An Energy-Dispersive X-Ray Fluorescence Analysis of Obsidian Artifacts from Archaeological Sites in Boulder, Grand, and Larimer Counties, Colorado

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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF
OBSIDIAN ARTIFACTS FROM ARCHAEOLOGICAL SITES IN BOULDER,
GRAND, AND LARIMER COUNTIES, COLORADO

28 January 2011

Dr. Jason LaBelle
Department of Anthropology
Colorado State University
Fort Collins, CO 80523

Dear Jason,

Your assumption was correct, and all the artifacts were produced from one of the three major
sources in the Jemez Mountains, Cerro Toledo Rhyolite, El Rechuelos, and Valles Rhyolite (Cerro del
Medio; see Shackley 2005; Table 1 and Figure 1 here). Cerro Toledo Rhyolite is available as secondary
deposits as far north as Española, New Mexico, El Rechuelos in the Rio Chama, but Cerro del Medio is
only available in the Valles Caldera proper (Shackley 2005, 2010).

The samples were analyzed with a Thermo Scientific Quant’X EDXRF spectrometer in the
Archaeological XRF Laboratory, El Cerrito, California. Specific instrumental methods can be found at
to source standards at Berkeley (Shackley 2005). Analysis of the USGS RGM-1 standard indicates high
machine precision for the elements of interest (Table 1).

Sincerely,

M. Steven Shackley, Ph.D.
Director

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http://www.swxrflab.net/
REFERENCES CITED

Shackley, M.S.


Table 1. Elemental concentrations for the archaeological samples. All measurements in parts per million (ppm).

<table>
<thead>
<tr>
<th>Sample</th>
<th>Ti</th>
<th>Mn</th>
<th>Fe</th>
<th>Rb</th>
<th>Sr</th>
<th>Y</th>
<th>Zr</th>
<th>Nb</th>
<th>Ba</th>
<th>Source</th>
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<td>2011-1</td>
<td>944</td>
<td>353</td>
<td>9729</td>
<td>155</td>
<td>12</td>
<td>45</td>
<td>170</td>
<td>53</td>
<td>126</td>
<td>Valles Rhy. (Cerro del Medio)</td>
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<td>879</td>
<td>506</td>
<td>1020</td>
<td>207</td>
<td>8</td>
<td>62</td>
<td>171</td>
<td>103</td>
<td>&lt;1</td>
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<td>426</td>
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<td>157</td>
<td>13</td>
<td>23</td>
<td>67</td>
<td>44</td>
<td>62</td>
<td>El Rechuelos</td>
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<td>350</td>
<td>9155</td>
<td>150</td>
<td>11</td>
<td>40</td>
<td>157</td>
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<td>&lt;1</td>
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<tr>
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<td>24</td>
<td>218</td>
<td>5</td>
<td>872</td>
<td>standard</td>
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1 Captured some Ba in white sample number on reverse side.
Figure 1. Y versus Nb bivariate plot of the archaeological specimens.