

TA  
705.4  
.C32  
Y8

04/78

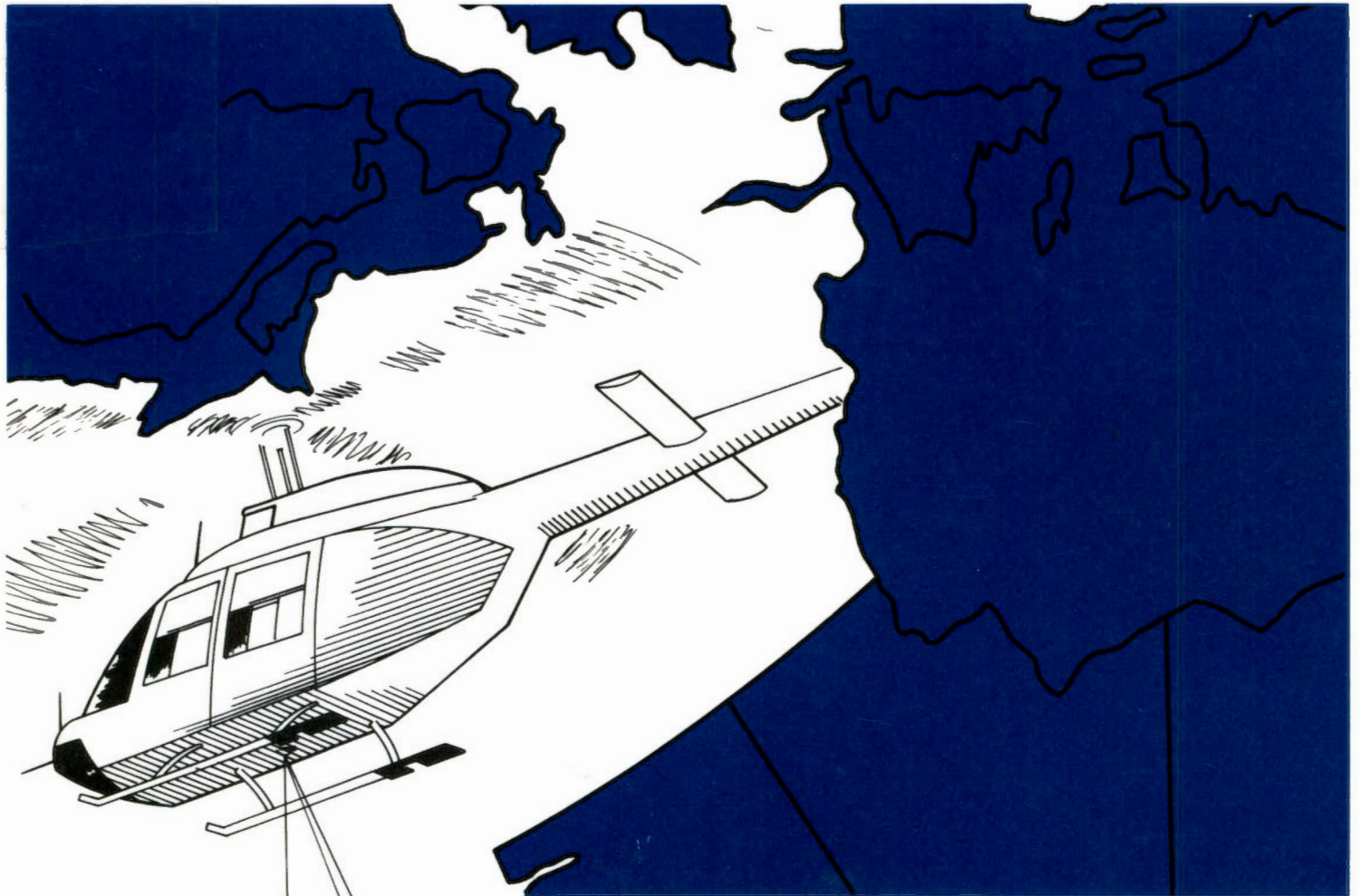
This document was produced  
by scanning the original publication.

Ce document est le produit d'une  
numérisation par balayage  
de la publication originale.

GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

SUBMITTED TO:  
GEOLOGICAL SURVEY OF CANADA

APRIL, 1978



EBA Engineering Consultants Ltd.

Arctic Geotechnical Group



LOCATIONS OF DRILL HOLES, SOUTHERN YUKON, MARCH-APRIL, 1978

<u>Hole No.</u>	<u>Lat. (N)</u>	<u>Long. (W)</u>	<u>UTM</u>	<u>Description</u>
Line 1 (Holes 1A1-1C2)	60° 52'	135° 40'	8V MC 6448	2 mi. N. of Hwy at MP Takhini River Valley
Line 2 (Holes 2A, 2B, 2C)	60° 51'	135° 07'	8V MC 9545	8 mi. disc. N. of Whitehorse Yukon River Valley
Line 3 (Holes 3A, 3B)	60° 20'	133° 58'	8V NB 5688	1 mi. S. of Hwy at MP Little Atlin Lake      Jakes Corner
Site 1	62° 34'	140° 58'	7V EV 0238	W. side of Hwy at MP 1218
2 (A-D)	62° 18'	140° 49'	7V EV 0808	1 mi. W. of Hwy at MP 1197
3	61° 55'	140° 15'	7V EU 3965	1½ mi. N. of Hwy at MP 1157
4	61° 55'	140° 14'	7V EU 4065	1 mi. N. of Hwy at MP 1156½
5	61° 55'	140° 14'	7V EU 4065	1 mi. N. of Hwy at MP 1156½
5A	61° 54'	140° 14'	7V EU 4064	N side of Hwy at MP 1156½
6	61° 33'	139° 20'	7V EU 8924	E side of Hwy at MP 1114
7, 7A	61° 27'	139° 10'	7V EU 9713	2 mi. NE of Hwy at MP 1104
8	61° 27'	139° 08'	7V EU 9912	2½ mi. NE of Hwy at MP 1103½
10 (A,B)	60° 54'	137° 54'	8V LC 4256	1 mi. S of Hwy at MP 1033
11	61° 50'	140° 10'	7V EU 4457	½ mi. SW of Hwy at MP 1152
12	61° 53'	140° 13'	7V EU 4254	2 mi. SW of Hwy at MP 1151

THE ASSOCIATION OF  
PROFESSIONAL ENGINEERS  
OF ALBERTA  
PERMIT NUMBER  
**P 245**  
E B A ENGINEERING  
CONSULTANTS LTD.

TA  
705.4  
.C32  
Y8

GEOTECHNICAL INVESTIGATION

SOUTHERN YUKON

SUBMITTED TO :

GEOLOGICAL SURVEY OF CANADA

APRIL, 1978

LIBRARY / BIBLIOTHÈQUE

APR 28 1982

GEOLOGICAL SURVEY  
COMMISSION GÉOLOGIQUE





E. W. Brooker, President  
D. W. Hayley, Vice President  
L. A. Balanko  
C. B. Dawley  
D. W. Devenny  
C. T. Hwang  
A. B. MacDonald  
D. B. McLean  
D. H. Seibt

April 27, 1978

*JAK*  
*07-05-78*

Mr. J. A. Heginbottom  
Geological Survey of Canada  
Department of Energy, Mines and Resources  
601 Booth Street  
OTTAWA, Ontario  
K1A 0E8

Dear Sirs:

This letter presents a concise summary of the geotechnical drilling program carried out in the southern Yukon for the Geological Survey of Canada under DSS Contract No. OSQ77-00268. A total of 28 boreholes were completed in the time period from March 24 to April 7, 1978.

The drill rig used on this program was a Ranger Drill supplied by Mobile Augers and Research Limited. A Bell 206B helicopter was used to transport the rig to the various sites. In frozen soils, a continuous 7 cm. diameter core was recovered using the EBA modified auger core barrel. Select segments of core were bagged and retained for future laboratory testing. In the case of thawed soils the samples were disturbed grab samples obtained from the auger flites.

Continuous stratigraphic logs were kept by the EBA geologist on site and are attached to this letter. Wherever possible the core was photographed with both colour and black and white film. Site photos of the surrounding terrain were also taken along with brief site descriptions which are also included in this letter. One set of prints and negatives has been sent directly to Dr. R. Klassen in Calgary, for his segment of the program, and the remainder has been included with this letter. All samples have been described in the field and have been assigned a temporary Unified Soil Classification Symbol until such time that index testing has been carried out by your staff.

The ground ice description is based on a modified NRC Technical Memo 79, Guide to the Field Description of Permafrost for Engineering Purposes (as attached). All colour was described in accordance with the Munsell Colour Charts. All representative soil samples were retained and shipped to respective G.S.C. personnel in Ottawa and Calgary (FOB Edmonton).

One copy of this report has been sent to Dr. R. Klassen in Calgary together with his airphotographs and relevant core photographs.

We have enjoyed working on this project with you and look forward to being of service to you in the future.

Respectfully submitted,

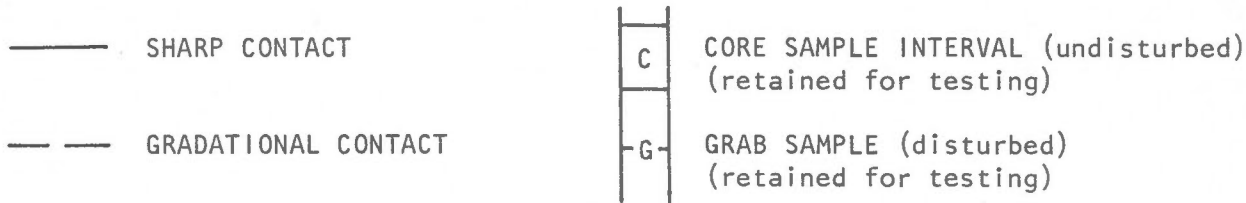
EBA Engineering Consultants Ltd.



Kurt O. Stangl, P. Eng.

KOS:dec

# SYMBOLS AND TERMS USED ON BORING LOGS



## TERMS DESCRIBING CONSISTENCY OR CONDITION

**COARSE GRAINED SOILS** (major portion retained on No. 200 sieve): includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as determined by laboratory tests.

DESCRIPTIVE TERM	RELATIVE DENSITY	N BLOWS PER FOOT
Loose	0 to 40%	0 to 10
Medium, dense	40 to 70%	10 to 30
Dense	70 to 100%	30 to 50

The number of blows, N, on a 2" O.D. split spoon sampler of a 140 lb. wt. falling 30" required to drive the sampler a distance of 1' from 6" to 18".

**FINE GRAINED SOILS** (major portion passing No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests.

DESCRIPTIVE TERM	UNCONFINED COMPRESSIVE STRENGTH TON/SQ. FT.
Very soft	less than 0.25
Soft	0.25 to 0.50
Firm	0.50 to 1.00
Stiff	1.00 to 2.00
Very stiff	2.00 to 4.00
Hard	4.00 and higher

Note: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.

## TERMS CHARACTERIZING SOIL STRUCTURE

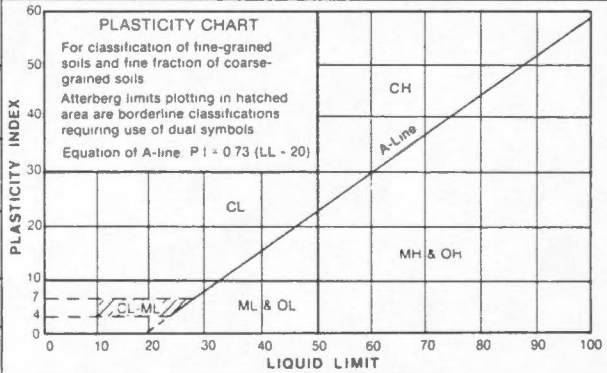
- Slickensided — having inclined planes of weakness that are slick and glossy in appearance.
- Fissured — containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
- Laminated — composed of thin layers of varying color and texture.
- Interbedded — composed of alternate layers of different soil types.
- Calcareous — containing appreciable quantities of calcium carbonate.
- Well graded — having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
- Poorly graded — predominantly of one grain size, or having a range of sizes with some intermediate size missing.





# UNIFIED SOIL CLASSIFICATION†

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve *	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	
		GRAVELS WITH FINES	GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	
		CLEAN SANDS	GM	Silty gravels gravel-sand-silt mixtures	
		SANDS WITH FINES	GC	Clayey gravels gravel-sand-clay mixtures	
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines	
		SANDS WITH FINES	SP	Poorly graded sands and gravelly sands, little or no fines	
		SANDS WITH FINES	SM	Silty sands sand-silt mixtures	
		SANDS WITH FINES	SC	Clayey sands sand-clay mixtures	
				Classification on basis of percentage of fines GW, GP, SW, SP, GM, GC, SM, SC Borderline Classification requiring use of dual symbols	
				Lps less than 5% Pass No. 200 sieve More than 12% Pass No. 200 sieve 5% to 12% Pass No. 200 sieve	
		$C_u = D_{60} / D_{10}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting both criteria for GW Atterberg limits plot below A line or plasticity index less than 4 Atterberg limits plot above A line and plasticity index greater than 7 Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols			
FINE-GRAINED SOILS 50% or more passes No. 200 sieve *	SILTS AND CLAYS Liquid limit 50% or less	ML	Inorganic silts very fine sands rock flour silty or clayey fine sands		
		CL	Inorganic clays of low to medium plasticity gravelly clays sandy clays silty clays lean clays		
		OL	Organic silts and organic silty clays of low plasticity		
	SILTS AND CLAYS Liquid limit greater than 50%	MH	Inorganic silts micaceous or diatomaceous fine sands or silts elastic silts		
		CH	Inorganic clays of high plasticity fat clays		
		OH	Organic clays of medium to high plasticity		
				* Based on the material passing the 3-in. (75-mm) sieve † ASTM Designation D 2487	
	HIGHLY ORGANIC SOILS		PT	Peat muck and other highly organic soils	



## GROUND ICE DESCRIPTION

### ICE NOT VISIBLE

GROUP SYMBOL	SUBGROUP		
	SYMBOLS	DESCRIPTION	
N	Nf	Poorly bonded or friable	
	Nbn	No excess ice well bonded	
	Nbe	Excess ice well bonded	

### VISIBLE ICE LESS THAN 50% BY VOLUME

V	Vx	Individual ice crystals or inclusions	
	Vc	Ice coatings on particles	
	Vr	Random or irregularly oriented ice formations	
	Vs	Stratified or distinctly oriented ice formations	

### VISIBLE ICE GREATER THAN 50% BY VOLUME

ICE	ICE + soil type	Ice with soil inclusions	
	ICE	Ice without soil inclusions (greater than 2.5 cm   1 in   thick)	

**NOTES:**

- 1) Dual symbols are used to indicate borderline or mixed ice classifications
- 2) Visual estimates of ice contents indicated on borehole logs ± 5%
- 3) This system of ground ice description has been modified from NRC Technical Memo 79, Guide to the Field Description of Permafrost for Engineering Purposes

**LEGEND:**



K20051

SITE NOTES - Line 1, Site A

- patchy snow cover to 0.3m thick
- gently rolling topography with overall gentle descending slope to the north
- good road access to within 200m of drill sites
- forest fire burn area (approx. 1958) with many deadfalls
- second growth consists of grasses and sedges to 0.5m high, scattered poplar, pine and spruce, and predominately alder and buck brush.
- the pond is roughly circular and is rimmed by 1 to 2 metre high banks
- no evidence of bank instability was noted
- Borehole No. 1 was located 10 metres north of the northern shore of the pond
- Borehole No. 2 was drilled through the ice near the centre of the pond
- Borehole No. 3 was located 30 metres north of Borehole No. 1
- it was noted that several other small ponds in the north-west had up to 5 metre high banks.



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT and CLAY - olive (5y 5/3)		Vs + Vr 1-5%							
	CLAY (CL) - trace silt and organic specks, olive (5y 5/3) with some rounded white mottling (no organics below .4m), low plastic	C	Vs 3-5% trace Vr							
		C								
		C								
2	- soft to firm, no visible structure	C	NOT FROZEN							
		C								
		C								
		G								
3	- medium plastic, laminations at 30° to core	G								
		G								
		G	Vs + Vr 2%							
		C	Vs + Vx 5%							
4	ICE and CLAY (CL) - as above	C	ICE + 30% soil							
	- very stiff to hard clay	C	ICE + 40% soil							
	CLAY (CL) - as above	C								
	- high unfrozen water content	C	Vr + Vs 5-8%							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON



DATE 25/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.4m

HOLE NO.  
Line 1, Site A  
Borehole No. 1

SHEET

1 of 3

BOREHOLE LOG  
PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf) 						
				POCKET PENETROMETER (tsf) 						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	CLAY (CL) - as above	C	Vx trace							
	ICE		ICE							
	CLAY (CL) - colour change to olive grey (5y 4/2)	C	Vr + Vx 30%							
	ICE and CLAY (CL)		ICE + 10% soil							
	CLAY (CL) - some mottling evident		Vs 10%							
	ICE and CLAY (CL)		ICE + 10% soil							
6	CLAY (CL) - horizontal laminations	C	Vx + Vr 40%							
	ICE		ICE							
	CLAY (CL) - as above	C	Vs+Vx+Vr 10-15%							
	ICE and CLAY (CL)		ICE + 45% soil							
7	ICE and CLAY (CL)		ICE + 35% soil							
	CLAY (CL) - hard	C	Vs + Vx 15%							
	ICE		ICE							
	- olive grey (5y 4/2) with olive mottling (5y 5/3)		Nonvisible ice							
	ICE		ICE							
8	CLAY (CL)-vague horizontal laminations	C	Nonvisible ice							
	ICE		ICE							
	CLAY (CL)	C	Vs + Vx 15-20%							
	ICE and CLAY (CL)		ICE + 20% soil							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 25/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.4m

HOLE NO.  
Line 1, Site A  
Borehole No. 1  
SHEET  
2 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
9	CLAY - as above	C	Vs + Vr 5-10%							
	ICE and CLAY (CL)		ICE + 10% soil							
	CLAY (CL)		Vx + Vr trace							
	ICE and CLAY (CL)		ICE + 10% soil							
	CLAY (CL)	C	Nonvisible ice							
	ICE and CLAY (CL)		ICE + 5% soil							
	END OF HOLE									
10										
11										
12										

	PROJECT <b>GEOTECHNICAL INVESTIGATION</b> SOUTHERN YUKON	DATE <u>25/3/78</u>	HOLE NO. Line 1, Site A Borehole No. 1.
	LOGGED BY <u>KOS</u>	ELEVATION _____	SHEET 3 of 3
_____	DEPTH <u>9.4m</u>		

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)								
				POCKET PENETROMETER (tsf)								
				1.0	2.0	3.0	4.0	5.0	6.0	7.0		
1	ICE											
2	WATER											
3	CLAY (CL) - silty to trace of silt, low plastic, olive (5y 5/3), stiff, moist, trace of black organic specks, appears to be massive	G	NOT FROZEN									
		G										
		G										
4		G										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 25/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 7.5m

HOLE NO.  
Line 1, Site A  
Borehole No. 2

SHEET  
1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
			NOT FROZEN							
5	- hard layer encountered but not indicated by sample return  - indistinct laminations to total depth of hole	G								
		G								
6		G								
		G								
7		G								
		G								
	END OF HOLE (extreme sloughing conditions)									
8										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 25/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 7.5m

HOLE NO.  
Line 1, Site A  
Borehole No. 2  
 SHEET  
 2 of 2



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	PEAT									
1	CLAY (CL) - trace silt, light grey (5y 7/2), trace of thin horizontal bedding (2cm thick), trace of slightly oxidized organics in top 0.5m	C	Vs + Vx trace							
			Nbn							
2	- olive grey (5y 5/2) - horizontal laminations  - very dry and crumbly	C	Vr trace							
			Not Frozen?							
		C								
3	- medium plastic, horizontal partings, dry to moist, olive grey (5y 4/2)  - faint laminations									
		C								
			Vs+Vr 2-5%							
			ICE							
			Vx+Vr 2-5%							
4	- fine interbedded olive grey (5y 4/2) and olive (5y 5/3)		ICE							
		C	Vs trace							
			Vs 40%							
		C	Vr + Vs 5%							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 25/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.1m

HOLE NO.  
Line 1, Site A  
Borehole No. 3

---

SHEET  
1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	Clay - as above		Vr + Vs 5%							
		C								
	ICE and CLAY - (trace)		ICE + trace soil							
5	ICE		ICE							
	CLAY (CL) - trace silt, horizontal laminations, some mottling, olive grey (5y 4/2) and olive (5y 5/3)	C	Vs + Vr 5%							
			Vs + Vx 20%							
6	ICE	C	ICE							
	END OF HOLE									
7										
8										



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
 SOUTHERN YUKON

DATE 25/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.1m

HOLE NO.  
 Line 1, Site A  
 Borehole No. 3

SHEET  
 2 of 2

SITE NOTES - Line 1, Site B

- Borehole No. 2 is located in a small grassy depression approximately 80 metres to the west of Borehole No. 1 at the crest of the bank.
- there is good road access directly to Borehole No. 1 which is located at the crest of the bank
- relief between the bottom of the depression and the surrounding banks is approximately 4 metres
- forest fire burn area with some scattered black spruce
- second growth of poplar and buck brush
- slumping and detachment cracks were noted to occur at the rim of the depression
- a small intermittent stream channel enters at the east end of the flat bottomed depression.
- the site was generally snow free at the time of drilling

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)							
				POCKET PENETROMETER (tsf)							
				1.0	2.0	3.0	4.0	5.0	6.0	7.0	
1	SAND and ORGANICS - fine grained, silty; rootlets	C	Nf								
	CLAY (CL-ML) - silty, trace sand, dry, light olive (5y 6/2), thinly interbedded clay and silty clay (2cm)										
	SILT (ML) - sandy, trace clay, horizontal laminations, trace of organics, slightly oxidized	C									
2	CLAY(CL-ML) - some silt, horizontal laminations, olive (5y 5/3) and olive grey (5y 5/2)	C	Nbn Vx trace								
	- silty, very thinly bedded(2cm) - 2cm band of fine sand (Nf)	C	Nbn								
	- trace of mottling	C	Vr+Vs+Vx 5%								
3		C									
		C	Vr+Vs+Vx 5%								
4	ICE and CLAY (CL-ML)		ICE + 30% soil								
	CLAY(CL-ML)-silty, horizontal laminations, olive (5y 5/3)		Vs + Vr 5%								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.5m

HOLE NO.  
Line 1, Site B  
Borehole No. 1

---

SHEET  
1 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	CLAY - as above, some distorted laminations	c	Vs + Vr 20%							
	ICE		ICE							
	CLAY (CL-ML) - silty, horizontal laminations of olive (5y 5/3) and olive grey (5y 5/2)		Vs 20%							
	ICE		Nbn							
6	CLAY (CL-ML)	c	ICE							
	ICE		Vs trace							
	CLAY (CL-ML) - silty, mottled		ICE							
	ICE and CLAY (CL-ML)		Vx+Vr 40%							
	ICE		Vr trace							
	ICE		ICE + 20% soil							
7	CLAY (CL-ML) - silty, stiff		ICE							
	ICE		Vx trace							
	CLAY (CL-ML)-silty, stiff	c	ICE							
	ICE		Vr trace							
	CLAY (CL-ML) - silty, horizontal laminations, olive (5y 5/3) some mottling and contorted bedding - pale olive mottles(5y 6/3)		ICE	Vr trace						
8	ICE and CLAY (CL-ML)	c	Vs+Vr 30-40%							
			Vs+Vr 1-4%							
			Vs 20%							
			ICE + 10% soil							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON


DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.5m

HOLE NO.  
 Line 1, Site B  
 Borehole No. 1

SHEET  
 2 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf) <span style="float: right;">€</span>						
				POCKET PENETROMETER (tsf) <span style="float: right;">▲</span>						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
9	ICE and CLAY (CL-ML)		ICE + 50% soil							
	CLAY (CL-ML) - silty, disturbed core, mottled olive and pale olive (5y 5/3, 5y 6/3)	C	Vr + Vs 10%							
	ICE		ICE							
10	END OF HOLE									
11										
12										

	PROJECT <u>GEOTECHNICAL INVESTIGATION</u> <u>SOUTHERN YUKON</u>	DATE <u>26/3/78</u> LOGGED BY <u>KOS</u> ELEVATION _____ DEPTH <u>9.5m</u>	HOLE NO. <u>Line 1, Site B</u> Borehole No. 1 SHEET 3 of 3
	<hr/>		

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	CLAY (CL) - trace silt, low plastic, trace of organics, horizontal laminations (2-4mm), olive (5y 5/3)	C	Vs+Vx 2%							
	- mottled appearance, olive (5y 5/3) and olive grey (5y 5/2)		Vs+Vx+Vr 2-3%							
	- soft from 1.1 to 1.3m		NOT FROZEN?							
		C	Vs+Vr+Vx 2%							
2	- poor recovery from 1.8 to 2.2m - very dry and crumbly		NOT FROZEN							
	- very soft from 2.2 to 2.3m									
	- dry to slightly moist, crumbly, vague horizontal laminations	C								
3	CLAY (CL-ML) - silty, very stiff, low plastic, olive (5y 5/3), horizontal laminations	C								
	SILT (CL-ML) - clayey, stiff, slightly moist, olive (5y 5/3)			●	▲					
4					▲					
		G								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON


DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.4m

HOLE NO.  
Line 1, Site B  
Borehole No. 2

SHEET  
1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT - as above, turning to olive grey (5y 5/2), firm, moist	G	NOT FROZEN	▲		●				
6		G		▲		●				
7	END OF HOLE									
8										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 26/3/78

LOGGED BY KOS

ELEVATION \_\_\_\_\_

DEPTH 6.4m

HOLE NO.  
Line 1, Site B  
Borehole No.2

SHEET  
2 of 2



## SITE NOTES - Line 1, Site C

- flat grassy depression rimmed by a 2 metre high bank to the south
- the terrain is generally flat to slightly rolling valley bottom
- there is a gradual overall slope to the river in the north-east
- area to the south of the site has been denuded by forest fire
- sparse concentration of black spruce and poplar exists in the immediate area
- undergrowth of buck brush and sedges; some mineral soil is exposed in the depression
- white calcic residue was found at the west end of the depression
- evidence for active slumping was found at the southern bank near Borehole No. 1
- Borehole No. 2 was centrally located in the depression
- the site was snow free at the time of drilling

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	CLAY (CL) - trace silt, trace of oxidation, horizontal laminations, olive grey (5y 5/2)		V <sub>x</sub> trace							
		C								
			V <sub>x</sub> +V <sub>r</sub> trace							
2		C								
			V <sub>x</sub> +V <sub>r</sub> 1%							
		C								
3	SILT (CL-ML) - clayey, dry to moist, some crumbly sections, olive grey (5y 5/2)		NOT FROZEN							
		C		●	▲					
		G								
4	- very dark grey (2.5y N4/)	C	V <sub>s</sub> +V <sub>r</sub> 30%							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.4m

HOLE NO.  
 Line 1, Site C  
 Borehole No. 1  
 SHEET  
 1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT(CL-ML) - clayey, very dark grey (2.5y N4/)	C	Vr + Vs 30-35%							
		C								
		C								
6	- dark grey (2.5y N4/)		Vs 15%							
			Vs trace							
		C	Vs 10%							
7	END OF HOLE									
8	END OF HOLE									



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.4m

HOLE NO.  
Line 1, Site C  
Borehole No. 1  
SHEET  
2 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	SILT (ML)-trace sand, trace clay, indistinct horizontal laminations, grey (5y 6/1)	C	Vx 1%							
			Vx 2%							
1	SAND (SP)-medium grained, uniform, slightly oxidized, olive (5y 5/3)		Nf							
			Nf							
	SILT (ML)-sandy, (fine grained) 1 to 2cm horizontal laminations, very dark grey (2.5y N3/)									
2	- soft and wet, only a trace of fine sand below 1.7m		NOT FROZEN							
3										
4		G								



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
 SOUTHERN YUKON

DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 4.5m

HOLE NO.  
 Line 1, Site C  
 Borehole No. 2

SHEET  
 1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	SILT - as above		NOT FROZEN							
	END OF HOLE									
5										
6										
7										
8										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 26/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 4.5m

HOLE NO.  
Line 1, Site C  
Borehole No. 2  
SHEET  
2 of 2

SITE NOTES - Line 2, Site A

- the site is located in an extensive grassy lowland
- patchy snow cover existed at the time of drilling
- black spruce are sparsely scattered throughout this area
- ground vegetation consists of dense tussocks of grass and many clumps of alders and buck brush



22432-96

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - horizontal interbeds (2cm) of dark and light brown organics	C	Vx + Vs trace							
		C								
	SILT (CL-ML) - clayey, horizontal laminations, trace of oxidized specks, dark grey (5y 4/1) - moist - trace sand, 5mm laminations	C	Vs 5%							
		C	NOT FROZEN							
2	SILT (ML) - finely laminated (horizontal), olive grey (5y 5/6) - oxidized horizon at 1.5m - moist	C								
		C								
		C								
		C								
3		C								
		C								
		C								
		C								
4	SILT (ML) - trace fine sand, very wet, soft, dark grey (2.5y N4/)	C								
		C								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 28/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.3m

HOLE NO.  
Line 2, Site A

---

SHEET  
1 of 3



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT - as above	G	NOT FROZEN							
6		G								
7		G								
8	- trace of clayey lumps	G								
	- trace of clayey lumps	G								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 28/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.3m

HOLE NO.  
Line 2, Site A  
 SHEET  
 2 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
9	SILT - as above	G	NOT FROZEN							
		G								
10	END OF HOLE									
11										
12										

	PROJECT <b>GEOTECHNICAL INVESTIGATION</b> SOUTHERN YUKON	DATE <u>28/3/78</u> LOGGED BY <u>KOS</u> ELEVATION _____ DEPTH <u>9.3m</u>	HOLE NO. <b>Line 2, Site A</b> SHEET 3 of 3

SITE NOTES - Line 2, Site B

- 30cm of continuous snow cover
- drill site is approximately 5m higher than elevation of grassy depression to the north
- vegetation is mainly a moderate cover of spruce and pine to 15 metres in height
- scattered buck brush and young poplar trees were also noted
- ground surface vegetation consists of mainly sparse patches of grass
- the site is well drained with a 15° slope to the depression in the north
- the surrounding terrain is gently rolling

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	SAND (SP) - fine grained, uniform, slightly oxidized, pale brown (10yr 6/3) to light brown (10yr 6/4)  - poor recovery for the most part due to loose and dry nature of the sand	C	Nf							
		C								
2		C	NOT FROZEN							
		C								
3		C								
		C								
4	SAND (SP) - fine to medium grained, light brown (10yr 6/3), slightly moist	C								
		C								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON


DATE 27/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 8.4m

HOLE NO.  
Line 2, Site B

SHEET  
 1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	SAND - as above	C	NOT FROZEN							
5	- easy drilling with augers									
6										
7										
8										
	END OF HOLE									



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 27/3/78  
LOGGED BY KOS  
ELEVATION \_\_\_\_\_  
DEPTH 8.4m

HOLE NO.  
Line 2, Site B

---

SHEET  
2 of 2

SITE NOTES - Line 2, Site C

- the drill site is located at the west of a 25 metre high hill
- due to the slope's southern exposure there was no snow cover at the time of drilling
- a moderate cover of 15 metre pine trees exists in the area
- a sparse growth of spruce was noted to the east
- young poplar trees cover the steep slope to the east of the site
- ground vegetation consists of sparse grass tussocks and dwarf shrubs
- the slope to the south is in the order of 30°


# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)							
				POCKET PENETROMETER (tsf)							
				1.0	2.0	3.0	4.0	5.0	6.0	7.0	
1	SAND (SP) - fine grained, uniform, yellowish brown (10yr 5/4), loose and dry	C	Nf, Nbn trace								
	SILT (ML) - trace sand, fine horizontal laminations, dry, white (5y 8/1) to light grey (5y 6/1)	C									
	- powdery, light grey (5y 7/2)	C									
2	- trace gravel		Impossible to tell if samples were frozen								
	GRAVEL (GM) - silty, sandy, gravel to 5cm in diameter	C									
3	SAND (SP) - fine grained, trace of gravel, light grey (5y 7/2), dry	C									
	- fine to medium grained, trace of fine gravel (5mm), pale brown (10yr 6/3), dry										
4	- serious sloughing, conventional augering below 3.3m										

	PROJECT <u>GEOTECHNICAL INVESTIGATION</u> <u>SOUTHERN YUKON</u>	DATE <u>27/3/78</u>	HOLE NO.
		LOGGED BY <u>KOS</u>	Line 2, Site C
		ELEVATION _____	SHEET
		DEPTH <u>5.7m</u>	1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SAND - as above									
6	END OF HOLE - refusal									
7										
8										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 27/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 5.7m

HOLE NO.  
Line 2, Site C  
 SHEET  
2 of 2



SITE NOTES -Line 3, Site A

- the drill site is located approximately 30 metres north of a small thaw pond
- the terrain is generally flat; a slight southward downslope was noted
- the vegetation consists of thick clumps of 1.5m high buck brush with dense grass undergrowth
- scattered black spruce occur in the site area
- snow cover at the time of drilling was patchy

105 C 2



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	PEAT		Vx trace							
	SILT(ML) - fine horizontal laminations, dark grey (5y 4/1) - trace clay - olive grey (5y 4/2), trace of organics	C	Vs 5%							
			Vs + Vx 30%							
		C	Vs 10%							
1	SILT(CL-ML)-clayey to trace of clay, horizontal laminations, trace of organics, brown(10yr 4/3) to olive grey (5y 4/2)	C	Vs 5%							
			NOT FROZEN							
		C								
2	CLAY (CL) - silty, olive (5y 4/3), firm, moist	G								
		G								
		G								
		G								
3	- trace of fine gravel	G								
		G								
		G								
		G								
4		G								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 5/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 8.9m

HOLE NO.  
Line 3, Site A  
 SHEET  
1 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	CLAY (CL) - as above		NOT FROZEN							
	SILT(ML)-trace clay, very wet, olive grey (5y 4/2)	G								
	SAND (SM)-fine grained, silty, wet, olive grey(5y 4/2)	G								
5	SILT (CL-ML)-clayey, trace of fine sand, wet, olive grey (5y 4/2), firm	G								
		G								
	CLAY (CL-ML) - silty,moist, olive grey (5y 5/2), firm to stiff	G								
6		G								
		G								
		G								
		G								
	- trace silt below 6.8m	G								
7		G								
		G								
		G								
		G								
8		G								
		G								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 5/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 8.9m

HOLE NO.  
Line 3, Site A  
 SHEET  
 2 of 3

BOREHOLE LOG  
PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf) ●						
				POCKET PENETROMETER (tsf) ▲						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	CLAY (CL-ML)-trace silt, olive grey (5y 5/2), firm to stiff		NOT FROZEN							
9	END OF HOLE									
10										
11										
12										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 5/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 8.9m

HOLE NO.  
Line 3, Site A  
 SHEET  
 3 of 3

SITE NOTES - Line 3, Site B

- the site supports a moderate cover of 12m high black spruce
- ground vegetation consists of grasses and scattered buck brush
- the ground surface slopes down to the north-west at approximately 1°
- a small pond and clearing exists 100m to the north-west of the site
- patchy snow cover was noted at the time of drilling

\*NOTE: Site C was not drilled due to its inaccessibility. In addition many bedrock outcrops were noted in the proposed site area.

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - dark grey brown(2.5y 3/2)	C	Nbn							
	CLAY(CL)-silty, horizontal lam- inations, olive grey(5y 5/2)	C	Vs 25%					x		
	SILT(CL-ML)-clayey, trace of fine gravel, thinly laminated, olive (5y 3/1)	C	NOT FROZEN							
2	CLAY (CL)-trace silt, moist, firm, trace of angular fine gravel and sand, olive grey (5y 4/2)	G								
	GRAVEL and CLAY (GC)-trace silt, firm, moist, some fine rounded gravel, olive grey (5y 5/3) -silty, more gravel (1.5cm)	G								
3	GRAVEL, CLAY and SILT(GC)-gravel to 1.5cm, olive grey (5y 5/3), trace sand -wet	G								
	-slightly finer gravel	G								
4	- grading into SILT. and GRAVEL - crumbly	G								
	- gravel to 2cm	G								

	PROJECT <u>GEOTECHNICAL INVESTIGATION</u> <u>SOUTHERN YUKON</u>	DATE <u>5/4/78</u> LOGGED BY <u>KOS</u> ELEVATION _____ DEPTH <u>5.9m</u>	HOLE NO. <u>Line 3, Site B</u> SHEET <u>1</u> of <u>2</u>

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT and GRAVEL(ML)-fine grained gravel, trace clay and sand, olive grey (5y 5/3), crumbly  - angular and rounded clasts  - moist to wet below 5.2m	G	NOT FROZEN							
		G								
		G								
		G								
		G								
		G								
6	END OF HOLE .									
7										
8										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 5/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 5.9m

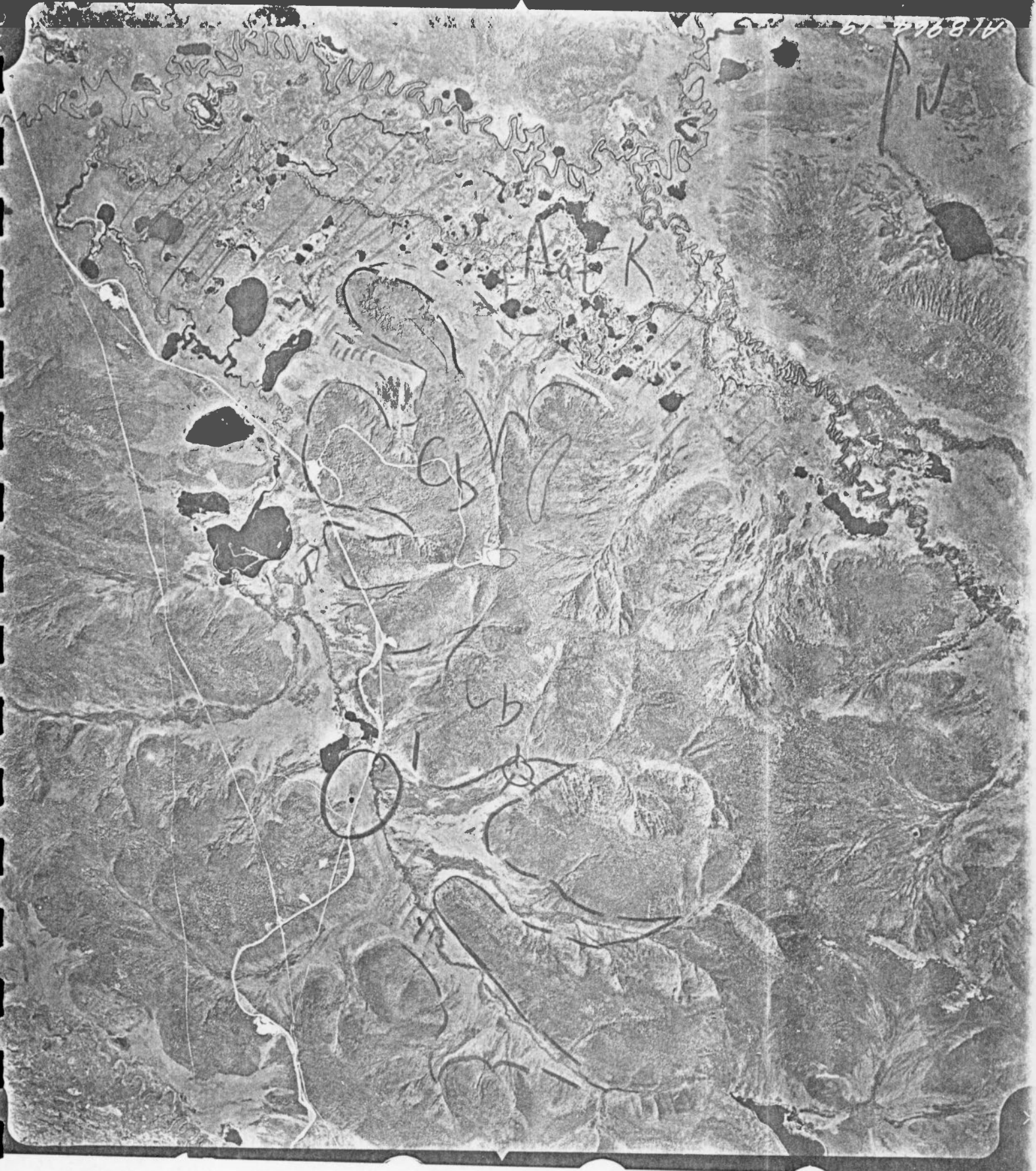
HOLE NO.  
Line 3, Site B  
 SHEET  
2 of 2



SITE NOTES - Site 1

- the drill site is located in flat organic terrain
- a sparse cover of black spruce and buck brush exists
- a 1 metre microrelief on hummocky grass tussocks was noted
- 30 cm of snow cover existed at the site at the time of drilling

118967-19



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - rootlets, woody, dark brown (7.5YR 3/2)  - trace of silt	C	Vx trace							
		C								
		C	Vs 2%							
		C	Vx + Vs 3%							
		C								
		C	Vx 2%							
		C								
		C	Vx 5-10%							
		C	Vx + Vs 5%							
		C								
2	- trace of silty clay  CLAY(CL) - silty, trace of peat from 1.8 to 1.9m, grey (5y 5/1)	C	Vs + Vx 10%							
		C	Vs + Vx 5%							
		C								
		C	Vs 3-5%							
		C	Vx trace							
		C	Vx + Vs 2-3%							
		C								
3	- 5mm laminations  - very wet or thawing	C								
		C	Vx + Vs 3-4%							
		C								
		C								
		C	Vs + Vx 5-8%							
4	SILT (CL-ML) - clayey	C								
		C								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 30/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 8.9m

HOLE NO.  
Site 1  
 SHEET  
 1 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT (CL-ML) - clayey, very dark grey (10yr 3/1), faint horizontal laminations	C	Vs + Vx 3%							
		C	Vs+Vx+Vr 3-5%							
		C	Vx + Vs 3%							
6	- dark grey (5y 4/1) - trace of organics - 5 to 10mm laminations	C	Vs + Vx 2%							
		C	Vs 2%							
		C	Vs + Vr 1-2%							
7	PEAT - dark brown (7.5yr 3/2)	C	Nbn							
		C	Nbn							
		C	Nbn							
8	SILT (ML) - dark grey(5y 5/1), fine 2mm horizontal laminations	C	Nbn							
		C	Nbn							

	PROJECT <u>GEOTECHNICAL INVESTIGATION</u> SOUTHERN YUKON	DATE <u>30/3/78</u>	HOLE NO.
		LOGGED BY <u>KOS</u>	Site <u>1</u>
	ELEVATION _____	SHEET	
	DEPTH <u>8.9m</u>	2 of 3	

BOREHOLE LOG  
PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf) <span style="float: right;">Ⓢ</span>						
				POCKET PENETROMETER (tsf) <span style="float: right;">Ⓢ</span>						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
9	SILT (ML) - dark grey(5y 5/1), fine horizontal laminations	C	Nbn							
9	END OF HOLE									
10										
11										
12										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 30/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 8.9m

HOLE NO.  
Site 1  
 SHEET  
 3 of 3

## SITE NOTES - Site 2

- Site 2A is located 100 metres north of the lake shore
- 5m high black spruce moderately cover the site area
- 70cm of snow cover was present at the time of drilling
- the ground supported a moderate cover of grasses
  
- Site 2B is located just north of a small clearing in a slight depression
- the surface is covered with 50cm high grassy hummocks
- the tree cover mainly consists of a moderate density of stunted black spruce with only occasional trees reaching 10m in height
  
- Site 2C is located in a minor drainage course (approximately 3m high slope to the south)
- very sparse stunted black spruce occur in the immediate area
- the ground vegetation consists of mainly grass tussocks
  
- Site 2D is located in a flat open area with only a very sparse cover of stunted black spruce
- scattered grassy hummocks are evident at the drill site
- in general the surrounding terrain is of low relief with gentle undulations

2



A. H.

A18964-27

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - rootlets									
	SILT (ML) - trace clay, fine 1 mm horizontal laminations, light olive grey (5y 6/2) - 30° bedding at 0.5 to 0.6m	c	Vs + Vr 25%							
	- trace of oxidized organics	c	Vs + Vr 20-25% (very fine ice laminations)							
	PEAT - dark brown (7.5y 3/2)	c	Vs 10%							
2	SILT (CL-ML) - clayey, olive (5y 5/2), trace of fine horizontal laminations	c	Vs 25-35%							
	- olive (5y 4/3)	c	Vs+Vx 5-8%							
	- vague thin bedding	c	Nbn							
	- olive grey (5y 4/2)	c								
	- grey (10yr 5/1), trace of organics	c	Nbn							
3		c	Nbn							
	SILT (CL-ML) - clayey, trace fine gravel, very dark grey (5y 3/1)	c								
4	END OF HOLE - refusal on coarse gravel									



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 30/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 3.65m

HOLE NO.  
Site 2A  
 SHEET  
1 of 1



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - finely bedded	C	Vs 10%							
	SILT (ML) - horizontal laminations, dark yellowish brown (10yr 4/6)	C	Nbn							
	ICE and SILT (ML) - trace clay, olive grey (5y 5/2)	C	ICE + 40% soil							
2	PEAT	C	Vs + Vr 5%							
	SILT (ML) - trace clay, fine laminations, olive (5y 5/3)	C	Vs 45%							
	- trace of organic specks	C	Vs 30-40%							
	- olive grey (5y 5/2)	C	Vs 30%							
		C	Nbn							
		C	Vs 5-8%							
		C	Vs 1%							
3	- dark grey (5y 4/1), horizontal laminations, trace of oxidation along bedding planes	C	Nbn							
	- trace of brown organic specks	C	Vx trace							
	- highly organic silt(3.55 to 3.65m)	C	Nbn							
4		C	Vs trace generally Nbn							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 1/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.4m

HOLE NO.  
Site 2B

SHEET  
1 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)							
				POCKET PENETROMETER (tsf)							
				1.0	2.0	3.0	4.0	5.0	6.0	7.0	
5	SILT (ML) - trace clay, dark grey (5y 4/1), vague horizontal laminations to very thinly bedded, trace of organic specks  - lost core (5.0 to 5.15m)  - trace of twigs and rootlets	C	Vs trace								
			Nbn								
		C	Vs trace								
			Nbn								
6		C									
			Nbn								
		C	Vs + Vr trace generally Nbn								
7	- grey (5y 5/1)		Nbn								
		C									
			Nbn								
		C	Vr trace in vertical frac- tures								
8	- fine horizontal laminations, some grey/brown mottling, trace of organics  - vertical layers of pale yellow (2.5y 7/4) silt		Vr 2-3%								
		C									
		C									



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 1/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 9.4m

HOLE NO.  
Site 2B  
 SHEET  
 2 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
9	SAND (SM) - medium grained, silty - light yellow brown laminations of silt	C	Vx trace							
		C								
	SILT (ML) - finely laminated, grey (5y 5/1)  - circular mottling		Nbn	Vr trace at 60° dip						
		C								
	END OF HOLE									
10										
11										
12										

	PROJECT <b>GEOTECHNICAL INVESTIGATION</b> SOUTHERN YUKON	DATE <u>1/4/78</u> LOGGED BY <u>KOS</u> ELEVATION _____ DEPTH <u>9.4m</u>	HOLE NO. Site 2B SHEET 3 of 3

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - very dark brown (10yr 2/2)	C	Vx + Vr 30%							
		C	Vs + Vr 25-30%							
		C	Vx + Vs 30-35%							
2	SILT (ML) - olive grey (5y 5/2), fine ice laminations	C	Vs 45%							
		C	Vs 35-40%							
3	SILT (ML) - very dark grey (5y 3/1) trace of twigs and other light brown organics, fine horizontal laminations  - dark grey (5y 4/1)	C	Vr + Vs 3%							
		C	Nbn							
4	- some laminations at 20° dip - trace of brown organic specks	C	Nbn							
		C	Nbn							
4	- trace of coarse sand and small wood fragments	C	Nbn							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 31/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 5.15m

HOLE NO.  
Site 2C  
 SHEET  
 1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)							
				POCKET PENETROMETER (tsf)							
				1.0	2.0	3.0	4.0	5.0	6.0	7.0	
5	SILT (ML) - dark grey (5y 4/1), trace of organics, horizontal laminations - trace of rounded fine gravel  - abundant wood chips and 2cm gravel	C	Nbn								
		C									
		C									
		C									
6	END OF HOLE - refusal on coarse gravel										
7											
8											



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 31/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 5.15m

HOLE NO.  
Site 2C  
 SHEET  
 2 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)							
				POCKET PENETROMETER (tsf)							
				1.0	2.0	3.0	4.0	5.0	6.0	7.0	
1	PEAT - woody, very dark grey brown (10yr 3/2)		Vx + Vr 10-15%								
		C									
		C									
2	PEAT and SILT (ML) - olive grey (5y 5/2), less peat with depth		Vs + Vr 15%								
		C									
3	SILT (ML) - dark grey (5y 5/1), very fine horizontal laminations		Vs + Vr 45%								
		C									
				Vs 5%							
		C									
					Nbn						
C											
4	- piece of wood		Vs + Vr 2%								
		C									
				Vs 2% Vr trace							
C											
4	SILT (ML) - trace clay and organics olive grey (5y 5/2)	C	Vs 5-8% Vr trace								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 31/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.4m

HOLE NO.  
Site 2D  
 SHEET  
 1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT (ML) - trace clay and organics, olive grey (5y 5/2), vague laminations	C	Vs 5-8% Vr trace							
		C	Vs 3-5% Vr trace							
		C	Vs 1-2% Vr trace							
6	- trace of fine gravel	C								
	GRAVEL (GM) - silty, olive grey (5y 5/2), 2cm diameter gravel	C	Nbn							
7	END OF HOLE - refusal									
8										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 31/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 6.4m

HOLE NO.  
Site 2D  
 SHEET  
 2 of 2

### SITE NOTES - Site 3

- the drill site is located on a sparsely treed slope of 1° to 2°
- a large fan of rock debris is located to the west of the site
- the surface is generally covered with minor hummocks
- the ground vegetation is mainly comprised of grasses, scattered buck brush and low shrubs
- the snow cover at the time of drilling was 50cm.





N  
V

A1522 91

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - layered, many rootlets	C	Nbn							
	SILT (ML) - some peat	C	Vs + Vx 5%							
	VOLCANIC ASH - coarse sand	C	Vs + Vx 35-40%							
	SILT (ML) - peaty, very dark greyish brown (10yr 3/2)	C	Vs + Vx 5%							
		C								
		C								
		C	Vs 45%							
		SILT (ML) - sandy, trace gravel some peat, horizontal laminations, very dark grey (10yr 3/1)	C	Vx 1%						
2		C	Vs trace							
	END OF HOLE - refusal on coarse gravel									
3										
4										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 2/4/78

LOGGED BY KOS

ELEVATION \_\_\_\_\_

DEPTH 1.4m

HOLE NO.

Site 3

SHEET

1 of 1

#### SITE NOTES - Site 4

- the drill site is located in a clearing of a moderately dense black spruce forest
- trees on the average are 10m in height
- the ground surface is hummocky with an overall site slope of 1° to 2° to the east
- the surface vegetation consists of a dense cover of grasses and scattered buck brush
- snow cover was in the order of 50cm at the time of drilling

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	PEAT - dark brown (10yr 3/3)	c	Vx trace							
	PEAT and SAND (SP) - coarse grained very dark greyish brown(2.5y 3/2)		Vc + Vs 5%							
	VOLCANIC ASH-coarse sand, white	c	Vc 5%							
	SILT and PEAT - fine horizontal laminations, very dark grey brown (10yr 5/2)	c	Vs + Vr 5%							
		c	Vs + Vr 5-10%							
1	- trace fine rounded gravel (1cm)	c	Vs 25%							
	END OF HOLE - refusal									
2										
3										
4										



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 2/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 1.15m

HOLE NO.  
Site 4  
 SHEET  
 1 of 1

SITE NOTES - Site 5A

- the drill site is located 30 metres north east of an existing pipeline right of way
- the area supports a moderate cover of 3 to 7m high black spruce
- the drill site is on a flat meander plain
- ground vegetation consists of grasses and minor shrubs
- the snow cover at the time of drilling was 50cm

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	PEAT		Nbn							
	PEAT and SILT (ML) - dark grey brown (10yr 3/2)	C	Vs + Vr 30%							
	PEAT		Vr trace							
	- lost core									
	SILT (ML) - very peaty	C	Vs 5-10%							
	- lost core, probably ICE +		ICE + ?							
1	SILT (ML) - peaty, dark grey brown (10yr 3/2)	C	Vr + Vx 15% (ice wedging ?)							
	VOLCANIC ASH - light grey, coarse sand texture	C	Vc 5%							
	PEAT and ASH	C	Nbn							
	SILT (ML) and PEAT	C	Vx + Vs 10%							
2	SILT (ML) - highly organic, laminated, olive grey (5y 5/2) and grey (5y 6/1)	C	Vx 2%							
	- very thinly bedded	C	Vs+Vx 10%							
			Vs 45%							
		C	Vs + Vr 30%							
			Vs 10%							
3	- trace of organics, laminated at 20° dip	C	Nbn							
	- 30° dip on silt/organic laminations		Vx 1%							
4	- trace of oxidation on some thin horizons	C								
	- 10° dip	C								



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 2/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 5.8m

HOLE NO.  
 Site 5A  
 SHEET  
 1 of 2

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT (ML) - as above, highly organic interbeds (10° dip), thinly laminated, olive grey (5y 6/1)	C	Vx 1%							
		C	Vs+Vr+Vx 1%							
	GRAVEL (GM) - silty, some sand	C	Nbn							
	SILT (ML) - laminated, 10-15° dip, olive grey (5y 6/1)	C	Vx trace							
6	GRAVEL and SAND (GM) - some silt, olive grey (5y 6/1), gravel to 2.5cm	C	Vc + Vx 5-8%							
	END OF HOLE - refusal									
7										
8										



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
 SOUTHERN YUKON

DATE 2/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 5.8m

HOLE NO.  
**Site 5A**  
 SHEET  
 2 of 2

SITE NOTES - Site 5

- the drill site is located in a clearing of the black spruce forest 100m to the south of a river bend
- the cut back is in the order of 5m high
- surface vegetation consists of dense grasses with scattered low bushes
- snow cover was in the order of 50 cm at the time of drilling



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT - dark brown (7.5yr 3/4) to black (7.5yr N2/)	C	Vs + Vx 10%							
	- trace silt	C								
	VOLCANIC ASH - white, coarse sand, dipping at 50°	C	Vc 5%							
	PEAT - silty	C	Vx + Vs 10%							
	SILT (ML) - peaty, very dark grey brown (2.5y 3/2)	C	Vx + Vs 10%							
		C								
2	END OF HOLE - refusal on coarse gravel									
3										
4										



	PROJECT <u>GEOTECHNICAL INVESTIGATION</u> <u>SOUTHERN YUKON</u>	DATE <u>2/4/78</u> LOGGED BY <u>KOS</u> ELEVATION _____ DEPTH <u>1.4m</u>	HOLE NO. <u>Site 5</u> SHEET <u>1</u> of <u>1</u>

## SITE NOTES - Site 6

- due to the well exposed soils on a nearby steep bank, the borehole was deleted from the program
- the proposed drill site is heavily covered with 1m high buck brush
- a dense growth of black spruce rims the clearing
- young poplar trees are scattered throughout the site area
- the terrain can best be described as a flat terrace overlooking a wide, braided river channel
- snow cover was patchy at the time of the reconnaissance landing



LOGGED EXPOSURE

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf) 						
				POCKET PENETROMETER (tsf) 						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	PEAT - many rootlets		NOT FROZEN							
1	GRAVEL and SILT (GM) - trace to some sand, vague horizontal bedding, gravel to 4cm, greyish brown (2.5y 6/2)	G								
2	SAND and GRAVEL (SP) - some cobbles, well rounded clasts									
3										
4	- same as above to bottom of cut (approximately 10m)									



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 4/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH +10m

HOLE NO.  
Site 6  
 SHEET  
1 of 1

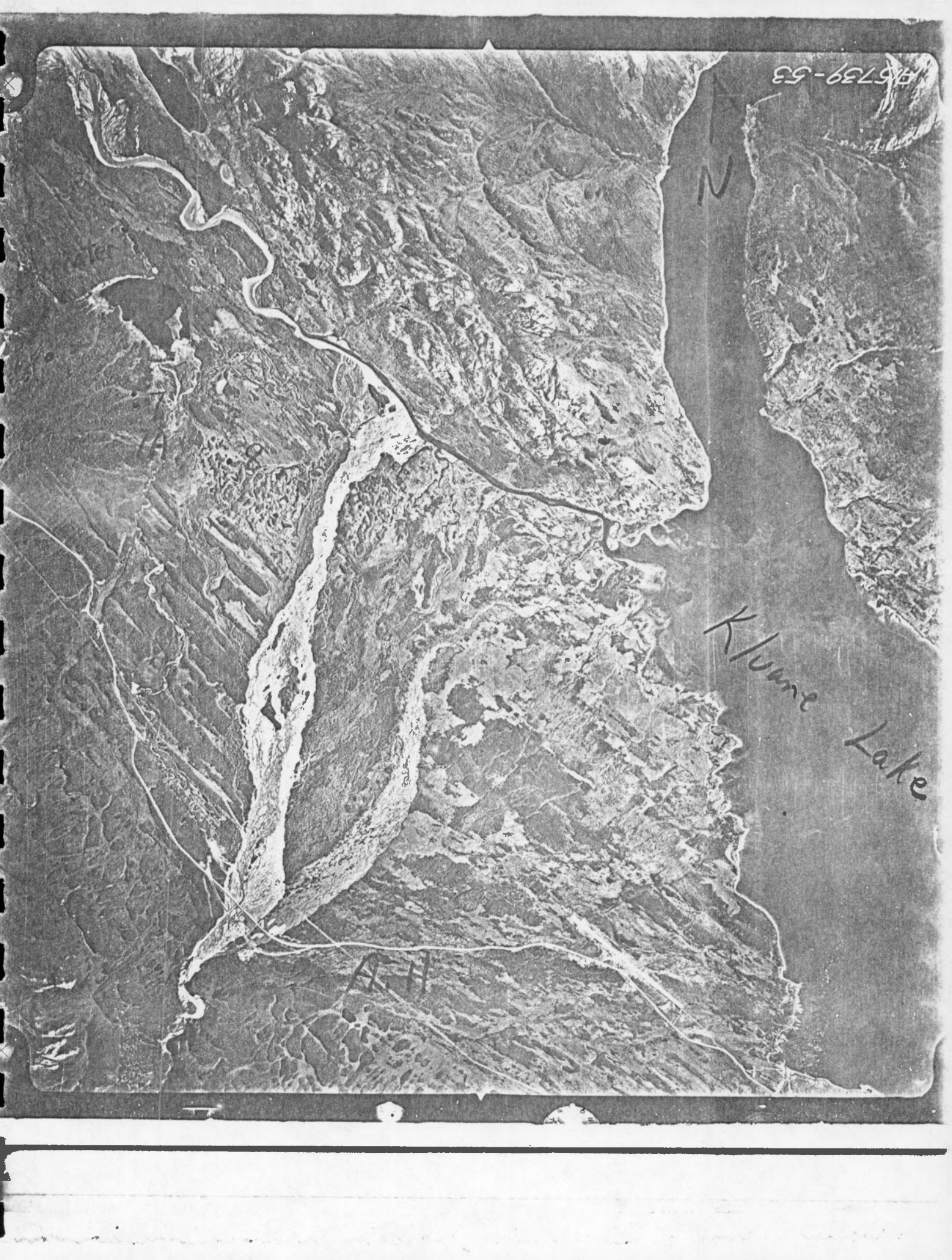
## SITE NOTES - Site 7

- the drill site is located in a clearing which appears to be related to a seasonal drainage system
- sparse 1m high spruce occur at the site
- the ground is generally grass covered with a moderate cover of low bushes
- 20m high spruce grow at the edges of the clearing
- only minor patches of snow remained at the time of drilling
- the topography is generally flat with a gradual 1° slope down to the east

965739-53

N

Kluane Lake



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT-very dark greyish brown (2.5y 3/2)	C	Nbn							
	SILT(ML)-olive grey (5y 5/2)	C								
	VOLCANIC ASH - white	C								
	PEAT	C								
	SILT(CL-ML)-clayey, olive(5y5/3)	C	Vs 1%							
	PEAT	C								
	SILT(CL-ML)-clayey, olive brown (2.5y 4/4)	C	Vs 5-10%							
	SAND(SP)-fine to coarse grained, sharp contact at top, dipping 30°	C	Nbn							
	SILT(CL-ML)-clayey, trace sand, olive grey (5y 5/2)	C	Vs 5% Vr trace							
	CLAY(CL)-silty, trace of or- ganics	C	Vs+Vr 30%							
2	SAND(SM)-silty, fine grained	C	Nbn							
	CLAY (CL)-silty	C	Vs 20%							
	SAND(SM)-silty, fine grained	C	Nbn							
	CLAY(CL-ML)-silty, horizontal laminations, trace of organics, olive(5y 5/3)to(5y 5/4)	C	Vs 5% Nbn							
	- dark grey (5y 4/2), wood fragment	C	Nbn							
3	SAND(SM)-silty, finely bedded, olive (5y 5/4)	C	Nbn							
	SAND(SP)-some gravel, coarse grained sand, trace of organics	C	Nbn							
	CLAY(CL)-trace silt, grey(5y5/1)	C	Vs trace							
	SILT(ML)-sandy, horizontal lam- inations	C	Nbn							
	SAND(SP)-coarse grained	C	Nbn							
4	CLAY(CL)	C								
	SAND (SM)-silty, some silt inter- beds, olive (5y 4/3)	C	Nbn							



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 4/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 7.7m

HOLE NO.  
Site 7  
 SHEET  
 1 of 2

SITE NOTES - Site 7A

- the drill site is located 100 metres south of a large clearing
- a dense cover of 10 metre high black spruce exists at the site
- the site is flat with a minor  $1/2^\circ$  slope down to the east
- the undergrowth was noted to be young spruce trees
- the snow was patchy at the time of drilling



# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	PEAT-dark brown (7.5yr 3/2)		Nbn							
	VOLCANIC ASH-medium grained sand texture	c	Nbn							
	PEAT-dark brown(7.5yr 3/2)									
	- clayey, dark grey brown (2.5y 3/2)	c	Nbn							
	SILT(ML)-clayey		Vs+Vr 40%							
	SILT(ML)-trace clay and sand, horizontal laminations, olive grey (5y 5/2), trace of organics	c	Vs 5%							
	CLAY(CL-ML)-silty, olive grey (5y 4/2)	c	Vs 5%							
2	SILT(ML)-sandy, fine grained, trace clay, olive grey(5y4/2), trace organics									
	- trace of medium sand	c	Nbn							
	- very coarse (no recovery)									
3	CLAY(CL-ML)-silty, some coarse sand interbeds, fine horizontal laminations, trace organics	c	Nbn, Vs trace							
	SAND and GRAVEL(SP)-fine gravel medium coarse sand, well rounded clasts	c	Nbn							
	END OF HOLE-refusal on coarse gravel									
4										



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
**SOUTHERN YUKON**

---



---

DATE 4/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 3.0m

HOLE NO.  
**Site 7A**

---

SHEET  
 1 of 1

#### SITE NOTES - Site 8

- the drill site is located in a fen area
- the clearing is roughly circular and grass covered
- a dense cover of 2m high buck brush covers the low lying area
- an elevated plateau 50 metres to the east supports a dense growth of 8 metre high black spruce
- the snow cover at the time of drilling was patchy

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	ORGANICS - rootlets		Nbn							
	SILT (ML)-highly organic,dark olive grey (5y 3/2)	C	Vx + Vs 15%							
	CLAY (CL)-trace of silt,olive grey (5y 5/2),horizontal laminations		Vs 30-40%							
		C	Vs 25%							
	SILT (ML)-trace of fine sand,thinly laminated,light olive brown (2.5y 5/4),trace of organics	C	Nbn							
	SILT(ML) and CLAY(CL)-finely interbedded									
	- sampled silt	C	Vs 5%							
2	CLAY(CL)-dark grey(2.5y N4/)	G	NOT FROZEN	▲	●	▲				
	SILT (ML) - very soft and wet, dark grey (5y 4/1),turning to very dark grey (5y 5/1) below 3m									
		G								
3		G								
4		G								



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
SOUTHERN YUKON

DATE 4/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 7.8m

HOLE NO.  
**Site 8**  
 SHEET  
 1 of 2

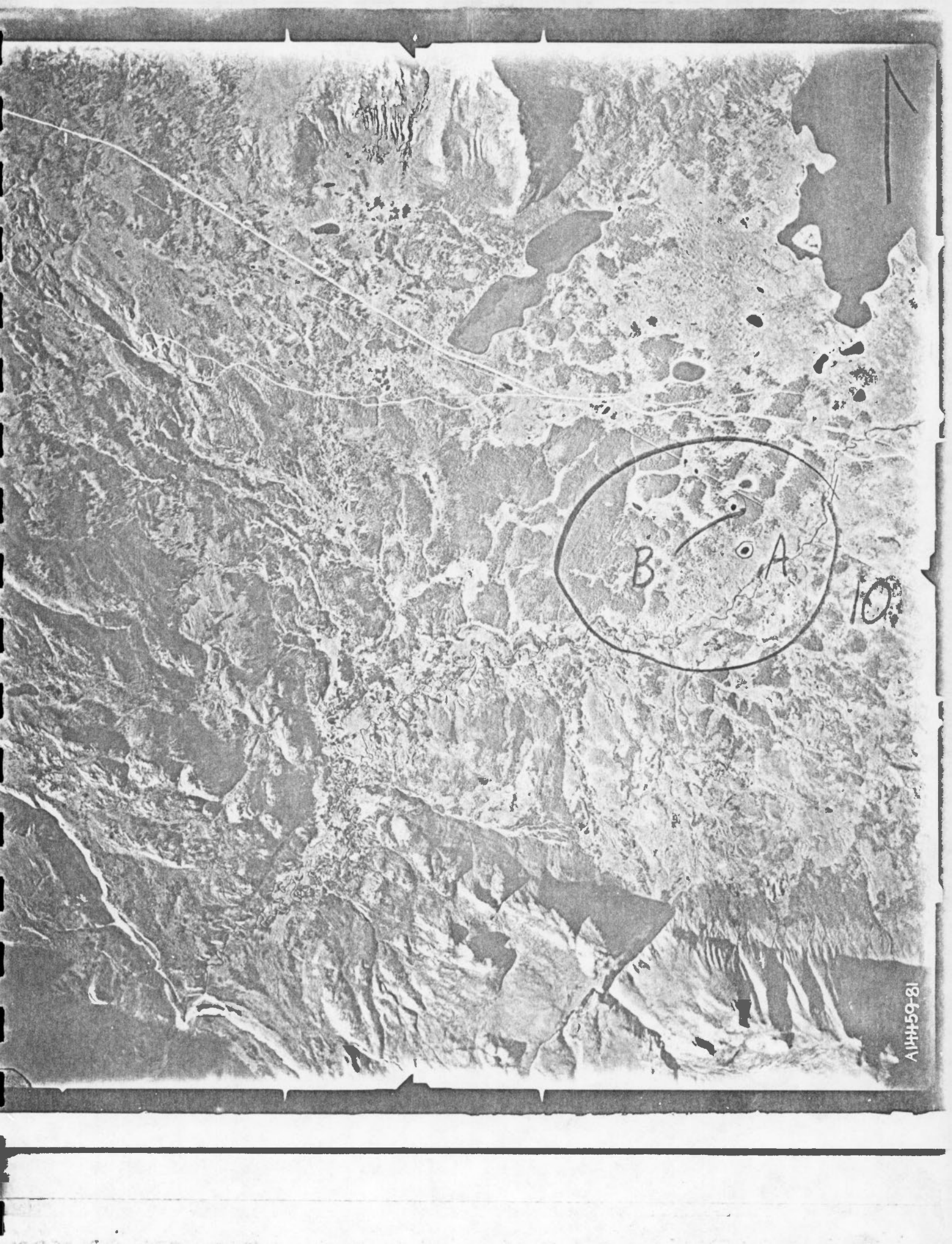
# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
5	SILT (ML) - very soft and wet, very dark grey (5y 5/1)		NOT FROZEN							
	- trace clay and sand, very slight trace of gravel	G								
6	SAND (SM) - medium grained, silty, very wet, very dark grey(5y 5/1)	G								
	SILT (ML) - trace of sand and fine gravel, very soft and wet, very dark grey (5y 5/1)	G								
7	- clayey below 6.5m	G								
		G								
8	END OF HOLE - severe sloughing conditions	G								

	PROJECT <u>GEOTECHNICAL INVESTIGATION</u> <u>SOUTHERN YUKON</u>	DATE <u>4/4/78</u>	HOLE NO.
		LOGGED BY <u>KOS</u>	Site 8
	ELEVATION _____	DEPTH <u>7.8m</u>	SHEET
			2 of 2

## SITE NOTES - Site 10

- the drill site at Site 10A is located in an open grassy area which gently sloped to the south east
  - sparsely scattered black and white spruce occur in this area
  - 1 metre of snow cover existed at the time of drilling
  - the surrounding terrain is very gently undulating
- 
- Site 10B is located in a flat area which supports a moderate density of white and black spruce
  - the ground vegetation consists of mainly scattered buck brush and dense grass
  - the terrain is generally flat to slightly sloping to the east
  - snow cover was in the order of 1 metre at the time of drilling



B

A

10

A114459-81

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
1	TOPSOIL - rootlets, etc., very dark brown (10yr 2/2)	C	Nbn							
	SILT(ML) - trace of 2cm rounded gravel, olive (5y 5/3), massive - very gravelly (0.5 to 0.8m)	C								
		C	Vs trace							
		C								
2	- trace of laminations at 1.5m to 1.7m - gravelly (fine grained, 1cm)	C	NOT FROZEN							
		G								
		G								
3	- trace clay, some gravel to 3cm diameter	G								
	- very coarse gravel (4 to 5cm)	G								
4	END OF HOLE - refusal									



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 29/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 2.9m

HOLE NO.  
Site 10A  
 SHEET  
1 of 1

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)							
				POCKET PENETROMETER (tsf)							
				1.0	2.0	3.0	4.0	5.0	6.0	7.0	
1	TOPSOIL-greyish brown(2.5y 5/2)	C	Nbn								
	SILT (CL-ML) - clayey, trace fine gravel, massive, olive(5y 5/3)										
	- trace of organics to 0.5m	C									
		C									
	- gravelly (to 3cm diameter)	C									
	- trace of fine laminations at 1m	C									
2	- very dry		Nf								
		C									
	- trace of medium brown organics										
	- very coarse gravel (to 4cm)										
	- dry and crumbly										
		G									
3	END OF HOLE - refusal										
4											



PROJECT  
GEOTECHNICAL INVESTIGATION  
SOUTHERN YUKON

DATE 29/3/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 2.4m

HOLE NO.  
Site 10B  
 SHEET  
 1 of 1



## SITE NOTES - Site 11

- the drill site is located at the edge of a wide treeless drainage course
- local relief consists of gently undulating hills which are in the order of 3 to 5m high
- the site area supports a moderately dense growth of black spruce which attain heights of 10m or more
- the ground vegetation is comprised of scattered shrubs and grass tussocks
- snow cover at the time of drilling was approximately 50cm



A12069-287

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)						
				POCKET PENETROMETER (tsf)						
				1.0	2.0	3.0	4.0	5.0	6.0	7.0
	TOP SOIL									
	SILT (ML)-highly organic	C	Vs + Vr 5%							
	VOLCANIC ASH - white	C	Vx + Vc 10%							
	PEAT		Vs 25%							
	SILT (ML) - fine laminations, dark greyish brown(2.5y 3/2)	C								
	VOLCANIC ASH-coarse sand texture	C	Vc 5%							
	SILT (ML) - highly organic,very dark greyish brown(2.5y 3/2)	C	Vs 15%							
1			Vs + Vr 40%							
	- many twigs		Vs + Vr 40%							
	- trace of 10° dipping lam- inations	C								
	- very dark brown(7.5yr 3/2)	C	Nbn							
2	SILT (ML) - sandy, trace fine gravel, olive grey (5y 5/2) to dark grey (5y 4/1)	C	Vs 5%							
	- coarse sand interbed	C	Vs trace							
	- fine gravel interbed	C	Vs trace							
	- thin horizontal bedding	C	Vs + Vr 20%							
3	- olive grey (5y 5/2)		Vs + Vr 45%							
		C								
4	END OF HOLE - refusal on coarse gravel									



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
SOUTHERN YUKON

DATE 3/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 3.5m

HOLE NO.  
**Site 11**  
 SHEET  
 1 of 1

#### SITE NOTES - Site 12

- Site 12 is located at the 2,600 ft. elevation on the west slope of the valley
- the overall slope is very gradual ( $1^{\circ}$ ) down to the river in the north east
- local topography is slightly rolling
- the drill site was located on a 50m wide, flat wooded plateau which rises 2 metres above the surrounding terrain
- tree cover consists of a scattered to moderate density of black spruce
- snow cover at the time of drilling was in the range of 40 to 50cm

NOTE - Site 13 was deleted from the drilling program due to a lack of adequate landing sites. The site area however was noted to exhibit many bedrock outcrops.

# BOREHOLE LOG PERMAFROST REGION

DEPTH ( m )	SOIL DESCRIPTION	SAMPLE	GROUND ICE CONDITION	POCKET VANE SHEAR (tsf)												
				POCKET PENETROMETER (tsf)												
				1.0	2.0	3.0	4.0	5.0	6.0	7.0						
1	PEAT-dark grey brown(2.5y 3/2)	C	Vs + Vx 5%													
	VOLCANIC ASH - medium to coarse sand texture, light grey (5y 7/2)		Vc 10-15%													
		C														
		C														
	PEAT - dark grey brown(2.5y 3/2)	C	Nbn													
	SILT(ML)-light grey(5y 6/1) PEAT - black (7.5yr N2/)		Vs 5% Vx trace													
		C														
2	END OF HOLE - refusal on coarse gravel															
3																
4																



PROJECT  
**GEOTECHNICAL INVESTIGATION**  
 SOUTHERN YUKON

DATE 3/4/78  
 LOGGED BY KOS  
 ELEVATION \_\_\_\_\_  
 DEPTH 1.7m

HOLE NO.  
**Site 12**  
 SHEET  
 1 of 1

