SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: South Hill
Max. Charge Weight: 175
Date of Blast: 3-11-11
Northing: 37°59'03" N
Time of Blast: 11:33
Easting: 122°27'11" W
Blast Duration: 242 ms
Blast Number: 1544

Seismograph Information:
- Seismograph Model: Mikro, Mikro, Mikro, Mikro
- Serial Number: 2481, 4550, 4567, 4570
- Last Calibration Date: 5/10/10, 5/17/10, 5/17/10, 5/17/10

Location Information:
- Location: Marin City, via Miantatagte, San Rafael, Mt. Tam Park
- Northing: 37°59'19" N, 37°59'18" N, 37°59'31" N, 37°59'30" N
- Easting: 122°27'22" W, 122°27'53" W, 122°27'30" W, 122°27'16" W
- Distance from Blast: 1637, 3010, 2957, 2693
- Scaled Distance: 124, 227, 223, 203

Vibration Information:
- Longitudinal Peak Particle Velocity (ips)
- Longitudinal Peak Frequency (Hz)
- Transverse Peak Particle Velocity (ips)
- Transverse Peak Frequency (Hz)
- Vertical Peak Particle Velocity (ips)
- Vertical Peak Frequency (Hz)
- Peak Vector Sum (ips)
- Peak Air Overpressure (db)

General Comments:
Nothing triggered

Seismograph Operator: Deron Lopes
Signature: Deron Lopes
### SAN RAFAEL ROCK QUARRY BLAST REPORT

**BASE DATA:**

<table>
<thead>
<tr>
<th>Location: South Hill E1.75'</th>
<th>Designed Bench Height (ft): 55</th>
<th>Date: 3-11-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northing: 32°59'03&quot; N</td>
<td>Rock Density (lb/ft³): 2.7</td>
<td>Time: 11:33</td>
</tr>
<tr>
<td>Easting: 12°17'21&quot; W</td>
<td>Relative Rock Hardness: 7</td>
<td>Blast Number: 1544</td>
</tr>
</tbody>
</table>

**DESIGN DATA:**

<table>
<thead>
<tr>
<th>Number of Holes Shot: 16</th>
<th>Hole Dia (in.): 3 1/4</th>
<th>Stemming (ft): 15 ± 1&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave. Hole Depth (ft): 9 1/2</td>
<td>Burden (ft): 8</td>
<td>Loading Time Required (man hrs):</td>
</tr>
<tr>
<td>Relative Confinement:</td>
<td>Spacing (ft): 8</td>
<td>Stem Type: 9/16&quot; Slant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staggered Pattern (Y or N): N</td>
</tr>
</tbody>
</table>

**EXPLOSIVES DATA:**

<table>
<thead>
<tr>
<th>Bulk Explosive</th>
<th>Weight</th>
<th>Boosters</th>
<th>Units</th>
<th>Delays</th>
<th>Units</th>
<th>Misc.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha M-1 4&quot;</td>
<td>6450</td>
<td>3000.00</td>
<td>33</td>
<td>1.5</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyno AP 2 3/8 x 16</td>
<td>117</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Max (lb/hole): 1.75 |
Blast Duration (sec): 242mS
Total Charge Wt.: 2591

**VIBRATION DATA:**

<table>
<thead>
<tr>
<th>Nearest Structure:</th>
<th>Seismograph Loc.:</th>
<th>Temperature: 62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sky Condition: Clear</td>
<td>Wind Direction: NE</td>
<td>RPPV: 0</td>
</tr>
<tr>
<td>Frequency: 0.5</td>
<td>Wind Speed: 0-2</td>
<td>Airblast: 0.5</td>
</tr>
</tbody>
</table>

**PERFORMANCE DATA:**

<table>
<thead>
<tr>
<th>Powder Factor (lb/ton):</th>
<th>Displacement:</th>
<th>Crushability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lb/yrd³: 3 1/3</td>
<td>Vibration: Card</td>
<td>Fines:</td>
</tr>
<tr>
<td>Fragmentation: Great</td>
<td>Digability:</td>
<td>Blaster in Charge:</td>
</tr>
</tbody>
</table>

Comments: electron with Bob Kelly
16 Holes
18% of unitram
14.30 unitram
32° 350 gram

2450 ft Alph咻咻x
119 ft DynAP 3½ x 16

Depth: 62 ft
20° Angle
Stem: 15 x 17 Avy

Main: 1637
Via: 3910
South: 2957
McC: 2693

31° 59' 03" N
122° 37' 31" W
GeoSonics Inc. Seismic Analysis
Stop Event Report

Serial No: 7155 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 16 MARIN BAY PARK CT.
Distance: 
Operator: VIBRA-TECH GSM
Comment: WILLIAM HOSKEN RESIDENCE

Begin Date: 03/11/2011 07:00:50 (UTC-8)
End Date: 03/11/2011 12:16:22 (UTC-8)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.9

Shaketable Calibrated: 01/26/2011
By: Vibra-Tech, Inc.
2700 Holloway Road - Suite 113
Louisville, KY 40299 U.S.A.
TEL: 502.240.9900 FAX: 502.240.9902

Dynamic Calibration Graph: [Diagram]

Cal Test Results:
Longitudinal: Pass
Transverse: Pass
Vertical: Pass
Sound: Pass

The seismograph located across the street from 16 Marin Bay Park Court (S/N 7155) did not trigger during the blast on March 11, 2011 at approximately 11:33 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph on Quarry Property (S/N 9856) did not trigger during the shot on March 11, 2011 at approximately 11:33 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph at 114 San Marino Drive (S/N 9669) did not trigger during the shot on March 11, 2011 at approximately 11:33 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.