

MAP NO.

ASSESSMENT REPORT

DOCUMENT NO.:

092030

PROSPECTUS

MINING DISTRICT:

DAWSON

CONFIDENTIAL

TYPE OF WORK:

SUMMARY OF WORK

J.S.N. 134679

116 K 8

OPEN FILE

REPORT FILED UNDER: Rio Alto Exploration Ltd

DATE PERFORMED: 1977

DATE FILED: January 18, 1978

LOCATION: LAT.: 66°27'N

AREA: Porcupine River

LONG.: 140°30'W

VALUE \$:

CLAIM NAME & NO.:

WORK DONE BY: P.S. White

WORK DONE FOR: Rio Alto Exploration Ltd

DATE TO GOOD STANDING | REMARKS: #2 RUSTY SPRINGS



R E P O R T

O F

1977 EXPLORATION

O F T H E

RUSTY SPRINGS MINERAL PROSPECTS
PORCUPINE RANGES, YUKON TERRITORY

B Y

PAUL S. WHITE P. ENG. (MINING)

JANUARY 18, 1978

WHITEHORSE, YUKON TERRITORY

Assign a new Number to this one

~~090938~~

Rio Alto Expl. Ltd.

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RUSTY SPRINGS REPORT FOR RIO ALTO EXPLORATION LTD.

INTRODUCTION

A mineralized locality was staked by Rio Alto Exploration Ltd. in 1975, and periodic additional staking was done in 1976 and 1977. The mineralized locality, known as the Rusty Springs Prospect, is located 280 km. north of Dawson City, 29 km. east of the Yukon-Alaska border, 8 km. south of the Arctic Circle, 150 km. west-northwest of Kilometer 240 on the Dempster Highway and 115 km. southerly from the settlement of Old Crow.

The location, access and climate are well described in a report titled "Geology of the Rusty Spring Mineral Prospect" dated September 30, 1976 by M. N. Chernoff, P. Geol. Mr. Chernoff also describes the physiography, regional geology, local surface geology and the 1976 Preliminary Prospecting Program which resulted in an exploration program conducted from May - September, 1977 on portions of 140 mineral claims and 15 iron claims, all staked under the Yukon Quartz Mining Act prior to work commencement. In late November, 1977 an additional 200 claims were staked resulting in a total of 380 quartz claims and 15 iron claims held by Rio Alto Exploration Ltd. at February 1st, 1978.

DESCRIPTION OF WORK TO MAY, 1977

The 1975 examination of the discovery locality, known as the "Tim Show", near Rusty Springs camp site was confined to basic prospecting in the discovery of float Cu, Zn, Pb, Ag minerals followed by staking of 96 quartz claims and 3 iron claims.

In the winter of 1976, a bulk sampling program with assays was performed on the Yeti iron deposit located a few kilometers east of the Rusty Springs discovery locality.

The summer of 1976 saw a preliminary program of basic prospecting, geological mapping, soil sampling and pitting and trenching which was the subject of the Chernoff report and a larger program of exploration was recommended for 1977, and financing arranged to carry out a \$200,000.00 program of prospecting, mapping, soil sampling, drilling and further staking.

DESCRIPTION OF 1977 PROGRAM

In May, 1977 an exploration team was assembled for the Rusty Springs program. The team consisted of a geologist, two geologists' assistants, a driller, a driller's helper, a cook, a supervising mining engineer and a Hughes 500 Model turbine Helicopter and pilot.

CREW LIST

Arnold Kendrick - Diamond driller

Norman James - Driller's helper

Geoffrey Garcia - Geologist-pro prospector

Dean White - Geologist's assistant

Tim Termuende - Geologist's assistant

Nancy Carroll - Cook

Paul S. White - Supervising Engineer

Helicopter - Chartered from Trans West Helicopters Ltd.

Howard Damron - pilot

The access to the prospect was by fixed wing aircraft from Mile 131 Dempster Highway airstrip to Mallard (Inexco Oil Ltd.) airstrip 80 km. south of the property or by helicopter from Dawson or Mile 131 on Dempster Highway. In May, 1977, 15-20 metric tons of freight were hauled by truck to a short, useable airstrip at Mile 131 and moved by Norcrown Air Ltd. of Ross River (Robert Ambrose - pilot) to Mallard Airstrip in 12 hours. The freight was slung by two turbine helicopters from Mallard Airstrip to Rusty Springs campsite in 20 hours and a semi-permanent 5 tent-frame camp was erected using 2" x 4"'s and plywood. On June 24th, the driller collared the first hole on the Tim Show near the camp with the Company's new Hydra-Wink Badger (Modified) diamond core drill on the discovery locations.

The 3 man geology crew prospected, soil sampled and mapped an area of 2-3 square miles around the discovery location and soil samples were air dried and flown on regular helicopter

supply flights to the Dempster Highway and trucked to the Whitehorse Assay Office at Whitehorse. A 7-10 day "turn-around" was required to get the sample results analyzed and results conveyed to the driller.

The drilling on the Tim Show, as shown on accompanying maps, was disappointing at the 5 locations down hill from the original float discovery known as the Tim Show (see Chernoff report). The soil sampling program indicated that the best drilling target (from soil sample assays) was located at 17S, 10E, approximately 1300' southerly and 1000' easterly from Drill Hole DDH 1 and 600 feet in elevation above it.

The hose and pumps available to transport water were deemed inadequate to support drill testing of the newly located target and the engineer abandoned the prospect until 1978 and moved the drill to a newly located target area approximately 1.5 miles east of Rusty Springs camp - named the Orma Show.

The Orma Show was located by basic prospecting of outcrop on Carrol Creek, a westerly flowing small creek fronting the campsite area. A sulphide occurrence was partially exposed in the southerly creek bank by stream erosion and the area examined in detail for further mineralization. Random soil samples indicated high silver, lead and copper values and a detailed find located high anomalies over an area 2000' striking north-northwest and 800' (open to west) dipping

at an undetermined altitude.

Eight holes were drilled to varying depths with mineralization in 5 holes. One hole returned low recovery but careful sampling of the 25%⁺ recovery by selecting equal volumes in teaspoon sized amounts every 2" along the core box trough, gave high assay results (see Assay Sheet DDH 8 August 20, 1977). Some solid high silver content (78-132 oz/ton Ag) were noted in solid core fragments and some high silver assays were obtained from bright red-brown granulated powdered material which dried from a mud-like core sample in the box.

A total of 3200' of drilling was performed on both the Tim and Orma prospects and the drill program was deemed to be complete at August 25, 1977. Camp was broken and cached in early September and the program information was examined to determine the next phases of exploration.

It was decided to take the following steps to summarize and analyze the data:

- (1) A program of topographic mapping, drafting of data, enlargement of aerial photographs and obtainment of earth satellite photographs. V. Zay Smith and Associates Ltd. of Calgary was selected as the contractor and the data maps were completed and submitted on January 18, 1978.

(2) The University of Western Ontario Geological Department was commissioned to examine the specimen mineral suites, the coarse program data and selected type drill cores and sludges to research:

- (a) The mineralogy and texture of the metallic minerals and host rock dolostone,
- (b) The comparison of Rusty Springs prospects to carbonate-hosted silver-lead-zinc deposits.
- (c) Development of a conceptual model to guide future exploration.

The report was undertaken by Gary Schoel as a fourth year (graduating) thesis project under the direction of Dr. Robert Hodder, Professor. The report was submitted on January 18, 1978 and is appendixd hereto.

In late November, 1977 an examination of all existing geological data, aerial photography, earth satellite photography and project work data resulted in the staking of 200 quartz mineral claims to the north and south of the central portion of the existing claims. The claim block now totals 380 mineral claims and 15 iron claims at the time of writing.

Also in November, it was decided that aircraft landing sites closer to the property were required. A winter tractor train project was planned for a 120 mile freight haul from Mile 123 Dempster Highway (Ogilvie Camp) over an existing

winter trail (Inexco Oil Co. Ltd. - 1972) to an existing earth airstrip (Porcupine Strip) to up-grade it after seasonal erosion to permit fixed wing all-weather access to 13 miles southerly from Rusty Springs. A second landing site was selected closer (2-3 miles) from Rusty Springs for testing and preparation if feasible. Land use application was made November 18, 1977 and approved on January 3, 1978.

The Governments of Canada and the Yukon Territory are joint cost sharing the program cost to a maximum contribution of \$30,000.00 under the Northern Construction Financial Assistance Program. The program will be performed between February 1 and March 31, 1978.

GEOLOGY AND DEPOSIT TYPE

Local geological data is included in Map Appendices to this report and the G. Schoel report (University Western Ontario) is also included herewith. Preliminary conclusions are that the Orma Show of the Rusty Springs prospect is a strata bound carbonate-hosted base metal occurrence with relatively high silver content. The mineral deposit's apparent characteristics are most comparable to growth fault controls in a marginal sedimentary basin.

In the opinion of this writer, the most closely related type deposit at this stage is the Tynagh Co. Galway deposit described by R. A. Fergus Graham in "The Mogul Base Metal

Deposits, Tipperary, Ireland" June, 1970 - University of Western Ontario. The high silver content of the Rusty Springs deposit and of the soils, which can be panned for heavy sulphides with 1-2 oz. Ag/ton, give the deposit an economic potential which demands intensive exploration.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions from the 1977 program, analyzed in conjunction with previous work data, and the allied research projects described above are:

- (1) A significant base metal deposit of abnormally high silver content has been located in sub-crop by drilling after prospecting.
- (2) The mineralogy and local geology indicate a carbonate-hosted deposit of type economic importance.
- (3) A more intensive program of exploration is required in 1978 and 1979 to evaluate the existing deposits and the unprospected 380 claim block which is geologically favourable to similar occurrences.

The recommendations for the 1978 program are:

- (1) A concurrent program of work be undertaken with the following components:
 - (a) Basic prospecting, soil sampling and mapping geology.

- (b) Geophysics in form of gravity and magnetometer surveys.
- (c) Prospecting of sub-crop by two Hydrawink core drills to the extent of 10,000 feet of AQ and BQ shallow hole drilling to 300[±] foot depth.
- (d) Post-field program follow up research to fully develop a conceptual model with potential economic worth of the deposit or deposits.

RESPECTFULLY SUBMITTED this 23rd day of January, 1978.


P. S. White, P. Eng. (Mining)

CERTIFICATE

I, the undersigned, Paul S. White, of the City of Whitehorse, in the Yukon Territory, do hereby certify:

- (1) That I am a Professional Engineer with an office mailing address at P. O. Box 4550, Whitehorse, Yukon, Y1A 2R8
- (2) That I graduated from the University of British Columbia in 1956 with a Bachelor of Applied Science (Mining Engineer) degree.
- (3) That I am a registered Professional Mining Engineer with the Association of Professional Engineers of the Province of Alberta and with the Association of Professional Engineers of the Yukon Territory.
- (4) That I have been practicing my profession as an exploration mining engineer for 20 years, and that I have had extensive experience in the Ogilvie Mountains, Northern Yukon over the past 10 years.
- (5) That I have no interest, direct or indirect in Rio Alto Exploration Ltd., nor do I expect to receive any interest either direct or indirect in the properties or securities pertaining thereto.
- (6) That I personally examined and supervised all work on the Rusty Springs projects mentioned herein during September, 1975, February, 1976, July 1976 and March - November, 1977.

DATED at Calgary, Alberta this 23 day of January 1978.



Paul S. White

AMENDED EXTRACT OF "AN ASPECT OF SEDIMENTARY BASIN EVOLUTION THE CONCENTRATION OF MISSISSIPPI VALLEY TYPE ORES DURING LATE STAGES OF DIA GENESIS" - S. J. JACKSON & F. W. BEALES

VOL. 15 NO. 4 (December, 1967) Pages 383-433

TABLE 1 - Comparison chart of selected areas of Mississippi Valley type lead-zinc mineralization. A=absent; P=present; p=minor

*(Amended to include Rusty Springs by P. S. White, P. Eng., January, 1978)

	Lime- stone	Dolo- mite	Porosity	Occurrence Adjacent to a basin	Associated igneous activity	Evaporite Association	Reef Type	Brecciation: Age relative to sedimentation	Depth
Mississippi Valley	A	P	P	many basins	minor, not related to ores	A	Biohermal in some deposits	Syndep. and Postdep.	Shallow & deep (500')
Calcareous Alps	P	P	P	Reef- basin	Volcanics, tuffs, etc.	A (back reef lagoon)	Bioherms	Syndep.	Shallow & deep
Northgate	P	A	P	Reef- basin	Volcanics	A (back reef lagoon)	Bank (biogenic)	?	Shallow ?
Pine Point	A	P	P	Reef- basin	A	Back reef evap. basin	Bank (biogenic)	Syndep. and Postdep.	Shallow
*RUSTY SPRINGS		P	P	Reef- basin	Volcanics to west	A ?	Bioherm	Syndep. and Postdep.	Shallow

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	Pb	Zn	Fe	Cu	Ag	Sb	As	Co	Ni	Barite	Fluorite	Fault Control	Fold Control	Massive zones	Mineralized vein	Bedded	Underlying Sediment	Overlying Sediment	Control by Sedimentary features
Mississippi Valley	P	P	P	p	p	A	A	P	P	p	p	P	P	P	P	A	Sandstone	Varied	P
Calcerous Alps	P	P	P	P	A	P	P	A	A	P	p	A	A	P	p	P	Bit. Lst. Cherts	Algal Lst.	P
Northgate	P	P	P	P	P	P	P	A	A	P	A	?	A	P	p	?	Sandstone	Argil. Lst.	P
Pine Point	P	P	P	A	A	A	A	A	A	A	A	?	A	P	p	A	Evaporates & dolomite	Lagoonal Lst. & argil. dol.	P
*RUSTY SPRINGS	P	P		P	P	P	P					P	P	P	P		Dolomites	Arg. dol/shale	P

AMENDED EXTRACT OF "AN ASPECT OF SEDIMENTARY BASIN EVOLUTION THE CONCENTRATION OF MISSISSIPPI
VALLEY TYPE ORES DURING LATE STAGES OF DIA GENESIS"- S. J. JACKSON &
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Calcareous Alps	P	P	P	Reef- basin		Volcanics, tuffs, etc.	A (back reef lagoon)	Bioherms	Syndep.	Shallow & deep
Northgate	P	A	P	Reef- basin		Volcanics	A (back reef lagoon)	Bank (biogenic)	?	Shallow?
Pine Point	A	P	P	Reef- basin		A	Back reef evap. basin	Bank (biogenic)	Syndep. and Postdep.	Shallow
Rusty Springs		P	P	Reef- basin		Volcanics to west	A ?	Bioherm	Syndep. and Postdep.	Shallow

	Heavy Metal Content									Barite	Fluorite	Fault Control	Fold Control	Massive zones	Mineralized veins	Bedded	Underlying Sediment	Overlying Sediment	Control by Sedimentary features
	Pb	Zn	Fe	Cu	Ag	Sb	As	Co	Ni										
Mississippi Valley	P	P	P	p	p	A	A	P	P	p	p	P	P	P	A	Sandstone commonly	Varied	P	
Calcereous Alps	P	P	P	P	A	P	P	A	A	P	p	A	A	P	p	P	Bit. Lst. Cherts	Algal Lst.	P
Northgate	P	P	P	P	P	P	P	A	A	P	A	?	A	P	p	?	Sandstone	Argil. Lst.	P
Pine Point	P	P	P	A	A	A	A	A	A	A	A	?	A	P	p	A	Evaporates & dolomite	Lagoonal Lst. & argil. dol.	P
RUSTY SPRINGS	P	P		p	p	p	p										Dolomites	Arg. dol/shale	P

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STATEMENT OF EXPENDITURES
1977 RUSTY SPRINGS PROJECT

I, Paul S. White, Professional Mining Engineer, of Whitehorse, Yukon Territory, do herewith certify that I have expended the following funds to the sum of \$150,000.00 and have caused to be expended under my supervision a further sum of \$36,250.00 from the office of Rio Alto Exploration Ltd., for office overhead, consulting geology, map and photograph preparation, mineralogical analysis report, for a total expenditure of \$186,250.00 on mineral exploration between the dates of May 1, 1977 and September 15, 1977 on the following Mineral Claims: *psw*

RIO 1 - 104 M.C.S. inclusive
NATE 3 - 14 M.C.S. inclusive
CARB 1 - 16 M.C.S. inclusive
YETI 1 - 12 Iron claims inclusive
RIO 1 - 3 Iron claims inclusive
all located on Map Sheets 116K8 and 116K9 in
the Dawson Mining District of the Yukon Territory.

YUKON EXPENDITURES

Air Transport: Fixed Wing	\$ 5,357.00	
Rotary	35,193.40	
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	\$40,550.40	\$ 40,550.40
Truck Transport		7,000.00
Labour Contracts		28,100.00
Cost of Assays		1,297.50
Petroleum Fuel		4,437.02
Camp Material, Subsistence, Equipment Repairs and Replacement of Parts		33,616.00
Equipment Rental, Office Costs, Consulting Fees and Supervision		35,000.00
		<hr/>
		\$150,000.00

psw

YUKON PROJECT EXPENSES INCURRED
BY RIO ALTO EXPLORATION LTD.

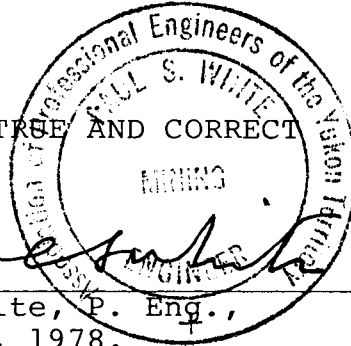
- Map, photograph, drill logs mineralogical	\$ 8,000.00
- Study by University of Western Ontario	3,500.00
- Geological Consulting Fees	9,750.00
- Project Office Overhead, Yukon travel and miscellaneous project expenses	15,000.00
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TOTAL YUKON PROJECT RIO ALTO EXPLORATION LTD. COSTS	\$ 36,250.00

TOTAL FUNDS EXPENDED ON RUSTY SPRINGS 1977 PROJECT \$186,250.00

CERTIFIED TRUE AND CORRECT



Paul S. White, P. Eng.,
23 January, 1978.



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