



BLAST REPORT

SOUTHWEST ENERGY LLC
2040 W GARDNER LANE
TUCSON, ARIZONA 85705-2208
(520) 696-9495

Date: 8/17/17 Customer: Martin Marietta Materials, Inc Location: Red Canyon
Shot Fired: 1:48 PM Permit No: 0405136 Pit: Main Pit Level: 7

Shot Number:	5	Shot Coordinates:	1656244X14019933.33
Rock Type:	Limestone/Granite	Rock Density:	122 lbs/cu ft
Shot Classification:	Production	Mats Used:	No
Sky Conditions:	Clear	Temperature:	78 °F
Wind Direction:	S	Wind Speed:	2 mph
Hole Diameter:	5 in	Avg Stem Height:	12 ft
Burden-Spacing:	16 x 16 ft	Avg Hole Depth:	50 ft
Holes:	48	Sub-Drilling:	3 ft
Total Holes:	48	Shot Tons:	35,230
Total Lbs Explo:	18,196	Powder Factor:	0.52 lbs/ton
Max Lbs/Delay:	340	Max Holes/Delay:	1
Stemming Type:	Crushed Stone	Shot Duration:	631 ms
Contract Blaster:	Travis Taylor	License No:	1-059-11062
Blast Crew:	Larks, Atwood, Castens, Taylor, Miller, Santiff		
Note:	Unitronic Initiation		
Safety Meeting:	Yes	Workplace Inspection:	Yes

Friday, August 18, 2017

Contract Blaster:



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DAILY BLAST REPORT

Thursday, August 17, 2017
Red Canyon

PRODUCT DESCRIPTION		HOLES	QUANTITY	UNIT
Shot # 5 Main Pit 7	Holes	48		
	502 (Fortis Control)		18,124	Lbs
	Harness Wire 500m		2	Spool
	Pentex BC 12 (340)		96	Ea
	Unitronic 600 15M 50'		48	Ea
	Unitronic 600 9m 30'		48	Ea
Totals for 8/17/17	Total Holes	48		
	502 (Fortis Control)		18,124	Lbs
	Harness Wire 500m		2	Spool
	Pentex BC 12 (340)		96	Ea
	Unitronic 600 15M 50'		48	Ea
	Unitronic 600 9m 30'		48	Ea

Seismic Analysis

Velocity Waveform Analysis

Serial Number: 9835
Firmware Version: 0C-06.05
Event Date: 08/17/2017 13:41:53 (UTC -06:00)
Event number: 13
Recording Time: 5 s
Client: Martin Marietta
Operation: Red Canyon Quarry
Location: North Hill Side
Distance:
Operator: Vibra Tech
Comment: Pueblo, Colorado
Seismic Trigger: 0.02 in/s
Sound Trigger: 133 dB

Additional Info:

j-GEO-16060
N38 36 22 W104 56 31

Summary Data

	L	T	V
PPV (in/s):	0.113	0.083	0.085
FREQ (HZ):	10	31.3	11.9
PD (.001"):	1.53	0.77	1.02
PPA (g):	0.039	0.052	0.059

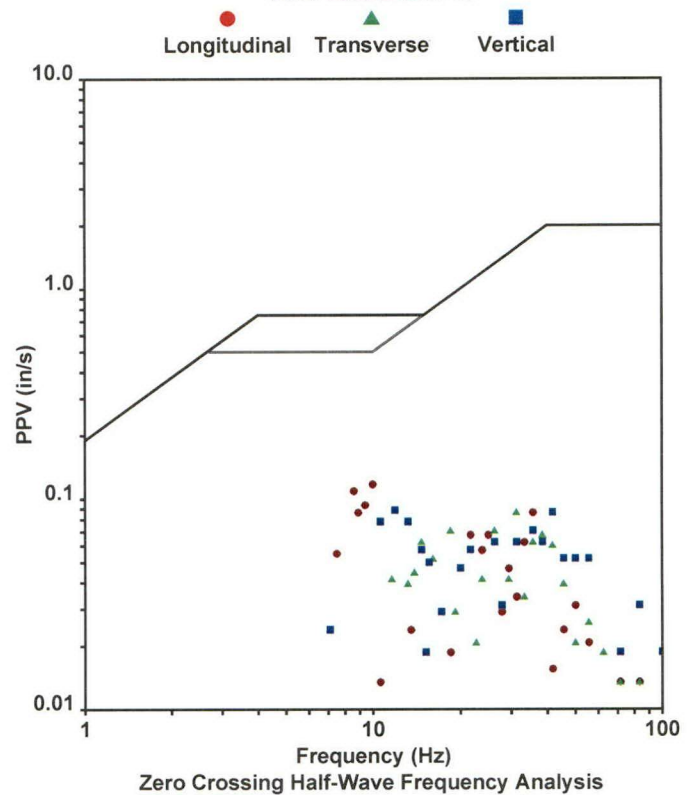
Peak Vector Sum: 0.115 in/s
Peak Air Pressure: 118 dB
0.0025 psi @ 3 HZ

Shaketable Calibrated

On: 10/21/2016 (UTC -06:00)
By: Vibra-Tech, Inc.
2700 Holloway Road - Suite 113
Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 9835 Event: 13

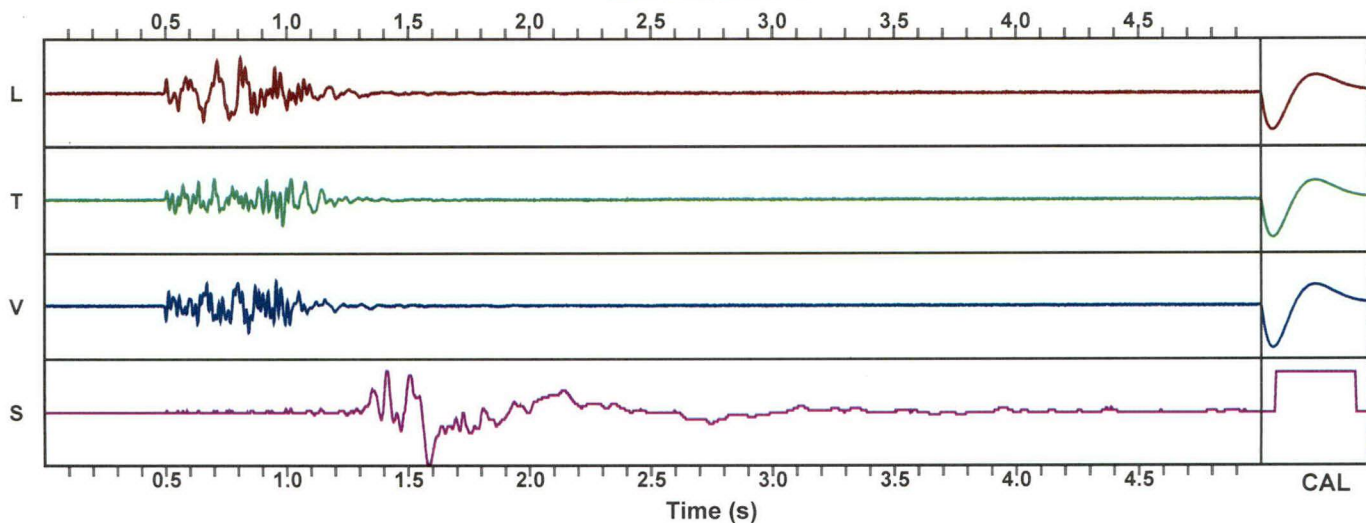


Waveform Graph Scale

Time Scale: 0.1 s
Seismic Scale: +/- 0.1695 in/s
Sound Scale: +/- 0.0024 psi

Velocity Waveform

SSN: 9835 Event: 13



Seismic Analysis

Velocity Waveform Analysis

Serial Number: 10696
 Firmware Version: 0C-06.05
 Event Date: 08/17/2017 13:41:52 (UTC -06:00)
 Event number: 5
 Recording Time: 5 s
 Client: Martin Marietta
 Operation: Red Canyon Quarry
 Location: Front Entrance
 Distance:
 Operator: Vibra Tech
 Comment:
 Seismic Trigger: 0.02 in/s
 Sound Trigger: 133 dB

Additional Info:

j-GEO-16222
 N38 36 04 W104 56 59

Summary Data

	L	T	V
PPV (in/s):	0.033	0.028	0.013
FREQ (HZ):	13.2	8.5	13.9
PD (.001"):	0.46	0.49	0.15
PPA (g):	0.013	0.013	0.013

Peak Vector Sum: 0.033 in/s
 Peak Air Pressure: 115 dB
 0.0017 psi @ 6.3 HZ

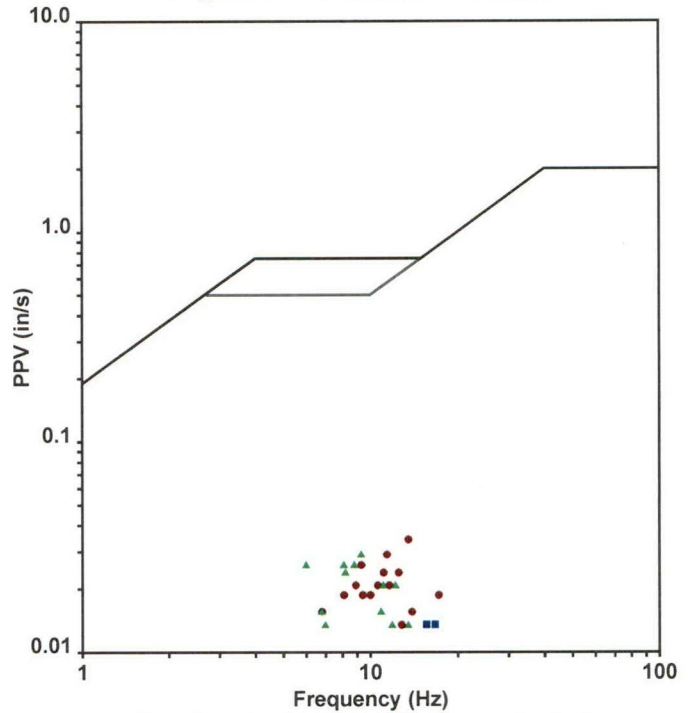
Shaketable Calibrated

On: 04/13/2017 (UTC -06:00)
 By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 10696 Event: 5

● Longitudinal ▲ Transverse ■ Vertical

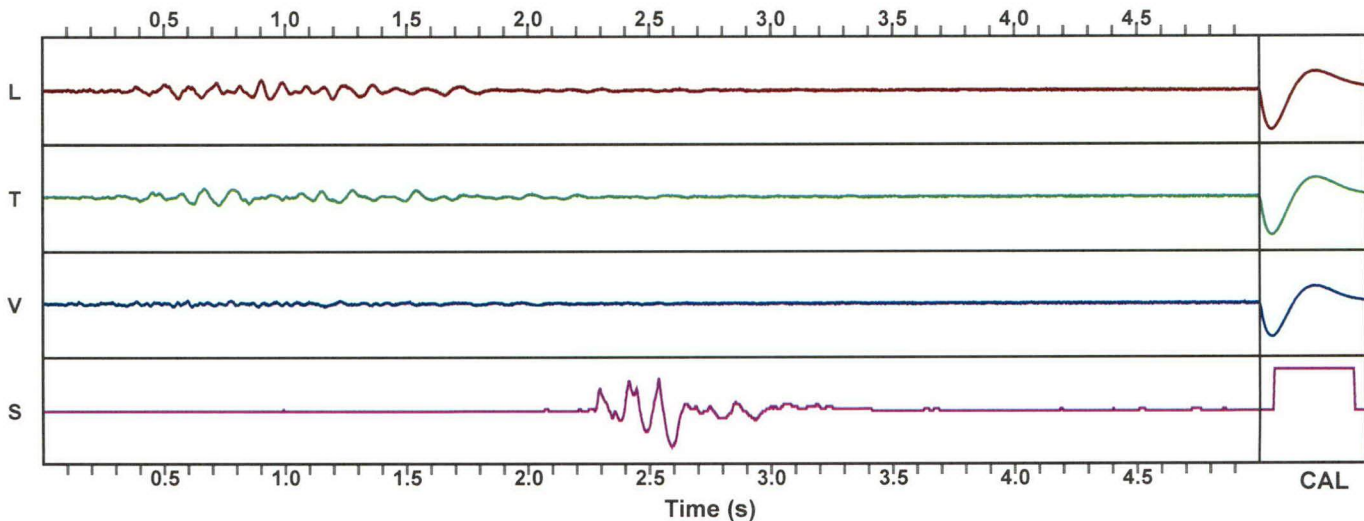


Waveform Graph Scale

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

Velocity Waveform

SSN: 10696 Event: 5



Martin Marietta Materials

Red Canyon Quarry

Blasting Check List

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The Mine Management and/or Designee, Blasting & Drilling Lead Person will insure all Martin Marietta Materials Blasting Rules and Regulations (Orange Book) are enforced and adhered to during all blasting operations at the Red Canyon Quarry Operation.

1. Blasting Schedule.
 - a. Notification of Need to Blast to Blasting Contractor: Date 8-10-17, Time 8:30 AM via email
 - b. Scheduled Blast: Date 8-17, Time 11:30-2:30
 - c. Daily weather forecast for Day of Blast to be checked and documented after Schedule of Blast Date is confirmed in Blasting & Drilling Lead Person's Diary. Print out of weather forecast on day of Blast: Date _____, Time _____
2. Notification of Outside Agencies and Neighbors. (Minimum of 72 hours prior to scheduled blasting event). NOTIFIED BY EMAIL ON @ 11:31 ON MON 8-14-17
 - a. Colorado Division of Reclamation, Mining and Safety
 - i. Tim Cazier at 303-866-3567, Ext 8169 & email: tim.cazier@state.co.us
 - b. Ken Bishop (Adjoining Property Owner)
 - i. Email: ken@kidlynx.com
 - c. Additional Notification
 - i. MIKE S.
 - ii. RUSTY C.
 - iii. JIM S.
3. Blasting & Drilling Lead Person Diary to be filled out and signed by all employees, contractors and guests when coming on to the mine site and when leaving the site to ensure head count when Clearing & Controlling the Site for Blasting.
4. Blasting Notification signs to be set up at designated locations.
 - a. Main Entrance in front of the Scale House approach: Date 8/17/17, Time 5:50 AM
 - b. Blast Site Location: Date 8/17/17, Time 6:59 AM
5. Mine Site Blasting JHA: Blasting JHA completed and signed by all employees on shift at the beginning of the Blast Day.
 - a. Date 8/17/17, Time 6:30 AM

Martin Marietta Materials

Red Canyon Quarry

Blasting Check List

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6. Blast Area Security: Communication will be maintained at all times between MMM designee and the Contractor's Lead Blaster via company radio and/or the physical presence of the RCQ Blasting & Drilling Lead Person and/or Designee.
- a. Safety Briefing with Contract Blaster, Loading Crew and RCQ management team. This briefing will include at minimum: drilling log, blast loading plan, clearing procedures and safety considerations: Date 8/17/17, Time 6:30 AM, RCQ Rep JON EDWARDS, Blaster in Charge Travis Taylor
 - b. Access to Blast area secured for Loading: Time 7:00 AM
By JON EDWARDS
 - c. Mine site cleared and access closed for blasting: Time 1:30 P.M.
By Travis Taylor
 - i. No later than 15 minutes prior to blasting all mining and process to be shut down and all personnel to clear the mine and meet at the Scale house location to verify head count against Blasting & Drilling Diary list.
 - ii. Blaster in charge or designee shall make a final sweep of blasting area prior to Blast Initiation to insure there are no trespassers or missing personnel.
 - d. Blast Initiation: Time 1:48 pm By Travis Taylor
 - i. Blast initiation will be signaled via air horn or similar device and company radio usage.
 - ii. Five short bursts for 2 minute warning.
 - iii. Three each of 5 second bursts for 1 minute warning.
 - iv. One long 10 second burst for the 10 second warning before Fire in the Hole is given.
 - e. Blast Area Cleared and safe to return to normal operations: Time 2:00 pm
By Travis Taylor
 - i. Blaster in charge to give notice of All Clear via company radio after the shot has been checked for fly rock issues, misfires and/or other issues that may negatively affect the safety of miners returning to work zones within the blast area.

Martin Marietta Materials

Red Canyon Quarry

Blasting Check List

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7. Post Blast Meeting to be held after return to normal operations: Time 2:30 pm,
By Contract Blasting Rep. TRAVIS TAYLOR
By MMM Rep. Ben Edwards ; Wayne Stoughton
- i. A preliminary Blast Report will be completed at the mine site by the Certified Blaster in charge of the event to include at minimum the following information.
- Mine Site Name & ID.
 - Date and Time of Blast.
 - Location of Blast, to include GPS Coordinates of the initiation point.
 - Weather Conditions at time of Blast.
 - Blast Shot Specifics to include number of holes, diameter, and depth, tonnage along with spacing, burden, and stemming height and sub drilling depth, explosive used along with delays used and timing pattern.
 - Seismograph recordings from 3rd party to be reviewed along with contract blaster seismograph recording of the blast.
 - All videos of the Blast to be reviewed at this time.
8. BOT meeting date and time to be scheduled and agreed upon within 2 business days after the blast to complete a high level review of the blasting event that took place.
- This meeting is to take place prior to any further drilling and blasting at Red Canyon Quarry.
 - Date and Time of BOT meeting: Date TBD, Time _____, Location _____

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Rock Creek

Report

☉ 5:13 AM MDT on August 17, 2017 (GMT -0600)

Elev **6368** ft **38.67** °N, **104.86** °W | Updated 17 min ago



Partly Cloudy
53.6 °F

Feels Like **53.6** °F
Wind from **North**

N

Today is forecast to be **MUCH WARMER** than yesterday.

Today

High **87** | Low **58** °F

20% Chance of Precip.

Yesterday

High **73** | Low **53.1** °F

Precip. -- in

UV Warning

✉ Sign up for your Daily Forecast Email

<u>Pressure</u>	30.09 in
<u>Visibility</u>	10.0 miles
<u>Clouds</u>	Scattered Clouds 15000 ft
<u>Dew Point</u>	48.3 °F
<u>Humidity</u>	82%
<u>Rainfall</u>	<i>Not available.</i>
<u>Snow Depth</u>	<i>Not available.</i>