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ELDORADO NUCLEAR LIMITED Exploration Division

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PROJECT 508 NORTHEASTERN ALBERTA REPORT ON WINTER EXPLORATION - 1979 -VOLUME 1 TEXT AND APPENDICES



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DISPOSITION MAINTENANCE

The third term of Alberta Quartz Mineral Exploration Permits 207 and 214 to 218 (inclusive) expired in early 1979. As stated in the Quartz Mining Regulations (Alberta Regulation 377/67), the permittee has the right to apply for a lease of quartz minerals for lands contained in the permits.

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It was decided to continue exploration in the area, but the land holdings were considerably reduced before applying for leases. In late 1978, the option on Permit 207 was not exercised by Eldorado Nuclear Limited, and the permit was returned to its original owners (Ram Petroleums Limited and Vipond Oil and Gas International Limited). Following an evaluation of the economic potential of the remaining property, a large portion of these lands, which lies south of the Athabasca Formation, was considered to be of little geologic value, and this land was dropped before applying for leases.

Leases on the remaining lands were applied for and partially granted. The reviewing committee determined that portions of those areas had not been substantially evaluated by Eldorado, and exploration rights to these lands have been denied. The validity of this decision is being questioned in order to obtain these lands. Figure 2 illustrates the land distribution in Project 508 as it now stands.

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1. J.

LEGEND

LEASES GRANTED, FEB. 2, 1979

e

LEASES REFUSED

ALLOWED TO LAPSE, FEB. 2, 1979
OPTION REFUSED, OCT., 1978

FIGURE 2

ELDORADO NUCLEAR LIMITED

PROJECT 508

DISPOSITIONS

SCALE I" = 2 MILES

Table I summarizes the land position in Project 508.

TABLE I - PROPERTY, TENURE AND FEES

Permit #	Date Issued	Present Acreage	Annual Rental			
214	February 2, 79	30,080	\$ 7,520			
215		30,720	\$ 7,680			
216		5,120	\$ 1,280			
217	10	3,200	\$ 800			
218		3,520	\$ 880			
TOTAL:		72,640	\$18,160			

Leases: Term - 21 years (renewable) Rental - 25¢/acre/year for first five years - \$1.00/acre/year for balance of term

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Note: Regulations are presently under review and subject to change.



REVIEW OF PREVIOUS WORK (1975-1978)

Eldorado Nuclear Limited has been engaged in uranium exploration in the Project 508 area since May, 1975. Discoveries at Rabbit Lake, Cluff Lake, Key Lake and Maurice Bay have proven the unconformity between the Athabasca Formation and underlying basement rocks to be a favourable target for uranium exploration.

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Originally, the project consisted of three permits, (185, 186 and 187). These were dropped in 1976 and an additional five permits (214 to 218) were granted. Permit 207 was obtained from Ram Petroleum Limited/Vipond Oil and Gas International Limited in 1977.

The search area is along the geologically favourable SW edge of the Athabasca Formation sandstone. Except for some granitic outcrops in and near the SW part of the Project area, there are no other outcrops in the area. The glacial overburden is thick, often in excess of 30 meters. Uncertainty regarding the actual location of the edge of the Athabasca Formation has been a major problem since the inception of the exploration program. In 1974, it was thought that this edge, which marks the unconformity between the Athabasca sandstone and Pre-Cambrian basement, lies along the NE boundary of Permit 185.

Field work during 1975 indicated that this edge is much farther toward the SW, between Maybelle and Richardson Rivers. Subsequently, five additional permits (nos. 214 to 218) were obtained in the Richardson River area and these make up the project area. The Winter Drilling Programs, 1976-1977 and 1978, were carried out to test this, assumption, and the results indicate that the edge of the Athabasca Formation is within the Permits 214, 215 and 216.

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The exact shape and location of the edge is by no means yet certain, and can only be determined by further work. The former Permits 185, 186 and 187 were found to be underlain entirely by thick (125m) Athabasca Formation sandstone, which, in turn, is partly overlain by remnants of calcereous Devonian mud- and sandstone.

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Aside from the above, summer exploration (1975, 1976 and 1977) involved various regional surveys. These included regional sediment, water and muskeg geochemistry, semi-detailed soil sampling, radiometric prospecting, outcrop geology and boulder mapping. The 1975 work was done on the Permits 185, 186 and 187, and in adjacent areas. The 1976 and 1977 work was done on the Permits 214 to 218, and in the areas adjacent to these; this work was more productive since it outlined several water and sediment geochemical anomalies by the end of summer 1976. A geochemical muskeg sampling program was started in late 1976 and continued in 1977.

Several grids have been cut on the property. Soil sampling and ground geophysical surveys have accounted for the bulk of the work in the area. Mapping of granitic outcrop in the southern portion of the permits was completed in 1976.

An airborne INPUT-EM and magnetometer survey in 1977 indicated a number of bedrock EM conductors in the area. Ground geophysics (Turam, horizontal loop, magnetometer and EM-16) and diamond drilling in winter, 1978 followed up these anomalies. Drilling intersected some graphitic zones. The edge of the Athabasca Formation and a deep alteration zone encountered during the 1976-1977 drilling were also tested.

The 1978 summer programme involved further follow-up of airborne conductors (Questor Zone 14) by horizontal loop EM. None were detected, and it was concluded that the airborne response was due to surficial phenomena.

Resistivity was run over a long line parallel to the assumed edge of the Athabasca sandstone. One structure has been interpreted from the data. Several broad lows were encountered; these are explained as layering effect caused by the Devonian sediments overlying the Athabasca.

In addition, resistivity and magnetometer surveys were carried out to define the alteration zone encountered in the DDH 2 area. This zone does not have any resistivity response where tested. The magnetometer data confirms a broad magnetic low trending E-W across the grid (seen in the airborne).

In the fall of 1978, Turam and magnetometer surveys were run over Grid E on Permit 214, with the intent of identifying bedrock structures or an extension of the graphitic horizon encountered in the 1978 diamond drilling near Esker Lakes (Grid B). One bedrock source conductor and another zone, possibly due to surficial features were interpreted from the Turam data. The magnetomter data confirms airborne trends. Diamond drilling was recommended to test the Turam zones.

Complete reports concerning previous work in the area are on file.

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OBJECTIVES OF THE WINTER PROGRAMME, 1979

The objectives of the winter diamond drilling programme were two-fold:

- 1 to pursue geophysical targets interpreted
 from the summer and fall, 1978 field work,
 and
- 2 stratigraphic drilling to better locate the edge of the Athabasca Formation and possibly any offsets related to it.

One probable bedrock-source conductor was defined by the Turam survey in fall, 1978, on Grid "E", southeast of Muddy Lake. The response was interpreted to be related to a graphitic zone. Graphite had been verified by diamond drilling to the south, near Esker Lakes. The conductive zone detected by the Turam and the graphite in the drilling both lie along the flanks of a magnetic high; it was believed that the Turam response might be an extension of this zone. Since graphitic zones immediately beneath the Helikian unconformity are associated with most of the uranium deposits in the Athabasca Basin, this area became a potential drill target; it is the first indication of graphite below the sandstone on the property. A minor amount of ground geophysics (Max-Min II, VLF-EM 16) was run to help establish drill hole locations.

A second conductive zone, source possibly surficial, was also suggested from the Turam data. This zone was followed up with geophysics and if determined to be due to bedrock, would be tested with diamond drilling.

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One fault was interpreted from the resistivity survey completed in the summer of 1978. Diamond drilling was planned to evaluate this feature.

The final phase of diamond drilling consisted of stratigraphic drilling along the assumed edge of the Athabasca sandstone. It was believed that, should any major offset in the sandstone exist, it could be established by this phase of the programme.

In addition to the diamond drilling, an airphoto interpretation of the surficial geology and bedrock structures was done. It is intended that the results of this work might lead us to areas of thin overburden cover of local origin, where prospecting and geochemistry could be used practically.

The ground magnetometer survey that was delayed in the fall due to unfavourable magnetic activity, was completed during the winter programme.

Refer to Table II for the distribution of work performed during winter, 1979.



DISTRIBUTION OF ACTIVITIES

The following table summarizes the work completed during the 1979 winter field programme.

TABLE II - DISTRIBUTION OF ACTIVITIES

						[1] A. M.
Activity	Permit 214	Permit 215	Permit 216	Permit 217	Permit 218	TOTAL
Diamond Drilling	886.63m	540.38m				1427.01m
Magnetometer	26.80 km		_			26.80 km
Max-Min II	4.28 km					4.28 km
VLF EM-16	4.40 km			·		4.40 km
Level Survey	10.18 km	12.50 km	· · · · · · · · · · · · · · · · · · ·			22.68 km
Linecutting	0.75 km	2.75 km				3.50 km

Refer to Figure 3 for location of drill holes and line grids.

SUMMARY

Geophysical anomalies (Turam, resistivity) were tested with diamond drilling. The Turam response was determined to be related to the incompetent (possibly faulted) contact between the Devonian and Athabasca Formations. The resistivity low is believed to be associated with a fault in the Devonian sediments. Neither are considered of economic importance.

Drilling indicates that the Devonian capping over the rocks of the Athabasca Formation is ubiquitous. In addition, data from drill holes does not suggest that any of the till is of local origin, due to the excessive thicknesses encountered. This is not in agreement with the interpretations of surficial geology, but is more reliable as it is factual information.

No interesting radioactivity was encountered in the drilling. The weak intersections that were detected in the Pre-Cambrian basement have a high thorium content and are not considered important.

With all known geophysical targets exhausted, and the added complexity to exploration due to the presence of Devonian sediments, only very expensive exploration methods can be applied to evaluate the area. There has been little to no encouragement from the results to date and the search area is still very large. Serious consideration should be given to the continuation of exploration activities in Project 508.

LOCATION AND ACCESS

Project 508 is located in N.E. Alberta, within the S.W. edge of the Pre-Cambrian Shield. The permits lie along the edge of the geologically favourable Athabasca Formation (Figure 1).

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Access to the project area is restricted to fixed wing or rotary aircraft. A winter road passes the Richardson airstrip, about 20 km WSW of the base camp. Uranium City (225 km north) and Fort McMurray (145 km south) serve as supply depots. Elevation control on drill hole collars was provided through the level survey. Where this was not practical, an aneroid barometer was used. Several of the holes drilled in 1976-1978 were also surveyed this winter.

All drill holes were probed radiometrically.

DISCUSSION AND INTERPRETATION

Turam Conductor - Probable Bedrock Source

Horizontal loop EM (Max-Min II) and VLF EM-16 surveys were conducted over the area of Grid "E" where the Turam response was interpreted to be bedrock-related (Figures 4 to 11). After the lines were initially run with a 250-meter cable, line 138+00N was determined to have best defined the anomaly (Figure 7), and was redone with a 50-meter coil separation. The flat character of these profiles (Figure 8) suggests a deep (in excess of 25 metres) source, in support of the Turam data. The Max-Min II indicates a westerly dip. (It should be noted that the quadrature response may be unreliable, as this phase was at times intermittent.) The conductive zone showed no response to the EM-16 (Figure 11).

Unfavourable ground conditions were consistently encountered in attempts to drill off the anomaly, and all holes were prematurely abandoned. Figure 12 illustrates the results. Overburden in the area is thick (55m±). The stratigraphic sequence is Devonian sediments, overlying Athabasca Formation sandstone, in turn underlain by altered Pre-Cambrian basement. No radioactivity was encountered. Refer to Appendix A for detailed drill logs and downhole radiometric profiles of the drilling on this anomaly.

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The Devonian sediments are generally mudstone in this area. Sand content increases towards the bottom of the section; the contact with the underlying Athabasca Formation is gradational. The rock is very incompetent, and a large percentage of core was lost. Incompetency at the overburden/bedrock contact is probably due to surface weathering effects. The unconformity between the Devonian and Athabasca Formations is another area of poor core recovery. Also, sand in-flow was encountered, indicating the presence of an open channelway. The dip of the unconformity is 15[°] west.

Athabasca sediments are mainly sandstone. An intensely hematitized red siltstone (?) is contained within the unit, near the base. (This feature was also noted in DDH's 508-14 and 508-26.) There are two intervals within the sandstone in DDH 508-34 where considerable core was lost. However, there is no geologic evidence (alteration, gouge) in the core that would suggest faulting.

The altered Pre-Cambrian rocks are gneissic in nature. Hematitization and kaolinization are the major alterations encountered. One well defined structure is marked by 5cm of gouge; the angle of intersection is 45° to the core axis; vertical depth is 158.5m. Fresh basement rock was not penetrated. No anomalous radioactivity was encountered.

Under ideal conditions, the vertical depth penetration of the Max-Min II survey would be 125 metres (when using a 250-meter cable). Since the Athabasca unconformity is at a vertical depth of about 150 metres, the possibility that the geophysical response from the Turam and Max-Min II surveys is due to graphitic zones in the

Pre-Cambrian basement must be ruled out. Also, the flat profiles from the 50-meter coil separation (Figure 11) present a good case against a surficial source.

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The unconformity between the Devonian and Athabasca Formations is approximately 80 meters below This contact is very incompetent (evidenced by surface. broken and lost core) and has at least one seam of unconsolidated sand just above it. There is a good possibility that this surface may be faulted in this area. The dip (15° W) agrees with the interpretation from the Max-Min II data. It is therefore concluded that the unconformity between the Devonian and Athabasca Formations is the source of the anomalies detected by the geophysical surveys.

This, of course, does not rule out the possibility of graphitic zones in the basement. If any do exist, they are not in range of the geophysical methods applied, and most probably do not extend up into the sandstone. Unfortunately, DDH 508-34 had to be abandoned before the basement rocks could be suitably penetrated.

Turam Conductor - Possible Bedrock Source

A second conductive zone was detected by the Turam survey on Grid "E", along the east shore of Little Muddy Lake. Response was very weak, and suggested the source may be surficial. Max-Min II and VLF EM-16 surveys were carried out over this zone.

The profiles (Figures 13 to 15) do not suggest any conductor, and the area was considered to be unimportant. No further work was done.

Resistivity Low - Line 100+00N/80+50W

One fault was interpreted from the resistivity survey conducted in 1978, along a line parallel to the assumed edge of the Athabasca Formation. Diamond drilling was carried out in order to determine the source of the anomaly. The results are illustrated in Figure 16. Refer to Appendix A for a detailed log of the core and radiometric profile of DDH 508-41.

Overburden is underlain by a very thick (72 metres) section of Devonian sediments, much more than was expected. The sequence continues through Athabasca sandstone and then into Pre-Cambrian basement rocks.

As seen from the detailed log, the Devonian sediments are quite variable. Mudstone ranges from the grey, in part sandy rock typical of the unit to a black, organic-rich (?) member, as well as blue-grey and red (hematitic) portions. Minor limestone is included in the sequence. Athabasca sandstone is very consistent throughout until it nears the unconformity, where large quartz clasts become intermixed. Altered (hematitization, minor kaolinization) Pre-Cambrian gneisses follow the sandstone. Weak radioactivity was encountered in the altered basement rocks.

Minor sections of gouge (up to 2cm wide) are present in both the mudstone and the sandstone. However, the most prominent feature is a zone of black, gritty, solidified gouge in the Devonian sediments. This zone is about 6 metres wide; recovery is poor (11%). The gouge is made up of 60-70% medium to coarse grained sand in a black, muddy matrix. A fault is interpreted; vertical depth is 45m[±]. This feature is believed to be the source of the resistivity response.

Stratigraphic Drilling

All the drilling, in combination with that done in 1976 to 1978, has been useful in providing a clearer picture of the stratigraphy in Project 508, and especially the position of the edge of the favourable Athabasca Formation, which is known to subcrop on the property. Appendix A contains the detailed drill logs and radiometric profiles of the work performed during the winter of 1979; Figures 17 to 22 (inclusive) illustrate the results.

Table III presents a very brief summary of the information obtained from diamond drilling. This data was used to develop isopach and contour maps of the thicknesses and surfaces of the units that make up the stratigraphic sequence in the area (Figures 23 to 26).

Overburden cover is generally quite thick, locally in excess of 68 metres. Muskeg covers a large portion of the property. Generally, the cover is composed of fine sand and boulders; boulder content is quite variable. The boulders are comprised of all lithologies encountered in the stratigraphic sequence. Figure 23 shows the varying thickness of the overburden cover in the project area.

Devonian sediments are predominantly mudstone, with some minor limestone and siltstone. In addition, a very coarse-grained, gritty sandstone (?) was encountered in DDH's 508-36 and 508-37, in the northeast corner of Permit 215. This rock unit lies at the base of the formation, and has not been seen in previous drilling. Figure 24 illustrates the distribution of Devonian sediments across the property. The general strike of formation is northwest.

TABLE III - DIAMOND DRILL HOLE DATA

DDH	COLLAR ELEV.	OVERBURDEN THICKNESS	TOP OF DEVONIAN	DEVONIAN THICKNESS	TOP OF ATHABASCA	ATHABASCA THICKNESS	TOP OF PRE-CAM.	REMARKS
508-1	-61.1	39.6					-100.7	
508-2	-45.9	27.7					-73.6	
508-3	-45.9	18.2	- 				-64.1	
508-4	-17.8	49.4			-67.4	territor and territor		Abandoned
508-5	-39.2	32.0	-71.2	45.7	-116.9	3.4	-120.3	
508-6	-38.5	49.0	-87.5	31.7	-119.2	17.9	-137.1	
508-7	-53.3	23.2	-76.5	10.6			-87.1	
508-8	-42.8	13.7	-56.5	>43.3				Abandoned in Devonian
508-9	-65.7	27.7	-93.4	5.5	-98.9	100.2	-199.1	
508-10	-73.3	36.9	-110.2	47.1	-157.3	>34		Abandoned in Athabasca F.
508-11	-70.2	>68.3						Abandoned in overburden
508-12								N/A
508-13	+36.4	36.6	-0.2	>29.8				Abandoned in Devonian
508-14	+2.9	59.7	-56.8	8.0	-64.8	64.3	-129.1	
508-15	-42.8	51.8	and the second				-94.6	
508-16	-15.3	33.5			-48.8	>139.6		Abandoned in Athabasca F.

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Note: All depths and thicknesses in meters; resolved to vertical. Datum elevation = 0.0 metres: Little Muddy Lake.

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TABLE III (Cont'd) - DIAMOND DRILL HOLE DATA

DDH	COLLAP ELEV.	R OVERBUR	DEN TOP OF SS DEVONIAN	DEVONIAN THICKNESS	TOP OF ATHABASCA	ATHABASCA THICKNESS	TOP OF PRE-CAM.	REMARKS
508-17	-88.5	21.9			ann an	Contraction of the second seco		
508-18	-79.4	26.5	-105.9	9.3			-115 0	
508-19	-61.1	15.8		i sa Pilan. Ngan anan an	-76.9	156 7	-775.5	
508-20	-67.2	19.8				130.7	-233.6	
508-21	-70.2	14.7					-87.0	
508-22	-15.4	28.7			••••••••••••••••••••••••••••••••••••••		-84.9	
508-23	-21.5	26.3					-44.1	
508-24	-12.3	18 5					-47.8	
508-25	-20 0	30.0					-60.8	
500-25	-23.0	20.4		and a state of the second s			-50.2	
500-20	-2.0	36.6	-38.6	15.5	-54.1	34.8	-88.9	
508-27	-45.9	22.4	•••••••••••••••••	ter	a di anti anti anti anti anti anti anti ant		-68.3	
508-28	-45.9	23.5	Same and the second	Constant for the case			-69.4	
508-29	-45.9	31.4				References in the second se	-77 3	
508-30	+8.3	Refer to	508-34					
508-31	+11.6	Refer to	508-34					
508-32	+17.6	45.1	-27.5	>49.1				Abandone

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Abandoned in Devonian

Note: All depths and thicknesses in meters; resolved to vertical. Datum elevation = 0.0 metres: Little Muddy Lake. TABLE III (Cont'd) - DIAMOND DRILL HOLE DATA

DDH	COLLAR ELEV.	OVERBURDEN THICKNESS	TOP OF DEVONIAN	DEVONIAN THICKNESS	TOP OF ATHABASCA	ATHABASCA THICKNESS	TOP OF PRE-CAM.	REMARKS
508-33	-9.9	42.6	-52.5	. 9.9	-62.4	15.2	-77.6	
508-34	+12.0	54.9	-42.9	21.9	-64.8	71.1	-135.9	
508-35	-15.7	52.0	-67.7	28.0	-95.7	4.9	-100.6	
508-36	-15.0	35.7	-50.7	58.5	-109.2	16.1	-125.3	
508-37	-10.5	57.9	-68.4	29.0	-97.4	26.4	-123.8	
508-38	-3.8	64.0		•			-67.8	
508-39	+62.5	Refer to 508.	-41					
508-40	+62.5	64.2	-1.7	17.7	-19.4	5.5	-24.9	
508-41	-17.3	37.1	-54.4	68.5	-122.9	23.9	-146.8	
508-42	-25.9	>64.6		1				Abandoned

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Abandoned in overburden

Note: All depths and thicknesses in meters; resolved to vertical. Datum elevation = 0.0 metres: Little Muddy Lake.

Rocks of the Athabasca Formation underlie the Devonian sediments; the strike of the unit is the same as the strike of the Devonian (Figure 25). The Athabasca is predominantly fine-grained quartz sandstone, locally hematitic. A red siltstone layer, which lies just above the unconformity with the Pre-Cambrian basement, is present in the central portion of the property. The thickness of the Athabasca Formation was fairly predictable over the course of the drilling programme, suggesting the absence of any major offsets in the unit.

Altered gneisses make up the bulk of the Pre-Cambrian rocks which underlie the sediments. Hematitization is pervasive, and kaolinization is encountered in the fractured and broken-up sections. Chloritization is a local feature. The altered gneisses grade into fresh granitic to mafic-rich gneisses. Minor granite and pegmatite, as well as crosscutting basic dykes are also present. Figure 26 shows the depth to the top of the Pre-Cambrian basement. The topographic control of the old paleo-surface on the distribution of overlying sediments is obvious.

Uranium Mineralization

No economic uranium was intersected in the drilling. Several local highs (2-3x background) were detected in DDH's 508-37 and 508-41; all are in the Pre-Cambrian basement. Assay values are below 10 ppm U in every case. In all cases, the thorium content is much higher than uranium. Refer to drill hole logs (Appendix A) for details.

Occurrences such as this are not uncommon in the basement rocks underlying the Athabasca Formation, and it was not felt that they were significant due to the low response and the lack of apparent structural control.

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Magnetometer Survey

The ground magnetometer survey on Grid "E" was completed during the winter programme. Response supports the airborne data, indicating a magnetic high in the northeast portion of the grid and flat response to the west.

No follow-up work was considered. The results are illustrated in Figure 27.

EVALUATION OF AIRPHOTO INTERPRETATION OF SURFACE GEOLOGY

Diamond drilling in 1976-1977 indicated that surficial cover in Project 508 was considerably thick, therefore, the reliability of prospecting and soil geochemistry would probably be suspect. An understanding of pleistocene conditions was necessary in order to pursue a practical ground exploration programme.

The following studies of surficial conditions in Project 508, based on airphotographs, have been completed:

- Surficial Geology, Project 508, Alberta; March 1978, L.A. Bayrock, Bayrock Surficial Geology, and
- Photo-Interpretation of Transport Conditions and Bedrock Geology, Project 508, Alberta; March, 1979; H.A. Lee, Lee Geo-Indicators Limited.

The latter study was more involved; it included an interpretation of subcrop geology as well as structures. This aspect will be dealt with further on. The study of pleistocene conditions was aimed at outlining areas where the overburden might be of local derivation, i.e. not far from its source. These would be the most favourable areas to apply detailed prospecting and standard geochemical techniques, as the results would be most likely to reflect bedrock conditions.

- 22 -

From the results of these studies, it is apparent that a very large portion of the project area is overlain by Cree Lake end moraine and outwash sands derived from it. As this material is far travelled, and of considerable thickness (known from diamond drilling), radiometric and geochemical methods are not reliable techniques. Both Bayrock and Lee have indicated some areas where the till is interpreted to be of local origin, well removed from areas of known outcrop (refer to Figure 28).

The only area where the two opinions seem to agree is in Permit 215, WNW of Muddy Lake. There is overlap in four small zones both have interpreted to be till of local origin. Diamond drilling results across Permit 215 suggest a considerable thickness of overburden cover over most of the permit area (as indicated on Figure 28). Based on this information, it would seem unlikely that the till could be of local origin and bedrock near surface, as suggested by these interpretations. In addition to this, Devonian sediments of considerable thickness overlie the Athabasca Formation. Consequently, if the till in these areas was local, it would be of Devonian origin, and ground-truth follow-up would not be recommended. There are no radioactive occurrences in the Devonian Formation in Alberta known to the author.

Similarly on Permit 214, factual data from diamond drilling presents the same argument against the area suggested by Bayrock to be locally derived. Data in the southeast corner of Permit 214 is more removed from the areas Lee has suggested as local. However, glacial cover is rather thick, and in the northeast, is underlain by Devonian sediments. In addition, these areas lie south of the edge of the Athabasca sandstone, as determined by the diamond drilling results.

- 23 -

Finally, in Permit 216, areas of till of possible local derivation are present along the southwest and northern boundaries of the permit. Diamond drilling near Labour Day Lake does not suggest the glacial cover is thinning out. This land was dropped in early 1979 as it was determined to lie well away from the edge of the sandstone. The northeast corner of Permit 216 is believed to be underlain by Athabasca sandstone. However, drilling (DDH's 508-10, 11) suggest thick overburden and Devonian cover. The possibility of local till in this area is weak. The application for exploration rights to this portion of the property was not granted by the Alberta government.

EVALUATION OF AIRPHOTO INTERPRETATION OF SUBCROP GEOLOGY AND STRUCTURES

Structural conditions and subcrop geology in the Project 508 area have always been in question due to:

- 1 lack of outcrop,
- 2 excessively thick overburden cover, and
- 3 wide spacing of diamond drill holes.

An attempt to predict the geology of the area through interpretation of airphotos was made by Dr. H. Lee. The results (refer to Figure 29) do not appear to be very reliable. One major difference is the presence of a long northeasterly-trending arm of Athabasca sandstone through the centre of Permit 215. Diamond drilling shows that Devonian sediments overlie the Athabasca Formation in almost every instance. This suggests very little to no sandstone subcrop on the property.

Moving east, drilling (DDH's 508-13 and 508-32) appears to eliminate the northeast-trending arm of Aphebian gneisses interpreted through Permit 214. In addition, Dr. Lee has shown the entire southeast corner of Permit 214 to be covered by sedimentary rocks, when in fact, results from DDH 508-38 show that Aphebian gneisses subcrop at least as far north as the Richardson River.

Several northeast-trending faults have been interpreted across Permits 214 and 215. As the occurrence of Athabasca sandstone was fairly predictable across the property, there is no apparent evidence of offset that would suggest that these exist. It should also be pointed out that none of the interpreted faults were indicated by the airborne Input EM or mag surveys done in 1977. Interference from the Devonian has been considered, but these interpreted faults also extend south of the assumed limits of the Devonian. If, in fact, they do exist, it can be assumed that they are not graphitic, and are probably completely healed.

The same logic can be applied to the majority of the structures indicated by Dr. Lee. There is agreement, however, with the fault interpreted from the mag and drilled in DDH 508-2. This structure is completely healed with quartz.

CONCLUSIONS

- Diamond drilling has indicated that the Turam anomaly on Grid "E" (detected in 1978) is related to the unconformity between the Devonian and Athabasca Formations, and not to a graphitic zone in the Pre-Cambrian basement, as originally thought.
- Max-Min II and VLF EM-16 surveys suggest that the weaker Turam zone on Grid "E" is the result of surficial rather than bedrock features.
- 3. The resistivity low on line 100+00N/80+50W is probably related to a fault in the Devonian sediments, and subsequently, considered unimportant.
- Drilling indicates that Devonian sediments overlie the Athabasca Formation across the entire Project 508 area. Athabasca subcrop is non-existent to minor.
- 5. No economic radioactivity was intersected in the diamond drilling programme. A few weak zones were encountered in the Pre-Cambrian basement; analysis indicates the response is mainly due to high thorium content. These are not considered significant.
- 6. Data from the ground magnetometer survey supports airborne response.
- 7. The interpretations of surficial geology do not appear to be reliable. Factual drill hole information indicates overburden cover is excessively thick across the entire project area. The areas indicated to be locally derived till are therefore suspect. In addition, Devonian sediments overlie the Athabasca Formation. Therefore, any local till would be Devonian in nature.
- 8. Diamond drilling does not suggest any offset in the Athabasca Formation. Therefore, the structural interpretation offered by Dr. H. Lee is still in doubt. Factual drill hole data has shown that his interpretation of subcrop geology is very unreliable.

RECOMMENDATIONS

Diamond drilling has provided factual data that discredit the interpretation of areas of locally derived till (offered by Bayrock and Lee). Ground truth followup is therefore not advised. The fact that the Athabasca Formation is overlain by Devonian sediments also presents a strong case against any surficial programmes.

All known geophysical targets in Project 508 have been tested and explained by diamond drilling, with no encouragement for follow-up. In addition, regular testing along the edge of the Athabasca Formation has neither indicated the presence of any significant offsets, nor intersected any economic radioactivity.

It appears that the only approach remaining would be a continuous programme of stratigraphic drilling. However, this would be very expensive as:

- 1 the target area is still very large and there are no guides to suggest one particular area is more favourable, and
- 2 unfavourable ground conditions in the Devonian inflated projected costs in 1979; drilling would have to be done using a larger core size and/or a very expensive mud programme.

Consideration may be given to a seismic programme as well, but this again will be very expensive, due to the size of the search area.

In light of these findings, serious consideration should be given to the continuation of exploration activities in Project 508.

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Peter A. Fortuna, P. Eng., Exploration Geologist May 29, 1979

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APPENDIX A

DIAMOND DRILL HOLE LOGS AND DOWN-HOLE RADIOMETRIC () PROFILES

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			DIP YESTS	LANDIAL				LOCATION	Pern	nit 214		MOIS	50	8-30	
uu Collar	FE04		-51			DIAMOND DRILL HOLE LOC		SECTION LATITUDE DEFAITURE ELEVATION	<u>Grid</u> <u>138</u> <u>112</u>	"E" 00N 90E	······································	HOLE No. AZUMUTH 090 DIP -51 E LENGTH 135.9m PURPOSE TEST TURAM			
						ELD.	DRADO NUCLEAR LIMITED	STORAGE				LOGGED	NY P.2	A. FORTUNA	
110M	PACE 10				DESCRIPTION							CONE SAM	PLES		
0.0	65.8	OVERBURDEN Fine sand a	and houldars	from gur	face to be				FROM	10	WIDTH	×		AALTYGI	
		sandstone b No plastic	pipe	pproximate	ely 30 met	ers BW cas:	nor recovery or ing left in hole.								
65.8	102.4	DEVONIAN (?) M	UDSTONE - PO	OST ATHAB	ASCA SEDIM	ENTS									
		The rock is fine graine good. The several sec the rock be Athabasca F Major struc more distin B.G. = 10 c	s grey in co ed, compacted upper portion tions of bro comes arenad formation san tures are in fort with depu- tions.	lour thron d mudstone on of the oken core ceous as t ndstone; o ndicated a th, Scann	ighout; ve ; porosit unit is r , and poss the unit g contact is at depth b hed with S	ry soft, H y generally elatively b ibly some of rades into gradations y lost core PP2; 15-25	= 3. Extremely low but locally ncompetent with ouge. With depth the underlying lover several me Banding is cps throughout;	' ters.							
		(67.6-67.8)	Vuggy po bitumen	prosity de	eveloped;	vugs partia	lly filled with					an a			
		(68.0-71.9)	Core ver mud deve	y incompeted. A	tent; bad bout 1.6	ly broken; neters lost	locally, sandy between 68.6-71.	9.							
		(71.9-75.0)	About 2.	4 meters	lost core	remainder	of section broke	n.							
		(76.6-78.0)	1.7 mete	rs lost.									n Mile A Di		
		(78.0-79.0)	Broken o	core; 15cm	fine (<	imm) mud ch	ips at 79.0.						and and and a second		
		(79.6-81.1)	Broken c	ore.											

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METE	PACE		DISCRIPTION				ORE SAM	PLES
ROM	to		DISCRIPTION	FROM	10	WIDTH	%	AVILACU
		(81.1-93.3)	Core competent throughout this section; generally banded at 60° to the core axis. Arenaceous. Dark grey in colour.					
		(83.9-84.1)	Broken core; gouge (?) Angles sub-parallel to the core.					
		(87.2-90.2)	1.0 meters lost.			•		
•		(87.5)	lcm mud on fracture at 45° to core axis. Core broken into 2-3cm blocks for 0.5 meters; fractures parallel to bedding.					
		(90.2-93.3)	Sandy mudstone to locally muddy sandstone. About 1.0 meters core lost in this section; probably at bottom.		••			
		• (93.3-96.3)	Run completely lost. (Drillers report flowing sand seam hit. Pulled up; 12.2 meters sand flowed up into hole. Had to drill down and use mud to pass through).		•			
•		(96.3-99.4)	1.5 meters lost (probably continuation of the above). Gradational section; 60%+ coarse grained sandstone intermixed with dark grey mud seams; banding at 60 to core.					
		(99.4-102.4)	2.4 meters of run lost. Hole making water at 102.4. Generally a medium grained, gritty sandstone with intermixed mudstone; good intergranular porosity.			•		

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METI	ERAGE			FAVE	NO	*****	MOLE 508-30
-	1 10					CORE SAM	PLES
			ILOM	TO	WIDTH	*	AVIALES
	102.4	UNCONFORMITY BETWEEN DEVONIAN AND ATHABASCA FORMATIONS	F	-			
102.	135.9	ATHABASCA SANDSTONE					
			La Sec	. .		1975 - 19	
		Generally white (buff) in colour with minor pink, weakly hematitized				1997) 1997 - 1997 1997 - 1997	
	la ka	well defined throughout at 30 -60 to core avis Black minoral					
		(possibly fine grained pyrite) locally along bedding planes, fractures,					
		in limonitic matrix. This rock is typical of the Athahaan and attack					
		seen in this area. Scanned with SPP2. No anomalous R/A; 15-20 cps					
		agains BG = 10 cps.	•				•
		(102.4-105.5). 0.4 meters lost. Impure sandstone (as 99.4-102.4);		••			
		grades into clean white sandstone.					
		(105.5-108.4) Clean; white Athabasca sandstone.					
		(108.0-108.4) Course smaller and fractioned and an entry of					
		Couge-amealed Hactubes; random orientation,					
		(108.4-112.2) Slightly impure sandstone. Black mafics disseminated					
		medium grained; especially from 111.6-112.2, where					
		mafics make up 10% of section.					
		(112.2-118.5) Weakly hematitized sandstone: pale nink (flech)					
		coloured. Generally fine grained with local medium					
	•	to coarse grained sections. Minor disseminated black mafics.			1999 - 1995 - 1995 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		
		그는 것에서 같은 것이 같은 것이 같은 것을 알았는 것이 같은 것을 알았다. 그는 것은 것은 것을 가지 않는 것이 같은 것이 같이 없는 것이 같이 같이 같이 했다. 것이 같이 많이 많이 많이 많이 나는 것이 않는 것이 없다. 것이 같이 많이 많이 많이 없다. 것이 없는 것이 없는 것이 없는 것이 없는 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없는 것이 않는 것이 없는 것이 없 않이 않는 것이 없는 것이 없 않이 않는 것이 없는 것이 않는 것이 않는 것이 않는 것이 없는 것이 없는 것이 없는 것이 않는 것이 않는 것이 않는 것이 않는 것이 않는 것이 않이 않이 않는 것이 않는 한 것이 않는 것이 않이 않이 않이 않이 않이 않이 않이 않이 않 않이 않					
		(118.5-135.9) White Athabasca sandstone. Banded at $30^{\circ}-60^{\circ}$ to core					
•		Locally up to 25%.					
		(122 8-122 2) -2004 -21-					
		Also at 127.5-127.7, 130.0-131 0					
	1.00	No. 2011년 2월 28일 - 2012년 1월 2012년 1월 2012년 1월 2012년 1월 2012년 - 2월 28일 4월 2012년 1월 2012년 1월	1		i se de la		

METERAGE FAUE PO HOLE 508-30-****** 71.04 70 DESCRIPTION . ۰. CORE SAMPLES TROM TO WIDTH (124.6)Mud chips along fracture at 50° to core. % AVILAC (129.0)Mud chips. (132.9-135.9) 2.7 meters lost. 135.9 END OF HOLE Hole abandoned at 135.9. Rods sanded-in; broke off. 85.3 metres BQ rods + core barrel left in hole. Could not retrieve. No dip test \rightarrow core barrel could not be pumped down hole. Probed with Mount Sopris only to depth of 40.0m; dummy probe encountered Drilled by: Longyear Canada Limited

DOWNHOLE LOG DAH 508-30 February 21, 1979 Mt. Sepris 1000-C S/N 7 Prose # 277 Scile: 50 cps/cm Spied: 6 m/minule (est) T. P. FORTUNA . J. MOORE : ł 0.0 m on counter Hele probed inside rols <u>r</u>, 1 BX 0-67.00 CHART NO. + 9.9--Ţ ÷., ī i--i t ĩ 20m



DDH 208-30

DIP TESTS Permit 214 . 508-31 DIP LATITUDE LOCATION DIPARTURT 1111 1 /104 HOLE 10 TOTAL -69 DIAMOND DRILL HOLE LOG CUH. CUM Grid "E" Collar SECTION _ 090 AZIMUTH -69 E 138+00N LATITUDE DIP 113+55E DEPARTURE 97.8m LENGTH 508 Project Test Turam ELEVATION ... PURPOSE B.Q. COMPLETED - 27/2/79 COLE ILDORADO NUCLEAR LIMITED P.A. FORTUNA STORAGE METERACE LOGGED BY 1104 10 DESCRIPTION CORE SAMPLES ROM 10 WIDTH % AVIMOIS 0.0 56.7 **OVERBURDEN** Fine sand and boulders from surface to bedrock. 56.7 79.5 DEVONIAN (?) MUDSTONE - POST ATHABASCA SEDIMENTS Very similar to mudstone seen in DDH 508-30. Light to dark blue-grey in colour; soft, H = 3. Very fine grained, compacted mudstone, becomes arenaceous with depth. Porosity very low. The unit grades into underlying Athabasca sandstone; contact is gradational over 2-3 meters. The upper portion of the unit is less competent; some core lost, Scanned with SPP2; 15-25 cps; B.G. = 10 cps. (56,7-59.7) 1.5 meters lost. (59.7 - 65.8)Core generally broken up; some lost. In places, the core appears as solidified mud (vs. rock); could be gouge but difficult to tell because of the general nature of this rock. (59.7 - 62.8)0.6 meters core lost. (62.8 - 65.8)1.4 meters lost. $\{65.8 - 68.9\}$ 2.5 meters lost. (68.9 - 71.9)Intermixed sandstone in bands; generally less than 1cm wide, but up to 15cm. Banding at 80°-90° to the core axis. (70.5 - 71.1)Broken core; last 0.3 meters consists of small ((2cm) fragments, gouge-smeared. (71.9 - 74.9)Blue-grey mudstone. Minor sandstone bands up to 15cm in width.

MET	EPACE			TAUE	None	******	- HOLE 508-31
1104	01	DESCRIPTION			••	CORT SAM	71.25
•		(74.9-78.0) 1.1 meters lost; mudstone becomes sandy with depth; .	720M	10	WIDTH	*	
		(78.0-79.5) Dark blue-grey mudstone, interbanded with sandstone; sandstone becomes the dominant rock type below 79.0m; coarse grained.					
•	• 10 40 • 10 40 • 20 40	(78.0-78.2) Core broken; in slices, less than 1cm wide, perpendicular to the core axis.					
	79.5	UNCONFORMITY BETWEEN DEVONIAN AND ATHABASCA FORMATIONS		n de la composition Norma de la composition de la compositio			
79.5	87.8	ATHABASCA SANDSTONE	•				•
		Typical buff (white) Athabasca sandstone. Upper portion somewhat coarse grained at contact with overlying Devonian. Generally fine grained quartz sandstone; some minor medium grained sections. $70-80\%$ quartz. Bedding is fairly well defined, $60-90^\circ$ to the core axis; minor cross- bedding. Sandstone is slightly impure, with black mafics (possibly fine grained pyrite) making up $10\% \pm$; this was also noted in DDH 508-30. Porosity poorly developed; intergranular in coarser grained sections.					
		(79.5-81.0) Gradational with underlying mudstone. Some thin $(\le 1 $ cm wide) mudstone bands at $60 + to$ the core axis. Sandstone is medium to coarse grained.					
		(81.0-87.8) Buff (white) Athabasca sandstone. Locally, mafics make up 20%±, but generally are absent.			•		
		(81.3-81.4) Broken core; sandy gouge and fragments, less than 2cm wide				in deserve Second	
•	87.8	END OF HOLE					
		Drill hole was abandoned at 67.8. Core barrel snapped when sanded-in, could not retrieve as sand flowed up into drill hole. Probed with Mount Sopris down to 70m; probe not working properly, Plastic pipe went down to 65m but dropped when casing and rods pulled; could not probe again. Core barrel lost.					
		Drilled by: Longyear Canada Limited					
	14 11 - 14	에는 것은 것은 것은 것은 것을 가지 않는 것은 것은 것은 것은 것은 것은 것은 것을 가지 않는 것을 가지 않는 것을 가지 않는 것을 하는 것을 하는 것을 가지 않는 것을 가지 않는 것을 가지 않는 같은 것은					

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DOWNHOLE LOG - 8 DDH 508-31 Ebruary 27, 1979 Mt. Sopris 1000 -c Probe #279 5/N 7 Scale: 50 cps / cm. Speed: 6 m/minute ((csf.) A. P. FORTUNA . J. MOORE -0.0-on-counter Itole probed inside rods and cosing Bx do - 56.99 • ÷ 1

i Note: This log may be unreliable, especially above 45 m. Probe shorting out. 5: Ē 2 ŝ L'HALT 0 ! 15-:

DDH 508-31













		DIP TESTS		•				· · · · · · · · · · · · · · · · · · ·	
<u>11 /134</u>		DI/ LATINUST		PERCUSSION DRILL HOLE LOG Project 508	LOCATION PERM SECTIONRESISTI LATITUDELDOLOON DEPARTURE 55+00E ELEVATION	VITY LI		HOLE NO AZIMUT DIJ LENGTI PULPO1	,508-32 -90 ⁰ 94.2m. 6tratigrap 8/10/79
THE DICE	•			AUCOLOGO HUCILAR LIMITED	STORAGE			LOGGEO 1	P.A. FORTU
			DESCRIPTION				1	CONT SAMA	
5.1 94.2	DEVONIAN (?) MU Cenerally 1 The rock is core is ver of broken c to the core material in anomalous R	<u>IDSTONE - POST ATHABASCA</u> ight grey in colour; up very soft; $H = 2-3$. C y incompetent, with abo ore. The mudstone is very axis. The core become creases towards the bot /A; 15 - 25 cps; BG = 10	SEDIMENTS per portion of ore recovery w ut 50% of the ery fine grain s arenaceous w tom of the sec cos.	f the unit is dark grey to b very poor. For the most par section lost. Numerous sec ned and laminated perpendi with depth; amount of sandy ction. Scanned with SPP2; n	lack. t, the tions cular o				
	(45.1 - 47.9) (47.9 - 53.9)	Lost. Tri-cone run i above. Dark grey to black mu grey clay layers at 9 Gouge healed fracture	adstone., Some	seal off sand flowing in from thin (less than 1 cm.) light e axis. Core not very compo-	om ht stent.				
	(47.9 - 50.0)	1.9 meters lost.		co the core axis.					
	(50.9 - 53.9)	1.0 meters lost.							
	(53,9 - 57.0)	Mudstone; medium grey axis. 1.8 meters los	in colour,	Laminations at 90° to the co	ore				
	🚺 이 이 모습을 가지 않는 것을 수 있다.				1		-		
	(57.0 - 60.0)	1.5 meters lost.							
	(57.0 - 60.0) (60.0 - 63.1)	1.5 meters lost. Light grey mudstone.	Last 0.6 mete	ers of the section are broke					

				•••••••••			CORE SAM	PLES
7,8 t al.			DESCRIPTION	FROM	TO	WIDTH	*	AVIAL
	,							
		(66.1 - 69.2)	0.3 meters lost. Generally competent. Core broken into small (less than 1 cm.) fragments between 66.7 and 66.9.					
		(69.2 - 72.2)	1.3 meters lost. Lower half of section broken up; fragments generally less than 3 cm. in size.					
		(72.2 - 75.3)	0.6 meters lost. Arenaceous bands make up 5 - 10% of section.					
		(73.7 [±])	0.2 meters broken core. Lower end of broken section marked by gouge along a fracture at 80^{-4} to the core axis.					
		(75.3 - 78.3)	100% recovery. 15 - 20% of the section is sandstone bands intermixed with the mudstone.					
		(77.4 - 77.8)	Medium grained, gritty sandstone band; intergranular porosity. Couge on fracture at 77.8 m. at 70^{-4} to the core axis.					
5		.(78.3 - 81.4)	1.0 meters lost. Increasingly arenaceous.		•			
		(81.4 - 84.4)	2.0 meters lost; as above.			•		
		(84.4 - 94.2)	About 1.0 meters recovered, most above 87.5 m. The rock is grading into a medium to coarse grained, muddy sandstone. Large (up to 2 cm.) pebbles of quartz and serpentine or talc (green) chips. Drillers report flowing sand.					
		END OF HOLE	이는 것 같은 것 같은 것은 것 같은 것이 있는 것 같은 것이 가장에 있는 것이 가지 않는 것이 있다. 것 같은 것은 것이 있는 것 같은 것이 있다. 같은 것은					
		Hole was aba in last 3 ru blocked by a Dropped down	andoned. Rods continually sanding in. Less than 10% recovery ans. Probed with Mount Sopris 1000 down to 65.0 m. Hole sand. Plastic pipe put down to 73 m. before sand encountered. In into hole when casing was pulled.					

		I		DIAA	AOND DRILL HOLE LOG	•		HOLE50832			
1-24-1	2465			DESCRIPTION	₹ .				• •	CORE SAN	IFLES
							FROM	70	WIDTH		AACUT
							—			T the	
										in the second	
		GEOLOGIST'S N	OTE								
		The rock that above the Ath in diamond dr possibility t and Athabasca	the drilling was a basca sandstone. till holes 508-30 and he hole was stopped formations.	stopped in, resembl Sand problems were nd 508-31 to the no d very near the cor	les the transition zo encountered at this orth. There is a str itact between the Dev	one just point ong onian					
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DUWNHOLE LOG - 8 DDH 508-32 March 10, 1979 5/1 7 Mf. Sopris 1000-C # 279 robe Scale: 50 eps /cmi Speece: 6 h / minter (est) A P. FORTUNA . S. MOORE Probed in side plastic pipe (+73m) and casing. HW 0.0 - 3.66 Bx. 0.0 - 47.85 i -0.0 m on counter 0 5-۲ c Ņ 15121211 ٣ 3 15è





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METI	EPACE	[MOLE 508-33"						
-	10		DISCRIPTION			•	CORE SAM	PLES		
				FROM	TO	WIDTH	*	AYEAGL		
	52.5	UNCONFORMITY I	BETWEEN DEVONIAN AND ATHABASCA FORMATIONS							
52.5	67.7 <u>+</u>	ATHABASCA SANI	STONE (WITH INTERMIXED RED SILTSTONE)							
		The sand in color the sand rock an below th is conta Scanned	Istone is quite variable (compared to that encountered in DDH 508-26 er, grain size and alteration. Bedding is fairly indistinct in Istone. Hematitization is the dominant alteration, giving the overall red colour. The upper portion of the unit is bituminous; is, bitumen is local along fractures. A fine grained red siltstone ined within the sandstone; bedding at 70°-90° to the core. with SPP2, no anomalous R/A; 20-25 cps; BG,= 10 cps.				3			
		(52.5-52.9)	Red altered sandstone.	•						
n State State State		(52.9-54.7)	Black bitumen-rich section; bitumen pervasive, filling pore spaces. In excess of 30%.							
		(54.7-56.0)	Fine grained sandstone. Buff coloured. Minor bituminous bands at 55.5m.							
		(56.0-57.5)	Coarse grained sandstone (possibly a sedimentary breccia). Rounded to angular quartz and feldspar grains in silicious matrix; some mafics as well. Hematitization more intense in lower portion of section.							
		(57.5-58.0)	Intensely hematitized sandstone; porosity well developed- intergranular. Pores saturated with hematite; brick-red in colour. Hematite dissolves on contact with water; possibly makes up 30% of the rock.							
		(58.0-58.9)	Fine to medium grained Athabasca sandtone. Intergranular porosity, in part filled with bitumen.							
		(58.9-59.3)	Intensely hematitized, brick-red siltstone. Some interbanded layers of green material, soft $(H = 3)$ up to 5mm wide; possibly clay.							

			PAGE No						
METE	PAGE		DISCRIPTION				CORE SAM	PLUS	
				TROM	70	WIDTH	*	AYIRAGU	
		(59.3-60.1)	Fine to medium grained Athabasca sandstone. Lower 0.3m fractured, coated with tar.						
		(60.1-63.4)	Red siltstone, extremely fine grained; soft, $H = 2-3$. Banding well defined at $70^{\circ}-90^{\circ}$ to the core, minor cross-bedding $(60^{\circ} \text{ at } 60.5\text{m})$. Hematitization intense throughout. Locally, interbanded with layers of green clay-like material as seen from 58.9-59.3. Note: Could be equivalent to red siltstone seen in DDH 508-14 and DDH 508-26.						
		(63.4-64.8)	Gradational. Siltstone intermixing with sandstone. Increasing frequency of green clay (?) bands (5-10% of section).						
		(64.8-67.7 <u>+</u>)	Base of Athabasca formation. Sandstone varies; minor inter- mixed siltstone below 66.1m. No well developed basal conglo- merate. Actual contact poorly defined.						
	67.7 <u>+</u>	UNCONFORMITY B	ETWEEN ATHABASCA FORMATION AND PRE-CAMBRIAN BASEMENT						
67.7+	74.5	ALTERED PRE-CA	MBRIAN BASEMENT - REGOLITH		•				
		Typical of alt colour .(of felds gneissic 45 ⁰ -60 ⁰ Fracture	ered basement rocks seen in the area. Generally purple-red in hematitization) with green chloritized sections. Some kaolinizatic par. Hardness of unit is 6. Originally, the rock was probably in nature; gneissic banding is still fairly well preserved at to the core axis. Rock is competent throughout the section. s are randomly oriented.						
		Composit	ion: 30-40% quartz, 30-40% feldspar, 20-30% mafics.						
		Scanned v	with SPP2, no anomalous R/A; 20-25 cps, BG = 10 cps.						
		(67,7 <u>+</u> -72,5)	Altered basement rock, as per general description.		n an Arrien Armenia Armenia				
		(72.5-74.5)	Brecciated. Intensely fractured. Chloritization (green alteration), most intense in this section. Fractures are healed with hematite and/or silica.						

			MOLE 508-33							
TION	TO	DISCRIPTION		and the second s		CORE SAM	PLES			
			FROM	70	WIDTH	*	AVILACU			
74.5	78.2	Fine grained mafic-rich band. Dark grey to red in colour (hematitized sections). 'Banding at 60° to core (75.2m). Upper contact broken; lower more competent. Both contacts at 600 to 200					•			
		76.2-76.8. Quartz-feldspar bands along fractures sub-parallel to the core Minor quartzo-feldspathic veining also between 75.6-76.2. Hardness of the unit is 5-6; silicified. This section is a basic dyke of some sort. No anomalous R/A.								
78.2	80.6	MAFIC GNEISS	29 - 19 - 19 - 19 - 19 - 19 - 19 - 19 - 1		• - • - • - • - • - • • • • • • •					
		Dark grey to black in colour; silicified; $H = 6$. Fine to medium grained, banding at $45^{\circ}-60^{\circ}$ to core. Minor quartzo-feldspathic veining.	•				•			
		Composition: 30-40% guartz, 30-40% mafics, 20-30% feldspar (hem.)								
		No anomalous R/A. Scanned with SPP2; 20-25 cps. BG = 10 cps.				a service				
80.6	83 .3	• GRANITIC GNEISS								
		Generally red-brown in colour. $40-50$ % feldspar, $20-30$ % quartz, $20-30$ % mafics. Gneissic banding well defined at 60° to core. No R/A.		•						
83.3	84.6	MAFIC GNEISS								
•		As described from 78.2-80.6. Banding 60°-90° to core.								
84.6	87.5	<u>GRANITE (PEGMATITE)</u>								
		Fine grained red granitic rock, grades into flesh-coloured pegmatite at 85.6m. Very coarse grained. Large feldspar clasts make up 60-70% of the section; silicious matrix; mafics <15%. Fracturing is locally intense.			•					
	87.5	END OF HOLE								
		No materials lost in hole. Plastic pipe down to 76.2m. Probed with Mount Sopris 1000 to 30m; blocked.								
•		Drilled by: Longyear Canada Limited								

DDH 508-33

DDH 508-33 March 04, 1979 Mf: Sopris 1000-C Probe #279 5/N 7 50 cps/div 6 my minute (est) Scale : Speed : T. P. FORTUNA ; J. MOORE J. 0 (to 76.2 n but blocked @ 30 m ī 0.5.6 and easing: HW 00-10.97 cororado. 0.0-48:77 βX N S 5 ł 3 192WOALSE! SOPR MOUTH b -! 15----1 ł -----٠t i









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	A 19	1 - 10/A) 186 ⁰ 186 ⁰	601¢			PERCUSSION DRILL HOLE LOG	LOCATION SECTION LATITUDE DEPARTURE	Grid 138+75 113+75	E 1384	-00N	HOLE	No. 508-34 WIN
CTE	RACE.					BIDOLADO HUCILAR LIMITID	ELEVATION CORI STORAGE	BQ		······································	PULP COMPLE	DIITEST_TURAN
• • •	10				DEICRIPTION				•		CO11 14	A/111
								ILOM	10	WIOTH	*	4 + 1.1
0.0	54.9	OVERBURDEN Fine sand a	nd boulder									
54.9	76.8	DEVONTANI (O) M										
		DEVONIAN (?) MU	DSTONE - P	OST ATHABASCA	SEDIMENTS							
		Light to da H=3. Gener towards bot is gradatio	rk grey, v ally as de tom of sec nal. Scan	ery incompeter scribed in DDI tion. The cor ned with SPP2	nt rock; seve H 508-30 and ntact with th ; no anomalou	aral sections lost core. Sof DDH 508-31. Becomes arenace he underlying Athabasca sands B R/A: 15-20 cps: BCald cos	t; ous tone					
		(54.9 - 66.1)	6.3 mete 0.3 m. 1 locally	ers lost; 15 c recovered betw sandy.	cm. recoverd ween 63,1 - 6	between 57.0 - 60.0; 6.1. Fine grained mudstone,						
		(62.9)	5 cm, sa	andy clay goug	ge material.							
		(63,1)	15 cm. E possibly	oroken core; 'f / gouge (?),	ragments gen	erally less than lcm. in size	•1					
	ан на селото 1990 г. –	(63.1 - 66.1)	Mudstone to 5 cm.	e more compete wide at 90°	to the core	nterlayered sandstone bands u axis.	I P					
		(68.0 - 68.2)	Broken c	ore				•				
		(69.2 - 71.0)	1.4 mete	rs lost.								
		(71.0 - 72.2)	0.3 mete	rs lost.						1		
		(71.5 [±] - 72.2)	Interlay 1 cm. wi	ered sandy mud de. Layering	dstone with h at 90° to th	blue-grey shale (?) layers; u le core axis.	p to					
		(72.2 - 75, 3)	2.3 meter	rs lost. As a	aboye, but la	yering not as well.defiped,				v sta		

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	n ar e Agencies		DIAMOND DRILL HOLE LOG	HOLE LOG					
	ERAGE		DESCRIPTION				CORE SAM	PLES	
11:4	1073 1073			7204	70	WIDTH	<u>×</u>	AV:	
							Γ		
		(75.3 - 78.3)	2.4 meters lost. Grades into Athabasca sandstone. Contact somewhere within this section but cannot be determined exactly due to lost core.						
	76.8±	UNCONFORMITY BET	WEEN DEVONIAN AND ATHABASCA FORMATION						
76.8±	147.9	ATHABASCA SANDST	ONE						
		Typical Atha hematitized described in more variabl (mudstone?), the sandston Contact with 15 - 20 cps; (76.8 [±] - 78.9) (78.3 - 81.4)	basca sandstone. White in colour to pale pink in weakly sections. Fine grained quartz sandstone, generally as DDH 508-30 and DDH 508-31. Below 130.1 m. the rock becomes e. A fine grained, intensely hematitized red siltstone also seen in DDH 508-14 and DDH 508-26 is contained within be. Brecciated with basement fragments at bottom of section. basement well defined. No anomalous R/A. Scanned with SSP2; BG = 10 cps. Muddy sandstone. Bottom of gradational contact with 'Devonian. 0.6 meters lost.						
		(78.9 - 86.3 [±])	Clean white Athabasca sandstone. Fine grained; bedding at 90° to core axis. Minor disseminated blacks (possibly fine grained pyrite or marcasite); also along fractures. Mud partings.						
		(84.4 - 87.5)	0.7 meters lost.						
		(86.3 [±] - 86.6)	Sandstone is grey to black in colour. Soft dark grey-black mafics disseminated throughout. Also concentrated along fractures.						
		(87.5 - 99,7)	White Athabasca sandstone. Intermixed medium to coarse grained sections (up to 15 cm. wide). Minor blacks, as from 78.9 - 86.3						
		(87.5 - 90.5)	2.5 meters lost,						
		(90,5 - 93.6)	1.8 meters lost.						
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			DIAMOND DRILL HOLE LOG	PAGE No HOLE 50						
METORAGE		DESCRIPTION					CORE SAMP	LES		
in all the second				TROM	70	WIDTH	<u> </u>	AND		
		(93.0 [±] - 93.9 [±])	Weakly hematitized, pink Athabasca sandstone.							
		(93.6 - 96.6)	0.7 meters lost.							
			NOTE: No evidence of faulting or broken core in the above section (87.5 - 96.6).							
		(99.7 - 102.7)	1.3 meters lost. Upper half of retained portion generally as described from 86.3 ² - 86.6. Lower half typical Athabasca sandstone. Minor shale (mud) chips.							
		(102.7 - 105.7)	Minor ground core, but none lost. 2 cm. broken core and sandy gouge at 103.6 m. at 90° to the core axis.							
		(103.3 - 105.5)	As described from 86.3^+ - 86.6.							
		(105.7 - 107.3)	Weakly hematitic, pink in colour. Fine to medium grained. Local intergranular porosity.							
		(107.3 - 110.9 [±])	White Athabasca sandstone. Generally as 78.9 - 86.3 ⁺ . Core broken along fracture sub-parallel to core axis between 107.6 - 107.9.			•				
		(108.8 - 111.9)	0.7 meters lost.							
		(110.9 [±] - 130.1)	Weak to moderately hematitized sandstone; pink to red in colour. Section becomes coarser grained and variable towards bottom. Liesegang rings; mud partings.							
		(114.9 - 117.3)	Most of section lest; only 20 cm. recovered. 5cm gouge smeared fragments, at 114.9m.							
		(121.9)	Angular gouge smeared fragments, 1 - 2 cm. in size.							
		(123.4 - 130.1)	Sandstone variable; fine to coarse grained.							
1		(123,7 - 127.1)	2.2 meters lost.							
		(127.1 - 130.1)	2.3 meters lost. Core broken up into fragments 2-3 cm. in size. No gouge							

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	-	DIAMOND DRILL HOLE LOG	•	PAGE.	No		, HOLE 508-34			
	ERAGE	DECRIPTION	CORE SAMPLES							
			FROM	70	WIDTH	*	Avenuers			
		(130.1 - 143.9) Red, intensely hematitized siltstone (mudstone?); as seen in DDH 508-14 and DDH 508-26. Minor intermixed bands of sand- stone. Laminated at 90° to the core axis. Minor crossbedding at 60° 30-40% floating gand grains and superformers.								
		(up to 5 mm. in size). Green to grey coloured clay layers are common throughout the section.								
		(133.5) 2 cm. gouge in sandy section along fracture at 70 ⁰ to the core axis.		•						
		(135.4 - 136.0) Blocky core. Fracturing sub-parallel to the core axis.								
•		(139.4 - 139.8) Blocky. Breaks along laminations (90^{O+}) and fractures sub-parallel to core axis.	•							
		(139.8 - 140.3) Core broken along bedding planes (90^{0+}) . Sandy gouge on fractures. 3 cm. reconsolidated mud gouge, dark red in colour at 140.2; fracture at 90° to the core axis.	•							
		(143.9 - 146.9) Rock variable, from fine to coarse grained Athabasca sand- stone to sandy mudstone (as described from 130.1 - 143.9).			• •					
		(146.9 - 147.3) Red siltstone; less than 5% floating sand grains.								
		(147.3 - 147.9) Base of Athabasca formation. Large angular quartz clasts in a red siltstone matrix. Section is intensely fractured.								
an da la	147.9	UNCONFORMITY BETWEEN ATHABASÇA FORMATION AND PRE-CAMBRIAN BASEMENT								
47.9	163.4	ALTERED PRE-CAMBRIAN BASEMENT - REGOLITH								
		Intensely hematitized throughout; deep red to purple in colour. In addition to the hematitic alteration, the rock has been chloritized and kaolinized locally. Originally was a gneiss; relict gneissic banding well preserved at $60^{\circ} - 90^{\circ}$ to the core axis. Generally fine grained. H= 4-6. Everything except quartz altered to hematite. Fracturing, gouge and broken core associated with kaolinized section. No anomalous R/A, scanned with								

			DIAMOND DRILL HOLE LOG	•	PAGE. No				
METER!	AGE		DISCRIPTION				CORE SAN	*125	
				TROM	TO	WIDTH	*	¥Y'1.	
		(147.9 - 152.0)	Altered basement rock with intermixed sandstone dykes making up 15 - 20%; bedding, in dykes parallels foliation; range in width to 15 cm.; red altered and white sandstone.						
		(152.0 - 154.1)	Altered basement, as per general description. Core blocky (15 cm.) at 153.6.					•	
		(154.1 - 155.6)	Intensely fractured, generally sub-parallel to the core axis and strongly altered. Feldspars kaolinized; dark green chlorite blebs; 40%- quartz.		•				
	e de la composition nomes de la composition nomes de la composition	(155.6 - 158.4)	As 152.0 - 154.1.						
		(158.4 - 159.1)	Silicious section. 50% [±] large angular quartz fragments; brecciated. Feldspar altered to kaolinite.	•					
		(158.5)	5 cm. gouge on fracture at 45° to the core axis.						
		(159.1 - 160.5)	Generally as described from 154.1 - 155.6.				•		
		(160.5 ~ 163.4)	As per general description. Foliation well defined at 70° - 90° to core axis. Minor dark green chloritic blebs.						
16	53.4	END OF HOLE	같은 가장						
		Hole stopped. hole, 3 m. N plastic pipe	Rods broke off 84.m [±] down. Couldn't retrieve. Lost in W casing lost in hole. Probed with Mt. Sopris 1000 to 82.m. down to 84.m,						
		Drilled by:	Longyear Canada Limited					andra († 1997) 1997 - Standard Galeria, 1997 1997 - Standard Galeria, 1997	
		Casing:	BX to 0.0 - 60.0						

а, ^с.

DOWNHOLF KOG - Y DDH 508-34 DDIT 508-34 March 19 , 1979 Mt. Sopris 1000 - C Prabe # 279 SIN 7 Scafe: 50 cps (cit) Speed: 6 n/minute (est.) A. P. FORTUNA ; S. MOORE 2 1 0.0 m a counter Ci Z é Hole probed inside CHART casing -plastic pip 1 ¢ 5 ¢ ¢ Ţ ţ ſ ٤ ţ (÷ 10 ¢ Î. ŧ ŧ C. 15 ł t (1 V-5.1 ŝ









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New 10 100A Cost Cost <t< th=""><th colspan="3">METRES</th><th></th><th>DIP</th><th>LA LA</th><th>TITUDE</th><th>DEPARTUR</th><th>LE</th><th></th><th>بيل ڪهند يا بليان د است است ي</th><th></th><th> HU</th><th>LE NO</th><th></th><th>•••••</th></t<>	METRES				DIP	LA LA	TITUDE	DEPARTUR	LE		بيل ڪهند يا بليان د است است ي		HU	LE NO		•••••						
AR -90 Output DP -90 DP -90 DPATUSE 43200// DPATUSE 43200// DPATUSE 43200// DPATUSE 43200// DPATUSE 43200// DPATUSE 43200// DPATUSE 43200// DPATUSE 43200// ETRES DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION 52.01 OVERBURDEN Sand and boulders; Athabasca sandstone boulders cored and recovered as follows: (27.4-30.5) 18cm of pebble size fragments, up to 7cm into a bout 40cm, pebble size sandstone COME LAWERS 52.02 OVERBURDEN Sand and boulders; Athabasca sandstone boulders cored and recovered (43.0-47.6) about 40cm, pebble size sandstone fragments; one gneissic piece recovered (47.6-50.9) less than 1 meter pebble size sandstone fragments; one gneissic piece recovered (47.6-50.9) less than 1 meter pebbles and boulders (up to 15cm long) (50.9-52.0.9) serent sandstone boulders 60.01 DEVONIAN (7) MURSTONE - POST ATHABASCA SEDIMENTE Exact depth of top of the unit is uncertain, since some core was lost due to the soft, muddy, horken up nature of the rock near the top. The core becomes harder (H = 3+), arenaceous and more competent downards, and grades into the underlying Athabasca sandstone. Scanned with SPP2, no anomalous R/A; 15-20 cps; BG = 10 cps. (52.4-57.1) Soft, muddy, medium to dark grey rock; partly washed out 2.6 meters lost). Contain much fine sand. Middle of section very dark; some organics (?) H = 1-2 (57.1	ST A	FROM	TO	TOTAL	CORR.		CUM.		CUM. SECTION RESISTIVILY													
OPARTMEN Cost BQ Cost BQ 57.05 OVERBURDEN Stand and boulders; Athabasca sandstone boulders cored and recovered as follows: (27,4-30,5) Iscm of pebble size fragments, up to 7cm long (39,6-43,0) about 50cm as above, one piece 19cm long; buff to pink sandstone (43.0-47.6) about 50cm as above, one piece 19cm long; (39,6-43.0) about 50cm as above, one piece 19cm long; (30,9-52.0-) several sandstone boulders (47.6-50.9) Iscs than 1 meter pebbles and boulders 80.04 DEVONIAN (1) MUDSTONE - DORT ATHABASCA SEDIMENTS Exact depth of top of the unit is uncertain, since some core was lost due to the soft, muddy, broken up nature of the rock near the top. The core becomes harder (H = 34), arenaceous and more competent downwards, and grades into the underlying Athabasca sandstone. Scanned with SP2, no anomalous R/A. 80.04 DEVONIAN (1) MUDSTONE - DORT ATHABASCA SEDIMENTS Exact depth of top of the unit is uncertain, since some core was lost due to the soft, muddy, broken up nature of the rock near the top. The core becomes harder (H = 34), arenaceous and more competent downwards, and grades into the underlying Athabasca sandstone. Scanned with SP2, no anomalous R/A; 15-20 cps; BG = 10 cps. (52.0-52.4) Washed out core, consisting of about 5cm of very soft, medium-grey, muddy fragments (52.0-52.4) Washed out core, consisting of about 5cm of very soft, medium-grey, muddy fragments (52.0-52.4) Washed out core axis, braned with SP2, no anomalous R/A; IS-20 cps; BG = 10 cps. (52.0-52.4) Washed out core, consisting of about 5cm of very soft, medium-grey, muddy fragments (52.4-57		<u> </u>			-90					LATITUDE LUU:	LATITUDE LOU+OON				DIP							
Image: Construction Purpose Stratiges 10 Construction Construction 10 Bit of the construction Construction 10 Construction Construction Construction 10 Bit of the construction Construction Construction										DEPARTURE4.3.	HUUW		LENGTH									
COMPRETS _ 224/31/3. TTRES TO STRACE COCER LINCE SCALE Social Structure CONTRELEDEN Sand and boulders; Athabasca sandstone boulders cored and recovered as follows: (27.4-30.5) 18cm of pebble size fragments, up to 7cm long (39.6-43.0) about 50cm as above, one piece 19cm long; buff to pink sandstone (43.0-47.6) about 40cm, pebble size sandstone frag- ments; one gneissic piece recovered (47.6-50.9) 1ess than 1 metre pebbles and boulders (up to 15cm long) (50.9-52.0-2) several sandstone boulders Scanned with SPP2; no anomalous R/A. EWONIAN (1) MUDSTONE - DOST ATHANASCA SEDIMENTS Exact depth of top of the unit is uncertain, since some core was lost due to the soft, muddy, broken up nature of the rock near the top. The core becomes harder (H = 3+), arenacous and more competent downwards, and grades into the underlying Athabasca sandstone. Scanned with SPP2, no anomalous R/A; 15-20 cp; 80 = 10 cps. (52.0-52.4) Washed out core, consisting of about 5cm of very soft, medium-grey, muddy fragments (32.4-57.1) Soft, muddy intervals which contain "dead out (about 2.6 meters lost). Contains much fine sand. Middle of section very dark; some organics (1) H = 1-2 (57.1-69.0) Above grades into more sandy, harder (H = 2-3) rock, with some softer, muddy intervals are washed out). Colour medium grey (sandy) to dark greenish grey (muddy). Locally, poor sorting, 85°-90° to the core axis. Porous						<u> </u>				ELEVATION	•••••••••••		Pl	JRPOSE	Stratigr	caph						
TABS 1000000000000000000000000000000000000										COREBQ		*******		PLETED	24/3/79							
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TO DESCRIPTION 52.01 OVERBURDEN Sand and boulders; Athabasca sandstone boulders cored and recovered as follows: (27.4-30.5) 18cm of pebble size fragments, up to 7cm (39.6-43.0) about 30cm as above, one piece 19cm long; buff to pink sandstone Image: Comparison of the size fragments, up to 7cm (43.0-47.6) about 40cm, pebble size sandstone frag- ments; one gneissic piece recovered (47.6-50.9) less than 1 meter pebbles and boulders (up to 15cm long) (50.9-52.01) several sandstone boulders Image: Comparison of the size sandstone frag- ments; one gneissic piece recovered (47.6-50.9) less than 1 meter pebbles and boulders Scanned with SFP2; no anomalous R/A. Image: Comparison of the unit is uncertain, since some core was lost due to the soft, muddy, broken up nature of the rock near the top. The core becomes harder (H = 3-), arenaceous and more competent downwards, and grades into the underlying Athabasca sandstone. Scanned with SPP2, no anomalous R/A; 15-20 cpe; BC = 10 cps. (52.01-52.4) Washed out core, consisting of about 5cm of very soft, medium-grey, muddy fragments (52.4-57.1) Soft, muddy, meddum to dark grey rock; partly washed out (about 2.6 meters lost). Contains much fine sand. Hiddle of section very dark; some organics (?) H = 1-2 (57.1-69.0) Above grades into more sandy, harder (H = 2-3) rock, with some softer, muddy intervals which contain "dead oil stain" (some of these intervals are washed out). Colour medium grey (sandy) to dark greenish grey (muddy). Locally, poor sorting, 85°-90° to the core axis. Porous.	MET	RES											CO	E SAMPLE	5							
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(57.1-69.0) Middle of section very dark; some organics (?) H = 1-2 Above grades into more sandy, harder (H = 2-3) rock, with some softer, muddy intervals which contain "dead oil stain" (some of these intervals are washed out). Colour medium grey (sandy) to dark greenish grey (muddy). Locally, poor sorting, 85°-90° to the core axis. Porous.	·				out (abo	ut 2.6 m	eters lost	t). Cont	ains :	much fine sand.												
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oil stain" (some of these intervals are washed out). Colour medium grey (sandy) to dark greenish grey (muddy). Locally, poor sorting, 85°-90° to the core axis. Porous.					with som	e softer	. muddy in	itervals	which	contain "dead			l de l									
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Locally, poor sorting, 85°-90° to the core axis. Porous.		- 6 A			Colour m	edium or	ev (candy)	to dark	oree	nich grou (muddu)												
Locally, poor soluting, of -30 to the core axis. Foroug.	1	alag ja 🛔			Tooslin	DOOT SC	rting QC	5_{00}	the e	aton Brey (muuuy)	l* :											
	. 1	 			Locally,	hoot so	rerug, oo	-90 60	Lue C	JIE AXIS. FOTOUS	• •	ľ										
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그는 것이 같아요. 이렇게 알고 좀 있었는 바람이 가지 않는 것 같아요. 성격 집에 있는 것은 것은 것은 것이 있다. 전 것은 것이 있는 것이 있는 것은		1			and the state of the state of the				S		1	E a la companya da serie de la companya de la compa	1 1		and the second second							
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METRES		BECOUNTION				CORE SAMPLES							
FROM	то	1	DESCRIPTION	FROM	TO	WIDTH	%	AVERAGES					
		(57.1-60.0)	1.5 meters lost										
1		(60.0-63.0)	0.7 meters lost										
		(63.0-66.0)	1.0 meters lost										
		(66.0-69.0)	1.5 meters lost										
		(69.0-70.8)	The above has graded into harder $(H = 3)$, competent,		1 . No.								
			medium to greenish grey muddy sandstone, consisting of										
			very fine sand and some larger grains (1-2mm) of altered										
			rock fragments in clayey matrix. Bottom 10cm broken.	an a			an a						
			Poor sorting. Medium to good porosity in coarser, sandy										
			intervals. Becomes liner grained, more modely at boccom.										
		(70.8-71.3+)	Broken core. Top part dark greenish grey soft mudstone,				5 - A						
			bottom part medium grey hard siltstone. Minor core loss	•									
		(71.3+-71.7)	Hard, competent, very fine medium grey siltstone.	a ba Aliante Aliante			n i sa Tantan Tantan						
		(71.7-72.4)	Above grades into soft, dark greenish grey mudstone				e a compositore de la						
			(similar to 52.4-57.1); contains small rock fragments				n de la composition de la composition de la						
			(green to whitish), quartz grains (up to several mm										
			across) and sand in clayey matrix.										
		(72.4-73.5)	Above grades into siltstone (as 71.3-71.7) containing										
		an ang karang kara	some gritty, coarser and softer intervals. The bottom										
			10-15cm becomes brownish-grey, very hard, and shaly,										
			with layering at 90° to the core axis, containing some										
			fine irregular fractures filled with dense, very fine,										
			DIACK MALEFIAI.										
		(73.5-73.7)	Soft, clayey gouge, containing siltstone fragments.										
			Possible fault (?). Dark green to brownish grey; sharp										
			broken contact, upper at 90 to core axis, lower irre-										
			n en gutat . An an				in de la composition de la composition Composition de la composition de la comp						
		(73.7-74.1)	Gritty siltstone (as 72.4-73.5); very hard, non-porous,										
			and dense. Colour medium to dark greenish grey. Grades										
			into sandy section below.										
		(74.1-76.3+)	Typical "Devonian mudstone", grading progressively from										
			silty section above into underlying sandy section.										
	1.		Colour light to medium grey; center part greenish, softe	r									
			and more porous. Sand and minor small rock tragments in										
			a clay matrix. No sorting or dedding. Doth contacts										
			and a standard stand An en										
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ME	TRES			CORE SAMPLES								
ROM	TO					WIDTH	%	AYERAGES				
		(76.3 <u>+</u> -78 <u>+</u>)	Arkosic (transitional) zone, showing reworking of lower Athabasca sandstone and regolith. Very hard, coarse, gritty rock made up of medium to coarse sand, quartz grains and some clasts of basement rocks and feldspars, in a pale clay matrix. Quartz fragments and clasts mostly angular, (up to 0.5-1.0cm across). Quartz pebbles, several cm across at 76.8. Colour buff to pinkish grey. Some porosity, some parts vuggy. Fracture from 77.1-77.3, sub-parallel to core axis; fracture and vugs filled with bitumen.									
		(78+-80+)	Transitional zone between Devonian and Athabasca formations. Top of interval consists of broken frag- ments of whitish, hard quartzitic sandstone, possibly an imbedded boulder of Athabasca sandstone. Below this, very coarse, gritty sandstone (similar to 76.3+-78.0+) with whitish clayey matrix. Centre part is broken and very porous; bottom of interval ends with broken pebbles of Athabasca sandstone. The material appears to be reworked Athabasca sandstone. Contact with sandstone consists of broken core, hence is poorly defined.									
		(78.0 + -81.0 +)	1.5 meters lost.									
	80.0+	UNCONFORMITY BE	TWEEN DEVONIAN AND ATHABASCA FORMATIONS									
0.0+	84.9	ATHABASCA FORMA	TION									
		Scanned wit	h SPP2; no anomalous R/A; 15-20 cps BG = 10 cps.									
		(80.0 <u>+</u> -81.4)	Broken core; pale grey to buff, very fine, hard quartzitic sandstone.									
		(81.4-82.6)	Buff coloured, very fine grained quartzitic sandstone with minor interstitial clay. Contains few irregular layers (up to 5mm) of grit, and whitish quartz gneiss, 490° to the core axis. Hard; porosity low; poor sorting Sharp contact with section below.									
		(82.6-84.9)	Transported regolith (pre-Athabasca). Clastic material consists largely of various size (up to 10cm) angular and fractured quartz fragments in dark purplish-brown hematitic matrix (with some limonitic intervals). Core very hard, competent, low porosity, minor small vugs. Last 10cm broken.									
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ME	TRES		DESCRIPTION	1		COI	RE SAMP	LES
FROM	то			FROM	TO	WIDTH	%	AVERAGES
	84.9	UNCONFORMITY BE	IWEEN ATHABASCA FORMATION AND PRE-CAMBRIAN BASEMENT					
84.9	115.5	ALTERED PRE-CAM	BRIAN BASEMENT					
		Mainly stron nization and most of core Scanned with	ngly altered and hematitized gneissic rocks; some kaoli- d white clay in fractures. Gneissic texture evident in e; some sections are cataclastic, broken, and shattered. n SPP2, no anomalous R/A; 20-30 cps; BG = 10 cps.					
		(84.9-87.5)	Strongly altered and hematitized, dark brownish-red, fine to medium grained, hard gneissic rock, with minor quartz. Gneissosity at 50° + to core axis. Some narrow fractures, parallel to gneissic banding, filled with siderite (?). Broken core segments at 84.7, 86.8 and 87.5. Kaolinite in fractures.					
		(87.5-90.3 <u>+</u>)	Similarly altered, texture coarser; less gneissic rock. All original minerals except quartz (25%; grains up to lcm long) completely altered. Some kaolinite in frac- tures.					
		(90.3 <u>+</u> -96.0 <u>+</u>)	Very coarse textured, strongly altered and hematitized, cataclastically shattered and fractured rock containing ±50% quartz (up to several cm across) in a hematitic matrix; dark reddish-brown. Partly silicified.					
		(96.0+-100.1)	As described from 87.5-90.3+.					
		(100.1-103.8 <u>+</u>)	Very fine grained, dark reddish-brown, hard rock; strong ly altered and hematitized; texture not apparent. Possibly dike rock (?) (intermediate or basic). Contains small irregular fractures healed with quartz. No sharp boundaries. Grades into more gneissic rock below.					
		(103.8+-107.3+)	Medium grained, slightly gneissic rock (similar to 84.9- 87.5); with intervals of very fine grained rock (as 101.1-103.8+). Still highly altered and hematitized, with quartz-healed fractures. Dark reddish-brown.					

ELDORADO NUCLEAR LIMITED

PROJECT PAGE

MET	RES		CORE SAMPLES						
FROM	TO			DESCRIPTION	FROM	то	WIDTH	%	AVERAGES
		(107.3 <u>+</u> -111.3 <u>+</u>) St he Fr cc pa ha	crongly fra ematitized actures ma ore axis, h ars and a pa alf of inte	ctured (cataclastic), strongly altered and coarse grained rock. Reddish to brown. inly irregular; one (0.5cm) sub-parallel to ealed with quartz. Kaolinization of felds- ale green mineralization appears in bottom rval; also partly silicified.					
		(111.3+-115.5) Ro me sc mc as on th	ock is cata edium grain ome hematit ore noticeal dominant aly slightly nan regoliz	clastically shattered gneiss of generally size. Fractures filled with quartz and e. Chloritization and kaolinization occur bly; hematitization still present, but not as before. Last 1.0 meter (+) of interval y altered; mainly due to cataclacism, rathe ation, and more fresh and granite-like.					
	115.5	END OF HOLE							
		Plastic pipe to bottom, through hole.) bottom of a plastic p	hole. Probed with Mount Sopris 1000 to ipe and casing. 48.7m BW casing left in					
		Drilled by: Longye	ar Canada I	Limited					
		CASING	B HW BW	0.0- 3.65 0.0-77.4					

NOWN HOLE LOG - 5 DDH 508-75 March 24, 1979 Mt. Sopris 1000 C Probe # 279 S/N 7 Scale: SUCPS/cm Speed: 6 m/min Cestl. T.H. LAANELA : S. MUORE 0.0 - Probe & sur face Meter reads 3.7 ; 5/1pph 8 Nau Þ Proted through Casing to 77.4 Plastic pipe to E.O.H. (115.5) 15ų, : t. ł ¢ (0 1 ¢ 10 ۲ 1 l ŧ. (£ € ſ (÷ • 25 i ; ۰, 5.2 J. 25024720.



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-			DI	P TESTS	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			<u></u>	IOCATION	Perr	nit 21	.5			508-36	
TEST	FROM	TO TOTAL	DIP	CORR. CUM.			DEPARTURI	UM.	SECTION	43+(WOC	····	HC	ZIMUTH	-90 ⁰	
									DEPARTURE ELEVATION CORE	.110+(.BQ)ON		 Pi CON	URPOSE	124.0m Stratigraphic 02/04/79	
	TRES	<u> </u>				<u> </u>		·	STORAGE	·····	· · · · · ·		LOG	GED BY .	.P.A. Fortuna	
FROM	10				DESCRIPT	ION						r	CO	RE SAMPL	ES a la	
											FROM	10	WIDTH	*	AVERÁGES	
0.0	35.7 94.2+	OVERBURDEN Fine s boulde DEVONIAN-PO	and and bo rs, up to OST ATHABA:	ulders; m 30cm in 1 SCA SEDIM	ninor recov ength. ENTS	ery of	mudstc	ne and	sandstone							
		conten grained Locally section basemen underly anomald	sandstone , "dead o: , is made u it rock in ving Athaba ous R/A; 1	s with de e. Mudst il stain" up of lar a coarse asca sand 5-20 cps,	pth, and r one is gre , as well ge (up to grained s stone is f BG = 10 c	ock gra y, fine as foss 3cm) fi andstor aulted. ps.	ades in e grain sil rem ragment ne matr . Scan	to a ve ed, and nants. s of qu ix. Co ned wit	ry coarse soft (H = The basal artz and ontact with th SPP2, no	2-3						
		(35.7-38.7)	1.5 part lami the bitu	meters 1 tly washe inated; d core axi uminous s	ost. The d out, and arker grey s. Fractu andstone.	uppper broker (orgar re at 3	portio n. Mid nic?) b 37.2 <u>+;</u>	n is ve dle int ands at healed	ery soft, erval is 80 ⁰ -90 [°] t with 2cm	0						
		(38,7-39,3)	Part sect	tly lost, tion brok	Limeston en into sm	e and m all (2c	nudston cm max.	e. Low) piece	er half of s.							
		(39.3-42.3)	0.2	meters 1	ost,											
•		(39.3-41.8)	Muds	stone, gra	ading into	sandy	mudsto	ne, <u>+</u> 40	% sand gra	ins.						
		(41.8-44.8)	Grey	y mudston	e; less th	an 5% s	sand.	Locally	sandy.							
		(44.8-47.2)	0.6 inte	meters lo ervals of	ost. Muds limestone	tone, 1	locally	sandst	one with m	inor						
		(47.2-50.9)	0.7 to a sect	meters lo a muddy sa tion, Lo	ost. The andstone, cally, lam	rock va "Dead inated	oil st at 90 ⁰	rom a s ain" in to the	andy mudst upper 0,2 core axis	one m of						
		(50.9-53.9)	98%	lost. Wa	ashed out 1	nudston	ne.								508-36	





MET	RES		CORE SAMPLES						
FROM	TO		DESCRIPTION	FROM	TÔ	WIDTH	%	AVERAGES (
		(53.9-57.0)	2.4 meters lost. Recovered portion consists of broken						
			up mudstone, very soft and incompetent; partly washed out.			•			
		(57.0-60.8)	Muddy sandstone; buff to grey in colour. 2.3 meters los "Dead oil stain" throughout section. Portions have smaller diameter (30%+ less than expected) core size.	t. 					
		(60.8-73.2)	Muddy sandstone to sandy mudstone. 75%+ sand grains. Buff (sandy) to grey (muddy) in colour. Fine grained. Small fragments of black shaly material (ζ 1%) inter- mittently distributed throughout section.						
		(63.1-64.0)	Core ground (washed?); 20%+ reduction in diameter.						
		(66.1-69.2)	0.3 meters lost. Upper 0.3m blocky; ground core, sandy gouge at 67.6.						
		(69,2-73,2)	1.5 meters lost. Top of interval and bottom of pre- ceeding section are broken.						
		(73.2-77.3)	Light to dark blue-grey mudstone. Laminations at 90 [°] to core axis; lighter grey mudstone; very thin. Also some interlayered bands of sandstone. Lower part of section contains intermixed calcareous layers (up to lcm).						
		(75.0-75.3)	Fracture zone. Gouge-coated fractures; 5mm at 75.0, 90° +; 2cm at 75.15, 60° +; 1cm at 75.3, 90° +.						
		(75.5)	5cm section is pitted, vuggy; filled with carbonate.						
		(77.3-79.0)	Sandy limestone(?); fine grained, H = 4, grey.						
		(79.0-79.6)	Medium to coarse grained Devonian sandstone, with inter- mixed mudstone layers. Sandstone contains some basement fragments (up to lcm).						
		(79.6-81.4)	Interval is pink to grey in colour. Pink material is carbonaceous; vugs common throughout. Grey bands are limestone. Minor intermixed coarse grained sandstone. The section grades into underlying sandstone.						
		(81.4-82.9 <u>+</u>)	Medium to coarse grained sandstone with intermixed layer of mudstone at 90°. Core washed (?); 20% diameter reduction.						
		(81.4-84.4)	1.2 meters lost.	1		ן חיש		i 508-36	







METRES				CORE SAMPLES						
FROM	то	DESCRIPTION	FROM	TO	WIDTH	%	AYERAGES			
		<pre>(82.9±-94.2±) Coarse grained, whitish-grey sandstone. Sand grains generally lmm±. The section contains 30-40% basement rock and quartz fragments, angular to sub-angular, up to 3cm in size. Well developed, intergranular poro- sity. Generally pitted, possibly due to leaching out of matrix. Poor sorting. Minor intermixed bands of sandstone (as 81.4-82.9±) at 84.2-84.4, 84.6-85.5±, 86 86.8±.</pre>	.4							
		<pre>(84.4-87.5) 2.4 meters lost. Several broken sections. Sandy goug lcm at 85.0+, 2cm at 86.0+. Depths estimated due to lost core.</pre>	e;							
		<pre>(87.5-90.6) 0.8 meters lost. (93.6-94.2+) 80% lost. Broken up sandy material. Lower half is completely unconsolidated coarse sand grains.</pre>								
	94.2+	UNCONFORMITY BETWEEN DEVONIAN AND ATHABASCA FORMATIONS								
94.2 <u>+</u>	110.3	ATHABASCA SANDSTONE								
		Generally buff to pink in colour; minor orange-brown and purple (here sections. Athabasca sandstone with minor intermixed sections of coarse grained sandstone (as seen from $82.9+-94.2+$). Bedding at $60^{\circ}-90^{\circ}$ to the core axis. No anomalous R/A, scanned with SPP2; 15-25 cps, BG = 10 cps.	n .)							
		(94.2+-100.5) Brown, fine to medium grained sandstone. Large (up to 5mm) fragments of quartz, basement rock, throughout (make up 2-3%). Bedding well defined at 70°-90° to core axis.								
	n en Andrean An Angel An Angel	(96.4) 10cm unconsolidated sand.								
		(97.4-97.9) As described from 82.9+-94.2+.								
		(100.0-100.5) As described from 82.9±-94.2±.								
		(100.5-107.8) Typical Athabasca sandstone. Buff to pink (weakly hematitic sections) in colour. Minor mud partings. Generally fine grained; intergranular porosity. beddin at 60°-90° to core axis.	8 8							







ME	TRES		CORE SAMPLES						
FROM	то	DESCRIPTION	FROM	то	WIDTH	%	AVERAGES		
		<pre>(107.8-110.3) Basal section ; variable. Core consists of orange- brown sandstone with minor intermixed purple (hem.) sandstone (5-10%). Medium to coarse grained. Top and bottom of section contain large (2-3cm) angular quartz clasts in sandstone matrix.</pre>							
	110.3	UNCONFORMITY BETWEEN ATHABASCA FORMATION AND PRE-CAMBRIAN BASEMENT		n de la composition de la comp					
110.3	120.5	ALTERED PRE-CAMBRIAN BASEMENT							
		Purple-red to yellow in colour; intensely hematitized, locally kao- linized. Everything but quartz altered to hematite. Gneissic bandin poorly defined, $45^{\circ}-60^{\circ}$ to core axis. Scanned with SPP2, no anoma- lous R/A; 20-30 cps, BG = 10 cps.							
		<pre>(110.3-116.5) Altered basement. Purple red-in colour. Coarser grained at depth. Below 115.2, black mafic splotches; possibly chlorite, micas?</pre>							
		<pre>(116.5-120.5) Kaolinization common; dominant between 117.0-118.0 and 119.5-119.9; rock yellow-green in colour. Chlorite alteration minor. Mafic blebs (0.3 meters extra core between 118.0-121.0).</pre>							
		(118.0) 2cm consolidated gouge.							
120.5	124.0	FRESH PRE-CAMBRIAN BASEMENT							
		<u>Granitic Gneiss</u> ; foliation at $45^{\circ}-60^{\circ}$ to core axis. Medium to coarse grained, H = 7. 60%+ quartz; feldspar, mafics. Orange-brown to grey in colour. Silicified, No anomalous R/A.							
	124.0	END OF HOLE							
		Probed with Mount Sopris 1000, through plastic pipe and casing. Plastic pipe to E.O.H.							
		Drilled by: Longyear Canada Limited							
		CASING: NW 0.0-24.4 BW 0.0-45.7							

DOWNHOLE LIG - J. DAH SUB-36 April 02,1979. Mount Sognis lovoc 5/27 Probe #279 Scale: 50 cps/cm Spead: 6 m/min (est). R. H. LAANELA . S. MOOKE O - COLLAR FLENATION - counter slipping ; reads 5.8 Proted through plastic pige خ١ č 20000 Ś. 10 on counter Ć. 110 21 211 ¢ € CIRACI ŧ NUD ¢ 15ł ----15.-1 55 1 20-

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			DIP TESTS			D				<u>-</u>				
TEET	ME	TRES	DIP	LATITUDE	DEPARTURE	LOCATION PET	m1 <u>c</u> 21	4	— но	DLE No. 5	08-37			
1891	FRUM	10 TOTAL	CORR.	CUM.	сим.	SECTION			. A	ZIMUTH	····			
		<u> </u>				LATITUDE 10+	80W			DIP T	90 ⁰			
		<u> </u>				DEPARTURE 115+	OON			IENGTH 1	42.3m			
						ELEVATION			aunors Stratioranhie					
						CORE BO			P	OKPOSE ?	8-0/-70			
						CORE		******************	COA	APLETED	A Easterna			
MET	RES			L		STORAGE	··· · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	LOG	GED BY	A. Fortuna			
FROM	TO			DESCRIPTION				1.1	, co	RE SAMPLE	5			
0.0	67.0						FROM	TO	WIDTH	*	AVERAGES			
0.0	57.9	OVERBURDEN												
$(x_{i}) \in [0,\infty)$		Fine sand	and boulders	s (sandstone, mu	ddv sandstone)									
		Approxima	telv 1.0m rec	overed.		•								
				.oreleu,						a da kara a				
57.9	86.9	DEVONTAN - POS	T-ATHABASCA C	THENTO										
			I ATIMINOUN O	EDIMEN15				·						
	a fina de	Mudstone	to sandy muds	tone, with some	minor section	e of limestone								
		Generally	soft. H - 2-	3. Locally lar	minated at 00 ⁰	s of limestone.								
		Very fine	grained. can	dy contions con		to core axis.								
		le a whit	febrarow cond	atoma coal	rser. Lower p	art of section								
		from 02 (1511-grey sand	stone, coarse gi	cained (as see	n in DDH 508-36,								
		1101 82.4	-94.2), Scan	ned with SPP2, r	no anomalous R	/A; 10-20 cps,								
		BC = TO C	ps.			승규는 물건 것이 많다.								
							1.0	54. 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 - 1910 -						
		(57.9-63.7)	Muddy sa	ndstone, 70%+ s	and. fine to	medium grained				1				
			Grev to	brown in colour.	Intergranul	ar porcoitu								
			Poor cor	e recovery: 57	9-60 0 1 0 -	al polosily.								
			60 0-63	1 1 2 motors 1 1 2 motors 1 1 2 motors 1 1 2 motors 2 2 2 2 2 2 2 2 2	9-00.0, 1.9 m	eters lost;		e e esterne	1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 -					
			Vd	1, 1.5 meters 10	st; 03.1-66.0	, 0.6 meters los	t .							
			Minor br	oken sections.										
		(03.7-67.1)	Sandy mu	dstone; less tha	n 30% sand.	Fine grained.								
			grey sand	dstone bands (up	to 0.2m wide) below 66.1m								
			Lost core	e: 0.2 meters be	tween 66 1-67	1			1					
				,					. · · · · [
	1.10	(67, 1-70, 1)	Dark blue	-aron mudators										
			Daix Diud	e-grey mudstone	with interband	led limestone.			la seña de					
			Minor in	cerbanded sandst	one, up to 2cm	n wide. Lami-			e di e					
1 E			nations a	at 90° to core a	xis.									
		((0 (70 1)												
		(69.6-70.1)	Fault zon	e. Gouge as fol	lows; 4cm at (59.6. lcm at								
· ·]			69.66, sm	ear at 69.8, 8cm	at 69.9. Mu	POURE, All			1					
			fractures	at 90° to the c	ore avis.	. 9		1						
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1				집 옷을 가 물었는 것이 없다.				1	1					
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MET	TRES		CORE SAMPLES					
FROM	то		DESCRIFTION	FROM	TO	WIDTH	%	AVERAGES ⁷
		(70.1-71.4)	Fine grained, muddy sandstone, grey to buff. Local iron staining. Upper 0.3m vuggy, carbonates (?). Lower contact faulted.					
		(71.4)	lcm gouge at 90 ⁰ to the core axis.					
		(71.4-72.8)	 Medium grained sandy mudstone to muddy sandstone. Locally interbanded at 80°+. 					
		(71.5)	2cm gouge at 90 ⁰ to the core axis.					
		(72.8-73.15)	Medium to coarse grained sandstone; intermixed clasts of basement material, up to 5mm wide.					
		(73.15-73.45)	Limestone (?). Hard, calcareous, pink in colour, generally vuggy. Impure; intermixed sand and base- ment clasts.					
		(73.45-85.5)	Whitish-grey, Devonian sandstone. Similar to unit described in DDH 508-36 (82.4-94.2). Very coarse grained, intergranular porosity, open. Intermixed clasts of quartz and basement rocks, up to 3cm in size; generally angular.					
		(73.45-81.3)	90%+ lost. Minor amount of cave material.					
		(81.3-84.4)	U.9 meters lost.					
		(81.9)	10cm block of quartzitic material; veinlet(?)					
		(85.5-86.0)	Buff, fine to medium grained sandstone.					
		(86.0-86.9)	As described from 73.45-85.5.					



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ME	TRES		DESCRIPTION			CO	ORE SAMPLES			
FROM	70			FROM	то	WIDTH	%	AVERAGES 1		
	86.9	UNCONFORMITY BETW	EEN DEVONIAN AND ATHABASCA FORMATIONS							
86.9	113.3	ATHABASCA FORMATI	<u>ON</u>							
		Typical buff Fine to medi	to pink Athabasca sandstone with red hematitic sections um grained, 90%+ quartz. Hematitic alteration increases							
		lying Devoni Basal sectio	an sediments. At depth, grades into brick red siltstone n is brecciated, with large intermixed clasts of basemen							
		materiat.								
		(86.9-89.5)	Transitional zone between Devonian and Athabasca. Medium grained sandstone. Minor coarse grained sec- tions similar to those described from 73.45-85.5							
			throughout, in lengths ranging to locm; make up 20%+ of the interval.							
		(89.5-91.7)	Buff coloured, fine grained Athabasca sandstone. Bedding at 80 [°] +.							
		(90.6)	2cm unconsolidated sand.							
		(91.7-103.6)	Fine grained, buff to pink Athabasca sandstone. Locally darker red, hematitic banding; parallels bedding (80°+). Frequency of red bands increases below 100.2m. Unit grades into section below.							
		(103.6-109.6)	Medium to coarse grained, red, hematitized Athabasca sandstone; local buff coloured sections. Commonly fractured; long, irregular fractures sub-parallel to the core axis over 60%+ of the interval; coated with pyrite and marcasite (?). Note: 0.5m lost between 109.4 and 111.3; helper neglected to put core tube down.							
		(109.6+-111.9)	Brick red, intensely hematitized siltstone; very fine grained, $H = 4$. Interbanded fine shale or mud layers at 90 ⁺ to the core axis. Upper 0.3m very hard green material; possibly chert (?). Lower half of section contains numerous intermixed blebs of brownish-green, granular material; possibly sandstone. Minor inter-							



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ME	TRES		CORE SAMPLES						
FROM	то		DESCRIPTION	FROM	TO	WIDTH	%	AVERAGES (
		(111.9-113.3)	"Transported regolith" similar to interval described in DDH 508-35 (82.6-84.9). Basal section, consisting of large, angular granitic and quartzitic fragments in a red siltstone matrix. The contact with the under-	#6051 111.93	112.6	0.6m	U - Th - Cu -	6.1 ppm 96 ppm 14 ppm	
			lying unit is sharp.				Co - Ni -	2 ppm 7 ppm	
		(112.3)	Weak radioactivity. Maximum count rate, 50 cps, SPP2, BG = 20 cps. Registers 150 counts on Mt. Sopris down- hole log (at 111.6). Radioactivity in breccia block of granitic and quartzitic fragments in a siltstone matrix; probably related to one of the basement clasts						
	113.3	UNCONFORMITY BETWE	EN ATHABASCA FORMATION AND PRE-CAMBRIAN BASEMENT						
1 3. 3	140.8	ALTERED PRE-CAMBRI	AN BASEMENT						
		(113.3–118.1)	Hematitic coarse grained granitic rock. Massive texture; $H = 6-7$. 60% quartz. The remainder has generally been altered to hematite. Green-black mafic blebs (soft, $H = 3-4$; possibly chlorite) occur spora- dically throughout; most common between 115-115.5. The rock is finer grained between 117.6-118.1.	#6052 117.37	118.0	0.6 m	U - Th - Cu - Co -	6.5 ppm 265 ppm 6 ppm 1 ppm	
		(117.6)	Weak radioactivity, maximum count rate, 60 cps, SPP2; BG = 20-35 cps. Radioactivity appears to be associate with a red hematitic band, 1cm wide, at 60 \pm to core axis. Registers 280 counts on down-hole gamma log (at 117.4m).				N1 -	3 ppm	
		(118.1-119.8)	Dike(?). Very fine grained. Foliation at 45° + to the core axis. Contacts well defined, sharp; upper at 55° lower irregular, 45-60°. Background 30-40 cps, slight ly higher. Also seen in down-hole log.	#6053 -119.2	119.8	0.6m	U - Th -	4.8 ppm 260 ppm	
		(119.6)	Weak radioactivity. Maximum count rate, 60 cps, SPP2. Source not determined. Registers 300 counts in down- hole gamma log (at 119.0m).				Co - Ni -	3 ppm 5 ppm	

508-37







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METRES CORE SAMPLES DESCRIPTION FROM TO FROM TO WIDTH % AVERAGES (119.8 - 124.5)BG = 20-30 cps. Gneiss. Hematitic alteration less intense than between 113.3-118.1. Section is finer grained, weakly gneissic. Some feldspar altered to kaolinite. Mafics generally appear unaltered. (124.5 - 140.8)Similar to 113.3-118.1. Not as strongly hematitized. Locally, kaolinization is dominant alteration. Generally coarse grained, pegmatitic; massive. Local variation. 40%+ feldspar, 40%+ quartz, mafics. (126.7 - 128.6)Intensely kaolinized. Feldspars yellow-green. (131.0 - 135.0)As 126.7-128.6. 140.8 142.3 FRESH PRE-CAMBRIAN BASEMENT Pegmatite (?). Coarse grained. Mainly quartz and feldspar, 15-20% mafics. Silicified, hard. Massive texture. No anomalous R/A. scanned with SPP2. 142.3 END OF HOLE Probed with Mt. Sopris 1000. Plastic pipe to 139m. No materials lost in hole. Drilled by: Longyear Canada Ltd. CASING: NW 0-33.5 BW 0-57.9

-DOUNHOLE LUG- J -DDH 508-37 DUH 508-37 April 08, 1979 Mt. Sopris 1000-C 5/N7 Probe #279 Scale: 50 cps/cm Speed: 6 m/nin (est/ T. P. FORTUNA : J. MOORE 0.0___ CULLAR. counter slipping reads 2.9 Probed through plastic pipe, casing 1 £ 1 ł • ¢ ና ¢ • İ. ٤. ę. 1 ٩ 1 ¢ ļ ٩ ŧ ٤ 10 ĸ ٤ 6 . • ; i € ¢ E. ¢ ŧ Ś € i 5 € 0 ¢ -** 6 ¢ 15-¢ < € (¢ . . -• ; ۲ ţ ŧ ŧ. 1 1













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	·		DIP TESTS			D	armite (716			FOO OO				
	ME	TRES	DIF	LATITUDE	DEPARTURE	T LOCATION	stmrt 4	4	:H(DLE No	508-38				
1591	PROM	TO TOTAL	CORR.	CUM,	CUM.	SECTION				ZIMUTH		(
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	<u> </u>					ELEVATION			. P	URPOSE	Stratigraphic				
						COREBC	<u> </u>	******	COA	APLETED	11-04-79				
						STORAGE			100	CED 84	P.A. Fortuna				
ME	THES								100	GED BT .	• • • • • • • • • • • • • • • • • • • •				
FROM	10	DESCRIPTION							CORE SAMPLES						
					·· .		FROM	TO	WIDTH	%	AVERAGES	-			
	1						1								
0.0	58.5	OVERBURDEN													
										1. S. S. S.					
		Sand an	d boulders; 0.3m	recovered at 2	4.3m - sands	tone boulder.				1.11	In the Research states are a				
	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	No sedi	mentary rocks.												
8.5	75.3	ALTERED PRE-	CAMBRIAN BASEMENT				l ante a								
										11.5					
		T					• •								
e gel		Intense	ly altered and fi	actured throug	hout; hemati	tization and		an an an taon an Taon	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -						
ang ang a		chlorit	ization. General	ly, the rock i	s medium to a	coarse grained.									
		Texture	quite variable:	gneissic to ma	ssive to cat:	clastic Colour		a se se a		1.5.1					
an a ta a		varies	with the type of	alteration S		crastic. Corour									
8 B. 1		70700	suggest faulting	diccideion. J	everal gouge-	-smeared fracture									
1		201103,	suggest faulting.	Good core re	covery. Scan	nned with SPP2;				1 A A					
		no anom	alous R/A; 20-30	cps; $BG = 10-1$	5 cps.										
										1. A. A. A. A. A. A. A. A. A. A. A. A. A.					
		(58.5-60.3)	Dark green: c	hloritization	strong Rold	lenar makee un									
			60%+ of the 1	nterval: altor	od mod and	ispar makes up									
				atter atter	eu, red and g	green in colour,					and a start of the				
			Subhedral Cla	sts. 20% quar	tz; chlorite.	Massive texture	•								
	1.19								1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -						
		(60.3-62.3)	As above, but	less chloriti:	zation: minor	guartzo-feldspa-									
			thic banding.					$(1,1) \in \mathcal{K}$							
		(61, 8-62, 0)	Fracture of 7	00 +- +1-											
		(0110 02.0)	Flacture at 2	U to the core	axis; nealed	with hematite.	1								
		110 0 11 1		e film ha ditta an ta saa											
		(62, 3-66.1)	Rock has chan	ged to a very s	silicious uni	t. 60%+ guartz.		a de la							
1			Feldspar abou	t 30%. Gneissi	ic banding at	45°-60° to the		1940 A.M. 1							
992 - E			COTE avie F	aldonaro homoti	ted and the at	45 -00 Lo Lile						20			
			core anto, r	erospais nemati	LLIZEd, Chior	itized. Interval									
	S. 200		scrongly frac	cured, broken,					12 H						
									- 18 C	1					
1		(62.3-62.5)	Gouge-smeared	fractures: 45	60° to cor	e avie									
	a ser la ser 🛔								1						
	a je stali j	(63 25-62 4)	Broko-				1			I					
	1	(00,20-00,4)	Droken Core.		전문의 관계 문화		I	1	1	- 1 - 1		÷			
							an an t								
12		(63.5- 64.0)	Long, irregula	ar fracture, su	b-parallel t	o the core axis						n Le ne			
i de la composición de la comp								- 18 g 🛛 🖡		1		ar A			
24日月	- 19 - 19 - 1		이는 것은 말했다. 아이는 것은 것은 것이 같아요.				- 20 A								
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METRES				CORE SAMPLES							
			DESCRIPTION	FROM	TO	WIDTH	%	AVERAGES			
ROM	то										
			The strength fractured shout 40% blocky to								
		(64.0-66.1)	Interval is strongly flactured, about 40% blocky to			l series					
			broken; iragments smeared with godge.								
		((() (0 0)	Fine to medium grained, appears to be composed of inter-								
ta a se		(00.1-09.9)	mixing of sections described from 60.3-62.3 and 62.3-								
			66.1. Alteration and degree of fracturing very intense;	. *							
			rock difficult to recognize. Broken core: 66.1-66.5,								
			66.9-67.1. Fractured throughout, 70-90 to the core								
			axis common.								
		(69.9-72.2+)	Coarse grained breccia section. Large angular quartz		1						
			and feldspar (hem.) fragments. Minor, soft, pale green								
	-		sections. Kaolinite on fractures. Blocky. Locally,								
			fine grained, silicious, with intermixed relospar.								
			to the second and broadlated Broken core								
		(72.2+-73.6)	As 58.5-60.3, but fractured and precedeted. Broken core								
			(Smm-2cm) irom /3.0-/3.3.			1 - 1	1.1.1				
		(72 6 72 0)	As 62 3-66 1 Lower contact very sharp, well defined			a shaa					
		(/3.0-/3.0)	As $02.5-00.1$. Hower contact your emerged at 40° to the core axis.								
		(73, 8-75, 3)	As 58.5-60.3.								
		(1510 1515)	영국 전문 영상 이 글을 잡아 있는 것을 가 들었다. 영화 등 것을 물었다.								
75.3	81.6	FRESH PRE-CAME	BRIAN BASEMENT								
		Medium to	coarse grained, massive to pseudogneissic section; hard								
		(H = 6-7)	. Generally greenish-grey, minor orange-brown sections.								
		30% felds	spar, 40%+ quartz, 30%+ mafics (chlorite). Core is very								
		competent	; silicified throughout. Minor fracturing. Scanned with								
		SPP2, no	anomalous R/A; 25-35 cps.								
			number 14mod functions 30° and 150°, minor seconda-		1.87						
		(80.3-80.4)	Fine gouge-lined fractures; 50 and 150, minor associate				1				
	1		teo cataciasism.				1 22				
	1	(01 / 01 6)	Plockus couce-smeared fragments.		1						
		(01.4-01.0)	DIACA' PARE SWEATCH TIRE MANAA								
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								FROM	то	WIDTH	%	AVERAGES
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	81.6	FND OF HOLE							1	1	1	
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DUWNINCE LUG - 0 DDH 508-38 DOH 508-38 April 11, 1979 5/N7 Mf. Sopnis 1000-c Probe #279 Scale: 50 cps /cm Speed: 6 m/min ((est) T. P. FORTUNA S. MOORE COLLAR devation 0.0d counter slipping ; reads 4.6 ! : 5 ţ ł ſ l ł (İ 10 C • ï ÷ 11114 Ţ ÷ ſ f • 4 15 1 £ . ÷. : 1 1 i

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	MET	RES	DIP			JDE	DE DEPARTURE LOCATIONPET							
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_						· · · · · · · · · · · · · · · · · · ·					••	UIP		
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_								ELEVATION			Pl	JRPOSE	SCIALIGIAPHIC	
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	L	<u> </u>				·		STORAGE			LOGO	JED BY	P.A. FOLLUIA	
E	TRES				DE	CRIPTION				1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 	<u></u> COI	RE SAMPLES	 A second sec second second >	
	10				U C				FROM	10	WIDTH	*	AVERAGES	
										•				
	64.0	OVERE	URDEN											
	1 . 1	Sa	ind and b	oulders.	Minor recov	erv of sa	indstone and r	udstone boulders						
		fr	om 63.0-	64.0m. Sc	anned with	SPP2: no	anomalous R/A							
		**												
	70 24	DEVON	TAN SEDTI	MENTS - PO	ST ATHABASC	A								
	12.24	DEVON				-		an an an an an an Araba. An taonachadh an Arganacha						
		Li	ght to d	ark grey m	udstone, fi	ne graine	d, generally	arenaceous.		14. 17.				
		Ve	ry incom	petent; po	or core rec	overy.					a and			
									a di perio					
		(64.0	-66.1)	9	5%+ lost.	Dark grey	mudstone. 1	linor organic						
					material(?).	black in	colour.							
					·····									
		(66.1	-69.2)	c	5%+ lost.	Dark grev	, sandy mudst	one: 30-40%						
		(0011	,		and.		, .,							
					Jea 1 1 6 1									
	l the l	160 2	-75 3)		5 motors 1	ost Boo	k grades from	above into ligh	- 1					
		(02.2			row olight	ly bitumi	nous mudeton	and then into						
					grey, Sirgur	no licht	arow in cold	ur Jouer por-				a start		
				8	andy muusto	me, iight	grey in condu	ation in core						
				Ľ	ion of inte	rvai grou		ICLION IN COLE						
				¢	lameter.									
		1												
		(75.3	-78.3)	1	L.5 meters 1	ost, San	dy mudstone.	Reduction in						
				C	ore size in	upper 60	% of recovere	d portion.						
-				L	lower 20cm o	of interva	l solidified	mud; gouge (?).						
											1.1.1.1			
		(78.3	8-79.24)	C),6 meters 1	ost. San	dy mudstone.				1 Same			
												1 1		
	79.24	END C	F HOLE											
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and the second second	l a star l	Ab	andoned.	uasing t	proke; ZL. 30	i tert in	note, Mote v	as not probed.	1		1 1			
and the second second		DE	H 508-40	drilled a	longside; r	efer to l	log for down-l	ole X -log.		, 1				
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DRILL HOLE				Ì				PROJECT									
P					DIP TESTS					location Per	mit 2	14			508-40		
TEST	FROM	TRES	TOTAL		OIP CORR.	L L	CUM.	DEPA	RTURE	SECTION			HL	71ALLTH			
								1	- com.	LATITUDE				DIP	-87		
													••	LENGTH	102.11m		
					ļ					ELEVATION		P	URPOSE	SLEALLYFAPHIC			
								4		CORE	••••••••	*******	CON	PLETED	P A Fortune		
		l			L			1		STORAGE			LOG	LOGGED BY			
ME	1 10						DESCRIPTION					T ===	CORE SAMPLES				
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64,3	82.0+	<u>DEVO</u>	NIAN SE	EDIMEN'	TS - POST	ATHABA	SCA					and a second second second second second second second second second second second second second second second s					
		v	ery lit	tle c	ore recov	ery; 2n	+. DDH	508-40 g	rilled f	rom same collar							
	as DDH 508-39, about 3 flatter (87, vs. 90). Due to poor ground							a an an an an an an an an an an an an an									
		conditions in the Devonian, it was agreed to tri-cone through and															
		ŗ	run the casing to the point at which DDH 508-39 was abandoned. Refer														
•			o log c	אעע זכ עריי	508-39 I	or repr	esentativ	re look	at the D	evonian sedi-							
			ents II	1 000 .	5.70-40.												
82.0+		UNCO	NFORMIT	Y BETW	VEEN DEVO	NIAN AN	D ATHABAS	SCA FORM	ATIONS		a an Ant						
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82,0+	87.5	ATHA	BASCA S	ANDST	ONE												
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		Ъ	ands of	Devoi	nian muds	tone up	to 10cm	wide.	Medium g	rained inter-							
		g	ranular	poros	sity. Bea	dding i	s fairly	well de	fined at	90° + to the							
		с	ore axi	s. Ul	pper conta	act (82	.0+) spec	ulative	. About	2.0 meters lost							
		Ъ	etween	84.4m-	-87.5m (g	round c	ore at 84	1.4). N	umerous	rounded pebbles							
		0	f basem	nent ma	aterial (up to l	cm in siz	:e) at 8	7.5m. S	canned with							
		5	PP2; no	anoma	alous K/A	; 15-20	cps.										
	87.5	UNCO	NFORMTT	Y BET	JEEN ATHAT	BASCA F	ORMATION	AND PRF	-CAMBRTA	N BASEMENT							
						<u></u>	<u> </u>		<u> </u>								
87.5	96.0	ALTE	RED PRE	-CAMBI	RIAN BASEN	MENT								10			
87.5		Rock is quite variable. Strongly fractured and broken up. No ano- malous R/A; scanned with SPP2.															
		(87.	5-92.0 <u>+</u>	•	Red frac at & felo	and gr ctured 39.0m. ispar(?	een alter and broke Green co).	ed, loc m up. loured	ally ban Well def alterati	ded. Strongly ined fault (?) on may be on							

DRILL HOLE



PAGE 2

MEI	RES	DECOUDTION			CORE SAMPLES						
FROM	TO		DESCRIPTION	FROM	TO	WIDTH	%	AVERAGES			
		(87.5-89.0)	0.8 meters lost. Lower half of recovered section broken into angular fragments.								
		(89.0-89.9)	Generally blocky. 80% recovery.								
		(89.1)	3-4cm solidified red (hem.) clay gouge; fracture at 80°+ to the core axis.								
		(89.9-90.8)	Rock grades from red altered gneiss (banding at 30° to the core axis), minor green alteration, to an intensely fractured cataclastic rock that con- tinues to 93.0m+. Blocky and broken below 90.2m. Locally, intense orange-red hematitic alteration.								
		(89.9)	Contact with the overlying section is smeared with gouge.								
		(90.8-93.0 <u>+</u>)	1.6 meters lost.								
		(92.9 <u>+</u>)	lcm gouge, solidified; 90° to the core axis.								
		(93.0 <u>+</u> -96.5)	Dark grey to black, fine grained, chloritized rock Locally gneissic (45°+ at 94.6m). Interbanded white feldspar clasts (totally altered to kaoli- nite, very soft, H = 2-3) and quartz. Locally, coarse grained breccia sections where large feld- spar clasts are only partially altered.								
		(93.0 <u>+</u> -94.2)	0.8 meters lost; core generally broken. 2cm dark grey clay gouge at 94.2; fracture irregular.								
		(94,2-94,5)	Breccia. Large, angular quartz and feldspar clast in chloritic matrix.	S							
		(94.6-95.0)	Blocky. Core broken into large angular fragments.								
		(95.4-96.0)	Core grades into unaltered, mafic-rich gneiss.								

DRILL HOLE



PAGE 3

ME	TRES	DECOUDTION)	CORE SAMPLES							
ROM	TO	DESCRIPTION	FROM	TO	WIDTH	%	AVERAGES			
.0	102.11	FRESH PRE-CAMBRIAN BASEMENT	-							
		<u>Mafic gneiss</u> . Gneissic banding generally well defined at 30° to the core axis. Upper portion of the interval is fractured; texture not well preserved. Fine to medium grained. Orange-brown to dark grey in colour. Silicified throughout; H = 6. Composition: $30-40\%$ mafics, $30-40\%$ feldspar, $20-30\%$ quartz. Scanned with SPP2; no anomalous R/A.								
		(100.0-100.5) Long fracture sub-parallel to the core axis; hematitized.								
		(100.5-101.6) Medium to coarse grained orange-brown, massive granite; mainly quartz and feldspar.								
	102.11	END OF HOLE								
		Probed with Mount Sopris 1000. Plastic pipe to E.O.H. 67.05m. BW casing lost in hole.								
		Drilled by: Longyear Canada Limited.								
		CASING: HW 0.0-8.84 NW 0.0-33.5 BW 0.0-88.39								

DOWNHOLE LOG - Y DAH 508-40 April 17, 1979 Mt. Jopris 1000-C Probe #279 5/N7 Scole: 50 cps/cm Speed: 6 h/nin (est) C < A P.FORTUNA . J. MOORE ¢ C C - COLLAR ELEVATION-C 0 C Probed through plastic pipes C and casing. C C ł C ¢ 11.5 €. S C 5 C ¢ ž C č <u>e</u>r: (C TUAN PART 1 C E C 6 18 € i **NOON** C 1 ¢ € ł € € € i C 15 C į. € ¢ €















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					DIP TESTS		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		Porm	1+ 21	ς			500-41
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Colla	r			1	-72			LATITUDE	100+	OUN		•	DIP .	-/2 SE
144.7	8		1	-74	-69			DEPARTURE	81+3	OW		••••	LENGTH	148.74m
								ELEVATION				F	URPOSE	Test Resistivity
								CORE	BQ			co	API FTFD	April 24, 1979
								STORAGE					CED BY	P.A. Fortuna
MET	RES					,	- <u>L</u>		1					
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0.0	39.0	OVERE	URDEN											
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		58	ing and	bould	ers.							La de se		
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39.0	111.04	DEVON	IAN SE	DIMENT	<u>S</u>									
		Va	rishle	but	nredominan	tly mudatona	Tatama 1	haadma				1		
		va fo	110000	, out	predominan	LIY MUDSLONE.	incerval	begins with limes	rone,					
		10	TTOMED	by ve	ry incompe	cent black gri	tty materi	al, possibly goug	e,					
		an	d then	a bla	ck mudston	e. This grade	s into typ	ical Devonian mud	l- :					
		st	one, g	eneral.	ly grey in	colour, with	minor sand	y sections; local						
		"d	ead oi	l stai	n". At dej	pth, the mudst	one grades	into a red (hema	titid)				
		si	ltston	e (?) 1	which conta	ains interband	ed mud-cla	y layers; this is						
		fo	llowed	by sau	ndy mudstor	ne (minor clay	lavers) t	hat grades into u	nder-				1.1	
	1	ly	ing At	habasca	a sandstone	e. The rock is	s fine-era	ined throughout	ev-					
		Ce	ntin	the are		actions Scan	nod with S	PP2: no enemalous		and the second sec				
	1.1	15	-20 cm	c		Sectons. Scan	ICG WICH D	iiz, no anomatous	A/A,					
			LO CP	3.					- I					
		(20 0	15 0.	Sec. Sec. 34										
a ta t		(39.0	(39,0-45,0+))	Limestor	stone; grey to brownish-grey in o		y in colour. San	dy	e e te di se		1. A. A.		
					below 42	2.1m. Upper ha	alf of int	erval contains vu	gs,			1.5		
					calcared	ous.			ang sa 👔					
1	18 A.													
		(39.0	-42.1)		0.9 mete	ers lost; core	blocky at	top of interval.						
									1. N. 1					
		(42.1	-43.0)		General1	v sandy limes	tone bloc	ky for 20m at 42	1 m					
		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,		001101011	Ly Bandy TIMES	cone, proc.	ky 101 • 2011 at 42	• 1 111					
		(1.2 5	\		1	1		0, .	e per la constante de la constante de la constante de la constante de la constante de la constante de la consta					
		(42.)	/		ICM Sand	ly gouge; iraci	cure at 60	to the core axi	s.					승규는 여기가 가지 않는다.
		· / / A					a fredstriftet							
		(42.1	-42.9)		Broken;	sand and mud g	gouge; 2cm	at 42.7m at 45 ⁺	to				N. La Maria	
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					the core	axis,								
	1							동안 가지 않는 것이 않는 것이 없다.						
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		n e na serie La constante			lost in	this interval	Lower 1	0-15 m is soft A	orb			.		
					Drov All	dy mudatoro -	iowu dalaa	otomb dates	arr	. <u>S.</u>				
					Ley sau	10 ± 0.45	ery incom	vecent. Contact (1				
					TTHESTON		e core ax	is; snarp. (Actua	ai I			e gegi l		
					contact	between the Li	lmestone ai	nd mudstone may be	e					508-41

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ME	TRES		ELDORADO NUCLEAR LIMITED		ri PA	OJECT GE	2
FROM	то		DESCRIPTION		COR	E SAMP	LES
		(45.0 <u>+</u> -51.3 <u>+</u>)	Fault zone(?) Black, gritty, solidified gouge; generally washed out (202+ reduction in core diamete Very poor recovery, 0.7 meters in total. Appears to be 60-70% sand in black muddy matrix. (No resistivi response on Multimeter.)	r).	WIDTH	%	AVERAGES
		(51.3 <u>+</u> -58.2)	Black, organic-rich(?) mudstone. Very fine-grained. Laminated, 60°-70° to the core axis. Top of interva is very incompetent. Minor intermixed grey mudstone Contact with underlying section is gradational.				
		(51.3±-52.7)	Broken throughout, mud chips generally less than 2cm in size. Lower 0.3m appears to be poorly reconso- lidated, broken up mud (gouge).				
		(52.7-54.6)	Brownish-black mudstone. Core commonly broken along fractures at 60°-70° to the core axis. Minor muddy gouge at 54.2m. 95% core recovery,				
		(54.6-55.7)	Dark grey to black mudstone, laminated 60 ⁰ + to core axis. Lower 10cm solidified, gouge, broken.				
		(55.7-56.0)	Light grey limestone, muddy; fractures sub-parallel to core axis.				
		(56.0-58.2)	0.1 meters lost. Above grades into underlying mudstone. Dark grey to black mudstone with minor arkosic bands ("dead oil stain") at 60°+ to the core axis. Core blocky, broken from 56.9+-57.2+. Locally pitted. Interbanded light grey mudstone.				
		(58.2-60.4)	Fine grained, grey mudstone. 95% recovery. Blocky core; 2cm at 58.35+, 4cm at 58.6+.				
		(59.5)	2cm clay gouge. Fracture irregular but appears to be about 90° to the core axis.				
		(60.4-66.4)	Blue-grey mudstone. Core recovery 100%. Generally pitted (partially washed). Locally, core is broken. Several gouge-lined fractures.				
		(60.4-60.75)	Core generally broken up. Contains minor limestone				







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<u>08-41</u> 3

MET	RES					CORE SAMPLES						
FROM	то		DESCRIPTION	FROM	то	WIDTH	%	AYERAGES (
		(61.8-61.9)	Sandy; 50-60% sand in mud-clay matrix.									
		(62.2)	lcm gouge; fracture at 55° to the core axis.									
		(63.1-63.4)	Broken core.									
		(64.2-64.3)	Broken core.	an an an an an an an an an an an an an a								
		(65.1)	lcm solidified mud gouge, 90°+ to core axis.									
		(65.6)	2 cm gouge; 60° -70° to the core axis.									
		(66.0-71.6)	Sandy mudstone (blue-grey) with intermixed muddy sandstone (brown), and minor limestone.									
		(67.5-67.6)	Pinkish-grey limestone; irregular fracture, sub- parallel, healed with tar, calcite.									
		(68.3)	lcm clay gouge, 90° to the core axis.									
		(68.8-69.0)	Core broken, fractured; lcm gouge at top of section, fracture 60° to the core axis.									
		(69.5-72.5)	1.0 meters lost (assume in upper portion of interval									
		(69.5-70.0 <u>+</u>)	Predominantly sandstone to muddy sandstone; minor "dead oil stain".									
		(71.6-73.1+)	Sandy mudstone with minor black splotches, particu- larly below 72.5m; possibly fine grained pyrite or marcasite.									
		(72.5-75.6)	1.5 meters lost.									
		(73.1 <u>+</u> -79.0 <u>+</u>)	Grey sandy mudstone grades into blue-grey mudstone, partially washed (pitted), and then back into sandy mudstone. 1.9 meters core lost between 75.6-78.6; section broken up and smeared with gouge.									
		(79.0+-87.8)	Upper 15cm is brown, bituminous sandstone; grades into muddy sandstone with intermixed sandy mudstone (25-30%). Lost core: 0.3 meters from 78.6-81.7;					508-41				







-41

METRES CORE SAMPLES DESCRIPTION FROM 70 FROM 10 WIDTH % AVERAGES (79.0 - 87.8)Broken core: 80.8-81.3, sandy gouge on fragments; (Cont^Td) cave material (limestone and basement fragments) between 81.7-84.4; 20cm in middle of interval 84.4-87.8 as well as the final 20cm, gouge-smeared fragments. (87.8 - 90.5)1.2 meters lost. Grey mudstone; numerous gougesmeared, broken sections. (90.5 - 94.2)Blue-grey to blue mudstone. Recovery generally good. Minor broken sections. 0.4 meters lost between 90.5-93.3. (92.6 + - 92.9 +)Laminated, grey and blue interbanded mud layers; 80 + to core axis. (92.9 + - 93.1 +)Grey limestone. Fractured sub-parallel to core axis; coated with pyrite. (93.1 - 93.3)Broken core; fragments generally less than 1cm. (93.7 - 94.0)Orange-red, carbonate (?) coating on fractures. (94.2 - 94.3 +)Limestone, dark grey; vugs in bottom cm. (94.3 - 94.8)Core broken along fractures, generally $60^{\circ}-90^{\circ}$ to core axis. Upper 2cm limy. (94.8 - 96.0)Medium grey mudstone; some minor intermixed arkosic laminae at depth; 60 + to core axis. (96.0 - 98.5 +)Sandy mudstone (grey) to muddy sandstone (brown). 0.8 meters lost between 96.9 and 100.0; lower contact estimated. (98.5 + -100.3 +)Limestone to sandy limestone with minor intermixed blue-grey mudstone bands at 60°-70° to the core axis. (100, 0-103, 0)0.5 meters lost. (100, 3 + -101.0 +)Medium to coarse grained sandstone; minor limestone chips.





PHUJECT 08-41 PAGE 5

METRES					CO	RE SAMP	SAMPLES			
FROM TO		DESCRIPTION	FROM	то	WIDTH	%	AVERAGES			
	(101 <u>+</u> -107.4)	Hematitic mudstone (silstone?). Maroon colour; minor blue-grey interbanded mud layers and minor interbanded sandstone. Banding is generally at 60° <u>t</u> to the core axis. Floating sand grains towards bottom of section (4 2%).								
	(101.9)	lcm red clay gouge; fracture 60 ⁰ to core axis.								
	(103.6-103.85)	Blocky.								
	(107.4-108.4)	As 101.0+-107.4; 20-30% floating sand grains.								
	(108.4–111.0 <u>+</u>)	Muddy sandstone to sandstone with minor intermixed blue clay bands, $50^{\circ}-70^{\circ}$ to the core axis. Transiti into underlying Athabasca sandstone. 0.5 meters los between 109.1-112.2.	on							
111.0 <u>+</u>	UNCONFORMITY BETW	EEN DEVONIAN AND ATHABASCA FORMATIONS								
111.0136.15	ATHABASCA FORMATI	<u>ON</u>								
	Typical <u>Athaba</u> Upper portion sandstone, whi SPP2; no anoma	sca Sandstone. Very consistent throughout interval. somewhat coarse, but generally fine grained quartz te in colour. Minor hematitic banding. Scanned with lous R/A.								
	(111.0 <u>†</u> -113.8)	Buff coloured sandstone. Minor pink to red hematiti bands. Bedding at 50° -70° to core axis.	6 							
	(113.8-134.7)	Clean, white sandstone. Fractures common, random orientation. Several are healed with a yellow-brown mineral, possibly carbonate. Very fine grained, clean sandstone. Little variation through interval. Minor broken sections. Core locally blocky: 5cm at 114.4+; 0.2 meters lost between 112.2-114.9.								
	(124.3-124.7)	Blocky, broken. Angular fragments.								
	(125.6-125.9)	Blocky, broken.								
	(134.7-135.6)	Sandstone contains numerous small (1-2mm) intermixed clasts of quartz, as well as a few larger (up to 3cm)								

DRILL HOLE LOG



508-41 PROJECT PAGE

METRES		ELDORADO NUCLEAR LIMITED		PAGE 6						
FROM	то	DESCRIPTION			CO	RE SAM	PLES			
	1.122		FROM	TO	WIDTH	%	AVERAGES			
136.1	136.15 148.7	 (135.2) lcm gouge; white to pale green, greasy (talc?). Fracture at 70° to the core axis. (135.6-136.15) Sandstone is quite variable. Brick red to buff co- loured. Lower portion contains large, broken up quartz clasts in a sandstone matrix. Contact with underlying basement sharp, well defined at 70° ± to the core axis. <u>UNCONFORMITY BETWEEN ATHABASCA FORMATION AND PRE-CAMBRIAN BASEMENT</u> <u>ALTERED PRE-CAMBRIAN BASEMENT</u> 	#6056 140.3 #6057 141.2	140.9	0.6m 0.6m	U - Th - Cu - Co - Ni - U - Th - Cu - Co - Co - Co - Co - Co - Co - Co	8.5 ppm 447 ppm 3 ppm 1 ppm 1 ppm 7.6 ppm 296 ppm 2 ppm 1 ppm			
		 4-5. Generally medium grained; gneissic banding well preserved at 40°-60° to the core axis. Central portion of the interval is finer grained and more intensely hematitized. Silica content increases in lower 2 meters of section; also minor kaolinization. Generally 40-50% loss. Scanned with SPP2; minor R/A; weak. (136.15-139.7) As per general description. Gneissic banding at 60° to the core axis. 	#6058 142.6 #6059	143.1	0.5m	NI - U - Th - Cu - Co - NI -	2 ppm 2 ppm 5.7 ppm 205 ppm 4 ppm 1 ppm 3 ppm			
		(139.7-144.4+) Fine grained, dark reddish-brown (strongly hematitize Weak radioactivity scattered throughout section; max- imum count rate, 85 cps, SPP2 at 140.7m; other R/A in the order of 40-50 cps (2x background) as follows; 140.45, 140.85, 141.5, 142.8, 143.0, 143.4 and 143.9. R/A associated with intense hematitization. Samples taken. Minor blocky sections.	143.4 d).	144.0	0.6m	U - Th - Cu - Co - Ni -	8.0 ppm 248 ppm 3 ppm 1 ppm 1 ppm			
		(144.4+-146.5+) Generally as described from 136-15-139.7. Minor green chloritic blebs.								
		(146.5+-148.7) 60-70% quartz in hematitic matrix. Medium grained. Feldspar kaolinized; fractures smeared with kaolinite.								

DRILL HOLE



PROJECT _____ PAGE ____7

5-41

ME	TRES						
FROM	то	DESCRIPTION		1	COR	E SAMP	LES
			FROM	<u> </u>	WIDTH	%	AVERAGES ,
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		BW 0.0-71.32					
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DOH 508-41 April 21, 1779 Mt. Jopris 1000 -C Probe #279 S/N Scale: 50 cps /cm Specil: 6 m/minute (est) ŧ T. P. FORTUNA : 5 MOORE 1 € 0 f Probed through rods. and casing_ 6 vi 2 (ċ 2440100 ((f Ś **.** ... ÷. Ë. 1 -€ ¢ é T.2.5. ! ť : ž ł ŧ : 1 SI3405 € 4 (1 1 INGON ¢ 6 ł ¢ ļ0-Ŧ Ī t , _ † ----15-_! ŗ ł ł į.



















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APPENDIX B

COST SUMMARY



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Winter Exploration - 1979

A budget of \$225,000 was approved by the Management Committee on January 15, 1979.

	Costs to April 30, 1979	Estimated to June 30, 1979	TOTAL (estimated)		
Destring Clarical	262.44	100.00	362.44		
Cumulan	756.56		756.56		
Penerting	845.09	2,500.00	3,345.09		
Cenlogical	8,024.69	and the state of the state of the state of the state of the state of the state of the state of the state of the	8,024.69		
Diamond Drilling	74,253.55*	124,658.80	198,912.35		
Ground Geophysics	7,630.95*	600.00	8,230.95 4,840.38		
Bore Hole Survey	890.38	3,950.00			
Supervision, Planning	5,961.39	1,500.00	7.461.39		
Logistic Support	29,770.00*	8,691.28	38,461.28 1,513.92 CR		
Disposition Maintenance	19,486.08	21,000.00 CR			
Linecutting	1,750.56		1,750.56		
Sub-total	149.631.69	121,000.08	270,631.77		
Operator's Fee	2,456.86	14,448.07	16,904.93		
TOTAL PROJECT	152,088.55	135,448.15	287,536.70		
ENL Share (60%)	133,063.37	39,458.65	172,522.02		
Shell Share (40%)	19,025.18	95,989.50	115,014.68		

*Corrections made to errors in Cost Statements.


















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ELDORADO NUCLEAR LIMITED





































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Operators: R. Major S. Stephen

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Fig. 29

(143)

RI 10000' LEGEND DEVONIAN **3** SILTSTONE, MUDSTONE (DOLOMITIC, LARGELY UNCONSOLIDATED) TP 105 HELIKIAN (athabaska) 2 SANDSTONE (PARTLY DE-CONSOLIDATED) APHEBIAN □ 1 - GRANITIC UNDIFFERENTIATED la - granitic gneisses, massive lb - granitic gneisses, banded FAULT ------ 🔨 ESCARPMENTS OF PROBABLE ROCK ORIGIN -----DRILL HOLE DEPTH OF OVERBURDEN IN METRES, FROM R.D. CRUICKSHANK, 1978 ----- Oov 78 photo-geology by lee geo-indicators limited, 1979 TP 104 Maybelle Lakes mon the Kevin S EDGE OF TP 102 STEREO COVERAGE 214 This **Ž**07 (RAM=VIPOND) RI