## SAN RAFAEL ROCK QUARRY VIBRATION REPORT

### Location Information
- Location: [Blank]
- Northing: 37° 59' 11.4" N
- Easting: 121° 27' 12" W
- Max. Charge Weight: 40.0
- Date of Blast: 8.7.13
- Blast Duration: 30.4 ms
- Time of Blast: 11:44
- Blast Number: 10

### Seismograph Information

<table>
<thead>
<tr>
<th>Unit #</th>
<th>UNIT #2</th>
<th>UNIT #3</th>
<th>UNIT #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.3.0.6</td>
<td>12.6</td>
<td>12.6</td>
<td>12.6</td>
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<tr>
<td>Initial Number</td>
<td>12.6</td>
<td>12.6</td>
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<tr>
<td>Last Calibration Date</td>
<td>5.3.13</td>
<td>5.3.13</td>
<td>5.3.13</td>
</tr>
</tbody>
</table>

### Location Information
- Location: [Blank] / Via Rambalato / San Martino / Mt. Aetna Park
- Northing: 37° 59' 11.4" N / 37° 59' 11.4" N / 37° 59' 21.1" N / [Blank] 10 N
- Easting: 121° 27' 12" W / 121° 27' 12" W / 121° 27' 38" W / 121° 27' 11.4" W
- Distance from Blast: 137.2 / 34.7 / 2.69 / 1006
- Scaled Distance: 46 / 177 / 13 / 97

### Vibration Information
- Longitudinal Peak Particle Velocity (ips): 0.07 / 0.07
- Longitudinal Peak Frequency (Hz): 12.3
- Transverse Peak Particle Velocity (ips): 0.06 / 0.07
- Transverse Peak Frequency (Hz): 12.3
- Vertical Peak Particle Velocity (ips): 0.06
- Vertical Peak Frequency (Hz): 27.3
- Peak Vector Sum (ips): 0.28
- Peak Air Overpressure (db): 116

### General Information
- Seismograph Operator: [Blank]
- Signature: [Blank]
SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:
Location: [Redacted] Designed Bench Height (ft): 40 Date: 2-3-13
Easting: 120277.43 Relative Rock Hardness: [Redacted] Blast Number: [Redacted]

DESIGN DATA:
Number of Holes Shot: 28 Hole Dia (in): 2 3/4 Streamline (ft): 10 Loading Time Required (min hrs): 1 Deck Type:

EXPLOSIVES DATA:
Bulk Explosive Weight Boosters Units Delays Units Misc. Units
TNT: 250 450 15 80 0 0

ivmax (in/sec): [Redacted] Blast Duration (sec): [Redacted]

VIBRATION DATA:
Northing: 37°59'48" Northing: [Redacted] Sky Condition: [Redacted] RPPV: [Redacted]
Easting: 12°27'42" Easting: [Redacted] Wind Direction: [Redacted] Frequency: 23.8
Distance Away: 12 Distance Away: [Redacted] Wind Speed: [Redacted] Airblast: [Redacted]

PERFORMANCE DATA:
Powder Factor (lb/ton): [Redacted] Displacement: Good Crushability: [Redacted]
Lb/yard³: 1.18 Vibration: 4.36m/. Fines: [Redacted]
Fragmentation: [Redacted] Dig ability: [Redacted]
Comments: [Redacted] Blaster in Charge: [Redacted]
Seismic Analysis
Velocity Waveform Analysis

Serial Number: 9591
Firmware Version: 08-03-23
Event Date: 08/02/2013 11:42:34 (UTC -07:00)
Event number: 2
Recording Time: 5 s
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QRY
Location: 16 MARIN BAY PARK CT.
Distance: 
Operator: VIBRA-TECH GSM
Comment: WILLIAM HOSKEN RES.
Seismic Trigger: 0.03 in/s
Sound Trigger: 75.9 DB
Additional Info: j-GEO-01252
N37 59.524, W122 27.373

Summary Data

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV (in/s):</td>
<td>0.0375</td>
<td>0.0225</td>
<td>0.03</td>
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<tr>
<td>FREQ (HZ):</td>
<td>22.7</td>
<td>17.2</td>
<td>18.5</td>
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<tr>
<td>PD (‘01”):</td>
<td>0.3575</td>
<td>0.2525</td>
<td>0.295</td>
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<tr>
<td>PPA (g):</td>
<td>0.01953</td>
<td>0.01302</td>
<td>0.02604</td>
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</tbody>
</table>

Peak Vector Sam: 0.045 in/s
Peak Air Pressure: 111.7 DB
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale
Time Scale: 0.1 s
Seismic Scale: +/- 0.16 in/s
Sound Scale: +/- 0.0023 psi

Velocity Waveform
SSN: 9591 Event: 2

Printed: August 02, 2013 File: 0000003248_201308g3k (GeoSonics Inc. PDFGenerator v 1.0)
Seismic Analysis
Velocity Waveform Analysis

Serial Number: 9808
Firmware Version: 08-03-23
Event Date: 08/02/2013 11:42:33 (UTC -07:00)
Event number: 19
Recording Time: 5 s
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QRY
Location: ON QUARRY PROPERTY
Distance:
Operator: VIBRA-TECH GSM
Comment:
Seismic Trigger: 0.03 in/s
Sound Trigger: 75.9 DB
Additional Info:
j-GEO-01253
N37 59.481, W122 27.256

Summary Data

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV (in/s):</td>
<td>0.0625</td>
<td>0.05</td>
<td>0.0575</td>
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<tr>
<td>FREQ (HZ):</td>
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<td>15.2</td>
<td>35.7</td>
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<td>PD (‰¹):</td>
<td>0.3875</td>
<td>0.435</td>
<td>0.5275</td>
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<tr>
<td>PPA (g):</td>
<td>0.05859</td>
<td>0.03255</td>
<td>0.07161</td>
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</tbody>
</table>

Peak Vector Sam: 0.08 in/s
Peak Air Pressure: 110.6 DB
Shaketable Calibrated
On: 02/20/2013 (UTC -07:00)
By: Vibra-Tech, Inc.
2700 Holloway Road - Suite 113
Louisville, KY 40203 U.S.A.

Waveform Graph Scale
Time Scale: 0.1 s
Seismic Scale: +/- 0.16 in/s
Sound Scale: +/- 0.0023 psi

Velocity Waveform
SSN: 9808 Event: 19

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