ARIS SUMMARY SHEET

District Geologist, Prince George — Off Confidential: 94.11.29

ASSESSMENT REPORT 23301 — MINING DIVISION: Omineca

PROPERTY: Par
LOCATION: LAT 55 58 00 LONG 124 45 00
UTM 10 6203538 390764
NTS 093N15E 093N15W
CLAIM(S): Echo 6-8
OPERATOR(S): Cominco
AUTHOR(S): Rhodes, D.
REPORT YEAR: 1994, 15 Pages
COMMODITIES SEARCHED FOR: Lead,Zinc
KEYWORDS: Proterozoic-Devonian,Sediments,Thrust,Old island arc
WORK DONE: Geological,Geochemical
GEOL 1300.0 ha
Map(s) - 2; Scale(s) - 1:10 000,1:100 000
SOIL 57 sample(s) ;ME

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS 93-N-15

1993 ASSESSMENT REPORT

WHISTLER 9, ECHO 6-9 inc., PAR PROPERTY

Record No's 303740, 306622 - 306625 incl.

Osilinka River

Omineca Mining Division

LATITUDE: 55°58'N

LONGITUDE: 124°°45'W

CLAIMS 100% OWNED BY COMINCO LTD.

OPERATOR: COMINCO LTD.

FEBRUARY, 1994

D. RHODES
SENIOR GEOLOGIST

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PLATES (within pouches)

COMINCO LTD.

EXPLORATION
NTS. 93-N-15

WESTERN DISTRICT
FEBRUARY, 1994

ASSESSMENT REPORT - 1993

PAR PROPERTY - CLAIMS WHISTLER 9, ECHO 6-8 INCL.

1. SUMMARY

Between July 31 and August 1, 1993, geological mapping and sampling of soil geochemical contour traverses was undertaken on the Whistler 9 and Echo 6,7 and 8 claims. The results of this mapping along with the soil geochemical data are presented on Plate 93-1

In the geological mapping the older names for much of the stratigraphy have been used with the more recent names of Ferri (1992,1993)presented in brackets. The geology on the claims consists of Lower Cambrian Boya Fm. (Mt Brown Fm.) quartzites and phyllitic mudstones and siltstones succeeded by Lower to Middle (?) Cambrian Rosella Fm. (Mt. Kison Fm.) argillaceous limestones with lesser shales and siltstones and by Lower Silurian (Ordovician?) to Lower Devonian Sandpile (Echo Lk.) Gp. limestones and dolomites.

Geological mapping and fossil age dating indicates an age gap between the basal Sandpile Gp. lithologies and underlying trilobite rich shales. This is not understood but may be due to an unconformity or to some regional thrust. Spectacularly thick and coarse dolomite breccias occur at the base of the Sandpile Gp. and represent a geologically anomalous condition though their genesis is not presently understood. Moderately to occasionally quite anomalous lead/zinc values occur in soil samples on Echo 7 and 8 claims.

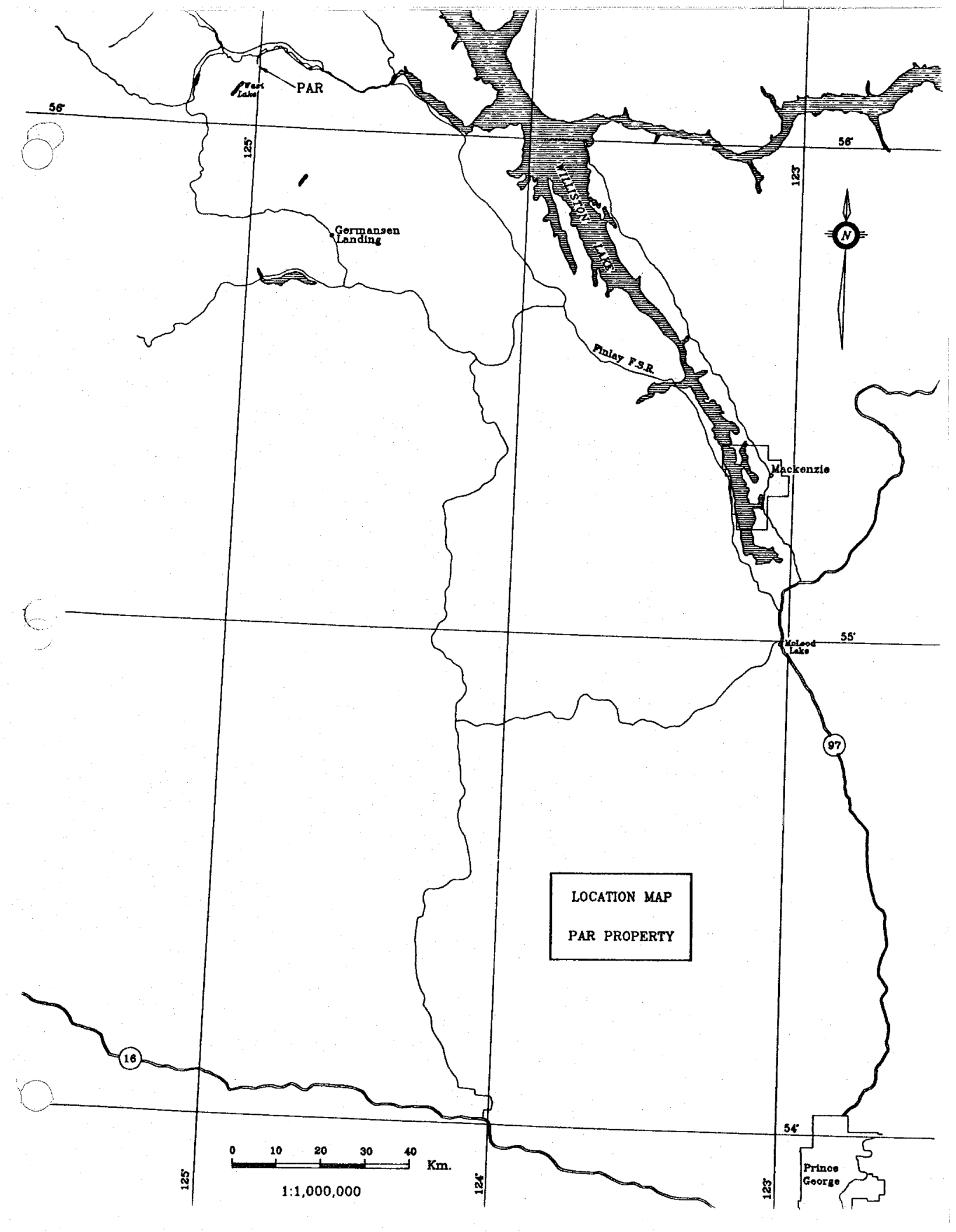
It is recommended that several more days be spent further prospecting, mapping and contour soil sampling in the vicinity of the anomalous soil geochemistry.

2. LOCATION AND ACCESS

The Whistler and Echo claims form part of the larger Par Property. The property is located 230 kilometres by road northwest of Windy Point on the Prince George- Mackenzie Highway 97 (See Figure 1 and Plate 2). Access is along the paved road to Windy Point, then via the Finlay Forest Road north to the Omineca Logging Camp, then from there west along the Osilinka Mainline to Km.21. At that point the Wasi Main Line branches off and follows the southern shores of the Osilinka river to the base camp (Par property), a distance of 14 km. Access to the Whistler and Echo claims was by helicopter from the Par Base camp.

3. TENURE

The Par property comprises 977 units. This report concerns only the work undertaken on claims Whistler 9 and Echo 6,7 and 8 claims. The work is all applied to Echo 7 and 8 listed below. All are 100% owned by Cominco Ltd. Expenditures in 1993 totalled $7232.80, details are given in Appendix 1.


PAR
Germansen Landing
Finlay F.S.R.
Mackenzie
McLeod Lake
Prince George
56'
55'
54'
125'
124'
123'
97
16
N
0 10 20 30 40 Km.
1:1,000,000
LOCATION MAP
PAR PROPERTY

Claim Name	Tenure No	Unit	Due Date
Echo 7	306623	20	Nov. 30/95
Echo 8	306624	18	Nov. 30/95

4. HISTORY

The only work known from the area of the traverses is some Cominco prospecting and stratigraphic section measuring in 1992. Records of prospecting by Cominco and others in the immediate vicinity go back to 1927 when many showings of lead/zinc/silver mineralization were found in dolomitic breccias in the Osilinka River region. One of these showings was the Crin lead and zinc showing located about a kilometre west of Whistler 9. This showing and others lying to the west of the Whistler and Echo claims were explored by Cominco in programs of trenching, soil sampling and mapping from 1973 to 1975. These trenches exposed erratic and low grade Pb/Zn/Ag mineralization in dolomitic breccias of the Devonian McDame Fm. The last recorded work on the Crin showings was by Equinox Resources in 1988 when several diamond drill holes were drilled in the vicinity of the showings, intersecting short lengths of lead/zinc mineralization.

5. 1993 WORK

The 1993 work consisted of three man days of geological mapping conducted by geologists M.G.Westcott, I.A. Neill and D.Rhodes and two days of contour soil sampling by temporary assistants M. Hamilton and N. A. Kern. This work was undertaken by means of helicopter out of the Par base camp between July 31 and August 1.

6. GEOLOGY

The general geology of the Par claims consists of sedimentary rocks ranging in age from upper Proterozoic through to Upper Devonian that lie within the Cassiar Terrane - a portion of the ancestral North American continental margin displaced by movement on the Tintina Fault. Younger Upper Devonian to Permian allocthonous rocks of island arc to oceanic crust origin have been thrust easterly over the continental rocks.

The first geological mapping in the area , on a 1/250,000 scale was in 1945 (Armstrong, J.). The most recent mapping was done in 1989 by Filippo Ferri and others at a scale of 1/50,000. Ferri's map (1990) used stratigraphic subdivisions consistent with previous mapping in the Cassiar Terrane. In subsequent mapping (1992) he revised the nomenclature to create new stratigraphic units. This report and the accompanying map use the earlier nomenclature with the equivalent new stratigraphic units shown in brackets. In part this reflects problems with the new stratigraphy as defined and also the thought that where the rocks resemble stratigraphic descriptions from other parts of the Cassiar terrane (ie McDame area) the older terminology should be adhered to.

The mapped geology on the claims consists of Lower Cambrian Boya Fm. (Mt Brown Fm.) quartzites and phyllitic mudstones and siltstones succeeded by Lower to Middle (?) Cambrian Rosella Fm. (Mt. Kison Fm.) argillaceous limestones with lesser shales and siltstones and by Lower Silurian (Ordovician?) to Lower Devonian Sandpile (Echo Lk.) Gp. limestones and dolomites. The rock types are adequately described in the legend and map notes of Plate 93-1. Geological details of significant stratigraphic and/or economic importance are further discussed below.

The only definitive age dates comes from trilobites in shales, immediately below the Sandpile (Echo Lk.) Gp. carbonates, that have been dated as Middle Cambrian (Appendix 3) and from two hole crinoids in carbonates overlying the Sandpile (Echo Lk) Gp., off the claims, to the west, that give a Lower Devonian age. The Middle Cambrian age date raises uncertainties about the stratigraphy and age associations as defined by Ferri. The shales and argillaceous limestones from which the trilobites came lie on Razorback Ridge and are the type section for Ferri's Razorback Gp. that was thought to be of Middle Cambrian to Lower Ordovician age. The trilobites, at the top of the section, indicate that the lithologies are no younger than Middle Cambrian. Since the rocks bear many similarities to lithologies of the underlying Lower Cambrian Rosella (Mt. Kison) Fm. this report has chosen for the present to include them with the Rosella Fm. and not use the Razorback Gp. designation. The presence of Middle Cambrian strata immediately below lithologies which distinguish the Sandpile (Echo Lk.) Gp. regionally, suggests that the Sandpile (Echo Lk.) Fm. might span all of Upper Cambrian to Lower Devonian time. This is thought to be unlikely because of the considerable time involved and also because similar Sandpile (Echo Lk.) Gp. lithologies lie directly on rocks to the north that can be dated as Ordovician by graptolites in one location and as Lower Cambrian by Salterella sp. in a second. All of this evidence suggests that the lower contact of Sandpile (Echo Lk.) Gp. is disconformable with underlying strata. The nature of this contact is enigmatic - it may be an unconformity however no evidence for erosion has yet been observed other than the age disparity - alternatively it may be that some low angle thrust of regional extent seperates the Sandpile (Echo Lk.) Gp. from underlying units.

Spectacular, several hundred metre thick, coarse breccias occur at the bottom of the Sandpile Gp. and overlie the Middle Cambrian Rosella (Mt. Kison) Fm.. These breccias are composed of angular clasts that range in size from less than one centimetre to much greater than a metre. The clasts are formed from typical Sandpile Gp. lithologies of shallow water to peritidal origin including burrow, fenestral, oncolitic and cryptalgal laminated textures. The matrix of the breccias ranges from a slightly recrystallized medium grey dolomite silt or sand to coarse white sparry dolomite. The origin of these breccias is at present uncertain. On the Whistler/ Echo claims they appear to be succeeded up section by normal, well bedded Sandpile (Echo Lk.) Gp. lithologies.

The Sandpile (Echo Lk.) Gp lithologies in the map area are identical with similar lithologies to the north but are, excluding the breccias, dominantly limestones with only some dolomitization. To the north of the map area the whole of the Sandpile (Echo Lk.) Gp. section is dolomitized while to the south the entire section is limestone. The map area therefore seems to be at the southern limits of the dolomitization that has affected the Sandpile (Echo Lk.) Group.

7. GEOCHEMISTRY

Method

The soil sampling lines were run along preselected elevations and samples were taken at 100 metre intervals along the lines. At each sample location a small pit was dug with a shovel and a 300 gram sample of the B soil horizon was retrieved and placed in a kraft paper bag. The bag was annotated with the grid coordinates and notes were taken of the colour, nature and surroundings of the sample and sample site. These samples were shipped to Cominco's Exploration and Research Laboratory at 1482 E. Pender St. in Vancouver. There the samples were dried, sieved and a 1 gram portion of the -80 mesh fraction was extracted. This sample was subsequently digested by reverse aqua regia and presented to the ICP. machine for analysis of a 27 element suite.

Results

The analyses are presented in Appendix 2 while the values for copper, lead,zinc and silver are listed beside their respective sample sites on Plate 93-1. Moderately anomalous values in lead (>100 ppm.) and zinc (> 500 ppm.) occur on the southern part of Echo 7 and Echo 8 with some very anomalous values locally (1472 ppm lead,2516 ppm. zinc).

8. CONCLUSIONS AND RECOMMENDATIONS

Geological mapping and fossil age dating indicates an age gap between the basal Sandpile Gp. lithologies and underlying trilobite rich shales. This is not understood but may be due to an unconformity or to some regional thrust. The breccias at the base of the Sandpile Gp. are spectacularly thick and coarse and represent a geologically anomalous condition though their genesis is not presently understood. Moderately to occasionally quite anomalous lead/zinc values occur in soil samples on Echo 7 and 8 claims.

It is recommended that several more days be spent further prospecting, mapping and contour soil sampling in the vicinity of the anomalous soil geochemistry.

REFERENCES

Armstrong, J.E. 1949: Fort St. James Map Area, GSC Memoir 252

Ferri,F et al 1990: Geology between Nina Lake and Osilinka River: B.C. Ministry of Energy, Mines and Petroleum Resources, Open File 1990-17

Ferri,F et al 1992: Geology of the Uslika Lake Area: B.C. Ministry of Energy, Mines and Petroleum Resources,Open File 1992-11

Reported by:

D.Rhodes
Senior Geologist

Endorsed by: for release

J.M. Hamilton, P. Eng.
Manager, Exploration
Western Canada

Distribution:
JMH→WD Files
Government (2)

DR/dr

APPENDIX I

STATEMENT OF
TOTAL EXPENDITURES WHISTLER 9,ECHO 6-9inc.

PERIOD JULY 31 - AUGUST 1

GEOLOGY:				
Field:				
Staff Costs:	MGW 1 day	$300.00		
	DR 1 day	460.00		
	IAN 1 day	215.00		
			$975.00	
REPORT WRITING & DOCUMENTATION				
Staff Costs:	MGW 0.5 day	$163.15		
	IAN 0.5 day	107.15		
	DR 1.0 day	460.00		
			717.50	
				$1692.50
GEOCHEMISTRY				
Salaries:	NK 1 day	$163.15		
	MH 1 day	163.15		
			326.30	
Analyses: 57 samples @ $8/ea			456.00	
Supplies:			100.00	
				882.30
HELICOPTER: 4.5 hours @ $700/hr				3150.00
BOARD/ACCOMODATION: 6 days @ 118.00/d				708.00
APPORTIONED EXPENSES				500.00
DRAFTING				300.00
TOTAL				**$7,232.80**

APPENDIX II

GEOCHEMICAL ANALYSIS

S9329722	177453*22	2Y231	18	33	90	<.4	5	122	<1	10	26	3.33	<2	24	<5	<5	51	<2	<2	13	3	15	183	.49	.01	1.78	.40	.01	.06
S9329723	177454*21	2G241	19	38	158	<.4	9	77	<1	7	25	1.52	<2	18	<5	<5	31	<2	<2	35	14	26	660	5.67	.03	1.11	9.73	.02	.04
S9329724	177455*22	2B231	15	46	251	<.4	7	123	2	13	30	2.33	2	27	<5	<5	62	<2	<2	26	12	18	915	2.97	.04	2.01	5.00	.01	.05
S9329725	177456*22	2B241	11	124	849	<.4	16	136	5	10	42	3.57	2	47	<5	<5	130	<2	<2	13	16	18	1040	1.52	.06	2.88	2.14	.01	.05
S9329726	177457*22	2B231	14	48	213	.4	<2	68	1	11	38	2.11	<2	39	<5	<5	63	<2	<2	32	13	19	1385	5.63	.01	1.31	10.19	.01	.02
S9329727	177458*24	2B232	1	14	57	<.4	<2	19	2	1	9	.29	<2	5	<5	<5	13	<2	<2	27	4	3	602	8.64	<.01	.26	14.98	.02	.01
S9329728	177459*24	2B231	3	17	95	<.4	<2	40	2	3	13	.92	<2	11	<5	<5	28	<2	<2	16	4	4	553	6.88	.01	.84	11.70	.01	.02
S9329729	177460*24	2B231	18	106	312	<.4	<2	145	2	7	31	1.45	2	17	<5	<5	52	<2	<2	41	8	6	364	5.86	.04	1.17	9.95	.01	.05
S9329730	177461*24	1B231	7	68	267	<.4	8	78	5	4	21	1.20	<2	13	<5	<5	43	<2	<2	25	8	7	1407	7.64	.01	1.10	13.05	.01	.02
S9329731	177462*24	2B231	7	99	629	<.4	7	125	10	8	25	2.82	<2	30	<5	<5	97	<2	<2	11	8	10	2547	1.07	.04	2.25	1.84	.01	.03
S9329732	177463*22	2Y232	8	160	755	<.4	<2	131	11	8	31	2.93	2	30	<5	6	112	<2	<2	14	14	16	1700	1.73	.03	2.19	3.12	.01	.03
S9329733	177464*22	2B 31	7	112	725	<.4	<2	101	7	9	26	3.41	2	34	<5	<5	119	<2	<2	11	3	6	719	.69	.04	2.49	1.10	.01	.04
S9329734	177465*22	3B 32	7	45	193	<.4	<2	66	2	13	18	2.48	<2	13	<5	<5	27	<2	<2	30	9	44	1390	3.25	<.01	1.06	6.17	.01	.02
S9329735	177466*22	2Y231	18	152	559	<.4	9	263	5	15	56	3.46	3	45	<5	<5	121	<2	<2	17	14	17	792	.92	.07	2.67	1.20	.01	.05
S9329736	177473*12	2B342	15	33	249	<.4	<2	213	4	10	44	2.41	3	31	<5	5	101	<2	<2	17	14	13	1295	2.28	.05	2.26	3.63	.01	.07
S9329737	177474*12	2B342	11	28	237	<.4	<2	107	2	9	37	3.37	2	40	<5	<5	119	<2	<2	14	9	11	653	1.03	.06	2.94	1.12	.01	.05
S9329738	177475*12	2B342	19	33	271	<.4	7	177	2	12	53	3.27	2	49	<5	<5	135	<2	<2	13	9	10	691	.85	.08	2.87	.53	.01	.05
S9329739	177476*12	2B342	19	41	169	<.4	<2	113	3	10	58	2.42	3	34	<5	<5	77	<2	<2	17	32	30	1017	3.08	.04	2.54	4.92	.01	.04
S9329740	177477*12	2B342	28	43	236	<.4	4	196	2	14	56	3.19	4	44	<5	<5	119	<2	<2	19	12	12	732	1.42	.06	2.83	1.45	.01	.07
S9329741	177478*12	2B342	22	40	367	<.4	7	145	5	12	41	2.90	<2	38	<5	<5	92	<2	<2	14	15	14	2768	1.09	.05	2.52	1.56	.01	.07
S9329742	177479*12	2B342	20	29	208	<.4	17	141	3	13	52	3.14	<2	51	<5	<5	103	<2	<2	16	19	17	714	.96	.06	3.21	.81	.01	.05
S9329743	177480*12	2B341	8	20	95	<.4	4	206	<1	4	12	1.71	2	25	<5	<5	107	<2	<2	15	2	7	365	.32	.04	1.60	.52	.01	.03
S9329744	177481*14	2B 41	22	23	266	<.4	4	153	1	9	35	2.69	<2	41	<5	<5	96	<2	<2	18	6	8	404	.88	.06	2.25	1.03	.01	.06
S9329745	177482*14	2B341	23	38	226	<.4	<2	216	2	12	53	2.99	4	48	<5	<5	135	<2	<2	17	10	10	425	.77	.07	2.76	.57	.01	.05
S9329746	177483*12	2B341	23	27	208	<.4	11	196	1	11	46	3.21	4	50	<5	<5	147	<2	<2	15	4	7	293	.77	.08	2.64	.43	.01	.04
S9329747	177484*12	1B341	13	30	155	<.4	<2	185	<1	6	28	2.70	4	38	<5	<5	168	<2	<2	13	3	7	106	.50	.09	2.24	.41	.01	.04

LAB NO	FIELD NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Ba ppm	Cd ppm	Co ppm	Ni ppm	Fe %	Mo ppm	Cr ppm	Bi ppm	Sb ppm	V ppm	Sn ppm	W ppm	Sr ppm	Y ppm	La ppm	Mn ppm	Mg %	Ti %	Al %	Ca %	Na %	K %
9329748	177485*12 2B341	25	54	284	<.4	16	253	2	11	46	4.22	5	50	<5	<5	174	<2	<2	15	5	6	216	.65	.09	2.78	.57	.01	.05
9329749	177486*12 2B341	12	37	382	<.4	<2	134	3	9	36	3.00	3	39	<5	<5	105	<2	<2	12	7	7	295	.53	.05	2.87	.63	.01	.03
9329750	177487*14 2B341	13	59	305	<.4	<2	128	3	11	36	3.33	<2	39	<5	<5	128	<2	<2	12	10	12	1255	.69	.05	2.64	.59	.01	.05
9329751	177488*12 2B 31	4	17	163	<.4	5	45	4	2	15	.56	<2	6	<5	<5	26	<2	<2	29	7	4	661	9.56	<.01	.54	18.45	.01	.03
9329752	177489*12 2B341	11	34	231	<.4	7	111	5	6	27	2.01	2	23	<5	<5	69	<2	<2	10	16	15	1900	.55	.02	1.61	.91	.01	.04
9329753	177490*12 2B342	8	118	288	<.4	<2	93	4	8	24	2.64	<2	21	<5	<5	60	<2	<2	78	14	20	613	.45	.02	1.82	5.45	.01	.06
9329754	177491*12 2B341	25	38	241	<.4	<2	87	3	14	34	3.20	2	50	<5	<5	101	<2	<2	14	20	12	772	.99	.05	2.65	1.41	.01	.04
9329755	177492*14 2B341	18	37	149	<.4	7	109	<1	5	19	2.57	<2	31	<5	5	107	<2	<2	14	4	10	299	.34	.03	2.24	.32	.01	.02
9329756	177493*12 2B341	21	74	332	<.4	12	90	4	7	31	2.06	2	26	<5	<5	61	<2	<2	30	29	28	1149	4.34	.02	2.40	7.89	.01	.03
9329757	177494*13 3B342	8	61	886	.4	8	123	6	2	4	.44	<2	5	<5	<5	9	<2	<2	781	3	3	1846	.71	<.01	.55	21.76	.01	.05
9329758	177495*13 3B 42	16	152	601	.5	4	160	7	6	12	2.19	<2	12	<5	<5	23	<2	3	205	10	10	5043	.90	.01	1.39	10.04	.01	.06
9329759	177496*13 3B 42	16	353	590	<.4	<2	115	13	8	19	2.41	<2	18	<5	6	34	<2	2	175	24	27	2707	.33	.01	2.06	3.98	.01	.09
9329760	177497*13 3B 42	11	208	418	<.4	<2	167	3	7	10	1.79	<2	12	<5	<5	22	<2	2	205	13	15	4417	.24	.01	1.49	4.59	.01	.07
9329761	177498*12 2B341	8	26	80	<.4	5	87	<1	5	15	2.73	<2	14	<5	<5	29	<2	<2	10	3	11	136	.39	<.01	1.57	.36	<.01	.06
9329762	177499*12 2B341	12	175	340	<.4	<2	148	2	10	32	2.88	<2	32	<5	<5	96	<2	<2	72	11	12	1467	.75	.05	2.51	1.49	.01	.05
9329763	177500*12 2B341	9	48	155	<.4	2	91	<1	6	17	3.06	<2	22	<5	<5	61	<2	<2	11	2	12	125	.33	<.01	1.72	.26	.01	.08
9329764	150462*12 2B341	6	18	53	<.4	<2	93	<1	3	9	1.35	2	9	<5	<5	39	<2	<2	10	<2	11	26	.11	<.01	1.10	.24	.01	.09
9329765	150463*12 2B341	13	22	65	<.4	<2	87	<1	5	18	2.49	2	24	<5	<5	60	<2	<2	12	2	9	95	.33	.02	1.68	.35	.01	.06
9329766	150464*12 2B341	22	40	83	<.4	<2	142	<1	15	27	2.67	<2	22	<5	<5	34	<2	<2	61	21	31	1583	.38	<.01	1.90	1.16	.01	.14
9329767	177467*22 1B231	19	134	502	<.4	<2	252	4	11	50	2.79	4	34	<5	6	87	<2	<2	19	16	18	420	1.58	.05	2.07	2.60	.01	.04
9329768	177468*22 2Y 31	9	66	282	<.4	4	203	1	7	26	2.67	4	37	<5	<5	113	<2	<2	11	2	6	80	.44	.05	2.09	.32	.01	.03
9329769	177469*22 1B231	9	81	277	<.4	10	216	1	6	22	2.08	5	29	<5	<5	134	<2	<2	12	3	8	94	.40	.06	1.73	.48	.01	.03
9329770	177470*22 2Y 31	9	81	279	<.4	<2	217	1	8	27	2.49	3	33	<5	<5	130	<2	3	13	4	7	348	.80	.06	2.00	1.06	.01	.04
9329771	177471*22 2G 31	10	68	164	<.4	8	188	<1	7	22	2.02	5	22	<5	<5	108	<2	<2	9	4	9	383	.25	.02	1.46	.36	.01	.04
9329772	177472*22 2R231	6	38	160	<.4	4	116	<1	3	12	2.64	3	24	<5	<5	132	<2	<2	7	<2	7	48	.27	.02	1.59	.18	<.01	.03
9329773	222938*22 2B231	29	42	138	<.4	10	73	<1	18	52	4.69	<2	32	<5	<5	25	<2	<2	3	3	11	187	.63	<.01	2.44	.11	.01	.02
9329774	222939*22 2B231	13	38	170	<.4	<2	164	1	7	22	4.87	4	38	<5	6	125	<2	<2	8	<2	5	84	.39	.02	2.44	.30	.01	.04
9329775	222940*24 2B231	13	24	94	<.4	<2	38	<1	4	16	5.12	<2	29	<5	<5	44	<2	<2	3	<2	10	105	.44	<.01	1.90	.07	.01	.03
9329776	222941*22 2G231	15	1472	242	<.4	16	62	1	7	27	3.24	<2	27	<5	<5	42	<2	<2	29	28	30	302	.73	<.01	1.82	1.53	.01	.04
9329777	222942*22 3B 32	9	138	820	<.4	10	82	7	9	26	2.74	<2	25	<5	<5	65	<2	<2	32	16	19	530	.52	.04	1.96	1.91	.01	.04
9329778	222943*22 1B231	19	105	300	<.4	<2	222	1	9	42	3.92	7	42	<5	<5	137	<2	<2	15	5	7	162	.50	.03	2.70	.56	.01	.04
9329779	222944*22 2B232	15	283	348	<.4	<2	174	2	10	31	3.55	4	32	<5	<5	147	<2	2	14	4	8	476	.38	.02	2.28	.44	.01	.03

-insufficient sample X=small sample E=exceeds calibration C=being checked R=revised
f requested analyses are not shown ,results are to follow

NALYTICAL METHODS

ICP PACKAGE :0.5 gram sample digested in hot reverse aqua regia (soil,silt) or hot Aqua Regia(rocks).

APPENDIX III

PALEONTOLOGICAL REPORT ON TRILOBITES

Report on trilobite collection from the PAR Property, Osilinka River area, N.E. B.C. submitted by A.R. Pauwels, Cominco Exploration

by Rolf Ludvigsen, PhD

GENERAL

The available sample consists of some 25 fragments of black sooty shale with abundant disarticulated trilobites. Even though all specimens are badly sheared and none retains any shell material, the preservation is adequate for confident identification. The stratigraphic provenance is not known with certainty. The shales probably belong to the Razorback Group of Ferri et al. (1992).

COMPOSITION

This low diversity trilobite assemblage comprises three species:

Ogygopsis cf. klotzi (Rominger)
very common cranidia, pygidia and free cheeks

Chancia latigena Rasetti
common cranidia

Zacanthoides sp.
a single cranidium

BIOSTRATIGRAPHY AND CORRELATION

These trilobite genera are common constituents of Middle Cambrian outer platform and slope assemblages of western Laurentia. The three species clearly belong to the Oryctocephalus Zone -- the lower of two Middle Cambrian zones (Figure 1). This zone is only applicable to faunas from open marine and slope limestones and shales (the "outer detrital belt"). Entirely different trilobite assemblages occur in shallow water and restricted carbonates (the "middle carbonate belt") of the same age. A separate set of zones is applied to these carbonates (Figure 2; see also Robison, 1976; Ludvigsen et al., 1986; Ludvigsen, 1989).

The black shales on the PAR Property are, on the basis of the trilobites, correlative to the Snake Indian and Chetang formations of the Mount Robson-Jasper area and to the Cathedral and Stephen formations in Yoho National Park.

The PAR Property trilobite assemblage is most similar to one from black limestones of slope aspect from the lower Cathedral Formation on Mount Stephen near Field, B.C. (Rasetti, 1951, p. 50).

SCIENTIFIC IMPORTANCE

This collection from the PAR Property appears to be the westernmost (structurally-speaking, that is) Cambrian trilobite collection in British Columbia. No other Cambrian trilobites have previously been reported west of Williston Lake.

In the recent authoritative assessment of Cordilleran geology, Fritz (in Gabrielse and Yorath, 1991, p. 173) noted that, "No Middle Cambrian strata have been identified on [the] Cassiar Platform. Strata at the top of the [Lower Cambrian] Rosella Formation have been nearly everywhere faulted against the overlying Kechika Group". He concluded that most of the Middle and Upper Cambrian strata on the Cassiar Platform were eroded prior to deposition of Lower Ordovician sediments (p. 181).

The PAR Property trilobite collection now provides the first evidence of unequivocal Middle Cambrian strata on this displaced fragment of the edge of Laurentia. These stratigraphic and biostratigraphic data revise current ideas of Cambrian geology, sedimentology and paleontology of this area of British Columbia. They should be published.

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APPENDIX IV

STATEMENT OF QUALIFICATIONS

I, Dereck Rhodes, of the District of North Vancouver, in the Province of British Columbia make oath and say:

1. THAT I am a geologist residing at 2514 Bronte Road, North Vancouver, British Columbia with a business address at 700-409 Granville Street, Vancouver, British Columbia.

2. THAT I graduated with a B.Sc in geology from McMaster University, Hamilton, Ontario in 1969.

3. THAT I have practised geology with Cominco Ltd. from June, 1969 to present.

Dereck Rhodes
Senior Geologist

DR/dr

February 1994

WOLVERINE RANGE
(SWANNELL RANGES)

FAMILY MOUNTAIN RANGE

FOREST

OMINECA

(SWANNELL RANGES)

MOUNTAINS

SWANNELL

RIDGE

ECHO 7 ECHO 8 ECHO 9 ECHO 6 ECHO 5 ECHO 4

WHISTLER 4 WHISTLER 5 WHISTLER 6 WHISTLER 3 WHISTLER 2 WHISTLER 1 WHISTLER 7

OBLIMKA 6 OBLIMKA 5 OBLIMKA 4 OBLIMKA 3 OBLIMKA 2 OBLIMKA 1

OSPREY 4 OSPREY 1 OSPREY 3 OSPREY 2

MAST 3 MAST 5 MAST 2 MAST 4 MAST 1

PAR 11 PAR 10 PAR 9 PAR 8 PAR 6 PAR 7 PAR 5 PAR 12 PAR 13 PAR 4 PAR 3 PAR 2 PAR 1

BEV 2 BEV 1

SWAN LAKE

125°00

56°00

0 2 3 4 5 Km

23301

PAR PROPERTY

CLAIM MAP

OMINECA M.D., B.C.

Scale 1:100,000 Date Oct. 30, 1991 Plate 93-2

ADJOINS AREA 5

WHISTLER 9

OMI 4

ECHO 6

ECHO 7

NICA 1

ECHO 8

BIDDY

CMI 2

NINA II

OMI 3

1976 CAMP

JEMIMA

OLD CAMP

NICA 3

OMI 4 Fr.

ECHO 9

NICA 2

NINA I

NINA SHOWING

VERNON SHOWING

ECHO 1

CRIN

OSI

LCP

1150

1500

1650

1796

56°00'

124°45'

387000 388000 389000 390000 391000 392000 393000

6207000 6206000 6205000 6204000 6203000 6202000 6201000 6200000

ADJOINS AREA 7

1994 PAR LEGEND

(Older stratigraphic terminology is used with equivalent stratigraphic nomenclature defined by Farrl in brackets)

Middle Devonian

McDAME GROUP (OTTER LAKES GROUP)

5 (undifferentiated)

5a VARIABLY FOSSILIFEROUS, FINE MEDIUM GRAINED, LIMESTONE/DOLOMITE. Medium-dark grey, massive to thick bedded, finely bioturbated. Fossils include: crinoids (1,2,4 and 5 holes), amphipora, stromatoporoids, rugose corals, bivalves and bryozoa. Locally fetid and bituminous.

BASINAL FACIES

5b MEDIUM TO THICK PLANAR BEDDED, FETID LIMESTONE/DOLOMITE. Dark grey to black, finely crystalline limestone or dolomite, well defined 10 to 50 cm thick planar beds, thin (10 cm) cherty beds locally, distinctly fetid, very few fossils, fine crackle brecciation common.

5c THINLY BEDDED, SILT AND SAND STRIPED 'TURBIDITES'. Medium to dark grey limestone and/or dolomite, 2-10 cm graded beds composed of carbonate mudstone striped with carbonate silt and sand laminae (1-10 mm), slightly fetid, no fossils observed.

5d VARIABLY CALCAREOUS AND/OR DOLOMITIC SHALES: Dark grey to black, fine shaley carbonates to very slightly calcareous shales, generally very fissile, planar to irregular (0.5 to 5 0 mm) laminations, recessive weathering.

PLATFORM FACIES

5e LIMESTONE DOLOMITE WITH SCATTERED QUARTZ SAND dense, medium bedded finely crystalline fight to dark grey dolomite (occasionally limestone) hosting <1% to 5% scattered well rounded quartz sand grains.

5f LIMESTONE/DOLOMITE WITH ABUNDANT QUARTZ SAND - as above thin to thick bedded carbonates hosting 5-50% quartz sand grains. Cross bedding of sand rich laminae and bands sometimes evident.

5g QUARTZ SANDSTONES SILTSTONES - Mature quartz sandstones and siltsones, crossbeds and ripple cross laminations common, variable carbonate cement. Occasional carbonate interbeds, some non calcareous mudstones.

Early Silurian - Early Devonian

SANDPILE GROUP (ECHO LAKE GROUP)
(lithologies not necessarily in stratigraphic order)

4 (undifferentiated)

4a FINE-MEDIUM GRAINED, MOTTLED LIGHT-MEDIUM GREY AND GREENISH BUFF DOLOMITE ± LIMESTONE. Bedding is generally indistinct, undulatory algal laminations locally, silica ribs and blebs are common and locally define bands (<1.0 m) with up to 50% silica, dark grey oolds (1-2 mm) locally, may be fetid and crackle brecciated.

4b MEDIUM-COARSE CRYSTALLINE WHITE-LIGHT GREY DOLOMITE. Massive-medium bedded (10-20 cm), may have sucrosic or "salt and pepper" appearance, coarse grained sections typically lighter colour, occasional bituminous vugs or crackle network, locally zebra and fenestral texture, patchy silicification.

4c MEDIUM-DARK GREY, FINE MEDIUM CRYSTALLINE DOLOMITE ± LIMESTONE. Characterized by fenestral fabric defined by lenses and discontinuous laminations of white dolomite, faint fetid odour, locally oolitic bioturbated.

4e INTENSELY SILICIFIED DOLOMITE - rock composed of 60-100% silica nodding and replacing dolomite locally. Sandpile lithologies evident elsewhere host carbonate of uncertain affinity.

4f DOLOMITE HOSTING SAND GRAINS - medium bedded, light to dark grey dolomites with 1-10% disseminated, well rounded quartz sand grains.

Age Unknown at least in part Middle Devonian

4d HETEROLITHIC SEDIMENTARY BRECCIAS

Breccia exhibits debris flow and more locally solution collapse characteristics. May be clast supported or matrix supported (diamictite).

Fragments: angular to subangular, <10 cm to >10 m. Fragment lithologies include units' 5a (one boulder with 2 holed crinoid fragment), 4a, 4b, 4c, 2a, 2b, 2c, 2d, 2A, 1b. Unit 4 (Sandpile) or Unit 2 (Roselle) usually represent the dominant fragment type.

Matrix:

Type 1: light green-grey, fine grained dolomite and white, medium-coarse crystalline dolspar.

Type 2: medium to dark grey, fine-medium grained to sucrosic, variably carbonaceous and argillaceous dolomite. Massive to well bedded and very locally classic turbidite (Bouma cycle) graded bedding.

Middle Ordovician

"ROAD RIVER" EQUIVALENT

3a GRAPTOLITIC SHALE. Dark grey-black, finely laminated, variably carbonaceous ± calcareous shale. Calcareous shales very fissile, non-calcareous shales have a more blocky fracture.

3b GREY-BLACK, VARIABLY CALCAREOUS SHALE As above, no graptolite are observed to define age.

ATTAN GROUP

Lower Cambrian (to Middle Cambrian?)

ROSELLA FORMATION (Mt. Kison Fm)

Roselle lithologies not necessarily in stratigraphic order.

2 (undifferentiated)

2a MEDIUM-DARK GREY, OOLITIC, ARGILLACEOUS LIMESTONE. Medium thick bedded (10-50 cm) to nodular, variably argillaceous and carbonaceous, ± (0.5 mm - 5.0 mm oolites), wavy to irregular partings and bedding surfaces, ± bioturbated, ± zebra texture, ± rose-reddish colouration. Archeocyathids (up to 5 0 cm) locally.

2b MEDIUM-DARK GREY, OOLITIC, ARGILLACEOUS DOLOMITE. Dolomitized equivalent of unit 2a? Dolomite is fine-medium crystalline, medium to thick bedded, local oolitic beds consist of 10-80% rounded, black oolites interbedded with argillaceous beds.

2c MEDIUM GREY TO WHITE, FINE-MEDIUM CRYSTALLINE LIMESTONE AND/OR DOLOMITE. Predominantly fine crystalline, clean limestone with lesser fine-medium (sucrosic) grained dolomite. Massive to non descript mottled texture; thin, indistinct wispy bedding and crickly algal laminations; local dark grey argillaceous bands (<2 cm) and black bituminous fracture networks and stylolite seams, few. Archeocyathids observed.

2d WHITE TO LIGHT GREY OR CREAM COLOURED, COARSELY RECRYSTALLIZED DOLOMITES ± MINOR LIMESTONE. May represent a dolomitized and/or coarsely recrystallized equivalent of unit 2c. Light cream to light grey, coarse (2-10 mm) rhombic dolomite and minor calcite, minor argillaceous laminae or patches, no fossils observed.

2a VARIABLY CALCAREOUS TO NON-CALCAREOUS SHALE. Occurs in association with Unit 2. Appears to occur at the base of the Roselle as well as higher up in the Roselle stratigraphy. It may represent a more shaley end member of unit 2a, which also occurs at more than one stratigraphic position. The shale is dark grey-black, commonly fissile, ± laminated, silty to muddy, and very calcareous to non-calcareous. Includes shale in upper portions of Roselle that have Saltorella (Area 3N) (L.C.) or trilobites of (Upper L.C.) (Area 3S). Similar shales and argillaceous limestones in apparent conformity with underlying Roselle Fm lithologies host trilobites dated as Middle Cambrian on Razorback Ridge. These are for the present included within the Roselle (Mt. Kison) Fm rather than the Razorback Fm as defined by Farrl.

Lower Cambrian

BOYA FM (MOUNT BROWN FORMATION

(In 1993 map/report referred to as Transitional Phyllite Unit)

1 BOYA FM (Undifferentiated)

1a INTERBANDED NODULAR LIMESTONE AND LMY. SERICITIC MUDSTONE. Light green-gray, variably sericitic mudstone ± siltstone interbanded with nodular, argillaceous limestone. Sericitic mudstone component generally <25% Phyllic appearance with increased sericite content.

1b LIGHT TO MEDIUM GREEN-GREY, VARIABLY CALCAREOUS, SERICITIC, PHYLLITIC MUDSTONE, ± MINOR VOLCANIC TUFF. ± MINOR SILTY SANDSTONE. Weathered outcrops and trench exposures are poorly indurated, have a very friable fibrous "woody" texture, and a wavy, crenulated and kinked foliation.

1c QUARTZITE - Quartz sandstones lesser siltstones sericitic.

Symbols

- outcrop
- subcrop
- defined contact
- lithological contact normal to strike – facies change or structure
- bedding (40°)
- fossil locality (7)
- rock sample for geochem or conodont analyses (NR-45)
- float, abundant rock chips in soil
- soil sample (Cu, Pb, Zn, Ag values in ppm)
- stream sediment sample

0 200 400 600 METRES

PAR PROPERTY

OMINECA M.D., B.C.

N.T.S. 93 N/15

1993
GEOLOGY & GEOCHEMISTRY
ON WHISTLER 9, ECHO 1, 6, 7, 8 CLAIMS

Drawn By D.R. | Compiled by g.k.g.

Scale 1 : 10,000 Date December 1993 Plate 93-1

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