

DATE: 3 January 1992
 TO: Ian Pirie
 COPIES TO: Alex Davidson, Dave Heberlein
 FROM: Cam Clayton
 RE: December 1991 Monthly Report

Rainbow-Tam O'Shanter/Wildrose Drilling: All results from the drilling program on the Rainbow-Tam O'Shanter and Wildrose properties have been received. Some encouraging Au results from holes TM91-19 and TM91-20 were the highlights. These two holes are located on the same line as TM91-16 reported last month containing 35.99 metres of 0.180 g/t Au. Important intersections are summarised below.

HOLE TM 91-19 (P-17): 53.48 metres @ 0.266 g/t Au
 incl: 5.08 m @ 0.442 g/t Au
 15.0 m @ 0.440 g/t Au
 9.00 m @ 0.510 g/t Au
 Cu < 0.1%

<u>Interval</u>	<u>Length</u>	<u>Cu (ppm)</u>	<u>Au (ppb)</u>	<u>Au Assay</u>
55.32-58.32	3.0	245	266	
58.32-61.32	3.0	196	304	
61.32-63.40	2.08	270	642	
63.40-65.00	1.6	250	115	
65.00-67.35	2.35	92	91	
67.35-70.35	3.0	93	74	
70.35-73.35	3.0	51	458	
73.35-76.35	3.0	197	114	
76.35-79.35	3.0	160	122	
79.35-82.35	3.0	103	108	
82.35-85.35	3.0	49	63	
85.35-88.35	3.0	204	112	
88.35-91.35	3.0	350	119	
91.35-94.35	3.0	319	639	
94.35-97.35	3.0	98	133	
97.35-100.35	3.0	97	788	
100.35-103.35	3.0	99	368	
103.35-106.35	3.0	51	376	
106.35-108.8	2.45	79	158	

Comments: The hole was originally planned to test resistivity and chargeability anomalies, as well as a strong magnetic anomaly. The location of the hole was changed due to weather conditions and access difficulty. The I.P. anomalies were explained by high pyrite content in chert and andesitic volcanics, but the strong magnetic anomaly was not explained.

From 55.3 to 65.0 the core is cut by 15% fine stockwork quartz and quartz carbonate veinlets. From approximately 65.0 m to 108.8 m (EOH) is feldspar porphyry and diorite to quartz diorite intrusive with weak potassic, propylitic, and argillic alteration seen. The interval is cut by occasional quartz carbonate veins as well as hydrothermal breccias.

HOLE TM 91-20A: 27.07 metres @ 1.09 g/t Au
 incl: 19.42 m @ 1.5 g/t Au
 16.42 m @ 1.71 g/t Au
 3.30 m @ 7.3 g/t Au

<u>Interval</u>	<u>Length</u>	<u>Cu (ppm)</u>	<u>Au (ppb)</u>	<u>Au Assay</u>
145.14-147.65	2.51	1663	425	
147.65-150.65	3.00	668	160	
150.65-153.40	2.75	616	280	
153.40-156.70	3.30	8321	5900	7.30 g/t
156.70-158.56	1.86	726	220	
158.56-161.56	3.0	254	412	
161.56-164.56	3.0	228	120	
164.56-167.56	3.0	170	81	
167.56-170.56	3.0	148	57	
170.56-172.21	1.65	291	339	

Comments: The main mineralized zone carrying most of the grade for the entire interval is what has been called a chalcopyrite stockwork zone. The thickness of the interval in core is 3.3 metres however it is questionable whether or not this is true thickness. Two distinct structural textures are seen through the interval from 153.4 m to 156.7 m. The first texture appears to be a fairly restricted set of mineralized quartz veins and chalcopyrite veins occupying a specific orientation at 10° to the core axis. Veins are up to 2 cm in width but more commonly 1/2 to 1 cm, occurring as parallel sets every 5 to 10 cm. The second type of structural texture seen is a reticulate, or "step-like" texture of 1/2 cm quartz/chalcopyrite veins with one orientation at 48° to the core axis, and the other at 45°. Mineralization is thought to be Tertiary as the veins cross-cut a number of different rock types, one appearing to be a Tertiary dyke. The purpose of this hole was to test for mineralization related to major west-northwesterly trending structures in this particular

area, and to that end the hole was quite successful. A true orientation and thickness on this zone could be obtained by a further drill hole followed by trenching along the projected strike of the zone.

MINNOVA, INC.

DATE: November 17, 1991

TO: I. PIRIE, D. HEBERLEIN

FROM: Cam Clayton

RE: DRILL HOLE SUMMARY

DRILL HOLE: TM 91-19 (P-17) START DATE: Nov 14 END DATE: Nov 16

NORTHING: 1+50N EASTING: 6+00E ELEVATION: 1370 m

AZIMUTH: 090 DIP: -70 LENGTH: 108.8m

PURPOSE: To test magnetic anomaly, chargeability high, resistivity low, and anomalous soil geochemistry on flanks of topographically high siliceous cap.

<u>INTERVAL</u>		<u>DESCRIPTION OF INTERVAL</u>
<u>FROM</u>	<u>TO</u>	
0.00	7.32	CASING
7.32	16.6	INTERBEDDED ANDESITIC TUFFS AND CHERT. This is an aphanitic ash tuff interbedded with grey chert. Dissolution along fractures gives vuggy appearance in areas. Pyrite occurs to 15% as fine disseminations.
16.6	46.9	CHERT/STOCKWORK SILICIFICATION. This is similar to the stockwork silicification described in hole TM91-16 and is highly microfractured with silica healing. Occasional zones of brecciation occur throughout. Pyrite generally occurs as disseminations and coarser blebs with some localised areas of pyrite stockwork and averages 5%. Minor Cp has been observed.
46.9	55.2	INTERBEDDED TUFF AND CHERT. This is similar to that described in the interval from 7.32 to 16.6. Chlorite and sericite alteration is commonly observed in the tuffaceous segments. Again visible mineralization consists primarily of pyrite as disseminations and occasional stockworks averaging 3 to 5% for the interval. Chalcopyrite is seen only in trace amounts.

55.2	63.4	ANDESITE. This is a fine grained to aphanitic flow with a mottled appearance in areas. Minor carbonate alteration is seen, as is chlorite and sericite. The occasional small scale fault cuts the core. Pyrite averages 8%. At 59.74 m a small feldspar porphyritic dyke cuts the core.
63.4	65.0	INTERBEDDED TUFF AND CHERT. Again this is similar to that described from 7.32 to 16.6. Pyrite occurs disseminated to 8% throughout.
65.0	65.93	ARGILLICLY ALTERED FELDSPAR PORPHYRY. The core has been strongly altered to sericite and chlorite and contains approximately 5% disseminated pyrite.
65.93	67.35	FELDSPAR PORPHYRY. This is a relatively unaltered feldspar porphyritic intrusive. Alteration that is present consists of very weak chlorite/sericite/k'spar. No visible mineralization.
67.35	108.8	DIORITE/QUARTZ DIORITE. This interval consists of intrusive rock showing gradational compositional variations from dioritic to quartz dioritic phases. Generally the quartz rich phases are coarser grained than the dioritic phases. Occasional hydrothermal breccias are seen in the interval. Alteration varies from a weak propylitic (with epidotic veins) to argillic (alteration of feldspars to clays). Pyrite averages roughly 2% through the interval with local highs of 8%.

**** END OF HOLE ****

DISCUSSION

Weather conditions and access difficulty necessitated moving of the originally planned location for hole TM91-19 from 200N, 575E to 150N, 600E. This may have had some effect on the adequacy of testing of the targets. The chargeability and resistivity anomalies are explained by the pyrite content of both the cherts and andesitic volcanics, and of the intrusives intersected in the drilling. However, the magnetic anomaly located on line 200N was not explained.

DATE: December 5, 1991

TO: I. PIRIE, D. HEBERLEIN

FROM: Cam Clayton

RE: DRILL HOLE SUMMARY

DRILL HOLE: TM 91-20A START DATE: Nov 16 END DATE: Nov 19

NORTHING: 2+00N EASTING: 4+70E ELEVATION: 1370m

AZIMUTH: 270 DIP: -50 LENGTH: 172.2m

PURPOSE: This hole was added to the original program and was designed to test for Tertiary Au mineralization along a strong northerly trending lineament, thought to be a Tertiary structure, near the silicified topographicly high area tested by hole TM 91-19. Strong Au soil geochem has been observed in the area, and some elevated Au values have been obtained from surface samples nearby. The hole was originally begun at -45° and was changed to -50° due to caving problems.

<u>INTERVAL</u>		<u>DESCRIPTION OF INTERVAL</u>
<u>FROM</u>	<u>TO</u>	
0.00	3.05	CASING.
3.05	17.00	BROKEN CORE. The material is extremely broken and oxidized.
17.00	19.84	PYRITIC CHERT. This is fine grained cherty interval with some chloritic fractures and 10 to 15% Py.
19.84	34.60	SILICIFIED ANDESITE. This grades from a fine grained aphanitic phase to a feldspar phyric phase. Pyrite occurs disseminated throughout with higher concentrations associated with small quartz carbonate and epidote veinlets. From 32.3 to 33.0 30% Py and trace Cp is seen.
34.60	38.70	MONZODIORITE. This is a relatively unaltered intrusive, weakly silicified. Trace disseminated pyrite occurs throughout.
38.70	46.50	ANDESITE. The andesite flow is cross cut by small quartz carbonate veins which generally

have sericitically altered selvages. Banded pyrite-quartz-carbonate-epidote veinlets are occasionally seen. Minor Cp is associated with these veinlets. Pyrite averages 5% disseminated throughout with trace amounts of Cp.

46.50 53.34 CHERT/STOCKWORK SILICIFICATION. Only trace amounts of pyrite are seen disseminated through this fine grained to aphanitic chert that grades into intense stockwork fracturing with silica introduction. A number of small faults cut the unit near its bottom contact.

53.34 56.50 FELSIC INTRUSIVE. This may possibly be alaskite, or strongly argillically altered diorite. It is crystalline/granular containing relict fine grained phenocrysts. No mafic minerals are seen. The interval is stockwork fractured up to 60 %, and up to 30% pyrite with trace Cp is seen along these fractures. The bottom contact appears intrusive.

56.50 60.66 ANDESITE TUFF. Another fine to medium grained chloritically altered and silicified tuffaceous unit. Minor hydrothermal breccias occur through the interval. Pyrite occurs in trace amounts throughout with occasional areas of higher concentration. From 58.6 to 59.45 2% Py is seen with trace Cp and possibly arsenopyrite. From 59.5 to 60.66 20% stockwork pyrite is seen.

60.66 83.20 HORNBLENDE DIORITE. This is a medium to coarse grained hornblende diorite. A number of major structures cut the interval. Pyrite generally occurs in only trace amounts, primarily along fractures. The bottom contact is faulted.

83.20 84.40 CHERT. Pyrite occurs only in trace amounts through this fine grained to aphanitic interval.

84.40 88.09 STOCKWORK SILICIFICATION. Similar to that described previously, this is fractured to 70% with subsequent silica introduction. Pyrite occurs in trace amounts throughout with the occasional pod of chalcopyrite seen. The

- 88.09 107.64 INTERLAYERED ASH TUFF AND CHERT/STOCKWORK. This is a sequence of stockwork fractured and silica healed cherty segments, and chloritically and sericitically altered fine grained tuffaceous units. Pyrite occurs in trace amounts throughout with occasional Cp seen locally.
- 107.64 109.94 ANDESITE FLOW. This is a small interval of silicified and chloritized andesite with 2-5% Py and trace Cp.
- 109.94 112.85 ARGILLIC ALTERATION. This is an indeterminate unit that has undergone strong argillic alteration. From 110.8 to 111.0 is a hydrothermal breccia with up to 50% very fine grained pyrite as breccia matrix.
- 112.85 124.46 ALTERED DIORITE. Chloritically and argillicly altered diorite with trace amounts of pyrite and chalcopyrite as fine grained disseminations and small veinlets.
- 124.46 135.04 ANDESITE. This is a chloritized, silicified, and sericitized unit with trace amounts of pyrite and chalcopyrite associated with quartz carbonate veinlets. The unit is sheared and faulted in a number of areas, including the bottom contact.
- 135.04 145.14 DIORITE. This is a gradational fine to coarse grained diorite intrusive. The unit shows some argillic, and some propylitic alteration zones. Pyrite content ranges from trace amounts up to 5%.
- 145.14 147.65 SILICA BRECCIA/FAULT ZONE. This is a strongly silicified fault zone with chloritic and graphitic fractures. From 146.2 to 146.5 some sheeted sulphide veinlets occur along the shear fabric. These contain up to 1/2% Cp.
- 147.65 153.4 TERTIARY DYKE. This unit is unstrained, containing euhedral to subhedral hornblende and feldspar phenocrysts. Strong clay and chlorite and clay alteration is seen in the interval accompanied by 5-10% disseminated pyrite.

- 153.4 156.7 CHALCOPYRITE VEIN STOCKWORK. This is a broad zone of chalcopyrite veins and veinlets generally paralleling each other at low angles to the C.A. The total Cp content over the interval is roughly 1%. The zone begins in a quartz vein, enters an andesitic unit, passes through a Tertiary dyke, and is faulted at its bottom contact. This suggests the mineralization is Tertiary in age.
- 156.7 158.56 DIORITE. The diorite is chloritized and silicified with up to 10% Py.
- 158.56 172.21 ASH TUFF. This is a very fine grained to aphanitic unit that has been weakly chloritized and silicified. Up to 2% pyrite occurs as fracture linings.

****END OF HOLE****

Discussion. The hole intersected a variety of rock types, primarily Permian cherts and andesite flows and tuffs. The 2.5 metre wide fault zone intersected from 145.14 to 147.65 may be a small splay fault related to the main structure through the area. The presence of Permian units in both hanging wall and footwall suggest this to be the case. The chalcopyrite vein stockwork is the most interesting in terms of mineralization. This mineralization is structurally controlled and is most likely Tertiary, as at one point it cross cuts what appears to be a Tertiary dyke. It is believed the main structural break was not intersected by this hole.

DATE: November 17, 1991
TO: I. PIRIE, D. HEBERLEIN
FROM: Cam Clayton
RE: DRILL HOLE SUMMARY

DRILL HOLE: TM 91-21 START DATE: Nov 19 END DATE: Nov 20
NORTHING: 0+65S EASTING: 5+25E ELEVATION: 1470 m
AZIMUTH: 050 DIP: -50 LENGTH: 149.35m

PURPOSE: This hole was added to the end of the program to test for Tertiary Au mineralization in sediments consisting primarily of sandstone and quartz/chert pebble conglomerate. A broad Au soil geochemical anomaly and I.P. chargeability anomaly occurs in this area of the grid.

<u>INTERVAL</u>		<u>DESCRIPTION OF INTERVAL</u>
<u>FROM</u>	<u>TO</u>	
0.00	6.10	CASING.
6.10	34.70	INTERBEDDED ASH AND CRYSTAL TUFF. This is an interesting interval, in that for the most part it resembles Permian chloritically altered ash and crystal tuff as described in previous holes, but also contains quartz rich interbeds (conglomerate and sandstone). The quartz rich, permeable interbeds are strongly oxidized and contain 10-15% pyrite.
34.70	36.1	SANDSTONE. This unit is strongly oxidized with 15% disseminated pyrite.
36.1	52.85	SANDSTONE/TUFF. This is similar to the first interval described but is less chloritic, more quartz rich. Again, fine grained intervals appear to be chloritically altered ash tuff and coarser grained intervals are quartz rich. Oxidation is associated with quartz rich intervals which again carry pyrite.
52.85	60.68	QUARTZ PEBBLE CONGLOMERATE. The grains in this interval are unstrained suggesting it is Tertiary in age. This is an oxidized interval

60.68 102.68 INTERBEDDED TUFFACEOUS SANDSTONE, SILTSTONE,
AND QUARTZ PEBBLE CONGLOMERATE. The
tuffaceous units are chloritically altered, and
the conglomeratic units are oxidized. The
more permeable units carry the higher
percentage of pyrite, generally 5%.

102.68 149.35 CHERTY ASH TUFF AND FINE GRAINED SANDY TUFF.
This is a gradational change from the
overlying unit with the absence of the
conglomeratic unit. It is strongly oxidized in
association with the sandy units, and
chloritized and silicified in association with
the finer grained ash tuff units. Trace Py is
seen throughout with up to 20% from 114.6 to
119.85.

****END OF HOLE****

Discussion. The quartz pebble conglomerate and sandstone units encountered in this interval were seen in this area at surface. The chloritically altered volcanoclastic units were not as apparent. This may reflect the more resistant mineralogy of the conglomerate and sandstone units. Outcrop exposure in this area is not particularly good (15%) and that seen usually stands out in a resistant manner. The permeable sandstone and conglomerate units have been affected by epithermal processes, as evidenced by the presence of vuggy quartz and chalcedony veinlets. The high degree of oxidation of these units, even deep in the hole, is of interest.

DATE: November 17, 1991

TO: I. PIRIE, D. HEBERLEIN

FROM: Cam Clayton

RE: DRILL HOLE SUMMARY

DRILL HOLE: TM 91-22

START DATE: Nov ²¹ 19 END DATE: Nov 22

NORTHING: 2+00S EASTING: 9+50E ELEVATION: m

AZIMUTH: 120 DIP: -55 LENGTH: 125.27m

PURPOSE: This hole was designed to test a broad chargeability and weak mag anomaly possibly associated with disseminated mineralization near the contact of diorite with Permian sediments. Weak to strong Au soil geochemistry is seen in the area.

<u>INTERVAL</u>		<u>DESCRIPTION OF INTERVAL</u>
<u>FROM</u>	<u>TO</u>	
0.00	6.10	CASING.
6.10	8.60	CROWDED FELDSPAR PORPHYRY. This is strongly chloriticly altered crowded feldspar porphyry dyke with trace to 2% pyrite.
8.60	48.10	INTERBEDDED SANDY TUFF, SANDSTONE, AND ASH TUFF. This is identical to that described in hole TM 91-21. These are interbedded fine grained to aphanitic tuffs, medium grained sandy tuffs, and quartz rich sandstones. Some of the more permeable units are oxidized and contain pyrite. Trace Cp is seen from 25.14 to 25.54 within what appears to be a small albite vein.
48.10	68.4	ARGILLACEOUS SEDIMENT. This is a grey to black very fine grained unit with graphitic fractures and fault gouge.
68.4	76.77	TERTIARY DYKE. Euhedral to subhedral feldspar and hornblende phenocrysts occur in this dyke. Several small fault zones cut the interval. The dyke is strongly carbonatized and is weakly magnetic from 68.2 to 68.4.

76.77 125.27 INTERBEDDED CHERT/QUARTZ PEBBLE CONGLOMERATE, QUARTZ RICH SANDSTONE. This is a sequence of interbedded quartz/ chert pebble conglomerate and quartz rich sandstone. These are clast supported units and the clasts are unstrained. Intervals from 94.0 to 94.22 and 114.65 to 115.05 are cut by quartz vein hydrothermal breccias containing trace amounts of pyrite. Some fracture surfaces are graphitic.

****END OF HOLE****

Discussion. The amount of magnetite contained in the Tertiray dyke from 66.4 to 76.77 is not really sufficient to explain the magnetic anomaly in the area. The presence of the argillaceous sediments accounts for the broad chargeability anomaly. The oxidation of the more permeable sandy units is of interest.

30000000

DATE: October 30, 1991
TO: Dave Heberlein
COPIES TO: Alex Davidson, Ian Pirie, Chris Nagati
FROM: Cam Clayton
RE: October Monthly Report

Rainbow-Tam O'Shanter/Wildrose Properties: Drilling finally began on the Rainbow-Tam O'Shanter property on October 1, 1991. The program began at the northern end of the property testing andesite volcanics north of the contact zone with the porphyry. The program is continuing in a southerly direction across the porphyry system testing both the porphyry and chlorite-magnetite zone, and will finish by testing disseminated and vein type mineralization in the Wildrose property area. Currently drilling is proceeding on hole P-13 in the area of chlorite-magnetite zone and this should be completed today. This will conclude the drilling of the north and central portion of the property and the drill will be moved to the southern portion. Six holes remain to be drilled and completion of the program is expected by November 15, 1991. Drill summaries are attached to this report, as is a plan map of drill holes completed. The following are summaries of the best intersections obtained to date. Only results for seven holes are available so far.

HOLE TM91-2 (P-1): 32.7 metres @ 0.136% Cu
32.7 metres @ 0.331 g/t AU

includes: 11.4 metres @ 0.213% Cu
11.4 metres @ 0.186 g/t Au

10.8 metres @ 0.068% Cu
10.8 metres @ 0.716 g/t Au

<u>Interval</u>	<u>Length</u>	<u>Cu (ppm)</u>	<u>Au (ppb)</u>
39.3-42.3	3 m	2262	183
42.3-44.3	2 m	2814	245
44.3-46.5	2.2 m	2208	244
46.5-47.7	1.2 m	1461	60
47.7-50.7	3 m	1740	157
50.7-53.5	2.8 m	834	364
53.5-54.4	0.9 m	719	4800
54.4-56.4	2.0 m	137	42
56.4-58.6	2.2 m	632	700
58.6-60.7	2.1 m	367	285
60.7-61.5	0.8 m	2414	216
61.5-63.0	1.5 m	958	188
63.0-66.0	3.0 m	1311	100
66.0-69.0	3.0 m	1231	45
69.0-72.0	3.0 m	1255	80

Comments: These grades are over the interval from 39.3 metres to 72.0 metres occurring within propylitically altered andesite containing variably altered zones of epidote, carbonate and minor hematite. The highest Au grade of 4800 ppb (719 ppm Cu) over 0.9 metres occurred from 53.5 metres to 54.4 metres and is associated with a shear.

HOLE TM91-4 (P-3): 31.5 metres @ 0.116% Cu
negligible Au

<u>Interval</u>	<u>Length</u>	<u>Cu (ppm)</u>	<u>Au (ppb)</u>
24.0-26.5	2.5 m	1466	19
26.5-29.0	2.5 m	1061	12
29.0-31.5	2.5 m	1088	20
31.5-34.25	2.75 m	1255	3
34.25-37.3	3.05 m	822	18
37.3-40.3	3.0 m	1099	21
40.3-43.3	3.0 m	1104	22
43.3-46.3	3.0 m	1017	16
46.3-49.3	3.0 m	1253	14
49.3-52.0	2.7 m	1411	30
52.0-53.5	1.5 m	1332	39
53.5-55.5	2.0 m	1113	30

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Comments: The samples are from a zone of chloritically altered andesite overprinted by patchy weak to very intense silicification. Magnetite occurs up to 8% fine grained in disseminations and as stringers and chalcopyrite occurs visibly in trace amounts throughout. Leucoxene may be present.

HOLE TM91-6 (P-7): 2.45 metres @ 1.15% Cu
2.45 metres @ 0.565 g/t Au
2.45 metres @ 5.7 g/t Ag

<u>Interval</u>	<u>Length</u>	<u>Cu (ppm)</u>	<u>Au (ppb)</u>
136.55-139	2.45 m	11547	565

Comments: The interval is from a fault zone that is bleached and intensely silicified within a chloritized zone of andesitic volcanics containing patchy zones of weak to moderate magnetism. Unfortunately the hanging wall and footwall of this zone are essentially barren (HW interval 298 ppm Cu, 3 ppb Au; FW interval 645 ppm Cu, 19 ppb Au).

HOLE TM91-7 (P-8): 12.0 metres @ 0.114% Cu
12.0 metres @ .049 g/t Au

<u>Interval</u>	<u>Length</u>	<u>Cu (ppm)</u>	<u>Au (ppb)</u>
54.2-57.2	3.0 m	1374	47
57.2-60.2	3.0 m	941	39
60.2-63.2	3.0 m	1128	48
63.2-66.2	3.0 m	1129	61

Comments: The interval is taken from a fine grained diorite containing chloritized mafics, sulphides, and magnetite comprising 50% of the core. Rare narrow K-spar alteration zones occur with quartz veinlets. Minor chalcopyrite is disseminated throughout.

Copper and gold grades have so far proven sub-economic for a large tonnage deposit. Results from holes associated with the chlorite-magnetite zone and the diorite in areas of highest Cu-Au soil geochemistry have not been obtained as yet and the possibility of higher grades occurring in drill core is still present.