becoming medium weathered ...9.1 m - 65° fracture ...9.2 m - becoming very weak ...9.3 m - 80° fracture ...9.6 m - 50° fracture ...9.6 m - becoming moderately widely spaced fracturing	UD2 RC5		9.08 - 10.60	5	103 103 98	4		8.73 m - LL = 77.5% PL = 29.9% PI = 47.6% 8.73 m - EC: 10.0 dS/m 8.73 m - SAR: 39.0 8.73 m - pH: 7.7		766
9												765
												764

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH309**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/11/2022 COMPLETED 07/11/2022 GROUND ELEVATION 773.89m N 5609476.500 E 415901.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...9.7 m - becoming slightly weathered, light grey	UD3							8.74 m - EC: 3.1 dS/m		763
		...9.8 m - becoming weak	RC6		10.60	6	101	3		8.74 m - SAR: 29.9		
		...9.9 m - 70° fracture			-		101			8.74 m - pH: 8.2		
		...10.2 m - horizontal fracture			12.12		96			10.34 m - LL = 41.0% PL = 20% PI = 21.0%		
		...10.4 m - 100 mm of alternating light grey and grey laminations								10.9 m - Sand = 2.9%		762
		...10.5 m - 88° fracture								Silt = 62.4% Clay = 34.7%		
12		...10.9 m - grey with no oxidation staining	RC7		12.12	7	106	2				761
		...11.1 m - 2 mm gypsum/quartz layer (suspect)			-		106					
		...11.5 m - becoming moderately strong			13.64		103					
13		...11.6 m - 2 mm gypsum/quartz layer (suspect)	UD4									760
		...11.6 m - 85° fracture								13.4 m - LL = 98.1% PL = 20.1% PI = 78.0%		
		...11.8 m - strong	RC8		13.64	8	103	2				
		...11.9 m - 82° fracture			-		103			13.4 m - EC: 2.0 dS/m		
14		...12.0 m - becoming unweathered			15.16		100			13.4 m - SAR: 29.0		759
		...12.1 m - moderately strong to strong								13.4 m - pH: 8.4		
		...12.8 m - 68° fracture										
15		...13.0 m - 73° fracture										
		...13.3 m - 78° fracture										
		...13.8 m - moderate mechanical fracturing from 13.85 m to 14.5 m	RC9		15.16	9	97	2				758
		...14.8 m - 76° fracture			-		97			15.6 m - Sand = 0.1%		
16		...15.1 m - 40° fracture			16.68		93			Silt = 59.2% Clay = 40.7%		
		...15.2 m - weak to moderately strong										
		...15.7 m - 66° fracture										
17		...16.0 m - interbedded shells										
		...16.3 m - interbedded shells	RC10		16.68	10	100	1				757
		...16.4 m - 53° fracture			-		100					
					18.20		99					
18		...17.4 m - 74° fracture										
			RC11		18.20	11	103	2		18.2 m - LL = 73.8% PL = 14.2% PI = 59.6%		756
			UD5		-		103					
		...18.7 m - 64° fracture			19.72		90					755
19		...19.2 m - 74° fracture										
		...19.4 m - 14° fracture from 19.42 m to 19.57 m	RC12		19.72	12	97	2				754

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH309**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/11/2022 COMPLETED 07/11/2022 GROUND ELEVATION 773.89m N 5609476.500 E 415901.100
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.0 m - 51° fracture intersecting an 80° fracture ...20.2 m - 29° fracture from 20.2 m to 20.32 m			- 21.24		99 89			20.5 m - LL = 73.7% PL = 18.7% PI = 55.0%		753
22												752
23												751
24												750
25												749
26												748
27												747
28												746
29												745
												744

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH310**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/11/2022	COMPLETED	07/12/2022	GROUND ELEVATION	772.77m N 5609466.800 E 415800.700
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		770.70 m	2.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1		OVERBURDEN. REFER TO 22BH310 LOG.									772
2											771
3		SHALE (Weathered), clay and silt, trace sand, highly weathered, brown, moist, high plastic, extremely weak, extremely closely spaced fractures, finely stratified, coal staining, oxide staining, gypsum crystals	SH1							3 m - LL = 62.0% PL = 14% PI = 48.0%	770
4		...4.8 m - 70 mm crumbled core								3 m - Sand = 0.9% Silt = 54.8% Clay = 44.3%	769
5		...5.2 m - becoming very weak	RC1		4.52 - 6.04	1	74 102 72	7			768
6		...5.2 m - 80 mm crumbled core									767
7		...5.5 m - 35 mm crumbled core	RC2		6.04 - 7.56	2	80 100 79	6			766
8		...5.9 m - 45° fracture									765
9		...6.2 m - 240 mm crumbled core	UD1								764
		...6.7 m - becoming medium weathered									763
		...7.2 m - 100 mm section that is weak, light brown, some sand	RC3		7.56 - 9.08	3	95 100 90	4			
		SHALE, clay and silt, trace sand, slightly weathered, grey, damp, high plastic, very weak, closely spaced fractures, finely stratified, oxide staining									
		...7.7 m - 70 mm crumbled core									
		...8.1 m - 88° fracture									
		...8.1 m - 10 mm possible sandstone layer									
		...8.2 m - becoming weak, moderately widely to widely spaced fracture									
		...8.2 m - horizontal fracture									
		...8.7 m - 74° fracture									
		...9.0 m - horizontal fracture									
		...9.1 m - becoming unweathered	RC4		9.08 - 10.60	4	94 100 99	4			
		...9.3 m - 89° fracture									
		...9.6 m - horizontal fracture									
		...9.7 m - 88° fracture									
		...9.8 m - horizontal fracture									

Notes:

Target depth of 21 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.98	PLAIN
6.98	8.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH310**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/11/2022	COMPLETED	07/12/2022	GROUND ELEVATION	772.77m N 5609466.800 E 415800.700
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		770.70 m	2.07 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.5 m - 84° fracture ...10.6 m - becoming weak to moderately strong ...11.1 m - becoming widely to very widely spaced fractures ...11.2 m - horizontal fracture	RC5		10.60 - 12.12	5	94 94 93	2				762
12		...11.9 m - 85° fracture	UD2							11.62 m - LL = 89.4% PL = 17.9% PI = 71.5%		761
13		...12.6 m - becoming moderately strong to strong ...12.6 m - 88° fracture ...12.8 m - 86° fracture ...13.5 m - 73° fracture ...13.8 m - 87° fracture	RC6		12.12 - 13.64	6	103 103 101	2				760
14			RC7		13.64 - 15.16	7	103 103 101	2				759
15		...15.0 m - 60° fracture	UD3							14.8 m - LL = 84.1% PL = 14.4% PI = 69.7% 14.8 m - Sand = 0.5% Silt = 74.3% Clay = 25.2%		758
16		...15.9 m - horizontal fracture ...16.4 m - 87° fracture	RC8		15.16 - 16.68	8	99 99 98	2				757
17		...17.2 m - weak to moderately strong	RC9		16.68 - 18.20	9	100 100 99	1				756
18		...17.7 m - 85° fracture ...17.8 m - moderately strong	RC10		18.20 - 19.72	10	105 105 105	0				755
19		...19.4 m - strong ...19.8 m - moderately strong to strong	UD4 RC11		19.72	11	93	1			19.56 m - UCS = 3225 kPa	754 753

Notes:

Target depth of 21 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.98	PLAIN
6.98	8.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH310**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 07/11/2022 COMPLETED 07/12/2022 GROUND ELEVATION 772.77m N 5609466.800 E 415800.700
DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 770.70 m 2.07 m
CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.4 m - horizontal fracture		UD5	21.24		93 92			20.83 m - EC: 1.5 dS/m		752
22		...21.1 m - 110 mm core loss								20.84 m - LL = 87.6% PL = 20.7% PI = 66.9%		751
23										20.84 m - SAR: 14.3		750
24										20.84 m - pH: 9.2		749
25												748
26												747
27												746
28												745
29												744
												743

Notes:

Target depth of 21 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	6.98	PLAIN
6.98	8.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH311**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/12/2022 COMPLETED 07/12/2022 GROUND ELEVATION 773.46m N 5609473.800 E 415698.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH311 LOG.										773
2		SHALE (Weathered), clay and silt, highly weathered, light brown to dark grey mottling, moist, high plastic, very weak, extremely closely spaced fractures, finely stratified, coal staining, oxide staining, gypsum crystals		SH1								772
3		...3.4 m - 60 mm crumbled core ...3.6 m - 110 mm crumbled core ...3.8 m - 80 mm crumbled core ...4.2 m - 72° fracture ...4.8 m - 240 mm crumbled core ...5.1 m - becoming moderately weathered, very closely spaced fractures		RC1	3.00 - 4.52	1	23 100 33	20				771
4		...5.4 m - becoming very weak to weak ...6.2 m - 160 mm crumbled core BENTONITE (6.4 m), 20 mm layer ...6.5 m - 10 mm strong sandstone layer		RC2	4.52 - 6.04	2	53 101 57	10				770
5		SILTSTONE, clayey, trace sand, unweathered, grey, damp, medium plastic, moderately strong ...7.6 m - moderately strong to strong ...7.7 m - horizontal fracture ...7.8 m - 86° fracture ...7.9 m - 83° fracture ...8.3 m - becoming weak to moderately strong ...8.4 m - 40° fracture		RC3	6.04 - 7.56	3	68 92 59	6				769
6		SHALE, clayey, silty, unweathered, grey, damp, moderately strong to strong, widely spaced fractures, finely stratified ...8.5 m - becoming medium spaced fractures		UD1								768
7		...8.6 m - 51° fracture ...8.9 m - 85° fracture ...9.2 m - 140 mm mechanically crumbled core ...9.9 m - 60° fracture		RC4	7.56 - 9.08	4	95 97 88	4				767
8												766
9												765
										9 m - LL = 130.6% PL = 18.4% PI = 112.2% 9 m - Sand = 0.4% Silt = 53.7% Clay = 45.9%		764

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH311**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/12/2022 COMPLETED 07/12/2022 GROUND ELEVATION 773.46m N 5609473.800 E 415698.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - 87° fracture ...10.4 m - horizontal fracture ...10.9 m - 58° fracture ...11.3 m - 56° fracture ...11.4 m - becoming widely spaced fractures		RC6	10.60 - 12.12	6	100 100 92	3		9.08 m - UCS = 550 kPa 9.5 m - EC: 2.0 dS/m 9.5 m - SAR: 27.8 9.5 m - pH: 8.6		763
12		...11.9 m - 86° fracture ...12.0 m - 72° fracture ...12.1 m - becoming strong ...12.2 m - 60° fracture ...12.2 m - 23° fracture ...12.4 m - becoming widely spaced fracture		RC7	12.12 - 13.64	7	91 97 88	2				762
13				RC8	13.64 - 15.16	8	100 100 97	2				760
14										14 m - Sand = 0.2% Silt = 56.6% Clay = 43.2%		759
15		...14.4 m - 76° fracture ...14.5 m - 65° fracture ...14.5 m - weak to moderately strong ...15.0 m - becoming moderately strong to strong		RC9	15.16 - 16.68	9	101 101 97	2				758
16		...15.6 m - 72° fracture ...15.8 m - 75° fracture ...16.0 m - becoming strong								16 m - LL = 70.2% PL = 18.8% PI = 51.4%		757
17		...16.6 m - 79° fracture ...17.2 m - 62° fracture ...17.6 m - 40° fracture ...17.9 m - 72° fracture		RC10	16.68 - 18.20	10	100 100 93	2				756
18		...18.2 m - becoming moderately strong strong ...18.6 m - becoming strong ...19.0 m - becoming moderately strong to strong		RC11	18.20 - 19.72	11	97 97 97	0				755
19				RC12	19.72	12	95	2		19.1 m - LL = 75.4% PL = 26.5% PI = 48.9% 19.1 m - EC: 1.7 dS/m		754

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH311**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
DATE STARTED 07/12/2022 COMPLETED 07/12/2022 GROUND ELEVATION 773.46m N 5609473.800 E 415698.300
DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.3 m - 64° fracture ...20.4 m - 58° fracture			- 21.24		99 96			19.1 m - SAR: 25.6 19.1 m - pH: 8.5		753
22												752
23												751
24												750
25												749
26												748
27												747
28												746
29												745
												744

Notes:

Target depth of 21 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH312**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/12/2022 COMPLETED 07/12/2022 GROUND ELEVATION 774.09m N 5609464.400 E 415603.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH312 LOG.										774
2		SHALE, clayey, silty, highly weathered, grey with some brown mottling, moist, high plastic, weak, extremely closely spaced fractures, finely stratified, oxide staining, sand pockets										773
3		4.5 m - 500 mm crumbled core	SH1									772
4		5.1 m - 60mm crumbled core										771
5		SILTSTONE, 200 mm layer, light brown, very weak										770
6		SHALE, "..."										769
7		5.7 m - 180 mm crumbled core										768
8		6.1 m - 100 mm crumbled core	RC1		4.54 - 6.06	1	33 95 40	20				767
9		6.3 m - 70° fracture with quartz/gypsum inclusions										766
10		6.6 m - 100 mm light brown sandstone layer										765
11		7.0 m - becoming medium weathered										
12		7.2 m - 120 mm crumbled core										
13		7.8 m - 300 mm crumbled core	RC2		6.06 - 7.58	2	63 100 54	10				
14		8.0 m - becoming weak to moderately strong										
15		8.2 m - 24° fracture										
16		8.4 m - 86° fracture										
17		8.5 m - becoming slightly weathered, moderately strong to strong, medium to widely spaced fractures										
18		8.7 m - 84° fracture	RC3		7.58 - 9.10	3	76 97 63	7				
19		9.3 m - parallel 77° fractures 30 mm apart										
20		BENTONITE (9.6 m), 60 mm layer										
21		SILTSTONE, some clay, slightly weathered to unweathered, grey, damp, weak, high plastic, widely spaced fractures, thinly laminated to finely stratified, slightly bentonitic										
22		9.8 m - becoming strong										
23		9.8 m - 86° fracture	RC4		9.10 - 10.62	4	100 100 95	3				

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH312**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/12/2022 COMPLETED 07/12/2022 GROUND ELEVATION 774.09m N 5609464.400 E 415603.900
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.3 m - horizontal fracture ...10.4 m - becoming very wide spaced fractures ...10.9 m - becoming moderately strong to strong		RC5	10.62 - 12.14	5	98 98 98	0		10.5 m - Sand = 4.4% Silt = 50.9% Clay = 44.7%		764
12		...11.7 m - becoming shale										
13		SHALE, clay and silt, trace sand, unweathered, grey, damp, high plastic, moderately strong to strong, widely spaced to very widely spaced fractures, finely stratified ...12.2 m - 69° fracture		RC6	12.14 - 13.66	6	100 100 96	2		13 m - LL = 111.7% PL = 16% PI = 95.7%		763
14		...13.4 m - 32° fracture intersecting a 76° fracture ...13.7 m - becoming strong		RC7	13.66 - 15.18	7	100 100 99	1				762
15		...14.8 m - 78° fracture		RC8	15.18 - 16.70	8	99 99 96	2				761
16		...15.7 m - 64° fracture										760
17		...16.4 m - interbedded shells ...16.7 m - 65° fracture		RC9	16.70 - 18.22	9	101 101 100	1		16.7 m - LL = 69.9% PL = 18.8% PI = 51.1%		759
18		...17.9 m - 87° fracture										758
19												757
												756
												755

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH313**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/13/2022 GROUND ELEVATION 774.02m N 5609465.500 E 415488.000
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 771.70 m 2.32 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
		OVERBURDEN. REFER TO 22CH313 LOG.							● MOISTURE CONTENT □ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
1											773
2		SHALE, clay and silt, trace sand, completely weathered, grey with brown mottling, moist, high plastic, extremely weak, blocky, finely stratified, oxide staining, gypsum crystals, trace sand to sandstone pockets									772
3		...4.9 m - 130 mm crumbled core	SH1								771
4		...5.0 m - 130 mm light brown, highly weathered, extremely weak to very weak sandstone layer with oxide staining									770
5		...5.2 m - 50 mm crumbled core	RC1		4.53 - 6.05	1	20	16		5 m - Sand = 1.1%	769
		...5.3 m - becoming highly weathered, extremely weak to very weak, extremely to very closely spaced fractures					100			Silt = 42.8%	
		...5.6 m - 110 mm crumbled core					38			Clay = 56.1%	
6		...5.7 m - 100 mm crumbled core	RC2		6.05 - 7.57	2	13	20		5 m - Dispersivity Classification = D2	768
		...6.1 m - 700 mm crumbled core					99			5 m - EC: 3.5 dS/m	
		...6.3 m - becoming weak to moderately strong					23			5 m - SAR: 21.1	
7		...7.0 m - becoming moderately to slightly weathered, moderately strong								5 m - pH: 7.6	
		...7.1 m - 60 mm crumbled core	RC3		7.57 - 9.09	3	80	6		7 m - LL = 67.0%	767
		SILTSTONE, clayey, sandy, slightly weathered, banded light and dark grey, damp, high plastic, weak, thinly laminated, suspect slightly bentonitic					97			PL = 27.2%	
8		BENTONITE (8.1 m), 200 mm layer	D1				74			PI = 39.8%	766
		SILTSTONE, "..."								8.3 m - LL = 175.5%	
		...8.3 m - 50 mm calcified siltstone section								PL = 20.8%	
9		...8.4 m - becoming strong, slight inclined medium spaced fractures	RC4		9.09 - 10.61	4	95	3		PI = 154.7%	765
		...8.6 m - becoming finely stratified					100			8.3 m - Sand = 25.4%	
		...9.3 m - 84° fracture					97			Silt = 39.8%	
		...9.6 m - 81° fracture								Clay = 34.8%	

Notes:

Target depth of 18 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	8.28	PLAIN
8.28	9.50	SLOTTED

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH313**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	07/13/2022	COMPLETED	07/13/2022	GROUND ELEVATION	774.02m N 5609465.500 E 415488.000
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	771.70 m 2.32 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11	...	...10.0 m - horizontal fracture										
	...	...10.1 m - 72° fracture										
		SHALE, clayey, silty, unweathered, grey, damp, high plastic, strong, widely spaced to very widely spaced fractures, finely stratified		RC5	10.61	5	99	2				
					-		99					
					12.13		96					763
12		...11.6 m - 83° fracture										
		...12.0 m - 84° fracture		RC6	12.13	6	95	2				762
		...12.1 m - 78° fracture			-		100					
					13.65		99					
13		...12.7 m - 87° fracture										761
		...13.5 m - 88° fracture		RC7	13.65	7	98	3				
		...13.6 m - 83° fracture			-		98					
		...13.7 m - 68° fracture			15.17		95					760
		...13.9 m - 88° fracture										
		...14.0 m - becoming strong to very strong										
15		...14.7 m - 83° fracture		RC8	15.17	8	101	2				759
		...15.0 m - 70° fracture			-		101					
		...15.3 m - horizontal fracture			16.69		99					
16												758
		...16.4 m - 83° fracture		RC9	16.69	9	93	2				
					-		99					
					18.21		97					757
17		...17.2 m - 88° fracture										
		...17.3 m - 72° fracture										
		...17.6 m - horizontal fracture										
18												756
19												755

Notes:

Target depth of 18 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	8.28	PLAIN
8.28	9.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH314**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/13/2022 GROUND ELEVATION 774.26m N 5609458.900 E 415393.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22CH314 LOG.										774
2		SHALE (Weathered), clay and silt, trace sand, completely weathered, light brown to dark grey mottling, moist, high plastic, extremely weak, extremely closely spaced finely stratified, coal staining, oxide staining, gypsum crystals										773
3		...3.0 m - 200 mm crumbled core										772
4		SANDSTONE, some silt, trace clay, highly weathered, light brown, damp, low plastic, extremely to very weak, very closely spaced fractures, very thinly laminated, oxide staining, gypsum crystals	RC1		3.00 - 4.52	1	40 101 43	15				771
5		...4.0 m - 120 mm crumbled core										770
6		...4.1 m - becoming weak										769
7		...4.2 m - 150 mm crumbled core										768
8		...4.3 m - becoming very weak, alternating sandstone, shale and oxide laminations	RC2		4.52 - 6.04	2	53 99 74	8		4 m - LL = 57.4% PL = 17.2% PI = 40.2%		767
9		SHALE, clayey, silty, highly weathered, grey, damp, high plastic, very weak, very closely spaced fractures, medium bedded, oxide and mudstone laminations, oxide staining										766
10		...4.8 m - 200 mm crumbled core	RC3		6.04 - 7.56	3	37 92 47	15				765
11		...5.0 m - alternating shale, sandstone, and oxide laminations, very weak to weak										764
12		...5.3 m - 40 mm crumbled core										763
13		...5.5 m - 50 mm crumbled core										762
14		...5.6 m - becoming very closely spaced fractures										761
15		...6.0 m - becoming moderately weathered	RC4		7.56 - 9.08	4	99 105 101	4		7.6 m - LL = 225.2% PL = 22.4% PI = 202.8% 7.6 m - Sand = 1.5% Silt = 42.5% Clay = 56.1%		760
16		...6.2 m - becoming moderately strong to strong	D1									759
17		...6.2 m - 500 mm crumbled and very fractured core										758
18		...6.8 m - 50° fracture										757
19		...6.9 m - 83° fracture										756
20		...7.1 m - 78° fracture										755
21		SHALE, clay and silt, trace sand,	RC5		9.08 - 10.60	5	95 100 96	4				754

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH314**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/13/2022 GROUND ELEVATION 774.26m N 5609458.900 E 415393.300
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		unweathered, grey, damp, medium plastic, moderately strong to strong, widely spaced fractures, finely stratified		RC6	10.60	6	78	4				764
		BENTONITE (7.6 m), 300 mm layer of bentonitic shale			12.12		99					763
		7.8 m - 76° fracture					76					
12		SHALE, "..."		RC7	12.12	7	80	4				762
		8.0 m - horizontal fracture					100					
		8.0 m - becoming unweathered, strong, medium to widely spaced fracture			13.64		76					
13		8.2 m - 74° fracture										
		8.7 m - 84° fracture										
		9.0 m - 85° fracture										
		9.0 m - becoming moderately strong to strong		RC8	13.64	8	96	2				761
		9.4 m - 88° fracture					100					
14		9.6 m - 82° fracture			15.16		92					760
		9.8 m - parallel 86° fractures 90 mm apart										
15		10.1 m - 89° fracture										
		10.3 m - 84° fracture										
		10.7 m - 80° fracture		RC9	15.16	9	97	2				759
		11.2 m - 30° fracture					97					
		11.8 m - 330 mm Crumbled core (possible mechanical fracturing)			16.68		92					
16		12.2 m - 250 mm crumbled core (possible mechanical fracturing)										
		12.5 m - 62° fracture										
		13.0 m - becoming moderately strong		RC10	16.68	10	101	3				758
		13.4 m - 55° fracture					101					
17		13.5 m - 70° fracture			18.20		86					757
		13.5 m - 55° fracture										
		13.7 m - becoming strong										
18		13.9 m - parallel 33° fractures										
		14.4 m - 140 mm weak to moderately strong seam										756
19		15.5 m - 63° fracture										
		15.8 m - 28° fracture, low plastic										
		17.1 m - 33° fracture										
		17.3 m - 32° fracture										
		17.4 m - 55° fracture										
		18.1 m - 60° fracture										755

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH315**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/13/2022 COMPLETED 07/14/2022 GROUND ELEVATION 775.18m N 5609445.800 E 415325.700
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)					REMARKS	Standpipe/ Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22BH315 LOG.								● MOISTURE CONTENT					775	
		SHALE, clay and silt, trace sand, completely to highly weathered, grey with some brown mottling, moist, high plastic, extremely weak to very weak, very closely spaced fractures, finely stratified, interbedded oxide laminations								┌ PLASTIC - LIQUID					774	
		4.7 m - 140 mm crumbled core								■ SPT (N) Blows/300 mm					773	
		4.9 m - 130 mm crumbled core								10 20 30 40						
		5.0 m - trace sandstone pockets to 20 mm								50 100 150 200						
		5.1 m - becoming very weak to weak								▲ POCKET PEN (kPa)						
		5.1 m - 70 mm crumbled core	SH1												772	
		5.5 m - 70 mm highly weathered, very weak, light brown and grey sandstone layer														
		6.1 m - 84° fracture													771	
		6.2 m - becoming weak to moderately strong, moderately weathered	RC1		4.52 - 6.04	1	33 100 46	15								
		6.4 m - 80° fracture													770	
		6.5 m - becoming moderately strong to strong, slightly weathered														
		6.6 m - 45 mm crumbled core	UD1												769	
		6.9 m - 59° fracture														
		7.0 m - becoming unweathered	RC2		6.04 - 7.56	2	100 100 88	5							768	
		7.2 m - 58° fracture														
		7.3 m - 67° fracture														
		7.6 m - 73° fracture														
		8.0 m - 88° fracture														
		8.4 m - 68° fracture														
		8.8 m - 78° fracture														
		8.8 m - 68° fracture	RC3		7.56 - 9.08	3	94 99 93	4							767	
		9.2 m - 81° fracture														
		SILTSTONE, and sand, clayey, slightly weathered, grey, damp, low plastic, weak, closely spaced fractures, very thinly laminated	UD2													
		9.3 m - 88° fracture														
		9.4 m - 88° fracture														
		9.5 m - 120 mm slightly bentonitic siltstone	RC4		9.08 - 10.60	4	94 100 97	4							766	
		9.8 m - becoming strong to very	UD3													



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COREHOLE No : **22CH315**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/13/2022	COMPLETED	07/14/2022	GROUND ELEVATION	775.18m N 5609445.800 E 415325.700
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH			
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		strong SHALE, clay and silt, trace sand, unweathered, grey, damp, high plastic, strong, widely spaced fractures, finely stratified		RC5	10.60	5	93	3				765
		...10.3 m - horizontal fracture			12.12		93					764
		...10.5 m - 85° fracture					91					
12		...10.7 m - 85° fracture		RC6	12.12	6	101	2				763
		...11.0 m - 82° fracture					101					
		...11.1 m - becoming moderately strong to strong		UD4	13.64		99					
		...11.2 m - 82° fracture										
13		...11.9 m - 88° fracture								12.68 m - LL = 111.1%		762
		...12.6 m - 86° fracture, suspect bentonitic shale								PL = 18.4%		
		...13.2 m - 88° fracture								PI = 92.7%		
14		...13.4 m - 87° fracture		RC7	13.64	7	97	2				761
		...13.4 m - becoming strong, very widely spaced fractures			15.16		97					
		...14.0 m - 85° fracture					95					
15		...14.8 m - 83° fracture		RC8	15.16	8	103	2				760
		...15.5 m - 89° fracture					103					
16		...16.0 m - 50° fracture		UD5	16.68		100			15.7 m - LL = 82.2%		759
										PL = 17.6%		
										PI = 64.6%		
17		...17.1 m - 85° fracture		RC9	16.68	9	100	1		15.7 m - UCS = 1726 kPa		758
					18.20		100					757
							99					
18												
19												756

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH317**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/14/2022 COMPLETED 07/14/2022 GROUND ELEVATION 774.82m N 5609454.900 E 415078.200
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		OVERBURDEN. REFER TO 22BH315 LOG.										774
2												773
3		SHALE, clayey, silty, slightly weathered, grey, damp, high plastic, weak, closely spaced fractures, finely stratified, oxide staining	SH1									772
4		...4.5 m - 210 mm crumbled core ...5.1 m - 30 mm crumbled core ...5.4 m - possible 100 mm siltstone layer										771
5		...5.5 m - becoming weak to moderately strong, unweathered, unoxidized ...6.1 m - 84° fracture ...6.2 m - 80° fracture ...6.2 m - becoming moderately strong to strong, medium to widely spaced fractures	RC1		4.52 - 6.04	1	68 99 78	6		4.52 m - EC: 3.3 dS/m 4.52 m - SAR: 28.1 4.52 m - pH: 8.7 5.1 m - LL = 66.9% PL = 20.3% PI = 46.6%		770
6		...6.2 m - 84° fracture ...6.3 m - 85° fracture ...6.7 m - 78° fracture ...7.4 m - 77° fracture ...7.6 m - 76° fracture ...7.9 m - becoming strong	RC2		6.04 - 7.56	2	90 101 97	4				769
7		...8.0 m - 59° fracture ...8.3 m - 50° fracture ...8.6 m - 70° fracture ...8.8 m - becoming siltstone	RC3		7.56 - 9.08	3	102 102 89	3				768
8		SILTSTONE, and clay, trace sand, unweathered, grey, damp, high plastic, strong, widely spaced finely stratified										767
9		...9.2 m - 80 mm crumbled core (possible mechanical fracturing) BENTONITE (9.4 m), 170 mm seam SILTSTONE, "..."	RC4 D1		9.08 - 10.60	4	87 98 86	3		9.4 m - LL = 192.8% PL = 24.3% PI = 168.5%		766
												765

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH317**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 07/14/2022 COMPLETED 07/14/2022 GROUND ELEVATION 774.82m N 5609454.900 E 415078.200
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH _____
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED _____

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 86° fracture ...10.1 m - becoming strong to very strong ...10.2 m - horizontal fracture		RC5	10.60 - 12.12	5	101 101 101	2		10.8 m - LL = 74.5% PL = 18% PI = 56.5%		764
12		...11.4 m - horizontal fracture ...11.4 m - becoming very strong ...11.8 m - horizontal fracture		RC6	12.12 - 13.64	6	97 97 95	3		10.8 m - Sand = 0.2% Silt = 57.3% Clay = 42.5%		763
13		SHALE, clay and silt, trace sand, unweathered, grey, damp, high plastic, strong, widely spaced to very widely spaced fractures, finely stratified								12.3 m - Sand = 0.2% Silt = 54.6% Clay = 45.2%		762
14		...12.4 m - 86° fracture ...12.6 m - 87° fracture ...12.8 m - becoming strong to very strong		RC7	13.64 - 15.16	7	100 100 99	2				761
15		...12.8 m - 87° fracture ...13.5 m - 89° fracture ...14.0 m - 88° fracture ...14.3 m - 89° fracture ...14.9 m - 88° fracture		RC8	15.16 - 16.68	8	100 100 100	0		15.16 m - EC: 1.7 dS/m 15.16 m - SAR: 18.0 15.16 m - pH: 9.0		759
16										16 m - LL = 76.8% PL = 15.9% PI = 60.9%		758
17				RC9	16.68 - 18.20	9	99 99 98	1				757
18		...17.8 m - 73° fracture										756
19												755

Notes:

Target depth of 18 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. BoydReviewed By: T. Curtis



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COREHOLE No : **22CH318**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/14/2022	COMPLETED	07/15/2022	GROUND ELEVATION	776.35m N 5609453.300 E 414998.600
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		774.07 m	2.28 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22CH318 LOG.							● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1			SH1							1.5 m - LL = 51.0% PL = 19% PI = 32.0%		776
2		SHALE (Weathered), clay and silt, trace sand, completely weathered, light brown to dark grey mottling, moist, high plastic, extremely weak, blocky, coal staining, oxide staining, gypsum crystals								1.5 m - Sand = 0.7% Silt = 52.7% Clay = 46.6%	▼	774
3		...3.6 m - trace sand pockets ...3.6 m - 560 mm crumbled core ...3.8 m - becoming shale	RC1		3.04 - 4.56	1	14 70 20	20		3 m - 450 mm of core loss		773
4		SHALE, clay and silt, highly weathered, grey, damp, high plastic, very weak, blocky, finely stratified, gypsum crystals oxide staining, trace mudstone fragments	RC2		4.56 - 6.08	2	88 96 86	3				772
5		...4.7 m - becoming moderately weathered, very weak to weak	UD1							4.9 m - LL = 53.0% PL = 17.5% PI = 35.5%		771
6		SILTSTONE, clayey, trace fine grained sand, slightly weathered, grey, medium to high plastic, moderately strong	RC3		6.08 - 7.60	3	0 101 0			5.61 m - LL = 61.0% PL = 26% PI = 35.0%		770
7		...5.1 m - 8 mm quartz vein ...5.2 m - 140 mm crumbled core ...5.4 m - becoming slightly weathered to unweathered, weak to moderately strong, widely spaced fractures								5.61 m - Sand = 3.5% Silt = 73.2% Clay = 23.3%		769
8		...5.6 m - 86° fracture ...6.1 m - severe mechanical fracturing from 6.08 to 7.60 ...7.6 m - becoming moderately strong to strong, unweathered	RC4		7.60 - 9.12	4	95 95 93	3		5.61 m - Dispersivity Classification = ND4		768
9		SHALE, "..." ...7.8 m - 83° fracture ...8.1 m - 87° fracture ...8.3 m - 88° fracture ...8.6 m - 63° fracture ...9.2 m - 66° fracture ...9.3 m - becoming strong ...9.4 m - 78° fracture	UD2 RC5		9.12 - 10.64	5	95 95 93	2		8.95 m - LL = 75.3% PL = 30% PI = 45.3% 8.95 m - EC: 2.6 dS/m 8.95 m - SAR: 40.3		767

Notes:

Target depth of 15 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH318**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/14/2022	COMPLETED	07/15/2022	GROUND ELEVATION	776.35m N 5609453.300 E 414998.600
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		774.07 m	2.28 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		SILTSTONE, clayey, some sand, unweathered, grey, damp, medium plastic, moderately strong, very widely spaced fractures, very thinly laminated to finely stratified	RC6		10.64 - 12.16	6	100 100 99	1		8.95 m - pH: 8.2		766
12		...10.6 m - slight bentonitic siltstone to bentonite from 10.64 m to 10.86 m	UD3							11.78 m - Sand = 20.1%		765
		...10.9 m - 220 mm calcified siltstone	RC7		12.16 - 13.68	7	101 101 98	2		Silt = 55.5% Clay = 24.4%		764
		...11.1 m - becoming strong to very strong										
		...11.2 m - 88° fracture										
		...11.5 m - 100 mm cemented siltstone	RC8		13.68 - 15.20	8	97 97 95	2				763
		...11.9 m - becoming moderately strong to strong	UD4									
		...12.7 m - 45° fracture										762
14		SHALE, clay and silt, trace sand, unweathered, grey, damp, high plastic, moderately strong to strong, very widely spaced fractures, finely stratified								14.4 m - LL = 85.8% PL = 18.2% PI = 67.6%		761
		...13.2 m - 85° fracture										
		...13.7 m - becoming weak to moderately strong										760
		...14.0 m - 150 mm weak seam										
		...14.5 m - becoming moderately strong to strong										759
		...14.6 m - 74° fracture										
		...15.0 m - 73° fracture										758
16												757
17												
18												
19												

Notes:

Target depth of 15 m achieved. Corehole backfilled with bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH319**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/15/2022	COMPLETED	07/15/2022	GROUND ELEVATION	776.27m N 5609451.900 E 414896.900
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		775.21 m	1.06 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
		OVERBURDEN. REFER TO 22CH319 LOG.							● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1												776
2												775
3		SHALE, clay and silt, some sand, slightly weathered, grey, moist, medium plastic, very weak, medium spaced finely stratified, oxide staining	SH1									774
4		...4.6 m - 90 mm crumbled core										773
5		...4.9 m - becoming unweathered, weak, unoxidized										772
6		BENTONITE (5.5 m), 20 mm layer										771
7		SILTSTONE, and clay, some fine grained sand, slightly weathered, light brown to grey, medium plastic, moderately strong	RC1		4.52 - 6.04	1	92 100 92	4				770
8		...5.8 m - 78° fracture										769
9		...6.0 m - becoming weak to moderately strong, widely to very widely spaced fractures										768
10		...6.1 m - 84° fracture	RC2		6.04 - 7.56	2	99 99 97	2		5.5 m - LL = 43.8% PL = 14.5% PI = 29.3%		767
11		...6.6 m - 70 mm mechanically crumbled core								5.5 m - Sand = 11.9% Silt = 50.8% Clay = 37.3%		
12		...6.7 m - becoming moderately strong								6.04 m - EC: 8.8 dS/m		
13		...6.9 m - 86° fracture								6.04 m - SAR: 15.5		
14		...7.3 m - becoming moderately strong to strong								6.04 m - pH: 7.4		
15		...7.4 m - 72° fracture	RC3		7.56 - 9.08	3	100 100 99	2		6.2 m - LL = 44.5% PL = 16.8% PI = 27.7%		
16		SHALE, clay and silt, some sand, slightly weathered, grey, moist, medium plastic, very weak, medium spaced finely stratified, oxide staining										
17		...7.8 m - 84° fracture										
18		...8.0 m - 83° fracture										
19		...8.1 m - 82° fracture										
20		...8.6 m - high plastic	RC4		9.08 - 10.60	4	100 100 97	2		8.6 m - LL = 93.7% PL = 17.4% PI = 76.3%		
21		...9.0 m - becoming strong										
22		...9.6 m - 87° fracture										
23		...9.9 m - 83° fracture										

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	13.00	PLAIN
13.00	14.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH319**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	07/15/2022	COMPLETED	07/15/2022	GROUND ELEVATION	776.27m N 5609451.900 E 414896.900
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		775.21 m	1.06 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	08/10/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.0 m - 60 mm unweathered, moderately strong, grey siltstone layer		RC5	10.60	5	99	2				766
		...10.4 m - 67° fracture			-		99					
		...10.7 m - becoming very widely spaced fractures			12.12		96					765
		...10.8 m - 88° fracture										
12		...11.8 m - 65° fracture		RC6	12.12	6	94	3				764
		...12.0 m - 68° fracture			-		99					
		...12.4 m - 80° fracture			13.64		97					
13		SILTSTONE, clayey, trace sand, unweathered, grey, damp, high plastic, strong to very strong, widely spaced fractures, very thinly laminated to finely stratified								12.12 m - EC: 1.9 dS/m 12.12 m - SAR: 20.4 12.12 m - pH: 9.5		
14		...12.4 m - 80° fracture		RC7	13.64	7	100	2				763
		...12.9 m - parallel 84° fractures 80 mm apart			-		100			13.2 m - Sand = 8.8% Silt = 63.8% Clay = 27.4%		
		...12.9 m - becoming slightly bentonitic, weak to moderately strong			15.16		99			13.64 m - UCS = 4187 kPa		762
15		...13.3 m - 90 mm calcified siltstone								13.9 m - EC: 1.0 dS/m		
		...13.4 m - 140 mm cemented siltstone								13.9 m - SAR: 15.6		
		...13.4 m - 82° fracture								13.9 m - pH: 8.9		761
		...13.5 m - becoming strong to very strong								14.4 m - LL = 96.4% PL = 18.5% PI = 77.9%		
16		...13.6 m - interbedded shells										760
		...13.9 m - 88° fracture										
		...14.2 m - 85° fracture										
		...14.7 m - 86° fracture										
17		SHALE, clay and silt, trace sand, unweathered, grey, damp, high plastic, strong, finely stratified										759
18												758
19												757

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	13.00	PLAIN
13.00	14.50	SLOTTED

Logged By: J. Boyd

Reviewed By: T. Curtis



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COREHOLE No : **22CH320**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	09/06/2022	COMPLETED	09/07/2022	
DRILLING CONTRACTOR	Val's Drilling	GROUND ELEVATION	771.49m	N 5609434.127 E 416204.701
CORING TYPE	HQ3	DIAMETER (mm)	61	
		GROUND WATER ELEVATION / DEPTH	769.72 m	1.77 m
		DATE GROUND WATER RECORDED	10/12/2022	

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument Elevation (m)
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)		
0		TOPSOIL								0 m - 6" SSA to 3 m.	
1		SHALE (Weathered), clay and silt, trace sand, completely weathered, brown to grey mottling, trace oxidation staining, damp, high plastic, extremely weak to hard soil, blocky, extremely closely spaced fractures, suspect white sulphate inclusions	AU1						16.1	0.6 m - LL = 75.1% PL = 18.5% PI = 56.6%	771
2			AU2						17.6		770
3		...3.0 m - 400 mm of slough	AU3						17.2		769
4		...3.4 m - becoming some oxidation staining	AU4						17.2		768
5		...3.8 m - becoming trace gypsum crystals	RC1 SH1		3.00 - 4.52	1	0 100 72	20		4.2 m - LL = 107.0% PL = 18.0% PI = 89.0%	767
6		BENTONITE, 190 mm of bentonitic shale, silt, light brown	RC2		4.52 - 6.04	2	0 103 80	20			766
7		SHALE (Weathered), "..."	RC3		6.04 - 7.56	3	0 100 82	20			765
8		...4.9 m - becoming dry	RC4		7.56 - 9.08	4	0 93 27	20		7.7 m - LL = 69.5% PL = 20.6% PI = 48.9%	764
9		SHALE, clay and silt, medium weathered, grey, damp, high plastic, extremely weak, extremely closely spaced fractures, thinly laminated, oxidation staining in joints	RC5		9.08 - 10.60	5	12 93 28	20		8.5 m - Sand = 0.1% Silt = 58.7% Clay = 41.2%	763
		...8.0 m - trace gypsum crystals									762
		...9.0 m - 100 mm of core loss									
		...9.1 m - 120 mm of slough									
		...9.6 m - 132° fracture									
		...9.6 m - becoming very weak									
		...9.8 m - 17° fracture with suspect white sulphate inclusions									
		...9.9 m - horizontal fracture with suspect white sulphate inclusions									

Notes:

Target depth of 25 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH320**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/06/2022	COMPLETED	09/07/2022	GROUND ELEVATION	771.49m N 5609434.127 E 416204.701
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		769.72 m	1.77 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - near horizontal fractures with suspect white sulphate inclusions ...10.3 m - becoming unweathered, weak ...10.5 m - 110 mm of core loss ...10.6 m - becoming closely spaced fractures		RC6	10.60 - 12.12	6	82 100 86	5				761
12		...12.0 m - becoming unoxidized ...12.1 m - 120 mm of strong calcified shale ...12.2 m - suspect white sulphate inclusions		RC7	12.12 - 13.64	7	16 64 19	20			12.3 m - LL = 65.8% PL = 17.6% PI = 48.2%	759
13		...12.6 m - 380 mm of crumbled core ...13.1 m - 540 mm of core loss		RC8	13.64 - 15.16	8	89 90 89	2				758
14		...13.6 m - becoming moderately widely spaced fractures ...13.7 m - becoming some centimeter to decimeter weakly cemented layers ...14.2 m - vertical fracture ...14.5 m - 78° fracture		RC9	15.16 - 16.68	9	99 100 99	1				756
15		...15.0 m - 150 mm of core loss ...15.4 m - 82° fracture		RC10	16.68 - 18.20	10	89 92 88	1				755
16		...16.1 m - vertical fracture		RC11	18.20 - 19.72	11	86 100 86	3				753
17		...16.9 m - 57° fracture ...17.5 m - vertical fracture		RC12	19.72	12	24	3				752
18		...18.1 m - 120 mm of core loss ...18.7 m - 104° fracture										
19		...19.4 m - 140 mm of strong calcified shale ...19.6 m - sub-horizontal fractures										
										20 m - Sand = 0.3%		

Notes:

Target depth of 25 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH320**

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CLIENT Eastern Irrigation District PROJECT NAME Snake Lake Reservoir Expansion
 PROJECT NUMBER 1560-193-00 PROJECT LOCATION NE 1/4 32-19-16
 DATE STARTED 09/06/2022 COMPLETED 09/07/2022 GROUND ELEVATION 771.49m N 5609434.127 E 416204.701
 DRILLING CONTRACTOR Val's Drilling GROUND WATER ELEVATION / DEPTH 769.72 m 1.77 m
 CORING TYPE HQ3 DIAMETER (mm) 61 DATE GROUND WATER RECORDED 10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument	Elevation (m)
									● MOISTURE CONTENT └─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
21		...20.1 m - becoming moderately strong			-		71					
		...20.5 m - 200 mm of crumbled core			21.24		32					751
		...20.8 m - 440 mm of core loss										
		...21.4 m - 75° fracture	RC13		21.24	13	99	2				750
22		...21.8 m - vertical fracture, becoming widely spaced fractures			-		101					
					22.76		100					
23		...22.9 m - vertical fracture	RC14		22.76	14	99	1				749
					-		99					
					24.28		99					748
24												
			RC15		24.28	15	93	1				747
25		...25.2 m - 54° fracture			-		103					
					25.80		92					746
26												745
27												744
28												743
29												742

Notes:

Target depth of 25 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	7.60	PLAIN
7.60	9.10	SLOTTED

Logged By: C. TamsReviewed By: T. Curtis

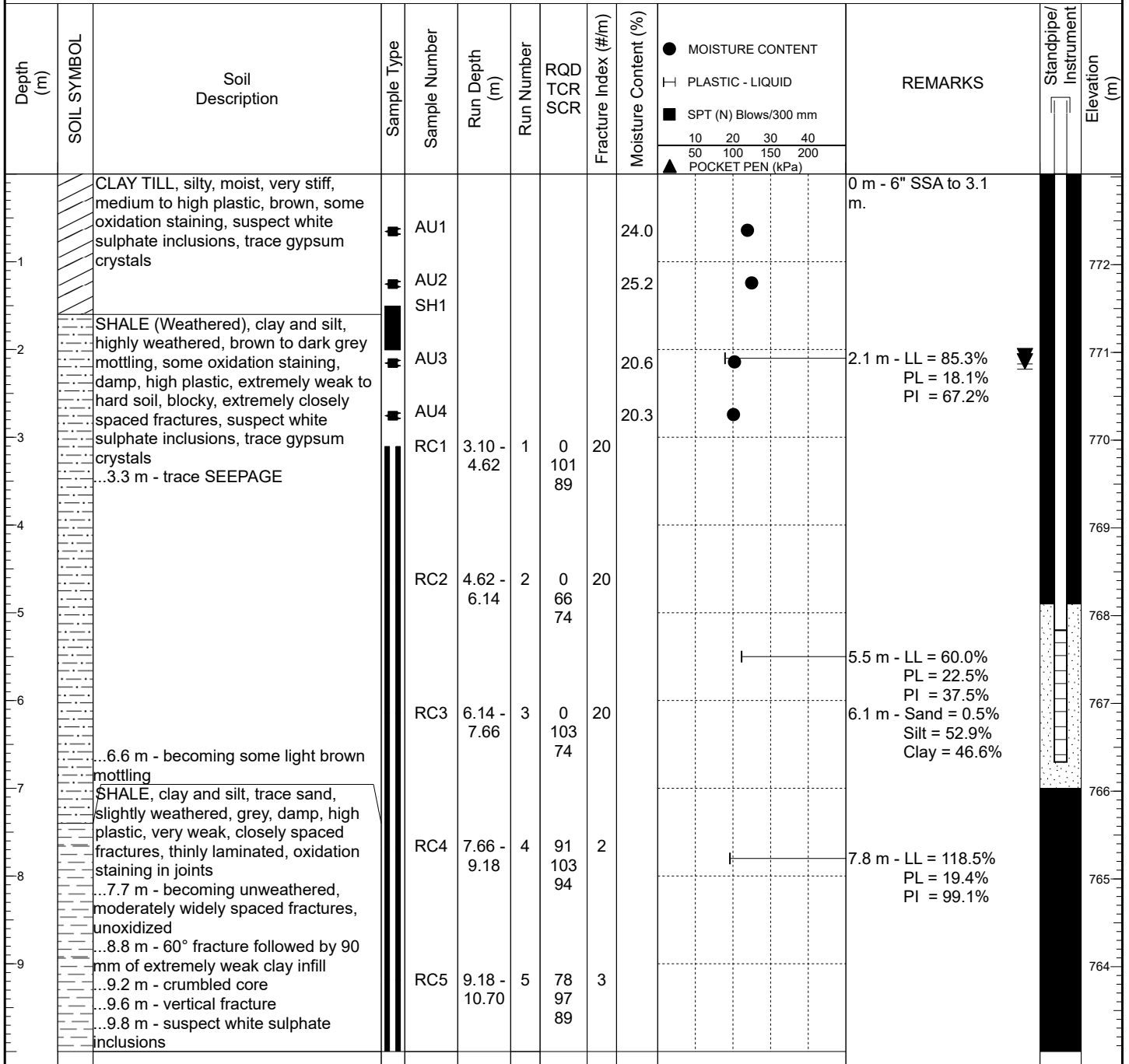


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COREHOLE No : **22CH321**

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CLIENT	Eastern Irrigation District		PROJECT NAME	Snake Lake Reservoir Expansion	
PROJECT NUMBER	1560-193-00		PROJECT LOCATION	NE 1/4 32-19-16	
DATE STARTED	09/08/2022	COMPLETED	09/08/2022	GROUND ELEVATION	773.03m N 5609430.825 E 415706.861
DRILLING CONTRACTOR	Val's Drilling		GROUND WATER ELEVATION / DEPTH	770.89 m 2.14 m	
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022



Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	5.20	PLAIN
5.20	6.70	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH321**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/08/2022	COMPLETED	09/08/2022	GROUND ELEVATION	773.03m N 5609430.825 E 415706.861
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		770.89 m	2.14 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	10/12/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT — PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - vertical fracture ...10.7 m - 40 mm of core loss ...10.8 m - 25° fracture		RC6	10.70 - 12.22	6	84 101 84	2				762
12		...11.4 m - trace shell inclusion ...11.7 m - trace shell inclusion ...11.8 m - horizontal fracture		RC7	12.22 - 13.74	7	99 100 99	2		11.7 m - LL = 80.0% PL = 24.4% PI = 55.6%		761
13		...12.8 m - becoming weak ...13.0 m - 97° fracture		RC8	13.74 - 15.26	8	98 101 98	1		13.1 m - Sand = 0.3% Silt = 70.7% Clay = 29.0%		760
14												759
15		...14.6 m - 77° fracture ...15.1 m - 79° fracture followed by 30 mm of calcified shale										758
16												757
17												756
18												755
19												754

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work		
Depth Top	Depth Bottom	Pipe Type
0.00	5.20	PLAIN
5.20	6.70	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH322**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/08/2022	COMPLETED	09/08/2022	GROUND ELEVATION	778.92m N 5609434.154 E 415206.870
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		773.64 m	5.28 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/ Instrument Elevation (m)	
									● MOISTURE CONTENT ┤ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
1		CLAY TILL, silty, some gravel up to 20 mm, trace sand, dry, stiff, medium plastic, light brown, some oxidation staining, suspect white sulphate inclusions	■	AU1					7.6	●	0 m - 6" SSA to 3.2 m.	778
			■	AU2					9.3	● ┤		

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	4.60	PLAIN
4.60	6.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH322**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/08/2022	COMPLETED	09/08/2022	GROUND ELEVATION	778.92m N 5609434.154 E 415206.870
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		773.64 m	5.28 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.1 m - 160 mm of laminated calcified shale		RC6	10.80	6	81	4				768
		...10.3 m - becoming unoxidized			-		100					
		...10.6 m - 121° fracture			12.32		88					
		...10.8 m - 40 mm of core loss										
		...11.1 m - extremely weak clay infill										
		...11.5 m - 73° fracture										
12				RC7	12.32	7	66	7				767
		...12.3 m - mechanically fractured run			-		100					
		...12.5 m - 132° fracture			13.84		72					
13												766
		...13.2 m - becoming weak										
14		...13.8 m - becoming moderately widely spaced fractures		RC8	13.84	8	102	3				765
					-		113			14 m - Sand = 2.4%		
					15.36		106			Silt = 63.3%		
15		BENTONITE (14.5 m), 150 mm thin bentonite laminations		D1						Clay = 34.3%		
		SHALE, "..."								PL = 28.5%		764
		...14.7 m - 30 mm of calcified shale followed by 60 mm of slough								PI = 187.0%		
16		...14.8 m - becoming moderately strong										763
17												762
18												761
19												760

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	4.60	PLAIN
4.60	6.10	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH323**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/07/2022	COMPLETED	09/07/2022	GROUND ELEVATION	776.12m N 5609425.157 E 415007.962
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		774.13 m	1.99 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	MOISTURE CONTENT PLASTIC - LIQUID SPT (N) Blows/300 mm POCKET PEN (kPa)	REMARKS	Standpipe/Instrument	Elevation (m)
1		CLAY TILL, silty, some sand, moist, stiff, medium plastic, brown, some oxidation staining, suspect white sulphate inclusions, trace coal staining	AU1						16.9	●	0 m - 6" SSA to 3.15 m.		776
1		...1.1 m - becoming sandy	AU2						14.5	●	1.2 m - Sand = 51.3%		775
2		SHALE (Weathered), clay and silt, trace sand, completely weathered, brown to dark grey mottling, some oxidation staining, damp, high plastic, extremely weak to hard soil, blocky	SH1								Silt = 24.1% Clay = 24.6%		774
2			AU3						20.0	●	1.2 m - EC: 4.0 dS/m		774
2			AU4						17.8	●	1.2 m - SAR: 5.8 1.2 m - pH: 7.7 2.1 m - LL = 50.6% PL = 16.6% PI = 34.0%		773
3		...3.2 m - becoming extremely closely spaced fractures	RC1		3.15 - 4.67	1	0	20			3.5 m - LL = 104.5% PL = 35.7% PI = 68.8%		773
4		BENTONITE (3.5 m), 70 mm seam									3.6 m - LL = 50.9% PL = 20.7% PI = 30.2%		772
4		SHALE (Weathered), ...	RC2		4.67 - 6.19	2	30	20					772
5							97						771
5		SHALE, clay and silt, trace sand, medium weathered, grey, dry, high plastic, extremely weak, very closely spaced fractures, thinly laminated, oxidation staining in joints					86						771
6		...5.3 m - 5 mm quartz lense	RC3		6.19 - 7.71	3	59	8			6.2 m - LL = 53.3% PL = 19.2% PI = 34.1%		770
6		...5.5 m - becoming slightly weathered					100						770
6		...5.6 m - becoming unoxidized					67						770
6		...6.1 m - 50 mm of core loss											770
7		...7.1 m - becoming very weak											769
7		...7.2 m - becoming unweathered											769
8		...7.8 m - 70 mm of crumbled core	RC4		7.71 - 9.23	4	30	7			7.3 m - Sand = 2.4% Silt = 58.4% Clay = 39.2%		768
8							103						768
8							63						768
9		...9.2 m - quartz crystals	RC5		9.23 - 10.75	5	18	7					767
9		...9.2 m - 260 mm of mechanical rubble					100						767
9							36						767

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.10	PLAIN
6.10	7.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis



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COREHOLE No : **22CH323**

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CLIENT	Eastern Irrigation District	PROJECT NAME	Snake Lake Reservoir Expansion		
PROJECT NUMBER	1560-193-00	PROJECT LOCATION	NE 1/4 32-19-16		
DATE STARTED	09/07/2022	COMPLETED	09/07/2022	GROUND ELEVATION	776.12m N 5609425.157 E 415007.962
DRILLING CONTRACTOR	Val's Drilling	GROUND WATER ELEVATION / DEPTH		774.13 m	1.99 m
CORING TYPE	HQ3	DIAMETER (mm)	61	DATE GROUND WATER RECORDED	09/15/2022

Depth (m)	SOIL SYMBOL	Soil Description	Sample Type	Sample Number	Run Depth (m)	Run Number	RQD TCR SCR	Fracture Index (#/m)	Moisture Content (%)	REMARKS	Standpipe/Instrument	Elevation (m)
									● MOISTURE CONTENT ┌─ PLASTIC - LIQUID ■ SPT (N) Blows/300 mm 10 20 30 40 50 100 150 200 ▲ POCKET PEN (kPa)			
11		...10.2 m - crumbled core		RC6	10.75 - 12.27	6	61 94 75	5		11.1 m - LL = 82.2% PL = 21.2% PI = 61.0%		766
12		BENTONITE (11.7 m), 290 mm seam ...11.1 m - becoming thinly laminated bentonite seams ...11.9 m - becoming very silty, weak SILTSTONE, and clay, unweathered, grey, damp, high plastic, weak, finely fissured		RC7	12.27 - 13.79	7	74 100 94	4				765
13		...12.2 m - 90 mm of core loss ...13.0 m - becoming moderately widely spaced fractures										764
14		...13.8 m - becoming some weakly cemented layers		RC8	13.79 - 15.31	8	82 99 86	3		13.9 m - Sand = 0.8% Silt = 60.7% Clay = 38.5%		763
15												762
16												761
17												760
18												759
19												758
												757

Notes:

Target depth of 15 m achieved. Corehole completed as a well and backfilled with sand and bentonite chips.

Monitoring Installation Pipe Work

Depth Top	Depth Bottom	Pipe Type
0.00	6.10	PLAIN
6.10	7.60	SLOTTED

Logged By: C. Tams

Reviewed By: T. Curtis