ENVIRONMENT CANADA CONSERVATION AND PROTECTION ENVIRONMENTAL PROTECTION PACIFIC AND YUKON REGION

BASELINE MONITORING CATEAR RESOURCES LTD. - August 9, 1988 -REGIONAL DATA REPORT DR 90-08

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#### Introduction

The Catear Resources Ltd. pilot mill is located in the Unuk Valley drainage system. The mine is surrounded by ice and snowfields at an elevation of 5000 feet. Goldpan Lake adjacent to the mine, flows eastward towards Brucejack Lake. Brucejack lake flows westward towards the Unuk River via Sulphurets Creek. Coho salmon are present in the Unuk River. Dolly Varden char were collected at the mouth of Sulphurets Creek. There is no indication that the salmon could not utilise the mouth of the creek for rearing purposes even though salmon catches have not been reported. A canyon located 1 km from the mouth of Sulphurets Creek would prevent further migration of the salmon.

The company is developing an underground mine. The gold and silver extraction will be performed by gravity separation. The tailings will be discharged under water to Goldpan Lake. The lake is devoid of fish resources and will be dammed to retain the mining tailings residues and increase the tailings pond volume. The pilot mill was not operating at the time of the survey.

#### Site description

Station	Location	Remarks
1	Emerald Creek	<b>Upstream of Catear Camp</b>
2	Goldpan Lake	Outlet of the lake
3	Catear Creek	Upstream of Brucejack Lake
4	Mine adit	

## Material and Methods

The site was visited on August 8, 1988. No flow measurements were taken at the sites. Water chemistry and sediments data were collected at the three creek stations but only water at the mine adit. The following chemical parameters were analysed : alkalinity, pH, conductivity, total residue, non filterable residue, and sulphate. These samples were kept cool with ice until analysed. Dissolved metals were filtered the same day through a 0.45 micron cellulose nitrate membrane filter. Total and dissolved metals were preserved with nitric acid (0.5 ml/100 ml of sample ). All samples were collected with clean polyethelene bottles. The bottles for metal samples were previously acid

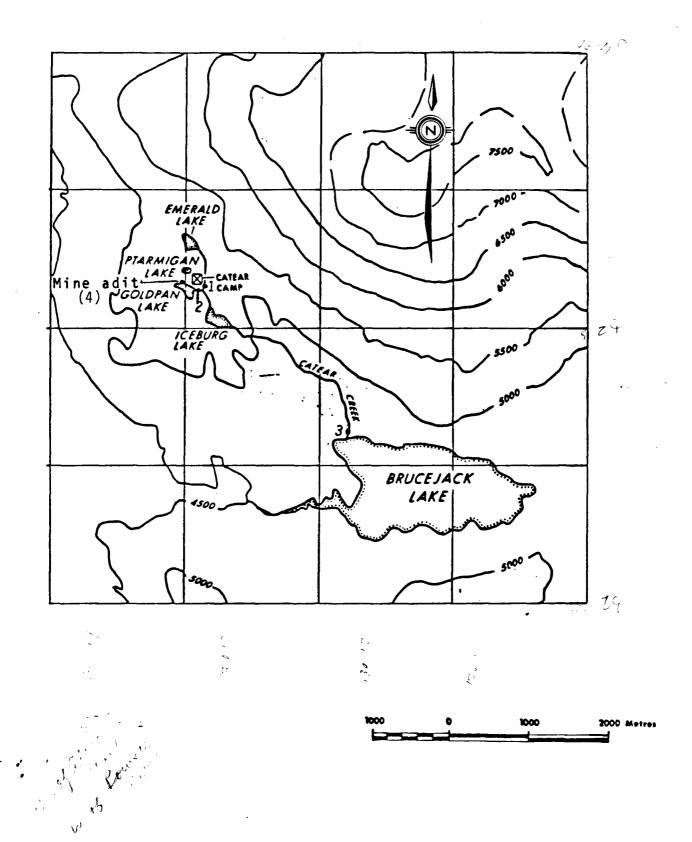


Figure 1

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washed. The hardness was determined from the dissolved metal sample.

Inductively Coupled Argon Plasma (ICP) was used for the total and dissolved metal analysis and gave a reading of twenty-six metals. For cadmium, copper, and lead the samples were reanalysed with the graphite furnace when the values were below two times the detection limit on the ICP procedure. For analytical method details refer to the Environment Canada Pacific Region Laboratory Manual (Anon, 1979).

Sediment samples were collected from the streambed, below the water level, with a clean acrylic corer. Four replicates were taken at each site. The samples were transfered into kraft bags and kept cool until analysed. The samples were air dryed, seived to <150 um, digested with aqua regia, and analysed for heavy metals using ICP. A portion of the sediments was also ignited at 550  $^{\circ}$ C in a muffle furnace. The loss of weight was reported as volatile residue and the remaining residue were reported as fixed residue.

## Results

The water metal results can be found in Table 1, while the other water quality results are found in Table 2. The sediment data are reported in Table 3.

The high suspended solids at station 2 (431 mg/l) is responsible for the higher metal content at this station. Surface water metal levels were noticeably higher for aluminum, barium, iron, manganese, sodium, silicon, strontium, and zinc. The metal content of the water as analysed, at that time is not considered an environmental problem. However the mine should keep the suspended solid levels low since particulate zinc levels were slightly elevated.

Mine adit water showed low metal concentrations and does not appear to be a concern. Trace metals were not found in significant amount in the effluent.

Metal concentration in the sediments was higher at station 3 for zinc (132 ug/g) and higher at station 2 for mercury (0.592 ug/g).

# Reference

Anon, 1979. Laboratory Manual. Department of the Environment, Environmental Protection Service, Department of Fisheries and Oceans ( Pacific Region ). Water Quality - Catear Resources -August 8, 1988

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DISICP CR	NG/L		<005	¢.005	¢.005	<o< td=""></o<>
TOTICP CR			<.005	0.007	<	<ul><li>005</li></ul>
DISICP	MG/L		<.005	<.005	<.005	<005
TOTICP CO	MG /L		¢.005	0.007	-	-
DISGF CD			(0.0001	<0.0001	<0.0001	<b>&lt;0.001</b>
DISICP	NG/L	*****	500°° >	<. 005 <	¢.005	¢.005
TOTGF CD	NG/L		•	(,0001	•	•
TOTICP CD	NG/L		¢.005	¢.005	Ū	•
DISICP			18	20.1		
TOTICP CA		114151	18.9	22.8	10.9	53.7
DISICP BA			0.025	0.042	0.028	0.017
TOTICP BA	MG/L		-	0.124	-	-
DISICP	NG/L			<ul><li>.05</li></ul>		
TOTICP AS	NG/L			0.05		
DISICP	MG/L			0.03		
TOTICP AL	NC/L	****		1.17		
DISICP	HG/L		¢.01	<b>*.01</b>	<b>10.</b>	<b>*.01</b>
TOTICP AG	NG/L	I.	<b>10.</b>	0.02	10.>	۰.01
Station		* * * * *	1	7	ო	4

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Water Quality - Catear Resources -August 8, 1988

DISICP P MG/L	3333
TOTICP DI P P MG/L MG	
	<ul><li>.02</li><li>.02</li><li>.02</li><li>.02</li><li>.02</li><li>.02</li><li>.02</li><li>.02</li><li>.02</li></ul>
CP DISICP NI NG/L	
P TOTICP NI NG/L	
DISICP NA NG/L	
TOTICP NA NG/L	0.5 3.2 0.5
DISICP NO NG/L	10.3 10.3
TOTICP NO NG/L	10.0 10.2
DISICP MN MG/L	<ul> <li>4.001</li> <li>0.096</li> <li>0.002</li> <li>0.057</li> </ul>
roticp NN NG/L	<ul> <li>.001</li> <li>0.122</li> <li>0.005</li> <li>0.073</li> </ul>
DISICP 1 16 16/L N	0.9 0.3 1.6
TOTICP D NG NG N NG/L N	1.2 1.2 3.4
DISICP T FE M MG/L M	<ul><li></li></ul>
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TOTICP TO CU CU CU MG/L MG	
TO Station CU MG	

Table 1

Water Quelity - Catear Resources -August 8, 1988

DISICP ZN MG/L		¢.002	¢.002	¢.002	<b>4.002</b>
TOTICP ZN MG/L		0.009	0.019	<.002	0.012
DISICP V MG/L		د.01	<b>10.</b>	¢.01	10.3
TOTICP		د.01	<b>(</b> ,01	<b>6.01</b>	۰.01
DISICP 1 TI V		<b>4.002</b>	<b>4.</b> 002	<b>ć.</b> 002	¢.002
TOTICP 1 TI 1 NG/L 1		¢.002	0.007	0.003	0.003
DISICP 1 SR 7 NG/L 1		0.057	0.429	0.064	2.07
TOTICP I SR MG/L I		0.061	0.504	0.064	2.19
DISICP .		¢.05	<b>č</b> . 05	<b>ć.</b> 05	د.05
TOTICP I SN SN SN SV		¢.05	¢.05	<ul><li>.05</li></ul>	¢.05
DISICP SI MG/L		0.95	0.97	0.76	2,95
TOTICP SI NG/L		0.81	2.04	0.99	2.61
DI <b>SGF</b> PB MG/L		¢.0005	¢.0005	\$000.5	\$.0005
DISICP PB MG/L	***	5	<b>.</b> .9	5	<b>\$0.</b>
TOTGF PB MG/L		¢.0005	¢,0005	<	<ul><li>.0005.</li></ul>
TOTICP PB MG/L		<b>8</b> .9	¢.05	50.0	<ul><li>•.05</li></ul>
Station	****	4	7	e	4

Table 1

Resources -	
uality - Catear	August 8, 1988
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		DISICP DISICP
DISICP	DISICP DISICP HT	DISICP
	DISICP HT	

Sediment Quality - Catear Resources August 8, 1988

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12400 13200 12400 12200 10900 10850 0060 1400 0060 11000 0600 0800 208 443 10800 271 11100 SEDICP MG UG/G 0.6440.6860.5920.1350.411 0.546 0.412 0.452 0.452 0.064 0.378 0.404 0.050 0.645 0.392 0.448 0.443 0.346 SEDHG HG UG/G 49100 51100 49300 47000 54600 55300 56000 54200 49500 50000 50300 51400 49525 55025 793 887 50400 1889 SEDICP UG/G ш 34.8 41.4 32.6 35.1 35.0 3.8 40.2 37.1 4.5 31.0 36.7 32.3 32.3 34.8 3.7 3.7 34.9 31.7 41.4 SEDICP UG/G С 8.0 9.8 4.9 5.1 4.8 4.8 0.4 7.1 41.5 7.7 7.7 14.0 15.6 16.3 11.0 16.6 11.4 3.7 SEDICP CR UG/G <20</pre><20</pre><20</pre><20</pre> <20</pre><20</pre><20</pre><20</pre><20</pre><20</pre> <20</pre><20</pre><20</pre><20</pre><20</pre> 1 1 1 SEDICP CO 1 UG/G 1 1 1 ∞ ∞ ∞ ∞ ✓ ✓ ✓ ✓ ∞. ∨ × × ∞. ∨ 1 1 1 1 1 1 1 1 1 SEDICP CD 0G/G 6630 6710 6710 6750 6580 6620 7840 6950 6860 7068 534 6620 6670 6590 102 6685 6440 73 SEDICP CA UG/G 0.5 0.5 0.0 SEDICP BE UG/G 0.4 0.5 0.5 0.5 0.50.5 258 2283 260 260 233 263 263 265 265 265 375 529 379 468 438 74 SEDICP BA UG/G 284 283 316 305 297 297 16 436 461 461 357 357 452 45 244 231 231 278 252 251 251 20 SEDICP AS UG/G 23100 24500 24100 22700 21100 23100 22200 21900 24700 24100 24500 23500 24200 529 23600 841 21200 942 SEDICP AL UG/G 1 SEDICP AG UG/G ~ <2 <2 % 1 1 1 ł ~ Average Average Average Repl.2 Repl.3 Repl.2 Repl.3 Repl.4 Repl.1 Repl.2 Repl.3 Repl.4 Repl.4 Repl.1 Repl.1 s.D. s.D. s.D. 2 m

Table 3

Sediment Quality - Catear Resources -August 8, 1988

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5	06/6	UG/G	uG/G	06/G	ng/6	06/6	UG/G	06/6	06/G	0G/G	UG/G	0C/G	MG/KG	MG/KG
Repl.1	1730	20	370	10								6.99		36000
	1690	17	370	5								102.0	-	33800
	2070	20	330	60								70.6	-	37700
	1840	2	370	10	1600	22	689	<b>6</b>		1240	87	70.1	-	37900
	1833	17	360	10								77.4		36350
	171	ŝ	20	-					1.3			16.5	1915	1902
	851	17	520	¥7	1720								-	44700
	847	6	410	6	1640		•							37800
	835	20	500	9	1670									44100
	811	8	320	ŝ	1700	20	705	<b>&lt;</b> 8	40.2	1540	88			44600
_	836	17	438	9	1683									42800
5.D.	18	an I	92	8	35			;				1.1	3367	3344
	1640	18	280	6										32300
	2080	22	350	EE										32600
	2050	18	470	6	1630	21	807	<b>6</b> 8	43.4	1020	110	109.0	956000	43700
Repl.4	1870	19	230	10				J						35100
-	1910	19	333	15										35925
	202	2	104	12										5333