SAN RAFAEL ROCK QUARRY VIBRATION REPORT

**Location:** South Hill  
**Max. Charge Weight:** 220  
**Date of Blast:** 6-9-11

**Northing:** 32°69′01″ N  
**Time of Blast:** 11:32

**Easting:** 122°03′22″ W  
**Blast Number:** 1545

**Seismograph Information:**

<table>
<thead>
<tr>
<th>Seismograph Model</th>
<th>UNIT #1</th>
<th>UNIT #2</th>
<th>UNIT #3</th>
<th>UNIT #4</th>
<th>UNIT #5</th>
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<tr>
<td></td>
<td>2000</td>
<td>Micro</td>
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<td>Serial Number</td>
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<td>95.26</td>
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<td>Last Calibration Date</td>
<td>5-26 W</td>
<td>5-26 W</td>
<td>5-26 W</td>
<td>5-26 W</td>
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**Location Information:**

<table>
<thead>
<tr>
<th>Location</th>
<th>Northing</th>
<th>Easting</th>
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<tbody>
<tr>
<td>Marlin</td>
<td>32°69′01″ N</td>
<td>122°03′22″ W</td>
</tr>
<tr>
<td>Napa</td>
<td>37°58′31″ N</td>
<td>122°03′53″ W</td>
</tr>
<tr>
<td>Santa Rosa</td>
<td>37°58′30″ N</td>
<td>122°03″53″ W</td>
</tr>
<tr>
<td>McKinley Park</td>
<td>37°58′30″ N</td>
<td>122°03″53″ W</td>
</tr>
</tbody>
</table>

**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)

**Scaled Distance:** 124, 202, 213, 199

**General Comments:** Nothing triggered

Seismograph Operator: Deon Lopez  
Signature: [Signature]
### Face 25°

<table>
<thead>
<tr>
<th>167</th>
<th>197</th>
<th>117</th>
<th>97</th>
<th>67</th>
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<td>176</td>
<td>151</td>
<td>126</td>
<td>84</td>
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<td>285</td>
<td>260</td>
<td>235</td>
<td>210</td>
<td>168</td>
<td>193</td>
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<td>349</td>
<td>319</td>
<td>299</td>
<td>262</td>
<td>277</td>
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<td>336</td>
<td>301</td>
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</tbody>
</table>

32 holes
82.50 units
33.30 units
640.450 gpm

6,980 lbs Titan

**Depth:** 25°

**15' steming**

**Old 100 tapered**

**470 lb max per delay**

---

**Main 1848**

**Via M 3010**

**5A 2168**

**114 2956**

**37° 50' 01" N**

**122° 37' 22" W**
**SAN RAFAEL ROCK QUARRY BLAST REPORT**

**BASE DATA:**
- Location: [Redacted]
- Designed Bench Height (ft): 25
- Date: 6-9-98
- Northing: 370.890
- Rock Density (lb/ft³): 2.7
- Time: 11:32
- Easting: 122.0272
- Relative Rock Hardness: [Blank]
- Blast Number: 1849

**DESIGN DATA:**
- Number of Holes Shot: 32
- Hole Dia.(in.): 63/4
- Stemming (ft): 1
- Loading Time Required (man hrs): 6
- Deck Type: [Blank]
- Ave. Hole Depth (ft): 19
- Burden (ft): 14
- Stem Type: 3/4 stem
- Staggered Pattern (y or n): y
- Length (ft): [Blank]
- Relative Confinement: [Blank]
- Spacing (ft): 14
- Subdrill (ft): [Blank]
- Number of Lost Holes: 0
- Tons Shot: 168.60

**EXPLOSIVES DATA:**
- Bulk Explosive Weight: 6980
- Boosters Units: 4
- Delays Units: 50
- Misc. Units: 32
- Max (lb/hole): 280
- Blast Duration (sec): 430
- Total Charge Wt.: 2049

**VIBRATION DATA:**
- Nearest Structure: [Blank]
- Seismograph Loc.: [Blank]
- Temperature: 62⁰F
- Max. Chrg. (lb/3000): 1400
- Northing: 370.890
- Sky Condition: Clear
- RPPV: [Blank]
- Easting: 122.0272
- Wind Direction: 90°
- Frequency: [Blank]
- Distance Away: 189.6
- Wind Speed: 2.5
- Airblast: [Blank]

**PERFORMANCE DATA:**
- Powder Factor (lb/ton): 1.4
- Displacement: good
- Crushability: [Blank]
- Lb/yard³: 1.2
- Vibration: [Blank]
- Fines: [Blank]
- Fragmentation: good
- Dig ability: [Blank]
- Comments: [Blank]
- Blaster in Charge: [Signature]
BLAST REPORT


Time Fired: 11:31 A.M. Shot No.: 4-11 Shot Coordinates: N40°49.435 W75°05.876

Shot Location - Level: 4 Face: WEST Rows: 3 Mine Permit No.: 

Rock Type: Good Density: 2.46 Shot Classification: Production Mats Used: NO

Sky Conditions: Clear Temperature: 38°F Wind Direction: S Wind Speed: 5 mph

Total No. Holes: 43 Shot Tons(Cu Yds.): 23.0 Total Lbs. Expl.: 3454.1184 Pounds Per Ton(Tons): 1.6

Max. Lbs. Expl./Delay: 563 Max. Holes / Delay: 1 Stemming Type: 3/4 Stone Sub-Drilling: 4-5'

Contract Blaster: Jeff Myhre License No.: 313 No. of Persons In Blast Crew: 5

Pre blast site inspection completed (Circle One): Yes No Comments:

Shot Duration: 6.84 sec Initiation System (Circle One): Nonel - Electric (Nonel / Electric Blaster)

Manufacturer: Dyno

In-Hole Units:

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<tr>
<th>No. Used</th>
<th>Surface Units:</th>
<th>No. Used</th>
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</thead>
<tbody>
<tr>
<td>1) 16</td>
<td>25 ea.</td>
<td>5 ea.</td>
</tr>
<tr>
<td>2) 25</td>
<td>25 ea.</td>
<td>25 ea.</td>
</tr>
<tr>
<td>3) 25</td>
<td>25 ea.</td>
<td>25 ea.</td>
</tr>
</tbody>
</table>

Total Detonators: 98 Lead in Type: 

<table>
<thead>
<tr>
<th>Row No.</th>
<th>Hole No.</th>
<th>Hole Dia.</th>
<th>Benches</th>
<th>Spanning</th>
<th>Face</th>
<th>Depth</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>Water</th>
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<td>563</td>
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TOTALS: 238 560 3330 10,600 7420

MAXIMUM BORE HOLE

<table>
<thead>
<tr>
<th>FACE HEIGHT</th>
<th>50</th>
<th>FACE HEIGHT</th>
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RECORDED DATA

<table>
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<tr>
<th>M&amp;3 UNIT</th>
<th>Type / Number</th>
<th>Operator</th>
<th>Instrument Location</th>
<th>Dist From Shot</th>
<th>Distance</th>
<th>Scale</th>
<th>Part. Vel. (gp)</th>
<th>Sound Db</th>
</tr>
</thead>
<tbody>
<tr>
<td>0550</td>
<td>Landfill Scale</td>
<td>E 1.16'</td>
<td>0.165</td>
<td>100</td>
<td>1.32</td>
<td>132</td>
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TOTAL P.01
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 RESIDENC

Begin Date: 06/09/2011 07:00:50 (UTC-7)
End Date: 06/09/2011 11:51:10 (UTC-7)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.8

Shakeable 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:

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 June 9, 2011 at approximately 11:31 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 June 9, 2011 at approximately 11:31 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
GeoSonics Inc. Seismic Analysis
Stop Event Report

Serial No: 9856 v3.23
Client: COUNTY MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance: 
Operator: VIBRA-TECH GSM
Comment:

Begin Date: 06/09/2011 12:00:33 (UTC-7)
End Date: 06/09/2011 12:07:05 (UTC-7)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/sec
Sound Trigger: N/A
Battery Level: 8.7

Shaketable Calibrated: 01/27/2011
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:

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

The seismograph on Quarry Property (S/N 9856) did not trigger during the shot on June 9, 2011 at approximately 11:31 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.