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ASSESSMENT REPORT FOR ALBERTA METALLIC AND INDUSTRIAL MINERALS PERMIT NUMBERS

9398030061 TO 9398030065
9398030085 AND 9398030086
9398030094 TO 9398030096

FROM

CALGARY PETROGRAPHICS LTD.

PREPARED BY

JOHN BLADEK B.Sc.
GEOLOGIST

ASSESSMENT REPORT

METALLIC AND INDUSTRIAL MINERALS PERMITS Nos.

9398030061 TO 9398030065
9398030085, 9398030086
9398030094 TO 9398030096

SUBMITTED BY CALGARY PETROGRAPHICS LTD.

JUNE 28, 2000

JOHN BLADEK
GEOLOGIST

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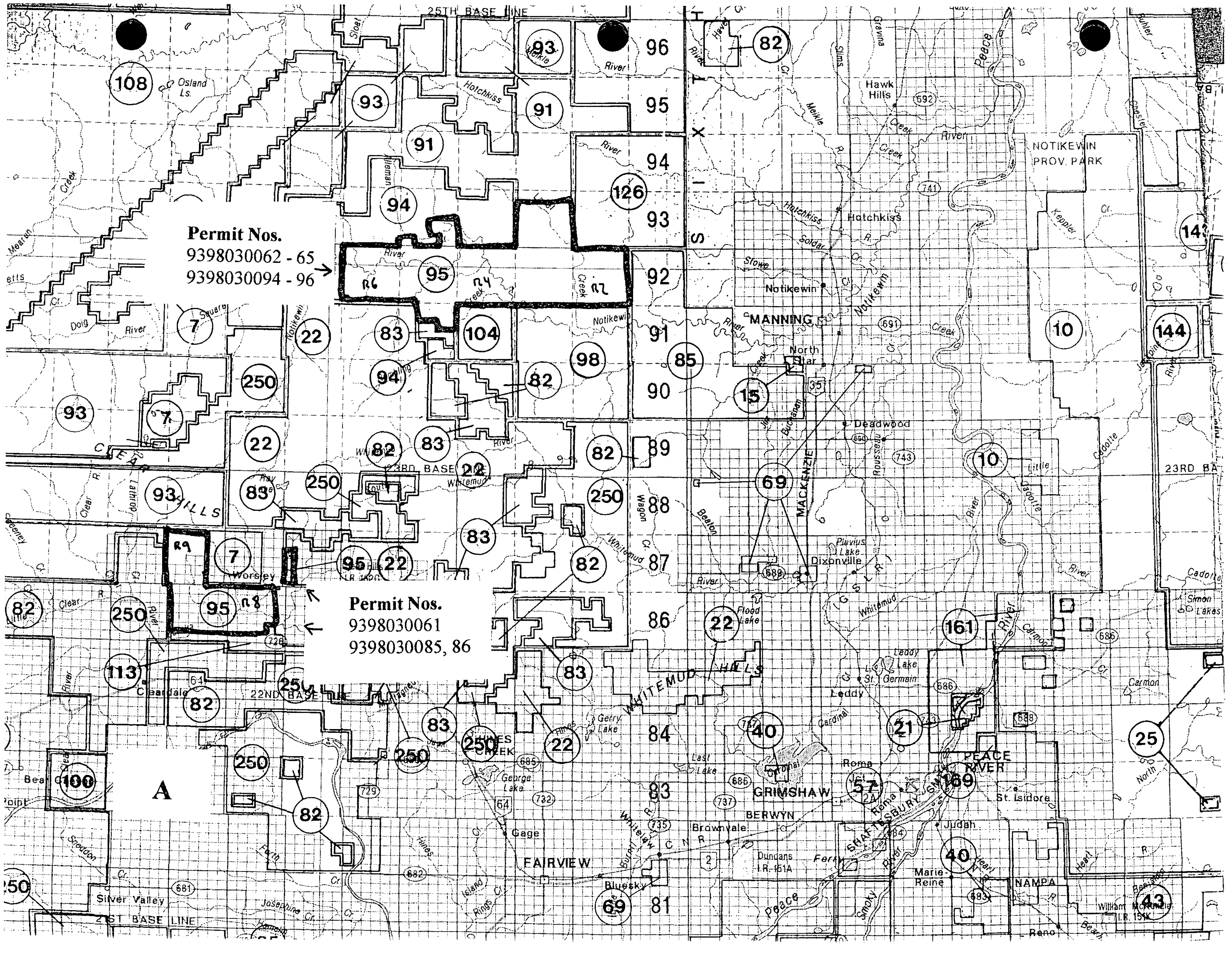


Permit Nos.
9398030062 - 65
9398030094 - 96
Permit Nos.
9398030061
9398030085, 86
A
25TH BASE LINE
23RD BASE LINE
22ND BASE LINE
21ST BASE LINE
MANNING
North Star
Notikewin
Hotchkiss
Hawk Hills
Deadwood
Dixonville
NOTIKEWIN PROV. PARK
MACKENZIE
Worsley
Cleardale
HINES CREEK
GRIMSHAW
Berwyn
Brownvale
FAIRVIEW
Gage
Bluesky
Silver Valley
PEACE RIVER
St. Isidore
Judah
Marie Reine
NAMPA
Reno
Leddy
Roma
Dunvegan
Duncans I.R. 151A
William McKenzie I.R. 151K
WHITEMUD HILLS
CLEAR HILLS
Peace
Notikewin
Whitemud
Meikle
Hotchkiss
River
Creek

AMMENDMENTS AND CANCELLATIONS

PERMIT No.	LAND RETAINED	Ha
9398030061	None	0
9398030062	91-05-W6 Sec. 23,24	512
9398030063	92-04-W6 Sec. 26,27, 31-36 NE, NW of Sec. 25,28,29,30	2560
9398030064	92-05-W6 Sec. 31-36 NE, NW of Sec. 25-30 93-05-W6 Sec. 2,5,6	3072
9398030065	92-06-W6 Sec. 31-36 NE, NW of Sec. 25-30	2304
9398030085	None	0
9398030086	None	0
9398030094	92-02-W6 Sec. 31-36	1536
9398030095	92-03-W6 Sec. 31-36	1536
9398030096	None	0

C

ALLOCATION OF EXPENDITURES

PERMIT No.	Ha.	EXENDITURE REQUIRED	EXPENDITURE ASSIGNED
9398030061	0	0	0
9398030062	512	$2,560.00	$2,560.00
9398030063	2560	$12,800.00	$12,800.00
9398030064	3072	$15,360.00	$18,885.00
9398030065	2304	$11,520.00	$11,520.00
9398030085	0	0	0
9398030086	0	0	0
9398030094	1536	$7,680.00	$7,680.00
9398030095	1536	$7,680.00	$7,680.00
9398030096	0	0	0
TOTAL	**11,520**	**$57,600.00**	**$61,125.00**

D

INTRODUCTION:

Alberta Metallic and Industrial Minerals Permits 9398030061 to 9398030065, 9398030085 and 9398030086, and 9398030094 to 9398030096 ("the permits") are located in N.W. Alberta in the Clear Hills Area. Two permits are located at the southern edge of the Clear Hills, roughly Township 86,87, Range 7,8,9, W6 ("the south permits"). The bulk of the permits ("the north permits") are in the area of the Notikewin River Valley, west of the town of Manning, Township 92, Ranges 2-6 W6, with some permits in Townships 91 and 93. The location of the north permits and some of the south permits is shown in Figure 1, page 2.

The permits were aquired because of their proximity to the Clear Hills (Swift Creek) iron- ore deposit held by Marum Resources Ltd. This oolitic iron-ore deposit has been discovered to contain relatively high amounts of vanadium and other metallic minerals. The deposit is part of the Badheart Formation, which, in the Clear Hills area, is essentially flat laying and found at an elevation of approx. 2600 feet or 800m. The permits were aquired to explore sedimentary rocks at the same stratigraphic level of the oolitic iron-ore deposit and to investigate the possibility that diatremes might be found at the same levels or at shallower horizons.

The work conducted on the permits can be divided into 3 phases. The first phase involved an overview of the area in an attempt to determine whether or not the oolitic iron-ore formation of the Badheart extended into the northern permits. The second and third phases of exploration involved field/sampling trips to the northern permits.

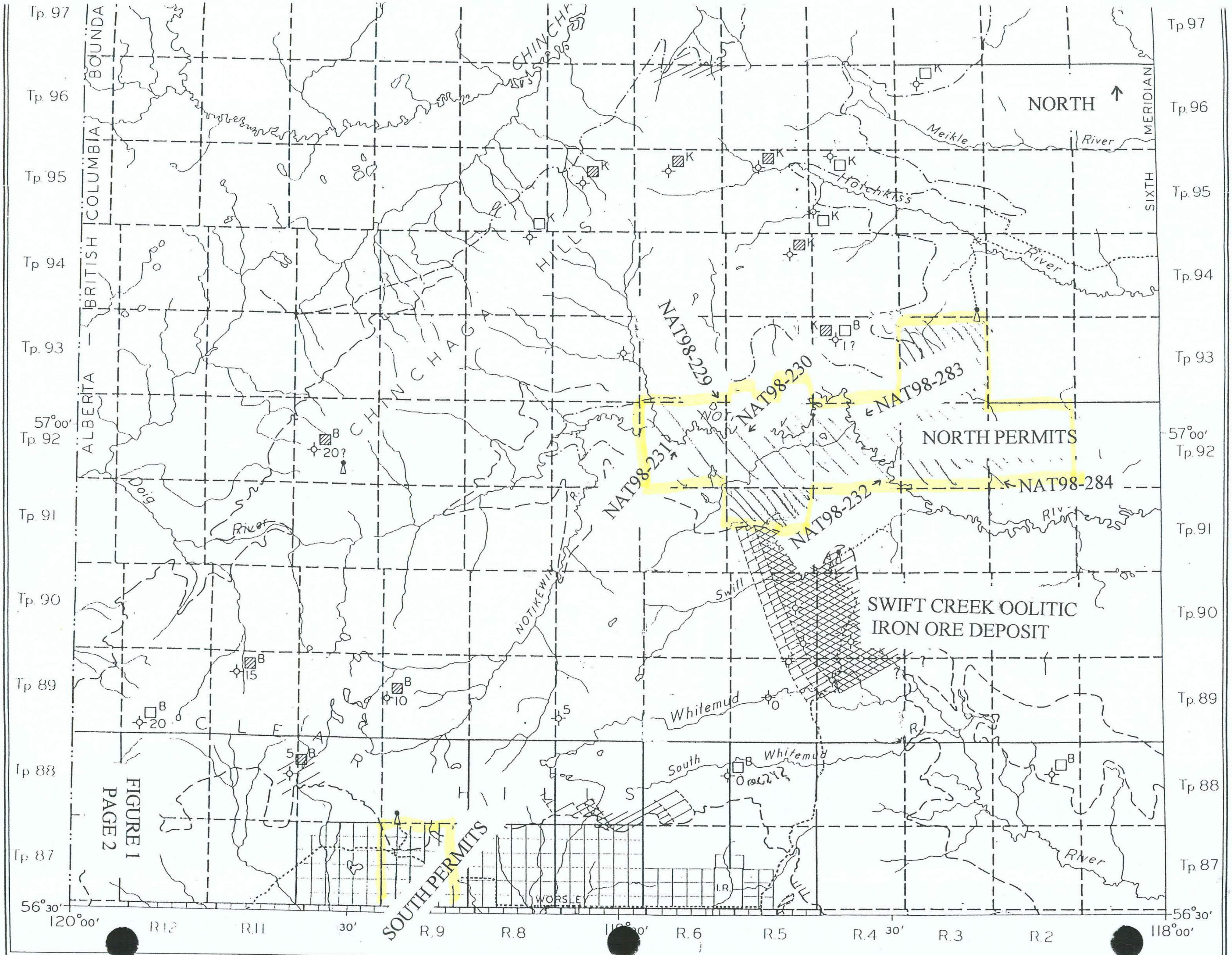
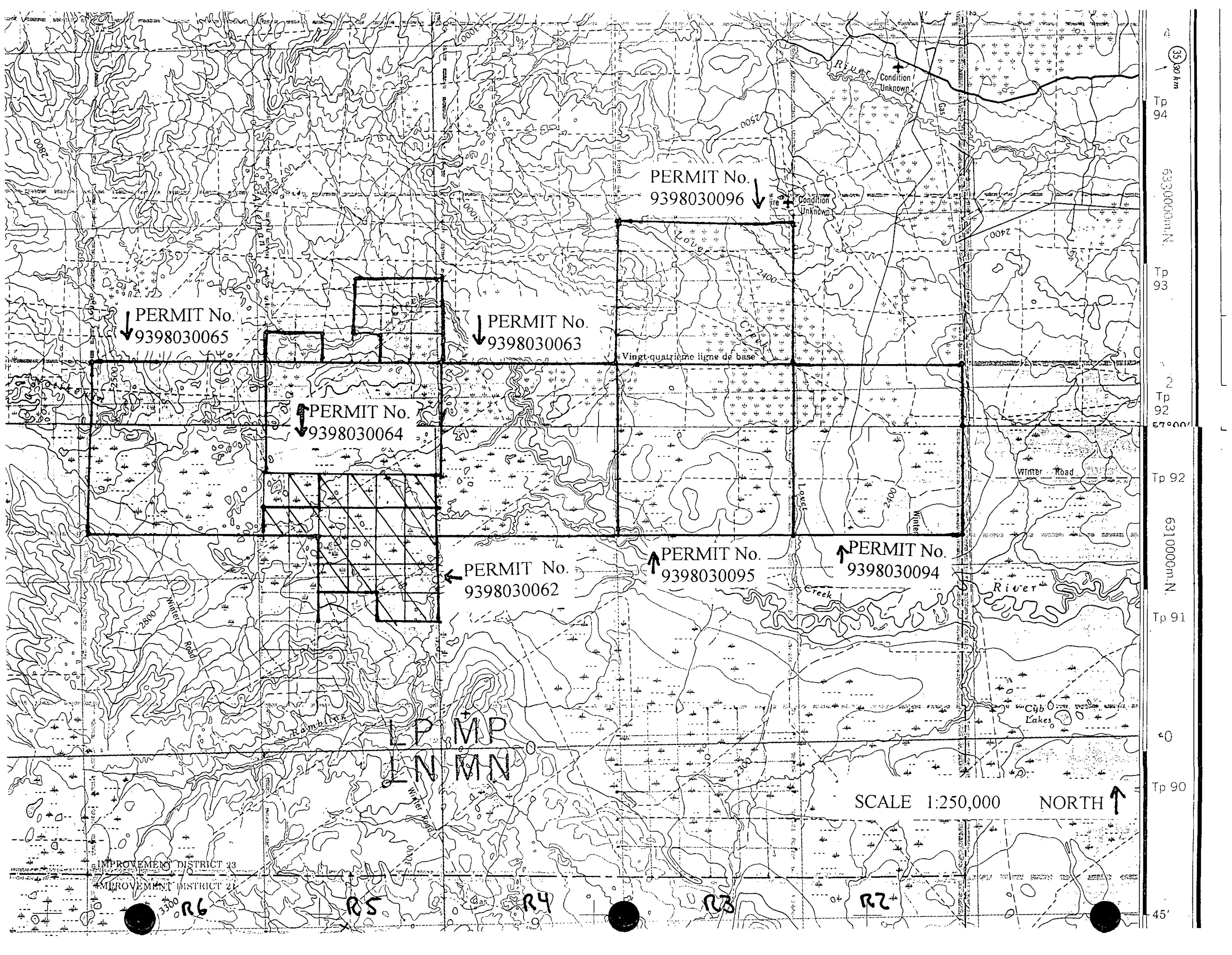


FIGURE 1
PAGE 2



PERMIT No. 9398030096
PERMIT No. 9398030065
PERMIT No. 9398030063
PERMIT No. 9398030064
PERMIT No. 9398030062
PERMIT No. 9398030095
PERMIT No. 9398030094
Vingt-quatrième ligne de base
Condition Unknown
Condition Unknown
River
Love
Creek
Winter Road
Cub Lakes
Rambling
LP MP
LN MN
SCALE 1:250,000
NORTH
IMPROVEMENT DISTRICT 23
IMPROVEMENT DISTRICT 21
R6
R5
R4
R3
R2
Tp 94
Tp 93
Tp 92
Tp 91
Tp 90
6330000m.N.
6310000m.N.

PHASE 1:

This phase of the exploration process involved examination of topographic maps, air photographs, and of drill cuttings from oil wells where possible.

In the northern permit area, the first objective was to establish which area had elevations of 800m or more. Study of a 1:50,000 topographic map immediately confirmed the presence of several topographic anomalies with elevations of 800m +/- 10 m. Of considerable interest was a topographic anomaly at section 36, 92-6 W6. In many ways this anomaly was similar in appearance to the Mountain Lake diatreme, with a gradual slope on the northern flank and steep slope on the southern. Immediately to the east a ridge exists at approximately the same elevation. Slightly further east, the Notikewin River makes an abrupt change of direction around what may be a resistant mound at a lower elevation. To the west of the topographic anomaly in 36-92-6W6 there exists another circular topographic anomaly with an elevation of approx. 800m. These hills are shown and marked in Figures 2 and 3, pages 4 and 5. These maps are at a scale of 1:50,000. The numbers corresponding to each hill in Figures 2 and 3 are the numbers which will be used to identify them in this report. Figure 4, page 7, is a combination Radarsat/topography image which shows the hills in a more photographic quality. The scale of this image has not been determined.

Of considerable interest was the fact that these mounds or topographic anomalies existed along a straight line as illustrated in Figures 2, 3, and 4 . The presence of resistant material in a straight line at the same elevaation as the Badheart oolitic iron ore formation suggested the possibilty that some sort of resistant sedimentary rock was deposited there, or that perhaps the resistant rocks could be volcanics and their straight line distribution could be attributed to their being emplaced through conduits along a deep seated fault.

In either case, the author decided that examination of drill cuttings from oilwells could help in determining what lithologies could be found at elevations of approx. 800m to the north of Twp 92. All oilwell drill cuttings that are required to be retained by the operator are cleaned and stored at the Core Research Centre in Calgary. Presently, operators are usually not required to retain drill cuttings until they have reached the depth of prospective oil and gas horizons. In the Clear Hills area, this would correspond to a depth of over 1000m. In the 1950's, however, many operators collected and retained drill cuttings at or near surface.

A search was conducted to find which oilwells in the area might have cuttings from near surface levels. All prospective wells were examined, and it was determined that a well at location 10-29-93-6 W6 had adequate sample quality and was close enough to the northern permits to warrant futher investigation.

This well had a K.B. of approx. 2800 feet. At approx. 200 feet below surface there was a noticeable change in lithology from shale to a medium to dark green "sandstone". This would correspond to an elevation of approx. 2600 feet, the precise elevation of interest. A thin section

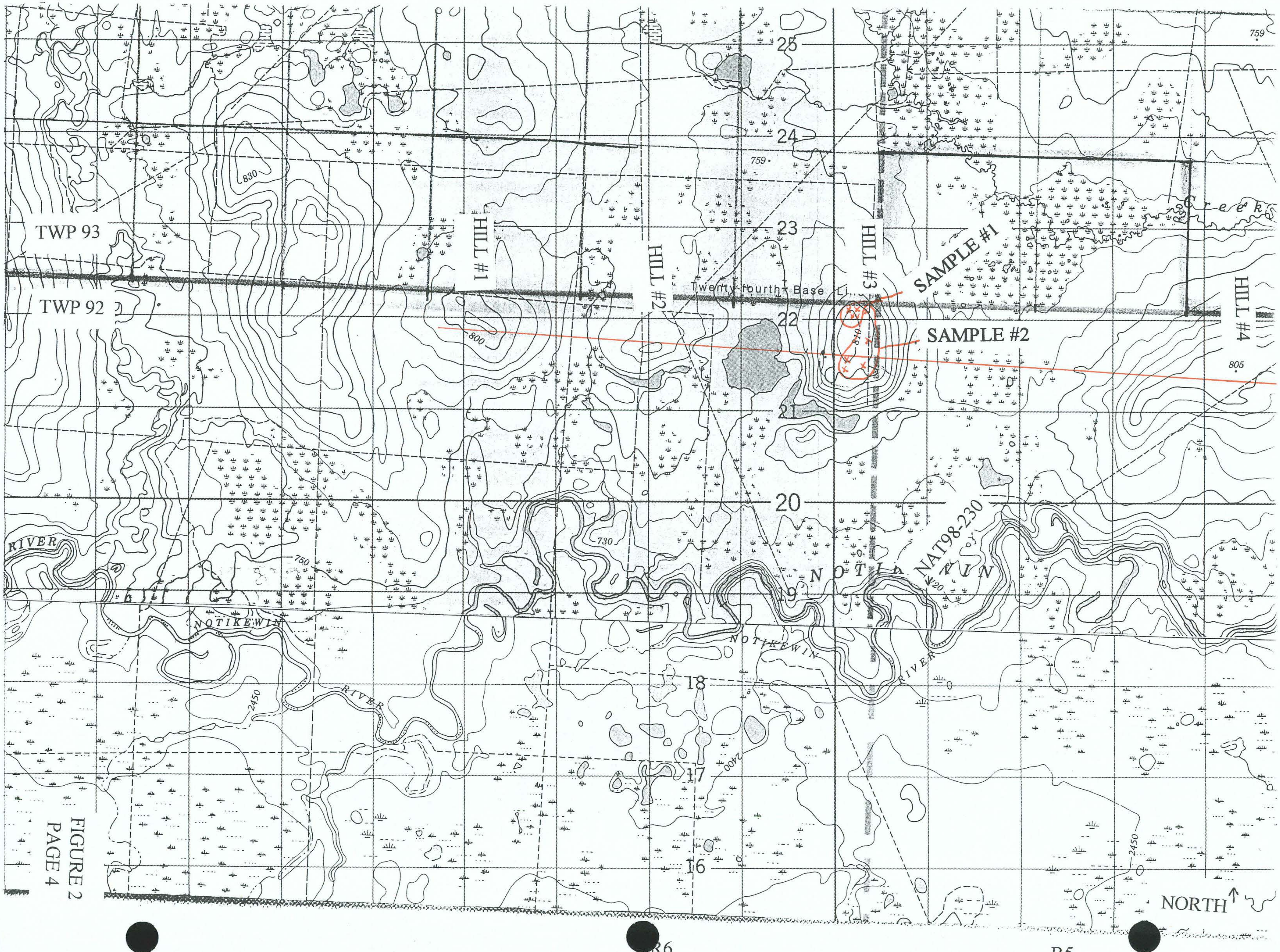


FIGURE 2
PAGE 4

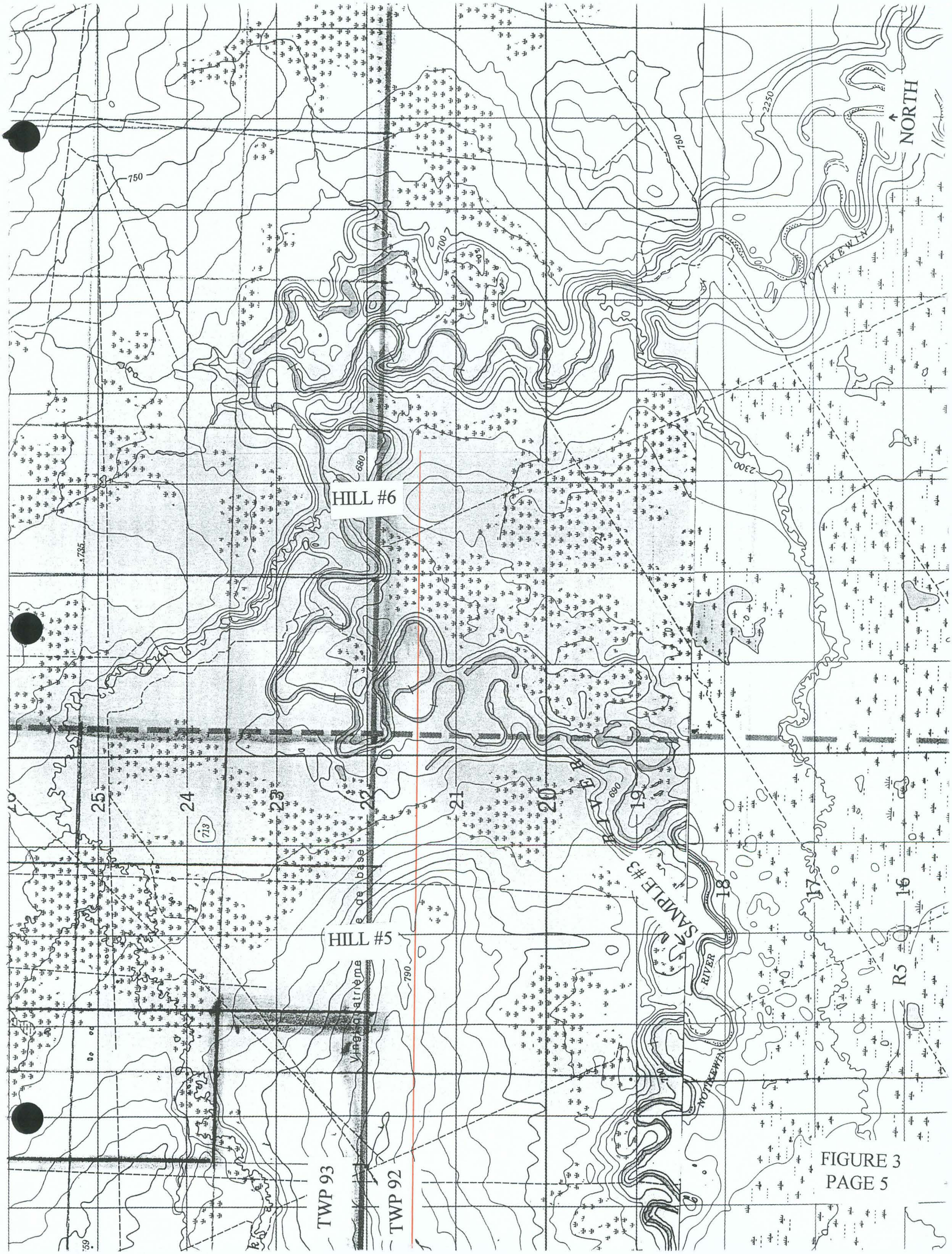


FIGURE 3
PAGE 5

of cuttings revealed a complex iron-rich sandstone. Detailed petrography was not determined to be necessary, but the EUB allowed the author to remove a small amount of sample for destructive elemental analysis. Figure 6, page 9 shows the results of the analysis of cuttings samples taken from the Core Research Centre. Samples 10 and 11 are samples of oolitic iron-ore formation taken from an oilwell drilled through the Swift Creek iron-ore deposit. These samples were taken mainly for comparison.

The analyses do indicate that the green iron rich sandstone found in the 10-29-93-6 W6 well does contain somewhat elevated vanadium and iron levels. This could correlate to high vanadium and iron levels in the oolitic iron-ore formation within the Badheart. This northward correlation suggested that it would be advisable to investigate the topographic anomalies in the the northern permits which had elevations of approx. 800m, for the reason that they might be resistant horizons of metallic enriched sandstones.

Preparation of thin sections from cuttings stored at the E.U.B. Core Research Centre in Calgary requires approval by the E.U.B. and all thin sections must be resubmitted to the Core Research Centre where they are stored for the use of other patrons. A list of the thin sections prepared by Calgary Petrographics Ltd. used in regional "scouting" is shown in Figure 5, page 8.

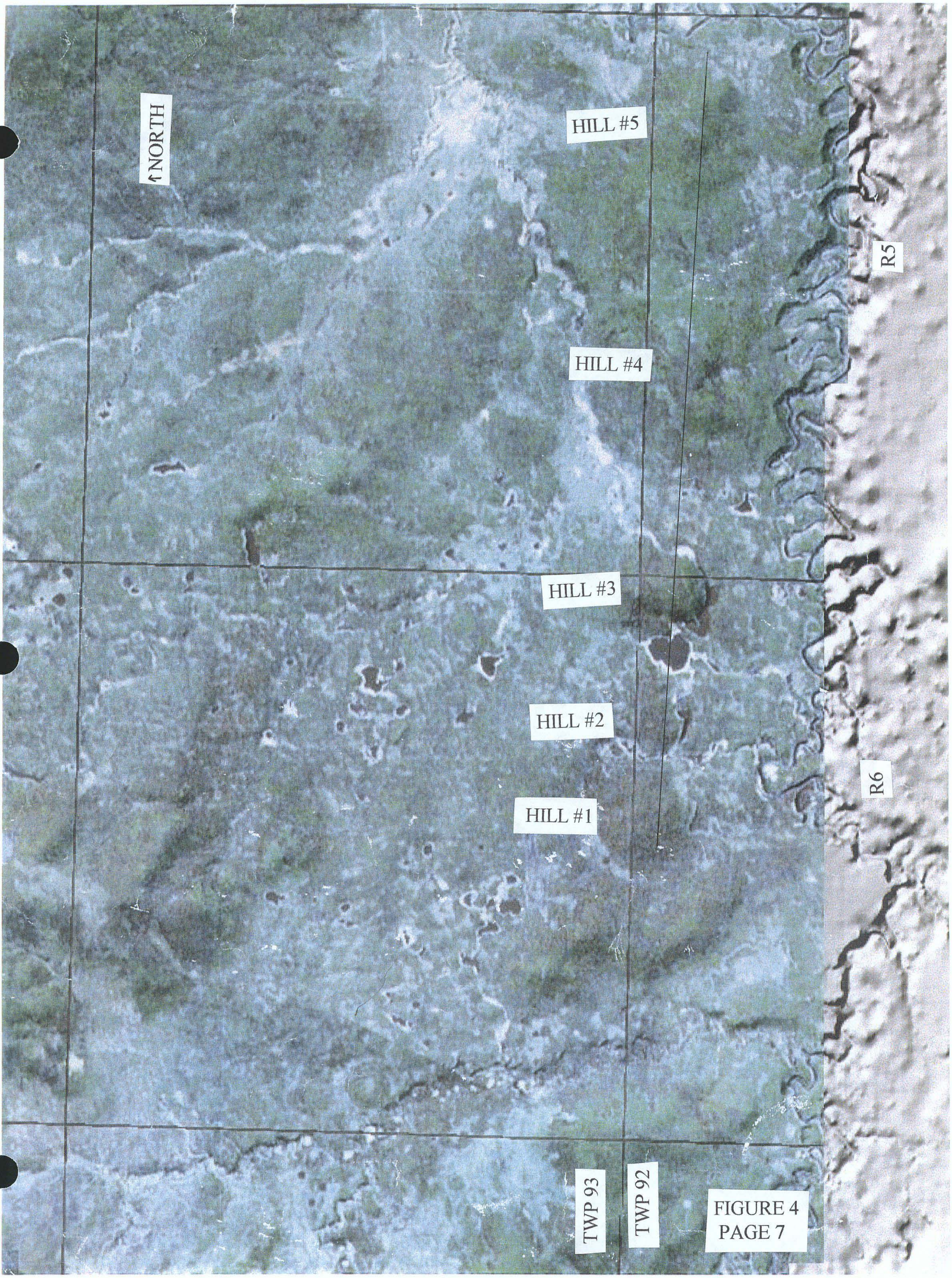


FIGURE 4
PAGE 7

LIST OF THIN SECTIONS PREPARED BY CALGARY PETROGRAPHICS LTD. AND SUBMITTED TO THE E.U.B. CORE RESEARCH FACILITY IN CALGARY

WELL LOCATION	DEPTH
2-15-91-5 W6	300'
2-15-91-5 W6	310'
2-15-91-5 W6	320'
2-15-91-5 W6	350'
2-15-91-5 W6	370'
2-15-91-5 W6	380'
2-15-91-5 W6	390'
2-15-91-5 W6	410'
2-15-91-5 W6	430'
2-15-91-5 W6	520'
2-15-91-5 W6	560'
8-23-90-5 W6	530'
8-23-90-5 W6	560'
8-23-90-5 W6	600'
8-23-90-5 W6	710'
8-23-90-5 W6	830'
8-23-90-5 W6	870'
12-29-89-4 W6	520'
12-29-89-4 W6	530'
10-29-93-6 W6	230'
7-29-93-4 W6	320'
7-29-93-4 W6	380'
7-29-93-4 W6	410'
7-29-93-4 W6	440'
7-29-93-4 W6	470'
7-29-93-4 W6	500'
7-29-93-4 W6	530'
2-21-89-5 W6	280'
3-35-89-5 W6	740'

FIGURE 5

Activation Laboratories Ltd.

Sample description	AU PPB	AG PPM	AS PPM	BA PPM	BR PPM	CA %	CO PPM	CR PPM	CS PPM	FE %	HF PPM	HG PPM	IR PPB	MO PPM	NA %	NI PPM	RB PPM	SB PPM	SC PPM	SE PPM	SN %	SR %	TA PPM	TH PPM
#1	<2	<5	42	630	<0.5	4	24	49	2	17.1	1	<1	<5	2	0.12	<30	38	1.4	7.1	<3	<0.01	<0.05	<0.5	6.1
#2	<2	<5	39	480	0.9	3	29	54	<1	19.5	2	<1	<5	3	0.09	<38	50	1.3	6.4	<3	<0.01	<0.05	<0.5	6.5
#3	<2	<5	35	930	3.5	<1	13	110	8	4.70	4	<1	<5	4	0.28	<68	95	1.1	15	<3	<0.01	<0.05	<0.5	11
#4	7	<5	98	580	<0.5	10	17	34	2	15.9	2	<1	<5	4	0.16	<51	<15	1.1	6.7	<3	<0.01	<0.05	<0.5	4.8
#5	5	<5	74	670	<0.5	5	13	29	2	16.0	2	<1	<5	5	0.15	<47	35	1.6	7.8	<3	<0.01	<0.05	<0.5	3.9
#6	56	<5	38	860	<0.5	8	22	60	3	9.18	4	<1	<5	3	0.41	<41	52	1.8	9.5	<3	<0.01	<0.05	<0.5	5.7
#7	5	<5	34	700	<0.5	5	10	26	2	18.1	2	<1	<5	4	0.16	<43	34	0.7	9.4	<3	<0.01	<0.05	<0.5	4.6
#8	<2	<5	69	4300	<0.5	4	11	30	<1	19.3	3	<1	<5	4	0.23	<51	<15	1.5	12	<3	<0.01	<0.05	<0.5	4.4
#9	5	<5	41	680	<0.5	4	23	30	1	22.8	2	<1	<5	<1	0.16	<55	30	1.0	12	<3	<0.01	<0.05	<0.5	4.2
#10	<2	<5	180	650	<0.5	3	51	130	<1	31.9	2	<1	<5	10	0.15	<63	<15	7.1	12	<3	<0.01	<0.05	<0.5	10
#11	4	<5	180	590	<0.5	4	45	110	<1	26.4	1	<1	<5	6	0.16	<59	34	5.6	11	<3	<0.01	<0.05	<0.5	8.5

Sample description	MO PPM	CU PPM	PB PPM	ZN PPM	AG PPM	NI PPM	MN PPM	SR PPM	CD PPM	BI PPM	V PPM	CA %	P %	MG %	TI %	AL %	K %	Y PPM	BE PPM
# 1	<2.	29.	8.	109.	<0.4	30.	814.	224.	<0.5	<5.	441.	5.15	0.649	1.11	0.08	2.02	0.50	43.	<2.
# 2	<2.	26.	21.	128.	0.9	37.	1013.	135.	<0.5	<5.	497.	4.07	0.272	1.23	0.08	1.96	0.49	25.	<2.
# 3	5.	39.	24.	121.	<0.4	39.	143.	145.	<0.5	<5.	228.	0.74	0.089	0.85	0.33	7.37	2.03	24.	<2.
# 4	2.	18.	15.	43.	0.6	21.	946.	282.	<0.5	<5.	211.	8.62	0.983	0.78	0.09	1.77	0.53	41.	<2.
# 5	3.	14.	16.	32.	1.1	17.	868.	172.	<0.5	<5.	89.	6.24	0.417	0.83	0.08	1.79	0.60	35.	<2.
# 6	3.	21.	10.	55.	<0.4	27.	1189.	169.	0.5	<5.	102.	8.57	0.135	0.68	0.18	3.70	0.96	22.	<2.
# 7	<2.	57.	8.	62.	0.8	17.	1926.	186.	<0.5	<5.	138.	4.97	0.659	0.92	0.07	1.68	0.53	42.	<2.
# 8	<2.	16.	13.	49.	0.5	21.	1942.	186.	<0.5	<5.	117.	4.44	0.374	1.07	0.08	1.87	0.56	36.	<2.
# 9	<2.	16.	15.	61.	<0.4	31.	1459.	146.	<0.5	<5.	174.	4.40	0.339	1.25	0.07	1.64	0.49	34.	<2.
# 10	4.	27.	33.	615.	1.2	80.	821.	199.	<0.5	<5.	1017.	2.82	0.539	1.11	0.08	2.66	0.41	61.	<2.
# 11	3.	22.	27.	408.	1.2	66.	898.	238.	0.6	<5.	769.	5.26	0.597	1.05	0.10	2.58	0.45	62.	<2.

Sample description	U PPM	W PPM	ZN PPM	LA PPM	CE PPM	ND PPM	SM PPM	EU PPM	TB PPM	YB PPM	LU PPM
#1	2.2	2	130	28.5	65	35	8.4	2.2	1.4	2.4	0.28
#2	1.3	1	150	17.7	38	20	4.7	1.1	0.8	1.8	0.19
#3	5.5	<1	160	40.5	70	32	5.4	1.3	<0.5	2.4	0.43
#4	4.1	<1	51	27.1	50	23	5.3	1.5	<0.5	2.1	0.25
#5	1.8	1	69	22.2	40	20	4.6	1.3	<0.5	2.4	0.36
#6	2.4	<1	<50	21.5	33	17	3.1	0.8	<0.5	1.9	0.32
#7	3.2	<1	120	24.6	51	27	6.2	1.6	1.1	2.6	0.42
#8	2.0	<1	91	19.6	39	20	4.6	1.2	0.6	2.5	0.42
#9	1.9	<1	110	18.0	36	18	4.3	1.1	<0.5	2.5	0.43
#10	4.5	2	720	24.7	46	33	8.9	2.5	1.7	3.8	0.59
#11	5.6	<1	420	27.4	48	32	8.6	2.5	1.8	3.8	0.52

# 1 - 10-29-93-6 W6	Depth 200 ft.
#2 - 10-29-93-6 W6	Depth 230 ft.
#3 - 10-29-93-6 W6	Depth 290 ft.
#4 - 7-29-93-4 W6	Depth 320, 350, 380 ft. (consolidated)
#5 - 7-29-93-4 W6	Depth 410, 440 ft. (consolidated)
#6 - 7-29-93-4 W6	Depth 500, 530 ft. (consolidated)
#7 - 9-23-93-7 W6	Depth 360 ft.
#8 - 9-23-93-7 W6	Depth 390 ft.
#9 - 9-23-93-7 W6	Depth 420 ft.
#10- 8-23-90-5 W6	Depth 470, 480, 490, 500 ft. (consolidated)
#11- 8-23-90-5 W6	Depth 520, 530, 540 ft. (consolidated)

FIGURE 6
PAGE 9

PHASE 2:

After determining it was possible that an extension of the Badheart oolitic iron-ore formation might exist into the northern permits, a field/sampling trip was planned. The primary objective was to investigate the topographic anomaly in 36-92-6 W6, attempt to determine the drift thickness on the hill, and to collect till samples on a regional basis and process them for diamond indicator minerals. The area of the northern permits had not yet been sampled for diamond indicators, therefore Calgary Petrographics Ltd. invited the Alberta Geological Survey to take part in the sampling, which took place in May, 1998.

The topographic anomaly in 36-92-6 W6 (Hill #3) is cut by 2 seismic lines, one east-west, at the northern edge, and fairly recent, and one north-south, to the east of the the middle of the hill, older and far more overgrown. The area was thought to be helicopter access only during the summer, which turned out to be a fair assessment. A portable handheld auger was used to attempt to determine drift thickness on top of the hill. Approximately 3.5 - 4 feet was the maximum depth that could be reached with the auger, and bedrock was not reached during any attempts. Difficult access and time constraints allowed only a short inspection of Hill #3, but it was discovered that the southern flank was quite steep, and had 2 distinct levels. It appeared that around the entire hill, at a level approx. 50 feet above "ground level" there existed a deposit of sand and gravel, thought to be of glaciofluvial origin, perhaps indicating that the core of the hill was preglacial in origin, had resisted erosion, and had allowed glaciofluvial sands and gravels to be deposited on its flanks. A 5 gallon pail of till was collected on the S.W. side of the hill, but it was acknowledged at the time that the quality of the sample was very poor since it was taken only slightly below surface.

The remainder of the field trip consisted of gathering 3 more 5 gallon pails of till, these being much better samples of basal till collected where the Notikewin River had cut down to where it was accessible. Also, 2 stream samples were taken, one from the Notikewin River and one from Lovett Creek. For these 2 samples screening of the coarsest cobbles and pebbles was done on-site. The locations of the various samples taken are listed below and shown in Fig 1, p2.

SAMPLE #	LOCATION	SEDIMENT	LONGITUDE	LATITUDE
NAT98-229	HILL #3, S.W.	TILL (POOR)	118.818056	57.026389
NAT98-230	NOTIKEWIN R.	TILL	118.797222	57.005278
NAT98-231	NOTIKEWIN R.	TILL	118.879722	56.990556
NAT98-232	NOTIKEWIN R.	TILL	118.494722	56.948611
NAT98-283	NOTIKEWIN R.	PAN CONC.	118.578611	57.014167
NAT98-284	LOVETT CR.	PAN CONC.	118.318889	56.973333

The six samples (4 till, 2 stream) were sent to The Saskatchewan Research Council (SRC) for processing and grain picking. Only one sample, NAT98-230, would yield any potential diamond indicator minerals, a pyrope garnet, a chrome diopside, and a magnesian ilmenite. Approximately 15 oxides were picked from each till sample by the SRC as possible ilmenites or chromites and this represented only about 20% of total available opaques. It should be noted that 2 other possible chrome diopsides or clinopyroxenes were picked from sample NAT98-230 by the author at a later date. The results of microprobe analysis for the 3 grains picked by the S.R.C. from sample NAT98-230 are shown in Figure 7, page 12. The results from the 2 grains picked by the author are shown in Figure 12, page 20, grains 8 and 9.

The pyrope garnet (G9) and chrome diopsides recovered do not plot within diamond inclusion fields (Alberta Geological Survey . Bulletin No. 63). The ilmenite had an Nb2O5 content that would be considered above normal for crustal grains. These grains were however, an important discovery and above background level for a sample of this size of Alberta till. Also significant is the fact that 3 separate types of grains were found, thus negating the possibility of multiple grains being fragments of a larger one. The fact that the only sample in which diamond indicators were found was the one closest to, and directly south (presumably down-ice) from Hill #3 gave more reason to suspect that the hill could also be an intrusive and not necessarily a resistant sedimentary rock.

Considerable time was taken in examining the remnant sample, with particular attention paid to what appeared to be local bedrock. Common lithologies included dense ironstone and iron-rich sandstones (Badheart or equivalent) and grey shales. Chemical analyses were done on two small samples, one of an iron-rich sandstone thought to be Badheart or equivalent (sample 229 Fe RUST) and another of a grey shale, thought to be from the Puskwaskau formation, overlying the Badheart (sample SHALE). Results of the analyses are shown in Figure 8, page 13. Results show that the sandstone has elevated levels of barium, magnesium and iron compared to the shale, and somewhat elevated levels of chromium and nickel compared to the shale.
Many small fragments of what apeared to be local bedrock, specifically the iron-rich sandstone, wre crushed and examined. The intent was to try to identify any possible diamond indicator minerals within the bedrock itself. No obvious diamond indicator minerals were found.

With the recovery of possible diamond indicators from sample NAT98-230, south of Hill #3, it was concluded that aeromagnetic data might be useful. Calgary Petrographics Ltd. had access to aeromagnetic data in the immeditae area, and it was presented to Gedco Geophysical for re-evaluation. It was concluded that no strong magnetic anomalies coincided with the targeted series of hills, although Hill #3 did show a possible weak anomaly (Figure 9, page 14). The survey used was flown at 600m spacing, and it was advised that much closer spacing would have to be used to obtain reliable data. It was decided that the money would be better spent on field work, with the emphasis being on obtaining basal till samples and possibly bedrock samples from on top of Hill #3.

Ilmenite oxide percent

	SiO2,	TiO2,	ZrO2,	Nb2O5,	Al2O3,	Cr2O3,	FeO,	MgO,	MnO,	NiO,	ZnO,	Total,	Label	
1,	0.0657,	50.21,	0.0000,	0.2372,	0.5224,	1.5591,	33.79,	12.69,	0.2370,	0.0822,	0.0578,	99.45,	Label	NAT98-230 pos ilm

Ilmenite weight percent

	Si,	Ti,	Zr,	Nb,	Al,	Cr,	Fe,	Mg,	Mn,	Ni,	Zn,	O,	Total,	Label	
1,	0.0307,	30.10,	0.0000,	0.1658,	0.2765,	1.0667,	26.26,	7.65,	0.1836,	0.0646,	0.0464,	33.60,	99.45,	Label	NAT98-230 pos ilm

Silicate oxide percent

	SiO2,	TiO2,	Al2O3,	Cr2O3,	FeO,	MgO,	MnO,	CaO,	Na2O,	K2O,	Total,	Label	
1,	53.91,	0.1496,	0.9381,	0.6841,	2.9575,	17.22,	0.0577,	23.52,	0.2372,	0.0000,	99.68,	Label	NAT98-230 pos Cr dio
2,	42.33,	0.1087,	21.00,	2.8721,	8.58,	19.26,	0.3843,	5.34,	0.0322,	0.0834,	99.98,	Label	NAT98 230 pyrope

Silicate weight percent

	Si,	Ti,	Al,	Cr,	Fe,	Mg,	Mn,	Ca,	Na,	K,	O,	Total,	Label	
1,	25.20,	0.0897,	0.4965,	0.4680,	2.2989,	10.39,	0.0447,	16.81,	0.1760,	0.0000,	43.71,	99.68,	Label	NAT98-230 pos Cr dio
2,	19.78,	0.0651,	11.11,	1.9651,	6.67,	11.61,	0.2976,	3.82,	0.0239,	0.0692,	44.56,	99.98,	Label	NAT98 230 pyrope

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Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

TO: CALGARY PETROGRAPHIC
1532 Varsity Estates Drive N.W.,
Calgary, Alberta
T3B 4C5

FILE: 41330

DATE: August 8,1999

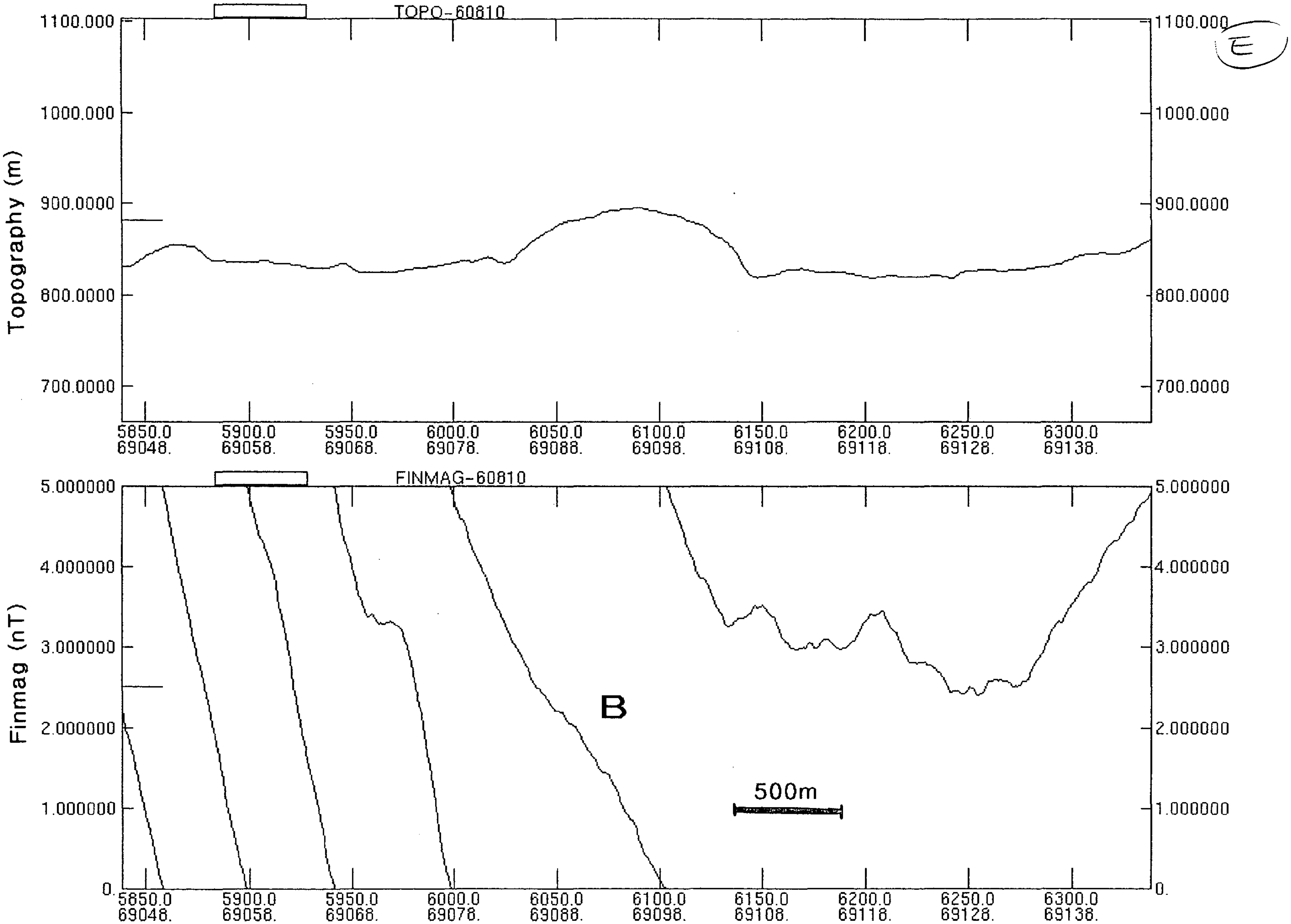
30 ELEMENT ICP ANALYSIS

Sample No.	Ag	Al %	As ppm	Au ppm	B ppm	Ba ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sb ppm	Sr ppm	Th ppm	Ti %	U ppm	V ppm	W ppm	Zn ppm
229 Fe RUST	0.9	1.84	18	<5	26	821	1	0.29	3	119	176	49	7.28	0.38	26	0.28	6900	12	0.03	138	0.362	59	4	25	39	0.02	<1	111	3	199
SHALE	0.5	2.31	17	<5	40	161	<1	0.90	2	36	85	113	2.71	0.52	22	0.41	232	17	0.05	54	0.059	39	3	44	27	0.01	<1	85	1	133

0.500 Gram sample is digested with Aqua Regia at 95 C for one hour and bulked to 10 ml with distilled water.
Partial dissolution for Al, B, Ba, Ca, Cr, Fe, K, La, Mg, Mn, Na, P, Sr, Ti, and W

Certified by: [redacted]

FIGURE 9
PAGE 14



Samples of local ironstones and sulphides from stream samples on the Notikewin River and Lovett Creek (samples NAT98-283 ("N") and sample NAT98-284 ("L") respectively) were sent for ICP and INAA analysis. The results are shown in Figure 10 , page 16.

Sample description	MO PPM	CU PPM	PB PPM	ZN PPM	AG PPM	NI PPM	MN PPM	SR PPM	CD PPM	BI PPM	V PPM	CA %	P %	MG %	TI %	AL %	K %	Y PPM	BE PPM
N	18.	27.	26.	249.	0.4	118.	2677.	173.	<0.5	<5.	137.	3.61	0.395	0.83	0.13	2.44	0.73	52.	<2.
L	42.	63.	40.	152.	1.9	246.	2258.	42.	<0.5	<5.	32.	0.47	0.063	0.25	0.07	0.77	0.19	17.	<2.

Sample description	AU PPB	AG PPM	AS PPM	BA PPM	BR PPM	CA %	CO PPM	CR PPM	CS PPM	FE %	HF PPM	HG PPM	IR PPB	MO PPM	NA %	NI PPM	RB PPM	SB PPM	SC PPM	SE PPM	SN %	SR %	TA PPM	TH PPM
N	<2	<5	130	8600	3.8	3	39	75	2	20.7	5	<1	<5	21	0.17	110	46	3.1	12	<3	<0.01	<0.05	<0.5	6.4
L	51	<5	290	12000	86	<1	58	49	<1	40.2	<1	3	<5	46	0.05	280	<15	8.2	5.1	13	<0.01	<0.05	<0.5	4.1

Sample description	U PPM	W PPM	ZN PPM	LA PPM	CE PPM	ND PPM	SM PPM	EU PPM	TB PPM	YB PPM	LU PPM	Mass g
N	4.2	<1	230	29	57	28	6.7	1.8	0.9	3.1	0.52	6.910
L	1.5	<1	160	12	25	9	2.1	0.4	<0.5	1.3	0.21	7.827

PHASE 3:

The fact that Hill #3 was a distinct topographic anomaly and that possible diamond indicator grains were found to the south of it made it the prime focus of exploration. In the earlier field trip, hand augers had penetrated about 4 feet of overburden on the top of the hill but were not capable of penetrating further. The next field trip was planned with the following objectives a) to determine the thickness of overburden in different locations on top of the hill b) to auger down to bedrock and obtain samples of till directly above the bedrock, and c) to try to break off and recover small pieces of the bedrock.

After investigating many types of portable power augers it was decided that only one could meet our demands. A seismic hole drilling company with a patented hand portable power auger capable of drilling up to 30 feet in overburden with a 2 3/4 inch auger stem, Rosie Drilling Ltd. of Edmonton, Alberta, was chosen. This auger unit could be hand transported over difficult terrain, even directly through the forest. The field trip took place in August, 1999.

Figure 2, page 4 shows the approximate location of various auger holes on top of Hill #3. Initial holes were drilled along the most recent seismic trail, at an area where a small clearing existed. At this point bedrock was encountered at approx. 8 feet. The auger was unable to penetrate the bedrock, even with the force of three men pushing down, and this was the case for every hole, the only exeption being a hole slightly to the right of the clearing, which went through approx. 20 feet of overburden and did not encounter bedrock. One hole was drilled on the older north-south seismic trail and 2 holes drilled at the southern flank of the hill. All of these hills also encountered unpenetrable bedrock at depths of 7 to 10 feet. Two holes were drilled directly south of the clearing on the east-west seismic line. These holes encountered bedrock at approx. 20 feet. The elevation was also slightly higher at the location of these 2 holes, suggesting that the bedrock was at the same elevation as elsewhere and the overburden was thicker.

Basal till samples were collected from all of the holes. Particular attention was paid to collecting as much sample as possible after the auger had encountered bedrock, in case small chips had been broken off. In some cases, water was poured into the holes at this final stage so that the till would stick to the auger stem and bit. The basal till samples from each hole were small, therefore it would have been uneconomical to process them individually, and the samples were consolidated. The red lines on Figure 2, page 4 show the location of auger holes related to which sample they were consolidated into. From the entire process, approx. 53 kg. of sample were collected.

It had been decided before the field trip that a till sample from below Hills #4 and #5 would be desirable. Of particular interest was hill #5, which had a semi-circular "swampy" area at a high elevation. A till sample was collected from approx. longitude 118.70, latitude 56.98 (marked on Figure 2, page 3). This sample was collected at a river cut, with an attempt made to recover the till closest to base level.

FIGURE 11
PAGE 18

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FILE # : 4 1 4 5 6   COMPANY: CALGARY PETROGRAPHIC   DATE : Sep 24, 1999

SAMPLE ID.	ORIGINAL WEIGHT	SCREEN ANALYSIS			TABLE CONC.	MIDDLINGS 2.9 - 3.3 SG		HEAVIES >3.3 SG							
								MAG.	+28	P.M.			W.P.M.		N.M.
	(Kg)	+35 mesh (kg)	35 x 80 mesh (kg)	-80 mesh (kg)	+80 mesh (g)	MAG. (g)	NON - MAG. (g)	(g)	Mesh (g)	0.5 (g)	0.6 (g)	0.7 (g)	1.2 (g)	2.0 (g)	2.0 (g)
# 1	32.0	0.9	1.5	29.6	434	0.13	5.37	0.34	1.78	0.83	0.78	0.70	0.47	0.07	0.63
# 2	21.4	0.7	0.2	20.5	296	0.09	2.13	0.28	1.31	0.21	0.10	0.16	0.19	<0.01	0.39
# 3	23.4	1.2	0.4	21.8	498	0.23	5.84	0.24	3.37	0.88	0.41	0.17	0.41	0.23	1.42

NOTE : P.M. = PARAMAGNETIC   W.P.M. = WEAKLY PARAMAGNETIC   N.M. = NON-MAGNETIC

[redacted]
ASSAYER

Till samples from auger holes on Hill #3, (Samples # 1 and #2), were sent to Loring Laboratories Ltd. in Calgary for processing, along with 23 kg of till collected at the river cut south of Hill #5 (sample #3). The rest of sample #3 was cleaned by the author and sent to the Saskatchewan Research Council for processing and grain picking. The weights of the samples and their constituents is seen in Figure 11, page 18

Grain picking of Samples # 1 and #2 was done by the author. The initial search for pyrope garnets and chrome diopsides in the non magnetic fractions yielded only a few possible chrome diopsides, 2 of them coming from the extremely small 2.0 fraction of Sample #2. These results were not particularly encouraging since one might expect to find multiple indicators if Hill #3 was indeed a kimberlite. While examining the paramagnetic fractions, .7, .6, and .5, it was noticed that there were a number of well formed brownish crystals of similar habit and size. Further examination revealed that some of the crystals were essentially euhedral and doubly terminated, some having unaltered and unweathered faces, some even showing extremely delicate and unweathered twins. Photomicrographs of some of the grains are shown in Figures16, 17, pages 27, 29. These images are for illustrative purposes and have not been properly scaled, although the average length of the grains is approx .4 mm.

Initial EDX analysis of some of these crystals by J.P. McGovern and Associates of Calgary found them to be orthopyroxenes, possibly bronzite. An image of one crystal with good form and very delicate twinning is shown in Figure 18, page 31. The unaltered form and delicate twins suggest that this grain could not have been subject to much abrasion or movement. Picking through the entire paramagnetic fractions of samples #1 and #2 yielded 250 to 300 orthopyroxenes. Additional selection of possible clinopyroxenes and opaques was done, and two batches of grains were eventually sent to The University of Saskatchewan for scanning and microprobe analysis. The Saskatchewan Research Council found no potential diamond indicators in the portion of sample #3 sent to them.

Hundreds of grains were scanned at the University of Saskatchewan to determine whether or not they might be diamond indicators. No peridotitic or eclogitic garnets were found. Numerous clinopyroxenes were indentified but only those with a significant chrome content were probed. Oxides were scanned and 14 chromites were microprobed. Several of the best orthopyroxene crystals were also microprobed. It should be noted at this point that the author decided that the discovery of numerous unweathered orthopyroxene grains in the samples suggested that they were of local origin, and that the bedrock on Hill #3 would have to be sampled. It was decided that it would be useful to microprobe some grains, but that the money would be better spent in aquiring bedrock samples.

Results of the first set of samples sent for microprobe analysis are presented in Figure 12, page 20. The #1 or #2 refer to sample #1 or #2. The next number, if it is a 2.0 or 1.2, refers to the magnetic fraction from which the grains came, and 2.9-3.3 refers to grains found in the 2.9-3.3 SG sample portion. Two of the grains, 8 and 9 were picked by the author from till sample NAT98-230, the sample aquired and processed earlier by the Saskatchewan Research Council. The probable identity of the grains, as determined by the author, is marked beside each analysis.

FIGURE 12
PAGE 20

Oxide	Percent				Bladek silicates								
Pt#,	SiO2,	TiO2,	Al2O3,	Cr2O3,	FeO,	MgO,	MnO,	CaO,	Na2O,	K2O,	Total,	Label	
1,	51.12,	0.3229,	1.8391,	1.1421,	3.44,	16.07,	0.0052,	23.65,	0.2638,	0.0172,	97.87,	Label	#1-2.0 lot 2 grain 1 CR. DIOPSIDE
2,	52.56,	0.1306,	1.3768,	0.3315,	3.49,	16.92,	0.0000,	23.55,	0.1669,	0.0000,	98.53,	Label	#1-2.9&3.3 grain 1 DIOPSIDE
3,	53.17,	0.1994,	1.4857,	0.6972,	3.51,	16.98,	0.0313,	23.79,	0.2757,	0.0000,	100.14,	Label	#2-2.0 lot 2 grain 1 DIOPSIDE
4,	51.27,	0.2550,	4.48,	0.1054,	8.29,	14.86,	0.1301,	20.25,	0.7055,	0.0274,	100.37,	Label	grain 3 CPX
5,	53.52,	0.2747,	1.3361,	0.5339,	3.71,	17.11,	0.0000,	23.83,	0.2119,	0.0521,	100.57,	Label	#2-2.9-3.3 grain 1 DIOPSIDE (CR?)
6,	52.67,	0.2977,	1.4533,	0.7701,	3.53,	16.28,	0.0052,	24.55,	0.2285,	0.1015,	99.88,	Label	grain 2 CR DIOPSIDE
7,	52.45,	0.0915,	1.7070,	0.3254,	3.05,	16.28,	0.0000,	24.71,	0.1265,	0.0000,	98.74,	Label	grain 4 DIOPSIDE
8,	53.28,	0.0766,	1.3102,	0.5834,	3.44,	17.13,	0.0000,	24.03,	0.1145,	0.0000,	99.95,	Label	NAT 230 grain 3 CR? DIOPSIDE
9,	51.77,	0.3924,	7.52,	0.8237,	2.8622,	15.05,	0.0000,	20.05,	1.7172,	0.0000,	100.19,	Label	grain 6 CPX
10,	53.21,	0.2355,	1.1084,	0.5218,	4.13,	16.10,	0.0157,	24.39,	0.3040,	0.0000,	100.02,	Label	#1-2.0 lot 2 grain 1 SAME AS GRAIN #1
11,	37.97,	0.1394,	25.07,	0.0000,	12.07,	0.0552,	0.0000,	23.59,	0.0103,	0.0712,	98.98,	Label	grain 3 GROSSULAR
12,	57.36,	0.0040,	0.7063,	0.5472,	6.39,	33.74,	0.0105,	1.3583,	0.0000,	0.0000,	100.11,	Label	#1-1.2 grain 1 OPX
13,	54.34,	0.3567,	1.8212,	0.2063,	12.52,	28.64,	0.0364,	2.2151,	0.0350,	0.0000,	100.17,	Label	grain 2 OPX
14,	52.17,	0.2253,	1.9802,	0.5251,	5.12,	15.62,	0.0000,	24.36,	0.4952,	0.0099,	100.50,	Label	grain 3 CR? DIOPSIDE
15,	50.45,	1.0616,	3.68,	0.0278,	7.37,	16.12,	0.0626,	20.89,	0.4215,	0.0000,	100.08,	Label	geain 4 DIOPSIDE?
16,	38.24,	0.0955,	24.32,	0.0274,	12.59,	0.0566,	0.0000,	23.70,	0.0026,	0.0000,	99.03,	Label	grain 5 GROSSULAR
17,	55.60,	0.1406,	2.1864,	0.2648,	9.74,	31.23,	0.0000,	1.3722,	0.0220,	0.0419,	100.61,	Label	grain 6 OPX
18,	51.37,	0.4581,	2.6688,	0.5239,	6.82,	15.93,	0.0156,	21.24,	0.3463,	0.0473,	99.43,	Label	grain 7 CR? DIOPSIDE

Weight	Percent													
Pt#,	Si,	Ti,	Al,	Cr,	Fe,	Mg,	Mn,	Ca,	Na,	K,	O,	Total,	Label	
1,	23.89,	0.1936,	0.9733,	0.7814,	2.6771,	9.69,	0.0040,	16.90,	0.1957,	0.0143,	42.54,	97.87,	Label	#1-2.0 lot 2 grain 1
2,	24.57,	0.0783,	0.7287,	0.2268,	2.7127,	10.21,	0.0000,	16.83,	0.1238,	0.0000,	43.05,	98.53,	Label	#1-2.9&3.3 grain 1
3,	24.85,	0.1196,	0.7863,	0.4770,	2.7277,	10.24,	0.0243,	17.01,	0.2045,	0.0000,	43.70,	100.14,	Label	#2-2.0 lot 2 grain 1
4,	23.97,	0.1529,	2.3714,	0.0721,	6.45,	8.96,	0.1008,	14.47,	0.5234,	0.0228,	43.29,	100.37,	Label	grain 3
5,	25.02,	0.1647,	0.7071,	0.3653,	2.8845,	10.32,	0.0000,	17.03,	0.1572,	0.0433,	43.89,	100.57,	Label	#2-2.9-3.3 grain 1
6,	24.62,	0.1785,	0.7692,	0.5269,	2.7428,	9.82,	0.0040,	17.55,	0.1695,	0.0843,	43.42,	99.88,	Label	grain 2
7,	24.52,	0.0549,	0.9034,	0.2227,	2.3675,	9.82,	0.0000,	17.66,	0.0938,	0.0000,	43.10,	98.74,	Label	grain 4
8,	24.91,	0.0459,	0.6934,	0.3992,	2.6715,	10.33,	0.0000,	17.17,	0.0850,	0.0000,	43.65,	99.95,	Label	NAT 230 grain 3
9,	24.20,	0.2352,	3.98,	0.5636,	2.2248,	9.08,	0.0000,	14.33,	1.2739,	0.0000,	44.31,	100.19,	Label	grain 6
10,	24.87,	0.1412,	0.5866,	0.3570,	3.21,	9.71,	0.0121,	17.43,	0.2256,	0.0000,	43.47,	100.02,	Label	#1-2.0 lot 2 grain 1
11,	17.75,	0.0835,	13.27,	0.0000,	9.38,	0.0333,	0.0000,	16.86,	0.0076,	0.0591,	41.53,	98.98,	Label	grain 3
12,	26.81,	0.0024,	0.3738,	0.3744,	4.96,	20.35,	0.0082,	0.9708,	0.0000,	0.0000,	46.26,	100.11,	Label	#1-1.2 grain 1
13,	25.40,	0.2138,	0.9639,	0.1412,	9.73,	17.27,	0.0282,	1.5832,	0.0260,	0.0000,	44.81,	100.17,	Label	grain 2
14,	24.39,	0.1351,	1.0480,	0.3593,	3.98,	9.42,	0.0000,	17.41,	0.3674,	0.0082,	43.39,	100.50,	Label	grain 3
15,	23.58,	0.6365,	1.9497,	0.0191,	5.73,	9.72,	0.0485,	14.93,	0.3127,	0.0000,	43.15,	100.08,	Label	geain 4
16,	17.87,	0.0573,	12.87,	0.0187,	9.79,	0.0341,	0.0000,	16.94,	0.0020,	0.0000,	41.45,	99.03,	Label	grain 5
17,	25.99,	0.0843,	1.1572,	0.1811,	7.57,	18.84,	0.0000,	0.9807,	0.0163,	0.0348,	45.75,	100.61,	Label	grain 6
18,	24.01,	0.2746,	1.4125,	0.3584,	5.30,	9.61,	0.0121,	15.18,	0.2569,	0.0393,	42.97,	99.43,	Label	grain 7

The second set of grains sent for scanning and microprobe analysis are shown in Figure13 and 14, pages 22 and 23. At this point, the author decided that samples #1 and #2 did not need to treated separately. Grain 1 was an unknown, grains 2 to 4 were possible clinopyroxenes, grains 6 to 9 were grains that showed good crystal form and/or unweathered crystal faces, grains 10 to 23 were diopsides that had been scanned and showed possible CrO2 content of >.5%, and grains 24 to 38 were assorted orthopyroxenes, mainly ones with the best crystal form. The probable identification of the first 9 grains, as determined by the author, is marked beside each analysis.

Microprobe analyses of oxides picked by the author are shown in Figure 15, page 25. Again, these grains are from either sample #1 or#2. Grains 1 to 14 are chromites, some of which showed moderate to good octahedral form. Grain 15 is a chromite picked from a plug which contained mostly euhedral ferrian ilmenites, which are represented by grains 16 and 17.

After the initial grain picking, attention was paid to the magnetic fraction of the sample. Here, numerous well-formed black submetallic crystals were found. The crystal form suggested ilmenites. Approximately 20 of the grains were sent to The University of Saskatchewan for analysis. Most were confirmed to be ilmenites and two of these grains were microprobed, samples 16, 17 in Figure 15, page 25. It was also evident that many, if not most of the orthopyroxenes contained inclusions of a similar submetallic black mineral, with some of these inclusions being quite sizable (Figure17, page 29). EDX analysis of these inclusions found them to be similar in composition to the black crystals, which appear to fall in the category of ferrian ilmenites.

Several orthopyroxenes of similar size and color to those found in Samples #1 and #2 were also found in Sample #3, the till sample taken from a river cut south of Hill #5. Some of the grains showed very good crystal form.

The discovery of so many fresh orthopyroxene crystals prompted the author to check if these same grains had been present in any of the till samples taken the previous year. Sample NAT98-230 seemed the most likely to contain the grains since it was taken south of Hill #3 and was the only till sample to have contained possible diamond indicators. This sample had been processed at The Saskatchewan Research Council. For the most part, the orthopyroxenes discovered in Samples #1 and #2 were smaller than the mesh size cutoff used by the SRC. The unused fines had been returned to the author and subsequently sent to Loring Laboratories for heavy media separation (August 1999, approx. one month before Samples #1 and #2 were processed.)

The >3.3 SG fraction of the NAT98-230 fines was re-examined after the discovery of orthopyroxenes in Samples #1 and #2. Several grains similar in size and appearance to the orthopyroxenes found in Samples #1 and #2 were picked and sent to The University of Saskatchewan for identification. Of 30+ grains sent, 28 were confirmed to be orthopyroxenes and 3 clinopyroxenes. An important detail is that the orthopyroxenes picked from NAT98-230 appeared more altered and/or weathered. None of the grains showed sharp or unaltered crystal

FIGURE 13
PAGE 22

Bladek silicates 05/01/2000

Oxide Pt#,	Percent SiO2,	TiO2,	Al2O3,	Cr2O3,	FeO,	MgO,	MnO,	CaO,	Na2O,	K2O,	Total,	Label	
1,	41.21,	0.0020,	22.20,	0.1355,	20.85,	14.62,	0.3453,	1.2066,	0.1038,	0.0000,	100.68,	Label	unknown #40 GARNET,
2,	52.56,	0.2212,	1.7701,	0.1789,	6.88,	13.04,	0.1130,	24.53,	0.5375,	0.0000,	99.83,	Label	CPX #1 DIOPSIDE?
3,	55.57,	0.2074,	0.8915,	0.1311,	14.84,	27.28,	0.3221,	1.2567,	0.0000,	0.0000,	100.50,	Label	CPX #10 OPX
4,	53.62,	0.3032,	1.6957,	0.0000,	6.07,	14.52,	0.2484,	23.62,	0.8733,	0.0414,	100.99,	Label	CPX #17 DIOPSIDE?
5,	55.19,	0.2827,	1.3476,	0.1646,	13.14,	26.79,	0.2404,	2.1461,	0.0279,	0.0000,	99.32,	Label	Crystal faces #1 OPX
6,	53.19,	0.0064,	0.7701,	0.0000,	30.00,	13.55,	0.3861,	0.4737,	0.0000,	0.0000,	98.38,	Label	crystal faces #4 OPX
7,	53.11,	0.2630,	2.4047,	0.3187,	4.71,	15.79,	0.1001,	23.84,	0.1526,	0.0528,	100.74,	Label	crystal faces #7 CPX
8,	57.34,	0.1020,	1.3367,	0.4688,	7.98,	31.68,	0.1886,	1.3499,	0.0120,	0.0000,	100.46,	Label	crystal faces #14 OPX
9,	54.03,	0.0727,	0.3488,	0.0000,	21.77,	22.75,	0.7560,	1.1090,	0.0763,	0.0000,	100.91,	Label	crystal faces #18 OPX
10,	54.48,	0.0798,	1.1364,	0.9501,	2.6968,	17.38,	0.0584,	22.92,	0.1835,	0.1099,	100.00,	Label	Cr diopside #1
11,	53.44,	0.4843,	1.7914,	0.3977,	4.67,	15.75,	0.0932,	23.62,	0.2236,	0.0075,	100.48,	Label	Cr diopside #1
12,	54.17,	0.2146,	1.6305,	0.5505,	4.32,	17.18,	0.0956,	22.40,	0.2049,	0.0000,	100.77,	Label	Cr diopside #1
13,	52.94,	0.2380,	1.5901,	0.4726,	3.95,	15.89,	0.0951,	24.15,	0.2218,	0.0000,	99.54,	Label	Cr diopside #1
14,	55.15,	0.2034,	0.5350,	0.3636,	6.19,	13.91,	0.0976,	21.49,	1.5979,	0.0831,	99.62,	Label	Cr diopside #1
15,	54.20,	0.1222,	1.2733,	0.6050,	3.38,	16.28,	0.0887,	24.30,	0.2025,	0.0000,	100.46,	Label	Cr diopside #1
16,	53.28,	0.1892,	1.4744,	0.7236,	5.07,	15.68,	0.1094,	22.46,	0.3014,	0.0000,	99.29,	Label	Cr diopside #1
17,	53.89,	0.2076,	1.0888,	0.3072,	4.11,	16.32,	0.0861,	24.12,	0.2362,	0.0000,	100.35,	Label	Cr diopside #1
18,	52.14,	0.3286,	3.99,	0.7051,	4.36,	15.56,	0.0978,	23.10,	0.3317,	0.0000,	100.62,	Label	Cr diopside #1
19,	53.46,	0.3025,	1.8750,	0.9842,	3.22,	16.09,	0.0397,	24.33,	0.2419,	0.0000,	100.55,	Label	Cr diopside #1
20,	53.74,	0.5051,	1.8461,	0.6957,	4.63,	16.27,	0.1514,	22.54,	0.2537,	0.1059,	100.74,	Label	Cr diopside #1
21,	53.63,	0.2868,	1.1480,	0.6361,	3.28,	16.41,	0.0904,	24.00,	0.2026,	0.0000,	99.68,	Label	Cr diopside #1
22,	54.03,	0.2533,	1.2017,	0.5756,	3.54,	16.26,	0.1260,	23.92,	0.1891,	0.0000,	100.10,	Label	Cr diopside #1
23,	54.10,	0.2580,	1.4298,	0.9928,	3.39,	16.62,	0.0700,	23.40,	0.2862,	0.0303,	100.57,	Label	Cr diopside #1
24,	53.38,	0.2438,	0.5940,	0.0000,	23.35,	21.12,	0.8783,	1.3776,	0.0377,	0.0000,	100.98,	Label	OPX
25,	54.65,	0.4220,	0.8056,	0.0826,	16.70,	24.98,	0.4060,	2.0908,	0.0297,	0.0000,	100.16,	Label	OPX
26,	54.68,	0.3514,	0.7312,	0.0083,	18.42,	24.21,	0.5589,	1.6947,	0.0401,	0.0000,	100.70,	Label	OPX
27,	54.56,	0.2767,	0.5996,	0.0000,	19.96,	23.41,	0.7600,	1.4565,	0.0000,	0.0000,	101.03,	Label	OPX
28,	55.47,	0.4577,	1.0399,	0.1622,	14.86,	26.70,	0.3800,	2.2868,	0.0264,	0.0000,	101.39,	Label	OPX
29,	54.58,	0.0682,	0.5633,	0.0299,	20.58,	23.93,	0.8040,	0.4281,	0.0778,	0.0000,	101.06,	Label	OPX
30,	54.96,	0.1701,	1.8073,	0.4548,	12.24,	28.70,	0.2036,	1.2756,	0.0552,	0.0236,	99.89,	Label	OPX
31,	54.99,	0.2914,	1.0282,	0.0582,	16.74,	25.83,	0.3678,	1.4915,	0.0100,	0.0000,	100.80,	Label	OPX
32,	54.71,	0.4015,	0.9148,	0.0194,	17.50,	24.77,	0.4658,	1.7732,	0.0577,	0.0234,	100.64,	Label	OPX
33,	53.37,	0.1226,	0.8961,	0.0000,	24.74,	20.91,	1.1322,	0.4964,	0.0162,	0.0000,	101.69,	Label	OPX
34,	53.14,	0.3614,	0.6413,	0.0000,	21.71,	22.32,	0.5331,	1.7218,	0.0514,	0.0000,	100.49,	Label	OPX
35,	53.75,	0.2953,	0.6787,	0.0000,	21.52,	22.08,	0.5470,	1.5274,	0.0735,	0.0000,	100.47,	Label	OPX
36,	56.85,	0.1234,	1.5096,	0.4152,	9.06,	30.72,	0.1698,	1.1466,	0.0071,	0.0000,	100.00,	Label	OPX
37,	52.86,	0.0798,	0.7954,	0.0000,	24.51,	19.85,	0.9646,	0.7921,	0.0201,	0.0385,	99.90,	Label	OPX
38,	53.59,	0.0530,	0.4515,	0.0027,	22.34,	22.17,	0.7443,	0.8095,	0.0490,	0.0000,	100.22,	Label	OPX

Weight Percent — Bladek silicates 05/01/2000

Pt#,	Si,	Ti,	Al,	Cr,	Fe,	Mg,	Mn,	Ca,	Na,	K,	O,	Total,	Label	
1,	19.27,	0.0012,	11.75,	0.0927,	16.21,	8.82,	0.2674,	0.8624,	0.0770,	0.0000,	43.34,	100.68,	Label	unknown #40
2,	24.94,	0.0639,	1.0186,	0.1884,	5.44,	7.87,	0.1615,	17.69,	0.5148,	0.0000,	43.48,	101.37,	Label	CPX #1
3,	25.98,	0.1244,	0.4719,	0.0897,	11.53,	16.45,	0.2495,	0.8982,	0.0000,	0.0000,	44.70,	100.50,	Label	CPX #10
4,	25.06,	0.1818,	0.8975,	0.0000,	4.72,	8.76,	0.1924,	16.88,	0.6478,	0.0344,	43.62,	100.99,	Label	CPX #17
5,	25.80,	0.1695,	0.7132,	0.1126,	10.21,	16.15,	0.1861,	1.5338,	0.0207,	0.0000,	44.42,	99.32,	Label	Crystal faces #1
6,	24.87,	0.0038,	0.4076,	0.0000,	23.32,	8.17,	0.2990,	0.3386,	0.0000,	0.0000,	40.98,	98.38,	Label	crystal faces #4
7,	24.57,	0.1326,	0.9368,	0.1224,	5.35,	7.87,	0.0875,	17.53,	0.3987,	0.0000,	42.84,	99.83,	Label	crystal faces #7
8,	26.80,	0.0611,	0.7074,	0.3208,	6.20,	19.10,	0.1461,	0.9648,	0.0089,	0.0000,	46.14,	100.46,	Label	crystal faces #14
9,	25.26,	0.0436,	0.1846,	0.0000,	16.92,	13.72,	0.5855,	0.7926,	0.0566,	0.0000,	43.35,	100.91,	Label	crystal faces #18
10,	25.47,	0.0479,	0.6014,	0.6500,	2.0962,	10.48,	0.0452,	16.38,	0.1361,	0.0912,	44.00,	100.00,	Label	Cr diopside #1
11,	24.98,	0.2904,	0.9481,	0.2721,	3.63,	9.50,	0.0722,	16.88,	0.1659,	0.0063,	43.73,	100.48,	Label	Cr diopside #1
12,	25.32,	0.1287,	0.8630,	0.3767,	3.36,	10.36,	0.0740,	16.01,	0.1520,	0.0000,	44.12,	100.77,	Label	Cr diopside #1
13,	24.74,	0.1427,	0.8416,	0.3233,	3.07,	9.58,	0.0737,	17.26,	0.1645,	0.0000,	43.34,	99.54,	Label	Cr diopside #1
14,	25.78,	0.1219,	0.2831,	0.2488,	4.81,	8.39,	0.0756,	15.36,	1.1854,	0.0690,	43.30,	99.62,	Label	Cr diopside #1
15,	25.34,	0.0732,	0.6739,	0.4140,	2.6242,	9.82,	0.0687,	17.37,	0.1502,	0.0000,	43.93,	100.46,	Label	Cr diopside #1
16,	24.90,	0.1134,	0.7803,	0.4951,	3.94,	9.45,	0.0847,	16.05,	0.2236,	0.0000,	43.23,	99.29,	Label	Cr diopside #1
17,	25.19,	0.1245,	0.5763,	0.2102,	3.19,	9.84,	0.0667,	17.24,	0.1752,	0.0000,	43.74,	100.35,	Label	Cr diopside #1
18,	24.37,	0.1970,	2.1142,	0.4824,	3.39,	9.38,	0.0758,	16.51,	0.2460,	0.0000,	43.85,	100.62,	Label	Cr diopside #1
19,	24.99,	0.1813,	0.9924,	0.6734,	2.5061,	9.70,	0.0307,	17.39,	0.1794,	0.0000,	43.90,	100.55,	Label	Cr diopside #1
20,	25.12,	0.3028,	0.9770,	0.4760,	3.60,	9.81,	0.1172,	16.11,	0.1882,	0.0879,	43.95,	100.74,	Label	Cr diopside #1
21,	25.07,	0.1719,	0.6076,	0.4352,	2.5480,	9.90,	0.0700,	17.15,	0.1503,	0.0000,	43.58,	99.68,	Label	Cr diopside #1
22,	25.26,	0.1519,	0.6360,	0.3938,	2.7511,	9.81,	0.0976,	17.09,	0.1403,	0.0000,	43.77,	100.10,	Label	Cr diopside #1
23,	25.29,	0.1547,	0.7567,	0.6792,	2.6319,	10.02,	0.0542,	16.72,	0.2123,	0.0251,	44.02,	100.57,	Label	Cr diopside #1
24,	24.95,	0.1462,	0.3144,	0.0000,	18.15,	12.74,	0.6802,	0.9846,	0.0279,	0.0000,	42.99,	100.98,	Label	OPX
25,	25.55,	0.2530,	0.4264,	0.0565,	12.98,	15.06,	0.3144,	1.4943,	0.0221,	0.0000,	44.01,	100.16,	Label	OPX
26,	25.56,	0.2107,	0.3870,	0.0057,	14.32,	14.60,	0.4329,	1.2112,	0.0297,	0.0000,	43.94,	100.70,	Label	OPX
27,	25.50,	0.1659,	0.3173,	0.0000,	15.52,	14.12,	0.5886,	1.0410,	0.0000,	0.0000,	43.78,	101.03,	Label	OPX
28,	25.93,	0.2744,	0.5504,	0.1110,	11.55,	16.10,	0.2943,	1.6344,	0.0196,	0.0000,	44.92,	101.39,	Label	OPX
29,	25.51,	0.0409,	0.2981,	0.0204,	16.00,	14.43,	0.6227,	0.3060,	0.0577,	0.0000,	43.77,	101.06,	Label	OPX
30,	25.69,	0.1020,	0.9565,	0.3112,	9.51,	17.31,	0.1577,	0.9117,	0.0409,	0.0196,	44.88,	99.89,	Label	OPX
31,	25.71,	0.1747,	0.5442,	0.0399,	13.01,	15.58,	0.2848,	1.0660,	0.0075,	0.0000,	44.40,	100.80,	Label	OPX
32,	25.57,	0.2407,	0.4841,	0.0132,	13.60,	14.94,	0.3608,	1.2673,	0.0428,	0.0194,	44.09,	100.64,	Label	OPX
33,	24.95,	0.0735,	0.4743,	0.0000,	19.23,	12.61,	0.8769,	0.3548,	0.0120,	0.0000,	43.11,	101.69,	Label	OPX
34,	24.84,	0.2167,	0.3394,	0.0000,	16.88,	13.46,	0.4129,	1.2306,	0.0381,	0.0000,	43.07,	100.49,	Label	OPX
35,	25.13,	0.1771,	0.3592,	0.0000,	16.73,	13.31,	0.4237,	1.0916,	0.0546,	0.0000,	43.20,	100.47,	Label	OPX
36,	26.57,	0.0740,	0.7990,	0.2841,	7.04,	18.53,	0.1315,	0.8195,	0.0053,	0.0000,	45.74,	100.00,	Label	OPX
37,	24.71,	0.0479,	0.4210,	0.0000,	19.05,	11.97,	0.7470,	0.5661,	0.0149,	0.0319,	42.35,	99.90,	Label	OPX
38,	25.05,	0.0318,	0.2389,	0.0018,	17.37,	13.37,	0.5765,	0.5785,	0.0363,	0.0000,	42.96,	100.22,	Label	OPX

faces similar to those found in Samples #1 and #2. The difference in appearance of these grains could be consistent with the theory that Hill #3 was the source of fresh unaltered grains which were transported and deposited south of the that location, in the process being somewhat altered and weathered. The presence of altered orthopyroxenes in sample NAT98-230 also would seem to negate the possibility that there had been any sample contamination of Samples #1, #2, or #3, on-site or during processing. Furthermore, the presence of euhedral orthopyroxenes in Sample #3, which was taken several miles east of Hill #3, raises the possibility that that Hills #4 and/or #5 might be a source for those grains.

Oxide	Percent		Bladek 05/01/2000											
Pt#,	SiO2,	TiO2,	ZrO2,	Nb2O5,	Al2O3,	Cr2O3,	FeO,	MgO,	MnO,	NiO,	ZnO,	Total,	Label	
1,	0.0230,	0.1785,	0.0000,	0.0180,	9.67,	57.05,	18.01,	15.08,	0.2341,	0.0788,	0.0445,	100.39,	Label	Opaques - small grai
2,	0.0000,	0.3058,	0.0000,	0.0421,	13.02,	49.57,	27.17,	10.18,	0.3754,	0.1216,	0.0973,	100.87,	Label	Opaques - small grai
3,	0.0000,	0.1619,	0.0252,	0.1551,	8.60,	55.95,	21.15,	12.16,	0.3235,	0.0732,	0.0472,	98.65,	Label	Opaques - small grai
4,	0.0000,	0.1916,	0.0127,	0.0482,	13.16,	43.54,	33.53,	7.83,	0.3610,	0.0451,	0.1739,	98.89,	Label	Opaques - small grai
5,	0.0173,	0.0634,	0.0250,	0.0296,	7.94,	58.64,	23.04,	8.80,	0.4719,	0.0621,	0.2345,	99.32,	Label	Opaques - small grai
6,	0.0000,	0.0231,	0.0135,	0.1465,	32.55,	33.65,	16.35,	16.32,	0.2793,	0.1382,	0.2139,	99.69,	Label	Opaques - large grai
7,	0.0000,	0.0079,	0.0000,	0.0126,	32.11,	33.22,	16.15,	16.42,	0.1668,	0.1907,	0.2267,	98.51,	Label	Opaques - large grai
8,	0.0694,	0.2376,	0.0000,	0.4014,	9.13,	57.17,	18.05,	14.46,	0.2960,	0.1610,	0.0460,	100.03,	Label	Opaques - large grai
9,	0.0000,	0.0487,	0.0000,	0.0258,	35.53,	27.72,	17.95,	17.10,	0.1625,	0.2799,	0.1794,	99.00,	Label	Opaques - large grai
10,	0.0000,	0.1488,	0.0000,	0.0000,	13.09,	47.48,	27.27,	9.96,	0.3697,	0.1014,	0.1447,	98.57,	Label	Opaques - large grai
11,	0.0000,	0.1180,	0.0000,	0.0362,	13.28,	47.99,	27.78,	9.61,	0.3594,	0.0657,	0.1116,	99.34,	Label	Opaques - large grai
12,	0.0000,	0.1176,	0.0376,	0.0000,	7.41,	56.22,	27.17,	8.49,	0.4492,	0.0278,	0.1066,	100.02,	Label	Opaques - large grai
13,	0.0047,	0.2512,	0.1648,	0.0000,	10.07,	55.96,	20.78,	12.38,	0.3507,	0.0788,	0.0531,	100.09,	Label	Opaques - large grai
14,	0.0366,	0.0300,	0.0412,	0.0000,	38.94,	26.88,	15.57,	17.89,	0.2039,	0.1991,	0.3344,	100.12,	Label	Opaques - large grai
15,	0.0000,	0.0000,	0.0000,	0.0000,	19.75,	46.50,	18.54,	13.98,	0.2832,	0.1190,	0.2054,	99.39,	Label	chromite from plug
16.	0.0485,	28.27,	0.0000,	0.0000,	0.4286,	0.0389,	64.93,	1.2078,	0.1711,	0.0352,	0.0099,	95.15,	Label	large ilmenite
17.	0.0000	26.79	0.0000,	0.0353	0.4233,	0.0000,	65.88,	0.8964,	0.2318,	0.0000,	0.0494,	94.30	Label	large ilmenite

Weight	Percent													
Pt#	Si	Ti	Zr	Nb	Al	Cr,	Fe,	Mg	Mn	Ni	Zn	O	Total	
1.	0.0108	0.1070,	0.0000	0.0126	5.12,	39.04,	14.00,	9.09	0.1813	0.0619	0.0358	32.73,	100.39,	Label	Opaques - small grai
2.	0.0000,	0.1833,	0.0000,	0.0294,	6.89,	33.91,	21.12,	6.14,	0.2907,	0.0956,	0.0781,	32.14,	100.87,	Label	Opaques - small grai
3.	0.0000,	0.0971,	0.0187,	0.1084,	4.55,	38.28,	16.44,	7.33,	0.2505,	0.0575,	0.0379,	31.47,	98.65,	Label	Opaques - small grai
4.	0.0000,	0.1149,	0.0094,	0.0337,	6.97,	29.79,	26.06,	4.72,	0.2795,	0.0354,	0.1397,	30.74,	98.89,	Label	Opaques - small grai
5.	0.0081,	0.0380,	0.0185,	0.0207,	4.20,	40.12,	17.91,	5.31,	0.3655,	0.0488,	0.1884,	31.09,	99.32,	Label	Opaques - small grai
6,	0.0000,	0.0139,	0.0100,	0.1024,	17.23,	23.03,	12.71,	9.84,	0.2163,	0.1086,	0.1718,	36.26,	99.69,	Label	Opaques - large grai
7,	0.0000,	0.0048,	0.0000,	0.0088,	16.99,	22.73,	12.55,	9.90,	0.1292,	0.1499,	0.1821,	35.85,	98.51,	Label	Opaques - large grai
8,	0.0325,	0.1424,	0.0000,	0.2806,	4.83,	39.12,	14.03,	8.72,	0.2292,	0.1265,	0.0369,	32.48,	100.03,	Label	Opaques - large grai
9,	0.0000,	0.0292,	0.0000,	0.0180,	18.80,	18.96,	13.95,	10.32,	0.1258,	0.2199,	0.1441,	36.42,	99.00,	Label	Opaques - large grai
10,	0.0000,	0.0892,	0.0000,	0.0000,	6.93,	32.48,	21.20,	6.01,	0.2863,	0.0797,	0.1163,	31.38,	98.57,	Label	Opaques - large grai
11,	0.0000,	0.0708,	0.0000,	0.0253,	7.03,	32.83,	21.59,	5.80,	0.2783,	0.0516,	0.0897,	31.58,	99.34,	Label	Opaques - large grai
12,	0.0000,	0.0705,	0.0278,	0.0000,	3.92,	38.46,	21.12,	5.12,	0.3479,	0.0219,	0.0856,	30.84,	100.02,	Label	Opaques - large grai
13	0.0022,	0.1506,	0.1220,	0.0000,	5.33,	38.29,	16.15,	7.47,	0.2716,	0.0619,	0.0426,	32.21,	100.09,	Label	Opaques - large grai
14	0.0171,	0.0180,	0.0305,	0.0000,	20.61,	18.39,	12.10,	10.79,	0.1579,	0.1565,	0.2687,	37.58,	100.12,	Label	Opaques - large grai
15	0.0000,	0.0000,	0.0000,	0.0000,	10.45,	31.82,	14.41,	8.43,	0.2194,	0.0936,	0.1650,	33.79,	99.39,	Label	chromite from plug
16.	0.0227,	16.95,	0.0000,	0.0000,	0.2268,	0.0266,	50.47,	0.7284,	0.1325,	0.0277,	0.0079,	26.55,	95.15,	Label	large ilmenite
17	0.0000.	16.06,	0.0000	0.0247	0.2241	0.0000	51.21	0.5406	0.1796	0.0000	0.0397	26.03	94.30	Label	large ilmenite

FIGURE 15
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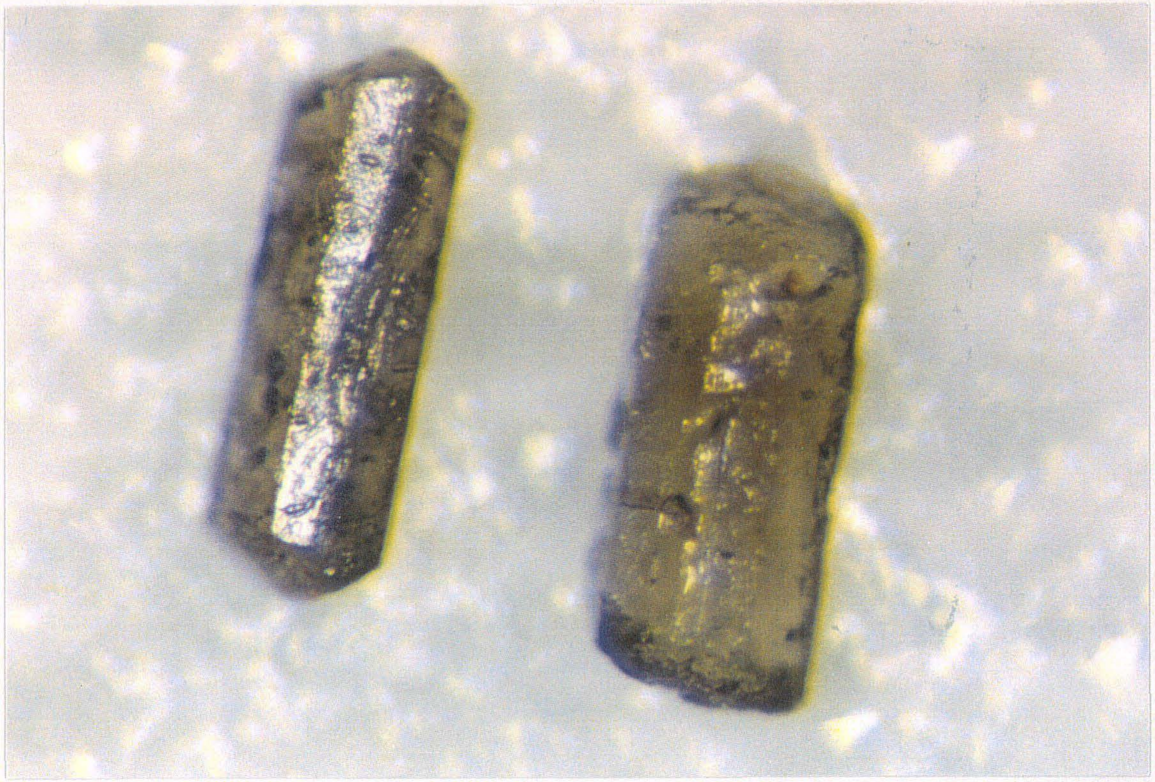

FIGURE 16
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FIGURE 17
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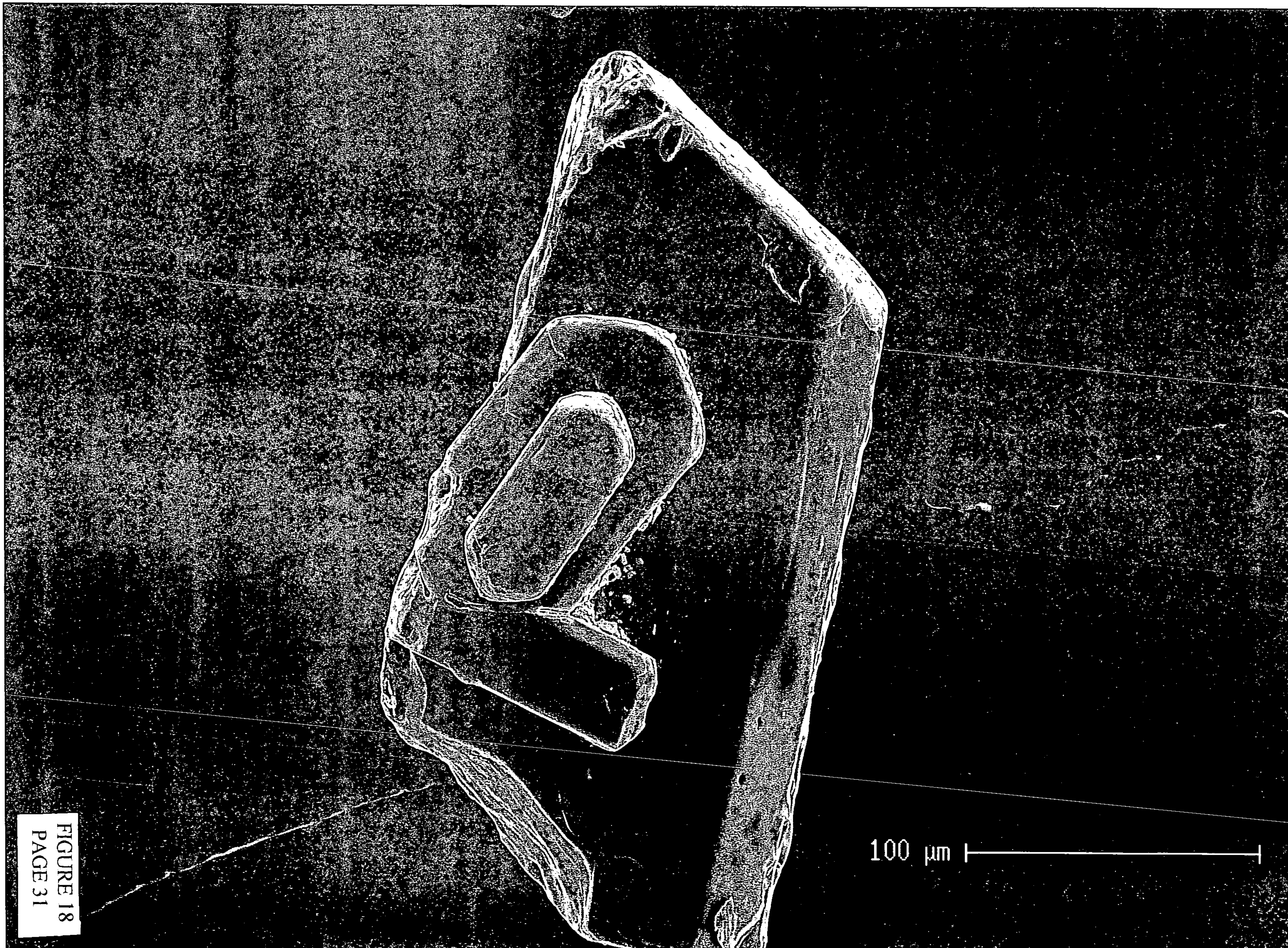

FIGURE 18
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DISCUSSION

The discovery of abundant orthopyroxenes, many in "pristine" condition, is difficult to explain. The author decided that in depth study of loose grains would probably not solve the question of their origin, and that the money would be better spent in obtaining a proper bedrock sample, at which time, if warranted, detailed petrographic studies could be made. The matter was discussed with a number of geologists and prospectors, and some of the more relevant points can be summarized below.

In general, orthopyroxenes are not a major constituent of kimberlites, and, if part of the kimberlite magma, would not be in the form of euhedral crystals. Orthopyroxenes can be more common in lamproites but again, would tend not to be well formed crystals. In either case, the orthopyroxenes found would be predominantly enstatite, not bronzite or hypersthene. The orthopyroxenes which were microprobed showed a wide variance in composition, with most being in the bronzite to hypersthene range with relatively few enstatites. Therefore, it is the conclusion of the author that these grains do not have the chemistry or form that would be favorable for diamond exploration.

Altough some clinopyroxenes were found, including some with >.5% CrO2, they are not nearly as abundant as the orthopyroxenes and tend to be smaller in grain size and somewhat weathered. In general, they fall within the CPX2 or CPX 5 groups (Stephens, Dawson, 1977), diopsides to chrome diopsides. Several fall within or close to the diamond inclusion field for peridotitic chrome diopsides (Alberta Geological Survey. Bulletin No. 63). The chromites that were microprobed do not fall within the diamind inclusion fields set out in Fipke et al 1995. In addition to this, it should be noted that chromites tend to weather fairly well and that chromites found in till may actually have come from local sandstones. Another relevant fact is that no diamond indicator quality garnets were recovered from any of the auger holes.

The consensus among most, if not all people who offered their opinion is that the grains found did not come from either a kimberlite or lamproite but could have a moderate to deep origin. There were few theories as to what the source rock could be in this setting but most agreed that the discovery of such a large number of orthopyroxenes, many in pristine condition, suggested a source of very close proximity.

The next logical step in the exploration process will be to obtain small core or chip samples from the bedrock on Hill #3. If this shows encouraging results, a larger scale diamomd drill operation would be undertaken. Although access is difficult in the summer, the top of the hill itself is dry, and water for drilling could be pumped from lakes on the west and south sides.. Drilling equipment could be lifted in by helicopter, or a winter program could be possible, access most likely being from the east.