

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

LOCATION INFORMATION
 Location: PB-7 Max. Charge Weight: 400 Date of Blast: 3-26-12
 Northing: 37° 59' 12" N Blast Duration: 235 ms Time of Blast: 11:31
 Easting: 122° 27' 14" W Blast Number: 1570

SEISMOGRAPH INFORMATION		LOCATION INFORMATION	
Seismograph Model	<u>MICRO</u>	<u>MICRO</u>	<u>MICRO</u>
Serial Number	<u>4550</u>	<u>4567</u>	<u>4570</u>
Last Calibration Date	<u>5 26 11</u>	<u>5 26 11</u>	<u>5 26 11</u>
LOCATION INFORMATION		LOCATION INFORMATION	
Location	<u>Moraga</u>	<u>San Marino</u>	<u>M. Near Park</u>
Northing	<u>37° 59' 18" N</u>	<u>37° 59' 31" N</u>	<u>37° 59' 30" N</u>
Easting	<u>122° 27' 22" W</u>	<u>122° 27' 53" W</u>	<u>122° 27' 16" W</u>
Distance from Blast	<u>950</u>	<u>3168</u>	<u>1715</u>
Scaled Distance	<u>47</u>	<u>158</u>	<u>89</u>

VIBRATION INFORMATION	
Longitudinal Peak Particle Velocity (ips)	<u>.17</u>
Longitudinal Peak Frequency (Hz)	<u>13.1</u>
Transverse Peak Particle Velocity (ips)	<u>.15</u>
Transverse Peak Frequency (Hz)	<u>14.7</u>
Vertical Peak Particle Velocity (ips)	<u>.18</u>
Vertical Peak Frequency (Hz)	<u>17.8</u>
Peak Vector Sum (ips)	<u>.23</u>
Peak Air Overpressure (db)	<u>118</u>

GENERAL COMMENTS
Ground Wet and Spongy
 Seismograph Operator: Peron Lopes Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-7 Designed Bench Height (ft): 40 Date: 3.26.12
 Northing: 37° 59' 12 N Rock Density (lbd³): 2.23 Time: 11:31
 Easting: 122° 27' 14 W Relative Rock Hardness: 7 Blast Number: 1570

DESIGN DATA:

Number of Holes Shot: 20 Hole Dia. (in.): 6 3/4 Stemming (ft): 19 Loading Time Required (min hrs): 5 Deck Type: —
 Ave. Hole Depth (ft): 43 Burden (ft): 15 Stem Type: 3/4" 6 min Staggered Pattern (y or n): N Length (ft): —
 Relative Confinement: — Spacing (ft): 16 Subdrill (ft): 3 Number of Lost Holes: 0 Tons Shot: 15,858

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units
Titan 1000 G	7,940	450g	40	60EZ	20		Max (lb/hole): <u>400</u>
				50EZ	30		Blast Duration (sec): <u>235 ms</u>
				40ms	5		
				17ms	1		Total Charge Wt.: <u>—</u>

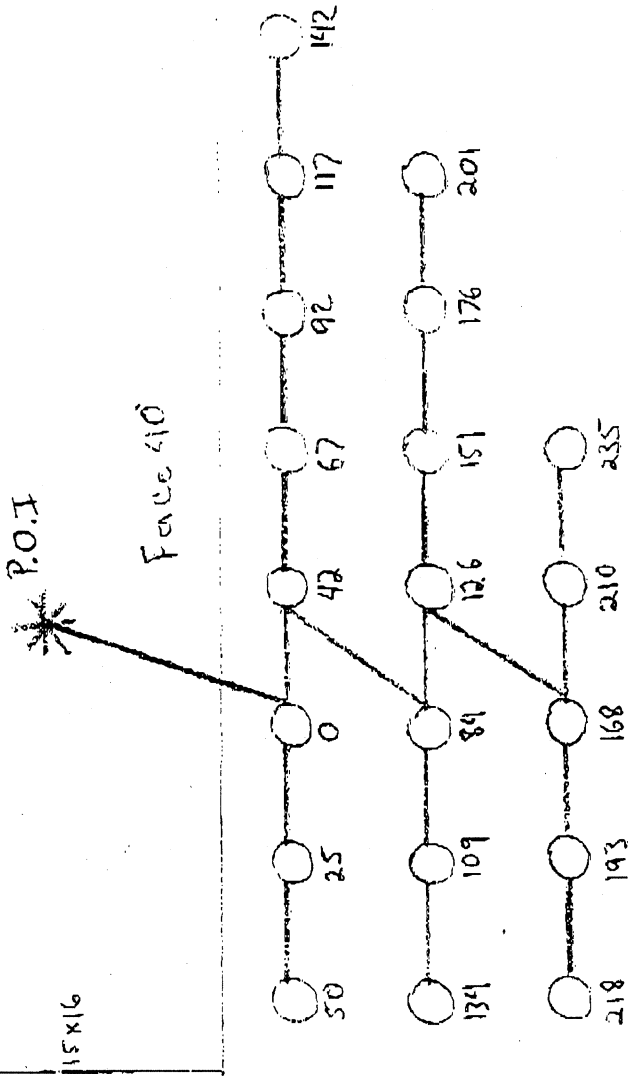
VIBRATION DATA:

Nearest Structure: — Seismograph Loc.: 6203 Temperature: 59° Max. Chg (lb/8ms): 400
 Northing: 37° 59' 12 N Northing: — Sky Condition: Overcast RPPV: 23
 Easting: 122° 27' 14 W Easting: — Wind Direction: MS Frequency: 177
 Distance Away: 950 Distance Away: — Wind Speed: 3.5 Airblast: 118

PERFORMANCE DATA:

Powder Factor (lb/ton): .5 Displacement: good Crushability: —
 Lb/yd³: 1.12 Vibration: Great Fines: —
 Fragmentation: good Dig ability: —
 Comments: Holes wet - ground at Seisograph location wet Blaster in Charge: R. Lopez

3.26.12
PB-7
#1570



Main 950
WMA 3168
SM 2323
M⁴N 1795
37° 59' 12" N
122° 27' 14" W

Depth 413

19 Stemming
400 lbs per

Very wet holes!!

20 Holes
20 = 80 EZ det
20 = 50 EZ det
5 = 42 MS EZTL
1 = 17ms EZTL
40 = 450 gram

7940 lbs titan

Seismic Analysis Velocity Waveform Analysis

Serial Number: 7257
 Firmware Version: 08-03.23
 Event Date: 03/26/2012 11:30:52 (UTC -07:00)
 Event number: 7
 Recording Time: 5 s
 Client: COUNTY OF MARIN
 Operation: SAN RAFAEL ROCK QUARRY
 Location: 16 MARIN BAY PARK CT.
 Distance:
 Operator: VIBRA-TECH GSM
 Comment: William Hosken Residence
 Seismic Trigger: 0.03 in/s
 Sound Trigger: 76 DB

Additional Info:

j-GEO-01252
 N37 59.524, W122 27.373

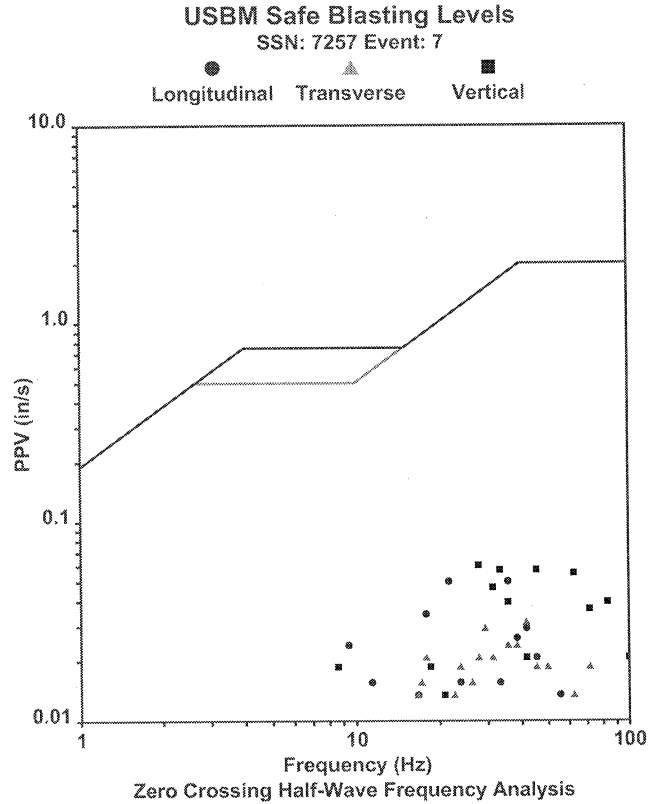
Summary Data

	L	T	V
PPV (in/s):	0.048	0.03	0.058
FREQ (HZ):	33.3	41.7	27.8
PD (.001"):	0.4	0.23	0.4
PPA (g):	0.033	0.02	0.052

Peak Vector Sum: 0.073 in/s
 Peak Air Pressure: 112 DB
 0.0012 psi @ 1.6 HZ

Shaketable Calibrated

On: 01/13/2012 (UTC -07:00)
 By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

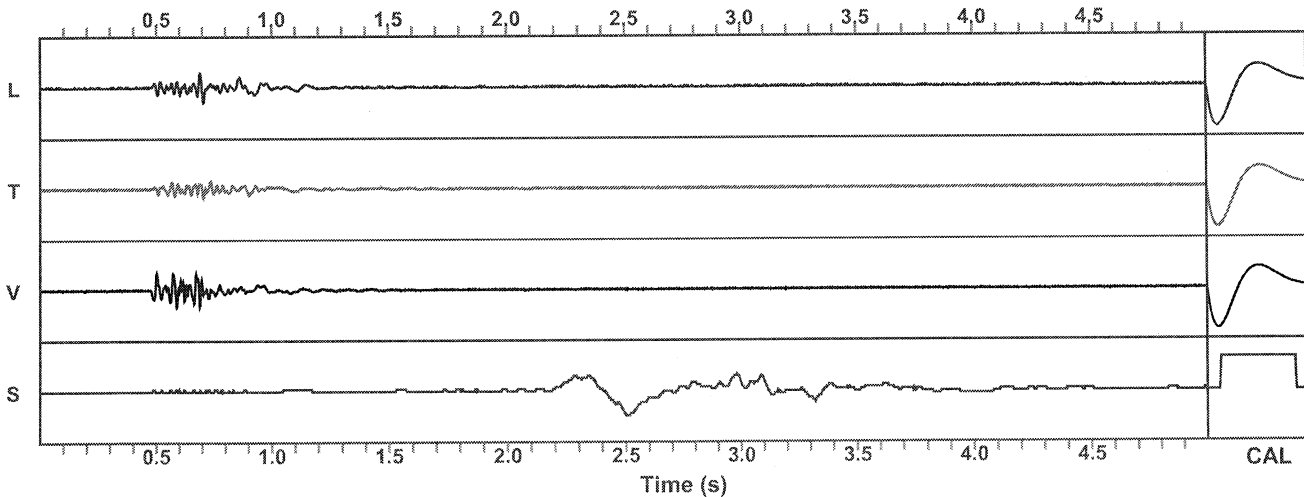


Waveform Graph Scale

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

Velocity Waveform

SSN: 7257 Event: 7



Seismic Analysis Velocity Waveform Analysis

Serial Number: 7179
Firmware Version: 08-03.23
Event Date: 03/26/2012 11:30:52 (UTC -07:00)
Event number: 7
Recording Time: 5 s
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance:
Operator: VIBRA-TECH GSM
Comment:
Seismic Trigger: 0.03 in/s
Sound Trigger: 76 DB

Additional Info:

j-GEO-01253
 N37 59.481, W122 27.256

Summary Data

	L	T	V
PPV (in/s):	0.05	0.028	0.083
FREQ (HZ):	27.8	41.7	31.3
PD (.001"):	0.42	0.29	0.55
PPA (g):	0.039	0.026	0.059

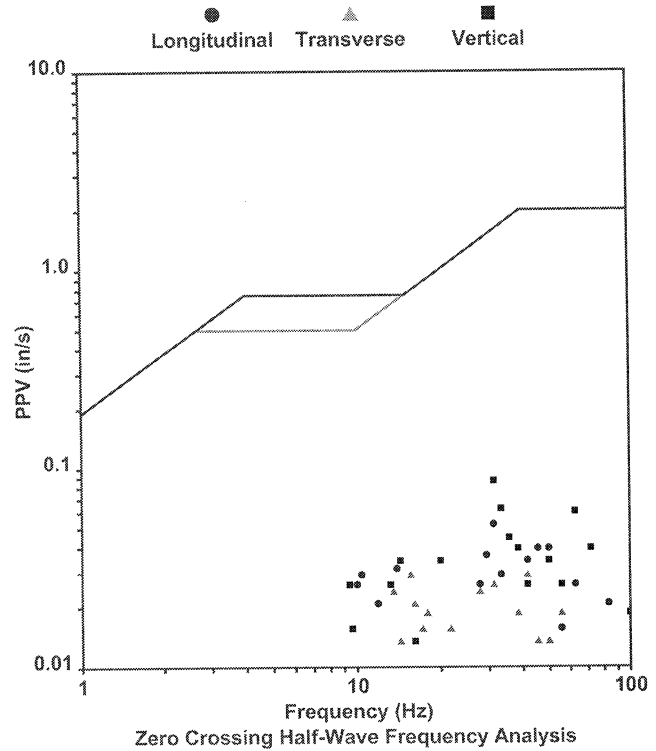
Peak Vector Sum: 0.088 in/s
Peak Air Pressure: 111 DB
 0.0011 psi @ 2.1 HZ

Shaketable Calibrated

On: 01/13/2012 (UTC -07:00)
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 7179 Event: 7

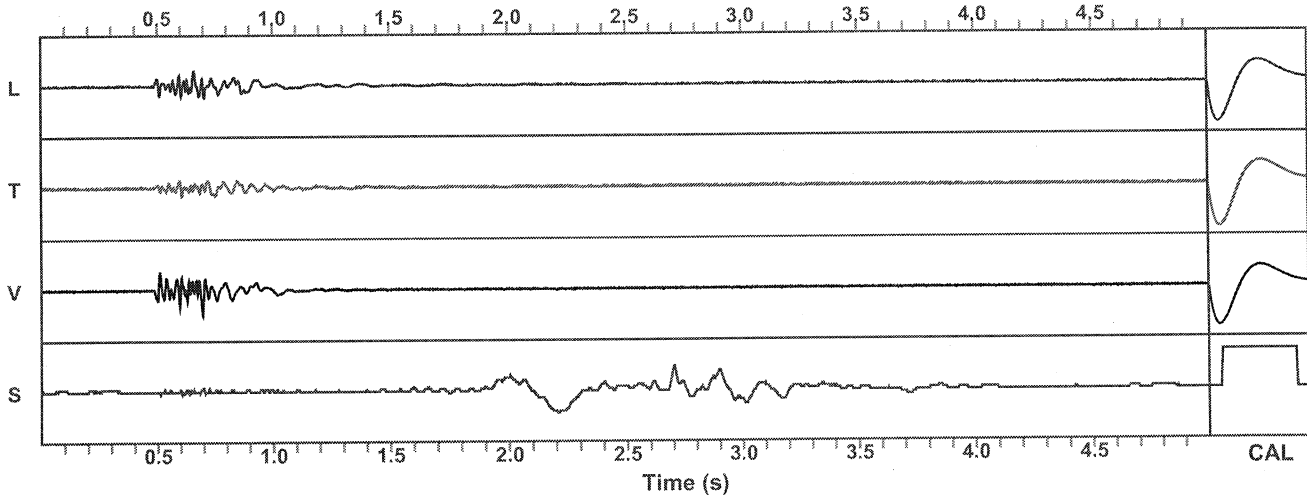


Waveform Graph Scale

Time Scale: 0.1 s
Seismic Scale: +/- 0.164 in/s
Sound Scale: +/- 0.0023 psi

Velocity Waveform

SSN: 7179 Event: 7



GeoSonics Inc. Seismic Analysis

Stop Event Report

Serial No: 7178 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 114 SAN MARINO DRIVE
Distance:
Operator: VIBRA-TECH GSM
Comment: VERONIQUE RASKIN

Begin Date: 03/26/2012 06:12:29 (UTC-7)
End Date: 03/26/2012 20:00:00 (UTC-7)
Events over Trigger: 0 (3-2)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.9

Additional Info:
RESIDENCE
j-GEO-01254
N37 59.395, W122 27.700

Shaketable Calibrated: 01/16/2012
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 at 114 San Marino Drive (S/N 7178) did not trigger during the shot on March 26, 2012 at approximately 11:30 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.