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DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud - Dreamland - Holly McEachlan
AUTHOR	McEachlan H
DATE OF DOC(S)	1999
MULTI_DIST Y / N?	
Additional Dist_Nos:	
QUAD_NAME	Sulphur 7½'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine
COMMODITY If not obvious	gold; silver
NOTES	Correspondence; geology 8 p.

Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

SS: DP 9/11/08
Initials Date

DB: _____
Initials Date

SCANNED: _____
Initials Date

DREAMLAND - Holly McLachlan

60001967

4010

Dear Randy Vance,

June 19, 1999

Included in this package should be a copy of my final report, my last expense report, a floppy disk containing the final report with and without color codes, and the strat picks (Dreamland.xls) that correspond with stratigraphic breaks on my re-logs. I hope they are suitable for data entry into Geomodel and/or Surpac. I think that the stratigraphic units in the Dreamland area are sufficiently planar that they should show the location of fault offsets well when viewed in three dimensions. I have much more confidence in my strat picks than I do in the faults as currently modeled on the cross-sections.

I will be at home (635-5399) through Tuesday the 22nd, and travelling thereafter until the 4th of July.

Sincerely,

A handwritten signature in cursive script, reading "Holly McLachlan". The signature is fluid and stylized, with the first name "Holly" and last name "McLachlan" clearly distinguishable.

Holly McLachlan

Dreamland Re-logging Project:

The Dreamland re-logging effort was undertaken in order to identify the structures that were most likely responsible for the deep 0.8 oz Au hit in the Dozer unit in RS-425, and to determine how to best pursue this newly identified target with further drilling. In order to do this it was necessary to establish a working stratigraphy in the 'Chocolate Formation' cover unit in the Dreamland area.

19 drillholes were re-logged, 8 with core tails. These were strictly stratigraphic re-logs, done on the basis that grade was structurally controlled at Dreamland, and that the purpose in re-logging was to locate significant structures that either controlled or offset grade (see accompanying Dreamland.xls spreadsheet with strat picks).

The project was completed in 38 working days. It took about 25-30 days to identify mappable and loggable stratigraphic units that could be correlated from hole to hole in the immediate Dreamland area. The remaining time was used to draft the suite of 9 sub-orthogonal cross-sections that accompany this report:

- 4 long, N55°W mine x-sections (1900NW, 2100NW, 2300NW and 2500NW)
- 4 N03°E x-sections
- 1 N60°E x-section

Surface information: Peter Mitchell's 1"=200' map, and Craig Byington's structural map in the Dreamland area were used in creating and interpreting the cross-sections.

STRATIGRAPHIC UNITS: The rock units employed in the Dreamland cross-sections correspond for the most part with those used by Peter Mitchell in surface mapping over the Dreamland target area. The Badger, RQL, Kamma Andesite (KA) and, the FeMag-phyric sub-unit of the Chocolate effusives are four units he delineated in mapping that were readily identifiable in drill cuttings. The Dozer and Auld Lang Syne are present at depth in the Dreamland area, but do not crop out. Color codes are the same for logs and x-sections, and are given with the unit descriptions below.



Badger: The Badger conglomerate had been identified in previous, small-scale mapping of the Rosebud land package. It is a heterolithic to monolithic conglomerate, and is exposed at surface on the north side of the Dreamland area. In chips it can be pervasively lightly bleached compared to the underlying, fully indurated rocks, or it can yield soft, brick-colored sandy-clay chips. It is difficult to pick the base of the unit.
(Standard color code for this unit is light grey, Verithin 734½)



RQL: The RQL is the surface unit in the south 3/4ths of the Dreamland area. The RQL is sill-like to laccolithic in overall shape. It is a comparatively late intrusive feature that cuts the Tcs sediments, the Dozer and the Chocolate Group volcanics.



The upper, glassy portion is strongly recrystallized along flow foliation and locally strongly to moderately bleached and argillized. It appears to be relatively flat lying in the Dreamland area and displays a moderately constant thickness of about 300' away from the feeder zone intersected in RS-444.

Feeder zone: the RQL may have come up along the same break that drops the Dreamland rock package obliquely down to the south. Dikes of RQL are found at depth in

the Dozer in RS-444, however it has not yet been identified as cutting ALS in this area. While the sill-like, upper portion of the unit tends to be flow-banded and may have originally been glassy, at depth the groundmass is fine grained and massive. Phenocryst content is the same in both. The color code is Lavender for the flow-banded RQL, and Violet for the deeper, massive RQL, reflecting the fact that I was not initially sure that they constituted one unit.

The RQL is characterized by variably elongate to equant sanidine (or possibly orthoclase) phenocrysts that have distinctive rounded corners. These tend to resist alteration to a greater degree than the more numerous plagioclase phenocrysts, which occur either singly or commonly in glomeroporphyritic clusters +/- relict amphibole. The unit contains characteristic sparse "quartz" eyes which are more common in the aphanitic, flow-banded, flat-lying portion of the body. Pete Rogowski has suggested that some if not all of these are entrained particles of glass, especially the 'smoky' quartz phenocrysts that I have only found in the upper, sill-like portion of the unit.

The RQL extends northwest of the Dreamland target area as a narrow dike. It appears as a sill closer to the mine in 96-385, and in the mine workings (Peter Mitchell).



Kamma Andesite: This highly distinctive unit appears to cross-cut stratigraphy and is comparatively weakly altered in most places. It varies between about 200-300' in thickness and dips gently to the west. It has a fine-grained, massive, brown to dark brown groundmass that is locally bleached to tan, and is characterized by strongly glomeroporphyritic, white plagioclase phenocrysts.

This is the least altered of the major rock units in the area and may be a comparatively late, intrusive body. It was not observed cutting the Dozer or Tcs sediments as was the RQL, but the Kamma Andesite *may* be correlative with the 'Bud Marker Porphyry' dike in the East Zone deposit. I do not remember seeing the diagnostic rounded sanidines in the East zone dike that were characteristic of the BMP in the Dreamland holes or in 96-385, which is the hole closest to the mine in which I have identified RQL. Peter Mitchell stated that he has seen both the Kamma Andesite and the RQL as late, cross-cutting features in the current mine workings.

Chocolate Flows (country rock): The Chocolate package described here lies below the Kamma Andesite and is in apparent fault contact with the ubiquitous Dozer. It is modeled as a set of shallowly west-dipping subunits, based primarily on the textural features identifiable in chips. This package is modeled as dipping subparallel to the overlying Kamma Andesite.



FeMag-phyric sub-unit: This is the major 'type' **Chocolate Lava** identified by Peter. It has a tan, massive, fine-grained groundmass and is characterized by acicular subhedral to euhedral dark brown relict amphiboles +/- biotites. The amphiboles average about 3mm to 1-0.5 mm, and have an unusually skinny, almost platy habit. The distribution of these characterizing FeMag phenocrysts is highly variable. They can be almost completely absent over thicknesses of 100-200', and tend to be more densely distributed in the upper portions of the unit (solid Tuscan Red). There are also very sparse plagioclase phenocrysts locally in this unit, or in related sub-units in the Chocolate Flows package.



Bud-like volcanoclastics: Locally, clay-altered unwelded to semi-welded volcanoclastics are found within and at the base of the Chocolate Lava. The chips through these intervals are soft, mottled or highly variable in color. These volcanoclastic or epiclastic units are usually 20-35' thick.





Mmb/sub-aphyric/flow-banded: This unit extends into the core tails of 3-4 drillholes and is characterized on the basis of some larger-scale textural features that do not show up readily in chips. It is often separated from the overlying Chocolate Lava by a thin bud-like layer. It contains sparse feldspar and amphibole phenocrysts, and is characterized by its mmb's, aphanitic to fine-grained devitrified groundmass and planar laminations. It varies in color from dusty lavender to off-white, depending on the degree of bleaching. This unit is **not** the **LBT**. The LBT as seen in RS-446 lacks mmb's, lacks phenocrysts, and is texturally distinct, exhibiting none of the signs of glassy/devitrified.



Dozer: The Dozer is in the footwall of the Cave Fault throughout the Dreamland area. It is fine-grained, totally aphyric, and variably grey, cream or light sage green in color. It is somewhat less aphanitic than many of the overlying units (LBT, mmb-bearing, sub-aphyric Chocolate Flow).



Tcs: Tertiary siltstone through conglomerate, with ALS clasts and grains common. Not seen in the immediate Dreamland drilling.



Auld Lang Syne: The Mesozoic basement is intensely carbonaceous and sheared in the Dreamland area. It is black, shiny and graphitic on shear planes, and shot through with sparry white calcite veins.

STRUCTURE: There are 2 main structural breaks in the Dreamland target area. A set of high angle strike-slip or oblique-slip structures are the most prominent surface features, and at depth the low angle Cave fault (or related faults) place Chocolate on top of Dozer in many drillholes.

Cave Fault: The Cave fault places mmb-bearing Chocolate on Dozer in RS-408 in the Dreamland area. The regional attitude of the Cave fault is N43°E, 24°NW (Byington), and I have modeled it accordingly, with an apparent dip of 8.5° on the N60°E cross-section. It appears to project in a fairly straight line from where Charlie Muerhoff and Kurt Allen identified it to the southeast near to mine area. This may be something of an accident however, given that it disappears across the significant offset between RS-444, and RS-408, 425, and 450. It may be dropped down to the south of the Dreamland area.

Conjugate High-angle shears: I have interpreted the Cave fault as being dissected by a nearly east-west striking, multi-strand, high-angle, oblique-slip fault set. This break was mapped by Craig Byington, and is well suited to explaining the changes in rock units as one goes south from the Dreamland target area. Byington has 3-4 strands mapped at surface; I've labeled them 0, 1, and 2, with 2 splitting into 2A and 2B on the west side of the study area (see 1"=200' map). Fault #3 does not appear to affect the rock units in the immediate Dreamland area. Fault #4 takes over from this multi-strand break on the west side of the study area; Byington has it cutting off 1, 2A, and 2B just east of my westernmost N03°E cross-section (478425E).

There appears to be only a modest amount of down to the south movement on the 2A and 2B strands of the fault, although with bedding dipping west this apparent offset could

be explained by modest left lateral movement, in keeping with Byington's interpretation for post-ore offset.

There must have been significant strike-slip movement on either the 0 and/or 1 strands of this fault set. The rock units in RS-423 and (even more so) in RS-424 are sufficiently different from the Dreamland stratigraphy that up/down motion cannot account for the changes. Most of the apparent down-to-the-south motion is likewise taken up on the #1, although there may have been just as much motion on the #0. There is not enough drill data to the south of the Dreamland target area to say otherwise.

DRILLHOLE RECOMMENDATIONS:

RS-425 *appears to be in the same structural block* as RS-408 (see N60E cross-section for the best view). If my interpretation is correct and the #2A & 2B fault traces come through north of the 0.8 oz Au hit in RS-425, then a possible explanation for the grade could be that it is located just below the intersection of a major high-angle shear trace and the Cave fault. These high-angle faults (0 thru 2A&B) were mined historically at the surface, and Byington postulates that they form a set of conjugate shears with the South Ridge and Cave fault set. The intersections of these fault sets would be prospective, and may be tested by drilling an angle hole from the RS-408 pad designed to intersect the Dozer just below the present intercept. If there were a low angle trace extending up to the northeast from RS-408 it would be intersected. Given the uncertainty over where specific high-angle fault traces cut through these rocks, a pair of 180° angle holes would probably be needed to begin to pin down an ore trend.

Dreamland Lithology Table

Holly McLachlin, June, 1999

Drillhole #	Badger from	RQL from	Mixed Lith Breccia from	RQL from	Kamma Andesite from	Tc:Bud-like from	Kamma Andesite from	Tc:Bud-like	Tc: Femag-phyric from
97-399	0	30	365	450	535	null	null	null	768
RS-400	0	170	null	null	490	null	null	null	837
RS-401	0	145	null	null	520	null	null	null	675
RS-402	null	0	null	null	null	null	null	null	null
RS-405	0	155	400	null	450	null	null	null	835
RS-408	0	17	810	null	840	null	null	null	1078
RS-423	0	35	null	null	null	null	null	null	393
RS-424	0	75	290	null	null	null	null	null	350
RS-425	null	0	435	null	640	null	null	null	1020
RS-443*	0	20				null	null	null	
RS-444	null	0	150	500	null	null	null	null	1300
RS-450	0	100	360	null	445	null	null	null	895
RB-1	null	0	390	null	null	null	null	null	null
RB-2	null	0	350	null	null	null	null	null	433
RB-5	null	0	null	null	null	null	null	null	null
RB-6	0	null	null	null	null	null	null	null	null
RL-223									
RL-224									
* need to relog									
RS-446	null	0	130	null	265	550	645	855	991

Dreamland Lithology Table

Holly McLachlin, June, 1999

Tc: Bud-like from	Tc: mmb/aphyric from	Cave Flt from	Dozer from	RQL from	Dozer from	RQL from	Dozer from	ALS from	TD
910	null		1005						
977	1000		1310	1490	1501.5	1593	1609	2365	
null	null		null	null	null	null	null	null	200
1000	1045		1225	null	null	null	null	null	1500
1431	1442.5		1565	null	null	null	null	2257	2269
null	null		null	815	null	null	null	null	1140
null	null		null	585	965	null	null	null	1500
1250	1300		1551	null	null	null	null	2397.5	2418
null	null		1746	1778	1871.5	1872.5	1970	null	2047
975									
null	null	null	null	null	null	null	null	null	500
null	null	null	null	null	null	null	null	null	660
null	null	null	null	null	null	null	null	null	425
null	null	null	null	null	null	null	null	null	405
	Bud	mixed	LBT	Low angle fault	Bud	LBT	fault	LBT BX	LBT
	1648-1749.5	1749.5-1767.5	1767.5-2021.3	2005.6-2021.3	2021.3-2043	2043-2189.5	2189.5-2195	2195-2236	2236-2362

Dreamland Lithology Table

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RQL	Wht Alps?	Tos?	Tcs	RQL	Tcs	ALS
2362-2447.6	2447.6-2460	2460-		2866.6-2952.2	2952.2-3024	3024-3070.