## SAN RAFAEL ROCK QUARRY VIBRATION REPORT

**Location:** South hill E1-75

**Max. Charge Weight:** 180

**Date of Blast:** 3-22-11

**Northing:** 37°59'03" N

**Blast Duration:** 2.17 ms

**Easting:** 122°27'20" W

**Time of Blast:** 11:34

**Blast Number:** 1545

### Seismograph Information

<table>
<thead>
<tr>
<th>Seismograph Model</th>
<th>micro</th>
<th>micro</th>
<th>micro</th>
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</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td>2481</td>
<td>4650</td>
<td>4567</td>
</tr>
<tr>
<td>Last Calibration Date</td>
<td>5/10/10</td>
<td>5/17/10</td>
<td>5/17/10</td>
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</tbody>
</table>

### Location Information

<table>
<thead>
<tr>
<th>Location</th>
<th>Marin Ag</th>
<th>Via Mont</th>
<th>San Marino</th>
<th>McNear Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northing</td>
<td>37°59'19&quot; N</td>
<td>37°59'18&quot; N</td>
<td>37°59'31&quot; N</td>
<td>37°59'30&quot; N</td>
</tr>
<tr>
<td>Easting</td>
<td>122°27'22&quot; W</td>
<td>122°27'53&quot; W</td>
<td>122°27'30&quot; W</td>
<td>122°27'16&quot; W</td>
</tr>
<tr>
<td>Distance from Blast</td>
<td>1690</td>
<td>3062</td>
<td>3001</td>
<td>2745</td>
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</tbody>
</table>

### Scaled Distance

<table>
<thead>
<tr>
<th>Micro</th>
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<tbody>
<tr>
<td>125</td>
<td>228</td>
<td>223</td>
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</tbody>
</table>

### Seismic Data

<table>
<thead>
<tr>
<th>Longitudinal Peak Particle Velocity (fps)</th>
<th>micro</th>
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</thead>
<tbody>
<tr>
<td>Longitudinal Peak Frequency (Hz)</td>
<td>micro</td>
</tr>
<tr>
<td>Transverse Peak Particle Velocity (fps)</td>
<td>micro</td>
</tr>
<tr>
<td>Transverse Peak Frequency (Hz)</td>
<td>micro</td>
</tr>
<tr>
<td>Vertical Peak Particle Velocity (fps)</td>
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</tr>
<tr>
<td>Vertical Peak Frequency (Hz)</td>
<td>micro</td>
</tr>
</tbody>
</table>

### Peak Vector Sum (fps)

- micro

### Peak Air Overpressure (db)

- micro

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Seismograph Operator: [Signature]

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### Blast Report

- **Company**: Dutro Group
- **Location**: San Rafael Rock
- **City/State**: San Rafael, CA
- **Shot Location**: Sweet Hill
- **Hole Diameter**: 4"  Depth: 14' 62"
- **Bench Height**: 56  **Sub Drill**: 9
- **Decking**: % Water: 15

#### Detonators

- **Length**: 15  **Times/MS**: Qty 10
- **Length**: 30  **Times/MS**: Qty 30
- **Length**:  **Times/MS**: Qty
- **Length**:  **Times/MS**: Qty
- **Length**:  **Times/MS**: Qty
- **Number**: Total Detonators 30

#### Explosives

- **Type**: Sparta 30  **Qty**: 20.2
- **Type**: Dyno AP 2.5x16  **Qty**: 11.7
- **Type**: Dynakap  **Qty**: 440
- **Type**: Dynapak  **Qty**: 850

#### Total Explosives 1429.2

- **Total Tons/yardage**: 522.6
- **Powder Factor**: lbs Ton/yd: 27

#### Shot Diagram/Timing

![Shot Diagram](image)

- **Comments**: Blasting done 15-18 pm  Tuesday 10-11 am

#### Blaster Signature: [Signature]  Labor: [Signature]
The seismograph on Quarry Property (S/N 9856) did not trigger during the shot on March 22, 2011 at approximately 11:34 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph located across the street from 16 Marin Bay Park Court (S/N 7155) did not trigger during the blast on March 22, 2011 at approximately 11:34 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 22, 2011 at approximately 11:34 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.