MAR 19940005: RAM RIVER

Received date: Dec 30, 1994

Public release date: Dec 31, 1995

19940005

Ram River Block Government Assessment Report

Ram River Block
NTS 83 B and C

Takla Star Resources Ltd. and Fairstar Exploration

BY
D. I. SRAEGA, Geologist
EDMONTON, ALBERTA

DECEMBER, 1994

Table of Contents

Ram River Block Summary

The Ram River Block is located in the Central Foothills of Alberta, 40 km west of the town of Rocky Mountain House. The block consists of 48 contiguous mineral permits with a net surface area of 422000 Hectares or 1,105,000 Acres.

A regional stream sediment heavy mineral program was initially conducted in the Ram River Block in September of 1992. Major drainages were sampled for minerals indicating the presence of diamond bearing alkaline ultrabasic rocks. In September of 1993 a sample program was carried out focusing on determining the source area of magnesiochromites found in the North Ram River in the 1992 program. The 1993 sample program determined the Kiska Creek and Nice Creek drainages were a source of anomalous chromites which prompted the undertaking of an aeromagnetic program and further detailed stream sampling. The aeromagnetic geophysical program was conducted over two areas in May of 1994. In the Spring and Summer of 1994 detailed stream sediment sampling was conducted in the vicinity of the Kiska Creek and Nice Creek drainages. Sampling was also conducted south of the North Ram River in the Cripple Creek and Pinto Creek drainages.

Work Performed	Dates
Stream heavy mineral sediment sampling	September 1 to 15, 1992
Stream heavy mineral sediment sampling	September 1 to 15, 1993
Stream heavy mineral sediment sampling	April 28 to June 3 and August 7 to 14, 1993
Airborne magnetic survey	May 4 to 6, 1994

The stream sediment heavy mineral programs delineated three anomalous source areas of chromites in the North Ram River area. The sources of chromites are the Kiska Creek area, the Nice Creek area and the Cripple Creek area. The Kiska Creek area is defined by the Kiska Creek drainage and adjacent creeks draining into the North Ram River. The Nice Creek area is defined by Nice Creek, Easy Creek and Gap Creek drainages. The Cripple Creek area is defined by Cripple Creek and an unnamed tributary to Cripple Creek which crosses an oilfield access road. (refer to map on page 25)

Chromites were the only mineral found indicating the presence of potentially diamondiferous source rocks. The chromites were euhedral, 200 microns in diameter, either equant or flat with either smooth or frosted texture. The chromites from samples taken from the Nice Creek area typically had a frosted texture as compared to chromites from other samples. The majority of chromites were found to have Mg# numbers in excess of .5 and analyzed Cr_2O_3 in excess of 35 weight percent indicating the chromites are magnesiochromites. Titanium is typically less than 1.5 weight percent indicating the chromites are magmatically unevolved.

Plots of Cr_2O_3 vs. MgO, Al_2O_3 vs. Cr_2O_3 and TiO_2 vs. Al_2O_3 indicate that the chromites derived from the Kiska Creek and Cripple Creek areas are geochemically similar (refer to appendix IV). The plots indicate that the chromites from the Nice Creek area are geochemically distinct from chromites from the Kiska Creek and Cripple Creek areas. Some samples taken from the Kiska Creek area and the Cripple Creek area contained chromites that are over 60 weight percent Cr_2O_3 and over 14 weight percent MgO which are similar geochemically to chromites included in diamond.

One sample from a tributary to Cripple Creek contained over 300 chromites while another sample taken in close proximity contained over 100 chromites. Two samples from the Kiska Creek area contained approximately 100 chromites. One sample from the Nice Creek area contained 79 chromites. (refer to table on page 28 and map on page 29)

The aeromagnetic geophysical program was conducted by helicopter with a mean magnetometer bird height of 45 meters and a line spacing of 150 meters over the Kiska and Nice Creek areas. The final product consisted of total field magnetics, total field magnetics with regional magnetic trend removed and first derivative of vertical magnetic gradient. The aeromagnetic survey delineated airborne magnetic anomalies in both survey areas in the range 50 nT or less. The aeromagnetic anomalies in the Nice Creek area are found along the valley trending northwest which contains Gap Creek, Gap Lake and Nice Creek. These anomalies are typically 250 meters or less in diameter and are localized in low lying areas. In the Kiska Creek survey area ridges are typically magnetic highs and the valleys typically magnetic lows. Aeromagnetic anomalies not correlated with ridges and valleys are found on the sides of hills or on gently sloping ground. (refer to map on page 30 and appendix VI)

The samples that yielded the highest number of chromites in the Cripple Creek area were derived from locations with Wapiabi Formation bedrock. The Formation forms the base of a small valley (GSC, Map 46-22A). The resistant Brazeau Formation outcrops along the ridge 2 km to the southwest.

In the Kiska Creek area both the Wapiabi and the Brazeau Formations outcrop (GSC, Maps 55-34, 1388 A and 1388 B). The two samples with highest numbers of chromites were associated with subcrops of Wapiabi Formation bedrock. Samples taken from small drainages with Brazeau Formation bedrock contained fewer numbers of chromites. Chromites derived from the Wapiabi and the Brazeau Formations are compositionally similar suggesting the Wapiabi Formation sediments were eroded and subsequently incorporated into the Brazeau Formation.

In the Nice Creek area the Mountain Park Member of the Gates Formation (Luscar Group) outcrops and subcrops. The member correlates with the highest number of chromites found in the area (GSC, Preliminary Map 55-34). The Brazeau and Wapiabi Formations are not found in this area. The Cardium (Bighorn) Formation was found to be the source of few chromites

The differences in the morphology and chemistry as well as bedrock sources of chromites between the Kiska Creek, Cripple Creek and Nice Creek areas suggest two different episodes of magmatism in what is now the Foothills of the Canadian Cordillera.

The episodes of magmatism each being in the upper and lower cretaceous. The lack of a discrete indicator mineral train in the areas and definitive aeromagnetic anomaly suggests the chromites are derived from local siliciclatic sedimentary rocks. The diffuse pattern of the number of indicator minerals found contrasts with the discrete indicator mineral train found in Australia at the M1 kimberlite (Towie et al., 1994). It is inconclusive at this time whether there are primary diamond bearing source rocks in the North Ram River area. Further exploration efforts should focus on the Wapiabi Formation and the Mountain Park Member of the Gates Formation and their stratigraphic equivalent units.

Introduction

This assessment report details the stream sediment heavy mineral surveys and the aeromagnetic survey carried out in the Ram River Block in the search for alkaline ultrabasic diamond bearing rock.

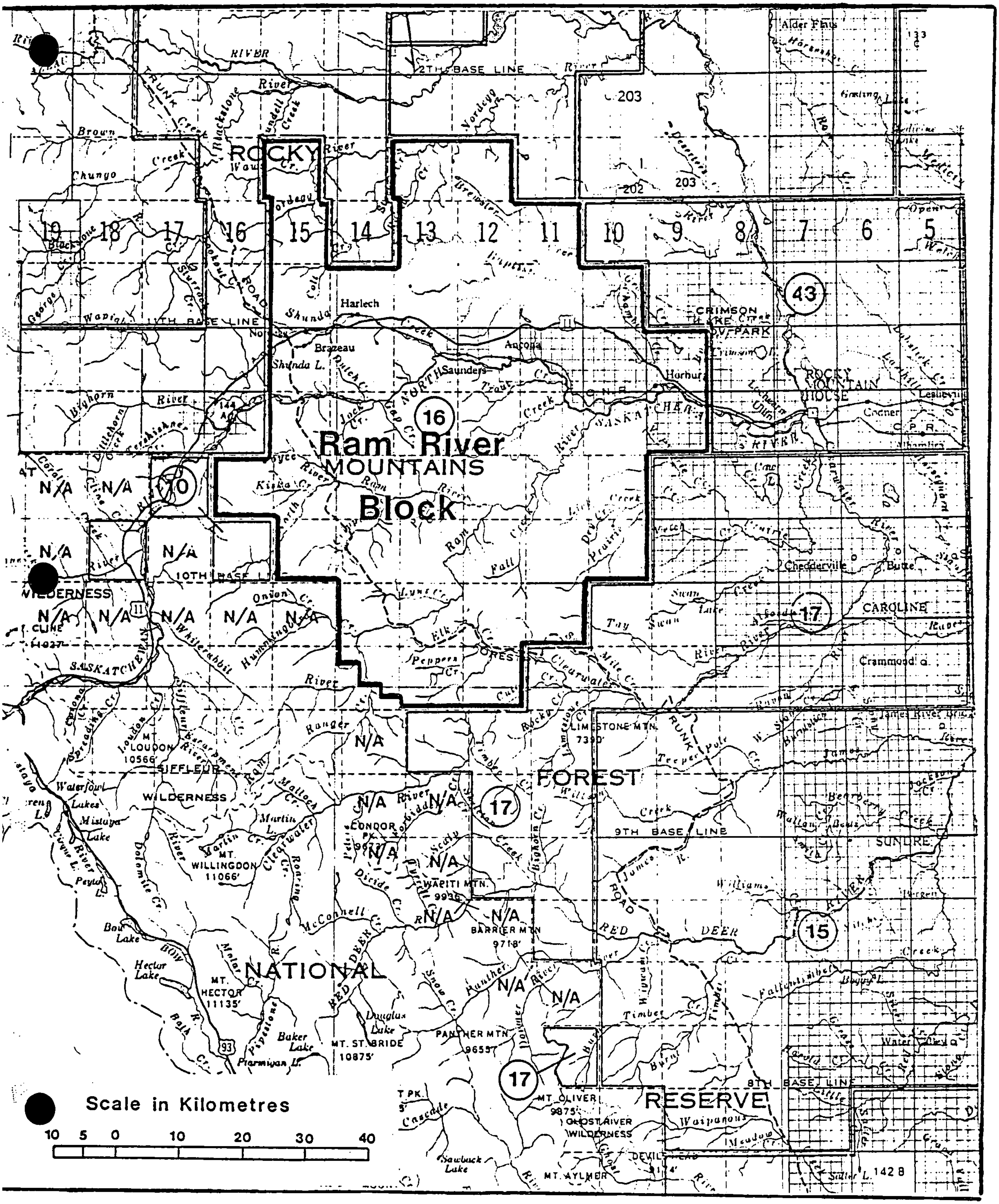
The Ram River Block lies on the SW-NE trending Thorsby Magnetic Low (Ross et al., 1990). Sheared gneiss and gabbro from the basement low have yielded ages of 2.29 and 2.38 Ga and a pegmatite dated at 1.92 Ga (Ross et al., 1990). The Jack Diatreme is known to contain diamonds (Fipke et al., 1989) and lies 35 km northwest of Golden B.C. on the Alberta-British Columbia border. The Jack Diatreme is part of a series of alkaline ultrabasic diatremes, blows and dikes which lie on the Alberta-British Columbia border 100 km west of the Ram River Block. Diamond bearing alkaline ultrabasic rocks coincident with the paleozoic Thorsby basement terrane make the Ram River Block a potential target for diamond exploration.

Location

This assessment report pertains to the Ram River Block. The block consists of 48 contiguous metallic and industrial mineral permits in the central foothills of Alberta from Township 35 to 43, Ranges 9 to 16 west of the 5th meridian. The block has a net surface area of 422000 hectares or 1,105,000 acres and is 40 km east of the town of Rocky Mountain House.

Accommodation, gas and food were obtained at Nordegg. The Nordegg Resort hotel and the Youth Hostel are the only accommodation in the area.

The Block is accessible by vehicle from highway 11 from Rocky Mountain House, the forestry trunk road and by oil and forestry roads. Old seismic cut lines, forestry roads, pack trails and oil lease roads provide good ATV Access. Helicopter seismic lines and alpine meadows provide good access by foot. The block is extensively covered by forests and is rugged limiting access to helicopters in some areas.


Ram River
MOUNTAINS
Block
ROCKY
FOREST
NATIONAL
RESERVE
19 18 17 16 15 14 13 12 11 10 9 8 7 6 5
16
17
43
70
15
N/A
Harlech
Brazeau
Saunders
Ancona
ROCKY MOUNTAIN HOUSE
CAROLINE
SUNDRE
Chedderville
CRIMSON LAKE PROV. PARK
SIFFLEUR WILDERNESS
GHOST RIVER WILDERNESS
MT. LOUDON 10566'
MT. WILLINGDON 11066'
MT. HECTOR 11135'
MT. ST. BRIDE 10875'
CONDOR PK.
WAPITI MTN. 9936'
BARRIER MTN 9718'
PANTHER MTN 9655'
MT. OLIVER 9875'
LIMESTONE MTN. 7390'
MT. AYLMER
RED DEER
9TH BASE LINE
10TH BASE LINE
11TH BASE LINE
12TH BASE LINE
8TH BASE LINE
Scale in Kilometres
10 5 0 10 20 30 40

Permit Tabulation

The permit holder of the metallic and industrial mneral permits which comprise the Ram River block are held by Takla Star Resources Ltd. This assessment report is submitted by Takla Star Resources Ltd. and authored by Douglas I. Sraega. G.I.T. The list of permits, which comprise the Ram River Block, is given below with amount of money allocated to retain the exploration permit in good standing. The retained lands are to be kept in good standing for 6 with expenditures in excess of $25 per hectare. The list of permits, which comprise the Ram River Block, is given below with amount of money spent on exploration per permit. As of December of 1994 the block is a joint venture between Takla Star Resources Ltd. (75%) and Fairstar Exploration (25%). The statement of expenditures is given in appendix VII

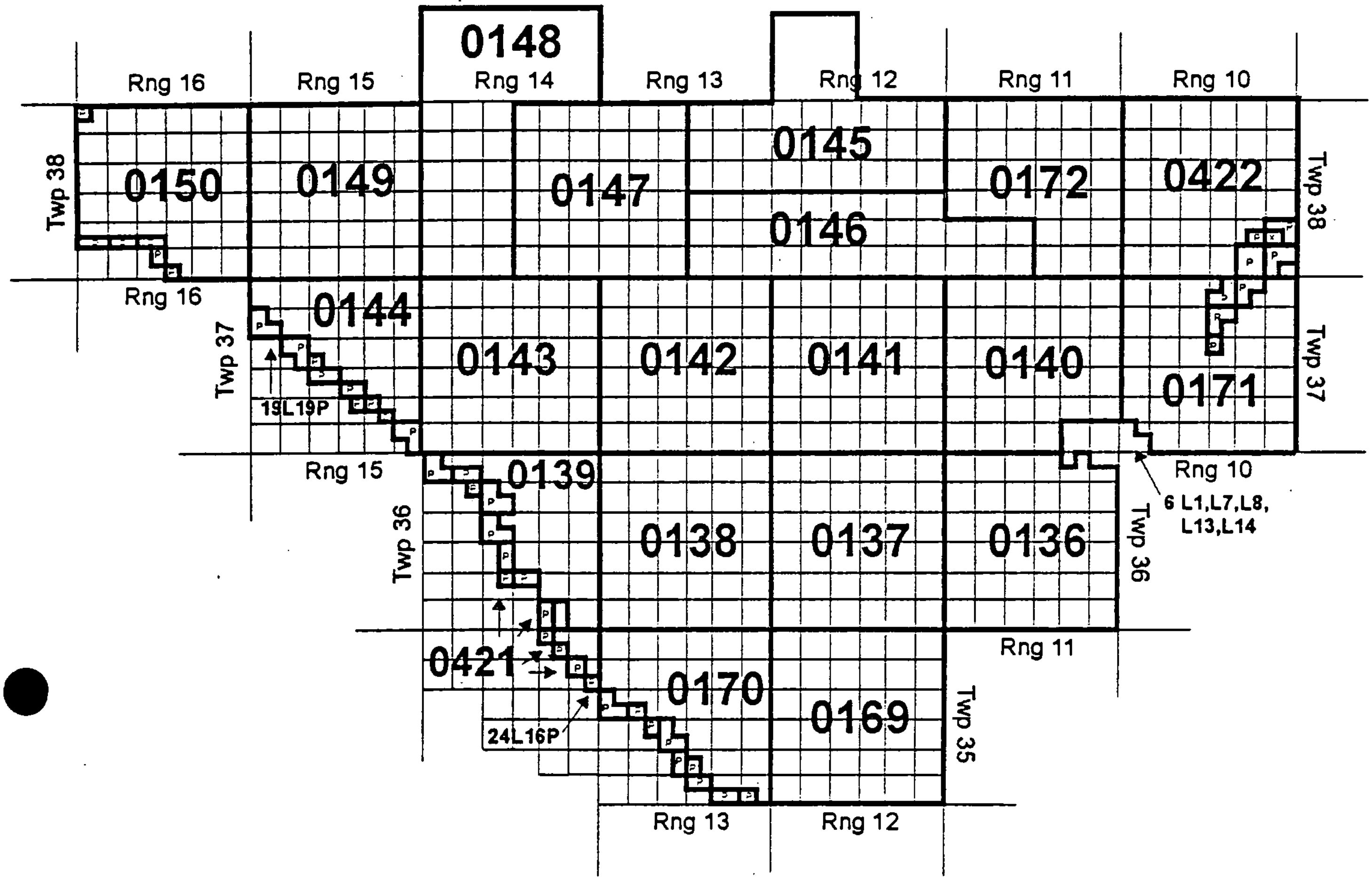
Permit Number	Amount of Money Allocated to the Permit
9393030136	$0.0
9393030137	$0.0
9393030138	$0.0
9393030139	$0.0
9393030140	$0.0
9393030141	$0.0
9393030142	$0.0
9393030143	$0.0
9393030144	$18,943.85
9393030147	$0.0
9393030148	$0.0
9393030149	$70,638.08
9393030150	$76,738.63
9393030151	$0.0
9393030152	$0.0
9393030153	$0.0
9393030154	$0.0
9393030169	$0.0
9393030170	$0.0
9393030171	$0.0
9393030172	$0.0
9393030173	$0.0
9393030174	$0.0
9393030175	$0.0
9393030176	$0.0
9393030177	$0.0
9393030178	$0.0
9393030179	$0.0
9393030180	$0.0
9393030181	$0.0

—9393030421	$0.0
—9393030422	$0.0
—9393030423	$0.0
—9393030424	$0.0
—9393030425	$0.0
—9393030426	$0.0
—9393030427	$0.0
—9393030428	$0.0
—9393030429	$0.0
—9393030430	$0.0
—9393030431	$0.0
—9393030432	$0.0
—9393030433	$0.0
—9393030434	$0.0
—9393030435	$0.0
—9393030436	$0.0

The list of metallic and industrial mineral permit numbers with the locations to be retained by Takla Star Resources.

Permit Number	Description of Lands to be Retained
9393030136	-
9393030137	-
9393030138	-
9393030139	-
9393030140	-
9393030141	-
9393030142	-
9393030143	-
9393030144	5-15-037: 30 P; 31; 32 Portions lying outside the Nordegg-Red Deer River Integrated Resource Plan
9393030145	-
9393030146	-
9393030147	-
9393030148	-
9393030149	5-15-038: 4; 5; 6; 7; 8; 9; 15; 16; 17; 18; 19
9393030150	5-16-038: 1, 2, 3 P, 10, 11, 12, 13, 14, 15, 25, 26, 27 Portions lying outside the Nordegg-Red Deer River Integrated Resource Plan
9393030151	-
9393030152	-
9393030153	-

9393030154	-
9393030169	-
9393030170	-
9393030171	-
9393030172	-
9393030173	-
9393030174	-
9393030175	-
9393030176	-
9393030177	-
9393030178	-
9393030179	-
9393030180	-
9393030181	-
9393030421	-
9393030422	-
9393030423	-
9393030424	-
9393030425	-
9393030426	-
9393030427	-
9393030428	-
9393030429	-
9393030430	-
9393030431	-
9393030432	-
9393030433	-
9393030434	-
9393030435	-
9393030436	-



Ram River Block: South

9393030169 Metallic and Industrial Minerals Permit Number for agreement type 93 issued in March of 1993

P Portions lying outside the Nordegg-Red Deer River or Rocky-North Saskatchewan integrated resource plan.

X Excluding indicated portions from metallic mineral permit

Twp 35 to 38, Rng 10 to 16-W5M

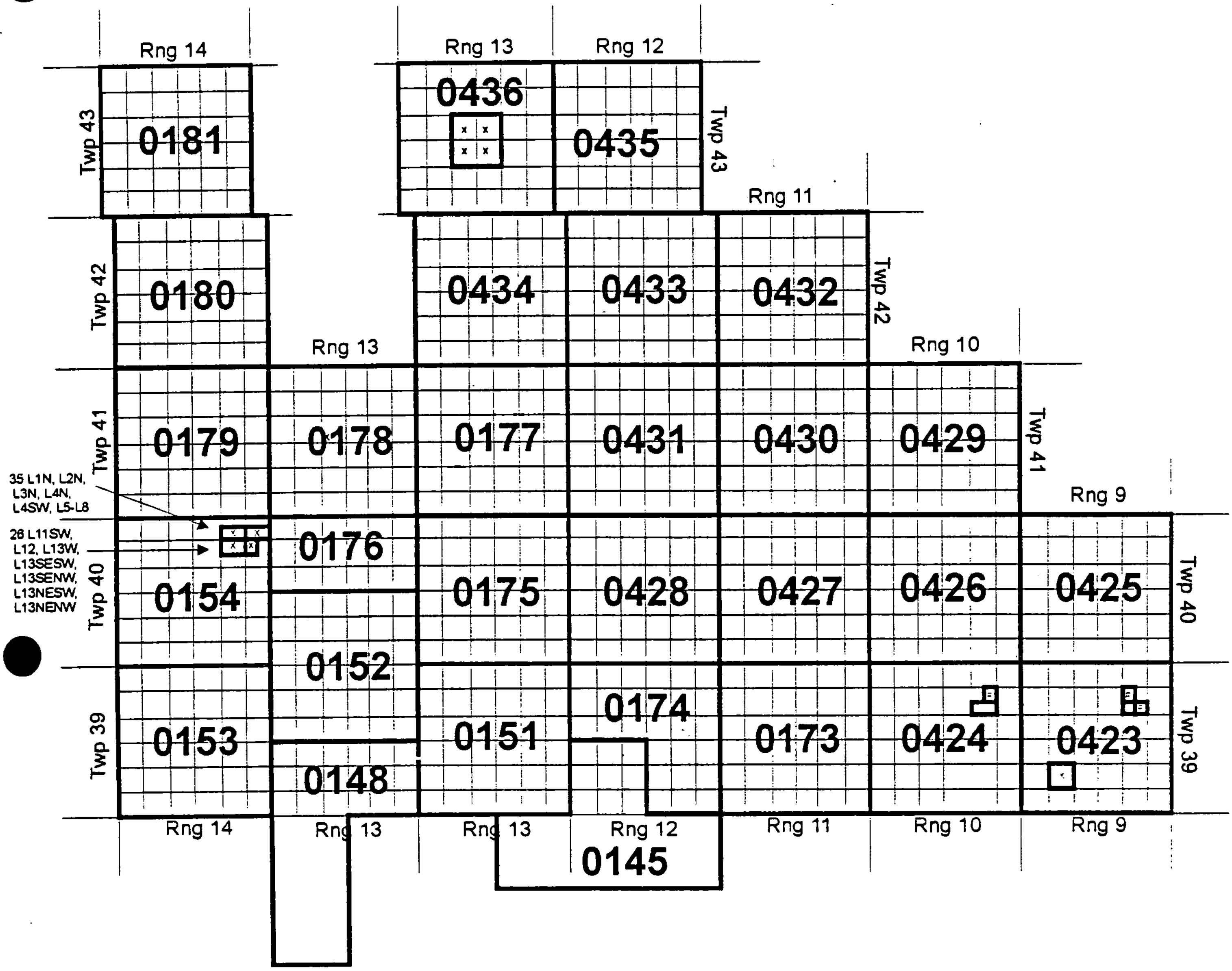
Kilometers 0 9

Miles 0 6

TKR TKR TKR

TAKLA STAR

RESOURCES LTD.



Ram River Block: North

939303**0151** Metallic and Industrial Minerals Permit Number for agreement type 93 issued in March of 1993

P Portions lying outside the Nordegg-Red Deer River or Rocky-North Saskatchewan integrated resource plan.

X Excluding indicated portions from metallic mineral permit

Twp 35 to 38, Rng 9 to 14-W5M

Kilometers 0 9
Miles 0 6

TKR TKR TKR
TAKLA STAR
RESOURCES LTD.

Work Performed

A stream sediment heavy mineral program was initially conducted in the Ram River Block in September of 1992. In September of 1993 a sample program was conducted focusing on the North Ram River. Subsequently, an aeromagnetic geophysical program was conducted over the two areas in May of 1994 and detailed stream sediment sampling was conducted in May and August of 1994.

Field Work	Dates
Stream sediment heavy mineral sampling	September 1 to 15, 1992
Stream sediment heavy mineral sampling	September 1 to 15, 1993
Stream sediment heavy mineral sampling	April 28 to June 3 and August 7 to 14, 1993
Airborne geophysical survey	May 4 to 6, 1994

Stream Sediment Heavy Mineral Programs

The R5000 series of samples consisted of 10 samples taken in the block from major drainages to test for minerals indicating the presence of diamond bearing alkaline ultrabasic rocks. The RS series of samples consisted of 21 samples taken from tributaries near their confluences with the North Ram River. The NR series of samples focused on sampling within the previously defined anomalous drainages, sampling drainages adjacent to anomalous drainages and further samples collected in the Cripple Creek and Pinto Creek areas. (refer to maps on pages XX and XX and table on pages XX to XX)

Field Sampling

Samples of the R5000 series taken in September of 1992 consisted of 10 samples each from major drainages in the Ram River Block. Each sample was sieved in the field to -1.8 mm and weighed approximately 10 Kg before shipment to the processing laboratory. The samples were sent to the Saskatchewan Research Council (SRC) for processing.

Samples of the RS series were taken in September of 1993 and consisted of 21 samples from tributaries to the North Ram River. Each sample was sieved in the field to -12 mesh and washed to remove excess silt and clay. The sample was then put into a 5 gallon plastic pail for consignment to the processing laboratory. The samples weighed +/- 40 Kg. The samples were processed at Loring Laboratories Ltd. in Calgary

Samples taken in the 1994 program are prefixed NR followed by the sample number. There are 50 samples in the NR sample series numbered from 1 to 50. Each sample consisted of 20 liters of -1 mm field sieved sediment. The sample was then hand panned in the field to approximately one fifth the original size.

Sample sites were chosen to avoid well sorted fluvial sediment which contain reduced amounts of heavy minerals and to avoid contamination. Talwegs and inside bends were sampled because natural bedrock traps do not exist. Clast or matrix supported gravel was typically sampled. (refer to maps on pages 25 and 26 and tables on pages 22, 23 and 24)

Laboratory Processing

The samples were not processed using alkali fusion, x-ray fluorescence or HF acid digestion for diamonds. Diamond would report in the heavy non-magnetic fraction or the heavy mineral fraction depending on the laboratory processing method.

The R5000 series samples were processed at the SRC were run individually through a wilfley table to produce a coarse heavy mineral concentrate. The concentrates were then dried and the ferromagnetic minerals removed with a hand magnet. The concentrate was then sieved into a fraction containing grains of 1 mm to 0.2 mm diameter. The sieved fraction was run through a magstream separator at a density setting of 3.1 g/cm^3. The heavy mineral fraction from a magstream was again processed through the magstream at a density setting of 3.4 g/cm^3 to produce the "Mids" concentrate. The greater than 3.4 g/cm^3 concentrate was then processed through a Frantz Isodynamic Magnetic Separator at 0.19 Amps to produce the "Uppers" heavy magnetic concentrate and the "Lower" paramagnetic concentrate.

The RS series samples, processed at Loring Laboratories Ltd. in Calgary, were weighed and run individually through a wilfley table to produce coarse heavy mineral concentrates. Each concentrate was dried under moderate heat then separated with heavy liquid utilizing acetylene tetrebromoethane (TBE) with a density of 2.96 g/cm^3. The heavy mineral separates were rinsed with acetone and the TBE recycled. The sample was sieved to + and - 28 mesh fractions. The -28 mesh fraction was magnetically separated using a Frantz Isodynamic Separator. Current Settings of .4 and .6 Amps were used to produce .4 paramagnetic, .6 paramagnetic and non-magnetic heavy mineral separates.

There were 50 samples taken of the NR series. Sample numbers 1 to 42 were processed at the Saskatchewan Research Council (SRC) in Saskatoon and samples 43 to 50 were processed were processed at Loring Laboratories Ltd. in Calgary.

Field samples of the NR series numbered 1 to 42, processed at SRC, were weighed and run individually through a wilfley table to produce a coarse heavy mineral concentrates. The concentrate was dried and the ferromagnetic minerals removed with a hand magnet. The concentrate was then sieved into two fractions containing sediment grains of 1 mm to 0.5 mm diameter and 0.5 mm to 0.25 mm diameter size fractions. The 1 mm to 0.5 mm fraction was run through the magstream separator at a density setting of 3.1 g/cm^3. The heavy mineral fraction from the magstream was processed through the magstream at a density setting of 3.4 g/cm^3 to produce the "Mids" concentrate. The greater than 3.4 g/cm^3 concentrate was run through a Frantz Isodynamic Magnetic

Separator at 0.19 Amps to produce the "Uppers" heavy magnetic concentrate and the "Lower" paramagnetic concentrate. The 0.5 mm to 0.25 mm diameter fraction was run through the magstream at density setting of 3.5 g/cm^3.

Field samples of the NR series numbered 43 to 50, processed at Loring Laboratories Ltd., were weighed and run through a wilfley table to produce coarse heavy mineral concentrates. The coarse concentrates were then dried under moderate heat and then the ferromagnetic minerals removed using a hand magnet. The coarse concentrates were then separated using diiodomethane (MeI_2) with a density of 3.2 g/cm^3.

Indicator Mineral Picking

Heavy mineral separates were picked for any potential lamproite, kimberlite and diamond indicator minerals. Separates were picked utilizing a stereoscopic reflected light microscope. The mineral grains were mounted on petrocraft booklets for shipment to the electron microprobe lab for mounting and probing. The concentrates were also visually scanned for chrome diopside, picroilmenite, diamond, olivine, eclogitic garnet and pyrope. All separates with magnetic susceptabilities less than Fe-ilmenite were picked for the appropriate indicator minerals. The regional heavy mineral suite includes the following minerals.

chalcopyrite	chromite	diaspore
epidote	goethite	grossular
hornblende	Fe-ilmenite	Kyanite
Mn-oxide	Magnetite	muscovite
pyrite	rutile	sillimanite
staurolite	tourmaline	zircon

Probe Analysis

R5000 series mineral grains were probed at the University of Saskatchewan in Saskatoon. Wavelength Dispersive Spectroscopy (WDS) was used to spot probe the core of each grain. Mineral grains were analyzed for CaO, FeO, ZnO, MgO, Al_2O_3, MnO, TiO_2 and Cr_2O_3. The probe electron beam was set to 2.00E-8 Amps with and accelerating voltage of 20 kV. The oxide weight analysis were corrected with the ZAF correction algorithm. The electron microprobe data is given in Appendix I.

RS series mineral grains were electron microprobed at CANMET a department of Energy, Mines and Resources in Ottawa. WDS was used to spot probe the core of each grain and the analysis repeated if the standard deviation of an analyzed oxide exceeded 40%. Mineral grains were analyzed for CaO, K_2O, Na_2O , SiO_2, FeO, NiO, ZnO, MgO, Al_2O_3, MnO, TiO_2 and Cr_2O_3. The probe electron beam accelerating voltage of 20 kV. The oxide weight analysis were corrected with the ZAF correction algorithm. All chromites picked from the concentrates were mounted and probed. The electron microprobe data is given in Appendix I.

NR series minerals were probed by Ixion Research in Montreal. WDS was used to probe the mineral grains. The core of each grain was spot probed utilizing a 5 micron electron beam. Mineral grains were analyzed for V_2O_3, FeO, NiO, ZnO, MgO, Al_2O_3, MnO, TiO_2 and Cr_2O_3. The electron microprobe utilized was a Jeol model JXA-8900L located at McGill University. The beam current was set at 40 nA with an accelerating voltage of 20 kV with 20 second counting times except for ZnO, V_2O_3 and NiO which had 25 second counting times. The lower detection limits for ZnO, V_2O_3 and NiO is 0.02 weight percent with detection limits of 0.01 to 0.02 for all other major elements. Approximately half of the total chromites picked from samples 1 to 42 were probed. Samples 43 to 50 chromites were not probed, instead the number of chromites picked was recorded. The electron microprobe data is given in Appendix I.

Data Analysis

The electron microprobe can not distinguish between ferrous and ferric iron. The estimate of FeO and Fe_2O_3 oxide weight percent is recast based on the method of Finger (1972). The recast totals are calculated as cation totals based on three cations in the idealized spinel formula. The Mg#, Ti#, Cr#, Fe^{3+}# and Fe^{2+}# numbers were calculated from the cation totals. The Zn and Ni contents in part per million (ppm) calculated based on their analyzed weight percents. These parameters were used to generate P-type classifications based on the method of Griffin et al. (1994). The calculated parameters are given in appendix II The formulas used to calculate chromite parameters are:

$$Mg\# = Mg / (Mg+Fe^{2+})$$

$$Fe^{2+}\# = Fe^{2+} / (Mg + Fe^{2+})$$

$$Cr\# = Cr / (Cr + Al + Fe^{3+})$$

$$Ti\# = Ti / (Al + Cr + Ti)$$

$$Fe^{3+}\# = Fe^{3+} / (Fe^{3+} + Al + Cr)$$

Zn ppm = (molar wt. Zn*10000)/molar wt. ZnO * Analyzed wt. % ZnO

Ni ppm = (molar wt. Ni*10000)/molar wt. NiO * Analyzed wt. % NiO

The P1 to P4 Chromite Classification System

The P1 to P4 chromite classification system (Griffin et al., 1994) is a paragenesis based system developed from on chromites from group 1 and 2 kimberlites and olivine lamproites. P1 and P4 chromites are of xenocrystal origin while P2 and P3 chromites are magmatic phenocrysts. It is common to have zoned chromites with xenocryst cores and magmatic rims. P1 chromites are the dominant population in group 1 kimberlites, significant in group 2 kimberlites and minor in olivine lamproites and represent chromites derived from dissaggregated dunites, harzburgites and subordinate lherzolites. P4 chromites are derived from disaggregated low temperature and pressure spinel +/- garnet lherzolites.

Partitioning of Zn between chromite and olivine in peridotite is temperature dependent and independent of pressure. Increasing temperature lowers Zn the content of chromites. The nickel content of chromite is controlled by temperature dependent partitioning of Ni with other minerals and Ni content of the rock. The Ni and Zn contents are crucial in the recognition of mantle derived chromites from other chromite sources. (refer to Appendix II)

Conclusions

A regional sample stream sediment heavy mineral program was initially conducted in the Ram River Block in September of 1992. Major drainages were sampled for minerals indicating the presence of diamond bearing alkaline ultrabasic rocks. In September of 1993 a sample program was carried out focusing on determining the source area of magnesiochromites found in the North Ram River in the 1992 program. The 1993 sample program determined the Kiska Creek and Nice Creek drainages were a source of anomalous chromites which prompted the undertaking of an aeromagnetic program and further detailed stream sampling. An aeromagnetic geophysical program was conducted over two areas in May of 1994. In the Spring and Summer of 1994 detailed stream sediment sampling was conducted in the vicinity of Kiska Creek and Nice Creek drainages. Sampling was also conducted south of the North Ram River in the Cripple Creek and Pinto Creek drainages.

The Stream sediment heavy mineral programs delineated three anomalous source areas of chromites in the North Ram River area. The sources are the Kiska Creek area, the Nice Creek area and the Cripple Creek area. The Kiska Creek area is defined by the Kiska Creek drainage and adjacent creeks draining into the North Ram River. The Nice Creek area is defined by Nice Creek, Easy Creek and Gap Creek drainages. The Cripple Creek area is defined by Cripple Creek and an unnamed tributary to Cripple Creek that crosses an oilfield access road.

Plots of Cr_2O_3 vs. MgO, Al_2O_3 vs. Cr_2O_3 and TiO_2 vs. Al_2O_3 indicate that the chromites derived from the Kiska Creek and Cripple Creek area are geochemically similar. The plots indicate that the chromites from the Nice Creek area are geochemically distinct from chromites from the Kiska Creek and Cripple Creek areas. Some samples taken from the Kiska Creek area and the Cripple Creek area contain chromites that are over 60 weight percent Cr_2O_3 and over 14 weight percent MgO similar geochemically to chromites included in diamond. Geothermometry estimates based on the Griffin et al (1993) zinc geothermometer established that some of the P1 and DI chromites were potentially derived the diamond stability zone in the upper mantle. (refer to appendix II

A large proportion of P3 chromites (Griffin et al., 1994) were found in samples from the Nice Creek area as compared to other areas. P3 chromites were also found in the Kiska Creek area and Cripple Creek area. P3 chromites are commonly found in lamproites and are phenocrysts, products of a lamproitic magma (Griffin et al., 1994). P1 chromites were found in abundance in the Cripple Creek area, Kiska Creek area and in the North Ram River. A large proportion of P4 chromites were found in the Nice Creek area.

One sample from the tributary to Cripple Creek contained over 300 chromites and another sample taken in close proximity contained over 100 chromites. Two samples from the Kiska Creek area contain approximately 100 chromites. One sample from the Nice Creek area contained 79 chromites. (refer to table page 28)

The aeromagnetic geophysical program was conducted by helicopter with a mean magnetometer bird height of 45 meters and a line spacing of 150 meters over the Kiska and Nice Creek areas. The aeromagnetic geophysical survey final product consisted of total field magnetics, total field magnetics with regional magnetic trend removed and first derivative of vertical magnetic gradient. VLF was recorded but not processed. The aeromagnetic survey delineated airborne magnetic anomalies in both survey areas in the range 50 nT or less. The aeromagnetic anomalies in the Nice Creek area are found along the valley trending northwest which includes Gap Creek, Gap Lake and Nice Creek. These anomalies are typically 250 meters or less in diameter and are localized in low lying areas. In the Kiska Creek survey area ridges are typically magnetic highs and the valleys typically magnetic lows. Aeromagnetic anomalies not correlated with ridges and valleys are found on the sides of hills or on gently sloping ground. (refer to map page 30 and Appendix VI)

The samples that yielded the highest number of chromites in the Cripple Creek area were derived from locations with Wapiabi Formation bedrock. The Formation forms the base of a small valley (GSC, Map 46-22A). The resistant Brazeau Formation outcrops along the ridge 2 km to the southwest.

In the Kiska Creek area both the Wapiabi and the Brazeau Formations subcrop and outcrop. The two samples with highest numbers of chromites were associated with subcrops of the Wapiabi Formation (GSC, Maps 55-34, 1388 A and B). Samples which were taken from drainages with Brazeau Formation bedrock contained fewer numbers of chromites. Chromites derived from the Wapiabi and the Brazeau Formations are compositionally similar suggesting the Wapiabi sediments were eroded and subsequently incorporated into the Brazeau Formation.

In the Nice Creek area the Mountain Park Member of the Gates Formation (Luscar Group) outcrops. The member correlates with the highest number of chromites found in the area (GSC, Preliminary Map 55-34). The Brazeau and Wapiabi Formations are not found in this area. The Cardium (Bighorn) Formation was found to be the source of few chromites

The differences in the morphology and chemistry as well as bedrock sources of chromites between the Kiska Creek, Cripple Creek and Nice Creek areas suggest two different magmatic episodes in what is now the Foothills of the Canadian Cordillera. The episodes of magmatism each being the upper and lower cretaceous. The lack of a discrete indicator mineral train in the areas and definitive aeromagnetic anomaly suggests the chromites are derived from local siliciclatic sedimentary rocks. The diffuse pattern of the distribution of indicator minerals found contrasts with the discrete chromite indicator mineral train found at the M1 kimberlite in Australia (Towie et al., 1994). It is inconclusive at this time whether potentially primary diamond bearing source rocks in the North Ram River area. Further exploration efforts should focus on the Wapiabi Formation and the Mountain Park Member of the Gates Formation and their stratigraphic equivalent units.

UTM Coordinates of Ram River Block Sample Series R5000

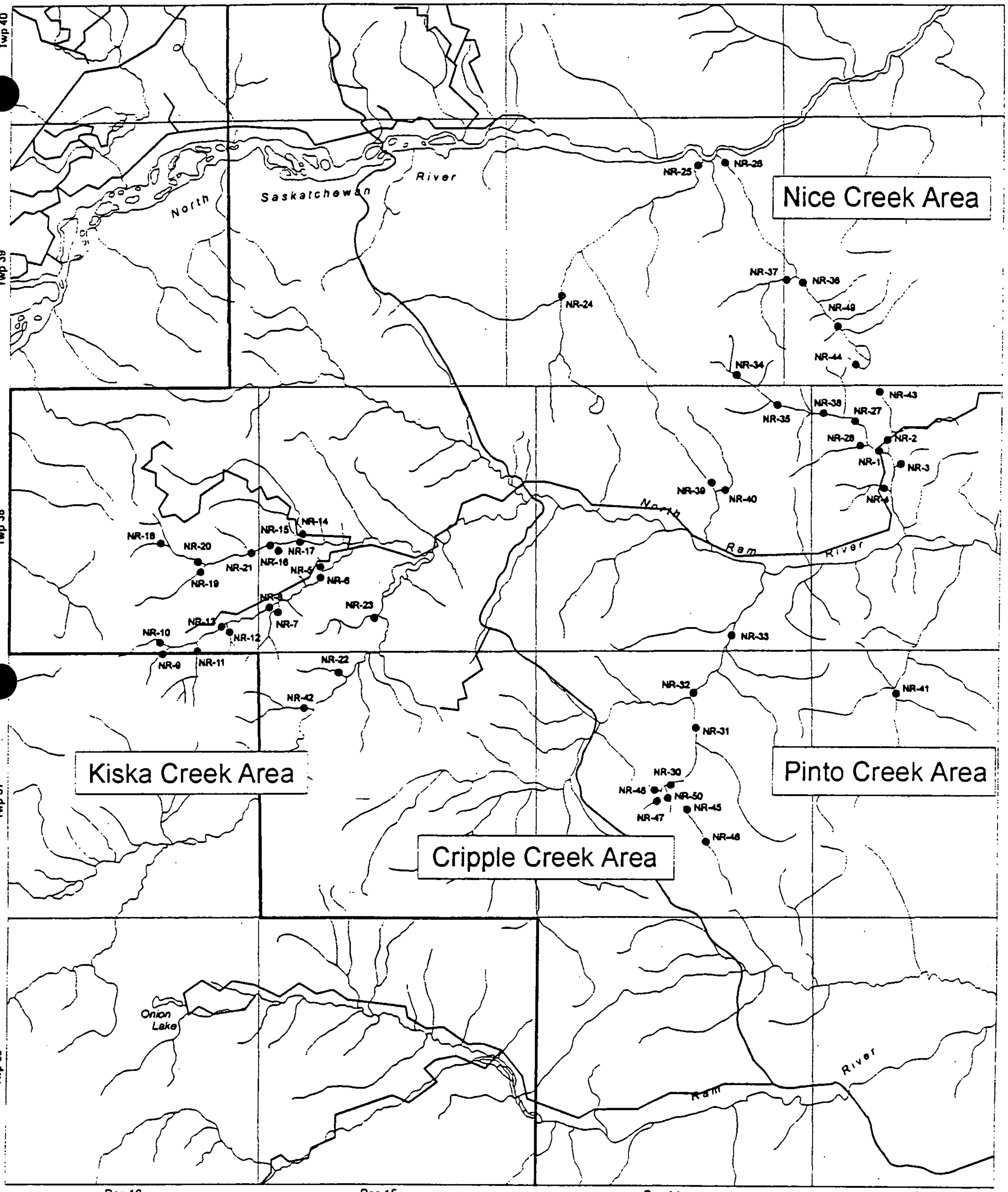
Sample	UTM Coordinates	Stream/Creek
R5001	5805500N 563100E	North Saskatchewan River at trunk road
R5002	5792750N568200E	North Ram River at trunk road
R5003	5784750N 570600E	Cripple Creek at trunk road
R5004	5770800N 579500E	South Ram River at trunk road
R5005	5468750N 597000E	Clearwater River
R5006	5824100N 596300E	Baptiste River
R5007	5816620N 567760E	Shunda Creek
R5008	5791520N 581350E	North Ram River downstream from Nice Creek
R5009	5804625N 607250E	North Ram River at trunk road
R5010	5791875N 617750E	Prairie Creek

UTM Coordinates of North Ram River Sample Series RS

Sample	UTM Coordinates	Stream/Creek
RS-1	559750E 5785500N	North Rem River
RS-2	564630E 5790670N	North Ram River
RS-3	561770E 5790680N	south fork Kiska Creek
RS-4	561725E 5791060N	Kiska Creek
RS-5	567470E 5793660N	Joyce River
RS-6	567960E 5792600N	North Ram River
RS-7	565865E 5795250N	trib. to Joyce River
RS-8	564740E 5795670N	Joyce River
RS-9	562190E 5791550N	trib. to Kiska Creek
RS-10	568920E 5792050N	Indian Creek
RS-11	570640E 5792530N	Lynch Creek
RS-12	572375E 5791450N	trib. to North Ram River
RS-13	576125E 5789725N	Cripple Creek
RS-14	574230E 5791620N	Philip Ceek
RS-15	577870E 5790740N	trib. to North Ram River
RS-16	580970E 5792220N	Nice Creek
RS-17	583200E 5790310N	Pinto Creek
RS-18	579450E 5790225N	trib. to North Ram River
RS-19	no sample	
RS-20	581225E 5791590N	North Ram River
RS-21	551450E 5766625N	Sifleur River
RS-22	563130E 5789360N	North Ram River

UTM Coordinates of North Ram River Sample Series NR

Sample	UTM Coordinates	Stream/Creek
NR-1	580450E 5794500N	Easy Creek
NR-2	580625E 5795060N	Nice Creek
NR-3	580950E 5794030N	unnamed tributary to Nice Creek
NR-4	580650E 5793470N	unnamed tributary to Nice Creek
NR-5	535920E 5789450N	unnamed tributary to south fork of Kiska Creek
NR-6	559910E 5789290N	south fork of Kiska Creek
NR-7	559080E 5788510N	unnamed tributary to south fork of Kiska Creek
NR-8	559070E 5788710N	south fork of Kiska Creek
NR-9	555310E 5787200N	unnamed tributary to south fork of Kiska Creek
NR-10	555300E 5787300N	unnamed tributary to south fork of Kiska Creek
NR-11	556420E 5787300N	unnamed tributary to south fork of Kiska Creek
NR-12	557410E 5787880N	unnamed tributary to south fork of Kiska Creek
NR-13	557250E 5788150N	south fork of Kiska Creek
NR-14	560110E 5791300N	unnamed tributary to Kiska Creek
NR-15	558720E 5790980N	Kiska Creek
NR-16	558900E 5790940N	tributary to Kiska Creek
NR-17	559950E 5791175N	Kiska Creek
NR-18	555410E 5790800N	tributary to Kiska Creek
NR-19	556560E 5790280N	tributary to Kiska Creek
NR-20	556540E 5790400N	tributary to Kiska Creek
NR-21	558000E 5790600N	Kiska Creek
NR-22	561530E 5786200N	tributary to North Ram River
NR-23	562750E 5788400N	tributary to North Ram River
NR-24	569020E 5800110N	Jock Creek
NR-25	573890E 5804930N	Jock Creek
NR-26	574470E 5805190N	Gap Creek
NR-27	579408E 5794961N	Easy Creek
NR-28	579790E 5794870N	tributary to Easy Creek
NR-29	548416E 5791800N	tributary to Crooked Creek
NR-30	573090E 5782260N	tributary to Cripple Creek
NR-31	574000E 5784360N	tributary to Cripple Creek
NR-32	573790E 5785690N	Cripple Creek
NR-33	575080E 5787590N	Cripple Creek
NR-34	575610E 5797217N	Easy Creek
NR-35	576820E 5796180N	Easy Creek
NR-36	576290E 5800900N	Gap Creek
NR-37	577190E 5800880N	tributary to Gap Creek
NR-38	578012E 5794730N	Easy Creek
NR-39	574500E 5793020N	Philip Creek
NR-40	574550E 5793050N	tributary to Philip Creek
NR-41	581000E 5785790N	Pinto Creek
NR-42	560370E 5785060N	tributary to North Ram River
NR-43	579860E 5797170N	tributary to Nice Creek
NR-44	579540E 5797710N	tributary to Gap Lake
NR-45	573670E 5781660N	tributary to Cripple Creek
NR-46	574550E 5780540N	tributary to Cripple Creek
NR-47	572560E 5781940N	tributary to Cripple Creek
NR-48	572770E 5782310N	tributary to Cripple Creek
NR-49	578960E 5798800N	Gap Creek
NR-50	573000E 5781600N	tributary to Cripple Creek

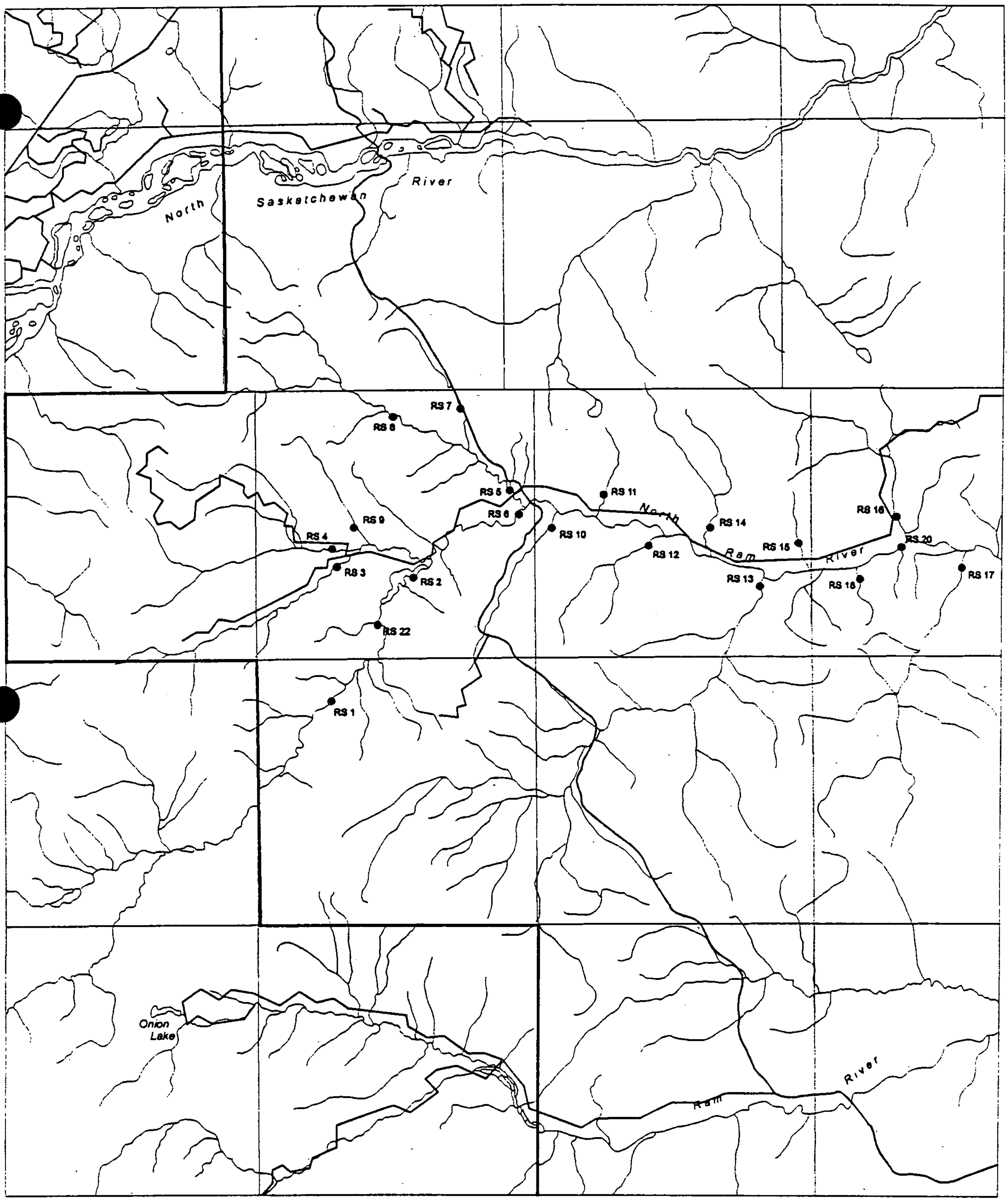


NR Series Sample Sites

Lakes
Rivers
Sample locations
Property boundary

0 5 km
scale

TKR TKR TKR
TAKLA STAR
RESOURCES LTD.



RS Sample Series Sites

Rivers
Roads
● Sample locations
Property boundary

0 5 km
scale

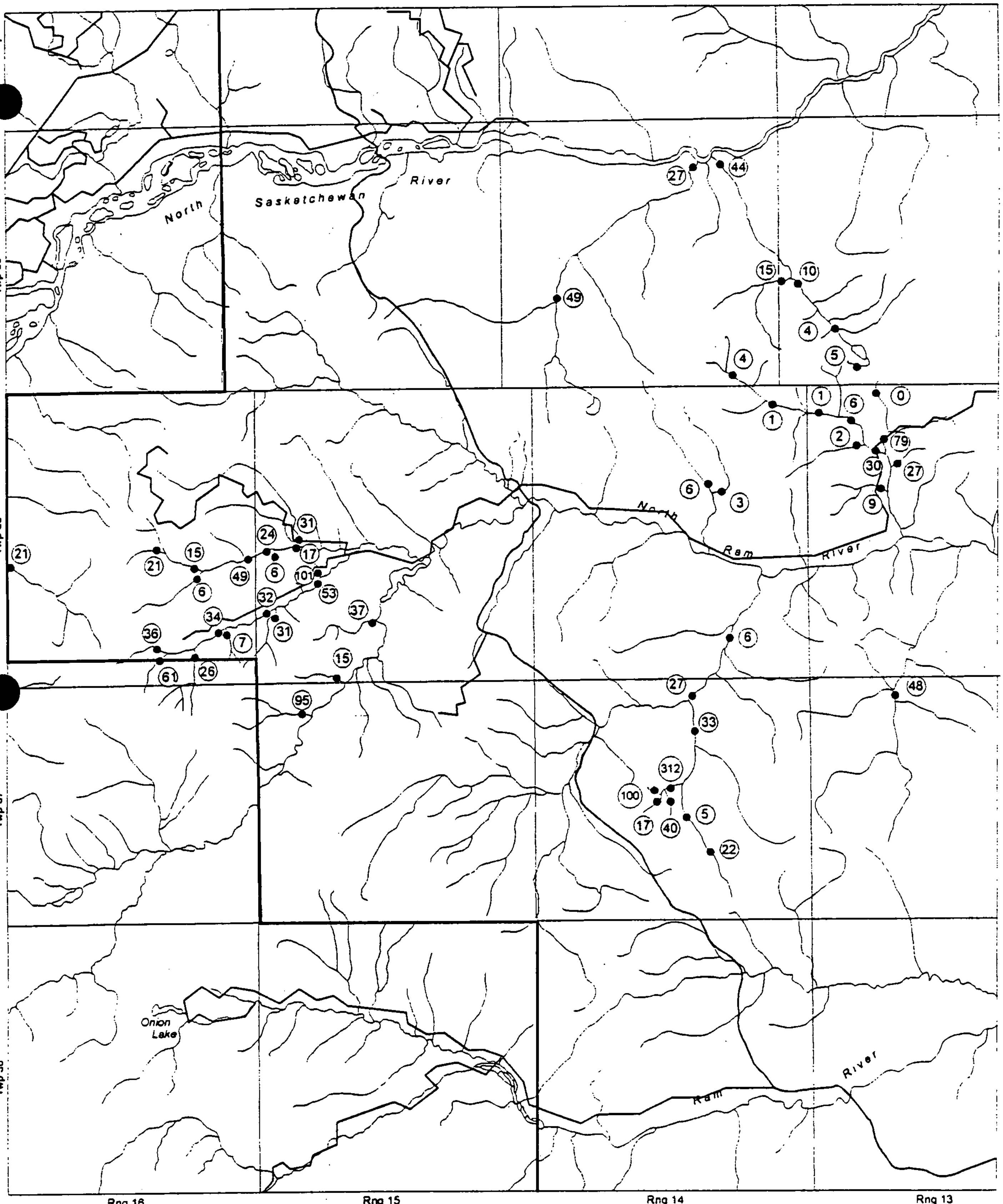
TKR TKR TKR
TAKLA STAR
RESOURCES LTD.

RS Series Total Chromites

Sample	Total chromites Picked	Stream/Creek
RS-1	6	North Rem River
RS-2	12	North Ram River
RS-3	13	south fork Kiska Creek
RS-4	2	Kiska Creek
RS-5	2	Joyce River
RS-6	31	North Ram River
RS-7	2	trib. to Joyce River
RS-8	0	Joyce River
RS-9	0	trib. to Kiska Creek
RS-10	3	Indian Creek
RS-11	3	Lynch Creek
RS-12	1	trib. to North Ram River
RS-13	10	Cripple Creek
RS-14	3	Philip Ceek
RS-15	5	trib. to North Ram River
RS-16	26	Nice Creek
RS-17	8	Pinto Creek
RS-18	3	trib. to North Ram River
RS-19	no sample	
RS-20	21	North Ram River
RS-21	2	Sifleur River
RS-22	9	North Ram River

NR Series Total Chromites

Sample	Total Chromites	Total chromites Probed	Indicators
NR-1	30	19	0
NR-2	79	40	3
NR-3	27	18	3
NR-4	9	4	0
NR-5	101	36	3
NR-6	53	21	1
NR-7	31	19	1
NR-8	32	20	2
NR-9	61	15	0
NR-10	36	16	2
NR-11	26	13	2
NR-12	7	4	2
NR-13	34	16	1
NR-14	31	16	2
NR-15	24	15	0
NR-16	6	4	0
NR-17	17	14	0
NR-18	21	15	1
NR-19	6	6	0
NR-20	15	14	0
NR-21	49	33	3
NR-22	15	12	2
NR-23	37	30	2
NR-24	49	22	2
NR-25	27	19	3
NR-26	44	24	3
NR-27	6	5	0
NR-28	2	2	0
NR-29	24	17	0
NR-30	312	47	6
NR-31	33	33	7
NR-32	27	27	3
NR-33	6	6	0
NR-34	4	4	0
NR-35	1	1	0
NR-36	10	10	1
NR-37	15	15	2
NR-38	1	1	0
NR-39	6	6	1
NR-40	3	3	0
NR-41	48	18	1
NR-42	95	41	3
NR-43	0	-	-
NR-44	5	-	-
NR-45	5	-	-
NR-46	20	-	-
NR-47	17	-	-
NR-48	100	-	-
NR-49	4	-	-
NR-50	40	-	-
Total	1651	701	61



NR Sample Series Total Chromites

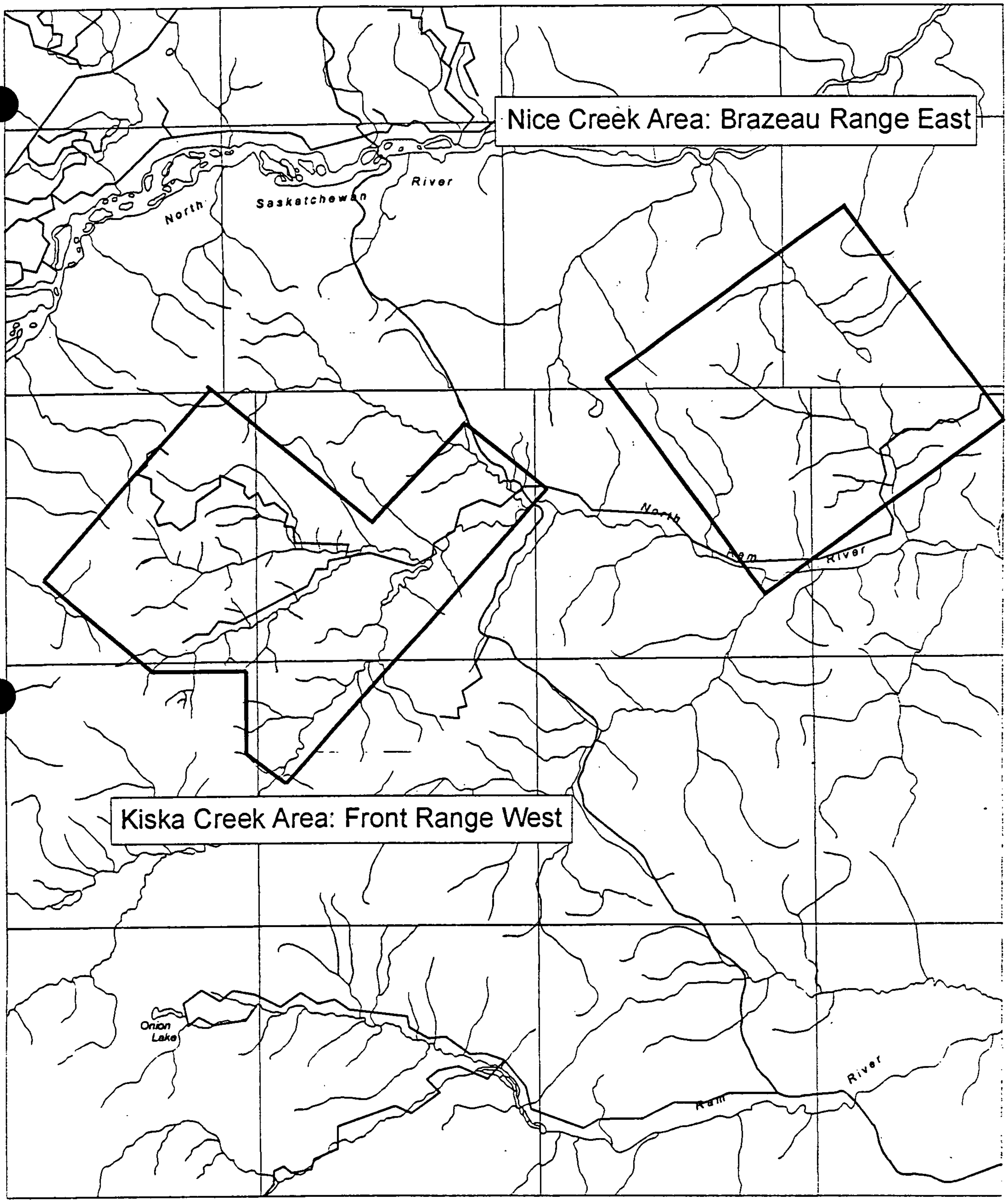
- Lakes
- Rivers
- Sample locations
- Property boundary

0 — 5 km
scale

TKR TKR TKR

TAKLA STAR

RESOURCES LTD.



1994 Aeromagnetic Survey Blocks

Lakes
Roads
Rivers
Property boundary

Survey boundary

0 5 10 Km
scale

TKR TKR TKR
TAKLA STAR
RESOURCES LTD.

References

Daniels L. R. M. and Gurney J. G., 1991, Oxygen fugacity Constraints on the Southern African Lithosphere. Contributions to Mineralogy and Petrology . vol. 1, pages 154-161

Boydell A. N., 1978, Multiple Glaciations in the Foothills, Rocky Mountain House area Alberta, Bulletin 36, Alberta Research Council, 35 pages.

Finger L. W., 1972, The Uncertainty of the Calculated Ferric Iron Content of a Microprobe Analysis, Carnegie Inst. Wash. Year Book 71, pages 145-154.

Fipke C. E. (ed.), 1989, The Development of Advanced Technology to Distinguish between Diamondiferous and Barren Diatremes. Geol. Surv. of Canada, Open file Report, pages, 143-166.

Griffin W. L., Sobolev N. V., Ryan C. G., Pokhilenko N. P., Win T. T. and Yefimova E. S., 1993, Trace Elements in the Garnets and Chromites: Diamond Formation in the Siberian Lithosphere. Lithos, 29, pages 235-256

Griffin W.L., Ryan C. G., Gurney J. J., Sobolev N. V., Win T. T., 1994, Chromite Macrocrysts in Kimberlites and Lamproites Geochemistry and Origin. Proceedings of the 5th Kimberlite Conference, Araxa Brazil, CPRM, vol. 1, pages 366-377.

GSC, Map 1388A and 1388B, Whiterabbit Creek, Alberta, NTS 83 C/1, 1:50000

GSC, Map 884A, Alexo, Alberta, 1:63,360

GSC, Map 46-22A, Cripple Creek, Alberta, 2 inches to 1 mile

GSC, Preliminary Map 55-34, Nordegg, Alberta, 1:63,360

Ross G. M., Parrish R. R., Villeneuve M. E. and Bowring S. A., 1991, Geophysics and Geochronology of the Basement of the Alberta Basin, Western Canada. Canadian Journal of Earth sciences, vol. 28, pages 512-522.

Towie N. J., Bush M. D., Manning E. R., Marx M. R. and Ramsay R. R., 1994, The Aries Diamondiferous Kimberlite Pipe Central Kimberly Block, Western Australia: Exploration, Setting, and Evaluation. Proceedings of the 5th Kimberlite Conference, Araxa Brazil, CPRM, vol. 2, pages 319-328.

Statement of Qualification

I, Douglas I. Sraega of [redacted] Edmonton , Alberta do hereby certify that.

1.) I am a graduate of the University of Alberta, Edmonton with a B.Sc. in Science obtained in 1987.

2.) I have completed a Special Certificate in Geology from the University of Alberta obtained in 1993.

3.) I am the author, except for the statement of expenditures, of this report.

Certified [redacted] Data Dec 16/94

Appendix I

Electron Microprobe Data

R5000 Sample Series Electron Microprobe Data

Takla Star Res Ltd. R5000-series Raw Data University of Saskatchewan Microprobe													
Sample	Grain	Al2O3	Cr2O3	Na2O	MgO	SiO2	K2O	CaO	TiO2	MnO	FeO	ZnO	Total
R5002	5	13.37	49.87	.00	14.66	.12	.00	.00	1.36	.28	22.20	.03	101.88
R5002	8	26.78	39.25	.00	16.01	.03	.00	.00	.33	.24	18.13	.12	100.90
R5003	5	11.20	40.31	.00	15.66	.13	.00	.00	1.04	.28	31.09	.01	99.72
R5003	8	16.53	41.97	.00	10.77	.11	.00	.00	.27	.32	30.18	.12	100.26
R5006	4	20.04	48.30	.00	14.54	.06	.00	.00	.01	.27	17.70	.10	101.02
R5006	6	8.14	44.26	.00	14.27	.05	.00	.00	.68	.31	32.57	.00	100.28
R5006	10	8.25	52.86	.00	8.55	.14	.00	.01	.51	.53	29.96	.08	100.80
R5007	7	18.01	42.35	.00	17.10	.06	.00	.00	1.97	.20	22.07	.02	101.76
R5007	10	14.52	52.73	.00	17.95	.18	.00	.00	.59	.24	15.14	.01	101.36
R5008	1	8.81	52.19	.00	14.08	.01	.00	.00	.44	.35	25.02	.03	100.93
R5008	6	34.98	32.65	.00	19.58	.04	.00	.00	.01	.18	13.74	.01	101.19
R5008	7	21.34	46.13	.00	14.76	.00	.00	.00	.07	.26	17.92	.16	100.63
R5009	3	29.29	37.26	.00	14.66	.03	.00	.00	.01	.29	18.56	.25	100.45
R5009	4	30.52	36.63	.00	16.98	.02	.00	.00	.00	.19	16.22	.13	100.69
R5009	8	16.43	38.18	.00	15.53	.03	.00	.00	2.85	.21	26.67	.04	99.92
R5010	6	19.78	48.86	.00	18.99	.13	.00	.00	.48	.19	13.82	.00	102.26

RS Sample Series Electron Microprobe Data

Takla Star Res. Ltd. RS-series Chromite Raw Data CANMET												
Sample-Grain	No.	TiO2	Al2O3	Cr2O3	FeO	MnO	MgO	NiO	ZnO	CaO	MnO	Total
RS-1-1	1	0.701	12.28	40.6	31.67	0.348	12.38	0.095	0.057	0.047	0.348	98.18
RS-1-4	4	0.169	15.74	50.13	21.22	0.36	10.73	0.054	0.186	0.003	0.36	98.59
RS-1-6	6	2.036	23.1	32.59	26.96	0.242	12.9	0.158	0.061	0	0.242	98.04
RS-1-7	7	0.055	34.61	32.3	14.62	0.214	16.77	0.212	0.14	0.003	0.214	98.92
RS-1-8	8	0.02	30.12	36.21	19.75	0.382	12.3	0.173	0.298	0.013	0.382	99.25
RS-2-1	15	0.632	11.84	41.75	30.16	0.339	12.49	0.136	0.072	0	0.339	97.41
RS-2-4	18	2.132	13.13	44.65	26.3	0.35	11.98	0.296	0.181	0.014	0.35	99.04
RS-2-8	22	0.319	9.751	50.98	22.44	0.366	14.08	0.11	0.032	0	0.366	98.08
RS-2-10	24	1.686	13.97	43.65	28.02	0.315	10.45	0.194	0.127	0.006	0.315	98.41
RS-2-13	27	0.544	9.122	40.6	34.02	0.418	12.52	0.224	0.086	0	0.418	97.53
RS-2-14	28	0.025	29.97	36.86	16.58	0.188	14.83	0.073	0.081	0	0.188	98.6
RS-2-15	29	0.899	12.79	30.96	37.79	0.262	14.66	0.318	0.054	0	0.262	97.73
RS-2-16	30	0.152	41.32	22.75	17.1	0.199	17.15	0.263	0.127	0.001	0.199	99.05
RS-2-17	31	0.075	10.51	57.06	21	0.432	10.11	0.131	0.287	0.026	0.432	99.64
RS-2-18	32	0.073	29.29	36.67	18.11	0.263	14.22	0.17	0.223	0.001	0.263	99.02
RS-2-19	33	0.062	4.99	62.17	22.96	0.515	8.34	0.139	0.308	0.024	0.515	99.51
RS-3-1	34	0.614	7.466	40.69	35.02	0.312	12.51	0.223	0.064	0.008	0.312	96.91
RS-3-2	35	0.139	11.56	53.25	25.66	0.564	7.437	0.12	0.372	0.027	0.564	99.13
RS-3-3	36	0.163	14.99	48.11	25.8	0.438	8.415	0.076	0.228	0	0.438	98.21
RS-3-4	37	0.045	9.767	56.09	24.18	0.477	7.355	0.045	0.288	0	0.477	98.25
RS-3-5	38	1.216	19.32	37.32	30.07	0.331	9.538	0.169	0.12	0	0.331	98.08
RS-3-6	39	0.131	16.71	48.88	19.75	0.32	12.8	0.068	0.123	0	0.32	98.78
RS-3-8	41	0.432	8.791	47.09	26.07	0.282	14.5	0.205	0.048	0.009	0.282	97.43
RS-3-9	42	0.051	23.12	41.5	21.22	0.305	12.08	0.058	0.198	0	0.305	98.53
RS-3-10	43	0.244	10.17	54.37	19.41	0.312	13.69	0.178	0.074	0.002	0.312	98.44
RS-3-12	45	0.295	8.62	48.45	31.46	0.465	8.579	0.088	0.124	0.001	0.465	98.08
RS-3-15	48	0.41	10.26	50.45	25.93	0.708	9.776	0.116	0.074	0	0.708	97.72
RS-4-1	49	0.641	18.97	41.21	26.77	0.363	10.44	0.08	0.184	0	0.363	98.66
RS-4-2	50	0.207	9.753	54.96	19.75	0.319	13.03	0.123	0.047	0	0.319	98.19
RS-4-3	51	0.129	0.026	0.01	88.46	0.07	0	0.056	0.135	0.013	0.07	88.9
RS-4-4	52	2.095	13.89	44.38	23.82	0.283	13.33	0.221	0.071	0	0.283	98.09
RS-5-1	53	1.355	17.22	43.61	21.06	0.242	14.45	0.218	0.03	0	0.242	98.18
RS-5-2	54	0.169	16.02	47.55	24.32	0.414	9.876	0.16	0.33	0.022	0.414	98.86
RS-6-1	55	0.122	10.21	56.76	15.41	0.305	15.26	0.238	0.129	0.018	0.305	98.46
RS-6-2	56	1.189	17.37	44.98	19.57	0.231	14.87	0.218	0.037	0	0.231	98.46
RS-6-3	57	0.591	31.26	24.43	26.35	0.212	14.71	0.101	0.028	0	0.212	97.68
RS-6-4	58	0.531	7.194	35.54	39.74	0.309	13.39	0.278	0.086	0.004	0.309	97.07
RS-6-5	59	1.994	16.19	40.44	25.87	0.256	13.16	0.209	0.06	0	0.256	98.17
RS-6-8	62	0.521	11.5	46.14	31.83	0.487	7.422	0.11	0.192	0.005	0.487	98.21
RS-6-9	63	0.286	8.821	56.3	19.47	0.333	13.19	0.159	0.053	0	0.333	98.61
RS-6-10	64	0.133	8.294	57.21	23.93	0.449	8.457	0.053	0.242	0	0.449	98.77
RS-6-11	65	0.379	33.41	31.11	17.49	0.185	16.13	0.111	0	0	0.185	98.8
RS-6-12	66	0.043	10.03	58.43	19.08	0.395	10.41	0.06	0.196	0	0.395	98.64
RS-6-13	67	0.555	8.309	47.2	27.79	0.309	13.77	0.18	0.057	0	0.309	98.16
RS-6-14	68	0.487	11.08	47.27	24.56	0.285	14.19	0.1	0.051	0	0.285	98.03
RS-6-17	71	1.245	17.76	44.31	20.36	0.237	14.26	0.197	0.048	0.003	0.237	98.42
RS-6-19	73	0.239	6.009	59.74	20.72	0.398	12.07	0.101	0.074	0	0.398	99.35
RS-6-20	74	0.199	9.72	55.93	20.33	0.376	12.18	0.164	0.055	0	0.376	98.96
RS-6-21	75	0.026	37.35	29.12	15.88	0.174	16.19	0.129	0.081	0	0.174	98.95

RS-6-22	76	0.17	7.532	58.95	19.81	0.384	12.17	0.131	0.057	0	0.384	99.21
RS-6-23	77	0.656	7.8	44.21	26.02	0.67	17.65	0.191	0.156	0	0.67	97.35
RS-6-25	79	1.276	17.17	44.94	20.96	0.253	13.68	0.187	0.022	0	0.253	98.48
RS-6-26	80	2.424	16.27	38.68	29.04	0.404	10.82	0.243	0.113	0	0.404	97.98
RS-6-27	81	0.174	9.308	53.38	26.52	0.471	8.045	0.082	0.17	0	0.471	98.15
RS-6-28	82	0.217	6.412	58.28	21.47	0.398	11.08	0.113	0.099	0	0.398	98.07
RS-6-29	83	0.607	27.5	34.55	21.71	0.243	13.36	0.151	0.031	0	0.243	98.15
RS-6-30	84	0.459	6.898	49.54	26.04	0.305	13.87	0.155	0.057	0	0.305	97.32
RS-6-31	85	0.254	6.318	54.26	25.99	0.44	10.23	0.124	0.096	0	0.44	97.71
RS-6-32	86	0.853	8.665	47.37	27.68	0.397	12.42	0.09	0.073	0.007	0.397	97.55
RS-6-33	87	0.218	19.45	44.53	20.49	0.268	13.19	0.145	0.094	0	0.268	98.39
RS-6-35	89	1.169	15.72	46.37	20.54	0.263	14.01	0.17	0.05	0	0.263	98.29
RS-6-36	90	0.834	11.27	44.56	28.14	0.365	12.58	0.166	0.092	0	0.365	98
RS-6-37	91	0.091	8.752	57.23	23.81	0.464	7.984	0.028	0.183	0	0.464	98.55
RS-6-38	92	0.242	27.22	38.18	15.13	0.186	17.01	0.153	0	0	0.186	98.13
RS-7-1	93	0.012	21.44	43.66	21.39	0.304	11.56	0.072	0.235	0	0.304	98.67
RS-7-2	94	0.342	9.219	47.48	36.11	1.394	2.719	0.109	1.147	0.007	1.394	98.53
RS-10-1	96	1.819	0.155	0.024	86.51	0.21	0	0.062	0.118	0.038	0.21	88.93
RS-10-6	101	0.711	28.46	34.4	20.34	0.264	14.31	0.089	0	0	0.264	98.56
RS-10-7	102	0.39	6.968	46.03	30.78	0.325	12.87	0.08	0	0.009	0.325	97.45
RS-11-1	106	0.155	20.62	42.12	24.03	0.337	11.01	0.07	0.121	0	0.337	98.47
RS-11-2	107	0.3	6.519	50.39	30.59	0.497	8.984	0.081	0.025	0	0.497	97.39
RS-12-1	108	0.133	10.81	55.49	21.36	0.503	9.646	0.049	0.695	0	0.503	98.68
RS-13-1	109	0.266	9.649	54.23	21.32	0.355	12.12	0.12	0	0	0.355	98.06
RS-13-2	110	0.301	24.08	38.11	22	0.275	13.18	0.079	0.004	0	0.275	98.03
RS-13-3	111	0.218	26.21	37.43	20.92	0.274	13.23	0.063	0.03	0	0.274	98.38
RS-13-4	112	1.681	15.14	43.84	24.22	0.262	13.05	0.197	0.044	0	0.262	98.43
RS-13-6	114	0.413	32.8	29.06	20.77	0.222	15.13	0.176	0.033	0	0.222	98.61
RS-13-7	115	1.127	17.65	43.52	21.86	0.255	13.73	0.2	0.036	0	0.255	98.37
RS-13-8	116	0.252	23.96	41.35	18.68	0.274	13.4	0.083	0.115	0	0.274	98.12
RS-13-9	117	0.328	32.42	30.78	18	0.191	16.23	0.105	0	0	0.191	98.05
RS-13-10	118	0.039	21.86	44.98	16.91	0.229	15.09	0.092	0.042	0	0.229	99.24
RS-13-11	119	0.041	21.91	45.14	18.53	0.283	13.28	0.054	0.091	0	0.283	99.34
RS-14-1	120	1.071	17.85	44.56	20.74	0.269	14.03	0.185	0.035	0	0.269	98.74
RS-14-2	121	1.724	17.09	39.98	26.67	0.267	12.47	0.194	0.062	0	0.267	98.47
RS-14-3	122	1.667	14.64	45.06	23.75	0.276	13.04	0.211	0.048	0.007	0.276	98.7
RS-14-4	123	0.207	0.148	0.07	87.73	0.163	0	0.082	0.119	0.032	0.163	88.56
RS-15-1	126	0.32	9.208	51.51	24.32	0.455	11.78	0.087	0.058	0.014	0.455	97.76
RS-15-2	127	1.182	13.58	46.61	26.58	0.345	9.586	0.135	0.154	0	0.345	98.17
RS-15-4	129	0.555	9.974	43.27	25.89	0.481	17.05	0.156	0.006	0.021	0.481	97.39
RS-15-6	131	0.483	8.987	45.64	30.02	0.357	11.65	0.104	0.046	0.007	0.357	97.29
RS-16-1	133	1.212	18.65	42.66	20.5	0.24	14.85	0.231	0.019	0	0.24	98.36
RS-16-2	134	1.615	17.79	40.68	23.75	0.248	13.9	0.151	0.004	0.008	0.248	98.14
RS-16-3	135	0.265	7.446	54.48	23.75	0.38	12.04	0.062	0.044	0.007	0.38	98.47
RS-16-4	136	0.633	8.78	42.8	30.62	0.302	13.9	0.187	0.027	0.011	0.302	97.26
RS-16-5	137	0.909	10.18	41.88	30.6	0.294	14	0.178	0.025	0.008	0.294	98.06
RS-16-6	138	0.144	6.679	54.44	29.42	0.505	7.049	0.067	0.17	0.005	0.505	98.48
RS-16-7	139	0.065	19.05	48.01	17.92	0.271	12.7	0.089	0.113	0	0.271	98.21
RS-16-8	140	0.641	11.04	41.63	29.78	0.321	14.17	0.177	0.027	0	0.321	97.79
RS-16-9	141	0.863	12.61	41.78	29.73	0.338	12.2	0.074	0.065	0.003	0.338	97.66
RS-16-10	142	0.476	30.98	32.12	18.43	0.288	15.49	0.217	0.092	0.012	0.288	98.11

RS-16-11	143	0.303	18.29	47.91	21.15	0.367	10.78	0.048	0.149	0.002	0.367	99
RS-16-13	145	0.36	5.557	54.02	28.94	0.467	8.562	0.114	0.2	0.028	0.467	98.25
RS-16-14	146	2.035	17.34	39.04	27.4	0.314	11.67	0.252	0.144	0.021	0.314	98.22
RS-16-15	147	0.709	23.31	40.57	20.21	0.294	13.01	0.105	0.092	0	0.294	98.3
RS-16-16	148	2.207	14.28	43.55	24.19	0.239	13.53	0.21	0.049	0	0.239	98.25
RS-16-17	149	1	12.63	42.24	28.62	0.357	12.89	0.116	0.153	0.022	0.357	98.03
RS-16-18	150	0.088	8.902	54.57	26.72	0.411	6.957	0.193	0.191	0.012	0.411	98.05
RS-16-19	151	0.374	18.38	44.74	22.06	0.361	11.98	0.143	0.245	0.025	0.361	98.31
RS-16-20	152	0.259	12.74	48.99	25.8	0.467	9.082	0.115	0.221	0.019	0.467	97.69
RS-16-21	153	0.713	35.74	19.58	28.41	0.25	12.94	0.195	0.148	0.003	0.25	97.98
RS-16-22	154	0.408	17.98	40.67	26.66	0.347	12.21	0.098	0.118	0.102	0.347	98.59
RS-16-23	155	0.392	7.896	53.81	19.04	0.273	16.83	0.225	0.106	0.021	0.273	98.59
RS-16-24	156	2.335	12.65	44.34	25.67	0.303	12.92	0.241	0.124	0.021	0.303	98.6
RS-16-25	157	0.043	44.9	20.83	12.95	0.161	18.43	0.25	0.169	0.011	0.161	97.75
RS-16-26	158	2.398	11.99	43.44	26.93	0.334	12.49	0.265	0.149	0.034	0.334	98.04
RS-16-27	159	0.423	25.45	36.25	21.92	0.331	13.2	0.171	0.194	0.026	0.331	97.95
RS-16-28	160	0.144	14.32	53	17.8	0.402	12.08	0.112	0.23	0.031	0.402	98.12
RS-17-1	161	0.096	21.75	41.7	21.18	0.375	12.44	0.157	0.279	0.031	0.375	98
RS-17-3	163	1.462	17.86	43.69	21.32	0.24	13.69	0.214	0.053	0	0.24	98.53
RS-17-4	164	0.483	29.08	33.94	20.92	0.254	13.31	0.117	0.143	0	0.254	98.25
RS-17-6	166	1.598	24.79	27.85	31.67	0.33	11.47	0.1	0.202	0.027	0.33	98.04
RS-17-7	167	0.294	10.68	53.26	17.05	0.298	16.66	0.288	0.105	0.037	0.298	98.68
RS-17-9	169	0.828	16.54	47.33	21.64	0.385	12.25	0.18	0.206	0.065	0.385	99.43
RS-17-10	170	1.704	19.74	36.73	26.36	0.32	12.81	0.228	0.154	0.025	0.32	98.07
RS-18-1	171	0.083	27.12	36.61	20.53	0.3	13.14	0.142	0.173	0.001	0.3	98.11
RS-18-2	172	0.216	12.15	47.44	29.42	0.507	7.629	0.114	0.271	0.01	0.507	97.75
RS-18-4	174	1.491	15.98	45.15	20.03	0.236	14.98	0.198	0.014	0.001	0.236	98.06
RS-20-1	175	0.246	7.398	57.37	21.56	0.446	11.23	0.111	0.061	0.007	0.446	98.44
RS-20-2	176	0.14	7.251	58.13	23.88	0.687	8.668	0.16	0.173	0.002	0.687	99.09
RS-20-3	177	0.336	19.32	40.92	26.17	0.364	10.72	0.086	0.142	0	0.364	98.06
RS-20-5	179	0.364	15.31	44.85	26.52	0.446	10.17	0.134	0.251	0.001	0.446	98.04
RS-20-6	180	0.139	0.209	0.033	88.14	0.089	0	0.063	0.128	0.014	0.089	88.82
RS-20-7	181	0.531	17.64	40.85	28.12	0.408	9.804	0.128	0.247	0.007	0.408	97.73
RS-20-8	182	0.322	7.547	54.96	25.8	0.46	10.21	0.088	0.129	0.012	0.46	99.52
RS-20-9	183	0.422	10.78	51.28	21.02	0.323	14.99	0.166	0.055	0.002	0.323	99.03
RS-20-10	184	0.328	15.39	47.26	25.71	0.482	9.167	0.102	0.245	0.005	0.482	98.69
RS-20-11	185	0.61	9.218	46.6	26.67	0.343	14.65	0.247	0.061	0.011	0.343	98.41
RS-20-12	186	0.549	12.71	48.52	22.97	0.369	13.17	0.146	0.09	0	0.369	98.53
RS-20-13	187	0.158	8.878	58.13	17.63	0.365	13.95	0.19	0.072	0.001	0.365	99.37
RS-20-14	188	1.993	15.87	42.51	24.02	0.272	13.62	0.245	0.043	0	0.272	98.57
RS-20-15	189	1.23	16.78	41.38	25.63	0.284	11.32	0.182	0.102	0	0.284	96.91
RS-20-16	190	1.706	20.58	36.82	25.45	0.257	12.98	0.193	0.066	0	0.257	98.06
RS-20-17	191	0.427	7.122	46.44	33.5	0.484	9.089	0.147	0.119	0	0.484	97.33
RS-20-18	192	0.099	9.325	56.03	24.74	0.438	8.516	0.046	0.144	0.013	0.438	99.36
RS-20-19	193	1.028	16.16	45.02	22.63	0.295	12.1	0.237	0.071	0	0.295	97.54
RS-20-20	194	0.389	27.93	35.57	19.08	0.237	15.17	0.148	0.068	0.005	0.237	98.6
RS-20-21	195	0.454	6.692	39.02	37.07	0.319	13.24	0.279	0.072	0.004	0.319	97.15
RS-20-22	196	0.065	15.5	50.61	19.77	0.37	11.48	0.086	0.311	0	0.37	98.2
RS-20-23	197	0.413	17.36	45.4	19.81	0.237	14.58	0.198	0.032	0	0.237	98.03
RS-21-1	198	0.096	7.006	58.12	24.76	0.479	7.883	0.051	0.233	0	0.479	98.63
RS-21-2	199	0.042	13.85	51.13	24.13	0.411	8.807	0.065	0.296	0	0.411	98.72

RS-22-1	200	0.018	33.84	31.44	17.37	0.191	15.48	0.129	0.061	0	0.191	98.52
RS-22-2	201	2.696	14.3	34.9	35.18	0.314	9.643	0.166	0.112	0	0.314	97.31
RS-22-5	204	0.176	14.01	48.39	26.39	0.417	8.459	0.092	0.276	0	0.417	98.21
RS-22-7	206	0.195	0.129	0.034	88.21	0.102	0	0.067	0.151	0.022	0.102	88.91
RS-22-8	207	0.257	17.51	45.19	25.38	0.399	9.985	0.101	0.174	0	0.399	98.99
RS-22-9	208	0.03	24.52	42.55	16.61	0.246	14.18	0.065	0.178	0	0.246	98.37
RS-22-10	209	0.26	17.87	48.04	17.38	0.244	14.92	0.17	0.037	0	0.244	98.92
RS-22-11	210	0.219	6.538	59.01	23.06	0.479	9.786	0.094	0.131	0.001	0.479	99.32
RS-22-12	211	0.032	11.24	56.57	21.27	0.437	9.012	0.038	0.238	0	0.437	98.83
RS-22-13	212	0.358	18.36	42.14	26.31	0.367	10.62	0.099	0.148	0.003	0.367	98.41
RS-22-14	213	0.435	11.82	45.87	27.21	0.348	12.05	0.137	0.157	0	0.348	98.03

Kiska Creek Area Electron Microprobe Data
(NR Sample Series)

Sample	Grain	TiO2	Al2O3	Cr2O3	V2O3	FeO	MnO	MgO	NiO	ZnO	Total
NR-5	1	0.53	8.25	39.95	0.03	34.83	0.3	14.34	0.248	0.052	98.52
NR-5	2	0.2	8.17	60.42	0.11	14.36	0.21	15.9	0.186	0.048	99.59
NR-5	3	0.56	9.78	47.75	0.06	29.53	0.32	11.18	0.131	0.099	99.4
NR-5	4	0.34	35	24.3	0.14	23.79	0.18	15.59	0.139	0.087	99.57
NR-5	6	0.06	13.78	55.79	0.17	16.81	0.32	12.48	0.047	0.191	99.65
NR-5	7	0.2	9.04	55.14	0.16	26.12	0.42	7.96	0.06	0.235	99.34
NR-5	8	0.11	11.12	52.38	0.14	27.65	0.45	7.14	0.028	0.327	99.35
NR-5	9	2.86	12.22	42.39	0.19	28.89	0.25	12.2	0.226	0.094	99.32
NR-5	10	1.44	15.35	45.78	0.18	23.14	0.2	12.92	0.203	0.082	99.3
NR-5	11	0.24	9.8	53.86	0.13	25.61	0.36	8.96	0.063	0.125	99.14
NR-5	12	0.47	10.45	52	0.12	25.82	0.32	9.7	0.068	0.1	99.04
NR-5	14	0.71	18.5	41.22	0.33	30.08	0.37	8.32	0.099	0.191	99.82
NR-5	15	2.08	14.71	41.32	0.13	29.61	0.31	10.12	0.171	0.139	98.59
NR-5	18	0.03	16.13	51.91	0.23	21.64	0.41	10.1	0.02	0.237	100.7
NR-5	22	0.23	14.73	46.54	0.26	27.97	0.35	9.2	0.053	0.258	99.59
NR-5	23	0.14	10.33	54.5	0.31	23.29	0.31	10.26	0.089	0.091	99.33
NR-5	24	0.28	15.53	45.57	0.2	29.32	0.41	7.97	0.072	0.223	99.56
NR-5	26	0.13	17.31	45.16	0.12	32.53	0.44	3.69	0.001	0.171	99.54
NR-5	27	0.32	8.06	57.29	0.05	23.36	0.5	10.03	0.137	0.106	99.85
NR-5	28	2.84	13.13	40.43	0.21	31.46	0.25	10.52	0.205	0.109	99.14
NR-5	29	1.46	18.5	42.73	0.11	21.38	0.19	15.21	0.218	0.068	99.86
NR-5	30	0.14	20.63	44.93	0.18	22.52	0.29	11.4	0.067	0.146	100.32
NR-5	31	0.35	10.1	51.62	0.11	24.88	0.31	11.79	0.074	0.102	99.33
NR-5	32	0.31	8.14	57.2	0.06	18.91	0.27	13.74	0.143	0.06	98.82
NR-5	33	0.82	14.72	43.16	0.24	26.97	0.26	12.52	0.13	0.096	98.92
NR-5	34	0.39	8.6	48.75	0.03	28	0.33	12.17	0.146	0.07	98.47
NR-5	35	2.03	14.95	40.68	0.19	31.2	0.34	9.28	0.151	0.146	98.97
NR-5	36	0.6	8.58	41.23	0.06	32.3	0.23	14.08	0.218	0.064	97.35
NR-5	37	0.48	8.36	48.07	0.03	27.92	0.3	13.25	0.158	0.098	98.67
NR-5	38	0.21	24.39	39.11	0.19	23.57	0.34	11.35	0.088	0.182	99.43
NR-5	39	0.52	10.52	47.93	0.1	26	0.32	13.1	0.114	0.08	98.69
NR-5	40	1.25	16.52	44.58	0.16	26.28	0.29	10.64	0.145	0.136	100
NR-5	41	1.08	16.26	48.46	0.13	17.61	0.21	15.62	0.216	0.048	99.62
NR-5	42	0.17	16.37	48.93	0.13	21.16	0.31	12.54	0.106	0.152	99.88
NR-6	1	0.1	10.79	57.79	0.11	20.34	0.38	10.66	0.045	0.209	100.42
NR-6	2	0.67	7.53	32.32	0.02	42.62	0.27	13.08	0.279	0.062	96.84
NR-6	3	1.27	15.87	47.62	0.12	20.07	0.18	14.29	0.183	0.076	99.67
NR-6	4	0.77	27.71	24.92	0.18	32.66	0.26	12.45	0.129	0.129	99.21
NR-6	5	0.05	8.82	59.99	0.27	21.94	0.4	8.75	0.05	0.281	100.54
NR-6	6	1.42	15.05	47.82	0.12	20.21	0.21	14.98	0.185	0.078	100.08
NR-6	7	2.59	16.78	38.37	0.18	29.84	0.28	12.05	0.2	0.096	100.39
NR-6	8	0.07	10.69	57.32	0.16	22.26	0.36	8.82	0.02	0.247	99.94
NR-6	9	0.6	16.75	41.17	0.27	31.71	0.37	8.3	0.101	0.269	99.53
NR-6	11	1.46	17.43	44.51	0.13	21.21	0.2	14.37	0.233	0.094	99.63
NR-6	12	0.06	20.38	46.2	0.21	21.49	0.29	11.42	0.052	0.267	100.37
NR-6	13	0.04	15.88	54.29	0.21	16.78	0.31	12.79	0.046	0.179	100.52
NR-6	14	1.31	18.44	42.05	0.19	25.88	0.26	11.63	0.171	0.126	100.06
NR-6	15	0.42	7.76	53.43	0.04	24.52	0.28	10.88	0.14	0.097	97.57
NR-6	16	0.32	16.54	50.12	0.1	19.65	0.26	13.02	0.109	0.094	100.2
NR-6	17	0.14	13.21	54.07	0.19	20.77	0.32	10.91	0.059	0.217	99.89

NR-6	18	0.15	8.01	58.65	0.07	22.84	0.33	9.95	0.035	0.116	100.14
NR-6	20	2	15.82	44.08	0.15	22.9	0.22	13.92	0.252	0.106	99.46
NR-6	21	0.03	24.82	43.45	0.17	18.26	0.29	13.28	0.064	0.257	100.61
NR-6	22	1.67	14.44	45.23	0.13	25.12	0.26	12.3	0.205	0.101	99.45
NR-7	1	0.24	10.38	55.5	0.13	22.82	0.37	10.36	0.055	0.211	100.05
NR-7	2	0.32	13.01	51.32	0.18	25.78	0.37	9.24	0.064	0.194	100.48
NR-7	3	0.04	15.32	49.33	0.23	24.4	0.35	9.61	0.051	0.264	99.59
NR-7	4	0.53	14.24	44.36	0.14	29.49	0.33	10.61	0.068	0.156	99.92
NR-7	5	0.1	8.59	56.15	0.13	25.93	0.44	8.28	0.06	0.25	99.93
NR-7	6	0.65	6.98	36.17	0.03	39.99	0.29	12.97	0.272	0.039	97.37
NR-7	7	0.13	8.32	57.18	0.13	25.47	0.41	8.38	0.073	0.168	100.26
NR-7	8	1.56	16.58	43.98	0.14	23.45	0.23	13.41	0.217	0.105	99.67
NR-7	9	1.1	18.19	45.42	0.14	19.66	0.22	14.78	0.23	0.089	99.82
NR-7	10	0.04	17.48	49	0.24	23.51	0.35	9.57	0.041	0.259	100.49
NR-7	11	0.98	7.78	35.3	0.06	40.81	0.24	12.38	0.187	0.067	97.8
NR-7	12	0.06	7.28	57.35	0.19	28.98	0.57	4.88	0.016	0.435	99.75
NR-7	13	0.48	6	47.26	0.04	32.28	0.32	12.2	0.118	0.069	98.77
NR-7	14	0.06	12.29	53.96	0.28	23.59	0.38	8.77	0.024	0.264	99.61
NR-7	15	0.38	41.81	24.24	0.13	15.16	0.16	18.41	0.23	0.07	100.58
NR-7	16	0.14	8.33	59.76	0.07	18.4	0.29	13.05	0.135	0.089	100.27
NR-7	17	2.62	16.84	38.91	0.15	27.29	0.22	12.44	0.264	0.123	98.85
NR-7	18	0.15	18.96	49.36	0.11	17.58	0.27	13.68	0.175	0.078	100.36
NR-7	19	0.46	14.1	46.34	0.14	29.19	0.52	7.94	0.06	0.419	99.17
NR-7	20	0.65	9.78	30.82	0.04	42.44	0.26	13.37	0.331	0.064	97.74
NR-8	1	1.3	16.37	45.2	0.14	23.51	0.29	11.82	0.204	0.11	98.94
NR-8	2	0.29	20.9	45.99	0.07	16.15	0.23	16.23	0.193	0.06	100.11
NR-8	3	0.12	7.6	57.98	0.22	25.3	0.41	7.55	0.03	0.248	99.46
NR-8	4	0.2	13.83	48.56	0.17	26.6	0.36	9.07	0.076	0.273	99.14
NR-8	5	0.23	15.23	50.08	0.12	21.55	0.32	12.06	0.054	0.196	99.84
NR-8	7	0.39	8.09	51.72	0.02	21.59	0.21	16.07	0.162	0.073	98.33
NR-8	8	1.29	24.49	34.57	0.2	25.02	0.22	13.95	0.201	0.09	100.04
NR-8	9	1.23	21.58	38.31	0.17	24.92	0.26	12.61	0.197	0.11	99.38
NR-8	10	1.1	17.97	45.89	0.15	18.02	0.22	15.57	0.251	0.073	99.25
NR-8	11	0.94	7.02	33.14	0.07	44.28	0.27	11.26	0.273	0.072	97.33
NR-8	12	0.27	21.45	43.18	0.22	22.01	0.31	11.82	0.085	0.202	99.54
NR-8	14	0.53	9.22	44.84	0.06	28.86	0.33	13.95	0.182	0.072	98.03
NR-8	15	0.2	8.51	56.25	0.06	23.93	0.36	9.41	0.042	0.103	98.87
NR-8	16	0.39	13.36	52.18	0.14	19.11	0.23	14.23	0.116	0.066	99.81
NR-8	17	1.31	19.96	40.16	0.15	26.01	0.29	11.08	0.217	0.08	99.25
NR-8	18	1.58	17.81	43.25	0.18	23.2	0.27	13.42	0.195	0.094	100.01
NR-8	19	0.38	6.18	44.95	0.01	32.9	0.32	13.31	0.206	0.06	98.32
NR-8	20	0.36	10.15	50.74	0.04	22.39	0.28	14.69	0.135	0.087	98.87
NR-10	1	0.06	12.01	53.17	0.25	24.24	0.4	8.63	0.003	0.286	99.05
NR-10	2	0.05	9.98	57.22	0.2	22.09	0.39	8.6	0.031	0.226	98.78
NR-10	3	0.05	17.44	51.2	0.12	15.59	0.24	14.93	0.147	0.047	99.77
NR-10	4	1.18	16.74	45.23	0.11	21.84	0.24	13.17	0.247	0.079	98.84
NR-10	6	1.21	18.96	43.44	0.14	20.3	0.19	15.04	0.224	0.092	99.6
NR-10	7	1.27	11.75	45.08	0.14	28.31	0.29	11.72	0.101	0.094	98.74
NR-10	8	0.29	10.09	56.38	0.07	17.6	0.23	14.26	0.143	0.088	99.14
NR-10	9	0.19	7.85	56.28	0.27	25.45	0.42	8.04	0.04	0.244	98.79
NR-10	10	0.03	16.81	49.8	0.29	21.73	0.37	10.16	0.036	0.279	99.51

NR-10	11	0.35	8	56.16	0.08	20.31	0.26	13.13	0.158	0.041	98.49
NR-10	12	1.36	19.42	42.86	0.22	22.54	0.24	13.15	0.195	0.09	100.08
NR-10	13	2.89	14.71	39.14	0.23	29.49	0.27	12.21	0.179	0.104	99.22
NR-10	15	0.63	7.78	35.72	0.05	39.4	0.26	13.85	0.285	0.033	98
NR-10	16	0.15	8.31	57.9	0.05	20.07	0.31	12.41	0.102	0.089	99.4
NR-10	17	0.4	16.05	44.96	0.21	27.37	0.34	10.13	0.086	0.215	99.77
NR-9	1	0.08	9.39	56.92	0.2	23.83	0.46	8.21	0.032	0.262	99.39
NR-9	2	0.98	18.32	45.37	0.13	19.34	0.23	14.31	0.232	0.064	98.97
NR-9	3	0.37	5.58	50.75	0.05	29.44	0.35	12.04	0.095	0.059	98.73
NR-9	4	0.09	8.44	54.62	0.19	28.54	0.5	6.52	0.029	0.363	99.27
NR-9	5	1.27	20.63	41.61	0.15	21.15	0.24	15.03	0.209	0.067	100.34
NR-9	6	0.61	7.73	49.32	0.09	30.43	0.4	10.46	0.088	0.113	99.24
NR-9	8	0.07	10.64	58.51	0.16	20.73	0.44	9.05	0.035	0.235	99.87
NR-9	9	1	17.65	45.87	0.11	18.5	0.22	15.23	0.223	0.081	98.89
NR-9	10	0.47	14.41	49.67	0.13	20.92	0.26	13.75	0.122	0.08	99.81
NR-9	11	0.38	11.36	49.12	0.07	26.23	0.31	11.17	0.066	0.113	98.83
NR-9	12	0.05	16.67	50.75	0.18	21.63	0.28	10	0.023	0.208	99.79
NR-9	13	0.52	9.17	46.58	0.09	34.83	0.6	6.67	0.042	0.226	98.73
NR-9	14	1.28	16.41	46.1	0.11	22.07	0.27	13.34	0.194	0.098	99.88
NR-9	15	0.26	16.58	47.61	0.22	24.89	0.33	9.62	0.049	0.216	99.78
NR-9	16	0.05	9.2	60.33	0.11	18.19	0.31	10.87	0.023	0.195	99.26
NR-11	1	0.03	7.41	60.58	0.22	21.72	0.35	9.11	0.026	0.207	99.65
NR-11	2	1.2	19.36	43.86	0.11	18.39	0.16	15.96	0.237	0.075	99.34
NR-11	4	1.34	19.2	41.9	0.14	21.31	0.21	15.19	0.238	0.074	99.6
NR-11	5	0.08	6.4	63.14	0.11	21.26	0.37	8.68	0.023	0.175	100.23
NR-11	6	0.07	8.9	60.78	0.05	16.59	0.32	12.24	0.063	0.179	99.2
NR-11	7	0.62	9.75	42.32	0.02	30.29	0.26	14.78	0.22	0.069	98.32
NR-11	8	0.14	9.2	58.62	0.07	15.24	0.24	15.24	0.138	0.075	98.95
NR-11	9	0.41	11.47	45.99	0.06	27.5	0.3	13.11	0.08	0.071	98.99
NR-11	10	0.79	13.01	37.16	0.06	31.07	0.25	15.53	0.264	0.044	98.17
NR-11	11	0.5	11.81	52.59	0.06	18.43	0.22	15.64	0.182	0.072	99.5
NR-11	12	0.08	13.39	52.92	0.16	22.74	0.34	9.72	0.043	0.374	99.77
NR-11	13	0.17	27.21	42.33	0.14	12.48	0.16	17.38	0.145	0.08	100.08
NR-11	14	0.36	11.62	52.63	0.11	23.38	0.3	11.52	0.068	0.093	100.06
NR-12	1	1.04	19.41	39.48	0.3	27.92	0.26	10.79	0.123	0.182	99.5
NR-12	2	0.13	18.18	44.24	0.2	27.93	0.44	8.58	0.089	0.274	100.07
NR-12	3	0.18	14.75	53.27	0.07	15.02	0.22	16.53	0.17	0.056	100.27
NR-12	4	0.75	12.77	49.16	0.3	23.68	0.25	12.28	0.116	0.072	99.37
NR-13	1	0.18	16.89	48.89	0.18	20.98	0.29	11.21	0.059	0.212	98.91
NR-13	2	0.15	9.86	54.51	0.04	25.86	0.49	8.59	0.067	0.097	99.66
NR-13	3	1.11	10.56	34.76	0.1	39.68	0.33	10.84	0.203	0.079	97.65
NR-13	4	0.64	9.03	39.11	0.03	34.85	0.31	13.88	0.239	0.074	98.15
NR-13	5	1.74	17.08	44.57	0.15	19.73	0.19	15.49	0.222	0.088	99.26
NR-13	6	1.39	18.53	40.46	0.16	27.04	0.29	10.84	0.201	0.099	99
NR-13	7	0.6	9.34	44.32	0.07	28.95	0.23	13.89	0.219	0.082	97.69
NR-13	8	0.95	23.19	37.17	0.14	22.41	0.22	13.83	0.218	0.081	98.21
NR-13	9	0.08	23.55	43.39	0.15	19.26	0.24	13.36	0.118	0.254	100.4
NR-13	10	1.33	12.12	37.43	0.09	32.12	0.23	14.68	0.27	0.054	98.3
NR-13	11	0.09	8.06	55.96	0.16	26.86	0.46	7.73	0.032	0.159	99.51
NR-13	12	0.01	9.96	59.1	0.18	21.04	0.36	9.45	0.038	0.226	100.36
NR-13	13	0.49	11.46	42.6	0.02	26.69	0.22	16.06	0.203	0.053	97.81

NR-13	14	0.49	14.75	49.47	0.09	18.88	0.26	14.75	0.2	0.082	98.98
NR-13	15	1.76	25.64	31.24	0.18	25.04	0.22	13.69	0.196	0.125	98.09
NR-13	17	0.24	32.06	34.28	0.15	15.31	0.15	17.12	0.207	0.066	99.57
NR-14	1	0.26	17.3	51.11	0.09	15.48	0.21	15.29	0.172	0.045	99.95
NR-14	2	0.48	7.02	52.44	0.02	24.82	0.32	13.7	0.179	0.088	99.07
NR-14	3	0.12	10.22	54.53	0.14	26.14	0.47	7.47	0.04	0.248	99.38
NR-14	4	0.14	8.33	57.06	0.04	25.04	0.37	8.29	0.125	0.103	99.5
NR-14	5	1.55	14.33	48.44	0.11	20.01	0.22	14.7	0.228	0.094	99.68
NR-14	6	1.29	19.16	43.56	0.16	19.94	0.21	15.07	0.229	0.08	99.7
NR-14	7	0.19	18.65	49.08	0.12	20.68	0.32	10.56	0.027	0.586	100.22
NR-14	8	2.43	12.79	43.5	0.17	27.36	0.27	12.17	0.189	0.096	98.98
NR-14	9	2.13	14.02	44.13	0.16	25.21	0.24	12.88	0.211	0.094	99.06
NR-14	10	0.8	15.81	45.83	0.15	23.56	0.28	12.57	0.118	0.108	99.23
NR-14	11	0.32	13.37	48.36	0.16	28.12	0.42	8.53	0.054	0.201	99.54
NR-14	12	1.67	19.62	38.62	0.17	29.79	0.29	9.09	0.198	0.123	99.56
NR-14	13	0.22	16.06	50.89	0.16	21.72	0.45	10.07	0.045	0.307	99.91
NR-14	15	0.6	7.89	33.94	0.03	43.53	0.46	10.87	0.274	0.1	97.69
NR-14	16	1.03	24.39	38.14	0.21	21.28	0.27	14.32	0.131	0.087	99.85
NR-15	1	2.35	16.54	40.49	0.2	25.33	0.24	13.44	0.219	0.096	98.89
NR-15	2	0.35	31.02	26.46	0.13	26.74	0.23	13.95	0.113	0.117	99.11
NR-15	3	0.12	7.7	53.58	0.16	29.23	0.41	7.47	0.049	0.231	98.95
NR-15	5	0.12	8.3	60.17	0.06	14.92	0.2	15.76	0.188	0.066	99.79
NR-15	6	0.46	19.12	41.2	0.24	28.41	0.36	8.8	0.06	0.263	98.92
NR-15	7	0.46	10.07	51.39	0.12	25.31	0.29	11.3	0.105	0.081	99.12
NR-15	8	0.97	10.33	28.55	0.07	44.35	0.26	12.48	0.295	0.064	97.37
NR-15	9	0.6	11.08	40.25	0.05	33.19	0.27	12.74	0.117	0.091	98.39
NR-15	10	0.05	18.5	49.6	0.21	18.44	0.27	12.42	0.073	0.207	99.77
NR-15	12	0.51	7.76	33.37	0.02	41.85	0.28	13.12	0.29	0.073	97.28
NR-15	13	0.55	8.09	48.34	0.04	28.58	0.31	12.64	0.145	0.084	98.78
NR-15	14	0.53	10.6	52.05	0.2	23.47	0.3	12.03	0.113	0.1	99.4
NR-15	15	0.04	10.91	57.73	0.23	21.24	0.38	8.84	0	0.232	99.6
NR-15	16	0.04	9.18	56.28	0.08	25.42	0.4	7.86	0.056	0.396	99.72
NR-15	17	0.34	6.04	56.44	0.06	23.59	0.3	12.59	0.035	0.076	99.47
NR-16	1	0.02	26.92	40.47	0.16	19.53	0.31	12.65	0.086	0.236	100.38
NR-16	2	0.38	11.71	49.6	0.09	29.04	0.55	7.88	0.061	0.267	99.58
NR-16	3	0.33	11.4	49.76	0.17	27.82	0.41	9.08	0.093	0.141	99.2
NR-16	4	1.28	20.5	39.9	0.14	23.87	0.21	13.17	0.203	0.117	99.39
NR-17	1	1.75	19.24	38.15	0.2	26.67	0.24	12.7	0.177	0.098	99.2
NR-17	2	0.72	8.81	35.19	0.04	38.92	0.26	13.61	0.258	0.06	97.86
NR-17	3	2.93	17.45	37.97	0.21	26.35	0.23	13.76	0.266	0.104	99.27
NR-17	4	1.2	18.75	43.95	0.09	19.16	0.24	15.42	0.214	0.068	99.09
NR-17	5	0.47	6.95	34.97	0.03	41.41	0.27	12.93	0.249	0.058	97.33
NR-17	6	0.22	20.21	46.72	0.16	20.45	0.29	11.5	0.036	0.187	99.77
NR-17	7	0.13	15	50.76	0.21	22.74	0.35	10.67	0.073	0.168	100.09
NR-17	8	1.25	11.54	40.11	0.14	33.14	0.32	11.85	0.201	0.079	98.63
NR-17	9	0.04	14.81	51.47	0.2	23.69	0.4	9.13	0.027	0.279	100.04
NR-17	10	0.14	5.94	60.77	0.03	21.81	0.42	10.31	0.106	0.09	99.61
NR-17	11	0.64	9.22	40.01	0.05	34.44	0.26	13.37	0.224	0.095	98.31
NR-17	13	0.08	27.81	39.08	0.17	19.33	0.27	13.28	0.098	0.275	100.39
NR-17	14	0.27	19	46.49	0.18	23.04	0.32	10.67	0.042	0.207	100.21
NR-17	15	0.88	18.33	34	0.17	34.88	0.36	9.79	0.093	0.214	98.72

NR-18	1	0.66	14.57	44.44	0.12	24.87	0.31	14.3	0.148	0.068	99.49
NR-18	2	0.05	21.87	44.91	0.26	20.42	0.31	11.87	0.07	0.258	100.01
NR-18	3	0.72	17.16	41.08	0.12	27.91	0.28	11.47	0.125	0.105	98.96
NR-18	4	1.24	21.49	40.05	0.16	21.75	0.16	14.52	0.211	0.064	99.64
NR-18	5	0.21	7.24	57.36	0.08	26.01	0.41	7.58	0.018	0.168	99.07
NR-18	8	0.07	12.73	51.77	0.22	25.03	0.4	9.17	0.039	0.228	99.65
NR-18	9	0.39	8.11	52.7	0	21.43	0.27	16.01	0.135	0.067	99.12
NR-18	10	2.97	13.1	41.21	0.19	29.21	0.26	12.1	0.183	0.085	99.3
NR-18	11	0.26	19.34	43.73	0.14	26.03	0.37	9.62	0.05	0.221	99.76
NR-18	12	1.17	17.98	45.03	0.13	19.8	0.24	14.85	0.222	0.064	99.47
NR-18	13	0.49	9.7	46.61	0.06	29.01	0.31	12.71	0.118	0.078	99.07
NR-18	14	0.69	11.13	48.25	0.11	29.45	0.53	8.7	0.109	0.157	99.14
NR-18	15	1.31	15.61	46.79	0.13	21.69	0.2	13.74	0.204	0.093	99.75
NR-18	16	0.1	11.25	56.32	0.09	21.48	0.33	9.82	0.04	0.236	99.66
NR-18	17	0.54	8.05	56.89	0.07	23.67	0.4	9.6	0.049	0.152	99.42
NR-18	18	0.15	7.64	60.83	0.05	14.07	0.27	15.9	0.194	0.049	99.15
NR-19	1	0.84	29.08	33.84	0.14	19.01	0.2	16.2	0.246	0.087	99.63
NR-19	2	0.7	7.11	43.22	0.07	34.65	0.32	11.92	0.106	0.097	98.19
NR-19	3	0.03	5.05	61.94	0.14	24.94	0.43	7.01	0.014	0.213	99.75
NR-19	4	0.15	13.71	51.22	0.13	23.09	0.32	11.34	0.067	0.149	100.17
NR-19	5	0.14	13.01	51.08	0.14	24.19	0.25	10.92	0.115	0.149	99.99
NR-19	6	0.03	20.74	45.87	0.22	22.89	0.42	9.71	0.028	0.304	100.21
NR-20	1	0.2	19.13	49.74	0.12	13.97	0.24	16.33	0.194	0.073	99.98
NR-20	2	1.4	18.36	42.34	0.12	24.96	0.26	11.98	0.218	0.099	99.73
NR-20	3	0.07	8.3	60.27	0.11	21.11	0.32	9.78	0.04	0.236	100.23
NR-20	4	0.09	6.66	59.43	0.23	25.93	0.39	6.97	0.028	0.255	99.98
NR-20	5	0.58	10.11	44.73	0.05	28.4	0.26	14.31	0.137	0.076	98.65
NR-20	6	0.04	13	52.64	0.17	24.47	0.42	9.13	0.033	0.262	100.15
NR-20	7	0.02	23.52	44.84	0.2	19.04	0.24	12.37	0.049	0.22	100.5
NR-20	10	1.35	17.66	41.44	0.14	25.6	0.25	12.29	0.181	0.114	99.01
NR-20	11	0.04	17.43	47.45	0.26	24.65	0.38	9.41	0.045	0.299	99.97
NR-20	12	0.12	9.03	56.08	0.06	26.61	0.48	7.58	0.114	0.154	100.24
NR-20	13	0.05	6.69	61.74	0.29	23.03	0.46	7.84	0.036	0.25	100.39
NR-20	14	0.73	9.64	36.96	0.04	36.14	0.31	13.68	0.25	0.059	97.82
NR-20	15	2.35	12.36	43.54	0.21	29.58	0.25	10.39	0.177	0.151	99
NR-20	16	0.13	7.86	60.9	0.06	20.3	0.36	10.25	0.033	0.235	100.13
NR-21	1	0.68	15.22	45.02	0.15	26.82	0.38	10.71	0.069	0.159	99.21
NR-21	2	0.19	32.83	28.82	0.15	23.35	0.21	13.29	0.162	0.261	99.25
NR-21	3	0.68	9.4	39.97	0.09	35.5	0.33	11.88	0.215	0.115	98.17
NR-21	4	1.12	17.74	45.8	0.13	18.52	0.18	15.56	0.21	0.069	99.32
NR-21	5	0.16	24.73	42.19	0.15	16.09	0.21	16.36	0.126	0.074	100.1
NR-21	6	0.42	7.45	52.61	0.11	29.97	0.4	7.96	0.082	0.205	99.2
NR-21	7	0.02	6.21	62.74	0.24	22.92	0.41	7.7	0.019	0.237	100.49
NR-21	8	0.09	35.72	31.47	0.14	13.8	0.19	18.13	0.215	0.109	99.85
NR-21	9	0.09	6.92	62.66	0.03	14.53	0.24	15.6	0.166	0.059	100.29
NR-21	10	0.49	6.68	34.58	0.02	42.49	0.25	12.96	0.288	0.074	97.83
NR-21	11	0.02	13.66	54.58	0.26	22.14	0.51	8.77	0.033	0.22	100.21
NR-21	12	0.25	16.53	44.88	0.27	27.32	0.37	9.39	0.066	0.239	99.31
NR-21	13	1.26	16.32	38.64	0.34	32.72	0.36	9.14	0.124	0.176	99.08
NR-21	14	1.4	10.15	28.74	0.08	44.9	0.25	11.64	0.304	0.068	97.53
NR-21	15	0.14	10.17	50.82	0.26	30.48	0.44	6.57	0.009	0.321	99.21

NR-21	16	0.92	9.13	43.03	0.08	33.06	0.31	11.7	0.079	0.098	98.4
NR-21	17	0.62	10.76	44.22	0.06	28.55	0.31	13.99	0.199	0.055	98.76
NR-21	18	0.85	29.65	20.73	0.26	34.5	0.25	12.61	0.033	0.124	98.99
NR-21	19	0.26	8.58	51.51	0.04	30.06	0.59	7.87	0.088	0.232	99.21
NR-21	20	0.6	9.15	36.48	0.05	39.53	0.4	11.62	0.218	0.072	98.11
NR-21	21	0.35	15.37	47.97	0.21	24.37	0.27	10.71	0.079	0.158	99.49
NR-21	22	0.56	10.15	39.81	0.03	33.09	0.23	13.87	0.235	0.08	98.05
NR-21	23	0.28	11.21	56.26	0.08	16.11	0.22	15.17	0.154	0.064	99.55
NR-21	25	0.19	11.39	54.39	0.13	23.74	0.34	9.47	0.056	0.172	99.88
NR-21	26	1.21	19.58	41.03	0.14	22.79	0.18	14.11	0.223	0.091	99.38
NR-21	27	0.7	30.48	28.29	0.18	25.16	0.26	14.34	0.118	0.114	99.63
NR-21	28	1.3	16.43	45.67	0.13	22.09	0.24	13.49	0.217	0.089	99.64
NR-21	29	0.29	5.32	50.14	0.05	36.02	0.52	6.67	0.068	0.153	99.22
NR-21	30	0.06	17.42	49.96	0.25	21.27	0.35	10.53	0.038	0.292	100.17
NR-21	32	0.07	6.86	58.13	0.13	26.11	0.42	8.04	0.031	0.228	100.02
NR-21	33	1.64	17.71	41.87	0.19	23.14	0.22	13.58	0.202	0.097	98.64
NR-21	34	0.24	11.86	49.13	0.1	24.46	0.41	12.88	0.115	0.094	99.28
NR-21	35	0.54	5.79	46.27	0.07	39.46	1.19	5.31	0.066	0.202	98.9
NR-22	1	1.71	18.06	40.86	0.17	25.21	0.31	12.56	0.182	0.083	99.14
NR-22	2	0.15	7.16	60.12	0.05	17.87	0.36	13.45	0.078	0.063	99.3
NR-22	3	0.14	17.66	47.99	0.2	23	0.29	10.38	0.075	0.135	99.86
NR-22	4	0.16	8.22	59.02	0.08	19.09	0.3	12.85	0.099	0.084	99.89
NR-22	6	0.21	18.12	46.49	0.23	24.36	0.38	9.82	0.03	0.226	99.86
NR-22	7	0.04	11.15	56.02	0.2	24.27	0.51	7.28	0.02	0.336	99.81
NR-22	8	1.44	19.71	41.04	0.14	22.18	0.23	14.73	0.244	0.078	99.79
NR-22	10	0.44	23	35.25	0.24	30.04	0.33	9.99	0.082	0.246	99.62
NR-22	12	0.04	14.17	50.58	0.21	25.29	0.4	8.76	0.059	0.228	99.73
NR-22	13	0.44	8.97	47.72	0.04	26.49	0.29	14.7	0.168	0.078	98.89
NR-22	15	1.54	17.3	43.65	0.15	21.67	0.23	14.36	0.23	0.077	99.21
NR-22	16	0.27	11.86	50.93	0.12	26.29	0.39	9.74	0.092	0.166	99.85
NR-23	1	0.06	20.23	45.19	0.2	21.44	0.27	12.46	0.107	0.207	100.15
NR-23	2	0.03	13.64	51.55	0.16	24.36	0.35	9.34	0.065	0.252	99.73
NR-23	3	1.2	17.61	39.98	0.34	31.01	0.38	8.44	0.098	0.372	99.42
NR-23	4	2.06	25.68	30.07	0.2	27.28	0.26	13.45	0.185	0.085	99.26
NR-23	5	2.11	21.43	36.85	0.16	24.1	0.22	14.06	0.171	0.096	99.19
NR-23	6	2.64	16.88	38.59	0.23	27.38	0.3	12.57	0.228	0.115	98.92
NR-23	7	0.89	21.49	41.08	0.14	25.77	0.3	10.05	0.157	0.107	99.97
NR-23	8	2.21	20.81	36.6	0.16	26.01	0.23	13.05	0.196	0.105	99.37
NR-23	9	1.03	18.32	45.21	0.12	20.97	0.25	13.57	0.218	0.087	99.77
NR-23	10	1.32	31.68	29.95	0.19	21.31	0.2	15.24	0.165	0.122	100.18
NR-23	11	0.09	11.62	56.99	0.08	20.82	0.32	10.13	0.048	0.22	100.31
NR-23	12	0.35	27.38	38.99	0.15	15.46	0.17	16.71	0.156	0.066	99.43
NR-23	13	0.67	10.03	43.39	0.07	30.28	0.25	13.57	0.116	0.04	98.41
NR-23	14	0.07	14.46	48.9	0.19	25.81	0.36	9.54	0.062	0.229	99.62
NR-23	15	2.38	16.32	39.41	0.22	28.68	0.29	11.58	0.198	0.119	99.19
NR-23	16	1.61	16.03	45.82	0.14	22.23	0.25	13.27	0.215	0.088	99.64
NR-23	17	0.63	8.48	51.29	0.1	25.34	0.39	12.81	0.052	0.113	99.19
NR-23	18	0.37	19.32	42.86	0.14	23.64	0.33	12.72	0.126	0.148	99.65
NR-23	19	0.06	6.65	61.16	0.09	22.34	0.43	8.94	0.042	0.231	99.95
NR-23	20	0.06	14.29	52.11	0.21	23.88	0.32	8.73	0.059	0.357	100.02
NR-23	21	0.76	15.1	45.73	0.23	28.67	0.41	8.27	0.098	0.263	99.54

NR-23	22	1.65	22.65	22.19	0.29	40.65	0.3	10.63	0.084	0.11	98.54
NR-23	23	0.48	9.18	50.04	0.04	23.79	0.32	14.86	0.129	0.059	98.9
NR-23	24	1.24	15.32	47.11	0.1	19.6	0.21	14.96	0.234	0.077	98.85
NR-23	26	1.38	17.72	42.69	0.13	25.83	0.29	11.2	0.171	0.146	99.56
NR-23	27	0.44	9.85	50.53	0.04	23.22	0.28	14.69	0.1	0.086	99.23
NR-23	28	0.2	11.44	53.33	0.1	23.44	0.41	9.03	0.027	0.689	98.67
NR-23	29	0.55	21.59	41.4	0.08	22.34	0.28	13.17	0.146	0.119	99.68
NR-23	30	0.27	10.13	57.19	0.08	16.2	0.26	15.07	0.138	0.097	99.44
NR-23	31	1.9	15.5	42.82	0.19	25.49	0.26	12.93	0.209	0.112	99.41
NR-29	1	0.69	13.36	44.32	0.08	27.96	0.28	11.77	0.125	0.116	98.69
NR-29	2	0.42	9.02	55.92	0.08	18.41	0.24	15.4	0.199	0.071	99.77
NR-29	3	0.05	16.77	49.65	0.13	21.03	0.34	11.33	0.041	0.193	99.52
NR-29	4	0.32	9.72	50.79	0.01	21.45	0.2	15.66	0.168	0.059	98.38
NR-29	5	0.61	28.65	36.23	0.19	17.7	0.22	16.28	0.116	0.09	100.08
NR-29	6	0.52	12.7	47.93	0.11	25.96	0.3	11.78	0.103	0.084	99.48
NR-29	7	1.18	18.58	44.89	0.12	18.36	0.21	15.68	0.241	0.076	99.34
NR-29	8	0.6	8.47	52.09	0.09	26.95	0.35	9.83	0.095	0.098	98.58
NR-29	9	1.29	21.31	39.28	0.14	22.78	0.26	14.28	0.207	0.114	99.66
NR-29	10	0.62	9.24	39.14	0.05	34.83	0.29	13.5	0.237	0.055	97.95
NR-29	11	2.64	14.19	40.33	0.21	29.04	0.27	11.96	0.206	0.123	98.97
NR-29	12	0.51	7.13	50.18	0.06	27.04	0.27	13.11	0.19	0.053	98.54
NR-29	13	0.42	14.32	47.85	0.21	27.07	0.41	9.04	0.058	0.181	99.55
NR-29	14	0.09	12.91	53.68	0.14	21.76	0.31	10.71	0.074	0.193	99.87
NR-29	15	0.42	12.61	49.44	0.19	26.59	0.38	9.52	0.091	0.177	99.4
NR-29	16	0.48	8.29	43.16	0.04	32.15	0.21	13.33	0.221	0.083	97.95
NR-29	17	0.47	30.65	34.53	0.18	16.62	0.16	16.86	0.153	0.087	99.72
NR-42	1	0.56	8.12	36.84	0.05	38.91	0.27	12.48	0.14	0.058	97.42
NR-42	3	0.78	9.15	45.79	0.09	31.02	0.3	11.6	0.153	0.091	98.96
NR-42	4	0.07	11.96	53.8	0.17	24.67	0.41	8.16	0.026	0.314	99.58
NR-42	5	1.72	19.56	36.18	0.17	27.69	0.19	13.07	0.204	0.096	98.88
NR-42	6	1.36	20.95	38.42	0.15	24.43	0.22	13.7	0.197	0.071	99.49
NR-42	7	0.5	9.61	53.6	0.09	25.78	0.66	8.95	0.103	0.196	99.49
NR-42	8	0.07	21.11	44.72	0.2	21.98	0.32	10.93	0.05	0.253	99.63
NR-42	9	0.07	12.64	55.84	0.24	21.68	0.35	9.06	0.027	0.247	100.16
NR-42	10	0.2	16.28	42.36	0.21	31.35	0.34	8.45	0.146	0.276	99.62
NR-42	11	0.54	10.13	46.96	0.07	27.1	0.28	13.1	0.061	0.07	98.3
NR-42	12	0.07	13.07	55.58	0.17	19.33	0.29	11.27	0.042	0.196	100.01
NR-42	13	1.08	21.23	32.53	0.21	31.79	0.29	11.45	0.135	0.184	98.89
NR-42	14	0.02	18.07	50.19	0.18	19.1	0.29	11.57	0.046	0.243	99.71
NR-42	15	1.78	14.19	46.6	0.13	23	0.21	13.48	0.237	0.088	99.7
NR-42	16	2.64	15.44	38.45	0.18	30.82	0.24	11.14	0.181	0.106	99.2
NR-42	17	0.22	17.28	42.29	0.12	27.8	0.29	10.93	0.144	0.175	99.25
NR-42	18	0.04	8.16	58.26	0.24	23.89	0.4	7.75	0.034	0.286	99.05
NR-42	19	0.51	33.15	29.14	0.16	21.09	0.27	15.17	0.204	0.116	99.79
NR-42	20	0.83	25.29	32	0.2	27.42	0.23	12.94	0.111	0.106	99.12
NR-42	21	0.24	8.63	59.22	0.04	14.93	0.21	15.8	0.193	0.051	99.32
NR-42	22	1.6	16.66	44.14	0.19	23.21	0.21	13.32	0.215	0.113	99.65
NR-42	23	0.36	9.27	52.65	0.05	22.15	0.26	14.4	0.096	0.069	99.3
NR-42	24	0.41	10.63	47.85	0.07	26.07	0.3	12.96	0.046	0.092	98.43
NR-42	25	1.43	18	43.33	0.14	20.83	0.24	14.55	0.214	0.092	98.82
NR-42	26	0.23	7.13	56.17	0.05	24.93	0.37	9.91	0.078	0.1	98.95

NR-42	27	0.66	10.71	43.7	0.08	31.87	0.35	10.93	0.096	0.099	98.5
NR-42	28	2.38	15.72	38.47	0.16	32.17	0.28	9.46	0.145	0.143	98.93
NR-42	29	0.79	17.85	42.54	0.24	28.56	0.38	8.69	0.068	0.18	99.29
NR-42	30	0.1	10.21	53.41	0.16	31.26	0.6	3.49	0.094	0.212	99.53
NR-42	31	0.04	47.54	20.51	0.09	13.46	0.14	17.8	0.245	0.198	100.02
NR-42	32	0.73	33.76	22.33	0.16	26.63	0.2	14.74	0.132	0.093	98.77
NR-42	34	2.25	15.26	41.23	0.13	27.21	0.23	12.62	0.209	0.118	99.25
NR-42	35	0.15	6.47	61.35	0.04	15.32	0.23	15.21	0.162	0.067	99
NR-42	36	0.86	16.88	42.48	0.24	29.8	0.53	8.2	0.077	0.353	99.42
NR-42	37	2.94	16.65	34.88	0.19	31.69	0.22	12.05	0.255	0.12	98.99
NR-42	38	0.03	17.57	50.25	0.22	19.28	0.25	12.22	0.082	0.169	100.07
NR-42	39	0.08	6.25	61.06	0.22	23.34	0.35	7.62	0.006	0.287	99.2
NR-42	40	0.3	6.46	57.18	0.07	21.39	0.29	13.66	0.085	0.082	99.51
NR-42	41	0.27	6.49	56.37	0.04	22.36	0.24	13.62	0.114	0.069	99.57

Nice Creek Area Electron Microprobe Data
(NR Sample Series)

Sample	Grain	TiO2	Al2O3	Cr2O3	V2O3	FeO	MnO	MgO	NiO	ZnO	Total
NR-1	1	2.45	14.05	41.51	0.25	30.18	0.25	11.27	0.179	0.099	100.23
NR-1	2	1.24	13.23	46.49	0.13	30.94	0.37	7.28	0.106	0.144	99.93
NR-1	3	1.51	19.43	42.73	0.14	20.51	0.21	15.63	0.234	0.063	100.46
NR-1	4	0.52	11.85	51.13	0.08	20.85	0.24	14.85	0.077	0.075	99.68
NR-1	5	0.19	6.85	57.34	0.03	24.96	0.37	10.31	0.04	0.126	100.2
NR-1	6	0.21	8.46	56.48	0.06	23.46	0.36	10.17	0.083	0.138	99.43
NR-1	7	0.04	9.69	55.3	0.18	26.05	0.37	8.07	0.047	0.314	100.07
NR-1	8	0.02	7.8	60.63	0.33	22.7	0.41	7.65	0	0.254	99.79
NR-1	9	1.15	16.96	46.23	0.15	20.79	0.21	14.59	0.16	0.094	100.33
NR-1	10	0.66	8.11	57.7	0.06	19.49	0.25	13.3	0.177	0.088	99.84
NR-1	11	1.04	0.56	0.02	0.57	86.4	0.32	0.01	0	0.033	88.95
NR-1	12	0.05	7.63	60.42	0.26	24.05	0.46	7.67	0.016	0.244	100.79
NR-1	13	1.56	23.77	37.32	0.23	22.42	0.18	15.23	0.22	0.069	101
NR-1	14	2.12	19.71	35.22	0.27	30.95	0.27	11.52	0.197	0.092	100.35
NR-1	15	0.61	15.21	45.43	0.15	23.18	0.21	14.65	0.134	0.074	99.64
NR-1	16	1.43	14.76	48.59	0.15	20.31	0.24	14.8	0.207	0.087	100.58
NR-1	17	0.83	9.96	40.5	0.1	37.09	0.38	9.75	0.062	0.133	98.81
NR-1	18	1.08	18.91	44.85	0.15	21.89	0.26	13.15	0.232	0.116	100.63
NR-1	19	1.59	19.25	39.38	0.2	26.17	0.23	13.06	0.177	0.075	100.14
NR-2	1	0.6	8.35	44.15	0.02	32.14	0.32	13.86	0.175	0.056	99.67
NR-2	2	1.71	18.42	41.85	0.2	23.7	0.2	13.67	0.24	0.083	100.07
NR-2	3	0.76	12.1	48.56	0.14	25.56	0.31	12.54	0.105	0.1	100.17
NR-2	4	0.32	10.03	52.59	0.24	25.57	0.34	9.86	0.064	0.137	99.16
NR-2	6	0.24	19.82	45.84	0.13	21.96	0.35	11.61	0.051	0.201	100.2
NR-2	7	1.28	21.21	41.39	0.19	20.97	0.19	15.02	0.204	0.066	100.51
NR-2	8	0.04	14.24	50.67	0.25	26.66	0.38	8.11	0.036	0.4	100.78
NR-2	9	0.06	7.7	60.43	0.1	22.37	0.36	9.15	0.026	0.186	100.37
NR-2	10	1.69	17.63	41.33	0.17	27.12	0.29	12.02	0.218	0.112	100.59
NR-2	11	0.17	16.94	47.3	0.24	25.84	0.38	9.34	0.066	0.228	100.5
NR-2	12	0.66	8.43	39.28	0.09	41.75	0.5	7.58	0.105	0.172	98.56
NR-2	13	1.27	19.33	43.34	0.17	20.13	0.21	15.17	0.265	0.076	99.95
NR-2	14	0.47	8.09	53.57	0.03	27.38	0.33	10.03	0.105	0.135	100.14
NR-2	15	0.27	11.75	52.38	0.04	24.47	0.29	10.8	0.049	0.112	100.15
NR-2	16	0.02	7.25	61.8	0.29	22.91	0.43	7.4	0.01	0.293	100.4
NR-2	17	1.4	19.24	42.32	0.18	22.7	0.24	13.93	0.158	0.092	100.26
NR-2	18	0.21	10.05	57.08	0.1	16.33	0.24	15.83	0.144	0.073	100.06
NR-2	19	1.99	21.33	33.56	0.24	29.35	0.27	12.2	0.21	0.099	99.25
NR-2	20	0.91	20.51	46.2	0.17	16.21	0.15	17.02	0.234	0.071	101.47
NR-2	21	1.63	15.95	44.08	0.14	23.38	0.29	14.44	0.133	0.053	100.08
NR-2	22	0.55	11.89	50.44	0.09	22.76	0.28	13.65	0.066	0.069	99.78
NR-2	23	0.96	19.98	43.06	0.13	20.96	0.25	15.16	0.165	0.077	100.74
NR-2	24	0.26	7.65	56.25	0.09	20.68	0.29	14.48	0.078	0.043	99.82
NR-2	25	0.03	5.26	61.72	0.13	24.66	0.39	7.19	0.008	0.274	99.65
NR-2	26	1.88	16.9	43.15	0.18	22.7	0.19	14.5	0.233	0.074	99.79
NR-2	27	0.14	27.9	38.15	0.18	22.06	0.27	11.85	0.064	0.15	100.76
NR-2	28	0.27	17.13	48.37	0.17	21.93	0.29	11.62	0.089	0.181	100.06
NR-2	29	1.39	17.35	45.86	0.17	20.01	0.21	15.06	0.222	0.06	100.34
NR-2	30	0.49	9.03	47.67	0.04	26.9	0.49	14.01	0.117	0.118	98.86
NR-2	31	1.94	15.54	44.35	0.22	23.81	0.19	14.02	0.186	0.079	100.34
NR-2	32	0.32	13.11	43.75	0.24	33.74	0.43	7.45	0.039	0.243	99.31

NR-2	33	0.35	8.69	53.34	0.05	20.9	0.21	15.63	0.139	0.057	99.36
NR-2	34	1.75	27.99	29.27	0.22	26.83	0.2	13.86	0.165	0.127	100.41
NR-2	36	1.98	14.46	44.64	0.17	24.66	0.27	13.42	0.217	0.103	99.92
NR-2	37	1.76	18.89	43.25	0.15	19.84	0.25	16.14	0.285	0.092	100.65
NR-2	38	0.1	10.85	56.93	0.14	21.3	0.38	10.56	0.043	0.13	100.42
NR-2	39	0.24	9.59	54.18	0.1	25.22	0.47	9.24	0.094	0.157	99.3
NR-2	40	0.29	10.34	54.95	0.08	24.02	0.36	9.87	0.053	0.159	100.12
NR-2	41	0.02	19.03	48.56	0.29	19.46	0.26	12.45	0.093	0.194	100.35
NR-3	1	0.35	8.08	44.63	0.05	36.59	0.5	7.62	0.117	0.195	98.13
NR-3	2	0.3	8.37	56.39	0.06	20.4	0.31	13.32	0.112	0.077	99.34
NR-3	3	2.26	19.34	37.82	0.22	24.98	0.16	14.3	0.262	0.07	99.4
NR-3	4	0.53	16.75	48.58	0.14	18.18	0.21	15.71	0.206	0.084	100.39
NR-3	5	1.11	11.48	36.29	0.13	35.94	0.28	12.95	0.165	0.062	98.4
NR-3	6	0.36	12.8	54.3	0.1	15.16	0.21	16.98	0.221	0.066	100.2
NR-3	7	1.58	16.69	42.81	0.19	24.23	0.26	13.77	0.246	0.098	99.88
NR-3	8	0.08	5.73	58.61	0.1	28.54	0.61	5.51	0.014	0.32	99.51
NR-3	9	1.84	13.82	43.48	0.14	26.82	0.26	12.91	0.19	0.089	99.55
NR-3	10	2.42	17.24	40.58	0.24	25.29	0.25	13.76	0.251	0.099	100.12
NR-3	11	1.77	17.37	42.25	0.25	24.72	0.2	12.99	0.209	0.116	99.86
NR-3	12	0.01	19.74	46.01	0.29	22.61	0.31	10.39	0.052	0.312	99.71
NR-3	13	0.46	10.48	53.44	0.02	19.12	0.25	15.85	0.148	0.06	99.82
NR-3	14	0.07	10.43	59.25	0.17	19.23	0.33	10.51	0.051	0.181	100.21
NR-3	15	1.13	22.91	41.37	0.16	17.78	0.22	16.47	0.227	0.069	100.35
NR-3	16	0.39	8.16	56.51	0.13	25.26	0.36	8.52	0.04	0.184	99.55
NR-3	17	0.87	26.61	24.78	0.29	34.06	0.22	11.98	0.101	0.081	99
NR-3	18	0.03	11.41	54.85	0.21	24.76	0.38	8.43	0.046	0.255	100.37
NR-4	2	1.36	18.9	42.75	0.19	21.66	0.26	14.3	0.218	0.07	99.71
NR-4	3	0.19	5.86	58.12	0.07	26.77	0.44	7.44	0.064	0.149	99.1
NR-4	4	3.04	16.94	35.28	0.47	31.78	0.34	11.27	0.135	0.117	99.36
NR-4	5	1.78	15.61	44.07	0.14	24.06	0.23	13.2	0.243	0.098	99.42
NR-24	2	1.32	16.95	45.38	0.13	20.16	0.2	15.09	0.216	0.081	99.53
NR-24	3	0.31	6.99	58.63	0.07	19.09	0.33	14.08	0.083	0.065	99.65
NR-24	4	3.04	13.72	38.45	0.19	30.72	0.21	11.73	0.193	0.103	98.36
NR-24	5	2.66	17.27	37.47	0.22	29.97	0.26	11.2	0.181	0.128	99.35
NR-24	7	2.27	19.24	39.23	0.17	23.26	0.2	14.89	0.241	0.087	99.57
NR-24	8	0.37	8.02	53.36	0	20.4	0.22	16.72	0.176	0.053	99.31
NR-24	9	0.41	14.2	47.92	0.08	20.78	0.24	15.21	0.09	0.048	98.98
NR-24	10	1.45	17.87	43.68	0.13	21.14	0.21	14.8	0.236	0.089	99.6
NR-24	11	0.06	8.32	59.28	0.16	22.31	0.38	8.52	0.021	0.24	99.3
NR-24	12	1.35	17.12	45.03	0.14	21.55	0.22	13.98	0.198	0.077	99.65
NR-24	13	1.72	15.16	45.58	0.13	22.04	0.21	14.57	0.204	0.064	99.68
NR-24	14	0.79	25.61	34.21	0.19	26.72	0.25	11.33	0.122	0.275	99.48
NR-24	15	0.44	10.97	48.38	0.14	27.09	0.28	11.98	0.075	0.069	99.43
NR-24	16	0.64	8.58	43.09	0.05	32.4	0.29	12.85	0.118	0.061	98.08
NR-24	17	1.64	16.26	45.57	0.14	20.2	0.22	15.28	0.275	0.069	99.64
NR-24	18	1.02	20.09	43.09	0.14	20.73	0.21	14.18	0.217	0.069	99.73
NR-24	19	1.7	14.9	44.31	0.14	23.37	0.21	14.66	0.219	0.089	99.6
NR-24	20	1.17	20.19	41.83	0.17	21.47	0.22	14.44	0.206	0.1	99.79
NR-24	21	0.06	4.7	59.18	0.13	28.19	0.48	6.34	0.026	0.291	99.39
NR-24	22	1.53	18.2	41.75	0.15	23.29	0.2	14.28	0.188	0.077	99.66
NR-24	23	1.23	18.32	44.54	0.13	19.49	0.19	15.67	0.25	0.072	99.88

NR-25	1	0.14	9.28	58.35	0.05	17.95	0.32	13.75	0.161	0.071	100.07
NR-25	2	0.36	11.47	50.26	0.08	25.78	0.32	11.18	0.078	0.122	99.64
NR-25	3	0.19	24.5	37.36	0.23	26.66	0.34	10.34	0.112	0.283	100.02
NR-25	4	0.31	16.78	43.67	0.13	27.65	0.39	10.35	0.095	0.189	99.57
NR-25	5	0.8	24.8	39.5	0.12	17.25	0.2	16.86	0.186	0.09	99.8
NR-25	6	0.08	11.97	55.91	0.17	21.5	0.38	9.76	0.037	0.25	100.05
NR-25	7	0.38	18.84	42.98	0.21	25.03	0.3	11.33	0.049	0.179	99.31
NR-25	8	2.48	12.9	44.37	0.19	25.67	0.25	13.1	0.188	0.088	99.23
NR-25	9	0.32	16.9	47.41	0.17	24.04	0.35	10.33	0.099	0.167	99.79
NR-25	10	0.14	9.15	59.16	0.07	15.66	0.25	15.51	0.163	0.064	100.17
NR-25	11	0.09	12.6	54.26	0.22	22.56	0.39	9.85	0.03	0.233	100.22
NR-25	12	1.43	19.7	41.65	0.12	22.09	0.19	14.32	0.243	0.092	99.85
NR-25	13	0.36	26.54	33.75	0.16	26	0.31	11.66	0.164	0.196	99.14
NR-25	14	0.14	8.27	58.9	0.04	17.31	0.3	14.56	0.13	0.082	99.74
NR-25	15	1.41	18.8	41.31	0.12	25.45	0.24	11.75	0.161	0.138	99.38
NR-25	16	0.18	7.92	57.15	0.06	22.12	0.36	11.06	0.084	0.096	99.02
NR-25	17	0.11	9.67	51.78	0.12	28.31	0.39	8.93	0.065	0.217	99.59
NR-25	18	1.3	19.58	41.6	0.12	22.08	0.23	14.4	0.219	0.097	99.61
NR-25	19	0.49	11.7	50.26	0.12	22.35	0.28	13.8	0.111	0.073	99.18
NR-26	1	0.12	0.06	0.13	0.13	89.19	0.07	0	0	0.049	89.74
NR-26	2	0.13	18.48	46.23	0.14	21.28	0.3	12.12	0.08	0.149	98.91
NR-26	3	1.85	18.68	37.87	0.16	28.78	0.26	11.55	0.225	0.126	99.51
NR-26	4	0.26	12.56	48.74	0.15	27.61	0.37	9.77	0.105	0.2	99.77
NR-26	5	1.47	19.56	39.38	0.15	25.03	0.25	12.88	0.193	0.1	99
NR-26	6	0.2	11.03	51.51	0.21	28.23	0.41	7.23	0.049	0.286	99.16
NR-26	7	0.03	8.11	60.76	0.06	21.5	0.42	8.05	0.005	0.221	99.15
NR-26	8	1.97	15.12	42.96	0.11	24.36	0.18	13.86	0.203	0.073	98.82
NR-26	9	1.25	13.44	30.81	0.09	40.9	0.39	10.55	0.138	0.087	97.65
NR-26	10	1.94	14.88	44.62	0.14	22.94	0.22	14.19	0.22	0.085	99.23
NR-26	11	1.21	19.36	42.15	0.16	22	0.27	13.84	0.229	0.115	99.34
NR-26	12	0.08	6.5	56.51	0.14	33.87	0.64	1.06	0.006	0.468	99.28
NR-26	13	1.15	19.89	41.22	0.13	22.65	0.23	14	0.179	0.079	99.52
NR-26	14	1.89	17.84	38.03	0.18	27.89	0.25	12.64	0.223	0.116	99.06
NR-26	15	0.71	31.5	32.56	0.14	16.84	0.16	16.9	0.176	0.088	99.07
NR-26	16	1.6	18.04	41.64	0.18	22.38	0.23	14.47	0.223	0.088	98.85
NR-26	17	1.62	15.39	44.83	0.13	22.33	0.26	14.15	0.221	0.071	99
NR-26	18	0.55	10.45	49.72	0.06	25.88	0.37	11.69	0.092	0.098	98.91
NR-26	19	1.52	18.16	42.34	0.17	25.87	0.29	10.78	0.199	0.108	99.44
NR-26	20	1.19	16.64	44.64	0.1	24.69	0.28	11.92	0.197	0.107	99.76
NR-26	21	1.64	14.86	45.64	0.11	22.33	0.19	14.4	0.209	0.087	99.47
NR-26	22	2.62	18.46	35.95	0.21	27.78	0.23	13.41	0.237	0.104	99
NR-26	23	2.69	14.88	39.01	0.2	29.44	0.3	12.03	0.2	0.1	98.85
NR-26	24	0.25	6.68	55.06	0.03	27.5	0.37	8.96	0.06	0.127	99.03
NR-27	1	0.16	15.42	47.74	0.16	26.09	0.39	8.75	0.055	0.305	99.06
NR-27	2	0.29	8.59	56.1	0.05	18.37	0.26	15.27	0.172	0.071	99.17
NR-27	3	0.06	7.98	59.01	0.16	23.48	0.43	7.91	0.046	0.229	99.3
NR-27	4	0.45	7.87	49.04	0.03	26.87	0.3	14	0.149	0.055	98.77
NR-27	5	1.32	22.54	37.14	0.16	23.24	0.26	14.56	0.198	0.086	99.5
NR-28	1	1.38	14.34	33.88	0.2	36.17	0.28	11.43	0.111	0.126	97.91
NR-28	2	1.88	16.66	41.57	0.15	24.74	0.19	13.7	0.211	0.087	99.18
NR-34	1	0.46	9.81	51.93	0.1	23.88	0.25	12.67	0.101	0.069	99.27

NR-34	2	0.26	9.05	49.81	0.13	30.13	0.35	9.26	0.072	0.141	99.2
NR-34	3	0.05	22.98	43.31	0.22	21.17	0.33	11.88	0.085	0.252	100.28
NR-34	4	1.42	16.83	45.2	0.13	21.16	0.22	14.29	0.182	0.081	99.52
NR-35	1	0.06	9.74	54.31	0.17	26.11	0.39	7.69	0.055	0.227	98.76
NR-36	1	0.01	22.89	44.97	0.26	18.43	0.29	12.97	0.091	0.187	100.08
NR-36	2	1.25	17.94	43.83	0.15	21.96	0.23	13.13	0.229	0.094	98.81
NR-36	3	2.84	15.56	36.92	0.17	31.07	0.25	11.44	0.198	0.13	98.57
NR-36	4	2.48	15.74	41.39	0.17	25.37	0.21	13.69	0.174	0.096	99.31
NR-36	6	0.97	17.39	46.66	0.11	18.86	0.24	14.67	0.25	0.068	99.22
NR-36	7	0.69	10.82	45.91	0.05	23.18	0.24	16.89	0.196	0.058	98.02
NR-36	8	1.52	15.5	48.14	0.15	18.69	0.23	15.18	0.212	0.073	99.68
NR-36	9	0.13	13.85	52.52	0.08	21.31	0.27	11.46	0.075	0.083	99.77
NR-36	10	1.14	16.34	46.07	0.14	22.75	0.27	12.21	0.189	0.113	99.22
NR-36	11	1.37	17.14	44.55	0.09	23.34	0.24	12.78	0.219	0.112	99.84
NR-37	1	0.31	5.5	58.98	0.04	21.43	0.33	12.5	0.056	0.07	99.21
NR-37	2	1.12	17.69	46.05	0.11	18.28	0.19	15.79	0.246	0.073	99.55
NR-37	3	0.08	11.31	53.86	0.14	24.92	0.41	8.61	0.045	0.233	99.61
NR-37	4	0.48	9.78	56.59	0.1	17.66	0.25	13.99	0.196	0.088	99.14
NR-37	6	0.19	21.15	42.6	0.17	23.57	0.33	11.14	0.075	0.196	99.42
NR-37	7	1.75	16.02	44.02	0.15	22.69	0.24	14	0.24	0.093	99.19
NR-37	9	0.02	15.81	51.74	0.33	21.37	0.39	9.93	0.028	0.292	99.9
NR-37	11	1.91	14.29	44.25	0.17	25.27	0.27	13.14	0.137	0.103	99.54
NR-37	12	1.45	21.6	37.54	0.13	25.69	0.2	12.46	0.198	0.099	99.38
NR-37	13	2.12	17.05	41.64	0.15	24.64	0.2	13.32	0.266	0.086	99.47
NR-37	14	1.68	18.37	39.24	0.16	26.37	0.26	13	0.239	0.109	99.42
NR-37	15	0.68	22.38	39.96	0.19	21.02	0.25	14.16	0.171	0.098	98.9
NR-37	16	0.06	9.9	59.3	0.16	20.13	0.37	9.92	0.029	0.227	100.1
NR-37	17	2.99	12.36	42.55	0.18	29.42	0.27	11.39	0.181	0.073	99.41
NR-38	2	1.6	19.39	39.4	0.14	25.13	0.24	13.24	0.188	0.071	99.4
NR-39	1	1.36	15.07	48.06	0.09	19.13	0.2	15.45	0.275	0.066	99.7
NR-39	2	0.27	18.68	47.75	0.1	22.37	0.4	10.32	0.085	0.254	100.23
NR-39	3	0.24	15.44	46.95	0.11	27.98	0.35	8.65	0.078	0.121	99.92
NR-39	4	0.04	17.34	50.38	0.29	21.23	0.34	10.4	0.033	0.282	100.34
NR-39	5	0.74	12.57	47.66	0.1	29.8	0.35	7.64	0.189	0.238	99.29
NR-39	6	1.35	16.84	42.89	0.17	27.94	0.32	9.9	0.124	0.143	99.68
NR-40	1	1.49	21.97	39.11	0.17	21	0.22	15.11	0.215	0.099	99.39
NR-40	2	0.07	6.11	57.47	0.13	28.7	0.51	6.41	0.036	0.29	99.73
NR-40	3	1.27	18.65	41.93	0.15	22.3	0.22	13.98	0.202	0.09	98.79

Cripple Creek Area Electron Microprobe Data
(NR Sample Series)

Sample	Grain	TiO2	Al2O3	Cr2O3	V2O3	FeO	MnO	MgO	NiO	ZnO	Total
NR-30	2	0.17	8.73	57.37	0.05	18.37	0.25	14.14	0.131	0.065	99.28
NR-30	3	0.37	9.5	52.06	0.04	25.58	0.33	11.36	0.139	0.111	99.47
NR-30	4	0.56	11.95	49.05	0.07	24.02	0.31	12.46	0.12	0.123	98.67
NR-30	5	0.24	24.8	37.42	0.19	25.4	0.28	10.81	0.08	0.214	99.42
NR-30	6	0.16	6.11	57.83	0.02	22.53	0.32	11.75	0.089	0.069	98.87
NR-30	7	0.09	11.68	52.48	0.19	25.36	0.38	8.59	0.05	0.217	99.04
NR-30	8	0.4	18.21	41.05	0.13	28.08	0.35	10.63	0.09	0.14	99.07
NR-30	9	0.45	8.72	54.06	0.07	21.77	0.3	13.36	0.109	0.055	98.9
NR-30	10	0.68	18.29	42.22	0.31	27.15	0.32	9.55	0.122	0.197	98.84
NR-30	11	0.15	8.68	56.91	0.05	18.61	0.27	13.8	0.123	0.065	98.66
NR-30	12	0.13	13.49	52.65	0.17	22.68	0.44	9.84	0.043	0.178	99.62
NR-30	13	1.25	14.84	47.63	0.13	22.89	0.25	12.44	0.236	0.096	99.75
NR-30	14	0.05	7.01	59.08	0.15	24.02	0.41	8.07	0.019	0.212	99.01
NR-30	15	1.69	15.32	44.48	0.1	23.09	0.21	13.88	0.222	0.071	99.08
NR-30	16	0.19	13.73	52.03	0.06	18.04	0.23	15.21	0.198	0.068	99.77
NR-30	18	1.05	27.58	36.21	0.11	17.62	0.19	16.6	0.222	0.072	99.65
NR-30	19	0.45	8.81	52.11	0.09	23.55	0.33	13.01	0.106	0.095	98.55
NR-30	20	2.88	23.13	29.99	0.26	29.29	0.25	13.22	0.173	0.118	99.31
NR-30	21	0.46	10.73	48.65	0.08	26.65	0.4	12.03	0.09	0.136	99.23
NR-30	22	1.17	16.43	46.85	0.11	18.95	0.19	15.24	0.226	0.064	99.22
NR-30	23	0.37	15.33	47.99	0.13	24.34	0.34	10.29	0.043	0.201	99.03
NR-30	24	1.72	20.69	36.8	0.14	25.9	0.21	13.47	0.193	0.089	99.2
NR-30	25	1.55	19.63	40.2	0.14	24.1	0.25	13.26	0.198	0.08	99.41
NR-30	26	1.25	18.87	43.23	0.12	19.92	0.18	15.24	0.225	0.083	99.13
NR-30	27	0.93	11.14	39.77	0.06	30.96	0.23	14.99	0.163	0.06	98.3
NR-30	28	0.11	9.27	55.07	0.17	25.43	0.35	8.56	0.058	0.202	99.21
NR-30	29	0.43	8.21	51.55	0.05	24.96	0.3	13.6	0.086	0.083	99.27
NR-30	30	0.48	12.67	46.1	0.08	26.76	0.3	12.81	0.1	0.078	99.37
NR-30	31	2.1	25.55	30.33	0.24	27.25	0.24	13.54	0.19	0.106	99.53
NR-30	33	0.25	11.33	47.77	0.09	29.7	0.42	9.38	0.104	0.174	99.22
NR-30	34	0.54	10.23	47.05	0.03	26.82	0.43	13.46	0.091	0.115	98.76
NR-30	35	1.11	16.88	38.48	0.34	33.99	0.39	7.56	0.126	0.2	99.07
NR-30	36	0.7	28.72	33.16	0.14	22	0.23	14.5	0.182	0.11	99.74
NR-30	37	1	20.33	38	0.22	27.3	0.27	12.21	0.038	0.128	99.49
NR-30	38	0.12	9.42	57.13	0.1	21.47	0.35	10.36	0.051	0.184	99.18
NR-30	39	0.09	7.78	59.47	0.14	22.97	0.41	8.86	0.031	0.185	99.94
NR-30	40	1.36	15.99	45.89	0.12	21.37	0.24	14.1	0.215	0.074	99.34
NR-30	41	0.13	8.26	50.5	0.17	33.26	0.46	6.12	0.061	0.299	99.26
NR-30	42	0.19	18.92	45.83	0.22	23.84	0.35	10.26	0.06	0.237	99.89
NR-30	43	0.28	11.65	54.82	0.07	20.34	0.31	12.09	0.109	0.119	99.79
NR-30	44	1.13	18.51	38.93	0.27	30.49	0.36	9.35	0.123	0.223	99.38
NR-30	45	0.46	8.25	49.91	0.1	27.78	0.33	11.5	0.054	0.087	98.46
NR-30	47	0.09	24.23	41.89	0.15	20.64	0.26	12.42	0.072	0.291	100.04
NR-30	48	0.45	31.13	29.99	0.11	21.76	0.24	15.16	0.149	0.095	99.07
NR-30	49	0.69	10.8	50.51	0.11	22.36	0.33	13.41	0.089	0.065	98.36
NR-30	50	0.61	19.53	41.01	0.32	26.71	0.29	10.65	0.12	0.216	99.44
NR-30	51	0.04	6.96	61.51	0.22	22.19	0.38	8.24	0.01	0.254	99.8
NR-31	1	0.19	7.87	59.8	0.06	16.83	0.2	14.37	0.167	0.063	99.55
NR-31	2	1.16	17.98	45.73	0.11	19.27	0.22	15.22	0.228	0.069	99.99
NR-31	4	0.02	20.7	45.26	0.21	21.63	0.28	11.59	0.073	0.208	99.97

NR-31	6	0.38	38.65	24.9	0.14	18.23	0.18	17.3	0.103	0.096	99.98
NR-31	7	0.44	27.98	35.81	0.15	22.66	0.31	12.54	0.13	0.22	100.23
NR-31	8	2.02	13.66	46.17	0.14	23.88	0.25	13.22	0.134	0.105	99.58
NR-31	10	0.59	11.38	48.46	0.12	26	0.32	12.27	0.105	0.071	99.32
NR-31	12	0.41	10.4	53.26	0.04	20.28	0.25	14.75	0.125	0.058	99.58
NR-31	13	0.25	8.53	50.78	0.03	29.36	0.46	9.71	0.101	0.117	99.33
NR-31	14	1.28	11.4	39.11	0.16	35.69	0.36	10.49	0.152	0.083	98.72
NR-31	15	1.21	17.26	42.5	0.11	28.11	0.29	10.11	0.13	0.123	99.85
NR-31	16	2.03	17.86	39.85	0.16	22.8	0.19	14.9	0.262	0.056	98.11
NR-31	17	0.51	7.51	34.71	0.04	40.83	0.2	13.77	0.283	0.052	97.9
NR-31	19	0.19	9.32	52.12	0.13	29.26	0.4	7.54	0.057	0.272	99.29
NR-31	20	0.15	14.15	52.21	0.17	23.26	0.39	9.22	0.068	0.287	99.9
NR-31	21	0.23	6.65	59.66	0.05	17.82	0.24	14.82	0.143	0.053	99.65
NR-31	22	2.29	10.86	44.89	0.17	27.22	0.26	12.37	0.142	0.117	98.3
NR-31	23	0.15	14.44	51.75	0.11	23.36	0.42	9.6	0.007	0.21	100.05
NR-31	26	0.69	9.52	39.26	0.05	35.28	0.34	12.42	0.241	0.077	97.89
NR-31	27	0.01	38.83	29.18	0.14	14.61	0.17	16.81	0.19	0.165	100.1
NR-31	28	0.43	15.15	46.23	0.09	27.09	0.4	9.44	0.068	0.221	99.11
NR-31	29	0.47	27.82	36.88	0.09	20.34	0.28	13.96	0.207	0.114	100.15
NR-31	30	1.3	18.73	43.16	0.15	20.88	0.23	14.89	0.231	0.079	99.63
NR-31	31	0.09	6.84	55.53	0.06	33.22	1.34	1.5	0.002	0.738	99.31
NR-31	32	0.33	11.14	54.91	0.08	18.75	0.26	13.88	0.129	0.078	99.54
NR-31	34	0.06	8.76	57.76	0.21	24.88	0.41	7.58	0.013	0.28	99.95
NR-31	35	0.63	14.07	-43.97	0.11	27.09	0.3	12.68	0.087	0.063	99
NR-31	36	0.09	20.42	46.38	0.08	19.73	0.26	12.91	0.117	0.11	100.09
NR-31	37	0.18	12.27	50.63	0.12	27.07	0.42	7.71	0.038	0.43	98.87
NR-31	38	0.33	16.59	45.26	0.22	27.76	0.37	8.84	0.061	0.225	99.66
NR-31	39	0	14.43	53.82	0.26	20.46	0.31	10.51	0.061	0.215	100.06
NR-31	42	0.25	8.71	57.56	0.08	20.71	0.3	12.22	0.105	0.1	100.03
NR-31	43	0.79	10.6	42.18	0.05	30.78	0.29	13.92	0.076	0.07	98.76
NR-31	44	1.65	17.2	42.62	0.15	26.96	0.33	10.01	0.186	0.154	99.26
NR-31	45	0.15	5.22	48.51	0.11	37.59	1.38	4.85	0.073	0.371	98.26
NR-31	46	1.74	15.31	45.81	0.13	21.73	0.21	14.29	0.232	0.058	99.51
NR-31	48	0.19	11.61	56.77	0.06	14.9	0.26	15.77	0.131	0.079	99.77
NR-31	49	0.07	19.86	46.92	0.2	21.12	0.31	11.02	0.042	0.222	99.76
NR-32	1	0.16	19.96	45.56	0.11	21.78	0.32	11.89	0.077	0.253	100.11
NR-32	2	1.11	9.37	36.89	0.04	36.97	0.29	12.54	0.173	0.089	97.47
NR-32	3	0.52	6.1	44.57	0.05	40.27	0.62	6.18	0.094	0.204	98.62
NR-32	4	1.04	10.09	35.89	0.07	36.19	0.3	13.66	0.218	0.045	97.49
NR-32	5	0.15	11.23	53.01	0.15	26.45	0.38	8.43	0.044	0.177	100.03
NR-32	6	0.04	21.57	45.78	0.2	19.92	0.32	12.08	0.065	0.196	100.16
NR-32	8	1.71	14.5	44.48	0.13	26.79	0.25	11.08	0.155	0.119	99.23
NR-32	9	0.01	5.68	59.74	0.22	27.42	0.49	5.96	0.005	0.321	99.85
NR-32	10	0.69	10.36	53.24	0.1	23.02	0.34	11.96	0.071	0.102	99.88
NR-32	12	0.35	9.98	50.86	0.11	31.05	1.32	5.11	0.053	0.901	99.73
NR-32	13	0.01	21.5	47.05	0.22	19.52	0.28	11.74	0.05	0.212	100.58
NR-32	14	0.43	15.46	48.64	0.13	21.09	0.24	13.59	0.121	0.086	99.77
NR-32	15	1.4	20.53	41.99	0.15	19.34	0.18	15.83	0.24	0.087	99.75
NR-32	16	0.75	23.87	35.86	0.18	25.77	0.22	12.79	0.112	0.109	99.67
NR-32	17	0.58	11.38	49.81	0.19	27.43	0.38	9.17	0.074	0.147	99.15
NR-32	18	0.03	9.37	58.65	0.24	22.52	0.39	8.37	0.025	0.254	99.85

NR-32	19	0.54	8.74	44.88	0.03	29.48	0.23	13.86	0.152	0.075	97.98
NR-32	20	0.03	8.98	60.74	0.12	19.35	0.34	10.12	0.03	0.225	99.94
NR-32	21	1.28	18.2	43.32	0.13	21.55	0.19	13.86	0.195	0.063	98.79
NR-32	22	0.61	8.83	35.23	0.03	39.34	0.26	12.71	0.279	0.097	97.39
NR-32	23	1.2	23.15	38.85	0.14	20.85	0.17	15.12	0.255	0.091	99.82
NR-32	24	0.15	7.8	59.5	0.05	18.27	0.27	12.99	0.134	0.075	99.25
NR-32	26	0.16	8.89	58.79	0.06	16.46	0.24	15.1	0.185	0.076	99.95
NR-32	27	0.09	11.89	52.19	0.16	26.54	0.42	8.45	0.049	0.216	99.99
NR-32	28	1.41	17.85	44.86	0.12	19.58	0.2	15.08	0.257	0.064	99.41
NR-33	1	0.08	36.09	32.33	0.1	14.98	0.24	15.44	0.108	0.197	99.57
NR-33	2	0.02	28.42	39.25	0.17	17.95	0.21	14.03	0.135	0.226	100.4
NR-33	5	0.23	12.96	49.29	0.19	28.12	0.37	8.33	0.052	0.202	99.73
NR-33	8	0.17	8.7	59.6	0.19	17.86	0.26	13.2	0.055	0.065	100.1
NR-33	9	0.44	6.09	51.7	0.03	29.02	0.32	9.73	0.139	0.088	97.56
NR-33	10	0.44	28.82	32.6	0.18	25.08	0.29	12.1	0.144	0.249	99.89

Pinto Creek Area Electron Microprobe Data
(NR Sample Series)

Sample	Grain	TiO2	Al2O3	Cr2O3	V2O3	FeO	MnO	MgO	NiO	ZnO	Total
NR-41	1	0.26	22.47	44	0.15	20.28	0.25	12.62	0.068	0.158	100.26
NR-41	2	1.08	21.98	41.33	0.12	19.97	0.22	14.86	0.215	0.074	99.85
NR-41	3	2.46	12.59	43.03	0.17	27.99	0.25	11.62	0.189	0.101	98.41
NR-41	4	0.1	6.83	61.84	0.06	14.7	0.23	15.23	0.147	0.043	99.17
NR-41	5	0.9	16.65	49.02	0.09	17.15	0.24	15.4	0.258	0.088	99.79
NR-41	6	0.62	11.26	37.26	0.05	34.7	0.25	13.52	0.231	0.06	97.94
NR-41	7	0.14	6.6	60.87	0.05	18.75	0.42	12.51	0.073	0.112	99.51
NR-41	8	0.71	14.24	39.11	0.12	33.44	0.3	10.76	0.09	0.127	98.9
NR-41	9	0.07	11.85	52.52	0.27	26.68	0.47	7.67	0.038	0.265	99.83
NR-41	10	0.02	25.59	42.4	0.21	18.87	0.27	12.28	0.058	0.32	100
NR-41	11	0.27	6.42	48	0.03	35.94	0.57	7.29	0.085	0.17	98.78
NR-41	13	0.59	10.56	47.88	0.1	27.24	0.31	12.1	0.052	0.089	98.91
NR-41	14	0.42	9.83	51.85	0	20.03	0.17	16.91	0.159	0.043	99.43
NR-41	15	0.37	25.17	34.12	0.22	29.17	0.3	10.01	0.098	0.3	99.75
NR-41	16	0.14	9.58	58.57	0.08	17.77	0.27	13.44	0.071	0.121	100.02
NR-41	17	0.06	6.45	60.57	0.2	24.72	0.47	7.27	0.02	0.262	100.03
NR-41	18	0.48	8.67	52.05	0.08	25.37	0.32	11.66	0.119	0.085	98.83
NR-41	19	0.8	16.03	35.83	0.14	34.46	0.3	11.07	0.113	0.158	98.91

Appendix II

Chromite Calculated Parameters Derived from Electron Microprobe Data

R5000 Sample Series Calculated Parameters

Takla Star Res. Ltd. R5000-series Processed Probe Data											
Sample	Grai	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Zn_ppm	Nomenclature
R5002	5	9.56	13.59	102.84	.658	.018	.632	.342	.115	277.	aluminous_ferrous_magnesiochromite
R5002	8	6.61	12.19	101.56	.701	.004	.459	.299	.074	992.	chromian_spinel
R5003	5	22.35	10.98	101.97	.718	.017	.515	.282	.272	57.	ferric_magnesiochromite
R5003	8	13.02	18.47	101.56	.510	.004	.531	.490	.157	968.	aluminous_ferrous_magnesiochromite
R5006	4	5.08	13.13	101.53	.664	.000	.582	.336	.058	789.	aluminous_magnesiochromite
R5006	6	22.47	12.35	102.53	.673	.011	.569	.327	.275	.	aluminous_ferrous_magnesiochromite
R5006	10	10.21	20.77	101.90	.423	.007	.706	.577	.130	659.	magnesian_chromite
R5007	7	12.12	11.17	102.98	.732	.026	.524	.268	.143	155.	titanian_aluminous_magnesiochromite
R5007	10	7.96	7.98	102.15	.800	.007	.643	.200	.092	65.	aluminous_magnesiochromite
R5008	1	13.95	12.47	102.32	.668	.006	.664	.332	.169	277.	aluminous_ferrous_magnesiochromite
R5008	6	6.39	7.99	101.83	.814	.000	.359	.186	.067	106.	chromian_spinel
R5008	7	5.66	12.82	101.19	.672	.001	.553	.328	.065	1285.	aluminous_magnesiochromite
R5009	3	5.07	13.99	100.86	.651	.000	.434	.349	.056	2066.	chromian_spinel
R5009	4	5.86	10.95	101.27	.734	.000	.418	.266	.064	1082.	chromian_spinel
R5009	8	14.64	13.49	101.39	.672	.042	.498	.328	.182	285.	titanian_aluminous_magnesiochromite
R5010	6	7.15	7.39	102.97	.821	.006	.574	.179	.080	.	aluminous_magnesiochromite

RS Sample Series Calculated Parameters

RS Series Processed Electronmicroprobe Data														
Sample-Grai	No.	Fe2O3	FeO	NewTo	Mg#	Ti#	Cr#	Fe2#	Fe3#	Ni_pp	Zn_pp	P-type	Nomenclature	T(Zn)
RS-1-1	1	18.66	14.88	100.05	.597	.011	.530	.403	.232	747.	464.	P3	aluminous_ferrous_magnesiochromite	
RS-1-4	4	4.32	17.34	99.02	.524	.002	.645	.476	.053	424.	1513.	nc	aluminous_ferrous_magnesiochromite	
RS-1-6	6	11.15	16.93	99.16	.576	.028	.420	.424	.137	1242.	496.	nc	chromian_spinel	
RS-1-7	7	3.92	11.09	99.32	.729	.001	.369	.271	.043	1666.	1139.	nc	chromian_spinel	
RS-1-8	8	3.05	17.00	99.56	.563	.000	.431	.437	.035	1360.	2424.	nc	chromian_spinel	
RS-2-1	15	17.59	14.34	99.17	.608	.010	.548	.392	.220	1069.	586.	P3	aluminous_ferrous_magnesiochromite	
RS-2-4	18	10.58	16.79	100.09	.560	.031	.601	.440	.135	2326.	1472.	nc	aluminous_ferrous_magnesiochromite	
RS-2-8	22	12.22	11.45	99.30	.687	.005	.661	.313	.151	864.	260.	nc	aluminous_ferrous_magnesiochromite	
RS-2-10	24	10.19	18.85	99.43	.497	.024	.588	.503	.131	1525.	1033.	nc	titanian_magnesian_chromite	
RS-2-13	27	22.56	13.72	99.79	.619	.009	.536	.381	.284	1760.	700.	nc	aluminous_ferrous_magnesiochromite	
RS-2-14	28	3.51	13.42	98.96	.663	.000	.434	.337	.039	574.	659.	nc	chromian_spinel	
RS-2-15	29	29.09	11.62	100.64	.692	.017	.398	.308	.356	2499.	439.	nc	ferric_magnesiochromite	
RS-2-16	30	5.98	11.71	99.65	.723	.002	.253	.277	.063	2067.	1033.	nc	ferrous_spinel	
RS-2-17	31	3.97	17.43	100.03	.508	.001	.746	.492	.049	1029.	2334.	nc	aluminous_ferrous_magnesiochromite	
RS-2-18	32	4.43	14.13	99.46	.642	.001	.434	.358	.050	1336.	1814.	nc	chromian_spinel	
RS-2-19	33	4.27	19.11	99.93	.437	.001	.844	.563	.055	1092.	2505.	nc	magnesian_chromite	
RS-3-1	34	23.94	13.48	99.30	.623	.011	.545	.377	.305	1752.	521.	nc	aluminous_ferrous_magnesiochromite	
RS-3-2	35	4.74	21.39	99.60	.383	.002	.710	.617	.060	943.	3026.	nc	magnesian_chromite	
RS-3-3	36	5.87	20.52	98.80	.422	.002	.633	.578	.073	597.	1855.	nc	magnesian_chromite	
RS-3-4	37	3.40	21.12	98.59	.383	.001	.759	.617	.044	354.	2343.	nc	magnesian_chromite	
RS-3-5	38	10.54	20.58	99.13	.452	.017	.490	.548	.132	1328.	976.	nc	titanian_magnesian_chromite	
RS-3-6	39	5.89	14.45	99.37	.612	.002	.616	.388	.071	534.	1000.	P4	aluminous_ferrous_magnesiochromite	869.6
RS-3-8	41	17.20	10.59	99.15	.709	.007	.615	.291	.214	1611.	390.	nc	aluminous_ferrous_magnesiochromite	
RS-3-9	42	5.40	16.36	99.08	.568	.001	.512	.432	.063	456.	1611.	nc	aluminous_magnesiochromite	
RS-3-10	43	8.19	12.04	99.26	.670	.003	.703	.330	.101	1399.	602.	P1	aluminous_ferrous_magnesiochromite	1030
RS-3-12	45	13.27	19.52	99.41	.439	.005	.655	.561	.171	692.	1009.	nc	magnesian_chromite	
RS-3-15	48	9.21	17.64	98.64	.497	.006	.677	.503	.118	912.	602.	nc	magnesian_chromite	
RS-4-1	49	8.87	18.78	99.55	.498	.009	.529	.502	.108	629.	1497.	nc	magnesian_chromite	
RS-4-2	50	7.58	12.93	98.94	.642	.003	.716	.358	.094	967.	382.	P1	aluminous_ferrous_magnesiochromite	1216
RS-4-3	51	65.55	29.48	95.47	.000	.716	.000	1.000	.999	440.	1098.	nc	magnetite	
RS-4-4	52	10.08	14.75	99.10	.617	.030	.594	.383	.128	1737.	578.	P3	aluminous_ferrous_magnesiochromite	
RS-5-1	53	8.97	12.99	99.08	.665	.018	.560	.335	.110	1713.	244.	P3	titanian_aluminous_magnesiochromite	
RS-5-2	54	6.48	18.49	99.51	.488	.002	.613	.512	.079	1257.	2684.	nc	magnesian_chromite	
RS-6-1	55	6.69	9.39	99.13	.743	.002	.724	.257	.081	1870.	1049.	nc	aluminous_ferrous_magnesiochromite	
RS-6-2	56	8.08	12.30	99.27	.683	.016	.572	.317	.098	1713.	301.	nc	titanian_aluminous_magnesiochromite	

RS-6-3	57	13.53	14.17	99.04	.649	.008	.291	.351	.153	794.	228.	nc	ferrous_spinel	
RS-6-4	58	30.70	12.11	100.15	.663	.011	.471	.337	.387	2185.	700.	nc	ferric_magnesiochromite	
RS-6-5	59	11.65	15.39	99.34	.604	.029	.534	.396	.147	1642.	488.	P3	aluminous_ferrous_magnesiochromite	
RS-6-8	62	11.10	21.84	99.32	.377	.008	.625	.623	.143	864.	1562.	nc	magnesian_chromite	
RS-6-9	63	7.54	12.69	99.37	.650	.004	.735	.350	.094	1249.	431.	P1	aluminous_ferrous_magnesiochromite	1161
RS-6-10	64	4.89	19.53	99.26	.436	.002	.771	.564	.063	416.	1968.	nc	magnesian_chromite	
RS-6-11	65	5.63	12.42	99.37	.698	.004	.361	.302	.062	872.	0.	nc	chromian_spinel	
RS-6-12	66	2.59	16.74	98.90	.526	.001	.770	.474	.033	472.	1594.	nc	aluminous_ferrous_magnesiochromite	
RS-6-13	67	17.56	11.99	99.92	.672	.009	.619	.328	.219	1415.	464.	nc	aluminous_ferrous_magnesiochromite	
RS-6-14	68	14.27	11.72	99.46	.683	.007	.611	.317	.176	786.	415.	P3	aluminous_ferrous_magnesiochromite	
RS-6-17	71	7.81	13.33	99.20	.656	.016	.566	.344	.095	1548.	390.	P3	titanian_aluminous_magnesiochromite	
RS-6-19	73	7.33	14.12	100.08	.604	.003	.789	.396	.092	794.	602.	P1_DI	aluminous_ferrous_magnesiochromite	1030
RS-6-20	74	6.65	14.34	99.62	.602	.003	.729	.398	.083	1289.	447.	P1	aluminous_ferrous_magnesiochromite	1146
RS-6-21	75	3.68	12.57	99.32	.697	.000	.330	.303	.040	1014.	659.	nc	chromian_spinel	
RS-6-22	76	6.37	14.08	99.85	.606	.002	.773	.394	.079	1029.	464.	P1_DI	aluminous_ferrous_magnesiochromite	1130
RS-6-23	77	22.89	5.42	99.64	.853	.011	.569	.147	.281	1501.	1269.	nc	ferric_magnesiochromite	
RS-6-25	79	7.52	14.19	99.23	.632	.017	.578	.368	.092	1470.	179.	P3	aluminous_ferrous_magnesiochromite	
RS-6-26	80	11.08	19.07	99.09	.503	.035	.526	.497	.144	1910.	919.	nc	aluminous_ferrous_magnesiochromite	
RS-6-27	81	7.01	20.21	98.85	.415	.002	.722	.585	.090	644.	1383.	nc	magnesian_chromite	
RS-6-28	82	6.94	15.23	98.77	.565	.003	.783	.435	.089	888.	805.	nc	aluminous_ferrous_magnesiochromite	
RS-6-29	83	6.77	15.62	98.82	.604	.008	.421	.396	.079	1187.	252.	nc	chromian_spinel	
RS-6-30	84	16.42	11.27	98.97	.687	.007	.657	.313	.207	1218.	464.	nc	aluminous_ferrous_magnesiochromite	
RS-6-31	85	10.61	16.44	98.77	.526	.004	.735	.474	.137	974.	781.	nc	aluminous_ferrous_magnesiochromite	
RS-6-32	86	15.07	14.12	99.06	.610	.013	.635	.390	.192	707.	594.	nc	aluminous_ferrous_magnesiochromite	
RS-6-33	87	6.93	14.26	99.08	.622	.003	.556	.378	.082	1139.	765.	nc	aluminous_magnesiochromite	
RS-6-35	89	8.06	13.29	99.10	.653	.016	.598	.347	.099	1336.	407.	P3	aluminous_ferrous_magnesiochromite	
RS-6-36	90	15.31	14.36	99.54	.610	.013	.587	.390	.192	1304.	748.	nc	aluminous_ferrous_magnesiochromite	
RS-6-37	91	3.94	20.27	98.94	.412	.001	.773	.588	.051	220.	1489.	nc	magnesian_chromite	
RS-6-38	92	6.02	9.72	98.73	.757	.003	.452	.243	.068	1202.	0.	nc	chromian_spinel	
RS-7-1	93	5.04	16.85	99.18	.550	.000	.543	.450	.060	566.	1912.	nc	aluminous_ferrous_magnesiochromite	
RS-7-2	94	10.33	26.82	99.57	.153	.005	.668	.847	.138	857.	9330.	nc	magnesian_aluminous_chromite	
RS-10-1	96	61.89	30.81	95.13	.000	.872	.000	1.000	.996	487.	960.	nc	magnetite	
RS-10-6	101	6.36	14.61	99.20	.636	.009	.415	.364	.073	699.	0.	nc	chromian_spinel	
RS-10-7	102	19.83	12.94	99.44	.639	.007	.611	.361	.251	629.	0.	nc	aluminous_ferrous_magnesiochromite	
RS-11-1	106	6.99	17.74	99.17	.525	.002	.530	.475	.084	550.	984.	nc	aluminous_ferrous_magnesiochromite	
RS-11-2	107	13.53	18.42	98.74	.465	.005	.690	.535	.176	637.	203.	nc	magnesian_chromite	
RS-12-1	108	4.17	17.60	99.10	.494	.002	.734	.506	.053	385.	5653.	nc	magnesian_chromite	

RS-13-1	109	7.77	14.33	98.84	.601	.004	.713	.399	.097	943.	0.	nc	aluminous_ferrous_magnesiochromite	
RS-13-2	110	7.64	15.13	98.80	.608	.004	.469	.392	.089	621.	33.	nc	aluminous_magnesiochromite	
RS-13-3	111	6.16	15.38	98.99	.605	.003	.454	.395	.071	495.	244.	nc	chromian_spinel	
RS-13-4	112	10.03	15.19	99.44	.605	.024	.577	.395	.126	1548.	358.	P3	aluminous_ferrous_magnesiochromite	
RS-13-6	114	7.83	13.73	99.39	.663	.005	.340	.337	.087	1383.	268.	nc	chromian_spinel	
RS-13-7	115	8.72	14.02	99.24	.636	.015	.557	.364	.106	1572.	293.	P3	titanian_aluminous_magnesiochromite	
RS-13-8	116	4.54	14.59	98.57	.621	.003	.508	.379	.053	652.	935.	nc	aluminous_magnesiochromite	
RS-13-9	117	6.83	11.85	98.73	.709	.004	.359	.291	.076	825.	0.	nc	chromian_spinel	
RS-13-10	118	5.50	11.95	99.79	.692	.000	.543	.308	.063	723.	342.	nc	aluminous_magnesiochromite	
RS-13-11	119	4.27	14.69	99.76	.617	.001	.551	.383	.050	424.	740.	P4	aluminous_magnesiochromite	959.3
RS-14-1	120	7.89	13.64	99.53	.647	.014	.566	.353	.095	1454.	285.	P3	titanian_aluminous_magnesiochromite	
RS-14-2	121	11.38	16.43	99.61	.575	.024	.524	.425	.142	1525.	504.	P3	aluminous_ferrous_magnesiochromite	
RS-14-3	122	9.56	15.15	99.66	.605	.023	.593	.395	.120	1658.	390.	P3	aluminous_ferrous_magnesiochromite	
RS-14-4	123	64.91	29.32	95.06	.000	.404	.001	1.000	.995	644.	968.	nc	magnetite	
RS-15-1	126	10.75	14.65	98.83	.589	.005	.682	.411	.136	684.	472.	nc	aluminous_ferrous_magnesiochromite	
RS-15-2	127	7.82	19.54	98.95	.466	.017	.627	.534	.100	1061.	1253.	nc	titanian_magnesian_chromite	
RS-15-4	129	21.08	6.91	99.50	.815	.009	.553	.185	.257	1226.	49.	nc	ferric_magnesiochromite	
RS-15-6	131	16.68	15.01	98.96	.580	.008	.609	.420	.212	817.	374.	nc	aluminous_ferrous_magnesiochromite	
RS-16-1	133	8.86	12.53	99.25	.679	.016	.541	.321	.107	1815.	155.	nc	titanian_aluminous_magnesiochromite	
RS-16-2	134	10.57	14.24	99.20	.635	.022	.526	.365	.130	1187.	33.	nc	titanian_aluminous_magnesiochromite	
RS-16-3	135	10.54	14.27	99.53	.601	.004	.720	.399	.133	487.	358.	nc	aluminous_ferrous_magnesiochromite	
RS-16-4	136	21.00	11.72	99.36	.679	.011	.564	.321	.263	1470.	220.	nc	aluminous_ferrous_magnesiochromite	
RS-16-5	137	20.33	12.30	100.10	.670	.015	.548	.330	.253	1399.	203.	P3	aluminous_ferrous_magnesiochromite	
RS-16-6	138	8.90	21.41	99.37	.370	.002	.747	.630	.116	527.	1383.	nc	magnesian_chromite	
RS-16-7	139	3.54	14.74	98.57	.606	.001	.602	.394	.042	699.	919.	P4	aluminous_ferrous_magnesiochromite	893.5
RS-16-8	140	19.96	11.82	99.79	.681	.010	.540	.319	.246	1391.	220.	P3	aluminous_ferrous_magnesiochromite	
RS-16-9	141	16.12	15.23	99.28	.588	.013	.550	.412	.202	582.	529.	nc	aluminous_ferrous_magnesiochromite	
RS-16-10	142	6.49	12.59	98.76	.687	.006	.380	.313	.073	1705.	748.	nc	chromian_spinel	
RS-16-11	143	3.58	17.93	99.36	.517	.004	.610	.483	.043	377.	1212.	nc	aluminous_ferrous_magnesiochromite	
RS-16-13	145	11.04	19.01	99.36	.445	.005	.742	.555	.144	896.	1627.	nc	magnesian_chromite	
RS-16-14	146	10.80	17.68	99.30	.541	.029	.519	.459	.137	1980.	1171.	nc	aluminous_ferrous_magnesiochromite	
RS-16-15	147	5.17	15.55	98.81	.598	.009	.506	.402	.061	825.	748.	nc	aluminous_magnesiochromite	
RS-16-16	148	10.49	14.75	99.30	.620	.031	.582	.380	.133	1650.	399.	P3	aluminous_ferrous_magnesiochromite	
RS-16-17	149	15.98	14.24	99.63	.617	.015	.554	.383	.199	912.	1245.	nc	aluminous_ferrous_magnesiochromite	
RS-16-18	150	5.69	21.60	98.62	.365	.001	.745	.635	.074	1517.	1554.	nc	magnesian_chromite	
RS-16-19	151	6.96	15.80	99.00	.575	.005	.568	.425	.084	1124.	1993.	nc	aluminous_ferrous_magnesiochromite	
RS-16-20	152	7.55	19.01	98.45	.460	.004	.652	.540	.096	904.	1798.	nc	magnesian_chromite	

RS-16-21	153	12.09	17.53	99.19	.568	.009	.232	.432	.136	1532.	1204.	nc	ferrous_spinel	
RS-16-22	154	12.20	15.68	99.81	.581	.006	.514	.419	.147	770.	960.	P4	aluminous_ferrous_magnesiochromite	881.1
RS-16-23	155	13.29	7.08	99.92	.809	.006	.688	.191	.162	1768.	862.	nc	aluminous_ferrous_magnesiochromite	
RS-16-24	156	11.33	15.47	99.74	.598	.034	.599	.402	.146	1894.	1009.	nc	aluminous_ferrous_magnesiochromite	
RS-16-25	157	3.55	9.76	98.11	.771	.000	.228	.229	.037	1965.	1375.	nc	chromian_spinel	
RS-16-26	158	12.35	15.82	99.27	.585	.036	.594	.415	.161	2082.	1212.	nc	aluminous_ferrous_magnesiochromite	
RS-16-27	159	7.65	15.04	98.72	.610	.005	.445	.390	.089	1344.	1578.	nc	chromian_spinel	
RS-16-28	160	3.47	14.67	98.47	.595	.002	.682	.405	.043	880.	1871.	nc	aluminous_ferrous_magnesiochromite	
RS-17-1	161	6.63	15.21	98.67	.593	.001	.518	.407	.078	1234.	2269.	nc	aluminous_magnesiochromite	
RS-17-3	163	7.66	14.42	99.30	.628	.019	.563	.372	.094	1682.	431.	P3	titanian_aluminous_magnesiochromite	
RS-17-4	164	5.73	15.77	98.82	.601	.006	.410	.399	.066	919.	1163.	nc	chromian_spinel	
RS-17-6	166	14.26	18.84	99.47	.520	.023	.355	.480	.173	786.	1643.	nc	ferrous_spinel	
RS-17-7	167	10.54	7.56	99.73	.797	.004	.672	.203	.127	2263.	854.	nc	aluminous_magnesiochromite	
RS-17-9	169	6.51	15.78	100.08	.580	.011	.605	.420	.079	1415.	1676.	nc	aluminous_ferrous_magnesiochromite	
RS-17-10	170	11.53	15.98	99.22	.588	.024	.476	.412	.142	1792.	1253.	nc	titanian_aluminous_magnesiochromite	
RS-18-1	171	5.91	15.22	98.70	.606	.001	.443	.394	.068	1116.	1407.	nc	chromian_spinel	
RS-18-2	172	9.27	21.07	98.68	.392	.003	.638	.608	.119	896.	2204.	nc	magnesian_chromite	
RS-18-4	174	8.80	12.11	98.95	.688	.020	.584	.312	.108	1556.	114.	nc	titanian_aluminous_magnesiochromite	
RS-20-1	175	6.99	15.28	99.13	.567	.003	.764	.433	.089	872.	496.	nc	aluminous_ferrous_magnesiochromite	
RS-20-2	176	5.55	18.88	99.64	.450	.002	.783	.550	.071	1257.	1407.	nc	magnesian_chromite	
RS-20-3	177	9.11	17.98	98.97	.515	.005	.522	.485	.111	676.	1155.	nc	aluminous_ferrous_magnesiochromite	
RS-20-5	179	9.48	17.99	98.99	.502	.005	.585	.498	.118	1053.	2042.	nc	aluminous_ferrous_magnesiochromite	
RS-20-6	180	65.21	29.47	95.35	.000	.277	.001	1.000	.994	495.	1041.	nc	magnetite	
RS-20-7	181	10.12	19.01	98.75	.479	.007	.532	.521	.125	1006.	2009.	nc	magnesian_chromite	
RS-20-8	182	9.48	17.26	100.47	.513	.005	.730	.487	.120	692.	1049.	nc	aluminous_ferrous_magnesiochromite	
RS-20-9	183	11.62	10.57	100.20	.717	.006	.654	.283	.141	1304.	447.	P3	aluminous_ferrous_magnesiochromite	
RS-20-10	184	6.73	19.66	99.36	.454	.004	.617	.546	.084	802.	1993.	nc	magnesian_chromite	
RS-20-11	185	17.64	10.80	100.18	.707	.010	.604	.293	.218	1941.	496.	nc	aluminous_ferrous_magnesiochromite	
RS-20-12	186	10.49	13.54	99.58	.634	.008	.626	.366	.129	1147.	732.	nc	aluminous_ferrous_magnesiochromite	
RS-20-13	187	6.73	11.57	100.04	.682	.002	.747	.318	.082	1493.	586.	P1	aluminous_ferrous_magnesiochromite	1039
RS-20-14	188	10.35	14.71	99.61	.623	.028	.559	.377	.130	1925.	350.	P3	aluminous_ferrous_magnesiochromite	
RS-20-15	189	9.46	17.12	97.85	.541	.017	.549	.459	.119	1430.	830.	nc	aluminous_ferrous_magnesiochromite	
RS-20-16	190	10.45	16.05	99.10	.590	.023	.475	.410	.128	1517.	537.	nc	titanian_aluminous_magnesiochromite	
RS-20-17	191	16.81	18.37	99.01	.469	.007	.636	.531	.219	1155.	968.	nc	magnesian_chromite	
RS-20-18	192	5.42	19.87	99.90	.433	.001	.746	.567	.069	361.	1171.	nc	magnesian_chromite	
RS-20-19	193	7.61	15.79	98.31	.577	.014	.590	.423	.095	1862.	578.	P3	aluminous_ferrous_magnesiochromite	
RS-20-20	194	6.93	12.84	99.29	.678	.005	.424	.322	.079	1163.	553.	nc	chromian_spinel	

RS-20-21	195	27.67	12.17	99.92	.660	.009	.518	.340	.350	2192.	586.	nc	ferric_magnesiochromite	
RS-20-22	196	4.45	15.77	98.64	.565	.001	.649	.435	.054	676.	2530.	nc	aluminous_ferrous_magnesiochromite	
RS-20-23	197	8.75	11.94	98.91	.685	.005	.570	.315	.105	1556.	260.	nc	aluminous_magnesiochromite	
RS-21-1	198	5.16	20.12	99.15	.411	.001	.791	.589	.067	401.	1895.	nc	magnesian_chromite	
RS-21-2	199	4.86	19.75	99.21	.443	.001	.669	.557	.061	511.	2408.	nc	magnesian_chromite	
RS-22-1	200	4.88	12.98	99.01	.680	.000	.363	.320	.054	1014.	496.	nc	chromian_spinel	
RS-22-2	201	15.95	20.84	98.91	.452	.044	.489	.548	.213	1304.	911.	nc	titanian_magnesian_chromite	
RS-22-5	204	6.79	20.29	98.89	.426	.002	.639	.574	.085	723.	2245.	nc	magnesian_chromite	
RS-22-7	206	65.26	29.49	95.45	.000	.450	.001	1.000	.996	527.	1228.	nc	magnetite	
RS-22-8	207	7.16	18.93	99.71	.484	.003	.578	.516	.087	794.	1415.	nc	magnesian_chromite	
RS-22-9	208	3.63	13.34	98.74	.655	.000	.515	.345	.042	511.	1448.	nc	aluminous_magnesiochromite	
RS-22-10	209	6.40	11.62	99.56	.696	.003	.595	.304	.075	1336.	301.	nc	aluminous_magnesiochromite	
RS-22-11	210	6.14	17.53	99.93	.499	.003	.791	.501	.078	739.	1066.	nc	magnesian_chromite	
RS-22-12	211	2.45	19.07	99.08	.457	.000	.748	.543	.031	299.	1936.	nc	magnesian_chromite	
RS-22-13	212	9.14	18.09	99.32	.511	.005	.539	.489	.111	778.	1204.	nc	aluminous_ferrous_magnesiochromite	
RS-22-14	213	13.72	14.86	99.41	.591	.006	.599	.409	.171	1077.	1277.	nc	aluminous_ferrous_magnesiochromite	

Kiska Creek Area Calculated Parameters
(NR Series)

Sample	Grain	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Ni_ppm	Zn_ppm	P-type	Nomenclature	T(Zn) C
NR-5	1	26.16	11.29	101.15	.694	.010	.518	.306	.323	1949	423	nc	ferric_magnesiochromite	
NR-5	2	6.23	8.75	100.23	.764	.003	.769	.236	.076	1462	390	nc	aluminous_ferrous_magnesiochromite	
NR-5	3	14.45	16.53	100.86	.547	.008	.628	.453	.181	1029	805	nc	aluminous_ferrous_magnesiochromite	
NR-5	4	11.22	13.69	100.69	.670	.004	.279	.330	.123	1092	708	nc	ferrous_spinel	
NR-5	6	2.47	14.59	99.90	.604	.001	.709	.396	.030	369	1554	nc	aluminous_ferrous_magnesiochromite	
NR-5	7	6.03	20.69	99.94	.407	.003	.742	.593	.077	472	1912	nc	magnesian_chromite	
NR-5	8	6.15	22.12	99.96	.365	.002	.700	.635	.078	220	2660	nc	magnesian_chromite	
NR-5	9	12.83	17.35	100.61	.556	.043	.582	.444	.168	1776	765	nc	aluminous_ferrous_magnesiochromite	
NR-5	10	8.53	15.46	100.15	.598	.020	.596	.402	.106	1595	667	nc	aluminous_ferrous_magnesiochromite	
NR-5	11	6.87	19.43	99.84	.451	.003	.718	.549	.087	495	1017	nc	magnesian_chromite	
NR-5	12	7.96	18.65	99.85	.481	.007	.692	.519	.101	534	813	nc	magnesian_chromite	
NR-5	14	8.61	22.34	100.68	.399	.010	.535	.601	.106	778	1554	nc	magnesian_aluminous_chromite	
NR-5	15	10.78	19.91	99.67	.475	.030	.562	.525	.140	1344	1131	nc	titanian_magnesian_chromite	
NR-5	18	3.14	18.82	101.02	.489	.000	.658	.511	.038	157	1928	nc	magnesian_chromite	
NR-5	22	8.97	19.90	100.49	.452	.003	.604	.548	.111	416	2099	nc	magnesian_chromite	
NR-5	23	6.40	17.53	99.96	.511	.002	.717	.489	.080	699	740	nc	aluminous_ferrous_magnesiochromite	
NR-5	24	8.25	21.90	100.40	.393	.004	.595	.607	.103	566	1814	nc	magnesian_chromite	
NR-5	26	4.35	28.61	99.99	.187	.002	.601	.813	.055	8	1391	nc	magnesian_aluminous_chromite	
NR-5	27	6.38	17.62	100.49	.504	.004	.760	.496	.081	1077	862	nc	aluminous_ferrous_magnesiochromite	
NR-5	28	12.74	19.99	100.43	.484	.043	.560	.516	.168	1611	887	nc	titanian_magnesian_chromite	
NR-5	29	9.66	12.69	100.83	.681	.019	.537	.319	.116	1713	553	nc	titanian_aluminous_magnesiochromite	
NR-5	30	5.35	17.70	100.84	.534	.002	.556	.466	.063	527	1188	nc	aluminous_ferrous_magnesiochromite	
NR-5	31	10.50	15.43	100.39	.577	.005	.673	.423	.130	582	830	nc	aluminous_ferrous_magnesiochromite	
NR-5	32	7.78	11.91	99.61	.673	.004	.745	.327	.097	1124	488	P1	aluminous_ferrous_magnesiochromite	1109.
NR-5	33	12.90	15.36	100.21	.592	.012	.558	.408	.159	1022	781	nc	aluminous_ferrous_magnesiochromite	
NR-5	34	15.12	14.39	100.00	.601	.006	.642	.399	.189	1147	569	nc	aluminous_ferrous_magnesiochromite	
NR-5	35	11.01	21.29	100.07	.437	.030	.554	.563	.143	1187	1188	nc	titanian_magnesian_chromite	
NR-5	36	23.15	11.46	99.68	.686	.010	.542	.314	.290	1713	521	nc	ferric_magnesiochromite	
NR-5	37	16.73	12.86	100.34	.647	.007	.629	.353	.208	1242	797	nc	aluminous_ferrous_magnesiochromite	
NR-5	38	6.12	18.07	100.04	.528	.003	.481	.472	.072	692	1480	nc	aluminous_magnesiochromite	
NR-5	39	13.93	13.46	100.08	.634	.008	.623	.366	.173	896	651	nc	aluminous_ferrous_magnesiochromite	
NR-5	40	7.98	19.10	100.80	.498	.017	.580	.502	.099	1139	1106	nc	titanian_magnesian_chromite	
NR-5	41	7.08	11.24	100.34	.712	.014	.610	.288	.085	1697	390	P3	titanian_aluminous_magnesiochromite	
NR-5	42	6.69	15.14	100.54	.596	.002	.614	.404	.080	833	1236	P4	aluminous_ferrous_magnesiochromite	814.
NR-6	1	3.56	17.14	100.78	.526	.001	.748	.474	.044	354	1700	nc	aluminous_ferrous_magnesiochromite	
NR-6	2	33.14	12.80	100.17	.646	.014	.430	.354	.420	2192	504	nc	ferric_magnesiochromite	

NR-6	3	7.36	13.45	100.42	.654	.017	.608	.346	.090	1438	618	nc	aluminous_ferrous_magnesiochromite	
NR-6	4	16.73	17.61	100.88	.558	.011	.303	.442	.194	1014	1049	nc	ferrous_spinel	
NR-6	5	2.57	19.63	100.81	.443	.001	.794	.557	.032	393	2286	nc	magnesian_chromite	
NR-6	6	8.56	12.51	100.93	.681	.019	.610	.319	.104	1454	634	nc	titanian_aluminous_magnesiochromite	
NR-6	7	12.73	18.38	101.66	.539	.037	.508	.461	.160	1572	781	nc	aluminous_ferrous_magnesiochromite	
NR-6	8	2.79	19.75	100.23	.443	.001	.755	.557	.035	157	2009	nc	magnesian_chromite	
NR-6	9	10.94	21.87	100.64	.403	.009	.538	.597	.136	794	2188	nc	magnesian_chromite	
NR-6	11	8.39	13.66	100.48	.652	.019	.567	.348	.102	1831	765	nc	titanian_aluminous_magnesiochromite	
NR-6	12	4.47	17.47	100.82	.538	.001	.571	.462	.053	409	2172	nc	aluminous_ferrous_magnesiochromite	
NR-6	13	2.28	14.73	100.75	.607	.000	.677	.393	.027	361	1456	nc	aluminous_ferrous_magnesiochromite	
NR-6	14	8.77	17.99	100.94	.535	.018	.540	.465	.107	1344	1025	nc	aluminous_ferrous_magnesiochromite	
NR-6	15	9.57	15.91	98.53	.549	.006	.721	.451	.123	1100	789	nc	aluminous_ferrous_magnesiochromite	
NR-6	16	5.44	14.76	100.76	.611	.004	.627	.389	.065	857	765	P4	aluminous_ferrous_magnesiochromite	949.
NR-6	17	4.14	17.04	100.30	.533	.002	.696	.467	.051	464	1765	nc	aluminous_ferrous_magnesiochromite	
NR-6	18	5.47	17.92	100.70	.497	.002	.774	.503	.069	275	944	nc	magnesian_chromite	
NR-6	20	9.35	14.48	100.39	.631	.027	.576	.369	.116	1980	862	nc	aluminous_ferrous_magnesiochromite	
NR-6	21	'3.23	15.36	100.94	.606	.000	.520	.394	.037	503	2090	nc	aluminous_magnesiochromite	
NR-6	22	9.62	16.47	100.42	.571	.023	.596	.429	.121	1611	822	nc	aluminous_ferrous_magnesiochromite	
NR-7	1	5.83	17.58	100.65	.512	.003	.725	.488	.072	432	1716	nc	aluminous_ferrous_magnesiochromite	
NR-7	2	6.51	19.93	101.13	.452	.004	.667	.548	.081	503	1578	nc	magnesian_chromite	
NR-7	3	5.84	19.14	100.18	.472	.001	.635	.528	.072	401	2147	nc	magnesian_chromite	
NR-7	4	12.54	18.21	101.18	.509	.008	.572	.491	.154	534	1269	nc	aluminous_ferrous_magnesiochromite	
NR-7	5	6.36	20.21	100.57	.422	.001	.749	.578	.081	472	2034	nc	magnesian_chromite	
NR-7	6	30.00	12.99	100.40	.640	.013	.481	.360	.380	2137	317	nc	ferric_magnesiochromite	
NR-7	7	5.83	20.23	100.84	.425	.002	.761	.575	.074	574	1367	nc	magnesian_chromite	
NR-7	8	9.30	15.09	100.60	.613	.021	.567	.387	.114	1705	854	nc	aluminous_ferrous_magnesiochromite	
NR-7	9	7.56	12.86	100.59	.672	.014	.570	.328	.090	1807	724	nc	titanian_aluminous_magnesiochromite	
NR-7	10	4.10	19.82	100.90	.463	.001	.620	.537	.049	322	2107	nc	magnesian_chromite	
NR-7	11	29.19	14.54	100.73	.603	.019	.473	.397	.372	1470	545	nc	ferric_magnesiochromite	
NR-7	12	4.62	24.82	100.22	.259	.001	.790	.741	.061	126	3538	nc	magnesian_chromite	
NR-7	13	20.06	14.23	100.78	.604	.008	.628	.396	.254	927	561	nc	aluminous_ferrous_magnesiochromite	
NR-7	14	4.06	19.94	100.02	.439	.001	.709	.561	.051	189	2147	nc	magnesian_chromite	
NR-7	15	5.00	10.66	101.09	.755	.004	.265	.245	.052	1807	569	nc	chromian_spinel	
NR-7	16	5.75	13.23	100.84	.637	.002	.770	.363	.070	1061	724	DI	aluminous_ferrous_magnesiochromite	967.
NR-7	17	11.12	17.28	99.97	.562	.037	.522	.438	.142	2075	1000	nc	aluminous_ferrous_magnesiochromite	
NR-7	18	4.05	13.94	100.77	.636	.002	.606	.364	.047	1375	634	nc	aluminous_magnesiochromite	
NR-7	19	8.57	21.48	100.03	.397	.006	.614	.603	.108	472	3408	nc	magnesian_chromite	

NR-7	20	32.79	12.93	101.04	.648	.013	.402	.352	.407	2601	521	nc	chromian_magnesioferrite	
NR-8	1	7.31	16.93	99.68	.554	.017	.590	.446	.091	1603	895	nc	aluminous_ferrous_magnesiochromite	
NR-8	2	6.32	10.47	100.75	.734	.004	.553	.266	.072	1517	488	nc	aluminous_magnesiochromite	
NR-8	3	4.71	21.06	99.93	.390	.002	.786	.610	.061	236	2017	nc	magnesian_chromite	
NR-8	4	7.64	19.72	99.90	.450	.003	.635	.550	.095	597	2221	nc	magnesian_chromite	
NR-8	5	6.46	15.73	100.49	.577	.003	.634	.423	.078	424	1594	nc	aluminous_ferrous_magnesiochromite	
NR-8	7	14.67	8.39	99.80	.773	.006	.665	.227	.180	1273	594	nc	aluminous_ferrous_magnesiochromite	
NR-8	8	10.65	15.44	101.10	.617	.017	.426	.383	.125	1580	732	nc	chromian_spinel	
NR-8	9	9.15	16.69	100.30	.574	.016	.484	.426	.110	1548	895	nc	titanian_aluminous_magnesiochromite	
NR-8	10	7.34	11.42	99.98	.708	.014	.576	.292	.088	1972	594	P3	titanian_aluminous_magnesiochromite	
NR-8	11	31.57	15.87	100.49	.558	.020	.450	.442	.408	2145	586	nc	ferric_magnesiochromite	
NR-8	12	5.59	16.98	100.11	.554	.003	.536	.446	.066	668	1643	nc	aluminous_ferrous_magnesiochromite	
NR-8	14	18.98	11.78	99.95	.679	.009	.585	.321	.236	1430	586	nc	aluminous_ferrous_magnesiochromite	
NR-8	15	6.10	18.45	99.48	.476	.003	.753	.524	.078	330	838	nc	magnesian_chromite	
NR-8	16	7.44	12.42	100.57	.671	.005	.659	.329	.089	912	537	P3	aluminous_ferrous_magnesiochromite	
NR-8	17	8.05	18.77	100.06	.513	.018	.518	.487	.099	1705	651	nc	aluminous_ferrous_magnesiochromite	
NR-8	18	8.71	15.37	100.87	.609	.021	.554	.391	.106	1532	765	nc	aluminous_ferrous_magnesiochromite	
NR-8	19	22.90	12.30	100.61	.659	.007	.592	.341	.287	1619	488	nc	aluminous_ferrous_magnesiochromite	
NR-8	20	12.79	10.88	100.15	.706	.005	.650	.294	.156	1061	708	nc	aluminous_ferrous_magnesiochromite	
NR-10	1	4.80	19.92	99.53	.436	.001	.703	.564	.060	24	2326	nc	magnesian_chromite	
NR-10	2	2.81	19.56	99.07	.439	.001	.765	.561	.036	244	1838	nc	magnesian_chromite	
NR-10	3	4.44	11.59	100.21	.696	.001	.629	.304	.052	1155	382	nc	aluminous_magnesiochromite	
NR-10	4	7.79	14.83	99.62	.613	.016	.583	.387	.096	1941	643	nc	aluminous_ferrous_magnesiochromite	
NR-10	6	8.49	12.66	100.45	.679	.016	.544	.321	.101	1760	748	nc	titanian_aluminous_magnesiochromite	
NR-10	7	13.14	16.48	100.07	.559	.019	.600	.441	.167	794	765	nc	aluminous_ferrous_magnesiochromite	
NR-10	8	6.78	11.50	99.83	.688	.004	.724	.312	.083	1124	716	nc	aluminous_ferrous_magnesiochromite	
NR-10	9	5.83	20.20	99.37	.415	.003	.765	.585	.076	314	1985	nc	magnesian_chromite	
NR-10	10	3.66	18.44	99.87	.495	.000	.636	.505	.044	283	2269	nc	magnesian_chromite	
NR-10	11	8.38	12.77	99.33	.647	.005	.738	.353	.105	1242	333	P1	aluminous_ferrous_magnesiochromite	1283.
NR-10	12	7.41	15.87	100.82	.596	.018	.543	.404	.089	1532	732	nc	aluminous_ferrous_magnesiochromite	
NR-10	13	13.06	17.74	100.53	.551	.043	.532	.449	.169	1407	846	nc	aluminous_ferrous_magnesiochromite	
NR-10	15	30.47	11.98	101.06	.673	.013	.468	.327	.380	2240	268	nc	ferric_magnesiochromite	
NR-10	16	6.79	13.96	100.07	.613	.002	.754	.387	.084	802	724	DI	aluminous_ferrous_magnesiochromite	967.
NR-10	17	9.39	18.92	100.70	.488	.005	.578	.512	.115	676	1749	nc	magnesian_chromite	
NR-9	1	4.03	20.20	99.79	.420	.001	.761	.580	.051	251	2131	nc	magnesian_chromite	
NR-9	2	6.80	13.22	99.66	.659	.013	.573	.341	.082	1823	521	nc	aluminous_magnesiochromite	
NR-9	3	16.88	14.25	100.43	.601	.006	.675	.399	.214	747	480	nc	aluminous_ferrous_magnesiochromite	

NR-9	4	6.68	22.53	99.96	.340	.001	.742	.660	.086	228	2953	nc	magnesian_chromite	
NR-9	5	8.81	13.23	101.24	.669	.016	.515	.331	.104	1642	545	nc	titanian_aluminous_magnesiochromite	
NR-9	6	14.65	17.25	100.71	.519	.009	.659	.481	.186	692	919	nc	aluminous_ferrous_magnesiochromite	
NR-9	8	1.63	19.26	100.03	.456	.001	.771	.544	.020	275	1912	nc	magnesian_chromite	
NR-9	9	7.55	11.71	99.64	.699	.013	.578	.301	.091	1752	659	nc	aluminous_magnesiochromite	
NR-9	10	8.41	13.36	100.65	.647	.006	.627	.353	.101	959	651	nc	aluminous_ferrous_magnesiochromite	
NR-9	11	10.88	16.44	99.91	.548	.005	.643	.452	.135	519	919	nc	aluminous_ferrous_magnesiochromite	
NR-9	12	3.00	18.93	100.09	.485	.001	.647	.515	.036	181	1692	nc	magnesian_chromite	
NR-9	13	13.42	22.75	100.07	.343	.008	.638	.657	.175	330	1838	nc	magnesian_chromite	
NR-9	14	7.92	14.94	100.67	.614	.017	.590	.386	.097	1525	797	nc	aluminous_ferrous_magnesiochromite	
NR-9	15	5.83	19.65	100.36	.466	.003	.611	.534	.071	385	1757	nc	magnesian_chromite	
NR-9	16	2.18	16.23	99.50	.544	.001	.793	.456	.027	181	1586	nc	aluminous_ferrous_magnesiochromite	
NR-11	1	3.35	18.71	99.99	.465	.000	.810	.535	.043	204	1684	nc	magnesian_chromite	
NR-11	2	7.94	11.25	100.15	.717	.015	.546	.283	.094	1862	610	nc	titanian_aluminous_magnesiochromite	
NR-11	4	9.69	12.59	100.57	.683	.018	.525	.317	.116	1870	602	nc	titanian_aluminous_magnesiochromite	
NR-11	5	2.03	19.43	100.44	.443	.001	.846	.557	.026	181	1423	nc	magnesian_chromite	
NR-11	6	2.81	14.06	99.47	.608	.001	.792	.392	.035	495	1456	nc	aluminous_ferrous_magnesiochromite	
NR-11	7	21.61	10.85	100.49	.708	.010	.547	.292	.266	1729	561	nc	ferric_magnesiochromite	
NR-11	8	6.20	9.66	99.58	.738	.002	.749	.262	.075	1084	610	nc	aluminous_ferrous_magnesiochromite	
NR-11	9	15.35	13.68	100.53	.631	.006	.592	.369	.188	629	578	P3	aluminous_ferrous_magnesiochromite	
NR-11	10	23.05	10.33	100.49	.728	.013	.473	.272	.280	2075	358	nc	ferric_magnesiochromite	
NR-11	11	9.38	9.99	100.44	.736	.007	.665	.264	.113	1430	586	P3	aluminous_ferrous_magnesiochromite	
NR-11	12	4.53	18.66	100.22	.481	.001	.685	.519	.056	338	3042	nc	magnesian_chromite	
NR-11	13	3.17	9.63	100.41	.763	.002	.493	.237	.035	1139	651	nc	aluminous_magnesiochromite	
NR-11	14	7.86	16.31	100.87	.557	.005	.680	.443	.097	534	756	nc	aluminous_ferrous_magnesiochromite	
NR-12	1	9.90	19.01	100.50	.503	.014	.507	.497	.121	967	1480	nc	aluminous_ferrous_magnesiochromite	
NR-12	2	7.38	21.29	100.80	.418	.002	.564	.582	.090	699	2229	nc	magnesian_chromite	
NR-12	3	6.66	9.03	100.93	.765	.002	.653	.235	.078	1336	456	P3	aluminous_magnesiochromite	
NR-12	4	9.10	15.49	100.29	.586	.010	.640	.414	.113	912	586	P3	aluminous_ferrous_magnesiochromite	
NR-13	1	4.51	16.92	99.34	.541	.002	.624	.459	.055	464	1724	nc	aluminous_ferrous_magnesiochromite	
NR-13	2	6.53	19.98	100.32	.434	.002	.723	.566	.082	527	789	nc	magnesian_chromite	
NR-13	3	24.96	17.22	100.16	.529	.020	.468	.471	.320	1595	643	nc	aluminous_ferrous_magnesiochromite	
NR-13	4	25.32	12.06	100.70	.672	.011	.510	.328	.314	1878	602	nc	ferric_magnesiochromite	
NR-13	5	8.54	12.05	100.12	.696	.023	.570	.304	.104	1745	716	nc	titanian_aluminous_magnesiochromite	
NR-13	6	9.03	18.92	99.91	.505	.019	.528	.495	.112	1580	805	nc	aluminous_ferrous_magnesiochromite	
NR-13	7	18.95	11.90	99.60	.675	.010	.581	.325	.236	1721	667	nc	aluminous_ferrous_magnesiochromite	
NR-13	8	8.80	14.49	99.09	.630	.012	.464	.370	.105	1713	659	nc	aluminous_magnesiochromite	

NR-13	9	4.70	15.03	100.87	.613	.001	.523	.387	.054	927	2066	nc	aluminous_magnesiochromite	
NR-13	10	22.34	12.01	100.56	.685	.022	.488	.315	.277	2122	439	nc	ferric_magnesiochromite	
NR-13	11	6.61	20.92	100.17	.397	.001	.753	.603	.085	251	1293	nc	magnesian_chromite	
NR-13	12	2.55	18.75	100.62	.473	.000	.774	.527	.032	299	1838	nc	magnesian_chromite	
NR-13	13	19.76	8.91	99.78	.763	.008	.543	.237	.240	1595	431	P3	ferric_magnesiochromite	
NR-13	14	8.15	11.55	99.79	.695	.006	.624	.305	.098	1572	667	nc	aluminous_magnesiochromite	
NR-13	15	10.29	15.78	99.12	.607	.024	.394	.393	.124	1540	1017	nc	chromian_spinel	
NR-13	17	5.14	10.69	100.10	.741	.003	.394	.259	.056	1627	537	nc	chromian_spinel	
NR-14	1	4.66	11.29	100.42	.707	.003	.628	.293	.055	1352	366	P3	aluminous_magnesiochromite	
NR-14	2	14.23	12.02	100.49	.670	.007	.686	.330	.177	1407	716	nc	aluminous_ferrous_magnesiochromite	
NR-14	3	5.14	21.51	99.89	.382	.002	.730	.618	.066	314	2017	nc	magnesian_chromite	
NR-14	4	5.40	20.18	100.04	.423	.002	.765	.577	.069	982	838	nc	magnesian_chromite	
NR-14	5	8.08	12.74	100.49	.673	.021	.625	.327	.099	1792	765	nc	aluminous_ferrous_magnesiochromite	
NR-14	6	8.02	12.73	100.50	.678	.017	.546	.322	.096	1800	651	nc	titanian_aluminous_magnesiochromite	
NR-14	7	2.69	18.26	100.48	.508	.002	.618	.492	.032	212	4767	nc	aluminous_ferrous_magnesiochromite	
NR-14	8	11.54	16.98	100.13	.561	.036	.591	.439	.149	1485	781	nc	aluminous_ferrous_magnesiochromite	
NR-14	9	10.42	15.84	100.12	.592	.030	.589	.408	.132	1658	765	nc	aluminous_ferrous_magnesiochromite	
NR-14	10	9.00	15.46	100.13	.592	.011	.588	.408	.110	927	878	P4	aluminous_ferrous_magnesiochromite	907.
NR-14	11	8.19	20.75	100.36	.423	.004	.636	.577	.102	424	1635	nc	magnesian_chromite	
NR-14	12	8.47	22.17	100.42	.422	.023	.509	.578	.106	1556	1000	nc	magnesian_aluminous_chromite	
NR-14	13	3.41	18.65	100.26	.490	.003	.652	.510	.042	354	2497	nc	magnesian_chromite	
NR-14	15	30.40	16.18	100.74	.545	.012	.455	.455	.388	2153	813	nc	ferric_magnesiochromite	
NR-14	16	7.50	14.53	100.61	.637	.013	.467	.363	.087	1029	708	nc	titanian_aluminous_magnesiochromite	
NR-15	1	10.90	15.52	100.00	.607	.033	.536	.393	.137	1721	781	nc	aluminous_ferrous_magnesiochromite	
NR-15	2	12.59	15.41	100.37	.617	.005	.312	.383	.141	888	952	nc	ferrous_spinel	
NR-15	3	9.02	21.11	99.85	.387	.002	.727	.613	.117	385	1879	nc	magnesian_chromite	
NR-15	5	6.61	8.97	100.45	.758	.002	.763	.242	.080	1477	537	nc	aluminous_ferrous_magnesiochromite	
NR-15	6	8.06	21.16	99.72	.426	.006	.532	.574	.099	472	2139	nc	magnesian_chromite	
NR-15	7	10.11	16.21	100.14	.554	.007	.676	.446	.127	825	659	nc	aluminous_ferrous_magnesiochromite	
NR-15	8	33.08	14.59	100.68	.604	.021	.378	.396	.417	2318	521	nc	chromian_magnesioferrite	
NR-15	9	21.06	14.24	100.50	.615	.010	.524	.385	.261	919	740	nc	aluminous_ferrous_magnesiochromite	
NR-15	10	3.29	15.48	100.10	.588	.001	.618	.412	.039	574	1684	nc	aluminous_ferrous_magnesiochromite	
NR-15	12	32.37	12.72	100.52	.648	.011	.440	.352	.407	2279	594	nc	ferric_magnesiochromite	
NR-15	13	16.36	13.86	100.42	.619	.009	.636	.381	.205	1139	683	nc	aluminous_ferrous_magnesiochromite	
NR-15	14	9.12	15.27	100.31	.584	.007	.680	.416	.113	888	813	nc	aluminous_ferrous_magnesiochromite	
NR-15	15	1.81	19.61	99.78	.445	.001	.762	.555	.023	0	1887	nc	magnesian_chromite	
NR-15	16	5.23	20.71	100.24	.403	.001	.751	.597	.066	440	3221	nc	magnesian_chromite	

NR-15	17	11.01	13.68	100.57	.621	.005	.743	.379	.138	275	618	nc	aluminous_ferrous_magnesiochromite	
NR-16	1	3.32	16.55	100.71	.577	.000	.483	.423	.038	676	1920	nc	aluminous_magnesiochromite	
NR-16	2	8.53	21.36	100.43	.397	.005	.660	.603	.108	479	2172	nc	magnesian_chromite	
NR-16	3	9.20	19.54	100.13	.453	.005	.659	.547	.116	731	1147	nc	magnesian_chromite	
NR-16	4	9.03	15.75	100.29	.598	.017	.505	.402	.109	1595	952	nc	titanian_aluminous_magnesiochromite	
NR-17	1	11.10	16.68	100.34	.576	.024	.493	.424	.137	1391	797	nc	titanian_aluminous_magnesiochromite	
NR-17	2	29.33	12.53	100.81	.659	.014	.462	.341	.366	2027	488	nc	ferric_magnesiochromite	
NR-17	3	11.75	15.78	100.45	.608	.042	.505	.392	.149	2090	846	nc	titanian_aluminous_magnesiochromite	
NR-17	4	8.12	11.85	99.91	.699	.016	.552	.301	.097	1682	553	nc	titanian_aluminous_magnesiochromite	
NR-17	5	31.66	12.92	100.51	.641	.010	.463	.359	.399	1957	472	nc	ferric_magnesiochromite	
NR-17	6	3.45	17.35	100.12	.542	.003	.583	.458	.041	283	1521	nc	aluminous_ferrous_magnesiochromite	
NR-17	7	5.52	17.78	100.65	.517	.002	.648	.483	.067	574	1367	nc	aluminous_ferrous_magnesiochromite	
NR-17	8	18.86	16.17	100.52	.566	.020	.533	.434	.238	1580	643	nc	aluminous_ferrous_magnesiochromite	
NR-17	9	4.24	19.88	100.47	.450	.001	.663	.550	.052	212	2269	nc	magnesian_chromite	
NR-17	10	5.64	16.73	100.18	.523	.002	.810	.477	.072	833	732	nc	aluminous_ferrous_magnesiochromite	
NR-17	11	23.89	12.94	100.70	.648	.011	.523	.352	.297	1760	773	nc	ferric_magnesiochromite	
NR-17	13	3.94	15.78	100.79	.600	.001	.464	.400	.045	770	2237	nc	chromian_spinel	
NR-17	14	4.95	18.59	100.71	.506	.003	.585	.494	.059	330	1684	nc	aluminous_ferrous_magnesiochromite	
NR-17	15	16.54	19.99	100.37	.466	.013	.441	.534	.204	731	1741	nc	magnesian_chromite	
NR-18	1	13.60	12.63	100.85	.669	.009	.562	.331	.164	1163	553	P3	aluminous_ferrous_magnesiochromite	
NR-18	2	3.96	16.85	100.42	.557	.001	.552	.443	.046	550	2099	nc	aluminous_ferrous_magnesiochromite	
NR-18	3	11.85	17.25	100.16	.542	.010	.527	.458	.145	982	854	nc	aluminous_ferrous_magnesiochromite	
NR-18	4	8.65	13.97	100.51	.649	.016	.499	.351	.103	1658	521	nc	titanian_aluminous_magnesiochromite	
NR-18	5	5.54	21.03	99.63	.391	.003	.781	.609	.072	141	1367	nc	magnesian_chromite	
NR-18	8	6.19	19.46	100.28	.456	.001	.675	.544	.077	306	1855	nc	magnesian_chromite	
NR-18	9	14.15	8.70	100.53	.766	.006	.673	.234	.172	1061	545	nc	aluminous_ferrous_magnesiochromite	
NR-18	10	12.71	17.77	100.58	.548	.044	.566	.452	.166	1438	691	nc	aluminous_ferrous_magnesiochromite	
NR-18	11	6.64	20.05	100.43	.461	.003	.554	.539	.080	393	1798	nc	magnesian_chromite	
NR-18	12	7.90	12.69	100.28	.676	.015	.567	.324	.095	1745	521	nc	titanian_aluminous_magnesiochromite	
NR-18	13	16.58	14.09	100.75	.617	.008	.606	.383	.205	927	634	nc	aluminous_ferrous_magnesiochromite	
NR-18	14	10.22	20.25	100.15	.434	.010	.647	.566	.130	857	1277	nc	magnesian_chromite	
NR-18	15	8.25	14.27	100.59	.632	.017	.600	.368	.101	1603	756	nc	aluminous_ferrous_magnesiochromite	
NR-18	16	3.55	18.28	100.02	.489	.001	.736	.511	.044	314	1920	nc	magnesian_chromite	
NR-18	17	5.78	18.47	100.00	.481	.007	.765	.519	.074	385	1236	nc	magnesian_chromite	
NR-18	18	6.28	8.42	99.78	.771	.002	.778	.229	.076	1525	399	nc	aluminous_ferrous_magnesiochromite	
NR-19	1	7.66	12.12	100.41	.704	.010	.400	.296	.086	1933	708	nc	chromian_spinel	
NR-19	2	21.99	14.86	100.40	.588	.012	.578	.412	.280	833	789	nc	aluminous_ferrous_magnesiochromite	

NR-19	3	3.80	21.52	100.15	.367	.000	.848	.633	.049	110	1733	nc	magnesian_chromite	
NR-19	4	7.13	16.67	100.89	.548	.002	.653	.452	.087	527	1212	nc	aluminous_ferrous_magnesiochromite	
NR-19	5	7.80	17.17	100.78	.531	.002	.656	.469	.095	904	1212	nc	aluminous_ferrous_magnesiochromite	
NR-19	6	3.32	19.91	100.54	.465	.000	.574	.535	.039	220	2473	nc	magnesian_chromite	
NR-20	1	4.57	9.86	100.45	.747	.002	.602	.253	.053	1525	594	nc	aluminous_magnesiochromite	
NR-20	2	8.41	17.39	100.58	.551	.019	.545	.449	.103	1713	805	nc	aluminous_ferrous_magnesiochromite	
NR-20	3	3.41	18.04	100.58	.491	.001	.794	.509	.043	314	1920	nc	magnesian_chromite	
NR-20	4	4.42	21.96	100.43	.361	.001	.808	.639	.057	220	2074	nc	magnesian_chromite	
NR-20	5	18.55	11.71	100.51	.685	.009	.577	.315	.228	1077	618	nc	aluminous_ferrous_magnesiochromite	
NR-20	6	5.37	19.64	100.70	.453	.001	.682	.547	.066	259	2131	nc	magnesian_chromite	
NR-20	7	2.73	16.59	100.77	.571	.000	.543	.429	.031	385	1790	nc	aluminous_magnesiochromite	
NR-20	10	10.01	16.59	100.03	.569	.019	.536	.431	.123	1422	927	nc	aluminous_ferrous_magnesiochromite	
NR-20	11	5.35	19.83	100.50	.458	.001	.604	.542	.065	354	2432	nc	magnesian_chromite	
NR-20	12	5.73	21.45	100.80	.386	.002	.748	.614	.073	896	1253	nc	magnesian_chromite	
NR-20	13	2.68	20.62	100.65	.404	.001	.831	.596	.034	283	2034	nc	magnesian_chromite	
NR-20	14	26.33	12.45	100.45	.662	.013	.484	.338	.328	1965	480	nc	ferric_magnesiochromite	
NR-20	15	11.15	19.55	100.13	.486	.035	.600	.514	.146	1391	1228	nc	titanian_magnesian_chromite	
NR-20	16	3.40	17.24	100.47	.514	.002	.803	.486	.043	259	1912	nc	aluminous_ferrous_magnesiochromite	
NR-21	1	9.79	18.01	100.19	.514	.009	.584	.486	.121	542	1293	nc	aluminous_ferrous_magnesiochromite	
NR-21	2	7.76	16.37	100.04	.591	.002	.338	.409	.087	1273	2123	nc	ferrous_spinel	
NR-21	3	22.63	15.14	100.45	.583	.012	.529	.417	.285	1690	935	nc	aluminous_ferrous_magnesiochromite	
NR-21	4	7.76	11.54	100.11	.706	.015	.575	.294	.093	1650	561	P3	titanian_aluminous_magnesiochromite	
NR-21	5	5.87	10.81	100.68	.730	.002	.498	.270	.066	990	602	nc	aluminous_magnesiochromite	
NR-21	6	10.30	20.70	100.24	.407	.006	.716	.593	.133	644	1667	nc	magnesian_chromite	
NR-21	7	2.31	20.84	100.73	.397	.000	.846	.603	.030	149	1928	nc	magnesian_chromite	
NR-21	8	4.69	9.58	100.33	.771	.001	.353	.229	.050	1690	887	nc	chromian_spinel	
NR-21	9	6.01	9.12	100.90	.753	.001	.796	.247	.073	1304	480	nc	aluminous_ferrous_magnesiochromite	
NR-21	10	32.78	13.00	101.12	.640	.010	.457	.360	.412	2263	602	nc	ferric_magnesiochromite	
NR-21	11	2.18	20.17	100.41	.437	.000	.709	.563	.027	259	1790	nc	magnesian_chromite	
NR-21	12	8.36	19.80	100.15	.458	.003	.579	.542	.103	519	1944	nc	magnesian_chromite	
NR-21	13	12.95	21.07	100.38	.436	.019	.513	.564	.164	974	1432	nc	titanian_magnesian_chromite	
NR-21	14	31.83	16.26	100.72	.561	.029	.387	.439	.408	2389	553	nc	chromian_magnesioferrite	
NR-21	15	8.43	22.89	100.06	.338	.002	.687	.662	.108	71	2611	nc	magnesian_chromite	
NR-21	16	19.21	15.78	100.33	.569	.015	.574	.431	.244	621	797	nc	aluminous_ferrous_magnesiochromite	
NR-21	17	18.09	12.28	100.58	.670	.010	.571	.330	.222	1564	447	P3	aluminous_ferrous_magnesiochromite	
NR-21	18	18.55	17.81	100.87	.558	.012	.251	.442	.214	259	1009	nc	ferrous_spinel	
NR-21	19	10.44	20.66	100.28	.404	.004	.694	.596	.134	692	1887	nc	magnesian_chromite	

NR-21	20	26.77	15.45	100.80	.573	.011	.483	.427	.337	1713	586	nc	aluminous_ferrous_magnesiochromite	
NR-21	21	7.21	17.89	100.21	.516	.005	.617	.484	.088	621	1285	nc	aluminous_ferrous_magnesiochromite	
NR-21	22	23.23	12.19	100.38	.670	.010	.517	.330	.287	1847	651	nc	ferric_magnesiochromite	
NR-21	23	6.33	10.41	100.18	.722	.004	.712	.278	.076	1210	521	P3	aluminous_ferrous_magnesiochromite	
NR-21	25	5.21	19.05	100.40	.470	.003	.712	.530	.065	440	1399	nc	magnesian_chromite	
NR-21	26	9.62	14.13	100.32	.640	.016	.517	.360	.115	1752	740	nc	titanian_aluminous_magnesiochromite	
NR-21	27	11.12	15.16	100.76	.628	.009	.335	.372	.126	927	927	nc	chromian_spinel	
NR-21	28	8.23	14.69	100.48	.621	.017	.585	.379	.100	1705	724	nc	aluminous_ferrous_magnesiochromite	
NR-21	29	15.30	22.26	100.76	.348	.005	.690	.652	.200	534	1245	nc	magnesian_chromite	
NR-21	30	3.40	18.21	100.51	.507	.001	.631	.493	.041	299	2375	nc	aluminous_ferrous_magnesiochromite	
NR-21	32	6.38	20.37	100.66	.413	.001	.781	.587	.082	244	1855	nc	magnesian_chromite	
NR-21	33	9.30	14.78	99.58	.621	.022	.543	.379	.115	1587	789	nc	titanian_aluminous_magnesiochromite	
NR-21	34	11.83	13.81	100.47	.624	.003	.629	.376	.144	904	765	nc	aluminous_ferrous_magnesiochromite	
NR-21	35	17.35	23.85	100.64	.284	.009	.648	.716	.231	519	1643	nc	magnesian_chromite	
NR-22	1	9.61	16.56	100.11	.575	.023	.531	.425	.119	1430	675	nc	aluminous_ferrous_magnesiochromite	
NR-22	2	6.36	12.15	99.94	.664	.002	.782	.336	.079	613	512	P1_DI	aluminous_ferrous_magnesiochromite	1090.
NR-22	3	4.83	18.65	100.35	.498	.002	.608	.502	.058	589	1098	nc	magnesian_chromite	
NR-22	4	6.26	13.45	100.53	.630	.002	.764	.370	.077	778	683	P1_DI	aluminous_ferrous_magnesiochromite	986.
NR-22	6	5.38	19.52	100.40	.473	.003	.591	.527	.065	236	1838	nc	magnesian_chromite	
NR-22	7	2.66	21.88	100.09	.372	.001	.745	.628	.034	157	2733	nc	magnesian_chromite	
NR-22	8	9.65	13.49	100.76	.660	.019	.515	.340	.115	1917	634	nc	titanian_aluminous_magnesiochromite	
NR-22	10	10.90	20.23	100.71	.468	.006	.441	.532	.130	644	2001	nc	magnesian_aluminous_chromite	
NR-22	12	5.57	20.28	100.29	.435	.001	.657	.565	.069	464	1855	nc	magnesian_chromite	
NR-22	13	17.43	10.81	100.64	.708	.007	.614	.292	.214	1320	634	nc	aluminous_ferrous_magnesiochromite	
NR-22	15	8.99	13.58	100.11	.653	.021	.560	.347	.110	1807	626	nc	titanian_aluminous_magnesiochromite	
NR-22	16	8.38	18.75	100.70	.481	.004	.665	.519	.104	723	1350	nc	magnesian_chromite	
NR-23	1	6.22	15.84	100.79	.584	.001	.556	.416	.073	841	1684	nc	aluminous_ferrous_magnesiochromite	
NR-23	2	5.59	19.33	100.31	.463	.000	.668	.537	.069	511	2050	nc	magnesian_chromite	
NR-23	3	9.82	22.17	100.41	.404	.017	.529	.596	.124	770	3026	nc	titanian_magnesian_chromite	
NR-23	4	11.61	16.83	100.43	.587	.028	.379	.413	.139	1454	691	nc	chromian_spinel	
NR-23	5	9.82	15.27	100.18	.621	.028	.472	.379	.120	1344	781	nc	titanian_aluminous_magnesiochromite	
NR-23	6	11.43	17.09	100.08	.567	.038	.517	.433	.146	1792	935	nc	aluminous_ferrous_magnesiochromite	
NR-23	7	5.93	20.43	100.58	.467	.011	.521	.533	.072	1234	870	nc	magnesian_chromite	
NR-23	8	10.21	16.83	100.39	.580	.030	.473	.420	.126	1540	854	nc	titanian_aluminous_magnesiochromite	
NR-23	9	7.05	14.63	100.48	.623	.013	.571	.377	.085	1713	708	nc	aluminous_ferrous_magnesiochromite	
NR-23	10	7.41	14.64	100.92	.650	.016	.355	.350	.084	1297	992	nc	chromian_spinel	
NR-23	11	3.05	18.08	100.62	.500	.001	.738	.500	.038	377	1790	nc	magnesian_chromite	

NR-23	12	5.34	10.66	99.97	.736	.004	.459	.264	.060	1226	537	nc	chromian_spinel	
NR-23	13	19.30	12.91	100.35	.652	.011	.566	.348	.239	912	325	P3	aluminous_ferrous_magnesiochromite	
NR-23	14	7.36	19.19	100.36	.470	.001	.631	.530	.090	487	1863	nc	magnesian_chromite	
NR-23	15	11.42	18.41	100.34	.529	.034	.528	.471	.146	1556	968	nc	aluminous_ferrous_magnesiochromite	
NR-23	16	7.79	15.22	100.43	.608	.021	.594	.392	.096	1690	716	nc	aluminous_ferrous_magnesiochromite	
NR-23	17	12.83	13.79	100.49	.623	.009	.674	.377	.160	409	919	nc	aluminous_ferrous_magnesiochromite	
NR-23	18	9.11	15.44	100.57	.595	.005	.533	.405	.108	990	1204	P4	aluminous_ferrous_magnesiochromite	821.
NR-23	19	3.86	18.86	100.33	.458	.001	.818	.542	.049	330	1879	nc	magnesian_chromite	
NR-23	20	3.88	20.39	100.41	.433	.001	.676	.567	.048	464	2904	nc	magnesian_chromite	
NR-23	21	7.73	21.71	100.31	.404	.010	.605	.596	.097	770	2139	nc	magnesian_chromite	
NR-23	22	22.63	20.29	100.82	.483	.027	.286	.517	.278	660	895	nc	aluminous_hercynite	
NR-23	23	14.65	10.61	100.37	.714	.007	.644	.286	.180	1014	480	nc	aluminous_ferrous_magnesiochromite	
NR-23	24	8.47	11.98	99.70	.690	.017	.604	.310	.103	1839	626	nc	titanian_aluminous_magnesiochromite	
NR-23	26	8.28	18.38	100.39	.521	.019	.554	.479	.102	1344	1188	nc	aluminous_ferrous_magnesiochromite	
NR-23	27	13.50	11.07	100.59	.703	.006	.647	.297	.165	786	700	nc	aluminous_ferrous_magnesiochromite	
NR-23	28	5.12	18.83	99.18	.461	.003	.709	.539	.065	212	5604	nc	magnesian_chromite	
NR-23	29	7.80	15.32	100.46	.605	.007	.511	.395	.092	1147	968	nc	aluminous_magnesiochromite	
NR-23	30	6.56	10.30	100.09	.723	.004	.728	.277	.079	1084	789	nc	aluminous_ferrous_magnesiochromite	
NR-23	31	10.70	15.86	100.48	.592	.027	.563	.408	.134	1642	911	nc	aluminous_ferrous_magnesiochromite	
NR-29	1	13.19	16.09	100.02	.566	.010	.577	.434	.163	982	944	nc	aluminous_ferrous_magnesiochromite	
NR-29	2	9.47	9.89	100.71	.735	.006	.713	.265	.115	1564	578	nc	aluminous_ferrous_magnesiochromite	
NR-29	3	4.70	16.80	100.01	.546	.001	.627	.454	.057	322	1570	nc	aluminous_ferrous_magnesiochromite	
NR-29	4	13.59	9.23	99.74	.752	.005	.649	.248	.165	1320	480	nc	aluminous_ferrous_magnesiochromite	
NR-29	5	6.40	11.94	100.73	.708	.007	.426	.292	.072	912	732	nc	chromian_spinel	
NR-29	6	11.00	16.06	100.59	.567	.007	.620	.433	.135	809	683	nc	aluminous_ferrous_magnesiochromite	
NR-29	7	7.65	11.47	100.10	.709	.015	.562	.291	.091	1894	618	nc	titanian_aluminous_magnesiochromite	
NR-29	8	9.85	18.09	99.56	.492	.009	.703	.508	.127	747	797	nc	magnesian_chromite	
NR-29	9	9.51	14.23	100.61	.641	.017	.490	.359	.113	1627	927	nc	titanian_aluminous_magnesiochromite	
NR-29	10	24.68	12.62	100.43	.656	.011	.512	.344	.307	1862	447	nc	ferric_magnesiochromite	
NR-29	11	12.62	17.68	100.23	.547	.039	.549	.453	.163	1619	1000	nc	aluminous_ferrous_magnesiochromite	
NR-29	12	15.72	12.89	100.12	.644	.008	.662	.356	.198	1493	431	nc	aluminous_ferrous_magnesiochromite	
NR-29	13	7.60	20.23	100.32	.443	.006	.626	.557	.095	456	1472	nc	magnesian_chromite	
NR-29	14	4.97	17.28	100.37	.525	.001	.691	.475	.061	582	1570	nc	aluminous_ferrous_magnesiochromite	
NR-29	15	8.22	19.19	100.24	.469	.006	.650	.531	.103	715	1440	nc	magnesian_chromite	
NR-29	16	21.69	12.63	100.14	.653	.008	.567	.347	.271	1737	675	nc	aluminous_ferrous_magnesiochromite	
NR-29	17	6.08	11.15	100.32	.729	.006	.401	.271	.067	1202	708	nc	chromian_spinel	
NR-42	1	27.74	13.95	100.21	.615	.011	.489	.385	.350	1100	472	nc	ferric_magnesiochromite	

NR-42	3	16.81	15.89	100.66	.565	.012	.607	.435	.212	1202	740	nc	aluminous_ferrous_magnesiochromite	
NR-42	4	4.36	20.75	100.02	.412	.001	.710	.588	.055	204	2554	nc	magnesian_chromite	
NR-42	5	12.90	16.09	100.17	.591	.024	.466	.409	.158	1603	781	nc	titanian_aluminous_magnesiochromite	
NR-42	6	10.29	15.17	100.53	.617	.018	.484	.383	.123	1548	578	nc	titanian_aluminous_magnesiochromite	
NR-42	7	7.13	19.36	100.20	.452	.007	.717	.548	.091	809	1594	nc	magnesian_chromite	
NR-42	8	4.32	18.09	100.07	.518	.001	.557	.482	.051	393	2058	nc	aluminous_ferrous_magnesiochromite	
NR-42	9	2.15	19.75	100.37	.450	.001	.728	.550	.027	212	2009	nc	magnesian_chromite	
NR-42	10	11.26	21.22	100.74	.415	.003	.548	.585	.139	1147	2245	nc	magnesian_chromite	
NR-42	11	15.20	13.42	99.83	.635	.008	.614	.365	.189	479	569	nc	aluminous_ferrous_magnesiochromite	
NR-42	12	3.15	16.50	100.33	.549	.001	.712	.451	.038	330	1594	nc	aluminous_ferrous_magnesiochromite	
NR-42	13	15.13	18.18	100.41	.529	.016	.414	.471	.183	1061	1497	nc	titanian_aluminous_magnesiochromite	
NR-42	14	2.75	16.63	99.98	.554	.000	.629	.446	.033	361	1977	nc	aluminous_ferrous_magnesiochromite	
NR-42	15	9.08	14.83	100.63	.618	.024	.610	.382	.113	1862	716	nc	aluminous_ferrous_magnesiochromite	
NR-42	16	12.82	19.28	100.48	.507	.039	.522	.493	.166	1422	862	nc	aluminous_ferrous_magnesiochromite	
NR-42	17	11.30	17.63	100.38	.525	.003	.537	.475	.136	1132	1423	nc	aluminous_ferrous_magnesiochromite	
NR-42	18	3.66	20.60	99.43	.401	.001	.788	.599	.047	267	2326	nc	magnesian_chromite	
NR-42	19	7.84	14.04	100.60	.658	.006	.339	.342	.087	1603	944	nc	chromian_spinel	
NR-42	20	12.14	16.49	100.34	.583	.011	.394	.417	.142	872	862	nc	chromian_spinel	
NR-42	21	6.67	8.92	99.98	.759	.003	.755	.241	.081	1517	415	nc	aluminous_ferrous_magnesiochromite	
NR-42	22	8.82	15.27	100.54	.609	.022	.570	.391	.109	1690	919	nc	aluminous_ferrous_magnesiochromite	
NR-42	23	11.96	11.39	100.50	.693	.005	.676	.307	.146	754	561	nc	aluminous_ferrous_magnesiochromite	
NR-42	24	13.87	13.59	99.82	.630	.006	.622	.370	.172	361	748	nc	aluminous_ferrous_magnesiochromite	
NR-42	25	8.52	13.17	99.68	.663	.019	.554	.337	.104	1682	748	nc	titanian_aluminous_magnesiochromite	
NR-42	26	8.24	17.52	99.79	.502	.003	.752	.498	.105	613	813	nc	aluminous_ferrous_magnesiochromite	
NR-42	27	16.64	16.90	100.16	.535	.010	.579	.465	.210	754	805	nc	aluminous_ferrous_magnesiochromite	
NR-42	28	11.83	21.52	100.11	.439	.035	.526	.561	.154	1139	1163	nc	titanian_magnesian_chromite	
NR-42	29	7.74	21.59	100.07	.418	.011	.556	.582	.096	534	1464	nc	magnesian_chromite	
NR-42	30	4.21	27.47	99.96	.185	.001	.735	.815	.055	739	1724	nc	magnesian_aluminous_chromite	
NR-42	31	1.80	11.84	100.20	.728	.000	.220	.272	.018	1925	1611	nc	ferrous_spinel	
NR-42	32	13.03	14.91	100.08	.638	.009	.262	.362	.146	1037	756	nc	ferrous_spinel	
NR-42	34	11.78	16.61	100.44	.575	.032	.548	.425	.149	1642	960	nc	aluminous_ferrous_magnesiochromite	
NR-42	35	6.69	9.30	99.67	.745	.002	.793	.255	.082	1273	545	nc	aluminous_ferrous_magnesiochromite	
NR-42	36	8.68	21.99	100.29	.399	.012	.560	.601	.109	605	2871	nc	magnesian_chromite	
NR-42	37	14.93	18.25	100.49	.541	.045	.472	.459	.192	2004	976	nc	aluminous_ferrous_magnesiochromite	
NR-42	38	3.90	15.77	100.46	.580	.000	.627	.420	.046	644	1375	P4	aluminous_ferrous_magnesiochromite	788.
NR-42	39	2.99	20.65	99.51	.397	.001	.834	.603	.039	47	2334	nc	magnesian_chromite	
NR-42	40	10.40	12.03	100.56	.669	.004	.745	.331	.129	668	667	P1	aluminous_ferrous_magnesiochromite	994.

NR-42	41	11.36	12.14	100.71	.667	.004	.733	.333	.141	896	561	P1	aluminous_ferrous_magnesiochromite	1055.

Nice Creek Area Calculated Parameters
(NR Series)

Sample	Grain	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Ni_ppm	Zn_ppm	P-type	Nomenclature	T(Zn) C
NR-1	1	12.41	19.01	101.48	.514	.036	.559	.486	.159	1407	805	nc	aluminous_ferrous_magnesiochromite	
NR-1	2	8.10	23.65	100.74	.354	.018	.629	.646	.104	833	1171	nc	titanian_magnesian_chromite	
NR-1	3	9.03	12.38	101.36	.692	.020	.532	.308	.107	1839	512	nc	titanian_aluminous_magnesiochromite	
NR-1	4	10.53	11.38	100.73	.699	.007	.649	.301	.127	605	610	nc	aluminous_ferrous_magnesiochromite	
NR-1	5	8.58	17.24	101.08	.516	.003	.757	.484	.108	314	1025	nc	aluminous_ferrous_magnesiochromite	
NR-1	6	6.74	17.40	100.10	.510	.003	.748	.490	.085	652	1123	nc	aluminous_ferrous_magnesiochromite	
NR-1	7	5.94	20.70	100.66	.410	.001	.733	.590	.075	369	2554	nc	magnesian_chromite	
NR-1	8	1.96	20.93	99.99	.394	.000	.818	.606	.025		2066	nc	magnesian_chromite	
NR-1	9	8.38	13.25	101.17	.662	.015	.582	.338	.100	1257	765	nc	titanian_aluminous_magnesiochromite	
NR-1	10	7.03	13.16	100.54	.643	.009	.754	.357	.088	1391	716	nc	aluminous_ferrous_magnesiochromite	
NR-1	11	62.44	30.22	95.21	.001	.536	.000	.999	.986		268	nc	magnetite	
NR-1	12	3.18	21.19	101.12	.392	.001	.808	.608	.040	126	1985	nc	magnesian_chromite	
NR-1	13	9.43	13.94	101.94	.661	.020	.457	.339	.110	1729	561	nc	titanian_aluminous_magnesiochromite	
NR-1	14	13.01	19.24	101.65	.516	.030	.457	.484	.161	1548	748	nc	aluminous_ferrous_magnesiochromite	
NR-1	15	12.11	12.28	100.86	.680	.008	.570	.320	.145	1053	602	nc	aluminous_magnesiochromite	
NR-1	16	8.30	12.84	101.41	.673	.019	.619	.327	.101	1627	708	nc	aluminous_ferrous_magnesiochromite	
NR-1	17	20.25	18.87	100.83	.479	.014	.543	.521	.258	487	1082	nc	magnesian_chromite	
NR-1	18	6.95	15.63	101.33	.600	.014	.563	.400	.083	1823	944	nc	aluminous_ferrous_magnesiochromite	
NR-1	19	10.96	16.31	101.23	.588	.022	.502	.412	.133	1391	610	nc	titanian_aluminous_magnesiochromite	
NR-2	1	21.89	12.45	101.86	.665	.010	.570	.335	.269	1375	456	nc	aluminous_ferrous_magnesiochromite	
NR-2	2	9.37	15.27	101.01	.615	.023	.535	.385	.114	1886	675	nc	titanian_aluminous_magnesiochromite	
NR-2	3	11.49	15.22	101.33	.595	.011	.626	.405	.141	825	813	nc	aluminous_ferrous_magnesiochromite	
NR-2	4	8.20	18.19	99.97	.491	.004	.698	.509	.104	503	1114	nc	magnesian_chromite	
NR-2	6	5.27	17.22	100.73	.546	.003	.570	.454	.062	401	1635	nc	aluminous_ferrous_magnesiochromite	
NR-2	7	8.37	13.44	101.36	.666	.016	.511	.334	.098	1603	537	nc	titanian_aluminous_magnesiochromite	
NR-2	8	5.73	21.51	101.36	.402	.001	.655	.598	.070	283	3254	nc	magnesian_chromite	
NR-2	9	3.77	18.97	100.76	.462	.001	.800	.538	.048	204	1513	nc	magnesian_chromite	
NR-2	10	10.43	17.74	101.62	.547	.023	.533	.453	.128	1713	911	nc	aluminous_ferrous_magnesiochromite	
NR-2	11	6.25	20.21	101.13	.452	.002	.602	.548	.076	519	1855	nc	magnesian_chromite	
NR-2	12	22.44	21.56	100.82	.385	.012	.537	.615	.292	825	1399	nc	magnesian_chromite	
NR-2	13	8.33	12.64	100.80	.681	.016	.541	.319	.099	2082	618	nc	titanian_aluminous_magnesiochromite	
NR-2	14	10.32	18.09	101.17	.497	.007	.710	.503	.130	825	1098	nc	magnesian_chromite	
NR-2	15	7.86	17.39	100.95	.525	.004	.677	.475	.097	385	911	nc	aluminous_ferrous_magnesiochromite	
NR-2	16	1.73	21.36	100.58	.382	.000	.832	.618	.022	79	2383	nc	magnesian_chromite	
NR-2	17	8.78	14.80	101.14	.626	.018	.533	.374	.105	1242	748	nc	titanian_aluminous_magnesiochromite	
NR-2	18	7.78	9.33	100.84	.752	.003	.718	.248	.093	1132	594	P3	aluminous_ferrous_magnesiochromite	

NR-2	19	12.66	17.96	100.52	.548	.028	.433	.452	.156	1650	805	nc	titanian_aluminous_magnesiochromite	
NR-2	20	6.66	10.22	102.14	.748	.011	.556	.252	.076	1839	578	nc	aluminous_magnesiochromite	
NR-2	21	10.76	13.70	101.17	.653	.022	.564	.347	.131	1045	431	P3	titanian_aluminous_magnesiochromite	
NR-2	22	10.56	13.26	100.85	.647	.008	.645	.353	.128	519	561	nc	aluminous_ferrous_magnesiochromite	
NR-2	23	9.07	12.80	101.65	.679	.012	.528	.321	.106	1297	626	nc	aluminous_magnesiochromite	
NR-2	24	10.68	11.07	100.89	.700	.004	.723	.300	.131	613	350	P1	aluminous_ferrous_magnesiochromite	1259
NR-2	25	3.80	21.24	100.04	.376	.000	.843	.624	.049	63	2229	nc	magnesian_chromite	
NR-2	26	9.83	13.86	100.79	.651	.025	.555	.349	.120	1831	602	nc	titanian_aluminous_magnesiochromite	
NR-2	27	4.17	18.31	101.18	.536	.002	.456	.464	.047	503	1220	nc	chromian_spinel	
NR-2	28	5.70	16.80	100.62	.552	.003	.610	.448	.068	699	1472	nc	aluminous_ferrous_magnesiochromite	
NR-2	29	8.04	12.77	101.14	.678	.018	.578	.322	.096	1745	488	nc	titanian_aluminous_magnesiochromite	
NR-2	30	16.88	11.71	100.56	.681	.008	.617	.319	.208	919	960	nc	aluminous_ferrous_magnesiochromite	
NR-2	31	10.18	14.65	101.36	.630	.027	.574	.370	.126	1462	643	nc	aluminous_ferrous_magnesiochromite	
NR-2	32	12.68	22.33	100.59	.373	.005	.580	.627	.160	306	1977	nc	magnesian_chromite	
NR-2	33	12.72	9.46	100.64	.747	.005	.680	.253	.154	1092	464	nc	aluminous_ferrous_magnesiochromite	
NR-2	34	11.27	16.69	101.54	.597	.023	.358	.403	.131	1297	1033	nc	chromian_spinel	
NR-2	36	10.54	15.17	100.98	.612	.028	.586	.388	.132	1705	838	nc	aluminous_ferrous_magnesiochromite	
NR-2	37	9.06	11.69	101.56	.711	.023	.540	.289	.108	2240	748	nc	titanian_aluminous_magnesiochromite	
NR-2	38	4.35	17.39	100.87	.520	.001	.737	.480	.054	338	1057	nc	aluminous_ferrous_magnesiochromite	
NR-2	39	7.08	18.85	100.00	.466	.003	.720	.534	.090	739	1277	nc	magnesian_chromite	
NR-2	40	6.19	18.45	100.74	.488	.004	.721	.512	.077	416	1293	nc	magnesian_chromite	
NR-2	41	4.19	15.69	100.78	.586	.000	.600	.414	.049	731	1578	nc	aluminous_ferrous_magnesiochromite	
NR-3	1	17.43	20.91	99.88	.394	.006	.609	.606	.226	919	1586	nc	magnesian_chromite	
NR-3	2	8.53	12.73	100.19	.651	.004	.732	.349	.105	880	626	P1	aluminous_ferrous_magnesiochromite	1015
NR-3	3	11.32	14.79	100.55	.633	.031	.488	.367	.139	2059	569	nc	titanian_aluminous_magnesiochromite	
NR-3	4	8.06	10.92	101.20	.719	.007	.598	.281	.095	1619	683	nc	aluminous_magnesiochromite	
NR-3	5	23.87	14.46	100.80	.615	.019	.477	.385	.298	1297	504	nc	aluminous_ferrous_magnesiochromite	
NR-3	6	7.80	8.14	100.98	.788	.005	.672	.212	.092	1737	537	P3	aluminous_magnesiochromite	
NR-3	7	10.70	14.60	100.95	.627	.022	.550	.373	.131	1933	797	nc	aluminous_ferrous_magnesiochromite	
NR-3	8	5.45	23.64	100.06	.293	.001	.810	.707	.072	110	2603	nc	magnesian_chromite	
NR-3	9	12.37	15.69	100.79	.595	.027	.573	.405	.155	1493	724	nc	aluminous_ferrous_magnesiochromite	
NR-3	10	10.83	15.55	101.21	.612	.034	.530	.388	.135	1972	805	nc	aluminous_ferrous_magnesiochromite	
NR-3	11	9.54	16.13	100.83	.589	.024	.547	.411	.118	1642	944	nc	aluminous_ferrous_magnesiochromite	
NR-3	12	4.43	18.63	100.17	.498	.000	.578	.502	.053	409	2538	nc	magnesian_chromite	
NR-3	13	10.62	9.56	100.89	.747	.006	.675	.253	.128	1163	488	P3	aluminous_ferrous_magnesiochromite	
NR-3	14	2.19	17.26	100.44	.520	.001	.771	.480	.027	401	1472	nc	aluminous_ferrous_magnesiochromite	
NR-3	15	7.29	11.22	101.07	.723	.014	.502	.277	.084	1784	561	nc	titanian_aluminous_magnesiochromite	

NR-3	16	5.78	20.06	100.13	.431	.005	.762	.569	.074	314	1497	nc	magnesian_chromite	
NR-3	17	17.52	18.29	100.75	.539	.013	.305	.461	.206	794	659	nc	ferrous_spinel	
NR-3	18	4.69	20.54	100.84	.422	.000	.719	.578	.059	361	2074	nc	magnesian_chromite	
NR-4	2	8.62	13.91	100.57	.647	.018	.540	.353	.104	1713	569	nc	titanian_aluminous_magnesiochromite	
NR-4	3	6.44	20.97	99.75	.387	.003	.796	.613	.084	503	1212	nc	magnesian_chromite	
NR-4	4	13.46	19.66	100.72	.505	.046	.481	.495	.175	1061	952	nc	aluminous_ferrous_magnesiochromite	
NR-4	5	9.67	15.36	100.40	.605	.025	.576	.395	.120	1910	797	nc	aluminous_ferrous_magnesiochromite	
NR-24	2	8.68	12.35	100.40	.685	.017	.575	.315	.105	1697	659	nc	titanian_aluminous_magnesiochromite	
NR-24	3	8.47	11.47	100.50	.686	.004	.760	.314	.105	652	529	DI	aluminous_ferrous_magnesiochromite	1078
NR-24	4	13.87	18.24	99.75	.534	.047	.533	.466	.183	1517	838	nc	aluminous_ferrous_magnesiochromite	
NR-24	5	11.65	19.49	100.53	.506	.038	.504	.494	.149	1422	1041	nc	aluminous_ferrous_magnesiochromite	
NR-24	7	10.41	13.89	100.63	.656	.031	.504	.344	.127	1894	708	nc	titanian_aluminous_magnesiochromite	
NR-24	8	14.15	7.67	100.74	.795	.005	.677	.205	.171	1383	431	nc	aluminous_ferrous_magnesiochromite	
NR-24	9	10.99	10.89	100.08	.713	.006	.602	.287	.131	707	390	P3	aluminous_magnesiochromite	
NR-24	10	8.99	13.05	100.51	.669	.019	.554	.331	.108	1855	724	nc	titanian_aluminous_magnesiochromite	
NR-24	11	3.01	19.61	99.59	.436	.001	.795	.564	.038	165	1952	nc	magnesian_chromite	
NR-24	12	8.23	14.14	100.49	.638	.018	.574	.362	.100	1556	626	nc	aluminous_ferrous_magnesiochromite	
NR-24	13	9.70	13.31	100.65	.661	.023	.589	.339	.119	1603	521	nc	aluminous_ferrous_magnesiochromite	
NR-24	14	8.75	18.85	100.37	.517	.010	.424	.483	.103	959	2237	nc	ferrous_spinel	
NR-24	15	12.90	15.48	100.72	.580	.006	.628	.420	.159	589	561	nc	aluminous_ferrous_magnesiochromite	
NR-24	16	20.88	13.62	100.17	.627	.011	.569	.373	.262	927	496	nc	aluminous_ferrous_magnesiochromite	
NR-24	17	8.87	12.22	100.54	.690	.022	.582	.310	.108	2161	561	nc	titanian_aluminous_magnesiochromite	
NR-24	18	7.46	14.02	100.49	.643	.013	.538	.357	.089	1705	561	nc	titanian_aluminous_magnesiochromite	
NR-24	19	11.44	13.08	100.74	.666	.024	.572	.334	.141	1721	724	nc	titanian_aluminous_magnesiochromite	
NR-24	20	8.55	13.78	100.65	.651	.015	.522	.349	.102	1619	813	nc	titanian_aluminous_magnesiochromite	
NR-24	21	6.53	22.31	100.05	.336	.001	.817	.664	.086	204	2367	nc	magnesian_chromite	
NR-24	22	10.24	14.08	100.69	.644	.021	.531	.356	.124	1477	626	nc	titanian_aluminous_magnesiochromite	
NR-24	23	8.66	11.70	100.76	.705	.016	.556	.295	.103	1965	586	nc	titanian_aluminous_magnesiochromite	
NR-25	1	6.37	12.21	100.71	.667	.002	.746	.333	.078	1265	578	P1	aluminous_ferrous_magnesiochromite	1045
NR-25	2	10.14	16.65	100.67	.545	.005	.653	.455	.125	613	992	nc	aluminous_ferrous_magnesiochromite	
NR-25	3	7.73	19.71	100.79	.483	.002	.460	.517	.091	880	2302	nc	magnesian_aluminous_chromite	
NR-25	4	10.13	18.54	100.58	.499	.004	.557	.501	.123	747	1537	nc	magnesian_chromite	
NR-25	5	7.50	10.50	100.56	.741	.010	.472	.259	.085	1462	732	nc	aluminous_magnesiochromite	
NR-25	6	3.30	18.53	100.39	.484	.001	.727	.516	.041	291	2034	nc	magnesian_chromite	
NR-25	7	8.42	17.45	100.14	.536	.005	.543	.464	.101	385	1456	nc	aluminous_ferrous_magnesiochromite	
NR-25	8	11.06	15.72	100.34	.598	.036	.599	.402	.142	1477	716	nc	aluminous_ferrous_magnesiochromite	
NR-25	9	5.99	18.65	100.39	.497	.004	.605	.503	.073	778	1358	nc	magnesian_chromite	

NR-25	10	6.72	9.61	100.84	.742	.002	.747	.258	.081	1281	521	nc	aluminous_ferrous_magnesiochromite	
NR-25	11	4.42	18.58	100.68	.486	.001	.702	.514	.054	236	1895	nc	magnesian_chromite	
NR-25	12	8.84	14.14	100.72	.643	.019	.524	.357	.106	1910	748	nc	titanian_aluminous_magnesiochromite	
NR-25	13	8.93	17.96	100.03	.536	.005	.412	.464	.104	1289	1594	nc	ferrous_spinel	
NR-25	14	7.28	10.76	100.46	.707	.002	.754	.293	.089	1022	667	DI	aluminous_ferrous_magnesiochromite	994
NR-25	15	8.56	17.75	100.24	.541	.019	.533	.459	.105	1265	1123	nc	aluminous_ferrous_magnesiochromite	
NR-25	16	6.98	15.84	99.73	.554	.002	.756	.446	.088	660	781	nc	aluminous_ferrous_magnesiochromite	
NR-25	17	9.88	19.42	100.58	.450	.002	.685	.550	.124	511	1765	nc	magnesian_chromite	
NR-25	18	9.20	13.80	100.55	.650	.017	.523	.350	.110	1721	789	nc	titanian_aluminous_magnesiochromite	
NR-25	19	10.72	12.71	100.26	.659	.007	.645	.341	.131	872	594	P3	aluminous_ferrous_magnesiochromite	
NR-26	1	65.89	29.90	96.35	.000	.342	.002	1.000	.997		399	nc	magnetite	
NR-26	2	6.09	15.80	99.52	.578	.002	.581	.422	.073	629	1212	P4	aluminous_ferrous_magnesiochromite	819
NR-26	3	11.48	18.45	100.65	.527	.026	.494	.473	.143	1768	1025	nc	aluminous_ferrous_magnesiochromite	
NR-26	4	9.82	18.77	100.75	.481	.004	.634	.519	.122	825	1627	nc	magnesian_chromite	
NR-26	5	9.93	16.09	100.01	.588	.020	.505	.412	.121	1517	813	nc	titanian_aluminous_magnesiochromite	
NR-26	6	6.87	22.05	99.84	.369	.003	.691	.631	.088	385	2326	nc	magnesian_chromite	
NR-26	7	1.45	20.19	99.30	.415	.000	.818	.585	.019	39	1798	nc	magnesian_chromite	
NR-26	8	11.08	14.39	99.95	.632	.028	.565	.368	.139	1595	594	P3	aluminous_ferrous_magnesiochromite	
NR-26	9	25.18	18.24	100.18	.508	.023	.412	.492	.320	1084	708	nc	aluminous_ferrous_magnesiochromite	
NR-26	10	10.09	13.86	100.25	.646	.027	.584	.354	.126	1729	691	nc	aluminous_ferrous_magnesiochromite	
NR-26	11	8.48	14.37	100.18	.632	.016	.533	.368	.102	1800	935	nc	titanian_aluminous_magnesiochromite	
NR-26	12	3.95	30.31	99.67	.059	.001	.808	.941	.054	47	3807	nc	magnesian_aluminous_chromite	
NR-26	13	9.23	14.35	100.45	.635	.015	.517	.365	.110	1407	643	nc	titanian_aluminous_magnesiochromite	
NR-26	14	12.57	16.58	100.32	.576	.027	.496	.424	.156	1752	944	nc	aluminous_ferrous_magnesiochromite	
NR-26	15	6.25	11.21	99.70	.729	.008	.381	.271	.070	1383	716	nc	chromian_spinel	
NR-26	16	9.89	13.48	99.84	.657	.022	.534	.343	.121	1752	716	nc	titanian_aluminous_magnesiochromite	
NR-26	17	9.69	13.61	99.97	.649	.022	.582	.351	.120	1737	578	P3	aluminous_ferrous_magnesiochromite	
NR-26	18	11.40	15.62	100.05	.571	.008	.653	.429	.142	723	797	nc	aluminous_ferrous_magnesiochromite	
NR-26	19	7.44	19.17	100.18	.501	.020	.553	.499	.093	1564	878	nc	aluminous_ferrous_magnesiochromite	
NR-26	20	8.51	17.03	100.62	.555	.016	.576	.445	.105	1548	870	nc	aluminous_ferrous_magnesiochromite	
NR-26	21	9.95	13.38	100.46	.657	.022	.591	.343	.123	1642	708	nc	aluminous_ferrous_magnesiochromite	
NR-26	22	12.92	16.16	100.30	.597	.038	.474	.403	.162	1862	846	nc	titanian_aluminous_magnesiochromite	
NR-26	23	13.05	17.69	100.16	.548	.040	.530	.452	.169	1572	813	nc	aluminous_ferrous_magnesiochromite	
NR-26	24	9.50	18.95	99.99	.457	.004	.743	.543	.122	472	1033	nc	magnesian_chromite	
NR-27	1	6.38	20.35	99.71	.434	.002	.622	.566	.079	432	2481	nc	magnesian_chromite	
NR-27	2	9.60	9.73	100.14	.737	.004	.719	.263	.117	1352	578	nc	aluminous_ferrous_magnesiochromite	
NR-27	3	3.39	20.43	99.64	.408	.001	.796	.592	.043	361	1863	nc	magnesian_chromite	

NR-27	4	16.87	11.69	100.45	.681	.007	.638	.319	.209	1171	447	nc	aluminous_ferrous_magnesiochromite	
NR-27	5	10.25	14.01	100.53	.649	.017	.461	.351	.121	1556	700	nc	titanian_aluminous_magnesiochromite	
NR-28	1	21.01	17.26	100.02	.541	.023	.450	.459	.266	872	1025	nc	aluminous_ferrous_magnesiochromite	
NR-28	2	10.96	14.88	100.29	.621	.026	.541	.379	.136	1658	708	nc	aluminous_ferrous_magnesiochromite	
NR-34	1	10.78	14.18	100.35	.614	.007	.676	.386	.134	794	561	nc	aluminous_ferrous_magnesiochromite	
NR-34	2	12.40	18.97	100.45	.465	.004	.663	.535	.157	566	1147	nc	magnesian_chromite	
NR-34	3	4.55	17.08	100.73	.553	.001	.529	.447	.053	668	2050	nc	aluminous_ferrous_magnesiochromite	
NR-34	4	8.35	13.65	100.35	.651	.019	.578	.349	.102	1430	659	nc	titanian_aluminous_magnesiochromite	
NR-35	1	5.74	20.94	99.33	.396	.001	.731	.604	.074	432	1846	nc	magnesian_chromite	
NR-36	1	3.39	15.38	100.44	.600	.000	.546	.400	.039	715	1521	nc	aluminous_magnesiochromite	
NR-36	2	7.58	15.14	99.57	.607	.017	.563	.393	.093	1800	765	nc	aluminous_ferrous_magnesiochromite	
NR-36	3	13.65	18.79	99.95	.520	.043	.505	.480	.178	1556	1057	nc	aluminous_ferrous_magnesiochromite	
NR-36	4	11.15	15.34	100.44	.614	.035	.548	.386	.141	1367	781	nc	aluminous_ferrous_magnesiochromite	
NR-36	6	7.00	12.56	99.92	.675	.013	.589	.325	.084	1965	553	nc	aluminous_magnesiochromite	
NR-36	7	17.17	7.73	99.75	.796	.010	.586	.204	.209	1540	472	P3	ferric_magnesiochromite	
NR-36	8	7.24	12.18	100.42	.690	.020	.616	.310	.088	1666	594	nc	titanian_aluminous_magnesiochromite	
NR-36	9	5.41	16.44	100.32	.554	.002	.671	.446	.066	589	675	nc	aluminous_ferrous_magnesiochromite	
NR-36	10	7.16	16.31	99.94	.572	.015	.596	.428	.088	1485	919	nc	aluminous_ferrous_magnesiochromite	
NR-36	11	8.17	15.99	100.66	.588	.018	.572	.412	.100	1721	911	nc	aluminous_ferrous_magnesiochromite	
NR-37	1	8.76	13.54	100.09	.622	.004	.781	.378	.110	440	569	nc	aluminous_ferrous_magnesiochromite	
NR-37	2	7.87	11.20	100.34	.715	.014	.576	.285	.094	1933	594	P3	titanian_aluminous_magnesiochromite	
NR-37	3	5.41	20.05	100.15	.433	.001	.710	.567	.068	354	1895	nc	magnesian_chromite	
NR-37	4	6.35	11.95	99.77	.676	.006	.733	.324	.078	1540	716	nc	aluminous_ferrous_magnesiochromite	
NR-37	6	6.34	17.87	100.06	.526	.002	.531	.474	.075	589	1594	nc	aluminous_ferrous_magnesiochromite	
NR-37	7	9.55	14.10	100.16	.639	.024	.572	.361	.118	1886	756	nc	aluminous_ferrous_magnesiochromite	
NR-37	9	2.95	18.72	100.21	.486	.000	.662	.514	.036	220	2375	nc	magnesian_chromite	
NR-37	11	10.89	15.47	100.63	.602	.027	.583	.398	.136	1077	838	nc	aluminous_ferrous_magnesiochromite	
NR-37	12	9.44	17.19	100.31	.564	.019	.477	.436	.114	1556	805	nc	titanian_aluminous_magnesiochromite	
NR-37	13	9.88	15.75	100.46	.601	.029	.544	.399	.123	2090	700	nc	aluminous_ferrous_magnesiochromite	
NR-37	14	11.52	16.01	100.58	.591	.023	.506	.409	.141	1878	887	nc	titanian_aluminous_magnesiochromite	
NR-37	15	8.00	13.82	99.71	.646	.009	.494	.354	.094	1344	797	nc	aluminous_magnesiochromite	
NR-37	16	2.40	17.97	100.34	.496	.001	.777	.504	.030	228	1846	nc	magnesian_chromite	
NR-37	17	11.82	18.78	100.60	.519	.045	.589	.481	.156	1422	594	P3	aluminous_ferrous_magnesiochromite	
NR-38	2	10.36	15.80	100.44	.599	.022	.504	.401	.126	1477	578	nc	titanian_aluminous_magnesiochromite	
NR-39	1	8.42	11.55	100.54	.704	.018	.612	.296	.102	2161	537	P3	titanian_aluminous_magnesiochromite	
NR-39	2	3.86	18.90	100.62	.493	.003	.602	.507	.046	668	2066	nc	magnesian_chromite	
NR-39	3	7.69	21.06	100.69	.423	.003	.607	.577	.095	613	984	nc	magnesian_chromite	

NR-39	4	3.09	18.45	100.64	.501	.000	.636	.499	.037	259	2294	nc	aluminous_ferrous_magnesiochromite	
NR-39	5	8.45	22.20	100.13	.380	.010	.640	.620	.108	1485	1936	nc	magnesian_chromite	
NR-39	6	8.53	20.26	100.53	.465	.019	.563	.535	.107	974	1163	nc	titanian_magnesian_chromite	
NR-40	1	8.69	13.18	100.25	.671	.019	.488	.329	.103	1690	805	nc	titanian_aluminous_magnesiochromite	
NR-40	2	6.88	22.51	100.42	.337	.001	.786	.663	.090	283	2359	nc	magnesian_chromite	
NR-40	3	9.19	14.03	99.71	.640	.017	.534	.360	.111	1587	732	nc	titanian_aluminous_magnesiochromite	

Cripple Creek Area Calculated Parameters
(NR Series)

Sample	Grain	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Ni_ppm	Zn_ppm	P-type	Nomenclature	T(Zn) C
NR-30	2	7.71	11.43	100.05	.688	.002	.738	.312	.094	1029	529	P1	aluminous_ferrous_magnesiochromite	1078.
NR-30	3	10.67	15.98	100.56	.559	.005	.682	.441	.133	1092	903	nc	aluminous_ferrous_magnesiochromite	
NR-30	4	10.46	14.61	99.71	.603	.008	.638	.397	.130	943	1000	nc	aluminous_ferrous_magnesiochromite	
NR-30	5	7.07	19.04	100.14	.503	.003	.461	.497	.083	629	1741	nc	aluminous_ferrous_magnesiochromite	
NR-30	6	8.89	14.53	99.77	.590	.002	.767	.410	.112	699	561	nc	aluminous_ferrous_magnesiochromite	
NR-30	7	5.94	20.01	99.63	.433	.001	.695	.567	.075	393	1765	nc	magnesian_chromite	
NR-30	8	10.80	18.36	100.16	.508	.006	.523	.492	.131	707	1139	nc	aluminous_ferrous_magnesiochromite	
NR-30	9	10.00	12.77	99.90	.651	.006	.706	.349	.124	857	447	P1	aluminous_ferrous_magnesiochromite	1146.
NR-30	10	7.85	20.09	99.63	.459	.009	.549	.541	.097	959	1602	nc	magnesian_chromite	
NR-30	11	7.67	11.71	99.43	.677	.002	.738	.323	.095	967	529	P1	aluminous_ferrous_magnesiochromite	1078.
NR-30	12	4.57	18.57	100.08	.486	.002	.683	.514	.056	338	1448	nc	magnesian_chromite	
NR-30	13	7.67	15.99	100.53	.581	.017	.618	.419	.095	1855	781	nc	aluminous_ferrous_magnesiochromite	
NR-30	14	4.45	20.01	99.47	.418	.001	.801	.582	.057	149	1724	nc	magnesian_chromite	
NR-30	15	9.94	14.15	100.06	.636	.023	.579	.364	.123	1745	578	P3	aluminous_ferrous_magnesiochromite	
NR-30	16	8.15	10.71	100.57	.717	.002	.648	.283	.097	1556	553	P3	aluminous_ferrous_magnesiochromite	
NR-30	18	6.81	11.50	100.34	.720	.013	.432	.280	.077	1745	586	nc	chromian_spinel	
NR-30	19	11.54	13.17	99.71	.638	.007	.684	.362	.144	833	773	nc	aluminous_ferrous_magnesiochromite	
NR-30	20	13.05	17.55	100.62	.573	.041	.390	.427	.162	1360	960	nc	chromian_spinel	
NR-30	21	12.81	15.13	100.51	.586	.007	.633	.414	.159	707	1106	nc	aluminous_ferrous_magnesiochromite	
NR-30	22	7.93	11.81	100.02	.697	.015	.594	.303	.096	1776	521	nc	titanian_aluminous_magnesiochromite	
NR-30	23	6.69	18.32	99.70	.500	.005	.621	.500	.083	338	1635	nc	aluminous_ferrous_magnesiochromite	
NR-30	24	11.30	15.73	100.34	.604	.024	.469	.396	.137	1517	724	nc	titanian_aluminous_magnesiochromite	
NR-30	25	9.31	15.72	100.34	.600	.021	.513	.400	.113	1556	651	nc	titanian_aluminous_magnesiochromite	
NR-30	26	8.54	12.24	99.97	.689	.016	.544	.311	.102	1768	675	nc	titanian_aluminous_magnesiochromite	
NR-30	27	22.06	11.11	100.51	.706	.015	.514	.294	.271	1281	488	P3	ferric_magnesiochromite	
NR-30	28	6.26	19.80	99.85	.435	.002	.736	.565	.080	456	1643	nc	magnesian_chromite	
NR-30	29	13.86	12.49	100.66	.660	.006	.670	.340	.171	676	675	nc	aluminous_ferrous_magnesiochromite	
NR-30	30	13.66	14.46	100.75	.612	.007	.591	.388	.167	786	634	nc	aluminous_ferrous_magnesiochromite	
NR-30	31	11.62	16.79	100.71	.590	.028	.382	.410	.139	1493	862	nc	chromian_spinel	
NR-30	33	11.89	19.00	100.41	.468	.004	.629	.532	.149	817	1415	nc	magnesian_chromite	
NR-30	34	15.56	12.82	100.32	.652	.008	.610	.348	.192	715	935	nc	aluminous_ferrous_magnesiochromite	
NR-30	35	11.81	23.36	100.26	.366	.016	.514	.634	.150	990	1627	nc	magnesian_aluminous_chromite	
NR-30	36	8.23	14.59	100.57	.639	.009	.396	.361	.094	1430	895	nc	chromian_spinel	
NR-30	37	11.34	17.10	100.63	.560	.014	.480	.440	.136	299	1041	nc	aluminous_magnesiochromite	
NR-30	38	4.89	17.07	99.67	.520	.002	.753	.480	.061	401	1497	nc	aluminous_ferrous_magnesiochromite	
NR-30	39	4.12	19.26	100.35	.450	.001	.793	.550	.052	244	1505	nc	magnesian_chromite	

NR-30	40	8.56	13.66	100.22	.648	.018	.589	.352	.105	1690	602	nc	aluminous_ferrous_magnesiochromite	
NR-30	41	11.09	23.28	100.37	.319	.002	.688	.681	.144	479	2432	nc	magnesian_chromite	
NR-30	42	5.42	18.96	100.45	.491	.002	.579	.509	.065	472	1928	nc	magnesian_chromite	
NR-30	43	5.75	15.17	100.36	.587	.004	.706	.413	.070	857	968	nc	aluminous_ferrous_magnesiochromite	
NR-30	44	10.56	20.99	100.44	.442	.016	.508	.558	.131	967	1814	nc	titanian_magnesian_chromite	
NR-30	45	13.68	15.47	99.84	.570	.007	.663	.430	.173	424	708	nc	aluminous_ferrous_magnesiochromite	
NR-30	47	4.64	16.46	100.51	.573	.001	.508	.427	.054	566	2367	nc	aluminous_magnesiochromite	
NR-30	48	9.10	13.58	100.00	.666	.006	.353	.334	.102	1171	773	nc	chromian_spinel	
NR-30	49	10.35	13.05	99.40	.647	.010	.661	.353	.129	699	529	P3	aluminous_ferrous_magnesiochromite	
NR-30	50	8.83	18.77	100.34	.503	.008	.522	.497	.107	943	1757	nc	aluminous_ferrous_magnesiochromite	
NR-30	51	2.49	19.95	100.05	.424	.001	.828	.576	.032	79	2066	nc	magnesian_chromite	
NR-31	1	6.43	11.04	100.19	.699	.003	.770	.301	.079	1312	512	P1	aluminous_ferrous_magnesiochromite	1090.
NR-31	2	7.76	12.28	100.76	.688	.015	.572	.312	.092	1792	561	nc	titanian_aluminous_magnesiochromite	
NR-31	4	4.98	17.15	100.47	.546	.000	.560	.454	.059	574	1692	nc	aluminous_ferrous_magnesiochromite	
NR-31	6	7.17	11.78	100.70	.724	.004	.279	.276	.076	809	781	nc	chromian_spinel	
NR-31	7	6.03	17.23	100.84	.565	.005	.430	.435	.069	1022	1790	nc	chromian_spinel	
NR-31	8	9.46	15.36	100.53	.605	.028	.611	.395	.119	1053	854	nc	aluminous_ferrous_magnesiochromite	
NR-31	10	12.09	15.12	100.53	.591	.009	.630	.409	.150	825	578	P3	aluminous_ferrous_magnesiochromite	
NR-31	12	10.17	11.12	100.59	.703	.006	.679	.297	.123	982	472	P3	aluminous_ferrous_magnesiochromite	
NR-31	13	12.49	18.12	100.59	.488	.004	.674	.512	.158	794	952	nc	magnesian_chromite	
NR-31	14	19.32	18.30	100.66	.505	.021	.525	.495	.247	1194	675	nc	aluminous_ferrous_magnesiochromite	
NR-31	15	9.03	19.99	100.75	.474	.017	.553	.526	.112	1022	1000	nc	titanian_magnesian_chromite	
NR-31	16	10.90	12.99	99.20	.671	.028	.518	.329	.135	2059	456	nc	titanian_aluminous_magnesiochromite	
NR-31	17	32.05	11.99	101.12	.672	.010	.454	.328	.399	2224	423	nc	ferric_magnesiochromite	
NR-31	19	8.74	21.39	100.17	.386	.003	.701	.614	.112	448	2212	nc	magnesian_chromite	
NR-31	20	4.01	19.65	100.31	.455	.002	.677	.545	.050	534	2334	nc	magnesian_chromite	
NR-31	21	8.40	10.26	100.51	.720	.003	.769	.280	.103	1124	431	DI	aluminous_ferrous_magnesiochromite	1161.
NR-31	22	12.38	16.08	99.56	.578	.034	.616	.422	.162	1116	952	nc	aluminous_ferrous_magnesiochromite	
NR-31	23	4.55	19.27	100.50	.470	.002	.667	.530	.056	55	1708	nc	magnesian_chromite	
NR-31	26	23.36	14.26	100.22	.608	.012	.519	.392	.294	1894	626	nc	aluminous_ferrous_magnesiochromite	
NR-31	27	2.84	12.05	100.39	.713	.000	.325	.287	.030	1493	1342	nc	chromian_spinel	
NR-31	28	8.33	19.60	99.95	.462	.006	.602	.538	.103	534	1798	nc	magnesian_chromite	
NR-31	29	5.84	15.09	100.75	.622	.006	.439	.378	.066	1627	927	nc	chromian_spinel	
NR-31	30	8.85	12.92	100.54	.673	.017	.543	.327	.106	1815	643	nc	titanian_aluminous_magnesiochromite	
NR-31	31	4.93	28.79	99.81	.085	.001	.789	.915	.067	16	6003	nc	magnesian_aluminous_chromite	
NR-31	32	7.05	12.41	100.26	.666	.004	.702	.334	.086	1014	634	nc	aluminous_ferrous_magnesiochromite	
NR-31	34	4.00	21.28	100.35	.388	.001	.774	.612	.051	102	2278	nc	magnesian_chromite	

NR-31	35	13.52	14.92	100.36	.602	.009	.565	.398	.165	684	512	P3	aluminous_ferrous_magnesiochromite	
NR-31	36	4.97	15.26	100.59	.601	.001	.569	.399	.058	919	895	P4	aluminous_ferrous_magnesiochromite	901.
NR-31	37	6.45	21.27	99.51	.392	.002	.674	.608	.082	299	3498	nc	magnesian_chromite	
NR-31	38	7.69	20.84	100.43	.430	.004	.585	.570	.095	479	1830	nc	magnesian_chromite	
NR-31	39	2.99	17.77	100.37	.513	.000	.688	.487	.036	479	1749	nc	aluminous_ferrous_magnesiochromite	
NR-31	42	6.78	14.61	100.71	.599	.003	.747	.401	.084	825	813	nc	aluminous_ferrous_magnesiochromite	
NR-31	43	20.13	12.67	100.77	.662	.013	.547	.338	.248	597	569	nc	aluminous_ferrous_magnesiochromite	
NR-31	44	7.52	20.19	100.01	.469	.022	.565	.531	.095	1462	1253	nc	titanian_magnesian_chromite	
NR-31	45	15.64	23.52	99.82	.269	.003	.681	.731	.209	574	3018	nc	magnesian_chromite	
NR-31	46	8.93	13.69	100.41	.650	.024	.594	.350	.110	1823	472	P3	aluminous_ferrous_magnesiochromite	
NR-31	48	5.99	9.51	100.37	.747	.002	.712	.253	.071	1029	643	nc	aluminous_ferrous_magnesiochromite	
NR-31	49	3.65	17.83	100.13	.524	.001	.586	.476	.043	330	1806	nc	aluminous_ferrous_magnesiochromite	
NR-32	1	5.67	16.68	100.68	.560	.002	.564	.440	.067	605	2058	nc	aluminous_ferrous_magnesiochromite	
NR-32	2	25.04	14.43	99.98	.608	.020	.494	.392	.319	1360	724	nc	ferric_magnesiochromite	
NR-32	3	19.16	23.03	100.53	.324	.009	.620	.676	.254	739	1659	nc	magnesian_chromite	
NR-32	4	26.01	12.78	100.11	.656	.019	.474	.344	.327	1713	366	nc	ferric_magnesiochromite	
NR-32	5	6.49	20.61	100.67	.422	.002	.698	.578	.081	346	1440	nc	magnesian_chromite	
NR-32	6	3.72	16.58	100.54	.565	.000	.562	.435	.043	511	1594	nc	aluminous_ferrous_magnesiochromite	
NR-32	8	9.39	18.34	100.15	.518	.024	.593	.482	.119	1218	968	nc	aluminous_ferrous_magnesiochromite	
NR-32	9	4.80	23.10	100.33	.315	.000	.821	.685	.063	39	2611	nc	magnesian_chromite	
NR-32	10	8.22	15.63	100.71	.577	.009	.696	.423	.102	558	830	nc	aluminous_ferrous_magnesiochromite	
NR-32	12	7.85	23.99	100.52	.275	.005	.695	.725	.102	416	7329	nc	magnesian_chromite	
NR-32	13	2.57	17.21	100.84	.549	.000	.577	.451	.030	393	1724	nc	aluminous_ferrous_magnesiochromite	
NR-32	14	8.17	13.74	100.61	.638	.006	.612	.362	.098	951	700	P4	aluminous_ferrous_magnesiochromite	978.
NR-32	15	8.26	11.91	100.57	.703	.018	.522	.297	.098	1886	708	nc	titanian_aluminous_magnesiochromite	
NR-32	16	10.22	16.57	100.69	.579	.010	.442	.421	.120	880	887	nc	aluminous_magnesiochromite	
NR-32	17	8.65	19.65	100.03	.454	.008	.664	.546	.110	582	1196	nc	magnesian_chromite	
NR-32	18	2.67	20.12	100.12	.426	.000	.780	.574	.034	196	2066	nc	magnesian_chromite	
NR-32	19	19.46	11.97	99.94	.674	.009	.587	.326	.242	1194	610	nc	aluminous_ferrous_magnesiochromite	
NR-32	20	2.09	17.47	100.14	.508	.000	.798	.492	.026	236	1830	nc	aluminous_ferrous_magnesiochromite	
NR-32	21	8.17	14.20	99.61	.635	.017	.554	.365	.099	1532	512	nc	titanian_aluminous_magnesiochromite	
NR-32	22	28.62	13.59	100.25	.625	.012	.466	.375	.360	2192	789	nc	ferric_magnesiochromite	
NR-32	23	8.45	13.25	100.67	.670	.015	.477	.330	.099	2004	740	nc	titanian_aluminous_magnesiochromite	
NR-32	24	5.91	12.95	99.83	.641	.002	.775	.359	.073	1053	610	DI	aluminous_ferrous_magnesiochromite	1025.
NR-32	26	7.03	10.13	100.67	.726	.002	.747	.274	.085	1454	618	nc	aluminous_ferrous_magnesiochromite	
NR-32	27	6.66	20.55	100.67	.423	.001	.684	.577	.083	385	1757	nc	magnesian_chromite	
NR-32	28	7.85	12.52	100.21	.682	.018	.568	.318	.095	2020	521	nc	titanian_aluminous_magnesiochromite	

NR-33	1	1.57	13.57	99.72	.670	.001	.369	.330	.017	849	1602	nc	chromian_spinel	
NR-33	2	3.56	14.74	100.77	.629	.000	.462	.371	.040	1061	1838	nc	chromian_spinel	
NR-33	5	7.89	21.02	100.53	.414	.003	.647	.586	.099	409	1643	nc	magnesian_chromite	
NR-33	8	5.24	13.14	100.63	.642	.002	.768	.358	.064	432	529	nc	aluminous_ferrous_magnesiochromite	
NR-33	9	12.86	17.44	98.85	.498	.007	.708	.502	.168	1092	716	nc	magnesian_chromite	
NR-33	10	7.94	17.94	100.70	.546	.006	.392	.454	.091	1132	2025	nc	ferrous_spinel	
												nc-no class		

Pinto Creek Area Calculated Parameters
(NR Series)

Sample	Grain	Fe2O3	FeO	NewTot	Mg#	Ti#	Cr#	Fe2#	Fe3#	Ni_ppm	Zn_ppm	P-type	Nomenclature	T(Zn) C
NR-41	1	4.49	16.24	100.71	.581	.003	.538	.419	.052	534	1285	nc	aluminous_magnesiochromite	
NR-41	2	7.36	13.35	100.59	.665	.014	.510	.335	.086	1690	602	nc	titanian_aluminous_magnesiochromite	
NR-41	3	11.50	17.64	99.55	.540	.036	.591	.460	.150	1485	822	nc	aluminous_ferrous_magnesiochromite	
NR-41	4	5.93	9.36	99.77	.744	.001	.796	.256	.073	1155	350	DI	aluminous_ferrous_magnesiochromite	1259
NR-41	5	6.37	11.41	100.43	.706	.011	.613	.294	.076	2027	716	nc	aluminous_magnesiochromite	
NR-41	6	24.18	12.94	100.37	.651	.011	.483	.349	.299	1815	488	nc	ferric_magnesiochromite	
NR-41	7	5.89	13.45	100.11	.624	.002	.798	.376	.073	574	911	nc	aluminous_ferrous_magnesiochromite	
NR-41	8	17.24	17.93	100.62	.517	.011	.510	.483	.214	707	1033	nc	aluminous_ferrous_magnesiochromite	
NR-41	9	5.70	21.56	100.40	.388	.001	.695	.612	.072	299	2156	nc	magnesian_chromite	
NR-41	10	2.35	16.76	100.25	.566	.000	.512	.434	.027	456	2603	nc	aluminous_magnesiochromite	
NR-41	11	16.32	21.25	100.41	.379	.004	.657	.621	.213	668	1383	nc	magnesian_chromite	
NR-41	13	13.39	15.19	100.26	.587	.009	.627	.413	.167	409	724	nc	aluminous_ferrous_magnesiochromite	
NR-41	14	13.59	7.81	100.77	.794	.006	.653	.206	.163	1249	350	nc	aluminous_magnesiochromite	
NR-41	15	9.67	20.47	100.73	.466	.005	.422	.534	.114	770	2440	nc	hercynite	
NR-41	16	5.52	12.80	100.60	.652	.002	.750	.348	.067	558	984	nc	aluminous_ferrous_magnesiochromite	
NR-41	17	3.73	21.36	100.40	.378	.001	.821	.622	.048	157	2131	nc	magnesian_chromite	
NR-41	18	11.15	15.33	99.95	.575	.007	.689	.425	.140	935	691	nc	aluminous_ferrous_magnesiochromite	
NR-41	19	18.53	17.79	100.76	.526	.013	.463	.474	.228	888	1285	nc	aluminous_ferrous_magnesiochromite	
												nc-no class		

Appendix III
DI, P1, P3 and P4 Chromites
(NR Series)

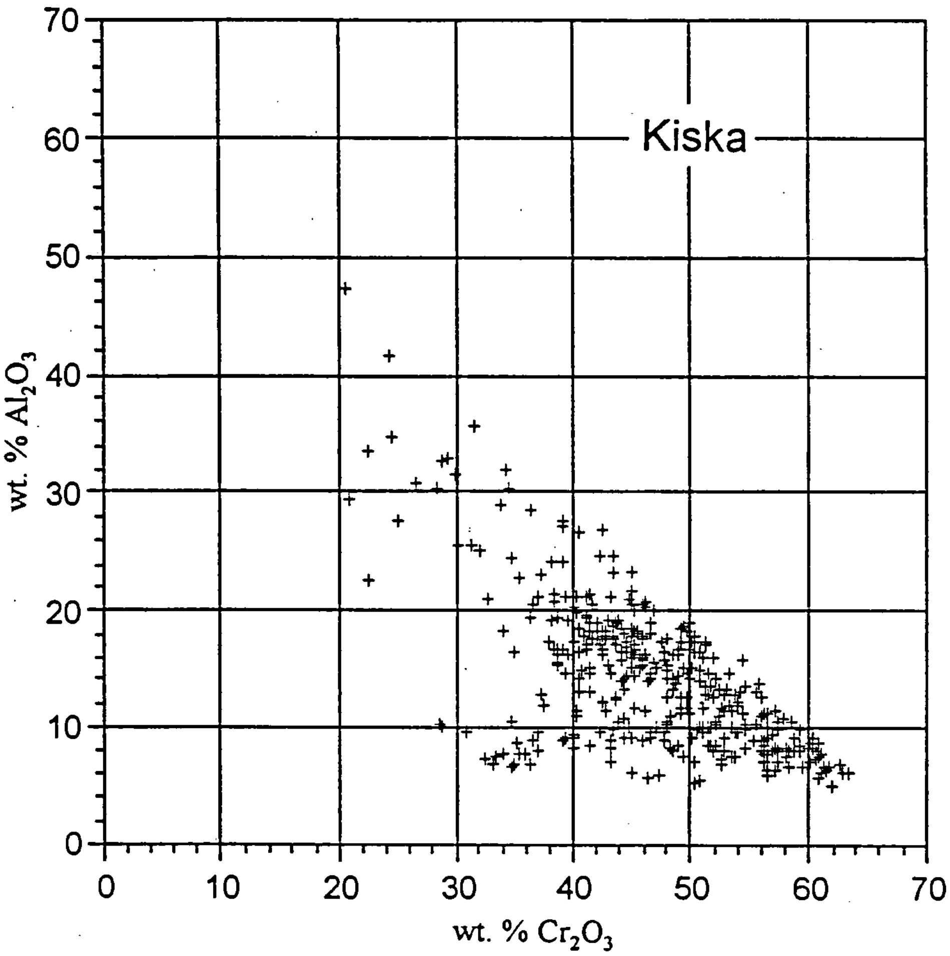
Sample	Grain	Al2O3	Cr2O3	MgO	Fe2O3	FeO	Mg#	Ti#	Cr#	Fe3#	Ni_ppm	Zn_ppm	P-type	Nomenclature	T(Zn) C
NR-2	18	10.05	57.08	15.8	7.78	9.33	.752	.003	.718	.093	1132	594	P3	aluminous_ferrous_magnesiochromite	
NR-2	21	15.95	44.08	14.4	10.76	13.70	.653	.022	.564	.131	1045	431	P3	titanian_aluminous_magnesiochromite	
NR-2	24	7.65	56.25	14.5	10.68	11.07	.700	.004	.723	.131	613	350	P1	aluminous_ferrous_magnesiochromite	1259
NR-3	2	8.37	56.39	13.3	8.53	12.73	.651	.004	.732	.105	880	626	P1	aluminous_ferrous_magnesiochromite	1015
NR-3	6	12.8	54.3	17	7.80	8.14	.788	.005	.672	.092	1737	537	P3	aluminous_magnesiochromite	
NR-3	13	10.48	53.44	15.9	10.62	9.56	.747	.006	.675	.128	1163	488	P3	aluminous_ferrous_magnesiochromite	
NR-5	32	8.14	57.2	13.7	7.78	11.91	.673	.004	.745	.097	1124	488	P1	aluminous_ferrous_magnesiochromite	1109
NR-5	41	16.26	48.46	15.6	7.08	11.24	.712	.014	.610	.085	1697	390	P3	titanian_aluminous_magnesiochromite	
NR-5	42	16.37	48.93	12.5	6.69	15.14	.596	.002	.614	.080	833	1236	P4	aluminous_ferrous_magnesiochromite	814.
NR-6	16	16.54	50.12	13	5.44	14.76	.611	.004	.627	.065	857	765	P4	aluminous_ferrous_magnesiochromite	949.
NR-7	16	8.33	59.76	13.1	5.75	13.23	.637	.002	.770	.070	1061	724	DI	aluminous_ferrous_magnesiochromite	967.
NR-8	10	17.97	45.89	15.6	7.34	11.42	.708	.014	.576	.088	1972	594	P3	titanian_aluminous_magnesiochromite	
NR-8	16	13.36	52.18	14.2	7.44	12.42	.671	.005	.659	.089	912	537	P3	aluminous_ferrous_magnesiochromite	
NR-10	11	8	56.16	13.1	8.38	12.77	.647	.005	.738	.105	1242	333	P1	aluminous_ferrous_magnesiochromite	1283
NR-10	16	8.31	57.9	12.4	6.79	13.96	.613	.002	.754	.084	802	724	DI	aluminous_ferrous_magnesiochromite	967
NR-11	9	11.47	45.99	13.1	15.35	13.68	.631	.006	.592	.188	629	578	P3	aluminous_ferrous_magnesiochromite	
NR-11	11	11.81	52.59	15.6	9.38	9.99	.736	.007	.665	.113	1430	586	P3	aluminous_ferrous_magnesiochromite	
NR-12	3	14.75	53.27	16.5	6.66	9.03	.765	.002	.653	.078	1336	456	P3	aluminous_magnesiochromite	
NR-12	4	12.77	49.16	12.3	9.10	15.49	.586	.010	.640	.113	912	586	P3	aluminous_ferrous_magnesiochromite	
NR-13	13	11.46	42.6	16.1	19.76	8.91	.763	.008	.543	.240	1595	431	P3	ferric_magnesiochromite	
NR-14	1	17.3	51.11	15.3	4.66	11.29	.707	.003	.628	.055	1352	366	P3	aluminous_magnesiochromite	
NR-14	10	15.81	45.83	12.6	9.00	15.46	.592	.011	.588	.110	927	878	P4	aluminous_ferrous_magnesiochromite	907
NR-18	1	14.57	44.44	14.3	13.60	12.63	.669	.009	.562	.164	1163	553	P3	aluminous_ferrous_magnesiochromite	
NR-21	4	17.74	45.8	15.6	7.76	11.54	.706	.015	.575	.093	1650	561	P3	titanian_aluminous_magnesiochromite	
NR-21	17	10.76	44.22	14	18.09	12.28	.670	.010	.571	.222	1564	447	P3	aluminous_ferrous_magnesiochromite	
NR-21	23	11.21	56.26	15.2	6.33	10.41	.722	.004	.712	.076	1210	521	P3	aluminous_ferrous_magnesiochromite	
NR-22	2	7.16	60.12	13.5	6.36	12.15	.664	.002	.782	.079	613	512	DI	aluminous_ferrous_magnesiochromite	1090
NR-22	4	8.22	59.02	12.9	6.26	13.45	.630	.002	.764	.077	778	683	DI	aluminous_ferrous_magnesiochromite	986
NR-23	13	10.03	43.39	13.6	19.30	12.91	.652	.011	.566	.239	912	325	P3	aluminous_ferrous_magnesiochromite	
NR-23	18	19.32	42.86	12.7	9.11	15.44	.595	.005	.533	.108	990	1204	P4	aluminous_ferrous_magnesiochromite	821
NR-24	3	6.99	58.63	14.1	8.47	11.47	.686	.004	.760	.105	652	529	DI	aluminous_ferrous_magnesiochromite	1078
NR-24	9	14.2	47.92	15.2	10.99	10.89	.713	.006	.602	.131	707	390	P3	aluminous_magnesiochromite	
NR-25	1	9.28	58.35	13.8	6.37	12.21	.667	.002	.746	.078	1265	578	P1	aluminous_ferrous_magnesiochromite	1045
NR-25	14	8.27	58.9	14.6	7.28	10.76	.707	.002	.754	.089	1022	667	DI	aluminous_ferrous_magnesiochromite	994
NR-25	19	11.7	50.26	13.8	10.72	12.71	.659	.007	.645	.131	872	594	P3	aluminous_ferrous_magnesiochromite	
NR-26	2	18.48	46.23	12.1	6.09	15.80	.578	.002	.581	.073	629	1212	P4	aluminous_ferrous_magnesiochromite	819

NR-26	8	15.12	42.96	13.9	11.08	14.39	.632	.028	.565	.139	1595	594	P3	aluminous_ferrous_magnesiochromite	
NR-26	17	15.39	44.83	14.2	9.69	13.61	.649	.022	.582	.120	1737	578	P3	aluminous_ferrous_magnesiochromite	
NR-30	2	8.73	57.37	14.1	7.71	11.43	.688	.002	.738	.094	1029	529	P1	aluminous_ferrous_magnesiochromite	1078
NR-30	9	8.72	54.06	13.4	10.00	12.77	.651	.006	.706	.124	857	447	P1	aluminous_ferrous_magnesiochromite	1146
NR-30	11	8.68	56.91	13.8	7.67	11.71	.677	.002	.738	.095	967	529	P1	aluminous_ferrous_magnesiochromite	1078
NR-30	15	15.32	44.48	13.9	9.94	14.15	.636	.023	.579	.123	1745	578	P3	aluminous_ferrous_magnesiochromite	
NR-30	16	13.73	52.03	15.2	8.15	10.71	.717	.002	.648	.097	1556	553	P3	aluminous_ferrous_magnesiochromite	
NR-30	27	11.14	39.77	15	22.06	11.11	.706	.015	.514	.271	1281	488	P3	ferric_magnesiochromite	
NR-30	49	10.8	50.51	13.4	10.35	13.05	.647	.010	.661	.129	699	529	P3	aluminous_ferrous_magnesiochromite	
NR-31	1	7.87	59.8	14.4	6.43	11.04	.699	.003	.770	.079	1312	512	P1	aluminous_ferrous_magnesiochromite	1090
NR-31	10	11.38	48.46	12.3	12.09	15.12	.591	.009	.630	.150	825	578	P3	aluminous_ferrous_magnesiochromite	
NR-31	12	10.4	53.26	14.8	10.17	11.12	.703	.006	.679	.123	982	472	P3	aluminous_ferrous_magnesiochromite	
NR-31	21	6.65	59.66	14.8	8.40	10.26	.720	.003	.769	.103	1124	431	DI	aluminous_ferrous_magnesiochromite	1161
NR-31	35	14.07	43.97	12.7	13.52	14.92	.602	.009	.565	.165	684	512	P3	aluminous_ferrous_magnesiochromite	
NR-31	36	20.42	46.38	12.9	4.97	15.26	.601	.001	.569	.058	919	895	P4	aluminous_ferrous_magnesiochromite	901
NR-31	46	15.31	45.81	14.3	8.93	13.69	.650	.024	.594	.110	1823	472	P3	aluminous_ferrous_magnesiochromite	
NR-32	14	15.46	48.64	13.6	8.17	13.74	.638	.006	.612	.098	951	700	P4	aluminous_ferrous_magnesiochromite	978
NR-32	24	7.8	59.5	13	5.91	12.95	.641	.002	.775	.073	1053	610	DI	aluminous_ferrous_magnesiochromite	1025
NR-36	7	10.82	45.91	16.9	17.17	7.73	.796	.010	.586	.209	1540	472	P3	ferric_magnesiochromite	
NR-37	2	17.69	46.05	15.8	7.87	11.20	.715	.014	.576	.094	1933	594	P3	titanian_aluminous_magnesiochromite	
NR-37	17	12.36	42.55	11.4	11.82	18.78	.519	.045	.589	.156	1422	594	P3	aluminous_ferrous_magnesiochromite	
NR-39	1	15.07	48.06	15.5	8.42	11.55	.704	.018	.612	.102	2161	537	P3	titanian_aluminous_magnesiochromite	
NR-41	4	6.83	61.84	15.2	5.93	9.36	.744	.001	.796	.073	1155	350	DI	aluminous_ferrous_magnesiochromite	1259
NR-42	38	17.57	50.25	12.2	3.90	15.77	.580	.000	.627	.046	644	1375	P4	aluminous_ferrous_magnesiochromite	788
NR-42	40	6.46	57.18	13.7	10.40	12.03	.669	.004	.745	.129	668	667	P1	aluminous_ferrous_magnesiochromite	994
NR-42	41	6.49	56.37	13.6	11.36	12.14	.667	.004	.733	.141	896	561	P1	aluminous_ferrous_magnesiochromite	1055

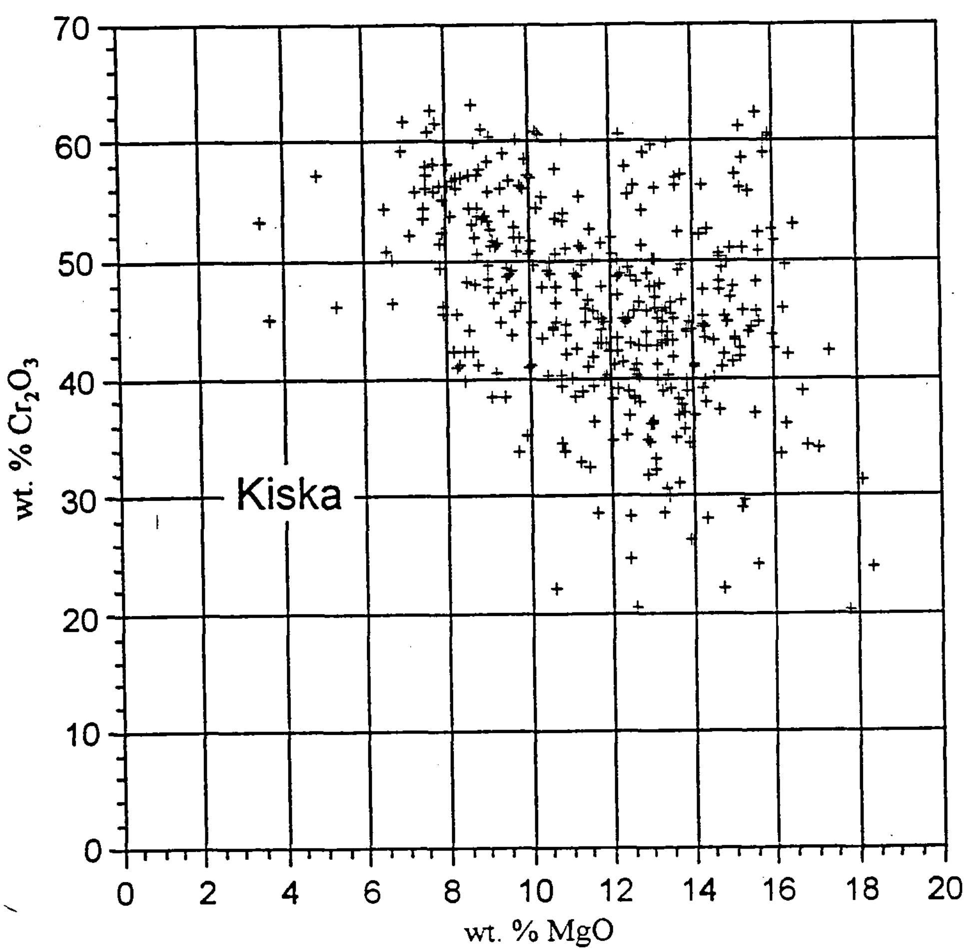
Appendix IV

Geochemical Graphs of Chromites
for the
Kiska, Nice, Cripple and Pinto Creek Areas
(NR Series)

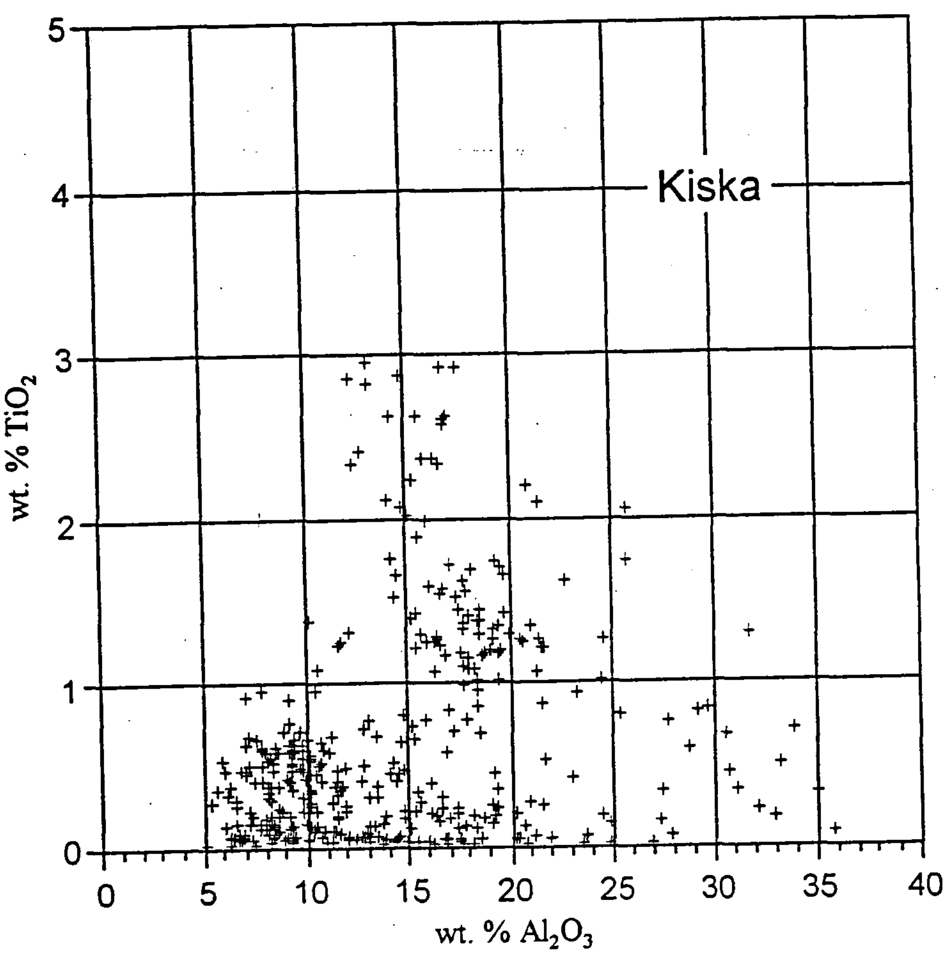
Kiska Creek Area

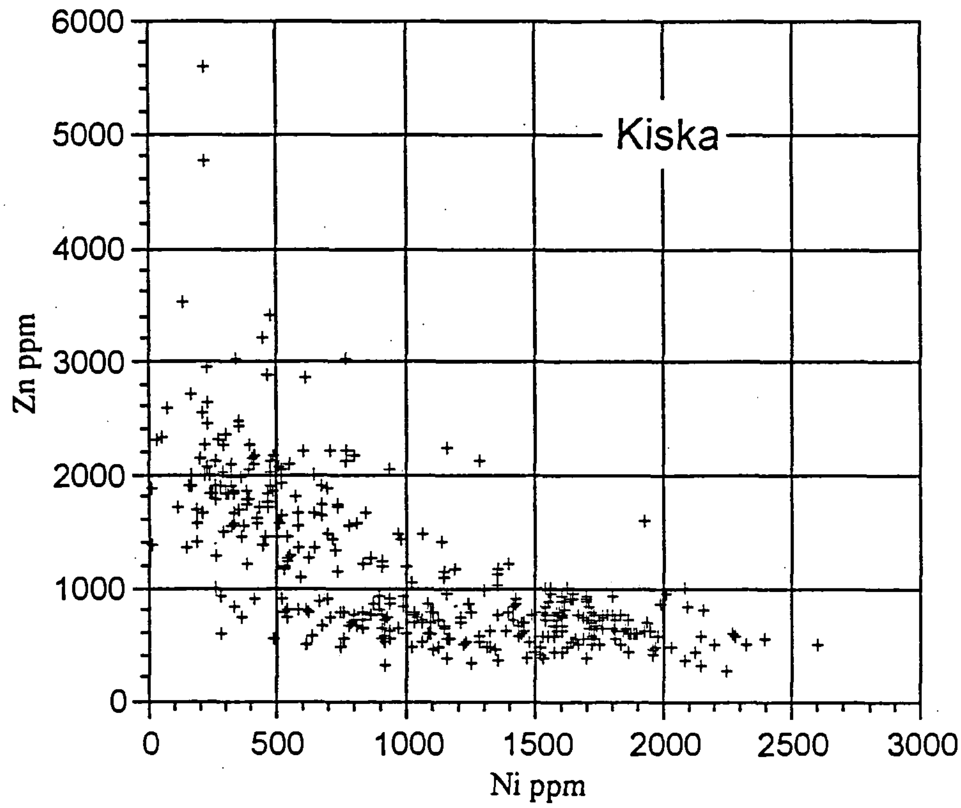


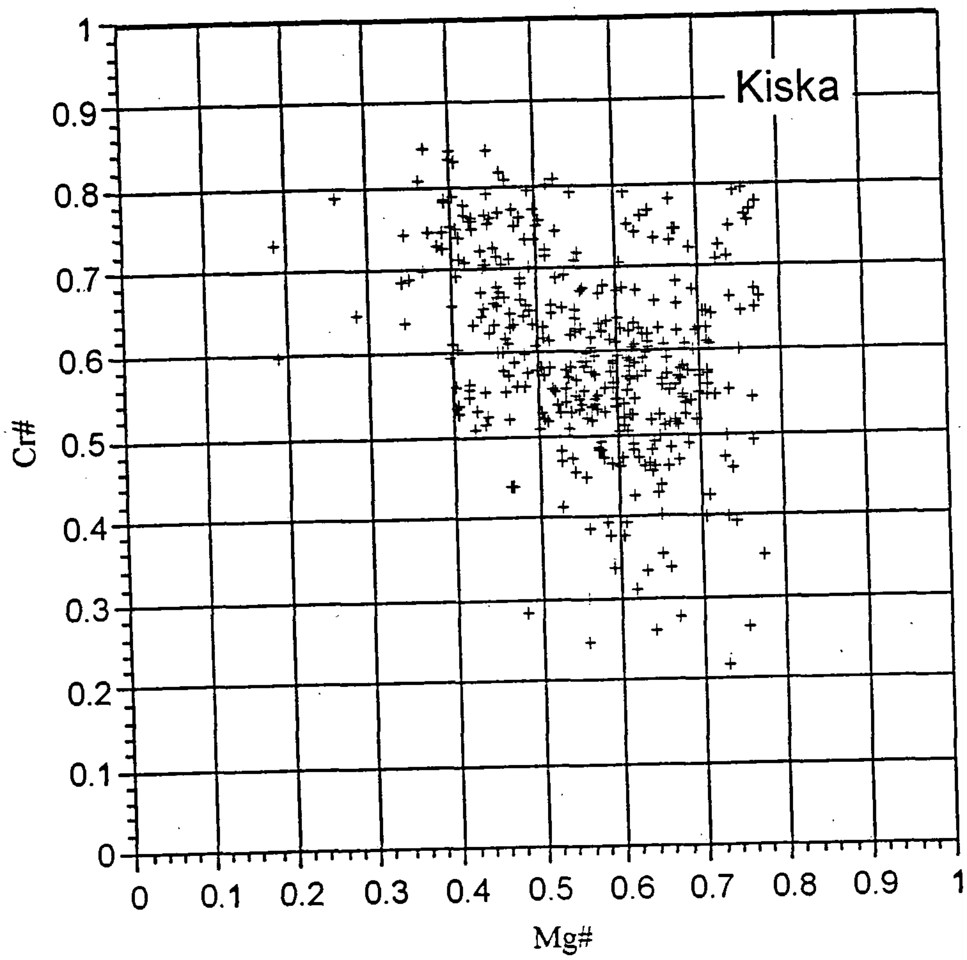
Kiska
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70



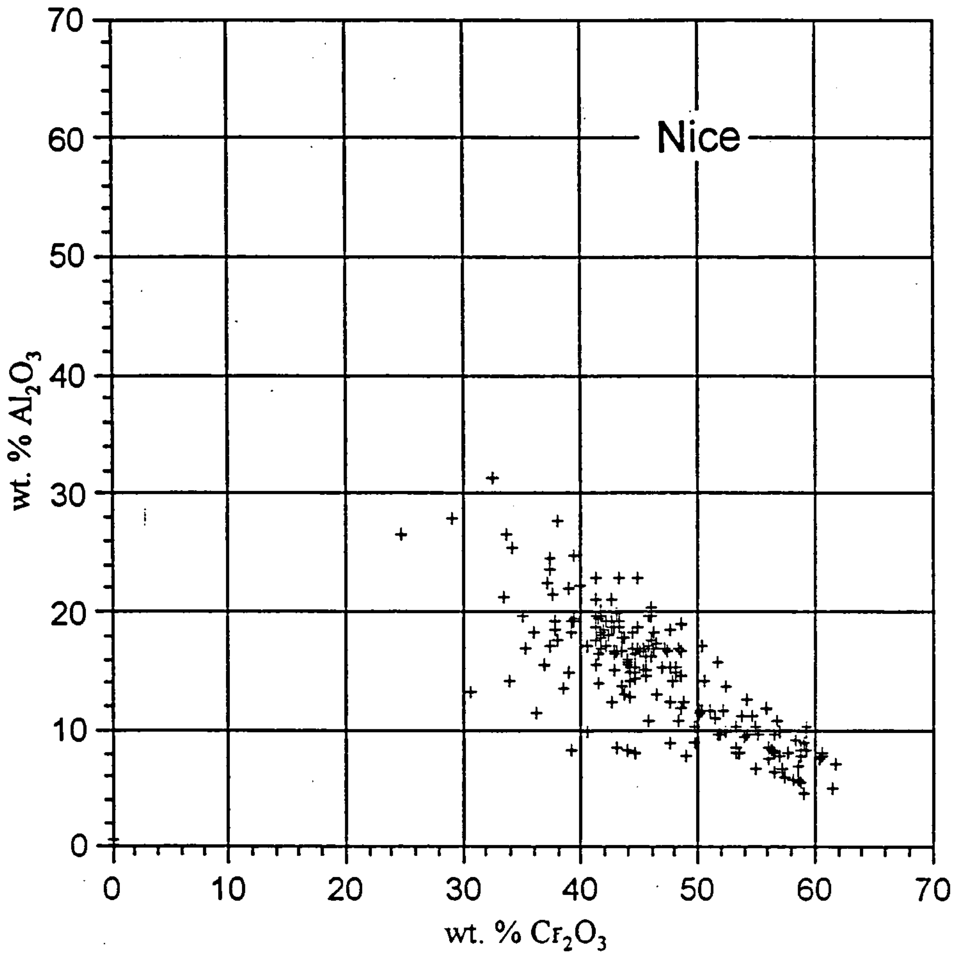
Kiska
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
2
4
6
8
12
14
16
18


Kiska
wt. % TiO_2
wt. % Al_2O_3
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40

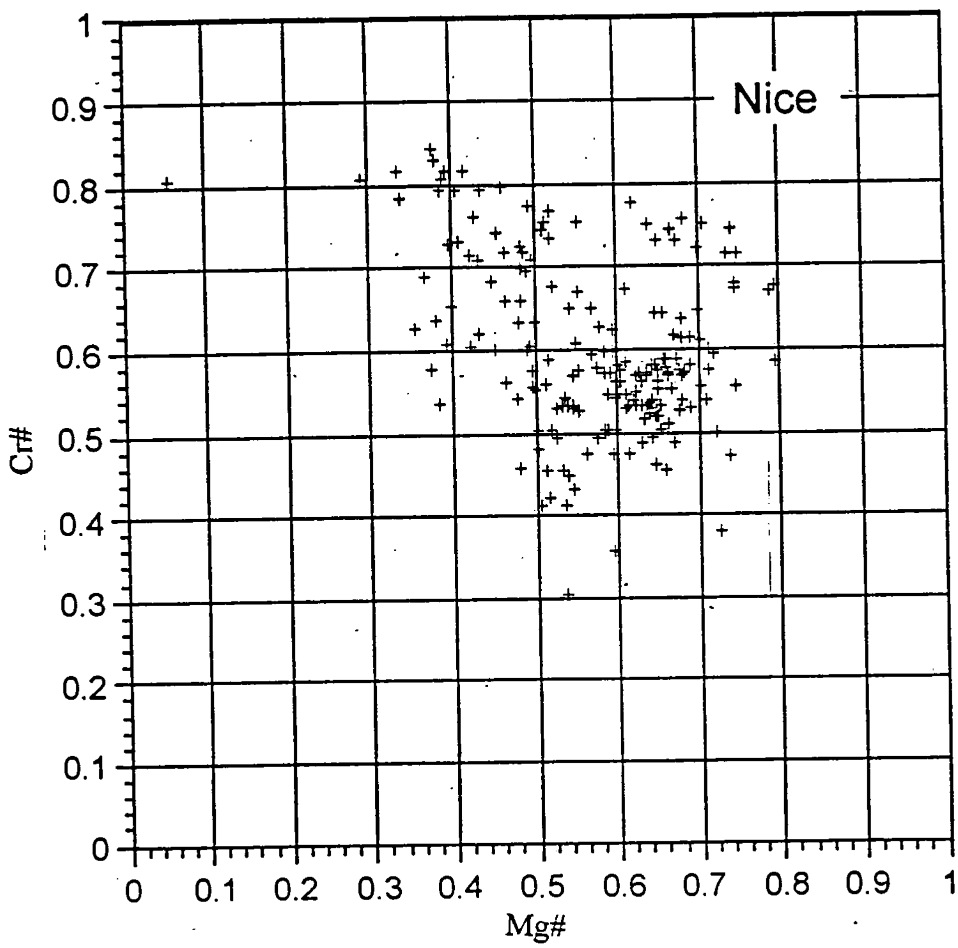

Kiska
Zn ppm
6000
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
Ni ppm


Kiska
Cr#
Mg#
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

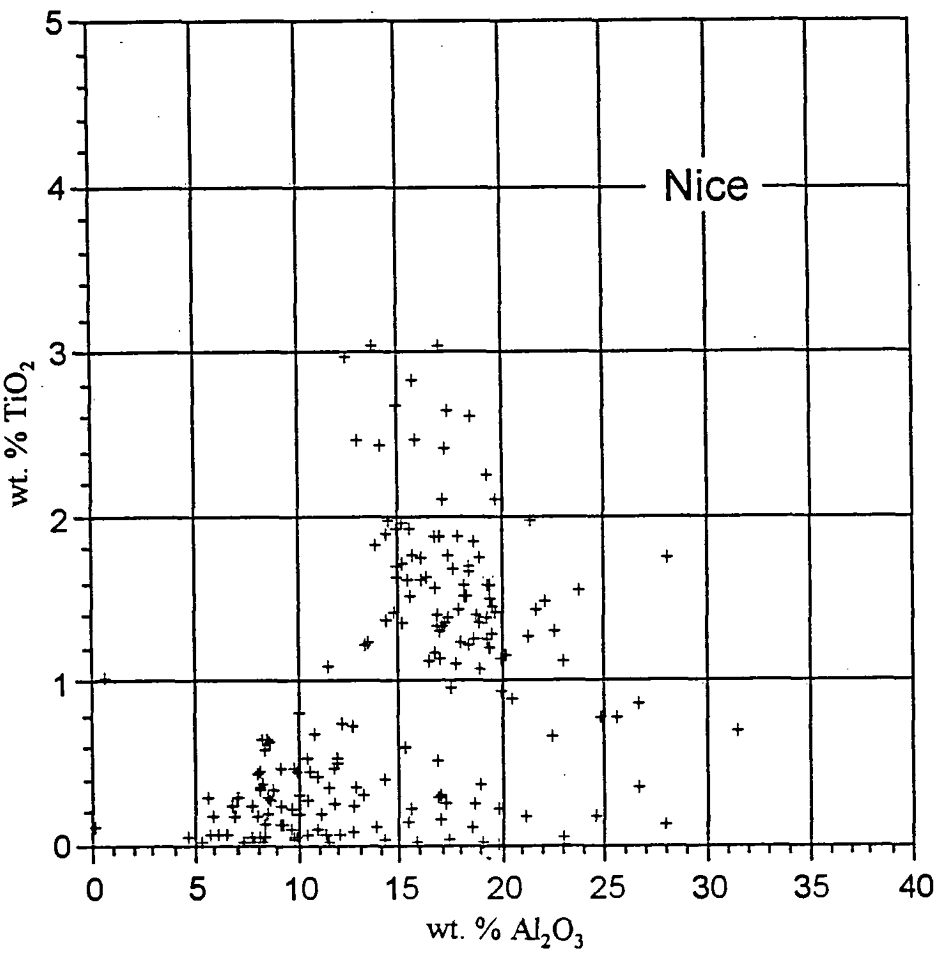
Nice Creek Area



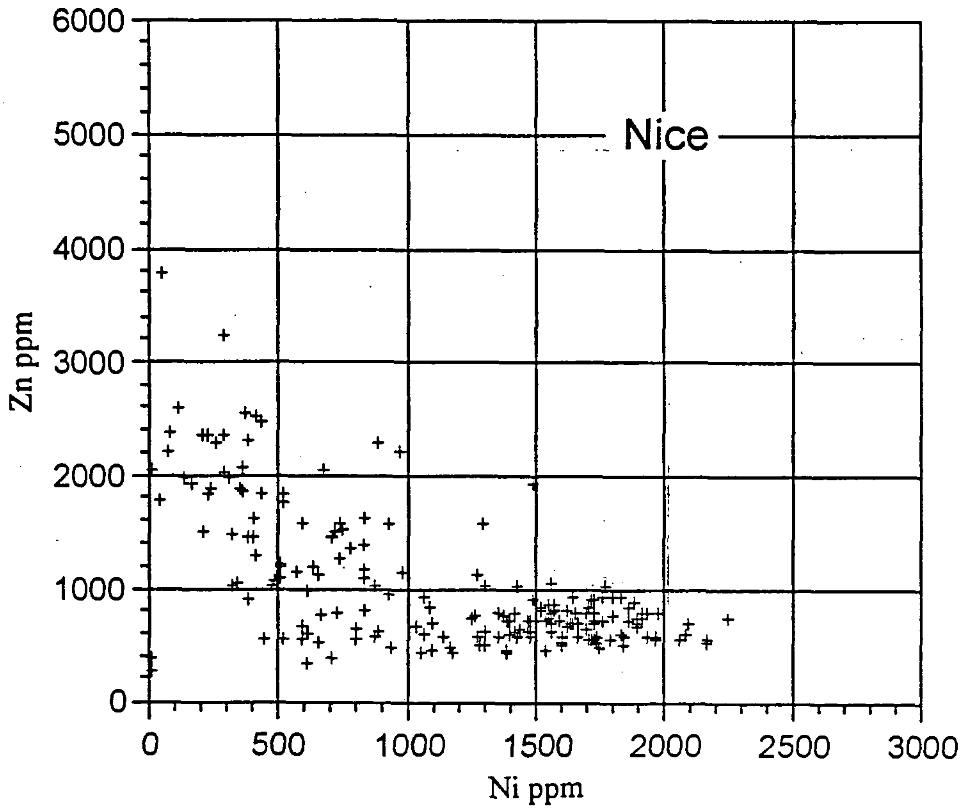
Nice
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70

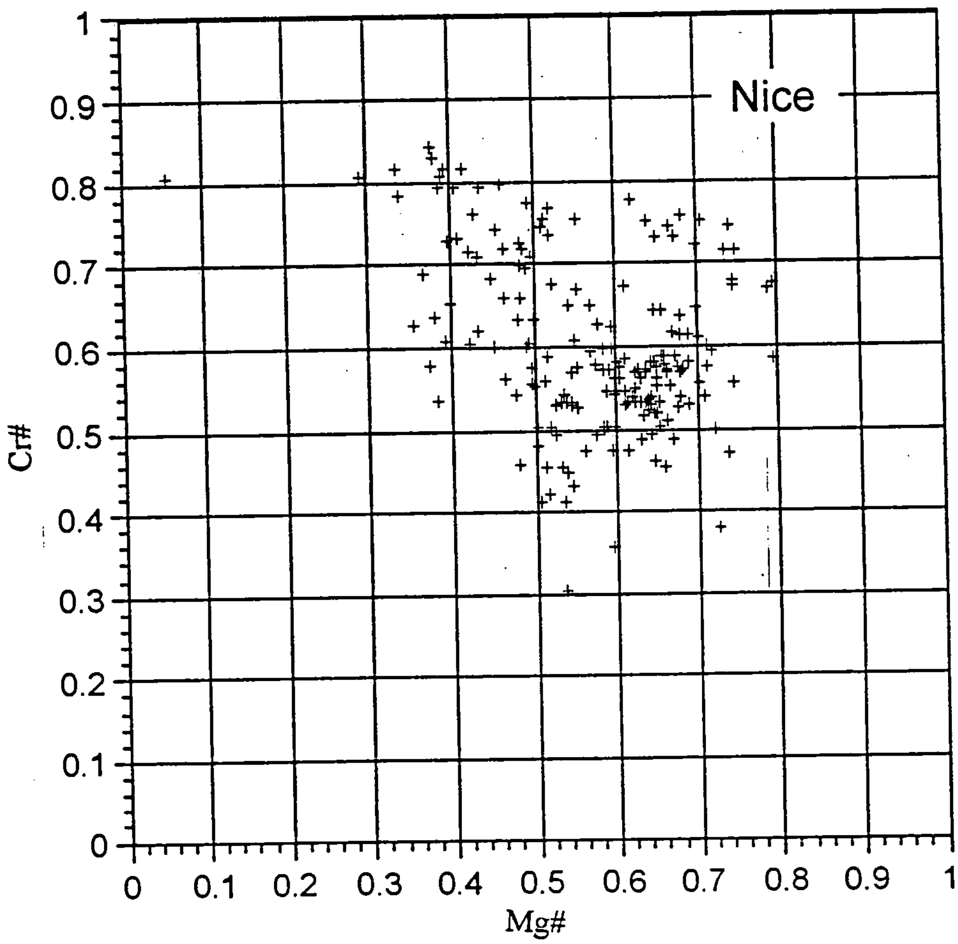


Nice
Cr#
Mg#
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1



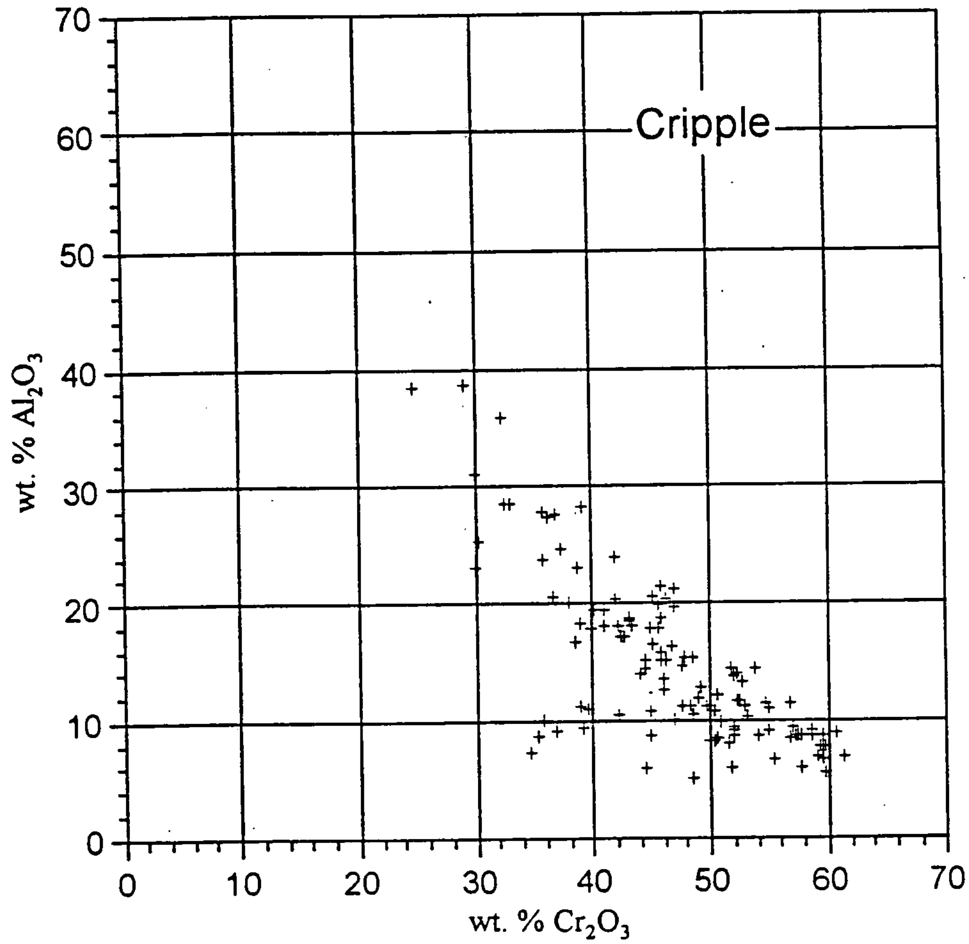
Nice
wt. % TiO2
wt. % Al2O3
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40


Nice
Zn ppm
6000
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
Ni ppm

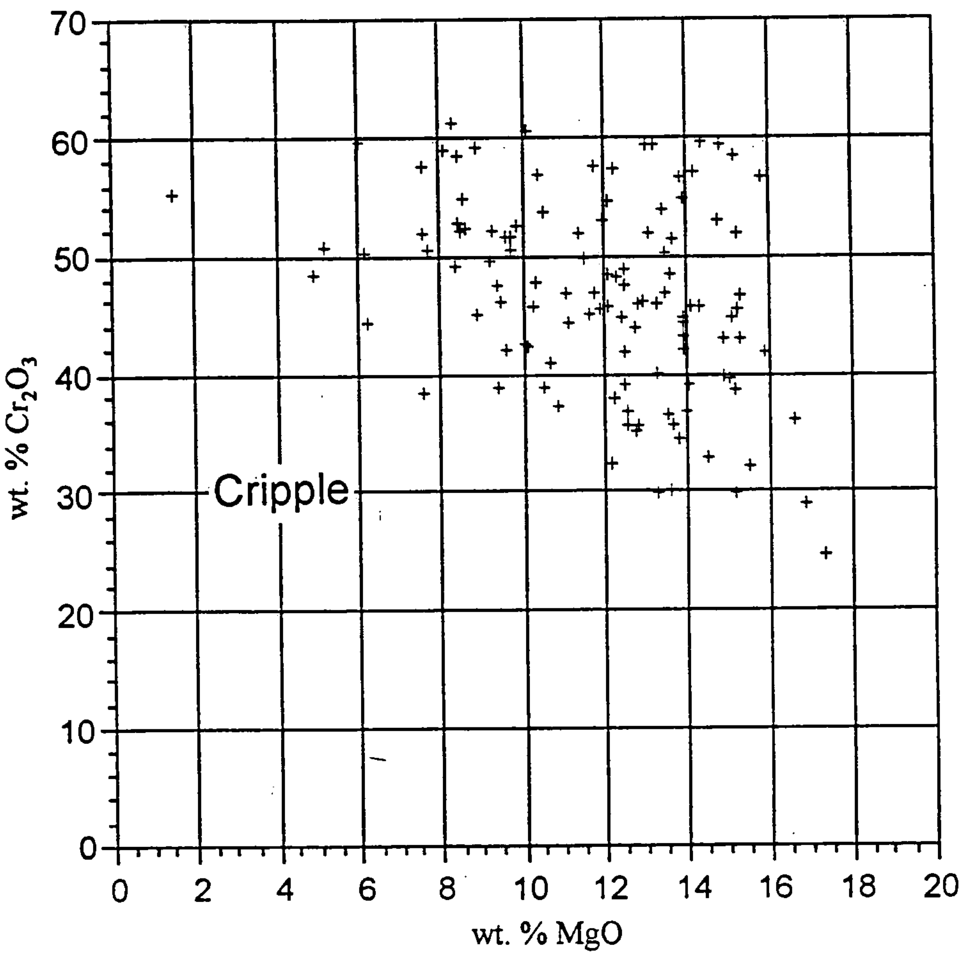


Nice
Cr#
Mg#
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

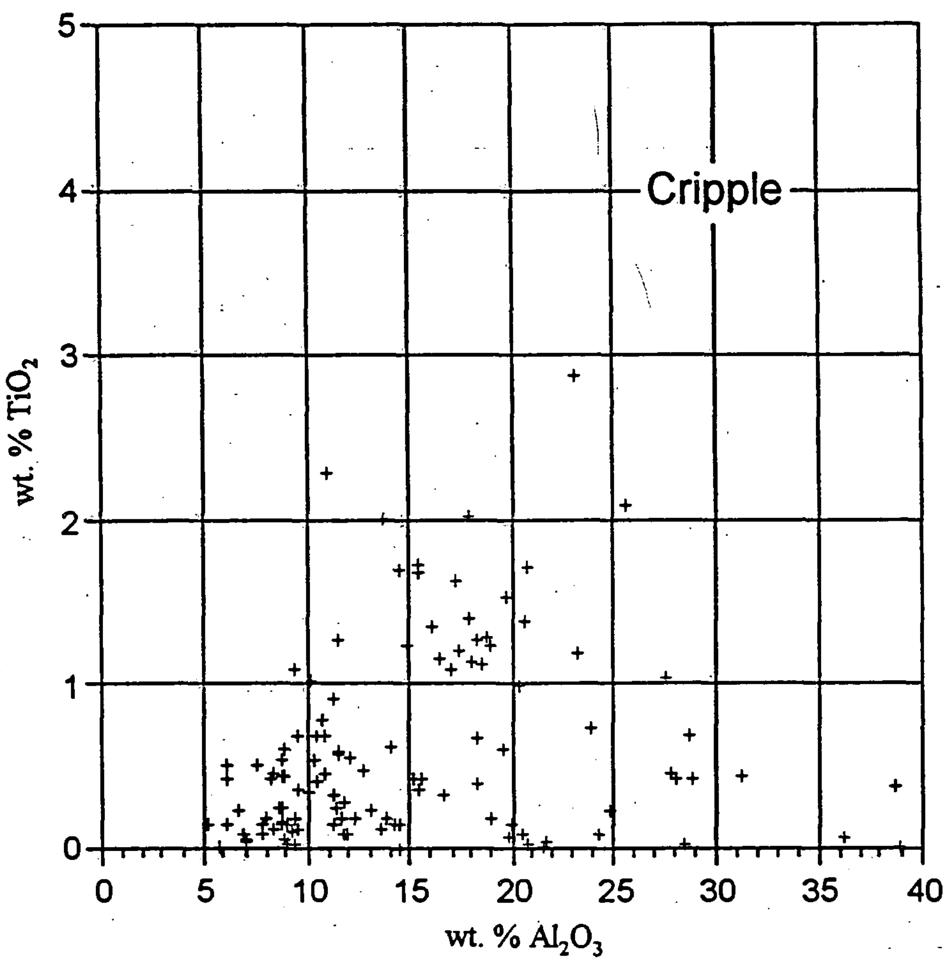
Cripple Creek Area

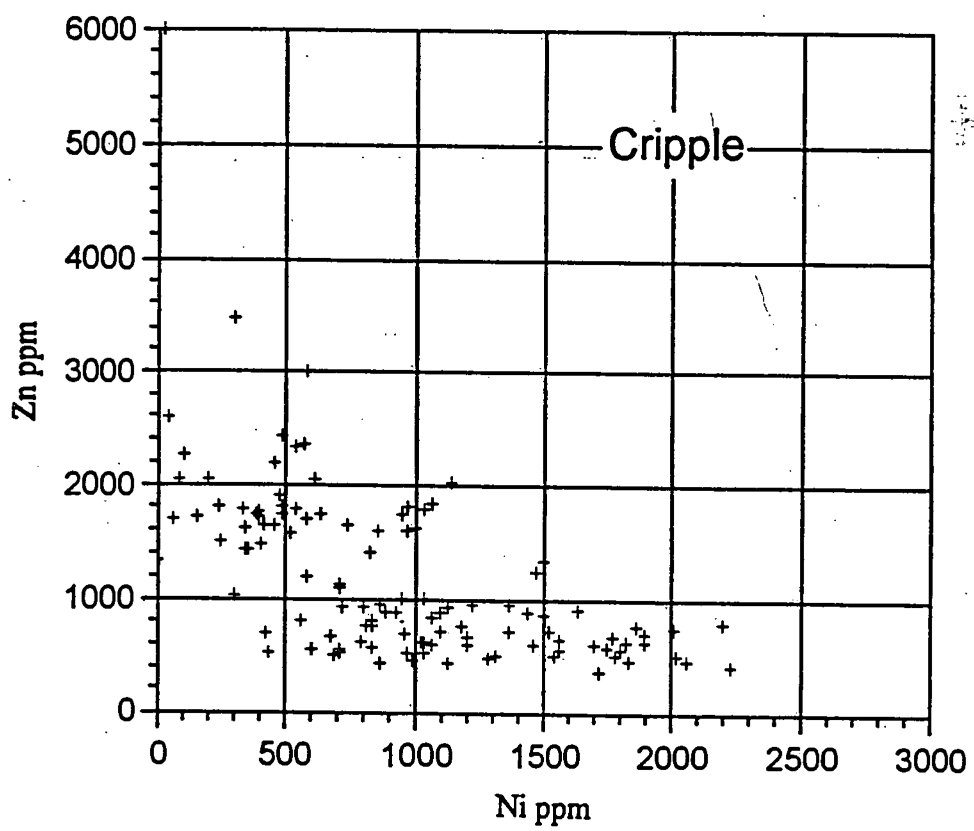


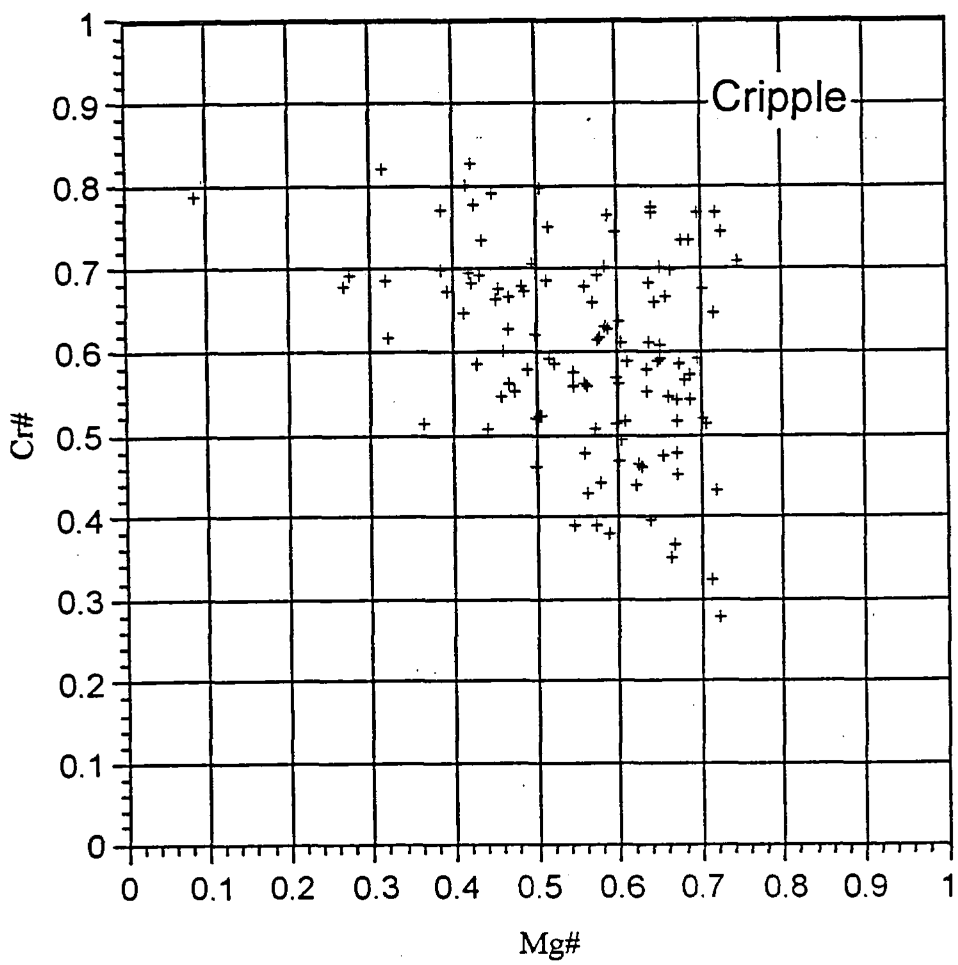
Cripple
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70



70
60
50
40
30
20
10
0
wt. % Cr_2O_3
Cripple
0
2
4
6
8
10
12
14
16
18
20
wt. % MgO

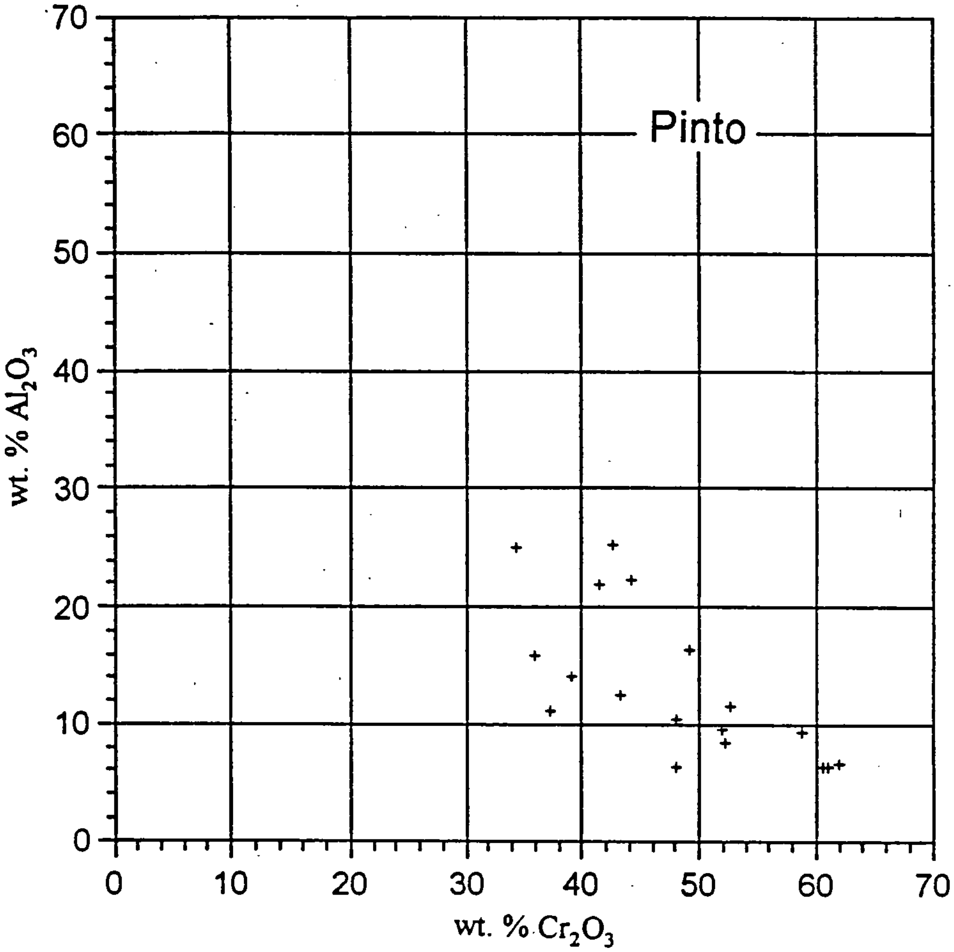

Cripple
wt. % TiO_2
wt. % Al_2O_3
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40


Cripple
Zn ppm
Ni ppm
6000
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000

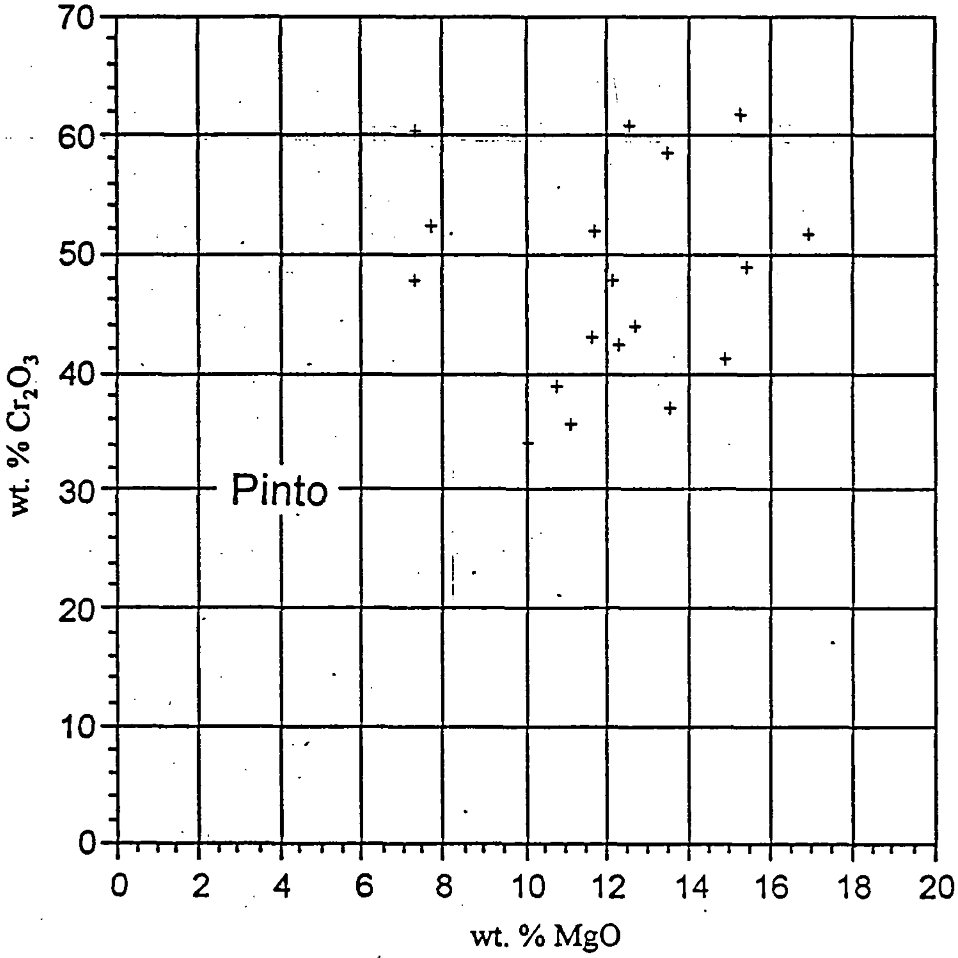


Cripple
Cr#
Mg#
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

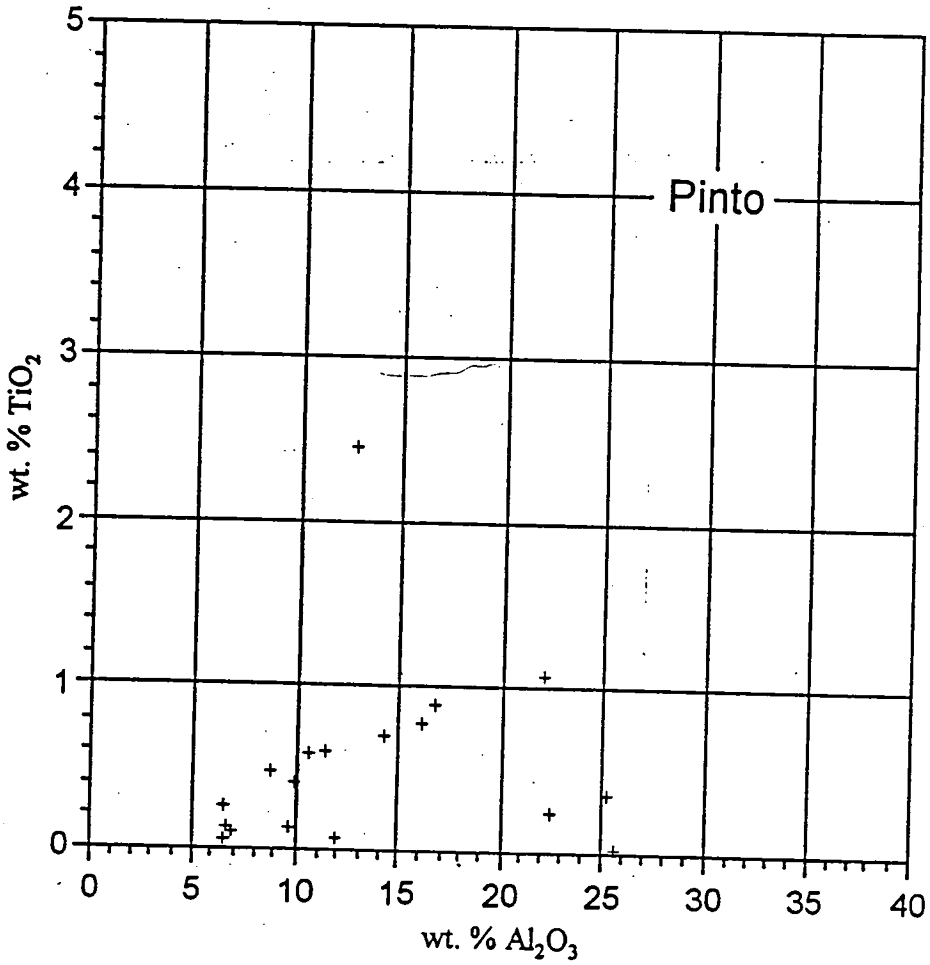
Pinto Creek Area



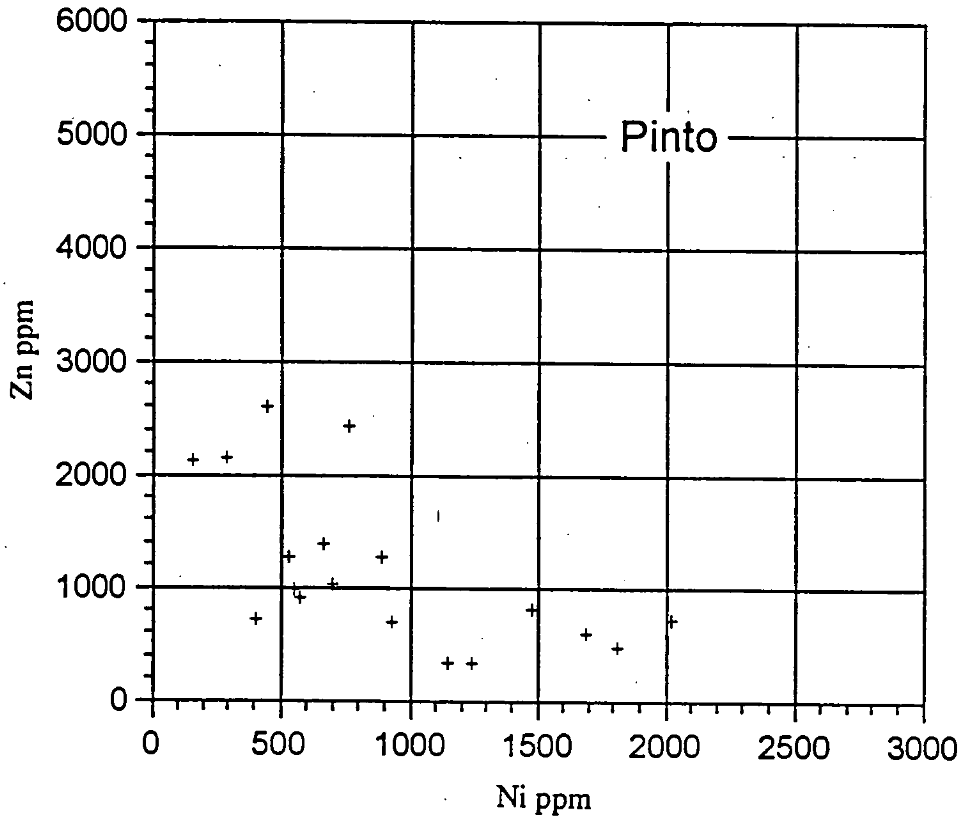
Pinto
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70



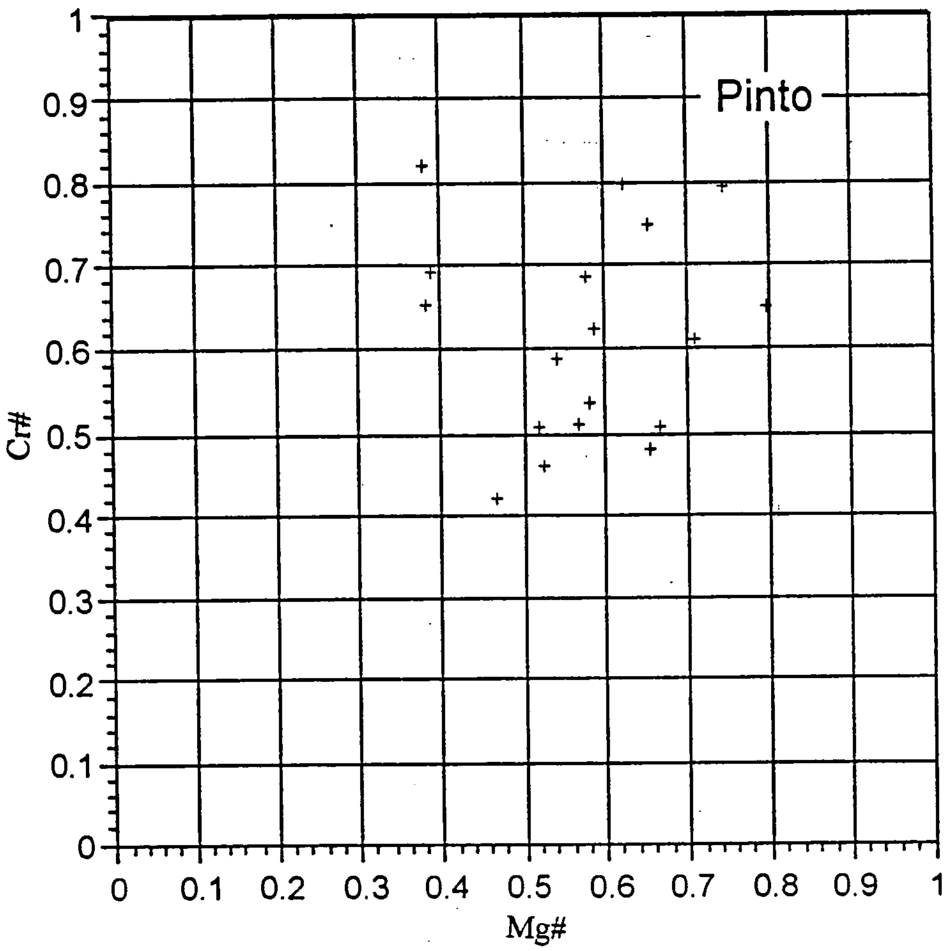
70
60
50
40
30
20
10
0
Pinto
0
2
4
6
8
10
12
14
16
18
20
wt. % Cr2O3
wt. % MgO



Pinto
wt. % TiO2
wt. % Al2O3
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40



Pinto
Zn ppm
6000
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
Ni ppm



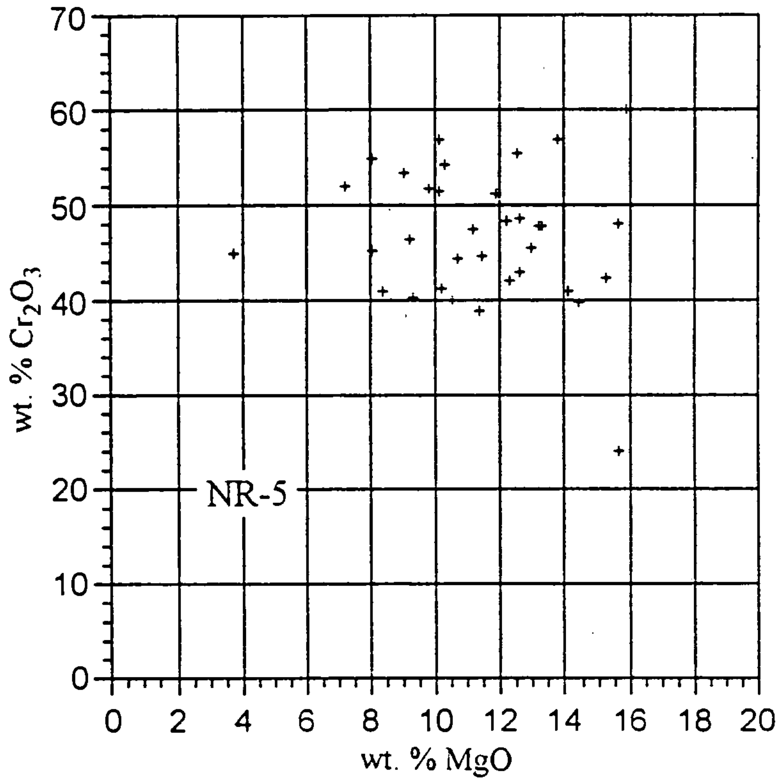
Pinto
Cr#
Mg#
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

Appendix V

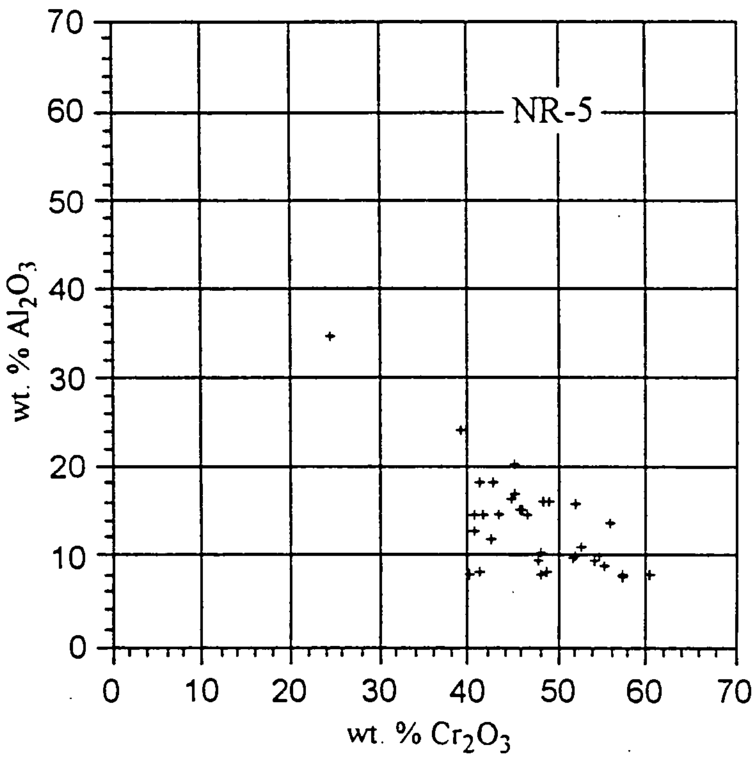
Chromite Graphs
of Cr_2O_3 vs. MgO and Al_2O_3 vs. Cr_2O_3

(Samples NR-1 to NR-42)

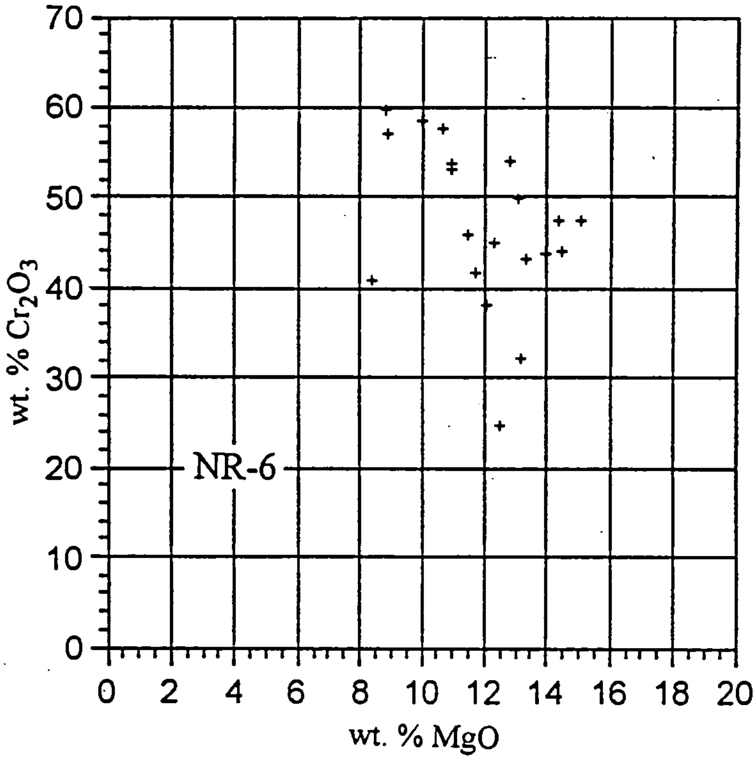
Kiska Creek Area



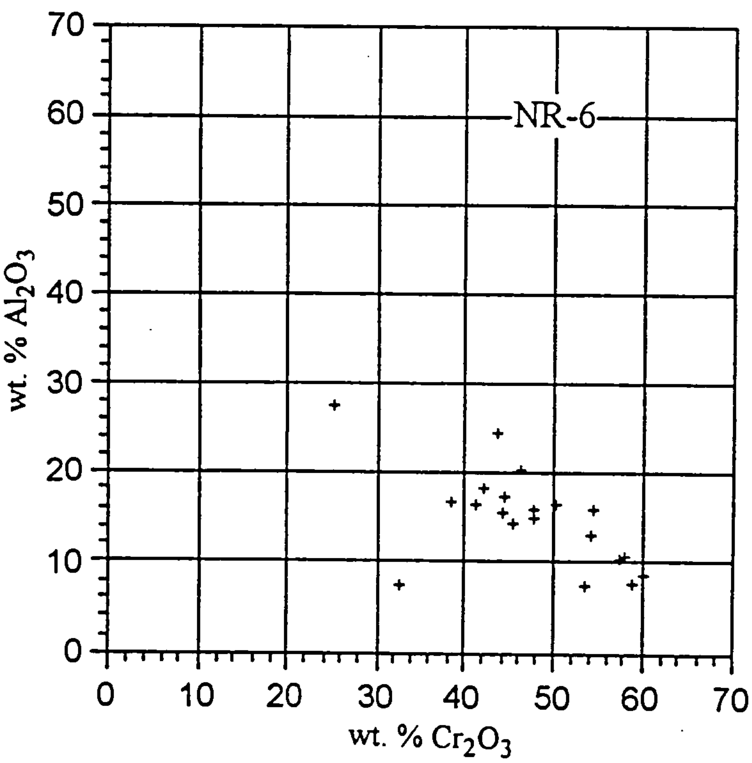
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-5
0
2
4
6
8
10
12
14
16
18
20
wt. % MgO



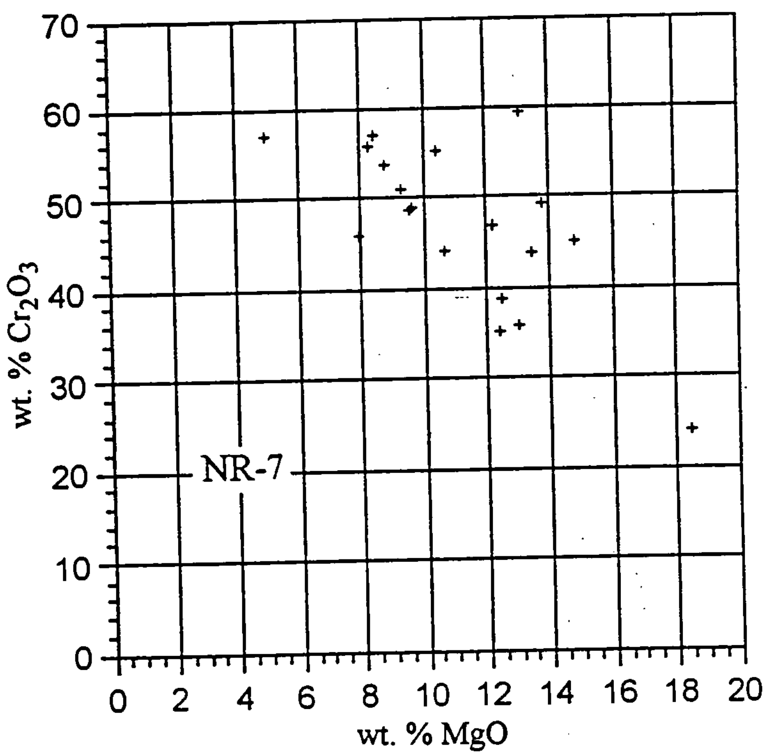
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-5
0
10
20
30
40
50
60
70
wt. % Cr_2O_3



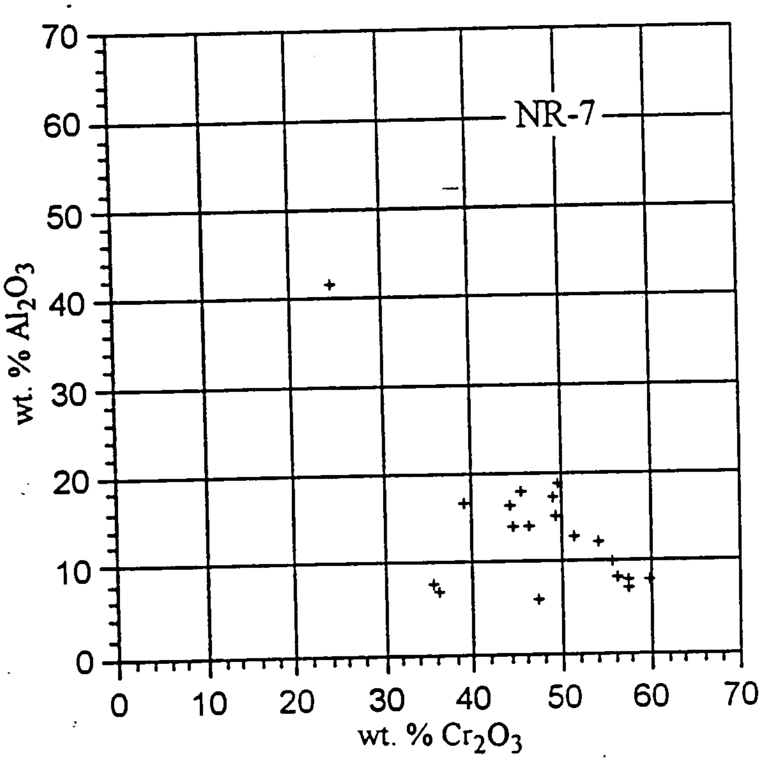
70
60
50
40
30
20
10
0
NR-6
wt. % Cr2O3
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO



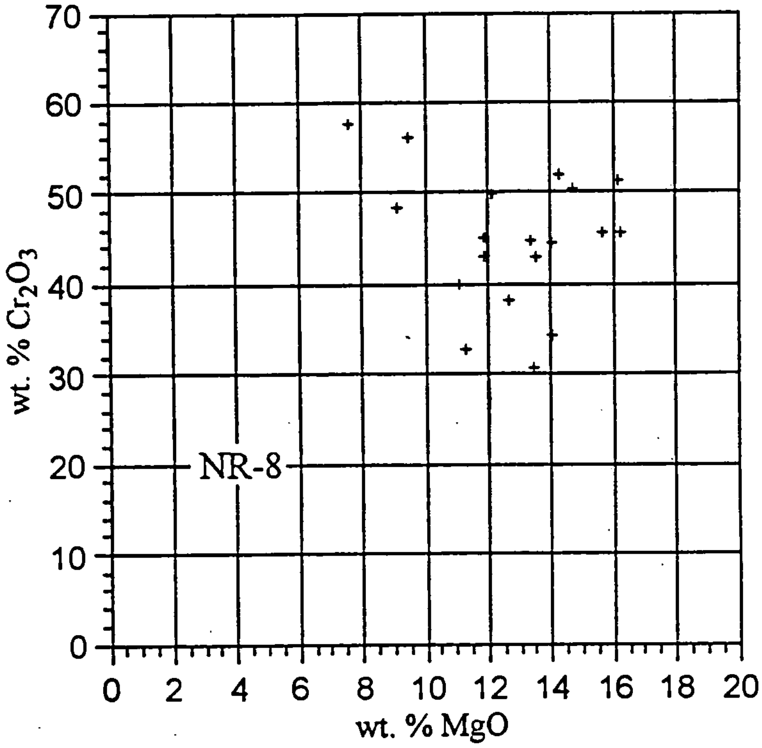
70
60
50
40
30
20
10
0
NR-6
wt. % Al2O3
0 10 20 30 40 50 60 70
wt. % Cr2O3

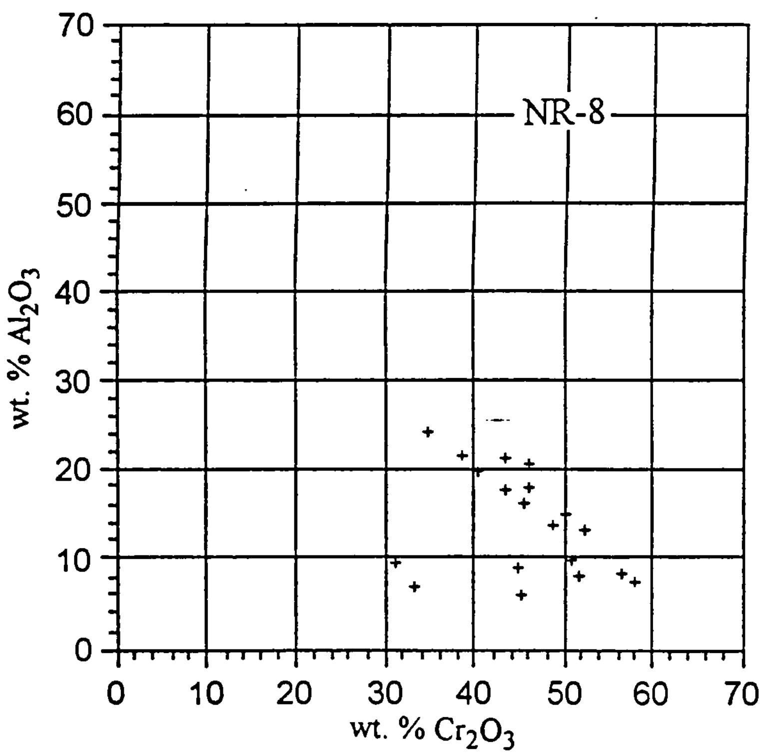


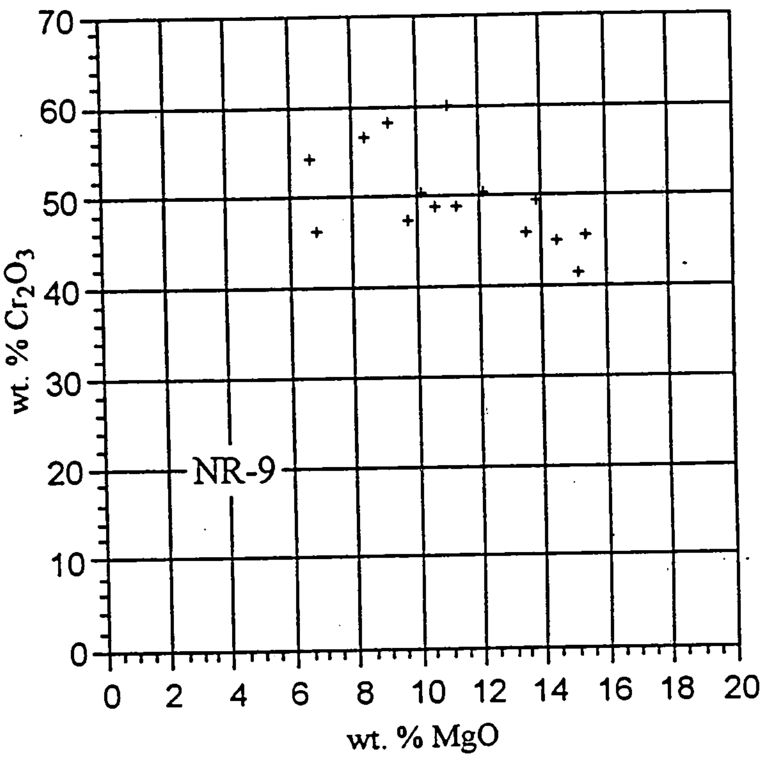
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-7
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO



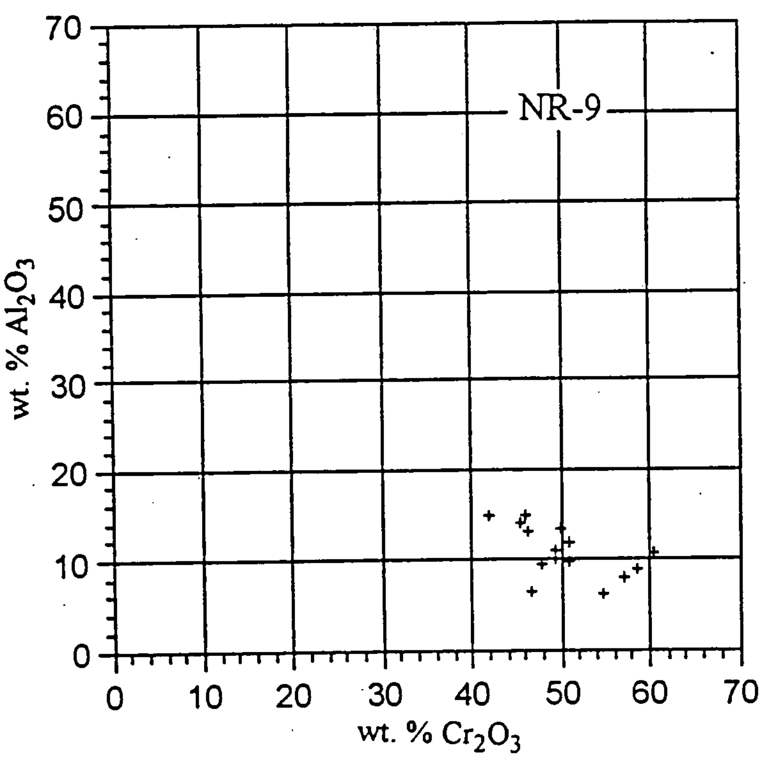
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-7
0 10 20 30 40 50 60 70
wt. % Cr_2O_3


NR-8
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

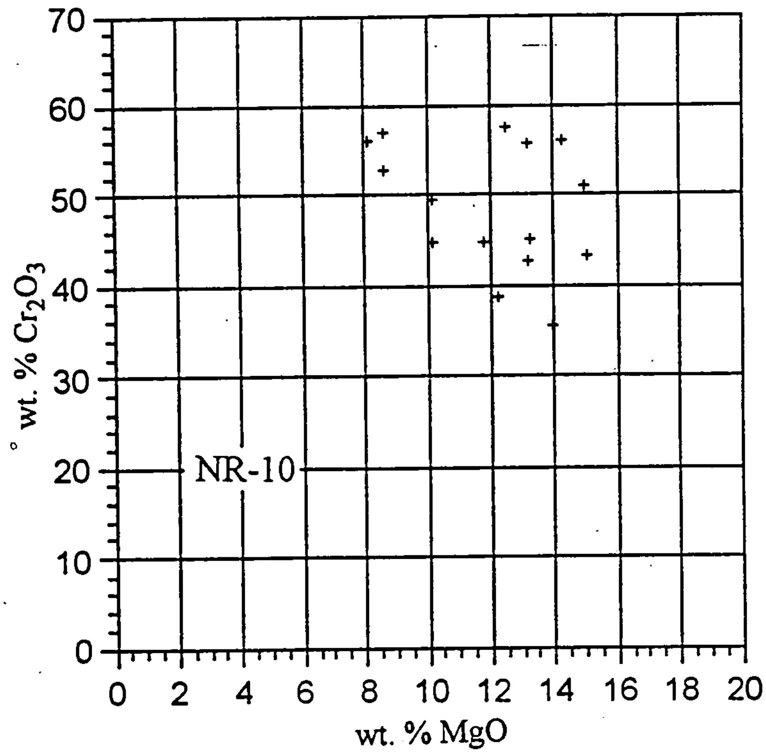

NR-8
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70



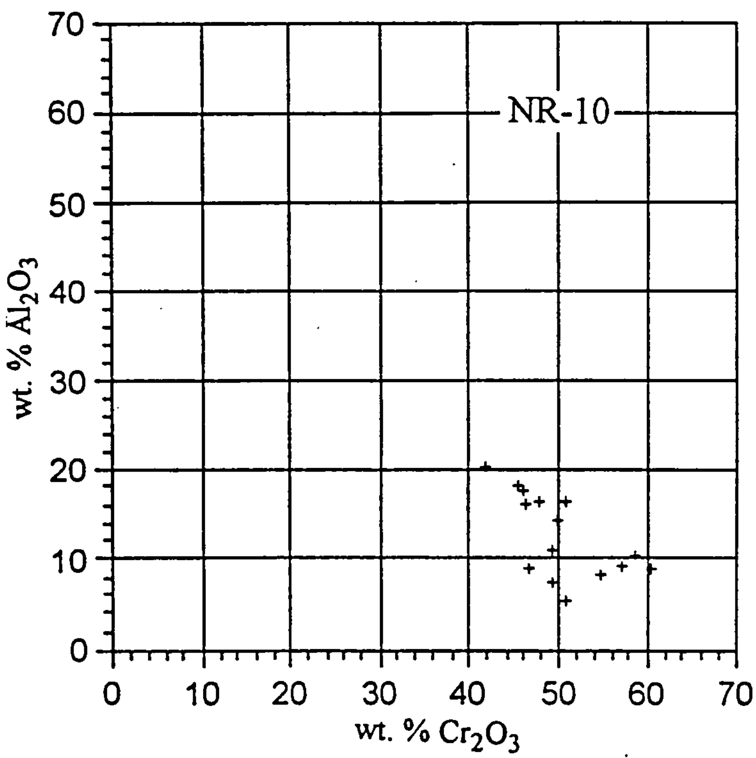
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-9
0
2
4
6
8
10
12
14
16
18
20
wt. % MgO



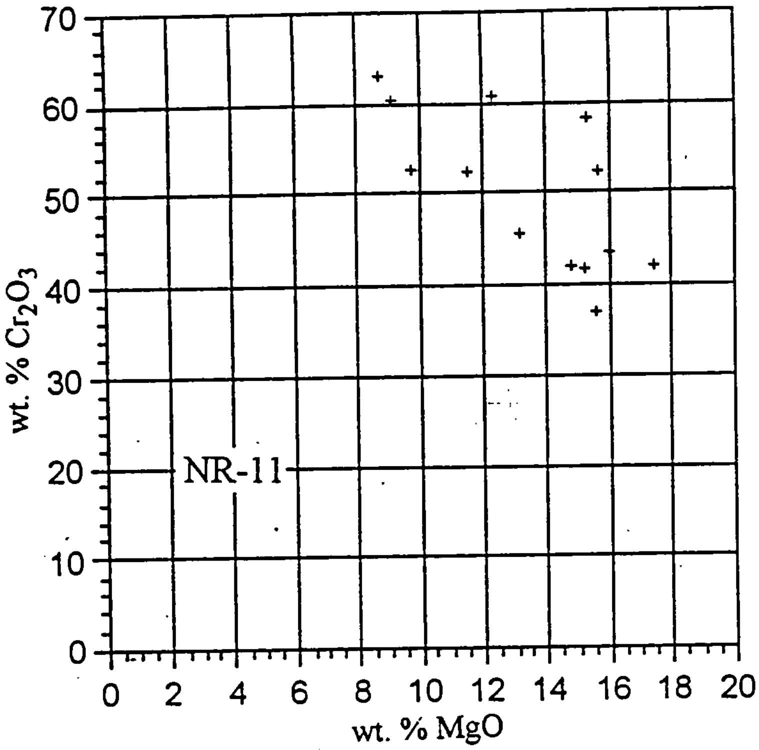
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-9
0
10
20
30
40
50
60
70
wt. % Cr_2O_3



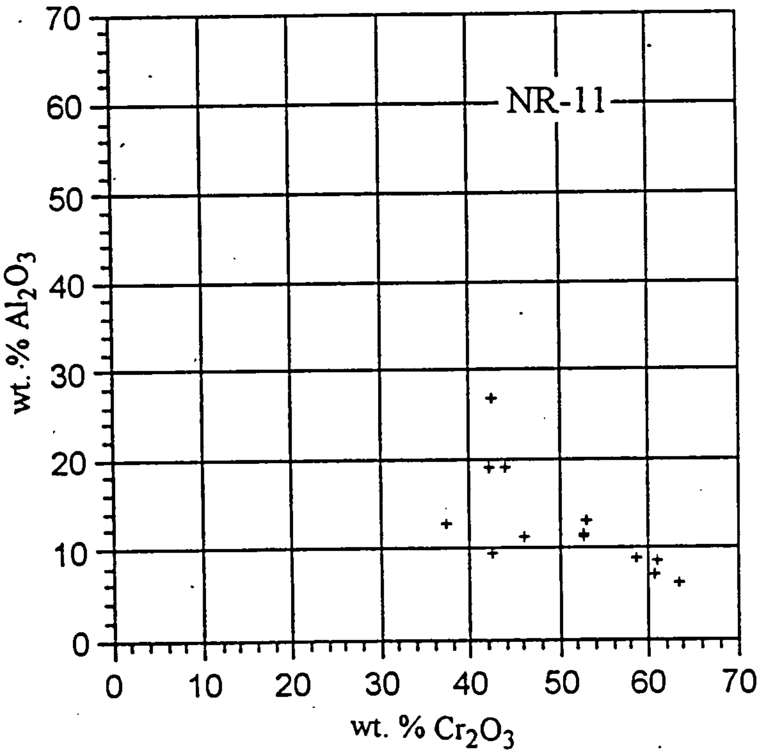
NR-10
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20



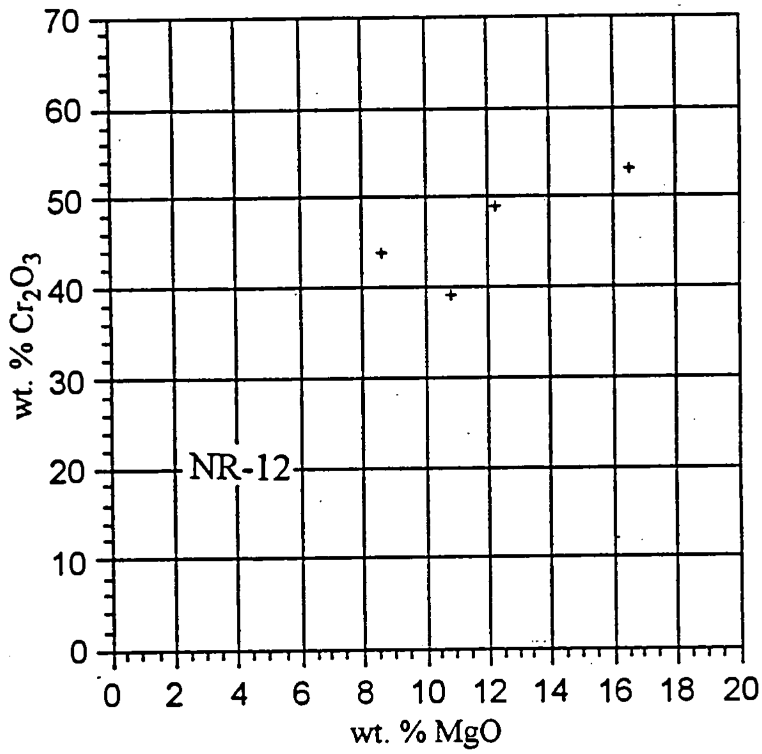
NR-10
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70



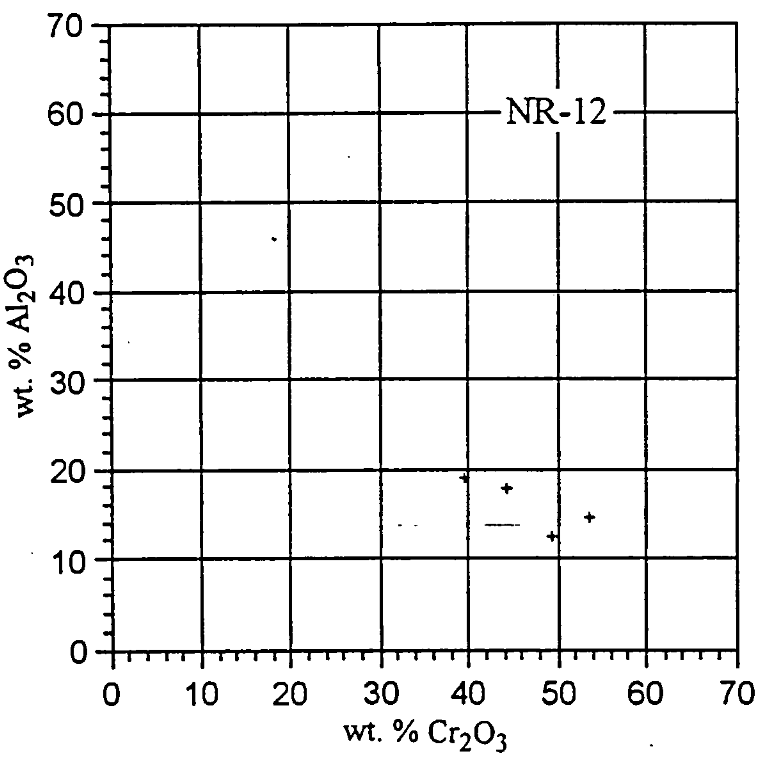
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-11
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO



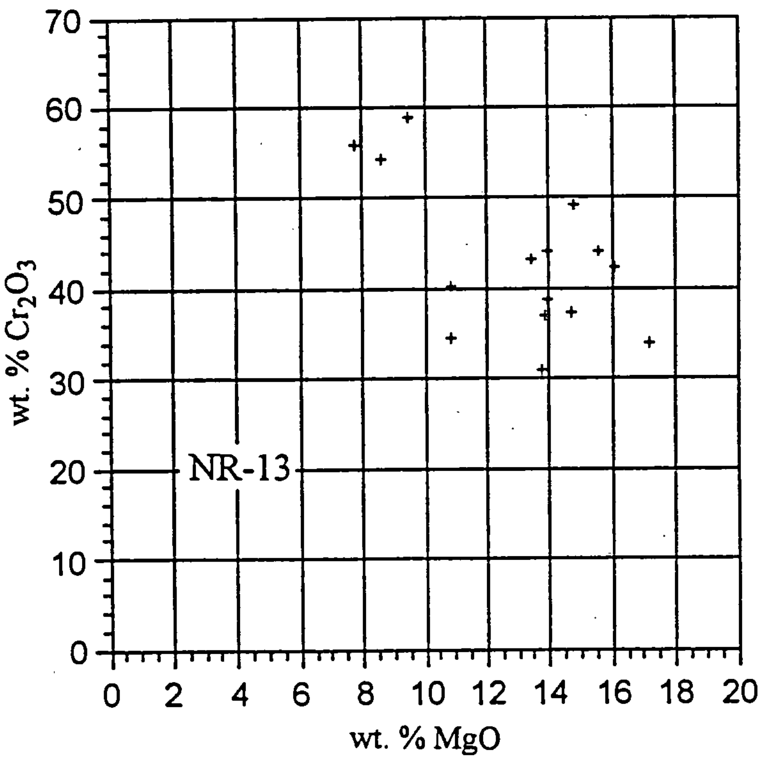
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-11
0 10 20 30 40 50 60 70
wt. % Cr_2O_3



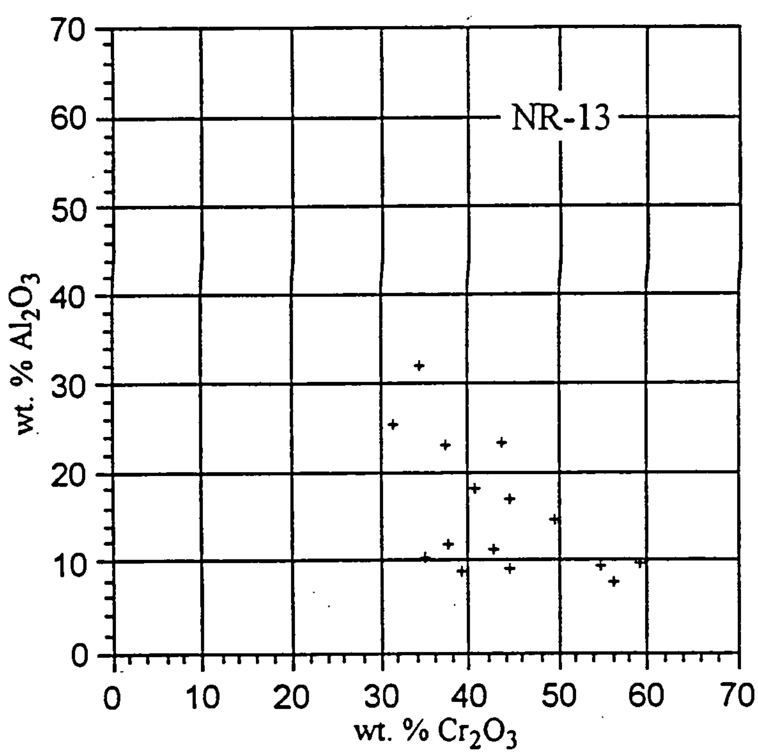
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-12
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO



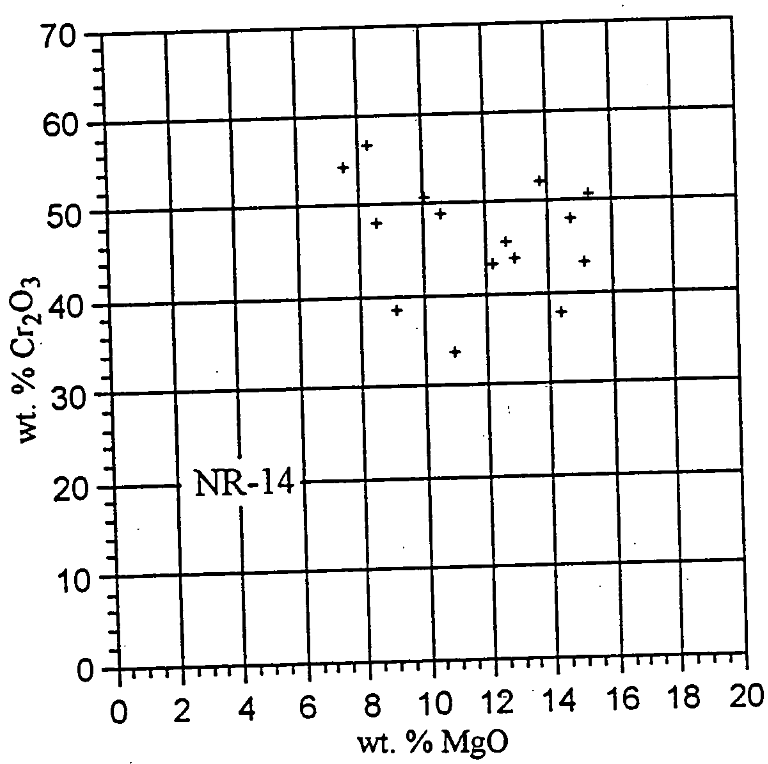
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-12
0 10 20 30 40 50 60 70
wt. % Cr_2O_3

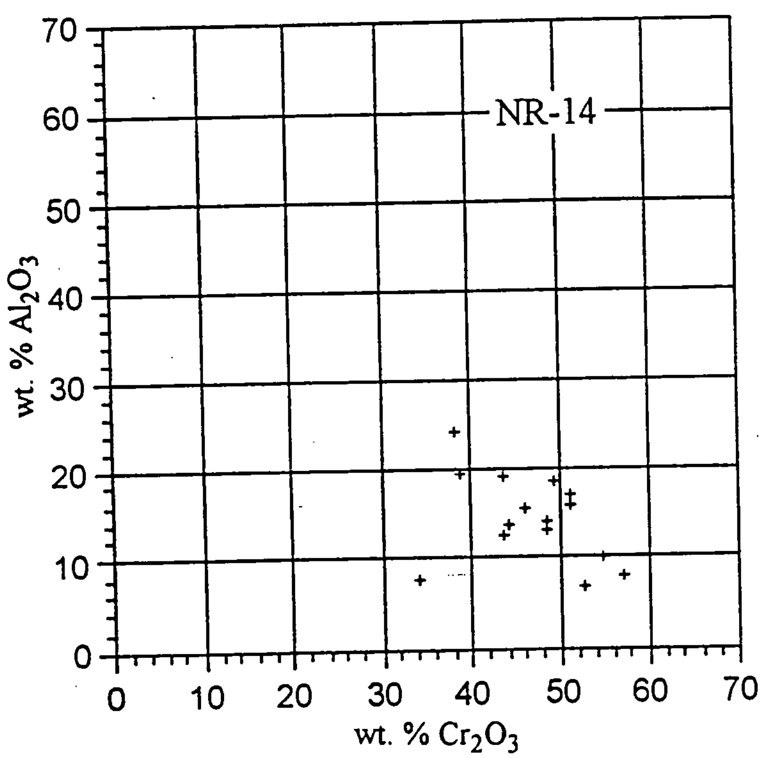


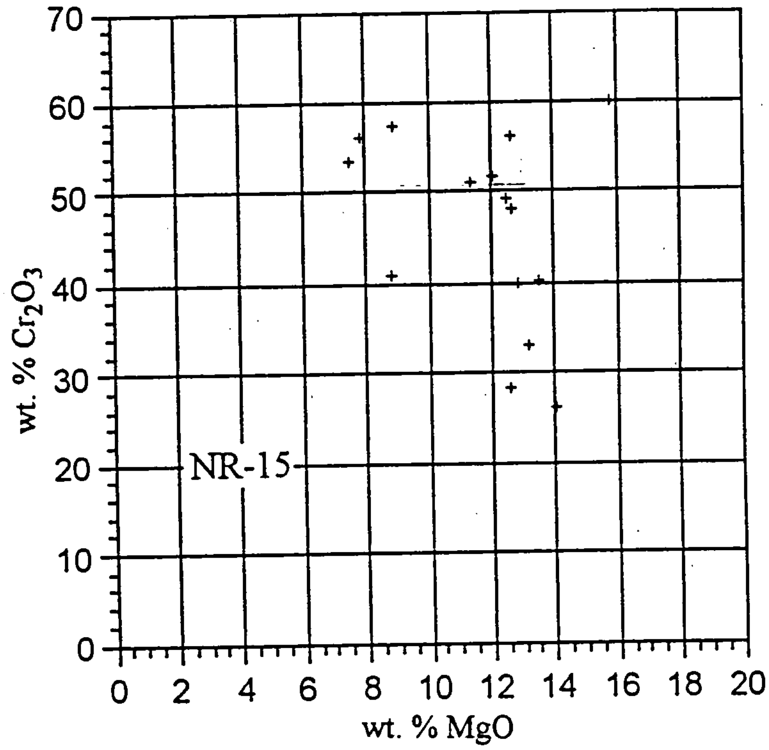
NR-13
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20



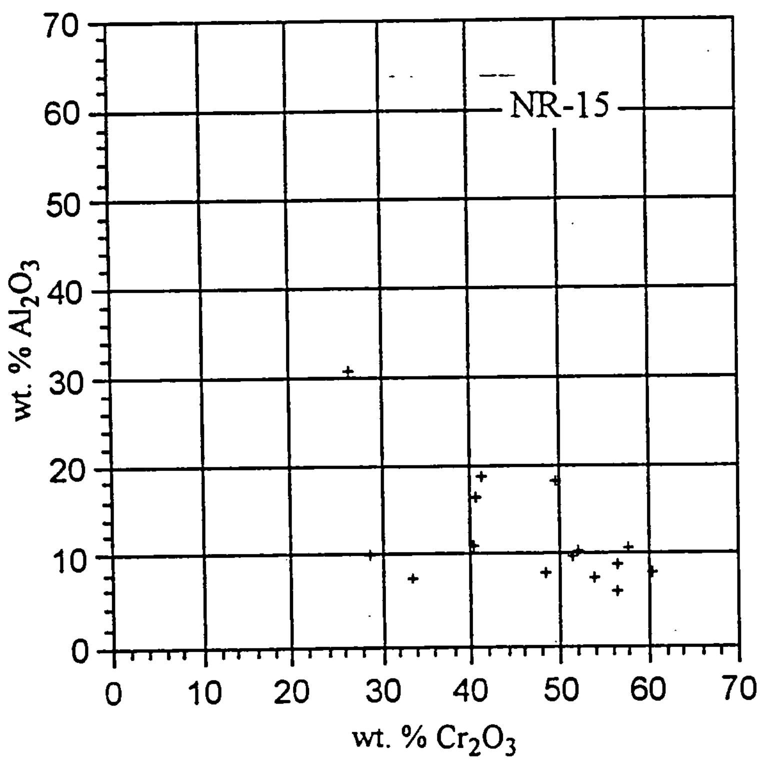
NR-13
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70


70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-14
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO

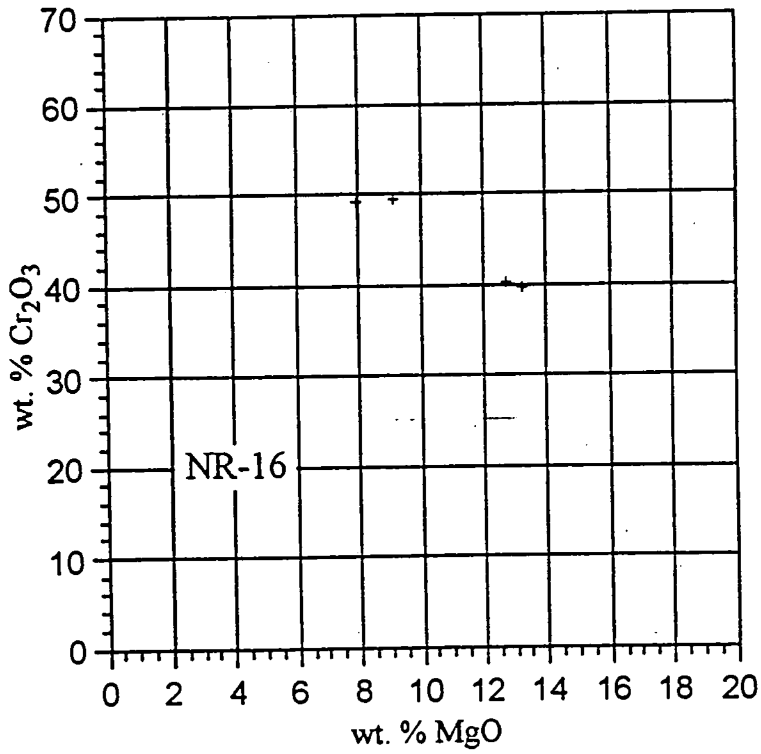

70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-14
0 10 20 30 40 50 60 70
wt. % Cr_2O_3



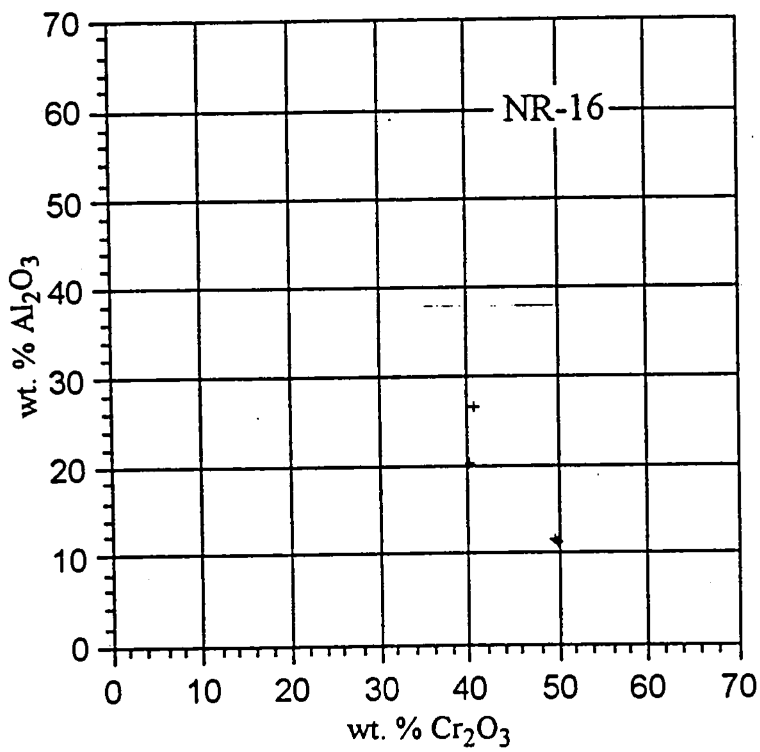
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-15
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO



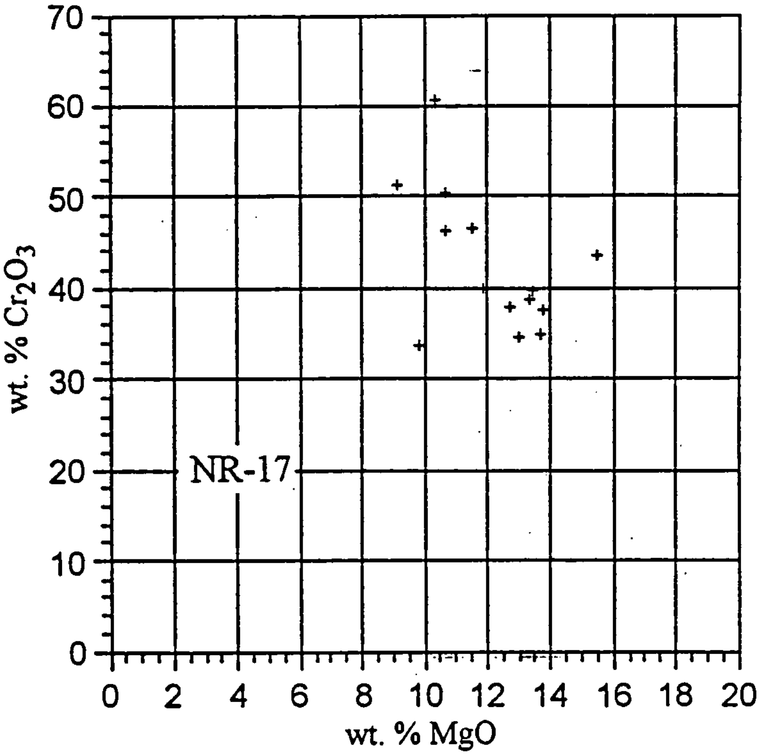
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-15
0 10 20 30 40 50 60 70
wt. % Cr_2O_3

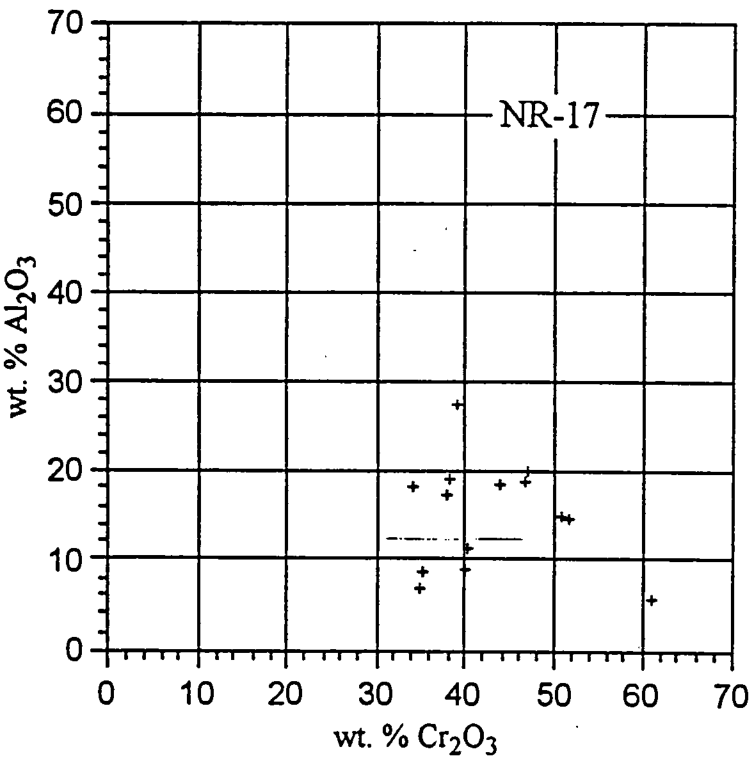


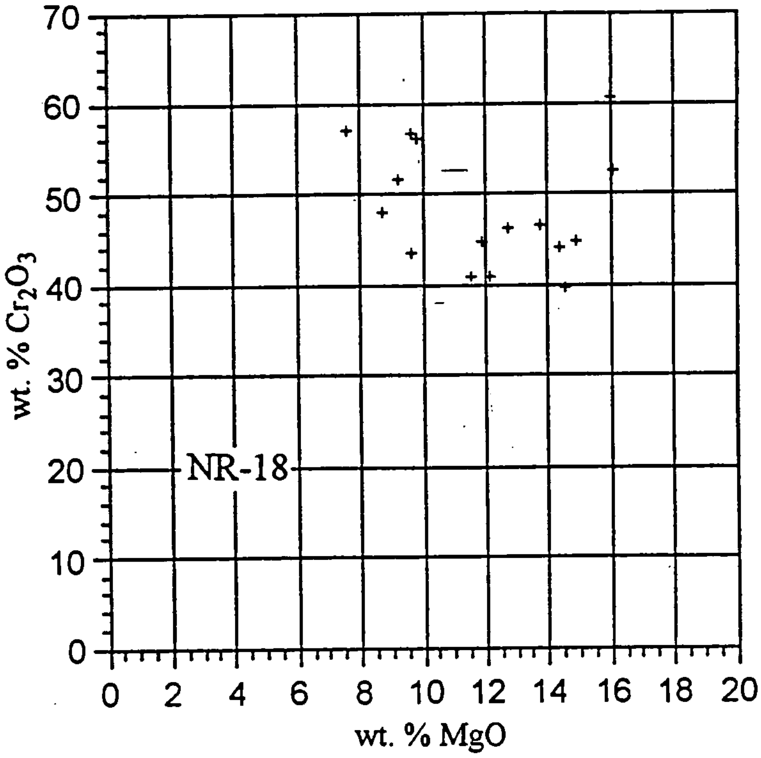
wt. % Cr_2O_3
wt. % MgO
NR-16



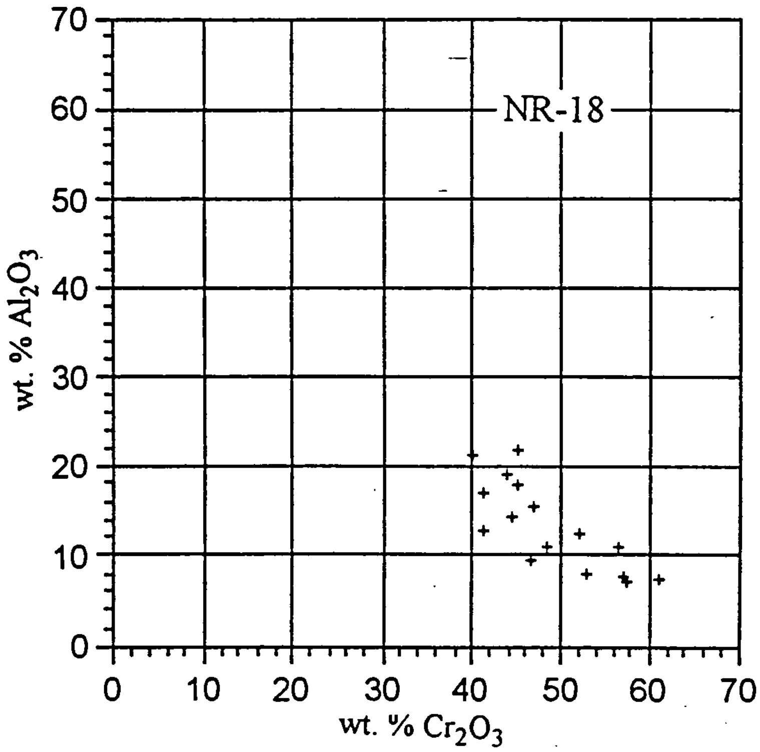
wt. % Al_2O_3
wt. % Cr_2O_3
NR-16


70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-17
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO

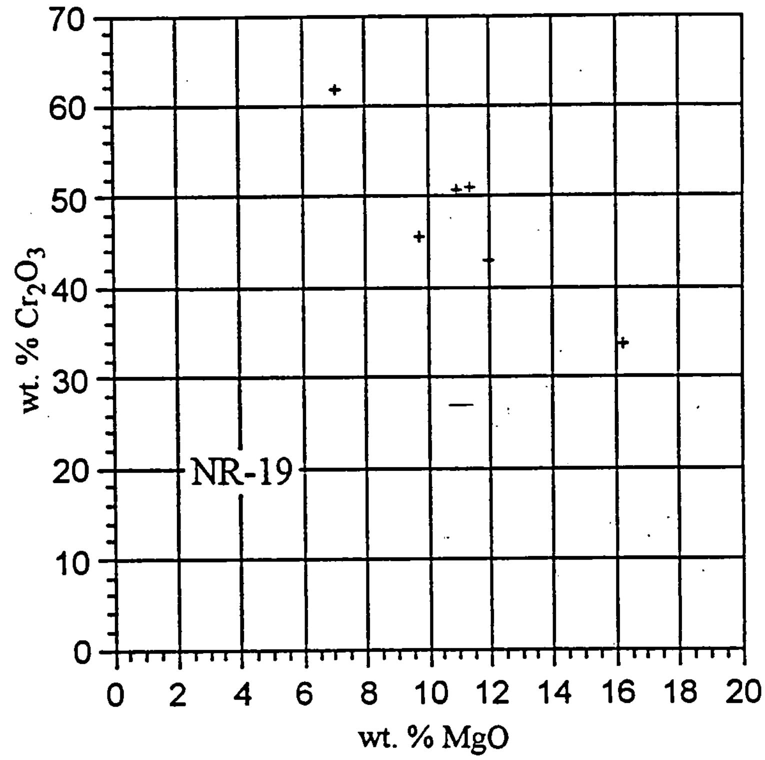

70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-17
0 10 20 30 40 50 60 70
wt. % Cr_2O_3



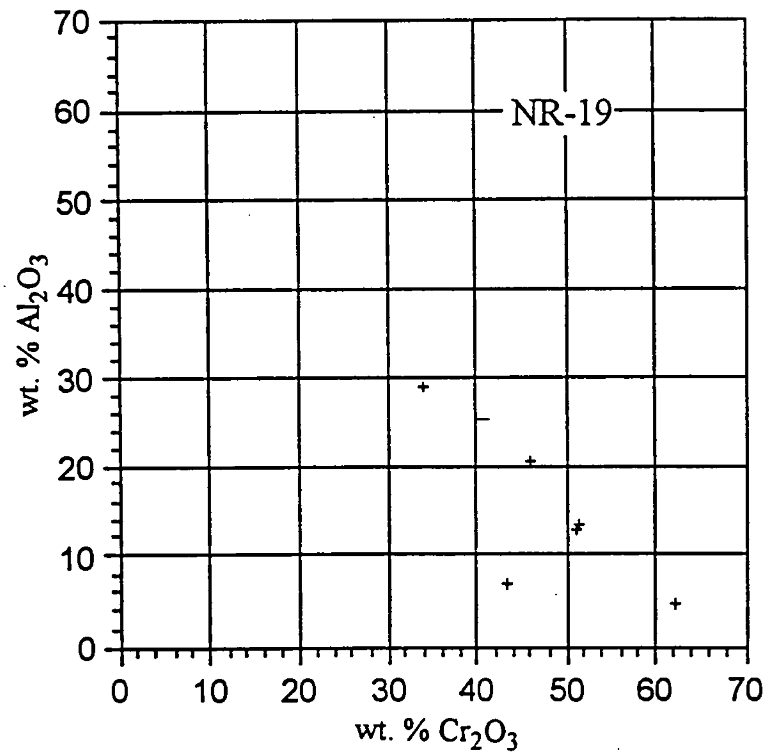
70
60
50
40
30
20
10
0
NR-18
wt. % Cr_2O_3
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO



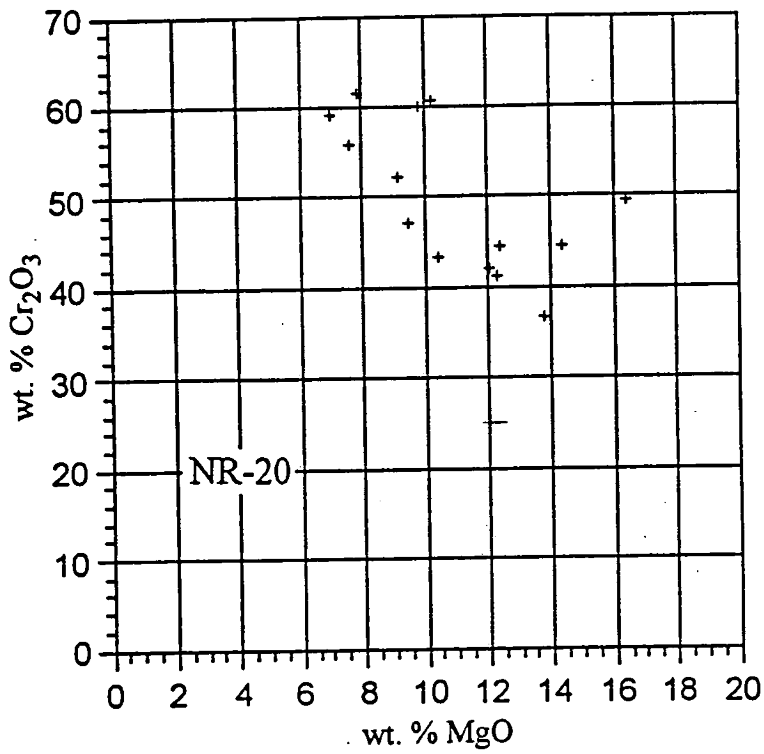
70
60
50
40
30
20
10
0
NR-18
wt. % Al_2O_3
0 10 20 30 40 50 60 70
wt. % Cr_2O_3

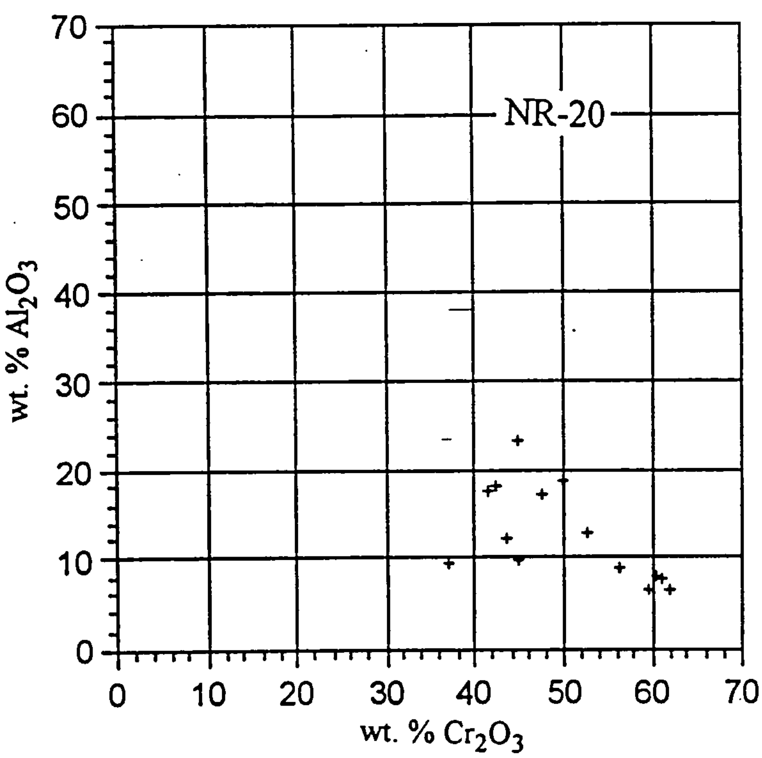


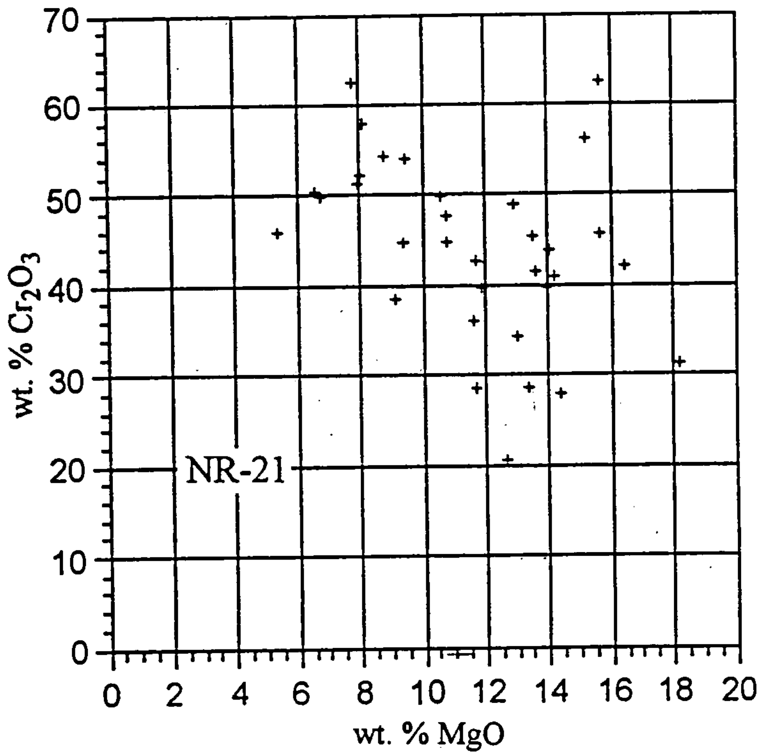
NR-19
wt. % Cr_2O_3
wt. % MgO
0 2 4 6 8 10 12 14 16 18 20
0 10 20 30 40 50 60 70



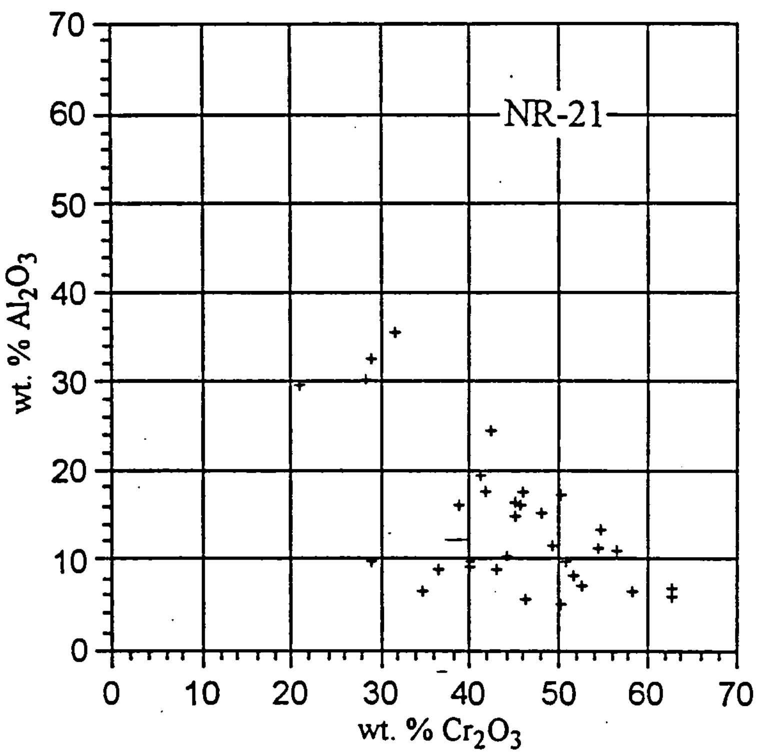
NR-19
wt. % Al_2O_3
wt. % Cr_2O_3
0 10 20 30 40 50 60 70
0 10 20 30 40 50 60 70


NR-20
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

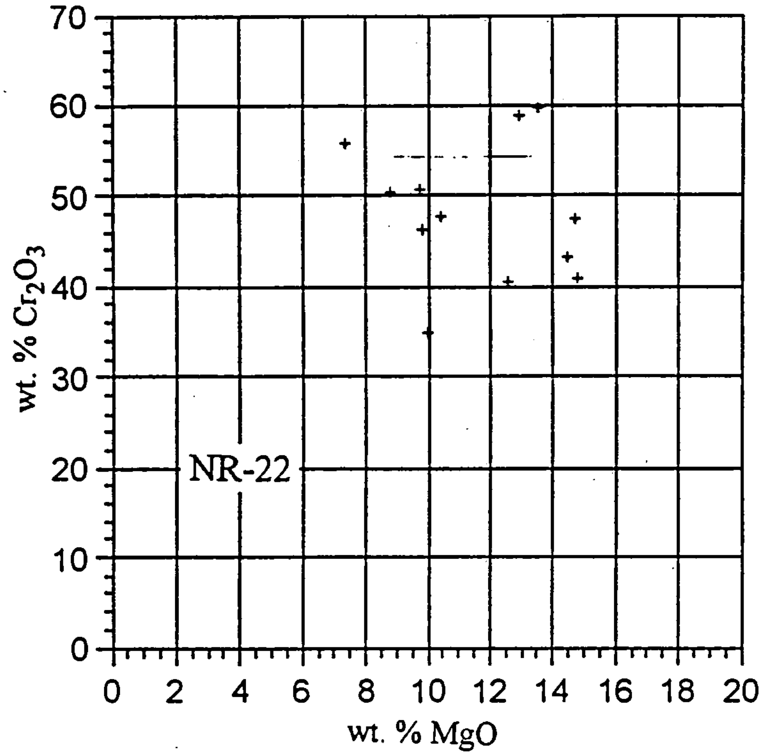

NR-20
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70



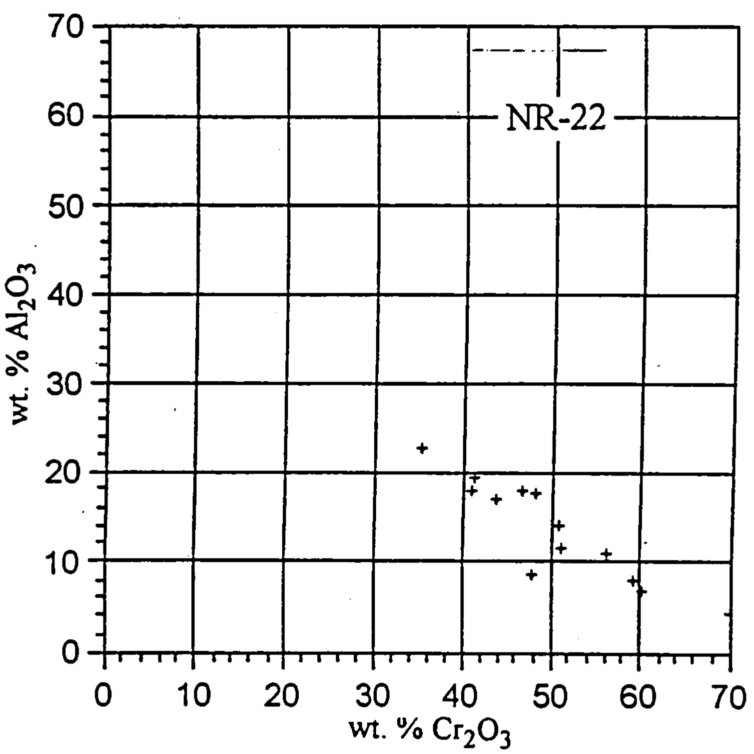
NR-21
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20



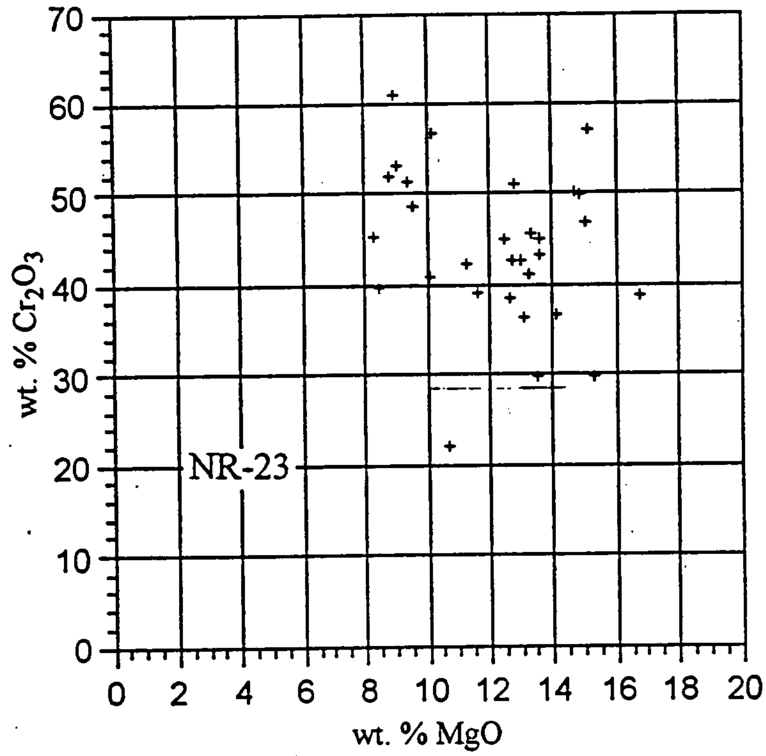
NR-21
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

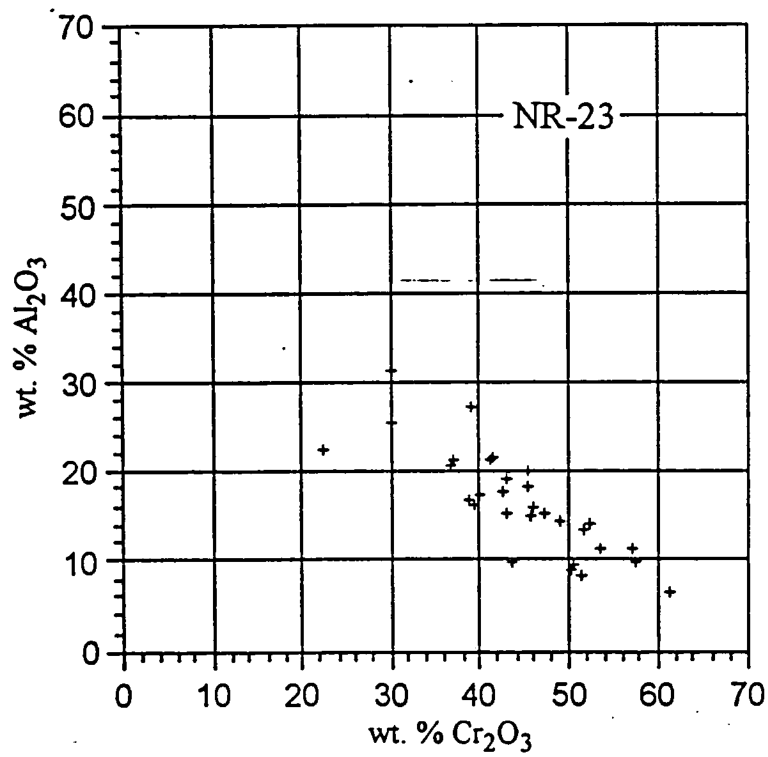


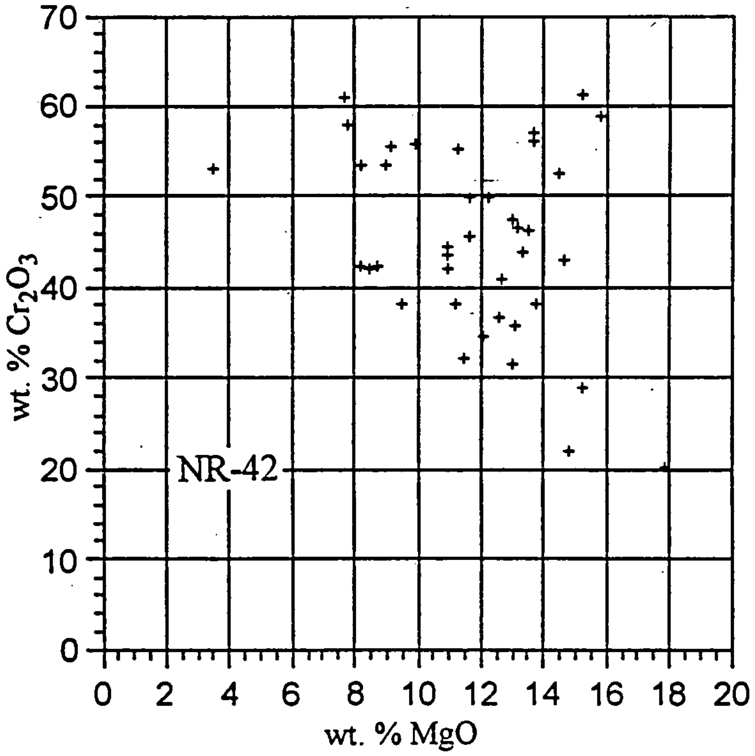
NR-22
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

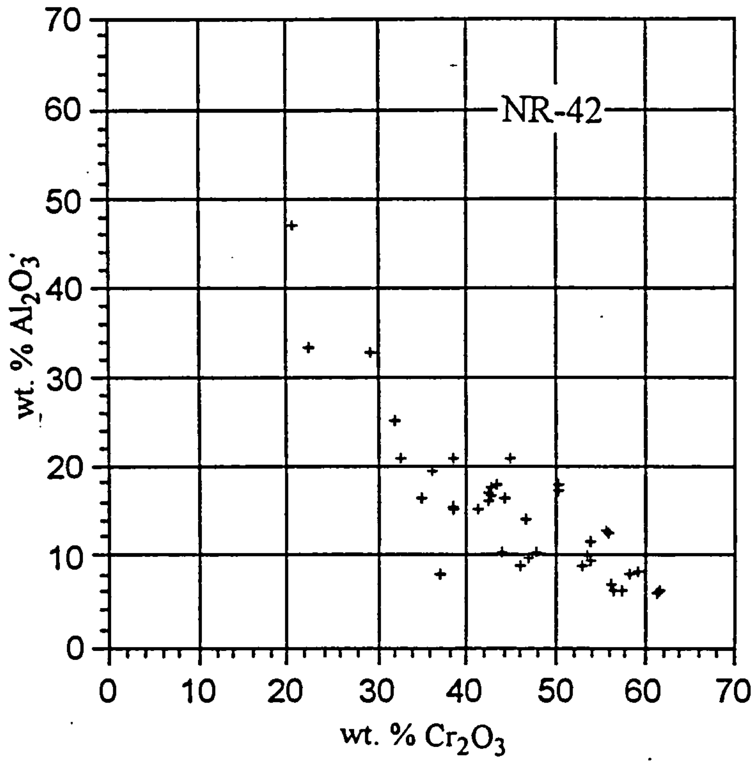


NR-22
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

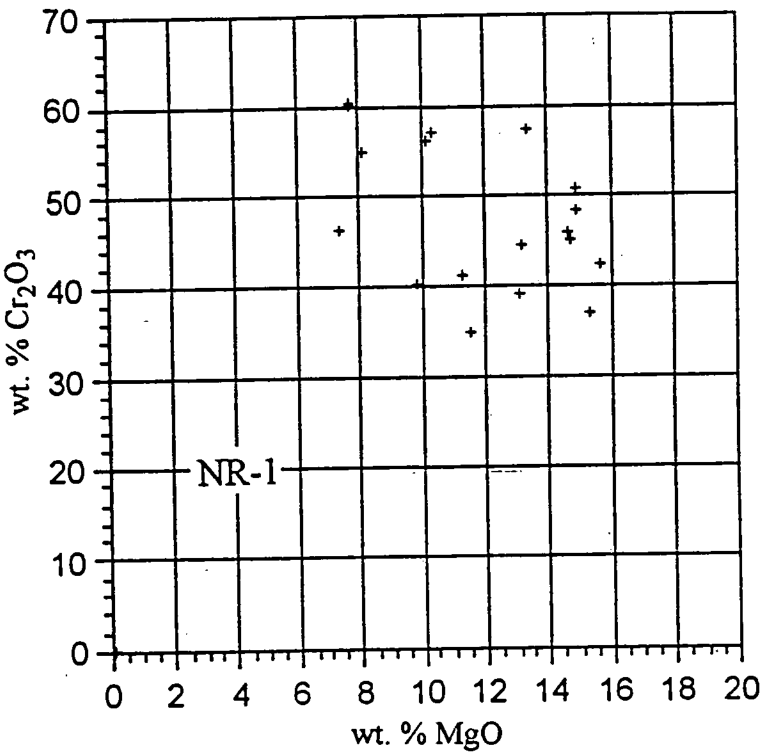

NR-23
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20


NR-23
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

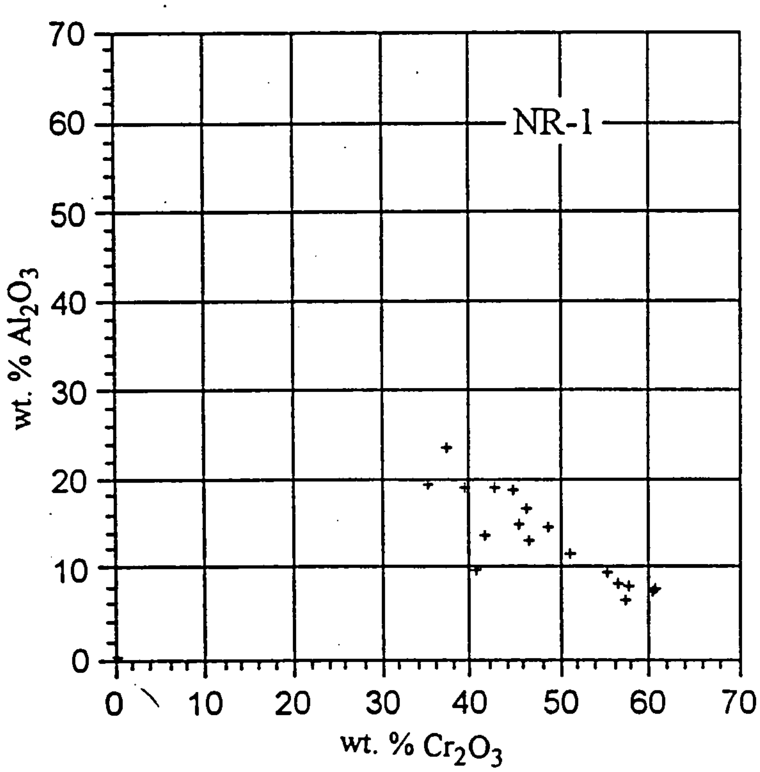

NR-42
wt. % Cr_2O_3
wt. % MgO


NR-42
wt. % Al_2O_3
wt. % Cr_2O_3

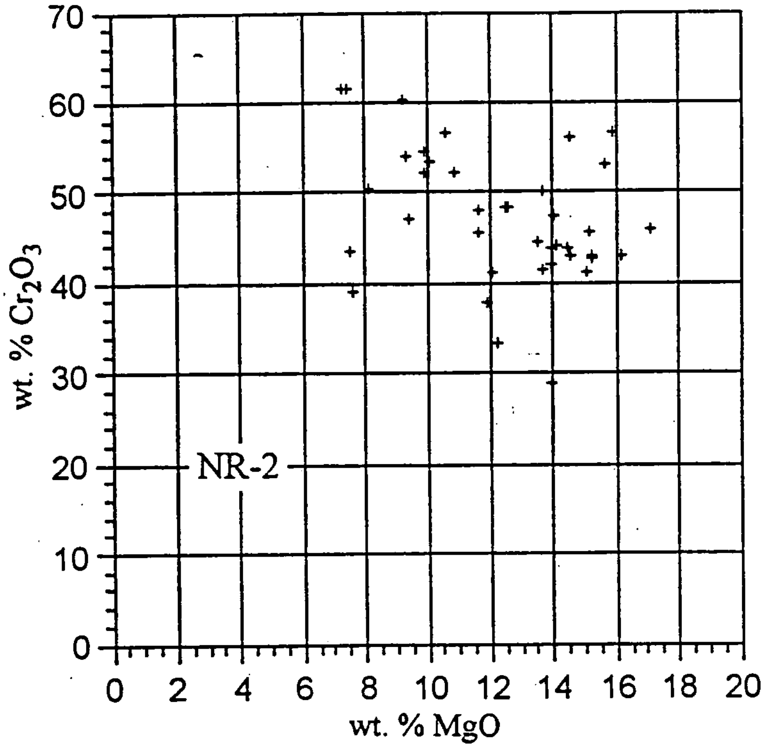
Nice Creek Area

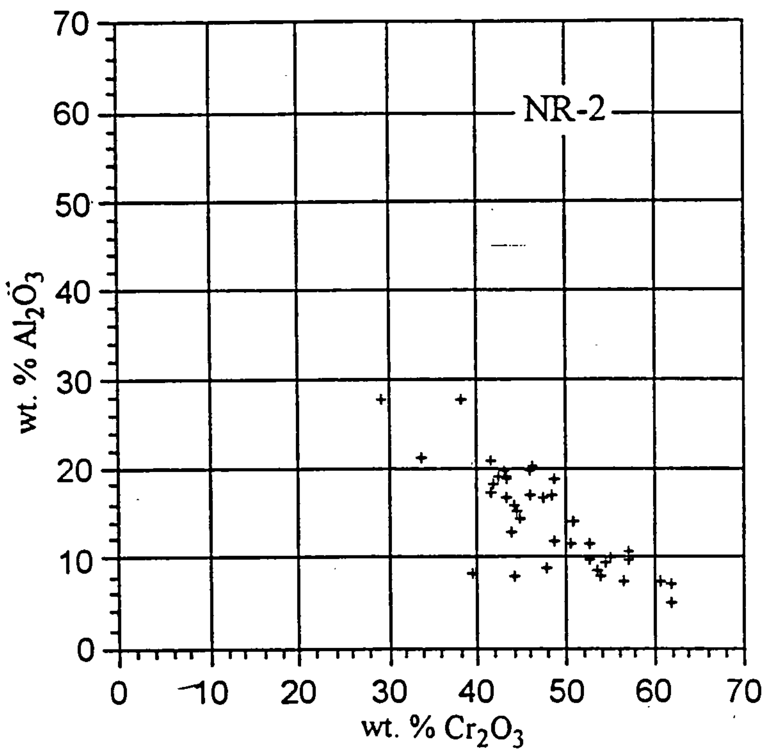


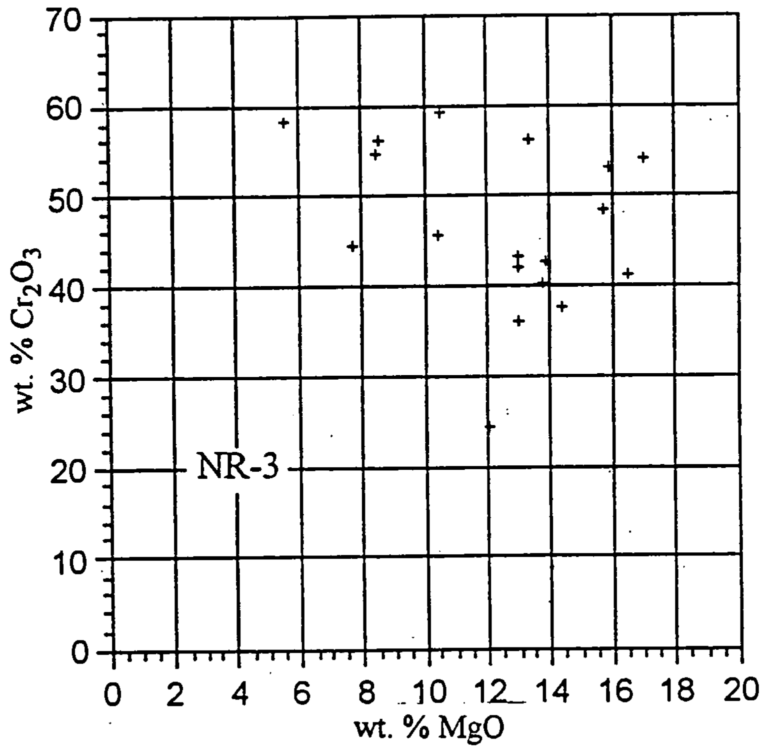
70
60
50
40
30
20
10
0
NR-1
wt. % Cr2O3
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO

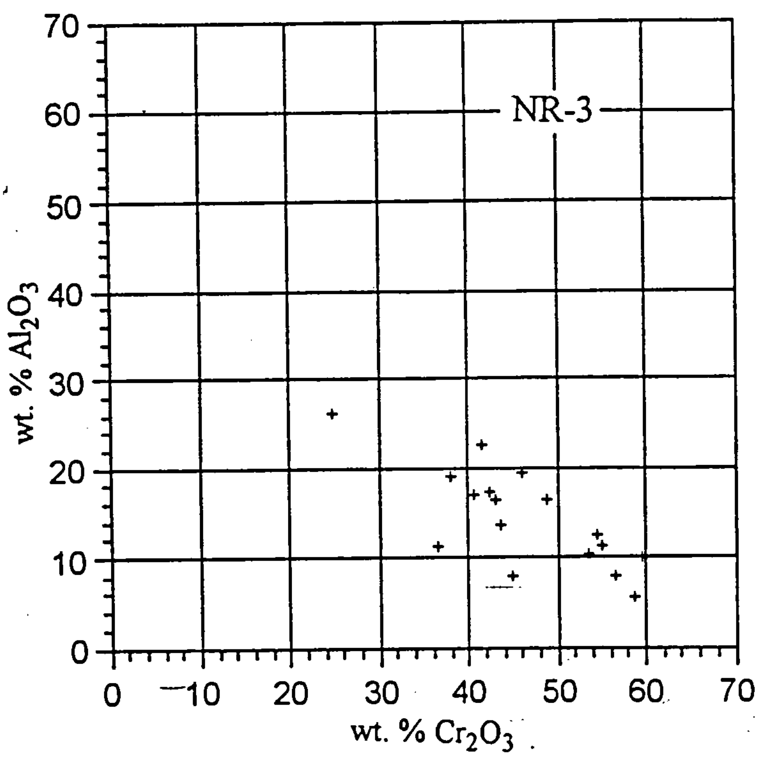


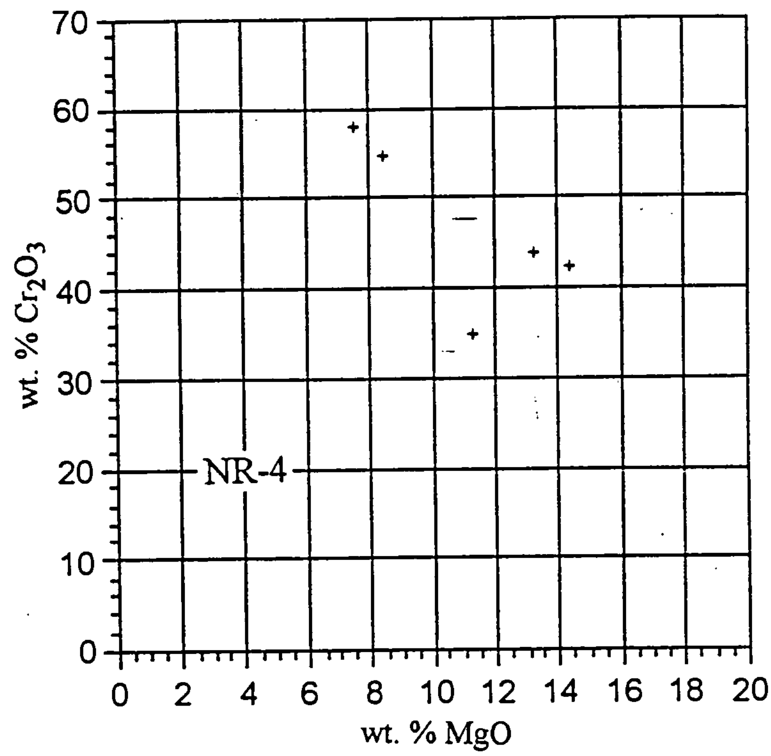
70
60
50
40
30
20
10
0
NR-1
wt. % Al2O3
0 10 20 30 40 50 60 70
wt. % Cr2O3


NR-2
wt. % Cr_2O_3
wt. % MgO

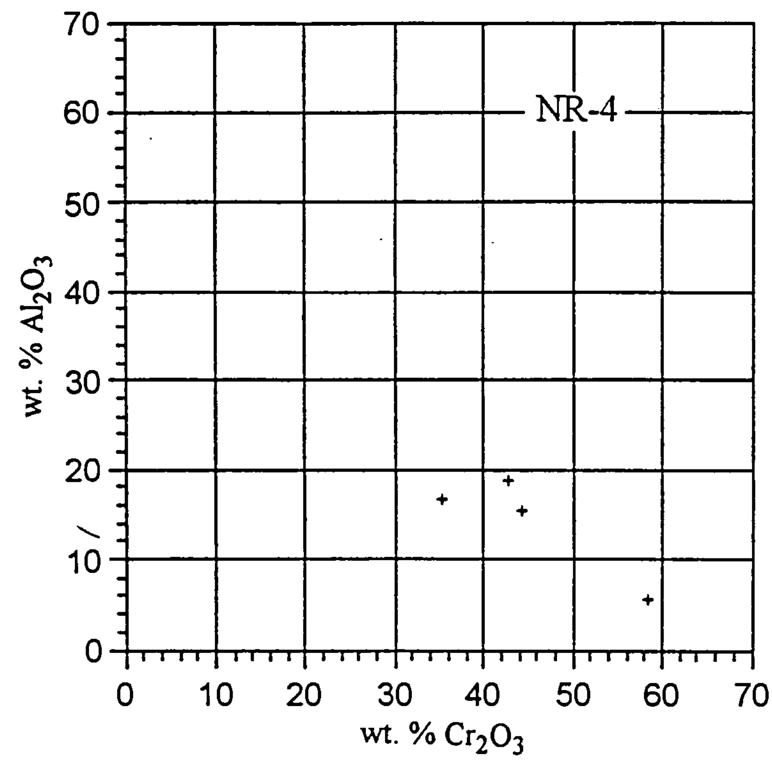

NR-2
wt. % Al_2O_3
wt. % Cr_2O_3


NR-3
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

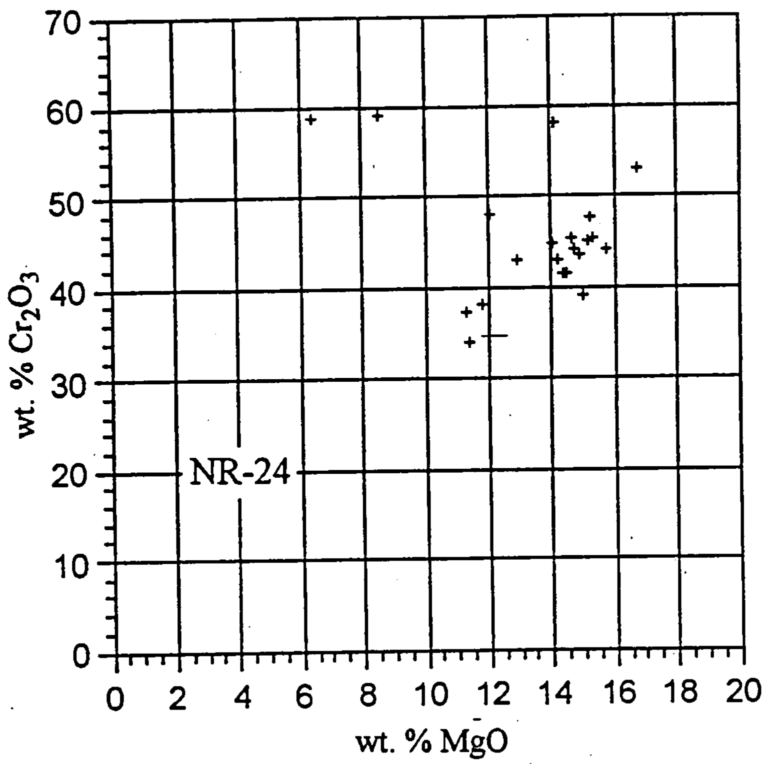

NR-3
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70



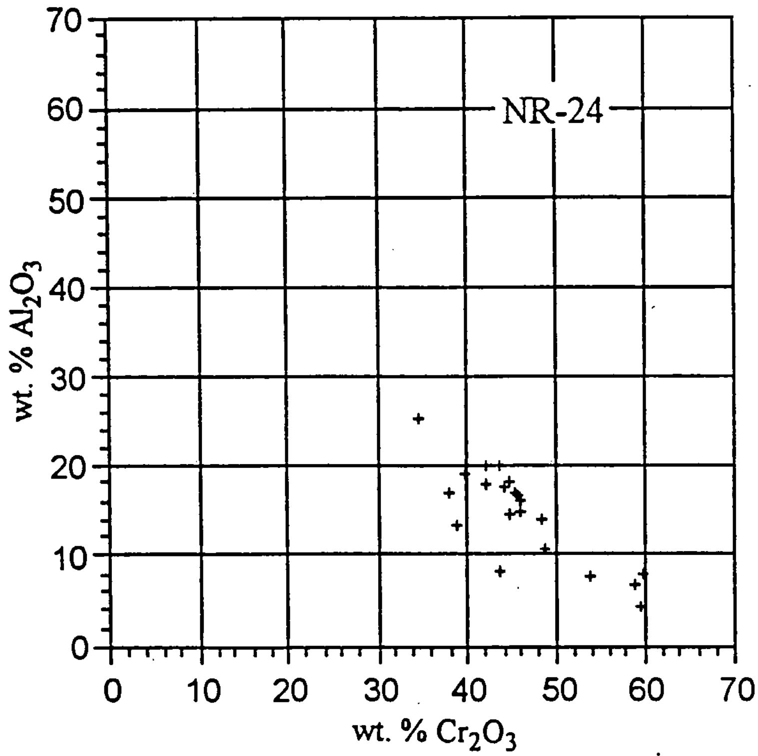
NR-4
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20



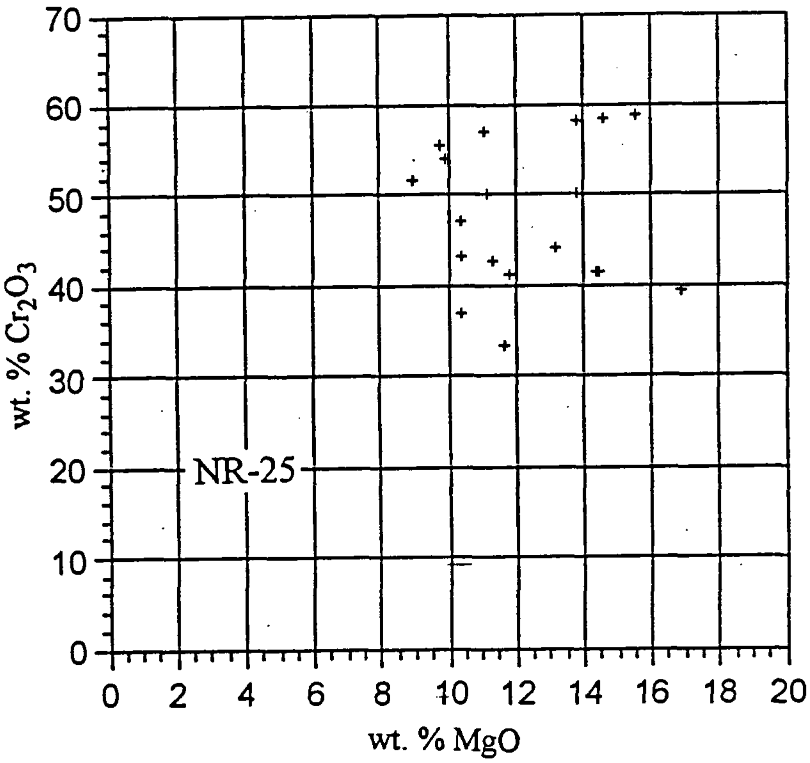
NR-4
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

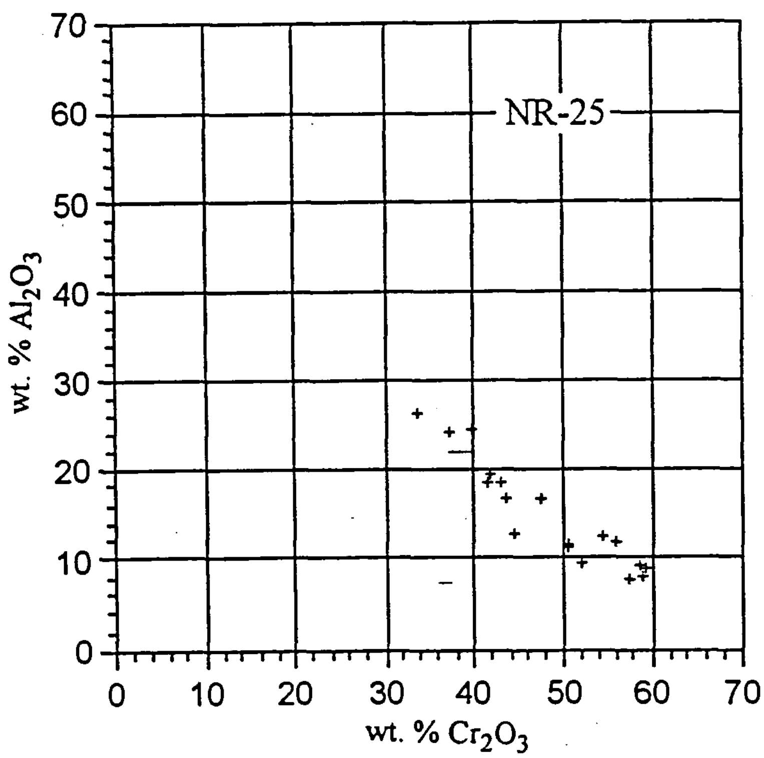


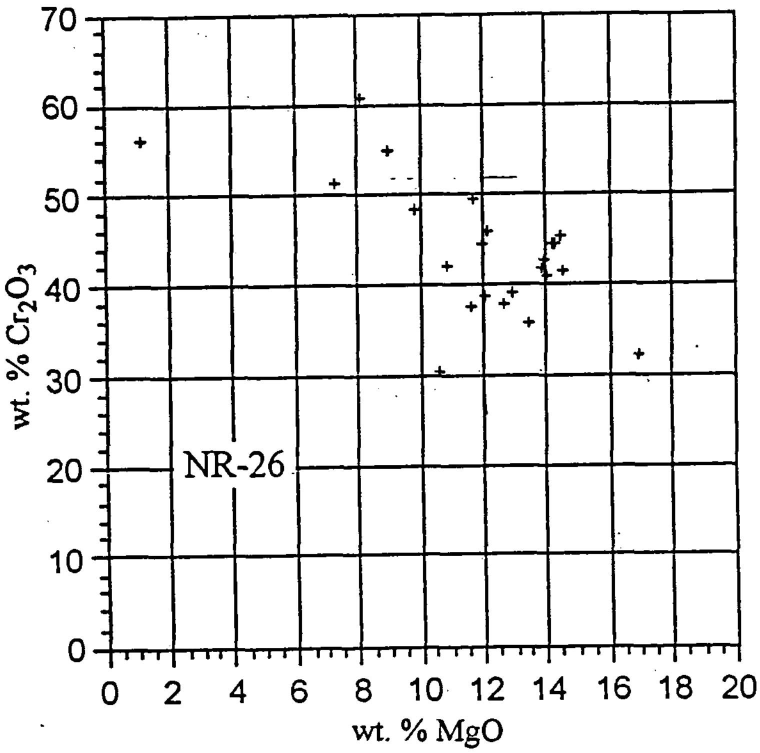
NR-24
wt. % Cr_2O_3
wt. % MgO



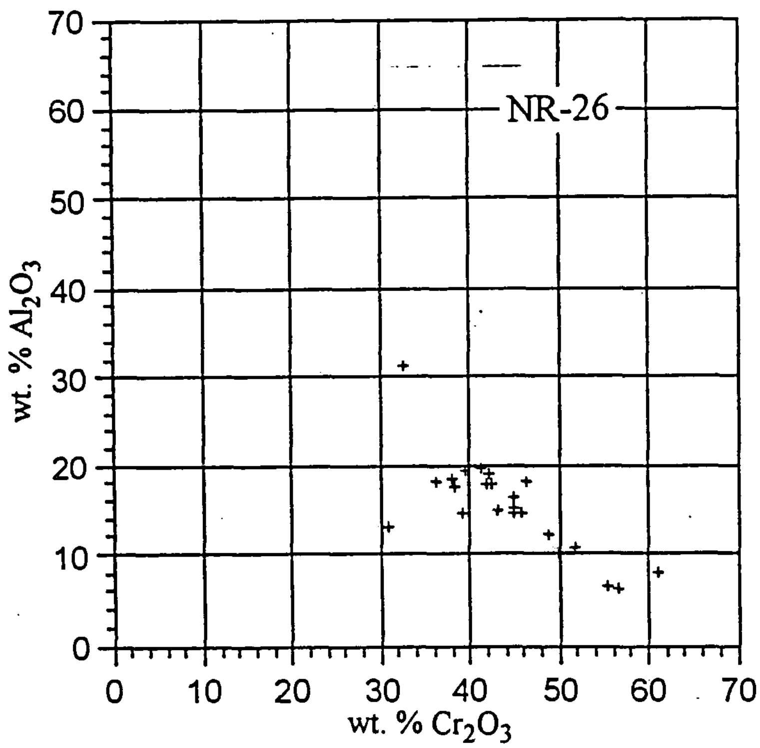
NR-24
wt. % Al_2O_3
wt. % Cr_2O_3


NR-25
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

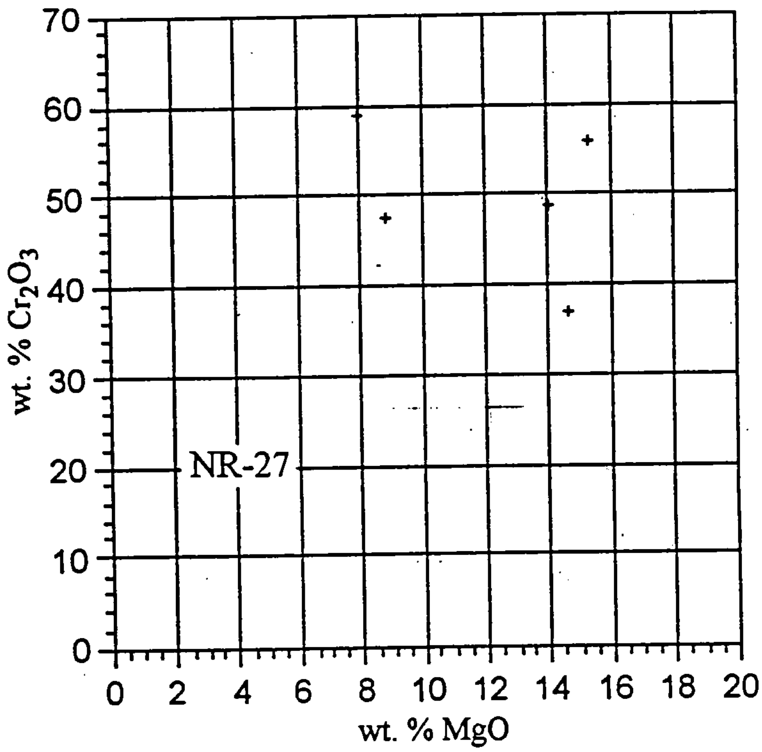

NR-25
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70



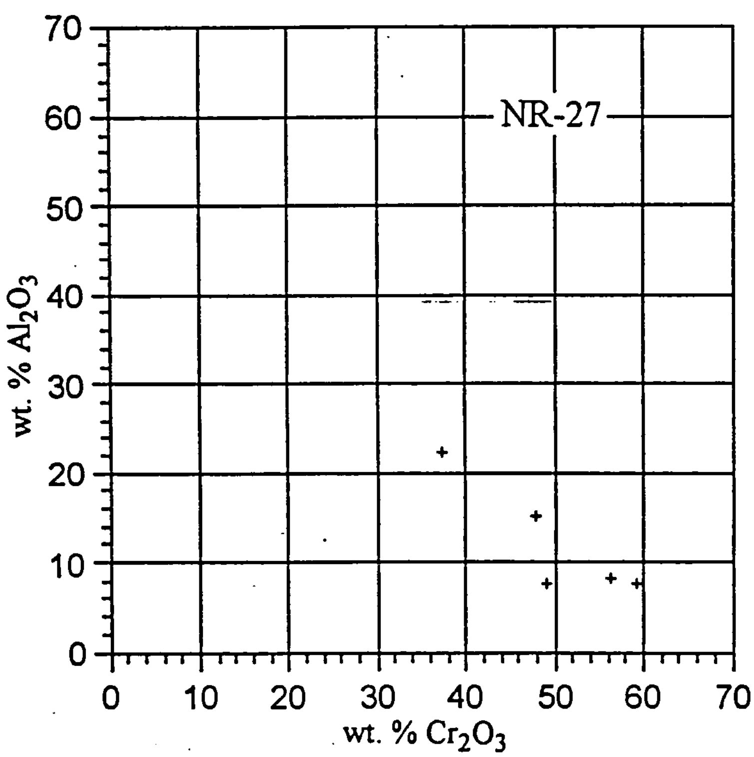
70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-26
0
2
4
6
8
10
12
14
16
18
20
wt. % MgO



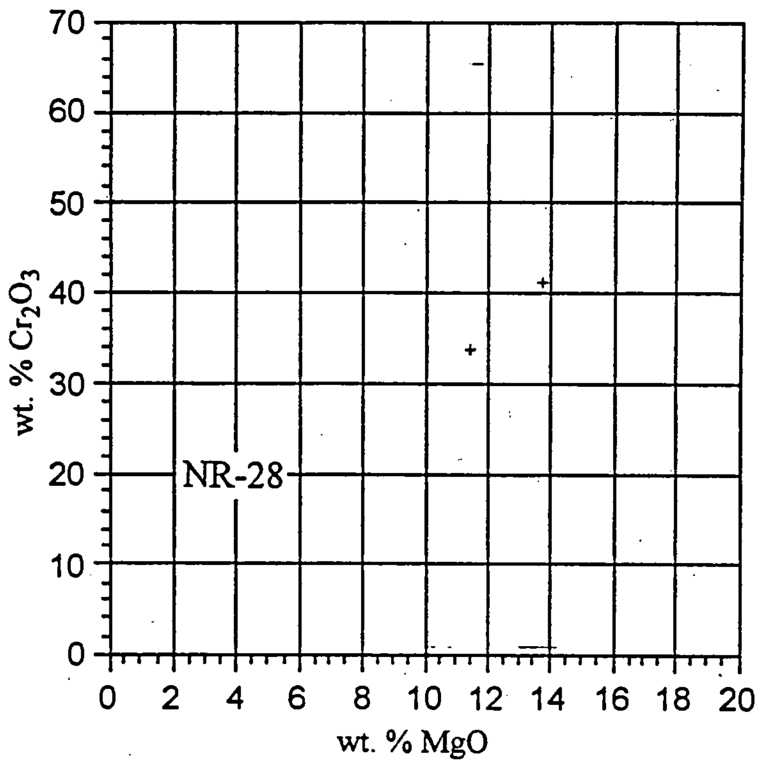
70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-26
0
10
20
30
40
50
60
70
wt. % Cr_2O_3

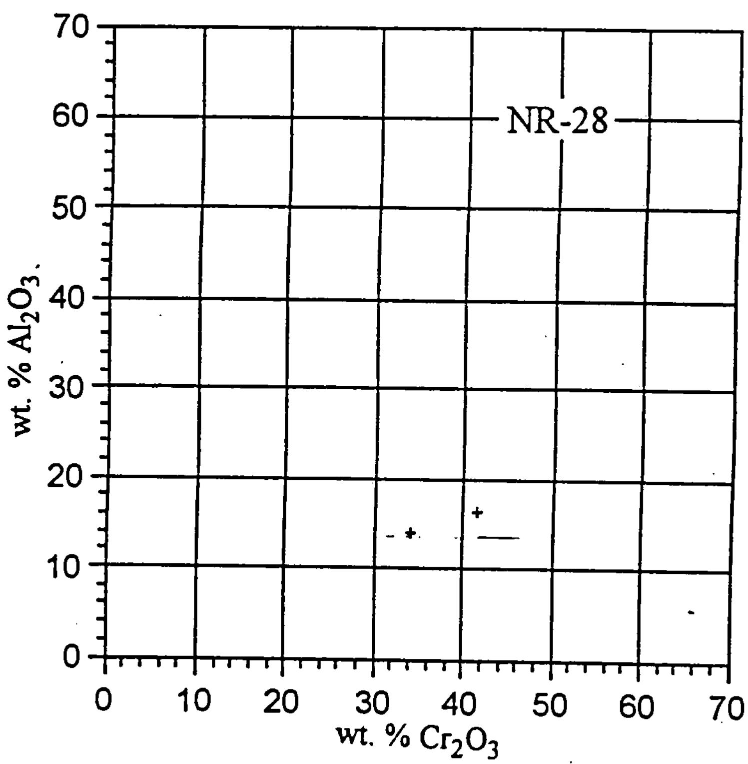


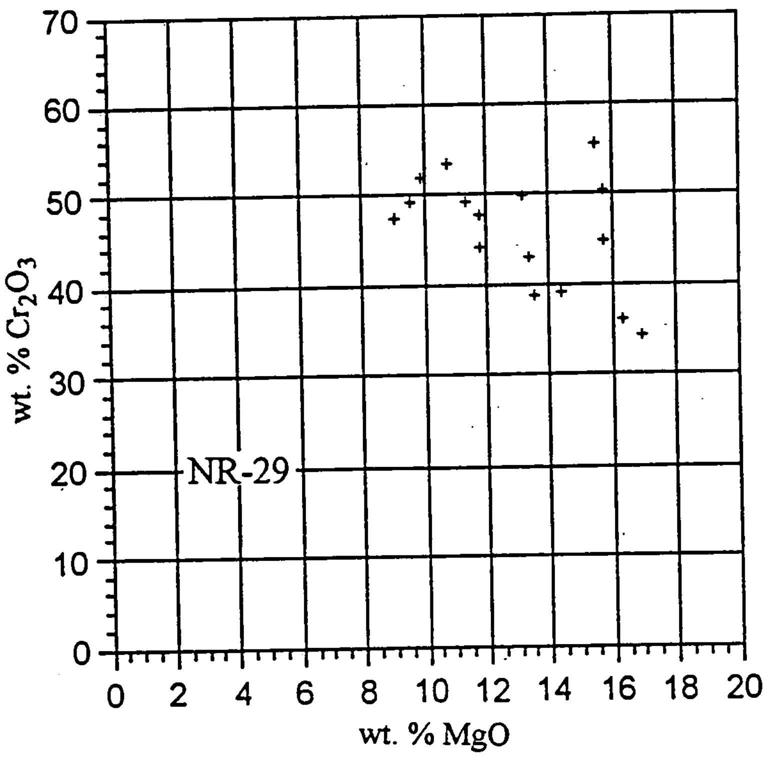
NR-27
wt. % Cr_2O_3
wt. % MgO
0
2
4
6
8
10
12
14
16
18
20
10
20
30
40
50
60
70

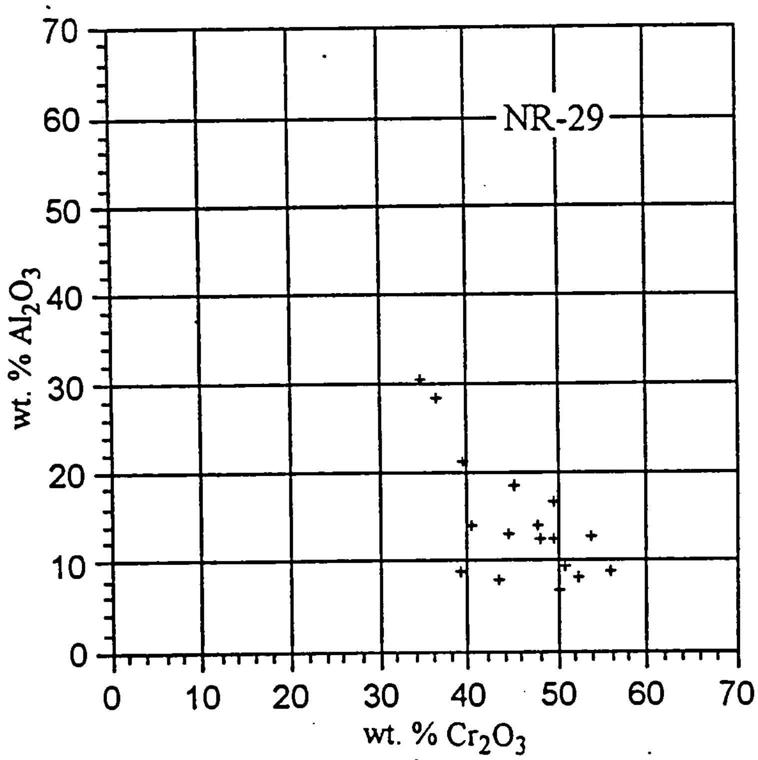


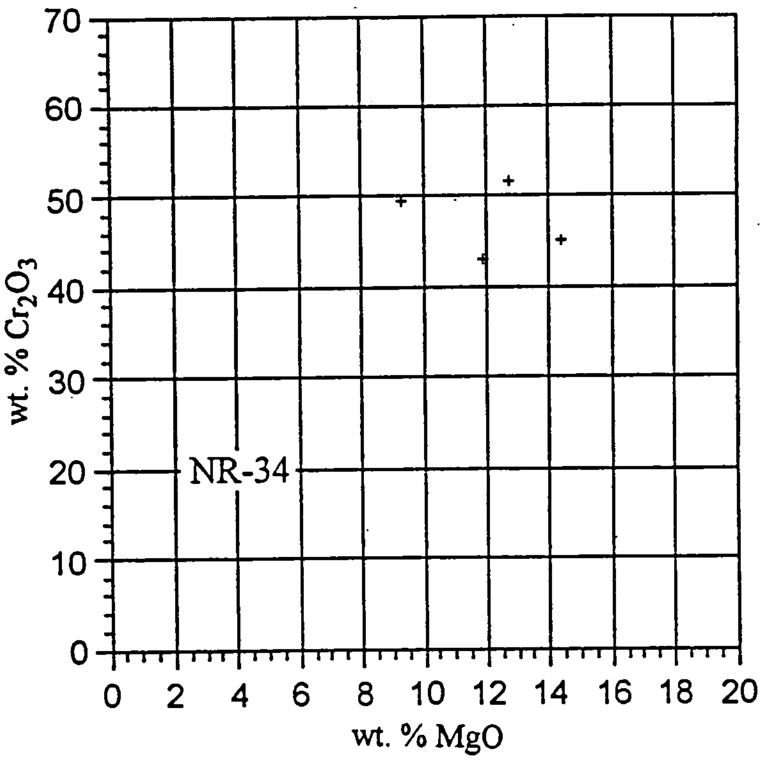
NR-27
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70

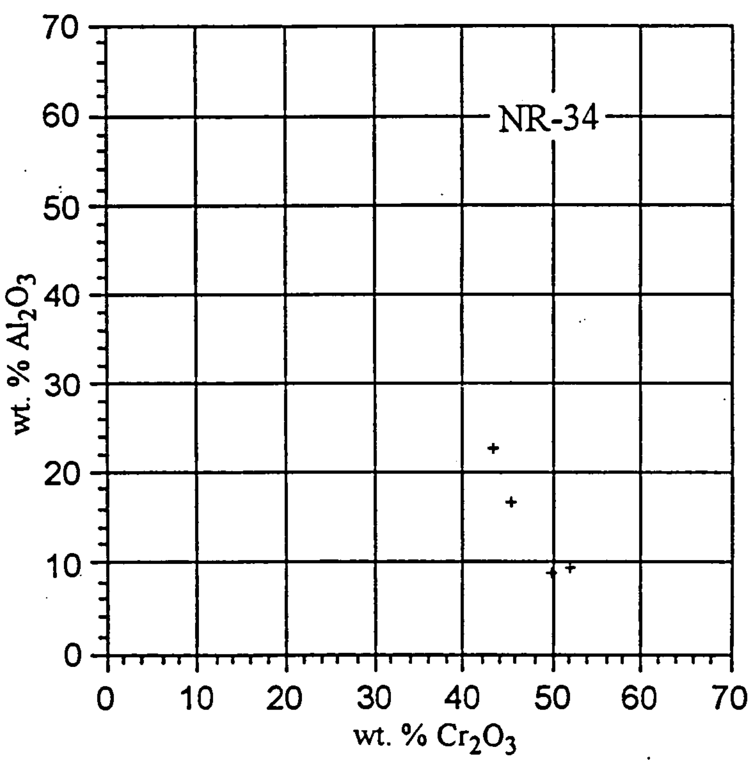

NR-28
wt. % Cr_2O_3
wt. % MgO
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40
50
60
70

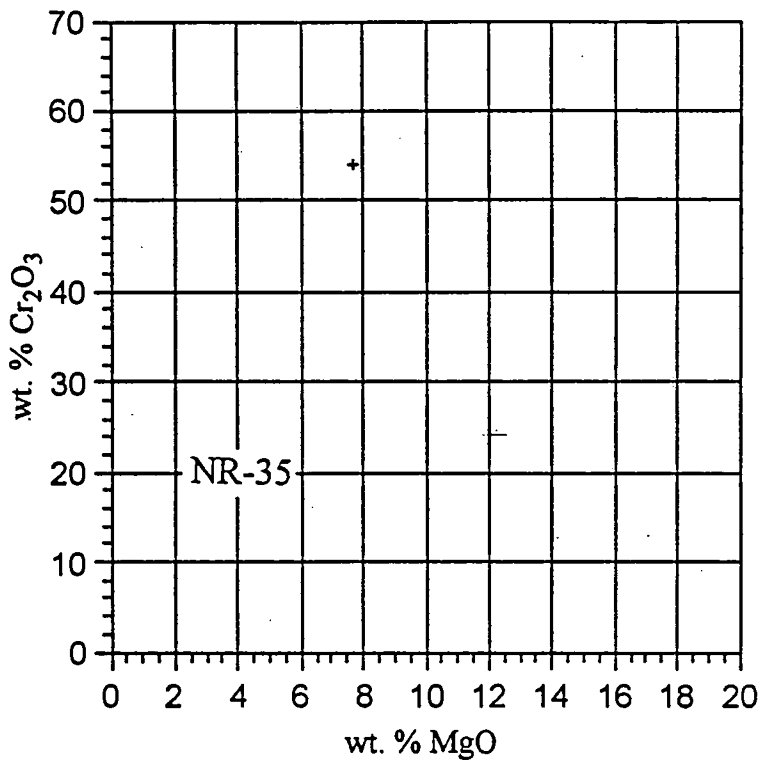

NR-28
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70


NR-29
wt. % Cr_2O_3
wt. % MgO

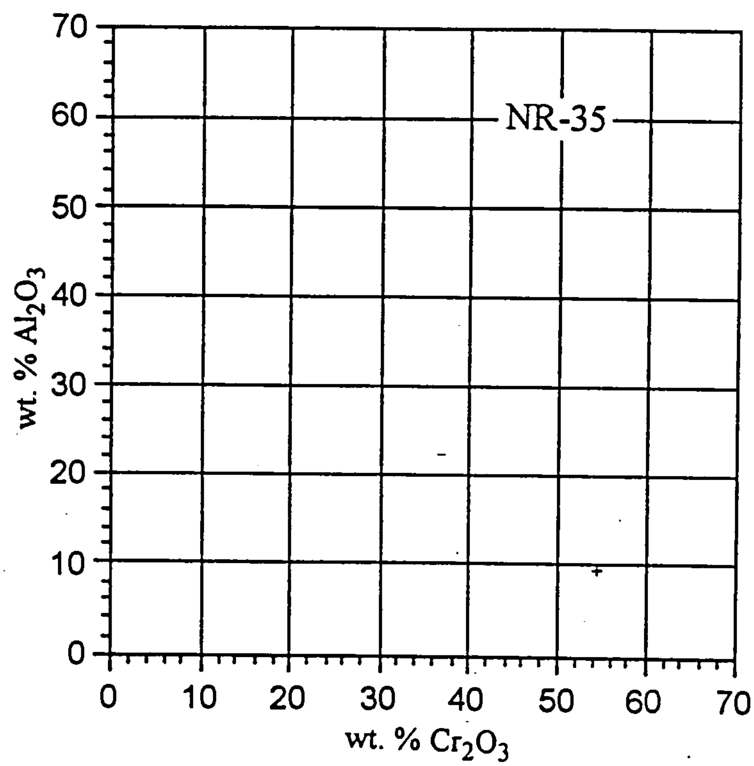

NR-29
wt. % Al_2O_3
wt. % Cr_2O_3


NR-34
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

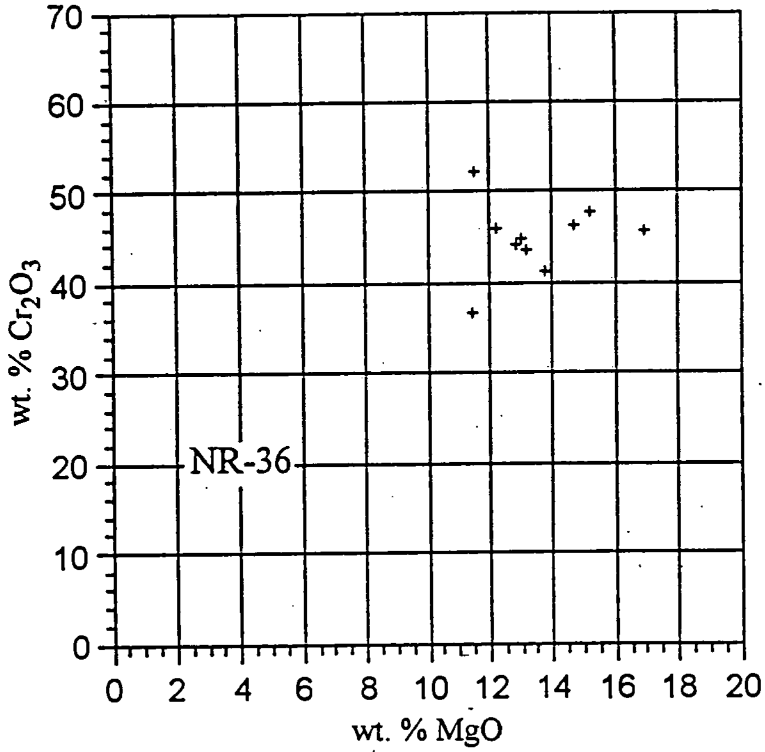

NR-34
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

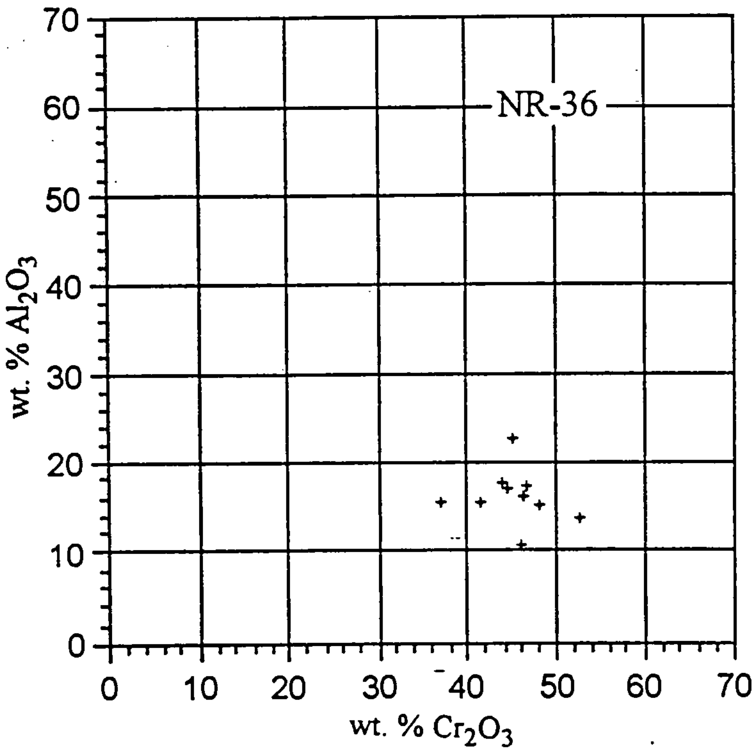


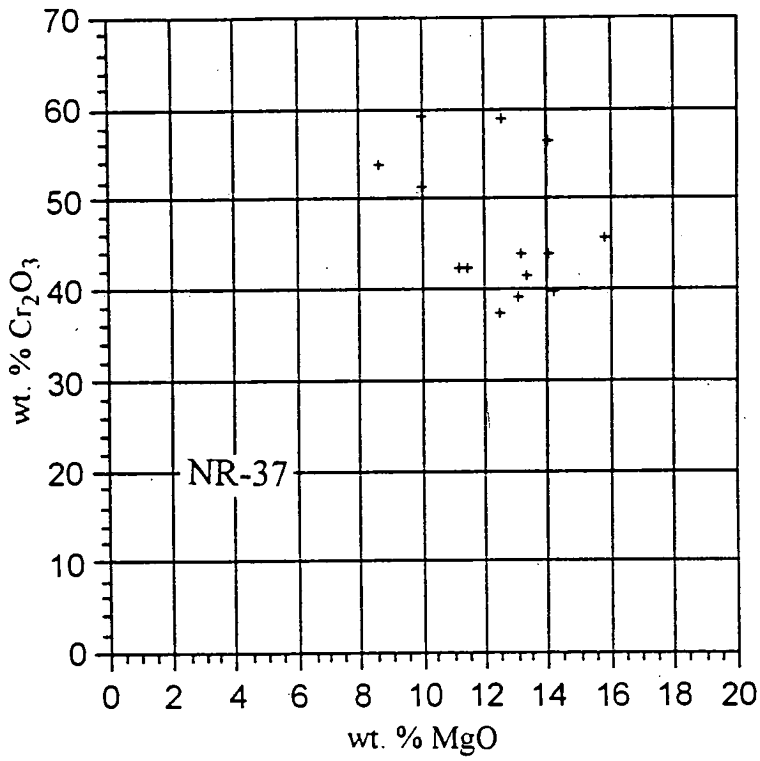
NR-35
wt. % Cr_2O_3
wt. % MgO
0 2 4 6 8 10 12 14 16 18 20
0 10 20 30 40 50 60 70

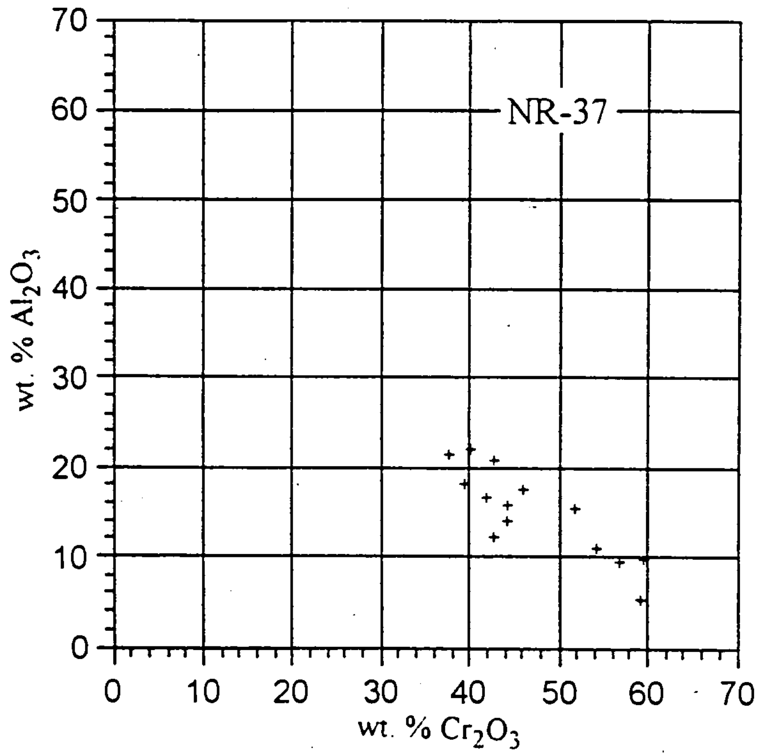


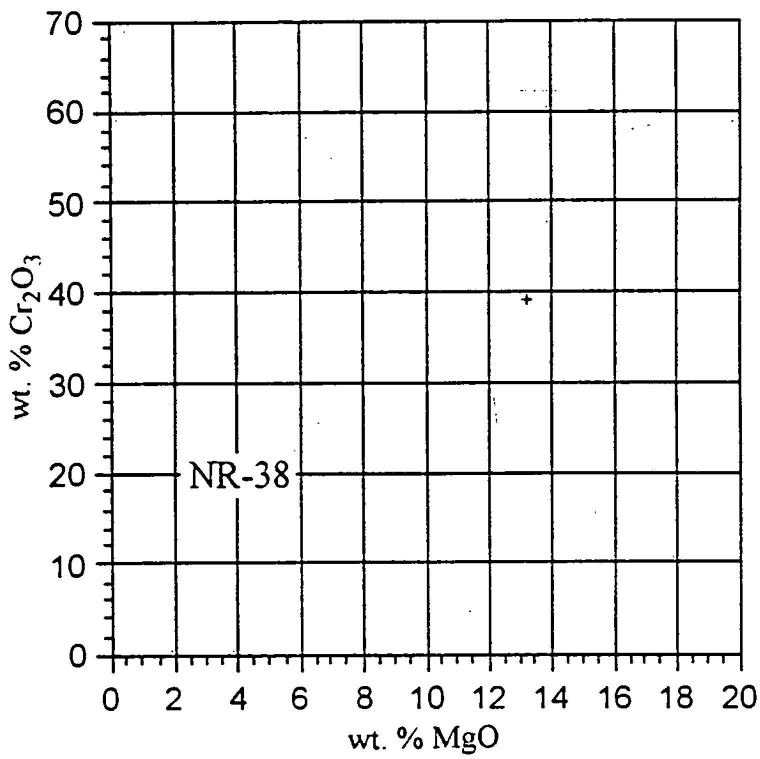
NR-35
wt. % Al_2O_3
wt. % Cr_2O_3
0 10 20 30 40 50 60 70
0 10 20 30 40 50 60 70


NR-36
wt. % Cr_2O_3
wt. % MgO
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20

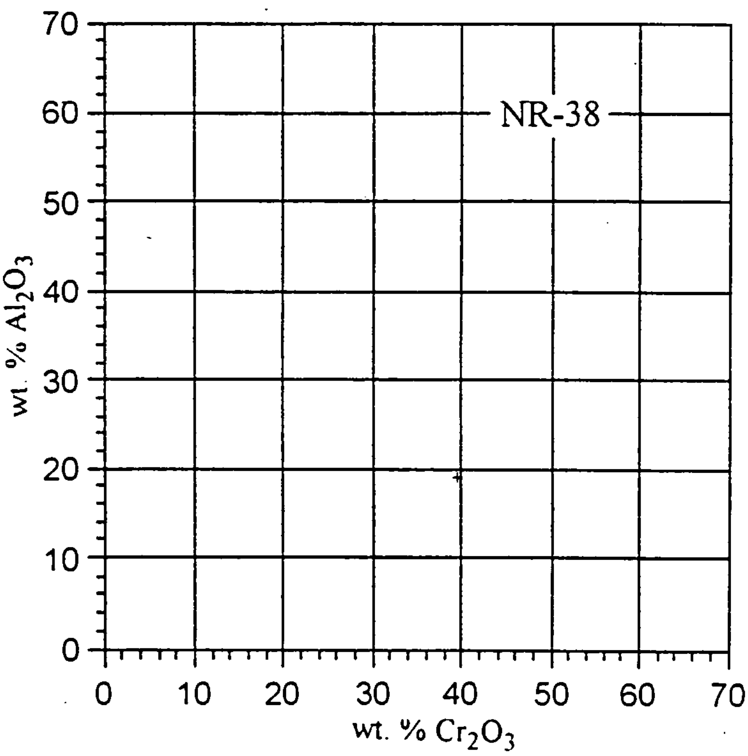

NR-36
wt. % Al_2O_3
wt. % Cr_2O_3
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70


NR-37
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

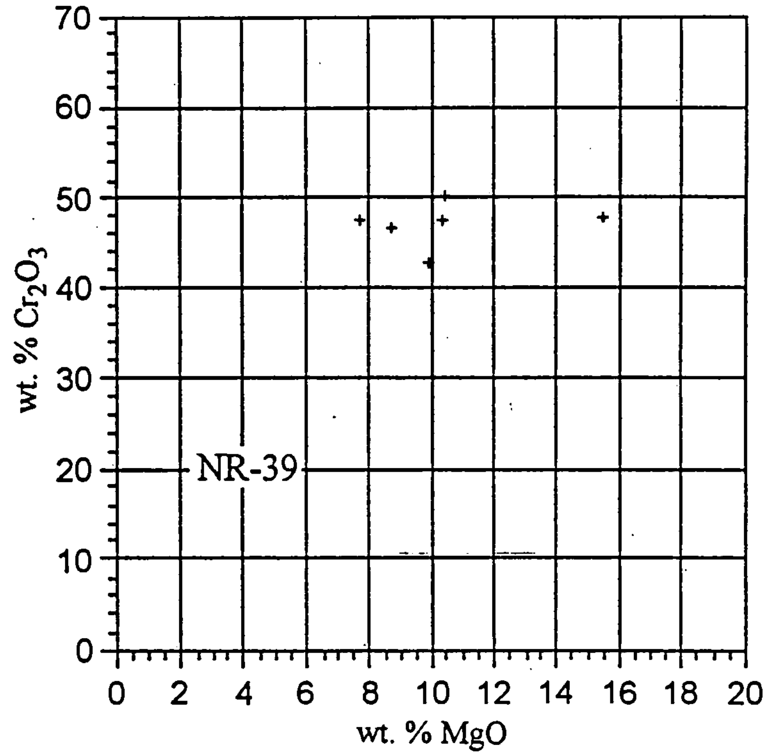

NR-37
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

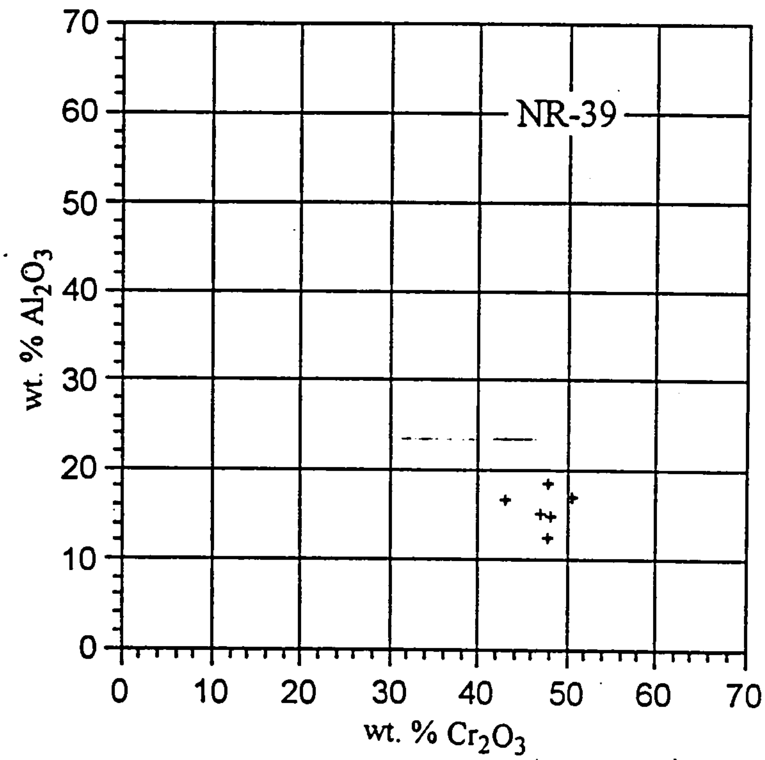


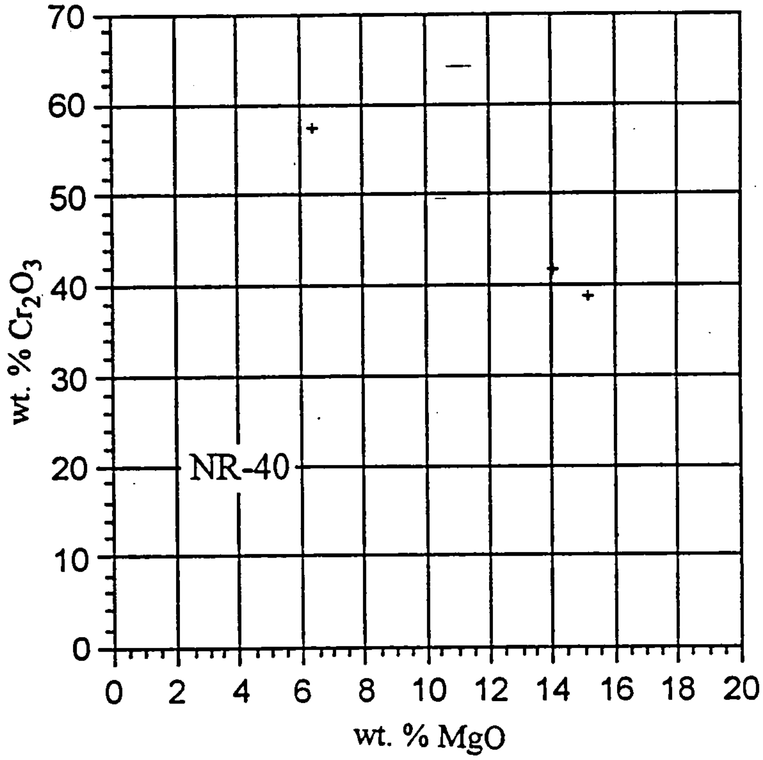
NR-38
wt. % Cr_2O_3
wt. % MgO
0 2 4 6 8 10 12 14 16 18 20
0 10 20 30 40 50 60 70

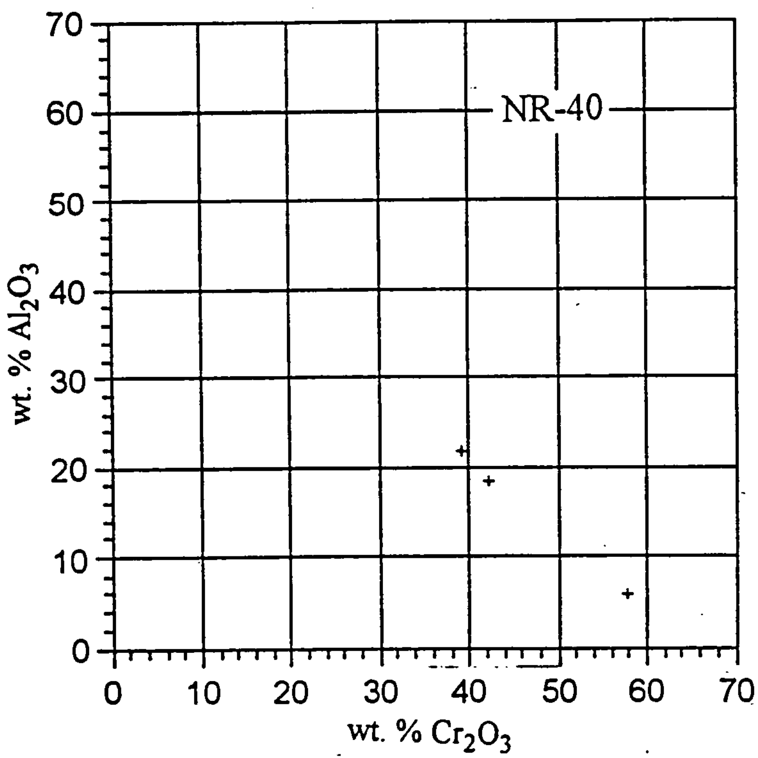


NR-38
wt. % Al_2O_3
wt. % Cr_2O_3
0 10 20 30 40 50 60 70
0 10 20 30 40 50 60 70

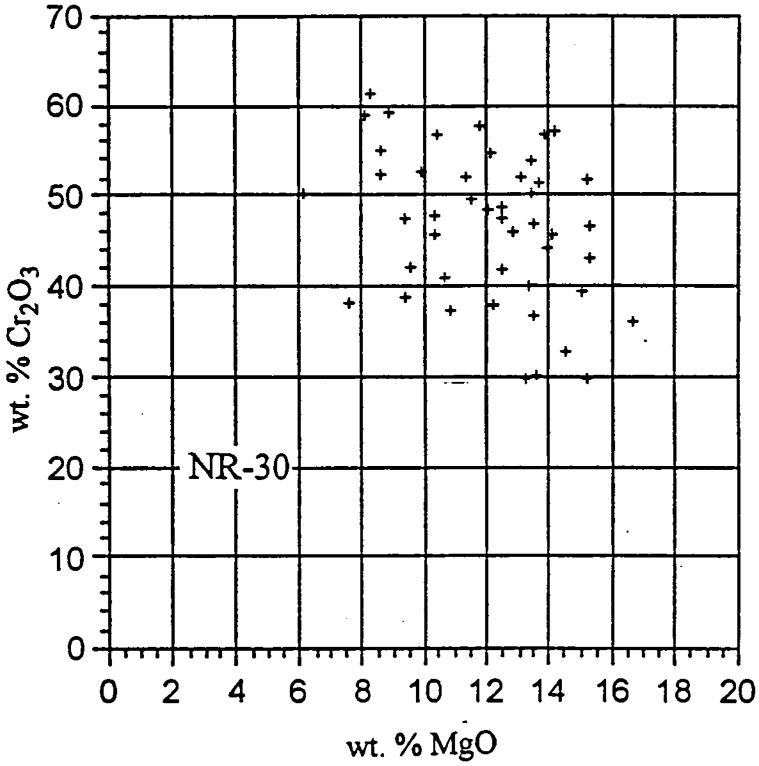

NR-39
wt. % Cr_2O_3
wt. % MgO
0 2 4 6 8 10 12 14 16 18 20
0 10 20 30 40 50 60 70

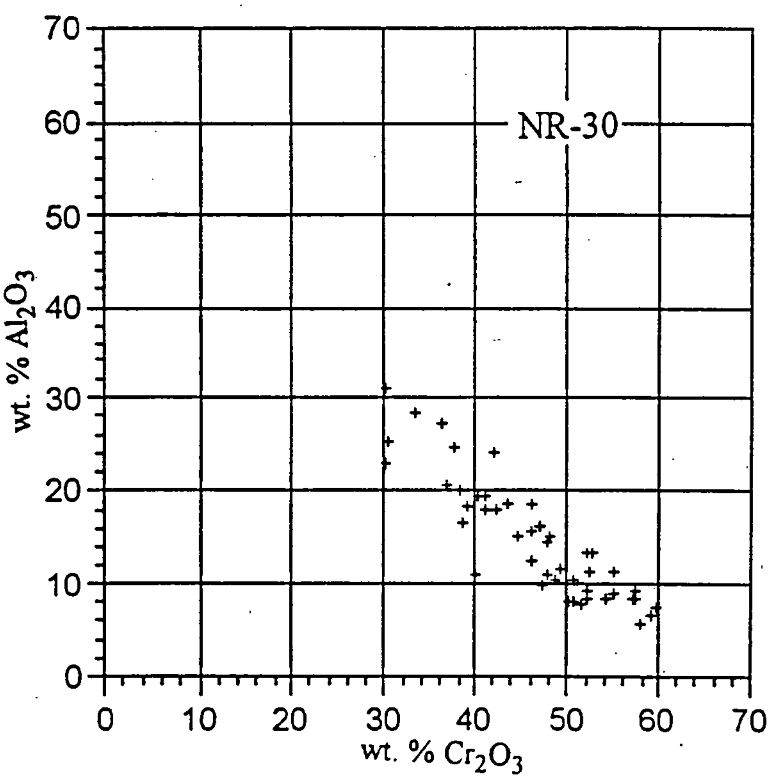

NR-39
wt. % Al_2O_3
wt. % Cr_2O_3
0 10 20 30 40 50 60 70
0 10 20 30 40 50 60 70

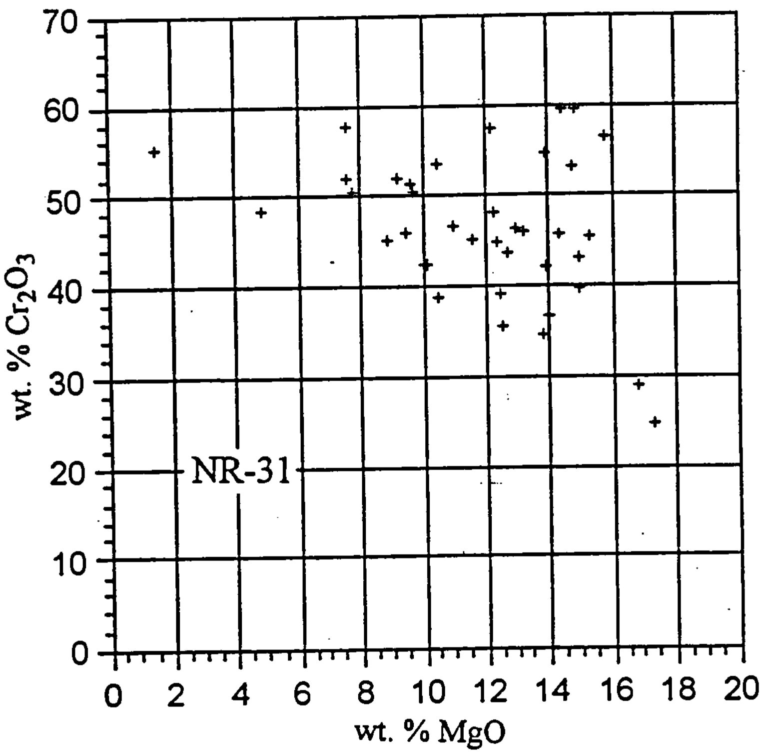

NR-40
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20


NR-40
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

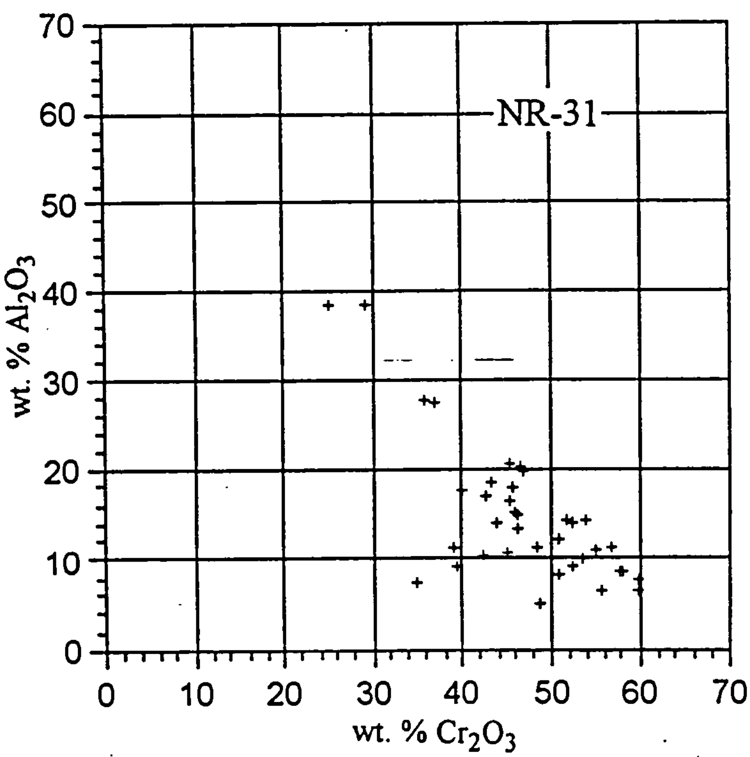
Cripple Creek Area


70
60
50
40
30
20
10
0
wt. % Cr_2O_3
NR-30
0 2 4 6 8 10 12 14 16 18 20
wt. % MgO

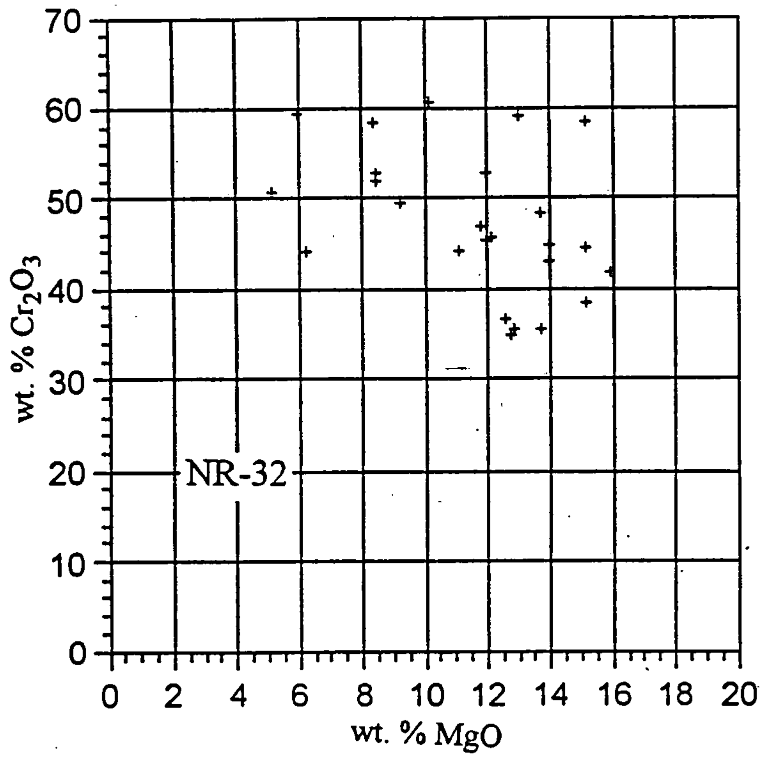

70
60
50
40
30
20
10
0
wt. % Al_2O_3
NR-30
0 10 20 30 40 50 60 70
wt. % Cr_2O_3

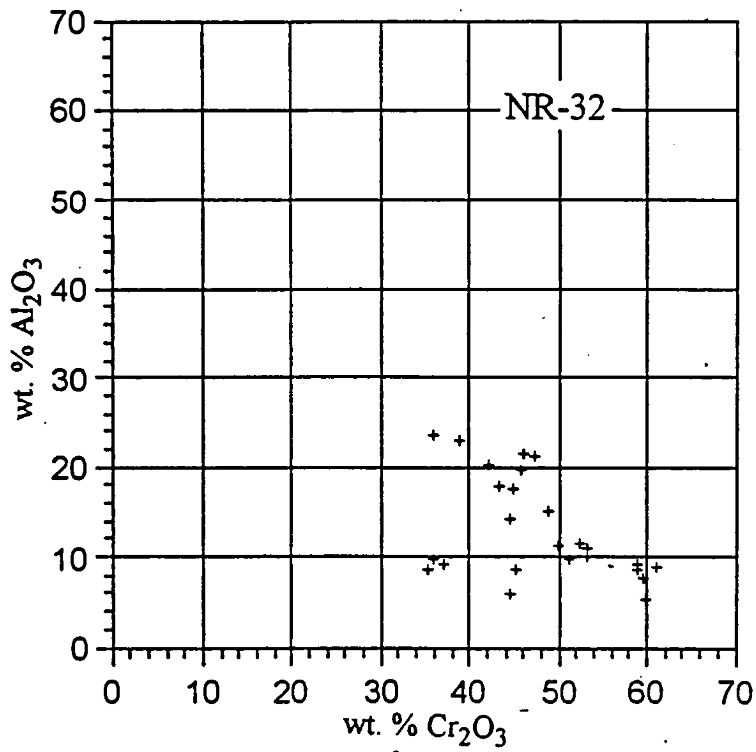


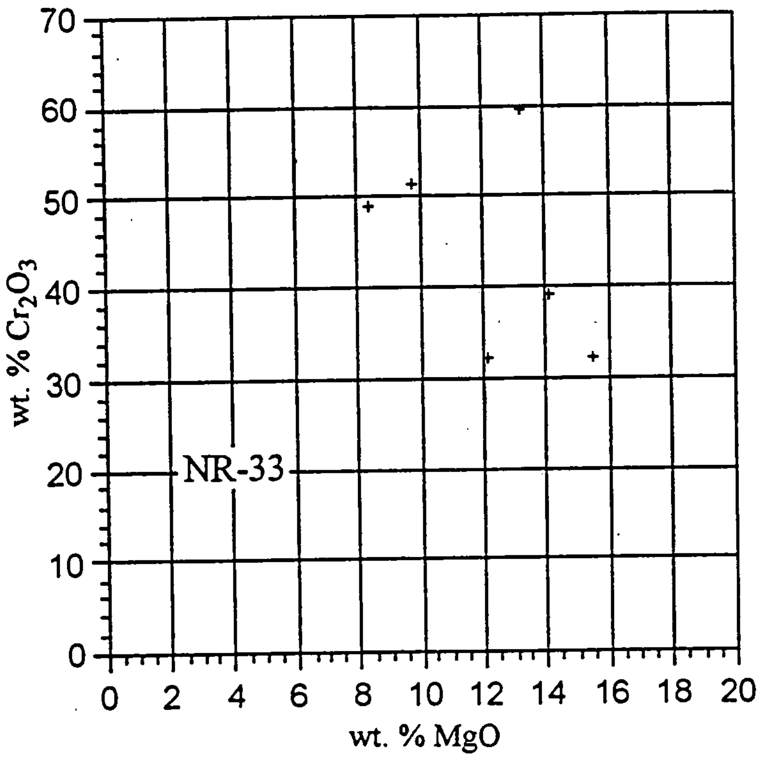
NR-31
wt. % Cr_2O_3
wt. % MgO



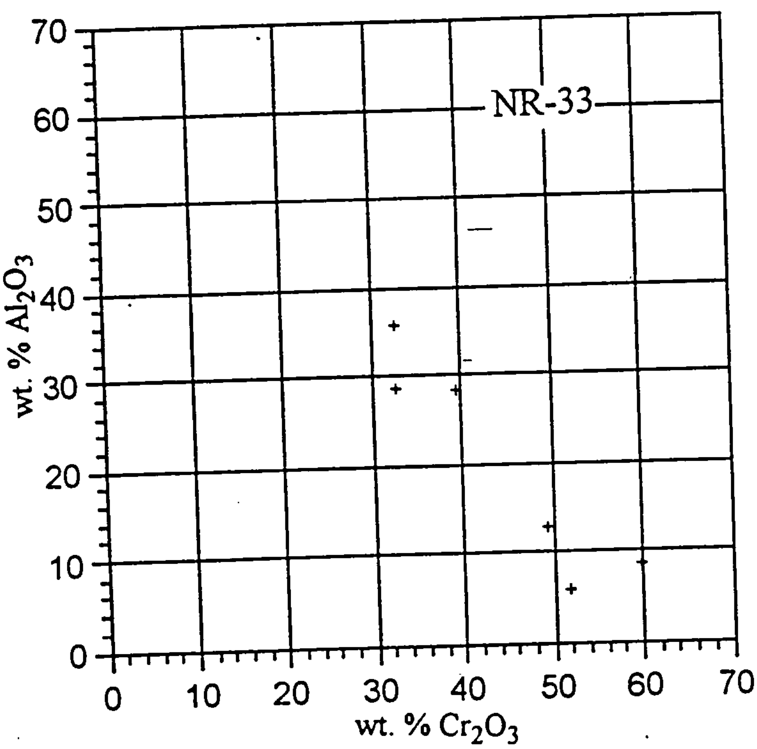
NR-31
wt. % Al_2O_3
wt. % Cr_2O_3


NR-32
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20


NR-32
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

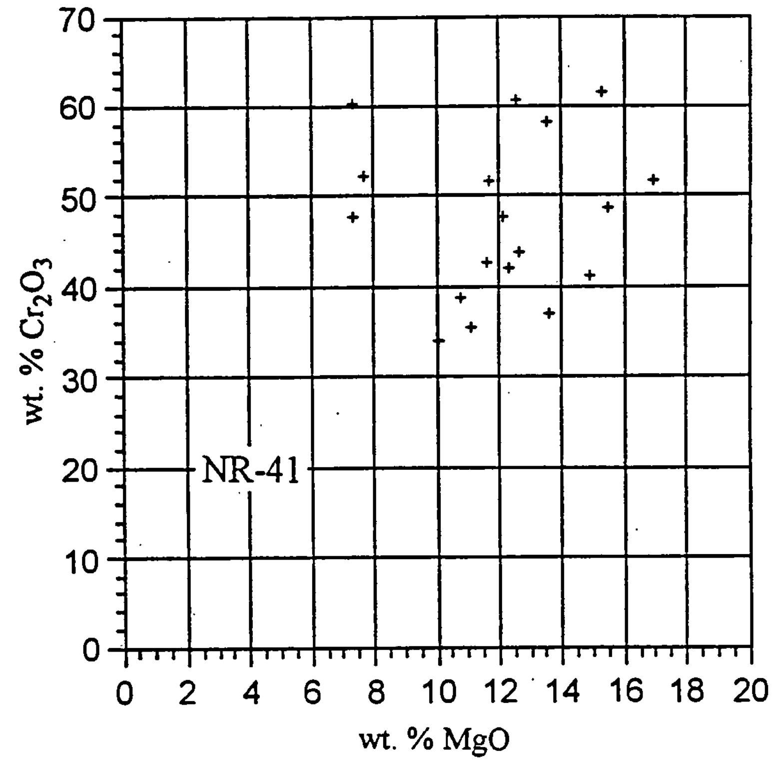


NR-33
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20

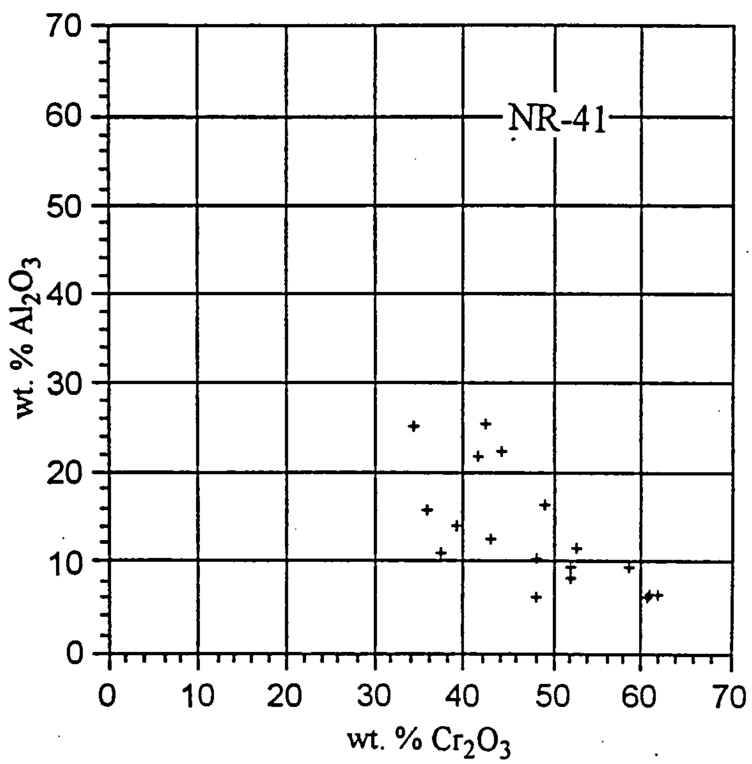


NR-33
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

Pinto Creek Area



NR-41
wt. % Cr_2O_3
wt. % MgO
0
10
20
30
40
50
60
70
0
2
4
6
8
10
12
14
16
18
20



NR-41
wt. % Al_2O_3
wt. % Cr_2O_3
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70

Geophysical Survey Report

Report #1178

DIGHEM SURVEY
FOR
TAKLA STAR RESOURCES LTD.
FRONT RANGE WEST &
BRAZEAU RANGE EAST
ALBERTA

NTS 83 B/5, C/1,8

Dighem, A division of CGG Canada Ltd.
Mississauga, Ontario
June 27, 1994

Douglas L. McConnell, P.Eng.
Geophysicist

A1178JUN.94R

SUMMARY

This report describes the logistics and results of a DIGHEM airborne geophysical survey carried out for Takla Star Resources Ltd. over the Front Range West and Brazeau Range East areas located near Ram River, Alberta. Total coverage of the survey blocks amounted to 1508 km. The survey was flown from May 4 to May 6, 1994.

The purpose of the survey was to detect lamproitic diatreme-type responses. This was accomplished by performing a DIGHEM high sensitivity cesium magnetometer survey, supplemented by a four-channel VLF receiver. The information from the magnetic sensor was processed to produce maps which display the magnetic properties of the survey area. A GPS electronic navigation system, utilizing a UHF link, ensured accurate positioning of the geophysical data with respect to the base maps. Visual flight path recovery techniques were used to confirm the location of the helicopter where visible topographic features could be identified on the ground.

The survey property contains several anomalous features which may warrant further investigation. Areas of interest may be assigned priorities on the basis of supporting geochemical and/or geological information. After initial investigations have been carried out, it may be necessary to re-evaluate the remaining anomalies based on information acquired from the follow-up program.

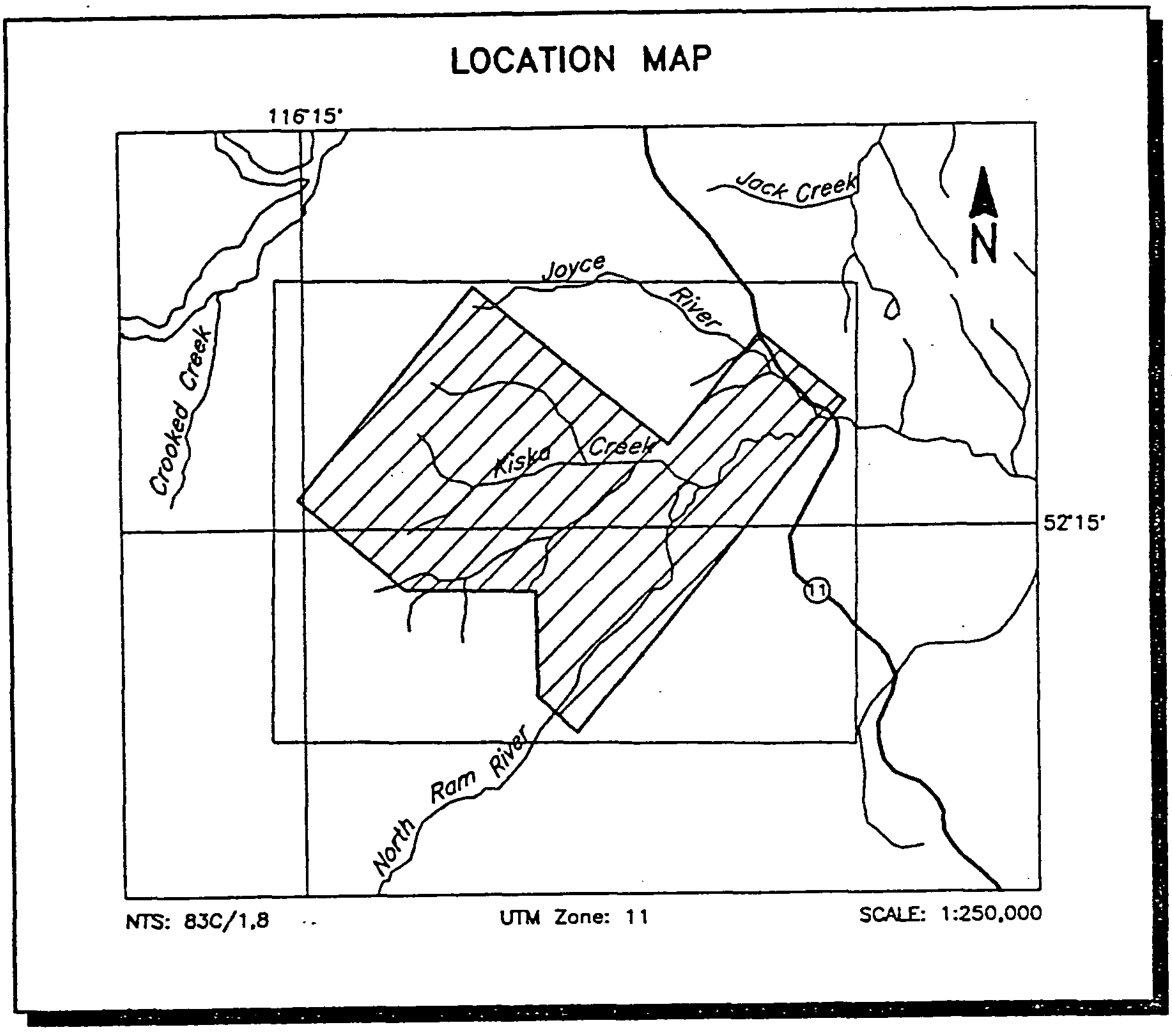


FIGURE 1

TAKLA STAR RESOURCES LTD.

FRONT RANGE WEST - 1178

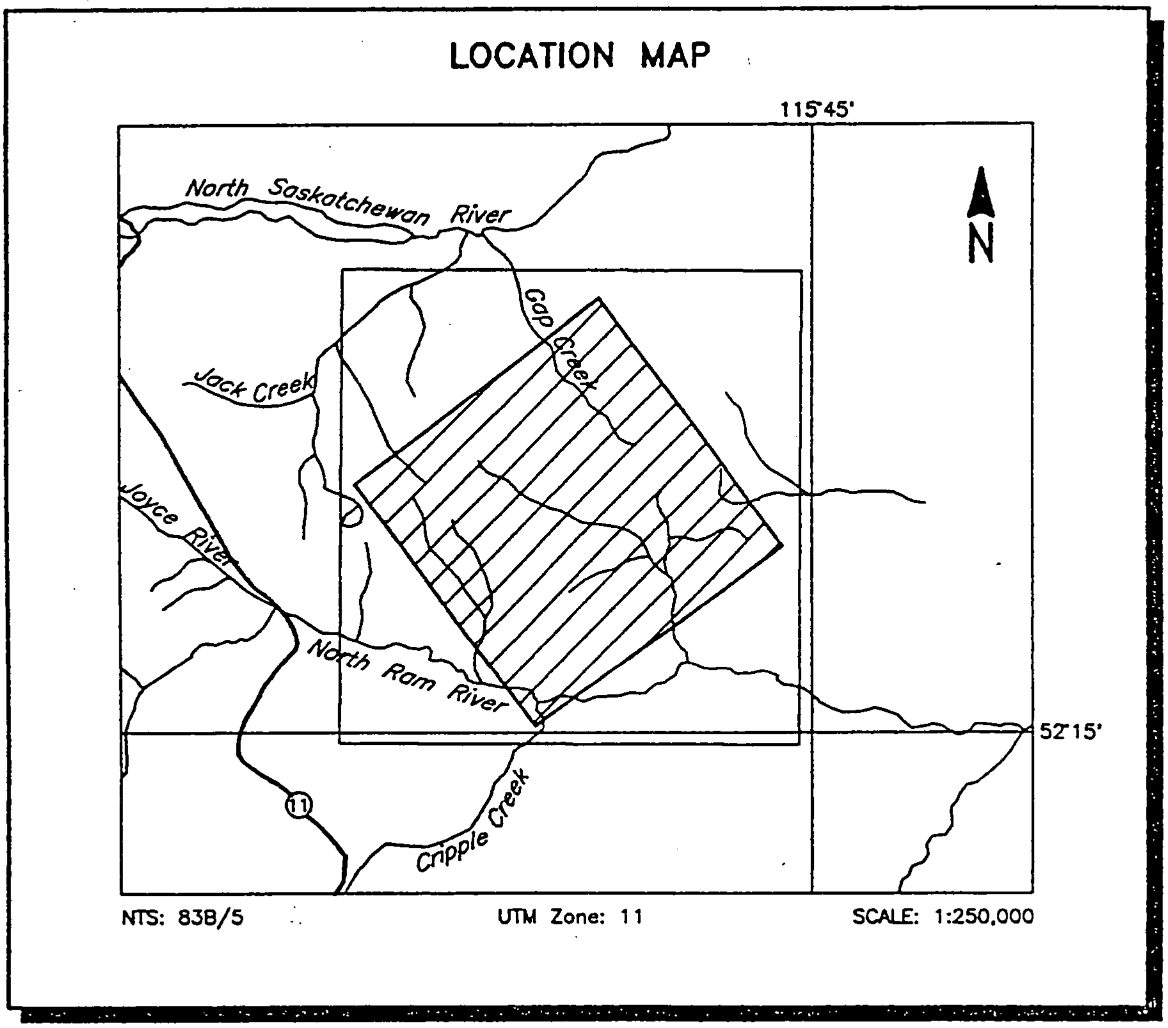


FIGURE 2

TAKLA STAR RESOURCES LTD.

BRAZEAU RANGE EAST - 1178

CONTENTS

INTRODUCTION

A DIGHEM magnetic/VLF survey was flown for Takla Star Resources Ltd. from May 4 to May 6, 1994, over the Front Range West and Brazeau Range East survey blocks located near Ram River, Alberta. The survey areas can be located on NTS map sheets 83 B/5, 83 C/1 and C/8 (see Figures 1 and 2).

Survey coverage consisted of approximately 821 line-km, including tie lines for the Front Range West block. Flight lines were flown in an azimuthal direction of 43° with a line separation of 150 metres.

Survey coverage consisted of approximately 687 line-km, including tie lines for the Brazeau Range East block. Flight lines were flown in an azimuthal direction of 57° with a line separation of 150 metres.

The survey employed a cesium magnetometer, radar altimeter, video camera, analog and digital recorders, a VLF receiver and an electronic navigation system. Details on the survey equipment are given in Section 2. Section 2 also provides details on the data channels, their respective sensitivities, and the navigation/flight path recovery procedure.

The instrumentation was installed in a Bell 206BIII Jet Ranger helicopter (Registration C-FFUJ) which was provided by National Helicopters Ltd. The helicopter flew at an average airspeed of 119 km/h with an magnetometer bird height of approximately 45 m.

SURVEY EQUIPMENT

This section provides a brief description of the geophysical instruments used to acquire the survey data:

Magnetometer

Model:	Picodas 3340
Type:	Optically pumped Cesium vapour
Sensitivity:	0.01 nT
Sample rate:	10 per second

The magnetometer sensor is towed in a bird 20 m below the helicopter.

Magnetic Base Station

Model:	Geometrics G826
Type:	Digital recording proton precession
Sensitivity:	0.10 nT
Sample rate:	0.2 per second

A digital recorder is operated in conjunction with the base station magnetometer to record the diurnal variations of the earth's magnetic field. The clock of the base station is synchronized with that of the airborne system to permit subsequent removal of diurnal drift.

VLF System

Manufacturer:	Herz Industries Ltd.	
Type:	Totem-2A	
Sensitivity:	0.1%	
Stations:	Seattle, Washington; Cutler, Maine;	NLK, 24.8 kHz NAA, 24.0 kHz

The VLF receiver measures the total field and vertical quadrature components of the secondary VLF field. Signals from two separate transmitters can be measured simultaneously. The VLF sensor is housed in the same bird as the magnetic sensor, and is towed 20 m below the helicopter.

Radar Altimeter

Manufacturer:	Honeywell/Sperry
Type:	AA 220
Sensitivity:	1 ft

The radar altimeter measures the vertical distance between the helicopter and the ground.

Analog Recorder

Manufacturer:	RMS Instruments
Type:	DGR33 dot-matrix graphics recorder
Resolution:	4x4 dots/mm
Speed:	1.5 mm/sec

The analog profiles are recorded on chart paper in the aircraft during the survey. Table 2-1 lists the geophysical data channels and the vertical scale of each profile.

Table 2-1. The Analog Profiles

Channel Name	Parameter	Scale units/mm
ALTR	altimeter	3 m
CMGC	magnetics, coarse	20 nT
CMGF	magnetics, fine	2.0 nT
VF1T	VLF-total: primary stn.	2%
VF1Q	VLF-quad: primary stn.	2%
VF2T	VLF-total: secondary stn.	2%
VF2Q	VLF-quad: secondary stn.	2%

Digital Data Acquisition System

Manufacturer: Picodas

Type: PDAS 1000

The PDAS 1000 has a built-in hard drive for digital data storage, and two internal magnetometer counters. The data are downloaded from the hard drive to a DC2120 cassette at the end of each flight.

Tracking Camera

Type: Panasonic Video

Model: AG 2400/WVCD132

Fiducial numbers are recorded continuously and are displayed on the margin of each image. This procedure ensures accurate correlation of analog and digital data with respect to visible features on the ground.

Navigation System (RT-DGPS)

Model:	Sercel NR106, Real-time differential positioning
Type:	SPS (L1 band), 10-channel, C/A code, 1575.42 MHz.
Sensitivity:	-132 dBm, 0.5 second update
Accuracy:	< 5 metres in differential mode, ± 50 metres in S/A (non differential) mode

The Global Positioning System (GPS) is a line of sight, satellite navigation system which utilizes time-coded signals from at least four of the twenty-four NAVSTAR satellites. In the differential mode, two GPS receivers are used. The base station unit is used as a reference which transmits real-time corrections to the mobile unit in the aircraft, via a UHF radio datalink. The on-board system calculates the flight path of the helicopter while providing real-time guidance. The raw XYZ data are recorded for both receivers, thereby permitting post-survey processing for accuracies of approximately 2 metres.

Although the base station receiver is able to calculate its own latitude and longitude, a higher degree of accuracy can be obtained if the reference unit is established on a known benchmark or triangulation point. The GPS records data relative to the WGS84 ellipsoid, which is the basis of the revised North American Datum (NAD83). Conversion software is used to transform the WGS84 coordinates to the system displayed on the base maps.

Field Workstation

Manufacturer:	Dighem
Model:	FWS: V2.41
Type:	80386 based P.C.

A portable PC-based field workstation is used at the survey base to verify data quality and completeness. Flight tapes are dumped to a hard drive to permit the creation of a database. This process allows the field operators to display both the positional (flight path) and geophysical data on a screen or printer.

PRODUCTS AND PROCESSING TECHNIQUES

The following products are available from the survey data. Those which are not part of the survey contract may be acquired later. Refer to Table 3-1 for a summary of the maps which accompany this report, some of which may be sent under separate cover. Most parameters can be displayed as contours, profiles, or in colour.

Base Maps

Base maps of the survey area have been produced from published topographic maps. These provide a relatively accurate, distortion-free base which facilitates correlation of the navigation data to the UTM grid. Photomosaics are useful for visual reference and for subsequent flight path recovery, but usually contain scale distortions. Orthophotos are ideal, but their cost and the time required to produce them, usually precludes their use as base maps.

Table 3-1 Plots Available from the Survey

MAP PRODUCT	NO. OF SHEETS	PROFILES ON MAP	CONTOURS		SHADOW MAP
			INK	COLOUR	
Total Field Magnetics	2	-	20,000	20,000	-
Enhanced Magnetics	N/A	-	-	-	-
1st Vertical Derivative Magnetics	2	-	20,000	20,000	-
2nd Vertical Derivative Magnetics	N/A	-	-	-	-
Filtered Total Field VLF	N/A	-	-	-	-
VLF Profiles	N/A	-	-	-	-
Trend Removed Magnetics	2	-	20,000	20,000	-
Multi-channel stacked profiles	Worksheet profiles				-
	Interpreted profiles				-

N/A Not available
- Not required under terms of the survey contract
* Recommended
20,000 Scale of delivered map, i.e, 1:20,000

Notes:

- Inked contour maps are provided on transparent media and show flight lines and suitable registration. Three paper prints of each black and white map and four sets of each colour map are supplied.

Total Field Magnetics

The aeromagnetic data are corrected for diurnal variation using the magnetic base station data. The regional IGRF can be removed from the data, if requested.

Enhanced Magnetics

The total field magnetic data are subjected to a processing algorithm. This algorithm enhances the response of magnetic bodies in the upper 500 m and attenuates the response of deeper bodies. The resulting enhanced magnetic map provides better definition and resolution of near-surface magnetic units. It also identifies weak magnetic features which may not be evident on the total field magnetic map. However, regional magnetic variations, and magnetic lows caused by remanence, are better defined on the total field magnetic map. The technique is described in more detail in Section 5.

Magnetic Derivatives

The total field magnetic data may be subjected to a variety of filtering techniques to yield maps of the following:

first vertical derivative (vertical gradient)

second vertical derivative

magnetic susceptibility with reduction to the pole

upward/downward continuations

All of these filtering techniques improve the recognition of near-surface magnetic bodies, with the exception of upward continuation. Any of these parameters can be produced on request. Dighem's proprietary enhanced magnetic technique is designed to provide a general "all-purpose" map, combining the more useful features of the above parameters.

VLF

The VLF data are digitally filtered to remove long wavelengths such as those caused by variations in the transmitted field strength.

Contour, Colour and Shadow Map Displays

The geophysical data are interpolated onto a regular grid using a modified Akima spline technique. The resulting grid is suitable for generating contour maps of excellent quality.

Colour maps are produced by interpolating the grid down to the pixel size. The parameter is then incremented with respect to specific amplitude ranges to provide colour "contour" maps. Colour maps of the total magnetic field are particularly useful in defining the lithology of the survey area.

Monochromatic shadow maps are generated by employing an artificial sun to cast shadows on a surface defined by the geophysical grid. There are many variations in the shadowing technique. These techniques may be applied to total field or enhanced magnetic data, magnetic derivatives, VLF, resistivity, etc. Of the various magnetic products, the shadow of the enhanced magnetic parameter is particularly suited for defining geological structures with crisper images and improved resolution.

SURVEY RESULTS

GENERAL DISCUSSION

The survey results are presented on 2 separate map sheets for each parameter at a scale of 1:20,000.

Magnetics

A proton precession magnetometer was operated at the survey base to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to permit subsequent removal of diurnal drift.

The background magnetic level has been adjusted to match the International Geomagnetic Reference Field (IGRF) for each survey area. The IGRF gradient across each survey block is left intact.

The total field magnetic data have been presented as contours on the base maps using a contour interval of 2 nT where gradients permit. The maps show the magnetic properties of the rock units underlying the survey areas.

The total field magnetic data have been subjected to a processing algorithm to produce calculated vertical gradient magnetic maps. This procedure enhances near-surface magnetic units and suppresses regional gradients. It also provides better definition and resolution of magnetic units and displays weak magnetic features which may not be clearly evident on the total field maps. Maps of the second vertical magnetic derivative were evaluated and found not informative. Background trend removed maps were produced instead.

The trend removed maps had a second order polynomial surface, which approximated a large regional gradient, removed. This improved the recognition of subtle features in the contours, which may be indicative of pipe-like sources, or confirmed that some features were due to structural or stratabound sources.

VLF

VLF results were obtained from the transmitting stations at Cutler, Maine (NAA - 24.0 kHz) and Seattle, Washington (NLK - 24.8 kHz). VLF maps were not produced as the VLF is not considered as useful as the magnetics in detecting lamproitic pipes in this area.

The VLF method is quite sensitive to the angle of coupling between the conductor and the propagated EM field. Consequently, conductors which strike towards the VLF station will usually yield a stronger response than conductors which are nearly orthogonal to it.

The VLF parameter does not normally provide the same degree of resolution available from EM data. Closely-spaced conductors, conductors of short strike length or conductors which are poorly coupled to the VLF field, may escape detection with this method. Erratic signals from the VLF transmitters can also give rise to strong, isolated anomalies which should be viewed with caution.

Brazeau Range East

The trend removed total field magnetics appears to be the most useful parameter for examining the subtle magnetic responses in the area. However, contouring at 0.5 nT also brings out the noise.

A steep ridge in the southwest portion of the survey area caused significant flying height variations based on line direction. This resulted in a series of alternating, 1.5 nT, highs and lows, which are particularly evident between lines 20170 and 20400.

The target is lamproites, which are expected to yield isolated magnetic highs or lows, which can be quite subtle. Lamproites have magnetic susceptibilities that average 600 10^{-6}emu. Airborne anomalies in the range of 50 nT or less would not be uncommon.

It is possible that any of the many small, isolated magnetic highs and lows which appear on the maps may reflect lamproitic diatremes even though they are within the noise levels in terms of amplitude. However, it is necessary to narrow these down to a manageable number of targets by correlation with geochemical data.

Front Range West

The Front Range West area is somewhat more active magnetically than the Brazeau Range East area.

An annular feature in the contours, that is centred at line 10240, fiducial 6580 may be of interest if there is supporting geochemical evidence. Numerous other annular features and weak, isolated magnetic highs and lows can be inferred from the contour patterns, but the interpretation is highly subjective.

A small isolated magnetic high, centred at line 10740, fiducial 1688 is thought to be culture as it is situated near a road.

The strongest, isolated anomaly on the map, situated at line 10760 fiducial 670 would be a high priority target, but may be due to culture. An on site check for man-made metallic objects may be warranted (unfortunately the flight path video was malfunctioning during the flying of this line, and could not be used as a quick check).

BACKGROUND INFORMATION

This section provides background information on parameters which are available from the survey data. Those which have not been supplied as survey products may be generated later from raw data on the digital archive tape.

MAGNETICS

The magnetometer data are digitally recorded in the aircraft to an accuracy of 0.01 nT for cesium magnetometers. The digital tape is processed by computer to yield a total field magnetic contour map. When warranted, the magnetic data may also be treated mathematically to enhance the magnetic response of the near-surface geology, and an enhanced magnetic contour map is then produced. The response of the enhancement operator in the frequency domain is illustrated in Figure 5-1. This figure shows that the passband components of the airborne data are amplified 20 times by the enhancement operator. This means, for example, that a 100 nT anomaly on the enhanced map reflects a 5 nT anomaly for the passband components of the airborne data.

The enhanced map, which bears a resemblance to a downward continuation map, is produced by the digital bandpass filtering of the total field data. The enhancement is equivalent to continuing the field downward to a level (above the source) which is 1/20th of the actual sensor-source distance.

Because the enhanced magnetic map bears a resemblance to a ground magnetic map, it simplifies the recognition of trends in the rock strata and the interpretation of geological structure. It defines the near-surface local geology while de-emphasizing deep-seated regional features. It primarily has application when the magnetic rock units are steeply dipping and the earth's field dips in excess of 60 degrees.

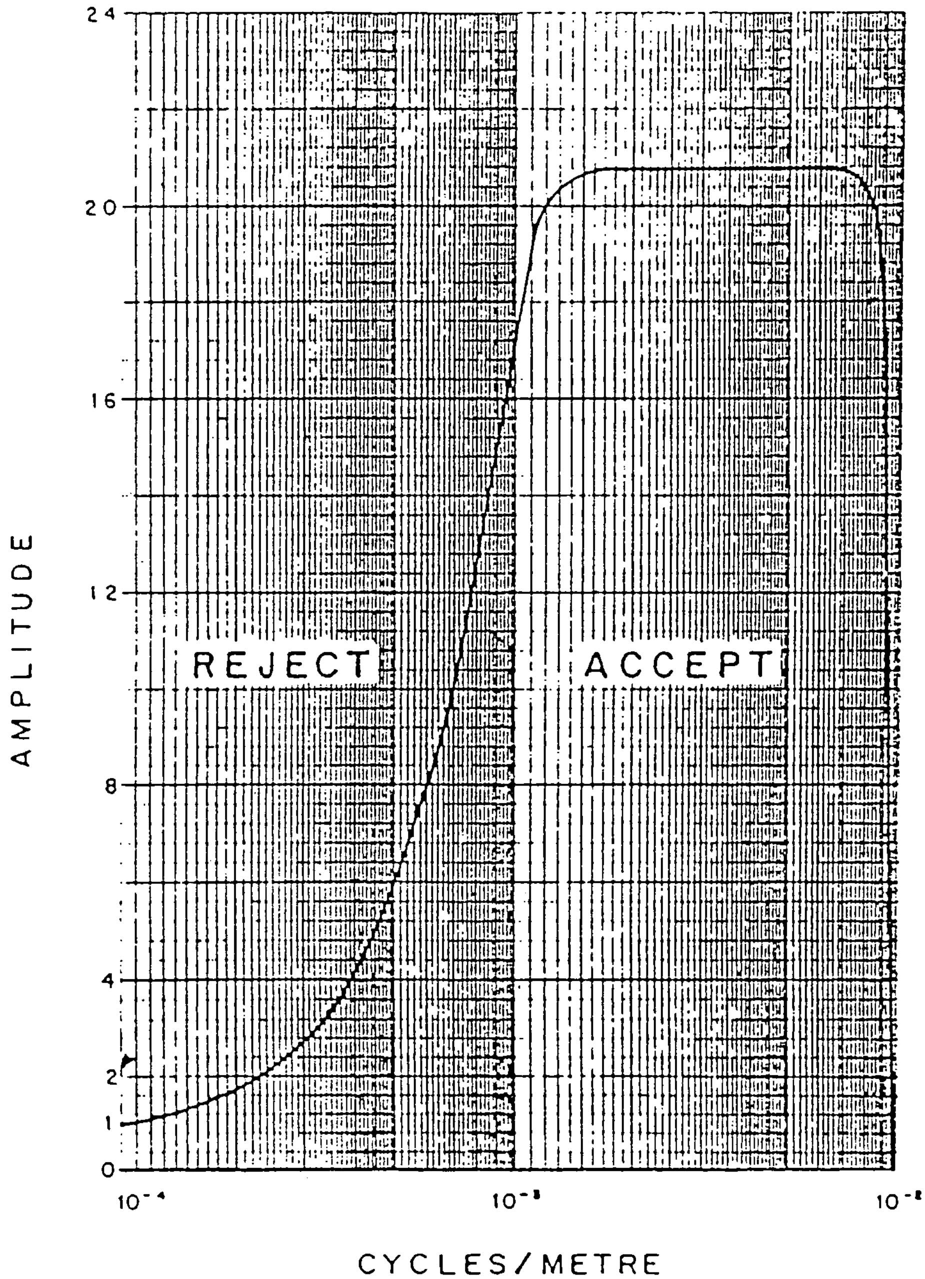


Fig. 5-1 Frequency response of magnetic enhancement operator.

Any of a number of filter operators may be applied to the magnetic data, to yield vertical derivatives, continuations, magnetic susceptibility, etc. These may be displayed in contour, colour or shadow.

VLF

VLF transmitters produce high frequency uniform electromagnetic fields. However, VLF anomalies are not EM anomalies in the conventional sense. EM anomalies primarily reflect eddy currents flowing in conductors which have been energized inductively by the primary field. In contrast, VLF anomalies primarily reflect current gathering, which is a non-inductive phenomenon. The primary field sets up currents which flow weakly in rock and overburden, and these tend to collect in low resistivity zones. Such zones may be due to massive sulfides, shears, river valleys and even unconformities.

The VLF field is horizontal. Because of this, the method is quite sensitive to the angle of coupling between the conductor and the transmitted VLF field. Conductors which strike towards the VLF station will usually yield a stronger response than conductors which are nearly orthogonal to it.

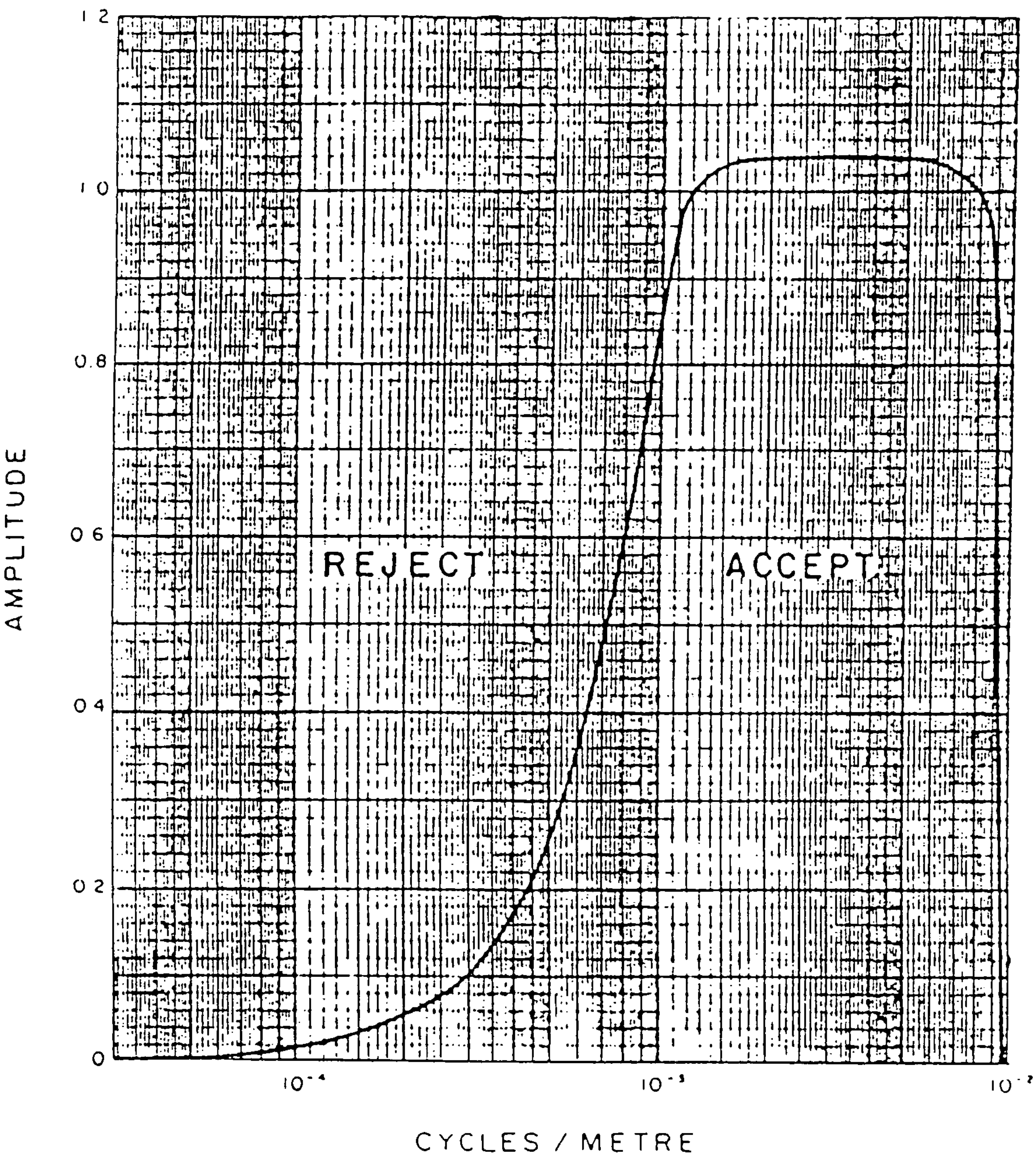


Fig. 5- 2 Frequency response of VLF operator.

The Herz Industries Ltd. Totem VLF-electromagnetometer measures the total field and vertical quadrature components. Both of these components are digitally recorded in the aircraft with a sensitivity of 0.1 percent. The total field yields peaks over VLF current concentrations whereas the quadrature component tends to yield crossovers. Both appear as traces on the profile records. The total field data are filtered digitally and displayed as contours to facilitate the recognition of trends in the rock strata and the interpretation of geologic structure.

The response of the VLF total field filter operator in the frequency domain (Figure 5-2) is basically similar to that used to produce the enhanced magnetic map (Figure 5-1). The two filters are identical along the abscissa but different along the ordinant. The VLF filter removes long wavelengths such as those which reflect regional and wave transmission variations. The filter sharpens short wavelength responses such as those which reflect local geological variations.

CONCLUSIONS AND RECOMMENDATIONS

There are magnetic anomalies in the survey areas which could be indicative of lamproitic diatremes. Follow up would be recommended if there is supporting geochemical evidence. The various maps included with this report display the magnetic properties of the survey area. It is recommended that the survey results be reviewed in detail, in conjunction with all available geophysical, geological and geochemical information.

It is also recommended that image processing of existing geophysical data be considered, in order to extract the maximum amount of information from the survey results. Current software and imaging techniques often provide valuable information on structure and lithology, which may not be clearly evident on the contour and colour maps. These techniques can yield images which define subtle, but significant, structural details.

Respectfully submitted,

DIGHEM

[redacted]

Douglas L. McConnell, P.Eng.
Geophysicist

APPENDIX A

LIST OF PERSONNEL

The following personnel were involved in the acquisition, processing, interpretation and presentation of data, relating to a DIGHEM airborne geophysical survey carried out for Takla Star Resources Ltd., near Ram River, Alberta.

Dave Hayward	Senior Geophysical Operator
Ken H. Jones	Pilot (National Helicopters Ltd.)
Gordon Smith	Data Processing Supervisor
Doug McConnell	Interpretation Geophysicist
Lyn Vanderstarren	Drafting Supervisor
Susan Pothiah	Word Processing Operator
Albina Tonello	Secretary/Expeditor

The survey consisted of 1508 km of coverage, flown from May 4 to May 6, 1994.

All personnel are employees of Dighem, A Division of CGG Canada LTD., except for the pilot who is an employee of National Helicopters Ltd.

DIGHEM

[redacted]

Douglas L. McConnell, P.Eng.
Geophysicist

APPENDIX B

STATEMENT OF COST

Date: June 27, 1994

IN ACCOUNT WITH
DIGHEM, A DIVISION OF CGG CANADA LTD.

To: Dighem flying of Agreement dated April 8, 1994, pertaining to an Airborne Geophysical Survey in the Ram River area, Alberta.

Survey Charges

1470 km of flying @ $42.00/km	$ 61,740.00

Allocation of Costs

- Data Acquisition	(60%)
- Data Processing	(20%)
- Interpretation, Report and Maps	(20%)

DIGHEM

[redacted]

Douglas L. McConnell, P.Eng.
Geophysicist

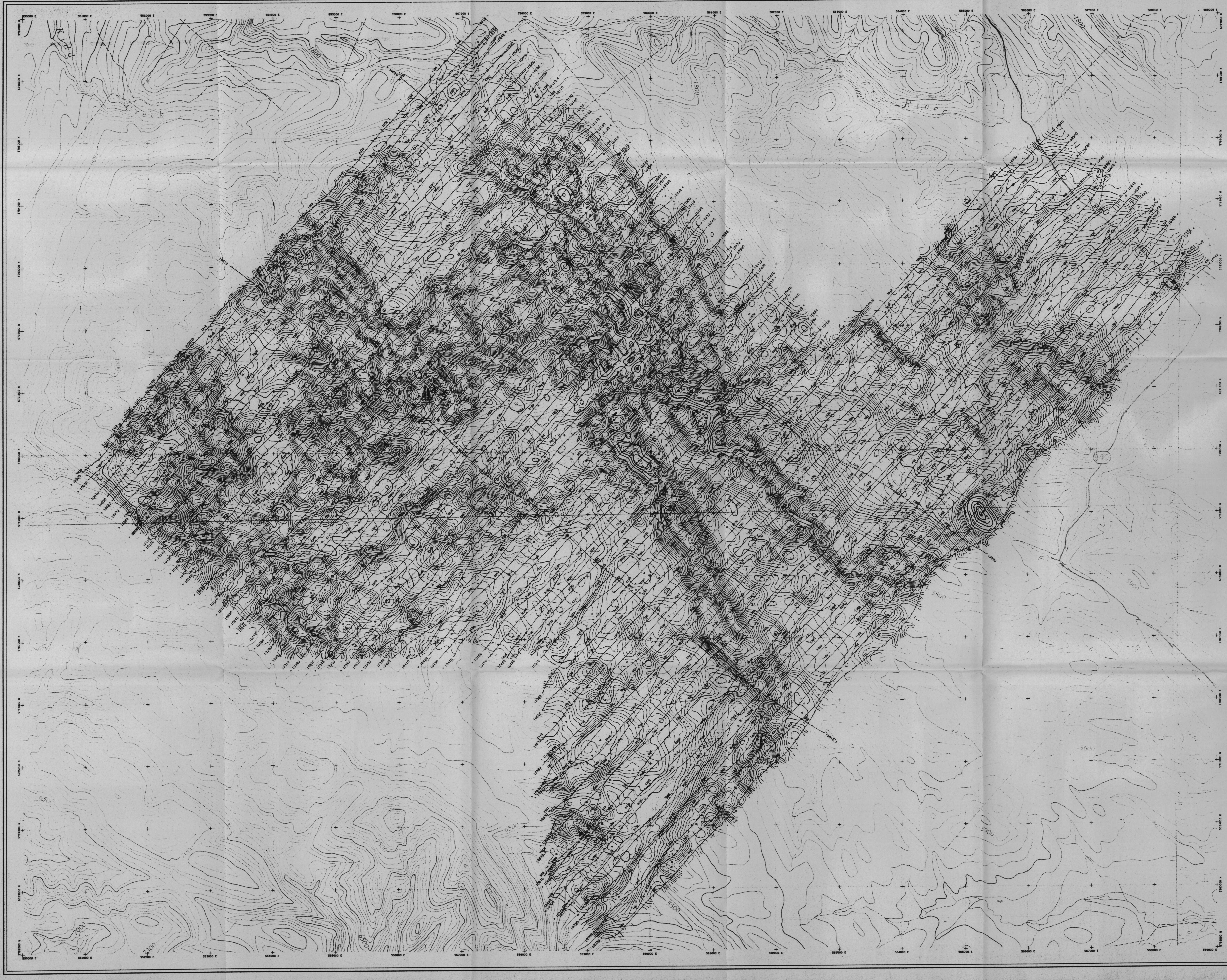
Appendix IV

Geochemical Graphs of Chromites
for the
Kiska, Nice, Cripple and Pinto Creek Areas
(NR Series)

TAKLA STAR RESOURCES LTD.
STATEMENT OF EXPENDITURES
DECEMBER 31, 1994
RAM RIVER BLOCK

	RAM RIVER
GEOPHYSICAL SURVEY COSTS	
FIELD STAFF EXPENSES	
ACCOUNTING FEES	
SUPPLIES	5.10
COMMUNICATIONS	79.30
DELIVERY AND FREIGHT	
TRAVEL AND ACCOMODATION	
AUTOMOTIVE EXPENSE	10.28
CONSULTING FEES	
GEOPHYSICAL CONTRACTS	61,740.00
EQUIPMENT EXPENSE	
EQUIPMENT RENTAL	
MEALS/ENTERTAINMENT/SUSTENANCE	
REFERENCE MATERIALS	256.43
ASSAYING	
FIELD STAFF WAGES	3,906.89
MANAGEMENT SALARIES	
SUBTOTAL	65,998.00
OVERHEAD COMPONENT - 15%	9,899.70
TOTAL GEOPHYSICAL SURVEY COSTS	**75,897.70**
GEOCHEMICAL SURVEY COSTS	
FIELD STAFF EXPENSES	3,007.00
ACCOUNTING FEES	240.00
SUPPLIES	376.69
COMMUNICATIONS	95.00
DELIVERY AND FREIGHT	17.70
TRAVEL AND ACCOMODATION	2,026.88
AUTOMOTIVE EXPENSE	1,871.84
CONSULTING FEES	0.00
GEOPHYSICAL CONTRACTS	0.00
EQUIPMENT EXPENSE	1,871.08
EQUIPMENT RENTAL	125.00
MEALS/ENTERTAINMENT/SUSTENANCE	1,268.01
REFERENCE MATERIALS	34.15
ASSAYING	26,360.50
FIELD STAFF WAGES	38,470.72
MANAGEMENT SALARIES	2,864.00
	78,628.57
OVERHEAD COMPONENT - 15%	11,794.29
TOTAL GEOCHEMICAL SURVEY COSTS	**90,422.86**
GRAND TOTALS	**166,320.56**

Compiled by L.R. Abrams, CMA



TECHNICAL SUMMARY

Navigation	Sercel real time differential GPS positioning
Data reduction grid interval	40 metres
Terrain clearance	Helicopter 60 m
	Magnetometer. VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%

FLIGHT LINES

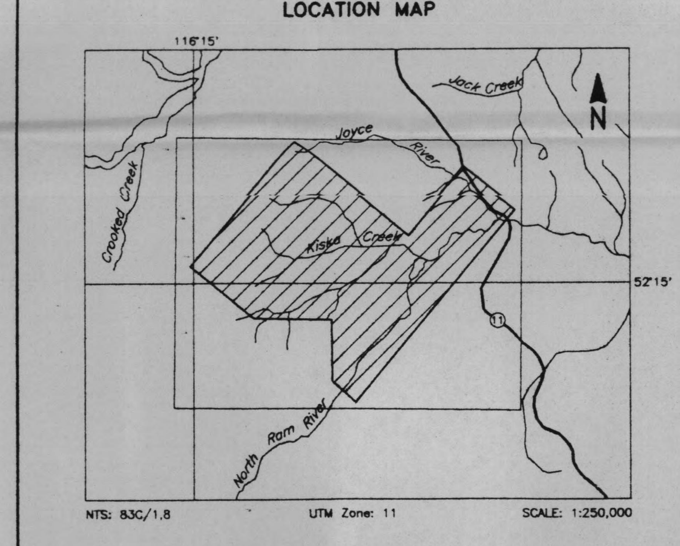
13010
13020
Flight direction
Flight line number
11020
Reflight Number
Line Number
Area Number
250
Fiducials identified on profiles

TOTAL FIELD MAGNETIC CONTOURS

25 nT
5 nT
1 nT
.5 nT
magnetic low

Magnetic inclination within the survey area: 74 degrees

LOCATION MAP



NTS: 83C/1,8 — UTM Zone: 11 — SCALE: 1:250,000

TAKLA STAR RESOURCES LTD.
FRONT RANGE WEST

TOTAL FIELD MAGNETICS
Trend Removed

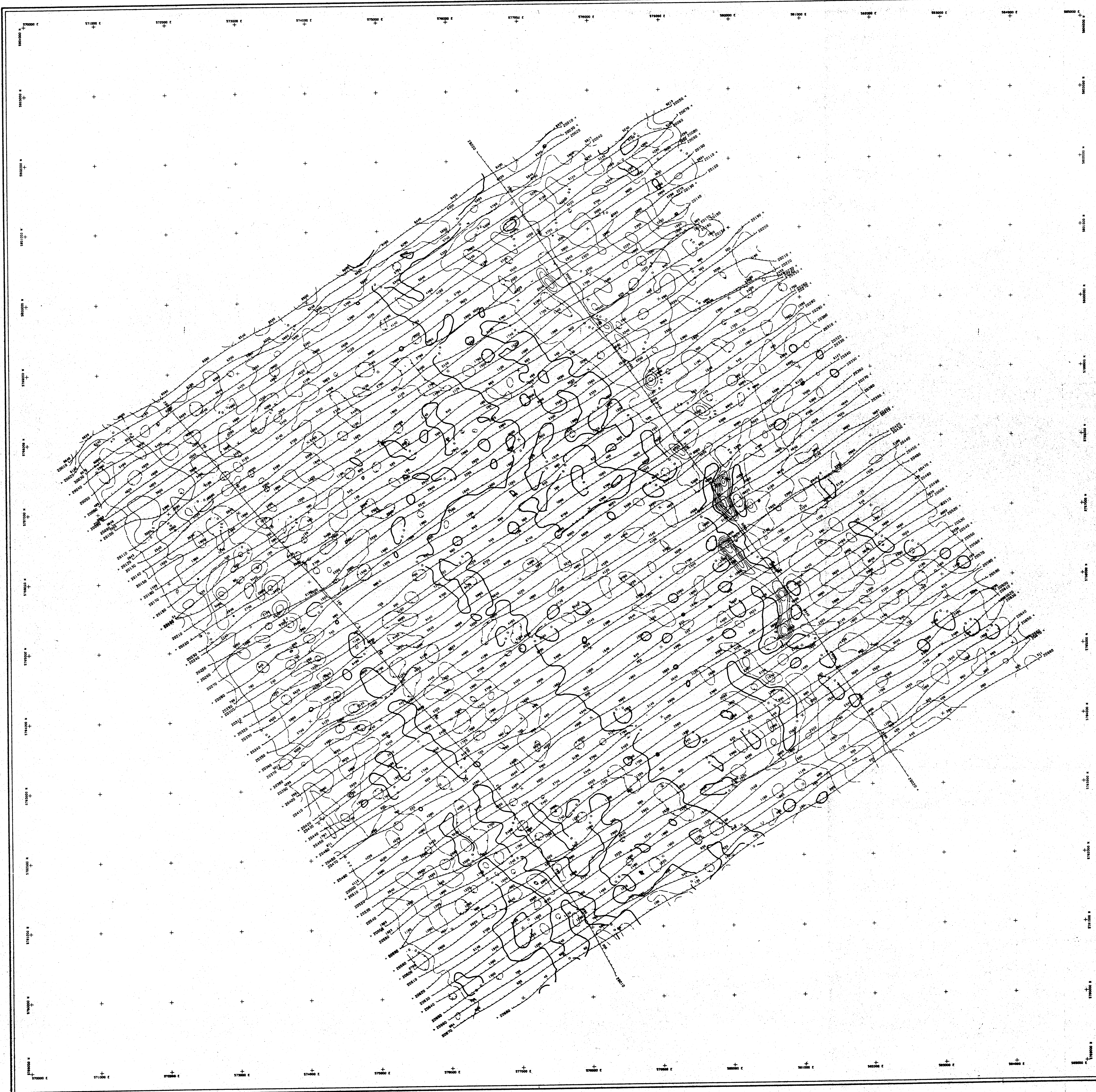
DIGHEM[V] SURVEY	NTS: 83C/1,8	GEOPHYSICIST: D.m.
DATE: MAY, 1994	JOB: 1178	SHEET: 1

DIGHEM, A division of CGG Canada Ltd.

0 — 1 — 2 Km
Scale 1:20 000

DIGHEM
Quality and Service in Airborne Geophysics

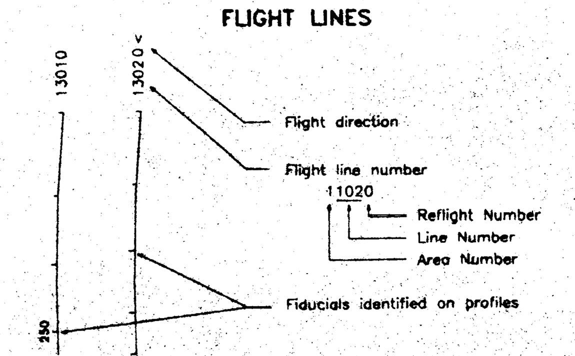

RANGE
North Ram River
TECHNICAL SUMMARY
Navigation . . . . Sercel real time differential GPS positioning
Data reduction grid interval . . . . 50 metres
Terrain clearance . . . . Helicopter 60 m
Electromagnetic sensor 30 m
Magnetometer. VLF receiver 40 m
Data sampling interval . . . . 0.1 second
Magnetometer / sensitivity . . . . . Scintrex cesium / 0.01 nT
VLF receiver / sensitivity . . . . . Herz 2A / 1%
Electromagnetic system . . . . . . DIGHEM
FLIGHT LINES
13010
13020
Flight direction
Flight line number
11020
Reflight Number
Line Number
Area Number
Fiducials identified on profiles
250
TOTAL FIELD MAGNETIC CONTOURS
. . . . 100 nT
. . . . 20 nT
. . . . 4 nT
. . . . 2 nT
. . . . magnetic low
Magnetic inclination within the survey area: 74 degrees
LOCATION MAP
North Saskatchewan River
North Ram River
Cripple Creek
NTS: 83B/5
UTM Zone: 11
SCALE: 1:250,000
TAKLA STAR RESOURCES LTD.
BRAZEAU RANGE EAST
TOTAL FIELD MAGNETICS
DIGHEM SURVEY
NTS: 83B/5
GEOPHYSICIST: O.M.
DATE: MAY, 1994
JOB: 1178
SHEET: 1
DIGHEM, A division of CGG Canada Ltd.
0
1
2 Km
Scale 1:20 000
DIGHEM
Quality and Service in Airborne Geophysics



TECHNICAL SUMMARY

Navigation	Sercel real time differential GPS positioning
Data reduction grid interval	50 metres
Terrain clearance	Helicopter 60 m Electromagnetic sensor 30 m Magnetometer. VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%
Electromagnetic system	DIGHEM*

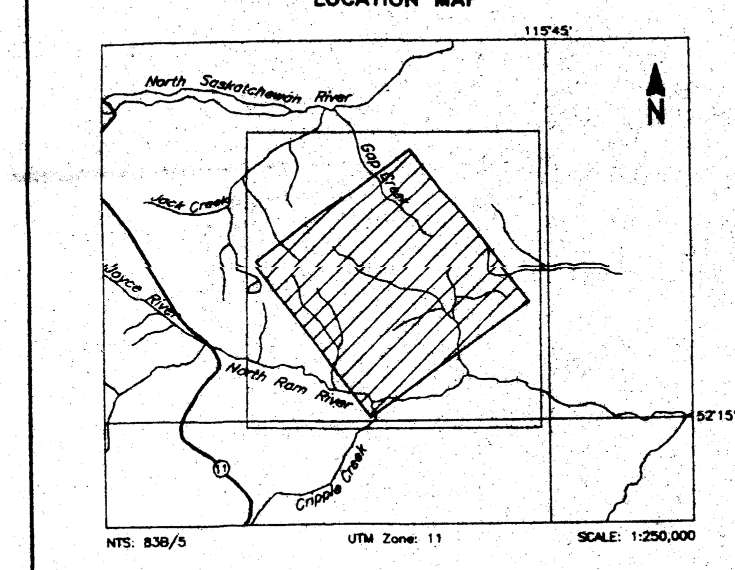
FLIGHT LINES



CALCULATED VERTICAL GRADIENT CONTOURS

- 0.5 nT/metre
- 0.1 nT/metre
- 0.02 nT/metre
- 0.01 nT/metre

LOCATION MAP



TAKLA STAR RESOURCES LTD.
BRAZEAU RANGE EAST

CALCULATED VERTICAL GRADIENT MAGNETICS

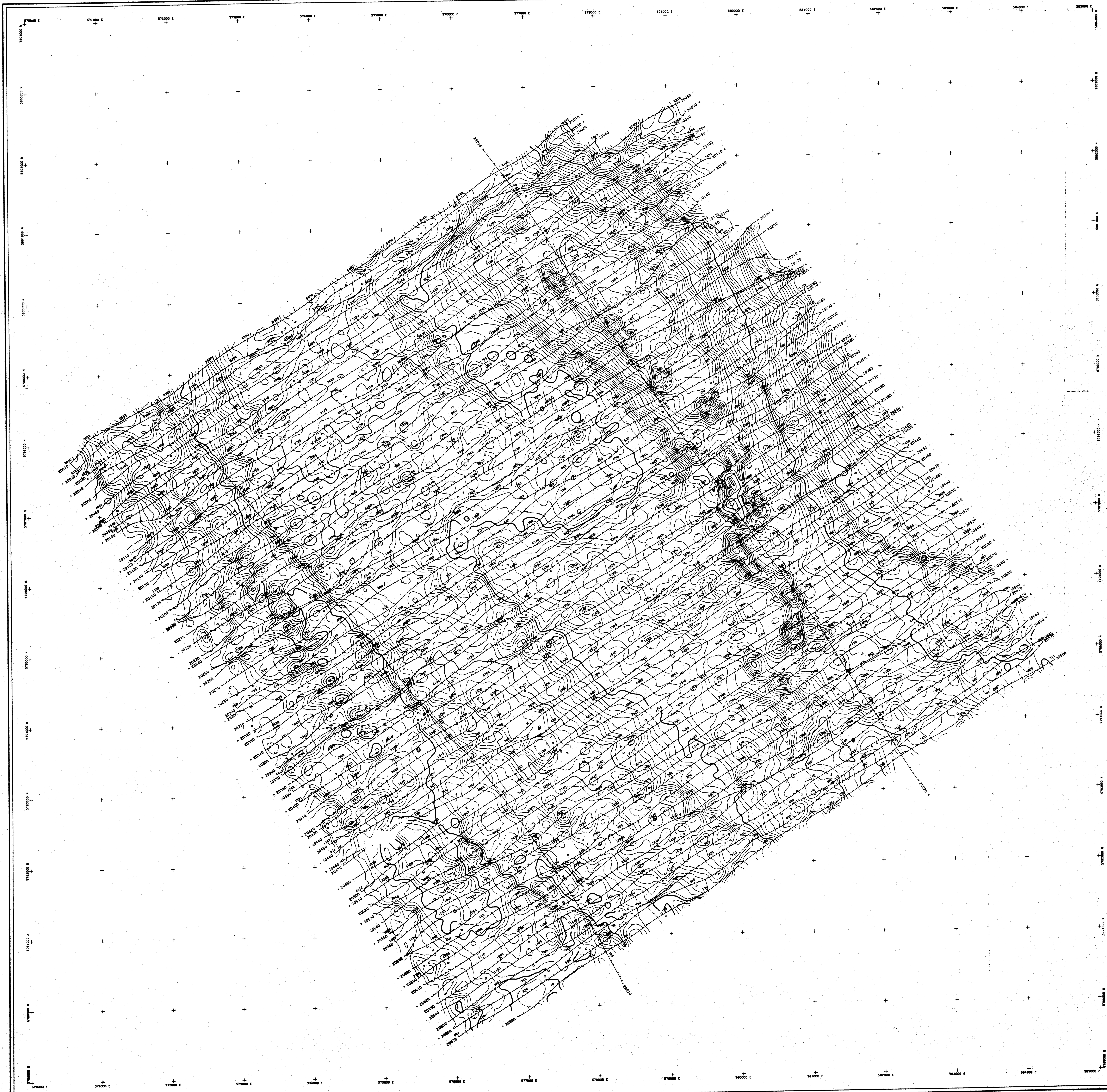
DIGHEM* SURVEY	NTS: 83B/5	GEOPHYSICIST: D.W.J.
DATE: MAY, 1994	JOB: 1178	SHEET: 1

DIGHEM, A division of CGG Canada Ltd.

0 — 1 — 2 Km

Scale 1:20 000

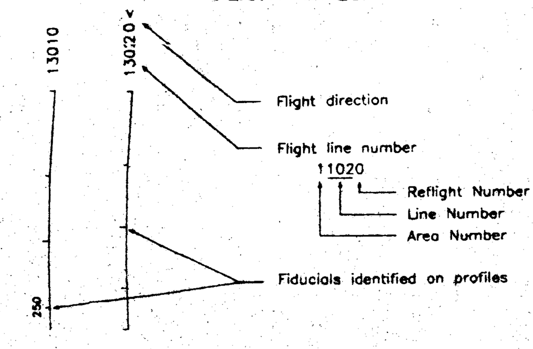
DIGHEM
Quality and Service in Airborne Geophysics



TECHNICAL SUMMARY

Navigation . . . . Sercel real time differential GPS positioning
Data reduction grid interval . . . . 50 metres
Terrain clearance . . . . Helicopter 60 m
Electromagnetic sensor 30 m
Magnetometer, VLF receiver 40 m
Data sampling interval . . . . 0.1 second
Magnetometer / sensitivity . . . . . Scintrex cesium / 0.01 nT
VLF receiver / sensitivity . . . . . Herz 2A / 1%
Electromagnetic system . . . . . . DIGHEM[V]

FLIGHT LINES

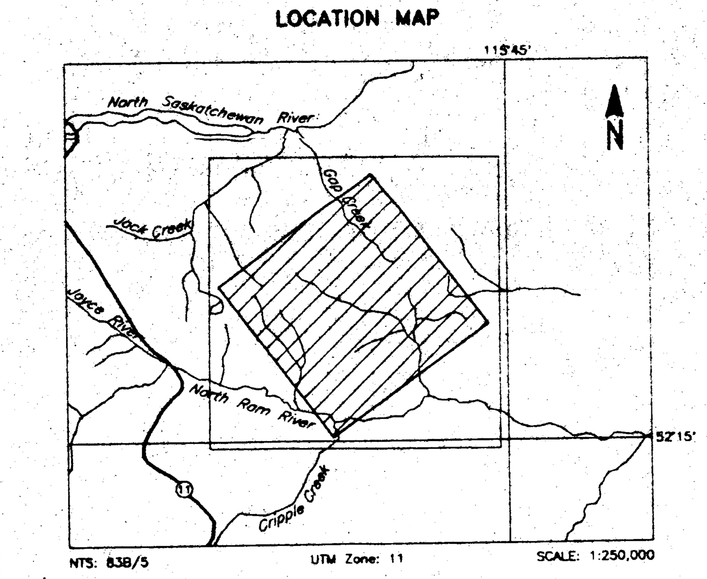


TOTAL FIELD MAGNETIC CONTOURS

———— . . . . 25 nT
———— . . . . 5 nT
———— . . . . 1 nT
— — — — . . . . 0.5 nT
(ellipse) . . . . magnetic low

Magnetic inclination within the survey area: 74 degrees

LOCATION MAP



NTS: 83B/5 UTM Zone: 11 SCALE: 1:250,000

TAKLA STAR RESOURCES LTD.
BRAZEAU RANGE EAST

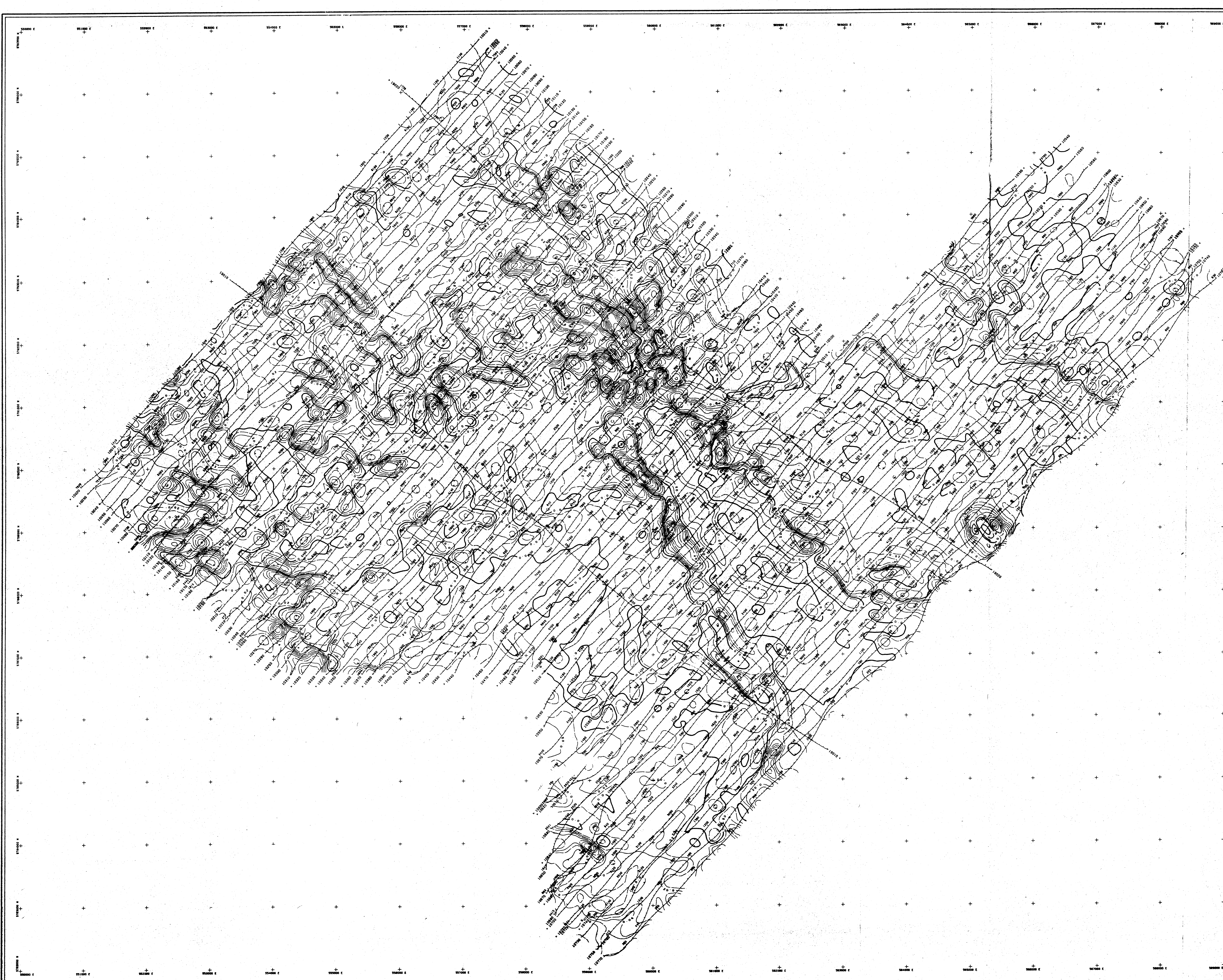
TOTAL FIELD MAGNETICS
Trend Removed

DIGHEM[V] SURVEY	NTS: 83B/5	GEOPHYSICIST: [illegible]
DATE: MAY, 1994	JOB: 1178	SHEET: 1

DIGHEM, A division of CGG Canada Ltd.

0 1 2 Km
Scale 1:20 000

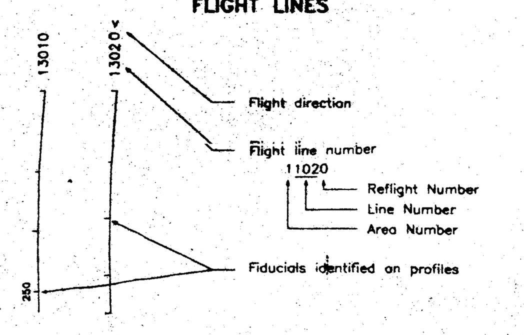
DIGHEM
Quality and Service in Airborne Geophysics



TECHNICAL SUMMARY

Navigation	Sercel real time differential GPS positioning
Data reduction grid interval	40 metres
Terrain clearance	Helicopter 60 m Magnetometer. VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%

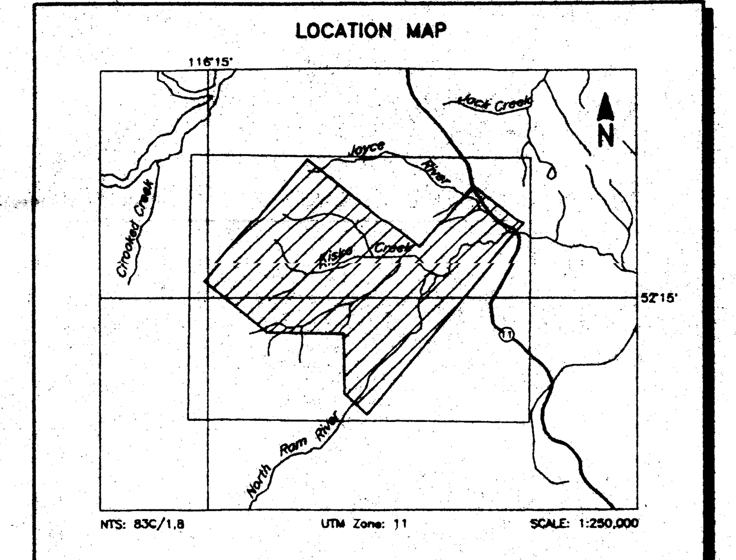
FLIGHT LINES



CALCULATED VERTICAL GRADIENT CONTOURS

- 0.5 nT/metre
- 0.1 nT/metre
- 0.02 nT/metre
- 0.01 nT/metre

LOCATION MAP



TAKLA STAR RESOURCES LTD.

FRONT RANGE WEST

CALCULATED VERTICAL GRADIENT MAGNETICS

DIGHEM[v] SURVEY	NTS: 83C/1,8	GEOPHYSICIST: D.M.
DATE: MAY, 1994	JOB: 1178	SHEET: 1

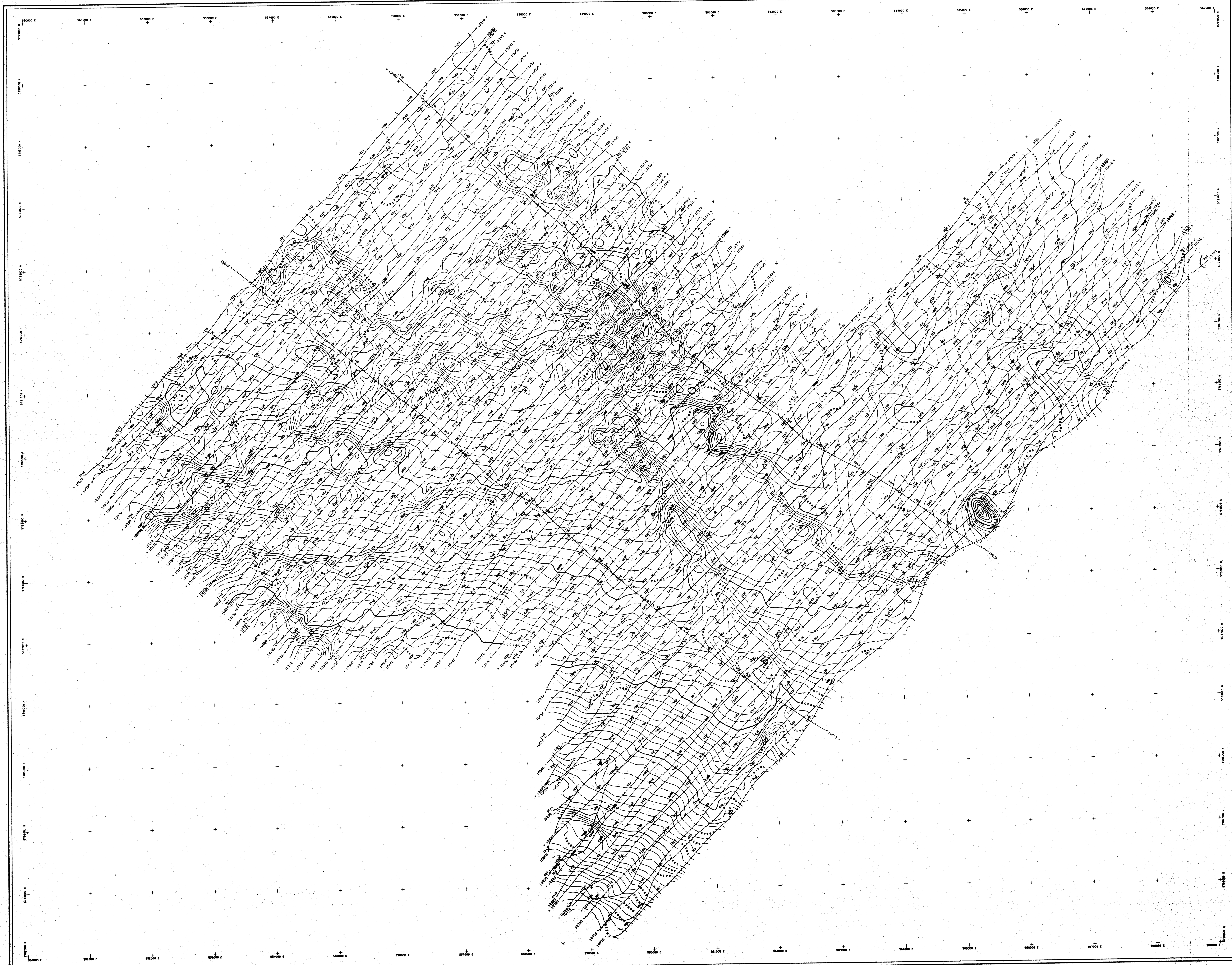
DIGHEM, A division of CGG Canada Ltd.

0 1 2 Km

Scale 1:20 000

DIGHEM

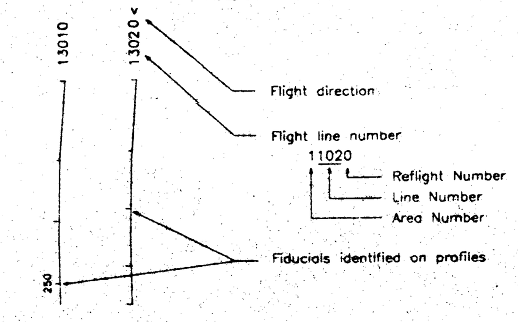
Quality and Service in Airborne Geophysics



TECHNICAL SUMMARY

Navigation	Sercel real time differential GPS positioning
Data reduction grid interval	40 metres
Terrain clearance	Helicopter 60 m
	Magnetometer, VLF receiver 40 m
Data sampling interval	0.1 second
Magnetometer / sensitivity	Scintrex cesium / 0.01 nT
VLF receiver / sensitivity	Herz 2A / 1%

FLIGHT LINES

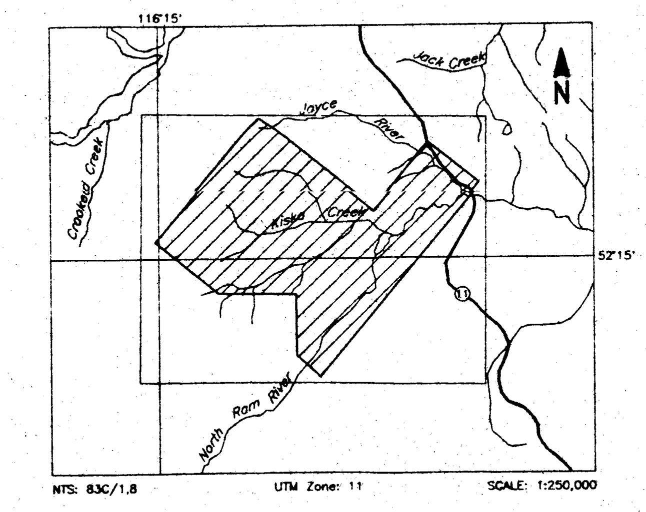


TOTAL FIELD MAGNETIC CONTOURS

(heavy line)	100 nT
(medium line)	20 nT
(light line)	4 nT
(dashed line)	2 nT
(ellipse)	magnetic low

Magnetic inclination within the survey area: 74 degrees

LOCATION MAP



NTS: 83C/1,8 UTM Zone: 11 SCALE: 1:250,000

TAKLA STAR RESOURCES LTD.
FRONT RANGE WEST

TOTAL FIELD MAGNETICS

DIGHEM* SURVEY	NTS: 83C/1,8	GEOPHYSICIST: D.M.
DATE: MAY, 1994	JOB: 1178	SHEET: 1

DIGHEM, A division of CGG Canada Ltd.

0 1 2 Km
Scale 1:20 000

DIGHEM
Quality and Service in Airborne Geophysics