

Black Warrior Minerals

Black Warrior Mine 2

Vibration and Air Overpressure Summary July 2020



Sauls Seismic, LLC
2879 Alton Way
Birmingham, Alabama 35210

Phone: 205-592-2466
Fax: 205-592-2477

VIBRATION AND AIR OVERPRESSURE SUMMARY

Seismic research during the past forty years has established criteria which relate the occurrence of structural damage to certain levels of ground motion. Vibration damage criteria are now commonly expressed in terms of particle velocity, the rate of ground movement at a given point produced by ground vibrations as they pass that point.

The Present laws for coal mine blasting in Alabama near occupied structures limit the peak particle velocity to 1.25 inches/second for distances of 0 - 300 feet, 1.0 inch/second for distances of 301 - 5,000 feet, and 0.75 inch/second for distances of 5,001 feet and greater. The airblast is limited to 133 dBL (for this particular instrument). These laws apply to all surface mines under new permits as issued by the Alabama Surface Mining Commission

Seismograph Results

For the period beginning July 01, 2020, and ending July 31, 2020, the maximum peak particle velocity was **0.73 inches/second with a corresponding frequency of 28.4 Hz**. This event was recorded at the CROSSFIELD PROPERTY LINE seismograph location. The blast associated with the maximum recorded vibration occurred on July 31, 2020 at 12:40.

The maximum air overpressure, which occurred on July 31, 2020 at 12:40, was **120 dBL**. The event with which this level is associated was recorded at the CROSSFIELD PROPERTY LINE seismograph location.

Seismograph Records

A copy of the seismograph records for blast related events has been attached to this summary. You will also find a Monthly Review report consisting of a summary and graphical representation of the vibration results.

Should you have any questions regarding this report or the results herein, please do not hesitate to contact me at my office.

Sincerely,

Sauls Seismic, LLC



John Hagadorn
Regional Manager

**Black Warrior Minerals
Black Warrior Mine 2
Monthly Review
July, 2020
CROSSFIELD PROPERTY LINE
33.74932, -86.85330**

#	Date	Time	Shot Location	Distance	Scaled Distance	Max lbs	PPV (in/s)	Freq (Hz)	Overpressure (dBL)
3	07/07/2020	09:10	New Castle	1092	56.8	370.3	0.18	13.1	113
4	07/08/2020	14:54	Mary Lee	1635	44.1	1374	0.26	18.9	118
5	07/10/2020	12:47	Blue Creek	2258	154.9	212.7	< 0.04	-	< 130
6	07/15/2020	13:07	Mary Lee	1359	50.9	713.4	0.31	15.5	116
7	07/16/2020	14:24	Cap Rock	1007	193.6	27.1	< 0.04	-	< 130
9	07/23/2020	12:42	Mary Lee	1464	55.9	687	0.29	16.5	115
11	07/24/2020	9:20	Blue Creek	2065	115.6	319	< 0.04	-	< 130
12	07/27/2020	14:41	Mary Lee	1293	34.2	1426.9	0.54	16.5	119
13	07/29/2020	9:22	Blue Creek	1889	91.6	425	< 0.04	-	< 130
14	07/31/2020	12:40	Mary Lee	1304	34.5	1427	0.73	28.4	120
MAX							0.73 (in/s)	120 (dBL)	