BRITISH COLUMBIA
PROSPECTORS ASSISTANCE PROGRAM
MINISTRY OF ENERGY AND MINES
GEOLOGICAL SURVEY BRANCH

PROGRAM YEAR: 2001/2002
REPORT #: PAP 01-28
NAME: PETER KLEWCHUK
PROSPECTOR'S ASSISTANCE GRANT REPORT

on

MG 1 - 7 MINERAL CLAIMS

Driftwood Creek Area

GOLDEN MINING DIVISION

NTS  82 K/15E
TRIM 82K.088 & 098
Lat. 50° 54' N  Long. 116° 33' W
UTM  5,639,000N  531,500E

By

PETER KLEWCHUK,  P. Geo.

January, 2002
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INTRODUCTION

This report describes a program of prospecting, geologic mapping and rock geochemistry completed on the MG 1-7 claims in the Driftwood Creek area west of Brisco, B.C. during the period September-November, 2001.

The Driftwood Creek magnesite deposit contains 20 to 30 million tonnes of magnesite and may be the largest undeveloped known magnesite deposit in North America.

Location and Access

The MG 1-7 mineral claims are located in southeastern British Columbia on the west side of the Rocky Mountain Trench and just north of Driftwood Creek, between the drainages of Bobbie Burns and Bugaboo Creeks. The property is within the Golden Mining District on NTS map 82 K/15 or TRIM maps 82K.088 & 82K.098, centered approximately at latitude 50° 54' N. longitude 116° 33' W or UTM coordinates 531,500E, 5,639,000N (Figs. 1 & 2).

The property can be accessed from Highway 93 from either Brisco or Spillimacheen. From Brisco the Bugaboo Creek and Driftwood Creek Forest Service roads are followed to about 39 km on the Driftwood road. From there a 1 km access trail leads onto the Black Bear claims and to the site of a small quarry at the western edge of the Driftwood Creek magnesite deposit where Kaiser Resources Ltd. excavated a small bulk sample in 1978. The MG 1-7 claims are situated immediately east of the Black Bear claims.

From Spillimacheen the road follows the south side of the Spillimacheen River and Bobbie Burns Creek, eventually using the Driftwood Creek Access Road to about 18 km. At this point a tributary road leads southeasterly to a saddle on the magnesite ridge. This road was utilized for a small diamond drilling program by Canadian Occidental Petroleum Ltd. in 1989 and was covered by extensive windfall which had to be cut and removed prior to gaining access in 2001. This road is quite steep in places and has a clay base thus is only suitable in dry weather, but it does allow access to the western edge of the Eastern Magnesite.

A spur line of the Canadian Pacific Railway parallels the highway and the Kootenay River east of Brisco and Spillimacheen, between Golden to the north and Cranbrook to the south.
1.20 Physiography

The MG magnesite property is located west of the Rocky Mountain Trench in the Purcell Range of the Columbia Mountains. The property covers part of a prominent isolated ridge that trends about 115° Azimuth between Driftwood Creek to the south and Bobbie Burns Creek to the north. Topography is moderate except for the magnesite itself which locally forms steep cliffs more than 15 m (50 feet) high on both sides of the deposit. Steep cliffs are present on the north side of the Eastern Magnesite and on the south side of the Western Magnesite. East of the claims and the magnesite, the host dolomite continues as a prominent ridge. Elevations on the claim block range from 1190 to 1370 meters. Forest cover consists mainly of Lodgepole Pine with lesser Western Yellow Larch and Douglas Fir and minor birch and aspen.

1.30 Property

The property includes seven contiguous two-post claims, MG 1 to 7 (Fig. 2).

1.40 History of Previous Exploration

Magnesite was first discovered in the Brisco area in the 1960's and a series of small deposits are described by MacCammon (1965) in British Columbia Minister of Mines Annual Report for 1964. The Driftwood Creek deposit is not included and was evidently discovered around this time as it was first staked in 1968.

In 1978 Kaiser Resources Ltd. (predominantly a coal-mining company) acquired the Driftwood Creek deposit and carried out a program of surface geologic mapping and some poorly documented diamond drilling. From their surface work, a resource of 22,500,000 tonnes of magnesite was inferred (using a specific gravity of 2.5). Publicly-available reports indicate some diamond drilling was done, but no data is provided. The property was held for ten years, then the claims were allowed to expire.

In 1987 the Driftwood Creek magnesite was staked by Canadian Occidental Petroleum Ltd. (‘Canoxy’). They completed 1:2000 scale geologic mapping, did widespread surface sampling (sixty-eight 5-kilogram samples spaced along 17 cross-section survey lines about 100 meters apart), and drilled four core holes. Surface mapping was used to infer a total magnesite resource of 29,400,000 metric tonnes. The claims were held for ten years with no additional work, and allowed to expire.

In 1999 the magnesite ridge was staked by the present owners and some additional rock geochemistry was completed on part of the Western Magnesite (Kikauka, 2000).
1.50 2001 Program

In 2001 a program of detailed section measuring and geologic mapping was undertaken on the Eastern Magnesite. This area was chosen for detailed work as it appears most suitable for an initial mining operation. Sample results provided by Canoxy (Rodgers 1989) indicate this portion of the magnesite contains the highest grade material; it is also closest to the rail in the Columbia River valley to the east and earlier mapping suggested it was a discrete continuous mass of magnesite.

Once the Eastern Magnesite was chosen for the work, it was evident that the best access would be to use the old drill road built by Canoxy to the western edge of the Eastern Magnesite. The road required considerable effort and time to clear it of windfall and small sloughs and to make passable the numerous large ‘high-relief’ water bars that were put in following the drill program.

As part of the 2001 program just over 900 meters of ATV trails were constructed from the end of the truck road, across the Eastern Magnesite and across the saddle leading to the Western Magnesite. This allowed the collection of four bulk samples ranging in size from 140 to 820 kg and totaling 2230 kg. Three of the bulk samples are from the Eastern Magnesite while one is from the Western Magnesite (Figs. 3 & 4).

One cross section line was chosen as a representative line for detailed sampling and seventeen three-meter rock chip samples were collected from the central zone of the magnesite to provide an indication of the surface grade.

2.00 GEOLOGY

The area of the Driftwood Creek magnesite deposit was mapped by Reesor (1973) although the magnesite deposits west of Brisco are not included in his work. Reports by Morris (1978), Rodgers (1989) and Simandl and Hancock (1992) provide the best available geologic information on the Driftwood Creek magnesite deposit.

The deposit is hosted by the Helikian (Precambrian) age Mount Nelson Formation, part of the Purcell Supergroup. The Mount Nelson Formation is about 1300 meters (4300 feet) thick and includes mainly dolomitic and quartzitic units with minor argillite. The magnesite occurs in the upper part of the formation, as a hydrothermal alteration product of dolomite.

Magnesite weathers prominently and the Driftwood Creek deposit is well exposed as an isolated ridge within relatively low valley bottom topography, at an elevation of ~1250 meters (4000 feet). Numerous cliff exposures are present, with some cliff walls greater than 15 meters (50 feet) high. A series of cross-cutting faults produce some offset of geologic contacts but displacement is minor. Magnesite has been mapped over a strike length of 1900 meters and maximum width of about 220 meters. The magnesite occurs at surface in two discrete bodies; a
larger ‘Western Magnesite’ and a smaller ‘Eastern Magnesite’ (Fig. 3). The Eastern Magnesite was mapped in detail in 2001.

An arbitrary baseline, trending 115° azimuth and roughly crossing the crest of the long axis of the magnesite ridge, was established for control. The magnesite deposit was mapped by surveying a series of cross section lines at 25 meter intervals. Detailed topography of the cross sections was measured using a Suunto hand-held inclinometer and hip chain. Geologic contacts of the magnesite and other features of interest were also noted. The topographic profile of the baseline was similarly surveyed. This eastern block was chosen to be mapped in detail first as it is the more likely to be mined first, given the features noted above, namely, closer to rail, apparent higher grade, apparent uniform grade and few included sedimentary blocks or larger quartz veins.

The cross section profiles are shown in a stacked manner as an ‘isometric projection’ (at 45° rather than the conventional 30°) in Figure 5. The baseline was used for control with variations in elevation between 25 m sections taken into account. Figure 5 thus allows a visualization of the Eastern Magnesite deposit and readily shows the topography as favorable for open cut mining.

General Nature of the Magnesite

The lens of Eastern Magnesite is elongate to oval in plan, about 345 meters long and up to 120 meters wide, averaging close to 100 meters wide (Fig. 4). Freshly broken magnesite is typically a milky white color but weathers to a pale yellow to slightly pinkish color. Exposures of magnesite are commonly coated with a black lichen which appears to locally favor this rock type. The host dolomite to the south is a much darker buff to reddish-brown while the (silty and cherty) dolomite to the north of the thicker magnesite is a medium gray color. Where magnesite contacts with dolomite are exposed, they tend to be quite sharp and easily recognized. Even where bedding-transgressive contacts exist, the boundary tends to be fairly sharp.

Structure

There is no evidence along the north and south contacts that any bedding-parallel faults have played a role; the contacts appear to be essentially conformable to bedding. Cross cutting zones of relatively lower topography do exist at the eastern and western edges of the main body of the Eastern Magnesite and these may reflect northerly-striking faults.

Texture

Texture of the magnesite is variable, ranging from fine and medium grained to very coarse grained. Most of the deposit is of medium and fine grained texture with irregular patches of more coarse grained texture. Areas of coarse-grained ‘granola-textured’ magnesite appear to be irregularly developed within the area of exposed magnesite and are not obviously related to any structure. Furthermore there does not appear to be any correlation between texture and grade.
Figure 3
DRIFTWOOD CREEK MAGNESITE SURFACE GEOLOGY
(Modified after Rodgers, 1989)
Scale 1 : 5,000

Figure 3
DRIFTWOOD CREEK MAGNESITE SURFACE GEOLOGY
(Modified after Rodgers, 1989)
Scale 1 : 5,000
On the south side of the magnesite ridge, a fairly continuous wavy banded unit exists within the magnesite. Banding in this unit is generally parallel to banding in the host dolomite to the south and probably reflects original bedding in the pre-existing dolomite. This unit is relatively low in visible quartz.

Quartz

Thin quartz veins are irregularly distributed through the magnesite, in a near-ubiquitous manner, although the concentration does vary. There are areas with no apparent quartz but these are not extensively developed. The more prominent quartz veins and quartz vein swarms tend to be oriented from N15E to N60E. Similar quartz veins are present in the host dolomite (seen mainly to the south of the magnesite) indicating these quartz veins are not related to development of the magnesite. Another set of quartz veins is relatively flat and seen mainly on the northern cliff exposures. There generally appears to be more quartz on the north side of the Eastern Magnesite ridge, and less on the south side.

There are some fine discontinuous silica bands or laminae within the host dolomite. They tend to be almost paper thin and weather prominently. These silica laminae are not seen within the magnesite and, if they were present originally, may have been amalgamated into the magnesite as it developed and the texture became more massive.

The near-ubiquitous nature of the quartz veining probably makes it impractical to selectively mine areas of low silica content. If the average silica content of the deposit is too high, a gravity separation process could be utilized to remove some of the quartz. One of the bulk samples collected was purposefully taken of rocks with abundant quartz content to have material available for such testing.

Tonnage

Both Kaiser Resources and Canadian Occidental Petroleum estimated the magnesite tonnage based on a series of measured cross-sections. The Canoxy work (Rodgers, 1989) was done in more detail. A series of 17 topographic profiles across the magnesite ridge, at 100 meter spacing, were surveyed and geologically mapped. Fill-in geologic mapping was also done between survey lines. These cross-section profiles were then used to infer a geologic resource, extrapolating the steeply-dipping magnesite to a shallow depth. Kaiser Resources (Morris, 1978) used a similar procedure but on fewer survey lines. The tonnages proposed by the two reports are similar: Kaiser Resources inferred 22,500,000 tonnes of magnesite using a specific gravity of 2.5 while Canoxy inferred a resource of 29,400,000 tonnes (SG of 3.0).

For the Eastern Magnesite alone, Kaiser inferred 3.7 million tonnes while Canoxy inferred 4.8 million tonnes. These tonnage figures rely heavily on the actual depth extent of the magnesite and very little specific data is available to establish that dimension.
Both Kaiser Resources and Canoxy did some diamond drilling on the property. The Kaiser Resources report (Morris, 1978) alludes to some diamond drilling but contains no description of the drilling, no information on the location or number of drill holes and no geochemical analyses of drill core.

In 1990 Canoxy drilled 4 holes from 3 sites at the western end of the 'Eastern Magnesite'. All the holes appear to have been drilled along the southern edge of the magnesite and may not represent the bulk of the deposit. Better grade magnesite was encountered to depths of 35 to 40 vertical meters below the drill collars. Core was split and sampled in 5 foot (~1.5 meter) increments and analyzed for a typical suite of elements. Geochemical results generally support a core zone of higher grade magnesite, compatible with Canoxy’s surface sample results. All samples were also ‘deadburned’ - heated to 1000°C for one hour and analyzed for MgO content.

**Grade**

Magnesite / magnesia grade information is available from a series of widespread surface samples taken by both Kaiser Resources (16 samples) and Canoxy (68 samples) as well as the Canoxy diamond drilling. Contouring of the Canoxy surface sample data supports a higher grade core to the deposit with lower grade margins. In 2000 A. Kikauka sampled a small area of the Western Magnesite with favorable results. In 2001, in association with detailed mapping of the Eastern Magnesite, one cross-section line was selected for sampling to provide additional information on the surface grade. Given the large size of the deposit, the sample data available is still quite sparse but does provide a ‘first approximation’ of the over-all grade.

Visually, the magnesite contains a variable amount of silica as generally narrow seams of quartz (1 to 6%). Margins of the deposit show lower magnesia grades and evidently reflect incomplete development of magnesite from dolomite, as well as inclusion of other sedimentary contaminants. Generally the deposit contains only minor CaO (as calcite or dolomite); content is variable but rarely exceeds 2% except with low grade magnesite. Fe2O3 is mostly less than 1% with values at levels of 1.5% associated only with low grade magnesite. Al2O3 content is less than 2% and commonly much less than1%; again, higher values exist where magnesite grade is low.

For the 20 samples collected in 2001, including representative portions of three bulk samples, the range of values is (see also Appendix 1):

<table>
<thead>
<tr>
<th>Element</th>
<th>Range</th>
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<tbody>
<tr>
<td>MgO</td>
<td>39.98 to 44.42 %</td>
</tr>
<tr>
<td>Fe2O3</td>
<td>0.71 to 1.11 %</td>
</tr>
<tr>
<td>P2O5</td>
<td>0.09 to 0.19 %</td>
</tr>
<tr>
<td>SiO2</td>
<td>2.48 to 13.16 %</td>
</tr>
<tr>
<td>CaO</td>
<td>0.34 to 3.21 %</td>
</tr>
<tr>
<td>MnO</td>
<td>0.02 to 0.04 %</td>
</tr>
<tr>
<td>Al2O3</td>
<td>0.05 to 1.11 %</td>
</tr>
<tr>
<td>TiO2</td>
<td>&lt;0.01 to 0.10 %</td>
</tr>
<tr>
<td>Cr2O3</td>
<td>.001 to .012 %</td>
</tr>
</tbody>
</table>
The contaminants are mainly components of minerals with specific gravity appreciably lower than magnesite and it should be possible to concentrate the magnesite, if deemed necessary, with a gravity separation process.

There are small inclusions of sedimentary rock which are minor within the deposit. These could be selectively mined as waste.

Pockets of higher grade material are evident within the deposit, and early selective mining of this material is possible, but it might prove more economical to incorporate a beneficiation process based on gravity separation, to upgrade more of the magnesite to a higher grade.

3.00 BULK SAMPLING

One of the objectives of the 2001 program was to collect a bulk sample from a better grade area of magnesite, to have such material available for metallurgical testing. About 20 years ago Kaiser Resources built a short road to what was then the most accessible portion of the deposit - the western edge of the Western Magnesite - and took a small bulk sample. Previous sampling by both Kaiser and Canoxy indicated this is a relatively low grade portion of the deposit. Wide-spaced sampling by Canoxy in 1989 indicated that better grade magnesite exists in the core of the Western Magnesite and near the western edge of the Eastern Magnesite. The most logical means of gaining access to a bulk sample site was to use the old drill road built by Canoxy which accesses the west part of the Eastern Magnesite. The roadbed is in fairly good condition as a series of large water bars were put in following the drilling. However the road was covered with an abundance of about 12 year's worth of windfall and about six man-days were required to cut and clear the windfall, clean off small sloughs and modify the numerous deep water bars.

Once road access was obtained to the magnesite ridge, ATV trails were constructed to sites selected for bulk sampling. Three bulk samples were taken from the Eastern Magnesite and a fourth was taken from near the eastern edge of the Western Magnesite (Figure 3).

<table>
<thead>
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<th>Sample location</th>
<th>UTM</th>
<th>Geochem Sample (Appendix 2)</th>
<th>Weight</th>
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<tr>
<td>1. Eastern Magnesite</td>
<td>18</td>
<td></td>
<td>590 kg</td>
</tr>
<tr>
<td>2. Eastern Magnesite</td>
<td>19</td>
<td></td>
<td>820 kg</td>
</tr>
<tr>
<td>3. Eastern Magnesite</td>
<td>-</td>
<td></td>
<td>140 kg</td>
</tr>
<tr>
<td>(Silica-rich sample)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Western Magnesite</td>
<td>20</td>
<td>680</td>
<td></td>
</tr>
</tbody>
</table>

Total of 4 Bulk Samples 2230 kg.
Analytical results of smaller, representative portions of three of the bulk samples are comparable to data gathered by chip sampling along one cross section line of the deposit (Appendix 1). This material provides a representative sampling of some of the magnesite and is now available for metallurgical testing if warranted.

4.00 CONCLUSIONS

Detailed mapping of the Eastern Magnesite has shown the deposit to be a discreet body of magnesite with very few small undesired inclusions.

Detailed surveying of close-spaced cross sectional profiles across the deposit clearly demonstrates the amenability to open cut mining.

Additional rock geochemistry completed in 2001 generally supports earlier results and further shows that most impurities are of fairly low concentration.

Opening the northern access road and constructing ATV trails has allowed the collection of four small bulk samples totaling 2300 kg. This access allows the further collection of bulk samples if required.

5.00 REFERENCES


Reesor, J.E., 1973: Geology of the Lardeau Map-area, east-half, B.C., GSC Memoir 369.

### 6.00 STATEMENT OF EXPENDITURES

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>16 man-days, Peter Klewchuk, field work, @ $100/day</td>
<td>$1600.00</td>
</tr>
<tr>
<td>9 man-days, Daniel Klewchuk, Road clearing, ATV trail &amp; collection of bulk samples, @ $100/day</td>
<td>900.00</td>
</tr>
<tr>
<td>6 man-days, Judy Brunner, Road clearing, ATV trail, @ $100/day</td>
<td>600.00</td>
</tr>
<tr>
<td>4X4 truck, 2912 km @ $0.38/km</td>
<td>1106.56</td>
</tr>
<tr>
<td>Geochemical Analyses 20 samples</td>
<td>454.00</td>
</tr>
<tr>
<td>Freight</td>
<td>49.65</td>
</tr>
<tr>
<td>ATV Rental 3 days @ $50/day</td>
<td>150.00</td>
</tr>
<tr>
<td>Report</td>
<td>800.00</td>
</tr>
<tr>
<td>Food 31 days @ $20/day</td>
<td>620.00</td>
</tr>
</tbody>
</table>

**TOTAL EXPENDITURE**  
$6280.21

### 7.00 AUTHOR'S QUALIFICATIONS

As author of this report, I, Peter Klewchuk, certify that:

1. I am an independent consulting geologist with offices at 246 Moyie Street, Kimberley, B.C.
2. I am a graduate geologist with a B.Sc. degree (1969) from the University of British Columbia and an M.Sc. degree (1972) from the University of Calgary.
3. I am a Fellow of the Geological Association of Canada and a member of the Association of Professional Engineers and Geoscientists of British Columbia.
4. I have been actively involved in mining and exploration geology, primarily in the province of British Columbia, for the past 25 years.
5. I have been employed by major mining companies and provincial government geological departments.

Dated at Kimberley, British Columbia, this 25th day of January, 2002.

[Signature]
Peter Klewchuk  
P. Geo.
| SAMPLE# | SiO2 | Al2O3 | Fe2O3 | MgO | CaO | Na2O | K2O | TiO2 | P2O5 | MnO | Cr2O3 | Ba | Na | Sr | Zr | Y | Nb | Sc | Loi | Tot/C | Tot/S | Sum |
|--------|------|-------|-------|-----|-----|------|-----|------|------|-----|-------|----|----|----|----|---|----|----|----|-----|------|------|-----|
| Mg-01-1 | 4.06 | .96   | .95   | 42.88 | 1.42 | .02  | .02  | .07  | .12  | .02 | .004 | <5 | <20 | 12  | 16  | <10 | 27  | 240 | 4.153 | <.01 | 99.93 |
| Mg-01-2 | 3.53 | .82   | 1.06  | 41.38 | 3.21 | <.01 | <.02 | .05  | .11  | .03 | .012 | <5 | <20 | 26  | 13  | <10 | 14  | 249 | 3.159 | <.01 | 99.92 |
| Mg-01-3 | 4.97 | 1.05  | .89   | 43.13 | .93  | .01  | .02  | .08  | .15  | .02 | .005 | <6 | <20 | 10  | 12  | <10 | 13  | 148 | 7.135 | <.01 | 99.96 |
| Mg-01-4 | 3.64 | 1.11  | 1.05  | 43.64 | .73  | .01  | .02  | .09  | .14  | .02 | .012 | <5 | <20 | 10  | 14  | <10 | 10  | 149 | 7.135 | <.01 | 99.96 |
| Mg-01-5 | 2.75 | .83   | 1.01  | 43.94 | 1.15 | .01  | .05  | .05  | .13  | .02 | .007 | <11 | <20 | 10  | 10  | <10 | 10  | 150 | 7.135 | <.01 | 99.95 |
| Mg-01-6 | 2.48 | .58   | .90   | 44.42 | .80  | .01  | .06  | .04  | .13  | .02 | .007 | 13  | <20 | 10  | 10  | <10 | 10  | 151 | 7.135 | <.01 | 99.95 |
| Mg-01-7 | 9.67 | .70   | .75   | 40.85 | .73  | .01  | .03  | .05  | .13  | .02 | .008 | <5  | 21  | 10  | 10  | <10 | 10  | 152 | 7.135 | <.01 | 99.95 |
| Mg-01-8 | 11.27| .70   | .99   | 39.98 | .79  | .01  | .03  | .06  | .10  | .02 | .004 | <6  | <20 | 10  | 10  | <10 | 10  | 153 | 7.135 | <.01 | 99.95 |
| Mg-01-9 | 13.16| .58   | .91   | 38.90 | .72  | <.01 | .02  | .06  | .11  | .02 | .004 | <5  | <20 | 10  | 10  | <10 | 10  | 154 | 7.135 | <.01 | 99.95 |
| Mg-01-10| 6.51 | .77   | .76   | 42.54 | 1.04 | <.01 | .02  | .07  | .10  | .02 | .003 | <5  | <20 | 10  | 10  | <10 | 10  | 155 | 7.135 | <.01 | 99.95 |
| Mg-01-11| 9.07 | .93   | .76   | 40.63 | .87  | <.01 | .05  | .09  | .17  | .02 | .005 | <5  | <20 | 10  | 13  | <10 | 10  | 156 | 7.135 | <.01 | 99.95 |
| Mg-01-12| 6.89 | .85   | .86   | 42.41 | 1.06 | <.01 | .02  | .07  | .14  | .02 | .002 | <5  | <20 | 10  | 10  | <10 | 10  | 157 | 7.135 | <.01 | 99.95 |
| Mg-01-13| 5.15 | .62   | 1.01  | 42.78 | 1.00 | <.02 | <.02 | .05  | .16  | .02 | .006 | <5  | <20 | 10  | 10  | <10 | 10  | 158 | 7.135 | <.01 | 99.95 |
| Mg-01-14| 5.80 | .92   | 1.11  | 42.07 | 1.20 | <.01 | <.02 | .10  | .19  | .02 | .004 | <5  | <20 | 10  | 11  | <10 | 10  | 159 | 7.135 | <.01 | 99.95 |
| RE Mg-01-14| 5.88 | .94 | 1.08 | 42.96 | 1.00 | <.01 | <.02 | .12  | .003 | <5  | <20 | 10  | 14  | <10 | 10  | 160 | 7.135 | <.01 | 99.95 |
| Mg-01-15| 3.60 | .87   | .73   | 43.60 | .99  | .02  | .03  | .09  | .11  | .02 | .005 | 5  | 22  | 10  | 12  | <10 | 10  | 161 | 7.135 | <.01 | 99.98 |
| Mg-01-16| 3.36 | .75   | .71   | 43.10 | 1.08 | .01  | .02  | .08  | .14  | .02 | .002 | <5  | <20 | 10  | 10  | <10 | 10  | 162 | 7.135 | <.01 | 99.88 |
| Mg-01-17| 3.71 | .84   | .75   | 43.11 | 1.25 | .01  | .03  | .08  | .12  | .02 | .003 | <5  | <20 | 10  | 10  | <10 | 10  | 163 | 7.135 | <.01 | 99.93 |
| Mg-01-18| 4.50 | .88   | 1.11  | 41.86 | 2.61 | .02  | .03  | .01  | .09  | .05 | .008 | <5  | <20 | 16  | 10  | <10 | 10  | 164 | 7.135 | <.01 | 99.97 |
| Mg-01-19| 2.99 | .87   | .76   | 43.71 | 1.17 | .02  | .02  | .06  | .13  | .02 | .007 | 15  | <20 | 11  | 10  | <10 | 10  | 165 | 7.135 | <.01 | 99.88 |
| Mg-01-20| 9.05 | .05   | 1.53  | 41.21 | .34  | .01  | .02  | .01  | .11  | .04 | .001 | <5  | <20 | 10  | 10  | <10 | 10  | 166 | 7.135 | <.01 | 99.97 |

| STANDARD SD-17/CSB | 61.65 | 13.64 | 5.85 | 2.35 | 4.68 | 4.12 | 1.38 | .62 | 1.01 | .53 | .453 | 401 | 31 | 283 | 363 | 27 | 29 | 23 | 3.4 | 2.37 | 5.30 | 99.82 |

GROUP 4A: 0.200 GM SAMPLE BY LIBG FUSION, ANALYSIS BY ICP ES, LOI BY LOSS ON IGNITION.
TOTAL C & S BY LECO. (NOT INCLUDED IN THE SUM)
SAMPLE TYPE: ROCK R150
Samples beginning 'RE' are Reruns and 'R' are Reject Reruns.

DATE RECEIVED: DEC 12 2001
DATE REPORT MAILED: Dec 20 2001
SIGNED BY: D. JOYE, C. LEONG, J. WANG; CERTIFIED B.C. ASSAYERS

All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of the analysis only.
PROSPECTOR'S ASSISTANCE REPORT

on

GEOLOGIC MAPPING & ROCK GEOCHEMISTRY

DAVID CLAIMS

Moyie River Area

FORT STEELE MINING DIVISION

TRIM MAP 82F040
NTS 82 F/81:

Latitude 49° 22' N
Longitude 116° 07' W

UTM 5468300 N, 562900 E

By

PETER KLEWCHUK, P.Geo.

January, 2002
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1.00 INTRODUCTION

1.10 Location and Access

The David property is located in southeastern British Columbia, in the Fort Steele Mining Division, approximately 30 kilometers southwest of Cranbrook, centered approximately at UTM coordinates 5468300 N 562900 E (Figs. 1 & 2).

The property is readily accessible by road, via Highway 3/95 south of Cranbrook and the Lumberton, Moyie and then Kutlits Creek or North Moyie logging roads.

1.20 Physiography

The David claims cover portions of east-flowing North Moyie River and Kutlits Creek, both tributaries of the Moyie River and include moderate to rugged, wooded mountainous topography with elevations ranging from 1500 to 2150 meters. Hillsides are forested with a mixture of pine, larch, spruce and fir. A number of logged clear cuts exist on the property, ranging in age from about 5 to 20 years old.

1.30 Property

The David property consists of thirteen contiguous 2-post claims, staked in the names of Lloyd Morgan of Cranbrook, B.C. and Peter Klewchuk of Kimberley, B.C.

1.40 History of Previous Exploration

Moyie River, Perry Creek and numerous of their tributary streams have produced considerable placer gold, with many small placer operations active on a small scale basis. Knowledge of this placer gold has spurred long-standing exploration activity for bedrock sources. A number of small lode gold occurrences were discovered and a few have seen very minor production. Virtually all of the lode gold has come from relatively small quartz veins, usually in association with minor base metal sulfides. The advent of historically high gold prices in the late 1970's prompted staking which blanketed these areas of known placer production.

Exploration activity has been constrained by the extensive coverage of glacial drift, and although many small exploration programs have been undertaken, few have been successful at delineating drill targets. Within the past 25 years logging activity has enhanced the exploration process by providing road access and exposing bedrock along haul roads and skid roads.
Modern interest in the David area arose in 1989 when prospecting activity discovered significant gold mineralization within a quartz-enriched shear system in bedrock exposed at surface near the headwaters of Kutlits Creek (Kennedy & Klewchuk, 1990, A.R. 20,365).

Within the next two years Dragoon Resources Ltd. explored the David claims utilizing geological mapping, soil and rock geochemistry, geophysics and diamond drilling, and established a 'drill-indicated' gold resource of just less than 100,000 tonnes of 10 grams gold/tonne (Murrell et al. 1991). The gold mineralization is within a steep west-dipping, north-northeast-striking shear zone which averages more than two meters in thickness. Most of the drilling was carried out during the winter of 1990-91.

In 1999 and 2000, small programs of rock geochemistry were utilized to evaluate areas near the main zone of gold mineralization, where previous exploration had identified high gold values in soils and rocks (Klewchuk, 2000 & 2001, A.R.s. 26,165 & 26,471).

In the summer of 2000 a wildfire burned through part of the David claims, including areas near the main showings of gold mineralization. The fire improved exposure of bedrock and new trails created to fight the fire exposed new bedrock and new float material. The rock geochemistry program in 2000 took advantage of this new and improved exposure on the claims.

1.50 Scope of present program

During the late summer of 2001 a program of geologic mapping/prospecting and rock geochemistry was conducted in part to follow-up on favorable rock geochemistry results obtained in 2000. The new fire access and fire guard roads created by fire fighting crews in 2000 were prospected in detail. Geologic mapping included developing stratigraphic control by locating and identifying unique Aldridge Formation stratigraphic markers, to help determine any movement along the main David shear zone.

Four 2-post claims were added to the northwest edge of the property to cover a prospective exploration target.

2.00 GEOLOGY

2.10 Regional Geology

The David property in southeastern British Columbia lies within the Purcell Anticlinorium, a geologic sub-province between the Rocky Mountain Thrust and Fold Belt to the east and the Kootenay Arc to the west. The core of the Purcell Anticlinorium is made up of the Mesoproterozoic Purcell Supergroup, an eleven kilometer thick succession of fine-grained terrigenous clastic, carbonate and very minor volcanic rocks.
The basal member of the Purcell Supergroup is the Aldridge Formation, a thick sequence (~4000 meters) of fine-grained siliciclastic rocks deposited largely by turbidity currents. Reesor (1958) has divided the Aldridge Formation in the Purcell Mountains into three informal units: rusty weathering siltstone, quartzitic wacke and argillite of the lower Aldridge Formation; grey weathering quartz wacke and siltstone of the middle Aldridge Formation; and laminated argillite of the upper Aldridge Formation.

The base of the lower Aldridge Formation is not exposed; within southeastern British Columbia this unit is about 1500 meters thick; the middle Aldridge is about 2500 meters thick and includes periodic inter-turbidite intervals of thin bedded, rusty-weathering argillites some of which form finely laminated marker beds that are time stratigraphic units and which can be correlated over great distances within the Aldridge basin and equivalent stratigraphy in the United States. The upper Aldridge Formation is about 300 meters thick. The lower and middle units of the Aldridge Formation are host to a proliferation of gabbroic to dioritic composition Moyie Intrusions, predominantly as sills. These intrusions are interpreted to be penecontemporaneous with deposition of their host sediments (Hoy, 1989).

The Aldridge Formation is gradationally overlain by shallower-water deltaic clastics of the Creston Formation. The Creston Formation is in turn overlain by predominantly dolomitic siltstones of the Kitchener Formation. Moyie Intrusions are rarely present within the Creston and Kitchener Formations.

Cretaceous granodiorite and quartz monzonite intrusives cut through these Purcell Supergroup rocks as batholiths and small stocks. Apparently late-stage quartz monzonite to syenite composition intrusives of this suite are known to occur locally as dikes within fault structures.

The Purcell Anticlinorium is transected by a number of steep transverse and longitudinal faults. The transverse faults appear to have been syndepositional (Lis and Price, 1976) and Hoy (1982) suggests a possible genetic link between mineralization and syndepositional faulting.

Longitudinal faults which more closely parallel the direction of basin growth faults may have played a similar role. Gold mineralization, most of which is believed Cretaceous in age, appears to be related to felsic intrusive activity and controlled by fault or shear structures.

Detailed interpretation of structure is hindered by the thickness and monotonous character of some of the litho-stratigraphic units. For example, the middle Aldridge Formation is lithologically quite uniform over a thickness of almost 2500 meters. Furthermore, glacial drift cover is extensive and recessive-weathering structural breaks that might host gold mineralization are usually not well exposed.
2.20 Property Geology

The David property is underlain by fine-grained clastic rocks of the middle Aldridge and Creston Formations. Bedding is northeast-striking with steep to moderate west dips. Structure on the claim block is dominated by NNE-striking, steeply west-dipping faults and shear zones with both normal and reverse movement. The most prominent of these is the Old Baldy Fault which crosses the northwest portion of the property and separates middle Aldridge Formation on the east from Creston Formation on the west (Fig. 3). No transverse east-striking faults are known although topographic linear of this orientation, namely Kutlits and North Moyie Creeks, suggest such breaks may be present.

Numerous small northeast-oriented quartz veins are present and many carry anomalous gold mineralization. The main zone of gold mineralization on the property is a NNE-striking shear zone (David Shear - Fig. 3) composed of wavy, lensey quartz veins and intensely sheared middle Aldridge Formation sediments. The gold mineralized zone and its immediate host rocks are characterized by strong silicification, related bleaching and elevated lead and copper values. Chlorite and pyrite occur within and marginal to the mineralized zone. Surface trenching and subsequent diamond drilling by Dragoon Resources Ltd. in the early 1990's established a 150 meter long by 150 meter deep extent to the higher gold values, with a resultant 'drill-indicated' tonnage and grade of "approximately 96,000 tonnes grading 13.08 grams/tonne gold (uncut) or 7.11 grams/tonne gold (cut)" (Murrell et al. 1991). Assay values greater than 30 grams/tonne gold were cut to 30 grams/tonne gold.

Another shear zone, the 'West Shear' is parallel to and about 250 meters northwest of the David Shear. Quartz veining, shearing and alteration within the West Shear are very similar to the David Shear although previous sampling had returned mainly low gold values. Prospecting and mapping along the fire roads in 2001 confirmed an extensive zone of limonitic alteration associated with the West Shear and its strike extension. The various improvements in bedrock and float exposure caused by the 2000 fire and related fire-fighting activity have made it much more obvious that the West Shear is very similar in general character to the David Shear. Rock geochemistry in 2000 located a few higher gold values within or near the West Shear and sampling activity in 2001 was conducted near the West Shear and its projection to the northeast.

A number of northeast-oriented gabbro to diorite composition sills and/or dikes cross the claims; geologic mapping done in the early 1990's established that some of these mafic intrusives are discontinuous, presumably due to structural attenuation during lateral movement along zones of northeast shearing (Klewchuk, 1991. A.R. 20,873).

Geologic work in 2001 was focused on establishing stratigraphic control in the immediate area of the David gold-mineralized shear zone to resolve any movement on that structure. In addition, further detailed prospecting/geologic mapping covered the numerous fire roads established in 2000. Control for geologic mapping was maintained by using a Garmin 12 XL hand-held GPS receiver.
Nine individual marker occurrences were located in the field; samples were collected, cut with a rock saw and matched by correlating with known standards. Markers from eight sites were identified while one remains unmatched. The eight identified markers correlate with three distinct stratigraphic markers from the upper half of the middle Aldridge Formation, and named by Cominco Ltd. as the Shaft, Meadowbrook and Sundown markers (Fig. 3).

The stratigraphically highest of these, the Shaft marker, occurs northwest of the West Shear. Separate Meadowbrook markers occur a short distance east of both the West Shear and David Shear. Immediately southwest of the claim block, Meadowbrook markers occur in two proximal localities and it appears the marker is split by intervening turbidite material. East of the claims, the Sundown marker was located in two places, immediately below a relatively thick gabbro sill.

Gabbro sills tend to follow stratigraphy but they can be used only as rough stratigraphic markers because they also can be erratic. Both Sundown and Meadowbrook markers are regionally associated with gabbro sills: commonly there is only one 'Sundown sill' and one 'Meadowbrook sill' but in places more than one sill can occur with either marker. On the David claims, the Meadowbrook marker occurs about 50 to 100 m above a gabbro sill and the Sundown marker occurs just below the thickest sill seen on or near the property. It appears there is more than one sill associated with each of the Meadowbrook and Sundown markers in the David area.

Both the West Shear and David Shear are more steeply-dipping than their host sediments. This relationship combined with the distribution of markers indicates the West Shear is a normal fault and the David Shear is a reverse fault, thus making the intervening block a horst. This structural relationship may have a bearing on the localization of gold in the David Shear. The regional Old Baldy Fault to the west is of normal movement. East of the David Shear, the stratigraphic distance between the Meadowbrook marker and the Sundown marker northeast of the claim block is much greater than normal, suggesting there is an intermediate structure with reverse movement.

The over-all structural picture is further complicated by a northeast-trending fault which crosses the south portion of the claims with a near-vertical dip and west-side up, reverse sense of movement. Although this structure appears separate from the David Shear, it may actually bend into the David Shear.
3.00 ROCK GEOCHEMISTRY

Seventeen rock chip samples were collected during the course of field work at the David property in 2001. All of the samples are of float material along the recently disturbed areas of the fire roads and from burned areas on the claims where the fire cleaned the lichen from rocks. The samples collected are of various styles of quartz veining, including massive quartz veins, quartz breccias and sheared sediments with quartz veins. All these styles of silicic alteration can be significantly gold-mineralized within the main David Shear.

Samples were analyzed for geochemical gold and a 30 element ICP package by Acme Analytical Laboratories Ltd. of 852 East Hastings Street, Vancouver, B.C., V6A 1R6. Sample locations are shown in Figure 3 (along with samples collected in 1999 and 2000; see A.R.'s 26.165 and 26.471). Sample descriptions are provided in Appendix 1 and complete analytical results are in Appendix 2.

Rock geochemistry results in 2000 included 2 bedrock samples with gold values of 1.15 and 3.17 grams/tonne (Klewchuk, 2001, A.R. 26.471). Both samples were taken essentially from one locality NNW of the main David shear zone. Geologic mapping available at the time suggested the anomalous samples could be from the northern extension of the West Shear. Previous sampling of this zone had returned only low gold values. However the David shear can be traced for 900 meters but is currently known to contain 'ore grade' gold values only within a 150 meter strike length. This limited gold mineralized zone within the shear suggests there may be a cross-cutting control for the mineralization. If this is the case, then the shear zone west of the David may host ore grade gold mineralization where this hypothetical cross-cutting feature intersects. For this reason, more detailed sampling was done along the strike length of the West Shear than elsewhere.

Unfortunately, the fire roads were recontoured some time after the fire was extinguished and the site of the higher grade samples collected in 2001 was not located; evidently the rock outcropping originally sampled was covered up by recontouring of the road.

Results

Only one of the seventeen rock samples collected in 2001 on the David property has a gold value over 500 ppb (890 ppb; Appendix 2). This sample is from west of the West Shear and from a previously unknown zone of alteration, possibly a third northeast-trending shear zone or a cross-cutting fault structure. The sample is of float material within a zone of alteration exposed within the disturbed material of one of the fire roads. Only one other sample is above 100 ppb (271 ppb; Appendix 2). The sample results do indicate that weaker anomalous gold mineralization is quite widespread on the claims.
4.00 CONCLUSIONS

Prospecting of recontoured fire roads has shown that the David Shear and West Shear have similar quartz veining, shearing and alteration; they remain the primary exploration targets on the property.

Detailed geologic mapping on the David claims in 2001 has considerably enhanced the structural picture on the property. Evaluation of unique middle Aldridge Formation marker stratigraphy indicates that the West Shear has normal movement and the David Shear has reverse movement. Both shear zones are similar in character although to date only the David Shear is known to host significant gold mineralization.

Rock sampling on the David claims was focused near the West Shear but was unsuccessful at defining a zone of better gold mineralization. The highest gold value obtained during the program, from west of the West Shear, may represent a third shear zone or a cross-cutting structure.

5.00 REFERENCES


Hoy, T., 1989 The age, chemistry and tectonic setting of the Middle Proterozoic Moyie Sills, Purcell Supergroup, Southeast British Columbia: Canadian Journal of Earth Sciences, V.26, p. 2305-2317.


6.00  STATEMENT OF EXPENDITURES

12 man-days, field work. @ $100/day $1200.00
4X4 truck 936 km @ $0.38/km 355.68
Geochemical Analyses 17 samples 284.75
Freight 8.75
Report 800.00
Food 12 days @ $20.00 240.00

TOTAL EXPENDITURE $2889.18
7.00 AUTHOR’S QUALIFICATIONS

As author of this report, I, Peter Klewechuk, certify that:

1. I am an independent consulting geologist with offices at 246 Moyie Street, Kimberley, B.C.
2. I am a graduate geologist with a B.Sc. degree (1969) from the University of British Columbia and an M.Sc. degree (1972) from the University of Calgary.
3. I am a Fellow of the Geological Association of Canada and a member of the Association of Professional Engineers and Geoscientists of British Columbia.
4. I have been actively involved in mining and exploration geology, primarily in the province of British Columbia, for the past 25 years.
5. I have been employed by major mining companies and provincial government geological departments.

Dated at Kimberley, British Columbia, this 25th day of January, 2002.

Peter Klewechuk  
P. Geo.
Appendix I.

2001 ROCK GEOCHEMISTRY
Sample Description

D-01-1  Banded limonitic quartz float with bands of oxidized, fine-grained pyrite.
D-01-2  Bleached fine-grained quartzite or siltstone, orange-brown limonite (float).
D-01-3  Float, quartz-breccia boulder. Reddish-brown hematitic with orange-brown
   limonitic, phyllitic included sediments. Disseminated oxidized pyrite ranges from
   very fine-grained to 2-3 mm diameter.
D-01-4  Quartz float. Fairly white, minor associated phyllitic sediments. Reddish-brown
   limonite. Patchy fairly coarse (2-3 mm) pyrite.
D-01-5  Series of coarse quartz veins cutting bleached orange-yellow limonitic siltstone.
   Quartz veins up to 1.5 cm. Coarse granular quartz, vuggy. Possible minor pyrite.
   Float.
D-01-6  No description!
D-01-8  Float banded quartz, yellow-brown limonitic. Numerous leached pyrite grains ~1
   mm diam.
D-01-9  Float. Banded very limonitic stained quartz with minor phyllitic sediments.
D-01-10  Quartz breccia, typical of zone marginal to larger gold-mineralized quartz veins.
   Float.
D-01-11  Float. Quartz vein breccia with thin light gray, cross-cutting quartz veins and
   oxidized pyritic thicker veins to ~1.5 cm. Reddish-brown to yellow-brown
   limonitic.
D-01-12  Thin quartz vein breccia. Silty argillite host. Strongly limonitic thin sub-parallel
   quartz veins. 2-3 mm thick, possibly part of shear zone. Vuggy. All pyrite
   oxidized.
D-01-13  Brecciated quartzite. Bleached light gray to yellow-white. Parallel-trending thin
   very rusty quartz veins and open lensey vugs. Few cross-cutting thin quartz veins.
   Also rusty.
   Some light gray, thin, relatively non-rusty. Some lensey, open vuggy and strongly
   rusty.
D-01-15  Quartz vein breccia. Quartz veins up to 1 cm. Coarse quartz, rusty and vuggy.
   Silty altered sediments. Float.
D-01-16  Quartz vein breccia. Series of thin, parallel-trending quartz veins 1-3 mm wide.
   Very limonitic, dark reddish hematitic oxidation. Float.
D-01-17  Orange limonitic fault (?) material with small quartz veins, some pyrite. Altered
   sediments with light gray cross-cutting thin quartz veins.
### Geochemical Analyses Certificate

**Kleuchuk, Peter**  
File # A104336  
246 Hoyle St., Kimberly BC VIA 2N8  
Submitted by: Peter Kleuchuk

| SAMPLE | Mo | Cu | Pb | Zn | Ag | Co | Ni | Cr | Mn | Fe | As | U | Au | Th | Sr | Cd | Sb | Bi | V | Ca | P | Be | Mg | Ba | Ti | B | Al | Na | K | W | Cr | Pb |
|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| S1     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| D-01-1 | 3  | 7  | 2  | 1  | 0  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| D-01-2 | 3  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| D-01-3 | 4  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| D-01-4 | 4  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

**Group 10**: 0.50 gm sample leached with 3 ml 2-2-2 HCl-HNO3-H2O at 95 deg. for 1 hour, diluted to 10 ml, analysed by ICP-ES.

**Upper Limits**: Al, Au, Ga, Hg = 100 ppm; Mo, Co, Cd, Sb, Bi, Th, U & B = 2,000 ppm; Pb, Zn, Ni, Mn, As, V, La, Cr = 10,000 ppm.

**Assay recommended for rock and core samples if Cu Pb Zn As > 1%, As > 50 ppm & Au > 1000 ppm**

**Sample Type**: Rock R150  
**Method**: Ignition by acid leached, analysed by ICP-MS (10 g).

**Samples beginning 'RE' are refuse; 'RRE' are reject refuse.

**Date Received**: Dec 12 2001  
**Date Report Mailed**: Dec 19/01  
**Signed by**: D. Toye, C. Leong, J. Wang; Certified B.C. Assayers

---

Appendix 2. Geochemical analyses of rock samples, David claims.

All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of the analysis only.