CREST EXPLORATION LIMITED

Summary Report of
Operations on Yukon Iron & Mica Claims
SNAKE RIVER AREA
for the
1963-64 Claim Year

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0171-43603
017164

Calgary, Alberta,
May 15, 1964.

In June of 1962 Crest Exploration Limited acquired a large number of claims in the Yukon and Northwest Territories on a deposit of iron ore, which has been called the Snake River Deposit. The deposit straddles the Yukon - Northwest Territories boundary, in the vicinity of the Snake and Cranswick Rivers. During 1963 the claims in the Yukon were surveyed, as required by the Yukon Quartz Mining Act, and as a result a number of fractional claims were staked by Crest.

In June of 1963 the work conducted by Crest during the 1962-63 claim year was submitted to the Yukon Mining Recorder and subsequently accepted as representation work.

This report is submitted in support of, and in conjunction with, the applications for Certificates of Work, covering the work on the claims during the 1963-64 claim year.

CREST EXPLORATION LIMITED

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ACCOMPANYING DATA

1. In attached folder:

   (a) Survey plan of Snake River Airstrip.

   (b) Geological map of Snake River Area.

   (c) Three stratigraphic cross sections illustrating the iron ore zone across the Yukon claim block.

   (d) Copies of the original legal survey plans of Yukon iron and mica claims:

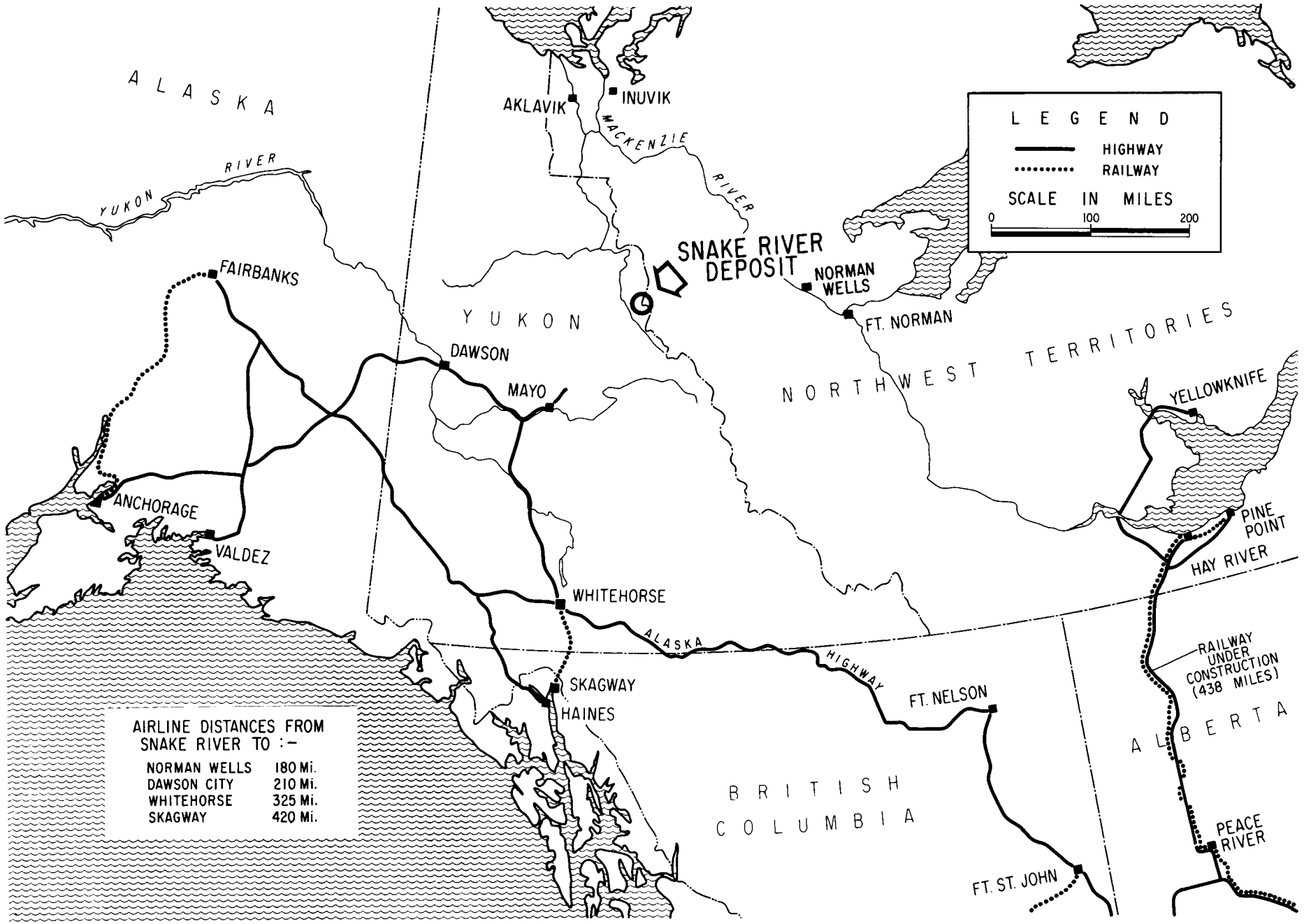
   - One index map of survey, scale 1 inch = 2640 feet.

   - Nine individual area maps covering Yukon claim block, scale 1 inch = 600 feet.

2. In separate folder:

   One complete set of rock-log charts for surface sections and diamond drill holes.

LOCATION MAP



INTRODUCTION

The Snake River deposit is located along the Yukon - Northwest Territories border in the vicinity of the Snake River, Yukon Territory, and the Cranswick River, Northwest Territories, as shown on the preceding map. The area now staked on the deposit covers approximately 105 square miles, lying between latitudes 65° 08'N to 65° 22'N and longitudes 132° 15'W to 133° 25'W. The area is within the Mackenzie Mountains and is one of very rugged topography. Maximum elevations range up to 6000 or 7000 feet, with local relief of up to 3000 feet being common. With the exception of a few scattered stands of trees, the area is north of the timber line and within the region of permafrost. During the winter months access into the area can be made by tractor from Mayo - via the Wind River Trail, a DEW line trail and a tote trail constructed by Crest south along the Snake River. Generally, however, and particularly in the summer months, access is readily available only to aircraft. A 4300 foot permanent gravel airstrip has been constructed by Crest at Snake River.

History of Discovery and Staking

In August, 1961, the Snake River iron ore deposit was discovered by geologists of the California Standard Company while carrying out regional stratigraphic and structural work related to oil and gas exploration. The deposit was staked in the spring and early summer of 1962. There were 493 iron and mica claims recorded in the Yukon and 369 mineral claims in the Northwest Territories. These claims were acquired from the stakers by Crest Exploration Limited, a subsidiary of the Standard Oil Company of California.

As a result of subsequent exploration work carried out on the claims by Crest, a number of claims were abandoned after the first year. In the Yukon, Crest now holds 433 full size iron and mica claims, one of which was staked in 1963, and 94 fractional claims. The fractional areas were indicated by the legal claim survey conducted in the summer of 1963. These areas were staked and acquired by Crest.

SUMMARY OF OPERATIONS DURING THE 1963-64 CLAIM YEAR

During the 1963 field season an extensive exploration program was conducted by Crest on its iron and mica claims located on the Snake River deposit. This was a continuation of the program commenced in 1962 and submitted as representation work for the 1962-63 claim year. In 1963 sampling crews measured, described and took channel samples of the iron bearing formation at 59 different locations. From one location, over 100 tons of bulk sample was mined to be used in pilot scale beneficiation tests. In addition to surface sampling, subsurface control was obtained by coring the ore zone in 18 diamond drill holes.

As required by the Yukon Quartz Mining Act, a legal survey of the claims was conducted.

The permanent gravel airstrip, construction of which had begun in April, 1963, was completed to its final length of 4300 feet. The airstrip is capable of handling multi-engined aircraft.

It is the above work which Crest is submitting in its applications for Certificates of Work, as representation work performed during the 1963-64 claim year on its Yukon iron and mica claims. A tabulation of the work and expenditures incurred is shown below.

CREST EXPLORATION LIMITED

Summary of Work & Expenditures on Yukon Claims

Snake River Iron Ore Deposit

April 30, 1963 - April 30, 1964

Project	Yukon Expenditures
Channel Sampling & Section Preparation	$ 60,113
Bulk Sampling	$ 44,062
Diamond Drilling	$ 232,451
Claim Survey	$ 127,660
Airstrip Construction Excavated and used since June 1, 1963	60,000 cu. yds. gravel

In the exploration and evaluation of the deposit, considerably more work, in addition to that submitted as representation work, was conducted during 1963-64. Some minor revisions were made in the geological map of the area as a result of further geological mapping and stratigraphic studies. A gauging station was installed on the Snake River, in conjunction with

engineers of the Water Resources Branch, to provide automatic stream flow and level readings. A gravel road was constructed from the airstrip to the base camp, a distance of approximately 9 miles. This greatly facilitated the movement of supplies and fuel to the camp and the movement of large volumes of ore sample to the airstrip for shipment to Mayo and Whitehorse.

All of the ore material obtained from surface channel sections and from diamond cores was assayed for iron, phosphorus and silica. In addition, a number of spectrographic analyses were run to determine the content of trace elements.

A program of beneficiation testing on the ore, a continuation of the program commenced in 1962, was conducted by the Mineral Processing Division of the Department of Mines and Technical Surveys in Ottawa and by the Ontario Research Foundation of Toronto. Some small scale direct reduction tests were conducted by industrial laboratories.

Crest personnel in Calgary, as well as supervising the field operations, compiled the geological data on maps and sections, made detailed mineralogical studies of the ore, prepared grade and reserve estimates, conducted engineering and economic studies. Much time was spent in supervising and guiding the various beneficiation test programs and analyzing the great deal of data these tests provided.

During the 1963-64 year Crest expended over one million dollars in its exploration and evaluation of the Snake River deposit. This year we have a budget of close to $300,000 which will be expended primarily on beneficiation test work. A field program is planned for this summer during which more ore material will be obtained for testing purposes.

SUMMARY OF RESULTS

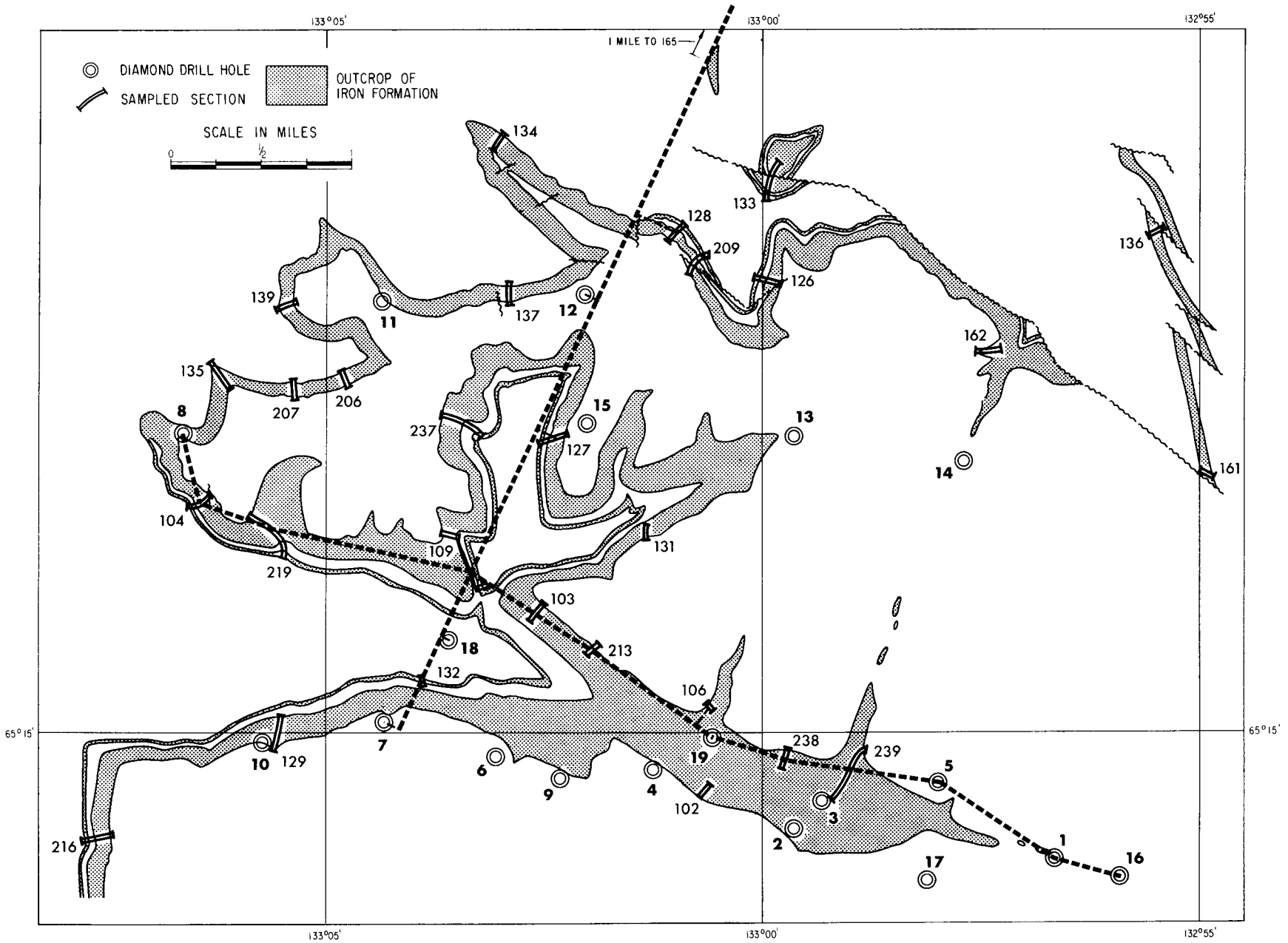
The results of Crest's exploration work to date on the Snake River deposit substantiate the original indication that the deposit is extremely large, with total reserves measured in the tens of billions of tons.

The iron bearing formation lies within the lower part of a massive conglomerate which is believed to be of Cambrian age. The formation is made up of two components - bedded hematite, with finely associated jasper lenses, and clastics consisting of conglomerates, shales and sandstones. The main ore unit varies in thickness from 100 feet in the Northwest Territories, to 400 feet in the west central part of the Yukon claim block.

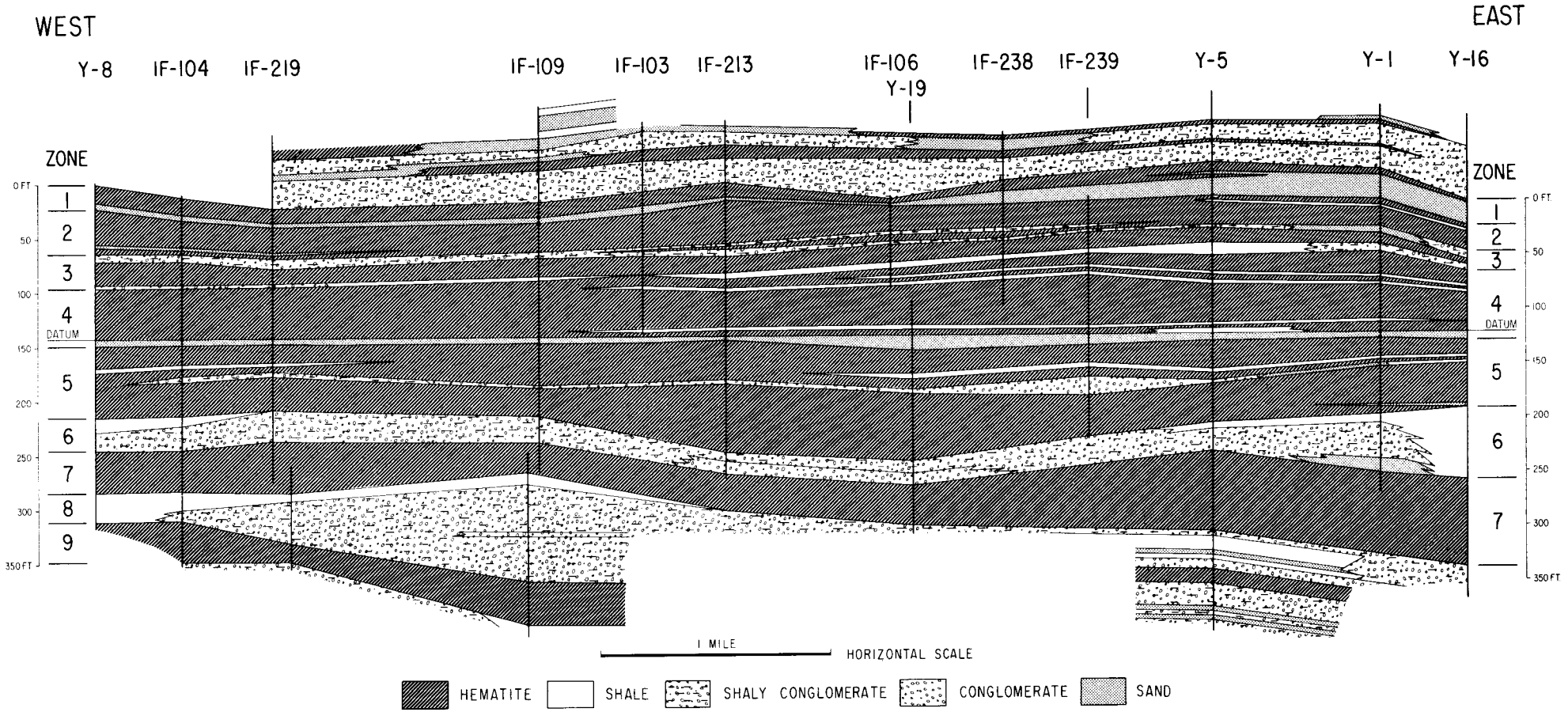
Iron Ore Outcrop at Surface Section 207

The iron formation is well exposed across the area within a belt 35 to 40 miles long. A number of areas are ideally suited to open pit mining methods. The most favourable area lies along the north of Iron Creek. This area is shown on the following map, along with two typical stratigraphic cross sections through the iron formation. These sections show the division of the main iron bearing unit into nine discrete zones.

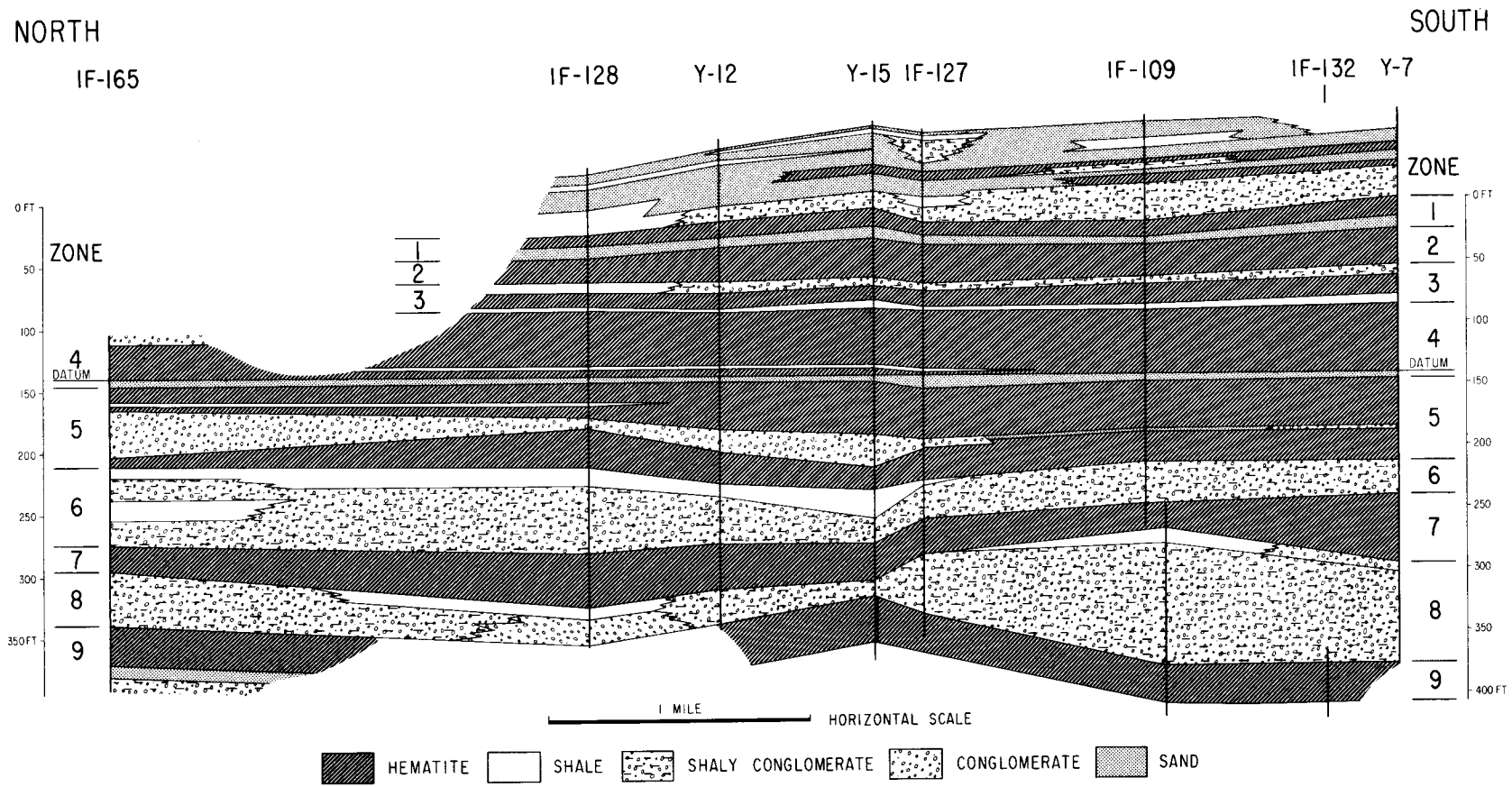
IRON CREEK AREA
LOCATION MAP OF STRATIGRAPHIC CROSS SECTIONS



EAST – WEST
STRATIGRAPHIC CROSS SECTION
IRON CREEK ORE ZONE



NORTH - SOUTH
STRATIGRAPHIC CROSS SECTION
IRON CREEK ORE ZONE



In the Iron Creek area, within zones 1 to 9, the total amount of bedded hematite, with a grade of 35% iron and better, is 11.5 billion tons. The average grade of this material is 43.8% iron, 0.34% phosphorus and 26.6% silica. Some thin bedded hematite above zone 1 was not included in this estimate. The reserves available for open pit mining, using a maximum permissible stripping ratio of 2/3 cubic yard of waste to 1 ton of ore, has been calculated to be 3.5 billion tons. Much of the ore is exposed at surface and, therefore, the average stripping ratio is in the order of 1/3 cubic yard waste to 1 ton of ore. With the 2/3:1 maximum stripping ratio, ore zone #9 is eliminated from the mineable reserve estimate because of a thick zone of waste which directly overlies it. Immediately along Iron Creek itself, there are 1.3 billion tons which could be mined with an average stripping ratio of 0.31 cubic yards of waste per ton of ore. The stripping ratio is an overall ratio and includes not only the waste material which lies above the ore, but also the clastic waste material which lies within the ore zone and would be discarded in mining.

Our economic and marketing studies have shown that steel manufacturers are demanding extremely high grade iron ore concentrates, containing in the order of 62% - 65% iron, less than 0.1% phosphorus and little silica. Our program of beneficiation testing has indicated that in small scale and laboratory tests a high grade product can be produced. The elimination of phosphorus has been particularly difficult and, as a result, mauch of our program has involved investigations into this particular problem. Tests are continuing to determine the most economic method of producing a marketable product.

One of the major considerations in the development of Snake River will be that of transporting the ore to the coast. In 1962 Canadian Bechtel prepared an overall feasibility report, a large part of which dealt with the construction of a railway to Skagway. Additional engineering studies have been conducted by Crest which indicate certain areas where railway costs might be reduced. As an alternate to a railway, we have investigated the possibility of transporting the ore in slurry form by pipeline. The method is feasible and less expensive than a railway, however, there are many advantages to a railway which a pipeline would not possess.

During the past year preliminary discussions were held with representatives of the Japanese steel industry who visited Snake River, and a number of U.S. steel companies, who plan to visit the deposit this summer. All were extremely impressed with the size of the deposit, but realize the problems which have to be overcome before it can be developed.

The market for Snake River ore will be primarily in Japan and, to a lesser extent, on the west coast of Canada and the United States. Our economic studies have indicated that there is no shortage of iron ore in the Pacific area. New deposits are being developed, particularly in Australia, all of which have their market primarily in Japan. As a result, there has been a weakening of the iron ore price structure, particularly in the past year. The Snake River ore will have to be priced to meet very strong competition.

OUTLINE OF WORK CARRIED OUT BY CREST EXPLORATION ON THE YUKON IRON AND MICA CLAIMS DURING THE 1963-64 CLAIM YEAR

SECTION A - Work submitted as representation work and contained in the applications for Certificates of Work.

In Crest's submission of representation work for the 1962-63 claim year, the work and expenditures which were reported covered the period from the time of initial staking and recording in June, 1962, to April 30th, 1963. This date approximated the commencement of the 1963-64 field season, with the exception of airstrip construction, which had began in March, 1963. The 1962-63 submission reported the status of the airstrip as of May 30th, 1963.

The period covered in this report is, therefore, from April 30th, 1963 to April 30th, 1964 and the airstrip from May 31st, 1963. The actual physical work on the claims was completed during the first week in October, 1963.

Present Status of Claim Holdings

Of the original 493 iron and mica claims staked and acquired in 1962, 61 claims were abandoned at the end of the 1962-63 claim year.	Balance	432
One full size iron and mica claim was staked and acquired in 1963.		1
Total full size iron and mica claims		433
As indicated by the legal claim survey, 94 fractional iron and mica claims were staked in 1963:		
Fractions greater than 77.5 acres	21	
Fractions less than 77.5 acres	73	94
Total number of iron and mica claims held by Crest, May, 1964.		527

Air Support

Due to the remoteness of the Snake River area, Crest's field operations relied heavily on the use of fixed wing aircraft for supply and on helicopters for transportation within the area of the deposit. Without aircraft, the work accomplished in the past two years would have taken many years to complete.

All of the supplies, fuel, equipment and personnel for Crest and the various contractors were flown into the Snake River airstrip - from Mayo early in the season and from Whitehorse after May 15th, 1963. Until the time of the break-up, in the latter part of April, the aircraft used a temporary winter airstrip which had been constructed with packed and graded snow. Fortunately, at break-up, the gravel airstrip had progressed to the stage where the aircraft could commence using it.

Aircraft used in the supply operations were California Standard's Douglas DC-3 and Boeing 247-D and a Curtis C-46 chartered from Pacific Western Airlines. The DC-3 flew a number of trips from Calgary and Edmonton. After the supply operations moved to Whitehorse, around May 15th, the Boeing normally flew a regular twice a week schedule to Snake River and addtional trips when necessary. The C-46 was chartered to transport primarily the fuel and bulky freight - i.e. the diamond drilling equipment and bulk ore sample. Approximately 110,000 gallons of fuel - 75,000 gallons of diesel and 35,000 gallons of aviation gas - were flown into Snake River. The total cost of the fixed wing aircraft charged to work in the Yukon amounted to nearly $80,000.

Pacific Western Airlines C-46
unloading fuel, April, 1963.

Transportation at Snake River was provided by helicopter. Over most of the season three Hiller 12E's were contracted from Okanagan Helicopters of Vancouver. During the peak period, in July and August, two additional machines were contracted - a Bell G-2 from Klondike Helicopters of Whitehorse and a Bell-J from Bullock Wings and Rotors of Calgary, Crest provided helicopters not only for its own use, but for each of the contractors working on the project - diamond drilling, surveying and airstrip construction. A total of 1500 hours of helicopter time was flown during work on the Yukon claims at a cost of $145,000.

Hiller 12E transporting one of
drilling contractor's portable huts

The aircraft costs have been allocated to the individual work projects and included in the project work costs as outlined in the following sections.

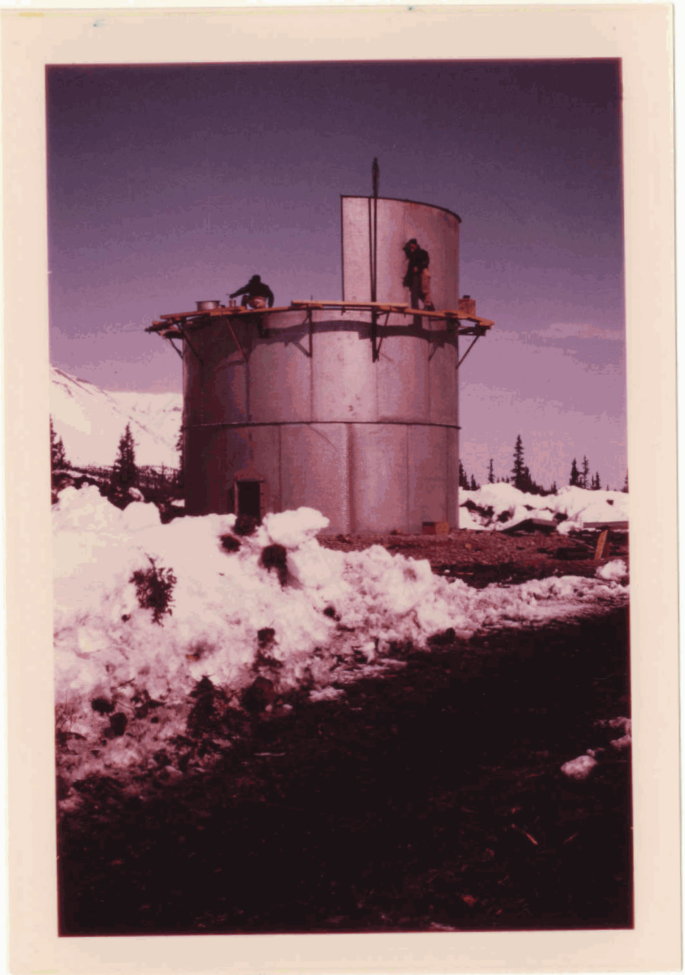
Snake River Camp

As in 1962, the base camp was established on Iron Creek in the western part of the Yukon claim block. Normally the camp had a population of approximately 45 men - 25 Crest personnel, a surveying crew of 10, 8 to 10 helicopter personnel and 2 of the diamond drilling crew. On occasion, with numerous visitors to the camp, as many as 55 to 60 people were accommodated. A radio shack was constructed at the airstrip. The construction crews provided their own living accommodation at the airstrip. The drilling personnel lived in portable huts directly at the drill sites. Crest provided food, fuel and other required camp supplies for the contract crews.

Portion of Snake River Camp on Iron Creek

A fuel storage depot was constructed at the airstrip in which could be stored 24,000 gallons of aviation gas and 52,000 gallons of diesel fuel. At the base camp tankage provided storage space of 4,000 gallons of aviation gas and 3,500 gallons of diesel fuel.

The total cost of the camp chargeable to work in the Yukon amounted to $118,000. This has been allocated to the various work projects and included in the expenditures as noted in the following sections.



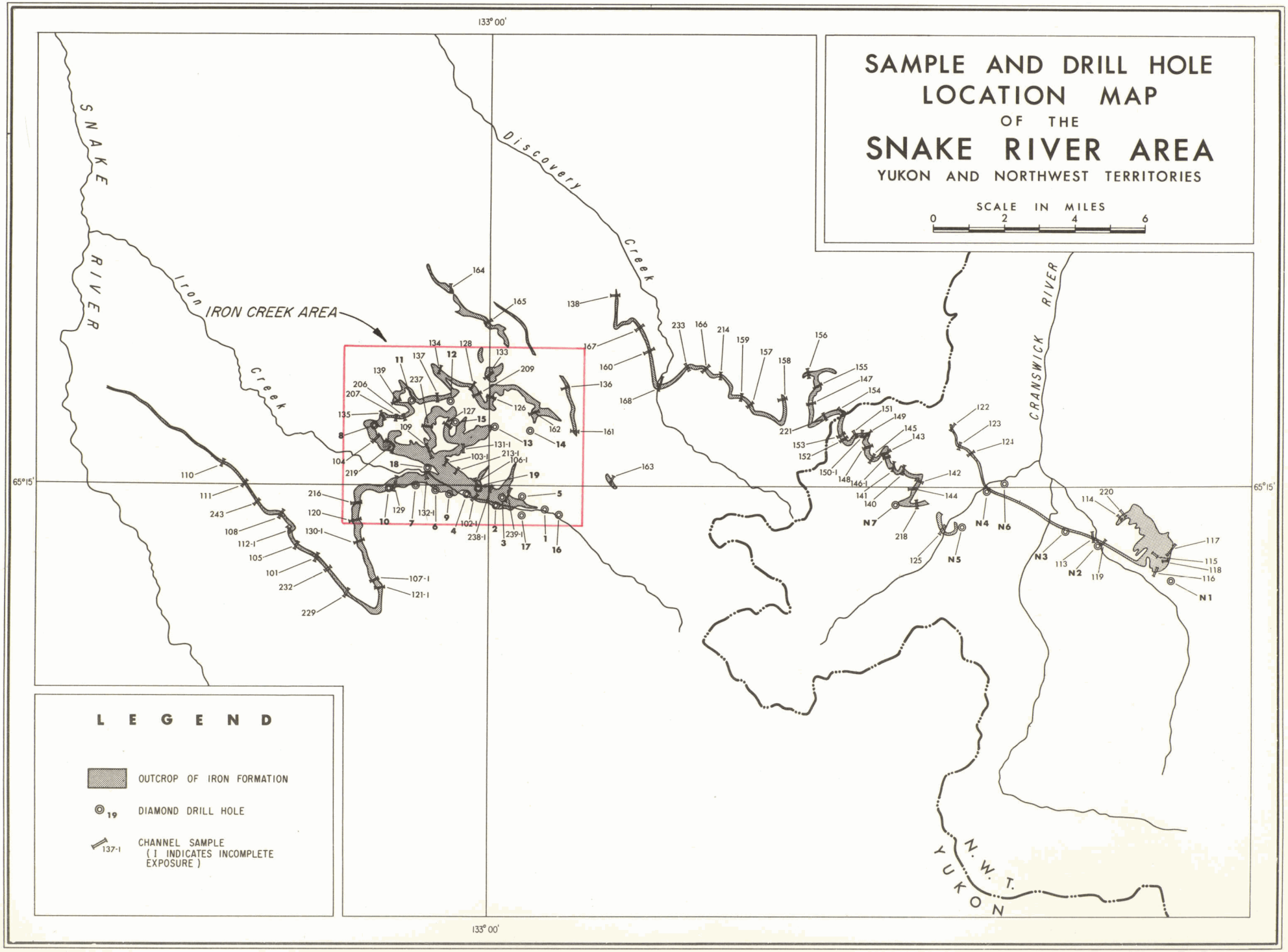
Constructing fuel storage tank
at Snake River airstrip

Channel Sampling & Section Preparation

The channel sampling in 1963 began early in June and was a continuation of the program commenced in 1962. The work was completed early in September. Many new surface sections of iron ore were stripped, where necessary, measured and channel sampled. A number of sections, partially sampled in 1962, were completed. The purpose of the sampling was to obtain a complete and representative sampling of the ore, across the entire deposit, for grade and reserve determinations and to provide material for beneficiation testing.

Sampler taking channel sample

The location of the channel sections are shown on the following map and on the maps accompanying our applications for Certificates of Work. Those sections in the 100 series are new sections sampled in 1963; those in the 200 series are sections partially sampled in 1962 and completed in 1963. Sections numbered below 100 are those sampled only in 1962.


SAMPLE AND DRILL HOLE LOCATION MAP
OF THE
SNAKE RIVER AREA
YUKON AND NORTHWEST TERRITORIES
SCALE IN MILES
0 2 4 6
133° 00'
65°15'
SNAKE RIVER
Iron Creek
IRON CREEK AREA
Discovery Creek
CRANSWICK RIVER
N.W.T.
YUKON
LEGEND
OUTCROP OF IRON FORMATION
DIAMOND DRILL HOLE
CHANNEL SAMPLE
(I INDICATES INCOMPLETE EXPOSURE)

In 1963 a total of 7,900 feet of channel sample was taken from 59 different locations in the Yukon. These locations were located so that the ore was well sampled along the entire length of outcrop. Wherever possible, the complete vertical width of the ore zone was sampled. A rock-log chart of each section accompanies this report.

The sampling crew consisted of 15 Crest employees, 12 of whom were university students hired for the season. All told, 957 man days were spent on the channel sampling and section preparation in the Yukon. The total cost amounted to $60,113. The main expenditures were for:

Salaries and Wages	$ 10,384
Fixed Wing Aircraft	$ 6,970
Helicopter	$ 17,653
Camp	$ 19,270
Sampling supplies	$ 3,744
Miscellaneous Expenses	$ 2,092

Channel Sampling & Section Preparation

1963-64 Claim Year

Section	Claim	Measured & Described (feet)	Channel Sampled (feet)
IF-101	Glory -20	120	112
IF-102	Quest -17	71	70
IF-103	Ole -15	165	137
IF-104	Kilt -14	336	243
IF-105	Ferrous -20	111	111
IF-106	Quest -16	80	74
IF-107	Klan -22	252	235
IF-108	Fool -18	175	168
IF-109	Neil -14	494	407
IF-110	Cony -15	99	89
IF-111	Dorine -16	90	90
IF-112	Ferrous -19	98	98
IF-120	Jasper -181	220	70
IF-121	Kaln -22	90	90
IF-126	Quest -111	408	258
IF-127 A & B	Ole -13	405	769
IF-128	Pile -11	336	284
IF-129	Lure -16	212	99
IF-130	Jet -19	184	133
IF-131	Pony -14	204	162
IF-132	Neil -16	38	33
IF-133	Quirt -10	327	154
IF-134	Neil -10	420	351
IF-135	Kilt -121	229	272
IF-136	Unit -11	272	138
IF-137	Neil -11	337	324

Section	Claim	Measured & Described (feet)	Channel Sampled (feet)
IF-138	Xacto -5	729	58
IF-139	Lure -12	206	180
IF-147	It -12	112	76
IF-155	It -11	251	97
IF-156	Inis -10	143	124
IF-157	Fifi -12	175	161
IF-158	GoGo -11	217	94
IF-159	Evee -11	170	132
IF-160	Zot -9	341	133
IF-161	Vimy -13	150	47
IF-162	Tang -12	138	82
IF-163	Xenon -16	141	141
IF-164	Oboe -5	165	94
IF-165	Quid -7	258	85
IF-166	ChaCha -10	305	92
IF-167	Yale -7	330	96
IF-168	Alaska -11	297	91
IF-206	Marian -13	75	75
IF-207	Lure -13	75	75
IF-209	Pile -11	184	184
IF-213	Neil -151	41	41
IF-214	Dido -10	72	72
IF-216	Jasper -18	111	111
IF-219	Lure -14	110	110
IF-221	Judo -12	72	72
IF-229	Ivy -221	27	27
IF-244	Jasper -181	65	65
IF-232	Honor -21	14	14
IF-233	Alaska -91	53	53
IF-237	Neil -13	145	145
IF-238	Quest -16	14	14
IF-239	Rose -17	31	31
IF-243	Dorine -17	36	36

Diamond Drilling

In March, 1963, the diamond drilling contract for Crest's 1963 program was awarded to Midwest Diamond Drilling of Winnipeg. Early in May the drilling equipment arrived in Mayo and from there was flown by Crest to Snake River. Drilling began in the Yukon on May 10th, 1963.

The contractor used 3 BBS-2D drills, each powered by a 65 H.P. PV6 Perkins diesel engine. The drilling units were equipped with BB5-12 pumps powered by Berning single cylinder air cooled diesel engines. Each drill had a crew of 5 men - 2 drillers, 2 helpers and a mechanic. They worked around the clock in two twelve hour shifts. Each drill had its own camp facilities, with food, fuel and other supplies provided by Crest from the main base camp. The drilling equipment was fully transportable by helicopter, even their portable huts were moved intact slung below a helicopter.

Drill on hole #15 being serviced by helicopter

The locations of the 18 diamond drill holes completed in the Yukon during 1963 are shown on the foregoing map, and on the maps accompanying our applications for Certificates of Work. They are numbered from 2 to 19 inclusive. Hole #1 was drilled in 1962. A total of 8,364 feet of hole was drilled, of which 8,066 was cored with an overall core recovery of 81%. Most of the core, 6,291 feet, was AX, with 55 feet of BX and 1,660 feet of EX. A total of 2,976 feet of casing was used, made up of 484 feet of BX, 661 feet of AX and 1,831 feet of EX. Crest personnel supervised the drilling, caught and described the core. Each core was split vertically, half to be used for assaying and beneficiation test work and the remaining half has been stored for permanent record. A rock-log chart of each diamond drill hole accompanies this report.

The total cost of the 1963 diamond drilling program in the Yukon amounts to $232,451. Major expenditures were for:

Drilling Contract	$ 120,900
Fixed Wing Aircraft	$ 11,210
Helicopter	$ 49,991
Camp & Expediting	$ 28,263
Salaries & Wages	
Crest field personnel	$ 6,274
Supplies	$ 11,177
Miscellaneous Expenses	$ 4,636

Diamond Drilling
1963-64 Claim Year

Hole No.	Claim	Collared	Completed	Casing(ft.) BX	AX	EX	Cored (ft.) BX	AX	EX	Total Depth(ft.)
Y-2-63	Rose -17	May 7	May 20	34	56	-	-	369	-	402
Y-3-63	Rose -17	May 8	May 23	30	37	168	-	139	108	275
Y-4-63	Pony -17	May 9	May 29	26	32	403	-	378	97	501
Y-5-63	Suzy -17	May 24	June 4	33	35	-	-	601	-	633
Y-6-63	Neil -17	May 21	June 13	26	48	389	-	293	396	636
Y-7-63	Marion-16	May 29	June 7	20	26	-	-	426	-	444
Y-8-63	Kilt -13	June 8	June 27	2	20	-	3	305	-	310
Y-9-63	Ole -17	June 14	June 27	30	34	-	4	386	-	420
Y-10-63	Lure -16	June 28	July 7	18	34	-	-	247	-	281
Y-11-63	Marion-12	June 28	July 16	12	36	170	12	154	271	441
Y-12-63	Oboe -11	July 7	July 16	7	10	275	5	232	281	524
Y-13-63	Quest -13	July 8	July 15	18	20	-	8	352	-	377
Y-14-63	Suzy -13	July 16	July 31	28	34	-	-	815	-	849
Y-15-63	Ole -13	July 17	Aug. 2	10	16	368	13	344	340	700
Y-16-63	Uranus-18	July 29	Aug. 12	85	90	-	-	546	-	557
Y-17-63	Suzy -18	Aug. 1	Aug. 17	26	31	-	9	509	-	541
Y-18-63	Neil -15	Aug. 2	Aug. 11	32	50	58	-	-	167	225
Y-19-63	Quest -16	Aug. 12	Aug. 16	47	52	-	1	195	-	248

Bulk Sampling

One of the most important purposes of our 1963 operations at Snake River was to obtain sufficient ore material on which large scale beneficiation tests could be performed. Arrangements had been made with the Mineral Processing Division of the Department of Mines and Technical Surveys in Ottawa to conduct pilot scale jigging tests on the ore. Their laboratory scale tests during the previous year had indicated that favourable results might be obtained with jigs. For the pilot tests at least 50 tons of ore material was required.

A site, approximately 3½ miles northeast of the base camp, adjacent to channel section IF-127, was chosen for the bulk sampling. At this location a complete section of the ore zone was at outcrop and there was a suitable landing site for the helicopter. From this location two 50-ton samples were mined, each representing the full vertical width of the ore zone. Two miners, both experienced in the use of explosives, and three labourers were hired to mine the samples. They were assisted on occasion by other Crest personnel. From the bulk sample location the ore material was flown in 500 lb. lots to the base camp, and from there by way of the gravel road to the airstrip in trailers hauled by a tractor.

Excavating Bulk Sample

Helicopter delivers load of bulk sample to site near base camp

The samples were flown to Mayo on the C-46 aircraft chartered from Pacific Western Airlines. The first sample went out in August and was shipped from Mayo to the Mineral Processing Division in Ottawa. The second sample was brought out in early October and is in storage at Mayo, to be used later this year in further beneficiation tests.

The total cost of our bulk sampling operation, which was conducted during July, August and September, amounted to $44,062. This figure does not include any freight charges for the ore. Major items of expenditure were:

Salaries & Wages	$ 7,481
Fixed Wing Aircraft (does not include freight)	$ 935
Helicopter	$ 14,256
Supplies	$ 5,315
Camp & Expediting	$ 14,168
Miscellaneous	$ 1,907

Claim Survey

In April, 1963, the contract to survey Crest's iron and mica claims in the Yukon and to conduct a perimeter survey of the block of mineral claims in the Northwest Territories, was awarded to the firm of Marshall Macklin Monaghan Limited of Don Mills, Ontario. This firm had considerable experience in claim surveys. Their proposed method of survey had been fully reviewed by the Surveyor General's department. The survey crew, consisting of 6 surveyors and 4 labourers, was flown into Snake River in mid-May and the survey began on May 21st. Conventional surveying techniques were employed - using tellurometers, transits and tapes. Crest provided one helicopter for the sole use of the surveyors.

Tellurometer set-up on Iron Creek

The survey indicated a number of fractional areas, between the full sized iron and mica claims. This was understandable considering the rugged terrain and the difficulties involved in staking the claims originally. The fractional areas were located, staked and surveyed. In all, 432 full sized claims and 94 fractional claims were surveyed. Of the fractions, 73 were less than 77.5 acres. One claim in the northern part of the block, Xacto 5, was not surveyed. It had been our original intention to abandon this claim but a review of the geology in October indicated that it should be retained.

We have received word from the Surveyor General's department that they plan to inspect the survey this summer. They anticipate that their surveyors will be in Snake River for a week in July.

In accordance with the Yukon Quartz Mining Act, we will post the claims with copies of the survey plans this summer, starting in June.

Copies of the original survey plans accompany this report. The maps accompanying our applications for Grouping and Certificates of Work are exact reductions of the plans prepared by Crest.

The total cost of the survey of the Yukon iron and mica claims amounted to $127,666. The main items of expenditure were:

Survey Contract	$ 38,397
Helicopter	$ 54,356
Fixed Wing Aircraft	$ 3,740
Camp	$ 24,491
Supplies	$ 5,774
Crest field supervision	$ 846

Airstrip Construction

In order to move the large volumes of supplies, fuel, equipment and personnel into Snake River quickly and efficiently, an airstrip was required capable of handling multi-engined freight aircraft. The contract for constructing the airstrip was awarded to Proctor Construction Limited of Whitehorse. In February and March, 1963, construction equipment was moved to Snake River by way of the Wind River Trail, a DEW line trail, and an 18 mile tote road which was constructed along the Snake River. The site for the airstrip was chosen on a bench along the north side of Iron Creek where it joins the Snake River. Initially a winter strip of graded and packed snow was built, so that additional supplies needed for the construction of the permanent strip could be flown in. Early in April, 1963, construction of the permanent gravel strip was commenced and by the latter part of April aircraft were able to utilize it in its partially completed state.

When our representation work for the 1962-63 season was submitted in June of 1963, the airstrip, as of May 30th, 1963, had progressed to a length of 3500 feet and 130 feet wide. At that time 40,000 cubic yards of gravel had been excavated and used in its construction.

Throughout the summer of 1963 the airstrip was lengthened to its final length of 4300 feet, widened along its full length to 130 feet and built up, crowned and dressed. Turn-around areas for the aircraft were also put in. Construction was completed in the latter part of September, 1963.

In September the airstrip was surveyed, copies of the survey accompany this report. In all, 100,000 cubic yards of gravel were used in its construction, of which 60,000 cubic yards were excavated and placed since May 31st, 1963. A portion of this amount has been submitted as representation work in 1963.

C-46 on end of partially completed airstrip, August, 1963. Streaks on picture caused by reflection of light from helicopter's plexiglass bubble.

SECTION B - Work conducted in 1963-64 claim year which is not submitted as representation work.

In addition to the work outlined in the preceding section, which is included in our applications for Certificates of Work, considerably more work and various studies were conducted during 1963-64 which have not been formally submitted as representation work. The physical work previously outlined was sufficient to meet the maximum work requirements on the claims.

To give some idea, however, of the total extent of Crest's work during the past year, a brief outline of the additional work is presented.

Geology and Ore Zone Delineation

Although most of the geological work at Snake River was conducted during the 1962 season, a moderate amount of detail was done in 1963. As a result some minor revisions have been made in the geological map, particularly in the southern part of the map sheet. With additional information obtained from channel sections and diamond drill cores, much more stratigraphic work could be done within the ore zone. Accompanying this report are copies of the revised geological map and three stratigraphic cross sections, with which the geological report, submitted in 1962, can be updated.

During the past winter detailed mineralogical studies were conducted, to determine primarily the physical characteristics of the hematite and the phosphorus bearing mineral, apatite. In the beneficiation of the ore, one of the main problems is the elimination of phosphorus. It was felt that a better understanding of the nature of the apatite would assist in finding a beneficiation method capable of reducing the phosphorus content to an acceptable level. It was found that the apatite which is extremely fine grained, is associated with that siliceous gangue which is finely disseminated in the hematite. It does not occur directly with the hematite. Therefore, any beneficiation method which will remove the fine gangue will reduce the phosphorus content.

Water Gauging Station

The main water course in the area is the Snake River and when the deposit is developed the water resources of this river will be utilized. In order to obtain a record of the water flows and levels over the future years, a gauging station was set up by Crest, under the supervision of the engineers of the Water Resources Branch. The station is located on the Snake River, three miles south of its junction with Iron Creek. Readings will be taken periodically by the Water Resources Branch and Crest will reimburse them for the expenses incurred.

Road Construction

During the summer of 1963 a permanent gravel road was constructed from Snake River airstrip to the base camp on Iron Creek, a distance of close to nine miles. The road is 16 feet to 18 feet wide and has a gravel base approximately 3 feet thick. Prior to construction of the road, all of our supplies for the camp, fuel and other equipment, had to be flown by helicopter. With the road, large volumes of supplies, etc. could be hauled more more economically by truck and trailer. This was particularly apparent when hauling out over 100 tons of bulk sample to the airstrip.

Looking northeast along the partially completed gravel road, August, 1963. Iron Creek on left. Snake River airstrip in distance near junction of Iron Creek and Snake River.

Assaying

The ore material which was obtained in 1963 in channel samples and diamond cores has been completely assayed. Over 2000 individual assays, each for iron, phosphorus and silica, have been obtained. In addition 90 spectrographic analyses for trace elements and 30 chemical analyses for titanium were performed. The assaying was done by Coast Eldridge, engineers and chemists, of Vancouver, B.C.

Beneficiation Testing

Snake River ore which has an average grade of in the order of 44% iron, .35% phosphorus and 26% silica, will require beneficiation before it can be marketed. Steel producers today are demanding higher grade concentrates. The Japanese, for example, indicate that within a few years they will require furnace feeds of 65% iron and less than 0.10% phosphorus. A low phosphorus content is most important, since even a small amount of phosphorus is detrimental in the manufacture of steel.

Crest began a program of beneficiation testing in 1962, to determine the most economic and efficient method of producing a high grade product, particularly one with a low phosphorus content. The reduction of silica to acceptable levels did not offer any great problem. This program was carried into 1963 and is still continuing. Some extremely encouraging results have been obtained. One of the main purposes of our 1963 field program was to obtain sufficient ore material for beneficiation tests.

The Mineral Processing Division of the Department of Mines and Technical Surveys in Ottawa had conducted laboratory scale jig tests in 1962-63, the results of which were encouraging and indicated that pilot scale tests would be warranted. A 50-ton sample of ore was mined and shipped to Ottawa. Pilot scale jig tests were conducted by the Mineral Processing Division during the period September to November, 1963. The results of the tests indicated that this inexpensive method could produce a product which approached the market requirements. The average grade of the jig concentrate was 61.9% iron and 0.13% phosphorus. Iron recoveries were in the order of 60%. In order to reduce the phosphorus content still further, the Mineral Processing Division then conducted laboratory scale acid leaching tests. In these tests the phosphorus content was reduced to acceptable levels, however, the amounts of acid required could make this process uneconomic. We are continuing our investigations of acid leaching as a method of reducing the phosphorus content.

The Mineral Processing Division also conducted a small program of roasting and magnetic separation.

The Ontario Research Foundation of Toronto, which had also initiated preliminary testing in 1962-63, undertook a program of basic laboratory scale testing in the latter part of 1963. Their program is nearing completion,

and we are now starting to receive the results of their work. The program included petrographic and microscopic analyses, grinding tests, screen and sieve analyses, gravity separation, high and low intensity magnetic separation, acid leaching and chemical analyses of iron, phosphorus and silica at various stages of the program. Representative core and channel sample material was provided for Ontario Research Foundation's test work.

Preliminary and small scale investigations in the field of direct reduction of the ore was begun. The R-N Corporation of New York conducted tests on samples of crude ore and jig concentrates. From the crude ore sample a product containing 96.8% iron and 0.31% phosphorus was obtained. From the jig concentrate sample the product contained 93.4+% iron and 0.08% phosphorus. Iron recoveries were as high as 95%.

We have shipped samples of the crude ore and jig concentrates to the Lurgi Co. of Frankfurt, Germany. This company has agreed to conduct direct reduction and electrostatic separation tests on the ore.

Crest's program of beneficiation testing is continuing and is our main budget item for the balance of this year. Flotation tests are now getting underway. We plan to conduct further tests on direct reduction processes, grinding, leaching, roasting and magnetic separation.

Engineering and Economic Studies

The largest single expenditure that will have to be made in the development of the Snake River deposit is that for transporting the ore to the coast. The closest port area is Skagway, which is 420 air miles southwest of Snake River and close to 600 miles by possible railway route. In 1962 a railway study was conducted by Canadian Bechtel Limited, as part of their overall feasibility study on the project. During 1963 Crest has studied methods of reducing the cost of railway construction.

Studies were also carried out by the Engineering Department of the Standard Oil Company of California on the feasibility of transporting the ore by pipeline in slurry form. A number of laboratory scale hydraulic tests were performed. Their studies indicate that the method is feasible and less costly than a railway. However, there are inherent advantages in a railway which a pipeline could not provide. Our transportation studies are continuing.

In addition to the transportation studies, engineering and economic investigations were conducted on various methods of producing marketable furnace feeds - sinter, pellets and the manufacture of primary iron by a number of direct reduction methods.

Visitors to Snake River

During the summer of 1963 a number of notable people visited Snake River, and we had the pleasure of showing them some areas of the deposit and the type of exploratory work that was being conducted. Among the visitors were:

Mr. Gordon Cameron	- Commissioner of the Yukon
Mr. Ushiba	- The Japanese Ambassador to Canada
Mr. K. J. Christie	- Administrator of Mines
Mr. C. S. Lord	- Chief Geologist for the Geological Survey of Canada
Mr. G. McIntyre	- Mining Recorder from Mayo
Mr. F. McCall	- Mining Recorder from Whitehorse
Mr. A. Oliver	- Chief Mining Inspector
Dr. L. Green	- Resident Geologist for the Geological Survey of Canada

Members of the Japanese technical team
examine ore outcrop, August, 1963.

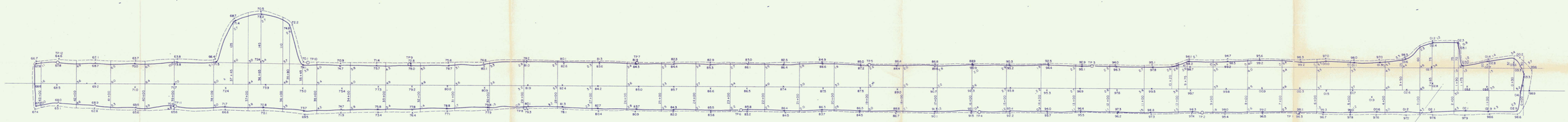
In July, the President of Crest Exploration Limited visited Japan and had the opportunity to discuss the Snake River deposit with a number of high Japanese Government officials and numerous top executives of the Japanese Iron and Steel industry. At his invitation, the Japanese Iron and Steel Federation sent a technical team to examine the deposit in early August.

Later in August representatives of Mitsui and Company, a trading firm, visited the area.

CREST EXPLORATION LIMITED

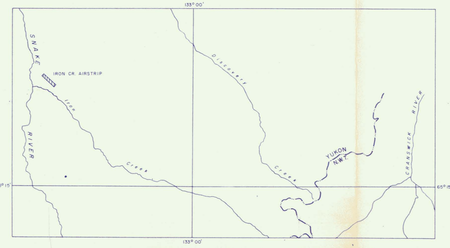
R. J. FLOWER,
Assistant to
General Manager Operations

RJF/mp



LOCATION MAP

SCALE IN MILES



LEGEND

ELEVATIONS 98.8 / 86.7 — DEPTH OF GRAVEL FILL

GRAVEL EXCAVATED AND USED FOR CONSTRUCTION

MAIN RUNWAY (4310' X 130')	—	74,290 cu yds
BERMS AND PARKING AREAS	—	5,650 cu yds
MUSKEG COMPRESSION	—	20,800 cu yds
TOTAL		100,740 cu yds

REVISIONS
April 1964

CREST EXPLORATION LIMITED

IRON CREEK AIRSTRIP

By
W.C. COOK

STADIA SURVEY BY
K. B. CULVER & R.W. WILLIAMS

SCALE	DATE	DRAWN
1 INCH = 100 FEET	SEPT 1963	L. P. L.

EAST SHEET

SURFACE GEOLOGY

65°00'

132°15'

20'

25'

30'

35'

40'

45'

50'

132°52'30"

65°30'

SCALE 1:9,680

CONTOUR INTERVAL - 100 FEET

Datel Dec 1962

1962

PLATE II - (East Sheet)

PREPARED FOR

CREST EXPLORATION LTD.

TOPOGRAPHIC MAP

SNAKE RIVER AREA

YUKON AND NORTHWEST TERRITORIES

LEGEND

- Barometric elevation (Crest Exploration Ltd.)
- Multiplex spot elevation
- Diagnostic center
- Area of shadow or no stereoscopic coverage, contour position indefinite
- Intermediate 50 foot contour
- Streams
- Sand wash

MAGNETIC DECLINATION 36°27' E 1962

North, Mags North

NOTE

This map was photogrammetrically prepared using a multiplex plotter

INDEX MAP

WEST SHEET

EAST SHEET

5

10

15

15

4

3

2

4

3

8

7

6

5

10

9

8

7

6

5

4

3

2

1

10'

65°15'

20'

Gypsum

Q

B

B'

YUKON TERRITORY

NORTHWEST TERRITORIES

Roll No. I2264

Roll No. A14405

Roll No. I2106

Roll No. A12106

Roll No. A12146

L E G E N D

AGE	DESIGNATION AND PROBABLE ROCK TYPE		PROBABLE CORRELATION
MIDDLE DEVONIAN	11	DARK GREY CARBONATE	HUME
SILURO - DEVONIAN	10	UPPER BLUFF (Not always separable)	LONE MOUNTAIN - BEAR ROCK
	9	LIGHT GREY CARBONATE	
	8	LOWER BLUFF (Not always separable)	
SILURO-ORDOVICIAN	7	UPPER BLOCKY CARBONATE (m. grey)	RONNING
ORDOVICIAN	6	SHALY CARBONATE	
CAMBRO-ORDOVICIAN	5	LOWER BLOCKY CARBONATE (lt. grey)	
CAMBRIAN	4	SHALE WITH CARBONATE STRINGERS (S port of map only) (upper part silty dolomite/truncated to North)	
	3	DARK SHALE (S port of map only) (Truncated to North)	
	2	CONGLOMERATE WITH IRON (truncated to North)	
	1	¢ UNDIFFERENTIATED INCL. GYPSUM	

NOTE - GEOLOGICAL CONTACTS, FAULTS ETC. WERE TRANSFERRED FROM PHOTOS BY SKETCH-MASTER AND ARE SUBJECT TO ERRORS INHERENT IN THIS METHOD. GEOLOGY IS A REVISION OF PREVIOUS GEOLOGICAL MAP RESULTING FROM 1963 FIELD WORK BY C.H RIDDELL. PREVIOUS GEOLOGY FROM FIELD WORK BY STUART AND HARRIS

DIAMOND DRILL HOLES

MEASURED SECTIONS

RC-23-61

ATTITUDES

FIELD OBSERVATION

CALCULATED FROM PHOTOS

TOPOGRAPHIC MAP
SNAKE RIVER AREA
YUKON AND NORTHWEST TERRITORIES

PREPARED FOR
CREST EXPLORATION LTD.

1962

CONTOUR INTERVAL 100 FEET

SCALE 1:31,680

1 mile 1/2 0 1/2 1

2000 1000 0 2000 4000 6000 ft

WEST SHEET

133°30' 25' 20' 15' 10' 05' 133°00' 55' 132°52'30"

65°00'

MAGNETIC DECLINATION 36°27' E 1962

Mean North

Grid North

LEGEND

- Barometric elevation (Crest Exploration Ltd.) △ 2830
- Multiplex spot elevation x 9620
- Diopsidive center + 369
- Area of shadow or no stereoscopic coverage
- Control position indefinite
- Interpolated 50 foot contour
- Streams
- Sand wash

INDEX MAP

EAST SHEET

WEST SHEET

This map was photogrammetrically prepared using a multiplex plotter.

NOTE

SURFACE GEOLOGY

PLATE II - (West Sheet)

Roll No A12148

Roll No 13614

Roll No. 12056

Roll No. 12056

Roll No. A12148

Roll No. A12145

Gypsum

NOTE - GEOLOGICAL CONTACTS, FAULTS ETC., WERE TRANSFERRED FROM PHOTOS BY SKETCH-MASTER AND ARE SUBJECT TO ERRORS INHERENT IN THIS METHOD. GEOLOGY IS A REVISION OF PREVIOUS GEOLOGICAL MAP RESULTING FROM 1963 FIELD WORK BY C.H. RIDDELL. PREVIOUS GEOLOGY FROM FIELD WORK BY STUART AND CHERNOFF TO 1962 AND PHOTO INTERPRETATION BY STUART AND HARRIS

DIAMOND DRILL HOLES

MEASURED SECTIONS RE-23-61

ALTITUDES

FIELD OBSERVATION

CALCULATED FROM PHOTOS

PROBABLE AGE	DESIGNATION AND PROBABLE ROCK TYPE		PROBABLE CORRELATION
MIDDLE DEVONIAN	11	DARK GREY CARBONATE	HUME
SILURO-DEVONIAN	10	UPPER BLUFF (Not always separable)	LONE MOUNTAIN - BEAR ROCK
	9	LIGHT GREY CARBONATE	
	8	LOWER BLUFF (Not always separable)	
SILURO-ORDOVICIAN	7	UPPER BLOCKY CARBONATE (m. grey)	RONNING
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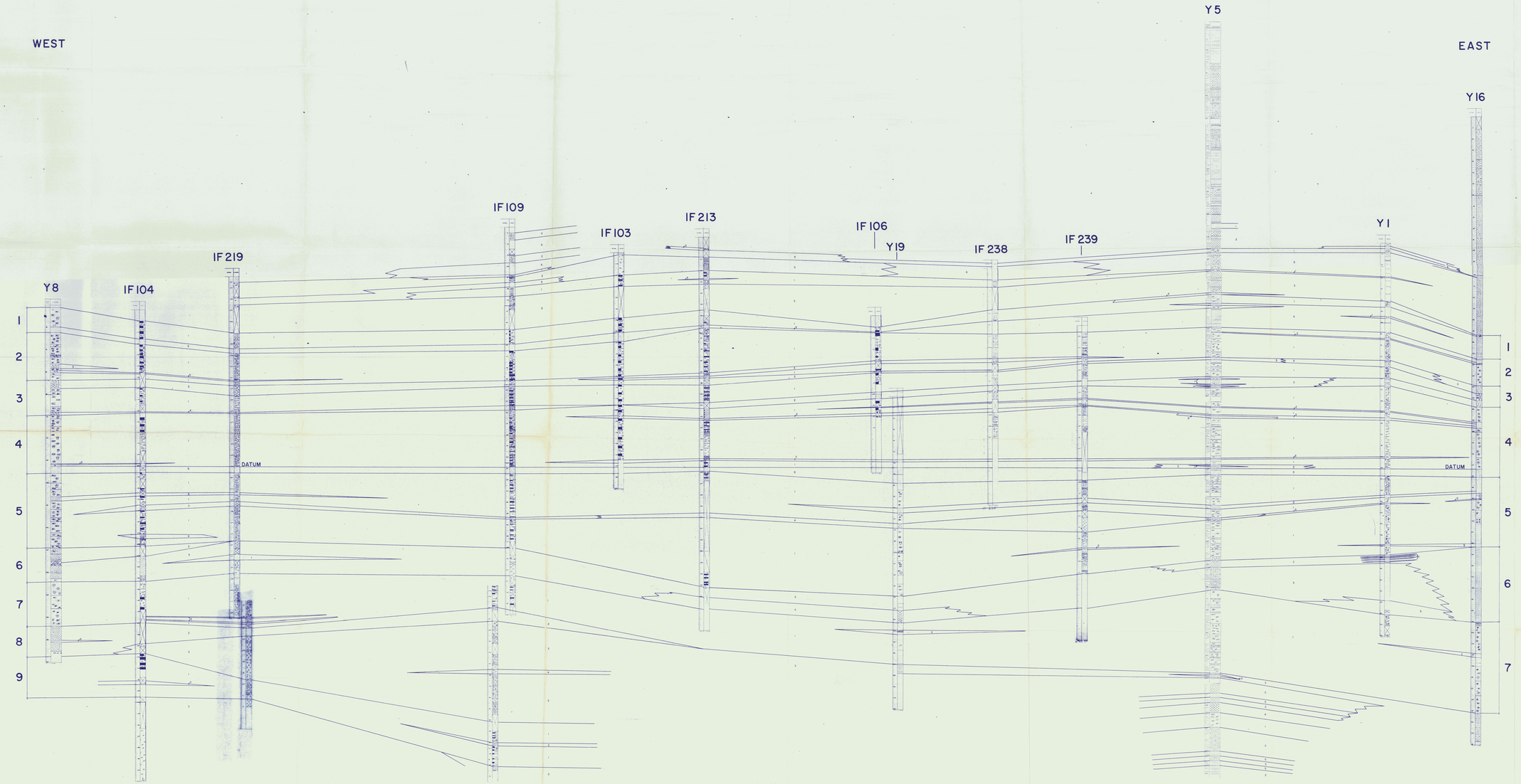
	3	DARK SHALE (S part of map only) (truncated to North)	
	2	CONGLOMERATE WITH IRON (truncated to north)	
	1	C UNDIFFERENTIATED INCL. GYPSUM	

LEGEND

STRATIGRAPHIC CROSS SECTION No. 2

IRON CREEK ORE BODY



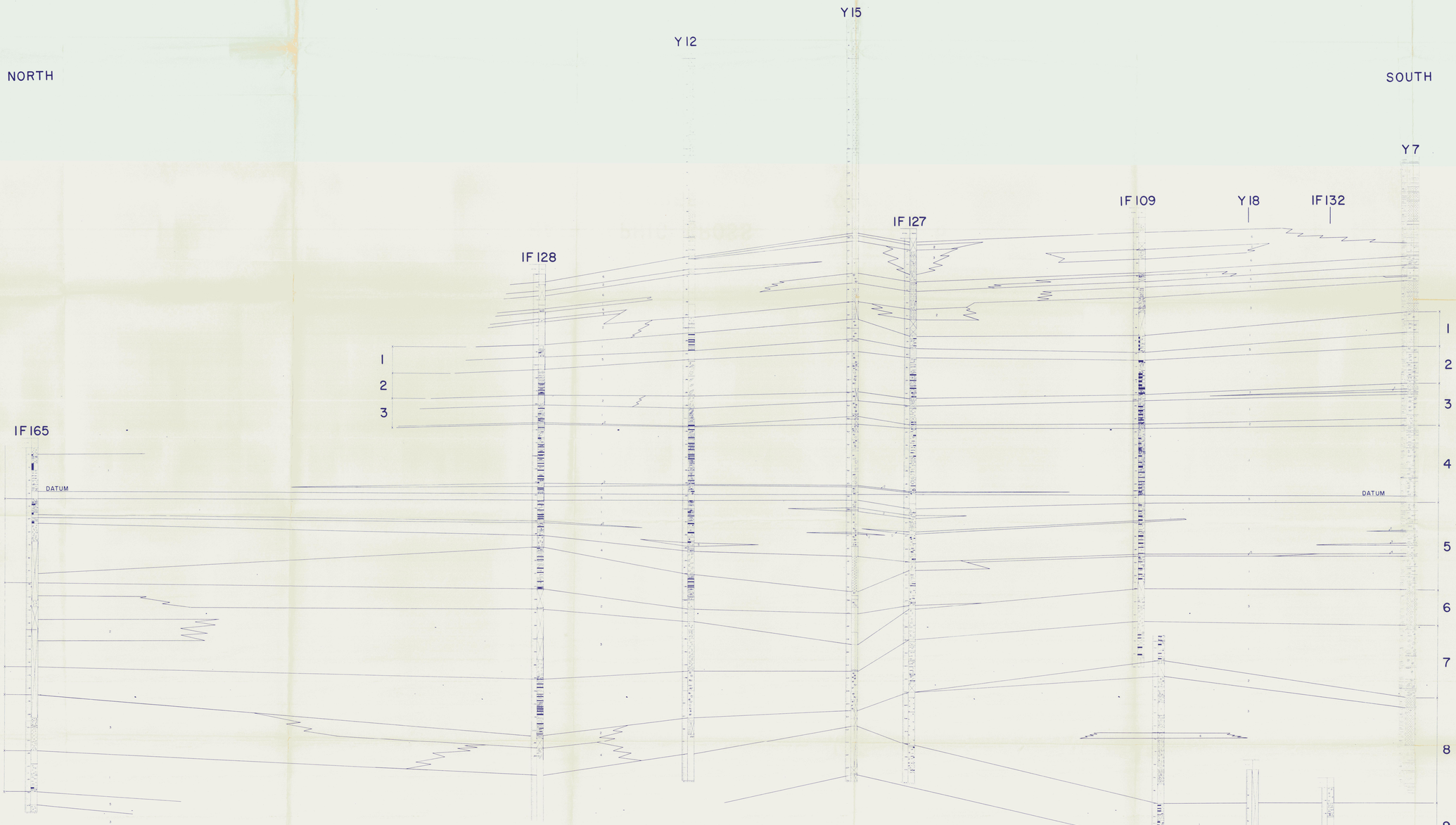
LEGEND

1	HEMATITE
2	SHALE AND SILTSTONE
3	CONGLOMERATE SHALE AND SILTSTONE (+ 30 to 40 % fragments)
4	CONGLOMERATE (+ 30 to 40 % fragments)
5	SANDSTONE
6	HEMATITIC SANDSTONE

REVISIONS	CREST EXPLORATION LIMITED
	STRATIGRAPHIC CROSS SECTION No. 2 IRON CREEK ORE BODY
	SCALE: HORZ. 1" = 500' VERT. 1" = 20' / DATE: FEB. 3, 1964 / DRAWN: L. P. L.

STRATIGRAPHIC CROSS SECTION No. 6

IRON CREEK ORE BODY



LEGEND

1	HEMATITE
2	SHALE AND SILTSTONE
3	CONGLOMERATIC SHALE AND SILTSTONE (+30 to 40% fragments)
4	CONGLOMERATE (+30 to 40% fragments)
5	SANDSTONE
6	HEMATITIC SANDSTONE

REVISIONS

CREST EXPLORATION LIMITED

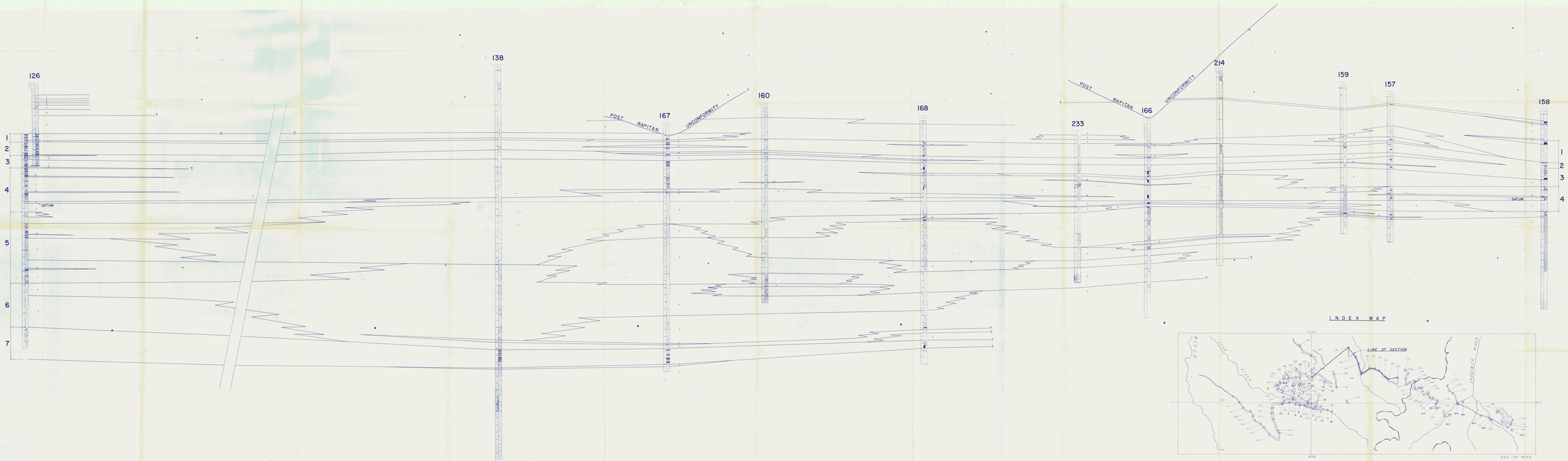
STRATIGRAPHIC CROSS SECTION
No. 6
IRON CREEK ORE BODY

SCALE	DATE	DRAWN
HORZ 1"=500' VERT 1"=25'	FEB. 3, 1964	L. P. L.

STRATIGRAPHIC CROSS SECTION No. II
IRON CREEK ORE BODY

WEST

EAST



INDEX MAP

LEGEND

1	HEMATITE
2	SHALE AND SILTSTONE
3	CONGLOMERATIC SHALE AND SILTSTONE (+10 to 40% fragments)
4	CONGLOMERATE (+ 30 to 40 % fragments)
5	SANDSTONE
6	HEMATITIC SANDSTONE

CREST EXPLORATION LIMITED

STRATIGRAPHIC CROSS SECTION
No. II

IRON CREEK ORE BODY

SCALE	DATE	DRAWN
HOR. 1" = 100'	MAY 25,1966	L. P. L.

IRON CLAIMS IN SNAKE RIVER AREA, Y. T.

LOCATION LINES

133° 00'

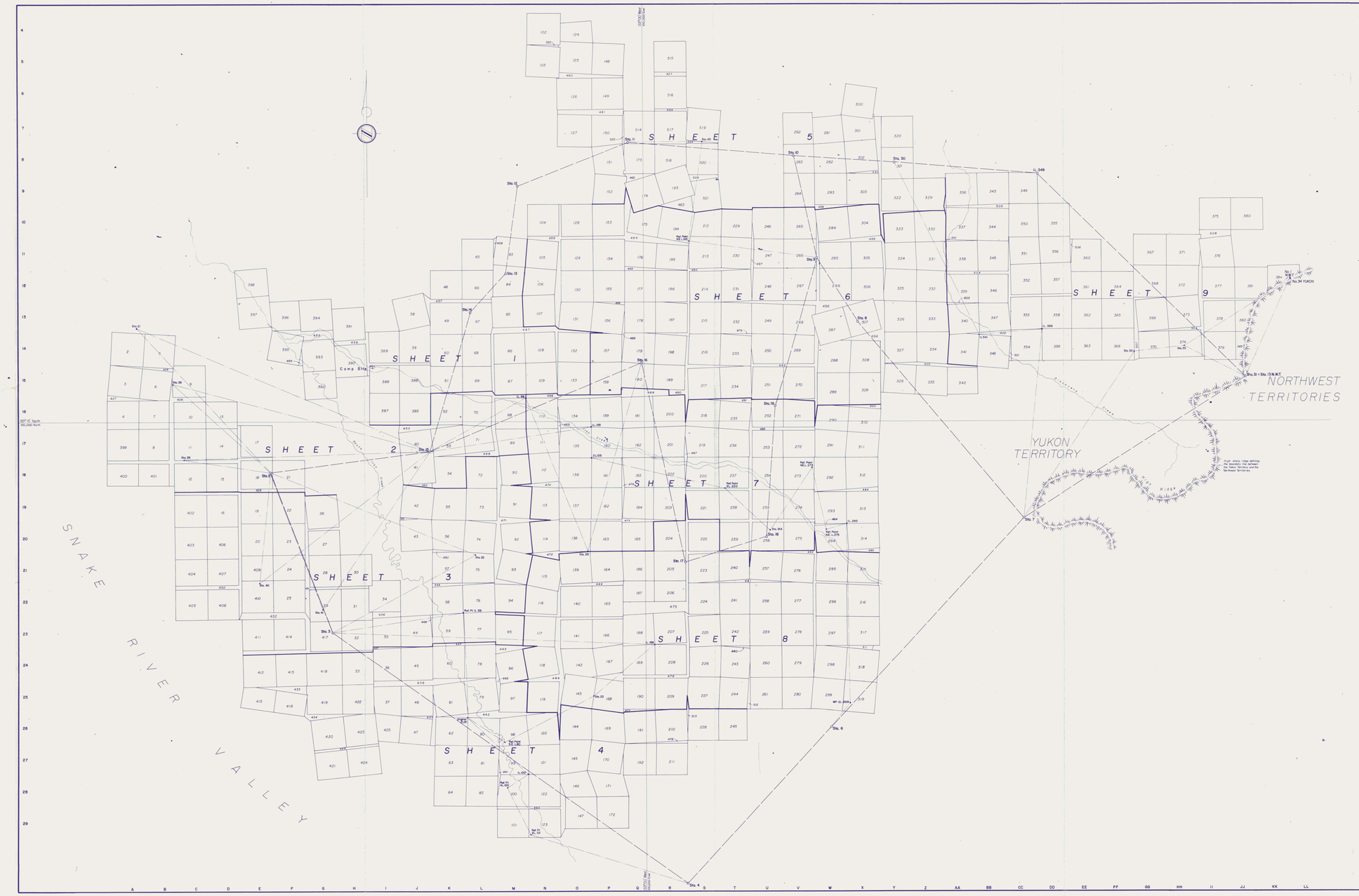
65°15'

133°00'

SNAKE RIVER

N. W. T.

Scale: 1 inch = 1 mile



INDEX PLAN
CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

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INIS 101 Fr.	509

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VINO 20, 21	275, 276
VICE 22-25	277-280
WREN 7-10	281-284
WEE 11-14	285-288
WIT 15-18	289-292
WASP 19	293
WISH 20, 21	294, 295
WIN 22-24	296-298
WAC 25	299
XACTO 6	300
XENO 7-10	301-304
XRAY 11-14	305-308
XENON 15-18	309-312
XRAY 19	313
XENA 20, 21	314, 315
XENO 22-25	316-319
YALE 7, 8	320, 321
YAK 9-12	322-325
YAM 13-15	326-328
ZOT 9-12	329-332
ZED 13, 14	333, 334
ZILCH 15	335
ALASKA 9-15	336-342
BEEBEE 9-14	343-348
CHACHA 9-12	349-352
CO-CO 13, 14	353, 354
DIDO 10-13	355-358
DI-DI 14	359
EVEE 11-14	360-363
FIFI 12-14	364-366
GOGO 11-14	367-370
HAHA 11-14	371-374
INIS 10	375
IT 11-13	376-378
IOTA 14	379
JAYJAY 10	380
JUDO 12	381
JOKE 13	382
JU-JU 14	383
KI-KI 12	384
UNO 21 Fr.	496
UNIT 261 Fr.	497
VENI 71 Fr.	498
VIMY 131 Fr.	499
VENUS 191 Fr.	500
VINO 201 Fr.	501
VICE 221 Fr.	502
WREN 101 Fr.	503
WEE 111 Fr.	504
WIT 151 Fr.	505
WASP 201 Fr.	506
WISH 211 Fr.	507
WIN 241 Fr.	508
WAC 251 Fr.	509
XACTO 61 Fr.	510
XENO 91 Fr.	511
XRAY 131 Fr.	512
XENON 161 Fr.	513
XENA 211 Fr.	514
YALE 81 Fr.	515
YAK 121 Fr.	516
YAM 141 Fr.	517
ZOT 131 Fr.	518
ZED 151 Fr.	519
ZILCH 161 Fr.	520
ALASKA 111 Fr.	521
BEEBEE 161 Fr.	522
CHACHA 131 Fr.	523
CO-CO 151 Fr.	524
DIDO 111 Fr.	525
DI-DI 151 Fr.	526
EVEE 171 Fr.	527

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N LONG. 133°00' W

INDEX PLAN SCALE 1" = 2640'
(SHEETS 1 TO 9 SCALE 1" = 600')

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963
BY J.W.L. MONAGHAN D.L.S.
FOR CREST EXPLORATION LIMITED

L E G E N D

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 133° W

Survey monuments 9"x 9" square by 30" long shown thus	▫
Stone cairns are ten feet from the survey post and shown thus	◆
Earth mounds are ten feet from the survey post and shown thus	✕
Iron claims dealt with on this plan are bordered thus	
Line indicating sheet limit shown thus	
Control traverse stations shown thus	○
Primary control traverse shown thus	
Secondary control traverse shown thus	

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims surveyed by me, and have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None

MARSHALL MACKLIN MONAGHAN LIMITED

DOMINION LAND SURVEYOR

I, J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
this 5th day of APRIL 1964

A COMMISSIONER FOR TAKING AFFIDAVITS IN AND FOR THE COUNTY OF YORK. MY COMMISSION EXPIRES MAY 6, 1965.

DOMINION LAND SURVEYOR

INDEX PLAN - YUKON

SL-63-85

SHEET 1

SHEET 1 OF 9
CREST EXPLORATION LIMITED
1963

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME AND NO.	GRID NUMBER
AANT 14-16	2-4
ANN 17-18	399,400
BONGO 14-16	5-7
BETH 17-18	8,401
CONY 15-18	9-12
CAM 19	402
CALL 20-22	403-405
DORINE 16-18	13-15
DODO 19	16
DOT 20	406
DELL 21,22	407,408
EGAD 12,13	398, 397
ELIZA 17,18	17, 18
EARL 19,20	19, 20
EMU 21-25	409-413
FAIR 13,14	396, 395
FOOL 18	21
FERRIS 19,20	22,23
FAG 21, 22	24, 25
FAG 23-25	414-416
GEM 13-15	394, 393, 392
GLORY 20-21	26-28
GO 22-24	29,417,418
GEM 25-27	419-421
HAM 13,14	391, 390
HEM 13-15	30-32
HEX 23-24	31-33
HOG 25-27	422-424
IOLENE 14	389
IRIS 15	388
IVY 16, 22	387, 34
INKY 23-26	35, 36, 37, 425
JOLT 13	38
JUPITER 14	39
JUSTICE 15	386
JOY 16, 17	385, 40
JESTER 18	41
JEFF 18	42
JONES 20	43
JAN 23-26	44-47
KILT 12-17	48-53
KLAN 18-22	54-58
KAY 23-25	59-61
KLAN 26-28	62-64
LURE 11-17	65-71
AIN'T 14Fr, 15Fr.	426,427
BETH 17Fr.	428
CONY 18Fr.	430
DODO 19Fr.	431
FAIR 13Fr, 14Fr.	455,454
FAG 23Fr, 24Fr.	432,433
GLORY 20Fr.	431
GEM 25Fr, 26Fr.	434, 435
HEM 13Fr.	456
IVY 22Fr.	436
INKY 23Fr.	437
JOY 16Fr.	453
JASPER 18Fr.	452
JET 19Fr.	451
JUSTICE 15Fr.	438,439
KILT 12Fr.	457
KLAN 20Fr, 21Fr.	450,449
KAY 23Fr, 24Fr.	447,438
LURE 10Fr, 15Fr.	458,468
LION 19Fr.	471
LIL 24Fr, 25Fr.	443, 442

CLAIM NAME AND NO.	GRID NUMBER
LION 18-22	72-76
LIL 23-25	77-79
MAY 16-19	80-83
MARIAN 16-17	84-85
MUD 18-22	90-93
MEL 22-25	94-97
MINTO 26,27	98,99
MAX 28,29	100, 101
NOVA 4,5	102, 103
NEIL 10-17	104-111
NED 18-21	112-115
NUT 22-25	116-119
NEST 23-27	120-121
NAN 28,29	122, 123
NEIL 10Fr, 11	124-126
OLE 13-17	132-135
OPAL 18-21	136-139
OXO 22-25	140-143
ORB 26-29	144-147
PILE 5-11	148-154
PONY 12-17	155-160
POGO 18-21	161-164
PAT 22-25	165-168
POE 26-29	169-172
QUID 7,8	514, 173
QUAD 18-22	174-178
QUEST 11-18	179-183
QUAD 19-23	184-188
QUIT 24-27	189-192
ROY 15-8	515-518
RHONDDA 9, 10	193, 194
ROSE 11-18	195-202
ROY 19-23	203-207
RYE 24-27	208-211
SALLY 7-9	519-521
SALLY 10	212
SUE 11-18	213-220
SUE 19-23	221-224
SAM 25-28	225-228
TARN 10	229
TANG 11-18	230-237
TERESA 19-22	238-241
TOM 23-26	242-245
TOM 27-29	246-253
URANUS 18,19	254, 255
MEL 23Fr.	445
MAX 27Fr.	441
NOVA 4Fr.	522
NEIL 10Fr, 13Fr.	460, 467
NEIL 15Fr, 16Fr.	468, 469
NED 18Fr, 20Fr.	470, 472
NUT 22Fr.	446
NAN 28Fr.	440
OXO 22Fr.	444
PILE 5Fr, 6Fr.	460, 461
PILE 7Fr, 8Fr.	523, 464
PONY 12Fr, 14Fr.	466, 489
POGO 18Fr, 19Fr.	474, 473
QUID 8Fr.	462
QUAD 19Fr.	463
QUIT 24Fr, 25Fr.	476, 477
RHONDA 9Fr.	463
ROSE 13Fr, 17Fr.	490, 487
ROY 15Fr, 6Fr, 20Fr.	527, 526, 475
RYE 26Fr.	478
SALLY 7Fr, 8Fr.	525, 524

CLAIM NAME AND NO.	GRID NUMBER
UNO 20, 21	256, 257
UNIT 22-25	258-261
VIC 22-25	262-265
VINY 16-17	266-272
VENUS 16, 19	273, 274
VINO 20, 21	275, 276
VICE 22-25	277-280
WREN 7-10	281-284
WEE 11-14	285-288
WIT 15-18	289-292
WASP 19	293
WISH 20, 21	294, 295
WIN 22-24	296-298
WAC 25	299
WAC 26-6	300
XENO 7-10	301-304
XRAY 11-14	305-308
XENON 15-18	309-312
XRAY 19	313
XENA 20,21	314, 315
XENO 22-25	316-319
YALE 7,8	320, 321
YAK 9-12	322-325
YUM 13-15	326-328
ZOT 15-12	329-332
ZIP 13-16	333, 334
ZLCH 35	335
ALL-ASKA 9-15	336-342
BIEBEE 9-14	343-348
CHACHA 9-12	349-352
CO-CO 13, 14	353, 354
DIDO 10-13	355-358
DI-DI 14	359
EVEE 11-14	360-363
FIFI 12-16	364-366
GOGO 11-14	367-370
HANA 11-14	371-374
INI 13-16	375
IVA 7-13	376-378
IOTA 14	379
JAYJAY 10	380
JUDO 12	381
JOKE 13	382
JU-JU 14	383
KI-KI 12	384
SAM 25Fr.	513
TANG 8Fr, 11Fr.	497, 479
TANG 9Fr.	481
TERESA 19Fr.	482
TOM 23Fr.	480
URANUS 19Fr.	486
NUT 22Fr.	512
VIMY 12Fr, 14Fr.	496, 492
WREN 9Fr.	498
WASP 19Fr.	484
XRAY 12Fr, 14Fr.	495, 494
XENON 15Fr, 28Fr.	493, 485
XENA 20Fr.	483
XENO 18Fr, 21Fr.	499, 482
YALE 7Fr, 8Fr.	500
ZED 14Fr.	502
ALASKA 9Fr, 10Fr.	505, 510
III Fr, 12Fr, 15Fr.	504, 503, 502
BEEBEE 14Fr.	501
DIDO 10 Fr.	506
FIFI 13 Fr.	507
HANA 13 Fr.	508
INIS 10 Fr.	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT 63°45'N LONG 135°00'W

INDEX PLAN SCALE 1"=2640'

SHEETS 1 TO 9 SCALE 1"=400'

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963

BY J.WL. MONAGHAN D.L.S.

FOR CREST EXPLORATION LIMITED

— LEGEND —

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 135° W.

Survey monuments 7¾" square by 30" long shown thus	⊕
Stone cairns one ten foot from the survey post and shown thus	⊙
Earth mounds one ten foot from the survey post and shown thus	⊙
Witness posts 4" square by 48" long bothered thus	⊕
Line indicating sheet inset shown thus	
Control traverse stations shown thus	⊙
Primary control traverse shown thus	
Secondary control traverse shown thus	

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims, surveyed by me, and have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no false or indication and have no knowledge or information of any such claim except as follows: None

MARSHALL WAKOLYN MONAGHAN LIMITED

DOMINION LAND SURVEYOR

I, J.WL. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, accepted to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by my plan and that this plan is correct and true to the best of my knowledge and belief

SO HELP ME GOD.

MARSHALL WAKOLYN MONAGHAN LIMITED

DOMINION LAND SURVEYOR

SWORN before me at TORONTO
in the Province of ONTARIO, this
5th day of NOVEMBER, 1963
A COMMISSIONER FOR TAKING AFFIDAVITS WITHIN ONTARIO

SHEET 1 OF 9

SL-63-85

SHEET 2 ADJACENT

SHEET 6 ADJACENT

SHEET 7 ADJACENT

SHEET 2

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME (HOLE)	GRP NUMBER	CLAIM NAME (HOLE)	GRP NUMBER	CLAIM NAME (HOLE)	GRP NUMBER
AIN'T 14-16	2-4	LION 18-22	72-76	UNIO 20, 21	256, 257
ANN 17, 18	399, 400	LIL 23-25	77-79	UNIT 22-25	258-261
BONZO 14-16	5-7	LION 26-28	80-82	VEN 7-9	262-264
BETH 17, 18	8, 401	MARIAN 11-17	83-89	VIMY 10-17	265-272
BONZO 17, 18	9, 402	MEL 18-21	90-93	VENUS 18, 19	273, 274
CAM 19	403	MEL 23-25	94-96	VIMY 22-25	277-280
CALL 20-22	403-405	MINTO 26, 27	98, 99	VIMY 22-25	277-280
DORINE 16-18	13-15	MAX 28, 29	100, 101	WREN 7-10	281-284
DODO 19	16	NOVA 4, 5	102, 103	WEE 11-14	285-288
DOT 20	406	NEIL 10-17	104-111	WIT 15-18	289-292
DELL 21, 22	407, 408	NED 18-21	112-115	WASP 19	293
EGAD 12, 13	398, 397	NUT 22-25	116-119	WISH 20, 21	294, 295
ELIZA 17, 18	17, 18	NEST 26, 27	120-121	WIN 22-24	296-298
ERL 19, 20	19, 20	NAN 28, 29	122, 123	WAC 25	299
EARL 23-25	409-413	OBOE 4-7, 10, 11	124-129	XACTO 6	300
FOOL 18	21, 396	OWL 18-21	130-133	XRAY 10-13	301-304
FOOL 19	21	ONAL 18-21	130-135	XRAY 17-18	305-308
FERROUS 19, 20	22, 23	OXO 22-25	140-143	XENON 15-18	309-312
FAG 21, 22	24, 25	ORB 26-29	144-147	XRAY 19	313
FAG 23-25	414-416	PILE 5-11	148-154	XENA 20, 21	314, 315
GEM 13-15	394, 393, 392	PONY 12-17	155-160	XENO 22-25	316-319
GLORY 19-21	26-28	POGO 18-21	161-164	YALE 7, 8	320, 321
GO 22-24	29, 417, 418	POE 26-29	165-168	YAK 9-12	322-325,
GEM 25-27	419-421	POE 26-29	169-172	YAM 13-15	326-328
HAM 13, 14	391, 390	QUID 7, 8	5-14, 173	ZOT 9-12	329-332
HONOR 21	30	QUIRT 9, 10	174, 175	ZED 13, 14	333, 334
HOG 22-24	31-33	QUEST 11-18	176-183	ZILCH 15	335
HOG 25-27	422-424	QUIT 24-27	184-187	ALFABET 8-15	336-340
IOLENE 14	389	QUAIL 24-27	188-192	ALFABET 8-14	345-348
IRIS 15	388	ROY 6-9	5-8, 518	CHACHA 9-12	349-352
IVY 16, 22	387, 34	RHONDA 9, 10	193, 194	CO-CO 13, 14	353, 354
INKY 23-26	35, 36, 37, 425	ROSE 11-18	195-202	DODO 10-13	355-358
JOLT 13	38	ROY 19-23	203-207	DI-DI 14	359
JUPITER 14	39	RYE 24-27	208-211	EVEE 11-14	360-363
JUSTICE 15	386	SALLY 7-9	519-521	FIFI 12-14	364-366
JOY 16, 17	385, 40	SALLY 10	212	GOGO 11-14	367-370
JASPER 18	41	SUZY 11-18	213-220	HAHA 11-14	371-374
JET 19	42	SUN 19-20	221-224	INIS 10	375
JONES 20	43	SAM 23-26	225-228	IT 11-13	376-378
KLAN 15-17	44-47	TAG 7-9	229-231	JOY 14	379
KILT 12-17	48-53	TANI 11-18	232-237	JUNIOR 10	380
KLAN 18-22	54-58	TERESA 19-22	238-241	JIFFY 12	381
KAY 23-25	59-61	TOM 23-26	242-245	JOKE 13	382
KLAN 26-28	62-64	UNIT 10-17	246-253	JU-JU 14	383
LURE 11-17	65-71	URANUS 18, 19	254, 255	KI-KI 12	384
AIN'T 14 Fr, 15 Fr	426, 427	MEL 23 Fr.	445	SAM 25 Fr.	513
BETH 17 Fr.	428	MAX 27 Fr.	441	TANG 18 Fr, 13 Fr.	497, 479
CONY 18 Fr.	430	NOVA 6 Fr.	522	TANG 15 Fr.	481
DORINE 17 Fr.	429	NEIL 10 Fr, 13 Fr.	459, 467	TERESA 21 Fr.	481
DOT 20 Fr, 19 Fr.	455, 454	NED 18 Fr, 19 Fr.	469, 469	TOM 24 Fr.	482
FAG 23 Fr, 24 Fr.	432, 433	NED 20 Fr, 21 Fr.	470, 472	URANUS 20 Fr.	486
GLORY 20 Fr.	431	NUT 22 Fr.	446	UNIT 15 Fr.	512
GEM 25 Fr, 26 Fr.	434, 435	NAN 28 Fr.	440	VIMY 22 Fr, 14 Fr.	496, 492
HEM 13 Fr.	456	OXO 22 Fr.	444	WREN 9 Fr.	498
IVY 22 Fr.	436	PILE 5 Fr, 6 Fr.	460, 461	WASP 19 Fr.	484
INKY 23 Fr.	437	PILE 7 Fr, 10 Fr.	523, 464	XRAY 12 Fr, 14 Fr.	495, 494
JOY 16 Fr.	453	PONY 13 Fr, 14 Fr.	466, 469	XENON 18 Fr, 20 Fr.	493, 485
JASPER 18 Fr.	452	POGO 18 Fr, 19 Fr.	474, 473	XENA 20 Fr.	483
JET 19 Fr.	451	QUID 8 Fr.	462	XENO 18 Fr, 21 Fr.	499, 482
JAN 23 Fr, 25 Fr.	448, 439	QUEST 11 Fr.	465	XENO 23 Fr.	511
KLAN 16 Fr.	450	QUIT 24 Fr, 25 Fr.	477	ZED 14	500, 501
KLAN 20 Fr, 21 Fr.	450, 449	RHONDA 9 Fr.	475	ZILCH 15 Fr, 16 Fr.	502, 510
KAY 23 Fr, 24 Fr.	447, 438	ROSE 13 Fr, 17 Fr.	490, 487	III Fr, 62 Fr, 13 Fr.	5045015302
LURE 13 Fr, 15 Fr.	456, 468	ROY 56 Fr, 60 Fr, 20 Fr.	527, 526, 475	BEEBEE 14 Fr.	503
LION 19 Fr.	471	RYE 26 Fr.	478	DIDO 10 Fr.	506
LIL 24 Fr, 25 Fr.	443, 442	SALLY 7 Fr, 8 Fr.	525, 524	FIFI 13 Fr.	507
				HAHA 13 Fr.	508
				INIS 10 Fr.	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N LONG. 133°00' W

INDEX PLAN SCALE 1"=2640'

(SHEETS 1 TO 9 SCALE 1"= 600')

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963

BY J.W.L. MONAGHAN D.L.S.

FOR CREST EXPLORATION LIMITED

— LEGEND —

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 133° W.

Survey monuments, 3"x" square by 30" long shown thus ..... ⊡

Stone cairns one ten feet from the survey post and shown thus ..... ●

Earth mounds one ten feet from the survey post and shown thus ..... ▲

Iron posts found with or set on this plan are bordered thus ..... ■

Claim boundaries shown thus ..... ——

Control traverse stations shown thus ..... △

Primary control traverse shown thus ..... ——

Secondary control traverse shown thus ..... ——

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims surveyed by me, and have otherwise made all reasonable investigations in my power & discretion if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None.

MARSHALL MACKLIN MONAGHAN LIMITED

DOMINION LAND SURVEYOR

I, J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

Sworn before me at TORONTO
this 15th day of NOVEMBER 1963

A COMMISSIONER FOR TAKING AFFIDAVITS IN AND FOR THE COUNTY OF YORK, IN THE PROVINCE OF ONTARIO

MARSHALL MACKLIN MONAGHAN LIMITED

DOMINION LAND SURVEYOR

SL-63-16

SL-63-29

SHEET 2 OF 9

NORTHERLY LIMIT OF LOCATIONS

WESTERLY LIMIT OF LOCATIONS

EASTERLY LIMIT OF LOCATIONS

SOUTHERLY LIMIT OF LOCATIONS

INACCESSIBLE AREA

SNAKE RIVER

AIN'T 14 L 2 160.00 A

BONZO 14 L 5 159.79 A

AIN'T 15 L 3 159.85 A

BONZO 15 L 6 159.99 A

AIN'T 16 L 4 159.94 A

BONZO 16 L 7 159.99 A

ANN 17 L 399 159.86 A

BETH 17 L 8 160.0 A

ANN 18 L 400 159.86 A

BETH 18 L 401 158.85 A

BETH 17 Fr. L 428 157.57 A

CONY 15 L 9 160.00 A

CONY 16 L 10 157.57 A

CONY 17 L 11 160.00 A

CONY 18 L 12 158.59 A

CONY 181 FR.

DORINE 16 L 13 157.72 A

DORINE 17 L 14 160.00 A

DORINE 18 L 15 158.59 A

DORINE 171 FR. L 429 142.42 A

ELIZA 17 L 17 160.00 A

ELIZA 18 L 18 143.95 A

FOOL 18 L 21 147.85 A

CAM 19

DODO 19

ERL 19

FERROUS 19

GLORY 19 L 26

SHEET 3 ADJACENT

SHEET 1 ADJACENT

SHEET 3 ADJACENT

SHEET 7 ADJACENT

JUSTICE 15

KILT 15

LURE 15

MARIAN 15

NEIL 15

JOY 16

KILT 16 L 50 150.33 A

LURE 16 L 70 160.00 A

MARIAN 16 L 88 154.99 A

NEIL 16

IVY 17

JOY 17 L 40 154.41 A

KILT 17 L 53 133.57 A

LURE 17 L 71 129.62 A

MARIAN 17 L 89 138.44 A

NEIL 17

IDIOT 18

JASPER 18 L 41 159.33 A

KLAN 18 L 54 147.8 A

LION 18

MAID 18

NED 18

IDIOT 19

JET 19

KLAN 19

LION 19

IRON CREEK

JOY 16 FR. L 833 98.6 A

LURE 151 FR. L 69 159.6 A

LURE 15' FR.

LION 19' FR.

Check chained 2639.65'

Too steep to climb

HIGH PEAK

SHEET 3

SHEET 3 OF 9
CREST EXPLORATION LIMITED
1963

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME	RECORD NUMBER	CLAIM NAME	RECORD NUMBER	CLAIM NAME	RECORD NUMBER
AIMT 14-16	2-4	LION 18-22	72-76	UNO 20, 21	256, 257
ANN 17, 18	399, 400	LIL 23-25	77-79	UNIT 22"-25	258-261
BONZO 14-16	5-7	MAID 18-23	80-82	VENI 7"-9	262-264
BETH 17, 18	8, 401	MARIAN 0-17	83-89	VIMY 10"-17	265-272
BOOT 17, 18	9, 10	MAID 18-23	90-93	VENUS 18, 19	273, 274
CAM 19	402	MEL 22-25	94-97	VINO 20, 21	275, 276
CALL 20-22	403-405	MINTO 26, 27	98, 99	VICE 22"-25	277-280
DORINE 16-18	13-15	MAX 26, 29	100, 101	WREN 7"-10	281-284
DODO 19	16	NOVA 4, 5	102, 103	WEE 11"-14	285-288
DOT 20 -	406	NED 16"-17	104-111	WIT 15"-18	289-292
DELL 21, 22	407, 408	NED 18"-21	112-115	WASP 19"-	293
EGAD 12, 13	397, 398	NED 181"-191	116-119	WISH 20, 21	294, 295
ELIZA 17, 18	17, 18	NEST 26, 27	120-121	WIRE 22"-24	296-298
ERL 19, 20	19, 20	NAN 28"-31	122-123	WEE 25	299
EARL 23"-25	409-411	OBOE 26, 27, 10, 11	124-129	XACTO 6	300
FAG 19"-24	21-26	OPAL 15"-17	130-135	XENO 7"-10	301-304
FOOL 18	396, 395	OPAL 18-21	136-139	XRAY 11"-14	305-308
FERROUS 19, 20	22, 23	OXO 22"-25	140-143	XENON 15"-18	309-312
FAG 21, 22	24, 25	ORB 26"-29	144-147	XRAY 19	313
FAG 23"-25	414-416	PILE 5"-11	148-154	XENA 20, 21	314, 315
GEM 13"-15	394, 393, 392	PONY 12"-17	155-160	XENO 22"-25	316-319
GLORY 19"-21	26"-28	POGO 18"-21	161-164	YALE 7, 8	320, 321
GO 22"-24	29, 417, 418	PAT 22"-25	165-168	YAK 9"-14	322-325
GEM 25"-27	419-421	POE 26"-29	169-172	YAM 13"-15	326-328
HAM 13, 14	391, 390	QUIP 7, 8	173, 174	YAK 16"-19	329-332
HONOR 19	30	QUIP 9, 10	175, 176	ZED 13, 14	333, 334
HEX 19"-22	31-33	QUEST 11"-18	176"-183	ZILCH 15	335
HOG 25"-27	422-424	QUAD 19"-23	184-188	AL-ASKA 9"-15	336-342
IOLENE 14	389	QUIT 24"-27	189"-192	BEEBEE 9"-14	343-348
IRIS 15	388	ROY 5"-8	515-518	CHACHA 9"-12	349-352
IVY 16, 22	387, 34	RHONDA 9, 10	193, 194	CO-CO 13, 14	353, 354
INKY 23"-26	35, 36, 37, 425	ROSE 11"-18	195"-202	DIDO 12"-15	355"-358
JOLT 13	38	ROY 19"-23	203"-207	DI-DI 14	359
JUPITER 14	39	RYE 24"-27	208"-211	EVEE 11"-14	360"-363
JUSTICE 15	386	SALLY 7"-9	519"-521	FIFI 12"-14	364"-366
JOY 16, 17	385, 40	SALLY 10	212	GAGA 11"-14	367"-370
JASPER 18	41	SUZY 11"-18	213"-220	HAHA 11"-14	371"-374
JET 19	42	SUE 19"-22	221"-224	INKS 10	375
JONES 20	43	SAM 23"-26	225"-228	IT 11"-13	376"-378
JAN 24"-26	44-47	TARN 10	229	IOTA 14	379
KILT 12"-17	48-53	TANS 11"-18	230"-237	JAGUAR 10	380
KLAN 18"-22	54-58	TERESA 19"-22	238"-241	JUDO 12	381
KAY 23"-25	59-61	TOM 23"-26	242"-245	JOKE 13	382
KLAN 26"-28	62-64	UNIT 10"-17	246"-253	JU-JU 14	383
LUKE 11"-17	65-71	URANUS 18, 19	254, 255	KI-KI 12	384
AIMT 14"-17, 15"-17	426, 427	MEL 23, Fr.	445	SAM 25, Fr.	513
BETH 17"-17	428	MAX 27, Fr.	441	TANS 18"-19, 13"-17	497, 479
CONY 18"-17	430	NOVA 4, Fr.	522	TANS 19"-17	491
DORINE 17"-17	429	NED 16"-17, 13"-17	459, 467	TERESA 21"-17	481
ELIZA 17"-17, 16"-17	455, 454	NED 16"-17, 16"-17	488, 469	TOM 23"-17	480
FAG 23"-17, 24"-17	432, 433	NED 18"-17, 20"-17	470, 472	URANUS 18"-17	496
GLORY 20"-17	431	NUT 22"-17	446	UNIT 25"-17	512
GEM 25"-17, 26"-17	434, 435	NAN 28"-17	440	VIMY 13"-17, 11"-17	496, 492
HEM 13"-17	456	OXO 22"-17	444	WREN 9"-17	498
IVY 22"-17	436	PILE 5"-17, 6"-17	460, 461	WASP 19"-17	484
INKY 23"-17	437	PILE 7"-17, 6"-17	523, 464	XRAY 13"-17, 14"-17	495, 494
JOY 16"-17	453	PONY 12"-17, 14"-17	466, 465	XENON 19"-17, 18"-17	493, 485
JASPER 18"-17	452	POGO 18"-17, 19"-17	474, 473	XENA 20"-17	483
JET 19"-17	451	QUIP 9"-17, 8"-17	468	YAM 13"-17, 14"-17	482, 482
JAN 23"-17, 25"-17	448, 439	QUEST 18"-17	462	YENO 23, Fr.	511
KAY 23"-17	450	ROY 5"-17, 6"-17, 25"-17	475, 477	ZED 14"-17	500
KLAN 20"-17, 23"-17	450, 449	RHONDA 9"-17	463	ALASKA 19"-17, 17"-17	505, 510,
KAY 23"-17, 24"-17	447, 438	ROSE 13"-17, 17"-17	490, 487	III Fr, 12"-17, 13"-17	504, 503, 502
LUKE 13"-17, 15"-17	458, 468	ROY 19"-17, 9"-17, 20"-17, 21"-17	527, 526, 475	BEEBEE 14"-17	509
LION 19"-17	471	RYE 26"-17	478	DIDO 10"-17	506
LIL 24"-17, 25"-17	443, 442	SALLY 7"-17, 8"-17	505, 524	FIFI 13"-17	507
				HAHA 13"-17	508
				INKS 10"-17	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N. LONG. 133°00' W

INDEX PLAN SCALE 1"=2640'
(SHEETS 1 TO 9 SCALE 1"=600')

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963
BY J.W.L. MONAGHAN D.L.S.
FOR CREST EXPLORATION LIMITED

— L E G E N D —

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 133° W.

Survey monuments "Ex" square by 30" long shown thus	□
Stone claims are ten feet from the survey post and shown thus	◆
Iron claims are 500 feet from the survey post and shown thus	●
Iron claims depict with an iris dark screened thus	
Line indicating sheet limit shown thus	
Control traverse stations shown thus	⊙
Primary control triverse shown thus	———
Secondary control triverse shown thus	———

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims surveyed by me, and have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no force or indication and have no knowledge or information of any such claim except as follows: None

MARSHALL MACKLIN MONAGHAN LIMITED

J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

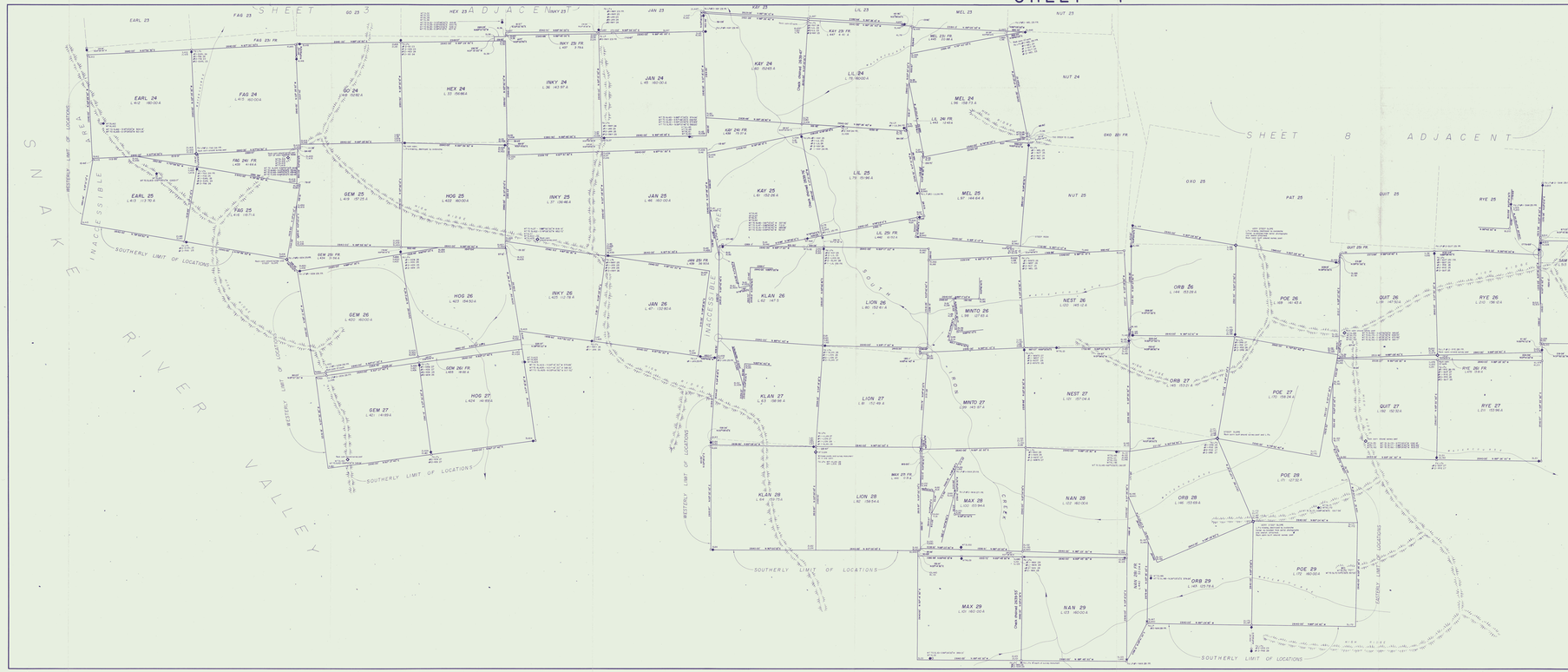
MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
this 15th day of NOVEMBER A.D. 1963
A COMMISSIONER FOR TAKING AFFIDAVITS WITHIN THE PROVINCE OF ONTARIO AND A NOTARY PUBLIC

SL-63-8E

SHEET 3 OF 9

SHEET 4



SHEET 4 OF 9
CREST EXPLORATION LIMITED
1963

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME (FR/BY)	NUMBER
AANT 14-16	2-4
ANN 17-18	399, 400
ANNE 17-18	5
BETH 17-18	6, 401
CONY 15-18	9-12
CAM 19	402
CALL 20-22	403-405
DORRE 17-18	13-15
DODO 19	16
DOT 20	406
DELL 21,22	407, 408
EGAD 17,18	398, 397
ELSIE 17-18	17
ERL 19,20	18, 20
EARL 21-25	409-413
FAIR 17-18	21
FOOL 18	394, 395
FERROUS 19,20	22, 23
FAG 21,22	24, 25
FAG 23-25	414-418
FAT 21-25	419-423, 392
GLORY 19-21	26-28
GO 22-24	29, 407, 418
GEM 25-27	419-421
HAM 17,18	391, 390
HEM 17-18	30
HEX 22-24	31
HOG 25-27	422-424
HOLE 18	389
IRIS 18	388
INKY 23-25	32-34
INKY 25-28	35, 36, 37, 425
JOLT 18	38
JUSTICE 17	39
JUSTICE 18	386
JOY 18, 17	385, 40
JASPER 18	41
JET 19	42
JAN 22-24	43
JAN 23-26	44-47
KILT 16-17	48-51
KLAN 18-22	54-59
KAY 23-25	59-61
KAY 25-28	62-64
LUKE 16-17	65-71
LION 17-18	72-76
LIL 23-25	77-79
LIL 25-28	80-82
MARIAN 16-17	83-89
MAID 18-21	90-93
MEL 22-25	94-97
MINTO 26, 27	98, 99
MAX 25-28	100-106
NOVA 16,17	107, 403
NEL 16-17	104-111
NED 19-21	112-115
NUT 22-25	116-119
NAN 25-28	120-123
NAN 28, 29	122, 123
OBOE 4-7, 10, 11	124-129
OXO 22-25	130-135
OIL 19-21	136-139
OXO 22-25	140-143
ORB 28-29	144-147
PILE 5-11	148-154
POE 22-25	155-160, 392
POGO 18-21	161-164
PAT 22-25	165-168
POE 28-29	169-172
QUID 7, 8	514, 173
QUIT 22-25	174-179
QUEST 17-18	179-183
QUAD. 19-23	184-188
QUIT 24-27	189-192
QUIT 28-29	193-196
RHONDA 9, 10	198, 194
ROSE 17-18	197-200
ROY 19-23	203-207
RYE 22-25	208-211
SALLY 7-9	519-511
SALLY 10	212
SUZY 11-18	213-220
SUN 19-20	221-224
SAM 22-25	225-228
TAMI 19	229
TANG 11-18	230-237
TERESA 19-22	236-241
TOM 23-26	242-245
TOM 25-28	246-249
URANUS 18, 19	254, 255

CLAIM NAME (FR/BY)	NUMBER
UNO 20, 21	256, 257
UNIT 22-25	258-261
VIC 17-18	262-264
VINY 17-17	265-272
VENUS 18, 19	273, 274
VEG 22-25	275-278
VICE 22-25	279-282
WEST 17-18	283-287
WET 17-18	285-288
WIT 17-18	289-292
WISH 19	293
WISH 20, 21	294-298
WISH 25, 28	299-298
WAC 25, 28	300
XACTO 16	300
XRAY 17-18	301-304
XRAY 17-18	305-308
XENON 15-18	309-312
XRAY 19	313
XENA 20,21	314, 315
YAK 17-18	316-319
YALE 7,8	320, 321
YAK 9-12	322-325
YAM 13-15	326-328
ZOT 11-12	329-332
ZAP 13-14	333-336
ZALCH 15	337-343
ALASKA 9-15	536-340
BUSSEX 14	343-346
CO-CO 13, 14	347-350
CO-CO 15, 14	353, 354
DODO 10-13	355-358
DI-DI 14	359
DODO 14-15	360-363
FIFI 13-14	364-366
GOGO 11-14	367-370
HANA 11-14	371-374
INIS 10	375
INIS 10, 11	376-378
IOTA 14	379
JAYJAY 10	380
JUDO 12	381
JOKE 13	382
KI-KI 11	383
KI-KI 12	384

CLAIM NAME (FR/BY)	NUMBER
MEL 25 Fr.	445
MAX 25 Fr.	446
NOVA 16 Fr.	522
NEL 15 Fr., 16 Fr.	456, 467
NEL 15 Fr., 16 Fr.	488, 469
NUT 25 Fr., 26 Fr.	470, 472
NUT 28 Fr.	440
NAN 28 Fr.	440
OXO 25 Fr.	444
PILE 5 Fr., 6 Fr.	460, 461
POE 25 Fr., 26 Fr.	462, 464
POKY 12 Fr., 16 Fr.	466, 466
POGO 18 Fr., 19 Fr.	479, 473
QUID 8 Fr.	462
QUEST 19 Fr.	465
QUIT 25 Fr., 26 Fr.	476, 477
RHONDA 9 Fr.	483
ROSE 15 Fr., 17 Fr.	490, 487
ROY 19 Fr., 20 Fr., 21 Fr.	506, 475
SAL 20 Fr.	507
SALLY 7 Fr., 8 Fr.	525, 524

CLAIM NAME (FR/BY)	NUMBER
SAM 25 Fr.	513
TANG 15 Fr., 16 Fr.	497, 479
TANG 19 Fr.	481
TERESA 21 Fr.	481
TOM 23 Fr.	489
TOM 25 Fr.	492
UNIT 25 Fr.	502
VIMY 13 Fr., 14 Fr.	496, 492
WREN 19 Fr.	498
WASP 19 Fr.	494
XENON 15 Fr., 16 Fr.	499, 484
XENON 15 Fr., 16 Fr.	493, 485
XENA 20 Fr.	483
XENO 19 Fr., 20 Fr.	499, 482
XENO 23 Fr.	501
YAM 13 Fr.	500
ALASKA 9 Fr., 10 Fr.	505, 510,
III Fr., 12 Fr., 13 Fr.	504, 503, 502
BUSSEX 13 Fr.	508
DODO 12 Fr.	509
FIFI 13 Fr.	507
HANA 13 Fr.	506
INIS 10 Fr.	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE.

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°16' N. LONG. 135°50'W

INDEX PLAN SCALE 1"=2640'
SHEETS 1 TO 9 SCALE 1"=400'

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963
BY J.W.L. MONAGHAN D.L.S.
FOR CREST EXPLORATION LIMITED

LEGEND

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 135° W.

Survey monuments "N" squire by 3/4" long shown thus
Stake claims are ten feet from the survey post and shown thus
Post intersecting claim lines shown thus
Line projecting claim lines shown thus
Line projecting claim lines shown thus
Primary control traverse shown thus
Secondary control traverse shown thus

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, Yukon Territory surveyed by me, and that I have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None

MARSHALL MACKLIN MONAGHAN LIMITED

J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, carefully examined the ground included in the foregoing plan of survey of Lots 2 to 527 both inclusive, all in Group 1155, and executed the survey shown by this plan, and that the plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
this 15th day of NOVEMBER
A.D. 1963

A Notary Public in and for the Province of Ontario
My commission expires on the 1st day of December, 1965

SHEET 4 OF 9

SCALE
SL-63-85

SHEET 5 OF 9
CREST EXPLORATION LIMITED
1963

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME AND GRID	GRANT	CLAIM NAME AND GRID	GRANT	CLAIM NAME AND GRID	GRANT
AINT 14-16	2-4	LION 19-22	72-76	UNO 20, 21	256, 257
ANN 17, 18	390, 400	LIZ 23-25	77-79	UNIT 22-25	258-261
BONZO 14-16	5-7	LOL 23-26	80-82	VAL 25-27	262-264
BETH 17, 18	8, 401	MARIAN 0-17	83-89	VIMY 10-17	265-272
CONY 15-18	9-12	MAUD 18-21	90-93	VENUS 18, 19	273, 274
CAM 19	402	MEL 22-25	94-97	VINO 20, 21	275, 276
CALL 20-22	403-405	MINTO 26, 27	98, 99	VICE 22-25	277-280
DORINE 16-18	13-15	MAX 28, 29	100, 101	WREN 7-10	281-284
DODO 19	16	NOVA 4, 5	102, 103	WEE 11-14	285-288
DELL 20	406	NEIL 10-17	104-111	WIT 15-18	289-292
DEAD 21, 22	401, 408	NED 18-21	112-115	WASP 19	293
DEAD 10, 13	396, 397	NEIL 24-26	116-118	WAX 20, 21	294, 295
ELIDA 17, 18	17, 18	NEST 26, 27	120-121	WIN 22-24	296-298
ERL 19, 20	19, 20	NAN 28, 29	122, 123	WAC 25	299
EARL 21-25	409-413	OBOE 4-7, 10, 11	124-129	XACTO 6	300
FAIR 13, 14	396, 395	OLE 15-17	130-135	XENO 7-10	301-304
FOOL 18	21	ORAL 18-21	136-139	XRAY 11-14	305-308
FERROUS 19, 20	22, 23	OXO 22-25	140-143	XENON 15-18	309-312
FAG 21-23	414-416	ORB 26-29	144-147	XRAY 19	313
FAG 25-28	64-66	POLE 5-7	148-154	XENA 20, 21	314, 315
GEM 13-15	394, 393, 392	PUG 16-17	155-157	YAK 7, 8	316, 317
GLORY 19-21	26-28	POGO 18-21	161-164	YALE 7, 8	320, 321
GO 22-24	29, 417, 418	PAT 22-25	165-168	YAK 9-12	322-325
GEM 25-27	419-421	PUG 26-29	169-172	YAM 13-15	326-328
HAM 13, 14	391, 390	QUID 7, 8	514, 173	ZOT 9-12	329-332
HONOR 21	30	QUIRT 9, 10	174, 175	ZED 13, 14	333, 334
HEX 22-24	31-33	QUEST 11-18	176-183	ZILCH 15	335
HOLE 25-27	422-424	QUAD 19-23	184-188	AL-ASKA 9-15	336-342
HOLE DIE 14	389	QUIT 24-27	189-192	BEEBEE 9-14	343-348
IRIS 7	14	RAT 7-9	193-195	BEE 10-14	349-353
IVY 16, 22	387, 34	RHONDA 8, 10	193, 194	CO-CO 13, 14	353, 354
INKY 23-26	35, 36, 37, 425	ROSE 11-18	195-202	DIDO 10-13	355-358
JOLT 13	38	ROY 19-23	203-207	DI-DI 14	359
JUPITER 14	39	RYE 24-27	208-211	EVEE 11-14	360-363
JUSTICE 15	386	SALLY 7-9	519-521	FIFI 12-14	364-366
JOY 16, 17	385, 40	SALLY 10	212	GOGO 11-14	367-370
JASPER 18	41	SUZY 11-18	213-220	HAHA 11-14	371-374
JAM 19	42	SUN 19-20	221-224	INIS 10	375
JENS 20	43	TARN 6-10	225-228	IDA 11, 13	376, 378
JAN 23-26	44-47	TARN 10	229	IOTA 14	379
KILT 12-17	48-53	TANG 11-18	230-237	JAYJAY 10	380
KLAN 18-22	54-58	TERESA 19-22	238-241	JUDO 12	381
KAY 23-25	59-61	TOM 23-26	242-245	JOKE 13	382
KLAN 26-28	62-64	UNIT 10-17	246-253	JU-JU 14	383
LURE 11-17	65-71	URANUS 18, 19	254, 255	KI-KI 12	384
AINT 14 Fr. 15Fr.	426, 427	MEL 23 Fr.	445	SAM 25 Fr.	515
BETH 17 Fr.	431, 432	NED 18 Fr.	446	TANG 18 Fr.	477, 479
CONY 28Fr.	432	NOVA 4 Fr.	522	TANG 19 Fr.	481
DORINE 17 Fr.	429	NEIL 10 Fr. 13Fr.	459, 467	TERESA 21 Fr.	481
FAIR 13 Fr. 14Fr.	455, 454	NEIL 15 Fr. 16 Fr.	468, 469	TOM 23 Fr.	480
FAG 23 Fr. 24Fr.	432, 433	NED 18 Fr. 20 Fr.	470, 472	URANUS 19 Fr.	486
GLORY 20 Fr.	43	NUT 22 Fr.	446	UNIT 25 Fr.	512
GEM 25 Fr. 26Fr.	434, 435	NAN 28 Fr.	440	VIMY 13 Fr. 14Fr.	496, 492
HEM 13 Fr.	456	OXO 22 Fr.	444	WREN 13 Fr.	484
IVY 22 Fr.	436	PILE 5 Fr. 6 Fr.	460, 461	WASP 19 Fr.	484
IVY 16 Fr.	437	PUG 26 Fr. 29Fr.	463, 464	XRAY 13 Fr. 14Fr.	495, 494
JOY 16 Fr.	453	POKY 13 Fr. 14Fr.	465, 466	XENON 15 Fr. 18Fr.	493, 485
JASPER 18 Fr.	452	POGO 18 Fr. 19Fr.	474, 473	XENA 20 Fr.	491
JET 18 Fr.	451	QUID 19 Fr.	462	XENO 19Fr. 21Fr.	499, 482
JAN 22 Fr. 25Fr.	448, 439	QUEST 18 Fr.	465	XENO 23 Fr.	511
KILT 13 Fr.	457	QUIT 24Fr. 25Fr.	476, 477	ZED 14 Fr.	500
KLAN 20 Fr. 21Fr.	450, 449	RHONDA 9 Fr.	483	ALASKA 9Fr. 10Fr.	505, 510,
KAY 23 Fr. 24Fr.	447, 438	ROSE 13Fr. 17Fr.	490, 487	11 Fr. 15Fr. 13 Fr.	504, 503, 502
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LIZ 23 Fr.	478	RYE 26 Fr.	478	DIDO 10 Fr.	506
LIL 24 Fr. 25Fr.	443, 442	SALLY 7 Fr. 8Fr.	525, 524	EVEE 12 Fr.	507
				HAHA 13 Fr.	508
				INIS 10 Fr.	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N LONG. 133°00' W

INDEX PLAN SCALE 1"=2640'

DETAILS 1 TO 9 SCALE 1"=600'

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963

BY J.W.L. MONAGHAN D.L.S.

FOR CREST EXPLORATION LIMITED

LEGEND

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 133° W.

Survey monuments 3/4" square by 30" long shown thus ▫

Stone claims one ten feet from the survey post and shown thus ●

Witness posts to claims not visible from post shown thus ▲

Iron claims identified with an iron post and numbered thus ⊕

Line indicating sheet limit shown thus ———

Claim boundaries shown thus ———

Primary control traverse shown thus ———

Secondary control traverse shown thus ———

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims surveyed by me, and have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None

MARSHALL MACKLIN MONAGHAN LIMITED

I, J.W.L. MONAGHAN of the City of Toronto, Common Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
in the Province of Ontario, this 1964
day of

A Commissioner, etc.

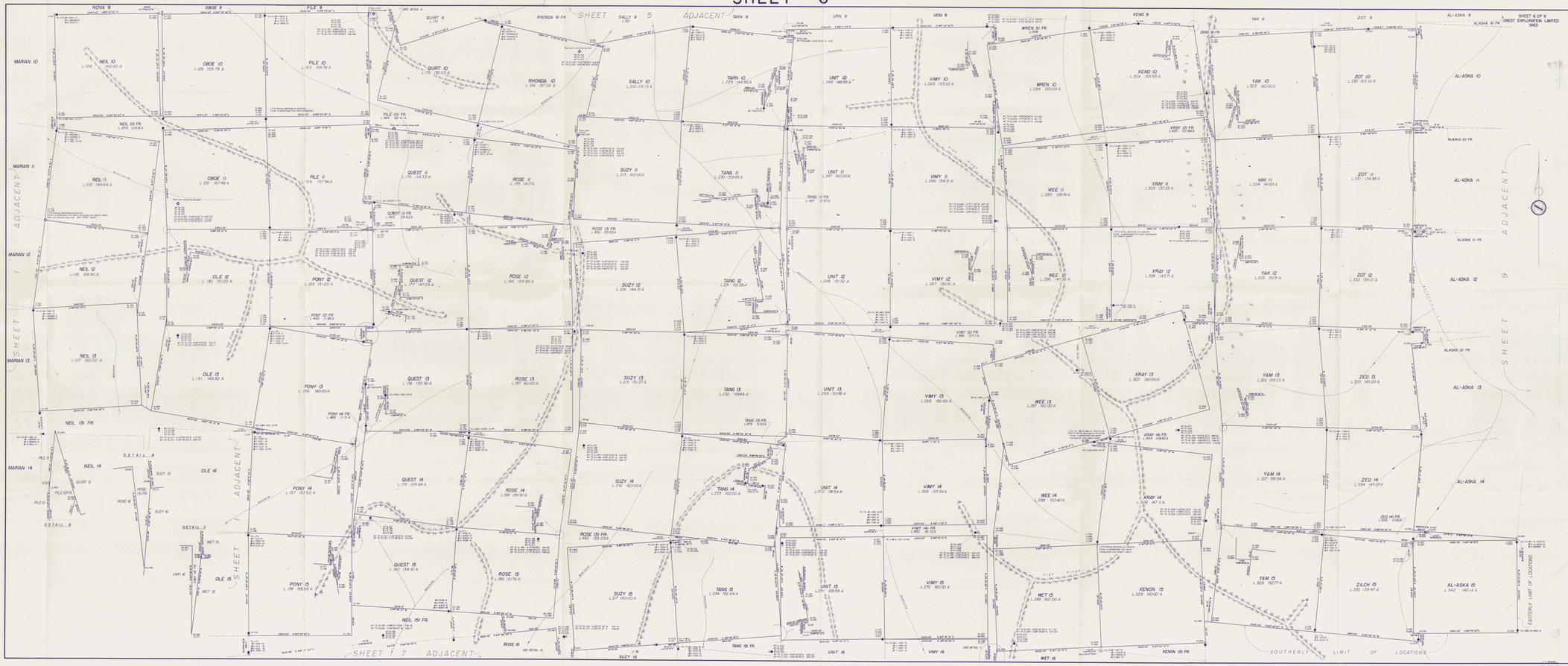
SL 63-85

SHEET 5 OF 9

SHEET 6 TARN 10 ADJACENT

SHEET 9 ADJACENT

SHEET 6



CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME AND FR.	GRANT NUMBERS	CLAIM NAME AND FR.	GRANT NUMBERS	CLAIM NAME AND FR.	GRANT NUMBERS
AINT 14-16	2-6	LION 18-22	72-76	UNO 20, 21	256, 257
ANN 17, 18	399, 400	LION 23-25	77-79	UNIT 22-25	258-261
BONZO 14-16	5-7	LION 26-28	80-82	VENI 7-9	262-264
BETH 17, 18	8, 401	MARIAN 9-17	83-89	VIMY 10-17	265-272
CONY 15-18	9-12	MAID 18-21	90-93	VENUS 18, 19	273, 274
CAM 19	402	MEL 22-25	94-97	VINO 20, 21	275, 276
CALL 20-22	403-405	MINTO 26, 27	98, 99	VICE 22-25	277-280
DORINE 16-18	13-15	MAX 28, 29	100, 101	WREN 7-10	281-284
DODO 19	16	NOVA 4, 5	102, 103	WEE 11-14	285-288
DELL 20	406	NED 6-8	104-106	WET 15, 16	289, 290
DELL 21, 22	407, 408	NED 9-11	107-109	WASP 28	291
EGAD 12, 13	398, 397	NUT 22-25	116-119	WISH 20, 21	294, 295
ELIZA 17, 18	17, 18	NEET 26, 27	120-121	WIN 22-24	296-298
ERL 19, 20	19, 20	NAN 28, 29	122, 123	WAC 25	299
EARL 20-25	409-413	OBOE 4-7, 10, 11	124-129	XACTO 4	300
FAIR 13, 14	396, 395	OLE 13-17	130-135	XENO 7-12	301-306
FOOL 18	21	OPAL 18-21	136-139	XRAY 11-14	307, 308
FERROUS 19, 20	22, 23	OXO 22-25	140-143	XENON 15-18	309-312
FAG 21-23	414-416	PONY 4-6	144-146	YAK 7-9	313
FAG 23-25	444-446	PILE 9-11	147-154	XENA 20, 21	314, 315
GEM 13-17	394, 393, 392	PONY 12-17	155-160	XENO 22-25	316-319
GLORY 19-21	28-28	POGO 18-25	161-164	YALE 7, 8	320, 321
GO 22-24	29, 417, 418	PAT 22-25	165-168	YAK 9-12	322-325
GEM 25-27	419-421	POE 26-29	169-172	YAM 13-15	326-328
HAM 13, 14	391, 390	QUID 7, 8	576, 173	ZOT 9-12	329-332
HONEY 21	30	QUIRT 9, 10	174, 175	ZED 13, 14	333, 334
HEX 22-24	31-33	QUEST 11-18	176-183	ZILCH 15	335
HOT 22-27	422-427	QUAIL 19-22	184-187	ZED 15-17	336-342
HOLE 28, 29	428-429	QUIT 24-27	189-192	BEEBEE 9-14	343-348
IRIS 15	388	ROY 5-8	516-519	CHACHA 9-12	349-352
IVY 16, 22	387, 34	RHONDA 9, 10	193, 194	CO-CO 13, 14	353, 354
INKY 23-26	35, 36, 37, 425	ROSE 11-18	195-202	DIDO 10-13	355-358
JOLT 13	38	ROY 19-23	203-207	DI-DI 14	359
JUPITER 14	39	RYE 24-27	208-211	EVEE 11-14	360-363
JUSTIN 15	386	SALLY 7-9	519-524	FIFI 11-14	364-366
JOY 16, 17	385, 40	SALLY 10	212	GOGO 11-14	367-370
JASPER 18	41	SUZY 11-18	213-220	HAHA 11-14	371-374
JEAN 20	42	SUN 21-23	221-223	INIS 4-7	375
JET 21-23	43	SUZY 25-28	224-226	INIS 11-13	376-378
JAN 23-26	44-47	SUN 25	229	IOTA 14	379
KILT 12-17	48-53	TANG 11-18	230-237	JAYJAY 10	390
KLAN 18-22	54-58	TERESA 19-22	238-241	JUDO 12	381
KAY 23-25	59-61	TOM 23-26	242-245	JOKE 13	382
KLAN 26-28	62-64	UNIT 12-17	246-253	KU-JU 14	383
LURE 11-17	65-71	URANUS 18, 19	254, 255	KI-KI 12	384
AINT 14Fr, 15Fr	426, 427	MAI 25Fr	445	MM 25Fr	485
BETH 17Fr	441	MEL 27Fr	446	TANG 151Fr, 13Fr	517, 479
CONY 18Fr	429	NOVA 4Fr	522	TANG 8Fr	430
DORINE 17Fr	429	NEIL 10Fr, 13Fr	459, 467	TERESA 21Fr	481
FAIR 13Fr, 14Fr	455, 454	NEIL 25Fr, 18Fr	488, 469	TOM 23Fr	480
FAG 23Fr, 24Fr	432, 433	NED 18Fr, 20Fr	470, 472	URANUS 19Fr	486
GLORY 20Fr	431	NUT 22Fr	446	UNIT 22Fr	512
GEM 25Fr, 26Fr	434, 435	NAN 28Fr	440	VIMY 12Fr, 14Fr	496, 492
HEM 23Fr	456	OXO 22Fr	444	WREN 9Fr	494
IVY 22Fr	436	PILE 5Fr, 6Fr	483, 466	WASP 29Fr	484
IVY 16Fr	437	POGO 18Fr, 24Fr	460, 464	XENO 151Fr, 18Fr	497, 494
JOY 16Fr	453	POGO 12Fr, 14Fr	468, 489	XENON 15Fr, 18Fr	493, 465
JASPER 18Fr	452	POGO 18Fr, 19Fr	474, 473	XENA 20Fr	463
JET 19Fr	451	QUID 8Fr	462	QUID 8Fr, 25Fr	499, 482
JAN 22Fr, 25Fr	449, 439	QUEST 11Fr	465	XENO 23Fr	511
KILT 12Fr	457	QUIT 26Fr, 25Fr	476, 477	ZED 14Fr	500
KLAN 20Fr, 22Fr	450, 449	RHONDA 9Fr	463	ALASKA 9Fr, 10Fr	505, 510
KAY 25Fr, 24Fr	447, 438	ROSE 12Fr, 17Fr	490, 487	11 Fr, 22Fr, 13Fr	504, 503, 502
LURE 10Fr, 15Fr	458, 468	ROY 5Fr, 6Fr, 20Fr	527, 526, 475	BEEBEE 14Fr	506
LION 24Fr	471	SYL 21Fr	478	FIFI 13Fr	508
LIL 24Fr, 25Fr	443, 442	SALLY 7Fr, 8Fr	525, 524	FIFI 13 Fr	507
				HAHA 15Fr	508
				INIS 10Fr	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N LONG. 133°00' W

INDEX PLAN SCALE 1"=2640'

SHEETS 1 TO 9 SCALE 1"=600'

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963

BY J.W.L. MONAGHAN D.L.S.

FOR CREST EXPLORATION LIMITED

LEGEND

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 135° W.

Survey monuments 'Pit' found or 30" long shown thus	●
Claims corners are felled trees with blazed and scribed faces	
Claim mounds are ten feet from the survey post and shown thus	▲
Iron claims identified with an iron plate and bordered thus	
Line indicating sheet limit shown thus	
Claim boundaries shown thus	
Primary control traverse shown thus	
Secondary control traverse shown thus	

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims surveyed by me, and I have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None.

MARSHALL MACKLIN MONAGHAN LIMITED

I, J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
this 7th day of NOVEMBER A.D. 1964

A Commissioner, etc.

SHEET 6 OF 9

SL 63-6E

SHEET 7

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME(S)	GRID NUMBER(S)	CLAIM NAME(S)	GRID NUMBER(S)	CLAIM NAME(S)	GRID NUMBER(S)
AIN'T 14-16	2-4	LION 18-22	72-76	UNO 20, 21	256, 257
ANN 17, 18	399, 400	LIL 23-25	77-79	UNIT 22-25	258-261
BONZO 14-16	5-7	LION 26-28	80-82	VEN 7-9	262-264
BETH 17, 18	8, 401	MARIAN 11-17	83-89	VIMY 10-17	265-272
CONY 15-18	9-12	MAID 18-21	90-93	VENUS 18, 19	273, 274
CAM 19	402	MEL 22-25	94-97	VINO 20, 21	275, 276
CALL 20-22	403-405	MINTO 26, 27	98, 99	VICE 22-25	277-280
DORINE 16-18	13-15	MAX 28	100, 101	WREN 7-10	281-284
DODO 19	16	NOVA 4, 5	102, 103	WEE 11-14	285-288
DOT 20-22	406	NEIL 15-21	104-110	WEL 22-25	289-292
DEAL 23, 25	407, 408	NED 20, 21	112-115	WASP 18	293
EGAD 17, 19	909, 397	NUT 23-25,	116-119	WISH 20, 21	294, 295
ELIZA 17, 18	17, 18	NEST 26, 27	120-121	WIN 22-24	296-298
ERL 19, 20	19, 20	NAN 28, 29	122, 123	WAC 25	299
EARL 21-25	409-413	OSCAR 4-7, 10, 11	124-129	XACTO 6	300
FAIR 13, 14	396, 395	OLE 15-17	130-135	XENO 7-10	301-304
FOOL 18	21	OPAL 19-21	136-138	XRAY 11-14	305-308
FERROUS 19, 20	22, 23	OXO 22-25	140-143	XENON 15-18	309-312
FAG 21-25	414-418	PONY 15-18	144-147	YAK 7-9	313
FAG 23-25	394, 393, 392	PLE 5-11	148-154	XENA 20, 21	314, 315
GLORY 19-21	26-28	PONY 12-17	155-160	XENO 22-25	316-319
GO 22-24	29, 417, 418	POGO 18-21	161-164	YALE 7, 8	320, 321
GEM 22-27	419-421	PAT 22-25	165-168	YAK 9-12	322-325
HAM 13, 14	391, 390	POE 26-29	169-172	YAM 13-15	326-328
HONOR 21	30	QUID 7, 8	514, 173	ZOT 9-12	329-332
HEX 23-24	31-33	QUIRT 9, 10	174, 175	ZED 13, 14	333, 334
HOG 25-27	422-424	QUEST 11-18	176-183	ZILCH 15-18	335
IOLENE 14	389	QUAD 18-21	184-187	BEEBEE 7-9	336-342
IVY 15	34	ROY 6-8	505-508	BEEBEE 9-14	343-348
IVY 16, 22	387, 34	RHONDA 9, 10	193, 194	CHACHA 9-12	349-352
INKY 23-26	35, 36, 37, 425	ROSE 11-18	195-202	CO-CO 13, 14	353, 354
JOLT 13	38	ROY 19-23	203-207	DIDO 10-13	355-358
JUPITER 14	39	RYE 24-27	208-211	DI-DI 14	359
JUSTICE 19	386	SALLY 7-9	518-521	EVEE 11-14	360-363
JOY 16, 17	385, 40	SALLY 10	212	FIFI 12-14	364-366
JASPER 18	41	SALLY 11-18	213-220	GOGO 11-14	367-370
JET 19	42	SUN 19-20	221-224	HAHA 11-14	371-374
JAN 19, 20	43	SUZY 15-18	225-228	IVY 11-13	375
JAN 23-26	44-47	SUN 21	229	IOTA 14	376-378
KILT 12-17	48-53	TANG 11-18	230-237	JAYJAY 10	379
KLAN 18-22	54-58	TERESA 19-22	238-241	JUDO 12	380
KAY 23-25	59-61	TOM 23-26	242-245	JOKE 13	381
KLAN 26-28	62-64	UNIT 10-17	246-253	JU-JU 14	382
LURE 11-17	65-71	URANUS 18, 19	254, 255	KI-KI 12	383
					384
AIN'T 14Fr, 15Fr	426, 427	MEL 23 Fr	445	SAM 2Fr, Fr	513
ANN 17 Fr	399, 400	MEL 24 Fr,	446	TANG 18 Fr, 13Fr,	497, 479
BONY 18Fr	430	NOVA 4Fr	522	TANG 19 Fr,	481
DORINE 17Fr	429	NEIL 20Fr, 13Fr,	459, 467	TERESA 21Fr,	481
FAIR 13Fr, 14Fr	455, 454	NEL 20Fr, 21Fr,	488, 469	TOM 23Fr, Fr	480
FAG 23Fr, 24Fr,	432, 433	NED 18Fr, 20Fr,	470, 472	URANUS 19Fr,	486
GLORY 20Fr	431	NUT 23Fr	446	NUT 25Fr, Fr	512
GEM 25Fr, 26Fr,	434, 435	NAN 28Fr	440	VIMY 12Fr, 14Fr,	496, 492
HEM 13Fr	456	OXO 22Fr,	444	WREN 9Fr,	494
IVY 22Fr	436	PLE 5Fr, 6Fr,	460, 461	WAC 25Fr,	484
JAY 23Fr,	437	PONY 13Fr, 14Fr,	462, 464	XENO 13Fr, 14Fr,	495, 494
JUPITER 18Fr,	452	PONY 20Fr, 14Fr,	466, 469	XENON 15Fr, 18Fr,	483, 485
JET 19Fr	451	POGO 18Fr, 19Fr,	474, 473	XENA 20Fr	483
JAN 23Fr, 25Fr	448, 439	QUO 18 Fr,	465	XENO 18Fr, 23Fr,	499, 482
KILT 16Fr, Fr	457	QUEST 11Fr,	465	XENO 23Fr,	511
KLAN 20Fr, 21Fr,	450, 449	QUIT 2Fr, 25Fr,	476, 477	ZED 14Fr,	497
KAY 23Fr, 24Fr,	447, 438	RHONDA 9Fr,	463	ALASKA 9Fr, 10Fr,	505, 510
LURE 10Fr, 15Fr,	458, 468	ROSE 13Fr, 17Fr,	490, 487	III Fr, 6Fr, 7Fr,	504, 503, 502
LION 19Fr,	471	ROY 5Fr, 6Fr, 20Fr,	527, 526, 475	BEEBEE 14Fr,	506
LIL 24Fr, 25Fr,	443, 442	RYE 25Fr, Fr,	478	BEEBEE 15Fr,	507
		SALLY 7Fr, 8Fr,	525, 524	FIFI 13Fr,	508
				HAHA 13Fr, Fr,	508
				INIS 10Fr, Fr	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N LONG 135°00' W

INDEX PLAN SCALE 1"=2640'

(SHEETS 1 TO 9 SCALE 1"=400')

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963

BY J.W.L. MONAGHAN D.L.S.

FOR CREST EXPLORATION LIMITED

LEGEND

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 135° W.

Survey monuments 'Fd' square by 3.0' long shown thus ▪
Stone posts one be-last from the survey post and shown thus ▲
Iron posts one be-last from the survey post and shown thus ●
Iron claims dealt with on this plan are bordered thus ▬▬▬
Line indicating sheet joint shown thus ——
Survey control traverse shown thus ——
Primary control traverse shown thus ——
Secondary control traverse shown thus ——

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive, all in Group 1155, iron claims surveyed by me, and I have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None.

MARSHALL MACKLIN MONAGHAN LIMITED

DOMINION LAND SURVEYORS

J.W.L. MONAGHAN, of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Limits, faithfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.
SO HELP ME GOD.

MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
this 21st day of OCTOBER, 1964
A.D. 1964

A COMMISSIONER, ETC.
THE COUNTY OF YORK, FOR MARSHALL MACKLIN MONAGHAN LIMITED

DETAIL 'A'

SHEET 1 ADJACENT

SHEET 2 ADJACENT

SHEET 3 ADJACENT

SHEET 4 ADJACENT

SHEET 5 ADJACENT

SHEET 6 ADJACENT

SHEET 8 ADJACENT

EASTERLY LIMIT OF LOCATIONS

SHEET 7 OF 9

SL-63-6E

SL-63-6E

SHEET 8

SHEET 8 OF 9
CREST EXPLORATION LIMITED
1963

CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

CLAIM NAME AND NO.	LOT NUMBER
AIMT 14-16	2-4
ANN 17,18	399, 400
BONZO 14-16	5-7
BETH 17, 18	8, 401
CONY 17-18	9-12
CAM 19	402
CALL 20-22	403-405
DORINE 16-18	13-15
DODO 19	16
DOT 20	406
DAN 21, 22	407, 408
ESAU 12,13	396, 397
ELIZA 17,18	17, 18
ERIL 19,20	19, 20
EARL 21-25	409-413
FAIR 13, 14	21, 22
FOOL 18	23
FERROUS 18,20	22, 23
FAG 21, 22	24, 25
FAG 23-25	24-26
GEM 13-15	26-28
GLORY 19-21	26-28
GO 22-24	29, 417, 418
GEM 25-27	419-421
HAM 13, 14	391, 390
HONOR 21	30
HEX 22-24	31-33
HOG 25-27	422-424
IRIS 15, 16	387, 388
IRIS 18	388
IVY 16, 22	387, 34
INKY 23-26	35, 36, 37, 425
JOLT 13	38
JUPITER 14	39
JUSTICE 15	386
JOY 16, 17	385, 40
JASPER 18 - 21	41
JOE 20	42
JONES 20	43
JAN 23-26	44-47
KILT 12-17	48-53
KLAN 18-22	54-58
KAY 23-25	59-61
KLAN 26-28	62-64
LURE 11-17	65-71
AIMT 14Fr, 15Fr	426, 427
BETH 17Fr	428
CONY 18Fr	430
DORINE 17Fr	429
FAIR 13Fr, 14Fr	455, 454
FAG 23 Fr, 24Fr	432, 433
GLORY 20Fr	431
GEM 25Fr, 26Fr	434, 435
HEM 13 Fr	456
INKY 23Fr	436
INKY 25Fr	437
JASPER 18Fr	452
JET 19Fr	451
JAN 23Fr, 25Fr	448, 439
KILT 12Fr	450
KLAN 20Fr, 21Fr	450, 449
KAY 23Fr, 24Fr	447, 438
LURE 13Fr, 15Fr	455, 468
LION 13Fr	72
LIL 24Fr, 25Fr	443, 442

CLAIM NAME AND NO.	LOT NUMBER
LION 18-22	72-76
LIL 23-25	77-79
LION 23-28	80-85
MARIAN 9-17	83-89
MAID 18-21	90-93
MEL 22-25	94-97
MINTO 26, 27	98, 99
MAX 28, 29	100, 101
NOVA 4,5	102, 103
NEIL 10-17	104-111
NED 18-21	111-115
NUT 18-21	116-119
NEST 24-27	120-123
NAN 28, 29	122, 123
OBOE 4-7, 10, 11	124-129
OLE 12-17	130-135
OPAL 18-21	136-139
OXO 22-25	140-143
ORB 26-29	144-147
OVID 5-11	148-154
POKY 13-17	155-160
POGO 18-21	161-164
PAT 22-25	165-168
POE 26-29	169-172
QUID 7,8	514, 173
QUIRT 9,10	174, 175
QUEST 11-18	176-183
QUAD 19-23	184-188
QUIT 24-27	189-192
ROY 13-17	193-198
RHONDA 9,10	515, 516
ROSE 11-18	199-202
ROY 19-23	203-207
RYE 24-27	208-211
SALLY 7-9	519-521
SAP	212
SUZY 11-18	213-220
SAM 19-25	221-224
SUN 23-26	225-228
TARN 13	229
TANG 11-18	230-237
TERESA 19-22	238-241
TOM 23-26	242-245
UNIT 10-17	246-253
URANUS 18,19	254, 255
MEL 23 Fr	445
MAX 27 Fr	441
MONA 6Fr	522
NEIL 10Fr, 13Fr	459, 467
NEIL 15Fr, 16Fr	468, 469
NED 18Fr, 20Fr	470, 472
NUT 22Fr	446
NAN 28Fr	440
OXO 22Fr	444
PILE 5Fr, 6Fr	460, 461
PILE 7Fr, 8Fr	523, 464
POKY 15Fr, 16Fr	465, 466
POGO 18Fr, 19Fr	470, 473
QUID 8Fr	462
QUEST 15Fr	463
QUIT 24Fr, 25Fr	476, 477
RHONDA 9Fr	463
ROSE 13Fr, 17Fr	490, 487
ROY 19Fr, 20Fr	525, 475
RYE 26Fr	478
SALLY 7Fr, 8Fr	523, 524
UNO 20, 21	256, 257
UNIT 22-25	258-261
VENI 7-9	262-264
VIDI 10-17	265-272
VENUS 18, 19	273, 274
VINO 20, 21	275, 276
VICE 22-25	277-280
WREN 7-10	281-284
WEE 11-14	285-288
WIT 15-18	289-292
WASP 19	293
WISH 20, 21	294-295
WIN 22-25	296-298
WAC 25	299
XACTO 6	500
XENO 7-10	300-304
XRAY 11-14	305-308
XENON 15-18	309-312
XRAY 19	313
XENA 20, 21	314-315
XENO 22-25	316-320
YAK 7-10	321, 321
YAK 11-12	322-325
YAM 13-15	326-328
ZOT 9-12	329-332
ZED 13, 14	333, 334
ZILCH 15	330
AL-ASKA 9-15	336-342
BEEBEE 9-14	343-348
CHACHA 9-12	349-352
DIDI 10-13	353-356
DODO 10-13	357-358
DI-DI 14	359
EVEE 11-14	360-363
FIFI 12-14	364-366
GOGO 11-14	367-370
HAHA 11-14	371-374
INIS 10	375
IT 11-13	376-378
JAM 11	379
JAY-JAY 10	380
JUDO 12	381
JOKE 13	382
JU-JU 14	383
KI-KI 12	384
SAM 25Fr	513
TANG 11Fr, 13Fr	497, 479
TAR 13Fr	481
TERESA 21Fr	481
TOM 23Fr	480
URANUS 19Fr	486
UNIT 25Fr	512
VIMY 12Fr, 14Fr	496, 492
WREN 9Fr	498
WASP 19Fr	484
XRAY 12Fr, 14Fr	495, 494
XENON 13Fr, 15Fr	491, 489
XENA 20Fr	483
XENO 9Fr, 21Fr	499, 482
XENO 23Fr	511
ZED 14Fr	500
ALASKA 9Fr, 10Fr	505, 510
III Fr, IIIFr, 13Fr	504, 503, 502
BEEBEE 14Fr	501
DIDI 10Fr	506
GOGO 11Fr	507
HAHA 15 Fr	508
INIS 10Fr	509

LOTS INCLUDED IN THIS SURVEY ARE NUMBERED CONSECUTIVELY FROM LOT 2 TO LOT 527 BOTH INCLUSIVE

ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°15' N. LONG 135°00' W

INDEX PLAN SCALE 1"=2640'

1"=1575 1 1/3 SCALE 1"=1000

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963

BY J.W.L. MONAGHAN D.L.S.

FOR CREST EXPLORATION LIMITED

— LEGEND —

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 135° W.

Survey monuments "X" square by 3/2" long shown thus	●
Corner posts not flush with the ground surface shown thus	◆
Earth mounds are set less than the survey post and shown thus	▲
Iron stakes (each set on this plan are bordered thus	■
Claim boundaries shown thus	———
Control traverse stations shown thus	○
Primary control traverse shown thus	———
Secondary control traverse shown thus	———

I hereby certify that I have carefully examined the ground included in Lots 2 to 527 both inclusive all in Group 1155, and claims surveyed by me, and have otherwise made all reasonable investigations in my power to ascertain if there are any other claims conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None.

MARSHALL MACKLIN MONAGHAN LIMITED

J.W.L. MONAGHAN

J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, on my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, truthfully and correctly executed the survey shown by this plan and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

Sworn before me at TORONTO
in the Province of ONTARIO
this 15th day of NOVEMBER A.D. 1963

A Commissioner for taking Affidavits in and for the Province of Ontario

MARSHALL MACKLIN MONAGHAN LIMITED

SHEET 8 OF 9

SURVEYED 15-6-63

SURVEYED 15-6-63

SHEET 7 ADJACENT

SHEET 7 ADJACENT

SHEET 3 ADJACENT

SHEET 4 ADJACENT

SHEET 5 ADJACENT

SHEET 6 ADJACENT

SOUTHERLY LIMIT OF LOCATIONS

EASTERLY LIMIT OF LOCATIONS

DETAIL A

DETAIL B

See Detail B

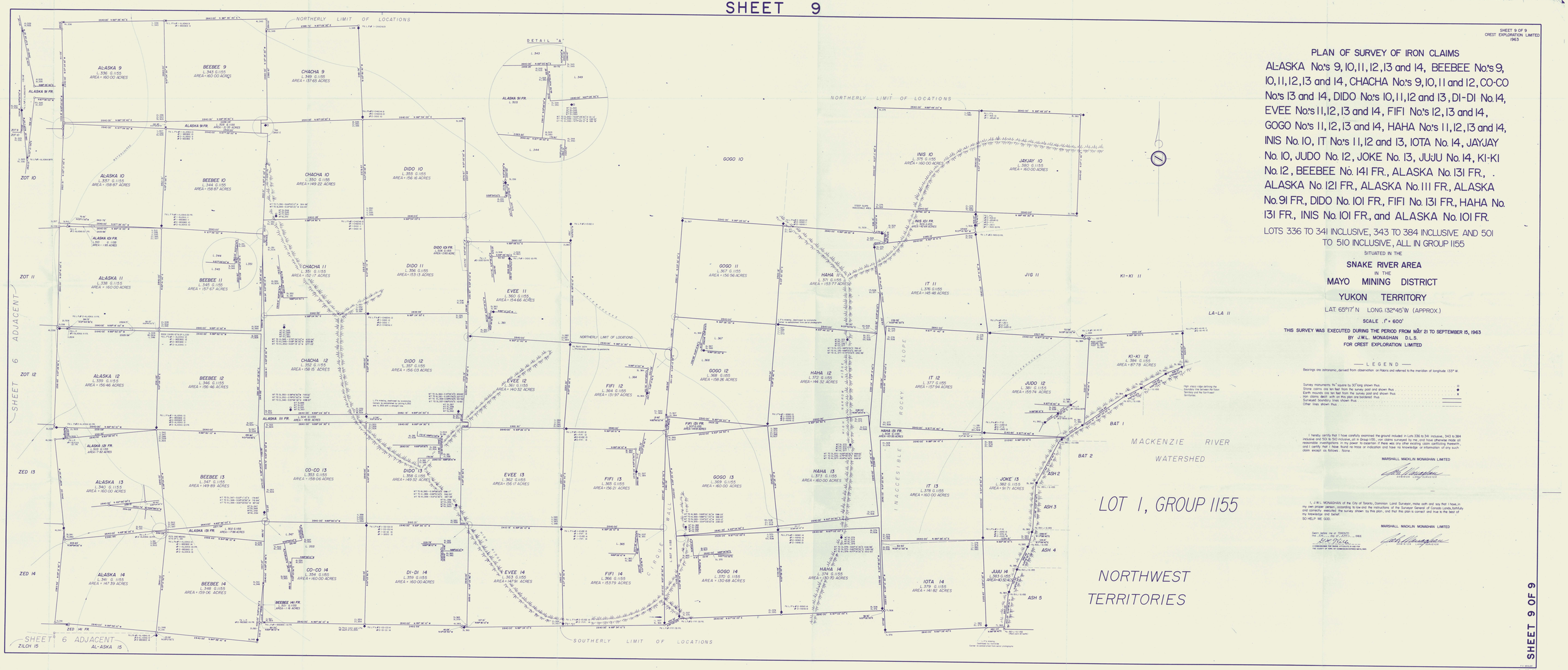
See Detail A

CIRQUE WALL

CIRQUE WALL

CIRQUE WALL

SHEET 9



SHEET 9 OF 9
CREST EXPLORATION LIMITED
1963

PLAN OF SURVEY OF IRON CLAIMS

AL-ASKA No:s 9, 10, 11, 12, 13 and 14, BEEBEE No:s 9, 10, 11, 12, 13 and 14, CHACHA No:s 9, 10, 11 and 12, CO-CO No:s 13 and 14, DIDO No:s 10, 11, 12 and 13, DI-DI No.14, EVEE No:s 11, 12, 13 and 14, FIFI No:s 12, 13 and 14, GOGO No:s 11, 12, 13 and 14, HAHA No:s 11, 12, 13 and 14, INIS No. 10, IT No:s 11, 12 and 13, IOTA No. 14, JAYJAY No. 10, JUDO No. 12, JOKE No. 13, JUJU No. 14, KI-KI No. 12, BEEBEE No. 141 FR., ALASKA No. 131 FR., ALASKA No. 121 FR., ALASKA No. 111 FR., ALASKA No. 91 FR., DIDO No. 101 FR., FIFI No. 131 FR., HAHA No. 131 FR., INIS No. 101 FR., and ALASKA No. 101 FR.

LOTS 336 TO 341 INCLUSIVE, 343 TO 384 INCLUSIVE AND 501 TO 510 INCLUSIVE, ALL IN GROUP 1155

SITUATED IN THE

SNAKE RIVER AREA

IN THE

MAYO MINING DISTRICT

YUKON TERRITORY

LAT. 65°17' N LONG. 132°45' W (APPROX.)

SCALE 1" = 600'

THIS SURVEY WAS EXECUTED DURING THE PERIOD FROM MAY 21 TO SEPTEMBER 15, 1963
BY J.W.L. MONAGHAN D.L.S.
FOR CREST EXPLORATION LIMITED

— LEGEND —

Bearings are astronomic, derived from observation on Polaris and referred to the meridian of longitude 133° W.

Survey monuments 9/16" square by 30" long shown thus □
Stone cairns and ten foot trees at the survey post and shown thus ◆
Earth mounds and ten feet from the survey post and shown thus ○
Iron claims (each with an iris plate) are bordered thus ———
Surveyed boundary lines shown thus ———
Other lines shown thus ———

High sharp ridge defining the boundary line between the Yukon Territory and the Northwest Territories

I hereby certify that I have carefully examined the ground included in Lots 336 to 341 inclusive, 343 to 384 inclusive and 501 to 510 inclusive, all in Group 1155, iron claims surveyed by me, and have otherwise made all reasonable investigations in my power to ascertain if there was any other existing claim conflicting therewith, and I certify that I have found no trace or indication and have no knowledge or information of any such claim except as follows: None

MARSHALL MACKLIN MONAGHAN LIMITED

DOMINION LAND SURVEYOR

I, J.W.L. MONAGHAN of the City of Toronto, Dominion Land Surveyor, make oath and say that I have, in my own proper person, according to law and the instructions of the Surveyor General of Canada Lands, faithfully and correctly executed the survey shown by this plan, and that this plan is correct and true to the best of my knowledge and belief.

SO HELP ME GOD.

MARSHALL MACKLIN MONAGHAN LIMITED

Sworn before me at TORONTO
this 28th day of APRIL 1964

A COMMISSIONER FOR TAKING AFFIDAVITS FOR THE COUNTY OF YORK, MY COMMISSION EXPIRES APRIL 1965

SHEET 9 OF 9

SL-63-85

CREST EXPLORATION LIMITED
SNAKE RIVER AREA

Rock-Log charts of Surface Sections and diamond cores
To accompany summary report of operations on Yukon iron and mica claims for 1963-64 claim year.

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No EF. 101-63
DESCRIBED BY C. RIDDELL
MEASURED BY W. GIBBONS
AIR PHOTO No A 12086-184
AREA 3 miles up from mouth of west side of Iron Creek
WEATHER . COLD, OCCASIONAL SHOWERS

DATE STARTED JUNE 6/63
DATE COMPLETED JUNE 6/63
MEASURING RATE 120' / 6 HRS.
COORDINATES 75,500 E 80,300 N
CLAIM GLORY 21
MEASURED DOWN

ROCK TYPES

OVOIDS : O O
UNALIGNED LENSES :
ALIGNED LENSES :
BANDS :

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

LIMESTONE
SHALE
ARGILLITE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS :
BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125° 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF #

DATE JUNE 6 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT OVOIDS	UNALIGNED LENSES AMT. OVOIDS COMP.	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT. OVOIDS COMP.	ALIGNED LENSES THICK RANGE	BANDS AMT. THICK WT.	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA EN TUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0												OVERLYING DRIFT: BROWN FRAGMENTS ANGULAR, MAINLY RED CONGLOMERATE FRAGMENTS, SOME BROWN FRAGMENTS ANGULAR, MAINLY RED CONGLOMERATE WITH MINOR IRON FORMATION, SOME RED AND SOME GREEN SHALE FRAGMENTS, MINOR LIMESTONE FRAGMENTS, MATRIX MAINLY SHALE-MONZONITE ORG. SANDY, POORLY WELDED			10		2301			
10															4.5		2302			
															1		2303			
															4.5		2304			
20															10		2305			
30															4		2306			
40															10		2307			
50															10		2308			
60															9		2309			
70															10		2310			
80															10		2311			
90															2		2312			
															2		2313			
100															10		2314			
110															6		2315			
120															7		2316			
130																				

OVERLYING DRIFT: BROWN FRAGMENTS ANGULAR, MAINLY RED CONGLOMERATE FRAGMENTS, SOME BROWN FRAGMENTS ANGULAR, MAINLY RED CONGLOMERATE WITH MINOR IRON FORMATION, SOME RED AND SOME GREEN SHALE FRAGMENTS, MINOR LIMESTONE FRAGMENTS, MATRIX MAINLY SHALE-MONZONITE ORG. SANDY, POORLY WELDED

½-1½ R

½-2" R

¼-½ R

2-2½ R

½-3" R OF 10% IRREGULAR RED JASPER PATTERN, SOME LENGTHS OUT, NO LENSES PROBABLY ORIGINAL SIDERITE & CALCITE OVOIDS WITH HEMATITE CORST.

½-2" R MANY LENGTHS OUT OVOIDS SIDERITE & CALCITE

½-1" R SOME THINLY BEDDED IRON FORMATION 10% OF INTERVAL SOME IRREGULAR LENSES SHALE - FRAGMENT LENS

½-1" R

½-1" R

½-1" R

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No I - 10 - 63
DESCRIBED BY C. H. Riddell
MEASURED BY Gibbins & Folingbee
AIR PHOTO No A 12148 (FL 11²) - 183
AREA Iron Creek - 4 miles upstream from camp
WEATHER 4/10 cloudy, light winds, cool

DATE STARTED June 7 1963
DATE COMPLETED June 7 1963
MEASURING RATE 70' / 3 hrs.
COORDINATES 98,200E 98,100 N
CLAIM Pony 17

ROCK TYPES

OVOIDS:
UNALIGNED LENSES:
ALIGNED LENSES:
BANDS:

% HEMATITE

SILICEOUS WASTE TYPES

VEINLETS

BOUNDARIES R - REGULAR i.e. Even boundary between Jasper and Hematite
I - IRREGULAR i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125° / 25°W
FAULT STRIKE / DIP eg 125° / 25°S
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict Texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 2

DATE June 7 1963

ENGINEER DATA				CRUDE ANALYSIS			
LEN RUN	No RUNS	FT REC	% REC	SAM No	%	SiO_2	P
		3.6		2003			
		1		2004			
		10		2005			
		4		2006			
		10		2007			
		15		2008			
		5		2009			
		2		2010			
		5		2011			
		1.5		2012			
		1		2013			
		13		2014			
4.445		8		2015			

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 103-63
DESCRIBED BY Gibbins
MEASURED BY Folinsbee
AIR PHOTO No A 12148 (Fl 112 - 183)
AREA Iron Creek - North Side - 3 mi E of camp
WEATHER 6/10 Cloud, light winds, cool

DATE STARTED June 7
DATE COMPLETED June 7
MEASURING RATE 4 hrs / 160'
COORDINATES 93,900 E 103,300 N
CLAIM Ole 15

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 3

DATE June 7, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	BANDS: AMT and COMP	BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
0												DK brown shale - finely cleavage 1/8"-1/4"								
												Lens sedimentary - DK brown grain of metallic hematite & red jasper - trace of Ca matrix								
10												Conglomeratic weathered surface - light brown fresh surface - dark maroon - angular - poorly sorted - well rounded (up to 2" dia) fragments (¼" to 2" diameter) - trace of — fragments - jasper matrix & carbonate (less than 5%)								
												Attitude 190°/15°S								
0												2 x 2" boulder of soft dark green shale			10'		2001			
10												A few blotches of jasper (< 2%)			13'		2002			
20												Dark greenish brown, calcareous, medium grained sandstone greenish white sub angular grains in a like maroon matrix			8'		2003			
															10'		2004			
												Some of the aligned lenses are carbonatic Bands are uniform in thickness & boundaries								
												Conglomeratic - as above with carbonate matrix from top 4" - fragments (¼" to ½") & rounded boulders								
												Conglomeratic - as above - very light brown to light maroon & slightly calcareous matrix. Fragments up to 2" - 25% of carbonate, dolomite & green sandstone etc								
												0.5' flat 20.5' of weak iron formation carbonate rocks & gritic pebbles								
												Attitude 110°/5 - 10° N.W. measured down								

GEO-23-2-CM (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 104-63
DESCRIBED BY C. Riddell
MEASURED BY A. Folinsbee
AIR PHOTO No A 12148-183 (FI 112)
AREA Yukon Mountain North of Camp
WEATHER 4/10 cloud, light breezes, cool

DATE STARTED June 8 1963
DATE COMPLETED June 9 1963
HAMMERING RATE 336'/6 hrs.
COORDINATES B3,1005 106,400 N
CLAIM Kilt 4

ROCK TYPES

OVOIDS: ○ ○
UNALIGNED LENSES:
ALIGNED LENSES:
BANDS:

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 8 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO2	CRUDE ANALYSIS P
0												Covered interval of about 30' overlying iron formation which is known to be overlain by shales, conglomerate & black which section measured seems to be slumped slightly.								
												Top of measured section								
												? at 20°/5° SE ? slumped								
												Interbedded 25% of interval covered 50% hematite 25% of interval contains 50% hematite			10					
10					Trace			⅛-½		⅛-2"		Sandstone near base of interval fractured veins & band ferruginous			6					
															5					
20												Some carbonate with nuds & small bands. Some hematite cores to jasper ovoids			10					
30										⅛-3"					10					
40															5					
50												One 4" band fine conglomerate near top. Some dolomite cores to ovoids			10					
												Poor shaly hematite			6					
60												Highly ferruginous massive shale. Poor shaly jasper and iron formation			4					
												Poor carbonate with some red jasper waste			11					
70												Chert interbed iron shale			10					
															5					
80															2					
												Highly ferruginous irregular broken surface shale & conglomerate & very siliceous			2					
												One irregular bleb of jasper hematite in pair of angular inserts & small scaling of red jasper waste			4					
90															10					
												Some quartz with jasper			3					
												Red jasper halos along random jasper bands			6					
												Weathered surface dark brown sediment (shaly iron) making fragments insecure			4					
100												One 6" shaly iron band & one 2" conglomerate band near top. Many ovoids have hematite core. Some relicts of oval beaded matrix. Some jasper waste & little specular hematite. One limestone fragment seen in rock formation			8.5					
										⅛-½"		Irregular jasper patches in conglomerate bands ½" thick			8.5					
										⅛-1"					8					
110												Fine grained near siderite cemented with green Fe-chlorite ferruginous matrix			2					
												Shale fragments as above and jasperoid (50-50%) jasper I			6.5					
120																				
130												Shale with rock fragments up to 10" (?) Very ferruginous shale, surface soil, forms slope			10					
140												Shale fragments up to 2" across. Forms gentle slope. Some carbonate veins. Some jasper formed as "chert"			10					
150												Minor hematite - Red band based along strike			15					
												W.S. - brown 20-30% fragments angular light buff on weathered surface. Fragments subangular-rounded 0.2"			10					
					Trace				Trace			Calcite in some ovoids								
160					Trace					⅛-1"		Some (single) bands 6" thick up to 80% hematite with red jasper & calcite ovoids. Some shaly bedded maroon hematite intervals. Massive cliff former.			13					
170																				
180																				
190																				
200												Weathered surface Jasper. Subangular fragments up to 1" but mainly 2-6 mm in size. About 25-40% fragments			5					
210												60-70% of jasper is in irregular patterns - red			10					
					Trace				Trace	⅛-2"		Ca in some ovoids								
220															4					
					⅛-½				⅛-¼R	½-2" R		Ca in ovoids with jasper in much of the waste								
230																				
240												Shale: badly weathered - ferruginous - not SAMPLED			2					
												Much calcite mixed with jasper waste.			12					
250																				
260																				
270																				
280																				
290																				
300																				
310																				
320																				
330																				
340																				
350																				
360																				
370																				
380																				
390																				
400																				
410																				
420																				
430																				

Conglomerate w.s. dark brown to maroon
f.s. dark brown
Fragments subangular to rounded
Pebbles are carbonate, quartzite and shale
Poorly bedded
Fragments occupy 20-30% but mainly 25-30%
Shale matrix

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 105 / 63
DESCRIBED BY Riddell
MEASURED BY Rinn
AIR PHOTO No. A 12056 - 356 (Fl. 93)
AREA West side South Iron CREEK 2.5 M. up from mouth
WEATHER Overcast + Windy

DATE STARTED June 8 / 63
DATE COMPLETED June 8 / 63
MEASURING RATE 111.5 / 3.5 hrs
COORDINATES 71,500 E., 91,000 N
CLAIM F - 19

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125° / 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 8/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0												Overlying beds Siltstone, marine & grey. Indurated. Very argillaceous, poorly bedded. Some fragments to 1". Top of measured section								
												Sample 4'-6'								
												25% irregular pattern of red jasper	73		1.5		2317			
															1.5'		2318			
10													115'							
			Trace									Much Ca replacement of jasper			10'		2319			
20													215'							
												Sample 28'-31.5'			10'		2320			
30												Much Ca in jasper	315'							
															10'		2321			
40												Much Ca in jasper	415'							
															10'		2324			
50												Sample 51.5'-55.5'	515'							
												Interbedding & interlensing of conglomeratic iron formation. Good iron formation (Lab test 70 % hematite jasper replacement formation & conglomerate - about 30% of interval is good iron formation ratios CLO - 70 %) Hematite in leases up to 6' thick.			95'		2323			
60													615'	W						
												Interbedding & interlensing of conglomerate & jasperoid iron formation. Iron formation mainly less than 30% hematite, but occasionally higher.			10'		2324			
70													715'							
															10'		2325			
80													815'							
												Conglomerate very few fragments to shale in places. Sandy in places. Mainly green shale fragments. Some limestone fragments			10'		2326			
90													915'							
															4'		2327			
			Trace									Ca with some of jasper waste. Hematite cores in many ovoids	955'		5'		2328			
100															11.5'		2329			
												Slickensides								
110													1115'							
												Overlying beds: Conglomerate rounded fragments of chert, quartzite, limestone & subangular shale fragments. Sandy, argillaceous shale matrix. Bedding indistinct. W.S. DK. maroon brown to sandy. Sandy argillaceous shale matrix. Bedding indistinct W.S. DK. maroon brown								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No I.F. 106-63
DESCRIBED BY Gibbins
MEASURED BY Polinsbee
AIR PHOTO No. A12148 - 183 (11")
AREA Iron Creek
WEATHER Overcast - Warm (Winds 10-22) → Warm & Sunny 4/10 (Calm)

DATE STARTED June 10
DATE COMPLETED June 10
MEASURING RATE 80' / 3½ hrs.
COORDINATES 98500 E ; 100,700 N.
CLAIM Penn 16

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125° / 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES -

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 2
DATE June 10, 1963.

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	BANDS: AMT and COMP	BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
0												Sandy dark brown shale - slightly calcareous - bedding plane parallel - ¼" - ½" thick.								
												Attitude 90°/10° S								
												Thin laminated green & brown siltstone.			4.3'		2017			
												5% red jasper blotches & few thin bands of brown shale			1'		2018			
10															13'		2019			
20												A few very thin (<1") bands of sandy shale & red jasper & get bleached.			7.5'		2020			
												Maroon bands regular boundaries, red bands are irregular streaks. Some bands have maroon cores.			4'		2021			
30												Dark brown shale - contains 2.5" band of Iron formation.			1'		2022			
												4-6" of conglomerate (38.0 - 38.5') Att 58/6 S.E. 15-20% of rock well			2'		2023			
40												Conglomerate - with dark brown shale matrix fragments - pebble size ¼" - ½" diameter.			1.5'		2024			
												Ovoids up to ¾" diameter - maroon jasper w metallic hematite core. Red jasper bands are irregular.			10'		2025			
50												Fairly low grade iron 2.5" bands of shale & conglomerate sand-stone as well as jasper bands ca. crystals in maroon jasper bands.			7'		2026			
												Hard laminated brown shale 3-6" bands of Iron formation partly covered.			6'		2027			
												Very high grade iron formation (Pit covered)			3'		2028			
												Ovoids [¼-½"] are very common. Many have maroon centers.			5.5'		2029			
70															0.5'		2030			
												Irregular bands & maroon lenses.			5'		2031			
															2.5'		2032			
												Att 90/10°S.			1'		2033			
80												Shale (ss.) light brown Fe: maroon to very dark grey.								
90																				

GEO - 25 - 2 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 107-63 -
DESCRIBED BY GIBBINS
MEASURED BY FOURNIER
AIR PHOTO No. A 12065 (10)2 - 284
AREA Iron Creek, 4 mi up stream from mouth, east side
WEATHER Rainy

DATE STARTED June 10/63
DATE COMPLETED June 10/63
MEASURING RATE 250 /6 Hrs
COORDINATES 83,600 E . 85,800 N
CLAIM Klan 20

ROCK TYPES

IRON FORMATION & JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 10/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0												DARK MAROON - BROWN CONGLOMERATE - MATRIX SOMEWHAT SIMILAR TO IRON FORMATION - CONTAINS ROUNDED BOULDERS (UP TO 18" DIAMETER) OF A LIGHT GREEN CALCAREOUS ROCK (SANDSTONE) MAKE UP ABOUT 5% OF THE ROCK. MATRIX IS A SANDY CALCAREOUS SHALE								
5													6.5				2461			
7.5													1				2462			
10													10				2463			
20													11.5				2464			
29													5.5				2465			
34.5													3.5				2466			
38													1.5				2467			
40													1.5				2468			
50																				
60													10				2469			
67													12				2470			
79													10				2471			
89													5				2472			
94													3				2473			
97													10				2474			
107													12				2475			
119													10				2476			
129													11.5				2477			
140.5													9.5				2478			
150													13				2479			
163													10				2480			
173													10				2481			
183													9.5				2482			
192.5													6				2483			
198.5													7				2484			
205.5													14				2485			
219.5													9				2486			
228.5													8				2487			
236.5													1				2488			
237.5													2				2489			
239.5													2				2490			
241.5													1.5				2491			
243													1				2492			
244													8				2493			
252																				

DARK MAROON - BROWN CONGLOMERATE - MATRIX SOMEWHAT SIMILAR TO IRON FORMATION - CONTAINS ROUNDED BOULDERS (UP TO 18" DIAMETER) OF A LIGHT GREEN CALCAREOUS ROCK (SANDSTONE) MAKE UP ABOUT 5% OF THE ROCK. MATRIX IS A SANDY CALCAREOUS SHALE

MINOR SLICKENSIDING

FINE CONGLOMERATE (1-3/16") DIAMETER SUBANGULAR CLASTS OF LIGHT TO DARK GREEN FINE SANDSTONE IN A MAROON JASPER MATRIX - CLASTS OF SANDSTONE WAS LIGHT GREEN FS DARK GREEN

Y = 160°/25°E 5-10% QUARTZ JASPER BLOTCHES

CONGLOMERATE MAROON JASPER MATRIX SUBROUNDED TO SUBANGULAR PEBBLES OF DARK AND LIGHT GREEN SILICEOUS IRON FORMATION UP TO 1" DIAMETER (AVG 3/8") 30% OF ROCK - 40-50% RED JASPER - 40-50% MAROON HEMATITE

DARK GREEN VERY FINE TO MEDIUM GRAINED SANDSTONE WITH LIGHT BROWN FS SUBROUNDED GREEN SILICEOUS IRON FORMATION CLASTS IN A MAROON JASPER MATRIX

MAROON JASPER MATRIX BRECCIA CONTAINING SUBANGULAR TO SUBROUNDED PEBBLES (1/16" - 1/4") OF DARK AND LIGHT GREEN SILICEOUS IRON FORMATION - 30% OF ROCK - 70% MAROON JASPER

DARK BROWN TO BLACK FS SANDSTONE WITH LIGHT BROWN FS SUBROUNDED GREEN SILICEOUS IRON FORMATION PEBBLES (1-2½") 10% OF ROCK - MATRIX IS A MAROON JASPER

INCLUDES 4" BAND OF CONGLOMERATE AT 49.0 MAROON JASPER IN LIEU OF SOME OVOIDS.

PATCHY PINK - RED PEBBLE KNOBS ARE COMMONLY GROUPED IN BANDS 1-3" WIDE & TEND TO HAVE IRREGULAR BOUNDARIES

SANDSTONE WAS LIGHT BROWN FS DARK MAROON BROWN (DARK GREEN . VERY FINE TO VERY COARSE GRAINED

101.5 - 107.5 ZONE OF ABUNDANT SIDERITE LENSES (1/16 - 1/8 - 1/4")

WEATHERED TO LIMONITE & PRODUCED A PITTED SURFACE ATT. 1HE/3HF IHE

CRYSTALLINE SPECULAR HEMATITE AT 89.0 - 89.5

FINE CONGLOMERATE - MATRIX WAS LIGHT GREEN BROWN FS DARK GREEN (GRADING TO FINE SUBANGULAR GREEN SILICEOUS IRON FORMATION CLASTS WITH MINOR INCLUSIONS OF MAROON JASPER AND SPECULAR HEMATITE

HEMATITE RICH CONGLOMERATE ABOUT 10" THICK AT 180' UNALIGNED LENSES OBSERVED IN BANDS 10" THICK SOME CRANNULE FORMAT ATT. 10° / 60° E

ORES OF CONGLOMERATE & HEMATITE MIXED BANDS OF WILDE CONGLOMERATE MATRIX BROWN FS DARK GREEN SUBANGULAR CLASTS ARE CONTORTED TO FROM LARGE LENSES

CONGLOMERATIC WITH JASPER BANDS ALIGNED THROUGH (INCLUDING BANDS AND SILICEOUS LENSES) MOST OF THE JASPER BANDS HAVE MINOR JASPER BRECCIA IN THE CONGLOMERATE (2mm-1") SOME BANDS HEMATITE (10%) JASPER 50-70 MAROON RED BANDS 1/2" - SOLID FOLIE 170°/75°E

THE JASPER BANDS ARE BROKEN IN SMALL PIECES ABOUT 12" LONG BY 1/2" - 1" WIDE & TWISTED - NOT BROKEN UP INTO SMALL PIECES OF BRECCIA LENSES" OF VIZ DISCONTINUOUS BAND OF CONGLOMERATE IS SUBANGULAR LOCAL FRAGMENTS COMPOSE 5% OF ROCK MINOR HEMATITE, CARBONATE

MINOR LENTICULAR PATCHES OF UNDER (1/2" DEEP) INCH OF ORE

20% OF JASPER IS IN IRREGULAR PATCHES WITH IRREGULAR CONTACTS

FINE CONGLOMERATE TENDING TO TRANSITION PEBBLE SIZE MINOR HEMATITE CONTENT INCREASES TOWARDS BOTTOM OF BROWN GRADING

BANDS BROKEN & TWISTED

FINE BANDED PATTERN IN DARK GREEN

CONGLOMERATIC HEMATITE CONTAINS PLATES OF JASPER 1-2"

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No I.F. 108-63
DESCRIBED BY Gibbins
MEASURED BY Folinsbee
AIR PHOTO No A12056 - FL 9(4) - 351
AREA W. side S. Iron Creek
WEATHER Sunny with a few clouds

DATE STARTED June 14
DATE COMPLETED June 14
MEASURING RATE 176 ft. - 5 hr.
COORDINATES 69, 200 E; 95, 900 N
CLAIM Fool 18.

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 14, 63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
170															8.3'		2231			
160															9'		2230			
150												Shale fine siltstone N.S. Brown, Rusty			1'		2219			
												Unaligned lenses Maroon jasper inside with red jasper halo outside			2.5		2218			
												Fine conglomerate with 5% siltstone at bottom particles predominately shale with a few quartz & chert pebbles subangular to rounded (~20)			2.8		2217			
															1.3'		2216			
140															7.6'		2215			
130															10'		2214			
120															9.5'		2213			
110												50% of waste is due to quartz & red jasper patches & have irregular boundaries			10'		2212			
100												Red jasper becomes more common than maroon.			10'		2211			
90												Thin 3.0" bed of brown siltstone at [illegible]			10'		2210			
80												Waste occurs as wide bands of red jasper			6.5'		2209			
70												Dark brown highly hematitic conglomerate - pea-gravel & red jasper pebbles up to 1.0" in the matrix consist of very rounded quartzite pebbles up to 2" diameter, make up less than 5% of the rocks			10'		2208			
60												streaks			2.0		2207			
50												Maroon hematite iron formation with red jasper waste			14'		2206			
40												Dark maroon brown sandy to conglomeritic shale fragments 5% quartz & chert pebbles & small rounded some red jasper boulders near 248 base - high hematite content			10'		2205			
30															10'		2204			
20												Iron formation grades into conglomerate			10'		2203			
10												Shaly	Iron formation which is predominately maroon hematite & red jasper lenses & stringers of shaly bands & lenses (massive)		1'		2202			
0												Some of the maroon bands have red jasper halos			6.5'		2201			
-10												Dark maroon conglomerate - rounded pebbles up to 2" across								
-20																				

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 109-63
DESCRIBED BY C. H. Riddell
MEASURED BY K. Culver
AIR PHOTO No. A 12148 - 183
AREA Iron Ck. - north side - 3 mi up from camp.
WEATHER Windy & cold

DATE STARTED June 18/63
DATE COMPLETED June 21st/63
MEASURING RATE 320'/6 hrs., 160'/3 hrs
COORDINATES 90,900 E 105,300 N
CLAIM Neil 14

ROCK TYPES

OVOIDS : o o o
UNALIGNED LENSES : ⬭
ALIGNED LENSES : ⬭⬭
BANDS : ═══

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES : R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS : BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE : Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 15/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	% OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	BANDS: AMT and COMP	BANDS: THICK RANGE	% VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	Fe	SiO_2	P
0												Overlying beds Fe formation (unaligned maroon & green Sandstone & siltstone (argillaceous) Some conglomerate bands.	0							
												Jasper mixed in hematite Extremely jasperoid poor maroon hematite	4.5		6.5'		2181			
10												Sandstone, ferruginous, fine to coarse. Some fragments to 1" Poorly bedded.	19.5		8.0'		2182			
												Ferruginous shale - laminated, partly recessive.	27							
20												Poor jasperoid iron formation approaching ferruginous shale. Weathers blotchy.	34.5		7.5'		2183			
30												Sandstone, W.S. - dk. brownish gray F.S. maroon brown. Beds 1/16 to coarse grained. Mainly medium grained, ferruginous Subangular.	44.5		10.5'		2184			
												Very fine shaly-jasperoid hematite.	53.5		5.0'		2185			
40												Conglomerate, large with sandy matrix. Probably lenses along strike. Shale - maroon - brownish - poorly bedded. Ferruginous but not as much	58.5		4.0'		2186			
50												W.S. - maroon brown F.S. - maroon & green. Fine grained calcareous Laminated in part - ferruginous but not to much.	68.5		10.0'		2187			
												Mostly small lenses but some large lenses of jasper. Conglomerate near base some calcite from formation cracks veined & lensed. 3 pictures taken 2 with flash, one at Fe. one at 52.								
60												Grades from conglomeratic iron formation near top to conglomerate at base of interval mainly shale & limestone fragments up to 6" in ferruginous (iron formation matrix in places) shale matrix. Lenses along strike.	78.5		6.0'		2188			
70												CONGLOMERATE W.S. MAROON & GREEN F.S. VARIES FROM GREEN TO MAROON (YELLOW FRAGMENTS) SHALY & SANDY MATRIX, FERRUGENOUS - SOME THIN BEDS SHALY I.F. NEAR BASE.	84.5		6.0		2189			
												OVER 6' APPARENT OUTCROP IN CENTER OF COVERED INTERVAL IS CONGLOMERATE - BROWN ROUNDED FRAGMENTS TO 6".								
80			R	1/16-1/8	Trace			1/4-3/4	R			SOME CALCITE VEINS WITH JASPER.	97.5		13.0		2190			
90												SANDSTONE, FINE GRAINED, LAMINATED MAROON & BROWNISH GREEN. FLAGGY BEDDED. CROSS-BEDDED. FERRUGENOUS.	103.5		6.0		2191			
100		Trace		1/8-1/2 1/2-6		Trace						Ca IN LENSES OF JASPER.	113.5		10.0'		2192			
												Ca COMMON WITH JASPER.	123.5		10.0		2193			
110												QUARTZITE BOULDER 8" DIAMETER SUBANGULAR, IN MIDDLE OF I.F. SOME CALCITE. PICTURE.	133.5		10.0		2194			
120		Trace		1/8-1/2 1/2-1"		1/8-1/2		1/8-3"				Ca WITH SOME OF MAROON JASPER.	140		6.5'		2195			
												BROWN, WEATHERING SHALY MATRIX, CARBONATE, QTZITE & SHALE FRAGMENTS. LENSES ALONG STRIKE.	146.5		6.5'		2196			
												AS ABOVE. IRON INTERBEDDED IN 1' - 4' BANDS.	156.5		10.0		2197			
130				1/8-1/2	R	Trace		1/8-2"	R				161.5		5.0		2198			
						Trace	Trace		1/8-3"	R			166.5		3.5'		2199			
140												FERRUGENOUS SHALY I.F. PROBABLY 10% or more is HEMATITE, IRREG. BEDDING. MAROON BROWN.	170		5.0'		2135			
												FG MARBLY TO JASPER FINELY DISPERSED IN HEMATITE. SHALY IRON FORMATION.	180		10.0'		2151			
150				1/8-1/2	R				I			CARBONATE WITH LENSES, OVOIDS, & BANDS.	190		10.0'		2152			
												MANY MICROCRYSTALLINE QTZ. OVOIDS IN ONE ONE FOOT LAYER.	200		10.0		2153			
160												SHALY IRON FORMATION.	210		10.0		2154			
				1/8-1/2	R							SOME Ca IN RED JASPER LENSES, SHALY BEDDING IN PARTICULAR. SOME MICRO-CRYSTALLINE QUARTZ.	220		10.0		2155			
170				1/8-1/2	R			1/8-2"	R			SOME MICROCRYSTALLINE QUARTZ WITH JASPER.	230		10.0		2156			
												SANDSTONE W.S. DARK BROWN F.S. GREEN GREY. FINE GRAINED, FERRUGENOUS IN PART, CALCITE PARTING MAINLY 1/2".	236		6.0		2157			
180				1/16-1/2 1/16-3"	R	1/8-1/4		2"	I				246		10.0		2158			
								1/8"	R			SOME SHALY BEDDED IRON FORMATION.	256		10.0		2159			
190												RED JASPER HALOS ALONG SOME OF MAROON JASPER BANDS & ALIGNED LENSES. Ca IN JASPER IN PLACES.	266		10.0		2160			
													275		9.0		2161			
200												FERRUGENOUS SANDSTONE, FINE GRAINED, PARTING 1/4" - 1". CALCAREOUS.	276.5		1.5		2162			
				1/16-1/4 1/8-4"	R			1/8-3"	R			30 - 40% OF JASPER IN IRREGULAR PATTERNS. MAROON SURROUNDED BY RED JASPER. SOME CONGLOMERATE LENSES 1' - 3' THICK & 5' - 25' LONG. SEEMS TO BE MUCH MORE CONGLOMERATE IN THIS INTERVAL ALONG THE STRIKE.	280		3.0		2163			
210						Trace			I				290		10.0		2163			
													297		7.0		2164			
220																				
230																				
240																				
250																				
260																				
270																				
280																				
290												SHALE WITH SOME ROCK FRAGMENTS. APPROACHES CONGLOMERATE NEAR BOTTOM OF INTERVAL. W.S. DARK BROWN. F.S. MAROON, GREY, FERRUGENOUS LIMESTONE FRAGMENTS.	296		6.0		2165			
												CONGLOMERATE APPROACHES SHALE TO FRAGMENTAL. 10-60% FRAGMENTS. VARIES. FRAGMENTS OF QTZITE, LIMESTONE & SHALE W.S. DK. BROWN. F.S. MATELY MAROON BROWN. COLOURLESS.	306		10.0		2166			
300													315		9.0		2167			
310				1/8-1/2 1/4-3"	R			1/8-2"	R				321		6.0		2168			
320				1/8-1/2 1/2-6"	R			1/8-2"	R				331		10.0		2169			
330												THE FOLLOWING SECTION IS SOUTH OF SECTION I.F. 109-63 DOWN NEAR CREEK THE TOP OF SECTION 109A-63 IS SOMEWHERE NEAR THE BASE OF SECTION I.F 109-63 BUT CANNOT BE EXACTLY CORRELATED. (JUNE 21)	341		10.0		2170			
				1/8-1/4 1/4-2"	R			1/4-2"	I											
340																				
350												CARBONATE IN JASPER & ALSO IN IRREGULAR PATTERNS IN PLACES IN I.F. SLIGHTLY CONGLOMERATIC NEAR BASE.	351		10.0		2171			
360												FERRUGENOUS, BROWN, MAROON, CONGLOMERATIC.	353		2.0		2172			
												THIS INTERVAL WAS ESTIMATED AS WE MOVED APPROXIMATELY 100 YDS. ALONG STRIKE.								
370												CONGLOMERATIC SHALE. MAROON BROWN. 5-10% FRAGMENTS. SUB ANGULAR TO ROUNDED SIZE UP TO 2" DIAM. IMP MAINLY UNDER 1/2". POORLY BEDDED. SOME GREENISH FRAGMENTS WHICH MAY BE CHERTOUS [?] OR FINE GRAINED SEDIMENTS FAIRLY HIGH CARBONATE CONTENT MAY BE FINE GRAINED CALCAREOUS, CHLORITIC SEDIMENT SAMPLE OF FRAGMENT I.F 109A-63 (3078) L.W.H.	361		8.0		2173			
												CONGLOMERATIC SHALE AS ABOVE. FRAGMENTS MAINLY CARBONATE & SILTSTONE	370		9.0		2174			
380																				
390												CONGLOMERATIC SHALE AS ABOVE.	380		9.0		2175			
400																				
410												CONGLOMERATE. ROUNDED FRAGMENTS OF LIMESTONE & QTZITE MAINLY MAKE UP 70% OF ROCK FRAGMENTS UP TO 6" DIAMETER. MATRIX SANDY.	390		10.0		2176			
												SHALY CONGLOMERATE SIMILAR TO 372' - 390'	400		10.0		2177			
420													406		6					
													410		6.0		2178			
430												CONGLOMERATIC SHALE SIMILAR TO 372' - 390'	421		11.0		2179			
440												CONTACT BETWEEN CONGLOMERATE & IRON FORMATION PROBABLY AT ABOUT 440'								
450				1/8-3" 1/4-10"	R			1/4-2"	I R				431		9.6		2180			
				1/8-1/4 1/4-1"	R			1/4-1"	I				434.5		3.6		2181			
460												VERY FERRUGENOUS SILTY SHALE.	437.5		3.0		2182			
												CARBONATE WITH SOME OF THE JASPER. SOME SHALY BANDS. BASAL 2' OF INTERVAL MAINLY JASPER BANDS.	447.5		10.0		2183			
470													456		8.5		2184			
												UNDERLYING BEDS FERRUGENOUS, FINE GRAINED SANDSTONE & FERRUGENOUS SHALE	459.5		3.0		2185			
480																				
490																				
500																				
510																				
520																				
530																				
540																				
550																				
560																				

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 110-63
DESCRIBED BY Gibbins & Riddell
MEASURED BY Folinsbee
AIR PHOTO No. Flight line 92 - 351
AREA 2 miles west of mouth of south iron creek.
WEATHER Cool windy 8/10 cloud

DATE STARTED June 16/63
DATE COMPLETED June 16/63
MEASURING RATE 80' / 3 hrs.
COORDINATES 61,600 E. 102,400 N.
CLAIM Cony 15.

ROCK TYPES

Ovoids :
Unaligned Lenses :
Aligned Lenses :
Bands :

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 16/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	BANDS: AMT and COMP	BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO2	CRUDE ANALYSIS: P
0												Section measured south to north. Conglomeratic shale, dark maroon brown. Fragments (10 to 75%) mostly 1/32" - 1/4" - subangular. Carbonate shale & schist.								
10												Upper part of interval predominantly shale with ½-1" lenses of ½-¾" jasper. Appears to be good jasper and iron formation. Not sampled. Jasper disappears in hematite but has quite high S.G. at base of conglomerate bed. Jasper is mainly in the form of irregular patches & bands with a few aligned lenses. Few calcite voids.								
20												Upper 4' grade iron formation. Strongly irregular and jasper bands 45° to S.W. Minor slickensides 140°/90° S.W. Conglomeratic.	4	8	8'		20V6			
30													8	16	6'		20V7			
40													16	34	8.5'		20V8			
50													34.5	41	7.5'		20V9			
60													41	49	7'		2031			
70													48	59	10'		2045			
80												Bands grade to irregular patches. Minor slickensides & conglomerate band near base.	58	69	10'		2051			
90													68	79			2052			
100												Irregular patches of jasper mainly with much disseminated jasper in hematite, recessive, thinly bedded in part. Few ovoids.	78.5	89	10'		2053			
												Outcrop forms a high resistant ridge. 30% of waste is formed by an irregular network & patches of red jasper with some white qtz. & calcite. Strike 165°/70° S.W. (Probably most accurate)	88.5	100	11.5'		2054			
												Much of jasper is in irregular patches. More recessive than previous interval.	100	110	10'		2055			
													110	122	12'		2056			
												Underlying beds: Siltstone W.S. - light greenish - brown F.S. - dark green - gray. Massive except for thinly cleavage. Calcareous, ferruginous.	122							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF III - 63
DESCRIBED BY Gibbins & Bray
MEASURED BY Gibbins & Bray
AIR PHOTO No. A 12056 (FLT) 3 - 351
AREA 2½ miles west of camp
WEATHER Rain

DATE STARTED June 21
DATE COMPLETED June 21
MEASURING RATE 6 hrs.
COORDINATES 63,400 E 100,000 N
CLAIM Dorine 16

ROCK TYPES

OVOIDS : 0%
UNALIGNED LENSES
ALIGNED LENSES
BANDS

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

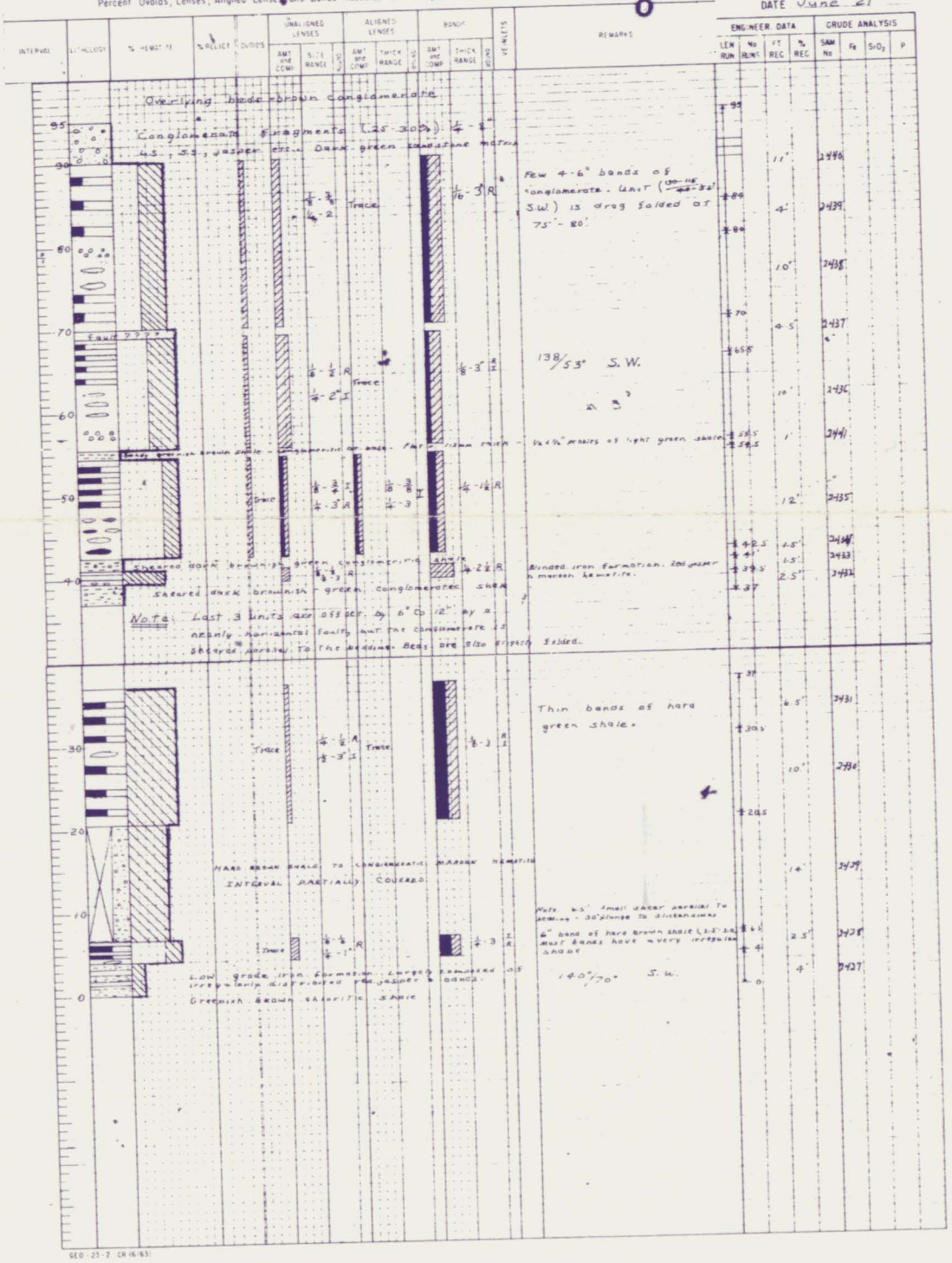
QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES : R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS :
BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125° / 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 21



CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF - 112 - 63
DESCRIBED BY W. GIBBINS
MEASURED BY R. BRAY
AIR PHOTO No. A 120-56-351
AREA IRON CREEK
WEATHER WARM, 8/10 CLOUDS, 20 M.P.H. WIND

DATE STARTED June 23, 1963
DATE COMPLETED June 23, 1963
MEASURING RATE 5½ hr / 997.5'
COORDINATES 70,900 E, 93,100 N.
CLAIM FERROUS 19

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRISTALLINE QUARTZ

VEINLETS

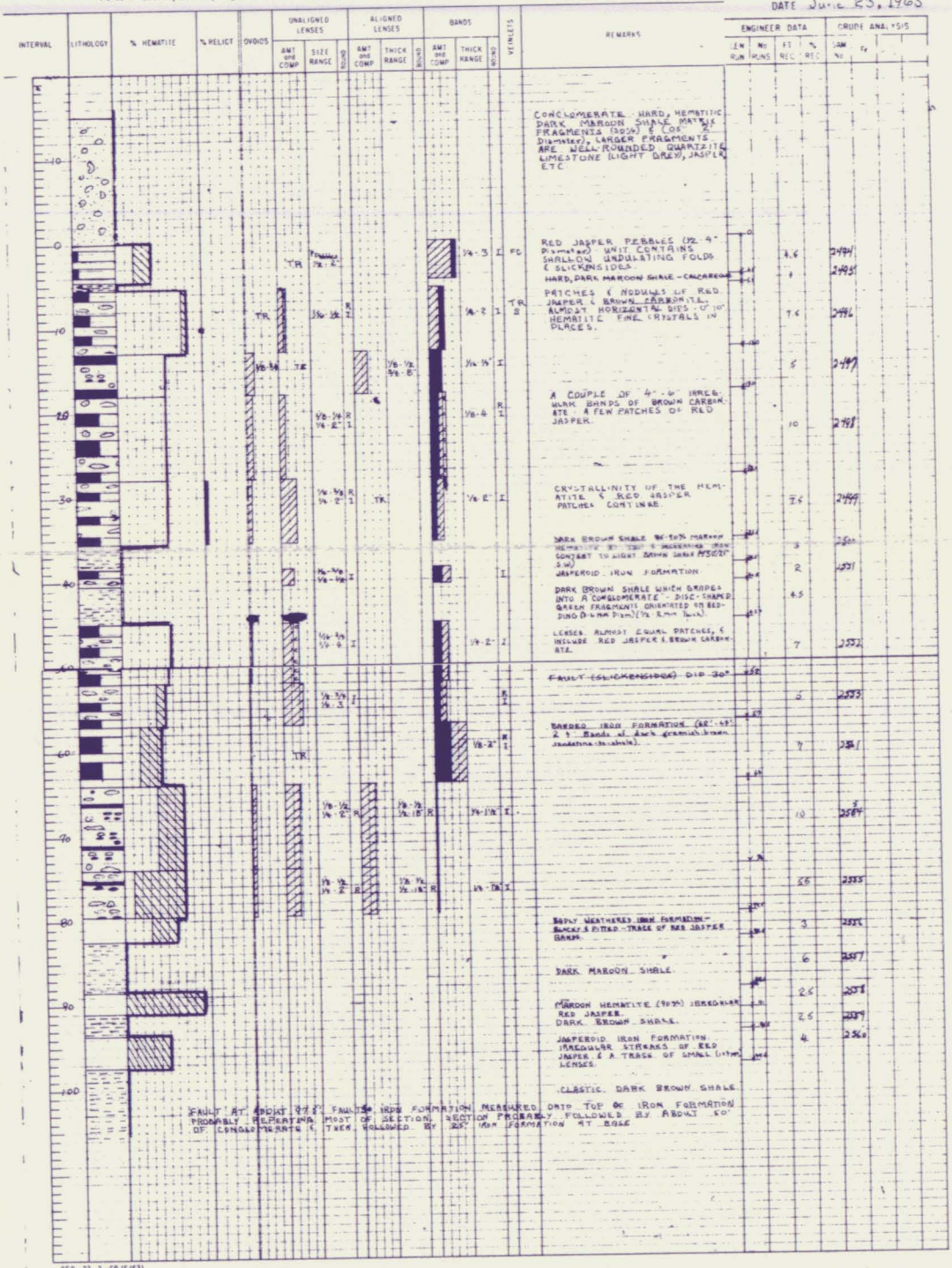
QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS: BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125° / 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 23, 1963



GEO - 23 - 2 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 120-63
DESCRIBED BY C. Riddell
MEASURED BY R. Bray
AIR PHOTO No A 12056 - Fl. 10² - 284
AREA South Iron Creek
WEATHER 8/10 overcast, warm, scattered showers

DATE STARTED June 29/63
DATE COMPLETED June 29/63
MEASURING RATE 2 hrs.
COORDINATES 80,600 E 94,500 N
CLAIM J - 19

ROCK TYPES

OVOIDS :
UNALIGNED LENSES :
ALIGNED LENSES :
BANDS :

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES : R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS :
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE June 29/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: % REC	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: % REC	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: % REC	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
0						⅛-¾ R						⅛-6" R			Interbeds of sandstone (a") and conglomerate up to 6". Some calcite in jasper	0		9'		2258			
10						⅛-¾ R									Mainly ferruginous fine conglomerate with minor jasperoid iron formation.	9'		35'		2259			
20						⅛-¾ R									Poor jasperoid iron formation. Red jasper very irregular & conglomerate interbedded & interlensed.	44.5		80'		2260			
30																24.5		80'		2261			
40																32.5							
50															W.S. :- Brown maroon. Varies from fine (→ coarse sandstone) conglomerate to coarse conglomerate. Pebbles up to 12" but mainly 1-3". Pebbles of dolomite, gtaite, green rock (?) & occasional jasperoid iron formation pebble. Mainly rounded. Band of fine conglomerate from 55-60'. Fine conglomerate has more angular fragments. Larger fragments mainly rounded but occasionally angular. Matrix ferruginous, calcareous sandy shale. 50 - 60% pebbles.								
60																							
70																							
80																							
90															Conglomerate with less pebbles & smaller pebbles up to 2". Calcareous, ferruginous shale, matrix. Poorly bedded. Weathers more maroon than above.								
100																							
110																							
120																120.5		10'		2262			
130															Conglomerate as above with some lenses & bands of poor jasperoid iron formation. Some sandstone & shale interbeds. Iron & jasper bands & lenses 1-12" thick form about 25% of interval.	130.5		10.5'		2263			
140						⅛-¼			⅛-3" R							141		7'		2264			
150																148							
160																							
170																							
180																							
190																							
200															Interbedded sandstone, shale, & conglomerate. Grades from one to the other. All have ferruginous shale matrix. Shale has sporadic pebbles. Sandstone fine to coarse.								
210																							
220						½-3" I ½-18"			⅛-3" I							Few irregular patches red jasper halo around maroon jasper lenses, in places. Some hematite centers to lenses eg.	216		5'		2265			
230															Underlying beds covered!	220							

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 121-63 — DATE STARTED June 30/63

DESCRIBED BY C. H. Riddell — DATE COMPLETED June 30/63

MEASURED BY W. Gibbins — MEASURING RATE 2.5 hrs.

AIR PHOTO No. A12056 - 284 — COORDINATES 83,800 E. 84,800 N.

AREA South Iron Creek — CLAIM K - 22

WEATHER Very warm, clear, windy

ROCK TYPES

OVOIDS : 0.0 0

UNALIGNED LENSES :

ALIGNED LENSES :

BANDS :

IRON FORMATION — SILTSTONE

JASPER — SHALE

CONGLOMERATE — LIMESTONE

BRECCIA — DOLOMITE

SANDSTONE — COVERED

% HEMATITE

STEEL GREY HEMATITE

MAROON HEMATITE

BOTH

SILICEOUS WASTE TYPES

RED JASPER

MAROON JASPER

MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S

CARBONATE C

HEMATITE H

FEW F

MANY M

BOUNDARIES : R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS : BEDDING STRIKE / DIP eg 125°/ 25°W

FAULT STRIKE / DIP eg 125°/ 25°E

BRECCIATED ZONE

HALOS OF JASPER

SPHERULITES

FRACTURING

ACCESSORIES - Calcite, Dolomite, Siderite, etc

LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite.

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 2

DATE June 30/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No. RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No.	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0														Overburden 0-10: Conglomerate w/ dk. maroon brown matrix 30-50% pebbles - mainly red jasper & maroon shale but some green shale - traces of carbonate pebbles. Pebbles up to 4" but mostly less than 1". Subangular. Matrix very sandy with many angular qtz. grains. Infilled with maroon shale much calcite cement. Bedding indistinct.	0		10'		2255			
10															10		10'		2256			
20			Trace		1/8 - 3/8 / 1/8 - 2"	R	1/16 - 2"	R		1/16 - 2"	R			Some carbonate waste mixed with jasper. Some 1/16" to 3" bands of sandstone & shale waste	20		5'		2264			
25															25		5'		2272			
30															30		13'		2277			
40			Trace		1/16 - 1/2 / 1/4 - 3	R / I							R / I	QF	Some irregular patches of jasper. Some carbonate in jasper lenses.							
43															43		2'		2278			
45															45		6'		2279			
50					1/16 - 1/2 / 1/2 - 6"	R / I				1/8 - 3	R			Some irregular patches of jasper.	50		4'		2287			
55			Trace		1/8 - 1/2 / 1/2 - 6"	R / I	1/8 - 1/2			1/8 - 1	R / I			Some slight tectonic disturbing of beds. Some calcite & jasper stringers sides. Beds flattened out.	55		10'		2288			
65															65							
70															77		12'		2291			
80														W.S. Greyish brown, pebbles of qtz/ & carbonate & green shale (igneous ??) Subangular/rounded. Minor maroon shaly hematite near bot. Calcareous maroon shaly matrix.			9'		2281			
86														Much disseminated jasper	86		3'		2282			
90														Paraconglomerate. Many green pebbles (igneous ??) irregular streaks of reddish jasper in hematite. Bedding slumped slightly	89		1.5'		2283			
100															95		1.5'		2284			

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 126-63
DESCRIBED BY C. Riddell
MEASURED BY G. Sutherland
AIR PHOTO No. A 12148 - 183 (W)
AREA Head waters of Gypsum Ck
WEATHER Intermittent sun between rain storms

DATE STARTED July 8-63
DATE COMPLETED July 8-63
MEASURING RATE 5 hours
COORDINATES 100,500 E 113,200 N
CLAIM Q - 1

ROCK TYPES

Ovoids : IRON FORMATION; SILTSTONE
Unaligned Lenses : JASPER; SHALE
Aligned Lenses : CONGLOMERATE; LIMESTONE
Bands : BRECCIA; DOLOMITE
SANDSTONE; COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES : R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS : BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE - Percent with Relict Texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE July 8/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	Fe	SiO2	P
												Overlying beds. About 200' exposed with few covered intervals. Conglomerate. W.S. - stark brown, maroon. 20-35 % pebbles of mainly cherty shale, Dolomite, shaly limestone, cherty jasper, siltstone, fairly coarse grained igneous, or shale pebbles. Pebbles up to 12" diameter. Matrix - calcareous Ferruginous shale.	0		6'		2625			
												Ferruginous shale. Slightly metallic sheen. Occasionally sandy. Grades to less ferruginous, poorly bedded (sandstone) shale.	6		3'		2626			
												Fine, grayish, ferruginous - grades to shale. Less hematite than above.	9		2.5'		2627			
												Ferruginous shale - metallic lustre in places.	11.5		3.5'		2628			
												Siltstone, ferruginous, grades to shale, calcareous.	15		1.5'		2629			
												Ferruginous shale - to shaly iron formation. Blocky.	16.5		4.5'		2630			
												Shale - to shaly conglomerate, poorly bedded (mudstone). Slightly calcareous. Silty & laminated.	21		9'		2631			
												Hematitic sandstone - shaly - metallic lustre in part - calcareous.	30							
												Fault with a 60' apparent throw. Fault passes through 1' shale with 4" to 6" displacement. Varies from 30° to 45° S	44		10'					
												Slickensides Beds dip slightly north.	54		10'					
												Conglomeratic poorly sorted green pebbles to 3/8" calc.	64		2'					
												Some very good hematite here.	66		9'					
												Fine conglomeratic ferruginous calcareous. Pebbles rounded to sub-rounded up to 3/8" diameter.	75		2'					
												Some Ca in lenses.	77		7'					
												Maroon slightly calcareous shale.	84		2.5'					
												Shaly bedded in part	86.5		7.5'					
												Mainly pebbles less than 1", green subangular to rounded fragments in sandy non calcareous shale matrix	94		7.5'					
												Same as 82' - 86'	118		11'		2631			
												Dk. Maroon, sandy shale. W.S. - dk. grayish brown. F.R. dk. grayish brown. Poorly bedded fine to coarse conglomerate typ.	128		7.5'		2632			
												Ca in many lenses	135.5		10'		2633			
												One 2" sand band.	145.5		9'		2634			
												Metallic hematite in masses.	154		1'		2635			
												Ferruginous angular, fine grained fragments.	155		1.5'		2636			
												W.S. brown, green, rock frags. & dolomite frags. Angular to subangular pebbles. Sandy calcareous matrix. Shale matrix 2" thick shaly L.F. typ.	156.5		2.5'		2637			
													159		11.5'		2638			
												Strong massive ferruginous shale with silty & fine sandstone laminations in shale.	170.5		1.5'		2639			
												3"-6" Sandy shale bands. (3 in number)	172		4'		2640			
												Some calcite with jasper in lenses. Some hematite in maroon jasper bands. Occasional 2" conglomeratic band.	176		7.5'		2641			
												Ferruginous, calcareous pebbles, Pebbles 1/4 to 2" diameter. Pebbles subangular to rounded. Matrix 20-30 % fragmental.	183.5		1'		2642			
													184.5		10'		2643			
												Ca in much of jasper.	194.5		11.5'		2644			
												Interbedded 1/4" - 1" poor shaly iron / calcareous sandstone.	206		4'		2645			
													210		10'		2646			
												Streaky jasper bands.	220							
												Grades to fine conglomerate. Parting flaggy, calcareous ferruginous.	230.5		10'		2673			
												40 % subrounded dolomite fragments with matrix as 202.5 - 215	240		9.5'		2674			
												As 202.5 - 215. 1 - 5 mm in yellow brown green fragments. Occasional jasper lense to 1" thick	249.5		9'		2675			
												As 222.5 - 231	259		10'		2676			
												Carbonate with jasper.	269		6'		2677			
												20% irregular patches of red & maroon jasper. Hematite with maroon jasper.	275		1'		2678			
												Hard hematitic poorly aregaed shale.	276		5.1'		2679			
												20% of irregular patches of red & maroon jasper.	281.1		10'		2730			
													291.1		10'		2731			
												W.S. brown green fragments 1/4" to 2" Rounded sandstone, grantic & dolomite - note pebbles. Occasional lense of banded jasperoid iron formation. Some of these look like large pebble blocks. 1" to 3".	301.1		10'		2732			
													311.1		Not					
												Poor jasperoid iron formation.	321.1		1.0		2733			
												Bd 322 - 328	322.1		1.5'		2734			
													323.6		10'		2735			
												(15%) 20% ? irregular patches of red & maroon jasper. Some Ca with jasper.	333.6		9.5'		2736			
												Hard maroon brown ferruginous shale, 2" band jasperoid iron formation.	343.1		1.5'		2737			
												Could not measure this interval accurately.	344.6		10		2738			
													354.6		5		2739			
												Some Ca in jasper	359.6		10.0'		2740			
												Underlying beds covered.	369.6							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF127-63 — DATE STARTED JULY 3/63

DESCRIBED BY C.H. RIDDELL — DATE COMPLETED JULY 3/63

MEASURED BY G. SUTHERLAND — MEASURING RATE 5 M/HR.

AIR PHOTO No. A12148 - 183 — COORDINATES 108,900 N; 93,500 E

AREA 2½ MILES UPSTREAM FROM CAMP ON N. TRIB. OF IRON CREEK — CLAIM O-13

WEATHER 3/10 CLOUD - LIGHT BREEZE - NICEST DAY OF THE YEAR

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite.

REMARKS:
BEDDING STRIKE / DIP..... eg 125°/ 25°W
FAULT STRIKE / DIP..... eg 125°/ 25°E
BRECCIATED ZONE.....
HALOS OF JASPER.....
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

DATE JULY 3, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP.	UNALIGNED LENSES SIZE RANGE	ROUND	ALIGNED LENSES AMT and COMP.	ALIGNED LENSES THICK RANGE	ROUND	BANDS AMT and COMP.	BANDS THICK RANGE	ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN. RUN	No. RUNS	FT. REC.	% REC.	CRUDE ANALYSIS SAM. No.	Fe	SiO_2	P
0															OVERLYING BEDS MAINLY COVERED WITH ODD OUTCROP OF MAROON CONGLOMERATIC SHALE	0'							
															FERRUGINOUS SANDY SHALE → SHALY SANDY IRON FORMATION → SHALY FERRUGINOUS SANDSTONE, TENDS TO BE FINELY CONGLOMERATIC IN PLACES. BEDS DIP 6-12° SOUTH	30'		3.0	2811	2291			
															SOFT DARK POORLY BEDDED MAROON SHALE.	60'		3.0		1676			
10															RATHER FLAKY TO SHALY IRON FORMATION. FRAGMENTS OF LIMONITE & GREEN SHALE APPEAR DISSOLVED. A BAND OF 10' OR LESS FERRUGINOUS, DARK BROWN SOFT SHALE NEAR BOTTOM CONTAINING A FEW GREEN SHALE FRAGS. & REDDISH BROWN SHALE FRAGS. (ANGULAR → ROUNDED). ≅ 0-3% FRAGS (UP TO 10%) UP TO ½" LONG MOSTLY ¼" - ⅛".			10.0		1677			
																90'							
															16' → 22' PARTIALLY COVERED.			6.0		1678			
20																120'							
															RUSTY SHALY SANDY IRON FORMATION. RED JASPER IN LARGE & SMALL LENSES. GRADES TO SANDSTONE IN PLACES. SHALY QUALITY SOME BANDS UP TO 1", MAINLY RED JASPER. SOME FINE CONGLOMERATE.			10.0	2812	2292			
30																210'							
																		9.0	2813	2293			
40															MASSIVE WEATHERING CONGLOMERATE. BOULDERS UP TO 1" SUB-ANGULAR TO ROUNDED MOSTLY VERY FERRUGINOUS MAROON SANDY SHALE.	210'							
																		5.0	2814	2294			
															VARY FERRUGINOUS SILTY SHALE. BAND DARK BROWN SHALE WITH OCCASIONALLY BROKEN GREEN SHALE FRAGS. FERRUGINOUS 2" BAND OF BROWN SHALE AT ABOUT 46' (50%) TENDS TO SANDSTONE WITH SMALL FRAGS. NEAR BOTTOM. INTERBEDDED HARD FERRUGINOUS SHALE AS 4.5' - 4.6' AND CONGLOMERATE IN 3" TO 12" BEDS. PEBBLES MAINLY SUB ANGULAR DOLOMITE & SANDSTONE 2mm to 1" MATRIX: SANDY MAROON SHALE.	240'		2.0	2815	1679			
																250'		5.0	2816	2295			
50																260'							
																270'							
60																280'							
															TOP OF MAIN IRON FORMATION	290'							
					1/8-3/8	1/8-4"		1/8-1"	1/8-2"	I								10.5	2817	2296			
70																300'							
															TOP MARKER SANDSTONE. WS. VERY DARK BROWNISH GREEN. BS. DK GREEN-BROWN, FINE-MEDIUM GRAINED FERRUGINOUS, SL. CALCAREOUS. QUARTZ & OTHER GRAINS SUB-ROUNDED. BEDDING 1/8 - 1".			7.0	2818	2297			
80																310'							
					1/8-1"										MOSTLY RED OXIDES & LENSES. SOME CALCITE WITH JASPER WHERE.								
					3/8-1½" R			1/8-½" I										10.0	2819	2298			
90																320'							
					1/8-1"													2.5	2820	2299			
					1/8-2" R			1/8-½" R										1.5	2821	2300			
															INTERBEDDED WEAK TO MOD. (60%) & FINE CONGLOM. TO SANDSTONE (40%) IN 2-5" BANDS.	330'							
															SOME CALCITE IN JASPER.								
100					1/8-½"	Trace					1/8-3/8" R							10.0	2822 2823	2301			
					1/8-1" R											340'							
					1/8-½"	Trace					1/8-2" R												
					1/8-2" R																		
110					1/8-1/4"													6.0	2824	2608			
					1/8-2"										INTERBEDDED & LENSES OF CONGLOMERATE & SHALE (≤ 1/2" THICK) DIMINISH TOWARDS PATCH OF RED JASPER. CHANGES TO MAINLY CONGLOMERATE ALONG STRIKE.								
																350'							
															W.S. BROWN-DK GRN FRAGS TO ½". SL. CALCAREOUS. SHALY SANDY MATRIX. OOLITE & FERRUGINOUS PEBBLES. ONE 1" BAND PINK SHALE.			2.0	2825	2609			
															INTERBEDDED CONGLOM & PINK SHALY MT.			6.0	2826	2610			
120																370'							
					1/8-3/8										F & MINOR IRREG PATCHES.								
					1/8-1" R													10.0	2827	2611			
																390'							
								1/8-1"							2 MINOR 3-6" CONGLOM BANDS AT BASE								
130																400'		2.5	1824	2606			
								1/8-2½"							TENDS TO BE SHALY IN PLACES.			2.5	1680				
															DK MAROON BROWN CONGLOMERATIC SHALY SHALE BANDS ARE INTERWEATHERED WITH CONGLOMERATE (PEBBLES → SUB-ROUNDED SYNCLINE) & LT GREEN SHALE & QTZITE ½8 - ½".			1.6	1681				
															OCCASIONAL HALO (MEM. CENTRE) SOME RED JASPER STREAKS & HEMATITIC GREY-MAROON SHALE BAND NEAR MIDDLE & BOTTOM OF INTERVAL. (8'-9' & 4')			8.5	1682				
140								1/8-2" R															
																420'		6.5	2828	2392			
					1/8-1/4"	Trace									WEATHERED-OUT LENSES & BANDS OR WEATHERED SURFACES.								
					1/8-6" I			1/8-2"			1/8-2" I				OCCASIONAL IRREG PATCH.			10.0	2829	2393			
150																440'							
																		10.0	2830	2394			
																460'							
160																							
					1/8-1/8										MINOR SHALY BEDDED HEMATITE IN MIDDLE OF 2' OF INTERVAL								
					<3"						I					480'							
																		10.0	2831	2394			
																500'							
170																							
																		10.0	2832	2396			
																520'							
180																		8.0	2833	2397			
								1/8-1" I			1/8-2" I					540'							
					1/8-1/4" R										SOME SIDERITE & CALCITE VEINS. SLICKENSIDES.			3.0	1683				
					1/8-2" R						1/8-2" I												
															SILICEOUS MAROON SHALY MATRIX. SOME GREEN SHALE PEBBLES. 5-10% LENS-SHAPED.	550'		2.0	1684				
															JASPEROID IRON FORMATION. 100% RED 2/3 (MAROON 1/3) JASPER PATCHES.								
190																560'							
															SANDSTONE. GREY-GREEN - MEDIUM TO COARSE GRAINED.			7.0	1685				
																580'							
															N.B. '63-204 WAS COVERED. MEASURED 700 LONG. STRIPPING REVEALED 4' ERROR FOR THOUGH IN REALITY ONLY 7 FEET LONG. SANDSTONE INTERVAL CALLED 588' TO 589'.								
200																600'							
					1/8 ¾" I						1/8 ¾" I				W50% REPLACEMENT (LEACHING?) OF LENSES, OVOID & BANDS BY LIMONITE, SIDERITE (?) & CALCITE. PITTED, WEATHERED SURFACE.			6.2	1686				
						Trace	Trace									620'							
																		9.5	1504	1502			
210																640'							
																		0.5	8747				
															50% of JASPER IN IRREG PATCHES.	645'		3.0	1501	1592			
																654'		1.5	1503	1593			
220															W.S. GRNISH-GREEN F.G. SAME. FINE TO COARSE - POORLY SORTED. NON-CALC.								
															W.S. GRNISH-GREEN F.G. SAME. FINE TO COARSE - POORLY SORTED. NON-CALC.								
															JASPER MAINLY IN IRREG PATCHES. 70% MAROON 30% RED. SOME 1-6" SANDY REDS.	670'		4.5	1504	1593			
230																680'							
															50% JASPER IN IRREG PATCHES (1/2 MAROON, 1/2 RED)			11.5	1687				
															INTERBEDDED GREEN, VERY FINE SANDSTONE AT 232.0'								
																700'							
															HEMATITIC CONGLOMERATIC SANDSTONE. W50% AND TO SUB-ROUND FRAGS GREEN SHALE	705'		1.0	1688				
					1/8-1/4" R						1/8-6"				50% JASPER IN PATCHES. 50% HARD FINE-GRAINED S.S. AT 237' (DK GREEN)/GREEN SHALE FRAGS < 5%.			6.5	1689				
240					1/8-2" I											714'							
															W.S. BRN GREY 70% FRAGS OF L.S. DOLOMITE, S.S. & SHALE, IN CALC SANDY SHALE MATRIX. SUB-ANG. TO SUB ROUND. ½-1" PEBBLES (OCCASIONALLY UP TO 2").			9.0	1690				
															(A) COVERED INTERVAL FOUND SHORTER WHEN EXPOSED.								
250																730'							
															40% RED JASPER PATCHES OR VERY IRREG BANDS.			4.0	1691				
																738'							
					1/8-1/2 R										REMAINDER OF JASPER IN IRREG PATCHES.								
					1/8-1" I													12.5	1692				
260																750'							
					1/8-1/2	Trace					1/8-6" R												
					1-2" H																		
																765'		8.0	1693				
270																778'							
															GREY-BROWN NON-CALCAREOUS SILTSTONE w/ BAND OF MASSIVE RED JASPER			8.0	1694				
																786'							
															FINE TO VERY FINE CONGLOMERATIC WITH A NON-CALCAREOUS DARK BROWN SILTSTONE TO SHALE MATRIX. FRAGS FROM ≤ 1-15% YELLOW & GREEN SHALE, LIMONITE, SANDSTONE, DOLOMITE, QTZ. SUB-ROUND → ROUND (1/16 - 1/2") (UP TO 1/2"). BECOMES FERRUGINOUS IN PLACES WITH GREEN SHALE FRAGMENTS (ca. 297.5 - 299.5').			10.0	1695				
280																796'							
																		13.0	1696				
																809'							
290															MINOR HEMATITE	811'		1.5	1697				
															FERRUGINOUS SHALE SLIGHTLY CONGLOMERATIC	821'		3	1698				
															1-5" FRAGMENTS								
															LARGE GREEN (LIMEOUS?) SANDSTONE BOULDER AT 302' (1½' Ø)	824'							
															MINOR SHALY BEDDED ZONE INTERBEDDED SOME CALCITE								
300																		10	1699				
					1/8-3/4																		
					1/8-2" R			1/8-1/4			1/8-1" R												
																854'							
																		10	1700				
310																874'							
					1/8-1/2																		
					1/8-2"			1/8-1/2			1/8-1" R				CALCITE								
																		18.5	1458				
320																894'							
																897.5		4.5	1459				
															GREY-GREEN, VERY FINE GRAINED SANDSTONE TO SILTSTONE WITH MINOR FERRUGINOUS IN PLACES	900'							
															INTERVAL PARTIALLY COVERED. FRAGMENTS ARE VARIES GREATLY. NON CALCAREOUS. INTERVAL VARIES FROM INTERBEDDED FINE CONGLOMERATE TO COARSE SANDSTONE TO CONGLOMERATE. MAINLY GREEN, BROWN DARK GREY SHALE. 383' - 355' IS COVERED			2	1460				
330																920'							
																		3	1461				
																939'							
															W.S. BROWN TO SANDSTONE TO SHALE TO CONGLOMERATE PEBBLES TO ½" MAINLY LESS THAN ¼" VERY SHALY & SANDY								
																		10	1462				
340																960'							
																		10	1463				
																980'							
																		6	1464				
350																988'							
					1/8-1/2 I						1/8-2" I				20-30% RED JASPER IN IRREGULAR PATCHES								
																		10	1465				
360																1008'							
					1/8-1 R			1/8-2" I			1/8-3" I							2.0					
																		7	1466				
																		2.0					
370																1028'							
					1/8-1/2 I										LAMINATED FERRUGINOUS, CROSS BEDDED, SILTSTONE CALCAREOUS								
					1/2-1 R						1/8-1" R							1.5	1467				
																1043'							
380															BENEATH THIS BEDS ARE COVERED FOR 50-70' FOLLOWED BY OUTCROPS OF CONGLOMERATE OF MAINLY LESS THAN ¼" TO 3" BOULDERS OF QUARTZITE, JASPER, CARBONATE, CALCAREOUS GREEN SANDY SHALE BENEATH THIS IS COVERED								
390																							
400																							
410																							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 128-63
DESCRIBED BY W. Gibbins
MEASURED BY R Bray
AIR PHOTO No A 12148 (11") 183
AREA Head waters of Bluff Creek
WEATHER Rain on July 2 Fair July 3

DATE STARTED July 2/63
DATE COMPLETED July 3/63
MEASURING RATE 8 hrs.
CO-ORDINATES 98,000 E 114,700 N
CLAIM P-11

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW f
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25° W
FAULT STRIKE / DIP eg 125°/ 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 6
DATE July 2/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	BANDS: AMT and COMP	BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
0												Sheared mineralized shale.								
												Medium grained brown sandstone - F.S. & W.S. greenish brown Shale & carbonate.								
												Iron sandstone fragments of red jasper (av. - 2 mm) & brown Shale (av 7 mm) & Matrix (av 15%) of maroon hematite.								
												Iron sandstone - more red jasper & larger fragments than above. Becomes conglomeratic (10%) maroon hematite 2-4" conglomeratic Sandstone.								
												Sandstone W. S. medium brown F.S. - dark brown Medium grained, oily & calcareous. 90°/ 2° W.								
10					35° 3 R				1/8-3/8 R			Pinched lenses of red jasper. Small bands - hematite in jasper & carbonate in hematite	20		2.5		2562			
					2-4								25		5'		2563			
												Iron sandstone. Medium to coarse grains of red jasper & hematite.								
												Maroon brown shale matrix - fragments (1/2 - 1") 20% well rounded light green calcareous & shale.	45		10'		2564			
20												Dark maroon brown shale - sandy (carbonate) in places.	65		10'		2565			
30																				
					0-4 3/4 I				3/8-3/8 R			Nodular iron formation with regular to irregular lenses of red jasper & white qtz & brown carbonate (usually altered to limonite)	85		5'		2566			
40					C 1/4-1/2 R								95		10'		2567			
					Trace		Trace 1/4-3/8		1/4-3.0" R			Banded iron Formation.			4.5		2567			
												Maroon fine to medium grained calcareous sandstone. F.S. - slight greenish tinge. Thin regular to massive bedding.	99.5		9.5		2568			
50																				
60					1/8-1/2 R		1/4-1/2 R		1/4-2" I			Iron Formation - 10% red jasper & qtz. patches (1/4 - 1/2" diameter). Regular boundaries. Waste is mostly red jasper.	109.5		10'		2569			
					3/8-2 I		1/4-6"					Maroon hematitic shale.	119.5		10'		2570			
70					1/8-1/2 I	Trace			1/4-3" R I			Iron formation - banded 15 - 20% of hematite = fine crystals.								
												Interbedded hematitic brown shale & maroon shale - altered.	129.5		7.5		2571			
												Low grade banded iron formation. Trace of green sandstone & carbonate.	137				2572			
80					I.F.							35% maroon hematite - waste bands of red (46%) & maroon (35%) jasper.	91		10'		2573			
					1/8-3/8 R				1/8-1/2 I			"Nodular" iron formation. Some lenses & pockets of red jasper have hematite core & rim of small hard light brown areas.								
90													97		5.5		2574			
					1/8-1" R				1/8-3/4 R			Banded iron formation.	102.5		5'		2575			
												Banded maroon hematite Trace of brown shale.	107.5		10'		2576			
100					1/8-3/8 R				1/8-3" I			10" of conglomerate (maroon) at 106.5' W.S. - light brown)	117.5		10'		2577			
					1/8-3" R															
110					Trace 1/8-3/8 R				1/8-1 1/2" I				127.5		10'		2578			
												Light brown qtz carbonate patches (1/2 - 1") (10%) & 2% iron sandstone matrix & maroon jasper (1/2 - 3 mm) in hematite matrix. 8° at conglomerate at 130.5	137.5		10'		2579			
120													147.5		8'		2580			
					1/8-1/2 R 1/2-1" R		1/8-3/8 R 1/2-2" R					Banded iron formation.	157.5		10.5		2581			
130												Maroon hematite & hard medium brown shale.					2582			
					1/4-6 R		1/4-6 R		1/4-2" R I			Banded iron formation. Trace of light brown qtz pockets at 165.0 - Maroon hematite.	169		5'		2583			
140																	2584			
					1/2-3/4 R							Dark brown to maroon shale & very fine sandstone. Slightly Calcareous.	177		10'		2585			
150																	2586			
					1/8-3/8 R				1/2-3" R			Low grade maroon hematite Shale 2' 158' (10") & 161' (12") &	181		6'		2587			
160																				
					1/8-1/2 R				1/2-6" I R			Medium brown & light green siltstone - poor irregular bedding	191		15'		2588			
170													206		10'		2589			
												Conglomerate: Fragments (Av. 85%) Mostly 2 - 10 mm to 10 mm = 1' rounded to angular - Mostly Brown Shale, light green shale, limestone & dolomite. Matrix brown hematitic shale & crystalline calcite.	216		10'		2590			
180																				
190																				
200																				
					Trace 1/4-3/8				1/4-3/8 I			Numerous calcareous shaly bands with brown ferruginous shales & few clastic carbonate beds. The last by carbonate matrix & contains siliceous & shaly pebbles, from 1/8 - 1" diameter.	232		2'		2591			
															4'		2592			
													242		10'		2593			
210					1/8-1/2 R 1/8-1 I				1/4-1" R			Blocky ferruginous shaly bands from 210.5 - 211 W.S. Mk. brown with a metallic lustre on F.S. Also many R.-E. lenses and bands (1/8 - 1/4" thick) of a calcareous material W.S. is dark brown.	252		5.5'		2594			
												Blocky ferruginous shaly band with a metallic lustre on F.S. Composed of 1/2" maroon jasper with some maroon (hematite) jasper.	257		1'		2595			
220					1/8-1/2 R				1/4-1" R			Light grey brown on fresh surface with weathered particles of gn. shale from 212 to 213 (av) W.S. is reddish brown.	262		2'		2596			
230																				
240												F.S. - dk. brown W.S. - reddish brown. Contains yellow-grey, green sandy carbonate particles. Few small grains appear to be red jasper.	282		1		2610			
250																				
260																				
270																				
280													276		10'		2875			
												Conglomeratic shale - massive & poorly bedded. W.S. & F.S. reddish brown. Consists of rounded pebbles (1/4 - 1") composed of carbonate shales & jasper. Grades to a poor quality iron formation with a more ferruginous matrix	286		20'		2876			
												Massive poorly bedded & irregular patches of red jasper. Also light brown weathering shaly carbonate patches containing veinlets of calcite	291		10'		2687			
290					1/8-1/4 R 1/8-3" R				1/4-2" R I			Many red jasper lenses have hematite cores. Numerous small patches of red jasper. Blocky weathering interbedded maroon hematite & silty bands from 302 - 302.5. Silty bands grade to maroon jasper in places.	301		12.5		2638			
300																				
					1/8-1/2 R 1/8-2" R		1/4-1/2 R		1/4-1" R											
310					1/8-1/2 R 1/8-1/2		1/4-1/2		1/4-1/2 R			Maroon jasper bands weathered on surface to limonite.	313.5		8'		2639			
													318.5		10'		2640			
320					1/8-1/4 R 1/8-2" I				1/4-3" R I			219 - 219.5 coarse grained carbonate sandstone band W.S. - light brown. F.S. has a mottled grey appearance								
												75°/ 9° J.	328.5		98'		2641			
330																				
					1/4-6 R 1/8-1" I				1/4-2" R I				336							
340												Slumped outcrop - appears to be sandy carbonate shales.								
350												Underlying beds are conglomerate composed of 80% well rounded pebbles & boulders with a reddish-brown shaly non-calcareous matrix. Pebbles range from 4" - 2' in diameter. Pebbles are composed of gitsite (usually largest) dolomite, calcareous sandstone & siltstones.								

GEO - 23 - 2 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 129-63
DESCRIBED BY GIBBINS & FOLINSBEE
MEASURED BY GIBBINS & FOLINSBEE
AIR PHOTO No. A 12148 (11") 188
AREA IRON CREEK & Mt. S.W. OF BARE END
WEATHER RAIN WITH SUNNY PERIODS

DATE STARTED JULY 8 1963
DATE COMPLETED JULY 8 1963
MEASURING RATE 3 MES.
COORDINATES 85,800 E 100,000 N
CLAIM L-13

ROCK TYPES

OVOIDS: ○ ○
UNALIGNED LENSES:
ALIGNED LENSES: ○ ○
BANDS:

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
WHITE

SILICEOUS WASTE TYPES

RED JASPER
MAROON SHALE
WHITE QUARTZ (CLEAR)

VEINLETS

QUARTZ Q
CARBONATE C
HEMATITE H
PYRITE P
MISC. M

BOUNDARIES R - REGULAR i.e. Even boundary between Jasper and Hematite
I - IRREGULAR i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125° / 25°W
FAULT STRIKE / DIP eg 125° / 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4
DATE July 8th 1963

FEET	ENGINEER DATA LEN RUN	No. RUNS	% REC	% REC	CRUDE ANALYSIS SAM No.	Fe	SiO2
0							
				3.5	2632		
10	1.5						
				9.5	2633		
20	9.5						
				6.5	2634		
30	6.5						
				6.5	2635		
40	6.5						
				2.5	2636		
50	2.5						
				13.5	2637		
60	13.5						
				2.5	1701		
70	2.5						
				10	1702		
80	10						
				10	1703		
90	10						
				6	1704		
100	6						
				6	1705		
110	6						
				10	1706		
120	10						
				5	1707		
130	5						
140							
150							
160							
170							
180							
				5	1708		
190	5						
				7.5	1709		
200	7.5						

HARD SILICEOUS MAROON SHALE - MAROON HEMATITE VARIES FROM 0 TO 7%.

SOFT SILICEOUS MAROON SHALE 20 - 25% MAROON HEMATITE

IRON FORMATION HIGH IN JASPER (VARIES ALONG STRIKE (80-80%) FOR FEAT (1/2) - 30% MAROON HEMATITE
STRIKE 72° / 9° SE (7%)

CONGLOMERATE - DARK MAROON SHALE MATRIX (1/8" - 1/2") WELL ROUNDED PEBBLES, MOSTLY SHALE & JASPER (1/8" - 20.0") OPAQUE FRAGMENTS (3 TO 5%) SHALE FRAGMENTS AT SURFACE & GREEN SILTSTONE ARE WELL ROUNDED & SMALLER FRAGMENTS (1/8" - 1/2") OF SHALE & CARBONATES ARE ANGULAR TO SUB-ANGULAR
NOTE: GRADUAL CHANGE FROM CONGLOMERATE TO IRON FORMATION

HEMATITE SHALE FRAGMENTS (1/8" - 2 1/2") INCLUDED LENSES & BROKEN BANDS OF RED JASPER, LENS OF SILICEOUS SHALE, ROUNDED PEBBLES OF GREEN SHALE (CARBONATE POWDER)

FLOAT INDICATES HARDER SANDSTONE HAS BEEN CROSSED (CALCAREOUS SANDSTONE & / BEDDED SILTSTONE

SILTSTONE, LIGHT GREEN SHALE 52.5-53.5
DARK MAROON - MAROON SHALE (THIN) BAND OF LIGHT GREEN SHALE WEATHERED YELLOW) BEDDING 30° TO CORE 30° TO UNDER CORE

IRON FORMATION
BANDED IRON FORMATION

MAROON-BROWN SILTSTONE WITH LIGHT BROWN - GREY & YELLOW TWIN BEDDING NOT EASILY SEEN FRESH SURFACE

BANDED IRON FORMATION

CONGLOMERATE - BROWN SHALE MATRIX ANGULAR TO ROUNDED FRAGMENTS (1/8" - 80%) (1/2 TO 1/2 %) OF LIGHT GREEN SHALE & LIGHT BUFF CARBONATES, INTERBANDED WITH REGULAR 2" TO 4" BANDS OF RED JASPER & A TRACE OF METALLIC & MAROON HEMATITE
MIGHT BE PARTIALLY DUG OUT

IRON FORMATION LARGE (1/8 - 1/2") OVOIDS MAY HAVE CENTERS OR INNER RINGS OF METALLIC HEMATITE.

OUTCROP OF IRON 10 CREEK 6" THICK

OUTCROPS OF HEMATITE IN CREEK BED CONFORMS TO BEDDING BUT IS LARGE BLOCKS
SMALL OUTCROP IN CREEK OF IRON

SILTSTONE IN CK. BOTTOM WEATHERED SURFACE FRESH SURFACE

CARBONATE LENSES - OVOIDS

VERY IRREGULAR PATCHES OF JASPER SOME OF WHICH CONTAIN CALCITE

CONGLOMERATE FRAGMENTS 1/4" - 3" OCCASIONAL TO 7" 80% OF ROCK MAINLY SHALES & CONGLOMERATE, MAROON SHALE FRAGMENTS ROUND - SUB-ANGULAR, MATRIX MAROON SHALE NO BEDDING

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. EP 130-63 — DATE STARTED JULY 9 1963

DESCRIBED BY GIBBINS & FOLINSBEE — DATE COMPLETED JULY 9 1963

MEASURED BY GIBBINS & FOLINSBEE — MEASURING RATE 200 ft (4.5 hrs)

AIR PHOTO No. A 12056 (10") 284 — COORDINATES 81,400 E 92,200 N

AREA SOUTH (5MI.) OF CAMP [SOUTH FROM CREEK ROAD] — CLAIM S-19

WEATHER 65° (approx) - LIGHT WINDS - 1/10 CLOUD

ROCK TYPES

OVOIDS: ○ ○ ○ — IRON FORMATION — SILTSTONE

UNALIGNED LENSES: — JASPER — SHALE

CONGLOMERATE — LIMESTONE

ALIGNED LENSES: — BRECCIA — DOLOMITE

BANDS: — SANDSTONE — COVERED

% HEMATITE

STEEL GREY HEMATITE

MAROON HEMATITE

BOTH

SILICEOUS WASTE TYPES

RED JASPER

MAROON JASPER

MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S

CARBONATE C

HEMATITE H

FEW F

MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
- BEDDING STRIKE / DIP — eg 125°/ 25°W
- FAULT STRIKE / DIP — eg 125°/ 25°E
- BRECCIATED ZONE
- HALOS OF JASPER
- SPHERULITES
- FRACTURING
- ACCESSORIES - Calcite, Dolomite, Siderite, etc
- LARGE ISOLATED LENSES

NOTE — Percent with Relict texture measured left to right as percent of total Hematite

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE JULY 9, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT OVOIDS	UNALIGNED LENSES: AMT (OR COMP)	UNALIGNED LENSES: THICK RANGE	ALIGNED LENSES: AMT (OR COMP)	ALIGNED LENSES: THICK RANGE	BANDS: AMT (OR COMP)	BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
180					1/8-1/2 R 1/8-2		1/8-1/6 R		1/8-1" R										
			TR		1/8-1/2 R		1/8-3" R				CARBONATE IN BANDS		9	7		2783			
											SILTSTONE - WEATHERED SURFACE - BROWN, FRESH SURFACE MAROON. POOR CLEAVAGE. ALSO SLIGHTLY BANDED, BECOMES FINER TOWARDS THE TOP.			3.5		2784			
170				1/8-1/6 1/4-2" R	1/8-1/2 R			1/8-4" R			MANY OF THE BANDS CONTAIN CALCITE AND SIDERITE. IT HAS BEEN LEACHED OUT OF THE SURFACE BANDS.			7.6		2789			
160														10		2795			
											CONGLOMERATE CONTAINING BAND 1-2" THICK OF MAROON HEMATITE & JASPER. CONGLOMERATE MATRIX MAROON SHALE FRAGMENTS 1-2 MM OCCASIONAL 6" MAKE UP 5% OF ROCK FRAGMENTS. SUBANGULAR - ROUND. COMPOSED OF CALCAREOUS SHALES & CARBONATE.			4.5		2796			
150				1/8-1/2 I 1/4-3				1/8-1/2 R			PART OF JASPER IS COMPOSED OF IRREGULAR PATCHES OF RED JASPER.			7.5		2797			
140											SOME (10%) LENSES & OVOIDS CONSIST OF CARBONATE (CALCITE & SIDERITE. SOME SMALL CRYSTALS OF HEMATITE LENSES 1/2 x 2" of CALCITE.			10		2799			
			TR					1/8-2 R			SHALEY HEMATITE.			5.0		2800			
130											CONGLOMERATE & RED JASPER WASTE. MAROON SHALE MATRIX. FRAGMENTS 17 MM. to 1/2". CALCAREOUS. SHALE FRAGMENTS 15%. SUB-ANGULAR.			2.5		2799			
				1/8-3/4 1/2-3/4 R				1/8-4 S R			SHALEY HEMATITE.			3.5		2801			
				1/32-1/4 1/2-1/2 R				1/8-2 1/2 R			VERY HARD MAROON BROWN SHALE - MAKSITE IRON FORMATION			1 6.5		2802 2794			
120																			
				1/16-3/4 1/8-3/4 R							TRACE OF BROWN CARBONATE IN SOME OF THE LENSES.			3		2795			
110														10		2798			
100																			
90																			
80																			
70																			
60											CONGLOMERATE - MATRIX: MAROON TO SANDY SHALE FRAGMENTS GREEN SHALE & BUFF CARBONATES, RED JASPER (4%) (1/8 x 1/4 to 2 1/2 x 2 1/2) SUB-ROUNDED TO ROUNDED.			2		2796			
											VERY JASPEROID IRON FORMATION (75% JASPER) (RED & MAROON) IN IRREGULAR STREAKS. FOLDED & FAULTED AT VARIOUS ATTITUDES.			4		2795			
50			TR								SHALEY TO CALCAREOUS IRON FORMATION. BANDED IRON FORMATION. 48° 42°			2		2798			
														11		2799	TOP		
40				1/8-3/4 1/4-8" R		1/8-3/4 1/2-8" R		TR											
30				1/8-3/4 1/4-1 1/4 I		TR		TR			DOME OVOIDS OF RED JASPER HAVE CORES OF HEMATITE - CARBONATE LENSES PRODUCE PITS IN WEATHERED SURFACE.			10		1616			
20														10		1617			
10				1/8-3/4 1/4-1" R		1/8-1/2 3/4-6" R		1/8-3" R			IRON FORMATION 130 5°			10		1618			
0											CONGLOMERATE - MAROON BROWN SHALE MATRIX FRAGMENTS (15%) (1/8" x 1/8") to (5" x 6") ROUNDED TO SUB-ROUNDED. LIGHT BROWN CARBONATE & SHALE, RED JASPER, ETC.			4.5		1619			
											INTERBEDDED IRON FORMATION (65% BANDED RED JASPER) & CONGLOMERATE. SLICK INSIDES AT BASE			1					

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF 131-63
DESCRIBED BY Folinsbee
MEASURED BY Sutherland
AIR PHOTO No. A 12148 (113) 183
AREA Indicision Creek (East Branch)
WEATHER C. A. V. U. Warm

DATE STARTED July 4/63
DATE COMPLETED July 4/63
MEASURING RATE 130'/4.5 hr.
COORDINATES 96,300 E 106,000 N
CLAIM P-14

ROCK TYPES

OVOIDS: IRON FORMATION
UNALIGNED LENSES: JASPER
CONGLOMERATE
ALIGNED LENSES: BRECCIA
BANDS: SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE July 4/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT OVOIDS	UNALIGNED LENSES: AMT. PER CENT	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT. PER CENT	ALIGNED LENSES: THICK. RANGE	BANDS: AMT. PER CENT	BANDS: THICK. RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS %: SAM No	Fe	SiO_2	P
0-72											Nearly bedded conglomerate. Matrix maroon calcareous shale → siltstone. Fragments .25 m.m. - 1" & 5% damage 5% of rock. Rounded fragments - pale grey green shales tend to siltstone.								
72-77											Banded siltstone (2 mm.) Maroon grey bands. Calcareous & poorly bedded W.S. brown.								
77-120											Non-calcareous shale tending to conglomerate. Fragments are round → subangular. Green shales = 1% of rock. Ferruginous.								
120-140											Ferruginous conglomerate. Fragments non-calcareous shale (1-2 mm.) 50% of rock. Matrix calcareous shale?								
140-150											Fine calcareous siltstone W.S. - grey brown F.S. grey green.								
150-161.5			½-4 R ½-1 I		⅛-1 R I		3" I				Ferruginous conglomerate. Very irregular contact with top of I.F. 130°/8° S.W. 10-15% ferruginous conglomerate. Calcareous in places & irregular boundary.	0 7		7'		2607			
161.5-175											Ferruginous conglomerate, partially calcareous. Fragments 1/4 (1mm-1") Fragments mainly shale & chert. Rounded - no bedding. Maroon shale fragments 25% mainly green shale. Subangular to angular. (1 mm. - 4") Top W.S. - Brown F.S. - red grey Bottom - W.S. grey F.S. maroon.	11.5		4.5		2608			
175-180		Trace	½-1 I ½-3 I		⅛-½ R I		½-2 R					30.5 32		1.5' 7.5'		2609 2610			
180-185											Fine sandstone W.S. brown → slightly calcareous F.S. grey green. Bedding (½") Fair	32.5							
185-200			½-1 ¼-4 I		⅛-½ R I		¼-3 R				Ovoids contain some carbonate. Some of the red bands have extremely irregular boundaries - almost patches.			10'		2611			
200-215			½-½ R ½-3 I		⅛-½ R I		¼-2 R	Fc			Some carbonate in red jasper.	49.5 57.5		10'		2612			
215-225			½-½ R ¼-3 I		⅛-½ R I		¼-4 R				Carbonate present in lenses.			10'		2613			
225-232											Conglomerate - W.S. brown F.S. maroon. Fragments 5%. No bedding. Calcareous.	65.5 68		7' 1.5'		2614 2615			
232-234		Trace	Trace		⅛-¼ R		¼-2 R					70		2'		2616			
234-236											W.S. brown F.S. maroon. Matrix - green shale. Frags. subangular. Shales, etc. Contains (eating band of conglomerate (2" - wide)	71 73		1' 1.5'		2617			
236-245			½-½ R ½-2 I		⅛-½ R I		¼-2 R					74.5		2'		2618			
245-255											W.S. brown F.S. maroon. Matrix - red shale. No bedding. Slightly calc. Frags.	76.5		10'		2619			
255-265			½-½ R ⅛-2 I		⅛-½ R I		⅛-4 R I	F.S.			Qtzite vein ¼" wide - very irregular boundary. Thin band of hematitic shale.	86.5		4'		2620			
265-275											Shale with conglomerate in bands about 4-6" wide. Shale W.S. brown F.S. maroon. Conglomerate W.S. brown F.S. maroon. Fragments imm- ⅛" subangular shales. Maroon shale matrix.	88.5 92.5		4' 1'		2621 2622			
275-285			½-½ R ½-3 I		⅛-½ R I		½-3 R I				Crotaiges a 6" band of siltstone. W.S. brown F.S. black. Irregular patches of maroon jasper.	92.5		10'		2623			
285-295			⅜-¾ R ½-2 I		R I		R I	F.S.			Patches of red & maroon jasper			10'		2624			
295-305			½-½ R		⅛-1 R I		⅛-¼ R I	F			Many of the ovoids on the surface are leached out & others contain carbonate. Some small ⅛ x ⅜ carbonate lenses.	108.5 118.5		10'		2625			
305-315			⅜-½ R ½-2 R		⅛-½ R		⅛-2 R I					128.5		10'		2626			
315-325			⅛-1 I ⅛-6 I		⅛-1 I						MOST OF RED JASPER CONTAINS QUARTZ	138		9.5		2627			
325-335			⅛-1 I ⅛-1½ I		⅛-2 R I						Q = QUARTZ	148 153.5		5.5		2628			
335-345		TRACE	⅛-½ I ⅛-4 I		⅛-½ R I		¼-½ R					163.5		9.5		2629			
345-355		TRACE	⅛-½ I ⅛-4 I		⅛-½ R I		⅛-⅛ R					170 173		2		2630			
355-360			⅛-½ I		⅛-½ R I		¼-½ I				20% PATCHY MAROON JASPER	178		3.5		2631			
360-365											VERY CONGLOMERATIC - FRAGMENTS 60% WELL ROUNDED CHERTS, ROUNDED JASPER FRAGMENTS (⅛"-4") MATRIX CALC. MAROON SHALE MASSIVE	181.2 183		4		2632			
365-370			⅛-½ I ⅛-3 I		⅛-1 R I		R I				SOME QUARTZ IN JASPER	188		5'		2633			
370-380		TRACE					R I				MINOR SILICIFICATION SOME QUARTZ IN JASPER	193 198		9'		2634			
380-384											COVERED	206							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 132 - 63
DESCRIBED BY Bray
MEASURED BY Riddell.
AIR PHOTO No A 12148 - 183 (11)²
AREA Iron Creek - 2.5 mi upstream from camp.
WEATHER Overcast

DATE STARTED July 2/63
DATE COMPLETED July 2/63
MEASURING RATE 38'/5 hr.
COORDINATES 90,300 E 101,200 N
CLAIM N - 16

ROCK TYPES

OVOIDS: ○○○
UNALIGNED LENSES:
ALIGNED LENSES:
BANDS:

IRON FORMATION
JASPER
CONGLOMERATE
GREENSTONE
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
RED

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

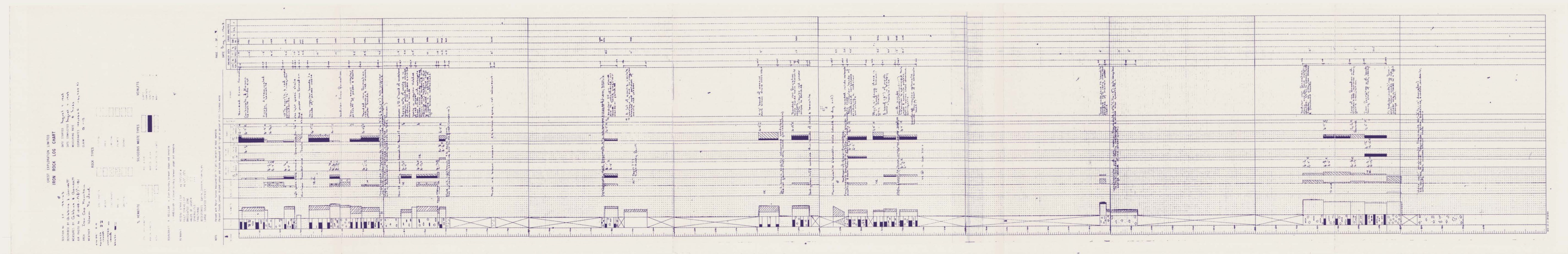
REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE____ OF____
DATE____

MATERIAL	% HEMATITE	% RELICT OVOIDS	UNALIGNED LENSES: AMT and % COMP	UNALIGNED LENSES: SIZE RANGE	%	ALIGNED LENSES: AMT and % COMP	ALIGNED LENSES: THICK RANGE	%	BANDS: AMT and % COMP	BANDS: THICK RANGE	%	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	No RUNS	FT REC	% REC	CRUDE ANALYSIS: SAM No	Fe	SiO_2	P
													Overlying massive, poorly bedded conglomeratic & ferruginous shales with lenticular dark maroon colour with a metallic lustre in some places. Subrounded pebbles from ¼" to 2" in diameter. Irregular jasper lenses ranging to a foot in length. 80% pebbles of dolomite, jasper & shale within a shaly sandy calcareous matrix.							
													Approaches poor iron formation. Not sampled.								
			⅜-½ R 1/4-2" I										30% irregular patches of red jasper with minor maroon jasper.	48							
			½-½ R ½-2" I			½-½ R			1-2" R I				Few sandy calcareous bands.		13'		22%				
			½-½ R ½-3" I			½-2"			½-2" R I				Some sandy calcareous bands & lenses from ¼" to 2" thick. Bands weathered out in irregular patches.	26	10'		22%				
														15							
															10'		21%				
														5							
													Lowest most iron band below main iron zone								
													Fine grained calcareous shale with widely scattered grains of dolomite about ⅛" in diameter. W.S. & F.S. don't Bleach								

GEO-23-2-CR (6/63)


CHEST EXPLORATION LIMITED
IRON ROCK LOG CHART

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 134 - 63
DESCRIBED BY Gibbins & Folinsbee
MEASURED BY Gibbins & Folinsbee
AIR PHOTO No A-12148 - FL (11) - 181
AREA West Side of Gypsum Creek.
WEATHER Sunny, light summer breezes.

DATE STARTED July 12 1963
DATE COMPLETED July 12 1963
MEASURING RATE 420' / 6 hrs.
COORDINATES 92,400 E 117,200 N
CLAIM N-10

ROCK TYPES

IRON FORMATION
JASPER
TUFF CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
GRANITE
GNEISS

% HEMATITE

DARK GREY HEMATITE
MAROON HEMATITE
RED

SILICEOUS WASTE TYPES

LIGHT GREY
MAROON SHALE

VEINLETS

QUARTZ Q
CARBONATE C
HEMATITE H
IRON F
MARK M

BOUNDARIES R - REGULAR i.e. Even boundary between Jasper and Hematite
I - IRREGULAR i.e. Uneven boundary between Jasper and Hematite

REMARKS
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FAULT STRIKE / DIP eg 125°/ 25°E
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SPHERULITES
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ACCESSORIES Calcite, Dolomite, Siderite, etc
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NOTE Percent with Relict Texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 7
DATE July 12 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT TEXTURE	OVOIDS AMT and COMP	OVOIDS SIZE RANGE	OVOIDS %	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES %	BANDS AMT and COMP	BANDS THICK RANGE	BANDS %	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0-10														Conglomerate - (65%) l.g. to ¼" fragments green & dark brown chert & banded jasp - angular (25%) large fragments (½ x ½" to 6"x3"x2" rounded - dolomite, limestone & sandstone) matrix is a maroon hematite shale	0		9		1770			
10-20			TR	⅛-½ ¼-½R						½-1½R				Banded iron formation ⅛" to ¼" fine hematite - trace of carbonate in lenses 2'3½" to 5'6"	10		10		1771			
20-30				Shaley maroon brown sandstone - slightly calcareous - thin regular bedding on weathered surface which is also lighter colored.											20		8.5		1772			
30-40				¼-½" ¼-¾I										Iron formation - top ½ contains nests of the bands - lenses grade into irregular streaks	30		10		1773			
				South side along ridge.											40		6		1774			
				Iron sandstone (2 - 5 mm) angular grains of red jasper, hematite calcite & shale - well to poorly regular bands (1 - 3" of red jasper)											50		6		1775			
				Iron sandstone - no jasper bands & more shale & less iron.											60		6		1776			
60-70				Conglomerate similar to (-20 to -25) but includes regular bands 3" - 1' of maroon shale - many ½" hematite 6' 4"											70		8	4.5	1777			
70-80															80		8		1778			
80-90				Maroon hematitic shaley sandstone - calcareous - thin regular bedding											90		6.5					
90-100					⅛-½ ¼-1½R		¼-⅜R ¼-4" I		¼-2" R					Brown carbonate in most of the lenses	100		10					
100-110			TR												110		11.5					
110-120					⅛-¼ ¼-10R				¼-2" R					Banded iron formation 4" in 140	120							
				Maroon hematitic shale & red jasper bands (30%)											128.5							
				Maroon hematitic shale.					⅛-3" R					Banded iron - mostly jasper	130		8.5					
				Maroon hematitic shale to cornalo mercator shale containing bands of red jasper ¼-2" thick.					¼-1½R					Banded jasper	138							
120-130			TR						¼-1½R					Host waste is red jasper rocks - a few have hematite or carbonate cores trace of brown carbonate (½" irregular bands)	140		10					
130-140					⅛-¼ ¼-1 R				¼-2" R					Banded iron formation 3-4" of medium brown conglomerate shale at 139.5'	150		10					
140-150															152		4					
				F.S. maroon mottled green & maroon sandstone - w.s. light brown					⅛-1" R						156		1					
150-160			TR		⅛-½ R ⅛-6" I									Many regular to irregular lenses of red jasper & green hematite - banded iron form. Brown carbonate lenses & bands - a few 1x6" brown carbonate lenses.	157		10					
							¼-1" R		⅛-½" R						167		10					
160-170					⅛-¼ ¼-1½R				¼-½ R					Hematite or carbonate in a few of the lenses & beds e.g. at maroon brown shale at 183.0	177		10.5					
170-180				Conglomeratic shale and low grade maroon hematite & jasper.											187.5		2.5					
				Sandy maroon shale to calcareous grey green very fine sandstone, thin (⅛") bedding, cleavage											190		0					
180-190					¼-⅜ ¼-1 R		⅛-¼ 1-10" R		¼-2 I					Light brown carbonate bands in iron formation - high in maroon hematite	200		10					
190-200															210		5					
				F.S. maroon shale - traces of sand (<2 mm) black to dark green fragments W.S. light brown											215		2.5					
200-210					¼-1 ½-8		⅛-1" R		¼-1" I					Large lenses (½ x 3') of carbonate.	217.5		8.5					
				F.S. maroon conglomerate. Fragments subangular 1-2 mm of rock.											226		4					
210-220					⅛-¼ ¼-½ I		⅛-¼		¼-4 R					Some of the lenses and ovoids have carbonate centers.	230.5		10.5					
															241							
220-230				Clastic iron formation slightly calcareous fragments 1-2 mm composed of red jasper & carbonate occasional fragments to ½ in shale and carbonate											241		1		1751			
															244		3					
230-240			TR		⅛-½ ¼-1 R		⅛-½		¼-3 R						249.5		2.5		1752			
				Clastic iron formation, fragments red jasper											251.5		1.5		1753			
240-250				Conglomerate w.s. brown f.s. maroon sub angular to round make up 60% of rock, composed of flakes carbonates, red jasper & some maroon hematite. Matrix calcareous maroon shale jasper fragments to 3 ft.										Fragments 1 mm - 3 ft	264		10		1754			
															274		12		1755			
250-260															286							
					⅛-¼ ¼-2" R		⅛-¼ R		⅛-2 R					Some carbonate in the lenses.	294.5		8.5		1756			
260-270					⅛-1 ¼-4		⅛-1" R								298.5		4		1757			
				Shale to siltstone f.s. maroon w.s. brown gray slightly calcareous											302		3.5		1758			
270-280					⅛-½ ¼-6 R		⅛-¼ R								310		8		1759			
				Conglomeratic shale in places to shale maroon w.s. gray fragments (1 mm - 3") sub-angular to rounded, shales contain hematite matrix maroon shale, poor bedding to 10° at 250' there is a lens of w.s. light brown shale, f.s. maroon, this bed pinches and swells (1 - 3 ft) and disappears under a covered interval, runs for at least 250 ft calcareous													320		10		1760			
280-290				At 315 ft there is a discontinuous band 2 ft wide of jasper w.s. light brown f.s. maroon shale. The shale & jasper are in band 1 ft thick that pinches & swells and does not follow the bedding.											330		10		1761			
															339		9		1762			
290-300					⅛-½ ¼-3		⅛-½ I		½-5" I						348		9		1763			
					⅛-½ ¼-2		⅛-¼ R		2 - 95% bands ¼-½ R					Some carbonate in loose rock has been leached out	358		10		1764			
300-310															368		10		1765			
			TR	TR	⅛-¼ ¼-4 R				⅛-¼" R						378		11		1766			
310-320					⅛-¼ ⅛-½ R		⅛-¼ R							Carbonate in ovoid centers.	389		9		1767			
				Hematitic shale w.s. - gray f.s. - maroon										Waste is carbonate bands & sand included with hematite	391		2		1768			
				Hematitic shale											393		3		1769			
320-330				Maroon shale											396							
330-340																						
340-350																						
350-360																						
360-370																						
370-380																						
380-390																						
390-400																						
400-410				F.S. maroon conglomerate fragments rounded to sub angular shales 80% of rock. Matrix maroon shale																		
410-420																						

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 135 - 63
DESCRIBED BY GIBBINS & GORVEATT
MEASURED BY GIBBINS & GORVEATT
AIR PHOTO No A 12148 - 150 FL 11(2)
AREA 1½ Miles NE of Camp
WEATHER RAIN - INTERMITTANT SNOW

DATE STARTED Aug 3/63
DATE COMPLETED Aug 3/63
MEASURING RATE 7 hrs.
COORDINATES 83,700 E, 110,900 N
CLAIM K - 13

ROCK TYPES

Ovoids: Aligned Lenses: Unaligned Lenses: Bands:

IRON FORMATION, JASPER, CONGLOMERATE, BRECCIA, SANDSTONE, SILTSTONE, SHALE, LIMESTONE, DOLOMITE, COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW f
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE August 3, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0-10															CONGLOMERATE FRAGMENTS (75%) (¼"-4") ANGULAR TO SUBROUNDED, MOSTLY RED JASPER, ALSO QUARTZITE & SHALE, ETC CALCAREOUS MATRIX.								
10-20															THIN LAMINATED GREEN & BROWN SILTSTONE. CONGLOMERATE (5%) DARK BROWN SHALE								
20-30															INTERBEDDED DARK BROWN SILTY & RED JASPER, BANDS (¼-1½")								
30-40															THIN SANDSTONE - MEDIUM TO COARSE GRAINED, SURROUNDED GRAINS OF HEMATITE & RED JASPER - CALCAREOUS								
40-50															CONGLOMERATE FRAGMENTS (15%) (¼"-4") ANGULAR TO SUBROUNDED - INCLUDE LIGHT GREEN SHALE & LIMESTONE MATRIX, DARK BROWN SHALE								
50-60															SANDY (25%) DARK BROWN SHALE								
60-70															BANDED IRON FORMATION								
70-80															MAROON DARK MAROON BROWN SHALE								
80-90															2% LARGE BRIGHT RED JASPER LENSES TRACE OF CARBONATE OVOIDS. LAST 1' IS 20% ¼-½" MAROON JASPER BANDS. 50% OF WASTE IS QUARTZ & RED JASPER PATCHES. SHREDDED DOLO 75% RED ½-1½" BROWN CARBONATE BANDS @ 27.0' - 85.2'								
90-100															2% BROWN CARBONATE NODULES - WHICH PROVIDE PITS ON WS. SOME RED JASPER OVOIDS HAVE QUARTZ &/OR METALIC HEMATITE IN CENTERS. TRACE OF BROWN CARBONATES BANDS.								
100-110															MARKER SANDSTONE (V3) BROWN - GRAY, F.G. GRAY WITH PURPLE PATCHES MEDIUM TO COARSE GRAINED, SUBROUNDED GRAINS, BEDDING, FLANE CLEAVAGE (1½-3½') TOP OF INTERNAL BEDDING POOR TENDING TO BE MASSIVE.								
110-120															BORDERS OF VESICULAR - (CALCITE)? & VESICULAR QUARTZ. SOME SMALLER OVOIDS HAVE HEMATITE IN THE CENTER. BROWN CARBONATE NODULES PRODUCES A BOTRYOIDAL SURFACE. A THIN CARBONATE BAND IS WEATHERED - PRODUCING A NODULAR APPEARANCE. ALSO 1.0' DOWN THERE IS A 3.0' BAND OF GREEN BROWN SHALE (NOT CALCAREOUS). RED JASPER BORDERS ALONG THE MAROON BANDS.								
120-130															GRAY SHALE (V3 - DARK BROWN F.S. DARK BROWN → PURPLE, TENDING TO BE MASSIVE. NOT CALCAREOUS. SOME MAROON BANDS ARE BORDERED BY RED JASPER. RELICT STRUCTURE TO ROCK IS FAIRLY HIGH. SOME SMALL AMOUNTS OF QUARTZ. SOME OVOIDS HAVE HEMATITE CENTERS IRREGULAR PATCHES OF RED JASPER & SMALL AMOUNTS OF QUARTZ.								
130-140															CONGLOMERATE, DARK BROWN & MAROON FRAGMENTS (40%) (¼"-6") SUBANGULAR TO SUBROUNDED. PEBBLES HAINST, JASPER, DOLOMITE, SANDSTONE ETC. MATRIX - JASPER, SHALE (CHERT) - FRIABLE HOWEVER ALSO LARGE BANDS OF JASPER (15%). SOME OF THE JASPER OCCURS IN IRREGULAR PATCHES. ABOUT 20% JASPER BEDS ALONG STRIKE ARE IRREGULARLY FOLDED HORIZONTAL TO VERTICAL POSITION.								
140-150															CENTERS IN SOME OVOIDS ARE WEATHERED OUT. SOME LENSES ARE WEATHERED OUT AND THE INTERVAL HAS THE APPEARANCE OF DRAG								
150-160															LENSES (TRACE OF SULPHIDE)								
															NR THIS COULD BE UNCOVERED! HEMATITIC CONGLOMERATE, SANDY, SHALE (15% SANDY) BROWN (CAL.) BROKEN & STAINED OF PYRITE?								
160-170			TR												ABOUT 15% OF REMAINING WASTE IS IRREGULAR BLOTCHES OF RED JASPER ALSO MAROON BANDS BORDERED WITH IRREGULAR RED JASPER BANDS. ALSO A CONGLOMERATE LENSE (1'-3' LONG & 0-2' THICK)								
170-180															BROWN SHALE - RED PARTICLES OF BROWN CARBONATE (¼-1") MATRIX - SANDY MAROON SHALE, SLIGHTLY HEMATITIC, ES. PURPLE TENDING TO HAVE BANDED APPEARANCE. SOME OVOIDS HAVE CARBONATE CENTERS. RED JASPER ABUNDANT AND COULD BE DESCRIBED AS IRREG. BANDS.								
180-190															HEMATITIC CONGLOMERATE. FRAGMENTS (10%) (¼"-1") SUBANGULAR. PEBBLES GREEN SHALE, CARBONATE, QUARTZ. MATRIX - MAROON HEMATITIC SHALE. BECOMES MORE HEMATITIC TOWARDS THE END OF INTERVAL								
190-200															75% OF WASTE IS BASICALLY IRREGULAR RED & MAROON JASPER PATCHES. SOME MAROON PATCHES HAVE RED JASPER BORDERS.								
200-210															CONGLOMERATE FRAGMENTS (35%) (¼"-3") SUBANGULAR TO ROUNDED. PEBBLES MAINLY LIMESTONE, GREEN SHALE, QUARTZ. ALSO A BOND OF (¼"-3") CONSISTING OF RED & MAROON LENSES. MAROON LENSES HAVE CENTRES WITH A LARGE % BEING HEMATITE. ALSO MANY OF THE RED LENSES ARE WEATHERED OUT. (RED LENSES 35%, MAROON LENSES 15%)								
210-220			TR	TR											BANDS MAROON - ½"-2" (40%) RED JASPER ½-2" (10%) 5% OF WASTE IS IN CARBONATE BANDS (LIGHT SANDY BROWN) SOME LENSES ARE WEATHERED								
220-230															N.B. SECTION IS COVERED FROM 229.0' MARK DOWNWARD EST TO 250' - MAROON SHALE OUTCROP.								

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 136-03
DESCRIBED BY R BRAY & W GIBBINS
MEASURED BY A GORVEATT
AIR PHOTO No A 12148 (12") - 213
AREA EAST SIDE - Gypsum BLUFF CREEK
WEATHER POOR - RAINY

DATE STARTED JULY 18, 1963
DATE COMPLETED JULY 30, 1963
MEASURING RATE 5 HRS.
COORDINATES 114 - 300 N
CLAIM U - 11

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
CHERT
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

VEINLETS

QUARTZ Q
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e Even boundary between Jasper and Hematite
I - IRREGULAR - i.e Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125°, 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 5 *
DATE JULY 18, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and CONC	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and CONC	ALIGNED LENSES THICK RANGE	BANDS AMT and CONC	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0												MASSIVE, POORLY BEDDED CONGLOMERATE. 75% WELL ROUNDED TO SUB ANGULAR PEBBLES OF SILTSTONE, DOLOMITE, SHALE & QUARTZITE, FROM 76" to 1" DIAMETER. MATRIX CALCAREOUS, SANDY, SHALE. W.S. GREEN, BROWN. F.S. DK GREEN.	0							
10			TR		1/8"-1/4"	R			1/4"-2"	R I		NON-CALCAREOUS, VERY CRUMBLY LIGHT BROWN SHALE, WEATHERED. F.S. GREEN TO BROWN.	9.5		9.5'		2791			
20												25% RED & MAROON JASPER IN IRREG. PATCHES MAROON HEMATITE SHALEY IN PLACES.	22.5		2.0'					
30												DARK BROWN, NON-CALCAREOUS & NON-CALC. WEATHERED. GRADES FROM SANDY TO FINE-GRAINED.	26.0		3.5'		2794			
40												AS ABOVE. VERY CRUMBLY.	29.5		3.5'		2794			
50												AS ABOVE	33.0		3.5'		2794			
60			TR		1/16"-3/16"	R			1/8"-1"	R I	10"	15% +/- RED & MAROON JASPER IN IRREG. PATCHES MANY IRREG. LENSES & PATCHES CARBONATE (GUM WHITE -> SIDERITE ?).	42.0		10.0'		2792			
70													52.0		10.0'		2793			
80													62.5		10.5'		2795			
90												MANY IRREG. PATCHES & LENSES OF CARBONATE (LIMONITE)	72.5		12.0'		2796			
100												SANDY, DARK BROWN SHALE. TRACE OF JASPER BANDS, 1" WIDE	76.5		4.0'		2797			
110			TR		1/16"-1/8"	R			1/4"-1"	I		LOW-GRADE IRON THICK SHALY CLASTICS	86.5		10.0'		2798			
120			TR		1/16"-1/8"	I			1/4"-3/4"	I			89.0		2.5'					
130												LOW-GRADE IRON FORMATION	96.5		1.0'		2995			
140												DARK BROWN SHALE W.S. GREENISH TO DARK BROWN	97.5		1.0'		2996			
150					1/8"-1/4"	R			1/4"-3"	I S			100.0		2.5'		2997			
160												DARK BROWN SHALE, MAROON HEMATITE CONTENT INC AT TOP & BOTTOM	101.0		1.0'		2998			
170					1/8"-1/4"	I			1/8"-1/2"	I		RESISTANT JASPER BAND	106.0		5.0'		2999			
180												STREAKS OF RED & MAROON TENDING TO BECOME IRREGULAR.	108.0		2.0'		2940			
190												DARK MAROON SHALE. SANDY, 80% TO CONGLOMERATIC <5%	116.0		8.0'		2941			
200												CONGLOMERATE @ 195.0								
210												CONGLOMERATE (GREYISH TO GREENISH (W.S.)) BOX FRAGMENTS OF SUB-ANGULAR TO SUB-ROUNDED DARK BROWN & GREEN SHALE, WHITE QUARTZ, RED JASPER (WHITE & GREEN CALCAREOUS SANDSTONE, ALSO LIGHT REDDISH-BROWN QUARTZ. MATRIX VERY CALCAREOUS LIGHT BROWN SHALE.	124.0		8.0'		2942			
220																				
230												TRACES OF DARK BROWN SHALE MARBLE								
240																				
250					1/4"-1/2"	R			1/8"-1/2"	R I		THREE STREAKS & PATCHES OF RED & MAROON JASPER, SOME RIMMED BY CHALCEDONIC WHITE	132.0		9.0'		2943			
260					1/4"-1/2"	R			1/8"-1/2"	R I		SLICKEN SIDE COMMON ALONG STRIKE FAULT (?)	140.0		8.0'		2944			
270					1/4"-1/2"	R			1/2"	I		TRACES OF SHALE MARBLE								
280																				
290																				
300																				
310												DECOLLEMENT ROCK FRAGMENTS UP TO 1/2 CENTIMETER. BROWN SHALE MATRIX								
320																				

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF. 137-63.
DESCRIBED BY GIOBINS
MEASURED BY PFAFF.
AIR PHOTO No A 12148 - FC (11) - 183
AREA Headwaters Gypsum Bluffs Creek
WEATHER RAINY, WINDY / CLOUDY, COLD.

DATE STARTED July 18, 1963.
DATE COMPLETED August 15, 1963.
MEASURING RATE 10 hours for 337'
COORDINATES 114, 300N 92A00E
CLAIM N-12

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 6
DATE July 18, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	% OVOIDS	UNALIGNED LENSES: AMT PER COMP	UNALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: AMT PER COMP	ALIGNED LENSES: THICK RANGE	BANDS: AMT PER COMP	BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER. DATA: LEN RUN	ENGINEER. DATA: No RUNS	ENGINEER. DATA: % REC	GRADE ANALYSIS: SAM No	GRADE ANALYSIS: Fe	GRADE ANALYSIS: S.G.	GRADE ANALYSIS: P
0												Conglomerate & Maroon shale.							
10												Sandstone. W.S.: Dark greenish brown fine to medium grained, calcareous. F.S.: Light to very dark green. Fine to medium grained, calcareous. Iron formation, trace of carbonate in some bands. Sandy I.Fm. - Waste is medium to coarse sand grains of red jasper (30%) and Calcite (30%) + pebbles (3"-1/2") of light green shale (+ 30%). I.Fm. - SHALY MAROON HEMATITE	0 / 3 / 9 / 17 / 19	3 / 6 / 8 / 2	100 / 100 / 100 / 100	1658 / 1659 / 1660 / 1661			
20												Conglomerate: Fragments (1/2"-1"x3" (30%?), subrounded to rounded Brown shale, jasper etc. Matrix: 150 medium to coarse Ca sandy Brown & green SHALE. ENTIRE MASS HEMATITIC SHALE. Dark chocolate brown SHALES	26	7 / 9	100 / 100	1662 / 1663			
30												Conglomerate: Same as (19.0' - 26.0'). Banded I.Fm. 45°SE Trace of carbonate.	35	12	100	1664			
40												Light grey calcareous sandstone (shaly & medium grained) Weathers Dull Dark Brown. Bedding plane average (45°/ 12°)	47 / 50	5 / 11	100 / 100	1665 / 1666			
50												Iron formation: First 1' is mostly jasper.	63 / 65	2	100	1667			
60												Shaly Iron formation. Most of the maroon jasper lenses have red jasper borders. Maroon hematite (50.0' - 73.5'). Rounded pebble (1"x 8") of dark green shale at 73.0'.	73.5 / 76 / 85 / 92.5 / 94 / 96	10.5' / 2.5' / 2.5' / 7 / 1.5 / 2'	100	1668 / 1669 / 1670 / 1671 / 1672 / 1673			
70												Dark Brown SHALE. Conglomerate: Dark maroon brown shale matrix (78.0' - 80.0'). Conglomerate: (77.4' - 78.0'). Conglomerate: (77.6' - 78.0'). 4 lenses (cong.). Banded maroon hematite, jasper & carbonates (78.0' - 80.0'). I.Fm. along strike! Some ovoids & lenses have calcite borders.	96	9' / 10.5'	100 / 100	1674 / 1675			
80												NOTE: 103.0' - 105.5', Dark Brown SHALE.	115	10'	100	2191			
90												10-15% of iron is specular. Calcite in some of lenses and ovoids. Also lenses as patches.	125	11'	100	2192			
100												Light brown carbonate.	135	10'	100	2193			
110												151.5 - 153.0' 3" 1" (12) bands of Light brown Carbonate (?) Sample separated.	145	10'	100	2194			
120												F.S. - Fine grey calcareous sandstone (shaly). W.S. - Maroon, brown, green, pebbles & clasts - grained top to bottom.	155	11'	100	2195			
130												Jasperoid I.Fm. Some specular hematite.	165 / 167.5	2' / 14'	100	2196 / 2199			
140												DARK BROWN SHALE.	167.5 / 174.5	7'	100	2200			
150												3-8" Bands of Sandy maroon SHALE (10%).	174.5 / 177	2.5' / 10'	100	1776 / 1777			
160												Conglomerate Fragments (80%) (4"x 2") to (1"x 3") subrounded to rounded Bands & blocks of I.Fm. especially near the bottom of the unit. Matrix is brown Carbonates, Ankerite, Siderite (5%), Sandstone, red jasper. Boulder composed of Jasperoid, quartz, F.S., quartzite & igneous rock. Matrix is a Dark Brown SHALE, W.S. is covered by vuggy calc. BROWN SHALE.	177 / 184	10'	100	1778			
170													184 / 214	6.5'	100	1780			
180												10-15% CLASTIC bands Fragments (1/2"-1") most SHALE matrix	220.5 / 228.5	10'	100	1782			
190												Dark Brown SHALE slightly sandy to Conglomeratic locally.	238.5 / 246.5	8' / 10'	100	1783 / 1784			
200												Maroon jasper lenses, very irreg. - red borders.	248.5 / 262.5	14' / 10'	100	1785 / 1786			
210												Partially covered large lumps of cong. rubble probably slumped out of the bluff above. Cong. contains 80% subrounded to rounded pebbles & clasts, composed of Sandstone, quartz, jasperoid, quartzite, recrystallized, & siliceous & some pebbles of igneous origin. Matrix is brown to grey Dark Br. SHALE grading to S.S. in places.	272.5 / 282.5	10' / 10'	100	1787 / 1788			
220												Some carbonate waste as lined patches, bands are contorted and appear to undulate in places.	286.5 / 290	4'	100	1789			
230												Poor I.Fm. - Contorted bands & patches of I.Fm. with lenses (1/4" wide) of Siltstone & Shale. Thin bands of Shale, quartzite with lenses & irreg. patches of Jasper & Carbonate material.	290 / 297	7.0' / 11.0'	100	1790 / 1791			
240												UNDERLYING MATERIAL SEEN: Mostly covered by rubble of cong. which contains 75% subrounded to rounded pebbles & clasts composed of Jasperoid, quartz, F.S., quartzite & igneous rock. Matrix is a Dark Brown SHALE grading to a Dk. Brown S.S. In places massive & poorly bedded.							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No I.F 138-63
DESCRIBED BY GIBBINS
MEASURED BY GIBBINS
AIR PHOTO No A 12148 - FL (12)² - A12148
AREA WEST DISCOVERY CREEK
WEATHER POOR - RAIN / WINDY COLD

DATE STARTED JULY 17, 1963
DATE COMPLETED AUG 14, 1963
MEASURING RATE 700 ft / 6 hrs
COORDINATES 138,000 N's 118,500 E
CLAIM X-6

ROCK TYPES

OOLITES
ALIGNED LENSES
UNALIGNED LENSES
BANDS
IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
QUARTZITE
SHALE
LIMESTONE
DOLOMITE
GNEISS

% HEMATITE

SIZE: GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MAROON JASPER & QUARTZ

VEINLETS

QUARTZ Q
CARBONATE -
HEMATITE H
PYRITE P
MANY M

BOUNDARIES R - REGULAR - i.e Even boundary between Jasper and Hematite
I - IRREGULAR - i.e Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125° / 25° W
FAULT STRIKE / DIP eg 125° / 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relief feature measured left to right as percent of total Hematite
Percent Ooloids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 11
DATE AUG. 14, 1963

METRES	LITHOLOGY	% HEMATITE	% RELIEF	OOLOIDS	UNALIGNED LENSES: ABT. NO. PER 1/2 FOOT	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: R/I	ALIGNED LENSES: ABT. NO. PER 1/2 FOOT	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: R/I	BANDS: ABT. NO. PER 1/2 FOOT	BANDS: THICK RANGE	BANDS: R/I	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
700														(DARK) SANDSTONE W.S. RUST BROWN F.S. GREY WELL ROUNDED Q.F.S. GRAINS SUB METALLIC LUSTRE ON SOME SURFACES, BUT NO VISIBLE HEMATITE (IN P.S.) SLIGHTLY CALCAREOUS.									
710														VERY JASPEROID I.F. CONTAINS MANY SILTSTONE BANDS & CALCAREOUS LENSES. BANDS OF CRYSTALLINE HEMATITE.								
720														MASSIVE CONGLOMERATE W.S. BROWN F.S. BROWN. FRAGMENTS (70%) (¼" - 8") ROUNDED TO WELL ROUNDED. JASPER, CHERT, JASPER, QUARTZITE, MATRIX CALC. SANDY ARGILLACEOUS									
730																						
740																						
750																						

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 139-63
DESCRIBED BY GIBBINS
MEASURED BY BRAY
AIR PHOTO No A12148-(1,[63])-183
AREA 2 miles NE of CAMP
WEATHER 3/10 Cloud, Sunny, Windy

DATE STARTED AUG. 8, 1963
DATE COMPLETED AUG. 8, 1963
MEASURING RATE 206'/8 hr.
COORDINATES 112, 400N, 83, 800E
CLAIM L-12

ROCK TYPES

OVOIDS : o o o
UNALIGNED LENSES : ⬭
ALIGNED LENSES : ⬭⬭
BANDS : ═

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

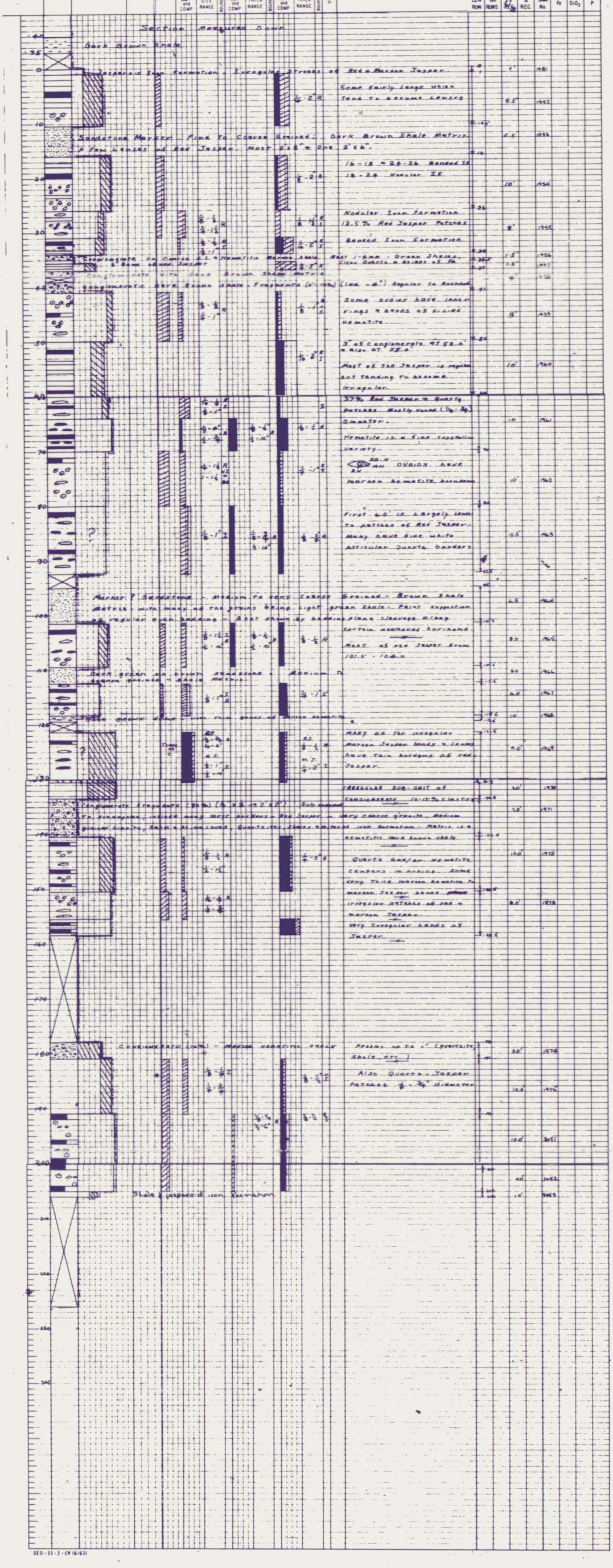
QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4
DATE AUG. 8, 1963



GEO-23-2-CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF-147-63
DESCRIBED BY A. Gorrell
MEASURED BY D. Pfaff
AIR PHOTO No. A 12106-(W2)-315
AREA East of Discovery Creek
WEATHER Sunny

DATE STARTED August 9/63
DATE COMPLETED August 9/63
MEASURING RATE 100'/HR.
COORDINATES 111,800 N, 148,100 E
CLAIM II-12

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e Even boundary between Jasper and Hematite
I - IRREGULAR - i.e Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict Texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 2

DATE August 9 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No. RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-155-63 — DATE STARTED August 11/63
DESCRIBED BY A. Gorreatt — DATE COMPLETED August 11/63
MEASURED BY D. Pfaff — MEASURING RATE 150'/3 hrs.
AIR PHOTO No. A 12106-(14³)-315 — COORDINATES 115,000 N; 148,600 E
AREA West of Discovery Creek — CLAIM II-11
WEATHER Foggy later on sunny

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
- BEDDING STRIKE / DIP — eg 125°/25°W
- FAULT STRIKE / DIP — eg 125°/25°E
- BRECCIATED ZONE
- HALOS OF JASPER
- SPHERULITES
- FRACTURING
- ACCESSORIES - Calcite, Dolomite, Siderite, etc.
- LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug. 11, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS
0-10															Quartzite (?) grey-white, fine-grained, siliceous. Bedding (?) strike/dip 130°/11° S
10-20															Conglomerate, light brown to gray. Fragments 35%, ¼"-4". Subangular, subrounded. Pebbles - quartzite, carbonate & quartzite. Matrix - maroon shale. Coarse arkose, grading to gray-maroon shale. Chert head of conglomerate.
20-30															Hematitic maroon shale. Large bands of red & maroon jasper (½-3"). Small bands of maroon hematitic shale. Few (1%) pebbles & streaks of red jasper.
30-40															Ferruginous (carbonaceous) Cherty breccia. Fragments (20%), ⅛"-2". Angular to subrounded. Pebbles - red jasper, carbonate, sandstone, etc. Matrix - relict sandy shale. Grades into a coarse-grained sandstone.
40-50															Ferruginous (carbonaceous) quartzite. Poor I.F. mainly jasper bands.
50-60															Sandstone - W3 - Dark Brown. F.S. - Gray. Medium - Coarse grained & calcareous. Bedding ½"-2"
60-70															Sample 64-65 - Ferruginous coarse grained sandstone. Sample 65-67.5 - Calcareous & massive patches of jasper.
70-80															Red jasper borders on maroon bands. Birch & Secette.
80-90															Green shale - W3 - light brown, F.S. green & dark green. Slightly calcareous & crumbly. 25% of waste in irreg. patches of jasper. Trace of carbonate.
90-100															Some carbonate.
100-110															Hematitic conglomerate - very fine, almost approaching a coarse sandstone. Fragments 60% subrounded, (4 mm) Pebbles - carbonate, hematite, jasper mainly. Matrix - sandstone. Slightly calcareous. West beds is poor iron formation with the conglomerate being interbedded. Also a large carbonate pebble. (5" x 6")
100-110															25% of waste in irreg. patches of red & maroon jasper.
110-120															Conglomerate - dark green. Fragments (40%) subrounded (⅛" - 2") Pebbles - mainly quartzite & carbonate. Matrix - dark brown, fine grained calcareous sandstone.
120-130															Bedded as I.F. 2 6", exposed under the conglomerate (101.5 - 105.0).
130-140															Conglomerate - dark brown. Fragments (40%) subrounded to rounded. Pebbles mainly quartzite & carbonate. Matrix: dark brown, fine grained calcareous sandstone.
130-140															15% of waste is in irreg. patches of red & maroon jasper.
140-150															Ferruginous sandstone, grades from a coarse grained to a fine grained type. Like if present maps. Hematitic. Tends to be banded. Grades into poor I.F.
150-160															Poor jasperoid iron F.m. 75% waste is due to large irreg. patches of red jasper. Also 25% carbonate & red jasper leases (aligned)
160-170															Hematitic conglomerate. Maroon - metallic fragments 25% (⅛-6"), Angular to subrounded (mostly 2-6"). Pebbles are quartzite, carbonate, & Matrix - ferruginous, calcareous, maroon shale.
170-180															
180-190															Conglomerate - maroon. Fragments (20%) (⅛-1"). Pebbles: carbonate & green shale. Matrix - maroon shale (calcareous)
190-200															
200-210															
210-220															
220-230															
230-240															
240-250															Conglomeratic shale, grading into a conglomerate with a maroon shale matrix.
250-260															
260-270															

ENGINEER DATA: LEN RUN	No RUNS	FT REC.	% REC.	CRUDE ANALYSIS: SAM No	Fe	SiO₂	P
0-10							
10-20		5'		1521			
20-30		3'		1522			
30-40							
40-50		6'	1523				
50-60		10'	1524				
60-70		10'	1525				
70-80		3.5	1527				
80-90		5'		1528			
90-100		1.5'		1529			
100-110		3'		1530			
100-110		9'		1531			
110-120		3.5'		1550			
120-130		3.5'		1552			
130-140		10'		1553			
140-150		10'		1554			
150-160		5.5'		1555			
160-170							
170-180							
180-190							
190-200							
200-210							
210-220							
220-230							
230-240							
240-250							
250-260							
260-270							

CREST EXPLORATION LIMITED
IRON ROCK LOG CHART

SECTION No. IF-156-63
DESCRIBED BY A. Barcroft
MEASURED BY D. Platt
AIR PHOTO No. A18804-(143)-315
AREA West of Discovery Creek
WEATHER Sunny, windy

DATE STARTED August 12/63
DATE COMPLETED August 12/63
MEASURING RATE 140'/4 hrs.
COORDINATES 117,200 N; 147,200 E
CLAIM II-10

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug. 12, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	% OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	No. RUNS	FT REC	% REC	CRUDE ANALYSIS: SAM No	Fe	SiO_2	P
0															Section Measured Down Cinnamon & ferruginous maroon shale - Grades into a hematitic, conglomeratic maroon shale - Pebbles of jasper, green shale, etc. Medium grained sandstone - Dark grey, massive & slightly calcareous fine red & green shale ?? N.B. Quartzite, pat crops 150' down the first iron formation. Strike/dip 90°/vert S Lower iron formation - waste due to bands (1" - 4") of jasper and ferruginous shale. Green shale, going to a maroon shale - Non-calcareous			4.5		1532			
10															Light brown conglomerate - Fragments (20%), (1/16" - 3") angular to sub-rounded, consisting of green shale, carbonate, red jasper, etc. Matrix is maroon shale (non-calcareous) Conglomerate - Light brown - Fragments (15%) (1/16" - 2"). Sub-angular to sub-rounded consisting of carbonate, green shale etc. Matrix - Calcareous, maroon shale. Bands appear to be mechanical cut, caused incessant difficult to measure true dip & strike. No mineralization. Slight faulting??			12		1533			
20															Jasperoid iron formation - Bands of jasper contain small lenses (1/16" - 1/8" by 1/4" - 1/2"). Also interbedded sandstone. Grey sandstone - medium to coarse grained. Bedding dips at 70° (1/4" - 1/2") grading into a massive sandstone - slightly calcareous.			5		1534			
30																		10		1535			
40															Ferruginous sandstone - Appears as small pebbled conglomerate with pebbles of hematite & jasper. Also grades from the sandstone above. Has bands of red jasper. Calcareous.			10		1536			
60															Same as above in grades into a maroon ferruginous iron formation			5		1537			
70															25% of waste occurs in irregular patches of red Jasper. Also a thin band (2") of green shale. Maroon lenses have main red jasper borders.			10		1538			
80															Red lenses have light colored borders.			9		1539			
90															Conglomeratic (brecciated) sandstone? Calcareous - Particles heavily red stained, some hematite and carbonate. Contains pebbles up to 2" (carbonate) Lens of hematite (3" by 1/4") in a red jasper band. Slickensides found near Bi but not in place! Slickensides occurs along strike.			4		1540			
																		2.5		1541			
100																		7.5		1542			
110															Conglomerate - Small pebbles - Fragments 25% sub-angular to rounded. Matrix - ? green shale (calcareous) Also Jasper lenses and ?? Conglomerate lenses (up to 2") Also Jasper beds (>6") carbonate weathering in the interval			2.5		1543			
																		10.5		1544			
															Ferruginous shale - Bedding (1/4" - 1/2") to massive calcareous - Also thin bands of Jasperoid iron formation. Fresh surface grey - Conglomerate (basal) fragments (30%) subrounded to rounded (1/8" - 2") consisting of shales, carbonate & quartzite.			5		1545			
120															Shaly iron formation - A lot of interbedded waste is jasper and ferruginous shales - Also large fragments of hematite at 123??. Formation is badly fractured.			10		1546			
130															Conglomerate (tectonic) Maroon shale matrix - Beds are pinching and swelling.			4.5		1547			
140					True										25% of waste occurs as irregular patches of Jasper and carbonate Poor iron formation.			11.5		1548			
150															Conglomerate. Ferruginous fragments (15%) (1" - 5") Subangular to sub-rounded. Pebbles - green shale, red jasper carbonate, etc. Matrix is hematitic maroon shale - calcareous. Measuring down from conglomerate at 142.5' Conglomerate dips at approximately 21° At 21° - small band of brecciated iron formation. (2" exposed) - Stringer band. Below iron formation - large pit shows conglomerate. Fragments (15%) (1" - 3") sub rounded to rounded. Pebbles - jasperoid, quartzite, jasper but mostly a green shale of unknown ??? Matrix - sandy, calcareous, shale								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-157-63
DESCRIBED BY G. Sutherland
MEASURED BY G. Sutherland
AIR PHOTO No. A 12,106 - (FL 14') - 315
AREA Head waters Discovery Creek
WEATHER 2/10 Cloud light breeze

DATE STARTED August 11/63
DATE COMPLETED August 12/63
MEASURING RATE 50'/hr.
COORDINATES 111,320 N; 138,700 E
CLAIM F.F. -12

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug 12, 1963

INTERVAL ft	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER. DATA LEN RUN	ENGINEER. DATA No RUNS	ENGINEER. DATA FT REC	ENGINEER. DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0														Overburden 50 ft								
														Upper grey to maroon sandstone, calcareous, conglomeratic, lenses up to 2" thick. Pebbles and fragments are subangular to subround. 40% voids. Matrix is brown, calcareous, fine to medium grained sandstone. Pebbles are dolomite, jasper, shale, quartzite, & some gneiss (trace)									
10														Upper grey to maroon sandstone, calcareous								
20																						
30																						
														Hematite conglomerate, calcareous, fragments are angular to subangular Pieces of jasper are up to 1 1/2" and hematite 1/4". 20% waste is dolomite & siderite. 40% hematite									
40																						
50																						
60																						
70																						
80																						
90																						
100																						
110																						
120																						
130																						
140																						
150																						
160																						
170																						
180																						
190																						
200																						

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-158-63
DESCRIBED BY G. Sutherland
MEASURED BY G. Sutherland
AIR PHOTO No. A 12106-(FL 14³)-315
AREA Headwaters Discovery Creek
WEATHER Clear sky Light breeze

DATE STARTED August 12/63
DATE COMPLETED August 13/63
MEASURING RATE 50'/hr
COORDINATES 113,500 N; 142,800 E
CLAIM GG-12

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS: BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

DATE AUGUST 12, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	GRADE ANALYSIS: SAM No	GRADE ANALYSIS: Fe	GRADE ANALYSIS: SiO_2	GRADE ANALYSIS: P
0															QUERLYING BEDS OF SO FT PLUS - RED WK CONGLOMERATE - CALCAREOUS - PEBBLES: BRK ROUND TO SUB-ROUND - FRAGMENTS: UP TO 1 FT IN DIAMETER - PEBBLES: CHERT, SHALE, DOLOMITE, QUARTZITE - MATRIX: BROWN SHALE								
0											L½" R		L3" R		STRIKE 147° DIP 19°N	0		4		2978			
4															BROWN CALCAREOUS CONGLOMERATE PEBBLES UP TO 3" IN DIAMETER - 40% PEBBLES FRAGMENTS ROUND TO SUB-ROUND. MATRIX BROWN SHALE, GREEN CONGLOMERATE BAND UP TO 3"	4		2		2979			
6																6							
10																10							
20																20							
26																26							
28															BROWN SHALE NON-CALCAREOUS	28		2		2980			
34					L1" R						L5" I				VERY POOR IRON A 5" BAND OF CALCAREOUS BROWN SANDSTONE AT 33'	34		6		2981			
															- GREY BANDED CALCAREOUS SANDSTONE - BANDS REF. MAROON SHALE - FRESH SURFACE IS GREY WHILE WEATHERED SURFACE IS BROWN			8		2982			
43																43							
															- FERRUGENOUS SANDSTONE - CALCAREOUS - PARTICLES OF DOLOMITE AND SIDERITE ARE WEATHERED OUT			10		2983			
50																50							
53																53							
54																54		6		2984			
63																63							
70															STRIKE 150° DIP 19°N UNALIGNED LENSES AND PATCHES ARE UP TO 3" LONG			10		2985			
73																73							
80					L1" R			L½" R			L½" R							11.5		2986			
84.5																84.5							
90																							
94.5					L½" R			L½" R			L1" R					94.5		5		2987			
99.5																99.5							
108															MAROON SHALE NON-CALCAREOUS CALCAREOUS - WK PEBBLE - SHALE, DOLOMITE - FINE GRAINED CONGLOMERATE - ¼" IN DIA. - POORLY WEATHERED	108		1		2988			
110					L2" R			L½" R			L2" R					110		1		2989			
114.5																114.5		4.5		2990			
120															- GREEN MARKER SANDSTONE - CALCAREOUS - A JASPER LENSE UP TO 6" THICK AT 118.5'	120		1		2991			
128																128		8.5		2992			
136.5					L1" R			L½" R			L½" R				STRIKE 153° DIP 23°N PATCHES ARE UP TO 2" LONG	136.5							
140																							
150															- CALCAREOUS MAROON CONGLOMERATE - 40% PEBBLES - PIECES ARE UP TO 1" IN DIAMETER - FRAGMENTS ARE ROUND TO SUB-ROUND - SHALE, CHERT, QUARTZITE, DOLOMITE, JASPER PEBBLES - MATRIX BROWN SHALE								
160																							
170																							
180																							
190																							
200																							
210																							
217																							
221															IRON AND JASPER LENSING FROM 6" TO 4'								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF-159-63 — DATE STARTED August 14/63
DESCRIBED BY G. Sutherland — DATE COMPLETED August 14/63
MEASURED BY H. Klassen — MEASURING RATE 60'/hr
AIR PHOTO No A 12106-(FL. 14³)-315 — COORDINATES 113,200 N; 137,400 E
AREA Headwaters Discovery Creek — CLAIM
WEATHER 2/10 Cloud Warm Light Breeze

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 3

DATE AUGUST 14

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No. RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS S&M No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0-2.5	O·O·O		BROWN CALCAREOUS CONGLOMERATE											PEBBLES ARE QUARTZITE, SHALE, JASPER, DOLOMITE, CHERT, (IRREGULAR) DIORITE FRAGMENTS UP TO 2 FT. IN DIAMETER 40% PEBBLES SUB ROUND TO SUB ANGULAR MATRIX BROWN SHALE							
2.5-5			GREY CALCAREOUS SANDSTONE											WEATHERED SURFACE IS BROWN WHILE FRESH SURFACE IS GREY								
5-10					¼" R						<2" R			AT 2' THERE IS A 1" BAND OF FERROUS SHALE STRIKE 135° DIP 4°S	2.5		2.5		4993			
10-14.5																	12		4994			
14.5-26.5			GREEN MARKER SANDSTONE												14.5							
26.5-36.5			CALCAREOUS												26.5		12		4995			
36.5-37.5	O·O·O		HEMATITE CONGLOMERATE 30% HEMATITE											CALCAREOUS SUB ANGULAR FRAGMENTS OF JASPER UP TO ½" AND HEMATITE TO ¼" IN THE WASTE IS DOLOMITE AND SIDERITE 40% HEMATITE	36.5		10		4996			
37.5-40															37.5		1'		4997			
40-48															40		6		4998			
48-54	O·O·O		GREEN CALCAREOUS CONGLOMERATE											PEBBLES ARE SHALE AND DOLOMITE SUB ROUND TO SUB ANGULAR PIECES UP TO ½" IN DIAMETER MATRIX GREEN SHALE 30% PEBBLES	48		6		4998			
54-57					<½" I		<½" I			<½" I				Very poor shale iron Pellets and lenses up to ½" long.	54		.5		4999			
57-60															57							
60-70																						
70-77.5																						
77.5-85					<½" I		<½" R			<2" I R				Lenses up to 3" long. Strike 130° Dip 10°S	77.5		7.5		5000			
85-90															85							
90-100			GREEN MARKER SANDSTONE														10		1376			
			CALCAREOUS												90							
100-110															100		10		1377			
110-120			Brown calcareous conglomerate												110	L	4		1278			
120-130			Grey calcareous conglomerate, pebbles up to 1" diameter Green fine arenaceous matrix Sub-rounded pebbles are Grey quartzite, shale, dolomite, Calcareous grey shale fragments Veinlets up to ½" thick and 4" long												120	L	2		1279			
130-140					<½" R		½-2" R			<½" R					130	L	7		1280			
140-150			Brown calcareous conglomerate, pebble, rounded to sub-rounded fragments of dolomite, shale, quartzite, jasper, granite, chert, shale, diorite												140	L	10.5		1281			
					<2" R		<½" R			<½" R				Pebbles are up to 3" long, calcareous veined shale and quartzite	150	L	2.5		1282			
150-160			Brown non-calcareous conglomerate 40% pebble up to 6" diameter Contains at iron formation and jasper lenses												160	L	8.5		1283			
					<2" R		<½" R			<5" R				Contains up to 2" lenses discordance along strike	162.5	L	2.5		1284			
			Maroon shale, non-calcareous												165	L	3		1285			
					<½" R		<½" R			<1" R					167.5	L	2.5		1286			
			Grey slightly calcareous conglomerate												170	L	4		1287			
					<½" R		<½" R			<3" R					172.5	L	2.5		1288			
			Marron calcareous conglomerate, 30% pebbles up to ½" Hematite maroon shale												175	L	2.5		1289			
180-190			Non-calcareous ferruginous maroon shale												180	L	5		1290			
															185	L	5		1291			
190-200			Brown calcareous conglomerate																			
			Cover and conglomerate from 170 on.																			

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF - 160 - 63
DESCRIBED BY Folinsbee
MEASURED BY Folinsbee
AIR PHOTO No. A 12148 - (132) - 272
AREA Discovery Creek
WEATHER Sunny

DATE STARTED August 21/63
DATE COMPLETED August 21/63
MEASURING RATE 350'/5 hrs.
COORDINATES 119,600 N ; 124,000 E
CLAIM Z - 9

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug. 21, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT ONE COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT ONE COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT ONE COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0															Conglomerate: Weathered surface brown, fresh surface maroon; Fragments 10% shales rounded (¼" - ½") Matrix Poorly bedded (⅛") Maroon non-calcareous shale.								
											½ - 5	R			very shaly maroon hematite grading to shale	0							
																4.5		4.5		1481			
10															Dacite sandstone - slightly calcareous Weathered surface white fresh surface dark gray Poorly bedded - 1 Shot.								
20																							
30																							
40					¼ - 1 ¼ - 3	I					½ - 4				3 bands of ferruginous sandstone about 2" wide	40							
					⅛ - ¼ ¼ - 3	R		⅛ - ¼	R		½ - ¾	R			Ovoids have hematite centers.	42		12	1982/1983				
50																52		7	1983/1984				
															Ferruginous Sandstone (patchy iron formation) slightly calcareous	54.5		2.5	1984/1985				
											½ - 1	R			shaly iron formation	57.5		3	1985/1986				
															Conglomerate: - Weathered surface brown, Fresh surface maroon								
60															Fragments 30% ¼" - 6" shales subangular to round.	63.5		6		1986			
															Shaly iron formation								
70																74.5		11		1987			
					¼ - 1 ¼ - 4	I		⅛ - ¼	I		¼ - ½	R			FS. Brown Jasper containing Carbonate								
80																84.5		10		1988			
90																94.5		10		1989			
																97.5		3		1990			
100					¼ - ½ ¼ - 1	R		¼ - ½	R		½ - ½	R			Dark grey green carbonaceous shale with away Seams			1		1991			
															Strike 145°. Dip 12° SW Carbonate in upper 2½ Patchy Red Jasper								
110															Calcareous conglomerate, W.S. Brown, Fragments with Well rounded ¼ round ¼ - 8", occasional Jasper fragments to 3" Matrix finely bedded maroon shale	107		8.5		1992			
120																							
130																							
140																							
150																							
160					¼ - 1 ½	I		¼ - 1	I		¼ - ½	R			Bed is leaning.	165							
																177		12.5		1994			
170															Carbonate calcareous sandstone Fragments to conglomerate with away N.S. maroon Shale fragments to 4" boulders of Jasper Rare (1) Jasper to 12" and chert and small beds of maroon hematite ¼ - ½	181.5		4		1995			
															Conglomerate - W.S. maroon; Finely bedded (⅛") Fragments 5% Sub-angular to round 1mm to 8" Matrix micro-calcareous shale								
180																							
190																							
200															Same as sandstone from 181.5 to 200.								
210					¼ - 1 ½ - 5	I		¼ - 1	I		¼ - 1	R		S	Bed leaves from 180 to 215 ft. Many of the bands are broken loose. Bands have maroon centres and red exteriors	205							
																219		10		1994			
220															Very calcareous conglomerate, W.S. Fragments ¼ - 2" Cementation poor to moderate	225		4		1995			
																226		4		1996			
					¼ - 1 ½ - 4	I		¼ - ½	I		½ - 1	R		S		233							
230																		10		1997			
																241		4		1998			
240															Conglomerate W.S. Dark Grey Fragments ½" shale ¼" - 1½" well rounded matrix abundant gray shale								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF - 161 - 63
DESCRIBED BY A. Gerreatt
MEASURED BY R. Bray
AIR PHOTO No. A 12148 - (12")-211
AREA Headwaters of Bluff Creek
WEATHER Warm and Sunny

DATE STARTED August 24/63
DATE COMPLETED August 24/63
MEASURING RATE 40'/hr
COORDINATES 113,200 E ; 107,400 N
CLAIM V - 14

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 3
DATE Aug 24/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: BOUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: BOUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: BOUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No. RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
0	Dust/ring 10'# (~80% [illegible]) Conglomerate: Light brown to grey. Fragments 65% (¼" - 4") Subangular to subrounded. Pebbles are: jasper, quartzite, igneous, sandstone & carbonate. Matrix is sandy.																						
10	Dust/ring 60# (~15" to 0") Sandstone: W.S. - Dark - grey brown. F.S. - Dark grey. Medium grained, massive & siliceous.				¼-½"	R					¼-½"	I			Some ovoid with carbonate centres. 25% of waste due to carbonate weathering (once at limonite)			5'		1908			
20	Last 10' of light brown conglomerate. Fragments (80%) ¼" - 2", subangular to angular - pebbles, greenstone & quartzite mainly. Matrix: maroon calcareous sandy.				⅛-¼"	I					¼-½"	R			Some carbonate weathering.								
					½-¾"													9'		1909			
	Shale: W.S. - Brown to maroon. F.S. maroon. Bedding: (¼" to massive)				¼-½"	R			½-1½"	R					Some voids are of hematite, 10% waste in irregular patches of red jasper. Also limonite patches??			2'		1910			
					½-¾"													10'		1911			
					¾-1¼"	R									10% of waste occurs in patches of carbonate			7'		1912			
40					½-¾"																		
					Ovoids with maroon jasper centers. Flow structures on lines of ff. 40% of waste occurs in irreg. patches & streaks of few % jasper.													2½		1913			
50	Sandstone Bedding: (½" - ½") W.S. - Grey - brown to massive, medium grained, & calcareous. F.S. - light grey																	25'		1914			
60					¼-½"	R			¼-1"	R					30% of waste occurs in lower patches of carbonate, sandy etc. 10% occurs in mainly maroon jasper patches			10'		1915			
70					¼-½"													5'		1916			
80																							
90																							
100																							
110																							
120																							
130																							
140																							
150	Shale: W.S. - Dark grey, brown F.S. - Light grey to maroon. Calcareous & massive.																						
160	Glacial conglomerate: F.S. - Brown grey (Slightly metallic) Fragments (20%), (¼" - ½") Subang to angular. Pebbles are: quartzite, greenstone, & carbonate. Matrix: maroon shale (freeze/thaws) & calcareous																						
170																							
180																							
190																							
200																							

GEO - 23 - 2 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-162-63
DESCRIBED BY Folinsbee
MEASURED BY Folinsbee
AIR PHOTO No. A 12148 - (12") - 211
AREA Tributary Bluff Creek
WEATHER C.A.V.U.

DATE STARTED August 24/63
DATE COMPLETED August 24/63
MEASURING RATE 140'/4 hrs.
COORDINATES 110,600 N; 106,900 E
CLAIM S-12 and T-12

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 3
DATE Aug. 24, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS
0															
10															
20															
30															
40															
50															
60															
70															
80															
90															
100															
110															
120															
130															
140															

ENGINEER DATA				CRUDE ANALYSIS			
LEN RUN	No RUNS	FT REC	% REC	SAM No	Fe	SiO_2	P
0							
4		4		1976			
7.8		3.5		1977			
11.6		10		1978			
15.5		8		1979			
23.5		12.5		1980			
38		4		1981			
42		9		1982			
46		C		1983			
48.5		1.5		1984			
50		2		1985			
52.5		2		1986			
54.85		1.5		1987			
56.5		1.5		1988			
59.0		2.5		1989			
60		1					
74							
76		1		1990			
86		10		1991			
96.5		9.5		1992			
98.5		1.8					
107		8.5		1993			
115		8		1994			
116.5		1.5		1995			
118		1		1996			
120		2		1997			
122.5		2.5		1998			
125		2.5		1999			
127.5				2000			

GEO - 23 - 2 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-163-63 (IF-40-62) DATE STARTED August 26/63
DESCRIBED BY E. C. Gronberg (reported from Ottawa) DATE COMPLETED August 26/63
MEASURED BY D. A. Darwin MEASURING RATE 140/5 hrs.
AIR PHOTO No. A 12148-L12(2)-211 COORDINATES 100, 400 N; 118, 100 E
AREA North of Iron Creek 7 miles East of Camp CLAIM X-16
WEATHER Warm Cloudy in afternoon becoming overcast

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite.

REMARKS: BEDDING STRIKE / DIP ..... eg 125°/25°W
FAULT STRIKE / DIP ..... eg 125°/25°E
BRECCIATED ZONE .....
HALOS OF JASPER .....
SPHERULITES ***
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

PAGE 1 OF 3
DATE Aug 26/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No. RUNS	ENGINEER DATA FT. REC.	ENGINEER DATA % REC.	CRUDE ANALYSIS SAM No.	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
160															Dark brown (reddish) shale interbedded with conglomerate.								
150																							
140															Underlying jasperoid iron band (Varies from 1'-2') 5-10% hematite (½ red ± ½ maroon jasper) Dark brown massive shale with a few banks of interbedded conglomerate. Occassional boulders up to 1' ϕ	141 / 139		2.0		3157			
130																							
120					Conglomerate with a few interbedded shale banks. Fragments - if 20% calc., boulders up to 8", green shale, quartz, yellow shale (limonite), Few Ca veinlets. Matrix - dk maroon brown shale. Dk maroon brown non calc. shale.	122 / 120		2.0		3156			
110					Top marker sandstone. Fine grained, calcareous, sticky green sandstone. Usk: brown green. Fault(??) 130° (vertical dip) SW side. Contact between S.S & following beds lost in fault zone.	115		9.5		3155			
100						104		7.0		3154			
90						97		7.0		3153			
80						90		6.5		3152			
70					Dk brown shale with chlorite(?) - non calc. poor bedding. Jasperoid iron formation. Few ovoids but mostly red & maroon jasper bands & patches. tends to be quite shaly.	83.5		7.5		3151			
60						76		2.0		3150			
50						74		2.5		3149			
40						71.5		4.5		3148			
30						67		5.0		3147			
20						62		10.0		3146			
10					Very coarse sandstone or maroon brown conglomerate. Many green & maroon shale fragments. Slightly calc. Few Ca veinlets. FS - grey green to brown green. Bedding indistinct. Becomes fine grained sandstone to siltstone to shale @ top of interval. (MARKER SANDSTONE ?)	52		10.0		3145			
0						42		9.0		3144			
-10						33		9.5		3143			
-20						23.5		7.5		3058			
						16.0		2.5		3042			
						13.5		7.5		3041			
						6.0		1.5		3056			
						4.5		6.5		3055			
						0		2.0		3054			
						-2							

Dk brown massive non calc. shale. Few (<1%) green shale frags. Lenses grade into bands in places. Beds are dragfolded producing 8-10' displacement. Felsic at bridseye. Slickensides strike 122° Dip 33°

Slightly hematitic dark brown conglomerate shale. Fe brown slickensides @ ~2Fe.

Underlying beds are of a dark brown conglomerate.

SECTION MEASURED UP!

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-164-63
DESCRIBED BY Bray
MEASURED BY Bray
AIR PHOTO No. A 12148-(11²)-181
AREA Remnant between Gypsum and Bluff Claim 0-6
WEATHER C.A.V.U.

DATE STARTED August 28/63
DATE COMPLETED August 28/63
MEASURING RATE 30'/hrs.
COORDINATES 129,500 N; 93,600 E

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug. 28, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS
0															OVERLYING BEDS - INCHES - DIPPING GENTLY EAST ON EAST LIMB OF SYNCLINE
10															CORRUGATED BANDS ABUNDANT - INTERTWINED HEMATITE SLICKENSIDES
20															20'-27' TOP OF THIS INTERVAL CONTAINS INTERBEDDED BLACK SHALE AND A FISSILE BLACK SHALE ONE 1" BAND OF RED JASPER AND MINOR HEMATITE AT 24' FC NO LOSS (SILTY) 23
30															ABUNDANT FINE SPHERULITES SHALE 27.5-28.5 AND COMPOSE 55% WITH SHARP LITE FORMERLY TOWARDS THE BASE LOWER 5% ROUNDED
40															FAULT AT 34' WITH 1' VERTICAL DISPLACEMENT
50															RED JASPER HEMATITE LOSS
60															50'-60' CONGLOMERATE CONTAINS 10% SUB ROUNDED TO ROUNDED PEBBLES OF JASPER, SILTSTONE, LARGE LENSES, ETCHED AND VEINLETS OF HEMATITE. CONGLOMERATE MATRIX NON-CALC SLIGHTLY FERRUGINOUS GROUPY SHARP, POORLY BEDDED
70															LOW LOSS ON HOLE
80															VERY FINE CRUSHED SILICEOUS CALC SANDSTONE, PARTIALLY FOLIATED (Clay Bx ?)
90															SAME AS 82'-91' WITH 5% TO 10% LENSES
100															COARSE CONGLOMERATE 55% PT BROWN TO GRY
110															
120															FRIABLE BROWN, SOFT SHALE WITH A CAST OF SILICIFICATION TO CONGLOMERATE AT TIME BASE 6' 95' CONG WITH FRAGMENTS 1/4" - 1/2" MAROON & GREEN FRAGMENTS (PEBBLES ?)
130															VERY FRIABLE NON-CALC GRAY BROWN SHALE FS CLAY
140															TWO 2" BANDS OF HEMATITE SEPARATED BY 12" OF SOFT MAROON HEMATITE AND FERRUGINOUS SHALE INTERBEDDED
150															BROWN SANDY NON CALC SHALE FS CLAY, BROWN
160															VERY GRAY TO BLUE WEATHERING MARLY LIMESTONE 5%
170															CONGLOMERATE CONTAINS 10% SUB ROUNDED TO ROUNDED PEBBLES OF CHERT, SILTSTONE, SHALE FRAGMENTS AND LENSES OF HEMATITE. MATRIX IS BROWN SILTY FISSILE FERRUGINOUS SHALE
180															50% RED & MAROON JASPER VEINS IN BOTTOMS
190															LOWER IRON BAND ?
200															LOSS 100% 82 193-198
210															10' 5" COVERED TO STRONG MARK 100% BOTTOMS 75% SUBROUNDED TO ROUNDED PEBBLES FINE 1" TO 1/4" CLAST OF CHERT, SILTSTONE, SHALE FILTERED OTHERS, UNEVENLY BROWN MATRIX MARL BROWN SUBCALC WEATHERING WITH SMALL BLOCKS

ENGINEER DATA: LEN RUN	No RUNS	FT REC	% REC	CRUDE ANALYSIS: SAM No	Fe	SiO_2	P
0							
5.5		4		3218			
13.5		8		3211			
19.5		4		3212			
23.5		6		3213			
27.5		3.5		3214			
28		10		3215			
38		5		3216			
43		1.5		3217			
44.5							
77.6		9		3222			
86.5							
119.5		3.5		3223			
123		5		3224			
128		4.5		3225			
132.5							
140		12		3158			

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-165-63
DESCRIBED BY A. Gorrealt
MEASURED BY A. Arthur
AIR PHOTO No A 12148 - (12⁴) - 213
AREA West side Bluff Creek
WEATHER Sunny Windy

DATE STARTED August 28/63
DATE COMPLETED August 28/63
MEASURING RATE 40'/hr.
COORDINATES 125,000 N; 99,700 E
CLAIM Q - 7

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS: BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4
DATE Aug. 28, 1963.

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC.	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0												OVERLYING BEDS CONGLOMERATE Dark brown to maroon. Fragments (upto 60%) (¼" - 4") subrounded to subangular in fine grained sandy matrix. Pebbles are: Greenstone, dolomite, shale (sandstone)								
10												Approx. 30% of siliceous waste in irregular patches of maroon jasper & red halos.	0 10'				1919			
20												Ovoids with weathered-out centers. 15% of waste in red jasper patches.	20 10'				1920			
30												Weathered surface, mainly due to weathered-out ovoid centers. 10% of waste in carbonate patches & red jasper stringers.	30 9.5'				1921			
40												SANDSTONE very fine grained (Siltstone) forming approximately 5% of the rock. W.S. Gray & light brown. Fx. Light gray, greenish gray & maroon. Contains thin beds of shale (0.1" to ½" thick) up to 2.0' thick and 20% of the rock. Sandstone beds decrease significantly	39 5.5'				1922			
												Traces of limonite.	44 5.0'				1923			
												Weathered-out patches.	49 7.5'				1924			
50												SILTSTONE wx. Reddish-brown. Fx. Gray to maroon. Rare very non-calcareous.	56.5 2.5'				1925			
												Some slicken-sides! 25% of waste occurs in masses & patches of red jasper.	59 4.5'				1889			
60												Light Brown Sandy Conglomerate Fragments (30%) ¼" - 3" subangular to subrounded. Pebbles are: shale, red jasper, dolomite, sandstone & green stone. Matrix: ferruginous calcareous maroon shale NB - Conglomerate appears to ramp? at the bed approaches the bluff at the ridge	63.5								
70												Shale and crumbly but not sure if it was in place?								
80																				
90																				
100																				
110																				
120												Conglomerate: Light Brown (surface weathered rough). An interesting conglomerate with fragments (30%) ¼" - 2" subangular mainly. Pebbles are: red jasper, greenstone, shale, and sandstones. Matrix: sandy & calcareous.								
130																				
140																				
150																				
160																				
170																				
180																				
190																				
200												Conglomeratic Shale: Maroon & slightly ferruginous. Fx: Maroon to reddish, calcareous.								
210												Conglomerate: Light Brown to Grey Fragments (10%) ¼" - 1" subangular to subrounded. Pebbles are: green sandstone, dolomite, dark greenstone. Matrix: MAROON SHALE, very calcareous								
220																				
230												UPPER IRON BAND Weathered & pitted surface also a carbonate lens (1" to 4" apart) 10% of waste occurs in large patches of red jasper & carbonate.	228 10'				1890			
240												25% of waste is in weathered out bands & patches of carbonate.	238 10'				1891			
250													248 6.5'				1892			
260												Same: Light Brown, Fx: Dark Br. Non-calcareous. Also a thin band of conglomeratic shale. Horizontal "pasp-like" drag striations on vertical surface from (256' - 258') 10% waste in red jasper streaks & patches. SANDSTONE Light Brown, coarse grained, massive (1' thick) CALCAREOUS	254.5 1.5' 256 2.5' 258.5				1893 1894			
270												Shaly maroon conglomerate Fragments (10%) ¼" - 1" subangular to subrounded mainly. Pebbles are: shale, sandstone, dolomite, greenstone mainly. Matrix: calcareous MAROON shale								

BFD-39-3-PB (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-166-63
DESCRIBED BY R. Bray
MEASURED BY A. Fryling
AIR PHOTO No. A 12148-(13")-272
AREA Discovery Creek
WEATHER C.A.V.U

DATE STARTED August 29/63
DATE COMPLETED August 29/63
MEASURING RATE 30'/hr
COORDINATES 117,300 N, 132,000 E
CLAIM CC-10

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE August 29/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0															Grey-white quartzite pebble followed by 20' of reddish brown, greyish sandstone. Unconformity covered by rusty, pulverized and decomposed FeF carbed to top of section. Interbed. Forming sandstone (Dark grey FeF Black weathering) Locally is rendrine with a platy cleavage) Sandstone is 12' thick.								
10															Dark brown weathering, fine grained non-calcareous sandstone F.S. dark grey								
20															Interbedded Kwartzose shale and maroon hematitic shale	0 to 7.5		1.5		3076			
																7.5 to 8.5		2.8'		3077			
																8.5 to 13.5		5.0		3078			
															Clastic conglomerate with fragments of red jasper, yellow carbonate matrix of maroon hematite	13.5 to 21.5		5'		3079			
															Conglomerate contains pebbles from ¼" to 2" composed of shale and quartzite. Matrix is brown ferruginous shale.	21.5 to 24.5		3'		3080			
30																24.5 to 29.5		4.5'		3081			
40															B.J. Brown jasper.	29.5 to 34.5		5.5'		3082			
50															DK. Gy. Black weathering platy non calc. S.S. F.S. - Grey. Grades to a conformable with the above. Lower boundary is MIDDLE MARKER BED	34.5 to 39.5		4.5'		3083			
																39.5 to 42.5		3'		3084			
60															Minor Carbonate waste as lenses.	42.5 to 47.5		5.0'		3085			
70																47.5 to 49.5		2'		3086			
80															DK. Gy. Black weathering platy non calc. S.S. F.S. - Grey. Grades to a conformable with the above. Lower boundary is MIDDLE MARKER BED. Contains quartz (pinch & swell).	49.5 to 53.5		4'		3087			
																53.5 to 55.0		1.5'		3088			
																55.0 to 64.7		9.8'		3089			
90																64.7 to 72.2		7.5'		3090			
100																72.2 to 79.7		7.5'		3091			
110															Some carbonate waste in small lenses.	79.7 to 87.5		7.8'		3092			
120															Grey slightly calcareous to ferruginous non-calcareous at.	87.5 to 94.1		6.6'		3093			
															Slightly ferruginous grey calcareous sandstone separated by 1' broken hematite and red jasper at 2-6"	94.1 to 98.6		3.5'		3094			
															Carbonate zone interspersed with sandstone F.S. light grey weathering sandstone. Interbedded coarse ortho quartzose and maroon hematite with red jasper bands. Jasper bands 1" to 3" thick and 1' to 3' apart. Conglomerate contains 10% pebbles from ¼" - 3"	98.6 to 102.1		4.8'		3095			
130																102.1 to 109.6		7.5'		3096			
140															Brown weathering calcareous sandstone - some evidence of cross bedding. Shale stringers. F.S. light grey.	109.6 to 117.5		7.9'		3097			
150															Conglomerate contains 10% pebbles from ¼" - 3" Matrix is a crumbly calcareous brown shale - Massive and poorly bedded. (Below 270' to 305')	117.5 to 127.5		10.0'		3098			
160															Gradation of sandstone to conglomerate. Conglomerate contains 10% pebbles from ¼" to 2" composed of shale, sandstone, quartzite, dolomite, limestone and tuffaceous rock. Matrix is calcareous gray green sandstone. Pinches and swells along strike. Calcareous sandstone same as that from (139'-199') grades to a sandy brown shale with many shale stringers showing cross bedding.	127.5 to 137.5		10.0'		3099			
170																137.5 to 147.5		10.0'		3100			
180																147.5 to 157.5		10.0'		3101			
190																157.5 to 167.5		10.0'		3102			
200																167.5 to 177.5		10.0'		3103			
210																177.5 to 187.5		10.0'		3104			
215																187.5 to 192.5		5.0'		3105			

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-167-63
DESCRIBED BY E.C. Gronberg
MEASURED BY D. Ptaff
AIR PHOTO No A 12148-(FL 13")-172
AREA Discovery Creek
WEATHER C.A.V.U.

DATE STARTED August 29/63
DATE COMPLETED August 29/63
MEASURING RATE 330'/Shr
COORDINATES 123,100 N; 122,100 E
CLAIM Y-7

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 5
DATE Aug 29/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No. RUNS	ENGINEER DATA FT. REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0															Section measured down dip. Overlying beds of qtzite containing red jasper & siliceous (?) maroon hematite fragments.								
			Qtzite																				
											½-3"	R			35% birdseye of red jasper (1 siderite 3" band of coarse hematite 3.5' of base	5		2.5		3176			
	Conglomerate - 40-50% fragments of qtzite & maroon shale in dk maroon shale matrix. Calcareous															5							
															Occasional band of S.F. (Chin)	7.5		2.5		3177			
10																10		4.0		3178			
													R		50% birdseye (2% red & ½ maroon) interspersed in bands.	14							
	Slightly ferruginous dk maroon brown conglomeratic shale Slickensides Noncalcareous Undulates															16		3.0		3179			
			Tr										I		25% red jasper birdseye interspersed in bands.	18		2.0		3180			
20																20							
																24		6.0		3181			
	Jaspelite (60% maroon to 40% red) iron formation. Very coarse ferruginous sandstone (Mostly red jasper particles) 25% fine carbonate																						
30											¼-1	R	FC		birdseye interspersed in bands.	30							
																37		4.8		3182			
40			TR		⅛-¼ / ⅜-½		R				¼-3"	R / I			Some qtzite boxes hematite centres. Some carbonate replacement of ands & lenses.	45		6.5		3183			
			TR					TR			½-4	R / I				48		6.5		3184			
50																							
					⅛-⅙ / ⅜-½		R								25% carbonate patches.								
																54.5		6.0		3185			
60														EC FC	Trace of carbonate patches.								
					⅛-½ / ¼-3"		R	TR	¼-½ / 2"-1	R						60.5		4.5		3186			
			TR								¼-1"	R / I			Some carbonate replacement & patches.								
			TRI		⅛-½ / ¼-2"		R								25% red jasper patches Slight carbonate replacement	65		7.5		3187			
																67.5				3188			
70					⅛-½ / ¼-2"		R	⅙-⅛ / ⅛-3"		R / I					Aligned lenses in form of birdseye			6.5					
																73		5.0		3191			
			TR		⅛-½ / ¼-1		R	1/32-⅛ / ⅛-1		R / I	¼-2"	I			3-4" band of dk maroon brown shale at top of interval - undulates to 2" wide. 50% red jasper birdseye Some carb replace	78		4.0		3189			
80	Dk maroon brown calcareous massive shale 1-2" band of jasper at 79.0																						
											⅛-5	R			25% red jasper patches	82 / 83		1.0		3190			
	Conglomeratic shale. Fragments (2-5%) of green shale, argillite & chert in matrix of dk maroon brown noncalcareous shale.																						
90																							
100																							
110																							
120																							
	Conglomerate - 70% fragments of qtzite, carbonate, sandstone & shale in a dk maroon brown shale matrix Calcareous																						
130	Bf 130' conglomerate becomes slightly ferruginous. Fragments are subangular to rounded.																						
140																							
150																							
160																							
170	Grey green, fine grained, slightly calcareous Sandstone W.S. - brown																						
180																							
190																							
200																							
210																							
220																							
230	Siltstone at top grading into silty shale Slickensides																						
240																							
250																							
260																							
270																							
280	Conglomeratic siltstone to shale becoming conglomerate with 15% fragments of qtz. sandstone, shale and carbonate in a dk brown maroon noncalcareous shale matrix.																						
290																							
300					⅛-½ / ¼-2"		R				¼-2½"	I				300		2.0		3192			
	Dk brown maroon calcareous shale															302		5.0		3193			
310																307		10.0		3195			
					⅛-½ / ¼-3"		R / I				¼-3"	R / I			Some carbonate replacement trace of red jasper birdseye. Most of maroon jasper bands have red jasper borders.								
320																317		8.0		3196			
					⅛-¾ / ¼-1		R / I				½-2"-1	I			Some carbonate replacement.	325		8.0		3196			
330																333							
	Conglomerate with a thin band of shale (dk. maroon brown) at the top of the interval																						

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF-168-63
DESCRIBED BY A. Gorveatt
MEASURED BY A. Gorveatt
AIR PHOTO No. A 12148 - (132) - 272
AREA Discovery Creek
WEATHER Sunny

DATE STARTED August 30/63
DATE COMPLETED August 30/63
MEASURING RATE 300/6 Hrs
COORDINATES 125,500 N, 115,700 E
CLAIM AA-10 & AA-11

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug 30, 1963.

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES BOUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES BOUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS BOUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No. RUNS	ENGINEER DATA FT REC.	ENGINEER DATA % REC.	CRUDE ANALYSIS SAM No.	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0															Conglomerate: w/red brown & maroon. Shaly near top of I.Fm. Fragments (12%) of F.F. rock, indicates to subrounded. Fragments consist of jasper, ironstone, cherty rock, etc. N.B. most pebbles are angular and pebble composition is dark green & has fragments (approx. ¼") within it. Matrix: MAROON calc. SHALE	0'							
10															Banded SANDSTONE: Light Brown alternating to dark grey. F.S.: Dk grey, Micaceous, calcareous, bedding ⅛" to massive near top of I.Fm.								
20																							
30																							
40															Ovoids have weathered out centres.	40'		5'		1995			
50															Conglomeratic shale: w/s: green with numerous small schist fragments (2-3mm).	45' 46		1'		1996			
60															Also a thin band (4.0") of green conglomeratic shale & schistose cut red jasper.			10'		1997			
70																56							
80															30% of waste in large patches of carbonate & red jasper.			5.5'		1998			
90																63½							
100															Conglomeratic texture in shaly Fm. Fragments (80%) (¼"-2") subang to subrounded in MAROON CALC. SHALE matrix. Bedding 0° - 5° to core axis.			8'		1999			
110															Aft. STRIKE 260°/ 13° S.W.								
120															Conglomeratic texture in shaly Fm. Fragments (80%) (¼"-2") subang to subrounded in MAROON CALC. SHALE matrix. Bedding 0° - 5° to core axis. Also about a 4" band of ½" fragments.	83' 85'		1.5'		1900			
130															mainly Jasperite Fm. 25% of waste in large patches & blebs (red/green jasper). Fragments (80%) (¼"-2") subang to subrounded in MAROON CALC. SHALE matrix. Slightly calc. maroon SHALE	85		3.5'		2001			
140																88.5							
150															Shaly I Fm. 10% of waste occurs in large patches & blebs of red jasper & a few large pieces of limonite. N.B. Placed bedding along strike (approximate) No marked beds.					2059			
160																103							
170															15% of waste occurs in carbonate patches & mainly red jasper patches			15'		2060			
180															Shaly I Fm. - waste is mainly in green (red jasper) lenses. Conglomeratic shale grading into a fragmentous slightly calc. MAROON SHALE.	113 114		1.5'		2061			
190															Ovoids over half are carbonate. Aligned lenses are carbonate & are together under an axis of limonite is present. Approx. 20% of waste is in carbonate bands & patches.			18'		2062			
200																159							
210															Lenses & bands are carbonate & chert or leached. 20% of waste in carbonate patches. Also a 6.0" band of Conglomeratic shale			10'		2063			
220																169							
230															MEASURED ALONG CREEK AND HOLE I.Fm. outcrops as appear, core is measured along strike, where the I.Fm. is cut (thus) one end of the line of measurement.								
240																							
250																							
260																							
270																							
280																							
290																							
300																							
310																							
320																							
330																							
340																							
350																							
360																							

Conglomeratic shale: w/s: green with numerous small schist fragments (2-3mm).

Also a thin band (4.0") of green conglomeratic shale & schistose cut red jasper).

30% of waste in large patches of carbonate & red jasper.

Aft. STRIKE 260°/ 13° S.W.

Conglomeratic texture in shaly Fm. Fragments (80%) (¼"-2") subang to subrounded in MAROON CALC. SHALE matrix. Bedding 0° - 5° to core axis. Also about a ½" band of ½" fragments.

mainly Jasperite Fm. 25% of waste in large patches & blebs (red/green jasper). Fragments (80%) (¼"-2") subang to subrounded in MAROON CALC. SHALE matrix. Slightly calc. maroon SHALE

Shaly I Fm. 10% of waste occurs in large patches & blebs of red jasper & a few large pieces of limonite. N.B. Placed bedding along strike (approximate) No marked beds.

15% of waste occurs in carbonate patches & mainly red jasper patches

Shaly I Fm. - waste is mainly in green (red jasper) lenses. Conglomeratic shale grading into a fragmentous slightly calc. MAROON SHALE.

Ovoids over half are carbonate. Aligned lenses are carbonate & are together under an axis of limonite is present. Approx. 20% of waste is in carbonate bands & patches.

Lenses & bands are carbonate & chert or leached. 20% of waste in carbonate patches. Also a 6.0" band of Conglomeratic shale

MEASURED ALONG CREEK AND HOLE I.Fm. outcrops as appear, core is measured along strike, where the I.Fm. is cut (thus) one end of the line of measurement.

Siltstone: Light Grey with green & brown. F.S.: Iron stn. non-calc. & massive.

20% of waste in stringers & patches of green jasper. Traces of limonite.

MAROON SHALE: w/s: Dark Brown. F.S.: MAROON. Non-calcareous in places.

Fine grained sandstone grades to coarse grained. w/s: Ironstone stn. F.S.: Dark grey, non-calc.

CONGLOMERATE: Blue-grey to green. Fragments: (30%) (¼"-2") subrounded to subangular. Fragments are: Quartzite, shale, cherty & leached rock, & sandstone. (20% are ¼" to ½" conglomerate & sandstone) Matrix: Calcareous MAROON SHALE

Primarily Conglomerate - grades into a large pebbled conglomerate.

Ferruginous cark shale, with veinlets of blurry CALCITE?

Ferruginous Shale: w/s: Dark grey to Reddish, maroony calcareous.

N.B. Most of F.F.S. shales etc. are intercepts and true thickness of beds was NOT taken.

Dark GRAY Ferruginous Conglomerate

Very ferruginous conglomeratic SHALE. F.S.: Maroon. W.S.: Reddish, Calcareous.

Insreeded I.Fm. a thin band of mainly red jasper. This band is deformed, could be a fold or slump?

MAROON FERRUGINOUS SHALE: w/s: Maroon to Light Brown. F.S.: Reddish, maroon. (Calcareous).

SANDSTONE: Quite hematitic, small amts. of red jasper & hematite interbedded with F.S. w/s: Grayish-yellow, F.S.: greenish-brown, very calcareous & fine grained.

Shaly Band: Shale with 25% jasper & hematite

N.B. Bedding varies from 0° to 15° to core axis. Bedding is band, ring band and bedding of ss. at 0° to 2° to core axis. Bedding is difficult to trace from wood - is sighted in approximations where shale, flaggy ss or cliff bed strike can be taken. Lateral structure ss of 45cm I.m band.

Stikensides! 25% of waste occurs in irreg. patches of red jasper & thin irreg. bands of carbonate.

STRIKE 108°/ 23° S.E.

MAROON Conglomerate: Fragments (30%) (¼"-2"), subang to subrounded pebbles are: ss, green shale, quartzite, red jasper, etc. Matrix: Maroon, calcareous SHALE

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No 1F-206-63
DESCRIBED BY WALTER GIBBINS
MEASURED BY FOLINSBEE, BRAY
AIR PHOTO No A 12148 FL(11)^2 -182
AREA 2 MILES N.E. OF BASE CAMP
WEATHER C A V U.

DATE STARTED AUGUST 12 1963
DATE COMPLETED AUGUST 12 1963
MEASURING RATE 8 hrs.
COORDINATES 87200 E 110500 N
CLAIM L 13

ROCK TYPES

OVOIDS ○○○ — UNALIGNED LENSES — ALIGNED LENSES — BANDS

IRON FORMATION, JASPER, CONGLOMERATE, BRECCIA, SANDSTONE, SILTSTONE, SHALE, LIMESTONE, DOLOMITE, COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE AUGUST 12, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No. RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
292	CONGLOMERATE, SANDSTONE, VERY JASPEROID, IRON FORMATION																						
290																							
285																							
280																							
275																							
273																							
270															IRON FORMATION HIGH IN MAROON HEMATITE								
265																							
261																261							
260																↓	8	1633					
255	FINE GRAINED DARK BROWN SANDSTONE																						
253																253							
250															RED JASPER LENS RESEMBLE CONGLOMERATE PEBBLES AT THE TOP								
245																							
240																							
235																							
229															A FEW SHALEY HEMATITE BANDS								
229	CONGLOMERATE (20% FRAGMENTS), (¼"-3") AND BROWN SHALE MATRIX PLUS BANDS 1"-4" OF RED JASPER AND HEMATITE															229							
223															6"-10" BANDS OF CONGLOMERATE (BROWN SHALE MATRIX)	223	6	1		1622			
217															EX 218, 220.5 + 223	220 ↓ 217	3			1631			
210															VERY IRREGULAR MAROON JASPER TO MAROON HEMATITE SOME OVOIDS HAVE HEMATITE AND/OR BROWN CARBONATE CENTERS	210 ↓ 205	5			1630			
200															SOME OVOIDS HAVE HEMATITE CENTERS								
196																							
180															SOME OVOIDS HAVE HEMATITE CENTERS								
175																							
170															BANDS OF WHITE QUARTZ OVOIDS 75% -1½-SAW PIECES OF RED AND MAROON JASPER								
167																							
160																160							
155	DARK BROWN SILTSTONE (TOP) TO SANDSTONE (BOTTOM). ALSO SLIGHTLY CALCAREOUS THIN PLATEY BEDDING PLANE CLEAVAGE (¼"-½") AT BOTTOM TO MASSIVE AND BLOCKY AT TOP															154	6	1629					
150															LIGHT BROWN CARBONATE OVOIDS AND MAROON JASPER BANDS TRACE OF IRREGULAR BROWN CARBONATE AND MAROON JASPER								
144																							
140															75% OF WASTE IS PATCHES OF RED JASPER (⅛"-2" TO 12") PLUS MINR QUARTZ								
135	MASSIVE DARK BROWN SHALE, SLIGHTLY CALCAREOUS															133.5	1.5	1628					
133.5															BANDED IRON FORMATION	132							
130																							
125																							
123																123							
120	CONGLOMERATE FRAGMENTS (½"-4") (¼"-¼") SUB ANGULAR TO ROUNDED, SHALE CARBONATE QUARTZITE MATRIX, IS DARK BROWN SHALE OF RED JASPER AND HEMATITE AT TOP TO CALCAREOUS AT BOTTOM														LARGE LENSES OF BOULDERS	↓	12	1628					
115																							
111															25% OF WASTE IS IRREGULAR PATCHES OF RED JASPER (⅛"-1½")	111 110	1	1627					
105																							
100															CHARACTERISTIC MAROON JASPER BANDS	104 ↓ 100	2	1627					
95																							
93.5															WASTE IS LARGELY THICK MAROON JASPER BAND, TRACE OF SHALE	93.5	1	1626					
90															97% WASTE IRREGULAR QUARTZ AND RED JASPER PATCHES ⅛"-½" SOME OF THE HEMATITE IS FINELY CRYSTALLINE (LOWER 2 CONTAIN MAROON JASPER BANDS. 15% WASTE IS IRREGULAR MAROON JASPER LENSES WITH RED JASPER BORDERS								
86																							
84	MASSIVE DARK BROWN SHALE														BANDED IRON FORMATION	84 83.5	1 5	1626 1625					
83																							
80																							
75																							
70																							
65																							
60																							
55																							
50																							
47	SAND (50%) TO CONGLOMERATE (IC DARK BROWN SHALE LOWER 3' (¼"-3") SUB ANGULAR TO ROUNDED, HEMATITE, QUARTZITE, CARBONATE ETC. TRACE OF SLICKENSIDES															47							
40																↓	9	1633					
38																38							
35															SIMILAR TO ABOVE EXCEPT WASTE IS 75% IRREGULAR STREAKS OF RED JASPER + MAROON JASPER LENSES	35	3	1632					
30															25% OF WASTE IS IRREGULAR STREAKS OF RED JASPER (SOME CONTAIN MAROON JASPER LENSES	↓	10	1631					
25																25							
20																							
15															TRACE OF MAROON JASPER OVOIDS								
11																							
4															SMALL 1/16"-¼" OVOIDS OF RED JASPER ⅓ ALIGNED ⅔ RANDOM ALSO IRREGULAR MAROON JASPER BANDS AND LENSES								
0	INTERBEDDED MAROON HEMATITE AND CROSS BEDDED CALCAREOUS SILTSTONE															4 ↓ -2	4	1630					

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. LF-207-63
DESCRIBED BY W. GIBBINS
MEASURED BY 1962
AIR PHOTO No. A-12148 (FL 11²)-182
AREA 2 MI. NE. of CAMP
WEATHER CAVU

DATE STARTED AUG 13/63
DATE COMPLETED AUG 13/63
MEASURING RATE 7 HRS
COORDINATES 110,400 N. 85,900 E.
CLAIM L-13

ROCK TYPES

Ovoids
Unaligned Lenses
Aligned Lenses
Bands

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE

SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4
DATE AUG 28-63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	No RUNS	FT REC	% REC	GRADE ANALYSIS: SAM No	Fe	SiO2	P
0															CONGLOMERATE FRAGMENTS: 5-10% TO 4" - MATRIX OF LIGHT GREEN & DARK BROWN SHALE								
5						¼-¾																	
10						¼-1½"R										110		10.0		1635			
15															MEDIUM GRAINED HEMATITE SANDSTONE - DARK BROWN TO MAROON COLOR. TRACE OF CONGLOMERATE	120							
20						¼-¾ R						¼-2" R			ALSO SOME IRREGULAR STREAKS OF RED & MAROON JASPER								
25						¼-2" R									SOME LENSES CONTAIN BROWN CARBONATE								
30						⅜-¾ R						¼-4" I											
35						¼-3" I						¼-2" R											
40												¼-2" R			BANDED JASPEROID I.F.	139.6		2.0		1634			
45															CONGLOMERATE - FRAGMENTS (5-25%) (¼-3") ANGULAR TO SUB ROUNDED MATRIX DARK MAROON BROWN SHALE	141.5		1.5		1637			
																143.5		2.0		1639			
50															CONTINUOUS BAND OF CONGLOMERATE (3-4" WIDE) AT 50'								
55												¼-2" R I											
60						⅜-½ ¼-6" R									BANDED FORMATION (IRON) 7" O± CONGLOMERATE (62.0-62.6) & (64.4-67.0)	152.0		2.0		1640			
																153.0		9.0		1641			
65															SHALE (69.5-70.0)	165		6.5		1642			
70																178.5							
75																							
80						¼-⅜ R																	
85						¼-1"																	
90						¼-⅜ R						¼-3" I											
95						¼-1" I																	
100						¼-⅜ R						¼-⅜ I											
105	GTI					¼-5"																	
												¼-1½ R I											
110															VERY FINE (TUF) TO VERY COARSE (CONGLOMERITIC) SANDSTONE (BOTTOM) SLIGHTLY CALCAREOUS - DARK GREYISH MAROON IRON FORMATION - PLANE STRATIFICATION 30-35°	167.0		7.0		1643			
115						⅜-½ ¼-7" I						¼-1" I			LIGHT BROWN CARBONATE & REDISH-MAROON JASPER MATRIX	174.0							
120																180.4		3.0		1644			
125												¼-5" R I				183.4							
130																188.0		2.0		1645			
															HAMINE LIGHT MAROON-BROWN SHALE - VARIABLE T & P MODERN-EARTHY BROWN COATING	191.0				1646			TRACE OF CALCITE
135																							
140				TR	¼-1 R ¼-2" I			⅜-⅜ ¼-10°				¼-2" R			IN PLACES RED LENSES LOOK LIKE CONGLOMERATE PEBBLES	191.0		9.0		1647			
145															CONGLOMERATE FRAGMENTS (25%) (¼-4") SUB ANGULAR TO ROUNDED, INCLUDES SUBMISSIVE SHALE, CARBONATE & LARGE LENSES (30%) ½" TO 2.8 OF RED JASPEROID IRON FORMATION (140.5-141.5) & (141.0-147.5) MATRIX - HEMATITE & SHALE								
150															RED IRON FORMATION - PEBBLES & IRREGULAR BANDS & PATCHES OF JASPER	193.0		2.5		1648			
155															CONGLOMERATE FRAGMENTS (30%) BROWN SHALE TO SANDSTONE MATRIX	196.0							
160				TR-BR	¼-⅜ ¼-15° R							¼-3" I			OVOIDS (4-10 MM) MICROCRYSTALINE SILICA & CARBONATE CENTERS								
165															NODULAR FORMATION IRON								
				BE																			
170															MASSIVE BROWN SHALE	217.0		1.0		1649			
175																218.0		6.8		1650			
180															JASPEROID IRON FORMATION - WASTE IS MOSTLY LARGE IRREGULAR STREAKS OF RED JASPER & CONGLOMERITIC & HEMATITE SHALE 50.0' NE								
185																							
190																							
195															CONGLOMERATIC & HEMATITIC SHALE - CONTAINS LARGE LENSES OF RED JASPEROID IRON FORMATION	199.6		10.8		1651			
200																							
205																208.3		4.0		1542			
															CONGLOMERATE FRAGMENTS (80%) (¼-3") MATRIX CALCAREOUS SHALE	209.0							
210																							
215															NODULAR IRON FORMATION TRACES OF CARBONATE								
220						⅛-⅜ R ¼-1½ I						¼-1½ R I											
225																							
230																							

GEO-23-2-CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-209-63 (IF-9-62)
DESCRIBED BY Gibbins + Sutherland
MEASURED BY 1962
AIR PHOTO No A 12148-(11²)-183
AREA Headwaters of Bluff Creek
WEATHER C.A.V.U.

DATE STARTED August 27/63
DATE COMPLETED August 27/63
MEASURING RATE 6 Ars.
COORDINATES 113,700 N.; 98,600 E
CLAIM P-12

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 8
DATE August 27 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC.	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
600															Conglomeratic Iron Sandstone - Matrix is rearse grained hematite and red jasper	626							
																		8.0'		2334			
620																618							
																		9.0'		2336			
640																609							
660																							
680															Large irregular bands and lenses from 2" to 5"								
															Upper member sandstone - slightly calcareous - medium grained - blocky cleavage ½" to 1½" - poorly banded and lensed 2"-6" beds barren of conglomerate								
700					½-2" I 1-10" R						½-3" R				- Trace of relict texture - Minor beds of shale								
																		8.5		2335			
720																							
																		10'					
740																							
																		10'		2331			
760																							
															Interbedded conglomeratic and hematitic maroon shale					2337			
					¼-1½ R vs ¼-½ I						¼-1½ R vs ¼-½ I												
780					¼-1" R						¼-4" R				- A 6" shale band at 429' & 425.5 - At 428.5' a band of brown conglomerate - Banded iron formation								
																		10'		2338			
800					½-1" I 1-2"						4" R				Some ovoids have metallic and maroon jasper centers - Trace of relict structure								
					¼-½" I						¼-½" I				Hematite matrix with 10% Chert - very fine to siltstone shale								
820					¼-½ I ¼-4"						¼-½ I				At 410-410.5' there is a band of brown shale; calcite ovoids - Trace of red ovoids - Trace of red BE (Hurds Eye)			2.0'		2346			
					½-¾ I ¼-4"						¼-½ R							10'		2333			
840					½-1½ R ¼-1½ I						½-1½ R				Ovoids have maroon jasper & hematite centers - 10% relict BE - with lenses are BE								
					½-½ R ¼-1" R						¼-2" R				- At 325' there is a 3" band of shale - 10% shredded dolomite			2.0'		2341			
860																		4.0'		2342			
																		4.0'		2343			
880																							
																		10.0'		2344			
900											¼-.5" R												
					¼-2" I ¼-1½ R			½-¾" R 1-6"							Nodular iron formation - few veinlets of quartz - Trace of red jasper BE (Hurds Eye)								
920					½-½ R ¼-1½ I						¼-2" I				Maroon lenses ½-1" long 1-10" long								
940																		10.0'		2345			
960																		10.0'		2346			
980																							
1000																							
1020																							
1040																							
1060																							
1080																							
1100																							
1120																							
1140																							
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1200																							
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2000																							
2020																							
2040																							
2060																							
2080																							
2100																							
2120																							
2140																							
2160																							
2180																							
2200																							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF 213-63 (w 13-62)
DESCRIBED BY W. (GIBBIE) GIBBINS
MEASURED BY 1962
AIR PHOTO No
AREA 3 MILES UPSTREAM FROM CAMP ON IRON CREEK
WEATHER CAVU

DATE STARTED Aug 9/63
DATE COMPLETED Aug 9/63
MEASURING RATE 7 hrs
COORDINATES 102,200 N , 95,200 E
CLAIM

ROCK TYPES

OVOIDS
UNALIGNED LENSES
ALIGNED LENSES
BANDS
IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e Even boundary between Jasper and Hematite
I - IRREGULAR - i.e Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands, measured left to right as percent of total Siliceous waste

DATE Aug 9/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES WIDTH	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES WIDTH	BANDS AMT and COMP	BANDS THICK RANGE	BANDS WIDTH	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0															HARD, DARK BROWN SHALE - TRACE OF CARBTIC FRAGMENTS - ½ - 4 mm & sm. ? RUBBLE ?								
10															SANDY (15%) & CONGLOMERATIC (UP TO 4-5") (25%) HARD HEMATITIC SHALE								
20															ABUNDANT LOW GRADE IRON. TRACE OF CLASTIC FRAGMENTS								
30															LIGHT SANDSTONE - COARSE GRAINED ANGULAR IRON FORMATION IRON FORMATION WITH IRREGULARLY ORIENTED LENSES &/or PEBBLES.								
40															LIGHT IRON FORMATION CONGLOMERATE WITH & MAROON HEMATITIC SANDSTONE MATRIX FRAGMENTS (25%) (1/32-2") ANGULAR TO SUB-ANGULAR SHALE, CHERTZITE, LIMESTONE, SANDSTONE, ETC								
50																							
60																							
70															FINE TO MEDIUM GRAINED CALCAREOUS SANDSTONE W.S. DARK GREENISH-BROWN F.S. DARK GREENISH-BROWN MOST OF OVOIDS & SOME OF LENSES ARE PARTIALLY TO COMPLETELY ALTERED TO HEMATITE. FAULTED SERS OF CONGLOMERATE MATRIX CALCAREOUS LIGHT GREEN MATRIX WITH ANGULAR PEBBLES (10-15%) OF LIGHT GREEN MEDIA (¼-½") & NUMBER OF CALCITE VEINLETS ½-¾" WIDE OF FEBRINT CALCITE. IRON FORMATION TO EAST OF FAULT ALSO A FEW BEDS OF SHALE								
80															TRACE OF HEMATITE IN OVOIDS & LENSES								
90															TRACE OF HEMATITE IN OVOIDS & LENSES								
100															MEDIUM OF SMALL GREENISH PEBBLES & MATRIX CONTAINS A NUMBER OF THIN, SHALEY BEDS. (MANY OVOIDS MISSED)								
110																							
120															SOME OVOIDS & LENSES HAVE THIN BANDS OF WHITE QUARTZ.								
130															IRON FORMATION IS SHALEY IN PLACES & CONTAINS HARD PEBBLES								
140															BEDS OF HEMATITIC SHALE, RED JASPER & MAROON HEMATITE.								
150															FAIRLY POOR IRON FORMATION - REGULAR TO IRREGULAR BANDS OF RED JASPER & MAROON HEMATITE.								
160															DARK BROWN MASSIVE SHALE. W.S. LIGHT BROWN F. CALCAREOUS.								
170															SHALEY IRON FORMATION (OCCURRING ALONG CLEAVAGE) MODULER IRON FORMATION - MOST OVOIDS HAVE SOME HEMATITE IN THEM								
180															LIGHT IRON FORMATION WITH THIN BEDS OF DARK BROWN SHALE								
190															CONGLOMERATE (5-10%) MAROON BROWN MATRIX.								
200															CALCAREOUS FINE TO MEDIUM GRAINED SANDSTONE W.S. BROWN & DK. GREEN F.S. DK GREENISH MAROON. SHALEY IRON FORMATION								
210																							
220																							
230																							
240																							
250																							
260																							
270																							
280																							
290																							
300															END								
310																							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-214-63 (IF-14-62) — DATE STARTED August 15/63
DESCRIBED BY G. Sutherland — DATE COMPLETED August 15/63
MEASURED BY H. Klassen — MEASURING RATE 60 ft./hr.
AIR PHOTO No. A 12106 - (FL.14) - 315 — COORDINATES 116, 300N; 134, 400E
AREA Headwaters Discovery Creek — CLAIM EE-11
WEATHER Clear, sky ; sunny and warm

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite.

REMARKS:
BEDDING STRIKE / DIP.... eg 125°/ 25°W
FAULT STRIKE / DIP..... eg 125°/ 25°E
BRECCIATED ZONE.....
HALOS OF JASPER.....
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

PAGE 1 OF 4

DATE Aug. 15/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: ROUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: ROUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: ROUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	GRADE ANALYSIS: SAM No	GRADE ANALYSIS: Fe	GRADE ANALYSIS: SiO_2	GRADE ANALYSIS: P
232															Unconformity - underlain by brown calcareous conglomerate with pebbles of chert, jasper, quartzite, dolomite and rare igneous rocks up to 3" diameter. Matrix is a brown shale.								
230					<½" R			<½" R			<1½" I			FC	Top of bed is leaning up to 2° downhill in thickness.								
220																							
210																							
200					<½" R			<½" R			<1½" I			FC	Slightly calcareous grey conglomerate contains 60% pebbles								
															Green marker sandstone, calcareous. 197.5 to 199								
															i.e. a hematitic sandstone.								
190																							
180																							
170																							
160																							
150																							
140																							
130					<½" R						<1" R				Irregular patches up to 1" long.								
120					<½" I			<½" R			<½" R												
110																							
100																							
90															Fine green non-calcareous sandstone (marker)	96							
					<½" R			<½" R								92	9			1400			
					Brown non-calcareous sandstone						<½" R					97	1			1401			
80					<½" R			<½" R			<1" R			MC									
					<1" R			½" R			<1" R				Ovoids and lenses are weathered out on the surface.								
70																97							
																93	2			1355			
60																98							
																94	3			1353			
50					Brown Siltstone non-calcareous																		
					<½" I			<½" R			<1" R												
40					Fine dark brown sandstone - non-calcareous											97							
					<1" R			½" R			<1" R				Patches and lenses are up to 2" long	94	3			1354			
															At 42 ft there is a 4" band of greenish brown shale.								
30																							
					~1" R			½"			<1" R												
20																							
10																							
					Ferruginous and calcareous band of sandstone											4							
0					<1" I						<2" I				one sandstone band 6" thick at 4"	15	2.5'			1356			
					Underlying Beds - Calcareous maroon conglomerate. 60% round to sub-rounded pebbles up to 1" diameter composed of quartzite, shale, dolomite and igneous rock. Matrix is brown shale.																			

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-216-63 (IF-16-62) — DATE STARTED August 22/63

DESCRIBED BY W. Gibbons + A. Folinsbee — DATE COMPLETED August 22/63

MEASURED BY 1965 — MEASURING RATE 330 / 5½ hrs.

AIR PHOTO No. A 12851 - (10²) - 284 — COORDINATES 94, 500 N; 58,800 E

AREA South Iron Creek 1½ miles South of CampCLAIM I - 18

WEATHER Warm, Clear, Slight Breeze to Calm

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE

MAROON HEMATITE

BOTH

SILICEOUS WASTE TYPES

RED JASPER

MAROON JASPER

MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP ..... eg 125°/ 25° W
FAULT STRIKE / DIP ..... eg 125°/ 25° E
BRECCIATED ZONE .....
HALOS OF JASPER .....
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

DATE AUG. 22, 1963

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: BEHIND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: BEHIND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: BOUND	VEINLETS	REMARKS	ENGINEER. DATA: LEN. RUN	ENGINEER. DATA: No. RUNS	ENGINEER. DATA: FT REC.	ENGINEER. DATA: % REC.	CRUDE ANALYSIS: SAM. No.	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
330															Section Measured UP	329		2.5		2231			
																328.5							
															Jaspilitoid iron formation Birds Eye occur in zone			10		2228			
																326.5							
320															Sandstone - Thinly laminated - Green & Brown Fine grained (bottom) To silty dark brown shale (Top)	326		3'		2227			
															Banded iron formation	324							
310																					3		
300																299							
															Conglomerate Fragments (20-25%) (1/32 - 4") Angular to rounded (Fragments increases with size) Consisting largely of light green shale & light buff limestones. Matrix is a dark brown shale (slightly sandy)	297.5		6.5		2226			
															Low grade iron 4"-8" bands of conglomerate			5.5		2225			
290																289							
															Nodular iron formation Some ovoids have hematite centres.								
															Banded iron formation. Narrow Jasper Bands have thin (¼") red Jasper borders.	279		1		2224			
															To sub-rounded, mostly ¼" light colored shale & carbonate types of Quartzite. Matrix is green shale								
260															Iron formation characterized by maroon & brilliant red jasper aligned lenses. Some of each type of ovoids have hematite centres irregular lenses which may contain saheruilites.								
250															Nodular iron formation Most ovoids occur in zones of red jasper or dark ovoids Nodular iron formation similar to 233.5-237 but zones of jasper & carbonate waste.								
240															Nodular iron formation. Most of the ovoids are light brown carbonates.								
230															Unusual very nodular iron formation brown & indistinct thin bedding. Fresh Surface dark grey, maroon & green-brown	231		4		2223			
220					Medium Sandstone very fine to medium grained, very slightly calcareous. Weathered surface dark brown										Conglomerate: Fragments (50%) (1/32" x 1/16") (1.5") angular to sub-rounded, mostly light colored carbonates	217							
210															Nodular iron formation Many ovoids have hematite centers. A few red jasper Birds eye's. Carbonate bands & veinlets are concentrated between 193' to 208'.	194.5		2		2222			
200																190							
					Conglomerate Fragments (30%) (1/16 - 4") Sub-angular to rounded Characteristic large red jasper inclusions Matrix is slightly Hematite Aphanitic Shale.													10		2221			
					Bands of carbonaceous (?) shale, weathered surface - light brown. Fresh surface medium brown.											175							
170															Nodular iron formation								
																166							
																163.5		25		2220			
160					Conglomeratic Shale similar to 164-150 but even less													9		2219			
																154.5							
																152.5		2		2218			
					Slightly Conglomeratic iron formation (2-5% rounded fragments)																			
150					Conglomeratic Shale:- Fragments (5-10%), (1/16 x 1/4 to 3x5"), Sub-rounded to rounded. Matrix is Maroon - Brown silty shale.													8.5		2217			
															Lower grade Iron 130-142 due to increase in shaly constituents & irregular streaks of red jasper	142.5							
															A = Calcium.								
140																							
130															Shaly iron formation 1-3" bands of conglomerate. Some maroon jasper ovoids with light brown carbonate centers & red jasper Bands. Also red jasper ovoids some having hematite centers. 12.5% irregular red jasper.								
120																							
110																							
100																							
90																							
80																							
																76.5							
70					Conglomerate Fragments (Quartz 15-25%) (1/8 x 1/8 - 4' x 2'), sub-angular to rounded. Include Quartzite (4'x2'), shale, carbonate, & diabase? Matrix is dark brown to dark Maroon brown shale.													10		2216			
																66.5							
																		10		2237			
60																56.5							
																		10		2238			
																46.5							
50																		11.5		2239			
																35							
40															Similar to below without lenses of jasper & bands of conglomerate.								
															Irregular poor iron formation. 50% composed of 4-8" bands of conglomerate & lenses of red jasper especially 16.0 - 19.0	19							
30																15		3		2240			
20															Banded iron formation: Trace of pebbles.								
10																							
0																							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF - 219 - 63 (IF - 19 - 62)
DESCRIBED BY Wilkins and Greenberg
MEASURED BY 1982
AIR PHOTO No. A 12148 (11") - 183
AREA Iron Creek 1½ miles East of Camp
WEATHER C.A.V.U.

DATE STARTED August 24/63
DATE COMPLETED August 24/63
MEASURING RATE 7 Ars.
COORDINATES 105,500 N; 85,500 E.
CLAIM L - 14

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite.

REMARKS:
BEDDING STRIKE / DIP ..... eg 125°/ 25° W
FAULT STRIKE / DIP ..... eg 125°/ 25° E
BRECCIATED ZONE .....
HALOS OF JASPER .....
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc..
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

DATE August 24/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: BOUNDS	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: BOUNDS	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: BOUNDS	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
340															Bore 2.5 y maroon hematite								
															Conglomerate with brown shale matrix (20% fragments)								
350																							
360															Conglomerate same as above								
															Coarse iron sandstone (10% jasper sand)								
370															Conglomerate (5% fragments of green shale, yellow shale dolomite and jasper etc) Dark brown arenaceous matrix								
380																							
390																							
400																							
410																							
420																							
430																							
440																							
450																							
460																							
470																							
480																							
490																							
500																							
510																							
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890																							
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960																							
970																							
980																							
990																							
1000																							

GEO - 25 - 2 CR 16/631

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-221-63 (IF-21-62) — DATE STARTED August 14/63

DESCRIBED BY A. Garrett (replaced Ross Nov '63) — DATE COMPLETED August 19/63

MEASURED BY 1962 — MEASURING RATE 25'/HR.

AIR PHOTO No. A 12106 - (FR 143) - 315 — COORDINATES 109,900 N, 152,600 E

AREA Creek between Discovery creek and Boundary — CLAIM JJ-12

WEATHER Sunny

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite.

REMARKS:
BEDDING STRIKE / DIP..... eg 125°/ 25°W
FAULT STRIKE / DIP..... eg 125°/ 25°E
BRECCIATED ZONE.....
HALOS OF JASPER.....
SPHERULITES ***
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

PAGE 1 OF 4

DATE Aug 19/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP.	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES BOUNDS	ALIGNED LENSES AMT and COMP.	ALIGNED LENSES THICK RANGE	BANDS BOUNDS	BANDS AMT and COMP.	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER. DATA LEN RUN	ENGINEER. DATA No. RUNS	ENGINEER. DATA FT REC.	ENGINEER. DATA % REC.	CRUDE ANALYSIS SAM. No.	Fe	SiO_2	P
														Poor iron formation (jasperoid), maroon - interbedded sandstone. One quartzite boulder (1 ft x 6') @ 4.5 ft.			2.0		427			
														Sandstone.			3.0		426			
																	2.0		556			
10														Conglomerate (Dark brown to maroon) Fragments 20% (1mm to 2") some up to 8" sub-angular to sub-rounded composed of shale, greenstone and quartzite. matrix calcareous maroon shale, bed pinches and swells.			4.0		557			
														Maroon shale interbedded with conglomerate. 10% sub-rounded to rounded fragments (1mm - 2") Pebbles of Greenstone, shale, carbonate. Also a 2" band of Sandstone.			10.0		558			
20																	8.0		559			
30									1/16-1/8"			1/4-1/2"	I				3.0		325			
														SANDSTONE: W.S. - grey green F.S. light grey - fine grained Calcareous & massive.								
																	10.0		560			
40														SANDSTONE: Blobby, coarse grained with hematite and jasper W.S. light brown F.S. metallic								
																	2.0		561			
50														SANDSTONE W.S. maroon to metallic F.S. grey, medium to coarse grained, high in hematite and jasper contents			1.0		562			
														Covered interval measured this year as 12.5' and not 16 ft.								
60																	2.0		324			
														SANDSTONE: W.S. light brown to maroon F.S. green to grey fine to coarse grained, calcareous			2.0		563			
70									1/4-1"	R				25% waste in irregular patches of red jasper.			3.0		323			
									1/2-1"	R				25% waste in irregular patches of red jasper			3.0		322			
														Some lenses are weathered out. 25% in irregular jasper & siderite nodules. Also about a 6" band of shale (bedding 1/4-1/2°)			3.0		321			
80									1/2-2"	R							5.0		320			
																	4.0		319			
				Trace		1/8-1/2"	R							SANDSTONE: W.S. Dark brown to grey F.S. Dark green, fine grained, massive, hard non calcareous. Also a thin band 6" of Jasper								
90																	10.0		565			
																	10.0		566			
100																						
110														25% and up of waste is a brown carbonate (limonite?) Interval becomes crumbly towards the bottom.			3.0		318			
																	3.0		317			
																	3.0		316			
120																	4.0		315			
																	2.0		1564			
														SHALE			2.0		314			
														WASTE IS IN RED JASP BANDS (1/4-1/2") & JASP STREAKS			1.0		1567			
														CONGLOMERATE SH			1.0		313			
									1/4-3/8"	R				Conglomerate frags 65% sub-angular to sub-rounded (1/8-3") of greste, greenstone & chert - Pebbles & swells.			3.0		1568			
130														Waste occurs in blotchy red jasper patches and a 1/4-1/2" band of maroon jasp.			2.0		312			
									1/8"-1/4"	I							2.0		311			
									1/4-3/4"					ovoids also occur as siderite (?) or carbonate			2.0		310			
														Quite Shaley @ Top			3.0		309			
140									1/8-1/4"	I							3.0		308			
									1/4-3/4"								3.0		307			
														Conglomerate - reddish to metallic, very ferruginous. 95% frags (1/8-1/4) sub-rounded to rounded. Pebbles are green shale, carbonate (dol), and qtzite. matrix calcareous and sandy. Also a 1 foot band of grey siltstone.								
150									1/4-1/2"	I				Shaly and crumbly, 50% of waste occurs as irregular red jasper patches and brown carbonate nodes.			3.0		306			
																	3.0		305			
									1/8-1/4"	R		1/4-1/2"	I	25% of waste in carbonate patches and irreg red jasper patches			2.0		304			
160									1/4-3/4"								3.0		303			
																	2.0		302			
									1/8-1/2"	I		1/2-1"	R	15% waste in carbonate nodules and lenses			2.5		301			
									1/4-1 1/2"								3.5		200			
170																	3.5		199			
														Poor iron formation - Conglomeratic sandstone and I.F.m we interbedded. I.F.m mostly banded with red jasper. Conglomerate: fine grained matrix with small pebbles of mostly greenstone (1mm - 1/2")								
180														Conglomerate: W.S. dark brown to grey. Frags (60%) (1/2 - 8") some larger, sub-rounded to rounded, pebbles are greenstone, carbonate, and qtzite matrix calcareous sandy and maroon shale								
190																						
200																						
210																						
220																						
230																						
240																						
														Thin 2" band of conglomerate			2.5		197			
														Waste occurs in thin bands of Jasper showing "flow structure" irregular Jasper patches			3.0		196			
250																	3.0		195			
														Conglomerate: W.S. - metallic green brown. Fragments smaller to rounded - matrix sandy and ferruginous								
260																						

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-229-63 (IF-29-62) — DATE STARTED Aug. 26/63

DESCRIBED BY A. Garrett — DATE COMPLETED Aug. 26/63

MEASURED BY Nixon and Steele — MEASURING RATE 50'/hr

AIR PHOTO No A-12056-(10")-283 — COORDINATES 83, 800N; 22,000 E

AREA South Iron Creek - Southernmost exposure on East side — CLAIM I-23

WEATHER Sunny / Hot

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS: BEDDING STRIKE / DIP — eg 125°/25°W

FAULT STRIKE / DIP — eg 125°/25°E

BRECCIATED ZONE

HALOS OF JASPER

SPHERULITES

FRACTURING

ACCESSORIES - Calcite, Dolomite, Siderite, etc

LARGE ISOLATED LENSES

NOTE: Percent with Relict Texture measured left to right as percent of total Hematite

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Aug. 26/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	BOUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BOUND	BANDS AMT and COMP	BANDS THICK RANGE	BOUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
140															Maroon conglomerate. Fragments (20%) sub-angular to sub-rounded (1 mm to 1") Pebbles are jasper, greenstone, dolomite and quartzite. Matrix is non-calcareous maroon shale.								
130																							
120						¼-½" R ¼-2" I			½-2" R							Sandstone, v.f. dark grey (banded) F.S. light green grey calcareous, medium grained. Conglomerate at upper and lower contact. At 111'-4" band of grey calcareous sandstone. 10% of waste in irregular patches of red jasper and carbonate (weathered out) Also a thin conglomeratic siltstone band at 91'	111	3		2266			
110																							
100																100	1.5			2267			
90						¼-½" R ¼-2" I		¼-½" R ¼-½" I								Sandstone, v.f. dark grey (banded) F.S. light green grey calcareous, medium grained. Conglomerate at upper and lower contact. 15% waste in streaks of red and maroon jasper.	92.5	3			2268			
									¼-3" R						15% waste in irregular patches of red and maroon jasper. Seat carbonate								
80																76							
70						¼-½" R ¼-2" I			½-1½" R							Very ferruginous conglomerate 15% fragments, slightly calcareous 15% of waste occurs in irregular streak showing a flow structure	71	3.5			2269			
60																59.5							
						¼-½" R ½-2" I									Conglomerate, dark maroon F.S. maroon slightly hematitic Fragments (2.5-7%) (¼-3") sub-angular to rounded. Pebbles are dolomite, green stone and sandstone. Matrix is ferruginous calcareous maroon shale.	52	1.5			2270			
50															F.S. 20% irregular patches of red jasper.	50							
40	Peace					¼-½" R ¼-2" I		¼-½" I							Light brown conglomerate interbedded with iron formation. 9 2" band of jasperoid iron formation at 45.5' 15% of carbonate nodules have weathered surface	45	5			2271			
30																							
20						¼-½" R ¼-2" I			¼-2" R							10% waste occurs in carbonate bands and irregular patches and streaks of jasper.								
10						¼-½" R ¼-1"		½-½" R ¼-1"			7½" R				A jasperoid iron formation								
0															Fine calcareous maroon shale. Bedding ½°, casually	15 0	1.5			2272			

Underlying Beds - Maroon calcareous conglomerate. Fragments - Sub-rounded to sub-angular (as % pebbles up to 4") of chert, jasper, quartzite, dolomite and shale. Matrix maroon shale.

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-232-63 (IF-32-62)
DESCRIBED BY G. Sutherland
MEASURED BY A. Garrett
AIR PHOTO No. A-12056-(62)-352
AREA South Iron Creek - West Side
WEATHER Sunny and Warm, light breeze

DATE STARTED Aug. 26/63
DATE COMPLETED Aug. 26/63
MEASURING RATE 50'/hr.
COORDINATES 82,200N, 75,400E
CLAIM H-21

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite.
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite.

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc.
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite.
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste.

DATE Aug. 26/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0-10															Calcareous brown conglomerate, fragments sub-round to sub-angular of quartzite, jasper, shale and dolomite up to 4" diameter. Lath. fragments grading to 35% fragments at the bottom. Matrix is brown shale.								
10-20																							
20-30																							
30-40																							
40-50															A few carbonate nodules.	94	3			2275			
50-60																							
60-70															Siltstone. Patches to 1" Twisted iron formation. FS	62	2			2274			
70-80															Maroon calcareous conglomerate, slightly hematitic, rounded pebbles and cobbles of chert, quartzite, shale, dolomite, some pieces of Archean? Matrix is maroon shale. FS structure is very twisted.	67	5			1917			
80-90															Calcareous maroon conglomerate, fragments of shale and quartzite up to 1" diameter. Matrix maroon shale. FS. Patches to 2" long.	89	3			1918			
90-100															FS Patches up to 1"								
100-110																							
110-120																							
120-130																							
130-140																							
140-150															Underlying beds: Calcareous maroon conglomerate and cream 20% fragments of shale, dolomite and quartzite (<4") subround to sub-angular. Matrix is maroon shale.								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF-233-63 (IF-33-62)
DESCRIBED BY Fol-nsbee
MEASURED BY Nixon
AIR PHOTO No A12148-(FL13)-272
AREA Discovery Creek
WEATHER 5/10 high cloud windy and warm

DATE STARTED August 26/63
DATE COMPLETED August 26/63
MEASURING RATE 180'/shot
COORDINATES
CLAIM BB 10

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
IR - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 3
DATE Aug 26/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES DIRNS	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES DIRNS	BANDS AMT and COMP	BANDS THICK RANGE	BANDS DIRNS	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0															Overlying debris - conglomerate W.S. dark grey F.S. grey 60% fragments - round to well rounded 1mm - 6" - shales. Matrix is hard calcareous sandy dark shale - very poorly bedded.								
															Very ferruginous sandstone - calcareous								
30					½-3" I			½-2" I							Shaly cleavage in places sandstone fragments 1" x 3"								
70					½-1" R ½-3" I			½-1½ R				½-1½			Round sandy frags ½"-3" Conglomerate lenses (½-1) (5" - 1ft.)								
100															Iron sandstone W.S. maroon, F.S. Maroon grey - calcareous								
															Conglomerate - 60% frags 1mm - 2" Matrix calcareous sandstone			4.5		1877			
															Tesperance iron formation								
125															Conglomerate - 60% frags of red and shales and quartzites Matrix is calcareous sandy maroon shale.			4		1880			
					½-1½ R ½-1 I			½-1½ R				½-1 R											
140					Brown ½-2 R ½-1 I			W.S. dark brown ½-½ R				F.S. maroon ½-1 R						1		1878			
					½-2" I																		
															Grey calcareous sandstone			2.5		1879			
130					½-1" R ½-2" I			½-1" R				½-1" R			Considerable amount of siliceous waste is brown.								
					Brown ½-1 R ½-1 I			Brown ½-½ R				½-1 R			F.S. grey			1		1881			
120					½-2" I																		
110																							
					Brown ½-1 R ½-1 I			Brown ½-½ R				F.S. grey ½-1 R				145		1		1882			
					½-1" I											142		1		1883			
100																139							
															Slightly calcareous sandstone W.S. brown grey F.S. brown grey Cherty lenses (¼" - 6" x 8" - oft)	93							
90					½-2 R ½-1 I			½-½ I				½-½ I			W.S. grey F.S. maroon, fragments 1mm - 4" 20 - 50% well rounded shales, limestone + quartzite. Matrix is sandy calcareous maroon shale. Poorly bedded and leaning	89	6			1885			
																86							
80					½-½ I ½-3"			½-½ I				½-1½ I			F.S.	80	8			1884			
70					½-1 R ½-3" I			½-½ R				½-3"			F.S.								
60																							
50					½-½ R ½-2			½-½ R				½-1 R			Carbonate lenses								
40					½-1 R ½-2" I			½-1 R				½-2" R			Maroon bands contain red jasper veinlets.								
					½-1 R ½-1" I			½-1 R				½-1 R			25% patchy red jasper Shaly cleavage in places								
30															Brown conglomerate - Frags are F.S. maroon massive siliceous maroon shale. 25% frags not of shale Matrix is calcareous sandy maroon shale. Brown conglomerate - Frags are 45% shale ½-3" well - rounded Matrix poorly bedded calcareous maroon shale.	30							
																20		9		1883			
20					½-1 R ½-1 I			½-½ R				½-3" R			F.S. Sandstone band from 3.5 to 4'	11		10		1886			
																2.5		½		1918			
0															Chocolate brown sandstone, calcareous F.S. grey								

GEO-23-2-CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-237-63 (IF-37-62)
DESCRIBED BY W. Gibbins
MEASURED BY 1962
AIR PHOTO No. A12148-(FL 11²)-182
AREA West side Indecision Creek
WEATHER Cloudy - Occasional light rain

DATE STARTED Aug 15/16/63
DATE COMPLETED August 26/63
MEASURING RATE 9 hrs.
COORDINATES 10+8, 600 N; 11,200 E
CLAIM N-13

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 7
DATE Aug 15/16/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: BOUND	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: BOUND	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: BOUND	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REL	ENGINEER DATA: % REL	CRUDE ANALYSIS: SAM No.	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: CO_2	CRUDE ANALYSIS: P
400															Conglomerate (fragments shale) (¼-2") sub-angular to sub-rounded. Matrix is a fine sandstone to siltstone. Phenocrysts = maroon									
															Conglomeratic iron sandstone. Matrix is a coarse grained hematite & red jasper. Fragments (as above) (¼-3") sub-angular to rounded, include quartzite, sandstone and cornelian.									
															Unmarketable shale (red-maroon) and conglomerate "Bands of hematitic shale in conglomeratic iron sandstone similar to that above	391								
380															Massive dark brown-maroon shale	381		23		1356				
															Light green and dark brown shale (few outcrops pebble in trench 2-3' out of 4')	381		4		1358				
370					¼-½ R I ¼-1"						½-1½ R				Banded iron formation with 10% red jasper & trace maroon hematite bands ¼-½" thick, a few leaves disseminated throughout the unit	370 / 361		11 / 1		1327 / 1360				
360															Dark brown calcareous sandstone flaky bedding plane cleavages (¼-½") Unit becomes more massive and coarser grained at the bottom	359								
					½-¾ R ¼-1"						½-1 R I				Hematitic conglomerate - fragments (10%) (¼-1½") mostly (¼-½") weathered carbonates - red jasper leaves (2mm-2½-3") (25%)	362 / 361		1 / 3		1361 / 1363				
350					¼-¾ R ¼-3" I										Nodular iron formation. Nodules and irregular red jasper bent to be concentrated in zones or bands	342								
					Trace			½-¾ R ¼-3"			½-1½ R I				Banded iron formation									
340											½-1½ R I			FC									
330																							
						½-¾ R ¼-3"					½-2" R												
320					Conglomerate fragments (10%) (¼-2") Angular to sub-angular.						¼-3" R				Isoperiuid iron formation	315 / 314		2		1364				
					Conglomerate similar to 345'-356'						½-2" R				Nodular iron formation. Some ovoids have 4 cm thick centers.									
310																							
											½-2" I R				Banded iron formation	297								
300					Massive dark brown shale						½-2" R I				Band much more regular than those from 292-299	292 / 291		5 / 1		1365 / 1366				
																288		4		1367				
290															25% slightly irregular patches to leases of red jasper plus a trace of microcrystalline quartz									
280																							
						¼-¾ I ¼-2"					½-2" R												
270					Mostly to calcareous iron formation						½-2 R				246-247 carbonate	246								
																241		6.5		1368				
260					Fine to medium grained calcareous sandstone. Very dark green-maroon color.											232		7.5		1369				
					Conglomerate fragments (20%) (¼-2") sub-angular to sub-rounded include jasper shale & carbonates. Calcite matrix												230		2		1370				
250					½-½ I ½-1½"						½-1½ R I				Irregular red jasper leases to patches.	225								
																222		3		1371				
240					½-¾ R ¼-1"										Very irregular bands to leases of red and maroon jasper									
230					Trace sandy to conglomeratic very dark brown shale											203 / 200		1		1373				
					Waste as irregular clasts of red jasper																			
220					Conglomerate fragments (30%) (¼-2") sub-rounded to rounded quartz and carbonate pebbles, hard dark brown shale matrix						½-1" R I					196		2		1329				
					½-¾ R ½-3"																				
											½-2" R				Banded iron formation	192.5								
210															Nodular iron formation	186 / 184		9 / 15		1375 / 1378				
					Bands of red jasper 4cm-8cm and ¼-2" red jasper																			
200					½-¾ R ½-¾ I						½-2" R I												
																165								
					BE ½-¼ R ¼-1¼			½-¾ I			¼-½ I					161.3		35		M61				
190																							
																152								
180					Poor carbonate and jasperoid iron formation																			
					Conglomeratic hard maroon brown shale																			
170																144		18		1952				
																139 / 138.5		12 / 15		1953 / 1954				
160					¼-7½ R 2-10"						¼-3" R				Poor iron formation. Nodular iron formation									
150																							
140																							
130																							
120																							
110																							
100																							
90																							
80																							
					Conglomeratic dark brown shale - sandy leases																			
70																							
60																							
50																							
40																							
30																							
					Conglomeratic dark brown maroon shale. Fragments (¼-2½") sub-angular to rounded (½-2½") Mostly buff Carbonate																			
20																							
						¼-¾ I ¼-1½					6-12°S					24		10.5		1665				
10					Fault Dip 60° Poor iron formation with large boudins (2-5") and lenses (¼-2½") of red jasper. Drag folded and faulted. Note: Two beds repeated in section because of fault																			
0					Siltstone dark brown shale fractured cut down dip											0		2		1715				
					Trace			½-¾ R ¼-2"			½-1½ R				A few voids have 4cm thick centers. Minor stringering and folding through last three units.	110		11.5		1667				
-10																							
-20					N.E. Conglomerate Iron Formation Drew										FAULT (?) S.W. Fault Drew									
-30																							
-40																							
-50																							
-60																							
-70																							
-80																							
-90																							

GEO-23-2-CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF-238-63 (IF-38-62)
DESCRIBED BY Gervenette
MEASURED BY 1982
AIR PHOTO No A-12148-(FL12")-210
AREA Iron Creek 5 miles West of camp
WEATHER C A V U

DATE STARTED August 22/63
DATE COMPLETED August 23/63
MEASURING RATE 4 hrs
COORDINATES 99,500 N, 160,200 E
CLAIM S-17

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FE* F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25°W
FAULT STRIKE / DIP eg 125°/25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF
DATE Aug 22, '63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	UNALIGNED LENSES: %	ALIGNED LENSES: AMT and COMP	ALIGNED LENSES: THICK RANGE	ALIGNED LENSES: %	BANDS: AMT and COMP	BANDS: THICK RANGE	BANDS: %	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS:	CRUDE ANALYSIS: P
0															Sandstone - WS dark grey brown FS light grey (metallic) Hematite, medium grained, highly calcareous. Also a red jasper lense.								
10				Trace											20% waste in carbonate lenses and bands.								
20															10% waste due to carbonate and red jasper streaks.								
30															Sandstone - WS light to dark brown (buff) FS iron grey (metallic luster) medium to fine grained, calcareous and ferruginous. Bedding is massive (10ft) to thick (4 ft).								
40															Thin band of weathered carbonate.	95	1	1.5		1905			
50															25% waste in irregular patches and streaks of red jasper.								
60					Poor iron formation conglomerate fragments										waste mainly jasper oroids + streaks brown to maroon	92 93				1906			
70																							
80																							
90															Trace of limonite. 10% waste in irregular red jasper patches.								
100					waste occurs in irregular patches										of red jasper. Also 5% of shale. 25% of waste occurs in irregular patches of red jasper.	98 99	1	1.5		1907			
110															25% waste (mid-color surface) carbonate patches. (Weather surface)								
120															10% waste occurs in carbonate patches and irregular red jasper patches.								
130					Trace										25% waste occurs in irregular jasper patches. Large weathered out carbonate patches.								
140															Carbonate and red jasper streaks.								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-23-63 (IF-39-62) DATE STARTED July 21/63

DESCRIBED BY Gibbins DATE COMPLETED July 21/63

MEASURED BY 1962 MEASURING RATE 7 hrs.

AIR PHOTO No. 12148-(FL 12[3]) - 210 COORDINATES 99,300N; 102,700E

AREA N. side Iron Creek 5 miles upstream from camp CLAIM R-17

WEATHER Scattered showers

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS: BEDDING STRIKE / DIP eg 125°/ 25°W

FAULT STRIKE / DIP eg 125°/ 25°E

BRECCIATED ZONE

HALOS OF JASPER

SPHERULITES

FRACTURING

ACCESSORIES - Calcite, Dolomite, Siderite, etc

LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4

DATE July 21/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
210															Strike 45° Dip 9° SE.								
200															A few shaly carbonate bands.								
190															Conglomeratic brown shale. Conglomerate (1"-2") 4-4"								
															Sandy to conglomeratic dark brown shale. Some lenses and ovoids have thin calcite borders								
180																							
170															Inter bedded maroon hematitic shale - Rare (1"-2") regular red jasper bands.								
															Many ovoids have hematite or maroon jasper cores.								
160															Hematitic maroon shale. Trace contemporaneous fracturing. Jasper bands & lenses whose boundaries grade into hematite.								
															Hematitic shale grading to conglomerate								
150			5%												Iron formation occurs in large blocks which are not necessarily in place. Some definitely not in place.								
140																							
130			Trace												75% of waste is quartz and red jasper pieces 1/8" to 4" - 2"								
120																							
110																							
100																							
90															Dark green and brown calcareous sandstone - fine. Co medium grained. WS dark brown, finely pitted.								
80																							
70															Strike 100° Dip 6-11°								
60															Strike 60° Dip 5-10° SE.								
50															Conglomerate fragments (1/8"-1") (1/4"-8") rounds sub-round. Limestone, calcareous sandstone & white quartz pebbles. Matrix is sand of calcareous dark brown and green shale. Conglomerate and iron rubble.								
40																							
30															Maroon jasper or hematite in areas 1/2" wide. Trace of 1/2" red jasper bands showing good contemporaneous fracturing.								
20															Red jasper borders on maroon jasper.								
10															Maroon jasper cores and jasper borders.								
															Strike 15° Dip 21° SE								
0																							

UEQ-23-2-GR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No. IF-243-63 (IF-43-62)
DESCRIBED BY Folinsbee
MEASURED BY 1962
AIR PHOTO No. A-12056-(9")-351
AREA 3 miles S.W. of camp
WEATHER Sunny, cool

DATE STARTED August 23/63
DATE COMPLETED August 27/63
MEASURING RATE 200'/5Acm
COORDINATES 97,700N; 65,000E
CLAIM D-17

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/25° W
FAULT STRIKE / DIP eg 125°/25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4
DATE Aug 23/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	ALIGNED LENSES ROUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS ROUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC.	ENGINEER DATA % REC.	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
210															Conglomerate matrix 10% fragments mm - 4" W.S. brown R.S. maroon. Leaning bank of jaspered iron formation containing leaning band of conglomerate.	209.5 210		1		1979			
200															Jaspered iron formation. Patchy red and maroon jasper.	206.5 207		1.5		1978			
190															Lense of conglomerate 1ft x 3ft. at 199'	194							
															Conglomerate matrix W.S. brown R.S. maroon Fragments 30% sub-angular shales (¼" - ½") Matrix maroon shale. Massive.	193		5		1977			
					Trace	½-¾"	R	½-¾"	R		½-¾"	R				180 178		2		1976			
180				Trace	½-¾"	R		½-¾"	R						Mock slickensiding	174 174		1		1975			
					½-1"	I		½-¾"	I		½-1"	R											
					½-3"																		
170											1ft	I			Patchy red jasper band leasing	167.7 168		1.5		1974			
					W.S. green brown			R.S. green red			slightly calcareous, massive					160		6		1973			
160				Trace	½-1"	R		½-¾"	R		½-2"	R											
					½-2"																		
150					½-1"	R		½-¾"	R		½-2"	R			brown non-calcareous sandstone	136 137		1		1972			
				W.S. light green and grey											30 mm conglomerate fragments	136		2		1971			
				Trace	½-¾"	R		½-¾"	R		½-¾"	R											
					½-4"																		
				Grey cherty siltstone							W.S. chocolate brown.					148 149		1.5		1970			
					½-¾"	R		½-¾"	R		½-1"	R											
					½-2"																		
140					½-¾"	R		½-5"	R		½-2"	R											
					½-5"																		
130				Conglomerate 30% sub-angular pebbles and broken bands (Thickness 20-25 ft.)											W.S. brown grey R.S. brown grey. Fragments round shales, jasper. Bed is leasing and may pinch out. Matrix is ferruginous shale.								
											½-3"	R			15% patchy red jasper.								
120																							
110				Conglomerate matrix				Illegible			½-2"	R			Finely bedded.	115 116		1		1967			
				W.S. brown sub-angular Trace	½-¾"	R		½-¾"	R		½-5"	R			Fragments 1mm - ½" 20% patchy red jasper.	115 116		2		1968			
100					½-¾"																		
					½-4"	R		½-¾"	R		½-1"	R			40% of waste is patchy red jasper bands (¼"-½")								
90					½-¾"																		
					½-4"	R		½-¾"	R		½-1"	R			Bands have maroon centres.								
80					½-¾"										Fe does not exist (see #2) Numbers are corrected								
					½-4"	R		½-¾"	R		½-3"	R			30% patchy red jasper.								
70					½-¾"																		
					½-¾"	R		½-¾"	R						Slickensiding 282-26°								
60					½-¾"																		
					½-¾"	R		½-¾"	R						Slickensiding, shaly calcareous lenses 2"x 3ft. Carbonate in some lenses.								
50					½-¾"	R		½-¾"	R						Considerable carbonate veins. Strike 135° Dip 46° SW.								
					½-¾"																		
40				Conglomerate sub-angular											W.S. brown maroon R.S. brown Jasper fragments medium texture on rock surface.								
30																							
20																							
10																							
0																							
-140				Qtz.	½-¾"			½-¾"	R		½-¾"	R				140							
-145					½-5"																		
-150																150		10		1980			
				Datum Fe	R.S. grey			W.S. brown							Fault at -150 ft.								
-160																							

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

SECTION No IF-244-63 (IF-44-62)
DESCRIBED BY W Gibbins and E Grondberg
MEASURED BY "
AIR PHOTO No A 12256-(FL 10") -284
AREA East side South Iron Creek
WEATHER Calm, Sunny, Warm

DATE STARTED August 23/63
DATE COMPLETED August 23/63
MEASURING RATE 200'/5 hrs.
COORDINATES 44,400 N; 81,000 E
CLAIM J-19

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 3
DATE Aug. 23/63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	ALIGNED LENSES ROUND	ALIGNED LENSES AMT and COMP	ALIGNED LENSES THICK RANGE	BANDS ROUND	BANDS AMT and COMP	BANDS THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	Fe	SiO2	P
200														Dark maroon to green silty shale. Siliceous to shaly maroon hematite, a few irregular bands of maroon hematite.	205							
															206		2.5		2241			
														Carbonate ovoids with red jasper borders. A few angular hematite fragments at 198' and irregular jasper patches	210		4		2242			
															197		1		2243			
190															196							
														Siltstone to very thin bedding plane laminae (1/2") Trace	thin sandstone bands (1/2")					FS. W.S. dark brown FS. medium to dark brown. Banded iron formation. Trace of conglomerate lenses. 25% irregular small nodules. (1/2-2 1/2")	192		2.5		2244			
															187							
180															182		5		2245			
					1/2-3/4" R 1-1.5"			1/4-1/2" R 1/2-0.5"			1/2-1 1/2" R			A few ovoids have hematite centres. 50% red jasper, occasional birdseye in bands. Trace of pebbles (180-183')	182							
170														Conglomerate - Fragments (15-25%) (1/2-2") Angular to sub-rounded mostly carbonate and shale traces of red jasper. Matrix is dark brown shale with occasional 1/2" bands of banded iron formation red jasper and maroon hematite.								
					1/2-1" R 1/2-1" I			1/2-2" R						Conglomerate Poor banded maroon hematite contains 3-4" bands of conglomerate	176							
														Ovoids have carbonate and hematite centres.	171		5		2247			
160					1/2-3/4" R 1/2-1"			1/2-3/4" R 1/2-1"			1/2-1 1/2" R			Birds eye in bands some ovoids have metallic centres.	166							
					1/2-1" R 1/2-1"						1/2-1 1/2" R			Banded iron formation. Conglomerate bands 188'-193.5' & 183.5'-187.5'; 175.7'-178.2' - 30% fragments (1/2"-6")	161							
															156							
150														Medium brown shale to siltstone.	151		1		2249			
														20-25% waste shredded dolomite. 75% regular to irregular ovoids.	146		1		2250			
														Fairly large ovoids.	141		2.5		2251			
					1/2-1" R 3/4-1 1/2" R 1/2" R			1/2-1" R			1/2-2" R			Regular to irregular grading and lodged traces of shredded dolomite.	136							
140															131							
					1/2-3/4" R 1/2-2" I						1/2-2 1/2" R/I			Light brown carbonate waste predominates. Highly concentrated ovoids in C bands.	126							
		Trace	C	C						C					121							
130					1/2-3/4" R 1-1 1/2"										116							
					1/2-1" I			1/2-1 1/2" I 1/2-3"							111							
		Trace			1/2-3/4" R 1/2-2" I						1/2-1 1/2" I			Many ovoids have hematite centres.	96		1		2252			
		Trace												Dark green to brown sandstone at green shale. coarse flattened 25% irregular patches of jasper, carbonate and quartz.	99		2		2253			
120					1/2-1" I 1/2-3"										93							
					1/2-3/4" 1-1"						1/2-1" R/I		F.E.	Birdseye lenses. Some carbonate centres. Nodular in places.								
110																						
														Hematitic brown calcareous shale								
		Trace	Trace		1/2-1" R 1/2-1"						1/2-1" I 1/2-3"		F.C.	Calcite replacement of some lenses.	103.5							
100														Conglomerate Fragments (1/2-12") (40%) quartz, quartzite, sandstone, carbonate. Jasper lenses (1"-4" x 6"-12") Matrix - hematitic shale	103.5		8		2254			
					1/2-1 1/2" R 1/2-8"			1/2-1 1/2" R 1"-4"						Aligned lenses tend to bands. Some carbonate lenses and ovoids.	105		6.5		2255			
90														Conglomerate Fragments (10-15%) (1/2-8") sub-angular to sub-rounded. Lenses and fragments of jasperoid iron formation up to 1' x 4'. Matrix is hematitic shale								
														Trace of clastic pebbles	28							
															30		4		2256			
80														Conglomerate fragments (10-15%) (1/2-8") mostly sub-rounded dark carbonates. Lenses of red jasper. Hand hematitic maroon shale matrix.	40		10		2257			
70											1/2-2" R/I			Nodular iron formation ovoids tend to be in bands.								
					1/2-3/4" R 1/2-2"						1/2-3/4" R/I			Low grade iron form.								
60																						

GEO-23-2-(R16/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

DDH
~~SECTION~~ No. Y-1-62
DESCRIBED BY R.M. Williams
MEASURED BY
AIR PHOTO No.
AREA Iron Creek Y.T.
WEATHER

DATE STARTED Nov 18-19 '63
DATE COMPLETED
MEASURING RATE
COORDINATES
CLAIM

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25° W
FAULT STRIKE / DIP eg 125°/ 25° E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE Nov 20 '63

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT and COMP	UNALIGNED LENSES SIZE RANGE	UNALIGNED LENSES BOUND	PATCHES and BANDS AMT and COMP	PATCHES and BANDS THICK RANGE	PATCHES and BANDS BOUND	BANDS AMT and COMP	BANDS THICK RANGE	BANDS BOUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
															overburden								
															Conglomeratic sandstone :- lt brn grey - med to fine grained - slightly limy & sub-angular grains & occassional frag's, siltst, ch up to 2"			1.8	81.7				
10					C	⅛-1	I								trace pyrite			3.3	84.6				
															Conglomeratic mudstone :- lt brn grey to maroon - poorly sorted - frags up to 1" of sandstone, qtzite, carbonate, ironstone - angular to rounded			3.2	94.2				
															mudstone :- lt grey - grading into S.S. at bottom - limy			2.9	90.6				
															conglomerate :- lt grey green - size up to ¼" - rounded to sub rounded, limy			0.6	100				
20															mudstone :- with bands of cong. mudstone - lt grey to pale maroon			8.7	68.6				
30								I	½"	R								0.8	80.0				
															mudstone :- med maroon brown with calcite veinlets & occassional ½" band sandy material - lt grey green to maroon - with frags up to 1" (carb, siltst, qtzite)			19.0	91.4				
50											⅛-¼	R	C		difficult to distinguish from Jasp			1.1	78.6				
			tr						½"	I	⅛-1	R			halos red Jasp on fractures			5.8	95.0				
60															sandstone :- med brownish green, med to fine grained - some coarse grains angular, rounded to sub rounded - maroon matrix			6.4	79.0				
			tr.					I		I					flat bedding			1.5	88.4				
															sandstone abundant - trace pyrite - limy in matrix - occassional halos around sand grains			12.0	96.8				
70															sandstone :-			12.0	96.8				
80						⅛-¼	I		¼	I		¼-1	I		carbonate halos			5.0	89.2				
															siltstone - dark brown grey - sandy hematite, brown streak			1.2	100.0				
			tr			⅛-½	I		¼	I				FC	Jasper halos & some carb halos - trace pyrite			4.7	94.0				
90												¼-½	I		sand streaks, Jasp □ concentrated laminae			1.8	100.0				
			tr			¼	I	FC				⅛-1	R	FC	ovoids ⅛-¼ ∈ carb halos - rounded			3.8	95.0				
															some carb in bands			3.0	85.6				
			tr			⅛-½	I								□, some carb patches seam like minor brecciated zones								
100			tr			⅛-½	I	FC				⅛-½	R		C - some elongated ovoids			2.9	90.6				
															siltstone					100%			
															dk maroon brn - Frags to 1" ϕ			1.6	82.9				
			tr												cong. S.S.			0.6	100				
															dark maroon brn - cobble @ 108'			1.6	88.9				
110															cong. S.S.								
						½	I	C				¼-1	I		C & □ - some rounded hem ovoids & irreg ovoids with maroon irreg patches			4.0	83.4				
															siltstone			1.0	100				
																		0.2	80				
			tr			⅛	I								chert bands			3.2	84.6				
120																		1.0	100				
																		0.2	80				
																		1.3	65.0				
															mudstone with Jasper bands			0	0				
																		1.5	100				
																		1.0	100				
130															mudstone - dk maroon brn			11.0	90.9				
															siltstone								
140																		0	0				
			tr	tr.								¼-1	I		a carb band			1.8	90.0				
						¼-½	I					½-1	I		ovoids ∈ carb centres & forms Patches also ∈ □			4.1	85.4				
																		0.5	80.0				
150									1"	I		½-1	R	FC	□ of red J			1.6	69.5				
												¼-1	R	FC	3" carb band ; cherty			2.4	82.8				
															siltstone - dk maroon brn			1.7	85.0				
160															many patches of carb plus silica - fine grained with fine xline hem replacements (?). many ∈ & □ some bands completely replaced by carb. Intergrown nodules some bands very high grade hem.								
			tr			⅛-¼"	I	C				¼-1	R	FC				26.6	85.9				
170								C															
180																							
																		0	0				
190																		0	0				
															∈ & □ 3" Chert band @ 196 Intergrown carb ovoids - elongated.			7.5	85.2				
			tr.			¼	I					¼-1	I		SANDSTONE: dk maroon brown - fine grain - limy matrix; poorly sorted, rounded to subangular, chlorite grains, qtz, felds, tuff			3.6	86.5				
200								C							∈ - very high carb zone ovoids & patches intergrown			3.4	87.8				
												¼-1	I										
															carb stringers (replacement) in bands			4.5	91.9				
			f.c					C				¼-1	I		Red □ ; Patches ∈ carb & red J ϕ			4.1	87.2				
210															fine xline hem								
			tr			⅛-¼	I	C				¼-½	I										
			tr									¼-½	I		red □ some carb			2.8	84.9				
																		1.8	90.0				
															mudstone - dk maroon brn - cherty bds								
220						¼	I					¼-½	R	FC	CARB in some patches & ovoids - also C & □ - some carb in bx.			4.7	94.0				
																		1.0	100				
															dk brn - typical								
			tr									½-½	I		red □ ; carb in patches & ovoids			4.1	87.2				
230																							
															1' of very low grade material ∈ silica - fine grained - laminae			3.3	97.1				
												¼-½	R										
						¼"	R		¼	I	tr				Red □, some carb ghosts some carb patches & bands some ovgs ∈ red □			7.2	88.9				
240																							
															Red □ on some patches mixture of xline carb & hem, silica, & finely disem. Jasp (patches & some ovoids) Common oolite laminae Carb ovoids irreg carb bx & lenses			12.4	88.6				
250			tr									¼-1	I										
260																							
															some bx (½") of dk brn carb & Jasp red □ - wavey tex to some carb brn ; some ∈ on ovoids			5.5	90.1				
																		1.0	98.9				
270															red □ on ovoids & patches								
															carb □ on bands & patches			7.3	91.4				
															Some large pat of silt carb								
															Narrow carb rich bands common								
280																		2.0	86.4				
															Interbedded mudstone & Iron Formation								
																		2.0	26.4				
															Interbedded mudstone & Iron Formation.								
290															mudstone :- dk maroon brown - scattered grains from sand size to pebble size - qtz, siltstn, Jasper, chlorite) - rounded to sub angular, occassional calcite veinlet.								
300																		22.7	67.7				
310																							
320															siltstone :- med maroon brown - material seems similar to S.S. of maroon type.			6.4	75.3				
																		0	0				
																		2.0	100				
330															siltstone : lt brn			3.7	80.6				
												¼-1	I		Carb □ - red ovoids with dark centres & often brown centres								
340												⅛-½	I	FC									
												⅛-1	I	I	"CHOPPED" red □ on ovoids & bands very little Carb.			2.5	16.3				
350															CHOPPED IRON FORMATION			0	0				
360																							

CREST EXPLORATION LIMITED

D.D.H. No. Y-2-78

Logged by: [illegible]

Area: [illegible] Creek Y.T. Claim: _____ Coordinates: 97,300 mE. ; 100,700 mN.

Elevation: _____ Total Depth: 401.5 Date Started: MAY 12 Completed: MAY 20

Inclination: 90°

ROCK TYPES

- Iron Formation
- Jasper
- Limestone
- Dolomite
- Shale
- Siltstone
- Sandstone
- Conglomerate
- Breccia
- No Sample
- Cavings

MODIFIERS AND ACCESSORIES

- Nodules (Relict)
- Lenses (Relict)
- Bands (Relict)
- Birdseye
- Spherulites
- Halo
- Maroon (M)
- Hematitic (H)
- Jasperoid (J)
- Siliceous (S)
- Carbonitic (C)
- Calcitic
- Dolomitic

STRUCTURES

- Strong Fault, Showing Dip
- Weak Fault, Showing Dip
- Fracture, Showing Dip
- Veinlet, Showing Dip
- Brecciated Zone

Depth / Elev.	Lithology	Gen. % Est. (with types)	Str	Description (Note feature dimensions, bedding dip, etc.)	Engineer. Data: Len Run	No Runs	% Rec.	% Rec	Crude Analysis: Sam. No.	Fe	SiO2	P
				SANDY CLASTIC - BROWN SHALE MATRIX								
				CLASTIC SANDSTONE (GREEN)	2'		2.0	100.0				
				IRON FORMATION - JASPER & CARBONATE NODULES (1-2 mm)	2.0				996			
				IRON FORMATION - (1-5 mm) NODULES OF JASPER	1.0		0.5	50.0				
				IRON FORMATION - (10-15 mm) NODULES OF PINK CARBONATE	1.5		0	0				
				IRON FORMATION - RELICT BIRDS-EYE + IRREGULAR LENSES & NODULES OF PINK LIGHT BROWN CARBONATE.	4.2		1.2	28.6	997			
					2.3		0	0				
				IRON FORMATION - IRREGULAR BANDS & (10-15 mm) NODULES OF PINK-BROWN CARBONATE	2.0		1.4	70.0	998			
				IRON FORMATION - LARGE (3-7") NODULES OF PINK CARBONATE (REPLACING ORGANICS ?) IN LIGHT GREEN CALCAREOUS SANDSTONE	2.0		1.9	95.0				
				IRON FORMATION (NODULES WITH SEPTARIA ?) (CLASTIC)	1.5		0.3	20.0				
				IRON FORMATION (LENS WITH QUARTZ SPHERULITES)	1.5		0.5	33.3	999			
				IRON FORMATION (VESICULAR METALLIC & CALCITE FILLED ?) (WEATHERED)	2.0		0.4	20.0				
				I.F. - IRREGULAR BANDS OF JASPER & BRIGHT GREEN SILICATE (CHLORITE ?) NODULES WITH HEMATITE	14		1.1	78.5				
				I.F. - IRREGULAR BANDS OF JASPER					1000			
				GREY CARBONATIC SHALE	5.6		4.2	75.0				
				I.F.								
				I.F. - FEW JASPER NODULES	2.0		1.8	89.6	1001			
				I.F.								
				I.F. - BANDED IN (1-2") BANDS - ELONGATED PIECES - DIP 22°	1.5		0.8	53.4				
				I.F. BANDED (1/2-3") + LIGHT BROWN CARBONATE VEINLETS DIP 15-20°	1.0		1.0	100.0	1002			
				I.F. - IRREGULAR STRINGS OF JASPER & CARBONATE	4.0		3.6	87.5				
				I.F. - GHOST BIRDS-EYE & JASPER NODULES	1.0		1.0	100.0				
				I.F. - JASPER NODULES & LENSES	1.0		0.5	50.0	1003			
					4.0		1.9	47.5				
				I.F. - PINK NODULES OF QUARTZ-HEMATITE CARBONATE	2.0		1.1	55.0				
				I.F. BANDED (1")	3.0		2.0	100.0				
				I.F. - CARBONATE NODULES & BANDS - CUT BY CALCITE VEINLETS WITH OFFSETS								
				I.F. - BANDS OF CLASTICS								
				I.F. - CARBONATE NODULES (2-5 mm)	4.5		3.0	66.7				
				I.F. - JASPER BIRDS-EYE - DIP 10-15°					1004			
				I.F. - BANDED (1/2" BANDS OF MAROON)								
					5.5		4.8	87.3				
				I.F. - WORMCAST NODULES	4.0		3.7	92.5				
				I.F. - PISOLITIC CARBONATE NODULES								
				I.F. - ACTIC NODULES - EAST-WEST DIPS AT 80° & SUBORDINATE DIP AT 10°					1005			
				I.F. - SPHERICAL (2-5 mm) NODULES OF MAROON CARBONATE & QUARTZ - DIP 10-20°	5.0		4.1	82.0				
				I.F. - BANDED								
				I.F. - (3-20 mm) LIGHT BROWN CARBONATE NODULES & LENSES - MAROON WITH 1/2" BANDS OF CLASTICS	5.0		2.9	58.0	1006			
				I.F. - RARE CARBONATE NODULES	2.4		1.0	41.7				
				BANDED I.F. (1/2-3") - VERTICAL FAULT PLANE WITH HORIZONTAL STRIAE	1.0		1.0	100.0				
					1.4		0.5	35.7				
				I.F. - MAROON BANDS & JASPER NODULES								
				I.F. - CARBONATIZED NODULES, CLASTIC (CALCAREOUS-SANDSTONE) = HEMATITE BANDS	4.0		3.7	92.5	1007			
				I.F. - BANDS OF CARBONATE NODULES & / OR CLASTICS								
				CLASTIC WITH METASTIC HEMATITE MATRIX								
				I.F. - LARGE (1-30 mm) JASPER NODULES WHICH ARE PARTIALLY CARBONATIZED	5.0		4.4	88.0				
				GREEN CONGLOMERATIC SANDSTONE								
				JASPEROID IF - NODULES OF CARBONATES MAROON SILICEOUS HEMATITE								
				BROWN CLASTIC WITH EVEN METASTIC MATRIX	5.0		4.1	82.0	1008			
				I.F. - MINOR JASPEROID MAROON SILICEOUS HEMATITE - JASPER GHOSTS OR JASPER & HEMATITE GHOSTS IN HEMATITE (2-10 mm)								
				MASSIVE BROWN SHALE - DARKER & MORE CLASTICS AT TOP & BOTTOM OF SECTION	5.0		4.4	88.0				
				I.F.	2.4		1.0	41.7	1009			
				JASPEROID I.F. - PINK NODULES	3.6		0.8	22.2				
				LIGHT GREY SHALE - LACED WITH VARIOUS VEINLETS	2.0		2.0	100.0				
				THIN BANDED I.F. - JASPER NODULES	1.4		1.3	92.9				
				BANDED I.F. - WITH NODULES OF JASPER								
					4.6		3.4	73.9				
				NODULAR I.F. - COMMON (2-8 mm) NODULES OF JASPER, PARTIALLY ALTERED TO QUARTZ & CARBONATE	3.0		2.3	76.7	1010			
				BANDED I.F. - CALCITE "METASOMES" IN MAROON BANDS	2.4		2.1	87.5				
				COARSE - CONGLOMERATIC - RED SHALE MATRIX - PARTICLES ANGULAR TO WELL ROUNDED & MICROSCOPIC TO 3"	5.0		5.0	100.0	1011			
					10.0		10.0	100.0				
					10.0		10.0	100.0	1012			
					2.5		2.5	100				
				BECOMES BROWN SHALE MATRIX	4.0		2.8	70.0				
									1013			
					8.5		8.3	97.7				
				JASPER & SILICEOUS HEMATITE	1.5		0.7	46.6				
				CONGLOMERATE (DARK BROWN SHALE MATRIX)								
				JASPER & SILICEOUS HEMATITE	3.5		3.1	88.6	1014			
				CONGLOMERATE (BROWN SHALE MATRIX)								
				JASPER & SILICEOUS HEMATITE	3.0		3.0	100.0				
				CONGLOMERATE (BROWN SHALE MATRIX) (1/2" TO 3" WELL ROUNDED PARTICLES)					1015			
					10.0		8.6	86.0				
				I.F.								
				DARK BROWN SHALE	5.0		4.3	86.0	1016			
				I.F. BANDED (1/2 TO 1" WIDE) MAROON WITH CALCITE AGGREGATES & BANDS (1/2 - 1") OF LIGHT BROWN CARBONATE.	2.0		1.8	90.0				
					4.6		3.9	84.7	1017			
					4.4		1.7	38.8				
				MEDIUM BROWN SHALE (DIP 15-20°)								
				GREEN CONGLOMERATIC SANDSTONE	10.6		10.2	96.2	1018			
				DARK CHOCOLATE BROWN SHALE								
					7.0		6.2	88.5	1019			
				THIN BEDDED GREEN BROWN SHALE BROWN SHALE WITH (1-2 mm) CLASTICS								
				THIN BEDDED GREEN-BROWN SHALE-SILTSTONE	10.4		10.3	99.0	1020			
				LIGHT GREY WELL ROUNDED CONGLOMERATE (1/2" TO 3" FRAGMENTS & CALCAREOUS SANDSTONE MATRIX.								
					10.0		10.0	100.0	1021			
					11.0		10.3	94.7	1022			
					13.5		13.1	101.8	1023			
				BANDED JASPEROID IRON FORMATION - BANDS 1" WIDE OF MAROON SILICEOUS HEMATITE	1.0		0.9	90.0				
				BANDED IRON FORMATION (1/8 to 1/2") BANDS OF MAROON HEMATITE & JASPER	4.0		3.3	82.5	1024			
				IRON FORMATION	3.0		2.4	80.0				
				LIGHT GREENISH - BROWN SANDSTONE IRON FORMATION - JASPEROID	3.1		2.5	80.6				
				MAROON FINE GRAINED HEMATITE					1025			
				VERY DARK BROWN SHALE	5.4		4.1	76.0				
				MAROON SILICEOUS HEMATITE								
				BLACK CLASTIC SHALE.	2.0		1.4	70.0	1026			
				IRON FORMATION BANDED (1" WIDE)								
				IRON FORMATION - QUARTZ - JASPER LENSES & BANDS	6.0		4.8	80.0				
									1027			
					4.0		3.3	82.6				
				CONGLOMERATE WITH BROWN SHALE MATRIX - ROUNDNESS INCREASES WITH SIZE OF FRAGMENTS	3.5		3.2	91.5				
					7.5		7.0	93.4				
					5.5		4.9	89.1				
					10.5		9.8	93.4				
					3.5		8.2	86.4				
				IRON FORMATION	2.1		2.0	95.2				
				CONGLOMERATE WITH CALCAREOUS SANDSTONE MATRIX.	2.4		2.1	87.5				
					3.0		2.0	67				
					6.6		4.7	71.3				
					1.4		0.9	64.3				
					3.6		1.6	44.5				
					6.4		6.4	100.0				
				BROWN SHALE WITH SAME CLASTICS	2.0		1.6	80.0				
				DARK GREEN CALCAREOUS SANDSTONE								
					10.0		8.3	83.0				
				DARK CHOCOLATE BROWN SHALE								
				CONGLOMERATE RED SHALE								
				IRON FORMATION (15% JASPER)	4.0		2.2	55.0				
				CONGLOMERATIC DARK BROWN SHALE	2.6		2.0	76.9				
					3.4		3.5	103.0				
					4.5		4.5	100.0				
					1.1		0.8	72.8				
				GREEN CALCAREOUS CONGLOMERATE	6.3		6.8	98.5				
				CONGLOMERATIC BROWN SHALE								

401.5' END OF HOLE

CREST EXPLORATION LIMITED

D.D.H. No. [illegible]

Logged by: [illegible]

Area: [illegible] Claim: 1 Coordinates: approx 98,300 ; 101,600

Elevation: _____ Total Depth: 275·2 Date Started: MAY 13 Completed: MAY 20

Inclination: 90°

ROCK TYPES

Iron Formation	
Jasper	
Limestone	
Dolomite	
Shale	
Siltstone	
Sandstone	
Conglomerate	
Breccia	
No Sample	
Cavings	

MODIFIERS AND ACCESSORIES

Nodules (Relict)	
Lenses (Relict)	
Bands (Relict)	
Birdseye	
Spherulites	
Halo	
Maroon	M
Hematitic	H
Jasperoid	J
Siliceous	S
Carbonitic	C
Calcitic	
Dolomitic	

STRUCTURES

Strong Fault, Showing Dip	30
Weak Fault, Showing Dip	30
Fracture, Showing Dip	30
Veinlet, Showing Dip	30
Brecciated Zone	

Depth Incr.	Lithology	Hem.% Est. (with types)	Str	Description (Note feature dimensions, bedding dip, etc.)	Engineer. Data: Len Run	No Runs	Ft. Rec	% Rec	Crude Analysis: Sam. No.	Fe	SiO_2	P
				GREEN TO DIRTY BROWN SANDSTONE PLUS PIECES OF IRON FORMATION								
	J	MJ		JASPEROID IRON FORMATION	2.0		1.7	85.0				
		MJ		DARK GREY SHALE	2.0		2.0	100.0				
				IRON FORMATION + SAND SIZED CLASTICS	2.0		2.0	100.0				
				DEEP MAROON SHALE + CONGLOMERITIC IN PART	2.0		1.9	95.0				
					2.0		2.0	100.0				
				FISSILE	2.0		1.4	70.0				
					3.0		2.9	96.8				
					10.4		9.8	94.2				
					11.0		9.6	87.2				
	J	MJ		IRON FORMATION + JASPER								
				IRON FORMATION + PINK NODULES & RELICT BIOT. ETC	5.5		6.0	109.0	1867			
					4.7		4.0	85.2				
				IRON FORMATION								
		MJ		IRON FORMATION - PINK NODULES (2-10 mm)	5.0		4.6	92.0	1868			
		MJ		IRON FORMATION - BANDS OF MAROON HEMATITE & SILICEOUS NODULES	3.6		2.5	73.6				
		MJ		IRON FORMATION - MAROON BANDS & SILICEOUS NODULES	6.2		4.1	66.2	1869			
		MJ		PINK DOLOMITIC LIMESTONE								
		MJ		IRON FORMATION - 2" BANDS OF PINK DOLOMITE + SILICEOUS & JASPER NODULES & LENSES (2-15 mm)	1.6		0.9	62.5				
					0.8		0.8	100.0				
		MJ		IRON FORMATION - LIGHT BROWN CARBONATE NODULES (2-10 mm) IRON FORMATION - 1-2 mm BANDS OF LIGHT BROWN ANKERITE	8.3		6.9	83.2	1865			
		MJ		IRON FORMATION - IRREGULAR BANDS OF MODULAR SILICEOUS HEMATITE - RARE 2 mm NODULES								
		MJ		IRON FORMATION - WHITE CARBONATE NODULES OF CHERTY & CLASTIC TEXTURE	6.1		4.9	80.2	1866			
		MJ		IRON FORMATION - MAROON BANDS & JASPER NODULES								
		MJ		IRON FORMATION - (1-5 mm) JASPER NODULES								
		MJ		IRON FORMATION - PERVASIVE BANDS OF SILICEOUS HEMATITE	1.4		0.9	64.3	1867			
	J	MJ		IRON FORMATION - (SANDSTONE-CALCAREOUS)								
				IRON FORMATION - BANDS OF SILICEOUS HEMATITE & JASPER	3.4		2.1	61.7				
				DARK CHOCOLATE BROWN SHALE								
				GREEN SANDSTONE					1868			
				HARD GREEN-BROWN SHALE								
				MEDIUM BROWN SHALE								
				DARK CHOCOLATE BROWN SHALE WITH CLASTIC MATERIAL + CONGLOMERATE	9.2		9.4	102.0				
					0.8		0.3	37.5	1869			
				DARK BROWN SILICEOUS SHALE	10.2		9.5	93.1	1870			
				CHOCOLATE BROWN CONGLOMERITIC SHALE								
				LIGHT GREEN CONGLOMERATE WITH CALCAREOUS SANDSTONE MATRIX	3.4		2.6	76.6				
				GREEN-BROWN SHALE					1877			
				FRAGMENTAL CHOCOLATE BROWN SHALE	9.7		8.2	84.5				
				JASPEROID IRON FORMATION - IRREGULAR BANDS OF JASPER & CARBONATE					1872			
				IRON FORMATION - INTER BEDDED MAROON & METALLIC HEMATITE	5.8		4.6	79.2				
				PYRRHOTITE IRON FORMATION ESPERANCE								
				IRON FORMATION - INTER BANDED (¼"-1") + 1" BANDS OF LIGHT BROWN CARBONATE	5.3		4.7	88.6	1873			
					1.6		0.9	56.2				
				IRON FORMATION - A FEW CALCITE NODULES	4.0		2.0	50.0				
		MJ		SILICEOUS HEMATITE BRECCIATED BY CALCITE VEINLETS.	4.9		4.8	98.0	1874			
	J	MJ		JASPEROID IRON FORMATION								
				DARK BROWN SHALE	2.4		1.7	70.8	1875			
				JASPEROID IRON FORMATION	2.5		0.7	28.0				
				IRON FORMATION - FINE BANDS ½ to 4" OF MAROON & CARBONATE					W1177			
					4.9		4.5	91.8				
				DARK CHOCOLATE BROWN SHALE								
					10.3		9.6	93.2	W1002			
									W1003			
				IRON FORMATION - 4" BANDS OF JASPER & CARBONATE	8.9		8.2	92.2	W1004			
				CONGLOMERATIC BROWN SHALE					W1005			
				IRON FORMATION - ABUNDANT CALCITE & JASPER	1.8		0.9	50.0				
									W1006			
				CONGLOMERATIC BROWN SHALE	9.9		9.1	91.9				
					10.4		9.7	93.2				
				BROWN SHALE	9.7		8.6	88.7				
				JASPER & VEIN QUARTZ GREEN-RED CALCAREOUS CONGLOMERATE								
					9.9		9.1	91.9				
				GREEN CALCAREOUS SHALE - MATRIX & PARTICLES								
					10.1		9.5	94.0				
					8.9		6.1	68.5				
				IRON FORMATION - (0-5 mm) JASPER & CARBONATE NODULES								
				BROWN CONGLOMERATIC SHALE (FINE SAND TO PEBBLE SIZED FRAGMENTS)	9.6		8.6	89.6				
					10.0		8.4	84.0				
				END OF HOLE								

CREST EXPLORATION LIMITED

D.D.H. No. Y-48

Logged by: W. Gibbins

Area: Zone Essex Y1

Claim: _____ Coordinates: 38,900 ; 96,000

Elevation: _____ Total Depth: 600' Date Started: May 2 Completed: May 2

Inclination: 90° Dip Tests: -10°

ROCK TYPES

- Iron Formation
- Jasper
- Limestone
- Dolomite
- Shale
- Siltstone
- Sandstone
- Conglomerate
- Breccia
- No Sample
- Cavings

MODIFIERS AND ACCESSORIES

- Nodules (Relict)
- Lenses (Relict)
- Bands (Relict)
- Birdseye
- Spherulites
- Halo
- Maroon
- Hematitic
- Jasperoid
- Siliceous
- Carbonitic
- Calcitic
- Dolomitic

STRUCTURES

- Strong Fault, Showing Dip
- Weak Fault, Showing Dip
- Fracture, Showing Dip
- Veinlet, Showing Dip
- Brecciated Zone

Depth	Elev.	Lithology	Her.% Est. (with types)	Str	Description (Note Feature dimensions, bedding dip, etc.)	Engineer. Data: Len No Run Runs; Ft. Rec; % Rec	Crude Analysis: Sam. No.; Fe; SiO2; P
420					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H0091
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H0092
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H0093
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H0094
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 34.0	
						2.0 — 1.6 80.0	
						4.0 — 3.6 90.0	
					BROWN SHALE	5.8 — 4.4 75.3	
						10.0 — 8.9 89.0	
						4.0 — 3.6 90.0	
460					END OF HOLE		
						10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						4.0 — 3.4 85.0	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.6 96.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						20 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H0095
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H0096
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H0097
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H0098
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H0099
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00100
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00101
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00102
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00103
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00104
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00105
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00106
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00107
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00108
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00109
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00110
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00111
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00112
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00113
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00114
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00115
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00116
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00117
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00118
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00119
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00120
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00121
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00122
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00123
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00124
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00125
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00126
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00127
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00128
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00129
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00130
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00131
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00132
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00133
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00134
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00135
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00136
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00137
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00138
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00139
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00140
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00141
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00142
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00143
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00144
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00145
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00146
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00147
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00148
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00149
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00150
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00151
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00152
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00153
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00154
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00155
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00156
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00157
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00158
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00159
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00160
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00161
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00162
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00163
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00164
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00165
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00166
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00167
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00168
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00169
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00170
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00171
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00172
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00173
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00174
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00175
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00176
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00177
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00178
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00179
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00180
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00181
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00182
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00183
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00184
						3.5 — 3.4 97.2	
						2.5 — 0.5 20.0	H00185
					IRON FORMATION CAVINGS ?	20 — 0.5 25.0	
						2.0 — 0.1 5.0	
						4.2 — 0.3 7.2	H00186
					DARK CHOCOLATE BROWN SHALE	7.8 — 7.5 96.5	
					CONGLOMERATE - DARK BROWN SHALE MATRIX - PARTICLES & MATRIX - MAX. PARTICLE DIAMETER 1/2"	4.0 — 3.4 85.0	
					COAGULATED BROWN SHALE - PARTICLES OF LIGHT GREENISH GRAY (0.5-2.5 mm) - ROUNDNESS IMPROVES WITH SIZE.	10.0 — 9.4 94.0	
						10.0 — 9.4 94.0	
						10.0 — 3.4 94.0	
						2.0 — 1.6 80.0	
						4.0 — 3.4 85.0	
					GREEN & BROWN SILTSTONE	1.9 — 1.4 73.6	H00187
					IRON FORMATION - THIN BANDS OF PINK JASPER & SARAMIDE (2¢" x 4" wide)	3.7 — 1.0 37.1	
						1.8 — 1.2 66.7	H00188

CREST EXPLORATION LIMITED

D.D.H. No. 75-63

Logged by: W. Gabbanna

Area: Izok, Canada, YT Claim: _____ Coordinates: approx. 98,600N ; 105,100E

Elevation: _____ Total Depth: 632.5 Date Started: MAY 24 Completed: June 4

Inclination: 90°

ROCK TYPES

- Iron Formation
- Jasper
- Limestone
- Dolomite
- Shale
- Siltstone
- Sandstone
- Conglomerate
- Breccia
- No Sample
- Cavings

MODIFIERS AND ACCESSORIES

- Nodules (Relict)
- Lenses (Relict)
- Bands (Relict)
- Birdseye
- Spherulites
- Halo
- Maroon (M)
- Hematitic (H)
- Jasperoid (J)
- Siliceous (S)
- Carbonitic (C)
- Calcitic
- Dolomitic

STRUCTURES

- Strong Fault, Showing Dip
- Weak Fault, Showing Dip
- Fracture, Showing Dip
- Veinlet, Showing Dip
- Brecciated Zone

Depth / Elev.	Lithology	Hem.% Est. (with types)	Str	Description (Note feature dimensions, bedding dip, etc.)	Engineer. Data: Len Run	No Runs	Ft. Rec	% Rec	Crude Analysis: Sam. No.	Fe	SiO2	P
				CONGLOMERATIC BROWN SHALE								
				GREEN & BROWN SILTSTONE - THIN BEDDED	3.1		3.1	100				
				DARK BROWN SHALE - MASSIVE - FEW SMALL (1/2"-1" dia) CLASTIC PEBBLES	6.0		4.2	70				
					7.6		8.0	105				
					6.5		6.2	95				
				GREEN & BROWN SILTSTONE								
				DARK BROWN CLASTIC SHALE	3.7		3.5	94				
60												
				BROWN SHALE WITH BANDS OF DARK GREEN CALCAREOUS SILTSTONE & PINK CALCITE MARBLE	9.5		9.8	99				
				DARK BROWN MASSIVE SHALE	3.5		2.8	84				
					3.6		3.5	97				
					7.7		8.0	104				
80												
				GRADES INTO SILTSTONE THIN SANDSTONE INTERVALS COARSE	1.8		1.6	89				
				DARK BROWN SHALE - CLASTIC MATRIX W/ CLASTIC FRAGMENTS 1mm ANGULAR TO 1" & RNDED	10.1		9.7	95				
				GREEN & BROWN SILTSTONE - IRREGULAR WAVY LAMINATIONS CONGLOMERATIC BROWN SHALE - SHALEY CONGLOMERATE - MATRIX CLASTIC + MICROCLASTIC TO 3" DIAMETER								
					7.0		7.0	93				
100				SHALEY BROWN SHALE - DISSEMINATED CARBONATE, FAIR								
				LIGHT GREEN CALCAREOUS SANDSTONE - CONTAINS STRINGERS & BANDS OF BROWN SHALE	10.1		9.8	97				
					10.1		9.7	96				
120												
					10.1		9.7	96				
				GRADES INTO GREEN & BROWN SHALEY SILTSTONE								
				LIGHT GREEN CALCAREOUS SANDSTONE - MASSIVE	4.6		4.5	97				
				DARK CHOCOLATE BROWN SHALE - CARBONATE VEINLETS - SHALEY LAYERS IN THE FIRST FOUR FEET								
140					9.3		8.9	95				
					2.1		1.4	66				
				SHALEY BROWN GREEN & BROWN SILTSTONE TO SANDSTONE (COARSE TO BOTTOM)	1.2		0.8	66				
		M		SHALEY MAROON SILICEOUS HEMATITE MASSIVE	3.3		2.3	69				
				BROWN SHALEY CLASTIC SANDSTONE (VERY) DARK BROWN SHALE - MASSIVE	3.0		2.9	95				
160					10.1		9.9	98				
				GREEN EROSION SURFACE								
				BLACK HEMATITIC SHALE								
		H		IRON FORMATION (39% METALLIC 12% CARBONATE)	6.3		5.7	82				
				DARK BROWN SHALE - MASSIVE								
					9.3		9.2	92				
180				GREEN & BROWN SILTSTONE - THIN BEDDED								
				DARK BROWN SHALE - CARBONATE VEINLETS - HIGH HEMATITE CONTENT	4.1		2.7	60				
					3.4		2.5	75				
		M		IRON FORMATION (46% METALLIC & 30% MAROON) - JASPER, IRON CARBONATE & RELICTS, BIRDSEYE TO NODULES (1mm-8mm)	6.5		4.8	73				
				BROWN SHALE								
				BROWN SHALE TO LIGHT GREEN SHALE CONGLOMERATIC TO NON CLASTIC	2.5		2.2	88				
200					1.9		1.5	100				
					10.2		10.0	100				
		M		IRON FORMATION (45% METALLIC, 35% MEDIUM TO MAROON JASPER) - BANDED & JASPEROID BROWN SHALE								
				CONGLOMERATE - BROWN SHALE MATRIX	9.6		7.9	91				
				BROWN SHALE								
220												
				LIGHT GREEN SHALE 60% - BROWN SHALE 40% + 1% CONGLOMERATE	8.2		7.7	92				
				SANDSTONE - COARSE TO VERY COARSE - GREEN - CALCAREOUS								
		M		IRON FORMATION (65% METALLIC & 25% MAROON) - CHERT & BANDS OF MAROON SILICEOUS HEMATITIC & PINK CARBONACEOUS JASPER (1/8" to 1/2" wide)	7.0		6.0	71				
											996	
				DARK GREEN & BROWN SILTSTONE	9.6		9.5	98			997	
240												
		M		IRON FORMATION - IRREGULAR MAROON BANDS - PINK TO RED JASPER NODULES (1/8 to 8 mm)							998	
				GREEN & BROWN SILTSTONE - THIN IRREGULAR BEDDED								
				DARK GREEN-BROWN MEDIUM GRAINED SANDSTONE - MASSIVE & CLOSELY CALCAREOUS							999	
					10.2		9.8	96				
											980	
260		M		IRON FORMATION	10.2		9.9	97				
		M		BRECCIA IRON FORMATION - MAROON BANDS (1/8 to 1" wide)								
				BROWN SHALE - IRON SILICATES							981	
		M		NODULAR IRON FORMATION - PINK TO RED JASPER NODULES (.25 to 6 mm) CALCITE (6 mm) & QUARTZ (6 mm) = GHOST NODULES - CARBONATE NODULES OR MATRIX	1.0		0.8	80				
					5.9		6.0	101				
		M		BANDED IRON FORMATION - (1/8 to 1") BANDS OF MAROON SILICEOUS HEMATITE							982	
		M		IRON FORMATION - IRREGULAR BANDS & PATCHES - GENERALLY LIGHT TO DARK PURPLE BANDS OF SILICEOUS HEMATITE & MAROON & PINK JASPER NODULES - SPHERULITIC TEXTURE OR QUARTZ - CARBONATE HEMATITE	10.1		9.9	98				
280		M		JASPEROID BANDED IRON FORMATION - BANDS OF JASPER & MAROON SILICEOUS HEMATITE & CLASTIC SHALE	9.2		7.8	85			983	
		M		CONGLOMERATIC BROWN SILTSTONE	4.8		4.8	100			984	
		M		IRON FORMATION								
				CLASTIC BROWN SHALE								
		M		BANDED IRON FORMATION - MAROON BANDS (1/8 to 3" wide)	5.1		4.8	94			985	
		M		NODULAR IRON FORMATION - PINK TO RED JASPER NODULES (1/8 to 16 mm) BANDED IRON FORMATION - JASPEROID NODULES (1mm to 8mm) - BANDS & LENSES (1/8 to 1" wide)								
		M		IF - MAROON BANDS UP TO 1" THICK - JASPER NODULES 1/8 TO 15 mm	3.8		3.0	78			986	
300												
				CLASTIC BROWN SHALE							987	
				JASPEROID IRON FORMATION	7.9		7.7	98			988	
				DARK BROWN SHALE - MASSIVE	2.5		1.7	68			989	
				IF - 10% JASPER								
				DARK BROWN SHALE								
				IF - 20% JASPER	10.0		9.8	98				
				MEDIUM BROWN SHALE							990	
		M		IF - IRREGULAR BANDS OF PURPLE SILICEOUS HEMATITE WITH SMALL 1mm METACRYSTS OF CALCITE - FEW PINK JASPER NODULES								
		M		IF - NODULES (1/8 to 12 mm) ARE MOSTLY GHOSTS OF HEMATITE AND JASPER & PINK TO BROWN CARBONATE - JASPER - BANDS OF MAROON HEMATITE & PINK CARBONATE	10.2		9.7	97				
320												
											991	
				BROWN SHALE								
		M		JASPEROID IRON FORMATION - STRONG IRREGULAR BANDS OF MAROON & JASPER							992	
				DARK BROWN SHALE - MASSIVE	8.8	9.5		91				
				LIGHT GREEN SILTSTONE - SAND SIZED DARK GREEN ANGULAR FRAGMENTS							993	
340		M		IRON FORMATION - FAINT TO NEAR RELICT BIRDSEYE & NODULES (.25 to 3 mm) - SPHERES & PINK CARBONATE & GREEN & MAROON SILICEOUS HEMATITE - PINK JASPER	5.3		5.3	100			994	
				NODULES AT BASE (1 to 2 mm)								
		M		IF - BANDED - 1/8 to 1/2" BANDS OF DARK MAROON SILICEOUS HEMATITE - PINK JASPER NODULES & LENSES (1-15mm)	16.3		10.5	100			995	
		M		IF - RELICT BIRDS-EYE STRUCTURE								
				JASPEROID - EYE; JASPER & HEMATITE BRECCIA								
		M		IF - PATCHES OF PINK QUARTZ - JASPER UP TO 3" THICK & CAN BE VUGGY - MEDIUM SIZED SPHERE NODULES	5.2		5.0	96			996	
360		M		IRON FORMATION - BANDS OF MAROON HEMATITE (1/8 to 4" wide) - PINK JASPEROID PATCHES (1/8 to 50 mm DIAMETER)								
				IRON FORMATION - MAROON BANDS (1/8 to 1") - MAROON JASPER LENSES - PINK JASPER PATCHES TO 3 NODULES - SPHERULITE PATCHES AT 368.8	5.9		5.9	100			997	
					3.8		3.7	96				
				IRON FORMATION - IRREGULAR BANDS OF MAROON HEMATITE								
		M		VIOLATE BROWN HARD ARGILLACEOUS HEMATITE	9.1		8.5	93			998	
		M		IF - RELICT BIRDSEYE & IRREGULAR PATCHES OF MAROON								
		M		IF - MANY 1/8" MAROON BANDS & RED JASPER NODULES (1 to 10 mm)							999	
				DARK BROWN SHALE								
				JASPEROID IRON FORMATION								
380				DARK BROWN SHALE								
				DARK GREENISH BROWN SILTSTONE								
				DARK GALENA BROWN SANDSTONE	10.8		9.7	90			1000	
				CONGLOMERATE WITH GREEN CALCAREOUS SANDSTONE MATRIX								
		M		IRON FORMATION - IRREGULAR & NODULAR PATCHES OF JASPER & MAROON - SOME RELICT BIRDSEYE								
		M		IF - MAROON & JASPER BANDS (1/8 to 1/2" wide)	5.8		5.0	100			1001	
		M		IF - PURPLISH MAROON BANDS TO 3" WITH MINOR RELICT QUARTZ - CARBONATE NODULES	2.2		2.1	98				
400		M		IF - IRREGULAR TO REGULAR MAROON BANDS (1/8" TO 12") - PATCHES OF PINK JASPER (1/8 to 1 1/2") MAY HAVE MAROON VEINLETS OF CALCITE - JASPER LENSES WITH RHOMBIC CUBES OF PYRITE (1 to 3 mm)*	3.9		3.6	93			1002	
					4.1		4.4	107			1003	
				HARD SILTY SHALE - BROWN	10.1		9.3	92				
				IRON FORMATION - MAROON BANDS (1/8" to 1" wide) - RELICT BIRDS-EYE TEXTURE (1 to 8 mm) - PINK TO RED JASPER NODULES & PATCHES & LENSES & BANDS (1/8 to 1" wide) PARTIALLY ALTERED	1.9		1.9	100			1004	
420												
				DARK GREEN - BROWN CALCAREOUS CONGLOMERITIC SANDSTONE	3.6		3.3	92			1005	
		H		IF - STREAKS OF MAROON HEMATITE IRON FORMATION - IRREGULAR MAROON JASPER BANDS - SMALLER & FEWER CARBONATE BANDS							1006	
				IRON FORMATION - (1/8 to 1") BANDS OF MAROON JASPER & WHITE CARBONATE NODULES (1 to 15 mm)	2.8		2.8	100				
					5.4		4.1	76			1007	
				IRON FORMATION - ORANGE JASPER NODULES (1 to 15 mm)	3.6		3.6	100				
440		MH		IRON FORMATION - BANDS OF NUMEROUS BIRDS-EYE TO OVOID NODULES	3.6		1.8	50				
				BANDED IRON FORMATION - REGULAR TO IRREGULAR BANDS OF MAROON JASPER	4.7		4.6	98			1008	
				IRON FORMATION - IRREGULAR MAROON RED JASPER PYROXENITE? - JASPER NOD. & BANDED IRON FORMATION (10% HEMATITE) (1/8 to 1") BANDS OF MAROON JASPER	5.4		4.9	90				
					4.8		4.1	102			1009	
				INTER-BANDED IRON FORMATION & CLASTIC CARBONATE								
				DARK CHOCOLATE BROWN SHALE	3.2		3.9	122				
460											1010	
				CLASTIC BROWN SHALE - CLASTICS: SAND SIZED TO 1/4" - BROWN SHALE MATRIX BECOMES DARKER TOWARDS THE BOTTOM	7.8		7.9	94				
											1011	
					8.9		8.7	98				
480											1012	
				IRON FORMATION - PATCHES OF PINK TO RED JASPER & CARBONATE (0.25") - IRREGULAR STREAKS OF RED JASPER	8.7		7.8	89			1013	
				COARSE GREEN SANDSTONE & BROWN SHALE IRON FORMATION - BAND NODULES OF JASPER (1 to 12 mm) SOME								
500		SGH		IRON FORMATION - MAROON JASPER NODULES (3 TO 15 mm) WITH RED JASPER HALO	10.4		9.5	91	1014			
				IRON FORMATION - JASPEROID - WIDE (UP TO 0.8 FEET) BANDS OF RED & MAROON JASPER	5.3		3.8	71			1015	
		M										
				NODULAR IRON FORMATION - MASSIVE NODULES (2 to 10 mm) OF MAROON, RED & PINK JASPER - SOFT ANGULAR FRAGMENTS IN THE NODULES - BANDS OF CARBONATE CLASTICS	9.5		2.7	94	1016			
520												
					10.4		10.1	97			1017	
				IRON FORMATION - IRREGULAR MAROON BANDS (1/8 to 1")								
				IRON FORMATION - BRIGHT WHITE CARBONATE PATCHES & NODULES (1/16 mm) IRON FORMATION - STRETCHED CARBONATE PATCHES, RED JASPER NODULES & FRAGMENTS OF PEVICOMP FRAGMENTED BEDS	10.3		10.0	96	1018			
				IRON FORMATION - RED CARBONATE NODULES IRON FORMATION - RED JASPER NODULES (2 to 8 mm) - RED & MAROON IRREGULAR BANDS								
540												
				NODULAR (1 - 6)% WIDE WHITE RIMED NODULES IN IRON FORMATION	9.2		7.5	82	1019			
				IRON FORMATION - A FEW MAROON JASPER BANDS & PATCHES - & ALTERED PINK JASPER NODULES								
		SGH		IF - MANY NODULES RED JASPER + PINK SILICIFICATION IRON FORMATION - MAROON BANDS (1/8 to 1") & NODULES (1/8 to 12 mm) - WITH THIN HALOS OF RED JASPER	10.0		9.8	98	1020			
560												
				CONGLOMERATIC BROWN SHALE								
				GREENISH BROWN CALCAREOUS SANDSTONE GRADES & BROWN SANDY SHALE TO LIGHT GREEN CALCAREOUS CLASTIC & MASSIVE SHALE							1021	
				DARK BROWN SHALE - MASSIVE	10.0		9.1	91				
				THIN BEDDED GREEN & BROWN SILTSTONE TO SANDSTONE - CALCAREOUS	10.0		9.9	99			1022	
				MASSIVE DARK BROWN SHALE								
580												
				LIGHT GREEN CALCAREOUS ROUNDED PEBBLE CONGLOMERATE - PEBBLES EXCEED SANDSTONE MATRIX	9.9		6.5	66	1023			
				BRITTLE JASPEROID & CLASTIC IRON FORMATION - UNIT IS LARGELY COMPOSED OF HARD MAROON & RED JASPER & DARK BROWN CLASTIC SHALE	6.6		1.2	19				
		MH			6.5	5.6		86	1024			
				CONGLOMERATIC BROWN SHALE SANDSTONE TO 2" PEBBLES - LIGHT GREEN CALCAREOUS CLASTICS	7.0	5.8		84	1025			
600												
					18.6	18.2		31				
					10.0	10.0		100				
620				COARSE GREENISH BROWN SANDSTONE - CLASTIC SAND GRAINS OF BROWN SHALE & LIGHT GREEN CALCITE								
				CONGLOMERATIC TO SANDY DARK BROWN SHALE	9.9		9.7	98				
				COARSE TO FINE GRAINED GREEN & BROWN SANDSTONE								
				END OF HOLE @ 632.5 FEET								
640												

CREST EXPLORATION LIMITED

D.D.H. No. Y-6-63

LOGGED BY W. Giddens

AREA Iron Creek X.T. CLAIM _____ COORDINATES 92,500 N.; 92,500 E. approx.

ELEVATION _____ TOTAL DEPTH 636' DATE STARTED May 21/63 COMPLETED June 13/63

INCLINATION 90° Dip of beds = 15°

ROCK TYPES

IRON FORMATION
JASPER
LIMESTONE
DOLOMITE
SHALE
SILTSTONE
SANDSTONE
CONGLOMERATE
BRECCIA
NO SAMPLE
CAVINGS

MODIFIERS AND ACCESSORIES

NODULES (RELICT)
LENSES (RELICT)
BANDS (RELICT)
BIRDSEYE
SPHERULITES
HALO
MAROON — M
HEMATITIC — H
JASPEROID — J
SILICEOUS — S
CARBONITIC — C
CALCITIC
DOLOMITIC

STRUCTURES

STRONG FAULT, SHOWING DIP
WEAK FAULT, SHOWING DIP
FRACTURE, SHOWING DIP
VEINLET, SHOWING DIP
BRECCIATED

Depth elev.	Lithology	Hem.% Est. (with types)	Str	Description (Note feature dimensions, bedding dip, etc.)	Engineer. Data: Len Run	No Runs	Ft. Rec	% Rec	Crude Analysis: Sam. No.	Fe	SiO2	P
				= CONGLOMERATE = BROWN SHALE MATRIX = LIGHT GREEN SUB-ANGULAR TO SUB-ROUNDED PARTICLES (⅛" TO 2" DIAMETER)	2.5		2.6	104.0				
				LIMESTONE DIKE IN FAULT ZONE ?	6.5		4.9	75.5				
				= CAVINGS: BROWN CONGLOMERATE & MARBLE, GREEN BROWN MARBLE	3.0		1.5	50.0				
				= CONGLOMERATIC BROWN SHALE — SCATTERED SUB-ROUNDED PARTICLES UP TO 2" ACROSS + SMALLER SUB-ANGULAR PARTICLES = LIGHT GREEN TO WHITE IN COLOR	5.0		3.3	110.0				
					1.5		1.2	80.0				
					6.0		6.9	97.7				
					5.0		4.7	94.0				
					7.0		6.0	85.7				
					3.0		3.4	113.4				
					3.5		2.5	83.5				
					4.5		3.9	86.7				
					1.5		1.2	80.0				
				= GREEN & BROWN SILTSTONE — THIN IRREGULAR BEDDING	3.5		2.9	82.9				
					5.0		4.7	94.0				
				= CONGLOMERATIC BROWN SHALE = CARBONATE VEINLETS (¼" TO 8 mm WIDE)								
					5.0		5.0	100.0				
					5.0		4.6	92.0				
					4.7		4.6	97.9				
				= CONGLOMERATE WITH A LIGHT GREEN CALCAREOUS MATRIX								
				= CONGLOMERATIC BROWN SHALE	2.8		2.4	85.8				
				= GREEN & BROWN SILTSTONE - IRREG. BEDDED.								
				= CONGLOMERATIC BROWN SHALE	5.0		4.5	90.0				
					5.5		4.7	94.0				
				= GREEN & BROWN SILTSTONE	2.5		1.3	52.0				
				= BROWN TO GREEN SHALE								
				= GREEN & BROWN SILTSTONE	4.0		3.2	80.0				
				= BROWN SHALE								
					1.0		1.0	100.0				
					1.6		1.3	81.3				
					1.4		1.0	71.5				
				= GREEN & BROWN SILTSTONE	3.0		2.5	83.3				
					2.0		1.7	85.0				
				= BROWN SHALE — CONGLOMERATIC TO SANDY = CALCAREOUS PARTICLES.								
					8.0		7.8	97.5				
					2.5		2.3	92.3				
				= SILTY BROWN SHALE	3.5		3.4	97.2				
				= GREEN & BROWN SILTSTONE GREEN & BROWN SILTSTONE								
					3.2		3.1	100.2				
					3.0		2.7	90.0				
					3.2		1.0	33.7				
				= SILTY BROWN SHALE	2.0		1.6	80.0				
					2.0		1.6	80.0				
					2.0		1.6	79.0				
					2.0		1.5	75.0				
				= GREEN & BROWN SILTSTONE - THIN BEDD	3.3		2.5	83.4				
					1.5		1.1	73.4				
				= DARK GREENISH BROWN SILTSTONE TO SANDSTONE - MASSIVE	1.5		0.5	33.3				
					1.0		0.1	10.0				
					2.0		1.0	50.0				
					2.0		1.4	70.0				
					5.0		5.0	100.0				
					3.0		2.4	78.4				
					5.0		4.6	92.0				
					2.0		1.3	65.0				
					3.0		2.1	70.0				
					3.0		3.3	110.0				
					6.0		6.0	100.0				
					2.9		1.9	71.0				
					4.5		4.1	102.5				
					2.4		2.2	91.6				
				= BROWN SHALE - MASSIVE								
				= GREEN & BROWN SILTSTONE - THIN BEDDED & CROSS BEDDED.								
					10.0		9.3	93.0				
					7.0		7.0	100.0				
					3.0		2.5	83.0				
				= BROWN SHALE - MASSIVE								
				= GREEN & BROWN SILTSTONE "BANDED"	9.0		6.2	77.5				
				= CONGLOMERATIC TO SANDY BROWN SHALE = FEW WHITE CALCITE VEINLETS	10.0		9.6	96.0				
					10.0		9.7	97.0				
				= FINE GRAINED CALCAREOUS SANDSTONE = LIGHT GREEN TO BROWN CONGLOMERATIC BROWN SHALE								
		MJ		= ARGILLACEOUS IRON FORMATION OR HEMATITIC ARGILLITE	6.2		3.8	96.0				
					4.9		3.1	72.5	H0178			
				= THIN BEDDED DARK GREEN & BROWN SILTSTONE HEMATITIC ARGILLITE	3.5		2.4	68.9	H0179			
					3.5		2.8					
				= DARK BROWN SHALE - MASSIVE - CALCITE VEINLETS	2.0		2.0	100.0				
					1.2		0.9	76.7	H0180			
					3.4		4.1	120.5				
					2.0		1.3	65.0	H0181			
					6.6		6.2	94.0	H0182			
		MJ		= IRON FORMATION - COARSE SAND SIZED GRAINS OF HEMATITE IN A MAROON JASPER METRIX.					H0183			
				= DARK BROWN SHALE - MASSIVE								
		MJ		= SANDY IRON FORMATION	3.0		2.9	96.9	H0184			
									H0185			
				= DARK BROWN SHALE - MASSIVE = THIN BEDD GREEN & BROWN SILTSTONE TO FINE SANDSTONE - CALCAREOUS	7.0		6.0	71.5	H0186			
									H0187			
					6.5		6.4	98.4				
		MJ		= IRON FORMATION - COARSE SAND SIZED HEMATITE TOWARDS BOTTOM					H0188			
				= GREEN & BROWN CALCITIC SILTSTONE TO SANDSTONE	6.5		6.1	93.9				
									H0189			
		H		= INTER-BEDDED CONGLOMERATIC ARGILLACEOUS HEMATITIC & IRON FORMATION	4.0		2.1	52.5	H0190			
				NO RECOVERY	3.0		0.8	26.6				
				= IRON SANDSTONE - COARSE SUB ROUNDED TO ANGULAR GRAINS OF METALLIC HEMATITE, WHITE HEMATITE & JASPER	1.5		-	-	H0191			
					5.0		4.8	96.0				
					4.0		2.0	50.0	H0192			
		MH		= IRON FORMATION - PURE SUB-METALLIC HEMATITE - MASSIVE HEMATITE	1.5		0.9	60.0	H0193			
		MJ		= IRON FORMATION - 50% OF SUB-METALLIC HEMATITE & 50% EX CLASTIC DARK GREEN CALCAREOUS SANDSTONE.	3.1		1.6	51.6				
				= LIGHT GREY QUARTZITE (X BEDDED) BROWN TO GREEN & BROWN SILTSTONE	4.5		3.2	71.1	H0195			
					2.0		2.1	105.0				
				= DARK BROWN SHALE - SOME LIGHT GREEN	3.0		2.1	70.0				
				= SHALEY IRON SANDSTONE					H0196			
				= CONGLOMERATIC LIGHT GREEN-BROWN CALCAREOUS SANDSTONE	5.0		3.6	72.0				
					2.9		0.4	13.8				
				DARK BROWN TO LIGHT GREEN SHALE OR FINE GLAUCONITE	3.0		2.0	66.7				
				= CONGLOMERATIC BROWN SHALE - LIGHT GREEN FROM BROWN TO LIGHT GREEN SHALE	3.0		3.2	85.0	H0197			
				= CONGLOMERATIC BROWN SHALE								
					3.5		2.8	80.0	H0198			
				= JASPEROID IRON FORMATION RED & MAROON JASPER BANDS (¼ to 2") WIDE & MOST WITH REGULAR BOUNDARIES = FEW RED JASPER NODULES	2.0	—	—	—				
		MH			3.5	0.5	0.5	14.3	H0199			
					1.5		0.1	6.7				
					1.9		0.7	36.8				
					1.0		0.2	20.0				
					1.2		0.2	16.7				
					1.3		0.8	61.5				
					1.2		0.2	16.	H0200			
				= GREEN & BROWN THIN BEDDED CALCAREOUS SANDSTONE - SCATTERED IRON SANDSTONE EAST BASIN	6.0		4.8	80.0				
					5.0		4.0	80.0	H0201			
			DIP 15-20°	= IF. = IRREGULAR STREAKS & PATCHES OF ORANGE - RED JASPER - RED-ORANGE JASPER NODULES (1-5 mm) - LIGHT MAROON JASPER BANDS (¼-½")	4.0		3.5	87.5				
					4.4		3.7	84.1	H0202			
				= IF. = MAROON JASPER BANDS (¼-½")	3.0		3.0	100.0				
		M		= IF. = WIDE BANDS OF PALE MAROON JASPER (UP TO 4" WIDE) - NODULES & LENSES OF RED JASPER (1 to 10 mm)	5.5		4.5	81.8	H0203			
				= IF. = IRREGULAR BANDS OF MAROON JASPER.								
					4.0		3.9	97.5				
					1.5		1.7	100.0	H0204			
				= IF. = MANY THIN (¼-½") BANDS OF MOSTLY MICROCRYSTALLINE QUARTZ-MEGA JASPER	2.5		2.5	100.0				
				= IF. = IRREGULAR BANDS OF MICRO JASPER	2.0		1.6	80.0				
				= GRAYISH BROWN CONGLOMERATE WITH A SANDSTONE MATRIX.	2.0		1.7	85.0	H0205			
		M		= IF. = IRREGULAR BANDS & PATCHES OF MAROON JASPER - A FEW FINE BANDS & LENSES OF RED JASPER.	4.0		2.3	57.5				
					1.5		0.5	33.3	H0206			
				= CONGLOMERATE - CLASTICS (¼" DIAMETER) IN MAROON MATRIX	4.5		4.1	91.1				
				= IF. = IRREGULAR BANDS OF MAROON JASPER (¼-1") WIDE - NODULES: RED JASPER, MAROON JASPER, FINE QUARTZ, & RELICT	3.0		3.0	100.0				
									H0150			
				= INTER-BEDDED JASPEROID (100) MAROON HEMATITE & DARK BROWN CLASTIC SHALE.	5.9		5.2	88.1				
					1.1		0.8	72.7	H0151			
				= DARK BROWN SHALE	1.6		1.3	81.2				
					3.0		1.8	60.0				
		M		= JASPEROID IF. = (¼-½") BANDS OF RED & MAROON JASPER.	2.0		1.5	75.0	H0152			
					2.0		2.0	100.0	H0153			
				= DARK BROWN SHALE TO SILTSTONE	2.4		1.6	66.7	H0154			
		M	DIP 10-15°	= IF. = BRECCIATED OR "SHEARED" RED JASPER & DOLOMITE - RELICT BIRDSEYE - MAROON JASPER NODULES & LENSES (¼-2" mm) - QUARTZ-HEMATITE PATCHES - TRACE OF CARBONATE VEINLETS & PYRITE	5.6		4.7	84.2				
					3.9		3.7	94.8	H0155			
		M		= IF. = NODULES (1-5 mm) & LENSES (¼-2 mm) OF RED & MAROON JASPER = PINK QUARTZ-HEMATITE PATCHES	6.0		5.7	95.0				
		M	DIP 10°	= IF. = BANDS OF MAROON JASPER (¼-1") = TRACE OF LIGHT BROWN SHREDDED CARBONATE								
		M		= IF. = RELICT BIRDSEYE (10% OF METRIC HEMATITE) = IRREGULAR PATCHES (¼-1") OF PINK QUARTZ-HEMATITE & LIGHT BROWN CALCITIC CARBONATE.	6.0		5.6	93.4	H0156			
					3.8		3.8	100.0	H0157			
		M		= IF. = NODULES & LENSES (⅛-½") OF LIGHT BROWN CARBONATE & RED JASPER (MAROON CORES)								
		M		= IF. = BRECCIATED OR SHREDDED RED JASPER & DOLOMITE.	6.5		4.7	72.4				
		M		= IF. = 30% OF BRECCIATED HEMATITE & BIRDSEYE - IRREGULAR PATCHES OF PINK QUARTZ-HEMATITE & A FEW NODULES OF RED JASPER	1.8		1.8	100.0				
					3.6		2.4	100.0	H0158			
		M		= IF. = RED JASPER NODULES (1-5 mm) & IRREGULAR MAROON JASPER BANDS.	4.5		4.0	88.9				
		M		= SHALEY IF. = SHALE & MAROON JASPER VEINLETS								
		M	DIP 10-15°	= IF. = 100% OF METALLIC TO RELICT (BRECCIATED) = IRREGULAR MAROON JASPER LENSES (¼-½" THICK) = 0-10% OF CHECKERED OR BRECCIATED DOLOMITE & RED JASPER.	7.5		5.3	70.7	H0159			
				= JASPEROID IRON FORMATION								
		M		= DARK BROWN GREEN CALCAREOUS SANDSTONE	6.0		4.5	75.0	H0160			
		M		= IF. = IRREGULAR BANDS & LENSES OF MAROON JASPER = (¼-1") WIDE - NODULES: RED JASPER (1-5 mm) & ROUNDED QUARTZ GRAINS (¼-½ mm) & NUMEROUS WHITE DOLOMITE NODULES)	7.0		6.9	98.6				
		M		= IF. = RELICT BIRDS-EYE = IRREGULAR MAROON JASPER BANDS UP TO 2" WIDE (¼-1") BEDS OF FINE CLASTIC.					H0161			
					7.0		6.3	90.0				
				= IF. = RED JASPER NODULES & LENSES (⅛-½ mm) SMALL CHOCKLES & IRREGULAR BANDS OF MAROON JASPER.	2.0		2.0	100.0	H0162			
				= HARD DARK BROWN HEMATITIC SHALE	5.0		4.3	86.0	H0163			
		M		= IF. VERY IRREGULAR BANDS & STREAKS OF RED & MAROON JASPER (¼-2") WIDE - RED JASPEROID HEMATITE (¼-½")	1.8		0.5	27.8				
					3.2		1.9	59.4	H0164			
				= JASPEROID IF. = IRREGULAR STREAKS, BANDS & PATCHES OF RED & MAROON JASPER (¼-1½ mm) FOR MOST SUBANGULAR CHALCEDONY (BOUDARY)	5.3		4.8	90.6				
					5.1		1.2	23.5	H0165			
					1.8		0.3	16.8				
				= HARD DARK BROWN SHALE	6.9		6.5	93.1				
				= JASPEROID IRON FORMATION = SANDY TO CONGLOMERATIC DARK BROWN SHALE.								
					10.0		7.3	73.0	H0166			
									H0167			
					9.6		9.2	83.2				
					7.0		3.4	86.0	H0168			
					4.4		3.4	77.3	H0169			
		MH		= SANDY TO CONGLOMERATIC MAROON HEMATITE	1.6		0.4	26.0				
									H0170			
				= HARD BROWN SHALE	7.8		7.8	100.0				
		J		= JASPEROID IRON FORMATION					H0171			
		J		= HARD BROWN SHALE					H0172			
									H0173			
				= JASPEROID IRON FORMATION	10.0		7.2	72.0	H0174			
				= HARD BROWN SHALE								
									H0175			
				= IF. = RED JASPER BANDS: EYES	2.0		1.6	79.0	H0176			
				= SANDY TO CONGLOMERATIC DARK BROWN SHALE	7.0		4.7	67.1				
					3.2		1.3	41.3				
					5.0		3.7	86.6				
					6.0		2.1	42.0				
					1.0		0.8	48.0				
				END OF HOLE 11-6-63	636.0 FEET.							

(B Continued)

CREST EXPLORATION LIMITED

D.D.H. No. Y-7-63

Logged by: W. Gibbins

Area: Izok Creek N.T. Claim: _____ Coordinates: 100,200N ; 88,800E approx.

Elevation: _____ Total Depth: 1443.0' Date Started: May 30/63 Completed: June 7/63

Inclination: 90° Dip of beds ≈ 25°/30°

ROCK TYPES

- Iron Formation
- Jasper
- Limestone
- Dolomite
- Shale
- Siltstone
- Sandstone
- Conglomerate
- Breccia
- No Sample
- Cavings

MODIFIERS AND ACCESSORIES

- Nodules (Relict)
- Lenses (Relict)
- Bands (Relict)
- Birdseye
- Spherulites
- Halo
- Maroon (M)
- Hematitic (H)
- Jasperoid (J)
- Siliceous (S)
- Carbonitic (C)
- Calcitic
- Dolomitic

STRUCTURES

- Strong Fault, Showing Dip
- Weak Fault, Showing Dip
- Fracture, Showing Dip
- Veinlet, Showing Dip
- Brecciated Zone

Depth / Elev.	Lithology	Hem.% Est. (with types)	Str	Description (Note feature dimensions, bedding dip, etc.)	Engineer. Data: Len Run	No Runs	Ft. Rec	% Rec	Crude Analysis: Sam. No.	Fe	SiO2	P
20				CLASTIC BROWN SHALE : CLASTICS (1/2 to 5") DIAMETER	3.0		1.7	56.7				
					1.0		1.0	100.0				
				LIGHT GREEN CRAWN FINE CALCAREOUS SILTSTONE								
				CLASTIC BROWN SHALE	5.0		2.6	52.0				
		MJ		COARSE IRON SANDSTONE (MARTIN MATRIX & HEMATITIC CALCITE SAND GRAINS) CLASTIC BROWN SHALE	2.0		1.5	75.0				
					5.0		4.5	90.0				
40					4.0		4.3	107.5				
					5.0		5.0	100.0				
		↔ MJ		IRON FORMATION - MAROON SILICEOUS TO JUSPEROIDAL + 100 % BROWN SHALE	2.8		2.5	89.4				
				GREEN & BROWN SILT STONE - DARKER TOWARDS THE BOTTOM.	10.2		9.8	96.1				
60					6.0		5.7	95.0				
	H			IRON SANDSTONE - COARSE HEMATITE & CALCITE GRAINS IN A SHALEY JASPEROID MATRIX					902			
				CROSS-BEDDED GREEN & BROWN SILTSTONE	13.0		12.1	93.0				
	RJ MJ	H		CONGLOMERATE - BROWN SHALE MATRIX JASPEROID IRON FORMATION - RED to MAROON					903			
	RJ	MH		NODULAR IRON FORMATION								
	RJ	MH		CLASTIC IRON FORMATION & IRON SANDSTONE WITH BANDS OF CONGLOMERATIC to MAROON CLASTIC MAROON HEMATITE.	2.6		1.9	73.5				
80	H	M			5.0		5.2	104.0	904			
	H	MH			1.9		1.6	84.3				
				CONGLOMERATIC GREEN-BROWN SILTSTONE JASPEROID IRON FORMATION	4.5		4.0	88.9	905			
		MH		ALTERNATE LIGHT GREEN & DARK BROWN BANDS OF MASSIVE SHALE	6.5		5.5	84.6				
									930			
100				CONGLOMERATIC GREEN & BROWN SHALE	3.9		3.4	87.2				
				MASSIVE DARK BROWN SHALE	6.1		4.6	75.5	944			
				LIGHT GREEN SHALE - MASSIVE - ALTERNATING CLASTIC & NON-CLASTIC	8.2		7.7	93.9				
									945			
		M		IRON FORMATION - RED & MAROON JASPER BANDS (1/2 to 2") THICK & FEW IRREGULAR to PATCHY NODULES OF PINK JASPER	6.8		5.6	82.4	906			
120		M		BANDED IRON FORMATION - NUMEROUS RED & MAROON JASPER BANDS (1/2 to 2") THICK	3.2		2.1	65.6				
		M			2.3		0.6	26.0	907			
					3.5		2.1	60.0				
			30° DIP	DARK GREENISH BROWN SILTSTONE - MASSIVE TO 30° DIP IN THE BEDDING	5.6		5.0	89.3				
									928			
140					5.0		4.9	98.0				
		M		IRON FORMATION - IRREGULAR RED & MAROON JASPER STREAKS & PATCHES	4.4		4.6	104.5				
		M	30° DIP	IRON FORMATION - LIGHT CALCAREOUS MAROON JASPER BANDS - GRADING TO IRREGULAR PATCHES OF ORANGE-RED JASPER	5.0		5.0	100.0	908			
					2.0		2.2	110.0				
		M		CLASTIC DARK BROWN SHALE	3.5		3.5	100.0	909			
		M		BANDED IRON FORMATION - REGULAR TO IRREGULAR BANDS OF LIGHT CALCAREOUS & DARK MAROON JASPER - A FEW RED JASPER NODULES WITH THIN WHITE BORDERS OF FIBROUS OR ASCICULAR CALCITE.	2.5		2.6	104.0				
160		H MH		IRON FORMATION - MASSIVE - EXCEPT FOR CLASTIC & SOME IRREGULAR STONE	7.1		6.7	38.1	910			
		N MH	70° DIP	BANDED IRON FORMATION - MAROON & RED JASPER	1.5	1	1.7	113.2				
				CLASTIC BROWN SHALE - WITH A SMALL AMOUNT OF SOOTY HEMATITE INTERBEDDED								
		H M		BANDED JASPEROID IRON FORMATION (1/8 to 1/4") BANDS OF MAROON & RED JASPER & CLASTIC DARK BROWN SHALE (1/4 to 1/2")	10.0		9.9	99.0	911			
				IRON FORMATION - IRREGULAR BANDS & LENSES OF LIGHT MAROON JASPER - RED JASPER NODULES (1/2 to 1" DIAM.) - IRREGULAR PINK JASPER PATCHES	4.5		4.5	100.0	912			
180		H M			7.5		7.6	101.3				
									914			
					2.3		2.1	91.4				
				INTER BEDDED BROWN SHALE & RED JASPER	5.7		4.7	83.5				
200		M										
		H MH		IRON FORMATION - IRREGULAR MAROON JASPER NODULES WITH RED HALO - IRREGULAR CARBONATE PATCHES - MANY RELICT BIRDS-EYES	12.6		12.8	101.5	915			
		M		IRON FORMATION - SHREDDY PINK DOLOMITE PINK JASPER PATCHES WITH WHITE CRUSTS NODULAR I.F. - MANY GHOST TO SUB-GHOST BIRDS-EYES. - OVAL RED JASPER NODULES								
		H	30° DIP	IRON FORMATION - MAROON JASPER BANDS (1/4 to 3") - PATCHES OF LIGHT COLORED JASPER.								
		S H		IRON FORMATION - METALLIC HEMATITE & MAROON JASPER. LIGHT COLOR DUE TO HIGH MICROCRYSTALLINE SILICA CONTENT.	6.9		6.5	94.2	916			
220		M		IRON FORMATION - PATCHES OF PINK JASPER (1 to 30mm.) & WHITE SILICA (0.5 to 6 mm.) ACROSS - MAROON BANDS - RED JASPER NODULES & LENSES - RELICT BIRDS-EYE - & A FEW SMALL VUGS (1 to 5 mm) WIDE	6.5		6.3	97.4	917			
			30-35° DIP		6.0		5.6	93.3				
		M			7.0		6.8	97.1	918			
240		M		IRON FORMATION - WIDE MAROON & RED JASPER BANDS - AS WELL AS NUMEROUS PINK to RED JASPER NODULES (1 to 5 mm), LENSES (3 to 15 mm), & PATCHES (1 to 8 mm).	8.5		8.1	95.4	919			
					10.0		9.8	98.0	920			
				FINE GRAINED GREEN-BROWN CALCAREOUS SANDSTONE.					921			
260				NODULAR IRON FORMATION - NUMEROUS WHITE SILICEOUS NODULES (1 to 15 mm) & PINK JASPER PATCHES (1 to 30 mm)	9.4		9.0	95.7				
		MH		IRON FORMATION - MAROON JASPER BANDS (2 to 3") WIDE	1.7		2.5	147.0	922			
		MH	30-35° DIP		4.9		3.5	71.5				
		M		IRON FORMATION - 3 to 5" BANDS OF RED JASPER & WITH NUMEROUS MAROON JASPER NODULES (1 to 4 mm) - RELICT BIRDS-EYE	7.5		7.1	93.4	923			
		M		IRON FORMATION - VERY IRREGULAR MAROON JASPER BANDS & PATCHES	7.0		6.6	94.3				
280		M							924			
		M		LIGHT BROWN CARBONACEOUS SHALE.					925			
		M		IRON FORMATION - COMMON RELICT BIRDS-EYE - ALSO SOME RED & MAROON JASPER	5.0		5.0	100.0				
				IRON FORMATION - CHARACTERISTIC BANDS & OVAL PATCHES OF ORANGE JASPER WHICH MAY OR MAY NOT HAVE CRUSTS OR WHITE ASCICULAR CRYSTALS - MAROON BANDS (1/2 to 3")	6.6		6.0	91.0	926			
		MH		CLASTIC IRON FORMATION - ANGULAR TO SUB ANGULAR CARBONATE PARTICLES (1/16 mm) - RELICT BIRDS-EYE	7.7		7.7	100.0	927			
		MH		IRON FORMATION - RED JASPER NODULES - PINK & MAROON JASPER					929			
300				CONGLOMERATE - CARBONATE FRAGMENTS IE. ARKOSIC? - PINK TO RED JASPER PATCHES & SHREDS - RELICT BIRDS-EYE	10.0		9.8	98.0	931			
					9.7		9.2	94.8	932			
			DIP 35°	BANDED IE - (1 to 2") BANDS OF MAROON JASPER	7.1		6.4	90.0				
		RJ MH		IRON FORMATION - RED JASPER PATCHES & NODULES - BANDS OF MAROON JASPER LENSES - RELICT BIRDS-EYE	8.0		6.1	86.0	933			
320		M			9.5		9.2	96.8	934			
				HARD MEDIUM BROWN SHALE								
	MJ MJ			INTER-BEDDED RED & MAROON JASPER CONGLOMERATIC DARK BROWN SHALE	10.0		8.9	89.0	935			
340					4.6		4.2	95.5	936			
					4.6		3.7	80.5				
					3.7		3.6	96.0	937			
360		M			6.4		6.2	96.9				
				IRON FORMATION - 75 PL. RED & 25 % MAROON JASPER IN THICK & IRREGULAR BANDS								
		M		NODULAR IRON FORMATION - VERY ABUNDANT - RED JASPER NODULES (1 to 8 mm) PINK JASPER PATCHES (1/4 to 12 mm). IRREGULAR STREAMS OF PALE MAROON JASPER, RELICT TO SUB-RELICT BIRDS-EYE	8.9		8.9	100.0	938			
380		M			10.0		9.6	96.0	939			
				BANDED IRON FORMATION - (1/8 - 1/4") BANDS OF MAROON JASPER - LESS CONTAINS WELL ROUNDED CLASTIC DOLOMITE	4.1		3.9	83.0	940			
			DIP 35°	IRON FORMATION - RED JASPER NODULES (1/8 to 1/2") WITH MAROON JASPER CORES - A FEW PINK JASPER BANDS OR LENSES (1/4 - 1/2") THICK	4.3		3.2	74.5				
400		M			7.0		6.8	97.2	941			
					18.8		9.5	97.8	942			
		M		IRON FORMATION - NUMEROUS & REGULAR RED JASPER NODULES (1 to 5 mm), LENSES, (1/8 - 1/2" x 1 - 1 1/2") & IRREGULAR BANDS	4.7		3.6	76.6	943			
					2.9		2.0	69.0				
				CONGLOMERATE - CALCAREOUS LIGHT GREEN WELL ROUNDED (1/8 - 3" DIAM.) FRAGMENTS (+ 75 %) - BROWN SHALE MATRIX	9.0		8.5	94.5				
420				CONGLOMERATIC to SANDY DARK BROWN SHALE - SUB ANGULAR FRAGMENTS UP TO 1/2" LONG - TRACE OF THIN (1-2 mm) CARBONATE VEINLETS.	4.0		1.0	25.0				
					4.6		2.1	45.6				
					10.0		5.7	57.0				
440					9.8		3.6	38.0				
			1443.0 FEET	= END OF HOLE # Y-7-63								
460												

CREST EXPLORATION LIMITED

D.D.H. No. Y-8-63

LOGGED BY W. Gibbins

AREA IRON CREEK CLAIM COORDINATES 108,400 N : 82,300 E

ELEVATION TOTAL DEPTH 310.0 DATE STARTED JUNE 11 COMPLETED JUNE 26

INCLINATION VERTICAL

ROCK TYPES

IRON FORMATION
JASPER
LIMESTONE
DOLOMITE
SHALE
SILTSTONE
SANDSTONE
CONGLOMERATE
BRECCIA
NO SAMPLE
CAVINGS

MODIFIERS AND ACCESSORIES

NODULES (RELICT)
LENSES (RELICT)
BANDS (RELICT)
BIRDSEYE
SPHERULITES
HALO
MAROON M
HEMATITIC H
JASPEROID J
SILICEOUS S
CARBONITIC C
CALCITIC
DOLOMITIC

STRUCTURES

STRONG FAULT, SHOWING DIP
WEAK FAULT, SHOWING DIP
FRACTURE, SHOWING DIP
VEINLET, SHOWING DIP
BRECCIATED

DEPTH ELEV	LITHOLOGY	HEM % EST. (with types)	STR	DESCRIPTION (Note feature dimensions, bedding dip, etc.)	ENGINEER DATA: LEN RUN	No. RUNS	FT REC.	% REC.	CRUDE ANALYSIS: SAM No.	Fe	SiO_2	P
				OVER BURDEN								
			DIP 30°	IRON FORMATION - RELICT NODULES: OVOIDS (1-8 mm) - REGULAR TO IRREGULAR BANDS OF MAROON JASPER - MICROCRYSTALLINE QUARTZ - HEMATITE PATCHES, LENSES, & VERY IRREGULAR BANDS	3.0		2.1	70.0				
					3.0		2.7	91.0	1072			
					2.3		1.4	60.8				
					2.3		0.0	—				
					1.0		0.2	20.0				
					0.9		0.4	44.5				
					2.2		1.1	50.0	1073			
					1.3		1.1	84.6				
					1.0		0.8	—				
					1.0		0.8	80.0				
					(4.0)		(4.0)	(—)				
20				FINE GRAINED, CALCAREOUS BROWN & GREEN SANDSTONE	4.3		4.3	100.0	1074			
				IF - BANDS ARE MOSTLY VERY IRREGULAR MAROON JASPER AS WELL AS SOME PINK QUARTZ-HEMATITE BANDS - NODULES & LENSES OF PINK QUARTZ-HEMATITE & RED JASPER	4.4		3.6	75.5				
					4.0		3.9	97.5	1075			
				JASPEROID IRON FORMATION - RED BANDS (1/2") IF - PATCHES (1/8-1/2") OF PINK QUARTZ-JASPER & IRREGULAR BANDS OF MAROON JASPER & BROWN CALCITIC CARBONATE	4.0		3.1	77.6				
					1.0		0.8	80.0				
40			DIP 15°		3.0		2.4	141.8	1076			
					1.0		1.0	100.0				
					2.0		1.9	95.0				
				SANDY DARK BROWN SHALE	1.7		1.5	88.3				
				IF - IRREGULAR BANDS OF JASPER & RELICT LENSES								
				IRON CARBONATE - RED JASPER/HEMATITE BAND								
				BANDED IRON FORMATION - (1/8" TO 1/2") REGULAR TO IRREGULAR BANDS OF RED & MAROON JASPER - TRACE OF INTERBEDDED SHALE	3.1		2.5	98.6	1077			
			DIP 15°									
				CONGLOMERATE & - DARK BROWN SHALE MATRIX - FRAGMENTS (35%) (1/2 TO 1" DIAMETER) - SHALE & CARBONATE, ANGULAR TO ROUNDED	9.2		8.2	89.2	1078			
			60° DIP TRANS	IRREGULAR BANDS OF JASPER & CARBONATE (1/8-1/2")								
60				IRON CARBONATE - SOME INTERBEDDED CONGLOMERATE								
				BANDED IRON FORMATION - RED JASPER BANDS (1/8-1/2") - SILICA NODULES PARALLEL BEDDING	5.5		5.5	100.0	1079			
			DIP 15°	IRON FORMATION - REGULAR BANDS OF JASPER (1/2-3/4") WIDE								
				CONGLOMERATE: DARK BROWN SHALE MATRIX - FRAGMENTS OF LIGHT GREEN SHALE & WHITE TO YELLOW CARBONATES, MICROSCOPIC TO 3" DIAMETERS - ANGULAR TO SUB-ROUNDED	6.7		5.0	74.6				
					4.6		3.2	69.5	1081			
				IRON FORMATION - (1-3") BANDS OF LIGHT BROWN CARBONATE & (1/2-1") BANDS OF MAROON JASPER	5.2		3.8	73.1	1082			
80				IRON FORMATION - STREAKY WASTE BANDS OF MAROON								
				JASPER & CARBONATE, OCCASIONAL (1/2-2")	4.0		4.0	100.0				
			DIP 15-20°		5.0		4.7	94.0				
				LOW GRADE IRON FORMATION - STREAKY BANDS OF RED & MAROON JASPER, CARBONATE & CLASTICS (1/8-2")	5.0		4.6	92.0	1083			
				CONGLOMERATE - BROWN SHALE MATRIX - FRAGMENTS UP TO 4" LONG.	5.0		3.9	78.0	1084			
100				LOW GRADE IRON FORMATION - BANDS UP TO 6" WIDE OF HARD DARK BROWN SHALE - RED & MAROON JASPER BANDS (1/8-3/4")	3.0		2.8	93.5				
				IRON FORMATION - RED JASPER-QUARTZ PATCHES & LENSES (1/8-1/2") - PALE PURPLE MAROON JASPER CALCITE LENSES - SHREDDED DOLOMITE	3.0		3.0	100.0	1085			
					4.0		3.1	77.5				
			DIP 30°	BANDED IRON FORMATION - MAROON & RED JASPER BANDS (1/8-1/2")	6.3		6.3	100.0	1086			
				IRON FORMATION: IRREGULARLY PATTERNED MASTIC CONSISTING OF SHREDDED DOLOMITE & RED JASPER ZONES, PINK PATCHES & LENSES OF HEMATITE-QUARTZ, THIN & IRREGULAR BANDS OF MAROON JASPER & CARBONATE	1.9		1.9	100.0				
120					3.9		3.6	92.1				
					2.5		2.5	100.0	1086			
					1.7		1.7	100.0				
					2.8		2.8					
					4.0		3.9	97.5				
									1087			
					5.0		4.7	94.0				
140					4.0		3.5	87.5	1088			
				HARD BROWN SHALE								
				JASPEROID IRON FORMATION	5.0		4.3	86.0				
				BROWNISH GREEN MEDIUM SIZED SANDSTONE					1089			
					6.5		6.5	100.0				
			DIP 20-25°	LOW GRADE IRON FORMATION: BANDS (1/8-1/2") OF IRREGULAR RED & MAROON QUARTZ-HEMATITE, BANDS OF CLASTICS	9.5		9.5	100.0	1090			
160					7.0		6.8	97.1				
				BANDED IRON FORMATION: (1/4-1") BANDS OF MAROON JASPER & (1/4-3/4") PATCHES OF RED JASPER	5.0		3.7	74.0	1091			
				HARD BROWN SHALE - TRACE OF VERY ANGULAR SOFT PALE GREEN FRAGMENTS	7.0		5.8	83.0	1092			
				IRON FORMATION: REGULAR TO IRREGULAR PATCHES (1/8-1/2") & BANDS (1/8-1") OF MAROON JASPER & LIGHT BROWN CARBONATE - RELICT BIRDS-EYE	1.0		1.0	100.0				
					1.0		1.0	100.0				
180					0.5		0.5	100.0	1093			
					2.5		2.2	85.6				
					1.0		1.0	100.0				
					(4.0)		(4.0)	(100.0)				
				CONGLOMERATIC IRON FORMATION: IRREGULAR FRAGMENTS OF BROWN CARBONATE & RED JASPER ETC. - MARBLE - STEEL GREY HEMATITE MATRIX.	5.0		3.3	89.0	1094			
				LOW GRADE BANDED IRON FORMATION (1/8 TO 2") BANDS OF MAROON & RED JASPER - 6" BAND OF SANDY SHALE	5.6		4.5	80.6				
				BANDED IRON FORMATION: BANDS (1/2-2") RED AMETHYSTINE MAROON JASPER SOME PALE BUFF CARBONATE - LIGHT BROWN CARBONATE BANDS.								
200			DIP 25°		2.1		2.0	95.3	1095			
					3.7		3.3	89.2				
				IRON FORMATION, WHICH CONTAINS SANDY BANDS OF LIGHT BROWN CARBONATE & IRREGULAR STREAKS OF RED JASPER								
				NODULAR IRON FORMATION: ROUNDED LENSES & PATCHES OF RED JASPER & CARBONATE (1/8-3/4") - RELICT BIRDS-EYE STRUCTURE MAKE UP 60% of HEMATITE.	16.0		5.8	86.0	1096			
					2.0		2.0	100.0	1097			
					(2.0)		(2.0)	(100.0)				
				IRON FORMATION, CONTAINS A FEW IRREGULAR BANDS & PATCHES OF PASTEY LIGHT BROWN CARBONATE.								
220				MARIUM BROWN HARD SHALE - CONTAINS IRREGULAR 6" STREAKS OF RED JASPER (INCLUDING CALCITE VEINLETS)	8.1		5.5	65.5				
				SANDY DARK BROWN SHALE	2.9		0.6	26.1	1098			
				ROCK WITH LARGE & ABUNDANT CARBONATE PATCHES WITH A SMALL AMOUNT OF HEMATITE MATRIX	9.0		7.7	85.5	1099			
				SANDY TO CONGLOMERATIC DARK BROWN SHALE.	2.0		0.9	45.0	1100			
240					2.6		1.1	42.3				
					3.9		2.8	74.4	1101			
				JASPER	2.7		2.7	100.0				
				IRON FORMATION WITH NUMEROUS PATCHES OF LIGHT BROWN CARBONATE (1/8-1/2")	5.3		4.4	83.0	1102			
					4.7		4.7	100.0				
260					5.3		4.6	86.9	1103			
				IRON FORMATION: RED JASPER & CARBONATE BANDS (1/2-1") & LENSES (1/4-3/8") - MOST OF THE LENSES ARE BETWEEN 247.0 & 271.0' LIMONITE PSEUDOMORPHS AFTER PYRITE AT 247.5.	6.5		5.4	98.2	1104			
					4.0		3.5	87.5				
			DIP ~25°	IRON FORMATION: CARBONATE PATCHES & LENSES (1/4 x 2-3") & CARBONATE & MAROON JASPER BANDS (1/8-1/2")	7.0		6.5	93.8	1105			
280					5.0		4.0	80.0				
					5.0		5.0	100.0	1106			
				DARK BROWN SHALE - SLIGHTLY SANDY TO CONGLOMERATIC	7.6		7.6	100.0				
300					7.4		4.7	63.5				
				DARK GREEN CALCAREOUS SANDSTONE & BOULDER	7.0		3.2	45.7				
				END OF DDH # Y-8-63 AT 310.0'								

310

GEO - 25 - CR (6/63)

CREST EXPLORATION LIMITED

D.D.H. No. Y-3-63

LOGGED BY W. Gibbins

AREA IRON CREEK CLAIM COORDINATES 198,300 N ; 94,100 E

ELEVATION TOTAL DEPTH 420.0 DATE STARTED JUNE 14 COMPLETED JUNE 26

INCLINATION 90°

ROCK TYPES

- IRON FORMATION
- JASPER
- LIMESTONE
- DOLOMITE
- SHALE
- SILTSTONE
- SANDSTONE
- CONGLOMERATE
- BRECCIA
- NO SAMPLE
- CAVINGS

MODIFIERS AND ACCESSORIES

- NODULES (RELICT)
- LENSES (RELICT)
- BANDS (RELICT)
- BIRDSEYE
- SPHERULITES
- HALO
- MAROON — M
- HEMATITIC — H
- JASPEROID — J
- SILICEOUS — S
- CARBONITIC — C
- CALCITIC
- DOLOMITIC

STRUCTURES

- STRONG FAULT, SHOWING DIP
- WEAK FAULT, SHOWING DIP
- FRACTURE, SHOWING DIP
- VEINLET, SHOWING DIP
- BRECCIATED

DEPTH ELEV	LITHOLOGY	HEM % EST (with types)	STR	DESCRIPTION (Note texture dimensions, bedding dip, etc.)	ENGINEER. DATA LEN RUN	No RUNS	FT REC	% REC	CRUDE ANALYSIS SAM No	Fe	SiO_2	P
				- OVERBURDEN								
				- HARD HEMATITIC SHALE & IRON SANDSTONE	4.0		1.7	42.5				
				- VERY FINE GREEN & BROWN SANDSTONE	5.0		3.5	70.0				
40				- DARK BROWN SHALE	3.0		1.5	50.0				
					2.6		0.7	26.9				
					[illegible]		[illegible]	[illegible]				
				- IRON SANDSTONE - COARSE RED JASPER & METALLIC HEMATITE SAND.	1.4		1.3	92.8				
				- SANDY BROWN SHALE TO BROWNISH GREEN SANDSTONE.	4.0		3.6	90.0				
					3.0		2.5	83.4				
					1.6		0.7	43.9				
					1.4		1.0	71.5				
60					2.0		0.4	20.0				
					3.0		-	-				
					[illegible]		[illegible]	[illegible]				
					5.0		0.4	8.0				
				- IRON FORMATION: JASPEROID & APPEARS TO CONTAIN SAND GRAINS OF QUARTZ & JASPER	2.5		0.1	4.0				
		MH			3.0		0.5	16.7	1028			
					1.0		-	-				
					3.0		0.3	10.0				
80					1.6		0.3	18.7				
		MH			2.4		0.2	8.3	1029			
				- DARK BROWN SHALE - BANDS OF GREENISH CONGLOMERATE & TRACES OF LIGHT GREEN SHALE	5.0		1.5	30.0				
				DIP ~ 20°	2.5		1.7	68.0				
					1.5		0.8	53.3	1030			
					2.0		0.7	35.0				
					6.0		5.1	85.0				
100												
					4.0		3.0	75.0	1031			
					5.0		3.7	74.0				
		MH		- IRON FORMATION - 75% OF WASTE IS RED & MAROON JASPER BANDS REGULAR TO IRREGULAR ½" TO 2" THICK.	1.6		0.6	37.7				
				DIP ~ 30°	3.4		1.8	35.3	1032			
					1.0		0.6	60.0				
					1.0		0.9	90.0				
					2.0		-	-				
					1.0		0.3	30.0				
120					1.0		0.3	30.0				
					2.5		0.5	20.0	1033			
					2.0		1.4	70.0				
					3.0		1.8	60.0				
				- FINE GREEN & BROWN SANDSTONE - LAMINATED & CALCAREOUS.	2.0		1.3	65.0	1034			
					5.0		2.7	54.0				
				- IRON FORMATION - IRREGULAR TO REGULAR BANDS OF JASPER & CARBONATE DIP 26-30°	1.5		1.1	73.4				
					1.2		0.3	25.0				
					1.0		0.6	60.0	1035			
140					1.0		0.3	30.0				
					3.0		2.5	83.4				
					1.0		0.6	60.0				
					4.0		3.5	87.5				
					1.0		1.0	100.0	1036			
					2.5		2.3	92.1				
					3.5		3.3					
					4.0		4.0	100.0				
					2.0		2.0	100.0	1037			
160					[illegible]		[illegible]	[illegible]				
				- CONGLOMERATE: BROWN SHALE MATRIX - FRAGMENTS (35 - 90%), (0.3 mm TO 8" DIAM.) LIGHT GREEN & YELLOW CARBONATES, ANGULAR TO SUB-ROUNDED - SMALL BANDS OF JASPEROID MAROON HEMATITE	4.0		2.2	55.0				
					3.1		0.0	-	1038			
					1.9		0.0	-				
					5.0		3.4	68.0	1039			
					4.0		3.5	87.5				
				- NODULAR IRON FORMATION: 50% OF OVOIDS (50% OF WASTE + RED JASPER BANDS HAVE CRUSTS OF ASSOCIATED CALCITE - PATCHES (25% OF WASTE) CONTAIN BROWN CARBONATE - DIP 20°	3.0		2.7	90.0				
180				DIP-20	2.0		0.0	-	1040			
					3.0		3.0	100.0				
		MH		- BANDED JASPEROID IRON FORMATION (¼ - 2½") REGULAR BANDS OF MAROON & RED JASPER - TRACE OF SANDY SHALE	2.5		1.7	68.0	1041			
				10-15°	2.0		1.5	75.0				
		VR+MH		- INTERBEDDED DARK BROWN SHALE & JASPEROID IRON FORMATION (¼ - 2") REGULAR TO IRREGULAR BANDS OF RED & MAROON JASPER	2.5		1.2	48.0				
		MH+MH			[illegible]		[illegible]	[illegible]	1042			
		VR+MH			2.2		2.7	85.0				
200				- IRON FORMATION: MOST OF THE HEMATITE IS NEAR THE STEEL GREY - MAROON BOUNDARY. - THIN BANDS OF BROWN SHALE.	2.5		2.1	98.5				
		MH			4.0		3.3	82.6	1043			
					2.0		1.7	85.0				
				- HARD MEDIUM GREY DOLOMITIC SHALE	4.5		4.3	93.3	1044			
		MH		- IRON FORMATION: IRREGULAR PATCHES & BANDS OF JASPER & LIGHT BROWN CARBONATE	4.1		4.0	97.6	1045			
				- IRON FORMATION: PATCHES OF PINK QUARTZ-HEMATITE, SHREDDED DOLOMITE & JASPER, SMALL LENSES TO BIRDS-EYE OF WHITE MICROCRYSTALLINE QUARTZ - TRACE OF SANDY SHALE. - MAROON JASPER BANDS (¼ - 1").	DIP 5°	4.4		4.3	97.8				
220					5.0		5.0	100.0	1046			
					5.0		4.8	96.0				
					6.0		4.7	78.0				
									1047			
					6.0		5.9	98.3				
240												
		MH		- IRON FORMATION: SIMILAR TO ABOVE BUT ONLY A TRACE OF DOLOMITE	2.0		1.9	96.0				
					5.0		5.0	100.0	1048			
					7.0		6.9	98.6	1049			
					4.0		4.0	100.0				
260				- VERY FINE DARK GREEN CALCAREOUS SANDSTONE.								
					10.0		10.0	100.0	1050			
				- IRON FORMATION: REGULAR & IRREGULAR BANDS (¼ - 1") & LENSES (½ - 3" x ½ - 2") OF RED & MAROON JASPER. - TRACE OF CHALCOPYRITE.	4.6		4.1	89.2	1051			
		MH			7.0		7.0	100.0	1052			
280				- INTER-BEDDED SHALE & LOW GRADE MAROON HEMATITE.					1053			
				- IRON FORMATION: NUMEROUS LENSES (½ - 3" x ½ - 2") OF RED JASPER & CARBONATE. (SOME HAVE BORDERS OF MACROCRYSTALLINE CALCITE.	6.7		6.5	97.0	1054			
				- IRON FORMATION: IRREGULAR BANDS OF MAROON JASPER (¼ - 1½") THICK. SOME HAVE RED JASPER IN BORDER & TINY MICROSCOPIC VEINLETS OF CALCITE.	4.7		4.7	100.0	1055			
					3.0		2.5	83.3				
				- HARD DARK BROWN HEMATITIC SHALE					1056			
300				- IRON FORMATION: REGULAR MAROON JASPER BANDS (¼ - 2") - TRACE OF CHALCOPYRITE. DIP-5°	8.0		7.8	97.6	1057			
				- COARSE CALCAREOUS SANDSTONE: ANGULAR GRAINS (0.5-3mm) IN BROWN SHALE MATRIX, SCATTERED	6.0		5.8	96.7	1058			
				- IRON FORMATION: BANDS (½ - 1") & LENSES (½ - 1½") OF MAROON & RED JASPER					1059			
				- DARK BROWN CONGLOMERATIC SHALE - SAND TO 1" ANGULAR PARTICLES OF CARBONATE	5.0		3.3	82.3	1060			
				- JASPEROID CONGLOMERATE: MATRIX OF HIGHLY HEMATITIC SHALE WHICH IS INTERRUPTED BY LARGE STREAMS OF RED JASPER								
320					6.6		6.6	100.0	1061			
				- IRON FORMATION: IRREGULAR BANDS (½ - 1") OF MAROON JASPER & PATCHES (½ - 2") OF PINK-WHITE CARBONATE - TRACE OF CHALCOPYRITE.	6.4		6.0	93.8	1062			
					1.0		1.0	100.0				
				- FAIRLY HARD CARBONATEOUS LIGHT BROWN SHALE - BRECCIATED BY CALCITE VEINLETS	10.0		10.0	100.0	1063			
				- SANDY DARK BROWN SHALE								
340				- LIGHT BROWN CARBONATEOUS SHALE								
				- SANDY DARK BROWN SHALE: SMALL (0.5-3 mm) ANGULAR FRAGMENTS OF WHITE CARBONATE & DARK GREEN CHLORITE	10.0		9.7	97.0	1064			
					12.0		9.7	97.0	1065			
360				- IRON FORMATION WITH VERY IRREGULAR BANDS & PATCHES OF CARBONATE & PINK QUARTZ-HEMATITE	2.0		1.6	80.0				
		RH			9.6		9.6	100.0	1066			
					2.2		2.2	100.0	1067			
				- CALCAREOUS CONGLOMERATE: ROUNDED TO SUB-ROUNDED FRAGMENTS (¼ - 4") OF SHALE, I.F., JASPEROID (RED); MATRIX IS PURE WHITE CALCITE.	5.2		5.1	98.1	1068			
380				- IRON FORMATION WITH REGULAR TO IRREGULAR LENSES & BANDS OF CARBONATE (CALCITE) DIP ~15°	6.0		5.2	86.7	1069			
					4.0		3.3	82.5				
					5.0		4.4	88.0				
					2.6		2.6	100.0	1070			
400					5.0		4.7	94.0				
				- IRON FORMATION: HEMATITE IS STEEL GREY, BUT APPROACHING MAROON - BANDS OF CARBONATE UP TO 4" WIDE, MAY BE "SHREDDED".	1.6		1.2	85.7	1071			
					6.0		5.6	93.4				
				- LIGHT GREEN CALCAREOUS CONGLOMERATE: FRAGMENTS UP TO 8" (90%) MOSTLY LIGHT GREEN CALCAREOUS SANDSTONE, ALSO SHALE, QUARTZITE, EX. MAROONESS INCREASES WITH PARTICLE SIZE. MATRIX IS DARK BROWN SHALE.	5.0		4.1	82.0				
420				END OF DDH # Y-3-63 AT 420'	5.0		4.0	80.0				

GEO - 25 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

DDH / ~~SECTION~~ No. Y-10-63

DESCRIBED BY W. GIBBINS

MEASURED BY

AIR PHOTO No.

AREA

WEATHER

DATE STARTED JUNE 30

DATE COMPLETED JULY 6

MEASURING RATE

COORDINATES 99,600 N ; 88,900 E

CLAIM

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
- BEDDING STRIKE / DIP — eg 125°/ 25°W
- FAULT STRIKE / DIP — eg 125°/ 25°E
- BRECCIATED ZONE
- HALOS OF JASPER
- SPHERULITES
- FRACTURING
- ACCESSORIES - Calcite, Dolomite, Siderite, etc
- LARGE ISOLATED LENSES

NOTE Percent with Relict Texture measured left to right as percent of total Hematite

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4

DATE

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	ANGULAR LENSES AMT and COMP	ANGULAR LENSES SIZE RANGE	ANGULAR LENSES SHAPE	PATCHES AMT and COMP	PATCHES THICK RANGE	PATCHES SHAPE	BANDS AMT and COMP	BANDS THICK RANGE	BANDS SHAPE	VEINLETS	REMARKS
20		- OVERBURDEN													
40					C	¼-4 / ½-2	A	TR			C	¼-1	R		- IRON FORMATION 15° DIP
			TR								C	¼-1	I		- IRON SANDSTONE: MEDIUM GRAINED HEMATITE, RED JASPER, & CALCITE. - BANDED IRON FORMATION
		- CONGLOMERATE: FRAGMENTS (40%) (¼ - 14") ROUNDED TO SUB-ROUNDED, WHITE & LIGHT GREEN CARBONATE MATRIX IS MAROON-BROWN SHALE													
60						¼-½ / ½-1	A/I				C	¼-14	I		- "ANGULAR" IRON FORMATION -VERY IRREGULAR MAROON JASPER CARBONATE BANDS - TINY FISSURES & CALCITE VEINLETS PROVIDE TINY OFFSETS IN FEATURES. DIP 5-10°
											C	¼-2	R		- BANDED IRON FORMATION - DIP 18°
		- INTERBEDDED DARK BROWN SHALE & FINE ANGULAR CONGLOMERATE (BRECCIA) OF LIGHT GREEN TINGE FRAGMENTS IN A DARK BROWN SHALE TO DOLOMITIC MATRIX.													
80											C	¼-14	I		- BANDED IRON FORMATION * STEEL GREY HEMATITE.
															- IRON FORMATION - ZONES UP TO 1" WIDE OF "SHREDDED" CARBONATE & RED JASPER - IRREGULAR BANDS OF BROWN CARBONATE & PINK QUARTZ-HEMATITE PATCHES. RELICT BIRDS-EYE.
						¼-½ / ½-1	I				C	¼-2	R/A		
100															- IRON FORMATION - RED JASPER BANDS SHOW PENECONTEMPORANEOUS FRACTURING
						¼-½ / ½-1	I		¼-½	I		¼-1	R		- IRON FORMATION - ZONES OF "SHREDDED" DOLOMITE & RED JASPER (UP TO 1.5")
120									¼-14	I			I		
		- FINE GRAINED DARK GREEN/GREY-BROWN CALCAREOUS SANDSTONE													- INTERBEDDED HARD BLACK SHALE & JASPEROID MAROON HEMATITE.
						¼-½ / ½-1	I								- IRON FORMATION CHARACTERIZED BY MANY IRREGULAR PATCHES OF RED JASPER, QUARTZ-HEMATITE & MAROON JASPER-CARBONATE.
140		- SILICA & JASPER WASTE.									C	¼-2	I		- IRON FORMATION - MOSTLY HEMATITE + IRREGULAR BANDS OF JASPER & CHERTY CARBONATE
			TR								R/C	¼-½	I		- IRON FORMATION WITH VERY IRREGULAR BANDS TO PATCHES OF MAROON JASPER
		- HARD DARK BROWN SHALE - TRACE OF SMALL ANGULAR FRAGMENTS OF SHALE													
						¼-½ / ½-1	I		¼-1	I		¼-2	R/I		- IRON FORMATION DIP 10°
160		- CONGLOMERATIC SHALE & MAROON HEMATITE (10-15%) LARGELY COMPOSED OF THICK (1-4") BANDS OF JASPER, CARBONATE, & COARSE SANDY SHALE.													
		- CONGLOMERATE: FRAGMENTS (95%) (½ - 2") WELL ROUNDED TO SUB-ROUNDED, INCLUDE: RED JASPER, BROWN SHALE, GREEN SANDSTONE & WHITE LIMESTONE. WHOLE UNIT IS VERY CALCAREOUS.													
		- SANDY TO CONGLOMERATIC BLACK SHALE													
						¼-½ / ½-1	I					¼-1	R/I		- "NODULAR" TO "SHREDDED" IRON FORMATION - IRREGULAR PATCHES TO LENSES OF WHITE CARBONATE & ZONES OF SHREDDED CARBONATE
180															- BANDED IRON FORMATION - DIP 10°
		- SANDY MAROON HEMATITE WITH IRREGULAR PATCHES & STREAKS OF RED & MAROON JASPER													- IRON FORMATION
						¼-½ / ½-1	I/R		¼-½	I		¼-3	R		
		- INTERBEDDED DARK BROWN SHALE & MAROON HEMATITE													
200		- BRECCIA TO CONGLOMERATIC DARK BROWN SHALE. FRAGMENTS (15-20%) (¼ - 2") LIGHT COLORED SHALE & CARBONATE, SUB-ANGULAR TO SUB-ROUNDED.													
															- SANDY MAROON HEMATITE - SHALE & CONGLOMERATE AS ABOVE UP TO 3" DIAMETER
220															- IRON FORMATION - DIP 20°
						¼-½ / ½-1	A		¼-½ / ½-1	I		¼-1	I		
			TR			¼-2 / ½-1	R	TR							- NODULAR IRON FORMATION - SOME OVOIDS & LENSES, MAFIC CARBONATE ABOUT CORES &/OR BORDERS.
															- IRON FORMATION - DIP 18-20°
240									¼-½	I		¼-14	R/A		
															- RELATIVELY LOW GRADE IRON FORMATION
		- INTERBEDDED CALCAREOUS BROWN & WHITE SILTSTONE WITH MINOR HEMATITIC SHALE & RED JASPER													
260		- CONGLOMERATIC TO FINELY DARK BROWN SHALE: FRAGMENTS (15%), (¼-2"), ROUNDED, MOSTLY LIGHT GREY OR DARKER PACKMATRIX													
280															

ENGINEER DATA				CRUDE ANALYSIS			
LEN RUN	No RUNS	FT REC	% REC	SAM No	Fe	SiO_2	P
1.5	1.4	93.4					
4.5	3.9	86.6		1107			
5.5	3.7	67.4		1108			
2.0	1.9	95.0					
2.0	1.8	90.0					
5.0	2.3	46.0		1110			
2.0	1.9	95.0					
3.5	1.2	34.3		1111			
1.0	0.6	60.0					
4.5	4.2	93.3					
5.0	3.1	62.0		1112			
2.0	2.0	100.0		1113			
2.6	2.5	96.1		1114			
1.4	0.7	50.0					
3.0	2.2	73.3		1115			
3.0	2.5	83.4					
3.9	3.9	100.0		1116			
5.0	4.6	92.0					
2.6	2.3	88.5					
4.4	3.4	77.3		1117			
5.0	5.0	100.0					
1.0	1.0	100.0					
4.0	3.8	95.0		1118			
0.5	0.5	100.0					
1.4	1.4	100.0					
3.0	3.0	100.0					
2.0	2.0	100.0					
5.0	4.8	96.0		1119			
5.0	5.0	100.0					
5.0	4.5	90.0		1120			
9.0	8.3	92.2		1121			
4.0	3.9	97.6		1122			
3.0	3.0	100.0					
3.5	2.6	74.3		1123			
4.5	4.4	97.8		1124			
5.0	5.0	100.0		1125			
7.0	6.7	95.7		1126			
8.0	7.6	84.8		1127			
6.6	6.2	94.0		1128			
5.0	5.0	100.0		1129			
7.4	7.4	100.0					
4.0	3.3	82.5		1130			
1.8	0.3	16.7					
8.0	7.4	92.5		1131			
4.0	2.7	67.5					
5.0	4.9	98.0		1132			
6.4	3.5	61.1					
2.2	2.2	100.0					
1.6	1.3	81.2					
3.0	3.0	100.0		1133			
4.4	4.3	98.6					
1.8	1.8	100.0					
2.0	2.0	100.0		1134			
3.5	2.6	74.4					
1.5	1.4	93.3					
6.5	2.3	46.6					
2.0	1.9	100.0					
2.8	1.7	85.0		1135			
7.5	6.8	90.7					
3.2	2.7	84.0					
8.0	7.5	93.0					
4.0	3.6	90.0					
10.0	9.4	94.0					

GEO-[illegible]

END OF BOR # Y-10-63 AT 281.0'

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

DDH
~~SECTION~~ No Y-11-63
DESCRIBED BY W. GIBBINS
MEASURED BY W. GIBBINS
AIR PHOTO No.
AREA
WEATHER

DATE STARTED JUNE 30
DATE COMPLETED JULY 6
MEASURING RATE
COORDINATES 112,400 N ; 88,600 E
CLAIM

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES AMT PER COMP	UNALIGNED LENSES SIZE RANGE	BOUND	PATCHES ~~& HALOS~~ AMT PER COMP	PATCHES ~~& HALOS~~ THICK RANGE	BOUND	BANDS AMT PER COMP	BANDS THICK RANGE	BOUND	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	No RUNS	FT REC	% REC	SAM No	CRUDE ANALYSIS Fe	SiO_2	P
															OVERBURDEN								
															- DIRTY, BROWNISH GREEN SHALE	1.0	0.7	70.0					
																1.0	0.8	80.0					
																1.0	0.6	60.0					
																1.0	0.5	50.0					
																2.0	2.0	100.0					
																1.5	0.8	53.4					
																4.0	4.0	100.0					
																2.7	1.7	63.0					
20																2.3	1.0	43.6					
																[illegible]	[illegible]	[illegible]					
																7.3	7.0	94.9					
																5.5	3.3	60.0					
																4.0	2.2	55.0					
																5.5	4.0	72.7					
40																4.5	4.5	100.0					
																5.0	4.5	90.0					
																5.0	4.8	96.0					
																4.5	3.5	77.8					
60																5.5	4.6	83.6					
															- LIGHT GREEN & DARK BROWN SHALE TO SILTSTONE, CALCAREOUS - THIN BEDDING (.02-3.0 mm) (a) REGULAR 1° DIP (b) CROSS BEDDING	5.0	3.8	76.0					
																5.0	1.7	28.0					
																6.0	5.8	96.6					
80															- SHALE	4.5	2.1	46.6					
																4.5	2.7	60.0					
																10.0	7.4	74.0					
100															- SANDSTONE								
															- CONGLOMERATIC CALCAREOUS SANDSTONE: FRAGMENTS (15%) (¼ - 4") ANGULAR TO SUB-ROUNDED, RED JASPER, DARK BROWN SHALE, WHITE LIMESTONE & LIGHT GREEN DOLOSTONE. MATRIX IS A VERY COARSE SANDSTONE (2 - 1 mm. Rare) LIMESTONE PEB, SHALE PEB, RED JASPER PEB.	11.0	10.1	91.8					
																2.0	1.2	60.0					
															- FINE GRAINED GREEN & BROWN CALCAREOUS SANDSTONE WITH IRREGULAR BEDDING	5.0	4.0	80.0					
120															- THIN & IRREGULARLY LAMINATED LIGHT GREEN & DARK BROWN SHALE	10.5	5.5	52.4					
															- FINE GRAINED GREY-GREEN CALCAREOUS SANDSTONE WHICH CONTAINS A FEW SMALL REGULAR FRAGMENTS OF BROWN SHALE - NO BEDDING	9.0	6.2	68.9					
					- MASSIVE BLACK-BROWN SHALE - A FEW VERY SMALL CALCITE GRAINS								
					- IRON SANDSTONE - MEDIUM TO COARSE GRAINED - CALCITE, RED JASPER, & METALLIC HEMATITE.	2.5	2.5	100.0					
140																							
					- CONGLOMERATE - FRAGMENTS (20%) (¼ - 2") ANGULAR TO ROUNDED, LIGHT GREEN & WHITE SHALE & CARBONATES IN A SAND (CLASTIC) DARK BROWN SHALE MATRIX	5.0	2.8	56.0					
						6.0	5.5	91.6					
						5.0	2.2	44.0					
						5.0	1.2	24.0					
160						3.1	1.1	36.9					
						1.0	-	-					
					TRACE - IRON FORMATION DIP 18°	5.5	4.2	89.6					1167
					- THIN BEDDED IRON & LIGHT GREEN CALCAREOUS SANDSTONE INTERBEDDED DIP ~15°	8.5	6.2	72.9					1168
180					- FINE GRAINED LIGHT GREEN CALCAREOUS SANDSTONE	4.0	3.6	90.0					
					- IRON FORMATION CHARACTERIZED BY IRREGULAR LENSES & PATCHES - TRACE OF INTER BEDDED SANDY SHALE	4.5	4.8	89.3					1169
						5.0	4.2	84.0					
						5.7	5.0	88.8					1170
200						5.0	4.5	95.0					
					- CONGLOMERATE - FRAGMENTAL (60%), ANGULAR SUB-ANGULAR FRAGMENTS OF GREEN SHALE & LIMONITE & CALCAREOUS SANDSTONE (¼ - 8") IN MATRIX OF WHITE QUARTZITE, HEMATITE MATRIX IS DARK BROWN SHALE - MINOR INTERBEDDED RED JASPER & MAROON	10.0	8.7	87.0					1171
					- LOW GRADE IRON FORMATION INTERBEDDED MAROON HEMATITE, RED JASPER, & SANDY CLASTIC BANDS - IRON FORMATION	2.0	1.6	79.0					
220						6.8	5.3	91.4					1172
					- INTERBEDDED MAROON HEMATITE, RED JASPER & BLACK BROWN CLASTIC SHALE DIP 15°	8.6	7.3	84.9					1173
					- HARD BROWN SHALE TRACE - MAROON HEMATITE WITH IRREGULAR MAROON JASPER-CARBONATE BANDS.								1174
					- IRON FORMATION DIP 10°	6.1	5.4	88.6					
240						9.7	9.6	98.9					1175
													1176
					- CLASTIC MAROON HEMATITE	10.8	9.6	88.9					1177
					- IRON FORMATION WITH "SHREDDED" CARBONATE & RED JASPER - MIDDLED PYRITE CRYSTALS (¼ - ½") IN CARBONATE BANDS - BANDS OF MAROON JASPER, RED JASPER, & CARBONATE.	7.5	7.5	100.0					1178
260																							1179
					- IRREGULAR RED & MAROON JASPER & TRACE OF BROWN SHALE	10.0	9.2	92.0					
					- FINE GRAINED DARK CALCAREOUS SANDSTONE - MASSIVE								1180
					- IRON FORMATION	3.5	0.3	8.6					1181
280																							
					- DARK GREEN SANDY SHALE - CONTAINS ANGULAR SUB-ROUNDED FRAGMENTS OF DARK GREEN SHALE	6.8	6.5	96.0					1182
					IRON FORMATION - IRREGULAR MAROON JASPER-CARBONATE BANDS	3.2	3.1	96.9					1183
						10.0	8.2	82.0					1184
					- DARK SILICEOUS DARK MAROON SHALE								1185
300					- IRON FORMATION DIP 10°	8.0	6.8	85.0					1186
					CLASTICS TO LOW GRADE IRON FORMATION - WASTE IS MOSTLY COMPOSED OF CLASTICS, SHALE, & IRREGULAR RED JASPER.	8.0	6.8	75.6					1187
320					- IRON FORMATION DIP 0 TO 10°	12.5	7.3	58.4					
						8.1	6.4	78.0					1188
													1189
340						11.4	1.8	15.9					
						3.0	0.5	16.8					1190
					- SANDY TO CONGLOMERATIC (60%) DARK BROWN SHALE - CLASTICS - MARLY & HEMATITIC FRAGMENTS (20%) (¼ - 8" MOST) ANGULAR TO SUB-ROUNDED, DARK GREEN SHALE & WHITE CARBONATES - ALSO SOME IRREGULAR STREAKS OF RED JASPER	7.7	8.2	98.0					1191
360						8.8	8.2	94.0					1192
					- JASPEROID IRON FORMATION - LARGE IRREGULAR STREAKS OF IRON OXIDES - "NODULAR" IRON FORMATION	8.5	8.3	97.7					1193
													1194
380						10.0	9.7	97.0					1195
					- IRON FORMATION - DIP 15°	10.0	9.8	98.0					1196
400					- DARK BROWN SHALE - SANDY IN PLACES	5.0	3.8	76.0					
						6.0	1.8	30.0					
						10.5	2.8	26.6					
420													
						4.0	0.7	17.5					
						9.0	2.1	23.4					
440						8.0	0.7	8.8					
					END OF DDH Y-11-63 AT 441.0'								
460													
480													

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

~~DDH~~ ~~SECTION~~ No. Y-12-63

DESCRIBED BY E. C. GRONBERG

MEASURED BY

AIR PHOTO No.

AREA

WEATHER

DATE STARTED JULY 8

DATE COMPLETED JULY 15

MEASURING RATE

COORDINATES 112,800 N ; 84,700 E

CLAIM

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE

MAROON HEMATITE

BOTH

SILICEOUS WASTE TYPES

RED JASPER

MAROON JASPER

MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ	Q
CARBONATE	C
HEMATITE	H
FE*	F
MANY	M

BOUNDARIES "R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS

BEDDING STRIKE / DIP	eg 125°/ 25°W
FAULT STRIKE / DIP	eg 125°/ 25°E
BRECCIATED ZONE	
HALOS OF JASPER	
SPHERULITES	
FRACTURING	

ACCESSORIES - Calcite, Dolomite, Siderite, etc.

LARGE CALCITED LENSES

NOTE Percent with Relief texture measured left to right as percent of total Hematite

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 5

DATE July 8

INTERVAL	LITHOLOGY	% HEMATITE	% RELIEF	VOIDS	ALIGNED LENSES	BANDS	% VEINLETS	REMARKS	ENGINEER DATA LEN (cm)	Rec (cm)	% REC	CRUDE ANALYSIS Lab No.	Fe	SiO2	P
0								Overburden							
									1.0	0.1	10.0				
									1.0	0.1	10.0				
									4.5	3.5	77.8				
									5.5	5.0	90.8				
20								Dark brown sandy to conglomeratic shale. Fragments ≈ 10% (¼" - 1") Calcareous, medium to fine grained sandstone fragments (¼" - ½") Occasional Jasper Fragments. Few calcite veinlets (¼" - ½" wide) Mostly green sandstone fragments	1.0	1.0	100.0				
									6.5	6.0	92.3				
30									10.0	9.6	96.0				
40									10.0	9.7	97.0				
									9.5	9.7	6.72				
60								Fine grained sandstone to siltstone. Irregular interbeds of thin shale - grey brown. Calcareous sandstone.	10.7	10.0	93.5				
70								Dark brown sandy to conglomeratic shale. Fragments 5-10% (¼" - ½") Jasper - brown. Calcareous sandy shale. Sandstone fragments mostly green & calcareous (medium to fine grained) Few calcite veins (¼" - 1")	10.3	9.8	85.4				
80								Medium to fine grained calcareous sandstone (grey-green) Occasional dark brown irregular non-calcareous shale band Few calcite veinlets (¼" - ½") throughout shale bands (usually)	8.5	5.5	1.00				
90									10.0	8.8	88.0				
									1.0	0.8	80.0				
100									5.0	4.5	90.0				
110								Grey-green, calcareous, shaly sandstone. ≈ 40-50% dark brown non-calcareous shale bands. Regularly bedded Regular cross bedding Dip 10-20°	7.0	5.7	81.0				
120									12.0	7.7	77.0				
130								Dark brown non-calcareous shale with some (trace) calcareous medium to fine grained sandstone (grey-green) Few calcite veinlets (¼" - ½"). Slight hematitic content	9.9	9.0	91.0				
									3.6	2.5	80.7				
									6.0	5.2	86.7				
140								Dark brown hematitic shale. Few grey green calcareous sandstone bands (medium to fine grained) Few calcite bands (¼" - ½")	8.0	5.5	68.8				
								Grey green calcareous, medium to fine grained sandstone. Regular & irregular bedding. Some cross bedding. Few dark brown shale fragments Occasional green, non-calcareous fragment (2" x 3") Blocky fracturing. Few calcite veinlets. Trace green calcareous sandstone bands (med. to fine) Shale matrix is brown - red							
150								Dark brown non-calcareous shale. Trace grey green calc. sandstone (medium to fine grained) Slickensided - dark green shale fragments. Non calcareous. Few calcite veinlets	3.0	2.8	93.4				
								Sandy type iron formation, calcareous, med to fine becoming shaly Dark brown shale. Few calcite veinlets.	3.5	4.20	120.5				
160								Sandy type iron formation. Sand fragments are mostly calcareous. Some jasper also.	5.5	2.7	49.1				
								Dark brown shale, low iron content. Grey-green bands of non-calcareous siltstone. Few calcite veinlets	10.0	6.5	65.0				
170								Iron type sandstone. Calcareous fragments or grains, mostly in matrix, often quite porous. F.S. grey-green to reddish brown with increasing iron content. Calcite veinlets	3.5	1.0	28.6				
									11.0	2.0	18.2				
180									16.0	1.6	10.0				
190								DARK BROWN NON CALCAREOUS SHALEY MATRIX. FRAGMENTS (20-25%) (¼" - 1½") QUARTZITE PEBBLES, CALCAREOUS FRAGMENTS, GREY & YELLOW SHALE FRAGMENTS, ANGULAR TO ROUNDED. CALCITE VEINLETS.	1.0	0.3	30.0				
									4.0	2.4	60.0				
200								VERY FINE GRAINED SANDSTONE TO SILTSTONE, INTERBEDDED WITH DARK BROWN SHALE BANDS, NON CALCAREOUS, BUT A FEW CALCITE VEINLETS PRESENT. A FEW BANDS (¼" - 2") OF 20% TO 30% FRAGMENTS, LIME CALCAREOUS, GREEN SHALE (¼" - ½") INTERBEDDED BY 2" BANDS OF GREEN non-calcareous shale.	6.0	3.6	60.0				
								Top of Iron Formation							
									9.7	2.9	61.1				
220								Trace Trace Trace ¼-½ I F.C. Irregular chert & calcite bands & patches.	4.3	2.3	53.5	1231			
								Trace ½-2 I F.C. Interbedded grd. Cn bands - almost tend to patches in places.	3.9	1.0	25.7	1232			
								Top sandstone marker							
230								Medium to fine grained sandstone. Some calcareous grains Few calcite veinlets Grey-green Laminations (¼" - ½")	9.2	5.5	59.8	1233			
									2.5	0.9	36.0				
									3.5	2.1	60.0	1234			
240									2.5	2.4	96.0				
								Trace Trace ¼-½ I 75% irregular jasper & calcite patches Few calcite veinlets	10.0	5.2	52.0	1235			
250									10.0	3.8	38.0	1236			
								Fragments 20-25% - green shaley shale, shale, calcite - augular to subrounded (¼" - ½") mainly shale fragment Brown fine siltstone to shale matrix	3.5	0.2	5.7				
260									9.5	5.8	61.0	1237			
								Trace 40% irregular calcite + jasper + siderite (?) patches.	6.7	3.7	55.2	1238			
								Trace ¼-½ I F.C. ≈ 3" of dark brown shaly shale at top of interval.	1.8	0.3	16.7	1239			
								Trace on bedding planes with interbedded calcite	4.0	1.0	25.0	1240			
270								Trace ½-¾ I Few metallic hematite ovoids ≈ 5% jasper & calcite patches.	7.1	3.6	50.8	1241			
									1.9	1.8	94.7				
280								Trace ¼-1" I 50% patches of calcite + qtz + jasper (sometimes + hematite) Few Ca veinlets.	3.5	3.5	100.0				
									11.0	9.5	86.4	1242			
290								¼-½ R Some voids have qtzite centres 10-15% qtzite & jasper patches.							
								¾-¾ Few calcite bands.							
								½-¾ ½-¾ R Trace I 25% qtzite + calcite + jasper patches. Few calcite bands.	7.5	7.4	98.6	1243			
300								Trace 75% calcite bands & qtzite + calcite patches. Few Ca veinlets				1244			
								¼-½ ½ I 20% qtzite + calcite + hematite patches.	10.2	9.9	97.0	1245			
310								¼-¾ I 50% jasper + calcite patches.				1246			
								¼-1" R F.C. 15-20% calcite + jasper (qtz) patches?	10.0	4.8	48.0				
320								Coarse grained sandstone. Grey-green & quite calcareous.				1247			
								Trace ½-¾ ½-¾ R ¼-½ R 50% red & maroon jasper around voids & lenses.	10.0	9.3	93.0				
								Few calcite + jasper + qtzite patches. M.C.							
								¼-½ I Some calcite bands & lenses, light green med. to fine sandstone band at bottom of interval.							
330								¼-½ ½-¾ R ¼-½ ½-¾ R ⅛-½ I F.C. Few Ca veinlets				1248			
								⅛-½ ½-¾ R ½-¾ F.C. Few qtzite + calcite patches Maroon hematite occurs in streaks.	10.0	9.5	95.0	1249			
340								¼-½ ½-¾ R ¼-½ ½-¾ R ¼-2" R F.C. Some calcite in bands, lenses & voids	8.3	1.8	21.7				
									10.0	8.6	86.0	1250			
350								1-2" R 90% pinkish tends to qtzite & silty material with a low iron content							
								Very coarse calcareous sandstone Brownish red shale matrix - dk green shale Trace ½-2" I F.C. Same voids & lenses have hematite centres. Band of coarse grained sandstone (3")				1251			
								Medium to coarse grained sandstone Brown green with a brown shale matrix	12.0	8.6	71.6				
360								Fragments 70-80% Very calcareous Jasper, calcite, qtzite, fine grained, light green shale, light green shale matrix, siderite (?) & limonite. Some halos & lenses of dark brown shale with Ca rings. From 359.0 to 362.2 fragments decrease from ¾" - 2" → ¼" - ½" comprising almost finer conglomerate. Various types of halos & lenses present here also. Fragments are angular to round.	10.0	8.5	85.0	1252			
												1253			
								Trace ⅛-¾ I 25% jasper + calcite patches. Qtz. intrusion ¼" - ½" wide.	7.5	5.7	76.0				
370								Dark Trace ¼-½ ½-¾ F.C. Few calcareous bands & veinlets plus jasper.				1254			
								¼-½ ½-¾ R Lenses, tend to patches Some, impurity of calcite in voids & lenses also.	10.0	7.9	79.0	1255			
								Shaly, clastic carbonaceous iron formation. Jasper & calcite. Few calcite veinlets.	10.5	2.9	27.6	1256			
380								Dark brown non-calcareous shale. Few fragments of green shale & calcite & calcite veinlets.	8.7	2.3	26.4	1257			
								Low grade conglomeratic iron formation. Few dark brown shale interbeds. Calcareous matrix & fragments. Some qtzite fragments. Iron formation tends towards top & bottom of interval. Few calcite veinlets.	7.3	6.2	85.0	1258			
390									8.0	5.0	62.5	1259			
								Conglomeratic dark maroon brown shale. Fragments ≈ 5-10%, mostly calcareous, ¼" - ½". Few Calcite veinlets. Few calcareous, medium grained sandstone bands. Low grade iron formation at base of interval. Angular to subround	10.5	3.5	33.8	1260			
400									10.0	5.8	58.0	1261			
								SUBANGULAR HEMATITIC CONGLOMERATE				1262			
410									8.1	4.8	59.3	1263			
									8.4	4.8	57.1				
								¼-½ ½-¾ R ¾-1" I ¾-2" I	6.1	1.2	19.7	1264			
420									5.4	0.8	14.8	1265			
									6.0	2.2	36.7				
									4.8	1.5	31.5	1266			
								BROWN SHALE WITH CARBONATE BANDS (10%) & RED JASPER (20%) TR. 5% 75% IRON FORMATION - TRACE OF MAGNETITE - VERY LOW GRADE IRON - MOSTLY MAROON JASPER WITH SMALL AMOUNT OF GREEN JASPER	6.5	3.8	84.5	1267 1268			
								SANDY TO CONGLOMERATIC HEMATITIC SHALE	5.0	0.4	8.0				
430									4.0	0.9	22.5				
								END OF DDH # Y-12-63 AT 424.0'							

GEO - 23 - 2 - CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

DDH ~~SECTION~~ No Y-13-63
DESCRIBED BY W. GIBBINS
MEASURED BY
AIR PHOTO No
AREA
WEATHER

DATE STARTED JULY 9
DATE COMPLETED JULY 15
MEASURING RATE
COORDINATES 108,500 N & 101,100 E
CLAIM

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict feature measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 2 OF 6
DATE

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	% OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	PATCHES: AMT and COMP	PATCHES: THICK RANGE	BANDS: AMT and COMP	BANDS: THICK RANGE	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
0											Overburden.								
20											Poorly bed'd thin-bedded very dark brown shale. ± 5% medium grained calcite banding.	2.5		1.7	68.0				
											Dirty, light green, calcareous & siltstone, which contains angular fragments & interbedded dark brown shale.	5.1		4.6	88.6				
											Hard siliceous brown shale	4.9		2.5	52.1				
30											Interbedded green calcareous siltstone & very fine sandstone & dark brown shale. Cross bedded.	2.5		1.6	64.0				
												2.0		1.8	90.0				
												3.0		2.9	96.7				
											Very dark brown hematitic shale								
40											Iron sandstone medium grained grams of calcite, maroon hematite & dark green chlorite or shale, (maroon brown shale) matrix - ±5% maroon hematite.	5.0		2.4	80.0				
												1.0		0.7	70.0				
												1.8		0.7	66.7				
											Sandy maroon-brown shale. Medium grained grams of calcite, maroon shale & dark green chlorite.	2.0		1.9	96.0				
												3.0		2.7	90.0				
50												5.0		4.9	98.0				
												1.5		1.0	66.7				
												1.5		0.9	60.0				
											Soft dark brown shale	3.6		2.0	57.2				
60												1.5		1.4	93.4				
											Sandy (calcite) to conglomeratic, hematitic maroon shale	5.0		4.4	88.0				
											Clast's iron formation (3 - ¾"). Banded to subrounded fragments of light green calcareous shale & sandstone in a hematitic matrix.	2.0		1.6	80.0				
											Hematitic conglomerate & leaching 5-10% fragments - calcareous, subround to rounded, calcareous shale fragments in maroon hematitic matrix.	1.5		0.6	40.0				
											Dark brown shale mostly. Fragments (90-95%) angular to subrounded (3-6") - generally mixed, larger than previous fragments. Some fragments have a green rim - calcareous. Fragments vary in size from medium to fine grained sandstone pebble. Some pure dark brown shale, top size 8" x 4". Light green calcareous medium to fine grained sandstone pebbles.	3.6		3.1	86.1				
												6.4		4.0	62.5				
80											Hard band of iron formation 81.6 - 82.1' - mostly jasperoid Large grains of calcite, minor green bands. Calcite veinlets. Band of soft green shale - gypsum or talc content ?	1.1		0.8	72.5				
												1.4		0.8	57.1				
												1.6		1.1	68.8				
											dk brown to green non-calcareous shale at top. Fragments (5-15") angular. Pale green shale fragments 5% at base. Occasional band of red jasper & calcite veinlets	2.5		2.1	84.0				
												2.5		2.0	80.0				
90											Dark brown shale. Occasional irregular green sandstone band Calcite veinlets	6.0		5.2	86.7				
												2.5		2.3	92.0				
												1.2		0.7	58.3				
											Medium to fine grained, interbedded irregular jasper bands. Large grains calcite, pyrite (?) fragments & angular to subrounded - green & calcareous. Some shale pebbles, & shale & sandstone.	5.0		3.9	78.0				
100											Alternate light green dk brown shale bands interbedded with dense conglomeratic bands. Fragments (95%) angular - subround bedded								
			½-1" R					⅛-1" R			Top of iron formation. Occasional halo (jasper centre, hematitic ring) Many Ca ovoids & lenses. Few Ca veinlets.	3.6		2.6	72.2				
			½-¼									4.0		3.2	80.0	1136			
											Mostly red jasper with metallic & maroon hematite bands or streaks. Few Ca veinlets. Iron S.S. in places	1.6		0.8	50.0				
												0.9		0.9	100.0				
110												2.2		1.7	77.3	1137			
											Top marker sandstone!	5.5		5.0	91.0				
																1138			
120											Regular bands of maroon jasper; Medium to fine grained Fairly calcareous & few Calc. inclusions. Shale fragments near bottom	100		100	100.0				
																1139			
130			Trace	Trace	C		I				Dark brown shale band (132.0'). Few Ca veinlets. Waste is mostly calcite replacement.	2.0		1.4	70.0				
									M.C.			3.0		2.6	86.7	1140			
			Trace						F.C.		Irregular patches of jasper - Medium to fine grained, calcareous & few Ca veinlets. Shale fragments near bottom	4.5		4.5	100.0	1141			
			Trace	Trace					M.C.		Ca veinlets & stringers. Few Ca bands often bordered by jasper.	3.0		2.0	66.7				
			Trace	Trace					R		Minor iron formation								
140									M.C.		Irregular calcite bands interspersed with jasper & hematite. Many calcite blobs. Some red & maroon jasper patches.	5.0		5.0	100.0	1142			
150									R.F.C.		Dip 20-25°. Some calcite bands & patches. Band of conglomerate (3-6") 152.0. Brown (garnet) shale matrix. Fragments angular to subrounded (¼-¾") & some calcareous. Green shale	10.5		7.5	70.5	1143			
																1144			
			Trace													1145			
											Dk brown shale band near base.	6.0		4.5	75.0	1146			
160			Trace								Dk brown non-calcareous shale matrix 15-20% frags. 20-25% green shale, glauite & sandstone. Slightly calcareous. Few Ca veinlets								
							½-¾ I	¼-1" I											
							½-¾ I	¼-1" I			20% calcite spheres. Some with jasper centers. - IRON FORMATION - DIP 20°- Most of the ovoids have hematite or maroon jasper in their centers - RED JASPER PATCHES HAVE ASCICULAR BORDERS OF CALCITE	6.0		6.0	100.0	1147			
							½-¾ I	¼-1" I	F.C.			3.0		2.6	86.7				
170											- JASPEROID MAROON HEMATITE - BANDS OF RED & MAROON JASPER + BROWN & GREEN SANDY SHALE.	3.5		2.0	57.2	1148			
								¼-12" S				2.1		0.8	23.8				
												2.9		1.5	51.8				
											DARK BROWN SHALE WITH BANDS OF LIGHT GREEN CALCAREOUS FINE SAND								
180								¼-3" S	M.C.		MAROON HEMATITE WITH REGULAR TO IRREGULAR JASPER BANDS.	2.0		1.6	80.0				
											DARK BROWN CALCAREOUS SHALE	2.5		1.6	64.0				
								¼-1" S			LIGHT BROWN CALCAREOUS SHALE	2.5		1.6	64.0	1149			
							¼-1"	¼-6" S	M.C.		- IRREGULAR MAROON JASPER-CARBONATE BANDS (LIGHT PURPLE). SOME OVOIDS HAVE HEMATITE CORES, & OTHERS ARE PARTIALLY TO COMPLETELY ALTERED TO WHITE CARBONATE. DIP 15-18°	4.0		3.6	90.0				
			½-1" I				½-1" I	¼-1½" I				1.6		1.3	86.7	1150			
			⅜-1½"									2.5		2.5	100.0				
												5.0		4.4	88.0				
											- IRON FORMATION - WASTE IS MOSTLY QUARTZ CARBONATE PATCHES WITH IRREGULAR BORDERS. DIP 5-10°	7.5		7.4	98.6	1151			
200																1152			
												3.5		2.7	87.9				
												3.0		3.0	100.0				
												6.5		6.2	95.4	1153			
220			TR		⅜-½ R	¼-½ R	½-¾ I	¼-1" I											
												7.0		7.0	100.0	1154			
												3.0		2.7	90.0				
230																1155			
												7.0		6.7	95.7	1156			
											VERY DARK BROWN MASSIVE SHALE - CALCAREOUS					1157			
			NE					¼-½ V I	C										
240											- DARK BROWN SHALE - GRADES TO SANDY SHALE - & THEN TO VERY FINE - & VERY COARSE LIGHT GREEN CALCAREOUS SANDSTONE.	5.0		4.1	82.0	1158			
												5.0		4.5	90.0				
												3.0		2.0	66.7	1159			
250							½-¾ V I	¼-1" I				5.5		4.8	87.4				
												2.0		2.0	100.0	1160			
												3.0		2.5	83.3				
											+ CALCAREOUS DARK BROWN SHALE	2.5		1.1	44.0	1161			
												3.0		2.8	93.4				
											- IRON FORMATION - WASTE IS COMPOSED OF IRREGULAR STRINGS OF RED JASPER	1.5		0.6	40.0	1162			
270											- INTERBEDDED: (1) GREEN CALCAREOUS CONGLOMERATE - 30% FRAGMENTS (¼-2") (2) SANDY (CALCITE) DARK BROWN SHALE + TRACE OF MAROON HEMATITE (3) RED JASPER BANDS WHICH CONTAIN UP TO 30% MAROON HEMATITE	1.5		1.4	93.4				
												10.0		9.0	90.0	1163			
												1.0		0.5	50.0				
												2.0		1.0	50.0				
											IRON FORMATION - DIP 5-10° MOST OF THE OVOIDS & MANY OF THE LENSES HAVE CENTERS OF BROWN CARBONATE & MICROCRYSTALLINE QUARTZ. THE IRON IS VERY BLOCKY IN PLACES.	3.3		1.8	54.6	1164			
												4.7		2.4	51.5				
290												1.5		0.8	53.3				
			⅜-½ R				½-1" I	¼-3" R				4.5		2.6	57.8	1165			
												1.5		0.9	60.0				
												2.0		1.9	95.0				
300												1.5		1.5	100.0				
												1.0		0.7	70.0	1166			
												2.0		1.9	95.0				
												1.5		0.6	40.0				
											- DARK BROWN SHALE - LOCALLY SANDY OR CALCAREOUS	2.5		0.7	28.0				
310												6.0		4.2	70.0				
												4.0		3.3	82.5				
												1.0		0.6	60.0				
320												4.4		4.2	95.5				
												4.6		4.5	98.0				
330																			
												10.0		9.8	98.0				
											- IRREGULAR STREAKS OF RED JASPER (75%) & SAME HEMATITIC CONGLOMERATIC SHALE	2.0		2.0	100.0				
340											- DARK BROWN SHALE - SLIGHTLY SANDY 365-375 HARDER & CONTAINS OVOIDS & IRREGULAR STREAKS OF RED JASPER & A FEW (1-2 MM) FRAGMENTS OF SOFT DARK GREEN CHLORITE OR SHALE.	9.5		6.5	68.5				
												1.5		0.7	46.6				
												8.0		3.8	47.5				
360																			
												6.0		3.9	65.0				
												1.0		1.0	100.0				
												7.2		6.1	84.8				
												9.8		9.8	100.0				
380											END OF DDH "Y-13-63 AT 377.0'								

GEO-23-2-CR (6/63)

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

HOLE No. 77-19-83

DRILLED BY: W. of NORMAN

MEASURED BY:

AIR PRESS No.

AREA

WEATHER

DATE STARTED: 25.8.83

DATE COMPLETED: 4.9.83

MEASURING MARK:

COORDINATES: 10,000 N E / 10,000 E

ELEVA.

ROCK TYPES

TOPA FORMATION		VOLCANIC	
SILTSTONE		TUFFACEOUS	
LIGHT LIMESTONE	LS	LIMESTONE	
DIFFICULT	DIFF	DOLOMITE	DOL
SANDSTONE	SS	OTHERS	

% HEMATITE

STEEL GRID CONTACT	
SAMPLE TAKEN	
NOTES	

SULFIDIC WASTE TYPES

PYRITE	P
MARCASITE	M
MIXED PYRITE / MARCASITE	PM

MINERALS

CHALCOCITE	C
CHALCOPYRITE	CP
PYRITE	P
OTHER	

DEFINITIONS: M = MATRIX, C = CLAST (BRECCIA) DETRITAL GRAINS AND FRAGMENTS

CLAST SIZE: A = ANGULAR, SA = SUB-ANGULAR, SR = SUB-ROUNDED, R = ROUNDED

SEDIMENTARY: SILTSTONE, SANDSTONE, CONGLOMERATE, LIMESTONE, DOLOMITE, MARL, CHERT, ANHYDRITE, GYPSUM, SALT, COAL, CARBONACEOUS SHALE, BLACK SHALE, OIL SHALE, CALCAREOUS SHALE, CALCAREOUS SILTSTONE, CHERTY LIMESTONE, SILICEOUS LIMESTONE, SILICEOUS DOLOMITE, DOLOMITIC LIMESTONE, SHALY LIMESTONE, SHALY DOLOMITE, SILICEOUS SANDSTONE, CALCAREOUS SANDSTONE, ARGILLACEOUS SANDSTONE, ARKOSE, GREYWACKE, CONGLOMERATIC SANDSTONE, CONGLOMERATE, BRECCIA, TUFF, TUFFACEOUS SILTSTONE, TUFFACEOUS SANDSTONE, TUFFACEOUS LIMESTONE, VOLCANIC BRECCIA, VOLCANIC CONGLOMERATE, VOLCANIC SANDSTONE, VOLCANIC SILTSTONE, VOLCANIC LIMESTONE, VOLCANIC DOLOMITE, VOLCANIC MARL, VOLCANIC SHALE, VOLCANIC CHERT, VOLCANIC ANHYDRITE, VOLCANIC GYPSUM, VOLCANIC SALT, VOLCANIC COAL, VOLCANIC CARBONACEOUS SHALE, VOLCANIC BLACK SHALE, VOLCANIC OIL SHALE, VOLCANIC CALCAREOUS SHALE, VOLCANIC CALCAREOUS SILTSTONE, VOLCANIC CHERTY LIMESTONE, VOLCANIC SILICEOUS LIMESTONE, VOLCANIC SILICEOUS DOLOMITE, VOLCANIC DOLOMITIC LIMESTONE, VOLCANIC SHALY LIMESTONE, VOLCANIC SHALY DOLOMITE, VOLCANIC SILICEOUS SANDSTONE, VOLCANIC CALCAREOUS SANDSTONE, VOLCANIC ARGILLACEOUS SANDSTONE, VOLCANIC ARKOSE, VOLCANIC GREYWACKE, VOLCANIC CONGLOMERATIC SANDSTONE, VOLCANIC CONGLOMERATE, VOLCANIC BRECCIA, VOLCANIC TUFF, VOLCANIC TUFFACEOUS SILTSTONE, VOLCANIC TUFFACEOUS SANDSTONE, VOLCANIC TUFFACEOUS LIMESTONE

NOTE: YOU CAN NOTE ROCK TYPES IN ACCORDANCE WITH THE LIST ON LEFT OF THIS PAGE.

YOU CAN ALSO NOTE ROCK TYPES BY USING THE FIRST TWO LETTERS OF THAT ROCK'S NAME.

DEPTH	DRILLING RATE (MINUTES PER METRE)	CORE RECOVERY (%)	CORE RECOVERY (METRES)	CORE RECOVERY (CUMULATIVE METRES)	CORE RECOVERY (CUMULATIVE %)	CORE RECOVERY (CUMULATIVE METRES)	CORE RECOVERY (CUMULATIVE %)	DRILLING RATE (MINUTES PER METRE)	CORE RECOVERY (%)	CORE RECOVERY (METRES)	CORE RECOVERY (CUMULATIVE METRES)	CORE RECOVERY (CUMULATIVE %)	CORE RECOVERY (CUMULATIVE METRES)	CORE RECOVERY (CUMULATIVE %)	REMARKS	DATE	TRACKING RATE (METRES PER HOUR)	TRACKING RATE (METRES PER HOUR)	TRACKING RATE (METRES PER HOUR)	TRACKING RATE (METRES PER HOUR)	CASING RATE (METRES PER HOUR)	CASING RATE (METRES PER HOUR)	CASING RATE (METRES PER HOUR)	CASING RATE (METRES PER HOUR)
0																								
10																								
20																								

CREST EXPLORATION LIMITED

D.D.H. No. 77-CE-03

LOGGED BY W. GILBERT

AREA Jane Lake CLAIM COORDINATES 4640.00 E, 9540.0 N

ELEVATION TOTAL DEPTH 704' DATE STARTED 1977 12 16 COMPLETED 1978 01 7

INCLINATION -90°

Rock Types

- IRON FORMATION
- JASPER
- LIMESTONE
- DOLOMITE
- SHALE
- SILTSTONE
- SANDSTONE
- CONGLOMERATE
- BRECCIA
- NO SAMPLE
- CAVINGS

Structures

- STRONG FAULT, SHOWING DIP
- WEAK FAULT, SHOWING DIP
- FRACTURE, SHOWING DIP
- VEINLET, SHOWING DIP
- BRECCIATED

Modifiers and Accessories

- MAGNETIC (WEAK) M
- LARGE (>50 CENTS) L
- BANDED (WEAK) B
- BARIOSITE BARIO
- SPHALERITE SPH
- HALO H
- MARTITE M
- HEMATITIC H
- LEUCOXENE F
- SILICIFIED S
- CARBONATIC C
- CALCITIC CLCS
- DOLOMITIC DOLO

IRON ROCK LOG CHART

Hilton No. 77-CE-03

DETERMINED BY W. GILBERT

MEASURED BY

AIR PHOTO No.

AREA Jane Lake

WEATHER

DATE STARTED 1977 12 16

DATE COMPLETED 1978 01 7

MEASURING TAPE

COORDINATES 4640.00 E / 9540.0 N

CLAIM

ROCK TYPES

IRON FORMATION — SILTSTONE
CHERT — SHALE
CONGLOMERATE — LIMESTONE
BRECCIA — DOLOMITE
SANDSTONE — GABBRO

% HEMATITE — SILICEOUS WASTE TYPES — HEMIATITE

TOTAL IRON — SILICA — QUARTZ
MAGNETIC (HEMATITE) — MAGNETITE (MICRO) — CHERT
WATER — METAMORPHIC/ALTERED — MAFIC

BOUNDARIES: P - PECULIAR = Even Boundary between Jasper and Hematite
I - IMPECULIAR = Uneven Boundary between Jasper and Hematite

HEMIATITE: BEDDING STRIKE / DIP ag 157 / 27 W
FOLIATION STRIKE / DIP ag 157 / 27 S
MAGNETISM (DIR) ag
FACES OF LEDGES
FOLDING
FRACTURES
ACCESSORIES Calcite, Dolomite, Siderite, etc.
LARGE BRECCIATED LENSES

NOTE: Percent and Metric Scales measured left to right as percent of total thickness
Chert, Jasper, Hematite, Magnetite, and Mafic measured left to right as percent of total Siliceous waste

PAGE 1 OF 11

DATE

DEPTH	% CHERT	% JASPER	% HEMATITE (MAGNETIC)	% MAGNETITE (MICRO)	% SILICEOUS WASTE	% MAFIC	% WATER	% METAMORPHIC/ALTERED	% QUARTZ	% SILICA	% IRON	% MAGNETIC (HEMATITE)	% TOTAL IRON	% SILICA	% IRON	% MAGNETIC (HEMATITE)	% TOTAL IRON
0																	
10																	
20																	
30																	
40																	
50																	
60																	
70																	
80																	
90																	
100																	
110																	
120																	
130																	
140																	
150																	
160																	
170																	
180																	
190																	
200																	
210																	
220																	
230																	
240																	
250																	
260																	
270																	
280																	
290																	
300																	
310																	
320																	
330																	
340																	
350																	
360																	
370																	
380																	
390																	
400																	
410																	
420																	
430																	
440																	
450																	
460																	
470																	
480																	
490																	
500																	
510																	
520																	
530																	
540																	
550																	
560																	
570																	
580																	
590																	
600																	
610																	
620																	
630																	
640																	
650																	
660																	
670																	
680																	
690																	
700																	
704																	

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

~~DDH~~ SECTION No Y-16-63 — DATE STARTED AUGUST 1

DESCRIBED BY W. GIBBINS — DATE COMPLETED AUGUST 11

MEASURED BY — MEASURING RATE 35,500 N ; 110,500 E

AIR PHOTO No — COORDINATES

AREA — CLAIM

WEATHER

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICROCRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES: R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS:
- BEDDING STRIKE / DIP — eg 125°/ 25°W
- FAULT STRIKE / DIP — eg 125°/ 25°E
- BRECCIATED ZONE
- HALOS OF JASPER
- SPHERULITES
- FRACTURING
- ACCESSORIES - Calcite, Dolomite, Siderite, etc
- LARGE ISOLATED LENSES

NOTE: Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT	OVOIDS	UNALIGNED LENSES: AMT and COMP	UNALIGNED LENSES: SIZE RANGE	PATCHES AND LENSES: ROUND	PATCHES AND LENSES: AMT and COMP	PATCHES AND LENSES: THICK RANGE	BANDS: BOUND	BANDS: AMT and COMP	BANDS: THICK RANGE	VEINLETS: BOUND	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC	ENGINEER DATA: % REC	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
10														+ OVERBURDEN								
														- CONGLOMERATIC & SANDY (10%) DARK BROWN SHALE - FRAGMENTS (10%), (½" - 4") SUB-ROUNDED TO SUB-ANGULAR INCLUDE WHITE CARBONATES & LIGHT TO DARK GREEN SHALE. TRACE OF CHALCOPYRITE & VEINLETS.	1.5		0.7	46.6				
															2.9		2.9	100.0				
															1.1		1.1	100.0				
															4.8		4.8	100.0				
20															2.9		1.5	51.8				
															4.2		4.2	100.0				
30															5.0		5.0	100.0				
															4.4		3.4	77.3				
40														- CONGLOMERATIC, FRAGMENTS (1"-3") (½" - ¼") ANGULAR TO SUB-ROUNDED, INCLUDE WHITE CARBONATE & LIGHT GREEN & DARK BROWN SHALE. THE MATRIX IS A COARSE SANDSTONE WHICH IS COMPOSED OF THE SAME FRAGMENTS.	5.1		5.0	100.0				
															5.0		5.0	100.0				
														- CONGLOMERATIC & SANDY DARK BROWN SHALE								
50															5.0		4.6	92.0				
														- CONGLOMERATIC (1½"-4") WELL-ROUNDED WITH IRREGULAR BANDS OF DARK BROWN SHALE & MEDIUM GRAINED LIGHT GREY CALCAREOUS SANDSTONE	5.0		4.8	96.0				
60														- SANDY TO CONGLOMERATIC DARK BROWN CALCAREOUS SHALE, FRAGMENTS ANGULAR TO SUB-ROUNDED & UP TO 3" DIAMETER - MOSTLY SHALE & CARBONATE	5.6		5.0	89.4				
															5.0		4.3	86.0				
70															9.9		2.6	46.7				
															6.9		4.3	62.4				
															2.1		0.3	14.3				
80															2.1		1.9	90.5				
															3.3		2.1	63.7				
															2.3		0.9	39.1				
															2.4		0.7	29.2				
90															7.0		2.6	37.2				
100															8.5		6.2	73.0				
110															10.0		30	30.0				
120															10.0		3.4	34.0				
130															9.6		1.0	21.8				
															2.0		1.2	60.0				
140															9.0		5.9	65.5				
															5.0		2.5	49.4				
150															8.3		8.5	35.5				
															7.3		5.5	65.6				
160																						
															3.7		3.5	91.5				
															9.2		1.2	37.4				
170																						
															6.5		4.3	95.3				
															1.2		0.1	58.0				
															4.7		4.4	93.5				
															1.9		1.4	73.6				
180															3.0		2.3	76.8				
															5.2		5.1	98.0				
190															5.6		4.8	85.6				
														- CALCAREOUS CHERTY BAND TO VERY CHERTY, DARK BROWN SHALE MATRIX (35-75%)	1.4		1.4	100.0				
															2.7		1.8	66.7				
200															5.2		5.1	98.1				
															3.5		3.5	100.0				
210																						
															4.0		4.0	100.0				
															4.8		4.8	100.0				
220														- RED JASPER - CARBONATE PATCHES								
														- VERY DARK BROWN SLIGHTLY HEMATITIC SHALE	6.7		5.5	82.1				
														- IRON FORMATION. WASTE ALSO INCLUDES IRREGULAR STREAKS of RED JASPER & BANDS of SHALE. CARBONATE MATRIX. DIP 15-45°	4.7		3.7	66.0				
230															6.2		5.9	95.1				
															2.0		1.9	95.6				
															3.8		2.7	69.6				
240														- CONGLOMERATIC (1½") TO SANDY (¼") DARK BROWN SHALE								
															5.6		3.5	62.4				
														HIGH GRADE METALIC TO MAROON HEMATITE TOWARDS THE BOTTOM.	0.3		0.2	66.7				
250															2.5		1.9	52.8				
														- SANDY & CONGLOMERATIC TO MASSIVE DARK BROWN SHALE	4.5		1.9	41.1				
															3.7		0.8	42.1				
														- MOST OF THE VOIDS HAVE INNER RINGS OR CENTERS OF HEMATITE. WASTE ALSO INCLUDES REGULAR TO IRREGULAR PINK PATCHES OF HEMATITE, MICROCRYSTALLINE QUARTZ, CARBONATE.	10.1		7.2	71.9				
260															4.2		4.2	100.0				
														- MAR. BROWN IRON FORMATION TO SHALE - MINH HARD BUT CAN BE SCRATCHED WITH A KNIFE, NON FERRUS ACID - TRACE OF CLASTIC FRAGMENTS & CALCITE VEINLETS.	5.6		4.1	73.2				
															(10.0)		(8.0)	(79.2)				
270															4.2		0.6	14.3				
														- MANY IRREGULAR PATCHES TO LENSES OF QUARTZ + CARBONATE & CARBONATE. TRACE OF CHALCOPYRITE & MALACHITE	4.5		3.3	73.4				
															2.5		1.6	64.1				
															3.9		2.9	74.8				
280															2.1		1.7	80.9				
															8.4		7.6	90.5				
290																						
															4.0		2.9	74.0				
														- "SHREDDED" BANDS OF JASPER & DOLOMITE & PATCHES OF MAGNESIAN JASPER WITH RED JASPER BORDERS								
															14.0		7.7	72.6				
300																						
														- SANDSTONE - CALCAREOUS DARK GRADISH TO BRWNISH GREY. LOWER MARKER	7.8		5.6	71.3				
														- WASTE IS IRREGULAR STREAKS & PATCHES OF CARBONACEOUS JASPER.	4.0		3.7	92.5				
															6.8		2.7	43.7				
310															3.0		1.6	53.9				
														GRAY CALCAREOUS SHALE	4.7		2.0	42.6				
														- IRON FORMATION. WASTE SAME AS ↑	3.8		2.0	52.7				
320														RUSTY EARTHY SHALE								
														- IRREGULAR PATCHES TO LENSES OF MICROCRYSTALLINE QUARTZ, HEMATITE & CARBONATE. DIP ~ 10°	2.2		0.6	27.7				
															2.8		2.2	78.6				
															9.6		8.0	83.4				
330																						
															5.0		4.8	96.0				
														- ALSO 25% OF THE WASTE IS "SHREDDED" RED JASPER & DOLOMITE	5.0		4.8	96.0				
														- WASTE IS IRREGULAR STREAKS OF RED & MAROON JASPER & CARBONATE, ALSO A FEW VOIDS.	4.8		3.9	81.3				
340															5.8		4.7	81.0				
															3.1		2.6	79.6				
350															5.4		4.7	87.0				
														- SANDSTONE - COARSE ANGULAR GRAINS OF GREEN SHALE & WHITE CALCITE.								
														- VERY DARK BROWN SHALE - TRACE OF CLASTIC FRAGMENTS.	6.1		4.3	70.5				
360															5.2		3.5	67.3				
															10.2		9.5	93.0				
370																						
															9.2		7.1	77.6				
380															10.0		7.9	79.1				
														- CONGLOMERATIC (10%) & SANDY (10%) VERY DARK BROWN TO BROWN SHALE FRAGMENTS (¼" - 4") ANGULAR TO ROUNDED, INCLUDE QUARTZITE, CARBONATE, SHALE ETC.								
															9.2		7.1	77.6				
390																						
															10.0		7.9	79.1				
400															6.3		4.5	71.5				
														END OF DRILL HOLE AT 403.8'								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

~~DDH~~ ~~SECTION~~ No Y-17-63
DESCRIBED BY W. GIBBINS
MEASURED BY
AIR PHOTO No
AREA IRON CREEK
WEATHER

DATE STARTED AUGUST 6
DATE COMPLETED AUGUST 17
MEASURING RATE
COORDINATES 96,300 N ; 105,100 E
CLAIM

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
MICROCRYSTALLINE QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE %
FEW F
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS
BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES
FRACTURING
ACCESSORIES - Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

DATE

INTERVAL	LITHOLOGY	% HEMATITE	% RELICT / OVOIDS	UNBANDED LENSES AMT. PER COMP.	UNBANDED LENSES SIZE RANGE	%	BANDS (PARGES) AMT. PER COMP.	BANDS (PARGES) THICK RANGE	%	VEINLETS	REMARKS	ENGINEER DATA LEN RUN	ENGINEER DATA No RUNS	ENGINEER DATA FT REC	ENGINEER DATA % REC	CRUDE ANALYSIS SAM No	CRUDE ANALYSIS Fe	CRUDE ANALYSIS SiO_2	CRUDE ANALYSIS P
0											OVERBURDEN								
20																			
											CONGLOMERATIC (10%) & SANDY (20%) DARK BROWN SHALE. FRAGMENTS (½" - 2"), SUB-ANGULAR, SHALE, CARBONATES, ETC.	4.0		4.0	100.0				
												5.0		2.0	40.0				
												2.0		2.0	100.0				
												3.0		3.0	100.0				
40												4.0		2.9	67.5				
												4.1		4.0	100.0				
											LIGHT GREEN & DARK BROWN CALCAREOUS SILTSTONE	3.0		3.0	100.0				
												2.0		2.0	100.0				
60											CONGLOMERATIC (15-20%) & SANDY (15-20%) DARK BROWN SHALE	5.0		4.4	88.0				
												3.0		2.9	96.6				
												5.0		4.7	94.0				
												5.0		4.5	90.0				
80											MEDIUM GRAINED CALCAREOUS SANDSTONE - MASSIVE - WHITE TO GREEN	5.0		2.0	100.0				
												3.0		3.0	100.0				
											LIGHT GREEN SANDSTONE INTERBEDDED WITH DARK BROWN SHALE - CROSS-BEDDED DIPS 10-15°	5.0		4.7	94.0				
											DARK BROWN SHALE - MASSIVE - A FEW CALCITE VEINLETS.	5.0		4.6	92.0				
100											MEDIUM TO COARSE GRAINED LIGHT GREEN SANDSTONE - CALCAREOUS - TRACE OF BROWN SHALE AIRLIFT	5.0		5.0	100.0				
											SILTY DARK BROWN SHALE	5.0		4.8	96.0				
											VERY DARK BROWN HEMATITIC SHALE	5.0		3.8	76.0				
120											CROSS BEDDED LIGHT GREEN SILTSTONE & DARK BROWN SHALE	5.0		1.8	36.0				
											DARK BROWN SHALE WITH A TRACE OF SILT, SAND, & CALCITE VEINLETS	5.0		4.9	98.0				
												5.0		5.0	100.0				
140											INTERBEDDED LIGHT GREEN SILT & DARK BROWN SHALE - PENECONTEMPORANEOUS BRECCIATION & CROSS BEDDING	5.0		5.0	100.0				
											SHALEY IRON SANDSTONE - BROWN SHALE MATRIX	2.0		1.8	90.0				
												2.0		1.6	80.0				
160											⅔ DARK BROWN SHALE & ⅓ CROSS BEDDED LIGHT GREEN SILTSTONE	8.0		7.5	93.8				
												5.0		5.0	100.0				
180											MASSIVE DARK BROWN SHALE - TRACE OF CALCITE VEINLETS	5.0		4.8	96.0				
											HARD SHALEY IRON FORMATION	5.0		3.4	68.0				
200											1-2% VUGGY POROSITY	2.0		1.5	75.0				
											IRON SANDSTONE, VERY COARSE GRAINED - GRAINS OF HEMATITE, CALCITE & JASPER	5.0		3.5	70.0				
											IRON FORMATION & DARK BROWN SHALE - TRACE OF PEA SIZED CONGLOMERATE	2.0		1.2	60.0				
											VERY COARSE IRON SANDSTONE	3.6		2.7	75.0				
220											CONGLOMERATE - FRAGMENTS (¼" - 2") 20% (½" - 2") ANGULAR TO SUB-ROUNDED, INCLUDE LIGHT & DARK BROWN SHALE & CARBONATES - MATRIX IS MAROON SHALE & LIGHT GREEN SHALE	5.0		4.7	94.0				
											VERY DARK BROWN SHALE - TRACE OF IRON FORMATION & LIGHT GREEN SANDSTONE	2.4		2.3	95.8				
											MASSIVE DARK BROWN SHALE - WITH A TRACE OF SILT	5.0		4.7	94.0				
240											CONGLOMERATE - FRAGMENTS (10%) (¼" - 2"), ANGULAR TO SUB-ANGULAR, SHALE & CARBONATES	5.0		5.0	100.0				
											MASSIVE DARK BROWN SHALE	5.0		4.9	98.0				
											CONGLOMERATE	XX		XX	XXX				
											MASSIVE DARK BROWN SHALE - TRACE OF LIGHT GREEN SILT	4.5		3.9	86.7				
260											CONGLOMERATIC (15-20%) & SANDY (85-80%) LIGHT GREEN & DARK BROWN SHALE	3.0		2.5	83.3				
											BANDED IRON FORMATION DIPS 5-10°	4.0		2.9	62.5				
												3.5		2.4	68.5				
280											DARK GREEN SILTSTONE & DARK BROWN SHALE - CROSS BEDDED	4.0		3.2	77.5				
											- A FEW VERY IRREGULAR BANDS OF HARD CARBONATE & PATCHES OF RED JASPER & QUARTZ	5.0		5.0	100.0				
											MARKER SANDSTONE - MEDIUM GRAINED & CALCAREOUS - FAINT REGULAR BEDDING DIPPING	3.5		3.2	91.4				
300											IRON FORMATION - SPHERULITIC PATCHES AT 232.5'. SOME SPHERULITES ARE IN VARIOUS STAGES OF REPLACEMENT BY GHOST HEMATITE WHILE OTHERS HAVE CENTERS OF MAROON JASPER & SOME SPHERULITES OCCUR WITHIN MAROON JASPER BANDS. - LENSES OF RED JASPER HAVE ASCICULAR WHITE CALCITE CRYSTAL BORDERS & MAROON JASPER LENSES HAVE RED JASPER BORDERS.	5.0		3.5	70.0				
												1.6		0.9	56.3				
												2.0		0.9	45.0				
320												3.4		1.9	55.9				
												3.0		2.4	80.0				
												5.0		5.0	100.0				
												3.0		3.0	100.0				
340												3.6		2.7	75.0				
											IRON FORMATION - SIMILAR TO ABOVE, BUT CONTAINS 3-6" BANDS OF SHALE & CARBONATE (15% OF WASTE). DIP ~ 8°	8.4		7.5	89.3				
											MEDIUM GRAINED GREY SANDSTONE, GRAINS OF WHITE CARBONATE & DARKER SHALE	XX		XX	XXX				
360											CONGLOMERATE - FRAGMENTS (10%) (¼" - 1"), ANGULAR TO SUB-ANGULAR, INCLUDE CARBONATES, LIGHT & DARK BROWN SHALE & SANDSTONE. MATRIX IS MAROON SHALE	5.0		4.2	84.0				
												5.0		4.5	90.0				
											MAROON JASPER BANDS WHICH ALSO HAVE BORDERS OF RED JASPER. MOST OF THE AVOIDS HAVE THIN BORDERS OF ASCICULAR WHITE CARBONATE. TRACE OF CLASTICS. DIPS OF 10-20°	4.5		4.2	93.4				
												4.0		3.5	87.5				
380											INTERBEDDED CONGLOMERATIC & IRON FORMATION.	4.5		3.4	75.6				
											VERY DARK BROWN SHALE. TRACE OF IRON FORMATION.	5.0		3.2	64.0				
												3.0		2.1	70.0				
												2.2		1.8	81.9				
400											SAME AS THE AVOIDS ABOVE HEMATITE CENTERS.	3.6		2.7	75.0				
												5.4		4.9	90.8				
												3.0		2.8	93.4				
420												1.0		0.4	40.0				
											LOW GRADE SHALEY IRON FORMATION.	3.6		3.0	83.4				
											CONGLOMERATIC, FRAGMENTS (5-10%) ANGULAR TO SUB-ROUNDED, (¼" - 2") SHALE & HEMATITIC, MATRIX IS CALCAREOUS SERICITIC SHALE	2.4		2.2	91.6				
											SANDY & CALCAREOUS, MAROON BROWN SHALE. CONTAINS (5%) (1-2 mm) ANGULAR CLASTIC GRAINS OF SANDY & CALCAREOUS, VERY DARK GREEN SHALE.	5.0		3.9	78.0				
											IRON FORMATION. WASTE CONSISTS OF A FEW JASPER & CARBONATE PATCHES & A FEW SMALL STREAKS OF MAROON JASPER.	2.5		2.1	84.0				
440												2.6		2.1	84.0				
											"SHREDDED" DOLOMITE WITH A TRACE OF HEMATITE & JASPER.	2.0		1.3	65.0				
											IRON FORMATION. CONTAINS A FEW SMALL PATCHES OF JASPER & CARBONATE, & A SMALL AMOUNT OF "SHREDDED" DOLOMITE.	2.0		0.4	20.0				
											- 0.1' OF SHREDDED DOLOMITE.	2.0		0.2	10.0				
											BANDED ZONES OF SHREDDED DOLOMITE & MICROCRYSTALLINE QUARTZ	3.6		2.3	63.9				
460												1.7		1.1	76.5				
												3.0		1.4	46.7				
											- BANDS OF MAROON HEMATITE (20-30%) PATCHES OF "SHREDDED" PINK QUARTZ-HEMATITE	2.6		1.4	53.9				
												1.4		1.3	92.8				
												3.0		1.6	53.4				
480												XX		XX	XXX				
												2.8		1.0	35.0				
												1.5		1.4	93.4				
												1.8		0.3	22.2				
												1.2		0.2	16.7				
												8.0		1.6	20.0				
500												7.0		1.0	100.0				
												3.0		2.5	83.4				
												XX		XX	XXX				
												7.3		7.1	97.5				
												4.7		1.3	76.5				
												0.8		0.8	100.0				
520												2.2		1.3	59.1				
												1.9		1.7	89.5				
											FAIRLY HARD MASSIVE MEDIUM BROWN SHALE - FEW CALCITE VEINLETS.	3.1		2.9	93.6				
540												5.0		4.5	90.0				
											DARK GREEN COARSE GRAIN SANDSTONE - VERY SILICEOUS IRON FORMATION - LOWER MARKER SANDSTONE (BOTTOM) - CALCAREOUS.	5.0		4.7	94.0				
												7.5		7.5	100.0				
											IRON FORMATION - TRACE OF SULFIDE. RED JASPER OCCURS AS BORDERS IN MAROON JASPER.	4.5		4.2	93.4				
560												2.0		2.0	100.0				
												3.5		3.3	94.4				
												4.9		4.9	100.0				
											HARD MEDIUM TO LIGHT BROWN SHALE	5.0		4.9	98.0				
580											DIP ~ 15°	4.4		4.4	100.0				
												1.0		0.3	30.0				
											LIGHT DARK GREEN TO BROWN SHALE	2.0		1.7	85.0				
											IRON FORMATION. TRACE OF BANDS OF "SHREDDED DOLOMITE & RED JASPER. PATCHES HAVE SHRINKAGE VEINLETS OF CALCITE.	2.9		1.6	84.1				
600												5.7		5.7	100.0				
											WASTE INCLUDES: PATCHES OF RED JASPER WHICH CONTAIN CALCITE VEINLETS, QUARTZ-CALCITE OVOIDS, SMALL STREAKS OF RED JASPER, & TRACES OF SHALEY IRON FORMATION.	5.0		4.9	98.0				
											DOLOMITE? & RED JASPER OVOIDS. TRACE OF SULFIDES	1.9		1.6	84.5				
												4.0		3.7	91.5				
620												5.0		4.7	94.0				
											SANDY OR SHALE, CARBONATE & RED JASPER BIRDS-EYE TO OVOIDS IN MAROON JASPER. TRACE OF SULFIDES	4.0		3.5	87.5				
											RED JASPER - CARBONATE PATCHES.	1.5		←	←				
												2.0		0.7	35.0				
												1.0		0.4	40.0				
												1.6		1.3	81.1				
												2.4		2.0	83.0				
												XX		XX	XXX				
640												1.5		0.7	46.6				
												1.5		0.5	33.3				
											SHALEY, MAROON HEMATITE	3.5		1.8	51.4				
											SANDY (10%) & CONGLOMERATIC (25%) DARK MAROON BROWN SHALE. FRAGMENTS (½" - 3") SUB-ANGULAR TO SUB-ROUNDED, INCLUDE GREEN SHALE & CARBONATES. A FEW CALCITE VEINLETS.	XX		XX	XXX				
												4.5		4.5	100.0				
660												5.0		4.9	98.0				
												5.0		4.8	96.0				
												5.0		4.8	96.0				
680												5.0		5.0	100.0				
											ALSO TRACE OF RED JASPER BANDS. MAROON HEMATITE INCREASES DOWNWARDS.	5.0		4.1	82.0				
												4.0		2.8	70.0				
700												4.5		3.1	68.9				
												4.0		4.0	100.0				
												4.0		3.0	75.0				
												3.5		1.8	51.5				
720											POOR JASPEROID IRON FORMATION COARSE VERY DARK GREEN SANDSTONE JASPEROID MAROON HEMATITE	5.0		3.2	64.0				
												2.5		1.7	68.0				
												2.5		2.3	92.0				
												1.0		0.6	60.0				
740												3.0		2.5	83.3				
												5.0		2.2	44.0				
											FAIRLY HARD BLACK TO VERY DARK BROWN SHALE WHICH CONTAINS A TRACE OF CLASTICS	5.0		5.0	100.0				
											- LARGE IRREGULAR STREAKS OF RED JASPER, BRECCIATED BY MANY QUARTZ-CARBONATE VEINLETS	4.0		3.2	80.0				
760												5.0		4.9	98.0				
											- SIMILAR TO ABOVE BUT NO VEINLETS.	5.0		3.9	78.0				
											- LARGE IRREGULAR STREAKS OF RED JASPER & CARBONATE. RED JASPER IS BRECCIATED BY QUARTZ CARBONATE VEINLETS.	2.0		1.6	80.0				
											IRON FORMATION. DIP 5-10°	1.0		0.6	60.0				
780												3.0		1.5	50.0				
											LARGE IRREGULAR STREAKS OF RED JASPER & CARBONATE. RED JASPER IS BRECCIATED BY QUARTZ-CALCITE VEINLETS.	1.0		0.8	80.0				
											CONGLOMERATIC - FRAGMENTS (10%) (¼" - 2") ANGULAR TO RHOMB (ROUNDNESS INCREASES WITH SIZE) INCLUDE LIGHT COLORED LIMESTONE, SANDSTONE, SHALE, ETC. MATRIX IS DARK BROWN SHALE.	2.0		1.0	50.0				
800											- MASSIVE DARK BROWN SHALE	5.0		4.9	98.0				
											END OF DDH # Y-17-63 AT 804.0'								

CREST EXPLORATION LIMITED

IRON ROCK LOG CHART

DDH SECTION No Y-18-63 — DATE STARTED AUGUST 8

DESCRIBED BY W. GIBBINS & R. WILLIAMS — DATE COMPLETED AUGUST 11

MEASURED BY — MEASURING RATE

AIR PHOTO No. — COORDINATES 102,800 N ; 30,400 E

AREA — CLAIM

WEATHER

ROCK TYPES

IRON FORMATION		SILTSTONE	
JASPER		SHALE	
CONGLOMERATE		LIMESTONE	
BRECCIA		DOLOMITE	
SANDSTONE		COVERED	

% HEMATITE

STEEL GREY HEMATITE	
MAROON HEMATITE	
BOTH	

SILICEOUS WASTE TYPES

RED JASPER	
MAROON JASPER	
MICRO-CRYSTALLINE QUARTZ	

VEINLETS

QUARTZ	S
CARBONATE	C
HEMATITE	H
FEW	F
MANY	M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite

I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS BEDDING STRIKE / DIP eg 125° / 25° W

FAULT STRIKE / DIP eg 125° / 25° E

BRECCIATED ZONE

HALOS OF JASPER

SPHERULITES

FRACTURING

ACCESSORIES - Calcite, Dolomite, Siderite, etc

LARGE ISOLATED LENSES

NOTE Percent with Relict Texture measured left to right as percent of total Hematite

Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4

DATE

FEET	% HEMATITE	% RELICT	OVOIDS	ALIGNED LENSES: AMT OF COMP	ALIGNED LENSES: SIZE RANGE	ALIGNED LENSES: DIP	PATCHES: AMT OF COMP	PATCHES: THICK RANGE	PATCHES: DIP	BANDS: AMT OF COMP	BANDS: THICK RANGE	BANDS: DIP	VEINLETS	REMARKS
0														OVERBURDEN
50														
30														
40														
50														
60														SANDY LIGHT TO DARK BROWN SHALE. ANGULAR TO SUB-ANGULAR FRAGMENTS OF LIGHT GREEN CALCAREOUS SHALE. PRESENCE OF CONGLOMERATIC FRAGMENTS
70														
80														VERY IRREGULARLY THIN BEDDED LIGHT GREEN SILTSTONE TO SANDSTONE & DARK BROWN SHALE. DIPS ARE IRREGULAR.
90														
100														
110														
120														COARSE LIGHT GREEN CALCAREOUS SANDSTONE - 15% DARK BROWN SHALE. DIP 0-15°.
130														SANDY DARK BROWN SHALE (CONGLOMERATIC). SUB-ANGULAR TO SUB-ROUNDED GRAINS UP TO 1" DIAMETER OF SILTSTONE & CARBONATE. MATRIX IS CALCAREOUS.
140														
150														
160														
170														
180														4" BOULDER OF LIMESTONE
190														AS ABOVE, BUT JASPER FRAGMENTS ARE QUITE COMMON AS ARE SMALL JASPER LENSES. ALSO OCCASIONAL JASPER OVOIDS
200														
210														
220														2" ARRIVE, NOT ALL JASPER FRAGMENTS.
230														END OF DDH # Y-18-63 AT 225'.

ENGINEER DATA: LEN RUN	No. RUNS	FT REC.	% REC.	CRUDE ANALYSIS: SAM. No	Fe	SiO_2	P
4.0		1.3	47.5				
5.0		4.8	96.0				
5.0		4.7	94.0				
5.0		5.0	100.0				
5.0		4.7	94.0				
5.0		3.5	70.0				
5.3		4.8	90.5				
5.2		5.0	96.1				
5.0		5.1	100.0				
5.0		4.7	94.0				
5.0		3.6	72.0				
5.0		4.7	94.0				
2.2		1.1	50.0				
5.0		4.8	96.0				
5.0		5.0	100.0				
5.0		4.7	94.0				
5.0		3.5	70.0				
5.3		4.8	90.5				
5.2		5.0	96.1				
5.0		5.1	100.0				
5.0		4.7	94.0				
5.0		3.6	72.0				
5.0		4.3	86.0				
5.0		4.8	96.0				
10.0		9.7	97.0				
10.0		9.4	94.0				
10.0		9.6	96.0				
10.0		9.5	95.0				
10.0		9.5	95.0				
10.0		9.5	95.0				
10.0		9.5	95.0				

GEO-93-2-CB 10/1971

GREST EXPLORATION LIMITED

IRON ROCK LOG CHART

~~DDH~~ SECTION No Y-19-63
DESCRIBED BY W. GIBBINS
MEASURED BY
AIR PHOTO No
AREA IRON CREEK
WEATHER

DATE STARTED AUGUST 12
DATE COMPLETED AUGUST 16
MEASURING RATE
COORDINATES 100,200 N ; 38,000 E
CLAIM

ROCK TYPES

IRON FORMATION
JASPER
CONGLOMERATE
BRECCIA
SANDSTONE
SILTSTONE
SHALE
LIMESTONE
DOLOMITE
COVERED

% HEMATITE

STEEL GREY HEMATITE
MAROON HEMATITE
BOTH

SILICEOUS WASTE TYPES

RED JASPER
MAROON JASPER
M.C. QUARTZ

VEINLETS

QUARTZ S
CARBONATE C
HEMATITE H
FEW f
MANY M

BOUNDARIES R - REGULAR - i.e. Even boundary between Jasper and Hematite
I - IRREGULAR - i.e. Uneven boundary between Jasper and Hematite

REMARKS BEDDING STRIKE / DIP eg 125°/ 25°W
FAULT STRIKE / DIP eg 125°/ 25°E
BRECCIATED ZONE
HALOS OF JASPER
SPHERULITES ***
FRACTURING
ACCESSORIES Calcite, Dolomite, Siderite, etc
LARGE ISOLATED LENSES

NOTE Percent with Relict texture measured left to right as percent of total Hematite
Percent Ovoids, Lenses, Aligned Lenses and Bands measured left to right as percent of total Siliceous waste

PAGE 1 OF 4

DATE

INTERVAL	% HEMATITE	% SILICEOUS WASTE	HAEMATITE BANDS: AMT and TYPE	HAEMATITE BANDS: THICK RANGE	HAEMATITE BANDS: AMT and TYPE	HAEMATITE BANDS: THICK RANGE	VEINLETS	REMARKS	ENGINEER DATA: LEN RUN	ENGINEER DATA: No RUNS	ENGINEER DATA: FT REC.	ENGINEER DATA: % REC.	CRUDE ANALYSIS: SAM No	CRUDE ANALYSIS: Fe	CRUDE ANALYSIS: SiO_2	CRUDE ANALYSIS: P
OVERBURDEN																
10																
20																
30																
40																
50																
60																
70																
70	BE							RED JASPER CARBONATE PATCHES SOME BANDS HAVE MAROON JASPER CENTERS SIDEROD DOLOMITE 51'-53.8'	5.0		4.6	92.0	1833			
								- INTERBEDDED SHALE & MAROON HEMATITE.	5.0		4.8	96.0	1834			
								- LOWER MARKER SANDSTONE, CALCAREOUS, LIGHT GREEN, VERY FINE & SHALEY (TOP) & LIGHT BROWN, VERY COARSE & SLIGHTLY HEMATITIC (BOTTOM)	5.0		4.4	88.0	1835			
80									5.0		5.0	100.0				
								- IRREGULARLY INTERBEDDED SANDSTONE & SHALEY MAROON HEMATITE	9.5		9.1	95.8	1837			
90	BE												1838			
								- DIP 5-10°, MOST OF THE MAROON JASPER BANDS ARE CALCAREOUS	5.3		4.1	77.4				
									2.2		0.5	22.8	1839			
									5.0		4.9	98.0				
100									3.0		2.4	80.0	1840			
								- SLIGHTLY CALCAREOUS SHALE - DARK GREENISH BROWN (FRESH SURFACE - BROKEN) LIGHT BROWNISH GREY (POWDER - KNIFE SCRATCH)	5.0		4.5	90.0	1841			
								- SOME OVOIDS HAVE MAROON JASPER CENTERS.	4.6		2.5	54.4				
110	BE								3.4		2.9	85.9	1842			
									5.0		4.6	94.0				
								- CONGLOMERATIC FRAGMENTS, (30%) (¼"-2½" TO ¾"x 3") ANGULAR TO ROUNDED IN GRANITIC MATRIX WITH SOME OF PARTICLES INCLUDE: BUFF DOLOMITE, LIGHT GREEN SANDSTONE, SHALE, QUARTZ ETC. MATRIX IS SANDY DARK BROWN SHALE.	5.8		4.9	84.5	1843			
120								- MOST OF THE CARBONATE IS VERY LIGHT BROWN SIDERITE OR DOLOMITE (A RANGE IS INTERBEDDED) VERY IRREGULAR RED JASPER & MICROCRYSTALLINE QUARTZ.	5.1		4.9	96.1	1844			
	TR	TR - BE							5.0		4.6	92.0				
130									4.4		3.9	88.8	1845			
									4.7		4.5	95.7	1846			
140								- SHREDDED - VERY IRREGULAR IRON FORMATION, (30% TO 45% BY VOL.) VERY MIXED (5% TO 45% BY VOL.) VERY LIGHT BROWN SIDERITE OR DOLOMITE								
		BE						- IRREGULAR IRON FORMATION. MANY MAROON JASPER OVOIDS WITH RED JASPER CENTERS.	5.0		5.0	100.0	1847			
									2.1		2.1	100.0				
150								- BANDED IRON FORMATION. DIP ~ 10° IRREGULAR PATCHES OF CARBONATE (CALCITE) & RED JASPER - QUARTZ.	4.9		4.4	89.8				
									4.0		3.9	97.5	1848			
									1.8		0.8	44.4				
160								LOW GRADE SANDY IRON FORMATION, MEDIUM TO VERY COARSE ANGULAR SIZED PARTICLES OF SHALE & CARBONATE ~ 60% OF ROCK. ALSO BANDS OF RED & MAROON JASPER & QUARTZITE	4.8		4.3	89.6				
									5.2		4.0	76.9	1849			
170								- SEMI RANDOMLY ORIENTATED LENSES TO OVOIDS MOST MAROON JASPER RED JASPER OR VEINLETS.	5.0		4.4	88.0				
									5.1		4.7	94.1	1850			
								} CONGLOMERATIC IRON FORMATION.	1.8		0.5	27.8				
180								- POOR VERY JASPEROID IRON FORMATION. WASTE IS MOSTLY LARGE IRREGULAR STRINGS OF RED & MAROON JASPER.	4.5		3.7	82.5	1851			
									4.6		3.8	84.5				
								- INTERBEDDED RED JASPER & SANDY VERY DARK BROWN SHALE	5.0		4.6	92.0	1852			
190								} CONGLOMERATIC IRON FORMATION.								
								GREENISH CONGLOMERATE (MORE COARSE GRAINED CALCAREOUS SANDSTONE), FRAGMENTS (70-80%) (¼"-2" TO ¾"x 3") MOSTLY ANGULAR TO SUB ANGULAR, INCLUDE: MOSTLY LIGHT COLORED SHALE & DOLOMITE, CALCAREOUS DARK BROWN SHALE MATRIX.	5.0		5.1	102.0	1853			
200									5.0		4.8	96.0				
								- IRON FORMATION - WITH PENECONTEMPORANEOUS FRACTURING OF LENSES & BANDS	4.0		4.0	100.0	1854			
210									1.0		1.0	100.0				
								FAIRLY HARD VERY LIGHT BROWN SHALE OR DOLOMITE BRECIATED BY CALCITE VEINLETS	5.0		4.7	94.0	1855			
								THINLY INTERBEDDED DOLOMITE, HEMATITE & JASPER								
								- IRON FORMATION WITH PENECONTEMPORANEOUS FOLDING & FRACTURING OF DOLOMITE BANDS & RED JASPER WASTE.	5.0		4.3	86.0	1856			
220									3.4		3.2	94.2				
									4.8		4.7	98.0	1857			
								- BANDS OF DOLOMITE OR CALCAREOUS SHALE	5.0		5.0	100.0				
230			½-2mm BANDS		2-4" R				4.8		4.5	93.8	1858			
									3.0		2.6	86.7	1859			
240								- SANDY GRADATION ZONE (5-20%) & CONGLOMERATIC (1-2½") DARK BROWN SHALE.	4.2		4.2	100.0				
									4.8		3.0	62.6				
250								END OF DDH # Y-19-63 AT 247.0'								
260																
270																
280																