Discovery of Gold Beneath a Barren Opaline Cap at Painted Hills, NW Nevada, and the Association of Gold with Molybdenum in a Low-Sulfidation Epithermal System

Jacob Margolis
True Grit Resources Ltd.

“Don’t be model driven”!
E.S. Cheney
Middle Miocene, Low-Sulfidation, Epithermal Au-Ag
Main opal stockwork zone

Opal Veins

Opal replacements in Ts

South Silicified Fault

"Mine Gulley"

Vent

Tcr

Ts

Tt

Vent Gulley

Opal replacements in Ts

South Silicified Fault

500m
Argillized Felsic Volcaniclastic Sequence

3 ppm Hg
24 ppm Sb
13 ppm As
no Au or Mo
Felsic Volcaniclastic Sequence
Looking NE

Upper Sandstone

stratiform opal

Ts

Tt
Looking NE

Upper Sandstone

stratiform opal

Ts

Tt
Felsic Pyroclastic Vent

24 ppm As
102 ppm Sb
14.5 ppm Hg
no Au, Mo
Felsic Pyroclastic Vent

14 Ma
Whole-rock K-Ar (Hulen, 1979)
Main opal stockwork zone

"Mine Gulley"

Opal Veins

Opal replacements in Ts

South Silicified Fault

Dome

500m
Opal Veins
South Silicified Fault
# Rock-chips
## Maximum Values

<table>
<thead>
<tr>
<th>Rock Type</th>
<th>Au</th>
<th>As</th>
<th>Sb</th>
<th>Hg</th>
<th>Mo</th>
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<tbody>
<tr>
<td>Opal replacement zones in Ts</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Opal veins</td>
<td>-</td>
<td>87</td>
<td>37</td>
<td>5</td>
<td>-</td>
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<tr>
<td>Hematitic argillized Tt</td>
<td>-</td>
<td>33</td>
<td>70</td>
<td>33</td>
<td>11</td>
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<tr>
<td>Silicified flow dome</td>
<td>-</td>
<td>114</td>
<td>190</td>
<td>81</td>
<td>-</td>
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<tr>
<td>North dike at range front</td>
<td>-</td>
<td>108</td>
<td>31</td>
<td>-</td>
<td>18</td>
</tr>
<tr>
<td>South silicified fault</td>
<td>-</td>
<td>103</td>
<td>90</td>
<td>&gt;100</td>
<td>-</td>
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<tr>
<td>Pyritic chalcedonic silica float from mine gulley</td>
<td>0.107</td>
<td>76</td>
<td>59</td>
<td>&gt;100</td>
<td>156</td>
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<tr>
<td>Values considered anomalous</td>
<td>0.015</td>
<td>25</td>
<td>15</td>
<td>0.75</td>
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</table>
Low-Sulfidation
Geologic Exploration Model

- Steam-heated zone
  - Hg, S°, no or trace Au
  - opaline silica grading down to chalcedony
  - sinter at water table

Zone 1

- Stratiform low-grade Au replacement system
  - Permeability/aquifer control
  - Tuffs, volcaniclastics

Zone 2

- High-grade veins
  - Focused along basement contact or in competent volcanic units
  - quartz-adularia-calcite
  - AgSe, low Pb-Zn
  - boiling

Zone 3

modified from Hedenquist et al. (2000)
South Silicified Fault
Chalcedonic silicification
Hg, As, Sb, no gold, no Mo

Looking 015

Unaltered Ts
Unaltered Tt
Unaltered Tb
Argillic
Mod. Silicic
Strong Silicic
Silicic

Base of oxidation

Au ppm
0-0.019
0.02-0.099
0.100-0.330
As-Mo
PH0701
PH0703
PH0704
Mo
Target?
No Mo
Fewer silicic zones
Lower Au
HK
Argillic
Mod. Silicic
Strong Silicic
Unaltered Ts
Unaltered Tt
Unaltered Tb
Au ppm
0-0.019
0.02-0.099
0.100-0.330

Looking 015
Opal Veins
1
3
4
100ft
300ft

Target?
No Mo
Fewer silicic zones
Lower Au

HK
Argillic
Mod. Silicic
Strong Silicic
Unaltered Ts
Unaltered Tt
Unaltered Tb

Au ppm
0-0.019
0.02-0.099
0.100-0.330
## Silicification and Veins

<table>
<thead>
<tr>
<th></th>
<th>3: 1028ft</th>
<th>3: 1024ft</th>
<th>3: 449ft</th>
<th>1: 1021ft</th>
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<tbody>
<tr>
<td>ppb Au</td>
<td>180</td>
<td>240</td>
<td>190</td>
<td>140</td>
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<tr>
<td>ppm As</td>
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<td>46</td>
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<td>ppm Sb</td>
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<td>24</td>
<td>21</td>
</tr>
<tr>
<td>ppm Hg</td>
<td>17</td>
<td>13</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>ppm Mo</td>
<td>26</td>
<td>70</td>
<td>31</td>
<td>63</td>
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</table>
Silicification and Veins

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Au (ppb)</th>
<th>As (ppm)</th>
<th>Sb (ppm)</th>
<th>Hg (ppm)</th>
<th>Mo (ppm)</th>
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<tbody>
<tr>
<td>3:1023</td>
<td>240</td>
<td>76</td>
<td>26</td>
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<td>70</td>
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<tr>
<td>2:932</td>
<td>170</td>
<td>29</td>
<td>29</td>
<td>9</td>
<td>247</td>
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<tr>
<td>1:571</td>
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<td>16</td>
<td>28</td>
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<tr>
<td>4:1410</td>
<td>120</td>
<td>16</td>
<td>20</td>
<td>1</td>
<td>1</td>
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</table>

no bladed cc, sug qz
**Silicification and Veins**

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<thead>
<tr>
<th></th>
<th>ppb Au</th>
<th>ppm As</th>
<th>ppm Sb</th>
<th>ppm Hg</th>
<th>ppm Mo</th>
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<tbody>
<tr>
<td></td>
<td>240</td>
<td>25</td>
<td>26</td>
<td>13</td>
<td>70</td>
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<tr>
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<td></td>
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<td>16</td>
<td>28</td>
<td>3</td>
<td>2</td>
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<tr>
<td></td>
<td>120</td>
<td>58</td>
<td>20</td>
<td>1</td>
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### Gold Correlations (R values)

<table>
<thead>
<tr>
<th></th>
<th>PH0701</th>
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<th>PH0704</th>
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<tbody>
<tr>
<td>Ag</td>
<td>0.25</td>
<td>0.05</td>
<td>0.06</td>
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<tr>
<td>As</td>
<td>0.04</td>
<td>0.02</td>
<td>0.06</td>
<td>0.00</td>
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<tr>
<td>Sb</td>
<td>0.15</td>
<td>0.34</td>
<td>0.46</td>
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</tr>
<tr>
<td>Cu</td>
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<td>-0.20</td>
<td>-0.25</td>
<td>-0.19</td>
</tr>
<tr>
<td>Pb</td>
<td>0.15</td>
<td>-0.07</td>
<td>-0.17</td>
<td>0.00</td>
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<tr>
<td>Zn</td>
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<td>-0.34</td>
<td>-0.19</td>
</tr>
<tr>
<td>Hg</td>
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<td>0.43</td>
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<tr>
<td>K</td>
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<td>0.06</td>
<td>0.09</td>
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<tr>
<td>Mo</td>
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<td>0.46</td>
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<td>S</td>
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<td>Se</td>
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<tr>
<td>Sn</td>
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<td>-0.40</td>
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<td>Te</td>
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<td>-0.16</td>
<td>-0.13</td>
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<tr>
<td>Tl</td>
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<td>0.31</td>
<td>0.22</td>
<td>0.12</td>
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<tr>
<td>U</td>
<td>0.11</td>
<td>-0.15</td>
<td>0.06</td>
<td>0.20</td>
</tr>
<tr>
<td>W</td>
<td>-0.03</td>
<td>-0.03</td>
<td>-0.07</td>
<td>-0.03</td>
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</table>
### Molybdenum-Rich Veins

<table>
<thead>
<tr>
<th>ppm</th>
<th>Au</th>
<th>As</th>
<th>Sb</th>
<th>Hg</th>
<th>Mo</th>
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</thead>
<tbody>
<tr>
<td>.130</td>
<td>109</td>
<td>27</td>
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<td>.160</td>
<td>60</td>
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<td>2.9</td>
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<tr>
<td>.200</td>
<td>94</td>
<td>23</td>
<td>2.9</td>
<td>664</td>
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</tbody>
</table>

Vein separate: 1.51 290 116 20 1.65% and 72 ppm Tl
Jordisite
Conclusions

1. Gold discovered below barren opaline cap in previously untested LS epithermal system; validation of epithermal exploration model
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   - Boiling level deeper or lateral to the area tested
   - Pediment untested
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3. System remains under-explored
   - Boiling level deeper or lateral to the area tested
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4. Au-Mo association
   - Au:Mo correlation
   - Possible metal source from felsic magmatism