

830404

GEOLOGICAL REPORT
ON THE
JOANNA III AND IV MINERAL CLAIMS
OMINECA MINING DIVISION
BRITISH COLUMBIA

FOR
INTERNATIONAL WESTWARD DEVELOPMENT CORPORATION

Nicholas C. Carter, Ph.D., P.Eng.
Consulting Geologist

Victoria, B.C.

April 2, 1985

SUMMARY

International Westward Deveioption Corporation owns the Joanna III and IV mineral claims, each comprised of 20 units and situated in the Toodoggone River area of north-central British Columbia.

The Joanna III and IV claims are 300 kilometers north of Smithers and are accessible by fixed-wing aircraft and helicopter.

The Toodoggone River area is a significant epithermal precious metals district. Proven deposits include the formerly producing Baker gold-silver mine and the Lawyers property which has a reported reserve of 1 million tonnes grading 7.27 grams/tonne gold and 254 grams/tonne siiver. The Lawyers and several other significant gold-silver prospects in the area are hosted by early Jurassic Toodoggone volcanic rocks.

The Joanna III and IV mineral claims, underlain by Toodoggone volcanic rocks, are a few kilometers northeast of the JD property on which significant gold-silver mineralization has been identified. Sulfide minerals have been reported in the area of the Joanna IV claim and one sample from a narrow bornite stringer yielded significant copper and silver values.

A two phase exploratory program is recommended to evaluate the Joanna III and IV claims. Phase I, involving geological mapping, prospecting and geochemical sampling and analysis, is estimated to cost \$43,700. A second phase, contingent on results of Phase I work, has estimated costs of \$50,000.

TABLE of CONTENTS

Summary	
Table of Contents	
List of Figures	
Introduction	i
Location and Access	1
Mineral Property	2
Physical Features	2
History	3
Regional Geological Setting and Mineral Deposits	5
Property Geology and Mineralization	7
Conclusions	8
Recommended Program	9
Cost Estimate	11
References	12
Certificate	13

Nicholas C. Carter, Consulting Geologist

LIST of FIGURES

Figure 1	Location - Toodoggone River Area	Following Page 1
Figure 2	Location - Joanna III and IV Mineral Claim	Following Page 2
Figure 3	Joanna III and IV - Mineral Claims	Following Page 2

INTRODUCTION

International Westward Development Corporation owns the Joanna III and IV mineral claims which are situated in the Toodoggone River area of north-central British Columbia.

This report, prepared at the request of International Westward Development Corporation, is based principally on available published and unpublished maps and reports dealing with the general area.

The writer has not visited the Joanna III or IV mineral claims, but has a good knowledge of the Toodoggone area by way of numerous property examinations and supervision of several exploration programs over the past 14 years.

LOCATION and ACCESS

The Joanna III and IV mineral claims are situated 300 kilometers north of Smithers in the Toodoggone River area of north-central British Columbia (Figure 1). The geographic centre of the claims is at latitude 57°28' North and longitude 127°05' West in NTS map area 94E/6E.

Access into the Toodoggone River area is by fixed wing aircraft to a 1.600 metre long gravel airstrip on the Sturdee River (Figure 2). The Joanna III and IV claims are a 35 kilometer helicopter flight north of the airstrip.

A road currently links Baker mine and the Lawyers property with the Sturdee airstrip (Figure 2). Extension of the Omineca mining road into the area from the present terminus 65 kilometers to the southwest, would provide conventional access to Prince George and points south.

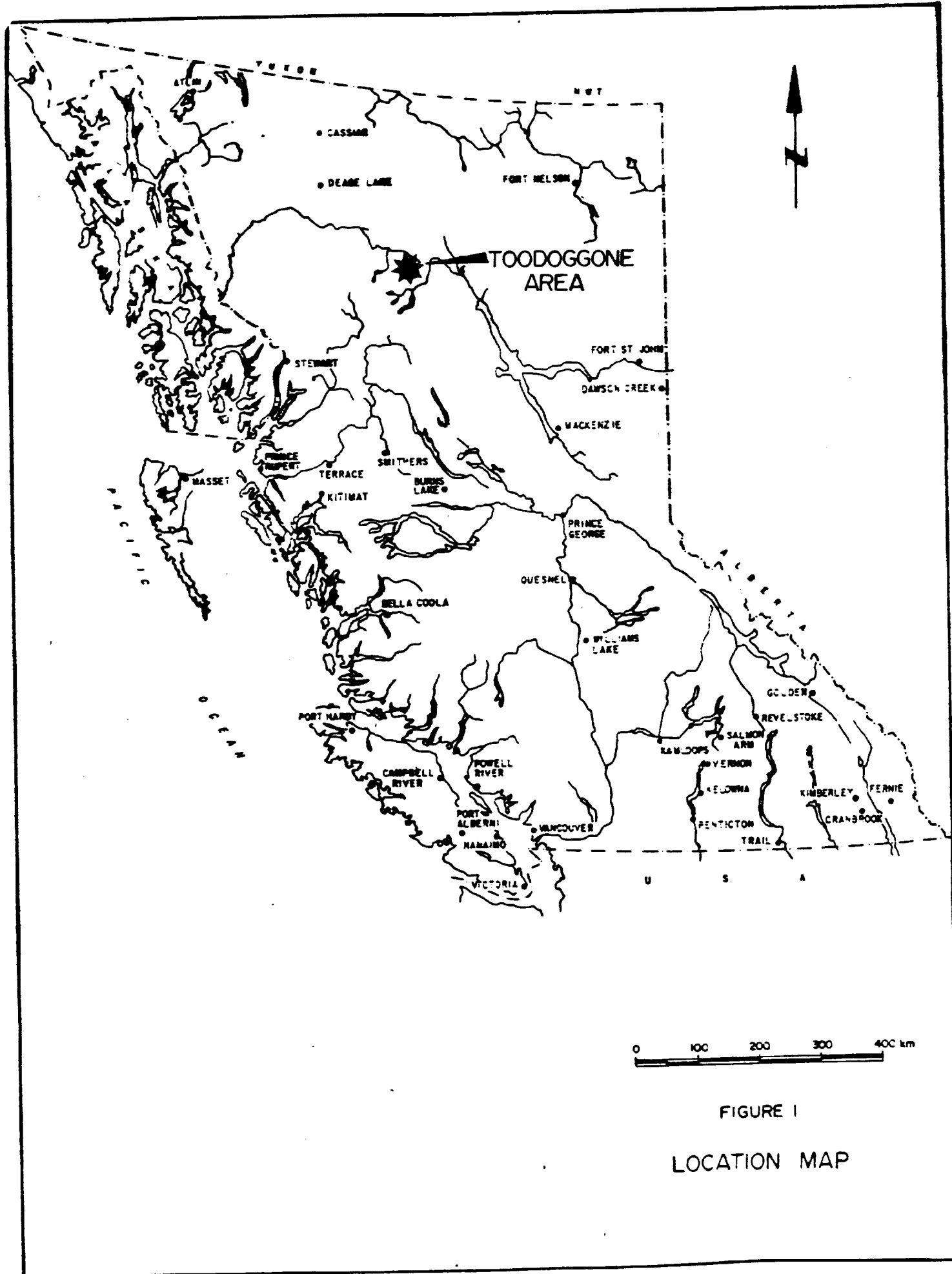


FIGURE 1

LOCATION MAP

MINERAL PROPERTY

The Joanna III and IV modified grid mineral claims are each comprised of 20 units and are situated in the northern part of the Omineca Mining Division.

The claims are believed to have been located in accordance with procedures as specified by the Mineral Act Regulations for the Province of British Columbia. The claim was located recently, subject to winter conditions and the westernmost part of the Joanna III claim overlaps the Gas 1 claim currently held by Energex Minerals Ltd.

The writer has reviewed data provided by locators of the claims and claim records on file with the office of the Gold Commissioner, Vancouver.

Details of the claims are as follows:

Name of Claim	Units	Tag Number	Expiry Date
Joanna III	20	102376	March 25, 1986
Joanna IV	20	102368	March 25, 1986

PHYSICAL FEATURES

The Toodoggone River region is an upland area featuring rounded to craggy mountains and ridges dissected by broad alluvium-filled valleys. Steep-walled cirques are common on north-facing slopes while southerly slopes are generally more gentle and rounded.

The Joanna III claim covers the broad open valleys of McClair and Belle Creeks (Figure 3). A prominent north-trending ridge with 45° slopes occupies the central part of the claim. Elevations within the claim range from 1,320 metres

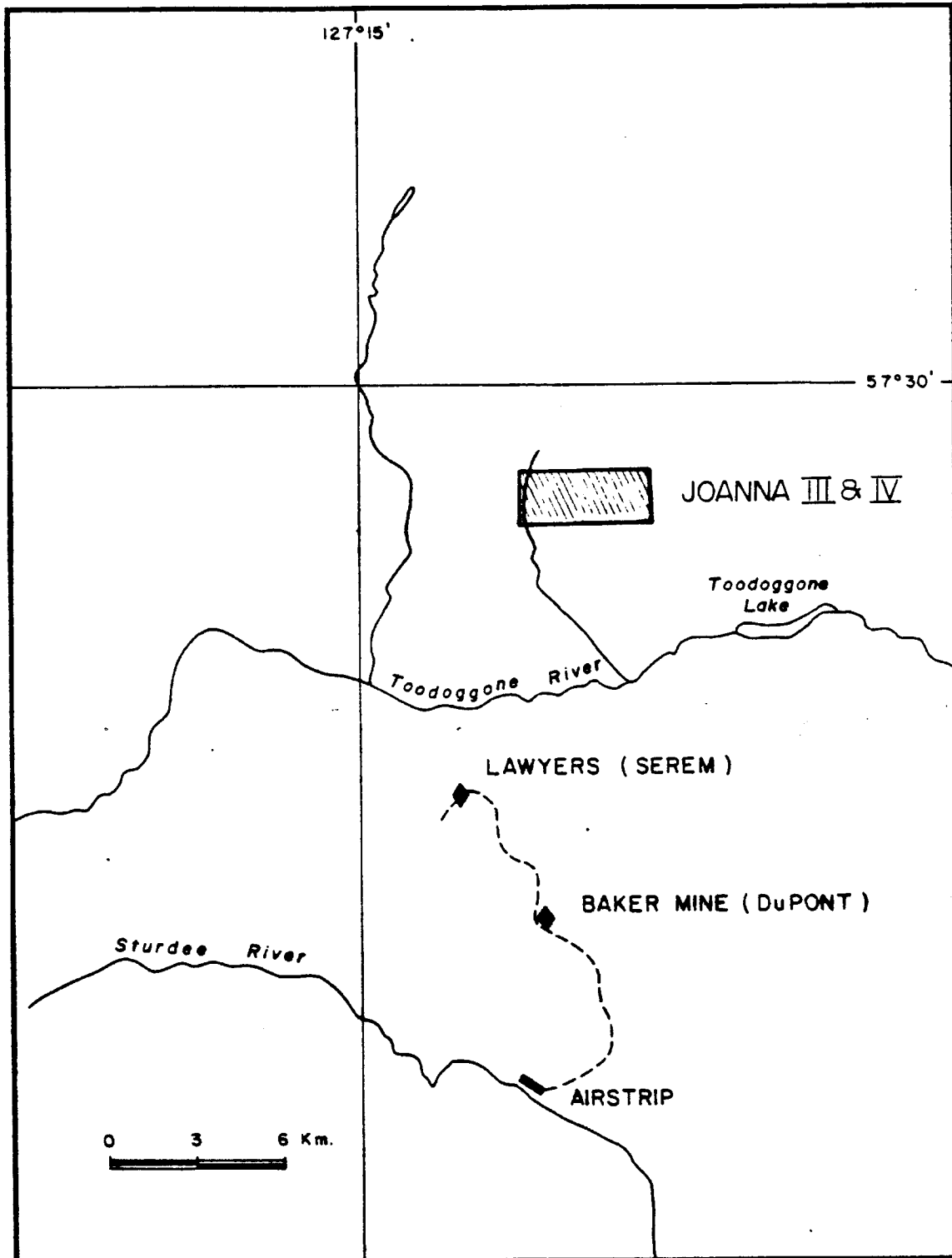


FIGURE 2 - LOCATION - JOANNA III & IV PROPERTY

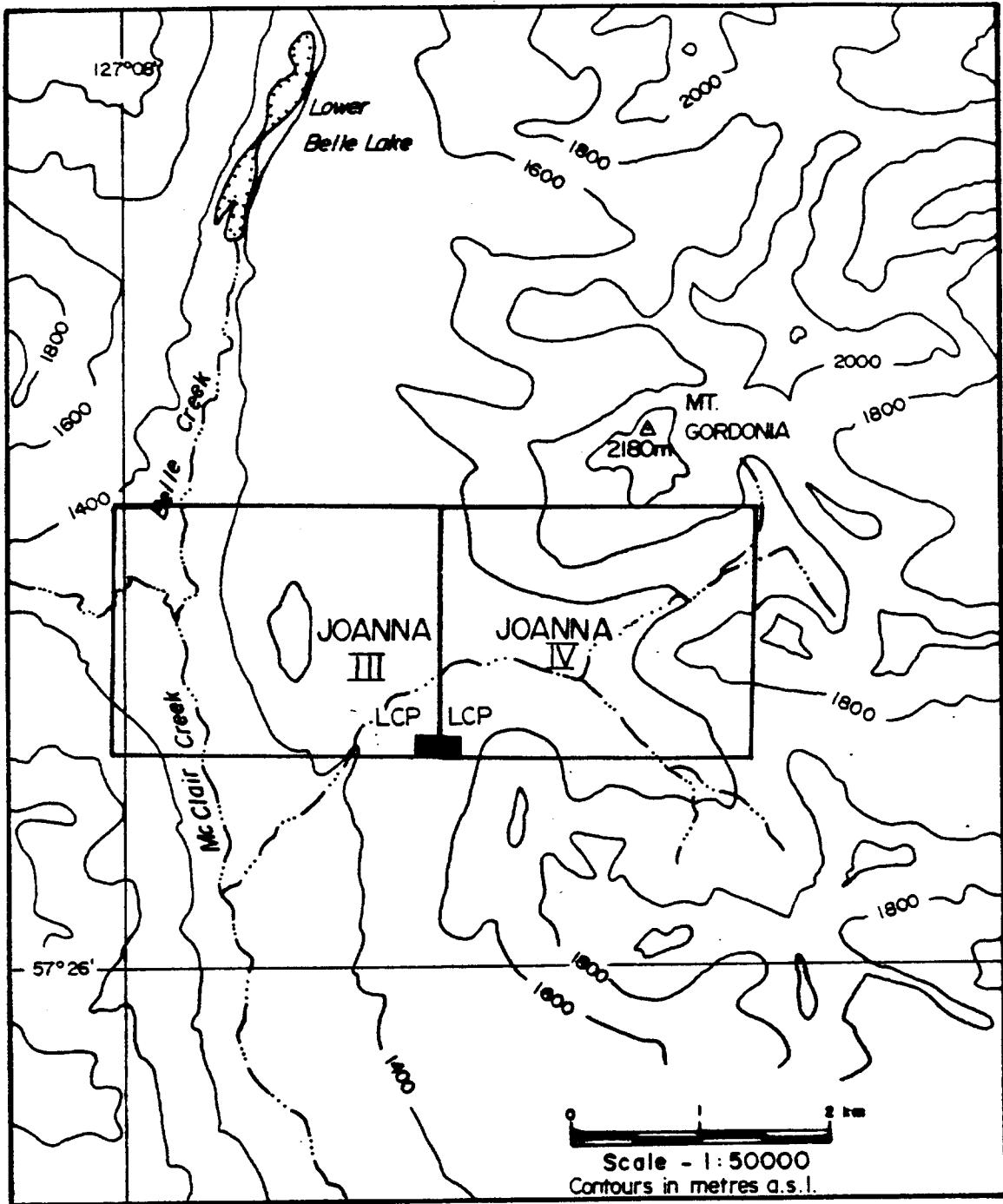


FIGURE 3 JOANNA III & IV MINERAL CLAIMS

along McClair Creek in the southern part of the claim to 1,680 metres at the summit of the prominent ridge.

The Joanna IV claim is situated in one of the more rugged areas of the Toodoggone region. The claim covers the steep southern slope of Mount Gordonia (Figure 3) and 45 to 50 degree slopes are common throughout the claim area. The central drainage is bounded by steep cirque headwalls in the eastern part of the claim. Elevations range from 1,450 metres in the valley on the west claim boundary to 2,100 metres near the summit of Mount Gordonia.

Locally dense alpine spruce, balsam and fir covers the base of steeper slopes extending to about 1,600 metres elevation. The open valley bottoms of McClair and Belle Creeks in the western part of the Joanna III claim feature alpine tundra with local growths of willows and buck brush.

Bedrock is confined to deeply incised valley bottoms and some of the steeper slopes. Talus slopes and felsenmeer are prevalent.

The area is snow free between late June and early October.

HISTORY

The Toodoggone area was investigated for placer gold in the 1920's and 1930's. A public company, Two Brothers Valley Gold Mines Ltd., undertook considerable test work, including drilling, in 1934. Most of this work was directed to extensive gravel deposits principally near the junction of McClair Creek and Toodoggone River several kilometers south of the present claim.

Lead-zinc mineralization near the north end of Thutade Lake and south of Baker mine was also investigated in the 1930's.

Gold-silver mineralization was discovered on the Chappelle (Baker Mine) property by Kennco Explorations (Western) Ltd. in 1969. DuPont of Canada Exploration Ltd. acquired the property in 1974 and began production at a milling rate of 90 tonnes per day in 1980.

Numerous other gold-silver discoveries were made in the area in the 1970's and 1980's, including the Lawyers deposit which was discovered by Kennco in 1973 and optioned by SEREM Ltd. in 1979. Work on this property to date has included considerable trenching, drilling and underground development and a feasibility study is currently underway.

The Toodoggone area has been the scene of intense exploration activity during the past four years with numerous companies exploring over 3,000 mineral claim units. Exploration and development expenditures to date are estimated to be in the order of \$33 million.

The only records of previous work in the area of the present Joanna III mineral claim are contained in assessment reports (McKelvie, 1970, Harron, 1981, Drown, 1982) dealing with areas immediately west and the Mount Gordon area. Work included geological mapping and geochemical and geophysical surveys. Considerable work, including trenching and drilling, has been carried out by Kidd Creek Mines Ltd. on Energex Minerals' JD prospect 2 kilometers southwest of the Joanna III claim.

REGIONAL GEOLOGICAL SETTING and MINERAL DEPOSITS

The Toodoggone River area is situated near the eastern margin of the Intermontane tectonic belt. Oldest rocks in the area are late Paleozoic limestones in the vicinity of Baker mine where they are in fault contact with late Triassic Takla Group volcanic rocks.

A distinctive lithologic volcanic unit of early Jurassic age, called the Toodoggone volcanics, is a subaerial pyroclastic assemblage of predominantly andesitic composition (Pantelyev, 1983). These unconformably overlie, or are in fault contact with older rocks, principally Takla Group volcanic rocks and undivided Hazelton Group feldspar porphyry flows and fragmental rocks.

Toodoggone volcanic rocks are contained in a 100 by 25 kilometer northwest-trending belt extending from Thutade lake in the south to Stikine River in the north.

Several major stratigraphic subdivisions of Toodoggone volcanics have been identified (Panteleyev, 1982, Diakow, 1983). These and older layered rocks of the Takla and Hazelton Groups are cut by Omineca granitic rocks of Early Jurassic age, which commonly occur along the eastern margin of the Toodoggone volcanic belt, and by subvolcanic intrusions related to Toodoggone volcanics.

Clastic sedimentary rocks of the Cretaceous-Tertiary Sustut Group overlie older layered rocks near the Stikine River and form the southwestern exposed margin of the Toodoggone volcanic belt.

Regional fault systems trend northwesterly and northerly throughout the

Toodoggone area.

Several styles of economic mineralization have been identified (Schroeter, 1981), of which the most important are epithermal precious and base metal deposits hosted principally by lower and middle units of Toodoggone volcanics and related to Toodoggone volcanic processes. Gold-silver mineralization occurs principally in fissure veins, quartz stockworks, breccia zones and areas of silicification in which ore minerals are fine-grained argentite, electrum, native gold and silver and lesser chalcopyrite, galena and sphalerite. Alteration mineral assemblages are typical of epithermal deposits with internal silicification, clay minerals and locally alunite, grading outward to sericite and clay minerals, chlorite, epidote and pyrite.

Examples include Baker Mine, a fissure vein system developed in Takla volcanic rocks, but spatially related to dikes believed to be associated with Toodoggone volcanic rocks. Pre-mining indicated reserves were 90,000 tonnes grading 30 grams/tonne gold and 600 grams/tonne silver. Recovered grades during the 3 year mine life were about half the indicated grades due to initial mill recovery problems and greater than expected dilution during mining.

The Lawyers deposit has gold-silver mineralization in banded chalcedony-quartz stockwork veins and breccia zones developed in Toodoggone volcanic rocks. Three potential ore zones have been defined to date and recently announced reserves (Schroeter, 1985) are 1 million tonnes grading 7.27 grams/tonne gold and 254 grams/tonne silver. Numerous other epithermal gold-silver deposits in the area are hosted by lower and middle units of the Toodoggone volcanic sequence. These include the Sha, Saunders, Graves,

Moosehorn, Mets, Metsantan, Al, JD and Golden Lion prospects. It is interesting to note that most of the known deposits and occurrences are adjacent to two northwesterly striking regional fault structures: the Sha-Baker-Lawyers-Alberts Hump structure and the Saunders-McClair fault system.

Soil, rock and stream sediment geochemistry have proven to be useful tools in the search for epithermal precious metal deposits in the area. Gold and silver give diagnostic signatures, but analyses for copper, lead and zinc are also helpful.

PROPERTY GEOLOGY and MINERALIZATION

Regional mapping (Gabrielse, et al, 1976) shows the Joanna III and IV mineral claims to be near the eastern limits of the Toodoggone Volcanic belt. An area of Omineca granitic rocks is a short distance south of the Joanna III claims and the Saunders-McClair fault system is 1-2 kilometers to the southwest. Much of Mount Gordonia is underlain by Takla Group and undivided Hazelton Group intermediate to basic volcanic rocks.

Pyrite, specular hematite, some copper staining and numerous quartz veins have been noted in cirques on the west side of Mount Gordonia (McKelvie, 1970). A grab sample from a 13 mm. stringer of bornite in a small rock exposure reportedly assayed 6.7% copper and 133 grams/tonne silver. The most significant mineralization in the area of the Joanna III claim is that on the Energex Minerals Ltd.'s JD property, 2 kilometers southwest. A number of mineralized zones have been identified, including the Gumbo zone where recent drilling by Kidd Creek Mines Ltd. has outlined a geological reserve of 27,000 tonnes averaging 5.48 grams/tonne gold within a thrust fault in Toodoggone volcanic

rocks. Energex press releases suggest the property has potential for large tonnage-low grade gold-silver deposits.

A limited magnetometer survey in the area of the Joanna IV claim in 1970 did not detect any significant anomalies. Geochemical surveys of claims previously held by DuPont of Canada Exploration Ltd. a few kilometers west of the claims showed anomalous values for gold, silver and base metals in soils. Values about 50 ppb gold and 2 ppm silver are considered moderately to strongly anomalous in the Toodoggone area. The DuPont data (Harron, 1981, Drown, 1982) indicates a number of silver anomalies and erratic gold values ranging up to 3,000 ppb which were believed to be due to weak placer gold concentrations on terraces above existing drainages.

CONCLUSIONS

The Joanna III and IV mineral claims are situated in the Toodoggone River area which is noted for epithermal gold-silver deposits and occurrences.

Available information for the area indicates that the claims are underlain in part by Toodoggone volcanics, principal host rocks for precious metals mineralization in the district. Hazelton and/or Takla Group volcanic rocks, underlying much of Mount Gordonia, are also known to host precious and base metal mineralization elsewhere in the area.

Significant gold-silver mineralization has been identified on an adjacent claim to the southwest, and limited previous work in the area of the Joanna IV claim detected a number of zones with pyrite, specular hematite and copper staining. One sample from a narrow bornite stringer yielded significant copper

and silver values.

An exploratory program of the Joanna III and IV claims is warranted on the basis of their geological setting and their proximity to known gold-silver mineralization.

RECOMMENDED PROGRAM

A first phase program of geochemical sampling and geological mapping and prospecting is recommended.

Stream sediment samples should be collected from the several tributary drainages on the claims and it is recommended that soil and/or rock samples be collected at 100 metre stations along 100 metre spaced flagged compass lines, or at 100 metre intervals along 100 metre spaced topographic contours. Swampy areas in the valley bottoms should be avoided and the possibility of contamination of samples by weak placer gold concentrations should be borne in mind. In view of the extremely rugged nature of part of the terrain in all parts of the Joanna IV claim may not be accessible and it is recommended that talus fines samples be collected where present at the base of steeper slopes.

All samples collected should be geochemically analyzed for gold, silver, copper, lead and zinc.

Geological mapping of the claim should include careful prospecting, with particular attention paid to structures, zones of alteration and possible mineralization noted in earlier investigations of the area.

Contingent on encouraging results being obtained from first phase work, phase two would include more detailed sampling of anomalous areas and possibly some hand trenching of selected areas. Geophysics may be useful in parts of the valley floors.

It would be advantageous to perform as much follow-up work as possible during the first phase because of the high support costs involved in this relatively remote area.

COST ESTIMATE

PHASE I

Geological Mapping and Prospecting	\$ 2,000
Crew Wages	10,000
Camp Costs	5,000
Mobilization and Demobilization	5,000
Helicopter Support	6,000
Analytical Costs	4,000
Engineering, supervision	4,000
Report Preparation	2,000
Contingencies	<u>5,700</u>
TOTAL OF PHASE I	<u>\$43,700</u>

PHASE II

Follow up sampling, hand trenching VLF-EM and magnetometer surveys	<u>\$50,000</u>
---	-----------------

N.C. Carter, Ph.D., P.Eng.

REFERENCES

CARTER, N.C.

1972: Toadoggone River Area and Chappelle, Geology, Exploration and Mining in British Columbia 1971, p. 63-70

1974: Lawyers, Geology, Exploration and Mining in British Columbia 1973, p. 458-461

DIAKOW, L.J.

1984: Geology between Toadoggone and Chukachida Rivers (94E), BCMEMPR Geological Fieldwork 1983, Paper 1984-1, p. 139-145

DROWN, T.J.

1982: Geological and Geochemical Report on the Air 1 and 2 Claims, Omineca Mining Division, BCMEMPR Assessment Report 10471

GABRIELSE, H., DODDS, C.J. and MANSY, J.L.

1976: Geology of the Toadoggone River (94E) Map Area, GSC Open File 306

HARRON, G.A.

1981: Geological and Geochemical Report on the Air 1 and 2 Claims, Omineca Mining Division, BCMEMPR Assessment Report 9282

MCKELVIE, D.L.

1970: Geophysical Report on the ED 1-14, EHL 1-12, Bella 1-42 Mineral Claims BCMEMPR Assessment Report 2506

PANTELEYEV, A.

1983: Geology between Toadoggone and Sturdee Rivers, BCMEMPR Geological Fieldwork, 1982, Paper 1983-1, p. 142-148

1984: Stratigraphic Position of Toadoggone Volcanics, BCMEMPR Geological Fieldwork, 1983, Paper 1984-1, p. 136-183

SCHROETER, T.G.

1981: Toadoggone River, BCMEMPR Geological Fieldwork, 1980, Paper 1981-1, p. 124-131

1982: Toadoggone River, BCMEMPR Geological Fieldwork, 1981, Paper 1982-1, p. 122-133

1983: Toadoggone River Area, BCMEMPR Geological Fieldwork, 1982, Paper 1983-1, p. 125-133

1984: Toadoggone River Area, BCMEMPR Geological Fieldwork, 1983, Paper 1984-1, p. 134-135

1985: Toadoggone River Area, BCMEMPR Geological Fieldwork, 1984, Paper 1984-1, p. 291-297

CERTIFICATE

I, NICHOLAS C. CARTER, do hereby certify that:

1. I am a Consulting Geologist, resident at 1410 Wende Road, Victoria, British Columbia.
2. I am a graduate of the University of New Brunswick with B.Sc. (1960), Michigan Technological University with M.S. (1962), and the University of British Columbia with Ph.D. (1974).
3. I am a registered Professional Engineer in the Association of Professional Engineers of British Columbia.
4. I have practised my profession in eastern and western Canada, and in parts of the United States over the past 24 years.
5. This report is based on the writer's extensive background in the Toodoggone River area and on published and unpublished reports and maps.
6. I have no direct or indirect interest in the Joanna III and IV mineral claims or in International Westward Development Corporation

Nicholas C. Carter
Consulting Geologist

DATED in the City of Vancouver, this 2nd day of April, 1985.