

GEOLOGICAL REPORT
CRO 1-5 and 7 QUARTZ CLAIMS
MAP SHEET 105C-5
60°27'N; 133°41'W



JAMES S. DODGE, P.ENG.
26 July-21 August, 1987

09 17 40

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INTRODUCTION

This assessment report describes the collection and interpretation of geological data on the six CRO quartz claims, CRO 1-5 and 7, during six days of field work and one full day of report preparation between 26 July and 21 August, 1987.

CLAIM OWNERSHIP

<u>Claim Name</u>	<u>Grant Number</u>	<u>Located By</u>	<u>Anniversary Date</u>
CRO 1	YA 95998	James S. Dodge	22 August, 1987
CRO 2	YA 95999	James S. Dodge	22 August, 1987
CRO 3	YA 96000	James S. Dodge	22 August, 1987
CRO 4	YA 96001	James S. Dodge	22 August, 1987
CRO 5	YA 96399	James S. Dodge	14 October, 1987
CRO 7	YA 96401	James S. Dodge	14 October, 1987

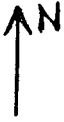
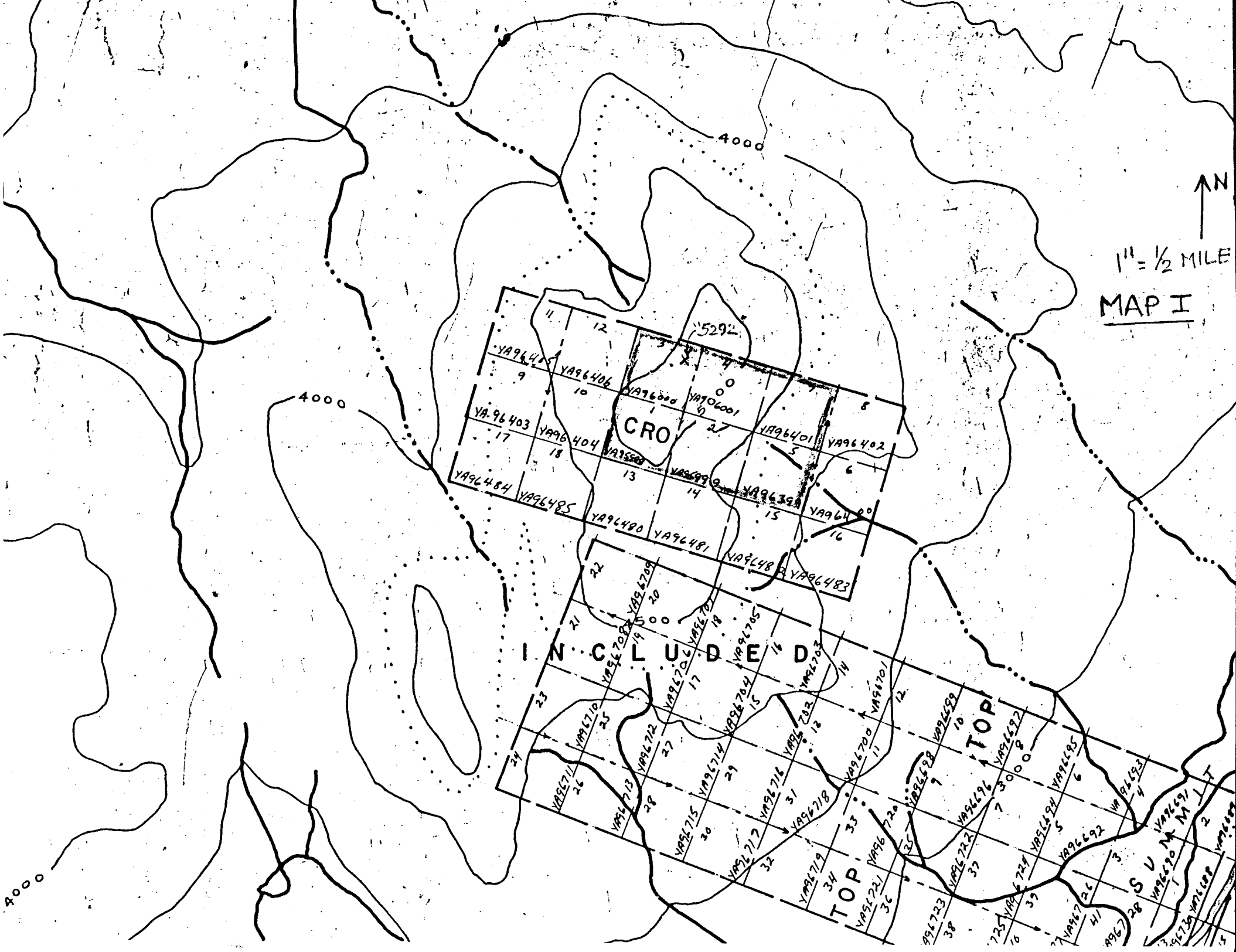
A 100% interest in each of the four CRO 1-4 claims and in each of the two CRO 5 and 7 claims, on 22 August and 14 October, 1987, respectively, was transferred to DODGEX LTD., a private Yukon corporation which, as of this date, is the holder of all the aforementioned claims.

CLAIMS LOCATION AND ACCESS

The CRO group of six full-sized quartz claims is located on claim sheet 105C-5 in south-central Yukon (Map I) 4 kilometres north of the Alaska Highway and 4 kilometres northwest of Summit Lake. Mountain peak "5292" is situated in the northwest quadrant of the claims at approximately $60^{\circ}27'$ north latitude and $133^{\circ}44'$ west longitude.

The claims cover an area ranging in altitude from 1,220-1,613m (4,000-5,292 feet) largely above timberline. Seasonal snow-melt runoff provides cascading water in several steep gullies through mid-July. Two shallow perennial tarns are situated near peak "5292" and the South peak.

Access to the claims is by helicopter or on foot from the Alaska Highway. The direct air distance from the Whitehorse airport is approximately 90 kilometres (55 miles). On foot the route is by way of a disused bulldozer trail commencing northwest of the small Wolf Lake (Map II) and extending 2 kilometres through an abandoned sawmill site up to the 1,130m (3,700') altitude. The remaining 2 kilometres to the South Peak pass at 1,570m (5,150') is by "packers' choice" route over fairly steep terrain largely at or above timberline. The latter is the route used daily by the writer from a base camp alongside the Alaska Highway.



1" = 1/2 MILE
MAP I

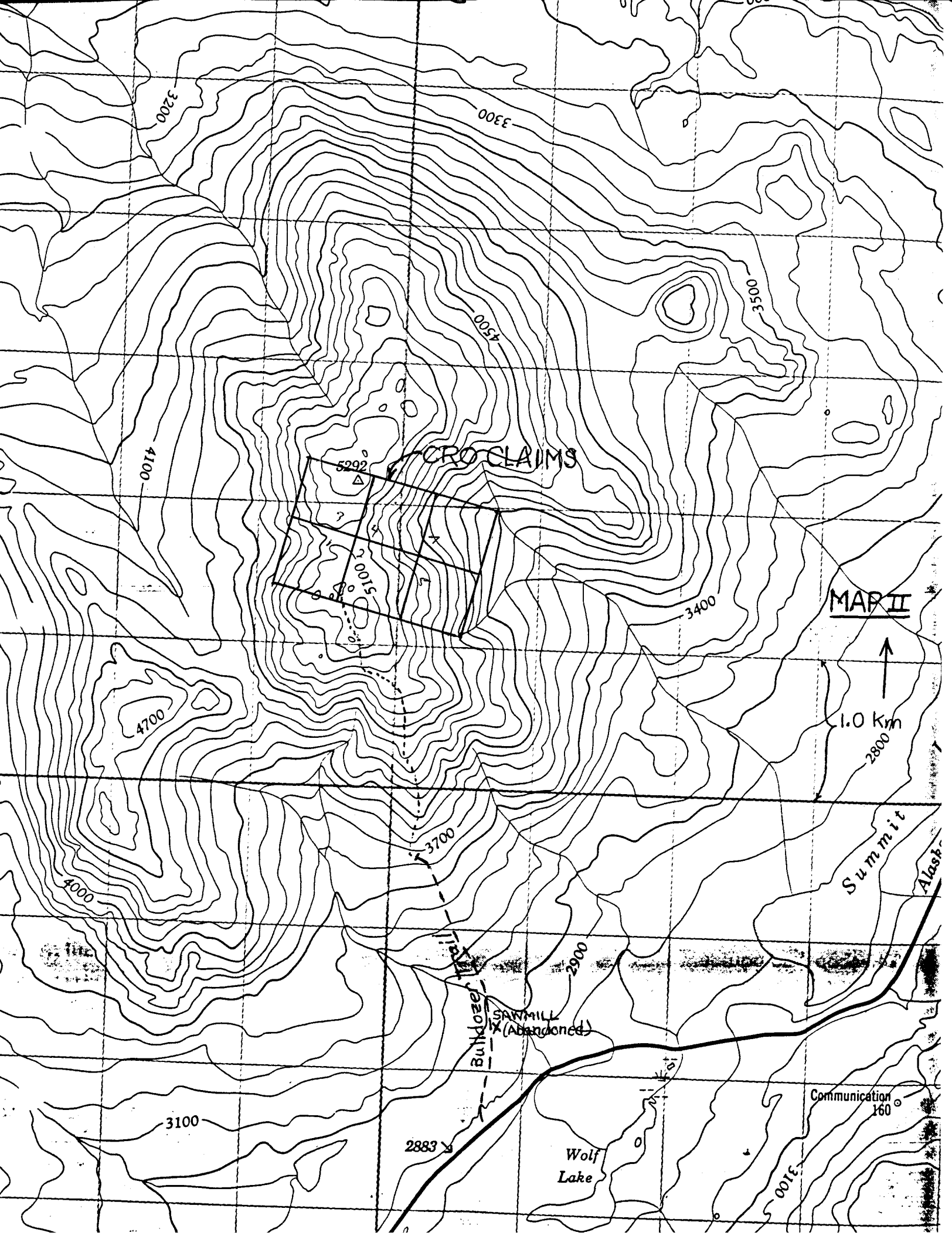
CRO

INC L U D E D

TOP

TOP

S U
M A J L T



CRO CLAIMS

MAP II

1.0 km

Summit
Alaska

SAWMILL
(Abandoned)

Wolf
Lake

Communication
160

3200

3300

3500

4100

5292

4500

5100

3400

4700

3700

4000

3100

2883

2900

3100

HISTORY

Chromite in boulders scattered throughout a 385m (1,260')-long glacially emplaced train was discovered by James S. Dodge in August, 1986 while prospecting under Yukon's Prospectors' Assistance Program. So far some 92 chromitiferous dunite rocks, ranging in size from cobbles to jagged boulders one metre cube, have been found in a 30m (100') wide configuration trending nearly east-west across a topographic saddle midway between the twin peaks of "Chromite" Mountain. Although the largest chromite-bearing boulders were found at the highest elevation in the saddle, the greater number of boulders are strewn down the east-facing slope below the saddle (Map III) east of the common cairn for Posts No. 1 for CRO 1-4 claims.

Detailed and systematic prospecting of the interlayered dunite and harzburgite bedrock, which is exposed discontinuously within and near the boulder train, failed to locate chromite in place. Meanwhile, assay results from CHEMEX LABS LTD. of North Vancouver, British Columbia on two select samples of massive chromite from boulders in the vicinity of the common discovery cairn for CRO 1-4 claims indicated that chromite was of acceptable metallurgical quality and, interestingly, was weakly anomalous in platinum, as follows:

<u>Sample Number</u>	<u>%Cr₂O₃</u>	<u>%Fe (Total)</u>	<u>Cr/Fe Ratio</u>	<u>%Al₂O₃</u>	<u>%MgO</u>	<u>Pt (ppb)</u>	<u>Pd (ppb)</u>
35918	52.40	12.11	2.96	7.66	14.50	100	n.a.
14651	48.00	11.01	2.98	7.47	16.00	100	10

Neither the examination of a suite of outcrop specimens under the binocular microscope, nor the geochemical determinations for anomalous chromium, were successful in delineating specific dunite layers underlying the boulder train as bedrock hosts for the chromite boulder train.

By October, 1986, 18 full quartz claims CRO 1-18 had been staked and transferred to DODGEX LTD. covering the area considered to have the highest potential for the discovery of not only the bedrock source of the known boulder train but also, perhaps, other chromite occurrences in the vicinity.

GEOLOGICAL SURVEY

1. Field Activities

During the periods 26-28 July, 30-31 July, and 11 August, 1987 Mr. Dodge carried out six days of geological field work. However, these are judged to be equivalent to only 4 full field days with respect to applicable assessment representation work, because 4 hours total each day were required to pack in and out from the base camp beside the Alaska Highway thereby reducing to 6 hours the actual daily field time. One additional day is applied for office preparation of this report on 21 August, 1987. Submission of this report has been delayed while anticipating receipt of results of sample assays which finally arrived on 01 September.

2. Discovery of Bedrock Chromite

On 26 August Mr. Dodge concluded from evidence of glacial striae and bedrock plucking that ice movement had been from east to west and clearly upslope in places as steeply as 75° . A sketch map was prepared to indicate the location of each of the 62 chromite-bearing boulders lying in the train east of Posts No. 1 of CRO 1-4 cairn (Map III). Control was by a base line established trending 105°AZ within the boulder train and, coincidentally, following the common end lines of CRO #2 and #4 claims. Stations were flagged at 10 metre intervals.

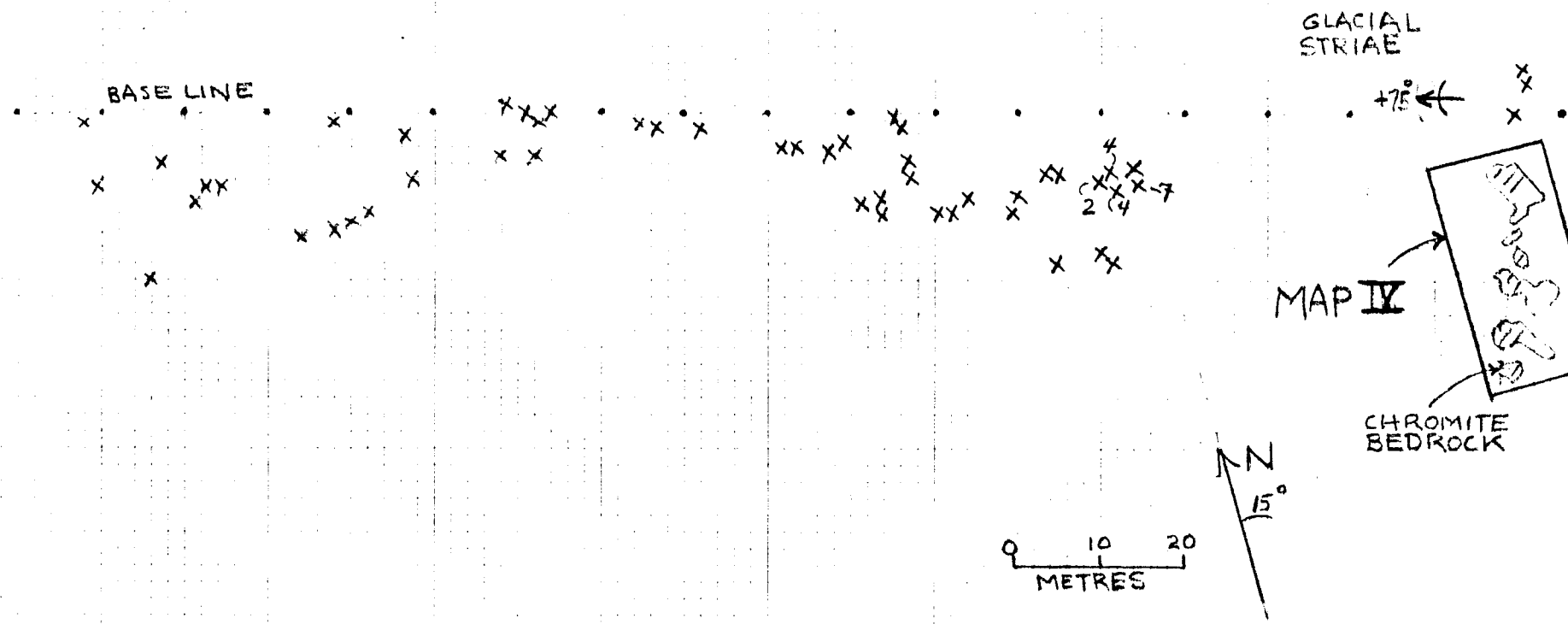
At the outset it was assumed that the chromitiferous rocks in the glacial train occurring in a tight cluster of 22 medium (20cm-30cm) to large (30cm-80cm) somewhat rounded dunite boulders in an area 10 metres south of the 150E metre point on the baseline was the easternmost expression of the boulder train.

The baseline was extended down the steepening slope to the 190E station in the area where glacial striae were well displayed on harzburgite bedrock. Less than 10 metres from this station two, heretofore undetected, chromitiferous boulders of dunite were found and, close by, the barely discernable banded chromite in bedrock dunite was identified.

CRO
POSTS No1

3	4
1	2

x



SITES (x) OF CHROMITE BOULDERS
IN EASTERN ONE-HALF OF GLACIAL TRAIN
CRO CLAIMS
MAP III

J. Dodge 08-87

Preliminary grubbing and test pitting subsequently revealed (Photos 1-5) bedrock exposures of harzburgite enclosing a dunite layer containing massive banded chromite with a 6-metre vertical relief over a 055° AZ strike length of 20 metres (65 feet) with overburden concealing possible lateral extensions. The exposed width of the steeply dipping (70° - 80° SE) chromite showing is at least 4 metres (13 feet) and, based on the relative location of an isolated bedrock exposure surrounded by overburden, the full width will most likely be greater (Map IV).

A chip sample was taken across a 1-metre outcrop face (Photo 5), even though this was undoubtedly less than the full width of the partially concealed bedrock chromite showing. Nevertheless, the assay result, coupled with the two previous assays of select chromite (p. 2) was considered to be useful in making a preliminary evaluation of the beneficiation ratio which may be expected in milling ore. The assay results follow:

<u>Sample Number</u>	<u>%Cr₂O₃</u>	<u>%Fe Total</u>	<u>%Al₂O₃</u>	<u>Pt (ppb)</u>	<u>Pd (ppb)</u>
12695	33.50	9.27	4.96	145	2

Assuming that a gravity method is used to concentrate crude ore of the above grade, that 90% of the contained chromite will be recovered, and that the chromite concentrate will contain a minimum of 48% Cr₂O₃, approximately 1.5t of feed ore will yeild 1.0t of chromite concentrate of metallurgical grade.

Of further interest in this sample is that the content of 145 ppb in platinum is anomalously high for most Alpine-type chromites.

This concordant deposit of chromite occurs as irregular massive bands and tabular lenses parallel with the foliation and lineation of the host peridotite. The CRO deposit appeared typical of the Alpine-type rather than either the Alaskan or the stratiform chromite deposits elsewhere, as subsequent geological reconnaissance in the vicinity of the claims confirmed.



PHOTO 1 Chromite showing on CRO #2 Claim at 1,490m (4,890') altitude, as exposed on 30 July, 1987. Alaska Highway is in the valley to the southeast on far side of Summit Lake. Chromitiferous dunite bedrock exposed at a number of sites over 20m (65') strike length from the lower left to the upper right (shovel) of photo wherever moss and shallow overburden has been removed.



PHOTO 2 Massive banded chromite (black) in medium-sized dunite boulder found within 385m (1,260')-long train comprising over 90 glacially distributed boulders plucked from bedrock outcrop area on CRO #2 Claim.



PHOTO 3 Original discovery site of chromite in weakly serpentinized dunite bedrock on CRO #2 Claim. Weathered surface with lichen coatings makes initial recognition difficult by concealing massive chromite bands such as in freshly broken outcrop specimen next to hammer.



PHOTO 4 Exposure of bedrock and glacially detached segments of dunite containing banded chromite (black) as revealed by partial stripping of moss and thin overburden. Ribbon identifies a minimum 4.0m (13') width of banded chromite as partially exposed. Looking north across slope below Peak "5292".



PHOTO 5 Bedrock dunite with irregular (tectonized) bands of black chromite standing out in slight relief. Viewed toward southwest along strike of showing.

3. Reconnaissance of Claims

Subsequent to mapping of the bedrock chromite showing situated midway on the north end line of CRO #2 claim, a general geologic reconnaissance was carried out on the entire group of six claims, namely CRO 1-5 and 7. Traverses were made guided by compass bearings on lines trending 015° AZ and 195° AZ alternatively at approximately 150m (500 feet) spacing, beginning with the western end and concluding along the eastern end of the six-claim group.

On the claims three rock types were distinguished, namely harzburgite and dunite of the weakly to strongly serpentinized peridotite assemblage, and a few scattered syenodiorite (monzonite) plugs and dykes (Map V). Harzburgite and dunite comprise a complexly interlayered and interfingering package such that their individual distribution could not be mapped satisfactorily in a reconnaissance program. In addition, since the daily route of ingress to and egress from the claims was varied, the presence of gabbro, pyroxenite, and andesite was noted in an area approximately one kilometre southeast of the claim group; no chromite was found.

It can now be demonstrated that the ultramafic complex of "Chromite" Mountain comprises an ophiolitic sequence of basal harzburgites (largely northwest of the claims), interlayered harzburgite and dunite (western half of the claims), dominantly dunite with minor harzburgite (eastern half of the claims), and a gabbro-pyroxenite-andesite uppermost succession approximately one kilometre southeast of the claims. Throughout the claims peridotite layering and foliation on the average strikes 050° AZ and dips steeply 70° - 80° southeast. As no microscopic thin-section study of olivine in the partly serpentinized dunite was carried out, foliation and lineation was determined in the field by observations on the enclosing harzburgite of the orientation of the weathering resistant pyroxene crystals which presumably are hypersthene or another orthopyroxene.

Although the allochthonous nature of the "Chromite" Mountain ultramafic rocks is suspected, no clear field evidence has yet been found for the presence of a thrust fault beneath the ophiolitic sequence.

Several small outcrops of syenodiorite occur as intrusive plugs and dykes crosscutting the foliation of both harzburgite and dunite. Contact alteration is largely confined to narrow (0.2-0.5m) pyritic border zoning in the syenodiorite. Two instances were noted where up to 20cm of the intruded peridotite was converted to grey, impure talc; more appropriately designated soapstone. These intrusives undoubtedly postdate chromite mineralization.



PHOTO 6 Cairn with No. 2 Posts (left) of CRO Claims #1 and #2 near the perennial tarn of South Peak at 1,580m (5,180') altitude on 11 August, 1987. Pond is capable of supplying sufficient water for drilling on chromite showing which is located at a distance of 470m (1,550') northwest and 120m (380') lower.

CONCLUSIONS

1. A new bedrock chromite showing has been discovered in southern Yukon by detailed ground prospecting of favourable geologic terrane.
2. The geologic setting is very similar to world-wide Alpine-type chromite deposits which occur in dunite near the interface between a basal harzburgite and overlying dunite layered zones in an ophiolitic cumulate construction.
3. Massive banded chromite occurs as a tabular deposit at least four metres thick and with a strike length of 20m (65 feet), open at both ends.
4. The chromite is of metallurgical quality as determined by assays of select samples.
5. Lineation of the pyroxene crystals in the harzburgite envelope bordering the chromite-bearing dunite is steeply inclined northeasterly. In chromite deposits of New Caledonia (D. Cassard, A. Nicholas et al, Economic Geology, vol. 76, 1981, p. 805-831) a similar lineation pattern indicates the direction of longest dimension of tabular deposits which may be two to four times greater than the short dimension.
6. As the chromite and its dunite host are essentially non-magnetic, while the enclosing more serpentinized magnetite-bearing harzburgite is noticeably magnetic, a magnetometer survey does not appear to be useful in delineating an extension of this showing or in the discovery of other dunite-hosted occurrences on the claims.
7. Because of the very subtle expression of chromite on weathered bedrock outcrops at this showing, even given the remarkable signal generated by the glacial boulder train, only very painstaking prospecting will be successful in locating additional chromite showings on the claims.
8. Diamond core drilling will be the preferred means of determining the down-dip and lateral extent of this chromite prospect.

RECOMMENDATIONS

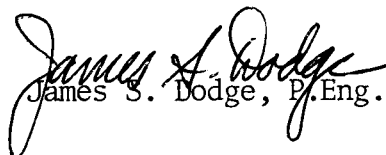
In order to evaluate the economic potential for the CRO chromite showing, it is recommended that:

1. Sub-surface exploration by drilling of the bedrock chromite showing on CRO #2 claim be undertaken commencing in June, 1988. Concomittantly, additional detailed prospecting should be carried out on the claim group.
2. Diamond core drilling of a fence(s) of short inclined holes will be the best method to carry out a preliminary test of the down-lineation extent of the tabular chromite showing.
3. A two-weeks' program employing a professional engineer and a 2-member crew using a portable Winkie drill, mobilized by helicopter from Whitehorse, will be adequate to complete a total of up to 150m (500 feet) of coring in 6 or 7 holes. Adequate drilling water from the South tarn by near-gravity flow is assured.
4. A budget of \$28,000 be committed to the drill evaluation program as follows:

a)	Helicopter charter from Whitehorse	
	Mobilization/demobilization 4 hrs. @ \$550/hr.	\$ 2,200
b)	Drilling charges: Winkie EX core 500' @ \$25/ft.	12,500
c)	Assaying allowance	800
d)	Camp charges (complete)	
	Three personnel @ \$35/person/day for 15 days	1,575
e)	Professional engineer/pro prospector	
	15 days @ \$500/day	7,500
f)	Miscellaneous:	
	Camp transciever radio, core boxes, vehicle	
	at Alaska Highway base camp for possible	
	resupply, office/report supplies	560
g)	Contingency allowance @ ca. 10%	2,765
		<hr/>
	TOTAL DRILLING BUDGET	\$28,000
		<hr/> <hr/>

VALUE OF 1987 GEOLOGICAL SURVEY ON CRO CLAIMS

Assays	1 bedrock chromite/platinum sample	\$46.00
Groceries	1 man for six days @ \$12/day	72.00
Transportation	Whitehorse-Summit Lake and return 200 km @ 30¢/km pickup camper	60.00
Geological Services	James S. Dodge, P.Eng. Yukon 4 days applicable field time (2 additional days re on-foot access time discounted) and 1 day report preparation: 5 days @\$300/d	1,500.00
TOTAL EXPENDITURES (26 July-21 August, 1987)		<u>\$1,678.00</u>


James S. Dodge, P.Eng.

Whitehorse, Yukon
21 August, 1987

STATEMENT OF QUALIFICATIONS

I, James S. Dodge, of 14 MacDonald Road, Whitehorse, Yukon submit the following information which establishes some of my qualifications bearing on the necessary level of competence required to carry out the field work and preparation of the report qualifying for assessment work credit on the CRO claims:

Education

Missouri School of Mines, B.S., Mining Engineering, 1941
 Princeton University, Field Geology, 1940
 Stanford University, M.S., Economic Geology, 1951
 Albert-Ludwigs Universitaet (Germany), Economic Geology, 1952

Experience

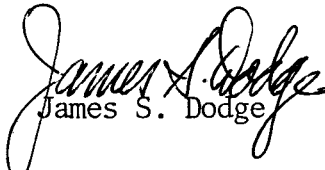
Active in mineral industry since 1941 in North and South America, Asia and Africa as prospector, company geologist, mining engineer, mine operator, and consultant in ferrous and non-ferrous metals and in industrial minerals. Among the many organizations with which I have been associated as an employee or consultant:

Anaconda, Esso, Mitsui, USAEC, Ventures, DIAND, SCAP-Japan, Atlas, Glidden, Spartan/Nuspar, Hirst-Chichagof, Floyd Odlum, Yukon Barite, Standard Silver, Ocean Gold

Experience on chromite deposits gained in stratiform type properties in Southern Rhodesia (Zimbabwe) in 1958 during prospecting program for emeralds, and with the Anaconda Company field party in the Stillwater Complex, Montana in 1943. I carried out field examinations of the Alpine-type deposits at 8 former chromite mines in southern Oregon and western California during the winter of 1986-87 to supplement a library research study at Stanford University on geology of chromite deposits in January-February, 1987.

Professional Affiliations

Registered Professional Engineer (No. 311) by Association of Professional Engineers of the Yukon Territory
 Member of Society of Economic Geologists
 Member of American Institute of Mining Engineers


 James S. Dodge



Chemex Labs Ltd.

Analytical Chemists • Geochemists • Registered Assayers

212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1

PHONE (604) 984-0221

To: DODGE, JAMES S.

**

14 MACDONALD RD.
WHITEHORSE, YUKON
Y1A 4L2

*** INVOICE NUMBER 18719843 ***

BILLING INFORMATION

Date : 26-AUG-87
Project :
P.O. # : NONE
Account : BKY

Billing : For analysis performed on
Certificate A8719843

Terms : Net payment in 30 Days
1.5% per month (18% per annum)
charged on overdue accounts.

Please remit payments to:

CHEMEX LABS LTD.
212 Brooksbank Ave.,
North Vancouver, B.C.
Canada V7J-2C1

CHEMEX CODE	ANALYSIS DESCRIPTION	SAMPLES ANALYZED	UNIT PRICE	AMOUNT
305	- Cr203			
325	- Fe tot			
366	- Al2O3			
975	- Au ppb			
977	- Pd ppb			
976	- Pt ppb			
		1	42.00	42.00
Sample preparation and other charges :				
208	- Assay - RING	1	4.00	4.00
Total Cost \$				46.00
TOTAL PAYABLE \$				46.00



Chemex Labs Ltd.

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Project:

Comments:

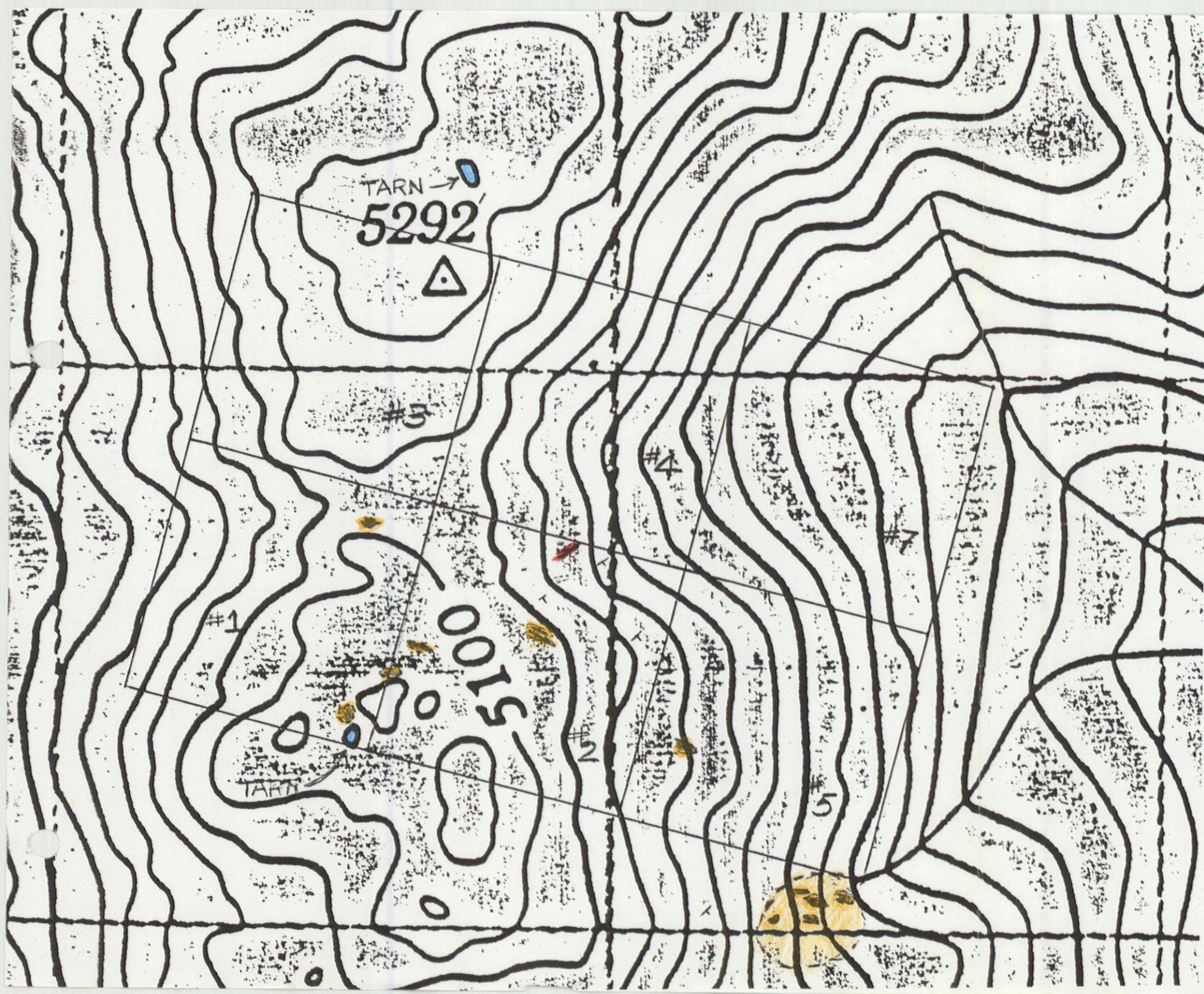
*Page No: 1
Tot. Pages: 1
Date: 26-AUG-87
Invoice #: I-8719843
P.O. #: NONE

CERTIFICATE OF ANALYSIS A8719843

SAMPLE DESCRIPTION	PREP CODE	Cr2O3 %	Fe tot %	Al2O3 %	Au ppb AFS	Pd ppb AFS	Pt ppb AFS				
12695	208 --	33.50	9.27	4.96	< 2	2	145				

ALL ASSAY DETERMINATIONS ARE PERFORMED OR SUPERVISED BY B.C. CERTIFIED ASSAYERS

CERTIFICATION:



MAP V
 GEOLOGIC SKETCH
 CRO CLAIMS 1-5, 7
 105C-5

SCALE
 0 500'
 150m (500 ft)

N ↑

- LEGEND
- chromite showing
 - syenodiorite (monzonite)
Peridotite
 - ⎵ contours - 100-ft interval

J. S. Dodge
 07-87