

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-7 Max. Charge Weight: 420 Date of Blast: 4/12/12
 Northing: 37° 59' 11" N Blast Duration: 428 ms Time of Blast: 11:31
 Easting: 122° 27' 14" W Blast Number: 1572

SEISMOGRAPH INFORMATION		UNIT	
Seismograph Model	3000	Mico	Mico
Serial Number	2481	4502	4570
Last Calibration Date	5/24/11	5/26/11	5/26/11

LOCATION INFORMATION		UNIT	
Location	Mexico Ag	Mexico Ag	Mexico Ag
Northing	37° 59' 19" N	37° 59' 18" N	37° 59' 30" N
Easting	122° 27' 22" W	122° 27' 53" W	122° 27' 16" W
Distance from Blast	1056	322.0	190.1
Scaled Distance	51	157	97

VECTORS INFORMATION		UNIT	
Longitudinal Peak Particle Velocity (ips)	.21	.10	.10
Longitudinal Peak Frequency (Hz)	26.3	3.9	16.1
Transverse Peak Particle Velocity (ips)	.11	.11	.08
Transverse Peak Frequency (Hz)	17.2	12.1	27.7
Vertical Peak Particle Velocity (ips)	.14	.11	.11
Vertical Peak Frequency (Hz)	19.2	12.5	26.3
Peak Vector Sum (ips)	.25	.12	.13
Peak Air Overpressure (db)	117	112	114

GENERAL COMMENTS: Ground Very Wet.

Seismograph Operator: Peron Lopes Signature: Peron Lopes

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-7 Designed Bench Height (ft): 40 Date: 4 12 12
 Northing: 37°54'11"N Rock Density (tyd³): 2.23 Time: 11:31
 Easting: 122°27'41"W Relative Rock Hardness: 7 Blast Number: 1517

DESIGN DATA:

Number of Holes Shot: 25 Hole Dia. (in.): 6 3/4 Loading Time Required (man hrs): 5 Deck Type: _____
 Ave. Hole Depth (ft): 43 Stemming (ft): 12 1/2 Staggered Pattern (y or n): M Length (ft): _____
 Relative Confinement: _____ Stem Type: 4 Number of Lost Holes: 0 Tons Shot: 12,533

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole):
<u>1000</u>	<u>1,800</u>	<u>450</u>	<u>50</u>	<u>8082</u>	<u>16</u>			<u>420</u>
				<u>5082</u>	<u>25</u>			<u>428ms</u>
				<u>42ms</u>	<u>1</u>			
				<u>17ms</u>	<u>1</u>			<u>9850</u>

VIBRATION DATA:

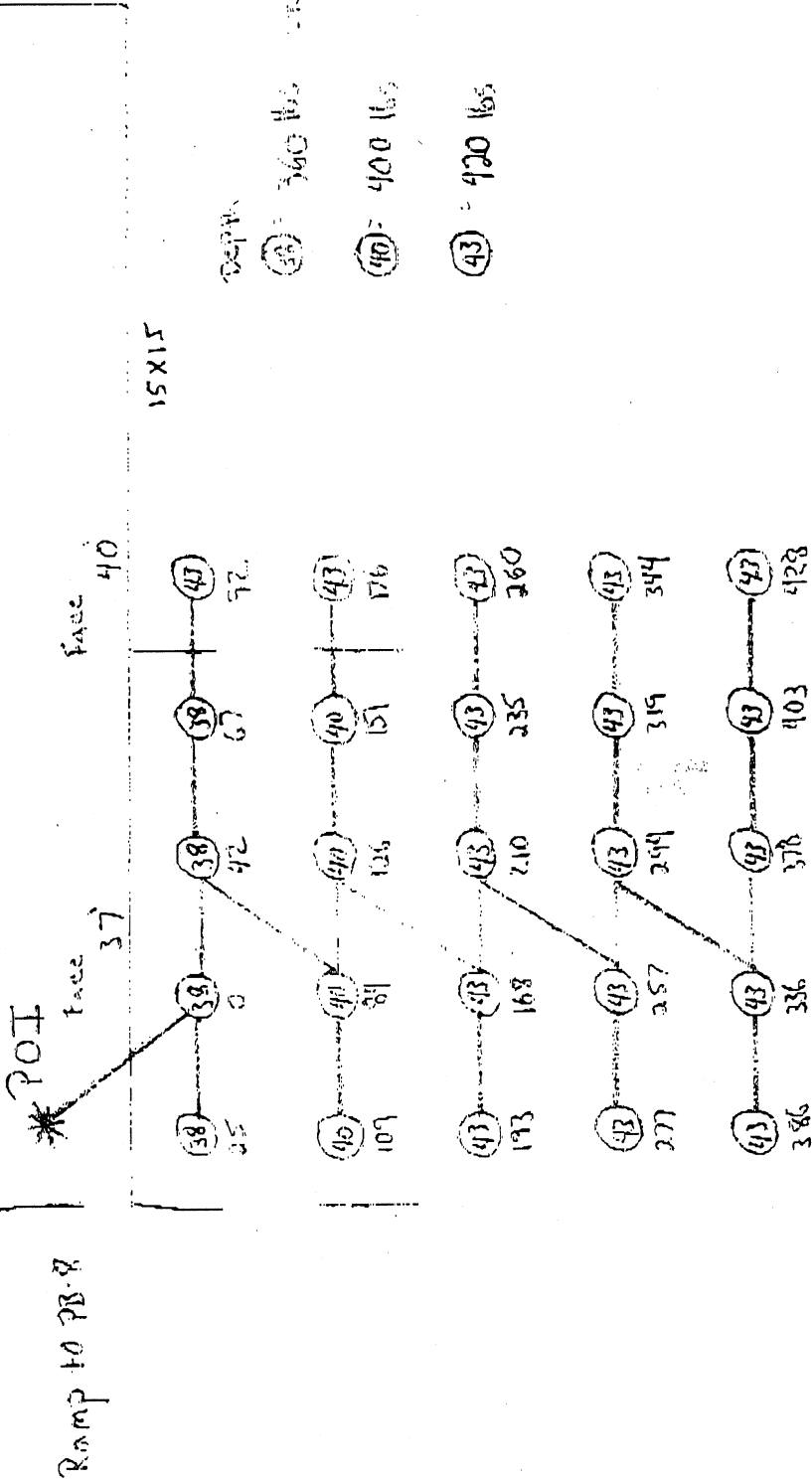
Seismograph Loc.: same Temperature: 61° Max. Chrg. (lb/8ms): 420
 Northing: 37°54'19"N Sky Condition: overcast RPPV: 2.5
 Easting: 122°27'41"W Wind Direction: SW Frequency: 26.3
 Distance Away: 1056 Wind Speed: 8-10 Airblast: 17

PERFORMANCE DATA:

Powder Factor (lb/ton): 1.5 Displacement: Great Crustability: _____
 Libbyrd's: 1.26 Vibration: Great Fines: _____
 Fragmentation: Great Dig ability: _____

Comments: _____ Blaster in Charge: [Signature]

4.12.12
P.B-7
#1572



main 1056
Vion 3220
SAMP 2488
W^N 1901
37° 59' 11" N
122° 27' 19" W

Dep th: 38-43

25 Hole
25-80 EZ det
25-50 EZ det
q= 42ms
l= 17ms
50-450 gram

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: 04/12/2012 06:00:50 (UTC-7)
End Date: 04/12/2012 20:00:00 (UTC-7)
Events over Trigger: 0 (4-3)
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 April 12, 2012 at approximately 11:31 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.

Seismic Analysis Velocity Waveform Analysis

Serial Number: 7257
 Firmware Version: 08-03.23
 Event Date: 04/12/2012 11:31:25 (UTC -07:00)
 Event number: 9
 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: 75.9 DB

Additional Info:

j-GEO-01252
 N37 59.524, W122 27.373

Summary Data

	L	T	V
PPV (in/s):	0.035	0.0275	0.05
FREQ (HZ):	29.4	33.3	31.3
PD (.001"):	0.21	0.2625	0.31
PPA (g):	0.02604	0.01953	0.04557

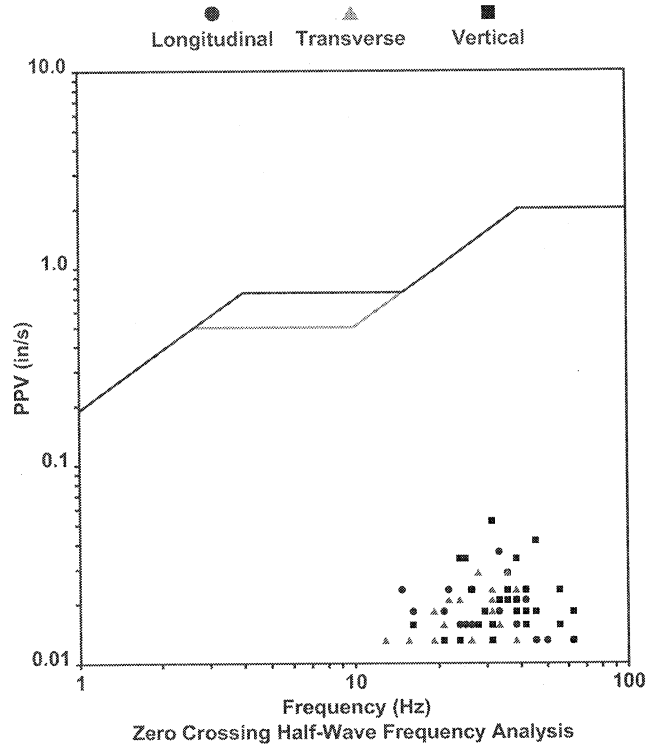
Peak Vector Sum: 0.055 in/s
 Peak Air Pressure: 111 DB
 0.001087 psi @ 3.6 HZ

Shaketable Calibrated

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

USBM Safe Blasting Levels

SSN: 7257 Event: 9

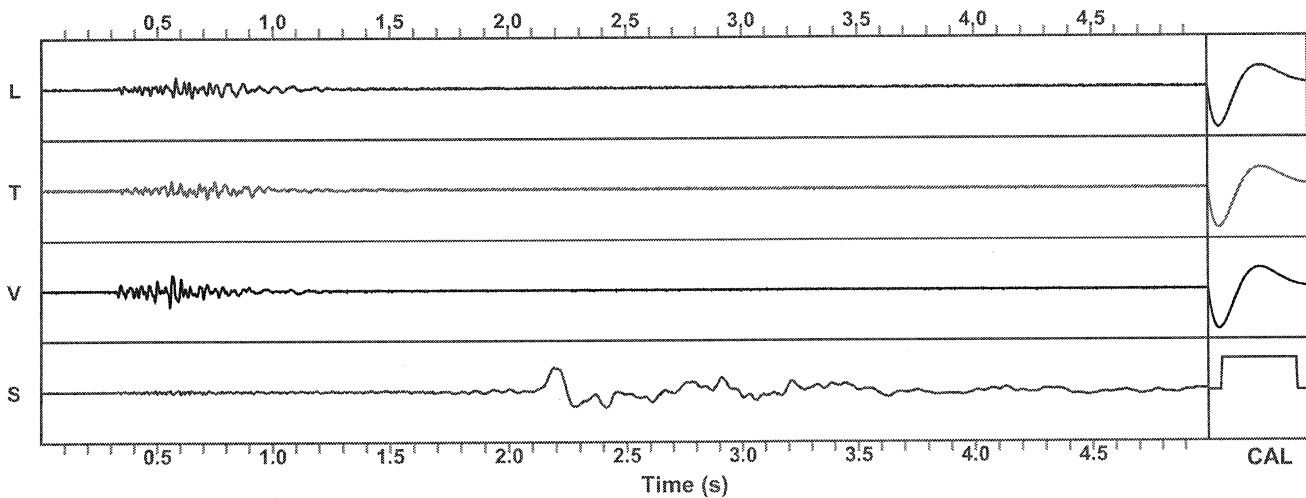


Waveform Graph Scale

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

Velocity Waveform

SSN: 7257 Event: 9



Seismic Analysis Velocity Waveform Analysis

Serial Number: 7179
 Firmware Version: 08-03.23
 Event Date: 04/12/2012 11:31:25 (UTC -07:00)
 Event number: 9
 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: 75.9 DB

Additional Info:
 j-GEO-01253
 N37 59.481, W122 27.256

Summary Data

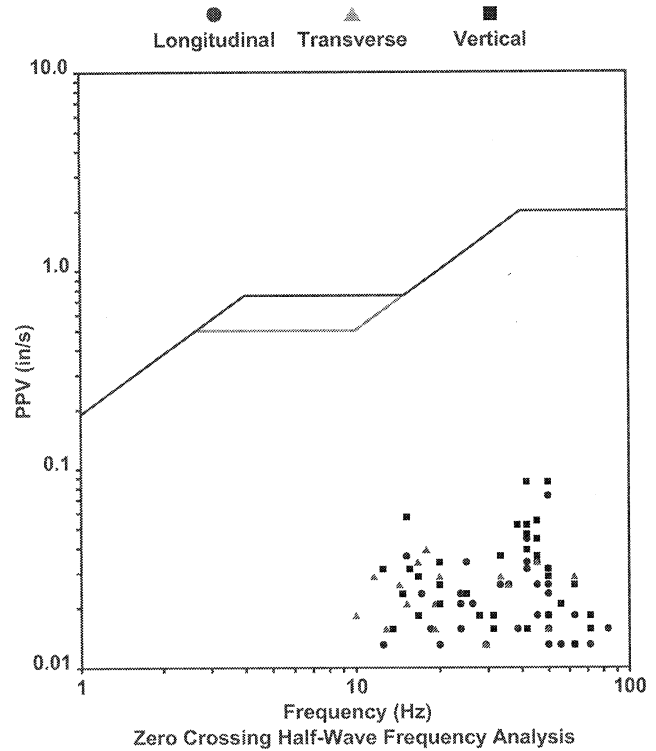
	L	T	V
PPV (in/s):	0.07	0.0375	0.0825
FREQ (HZ):	50	16.1	50
PD (.001"):	0.265	0.5025	0.37
PPA (g):	0.05208	0.02604	0.08464

Peak Vector Sum: 0.1125 in/s
 Peak Air Pressure: 111 DB
 0.001087 psi @ 4.3 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: 9



Waveform Graph Scale

Time Scale: 0.1 s
 Seismic Scale: +/- 0.165 in/s
 Sound Scale: +/- 0.0023 psi

Velocity Waveform

SSN: 7179 Event: 9

