EXPLOTECH

Specialists in Explosives, Blasting and Vibration
Consulting Engineers

Blast Impact Analysis
Proposed West Carleton Quarry Extension Quarry
Part of Lot 15, Concession 11, former geographic township of Huntley, City of Ottawa

Submitted to:

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EXECUTIVE SUMMARY

Explotech Engineering Ltd. was retained in November 2020 to provide a Blast Impact Analysis for the proposed Cavanagh West Carleton Quarry Extension operation located on Part of Lot 15, Concession 11, former geographic township of Huntley, City of Ottawa.

Vibration levels assessed in this report are based on the Ministry of the Environment, Conservation and Parks Model Municipal Noise Control By-law (NPC 119) with regard to guidelines for blasting in Mines and Quarries. We have assessed the area surrounding the proposed license area with regard to potential damage from blasting operations and compliance with the aforementioned by-law document. In addition, we have reviewed blast and vibration reports collected at the existing licenced quarry for the 2017 - 2020 blasting campaigns.

We have inspected the site and reviewed the available site plans. Explotech Engineering Ltd. is of the opinion that the planned mineral extraction extension on the site can be carried out safely and within Ministry of the Environment, Conservation and Parks guidelines as set out in NPC 119 of the By-Law.

Recommendations are included in this report for blasting operations to be carried out in a safe and productive manner and to suitably manage and mitigate the possibility of damage to any buildings, wells, structures or residences surrounding the property.

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INTRODUCTION

The proposed West Carleton Quarry Extension operation is located on the West side of the existing licensed and operating West Carleton Quarry (Licence 4085). The legal description for the subject property is Part of Lot 15, Concession 11, former geographic township of Huntley, City of Ottawa.

This Blast Impact Analysis is based on the Ministry of the Environment, Conservation and Parks (MECP) Model Municipal Noise Control By-law (NPC 119) with regard to guidelines for blasting in mines and quarries. We have additionally assessed the area surrounding the proposed license with regard to potential damage from blasting operations.

Given that quarry operations are currently underway on the adjacent Cavanagh licenced property and all blasts conducted are monitored for ground vibrations and overpressure, site-specific blast monitoring data is available for the area. The site specific data has been incorporated into this assessment. It is a recommendation of this report that a vibration monitoring program be continued on this site, including within the proposed West Carleton Quarry Extension lands, and that the program be maintained for the duration of all blasting activities to permit timely adjustment to blast parameters as required.

While not specifically required as part of the required scope of the Blast Impact Analysis under the Aggregate Resources Act, this report reviews the topics of flyrock and residential water wells. Details related to residential water wells are addressed in the hydrogeological report prepared by Golder Associates while specific flyrock control is addressed at the operational level by Cavanagh given significant influences related to blast design, geology and field accuracy.

Recommendations are included in this report for blasting operations to be carried out in a safe and productive manner and to suitably manage and mitigate the possibility of damage to any buildings, wells, structures or residences surrounding the property.

EXISTING CONDITIONS

The existing licensed area for the West Carleton Quarry (Licence 4085) is described as Lot 14 and part of lot 15, Concession 11, former geographic township of Huntley, City of Ottawa. This property is bound by March Road to the North, Upper Dwyer Hill Road to the East and vacant forested lands to the South and West. The lands surrounding the licence are sparsely populated with the areas of closest and densest development lying immediately to the North / Northwest.

The licenced area for the proposed West Carleton Quarry Extension lands encompasses a total area of approximately 18.2HA. The associated extraction area is approximately 16.5HA when allowing for setbacks and sterilized areas.

The proposed West Carleton Quarry Extension is located immediately West of the existing licence Lot 14 and part of lot 15, Concession 11, former geographic township of Huntley, City of Ottawa. The extension lands are bound by vacant lands to the West and South, the existing West Carleton Quarry to the East, and March Road to the North with properties located along Burnt Lands Road to the Northwest. The closest sensitive receptors surrounding the proposed limit of extraction are listed in Table 1 below as well as in the Sensitive Receptor Overview contained in Appendix A:

Sensitive Receptor Address	Sensitive Receptor or Non Sensitive Receptor	Distance to Receptor (m)	Direction from Extraction Limits
1616 Burnt Lands Road	Sensitive	135	Northwest
1644 Burnt Lands Road	Sensitive	305	Northwest
1654 Burnt Lands Road	Sensitive	385	Northwest
1674 Burnt Lands Road	Sensitive	480	Northwest
1692 Burnt Lands Road	Sensitive	585	Northwest
1720 Burnt Lands Road	Sensitive	705	Northwest
1730 Burnt Lands Road	Sensitive	820	Northwest
4061 March Road	Sensitive	420	North
4512 March Road	Sensitive	1255	West
1331 Upper Dwyer Hill Road	Sensitive	1375	East
1486 Upper Dwyer Hill Road	Sensitive	1550	Northeast
1550 Upper Dwyer Hill Road	Sensitive	1080	Northeast
1661 Upper Dwyer Hill Road	Sensitive	975	North
1350 Golden Line Road	Sensitive	1435	Southwest

Sensitive Receptor Address	Sensitive Receptor or Non Sensitive Receptor	Distance to Receptor (m)	Direction from Extraction Limits
1491 Golden Line Road	Sensitive	1270	Southwest
1509 Golden Line Road	Sensitive	1260	Southwest

Table 1: Closest Sensitive Receptors

PROPOSED MINERAL EXTRACTION

As per the November 2020 Extraction Plan (Refer to Appendix A), the proposed initial quarry operations will commence on the Northeast face or Southeast face of the proposed extension licence extraction limit and will retreat Southwesterly and Northwesterly respectively across the extension lands. This will eliminate the need for a sinking cut and provide the maximum distance separation to neighbouring receptors. It is a recommendation of this report to initiate extraction operations at the Southeast corner of the extension extraction limits and retreat in an echelon pattern towards the Northwest corner to both direct all overpressures away from sensitive receptors along March Road and provide the maximum distance separation to neighbouring receptors for the initial operations. Alternatively, in the event that the rock in the existing licence adjacent the Southeast face has not been extracted prior to entering into the proposed licence, a slot could be advanced starting near the Southeast corner of the Northwest face, retreating in a Southwest direction before turning the face 90 degrees and retreat northwesterly as shown on the operational plan attached in Appendix A.

Bedrock will be extracted to a final floor elevation of 107masl. Given existing topography of approximately 153masl, it is anticipated that the extraction will take place in up to 5 benches. The approximate floor elevations for each respective bench is anticipated to be 142masl, 134masl, 125masl, 116masl and 107masl, respectively.

As quarry operations migrate across the property, the closest sensitive receptors to the required blasting operations will vary. While recommended initial mineral extraction in the proposed licence area will occur approximately 725m from the closest sensitive receptors to the blast location, the quarry face along the Northwest limits of extraction will come within 135m of the closest property located on Burnt Lands Road, namely 1616 Burnt Lands Road (Refer to Table 1 above).

Current practice at the Cavanagh West Carleton Quarry operation employs 101mm diameter blast holes with a typical load per delay of between 65Kg - 100kg based on an 8m – 10m bench height. While current practices would be acceptable for the initial blasting in the extension area, calculations contained within this report suggest modifications to current blast designs will be necessary as operations progress towards adjacent receptors. Fortunately, given advanced initial separation distances between blasting operations and neighbouring receptors, there exists ample opportunity for data collection and analysis prior to any required blasting in closer proximity to the adjacent homes.

BLAST VIBRATION AND OVERPRESSURE LIMITS

The Ontario MECP guidelines for blasting in quarries are among the most stringent in North America.

Studies by the U.S. Bureau of Mines have shown that normal temperature and humidity changes can cause more damage to residences than blast vibrations and overpressure in the range permitted by the MECP. The limits suggested by the MECP are as follows.

Vibration	12.5mm/s	Peak Particle Velocity (PPV)
Overpressure	128dB	Peak Sound Pressure Level (PSPL)

The above guidelines apply when blasts are being monitored. Cautionary levels are slightly lower and apply when blasts are not monitored on a routine basis. It is a recommendation of this report that all blasts at the operation be monitored to quantify and record ground vibration and overpressure levels employing a minimum of two (2) digital seismographs, one installed at the closest receptor behind the blast, or closer, and one installed at the closest receptor in front of the blast, or closer.

BLAST MECHANICS AND DERIVATIVES

The detonation of explosives within a blast hole results in the development of very high gas and shock pressures. This energy is transmitted to the surrounding rock mass, crushing the rock immediately surrounding the borehole (approximately 1 borehole radius) and permanently distorts the rock to several borehole diameters (5-25, depending on the rock type, prevalence of joint sets, etc).

The intensity of this stress wave decays quickly so that there is no further permanent deformation of the rock mass. The remaining energy from the detonation travels through the unbroken material in the form of a pressure wave or shock front which, although it causes no plastic deformation of the rock mass, is transmitted in the form of vibrations.

Particle velocity is the descriptor of choice when dealing with vibrations because of its superior correlation with the appearance of cosmetic cracking. As such, for the purposes this report, ground vibration units have been listed in mm/s.

In addition to the ground vibrations, overpressure, or air vibrations, are generated through the direct action of the explosive venting through cracks in the rock or through the indirect action of the rock movement. In either case, the result is a pressure wave which travels though the air, measured in linear decibels (or dBL) for the purposes of this report.

VIBRATION AND OVERPRESSURE THEORY

Transmission and decay of vibrations and overpressure can be estimated by the development of attenuation relations. These relations utilize empirical data relating measured velocities at specific separation distances from the vibration source to predict particle velocities at variable distances from the source. While the resultant prediction equations are reliable, divergence of data occurs as a result of a wide variety of variables, most notably site-specific geological conditions and blast geometry and design for ground vibrations and local prevailing climatic conditions for overpressure.

In order to circumvent this scatter and improve confidence in forecast vibration levels, probabilistic and statistical modeling is employed to increase conservatism built into prediction models, usually by the application of 95% confidence lines to attenuation data.

The attenuation relations are not designed to conclusively predict vibration levels at a specific location as a result of a specific blast design, application of this probabilistic model creates confidence that for any given scaled distance, 95% of the resultant velocities will fall below the calculated 95% regression line.

While the data still provides insight into probable vibration intensities, attenuation relations for overpressure tends to be less reliable and precise than results for ground vibrations. This is due primarily to wider variations in variables outside of the influence of the blast design which impact propagation of the vibrations. Atmospheric factors such as temperature gradients and prevailing winds (refer to Appendix B) as well as local topography can all serve to significantly alter overpressure attenuation characteristics.

Our experience and analysis demonstrates that blast overpressure is greatest when blasting towards receptors, and blast vibrations are greatest when retreating towards the receptors.

GROUND VIBRATION AND OVERPRESSURE ATTENUATION STUDY

A comprehensive network of seismographs was installed by Explotech to measure ground vibration and air overpressure intensities for three (3) blasts conducted in April 2021 and July 2021 at the existing West Carleton Quarry in Ottawa, Ontario. Monitor locations were established in linear arrays emanating from the blast site to assess the rate of decay of the ground vibration and overpressure. All ground vibration data was plotted using square root scaling from blast vibration data collected (refer to Appendix C). Overpressure data was plotted employing cube root scaling (refer to Appendix C).

It should again be noted that given the high dependence on local environmental conditions, overpressure prediction is far less reliable as a means of blast control.

VIBRATION LEVELS AT THE NEAREST SENSITIVE RECEPTOR

The most commonly used formula for predicting PPV is known as the Bureau of Mines (BOM) prediction formula or Propagation Law. We have used this formula to predict the PPV's at the closest house for the initial operations.

$$PPV = k\left(\frac{d}{\sqrt{w}}\right)^{e}$$

Where, PPV = the predicted peak particle velocity (mm/s)

K, e = site factors

d = distance from receptor (m)

w = maximum explosive charge per delay (kg)

The value of K and e are variable and influenced by many factors (i.e. rock type, geology, thickness of overburden, etc.). As such, these site factors are developed empirically through the measurement of vibration characteristics at the specific operations of interested.

Based on the vibration data collected from the April 2021 and July 2021 attenuation study, the values for “e” and “K” have been established at -1.683 and 3507.6 respectively for receptors falling behind the blast at the West Carleton Quarry site.

For a distance of 725m (the standoff distance to the closest sensitive receptor behind the blast for the initial blasting, namely 1616 Burnt Lands Road) and a maximum explosive load per delay of 80kg (101mm diameter hole, 10m deep, 2m surface collar and 1 hole per delay), we can calculate the maximum PPV as follows:

$$PPV = 3507.6\left(\frac{725}{\sqrt{80}}\right)^{-1.683} = 2.15 mm/s$$

The calculated PPV based on the blast discussed above would be 2.15mm/s.

As discussed in previous sections, the MECP guideline for blast-induced vibration is 12.5 mm/s (0.5 in/s). The calculated 95% predicted PPV (based on the standoff distance to the closest sensitive receptor for the initial blasting) would be 2.15mm/s, below the MECP guideline limit. It is understood that as separation distance to receptors decreases, adjustments to blast designs may be necessary to maintain compliance with the guideline limits.

Similarly, the above equation used to calculate PPV can be reformatted to find an approximation of the distance at which a vibration velocity of 12.5mm/s would occur at a receptor behind the blast if all blasting parameters are kept the same as used in the example above:

$$12.5 = 3507.6\left(\frac{d}{\sqrt{80}}\right)^{-1.683} = 254.77m$$

The above result suggests that design modifications to the above preliminary design would be required once blasting operations encroach to within 255m of sensitive receptors surrounding the quarry extraction operations. Fortunately, vibration data will be continually collected and analyzed as part of the Compliance Monitoring Program as the sensitive receptors are approached in order to confirm the requirement for any design modifications. An abundance of design modifications are available which would readily maintain vibration intensities below guideline limits.

Given the separation distances that will be involved at the West Carleton Quarry Extension, Table 2 below provides initial guidance on maximum loads per delay based on various separation distances. The following maximum loads per delay were derived from the equation developed through the April 2021 and July 2021 attenuation study and are based on a maximum intensity of 12.5mm/s:

TABLE 2
Maximum Loads per Delay to Maintain 12.5mm/s at Various Separation Distances

Separation distance between sensitive receptor and closest borehole (meters)	Maximum recommended explosive load per delay (Kilograms)
500	308
450	249
400	197
350	150
300	110
250	77
200	49
150	27
135	23

It is noteworthy that the above values are typically conservative and are intended as a guideline only as the ground vibration attenuation equation is based on a calculated 95% regression line. Actual loads employed shall be based on the results of the monitoring program in place and adjusted as necessary.

The closest separation distance between a sensitive receptor and any blast over the life of the license is 135m. While blasting at this separation distance is feasible from a technical perspective, given current blasting technology and techniques, market economics will dictate the feasibility of extracting rock at lesser separation distances. Monitoring and changes in blasting designs will be required in order to confirm all blasts are within MECP guidelines when blasting comes closer to adjacent sensitive receptors.

OVERPRESSURE LEVELS AT THE NEAREST SENSITIVE RECEPTOR

It is unusual for overpressure to reach damaging levels, and when it does, the evidence is immediate and obvious in the form of broken windows in the area. However, overpressure remains of interest due to its ability to travel further distances as well as cause audible sounds and excitation in windows and walls.

Air overpressure decays in a known manner in a uniform atmosphere, however, a uniform atmosphere is not a normal condition. As such, air overpressure attenuation is far more variable due to its intimate relationship with environmental influences. Air vibrations decay slower than ground vibrations with an average decay rate of 6dBL for every doubling of distance.

Air overpressure levels are analyzed using cube root scaling based on the following equation:

$$P = k\left(\frac{d}{\sqrt[3]{w}}\right)^{e}$$

Where, P = the peak overpressure level (psi – imperial, Pa, dB - metric)
K, e = site factors
d = distance from receptor (ft – imperial, m - metric)
w = maximum explosive charge per delay (lbs – imperial, kg - metric)

The value of K and e are variable and are influenced by many factors (i.e. rock type, geology, thickness of overburden, environmental conditions at the time of a blast, etc.). As such, these site factors are developed empirically through the measurement of overpressure characteristics at the specific operations of interest.

Based on the overpressure data collected from the April 2021 and July 2021 attenuation study, the values for “e” and “K” have been established at -0.102 and 224.3 respectively for receptors falling in front of the blast at the West Carleton Quarry site.

As discussed in previous sections, the MECP guideline for blast-induced overpressure is 128dBL. For a distance of 1100m (i.e. the standoff distance to the closest sensitive receptor in front of the blast for the initial blasting, namely 1550 Upper Dwyer Hill Road) and a maximum explosive load of 80kg (101mm diameter hole, 10m deep, 2m surface collar and 1 hole per delay), we can

calculate the maximum overpressure at the nearest receptor in front of the blast as follows:

$$P = 224.3\left(\frac{1100}{\sqrt[3]{80}}\right)^{-0.102} = 127.44 dB(L)$$

We reiterate that air overpressure attenuation is far more variable due to its intimate relationship with environmental influences and as such, the equation employed is less reliable than that developed for ground vibration. Overpressure monitoring performed on site shall be used to guide blast design as it pertains to the control of blast overpressures. As demonstrated in Appendix B, prevailing winds during quarry operational periods are predominantly out of the South and West, a condition which will assist in attenuating overpressures at the receptors in front of the blasting throughout the phasing of the extension licence.

Given the intimate correlation between overpressure and environmental conditions as stated previously, care must be taken to avoid blasting on days when weather patterns are less favourable. Extraction directions have been selected so as to minimize overpressure impacts on adjacent receptors. Table 3 below can be used as an initial guide showing maximum loads per delay based on various separation distances for receptors in front of the blast face. The following maximum loads per delay are derived from the air overpressure equation above and are based on a peak overpressure level of 128dB(L):

TABLE 3
Maximum Loads per Delay to Maintain 128dB(L) at Various Separation Distances for Receptors in Front of the Face

Separation distance between sensitive receptor and closest blasthole (meters)	Maximum recommended explosive load per delay (Kilograms)
1100	91
1000	68
900	49
800	35
700	23
600	14
500	8

We note that the above values are conservative and are intended as a guideline only as the air overpressure attenuation equation is based on a calculated 95% regression line. Actual loads employed shall be based on the results of the monitoring program in place.

ADDITIONAL CONSIDERATIONS OUTSIDE OF THE BLAST IMPACT ANALYSIS SCOPE

The following headings are addressed for general information purposes and are not strictly required as part of the scope of the Blast Impact Analysis as required under the ARA to ensure compliance with MECP NPC-119 guidelines. The hydrogeological study prepared by Golder Associates as part of the licence application will address residential water wells in detail. Flyrock control is addressed at the operational level given significant influences related to blast design, geology and field accuracy which render concrete recommendations related to control inappropriate at the licencing phase.

FLYROCK

Flyrock is the term used to define rocks which are propelled from the blast area by the force of the explosion. This action is a predictable and necessary component of a blast and requires that every blast have an exclusion zone established within which no persons or property which may be harmed are permitted.

Government regulations strictly prohibit the ejection of flyrock off of a quarry property. The regulations regarding flyrock are enforced by the Ministries of Natural Resources and Forestry, Environment, Conservation and Parks and Labour. In the event of an incident where flyrock does leave a site, the punitive measures include suspension / revocation of licences and fines to both the blaster and quarry owner / operator. Fortunately, flyrock incidents are extremely rare due to the prevalence of professionally designed and implemented blasting programs as well as rigorous prosecution of such events. It is in the best interest of all, stakeholders and non-stakeholders, to ensure that dangerous flyrock does not occur. Through proper blast planning and design, it is possible to control and mitigate the possibility for flyrock.

THEORETICAL HORIZONTAL FLYROCK CALCULATIONS

Flyrock occurs when explosives in a hole are poorly confined by the stemming or rock mass and the high pressure gas breaks out of confinement and launches rock fragments into the air. The three primary sources of fly rock are as follows:

- **Face burst:** Lack of confinement by the rock mass in front of the blast hole results in fly rock in front of the face.

- **Cratering:** Insufficient stemming height or weakened collar rock results in a crater being formed around the hole collar with rock projected in any direction.

- **Stemming Ejection:** Poor stemming practice can result in a high angle throw of the stemming material and loose rocks in the blasthole wall and collar.

The horizontal distance flyrock can be thrown (L_H) from a blast hole is determined using the expression:

$$L_H = \frac{V_o^{\,2} Sin2\theta_0}{g} \qquad [1]$$

where:

V_o = launch velocity (m/s)

θ_0 = launch angle (degrees)

g = gravitational constant (9.8 m/s^2)

The theoretical maximum horizontal distance fly rock will travel occurs when θ_0 = 45 degrees, thereby yielding the equation:

$$L_{H\max} = \frac{V_o^{\,2}}{g} \qquad [2]$$

The normal range of launch velocity for blasting is between 10m/s - 30m/s. To calculate the launch velocity of a blast the following formula is used:

$$V_o = k\left(\frac{\sqrt{m}}{B}\right)^{1.3} \qquad [3]$$

where:

k = a constant

m = charge mass per meter (kg/m)

B = burden (m)

By combining equations 2 and 3 and taking into account the different sources of fly rock, the following equations can be used to calculate the maximum fly rock thrown from a blast:

Face burst: $$L_{H\max} = \frac{k^2}{g} * \left(\frac{\sqrt{m}}{B}\right)^{2.6}$$

Cratering: $$L_{H\max} = \frac{k^2}{g} * \left(\frac{\sqrt{m}}{SH}\right)^{2.6}$$

Stemming Ejection: $$L_{H\max} = \frac{k^2}{g} * \left(\frac{\sqrt{m}}{SH}\right)^{2.6} Sin2\theta$$

where: θ = drill hole angle
L_{hmax} = maximum flyrock throw (m)
m = charge mass per meter (kg/m)
B = burden (m)
SH = stemming height (m)
g = gravitational constant
k = a constant

For flyrock calculation purposes, we have applied the current blasting parameters used in the West Carleton Quarry which utilize 101mm (4") diameter holes on a 3.0m x 3.0m (10'x 10') pattern, with total depths of up to 10m (33') and a collar length of 2m (6.5').

The range for the constant k is 13.5 for soft rocks and 27 for hard rocks. Given the proposed licence area is predominantly limestone, we have applied a k value of 21. The explosive density is assigned to be 1.2 g/cc for emulsion products and the drill hole angles are assumed to be 90 degrees (i.e. vertical).

Based on a free face blast, maximum anticipated horizontal flyrock projection distances are calculated as follows in Table 4:

Table 4 – Maximum Flyrock Horizontal		
Collar **Lengths** (m)	**Maximum Throw Face Burst** (m)	**Maximum Throw Cratering and Stemming Ejection** (m)
1.5	48	302
2.0	48	143
2.5	48	80
3.0	48	50
3.5	48	33

Different collar lengths are displayed in the table above to account for over or under loaded holes. As demonstrated with these various collar lengths, any deviation, no matter how slight, can greatly affect these maximum values. The current proposed initial blasting parameters have the potential to send flyrock 143m assuming all holes achieve the designed collar lengths of 2.0m.
Blast mats or sand can be placed on top of the shot to further reduce the distance for potential flyrock.

Through proper blast design and diligence in inspecting the geology before every blast, flyrock can readily be maintained within the quarry limits. It may be necessary to increase collars and adjust designs accordingly when blasting along the perimeter to accommodate the reduced distance to receptors and to ensure flyrock remains within the property limit. The operational plan for the quarry has been designed to retreat towards the closest receptors thereby projecting flyrock and overpressures away from the receptors.

RESIDENTIAL WATER WELLS

Possible impacts to the water quality and production capacity of groundwater supply wells is a common concern for residents near blasting operations. Complaints related to changes in water quality often include the appearance of turbidity, water discolouration and changes in water. Complaints regarding water production most often involve loss of quantity production, air in water and damage to well screens and casings. A review of research and common causes of these problems indicates that most of these concerns are not related to blasting and can be shown to be the direct impact of environmental factors and poor well construction and maintenance.

There is an intuitive belief that blasting operations have dramatic and disastrous impacts on residential water wells for large distances around such operations. However, there is no scientific basis for such claims. Outside of the immediate radius of approximately 20-25 blasthole diameters from a loaded hole, there is no permanent ground displacement. As such, barring blasting activity within several meters of an existing well, the probability of damage to residential wells is essentially non-existent.

Despite the scientific support for the above conclusion, numerous studies have been performed to verify the validity of this statement. These studies have investigated the effects of blasting on varied well configurations and in varied geological mediums to ensure results could be readily extrapolated to all blasting operations. The conclusion of these studies has confirmed that with the exception of possible temporary increases in turbidity, blasting operations did not result in any permanent impact on wells outside of the immediate blast zone of the blast until vibrations levels reached exceedingly high intensities. Applying universally accepted threshold levels for ground vibrations eliminates the possibility for any long term adverse effects on wells in the vicinity of blasting operations.

In a study by Froedge (1983), blast vibration levels of up to 32.3mm/s were recorded at the bottom of a shallow well located at a distance of 60 meters (200 feet) from an open pit blast. There was no report of visible damage to the well nor was there any change in the water pumping flow rate. This study concluded that the commonly accepted limit of 50mm/s PPV level is adequate to protect wells from any damage. We reiterate, the current guideline limit for vibrations from quarry and mining operations is 12.5mm/s.

Rose et al. (1991) studied the effect of blasting in close proximity to water wells near an open pit mine in Nevada, USA. Blasts of up to 70 kilograms of explosives per delay period were detonated at a distance of 75 meters (245 feet) from a deep water well. There was no reported visible damage to the well. Fluctuations in water level and flow rate were evident immediately after the blast. However, the well water level and flow rate quickly stabilized.

The U.S. Bureau of Mines conducted a study (Robertson et al., 1990) to determine the changes in well capacity and water quality. This involved pumping from wells before and after nearby blasting. One experiment with a well in sandstone showed no change in well capacity after blasts induced PPV's at the surface of 84mm/s and there was no change in water level after PPV's of 141mm/s, well above the current guideline limit of 12.5mm/s.

Matheson et al. (1997) brought together available information on the most common complaints, the possible causes of the complaints and the relation between blasting and the complaint causes. This study yet again reaffirmed the fact that the attribution of well problems to blast sources are unfounded.

The MECP vibration limit of 12.5mm/s effectively excludes any possibility of damage to residential water wells. Based on available research and our extensive experience in Ontario quarry blasting, blasting at the West Carleton Quarry will induce no permanent adverse impacts on the residential water wells on properties surrounding the site.

REVIEW OF HISTORICAL WEST CARLETON QUARRY DATA

A vibration and overpressure monitoring program has been in place for all blasts conducted at the Cavanagh West Carleton Quarry in recent years. As part of this analysis, Cavanagh has provided copies of vibration data summaries collected from 2017 – 2020. For continuity, summaries of the historical data collected and supplied by Cavanagh are included in Appendix C to this report.

2017 – 2020 DATA

Vibration monitoring conducted from 2017 – 2020 has included the installation of seismographs at the following locations:

- 1331 Dwyer Hill Road
- 1550 Dwyer Hill Road
- 3950 March Road

All vibration monitoring was performed by either the blasting contractor or the quarry owner. A review of the data supplied confirms that for 2017 through 2020 inclusive, all blasts were compliant with the MECP guideline limit of 12.5mm/s set for ground vibration and 128dB(L) set for overpressure.

Based on the reviewed blast reports, the maximum blast related ground vibration during the 2017 – 2020 period was a reading of 5.27mm/s registered on April 2, 2020, at 1550 Dwyer Hill Road at a separation distance of 875.4m. The maximum overpressure was a reading of 127.7dB(L) registered on August 10, 2017 at 1331 Dwyer Hill Road at a separation distance of 1617.3m.

RECOMMENDATIONS

It is recommended that the following conditions be applied for all blasting operations at the proposed Cavanagh – West Carleton Quarry Extension areas:

1. All blasts shall be monitored for both ground vibration and overpressure at the closest privately owned sensitive receptors adjacent the site, or closer, with a minimum of two (2) instruments – one installed in front of the blast and one installed behind the blast.

2. In order to safeguard the structural integrity of non-sensitive receptors, we recommend that vibrations at these properties be maintained below 50mm/s (>40Hz) in accordance with research performed by the United States Bureau of Mines (USBM RI8507).

3. The guideline limits for vibration and overpressure shall adhere to standards as outlined in the MECP Model Municipal Noise Control By-law publication NPC 119 (1978) or any such document, regulation or guideline which supersedes this standard.

4. In the event of an exceedance of NPC 119 limits or any such document, regulation or guideline which supersedes this standard, blast designs and protocol shall be reviewed prior to any subsequent blasts and revised accordingly in order to return the operations to compliant levels.

5. Orientation of the aggregate extraction operation will be designed and maintained so that the direction of the overpressure propagation will be away from structures as much as possible.

6. Blast designs shall be continually reviewed with respect to fragmentation, ground vibration and overpressure. Blast designs shall be modified as required to ensure compliance with current applicable guidelines and regulations.

7. Blasting procedures such as drilling and loading shall be reviewed on a yearly basis and modified as required to ensure compliance with industry standards.

8. Detailed blast records shall be maintained in accordance with current industry best practices.

The blast parameters described within this report are supported by the modeling in the attached appendices. As the quarry progresses and as site-specific data is collected from the on-going operation, the blast parameters can be refined, as necessary, to ensure continual compliance with MECP Guidelines.

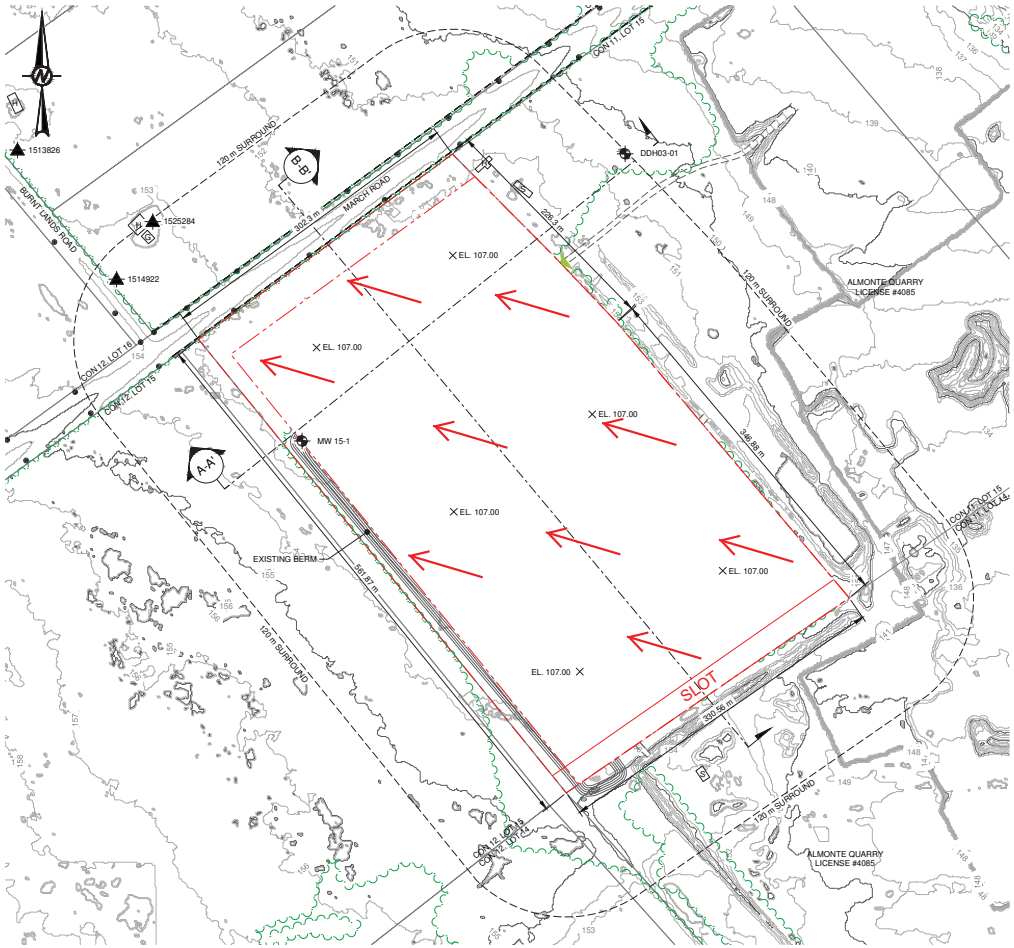
CONCLUSION

The blast parameters described within this report will provide a good basis for the initial blasting operations at this location. As site specific blast vibration and overpressure data becomes available, it will be possible to refine these parameters on an on-going basis.

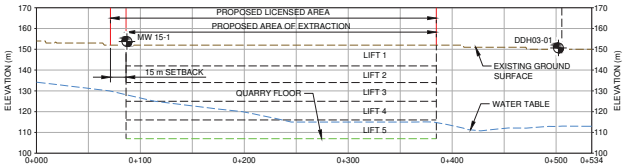
Blasting operations required for operations at the proposed Cavanagh – West Carleton Quarry Extension site can be carried out safely and within governing guidelines set by the Ministry of the Environment, Conservations and Parks.

Modern blasting techniques will permit blasting to take place with explosives charges below allowable charge weights ensuring that blast vibrations and overpressure will remain minimal at the nearest receptors.

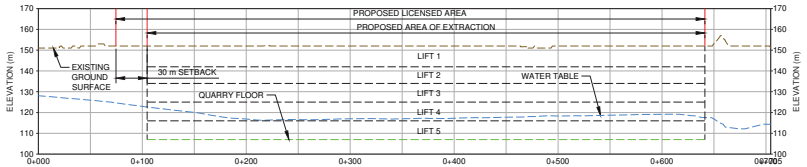
Appendix A



OPERATIONS PLAN
SCALE 1:2 mm



SCALE 1:2,000 m
VERT. 1:1,000 m
A-A' SECTION



SCALE 1:2,000 m
VERT. 1:1,000 m
B-B' SECTION

TYPICAL BERM DETAIL
SCALE NTS

SIGNATURE OF APPLICANT/LICENSEE — DATE

PREPARED UNDER THE DIRECTION OF: JAIME OXTOBEE — DATE

THOMAS CAVANAGH CONSTRUCTION LIMITED

AMENDMENTS	DATE	APPROVAL DATE

SITE PLANS APPROVED BY THE MINISTRY OF NATURAL RESOURCES AND FORESTRY.

SIGNATURE — DATE

DRAFT

0 100 200
1:2,000 METRES

KEY MAP

SCALE 1:25,000 m

ALMONTE QUARRY

PART OF LOT 15, CONCESSION 11
FORMER GEOGRAPHIC TOWNSHIP OF HUNTLEY,
CITY OF OTTAWA

APPLICANT:
THOMAS CAVANAGH CONSTRUCTION LIMITED
9094 CAVANAGH ROAD
ASHTON, ONTARIO
K0A 1B0

QUARRY LICENSE NO. _____

NOTE(S)
1. LICENCED AREA, ALMONTE QUARRY 18.2 HECTARES.
2. AREA OF OPERATION, ALMONTE QUARRY 16.5 HECTARES.
3. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES AND FORESTRY IN CONJUNCTION WITH AN APPLICATION FOR A CLASS 'A', CATEGORY 2 QUARRY BELOW WATER UNDER THE AGGREGATE RESOURCES ACT AND REGULATIONS.
4. THIS PLAN WAS PREPARED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS.
5. LOT, CONCESSION AND BOUNDARY LINES ON THIS PLAN ARE APPROXIMATE.
6. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987. THIS DRAWING WAS PRODUCED USING STANDARD PHOTOGRAMMETRIC PRACTICES.

LEGEND
- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION
- 120-METRE SURROUND
- BOREHOLE / MONITORING WELL
- PRIVATE WELL (AS PER MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS WATER WELL INFORMATION SYSTEM)
- CON 12, LOT 15 / CON 12, LOT 14 — LOTS AND CONCESSION LINES
- H — BUILDING; S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED, O-OFFICE, SC-SCALE HOUSE, A-AUTO
- PAGE WIRE FENCE/GATE
- UTILITY POLE
- ROADSIDE DITCH
- WOODED AREA
- 127 — CONTOURS/INDEX CONTOURS
- A-A' — CROSS-SECTIONS
- PRIMARY ENTRANCE
- PRIMARY EXIT
- GENERAL DIRECTION OF EXCAVATION
- EL. 107.00 — PROPOSED QUARRY FLOOR SPOT ELEVATION, mASL

REFERENCE(S)
1. KEY PLAN: Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community.
2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2016
3. CITY OF OTTAWA 2012 TOPO LIDAR TILES
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28.

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
ALMONTE QUARRY EXTENSION

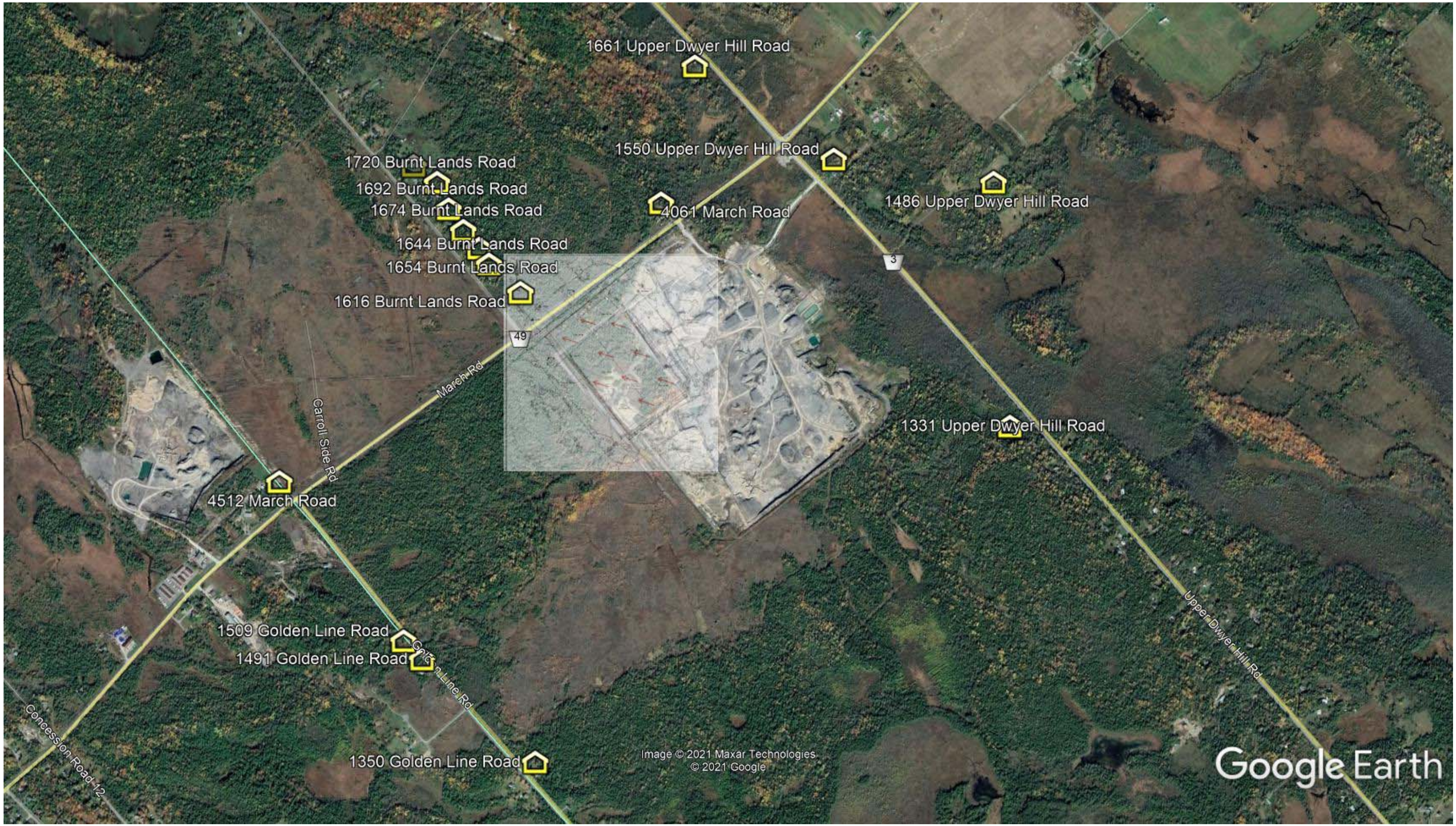
TITLE
OPERATIONS PLAN

APPLICANT

THOMAS CAVANAGH CONSTRUCTION LIMITED

YYYY-MM-DD	2020-10-06
DESIGNED	----
PREPARED	JM
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
1899975	0009	A	3 OF 4


1661 Upper Dwyer Hill Road
1550 Upper Dwyer Hill Road
1720 Burnt Lands Road
1692 Burnt Lands Road
1674 Burnt Lands Road
1644 Burnt Lands Road
1654 Burnt Lands Road
1616 Burnt Lands Road
4061 March Road
1486 Upper Dwyer Hill Road
3
49
March Rd
Carroll Side Rd
4512 March Road
1331 Upper Dwyer Hill Road
1509 Golden Line Road
1491 Golden Line Road
Golden Line Rd
Concession Road 12
1350 Golden Line Road
Upper Dwyer Hill Rd
Image © 2021 Maxar Technologies
© 2021 Google
Google Earth


Carroll Side Rd
1730 Burnt Lands Road
1720 Burnt Lands Road
1692 Burnt Lands Road
1674 Burnt Lands Road
1654 Burnt Lands Road
1644 Burnt Lands Road
1616 Burnt Lands Road
4061 March Road
March Rd
49
Image © 2021 Maxar Technologies
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Google Earth

Appendix B

EXPLOTECH

West Carleton (Almonte) Quarry Extension

PREVAILING METEOROLOGICAL CONDITIONS

Medians provided by Environment Canada
Canadian Climate Normals 1981-2010

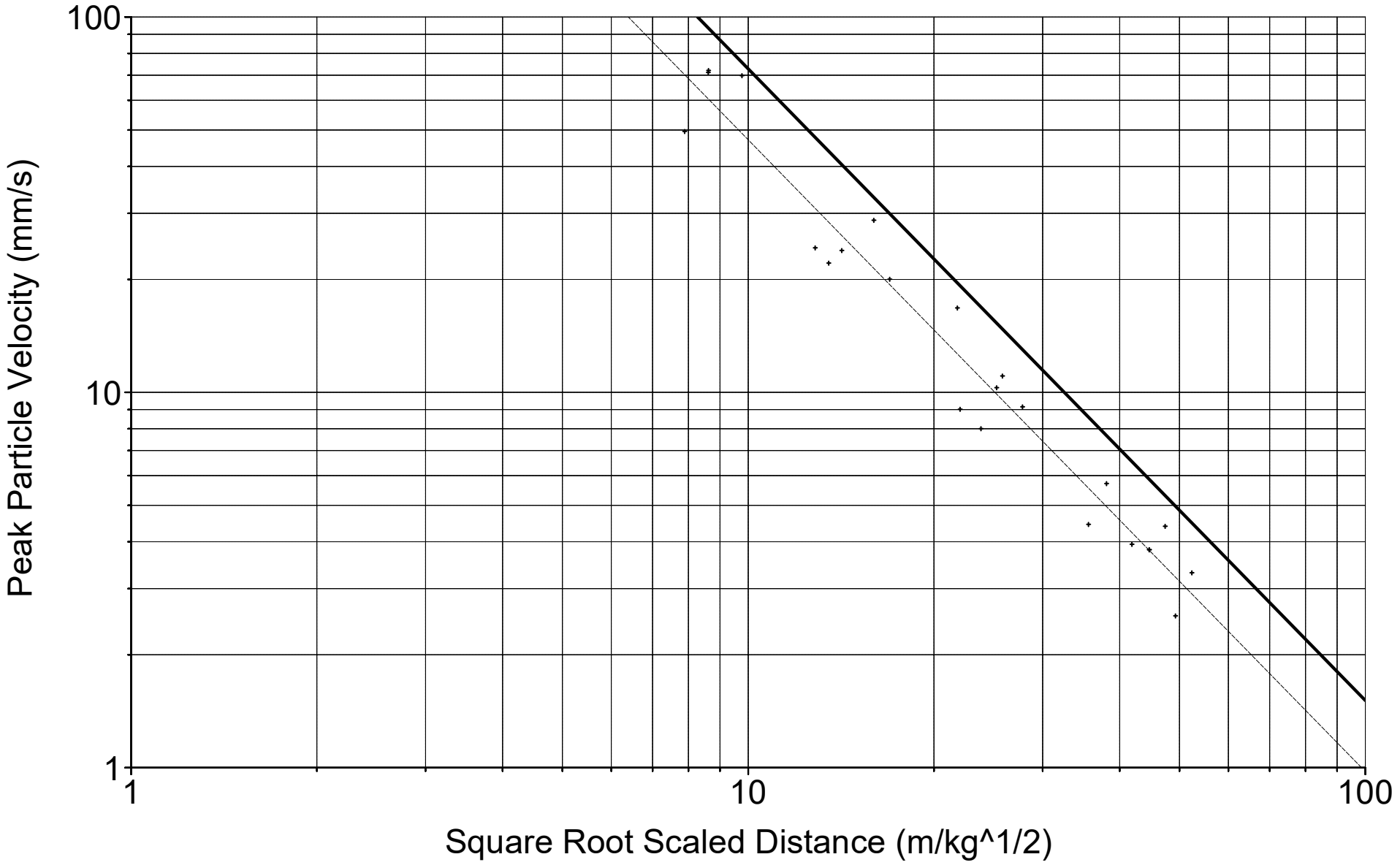
Date	Wind Direction	Max Hourly Wind Velocity Km/h	Temperature (Deg Celsius)
January	SW	48	-11.5
February	NW	40	-9.5
March	SW	45	-3.3
April	SW	53	5.6
May	NW	47	12.9
June	SW	40	18.1
July	NW	34	20.7
August	SE	32	19.4
September	SW	35	14.5
October	SW	39	7.8
November	SW	48	0.8
December	SW	42	-6.8

Appendix C

Regression Line For WEST CARLETON ALMONTE REGRESSION - GROUND VIBRATIONS.SDF

95% Line Equation: V = 3507.6 * (SD)^(-1.683)

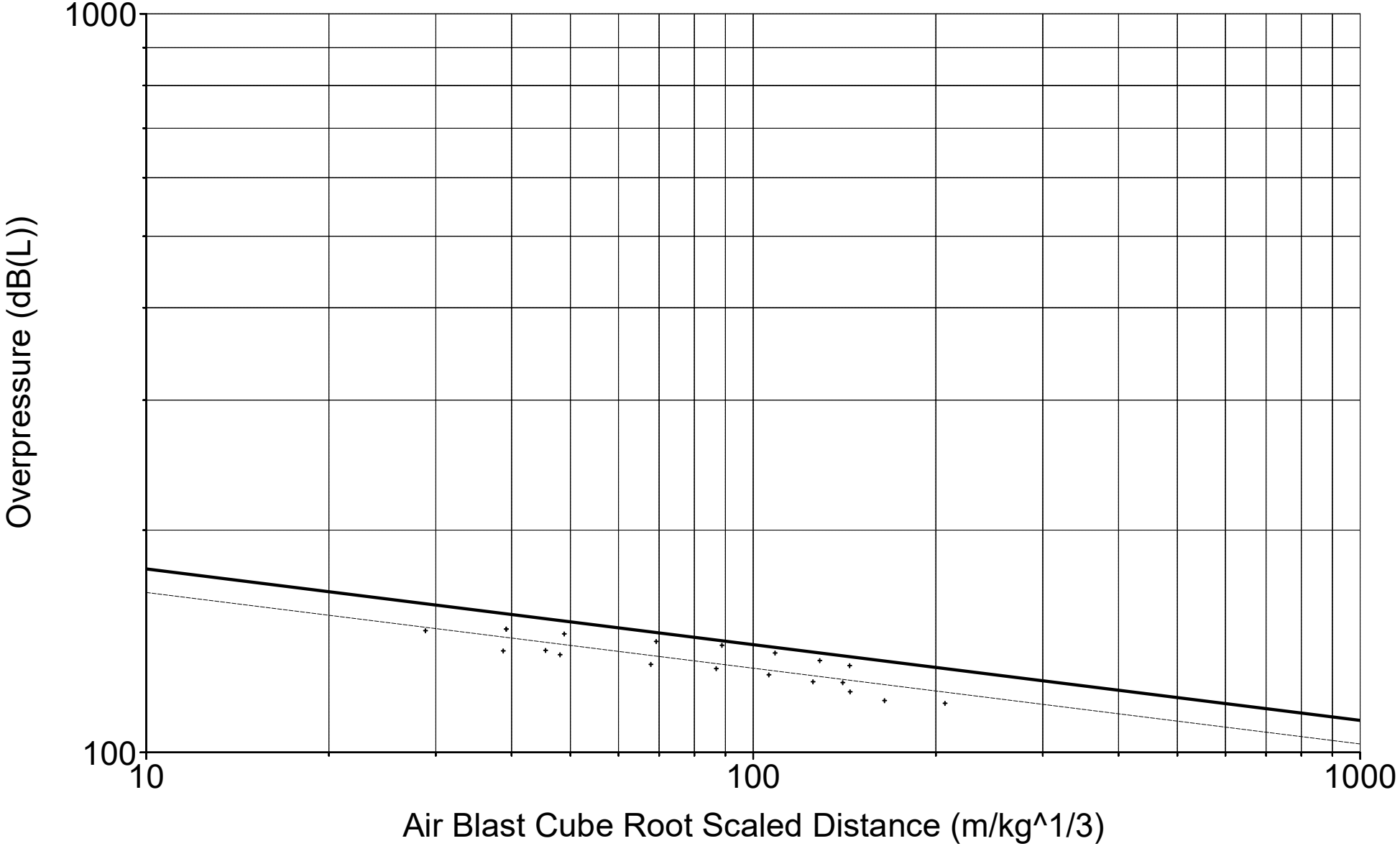
Coefficient of Determination = 0.956 Standard Deviation = 0.094



Regression Line For WEST CARLETON ALMONTE REGRESSION - AIR OVERPRESSURE.SDF

95% Line Equation: V = 224.3 * (SD)^(-0.102)

Coefficient of Determination = 0.710 Standard Deviation = 0.016



Event Report

Date/Time	Long at 12:45:08 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE22087 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	April 16, 2020 by Instantel
File Name	X087IXCR.F80

Notes

Location: 9-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

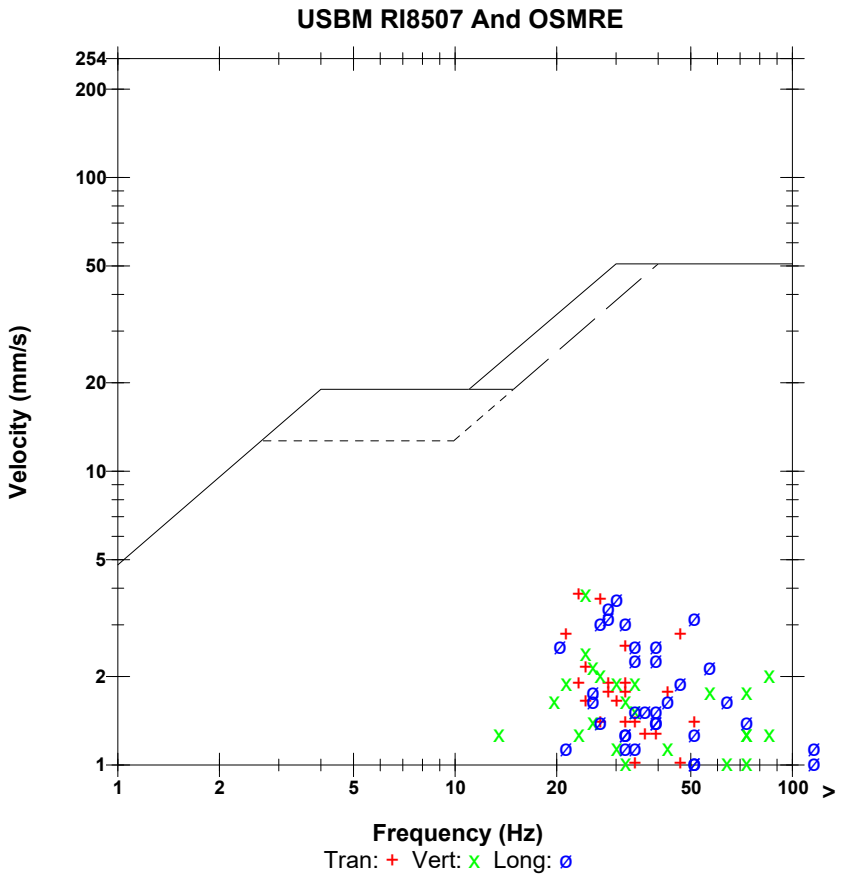
Extended Notes

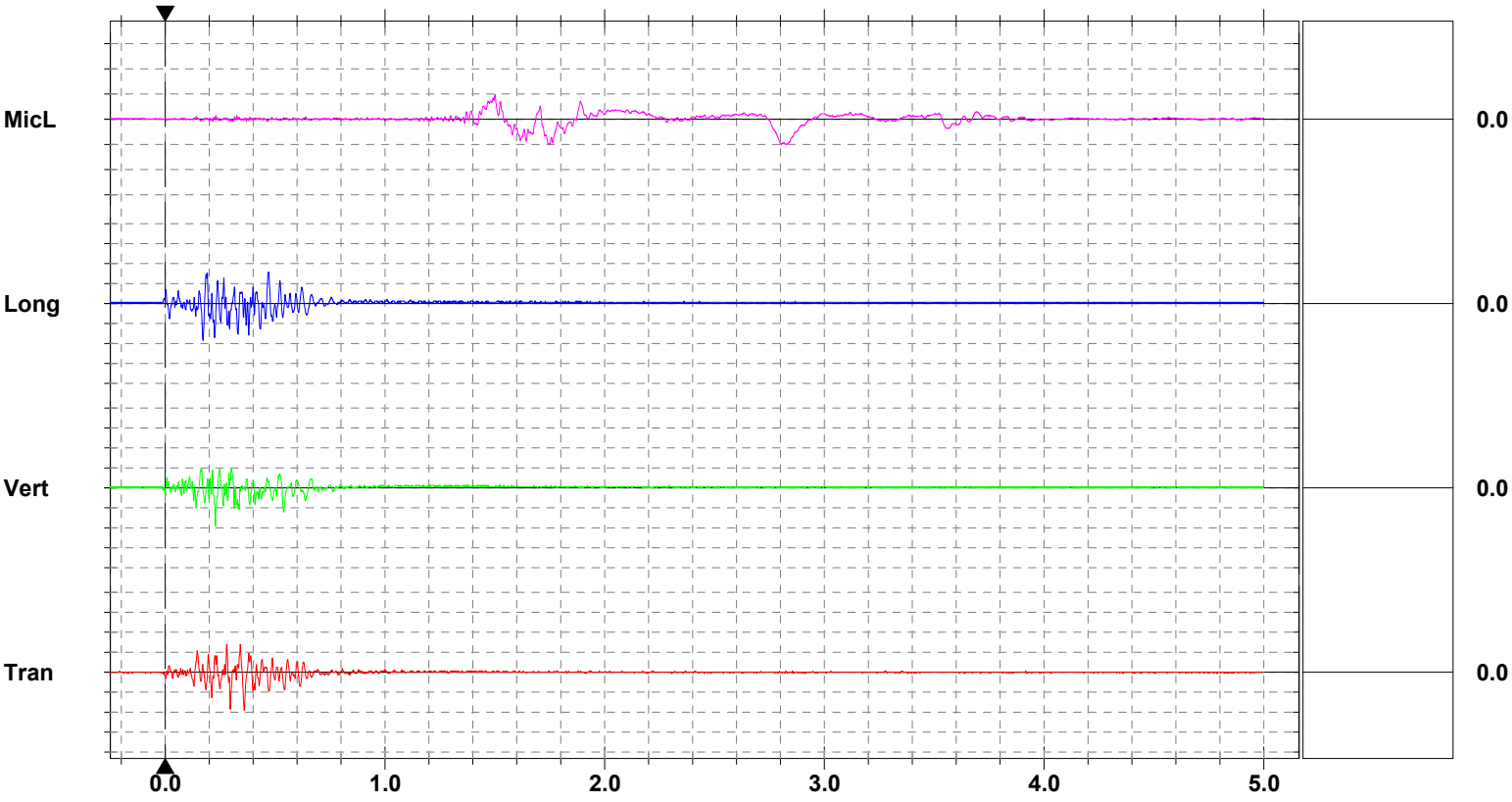
Combo Mode April 7, 2021 09:29:36
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	114.0 dB(L) at 1.749 sec
ZC Freq	3.4 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	3.810	3.810	3.683	mm/s
ZC Freq	23	24	30	Hz
Time (Rel. to Trig)	0.359	0.229	0.171	sec
Peak Acceleration	0.119	0.093	0.106	g
Peak Displacement	0.020	0.017	0.017	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 4.538 mm/s at 0.229 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger = ▶——◀

Event Report

Date/Time	Vert at 12:45:09 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15861 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	January 25, 2021 by Instantel
File Name	Q861IXCR.F90

Notes

Location:	3-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

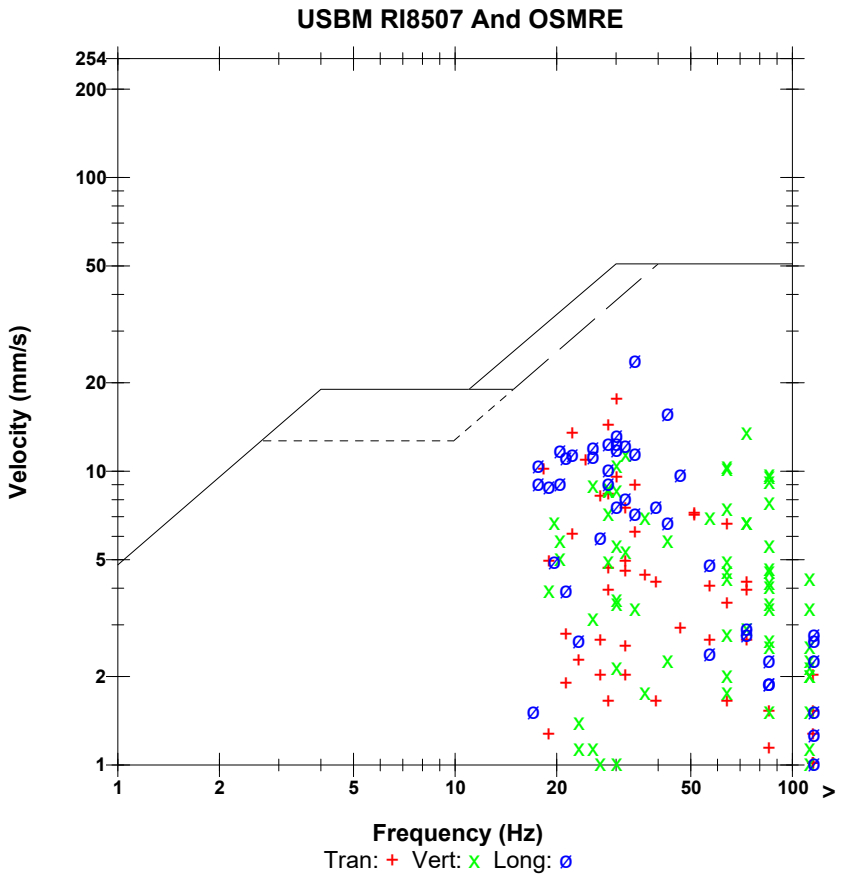
Extended Notes

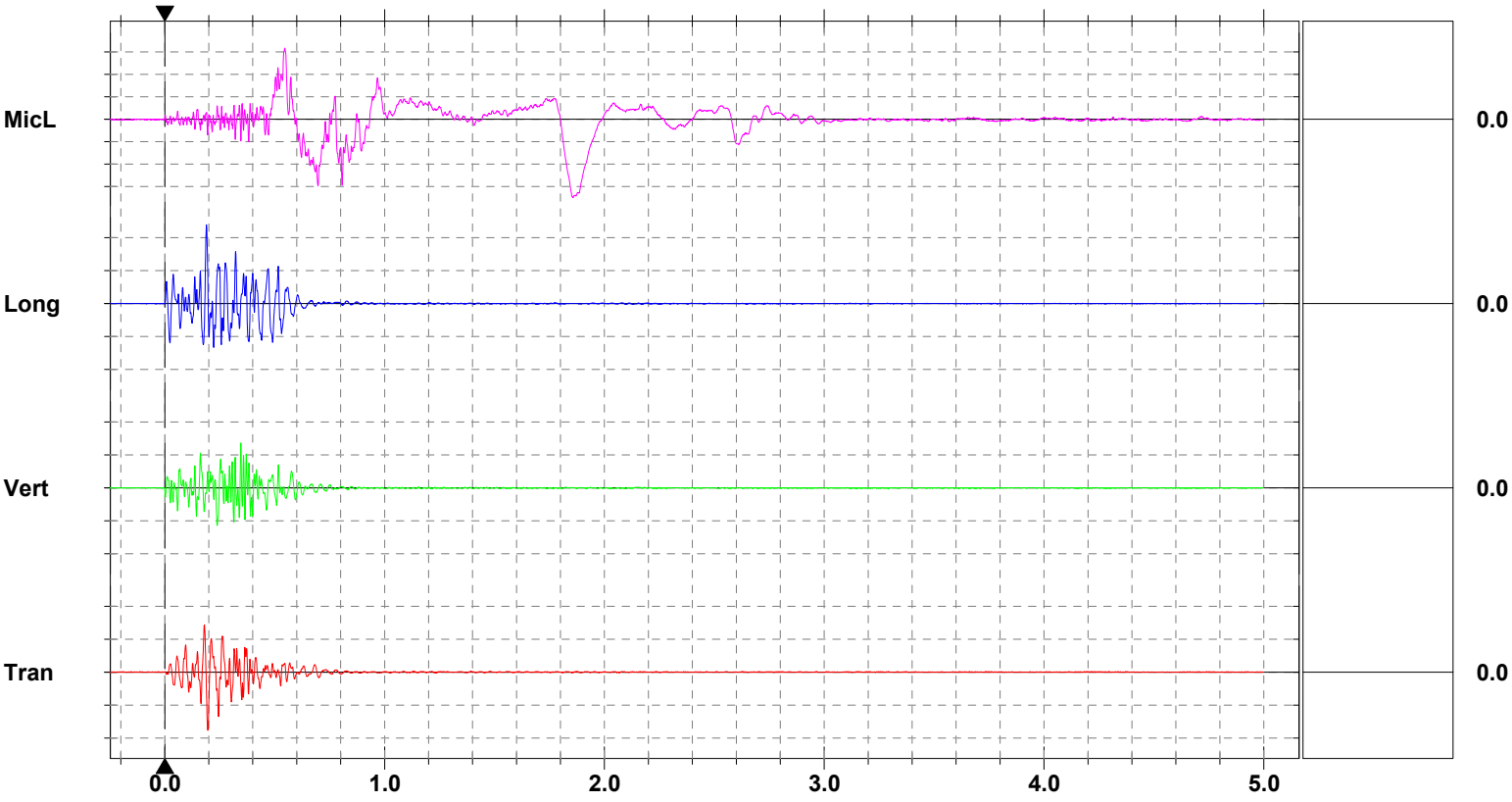
Combo Mode April 7, 2021 09:46:21
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	124.9 dB(L) at 1.856 sec
ZC Freq	2.7 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	17.65	13.59	23.88	mm/s
ZC Freq	30	73	34	Hz
Time (Rel. to Trig)	0.195	0.346	0.189	sec
Peak Acceleration	0.384	0.544	0.530	g
Peak Displacement	0.087	0.058	0.110	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 24.75 mm/s at 0.190 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 10.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 12:45:15 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE19649 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 4, 2020 by Instantel
File Name	U649IXCR.FF0

Notes

Location:	5-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

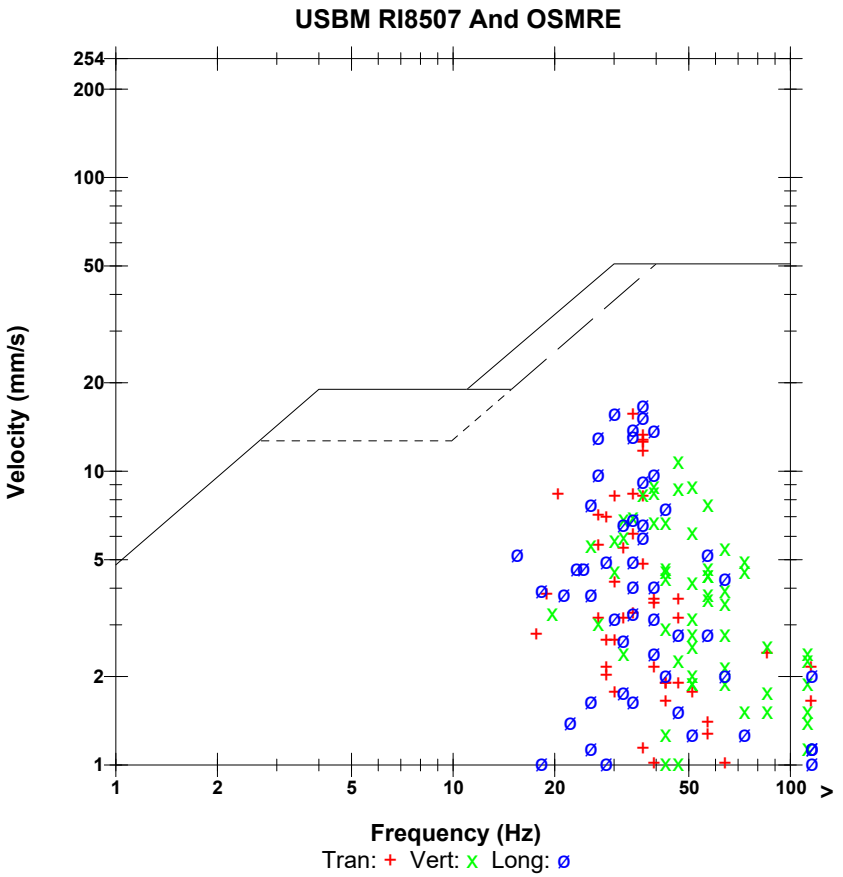
Extended Notes

Combo Mode April 7, 2021 09:41:06
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	120.4 dB(L) at 2.096 sec
ZC Freq	3.2 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	15.62	10.79	16.76	mm/s
ZC Freq	34	47	37	Hz
Time (Rel. to Trig)	0.406	0.229	0.289	sec
Peak Acceleration	0.358	0.331	0.437	g
Peak Displacement	0.067	0.034	0.084	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 17.65 mm/s at 0.189 sec



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:20 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE22084 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	April 16, 2020 by Instantel
File Name	X084IXCR.FK0

Notes

Location:	8-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

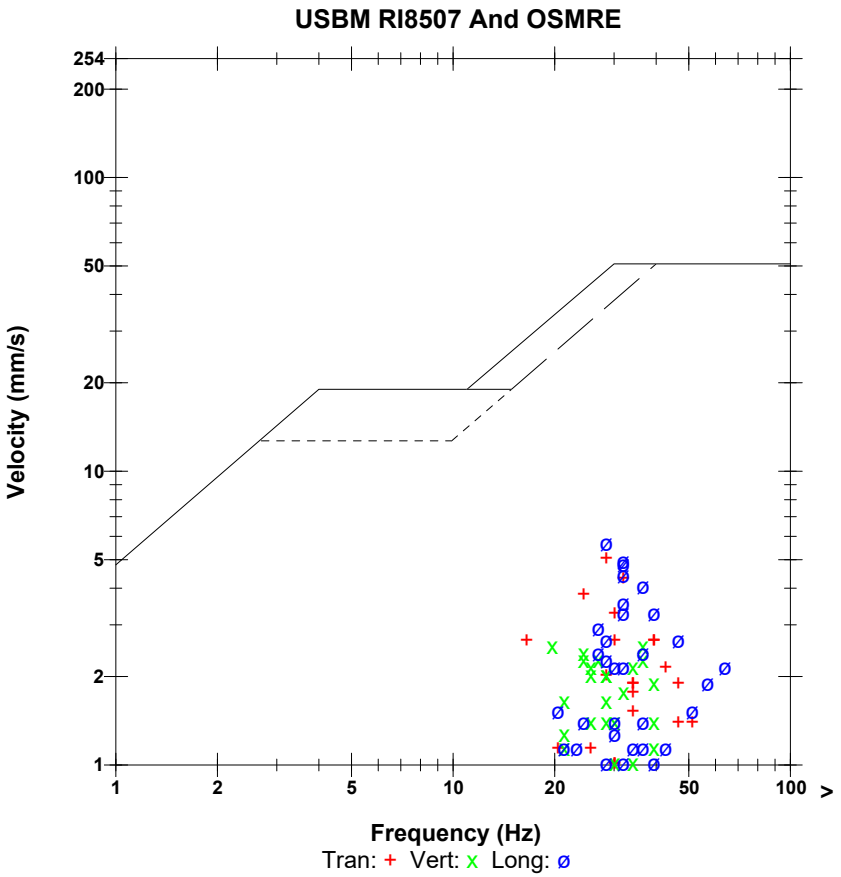
Extended Notes

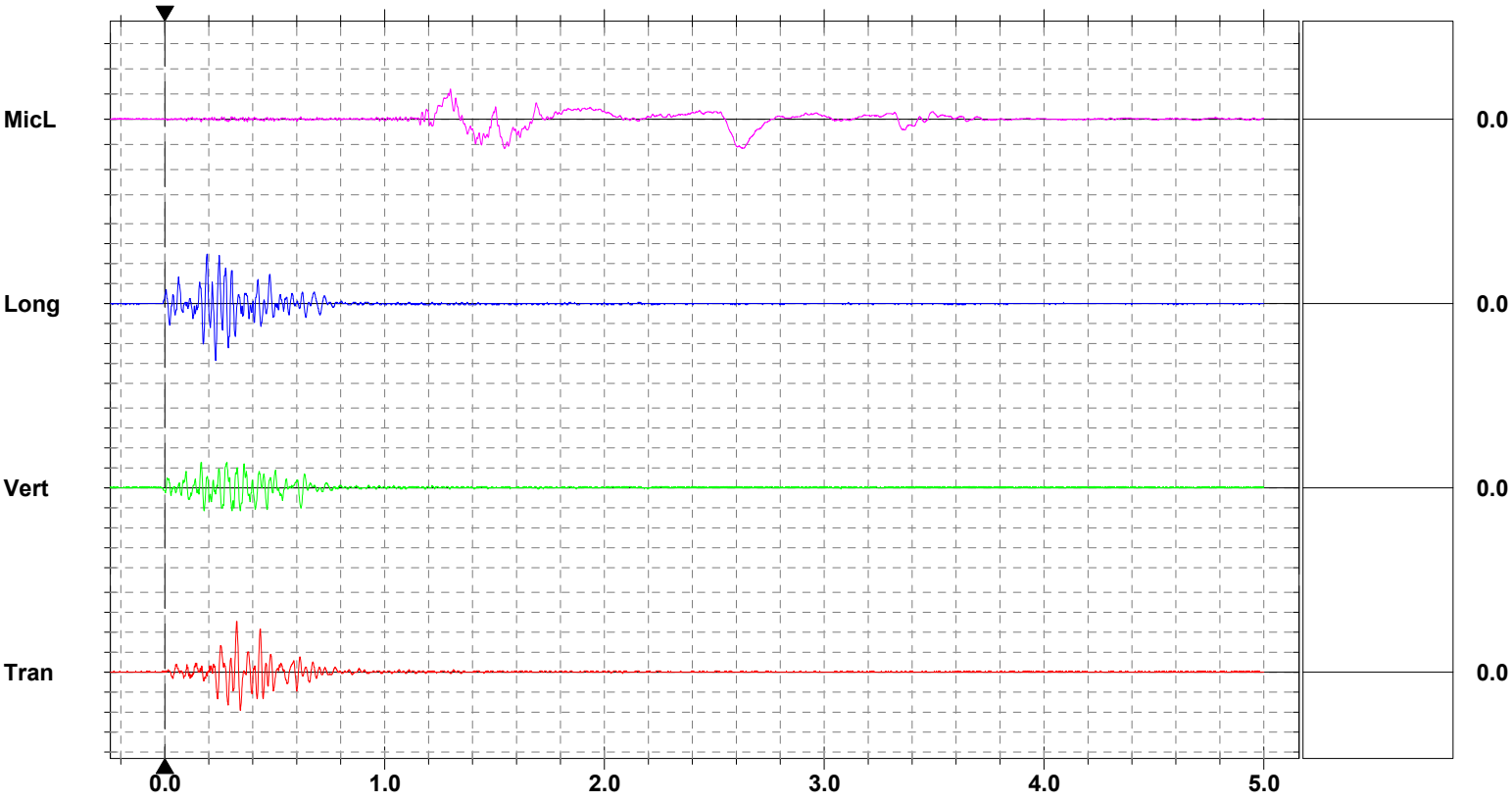
Combo Mode April 7, 2021 09:23:21
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	115.6 dB(L) at 1.300 sec
ZC Freq	4.3 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	5.080	2.540	5.715	mm/s
ZC Freq	28	37	28	Hz
Time (Rel. to Trig)	0.326	0.164	0.231	sec
Peak Acceleration	0.106	0.080	0.133	g
Peak Displacement	0.027	0.020	0.029	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 5.760 mm/s at 0.231 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:23 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE21252 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	December 31, 2020 by Instantel
File Name	W252IXCR.FN0

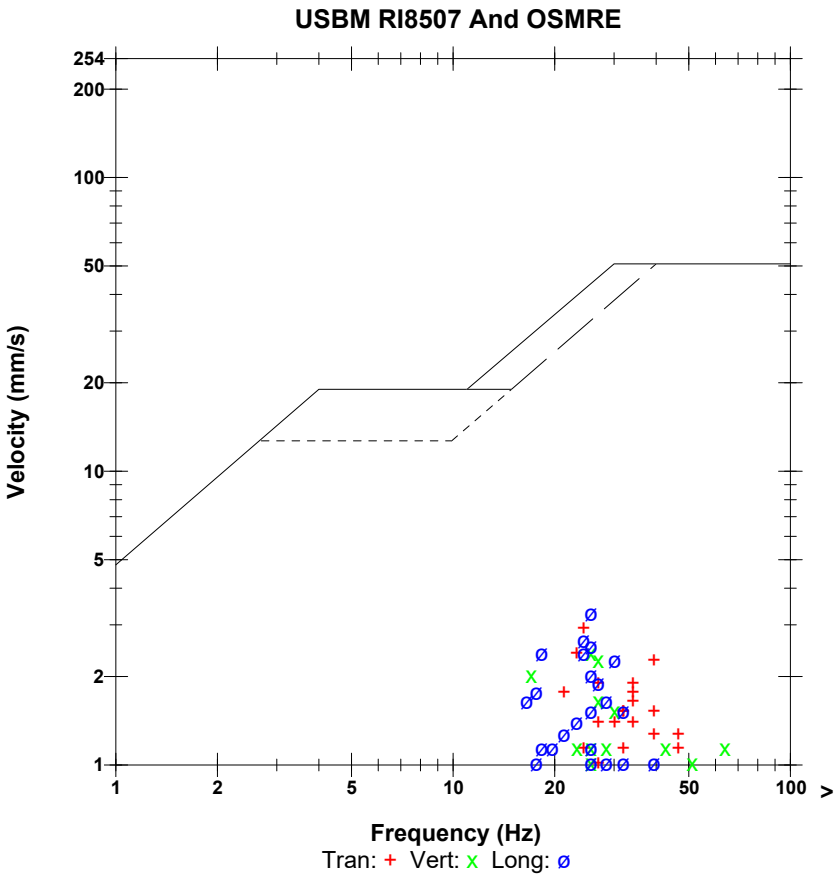
Notes
Location: 10-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

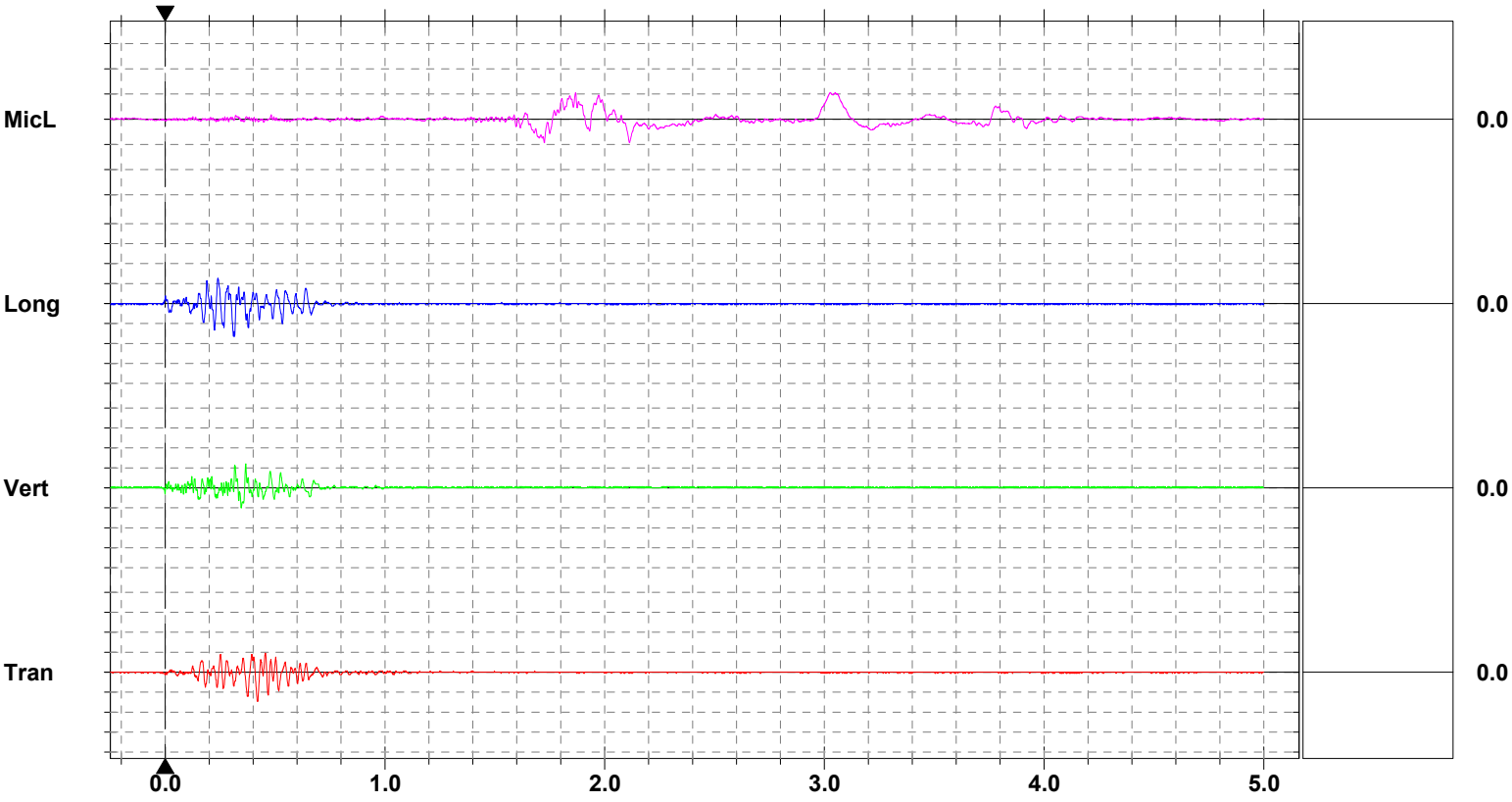
Extended Notes
Combo Mode April 7, 2021 09:33:45
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	114.4 dB(L) at 1.867 sec
ZC Freq	3.4 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	2.921	2.413	3.302	mm/s
ZC Freq	24	26	26	Hz
Time (Rel. to Trig)	0.419	0.366	0.311	sec
Peak Acceleration	0.053	0.080	0.080	g
Peak Displacement	0.018	0.017	0.022	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 4.074 mm/s at 0.315 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 12:45:24 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE20051 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	February 26, 2021 by Instantel
File Name	V051IXCR.FO0

Notes

Location:	6-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

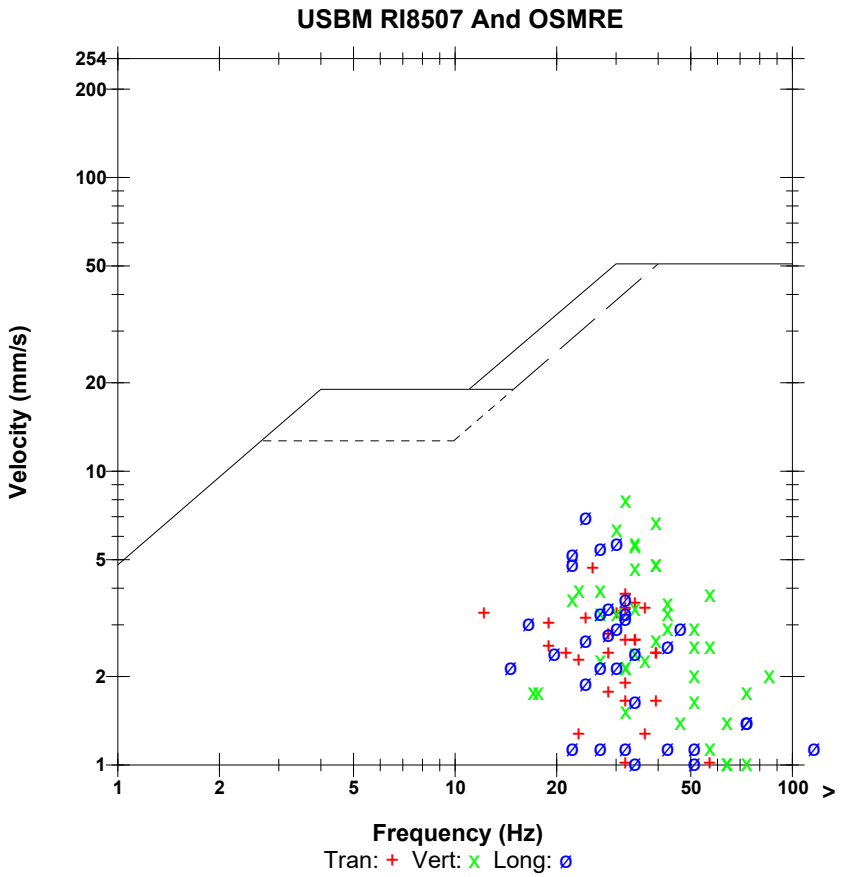
Extended Notes

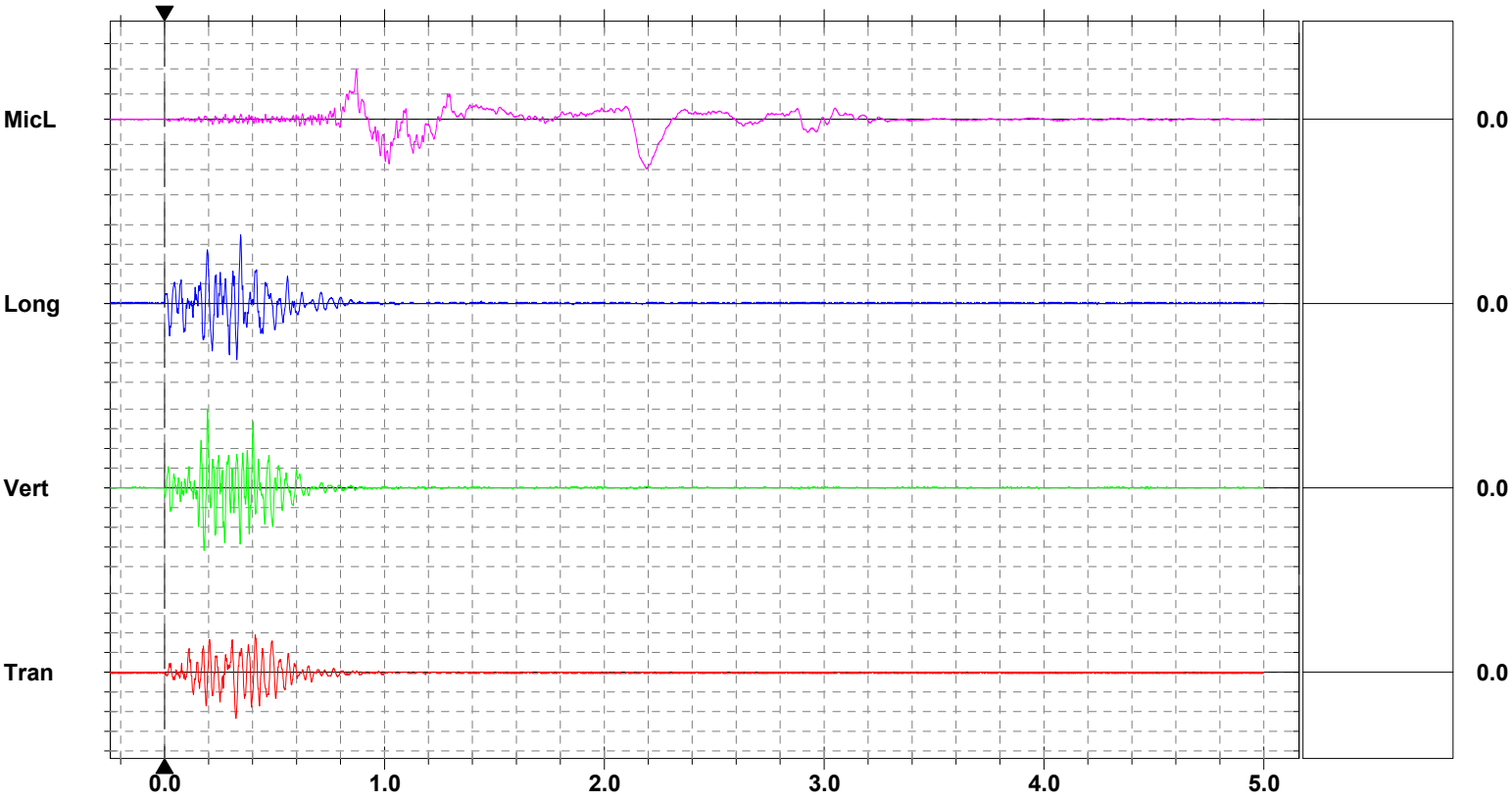
Combo Mode April 7, 2021 09:12:15
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	119.9 dB(L) at 0.872 sec
ZC Freq	4.1 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	4.699	8.001	6.985	mm/s
ZC Freq	26	32	24	Hz
Time (Rel. to Trig)	0.324	0.195	0.346	sec
Peak Acceleration	0.106	0.239	0.146	g
Peak Displacement	0.028	0.034	0.038	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 9.617 mm/s at 0.195 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:24 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE21128 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	January 25, 2021 by Instantel
File Name	W128IXCR.FO0

Notes

Location: 7-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

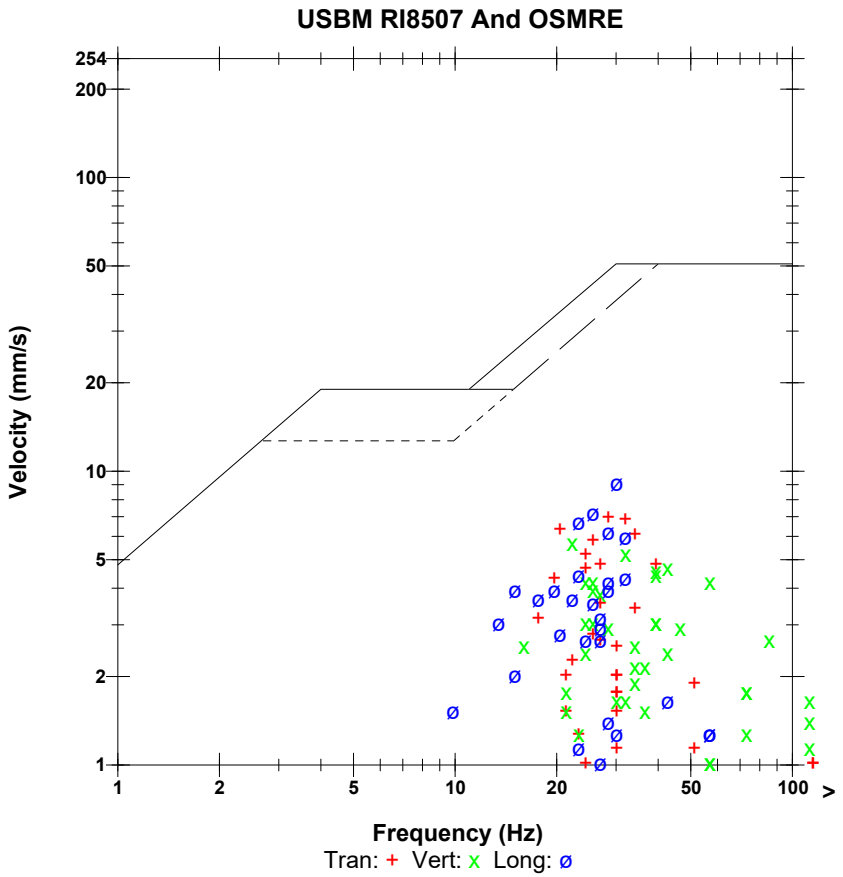
Extended Notes

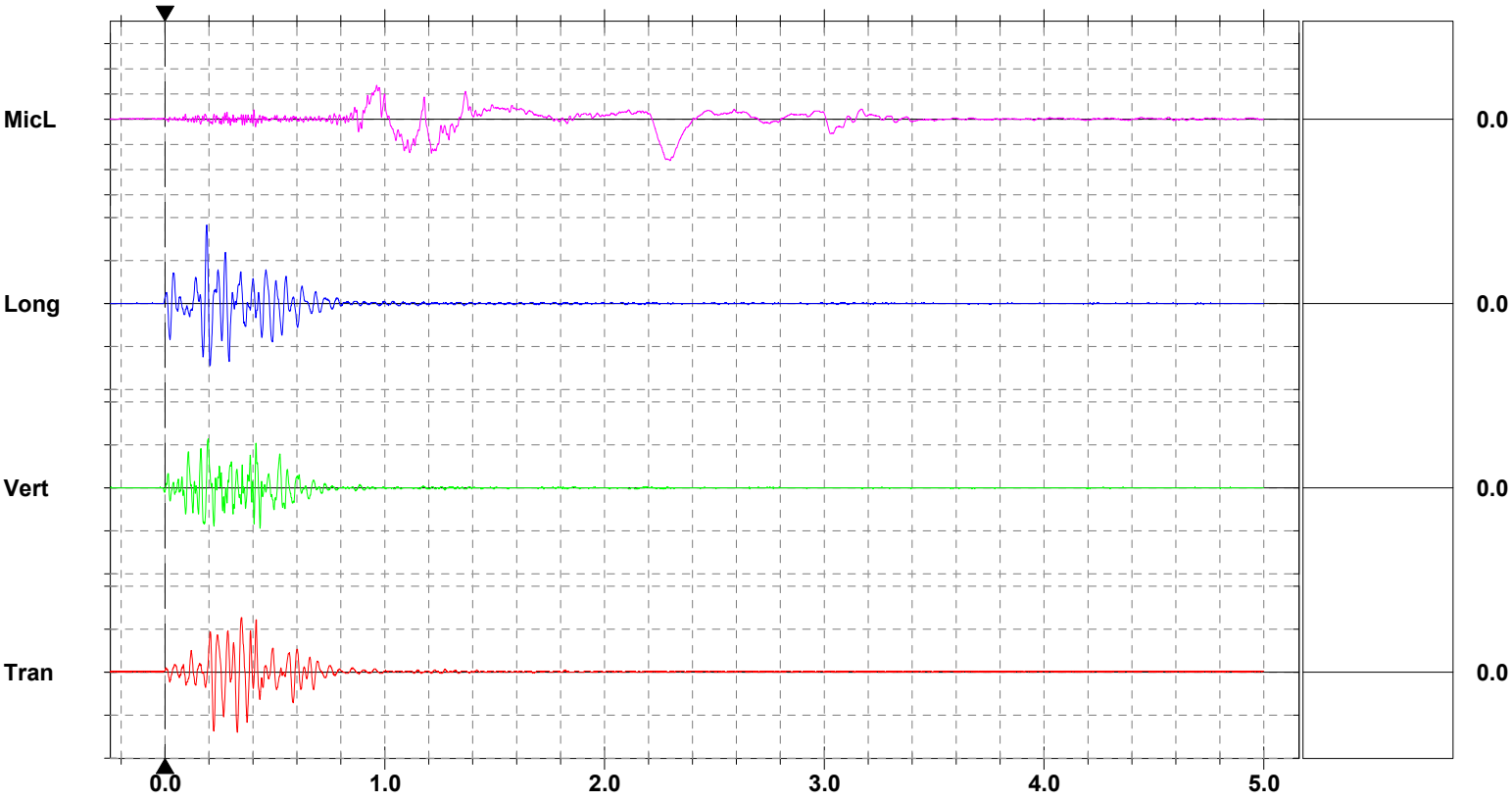
Combo Mode April 7, 2021 09:17:08
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	118.3 dB(L) at 2.298 sec
ZC Freq	2.8 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	6.985	5.715	9.144	mm/s
ZC Freq	28	22	30	Hz
Time (Rel. to Trig)	0.328	0.196	0.189	sec
Peak Acceleration	0.146	0.172	0.172	g
Peak Displacement	0.047	0.033	0.048	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 9.532 mm/s at 0.190 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 12:45:42 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator/2halfF.mmb

Serial Number	UM10656 V 10-90 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	March 16, 2021 by Instantel
File Name	UM10656_20210407124542.IDFW

Notes

Location:	2.5-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to Ground

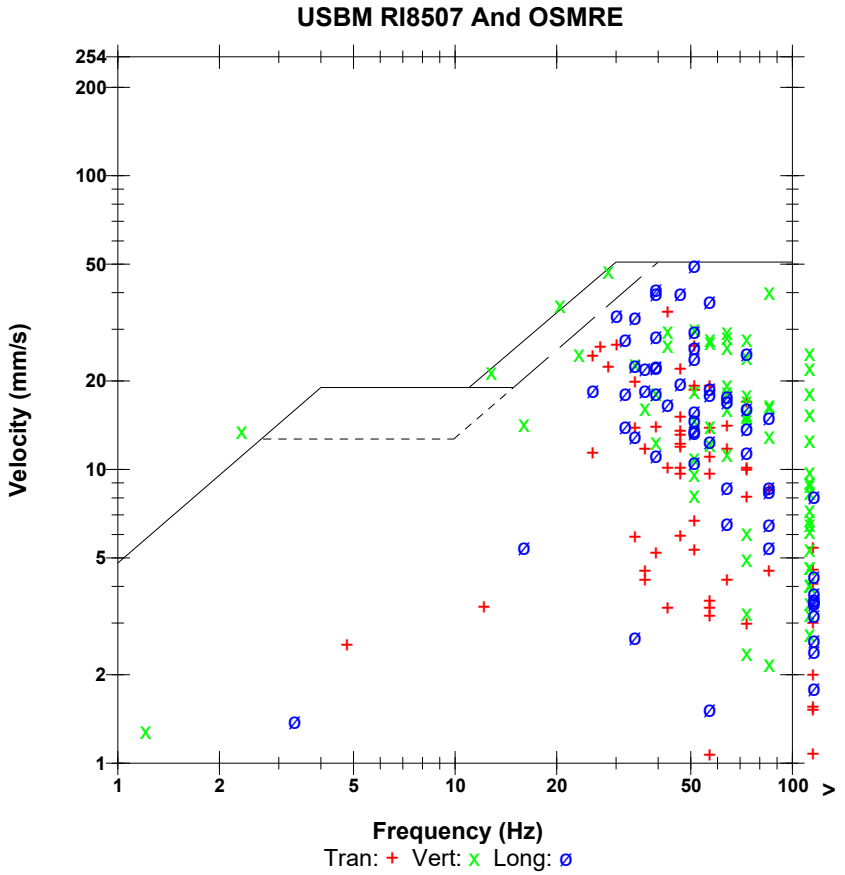
Post Event Notes
Location is 2.5-B

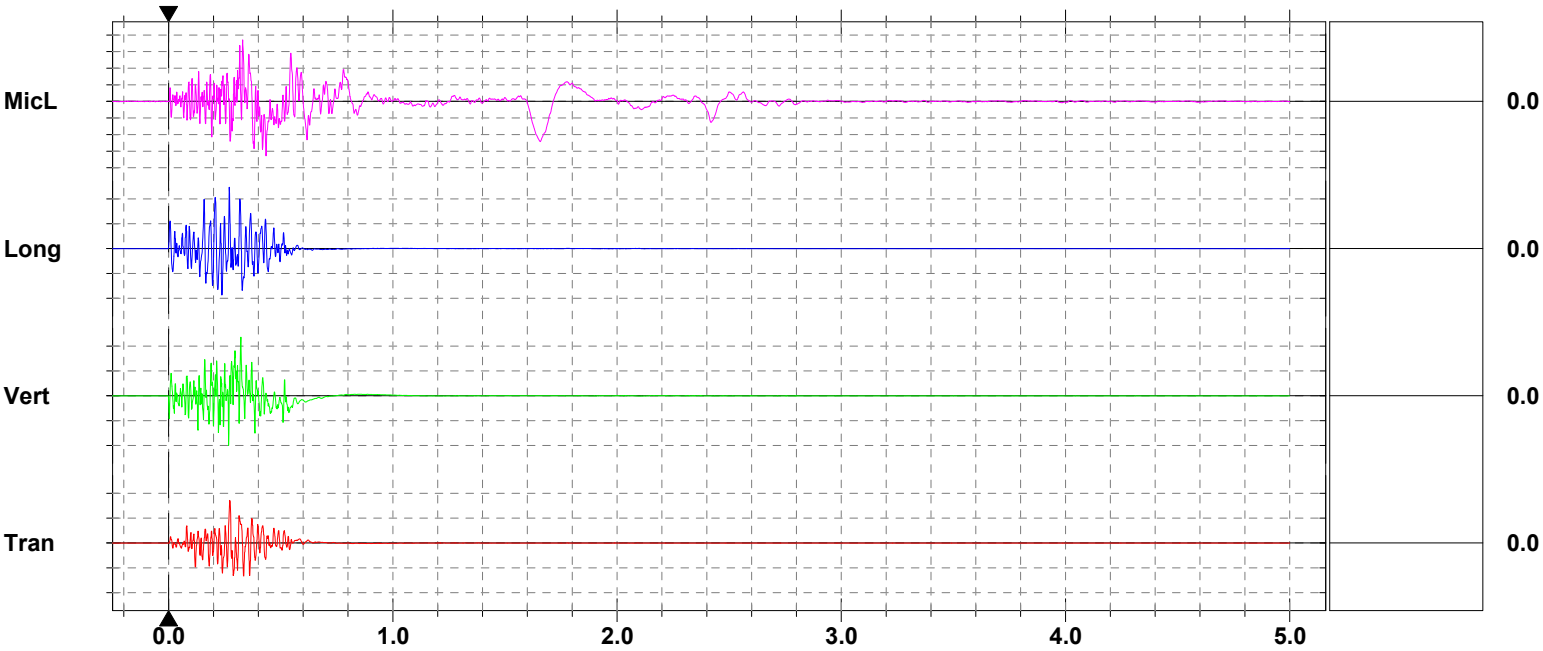
Extended Notes
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	125.4 dB(L) at 0.330 sec
ZC Freq	43 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	34.49	47.42	49.56	mm/s
ZC Freq	43	28	51	Hz
Time (Rel. to Trig)	0.272	0.322	0.271	sec
Peak Acceleration	1.919	3.092	3.024	g
Peak Displacement	0.141	0.373	0.177	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 56.14 mm/s at 0.271 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 20.00 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:48 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15860 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	May 8, 2020 by Instantel
File Name	Q860IXCR.GC0

Notes

Location:	2-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

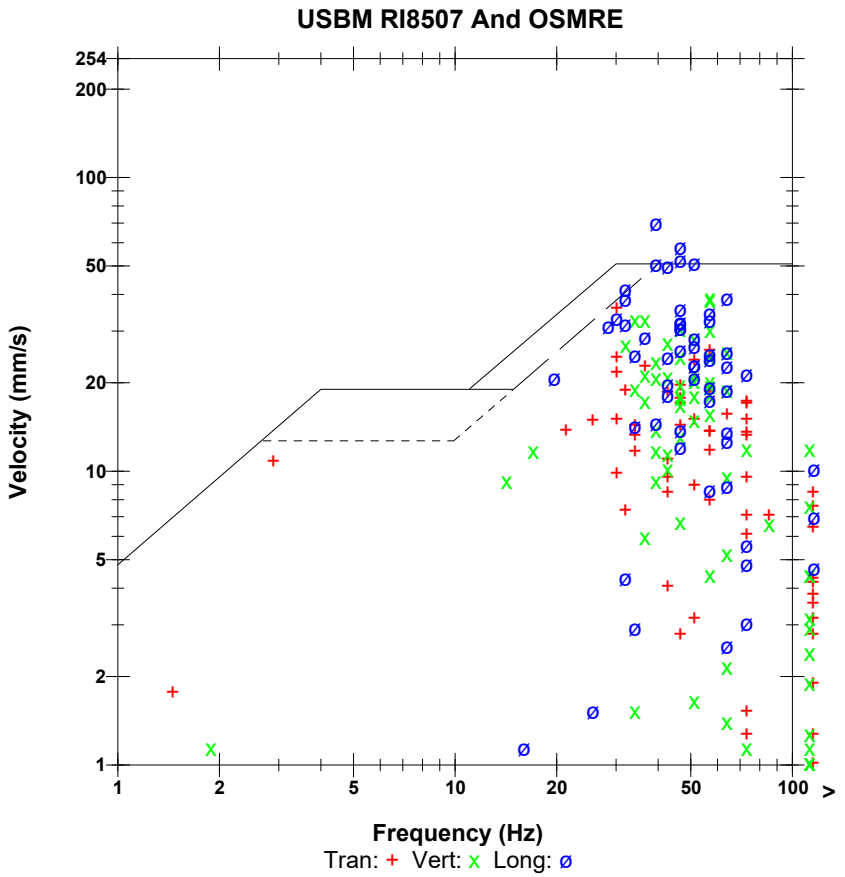
Extended Notes

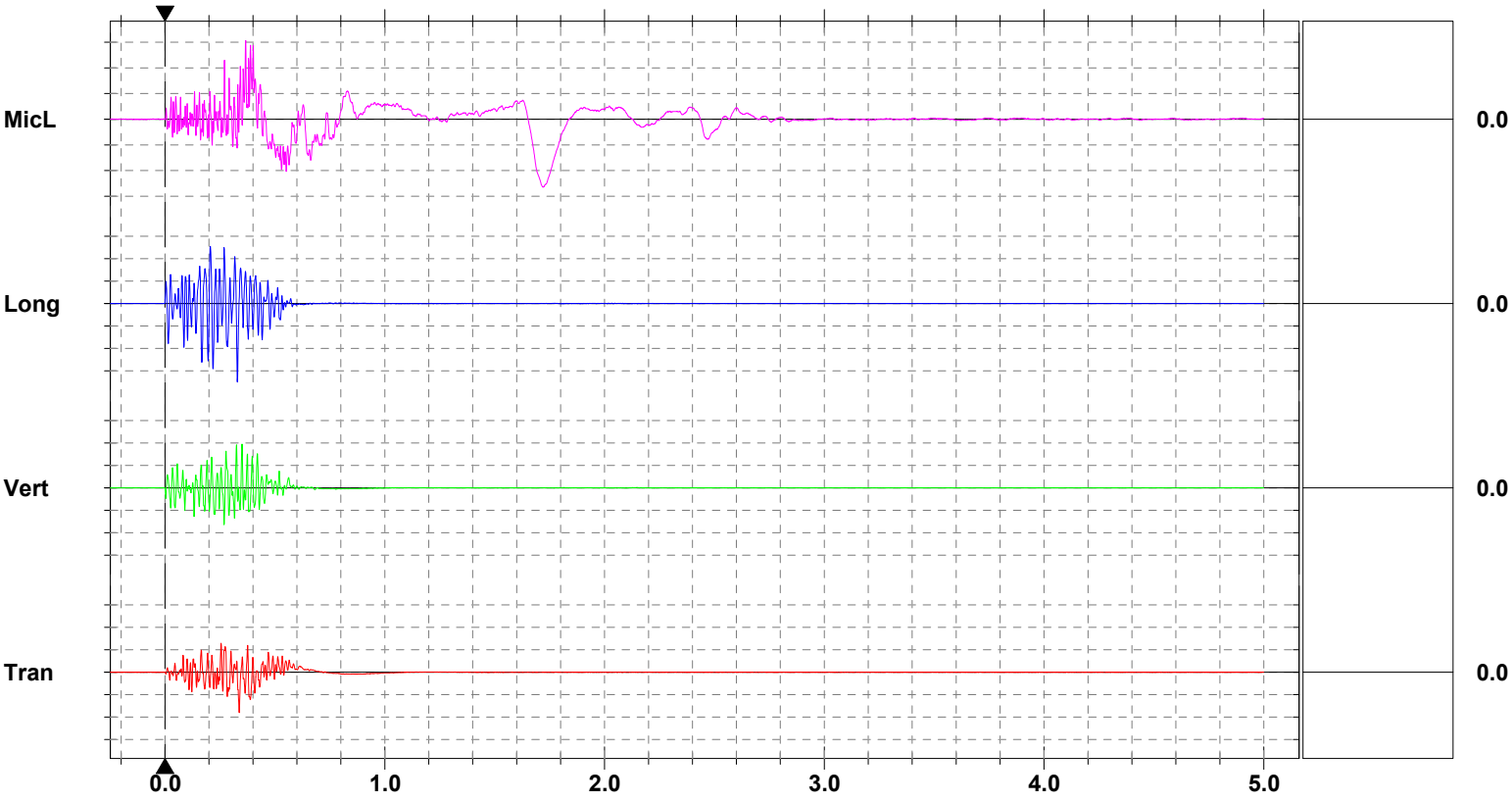
Combo Mode April 7, 2021 08:18:47
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	129.7 dB(L) at 0.367 sec
ZC Freq	7.8 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	36.07	38.99	69.85	mm/s
ZC Freq	30	57	39	Hz
Time (Rel. to Trig)	0.338	0.351	0.329	sec
Peak Acceleration	1.206	1.723	1.975	g
Peak Displacement	0.280	0.131	0.238	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 70.24 mm/s at 0.329 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 20.00 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:44 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15860 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	May 8, 2020 by Instantel
File Name	Q860IXEJ.XW0

Notes

Location:	2-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

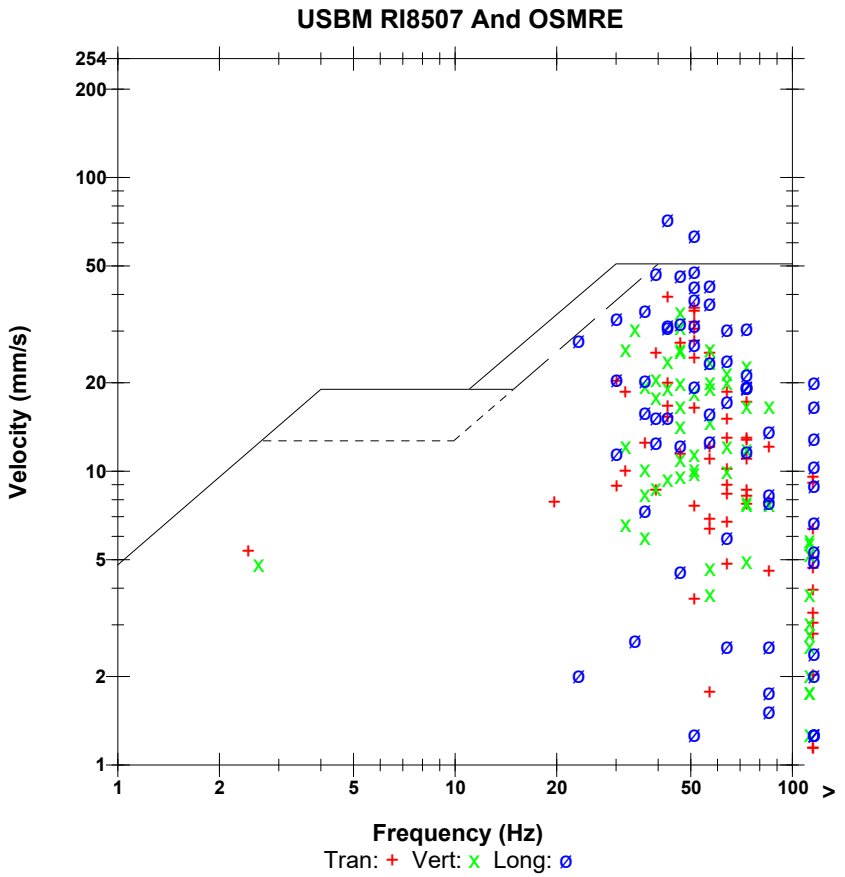
Extended Notes

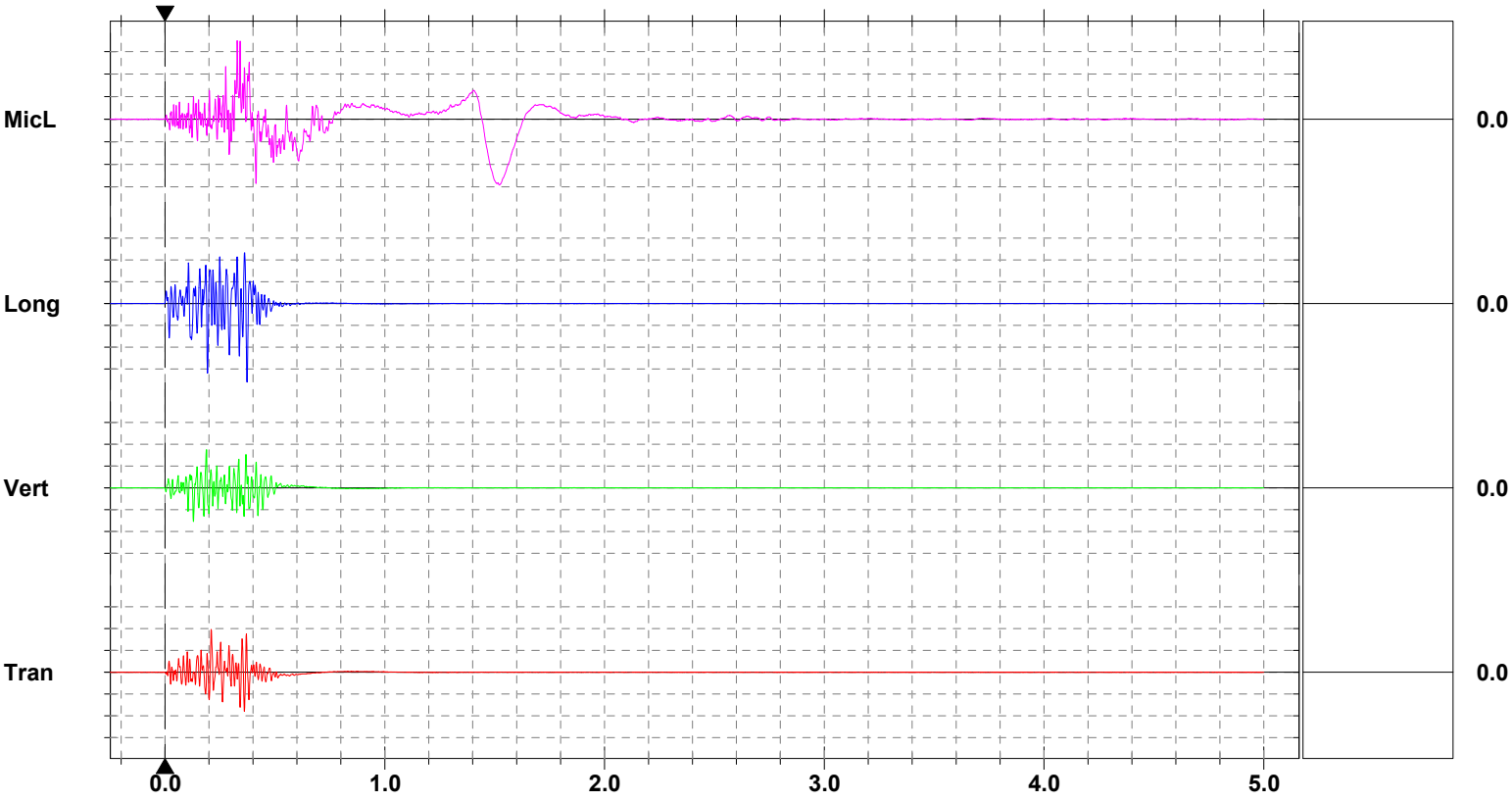
Combo Mode April 8, 2021 09:02:22
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	130.9 dB(L) at 0.328 sec
ZC Freq	9.7 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	39.24	34.92	72.01	mm/s
ZC Freq	43	47	43	Hz
Time (Rel. to Trig)	0.210	0.188	0.373	sec
Peak Acceleration	1.286	1.339	2.373	g
Peak Displacement	0.189	0.148	0.243	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 74.45 mm/s at 0.372 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 20.00 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 11:58:44 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15861 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	January 25, 2021 by Instantel
File Name	Q861IXEJ.XW0

Notes

Location: 3-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

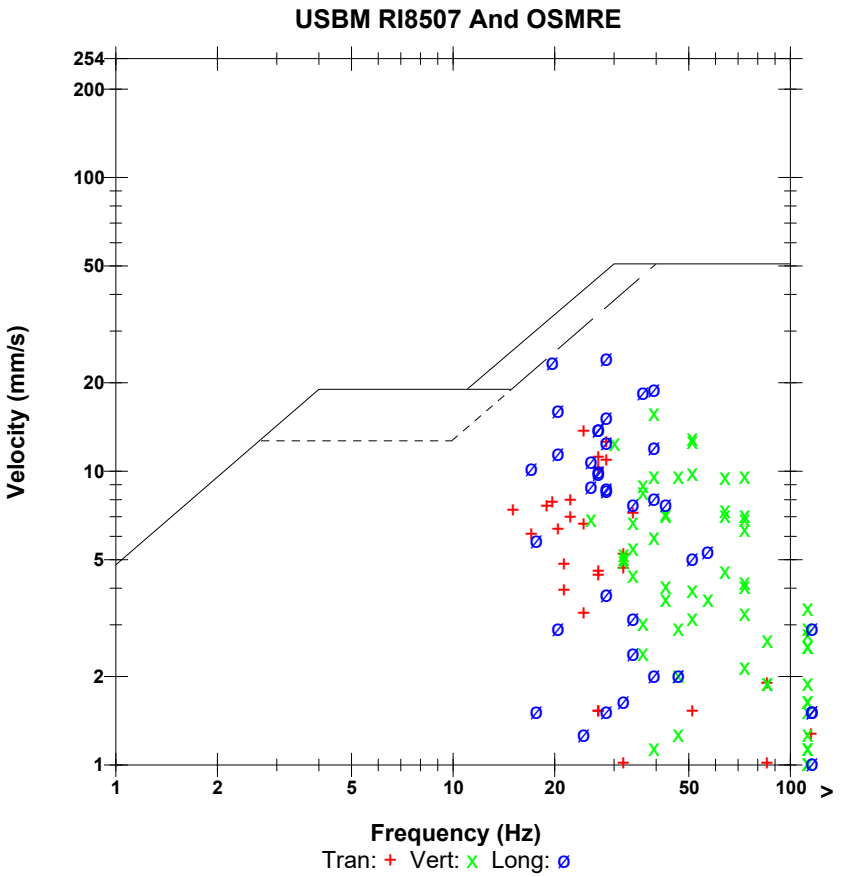
Extended Notes

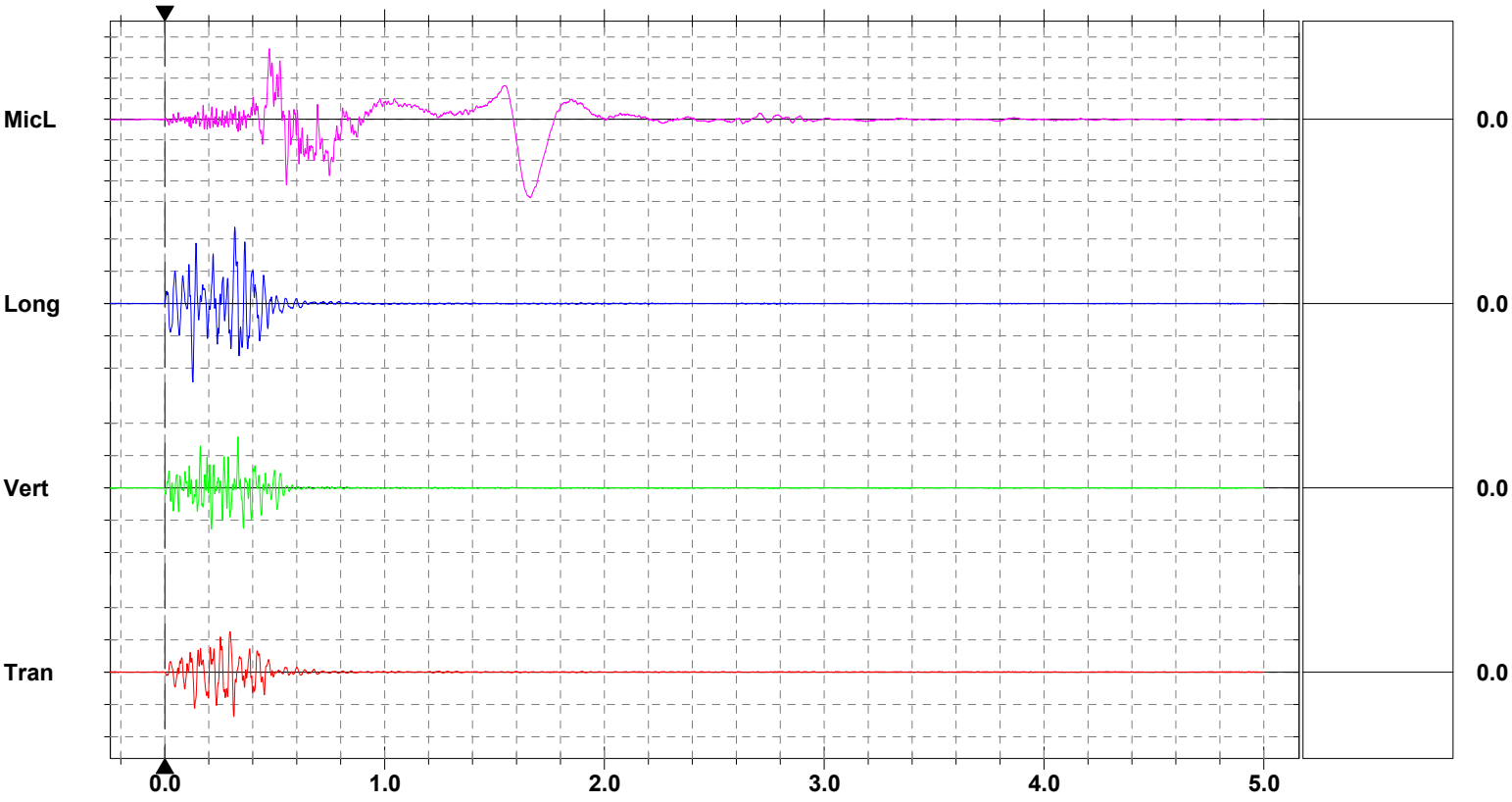
Combo Mode April 8, 2021 08:55:16
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	125.6 dB(L) at 1.662 sec
ZC Freq	2.7 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	13.72	15.75	24.26	mm/s
ZC Freq	24	39	28	Hz
Time (Rel. to Trig)	0.313	0.333	0.127	sec
Peak Acceleration	0.318	0.544	0.544	g
Peak Displacement	0.072	0.051	0.166	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 24.78 mm/s at 0.127 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 10.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:45 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE21128 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	January 25, 2021 by Instantel
File Name	W128IXEJ.XX0

Notes

Location:	7-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

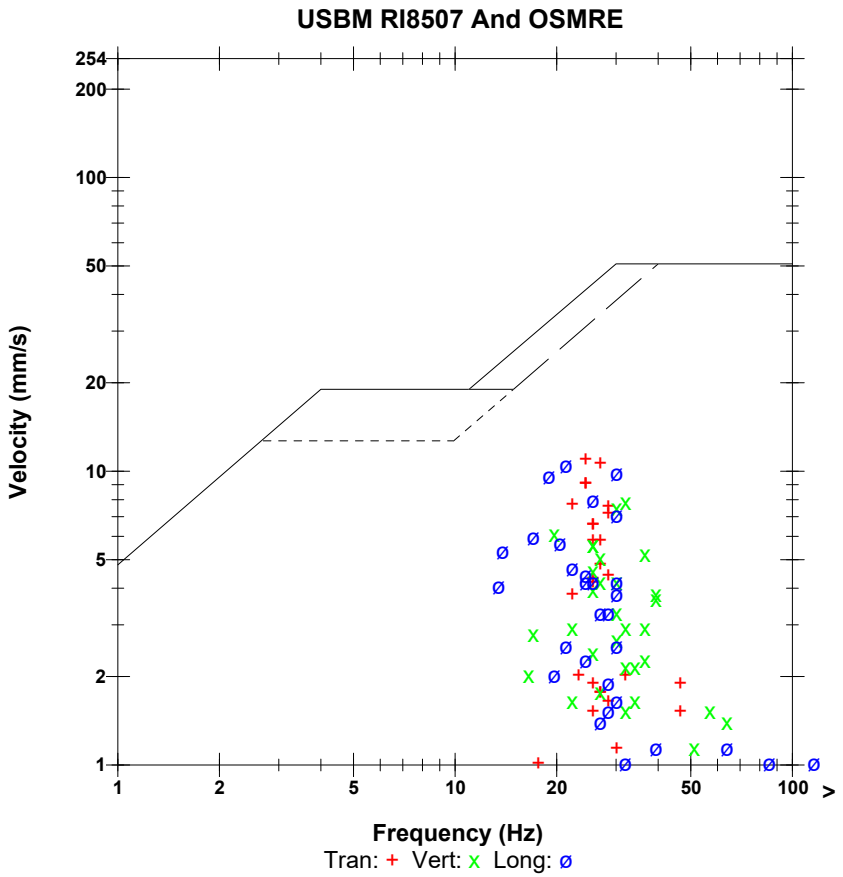
Extended Notes

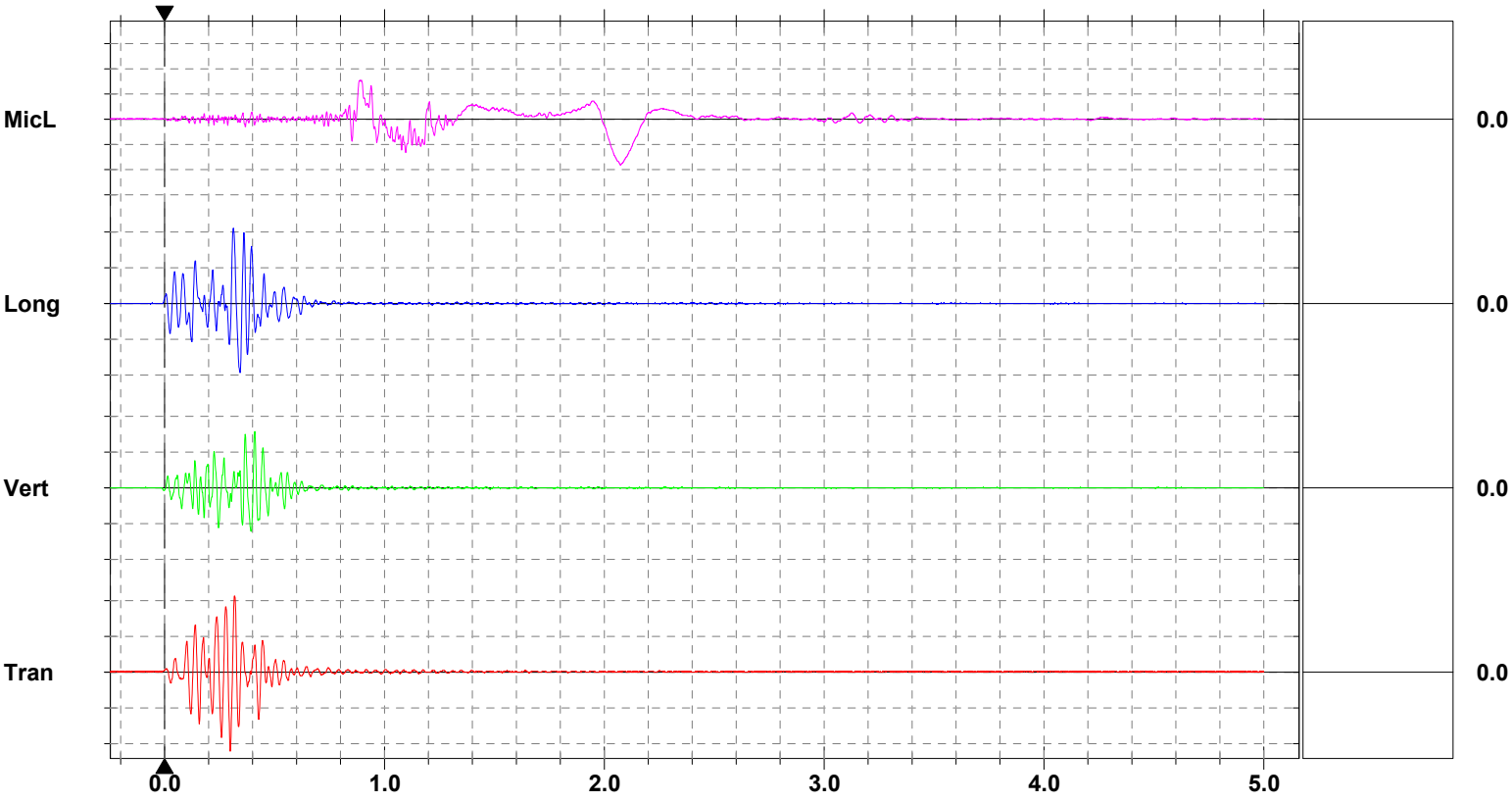
Combo Mode April 8, 2021 08:17:56
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	119.2 dB(L) at 2.073 sec
ZC Freq	2.6 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	11.05	7.874	10.54	mm/s
ZC Freq	24	32	21	Hz
Time (Rel. to Trig)	0.299	0.409	0.313	sec
Peak Acceleration	0.199	0.186	0.186	g
Peak Displacement	0.068	0.049	0.078	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 14.47 mm/s at 0.316 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:45 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE21252 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	December 31, 2020 by Instantel
File Name	W252IXEJ.XX0

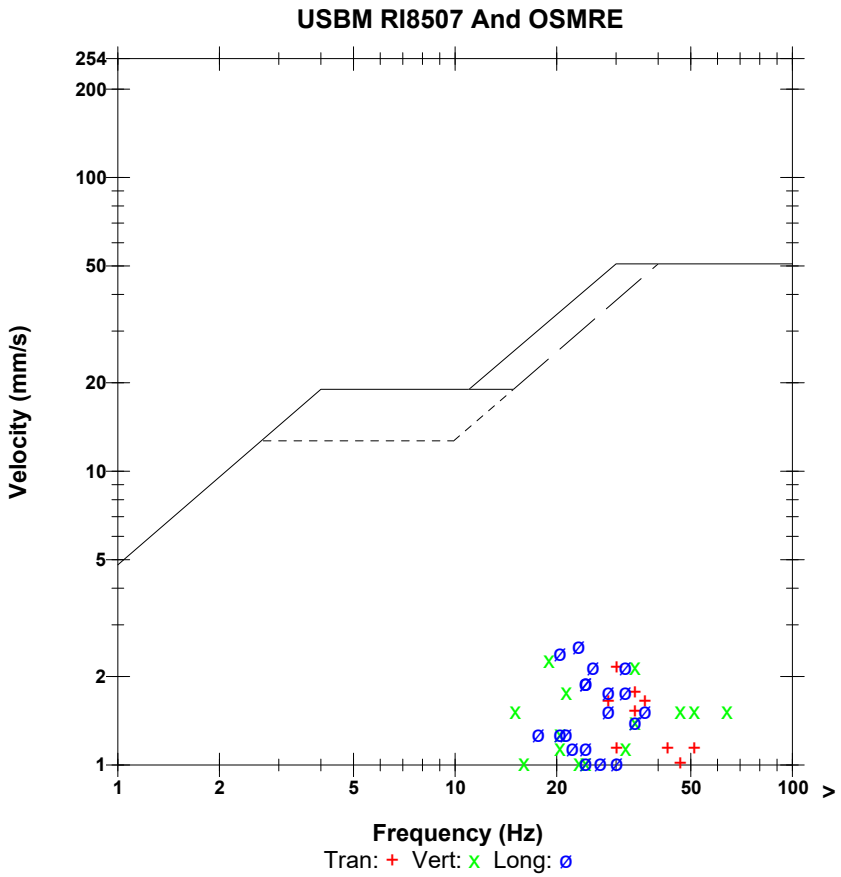
Notes
Location: 10-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

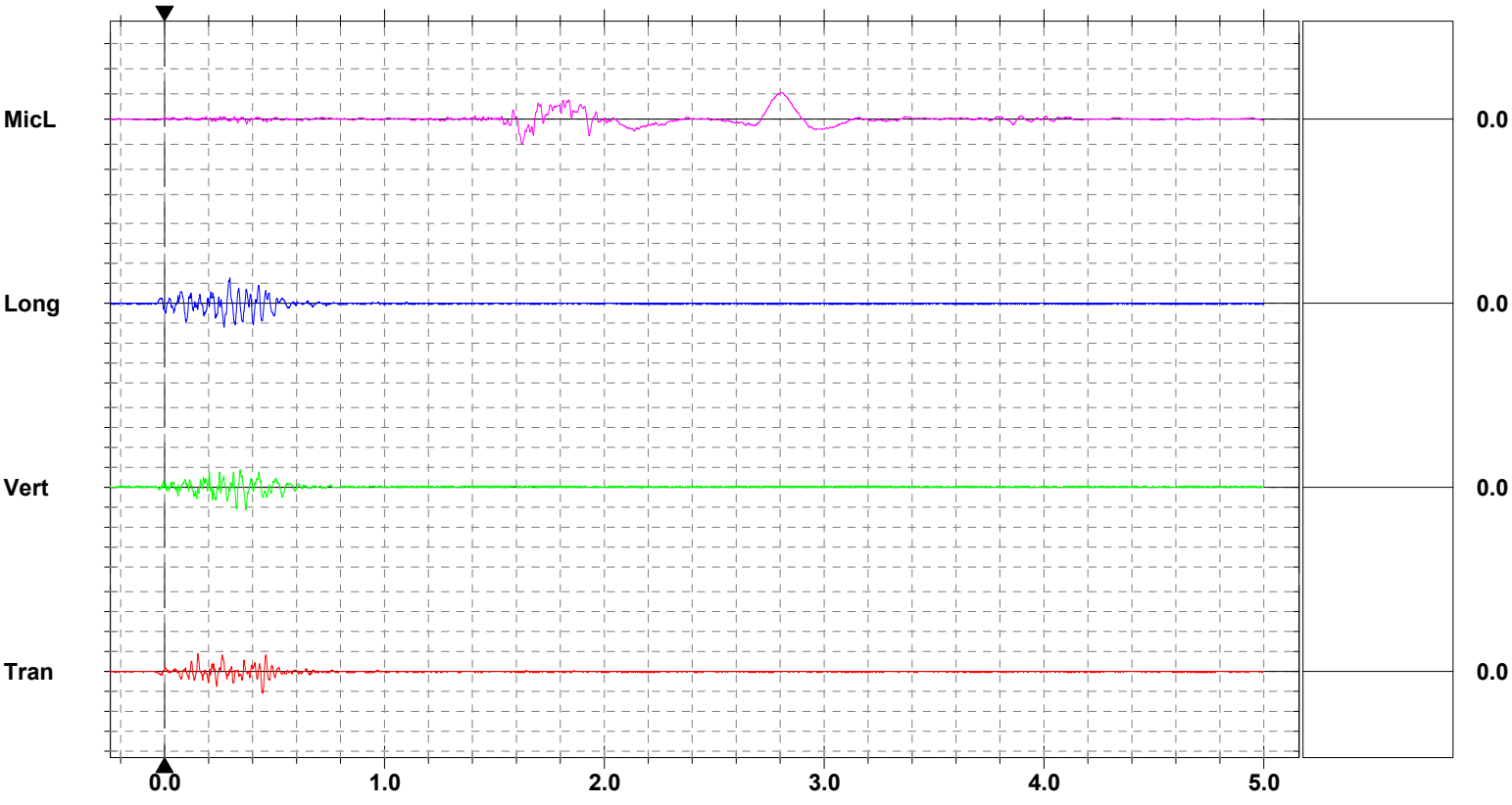
Extended Notes
Combo Mode April 8, 2021 08:43:02
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	114.4 dB(L) at 2.801 sec
ZC Freq	2.7 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	2.159	2.286	2.540	mm/s
ZC Freq	30	19	23	Hz
Time (Rel. to Trig)	0.444	0.369	0.297	sec
Peak Acceleration	0.053	0.066	0.066	g
Peak Displacement	0.012	0.013	0.016	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 2.935 mm/s at 0.444 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:45 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE22084 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	April 16, 2020 by Instantel
File Name	X084IXEJ.XX0

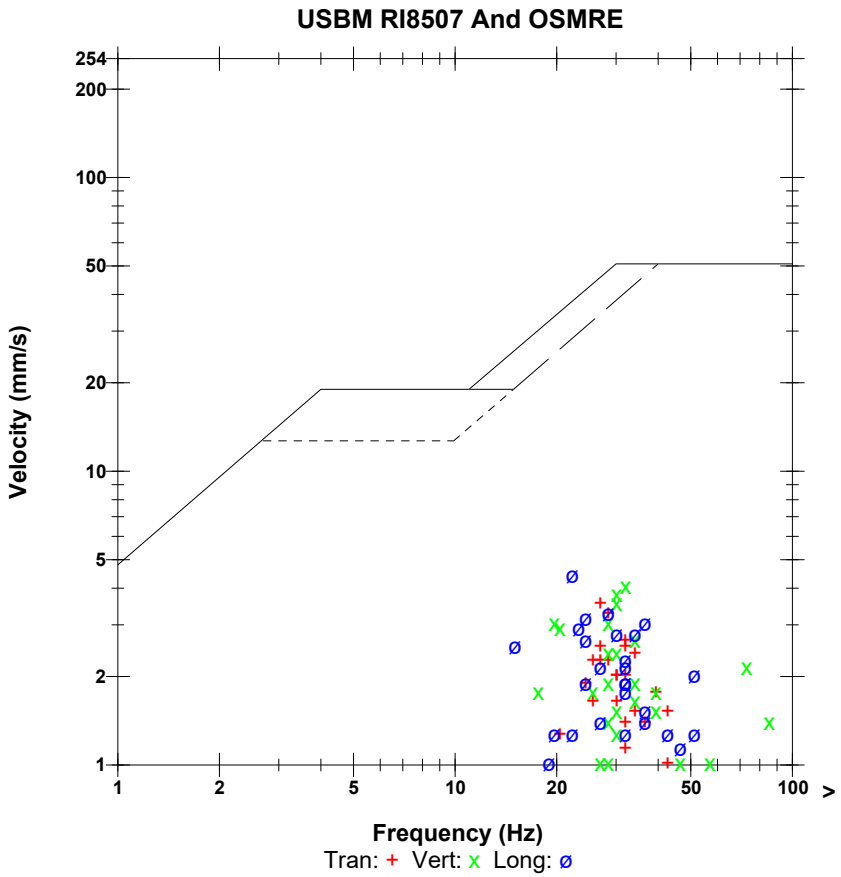
Notes
Location: 8-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

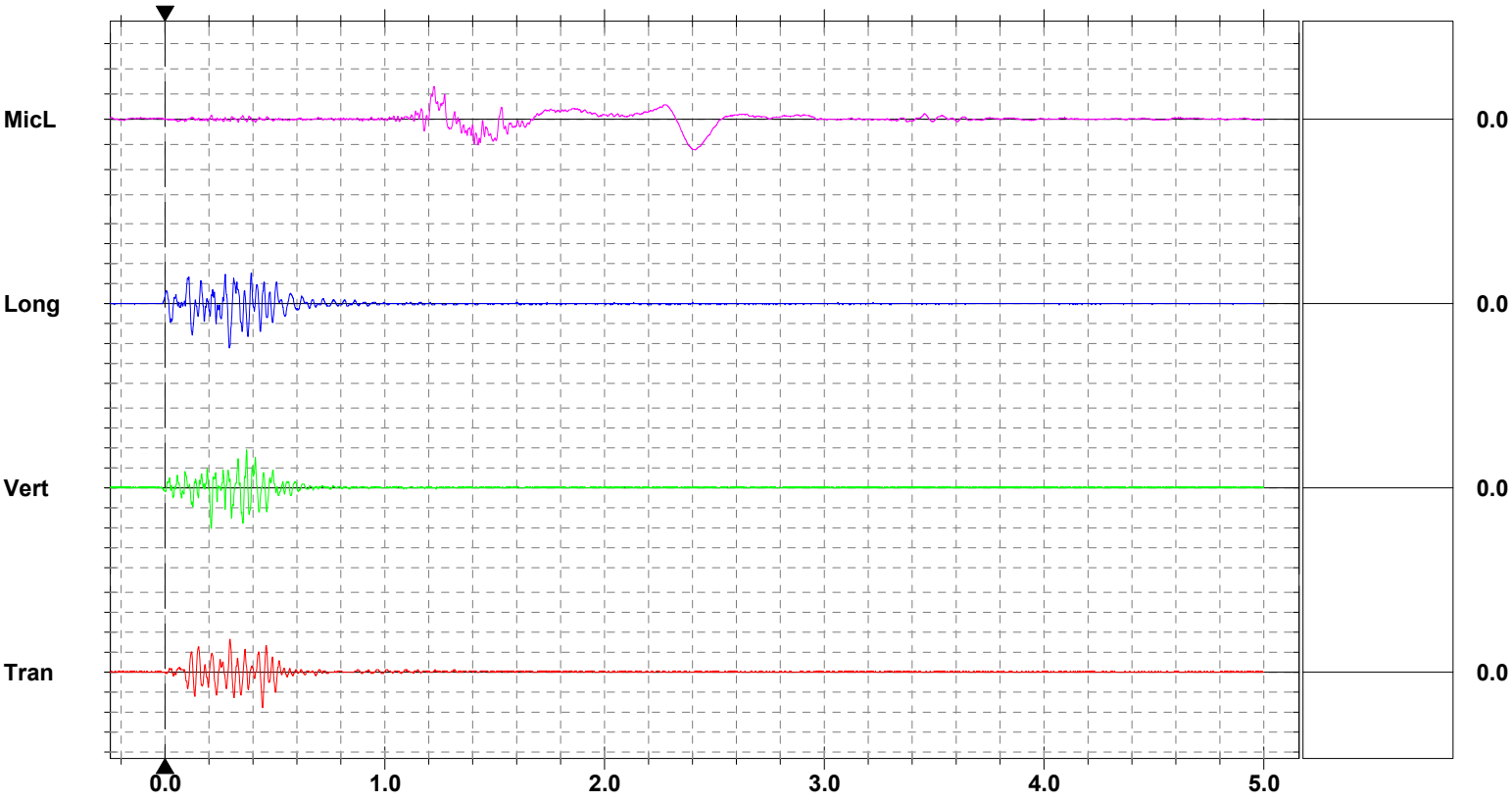
Extended Notes
Combo Mode April 8, 2021 08:27:23
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	116.3 dB(L) at 1.224 sec
ZC Freq	6.2 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	3.556	4.064	4.445	mm/s
ZC Freq	27	32	22	Hz
Time (Rel. to Trig)	0.443	0.209	0.292	sec
Peak Acceleration	0.066	0.106	0.066	g
Peak Displacement	0.019	0.021	0.030	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 5.414 mm/s at 0.294 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:45 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE22087 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	April 16, 2020 by Instantel
File Name	X087IXEJ.XX0

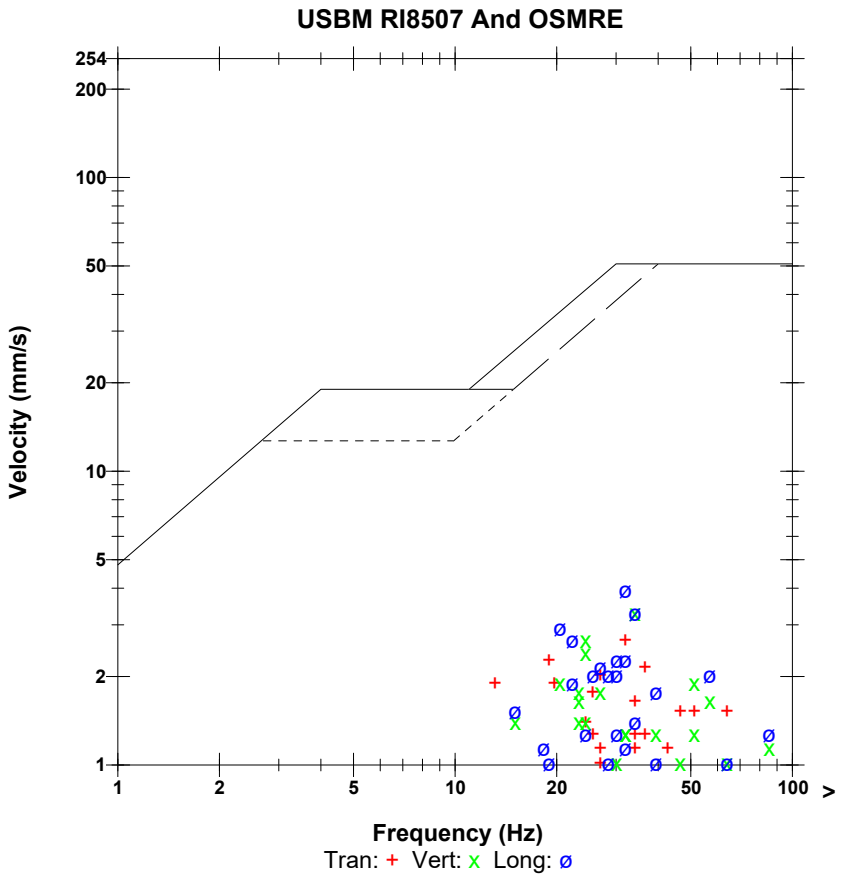
Notes
Location: 9-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

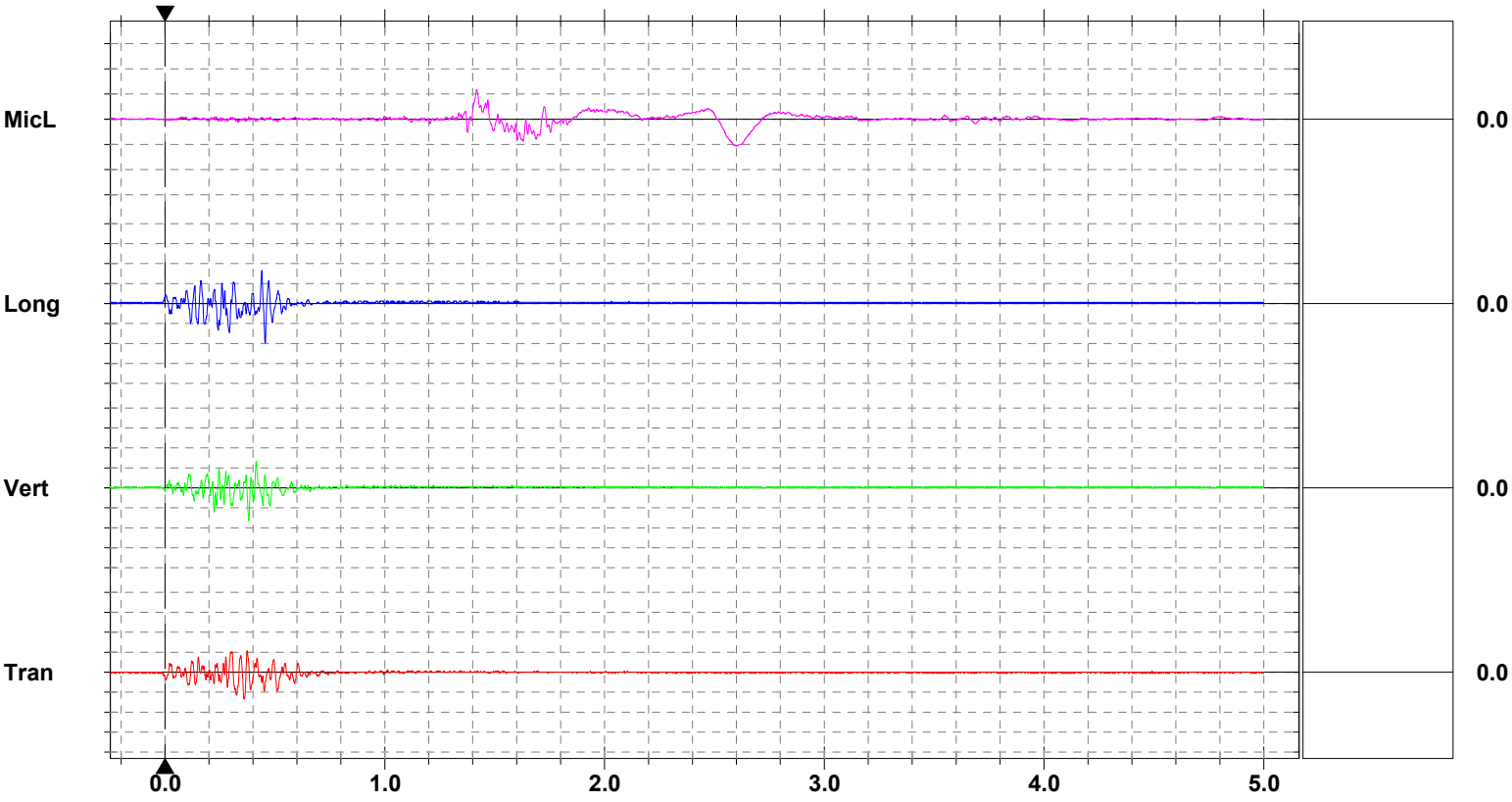
Extended Notes
Combo Mode April 8, 2021 08:36:04
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	115.4 dB(L) at 1.417 sec
ZC Freq	6.2 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	2.667	3.302	3.937	mm/s
ZC Freq	32	34	32	Hz
Time (Rel. to Trig)	0.358	0.381	0.455	sec
Peak Acceleration	0.080	0.080	0.080	g
Peak Displacement	0.020	0.014	0.019	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 4.366 mm/s at 0.455 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:46 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE20051 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	February 26, 2021 by Instantel
File Name	V051IXEJ.XY0

Notes

Location:	6-B
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

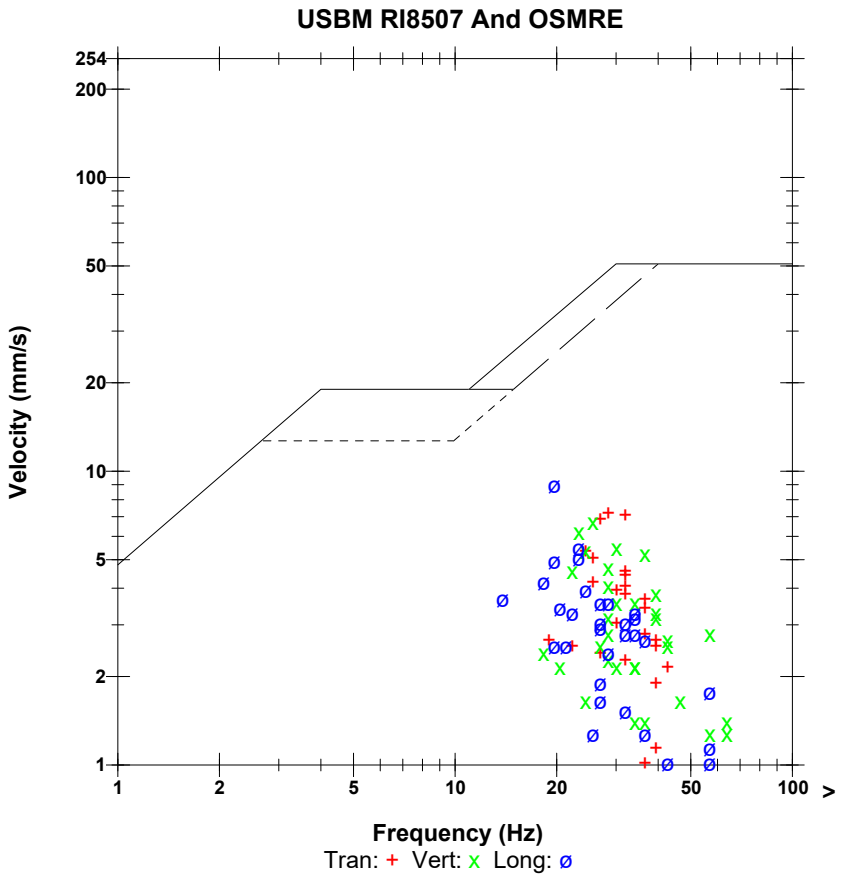
Extended Notes

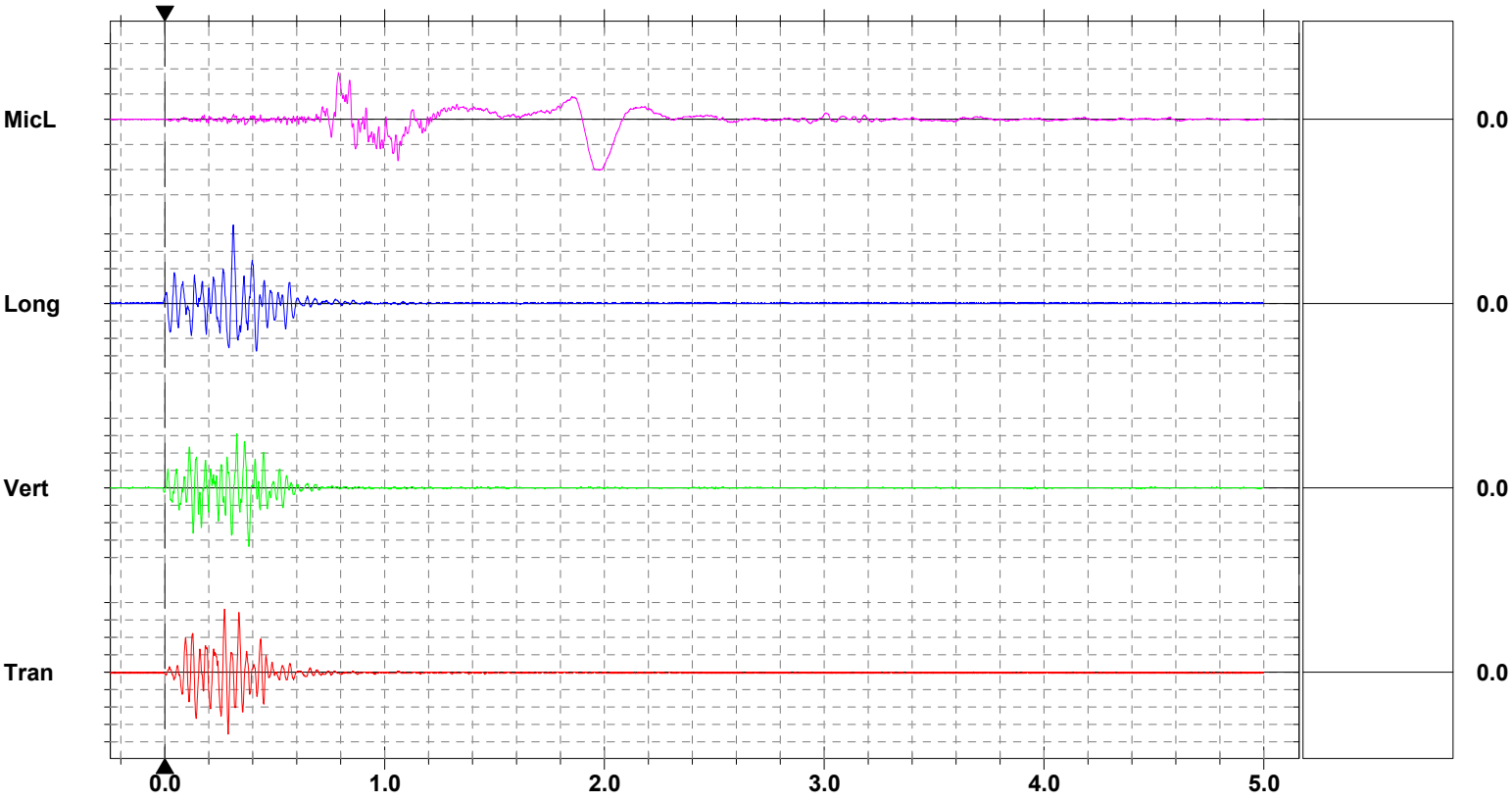
Combo Mode April 8, 2021 08:51:35
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	120.1 dB(L) at 1.975 sec
ZC Freq	2.8 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	7.239	6.731	9.017	mm/s
ZC Freq	28	26	20	Hz
Time (Rel. to Trig)	0.271	0.383	0.311	sec
Peak Acceleration	0.133	0.159	0.119	g
Peak Displacement	0.036	0.040	0.062	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 9.386 mm/s at 0.310 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 11:58:47 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE17375 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	May 29, 2020 by Instantel
File Name	S375IXEJ.XZ0

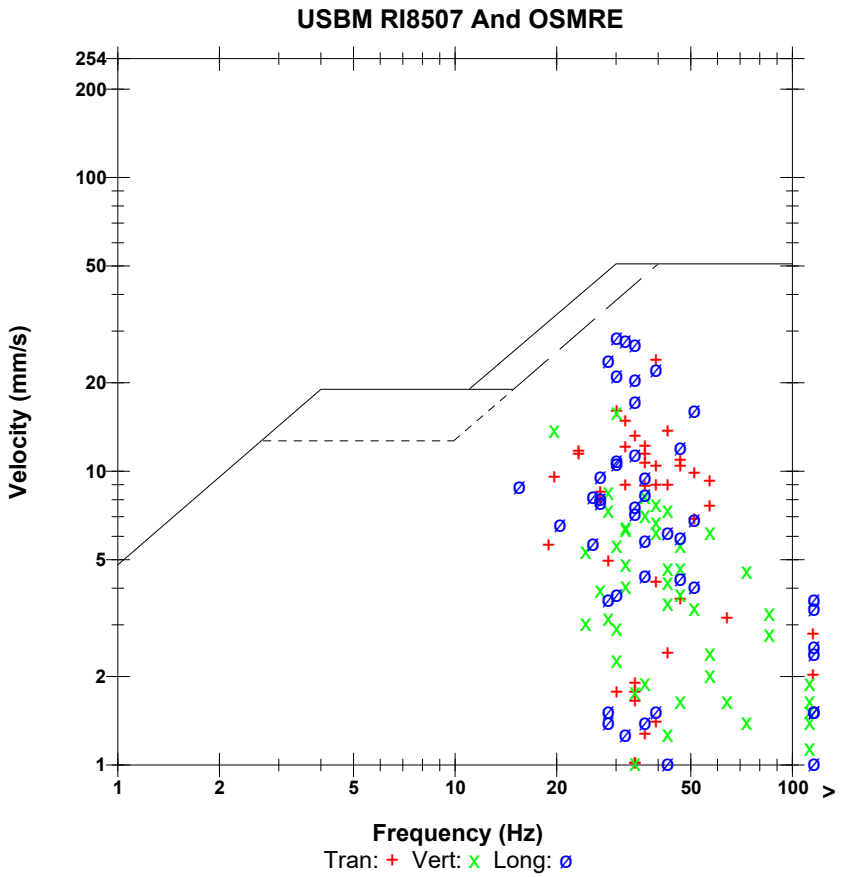
Notes
Location: 4-B
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

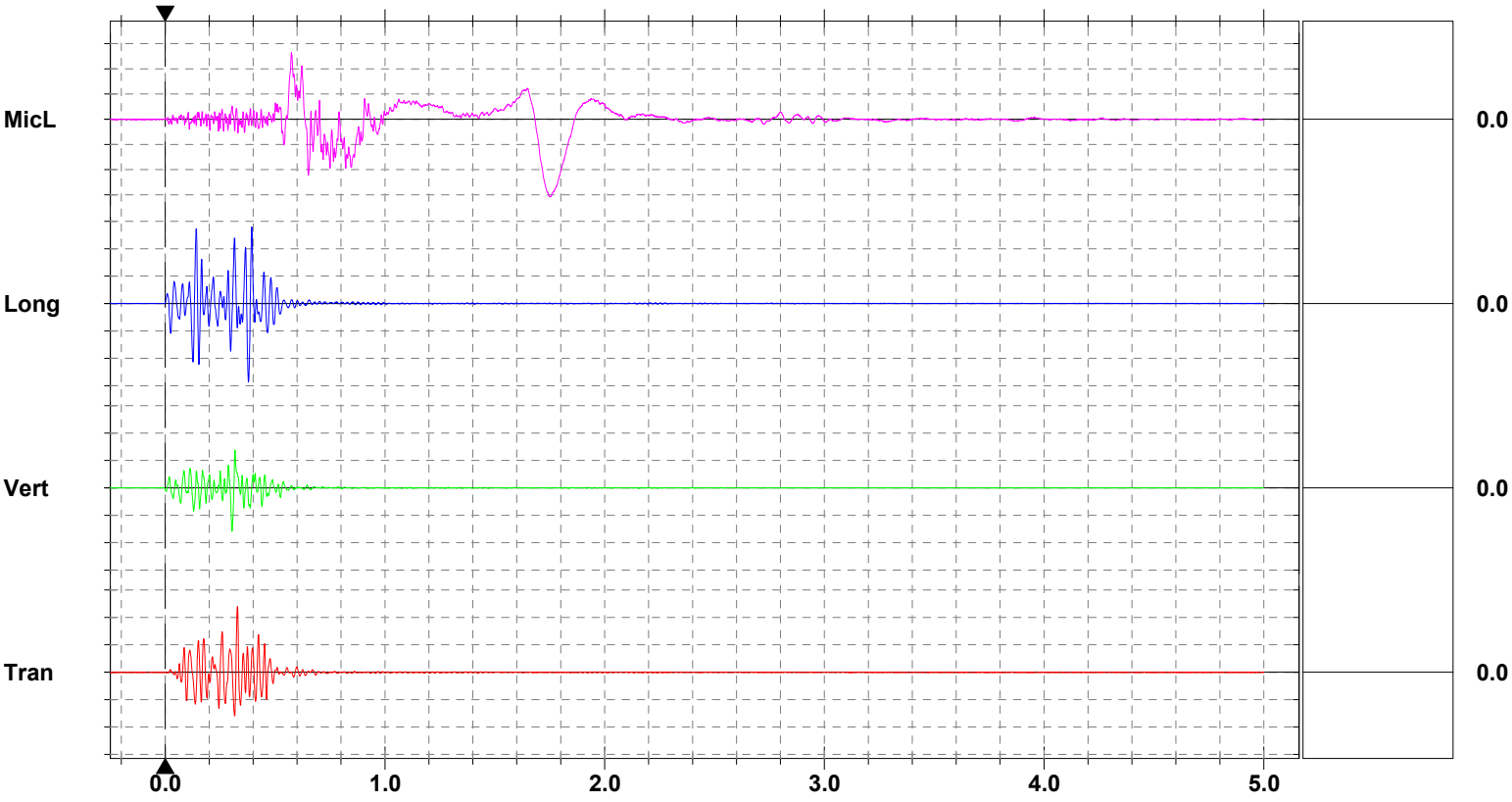
Extended Notes
Combo Mode April 8, 2021 07:58:52
Unit is setup behind the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	123.7 dB(L) at 1.748 sec
ZC Freq	2.8 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	24.00	15.87	28.70	mm/s
ZC Freq	39	30	30	Hz
Time (Rel. to Trig)	0.328	0.304	0.379	sec
Peak Acceleration	0.663	0.371	0.663	g
Peak Displacement	0.098	0.078	0.148	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 30.58 mm/s at 0.316 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 10.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 10:15:01 July 23, 2021
Trigger Source Geo: 0.750 mm/s
Range Geo: 31.75 mm/s
Record Time 5.0 sec at 1024 sps
Job Number: 8415

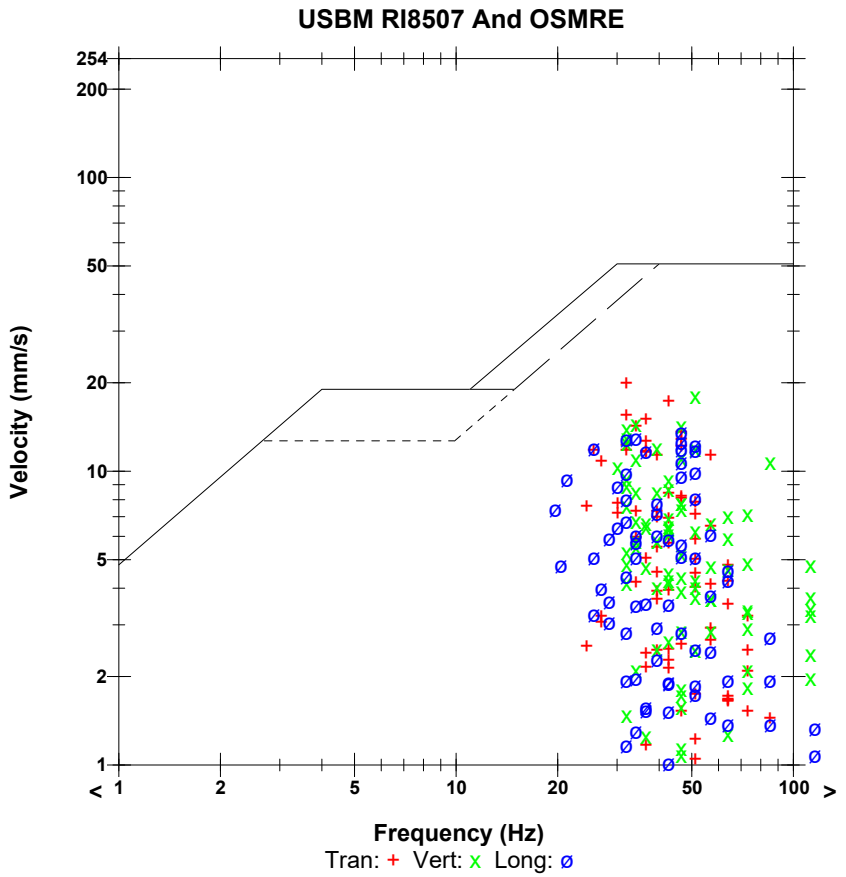
Serial Number BA20200 V 10.72-8.17 BlastMate III
Battery Level 6.3 Volts
Unit Calibration August 21, 2020 by Instantel
File Name V200J2UP.T10

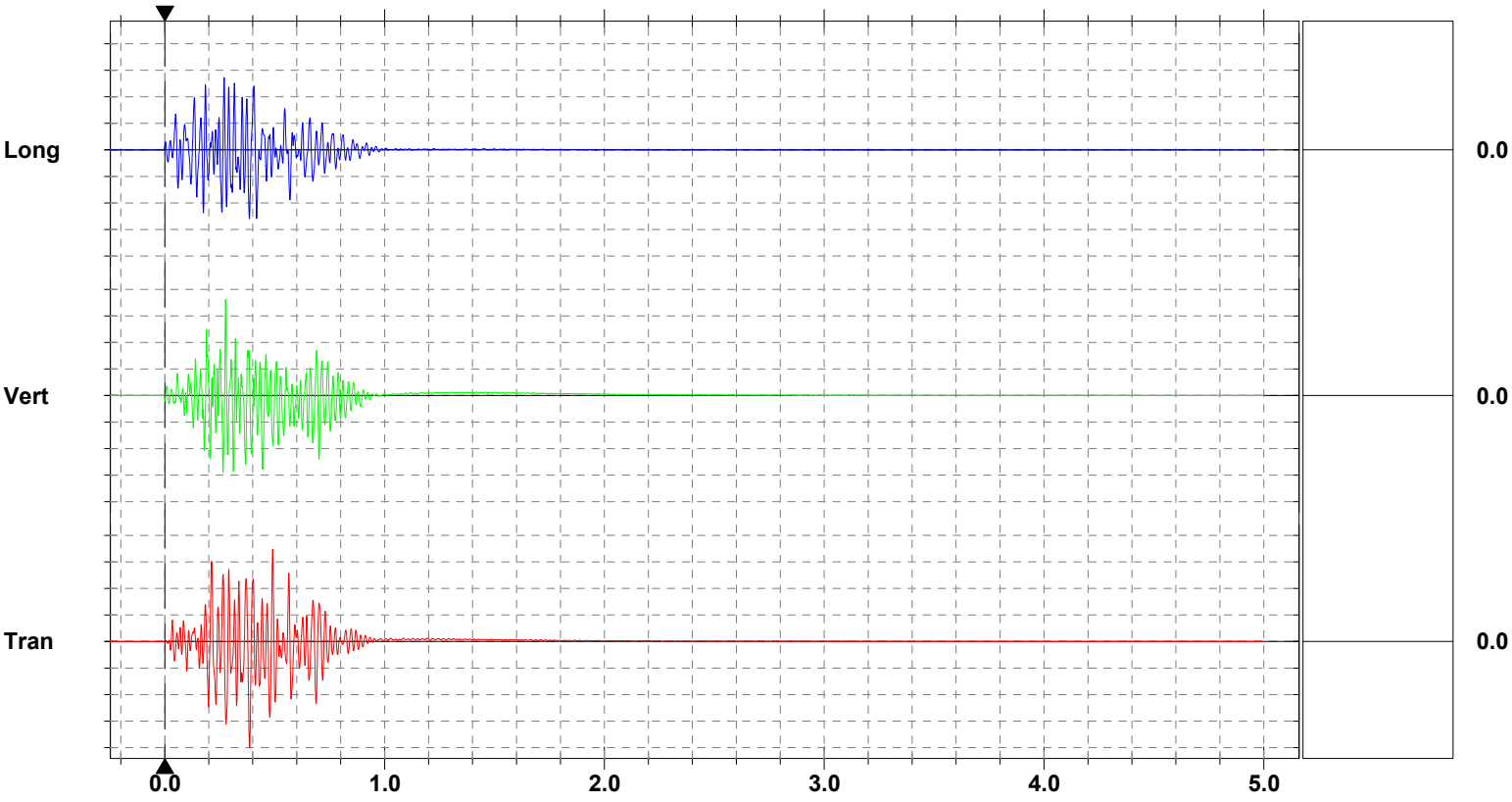
Notes
Location: B3
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General: Coupled to ground

Extended Notes
Combo Mode July 23, 2021 07:44:50
Unit is installed using industry standard practices for the West Carleton Quarry extension attenuation study.

	Tran	Vert	Long	
PPV	20.03	18.03	13.64	mm/s
ZC Freq	32	51	47	Hz
Time (Rel. to Trig)	0.386	0.276	0.270	sec
Peak Acceleration	0.482	0.575	0.399	g
Peak Displacement	0.193	0.271	0.064	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 24.35 mm/s at 0.385 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 10:15:23 July 23, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE5717 V 10.72-4.32 MiniMate Plus
Battery Level	6.5 Volts
Unit Calibration	August 18, 2020 by Instantel
File Name	G717J2UP.TN0

Notes

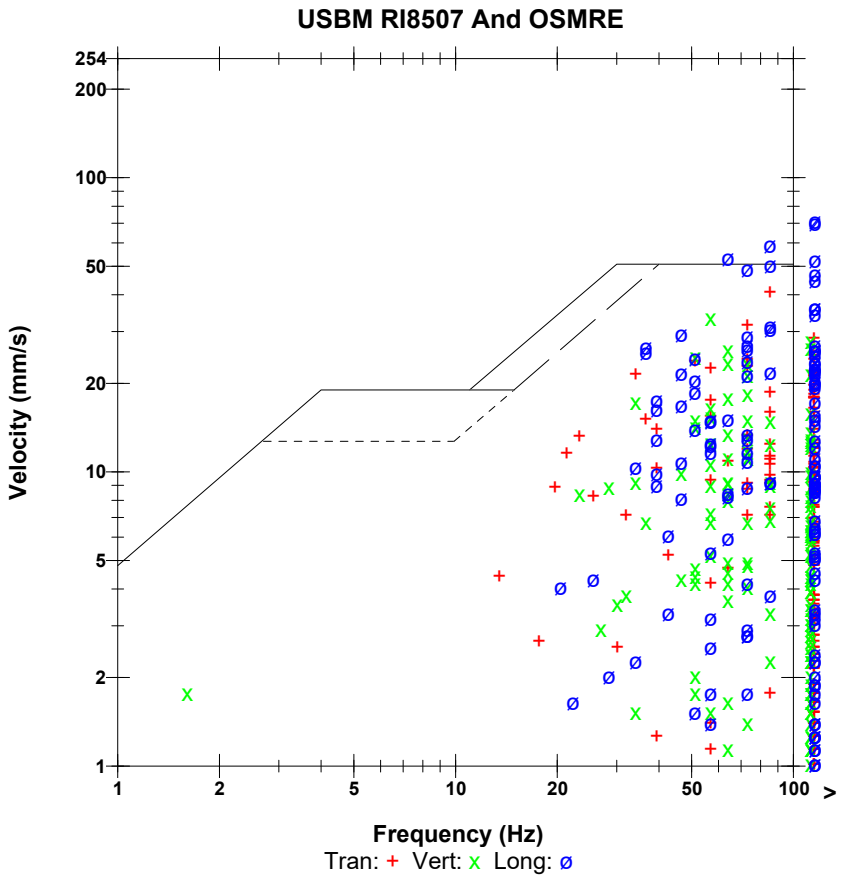
Location:	B1
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to ground

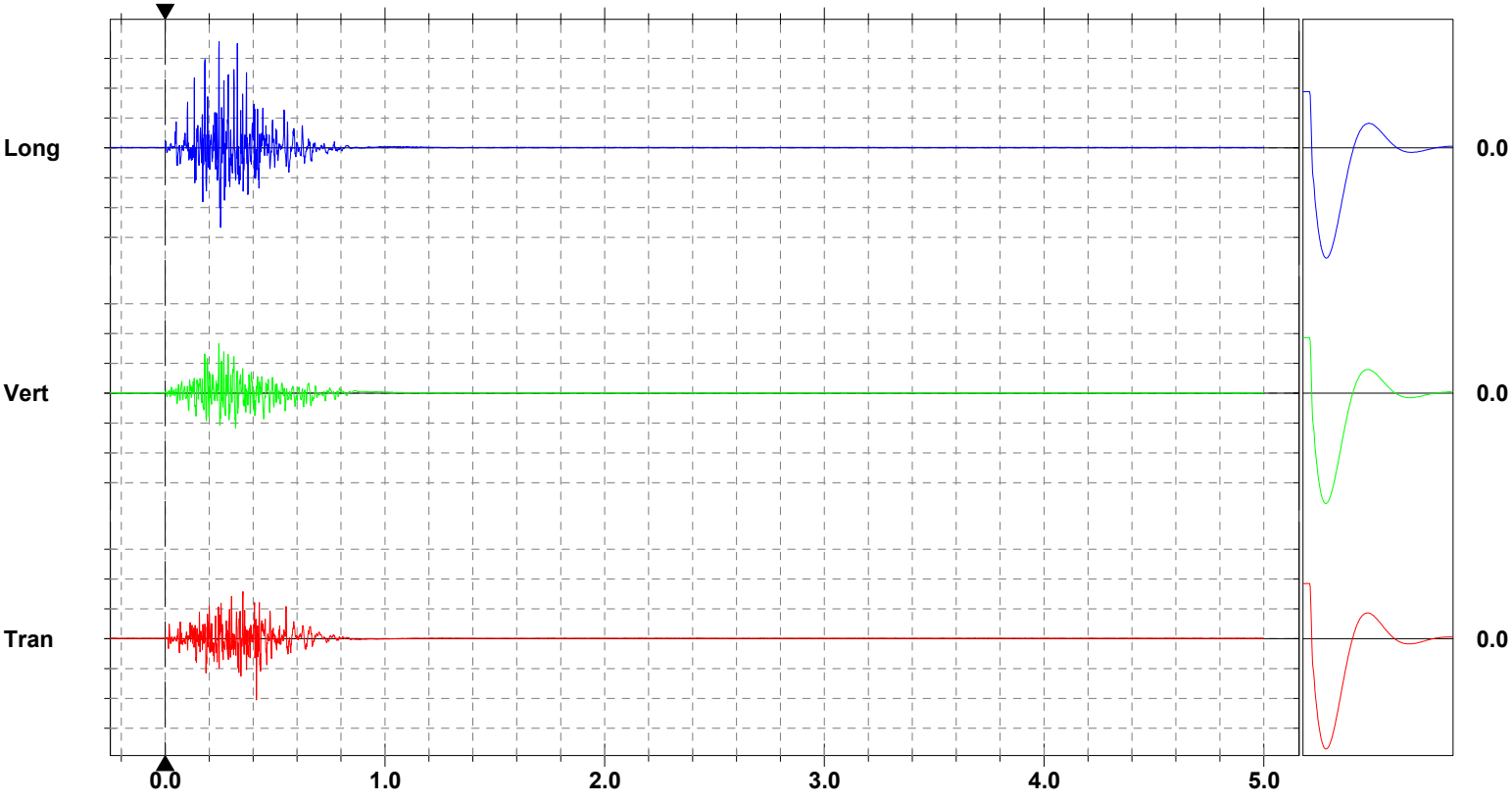
Extended Notes

Unit is setup behind the blast for attenuation study for the West Carleton Quarry Extension using standard practice methods.

	Tran	Vert	Long	
PPV	41.02	33.27	71.12	mm/s
ZC Freq	85	57	>100	Hz
Time (Rel. to Trig)	0.415	0.244	0.245	sec
Peak Acceleration	3.579	2.002	5.581	g
Peak Displacement	0.073	0.110	0.115	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.4	7.3	Hz
Overswing Ratio	4.3	4.7	4.5	

Peak Vector Sum 77.18 mm/s at 0.245 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 20.00 mm/s/div Sensor Check

Trigger =

Event Report

Date/Time Long at 10:15:39 July 23, 2021
Trigger Source Geo: 0.750 mm/s
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps
Job Number: 8415

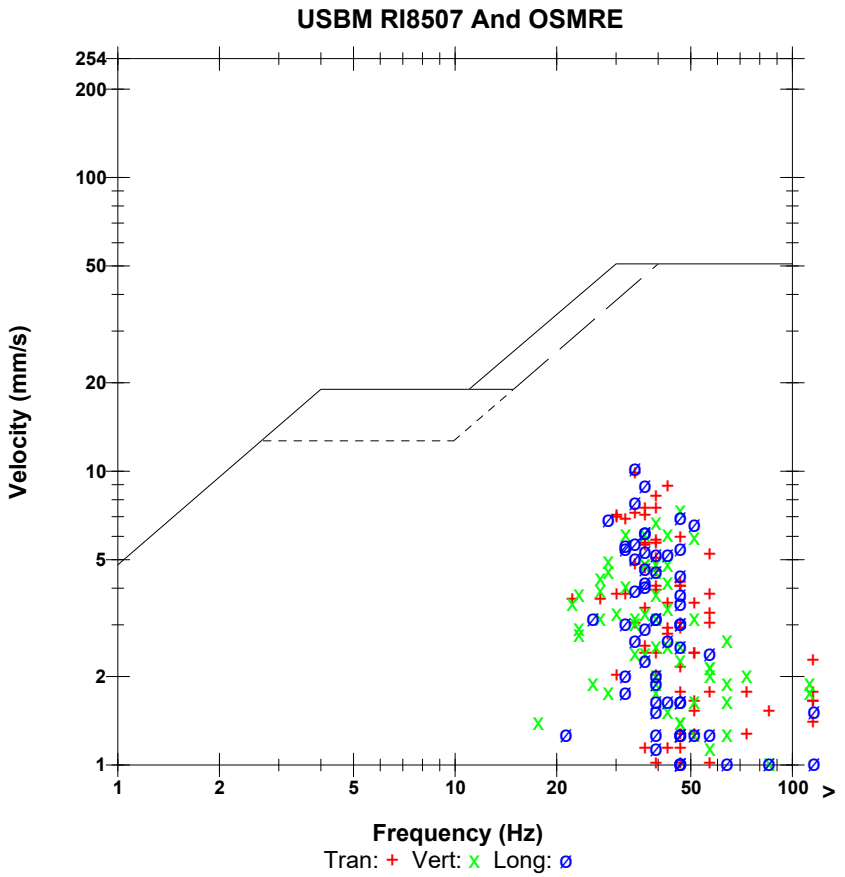
Serial Number BE20061 V 10.72-8.17 MiniMate Plus/8
Battery Level 6.4 Volts
Unit Calibration August 17, 2020 by Instantel
File Name V061J2UP.U30

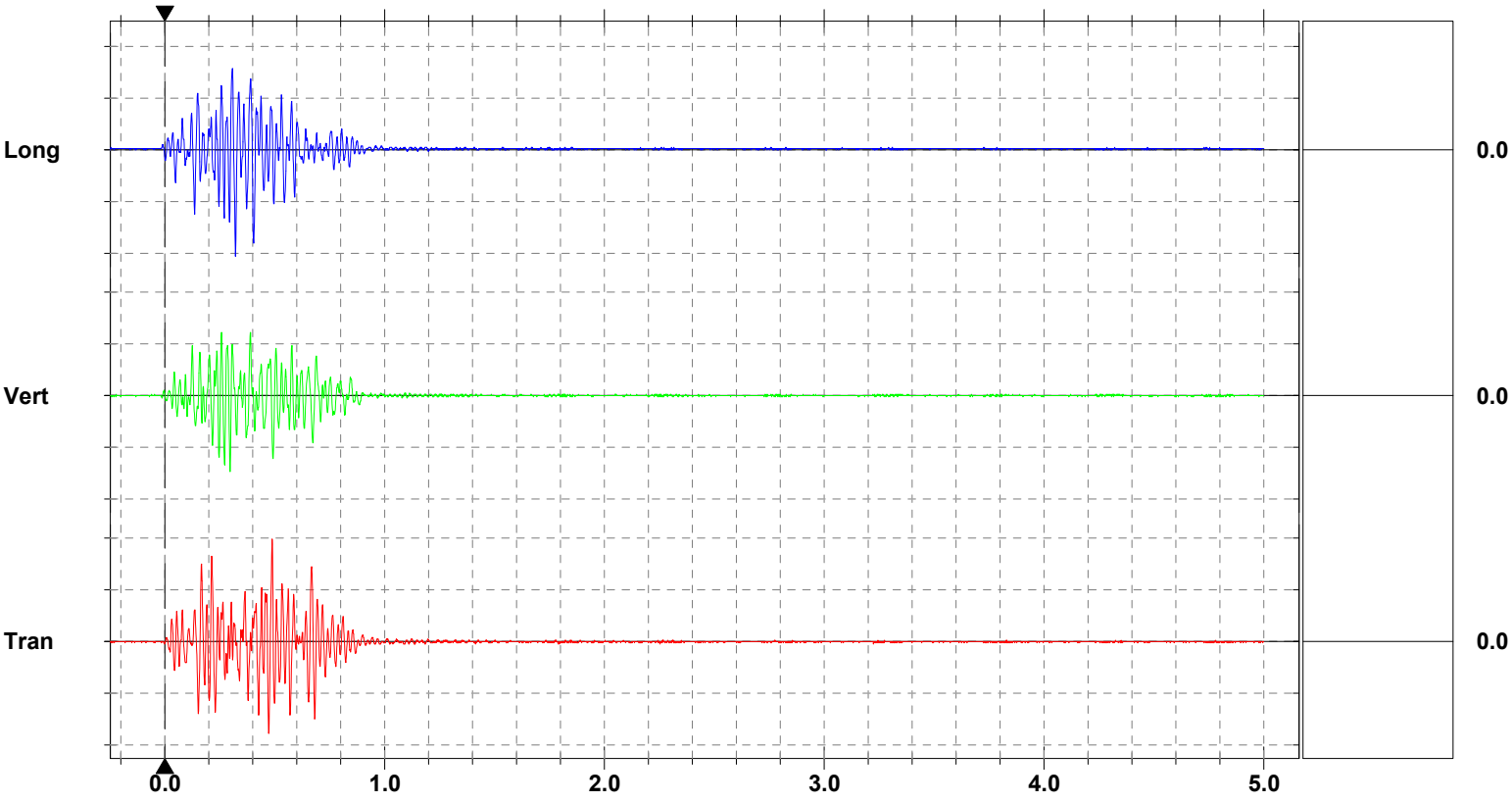
Notes
Location: B5
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General: Coupled to ground

Extended Notes
Combo Mode July 23, 2021 07:57:24
Unit is setup behind the blast for attenuation study for the West Carleton Quarry Extension using standard practice methods.

	Tran	Vert	Long	
PPV	9.906	7.366	10.29	mm/s
ZC Freq	34	47	34	Hz
Time (Rel. to Trig)	0.488	0.297	0.321	sec
Peak Acceleration	0.305	0.239	0.239	g
Peak Displacement	0.039	0.028	0.040	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 11.23 mm/s at 0.488 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 10:15:40 July 23, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE8899 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	August 7, 2020 by Instantel
File Name	J899J2UP.U40

Notes

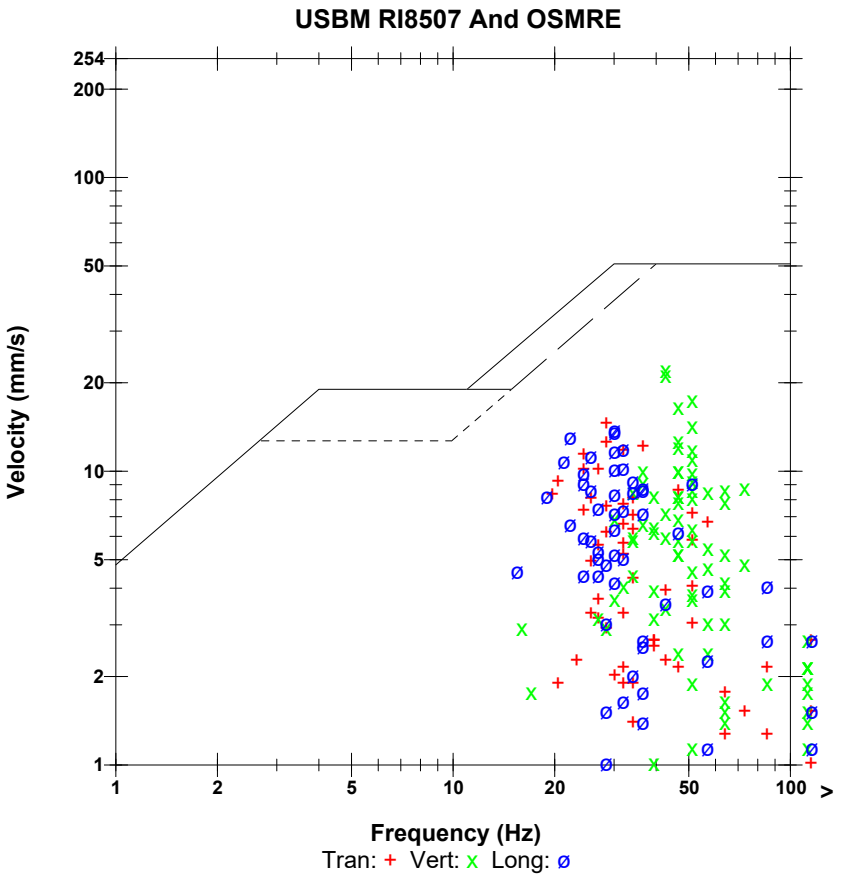
Location:	B2
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to ground

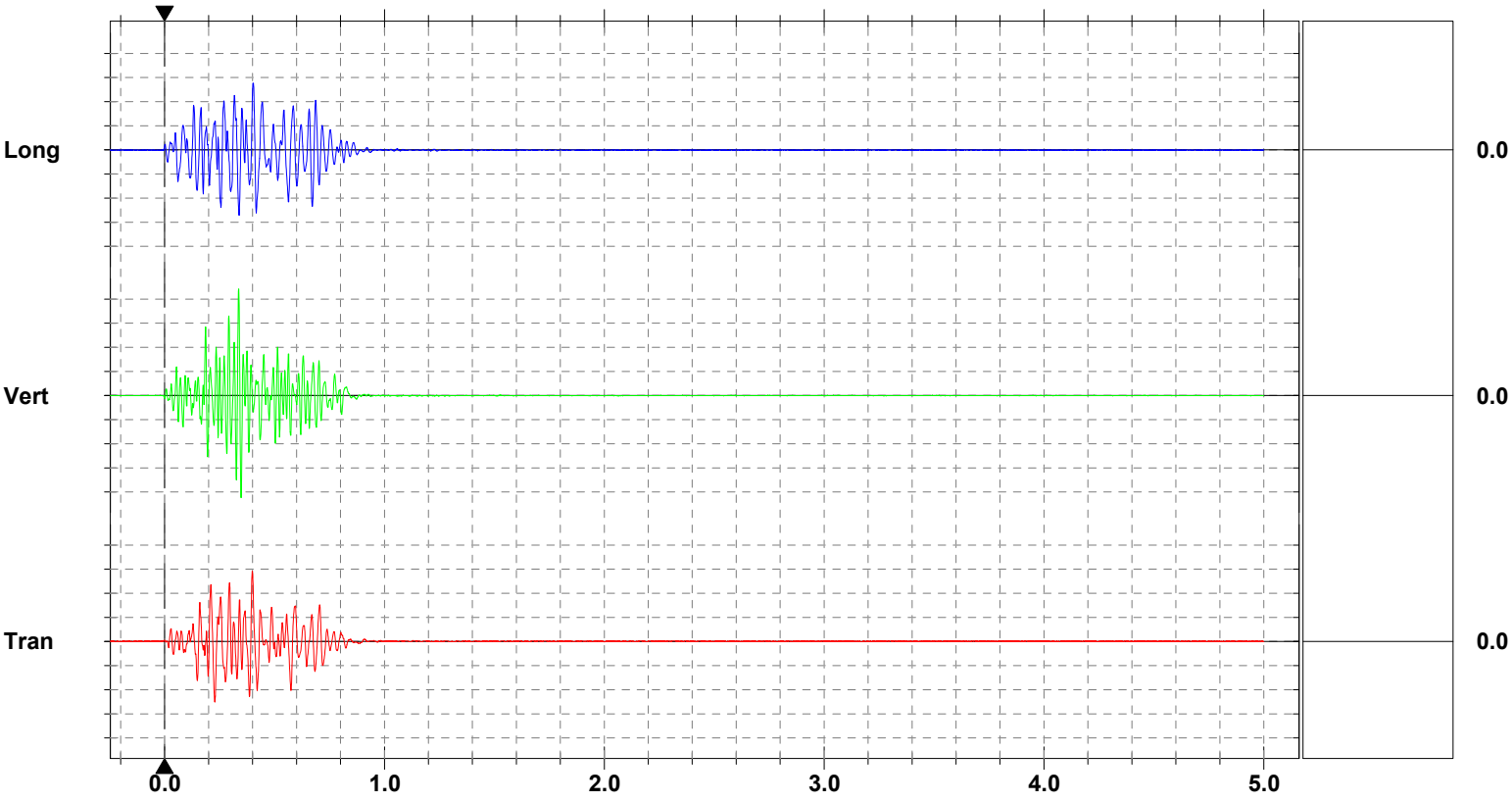
Extended Notes

Combo Mode July 23, 2021 07:30:33
Unit is setup behind the blast for attenuation study for the West Carleton Quarry Extensions using standard practice methods.

	Tran	Vert	Long	
PPV	14.60	22.10	13.84	mm/s
ZC Freq	28	43	30	Hz
Time (Rel. to Trig)	0.398	0.337	0.401	sec
Peak Acceleration	0.398	0.650	0.305	g
Peak Displacement	0.074	0.080	0.082	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 25.66 mm/s at 0.338 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 10:15:42 July 23, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 31.75 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE20939 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	July 21, 2021 by Instantel
File Name	V939J2UP.U60

Notes

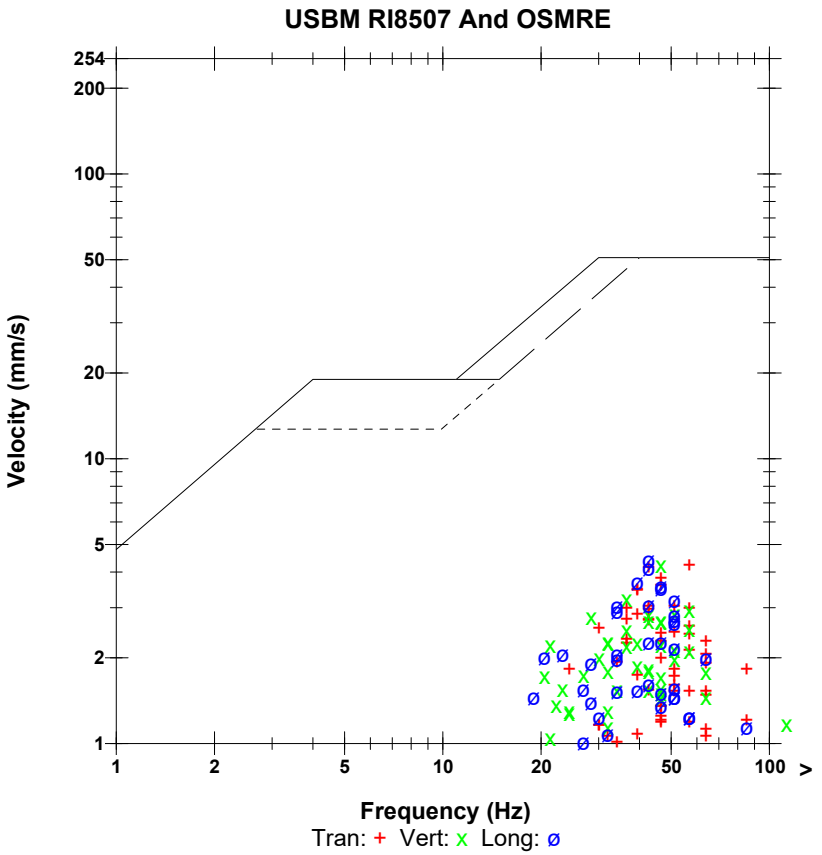
Location:	B7
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd
General	Coupled to ground

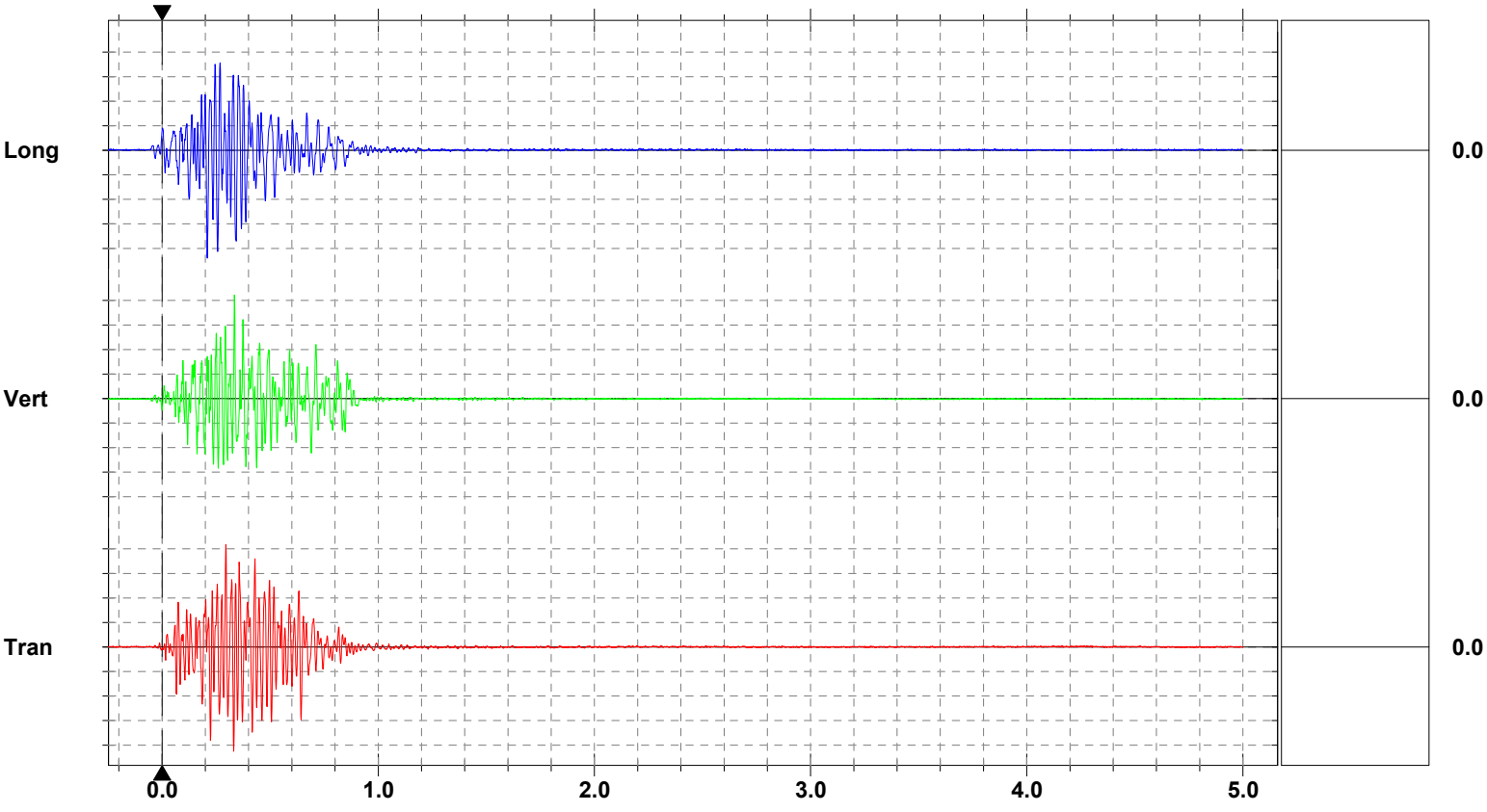
Extended Notes

Combo Mode July 23, 2021 08:07:47
Geophone is coupled to ground using industry standard practices for the West Carleton Quarry extension attenuation analysis.

	Tran	Vert	Long	
PPV	4.254	4.223	4.397	mm/s
ZC Freq	57	47	43	Hz
Time (Rel. to Trig)	0.331	0.334	0.209	sec
Peak Acceleration	0.136	0.128	0.124	g
Peak Displacement	0.013	0.014	0.016	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 5.203 mm/s at 0.331 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:44:45 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE10846 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	May 11, 2020 by Instantel
File Name	L846IXCR.EL0

Notes

Location:	3-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

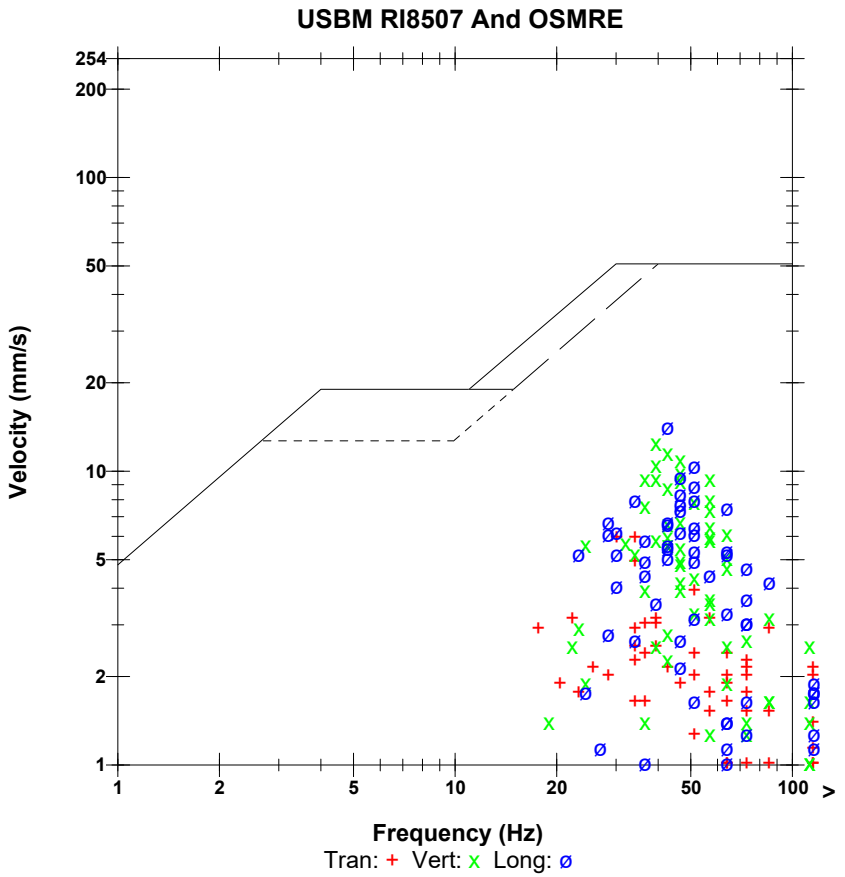
Extended Notes

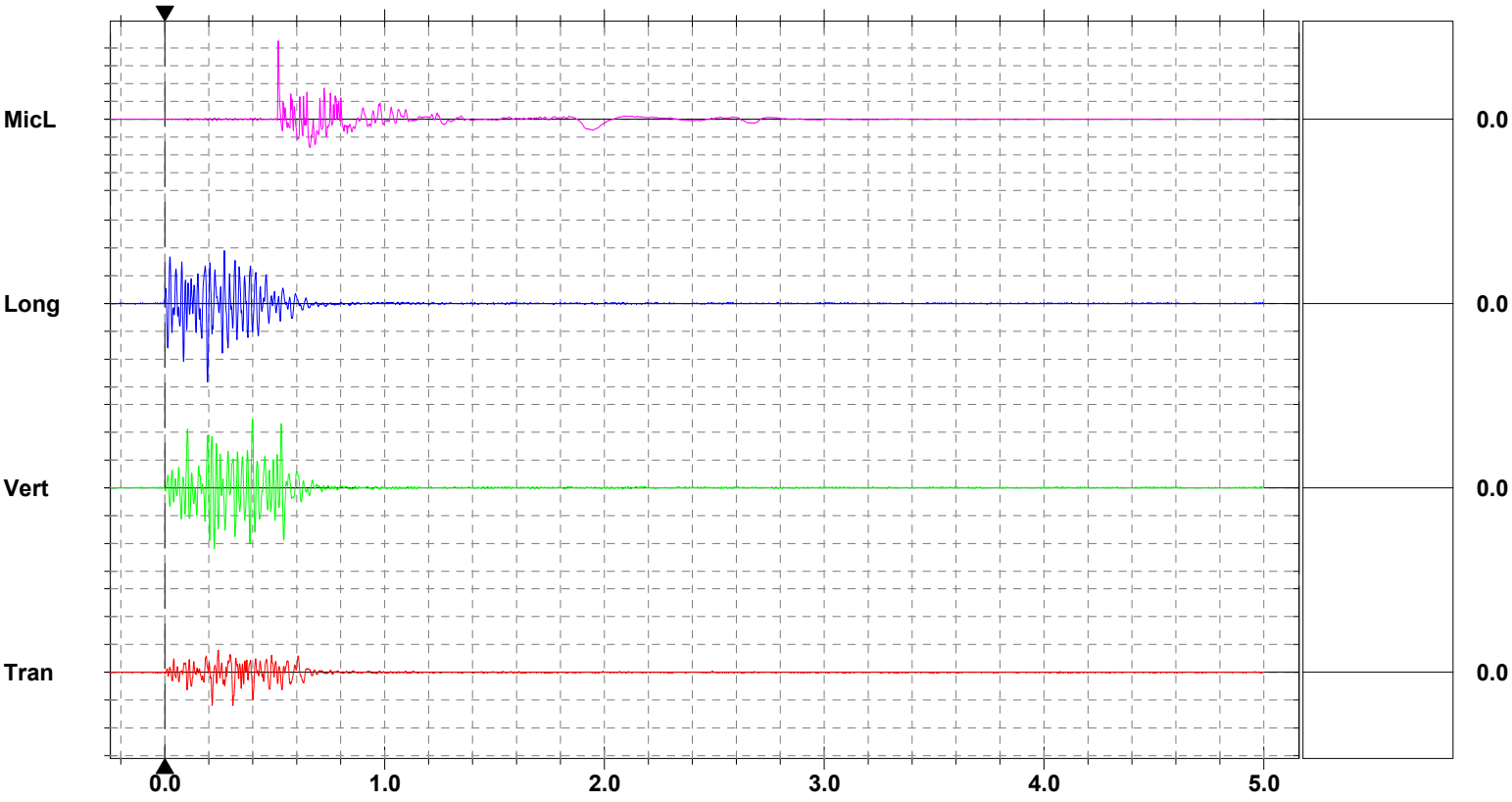
Combo Mode April 7, 2021 10:28:07
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	146.9 dB(L) at 0.516 sec
ZC Freq	34 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	5.969	12.45	14.10	mm/s
ZC Freq	30	39	43	Hz
Time (Rel. to Trig)	0.216	0.398	0.194	sec
Peak Acceleration	0.172	0.384	0.371	g
Peak Displacement	0.026	0.048	0.050	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 16.97 mm/s at 0.194 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 100.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:03 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE10735 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	March 26, 2021 by Instantel
File Name	L735IXCR.F30

Notes

Location: 2-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

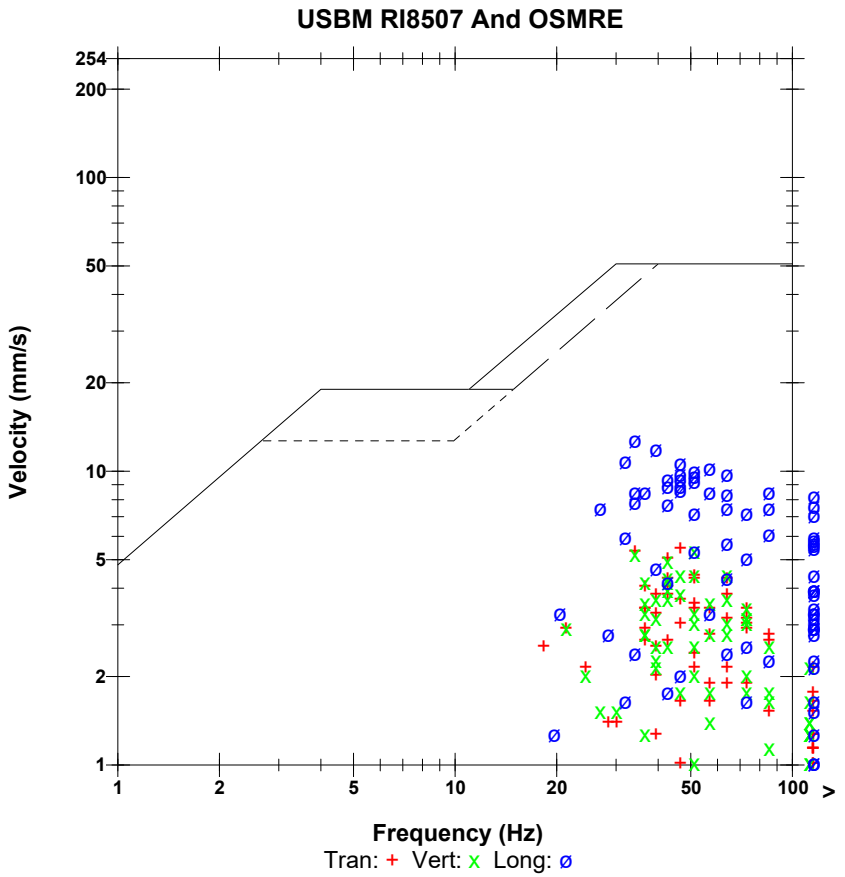
Extended Notes

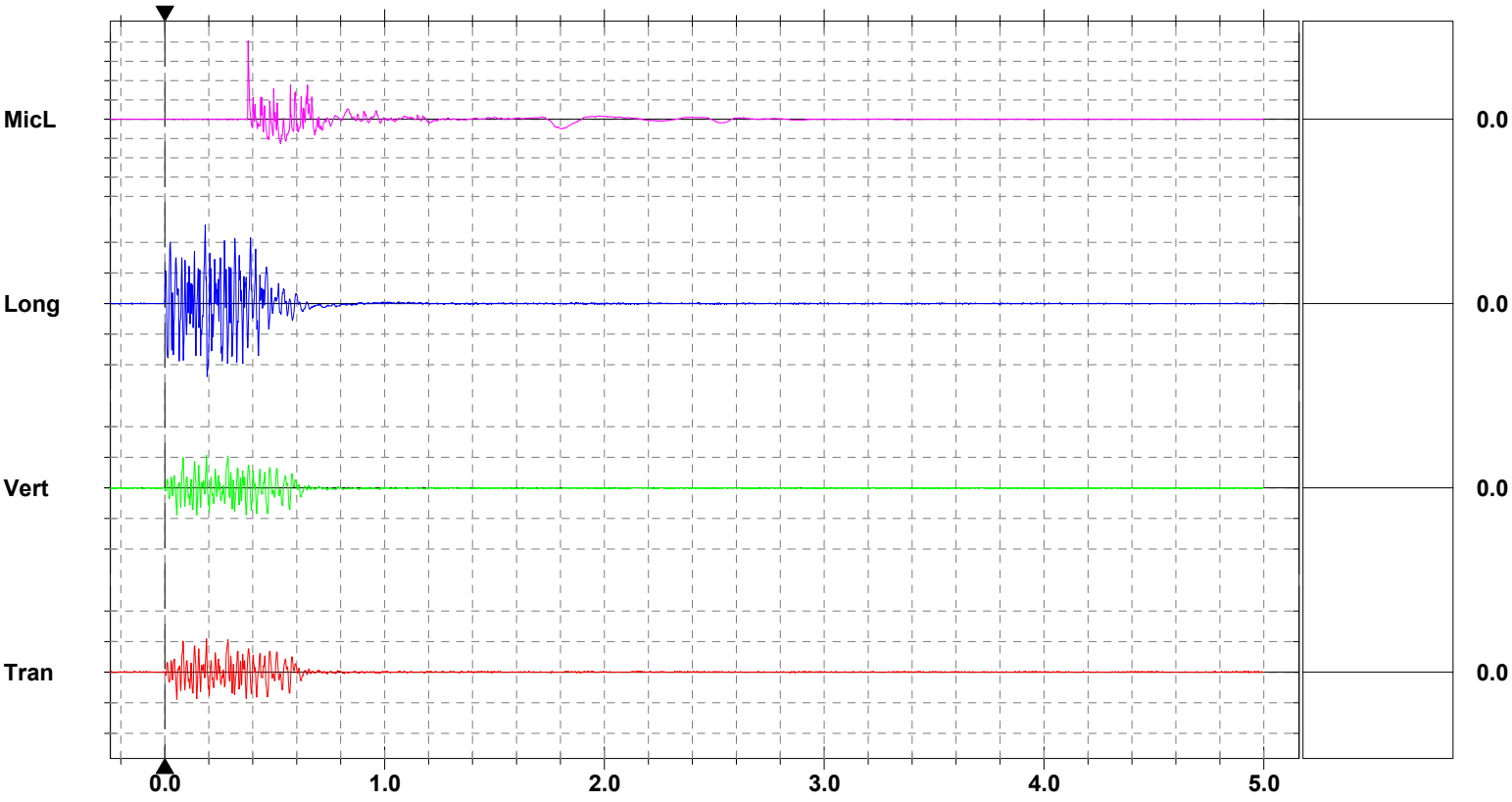
Combo Mode April 7, 2021 10:26:27
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	146.2 dB(L) at 0.379 sec
ZC Freq	34 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	5.461	5.334	12.83	mm/s
ZC Freq	47	51	34	Hz
Time (Rel. to Trig)	0.189	0.189	0.184	sec
Peak Acceleration	0.225	0.212	0.703	g
Peak Displacement	0.024	0.024	0.051	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 12.83 mm/s at 0.184 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 100.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:06 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15256 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	March 30, 2021 by Instantel
File Name	Q256IXCR.F60

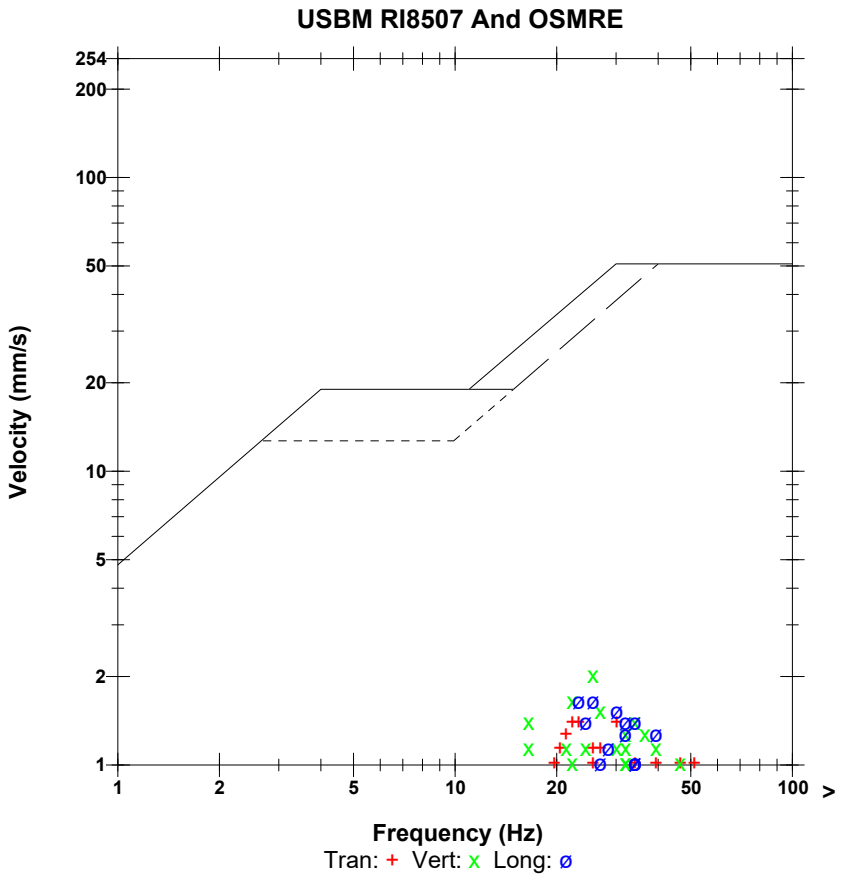
Notes
Location: 7-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

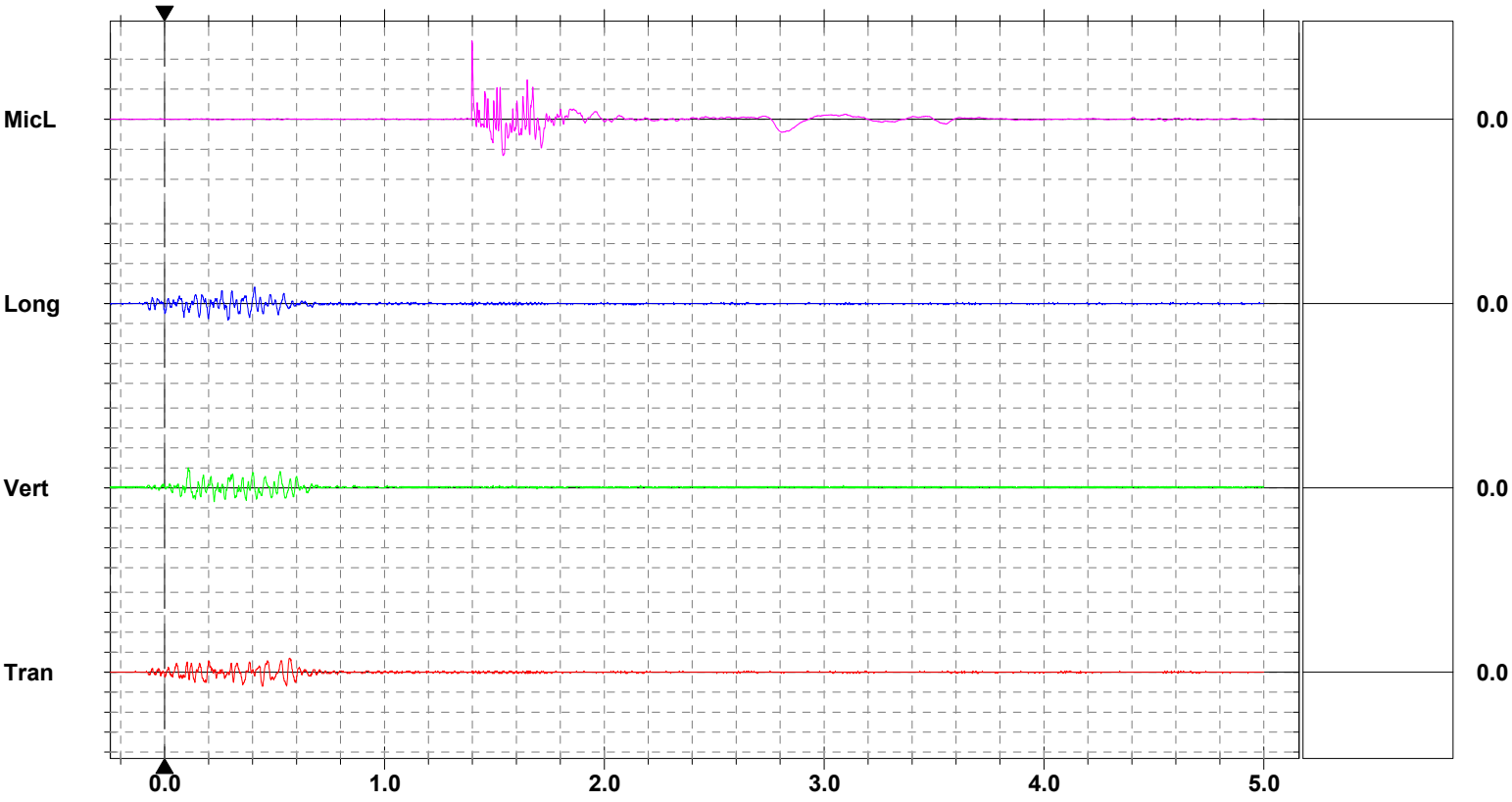
Extended Notes
Combo Mode April 7, 2021 10:43:55
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	136.3 dB(L) at 1.398 sec
ZC Freq	28 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	1.397	2.032	1.651	mm/s
ZC Freq	30	26	23	Hz
Time (Rel. to Trig)	0.443	0.107	0.287	sec
Peak Acceleration	0.040	0.040	0.053	g
Peak Displacement	0.010	0.014	0.010	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 2.129 mm/s at 0.107 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:34 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15257 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	March 30, 2021 by Instantel
File Name	Q257IXCR.FY0

Notes

Location:	6-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

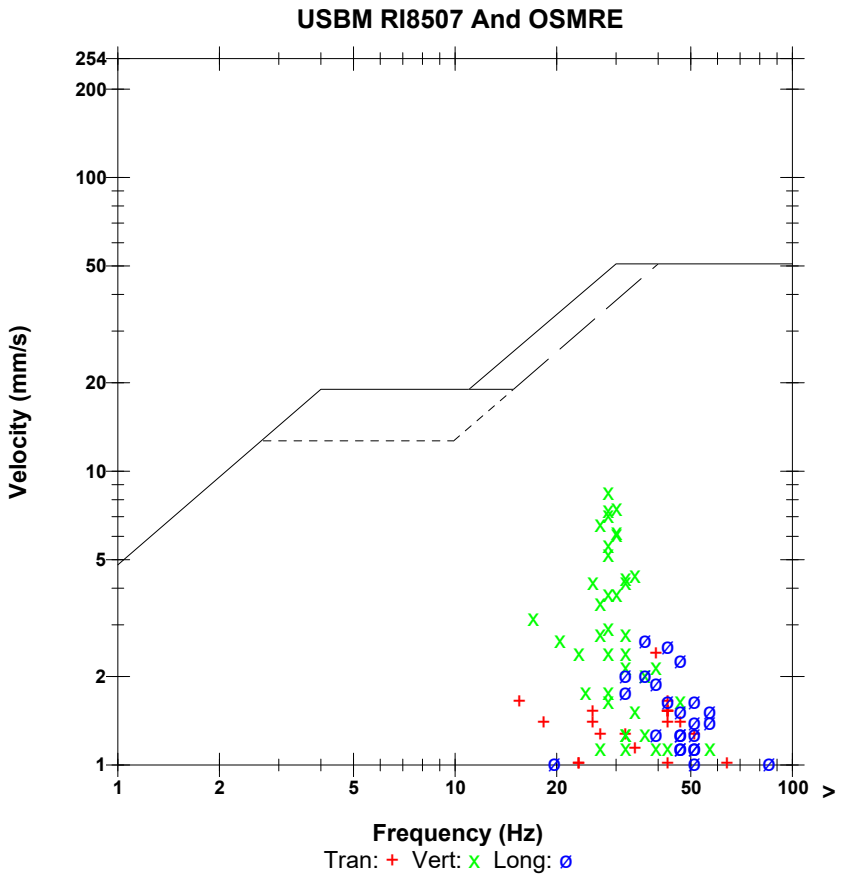
Extended Notes

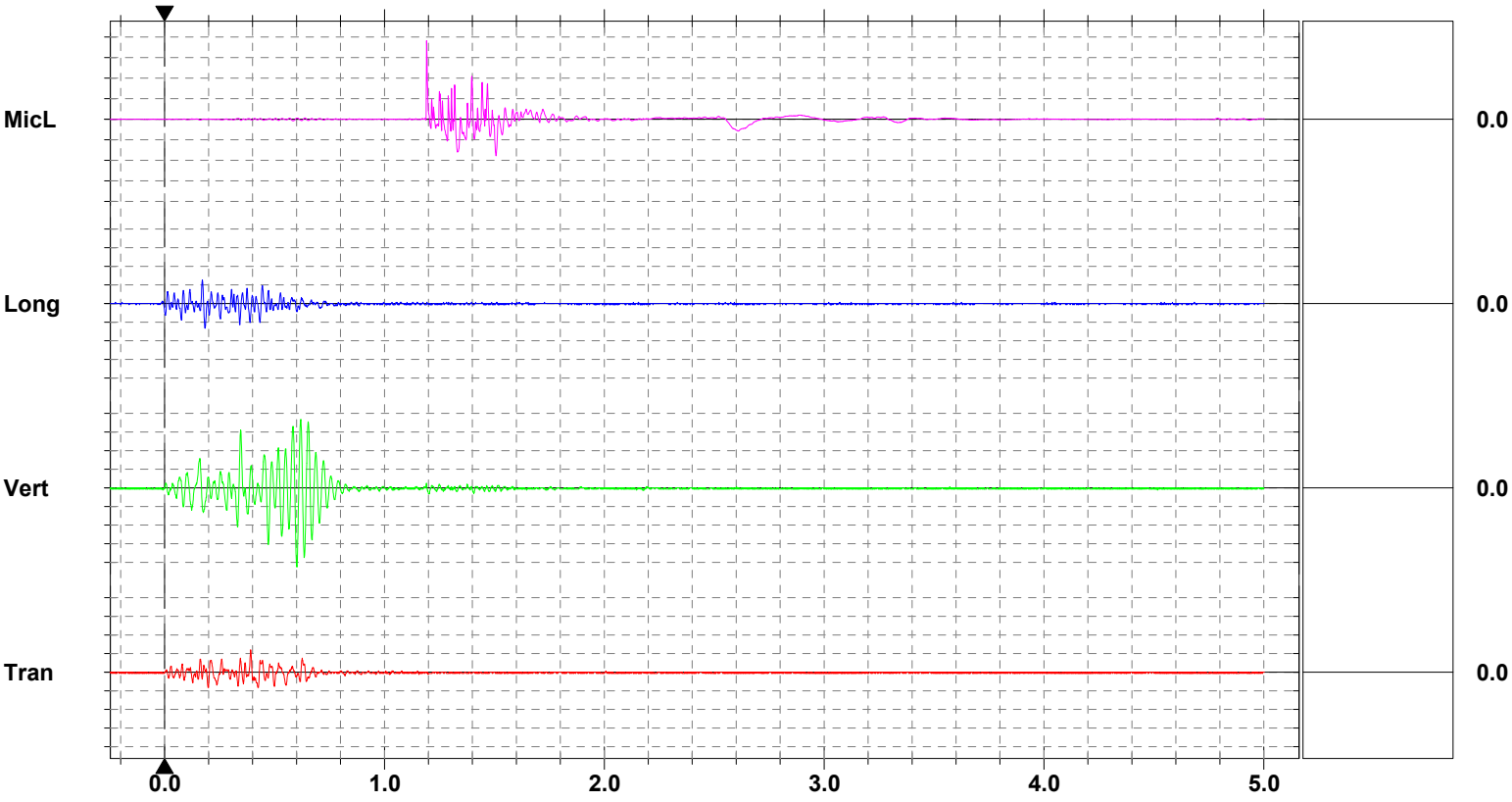
Combo Mode April 7, 2021 10:42:22
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	139.6 dB(L) at 1.191 sec
ZC Freq	32 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	2.413	8.509	2.667	mm/s
ZC Freq	39	28	37	Hz
Time (Rel. to Trig)	0.392	0.602	0.184	sec
Peak Acceleration	0.053	0.159	0.066	g
Peak Displacement	0.015	0.048	0.011	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 8.564 mm/s at 0.602 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 12:45:36 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator/8F.MMB

Serial Number	UM11714 V 10-89 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	May 6, 2020 by Instantel
File Name	UM11714_20210407124536.IDFW

Notes

Location:	8-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to Ground

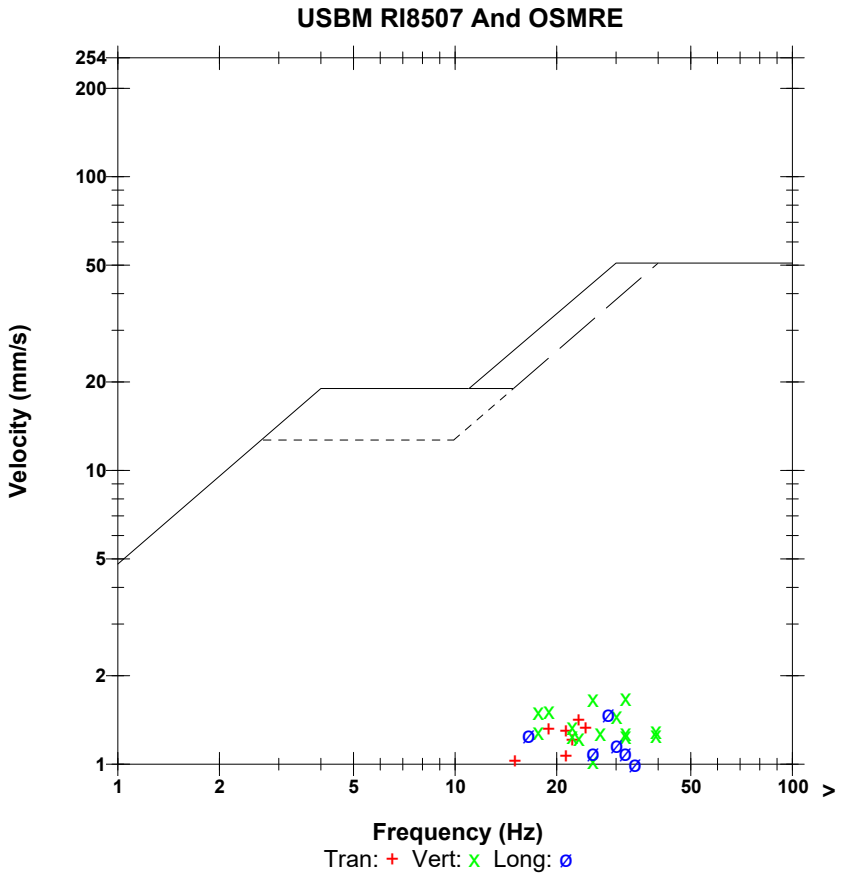
Extended Notes

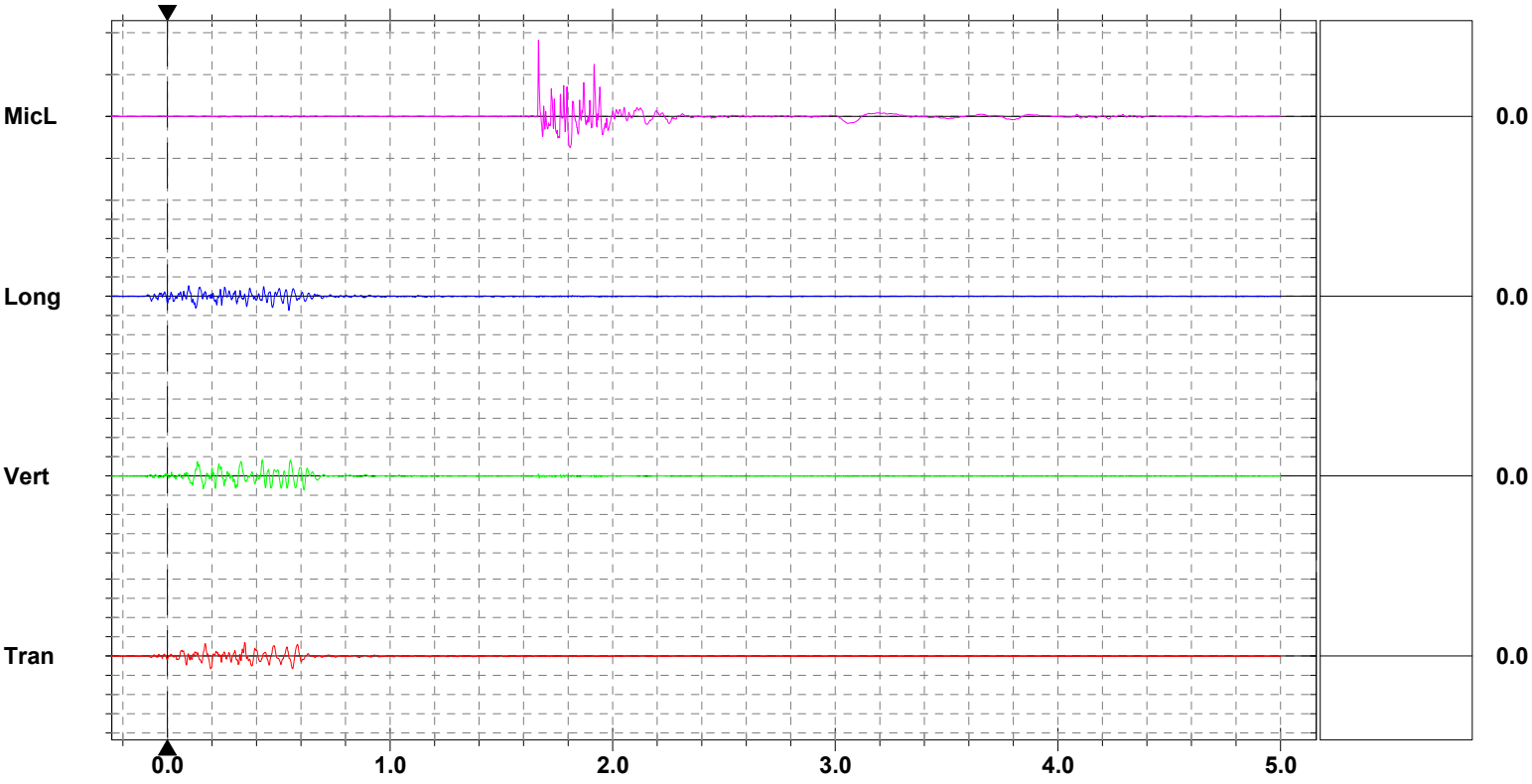
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	133.2 dB(L) at 1.667 sec
ZC Freq	34 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	1.411	1.679	1.482	mm/s
ZC Freq	23	32	28	Hz
Time (Rel. to Trig)	0.348	0.426	0.546	sec
Peak Acceleration	0.049	0.064	0.057	g
Peak Displacement	0.009	0.012	0.011	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 1.772 mm/s at 0.552 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check

Trigger =

Event Report

Date/Time	Long at 12:45:41 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE14197 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	May 29, 2020 by Instantel
File Name	P197IXCR.G50

Notes

Location: 4-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

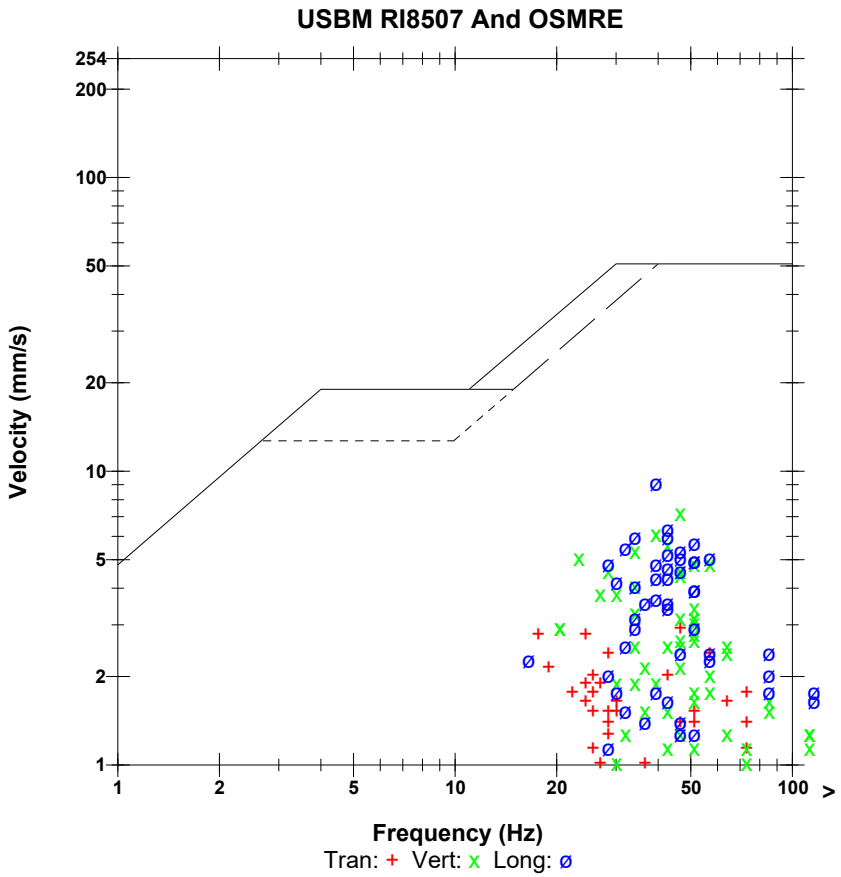
Extended Notes

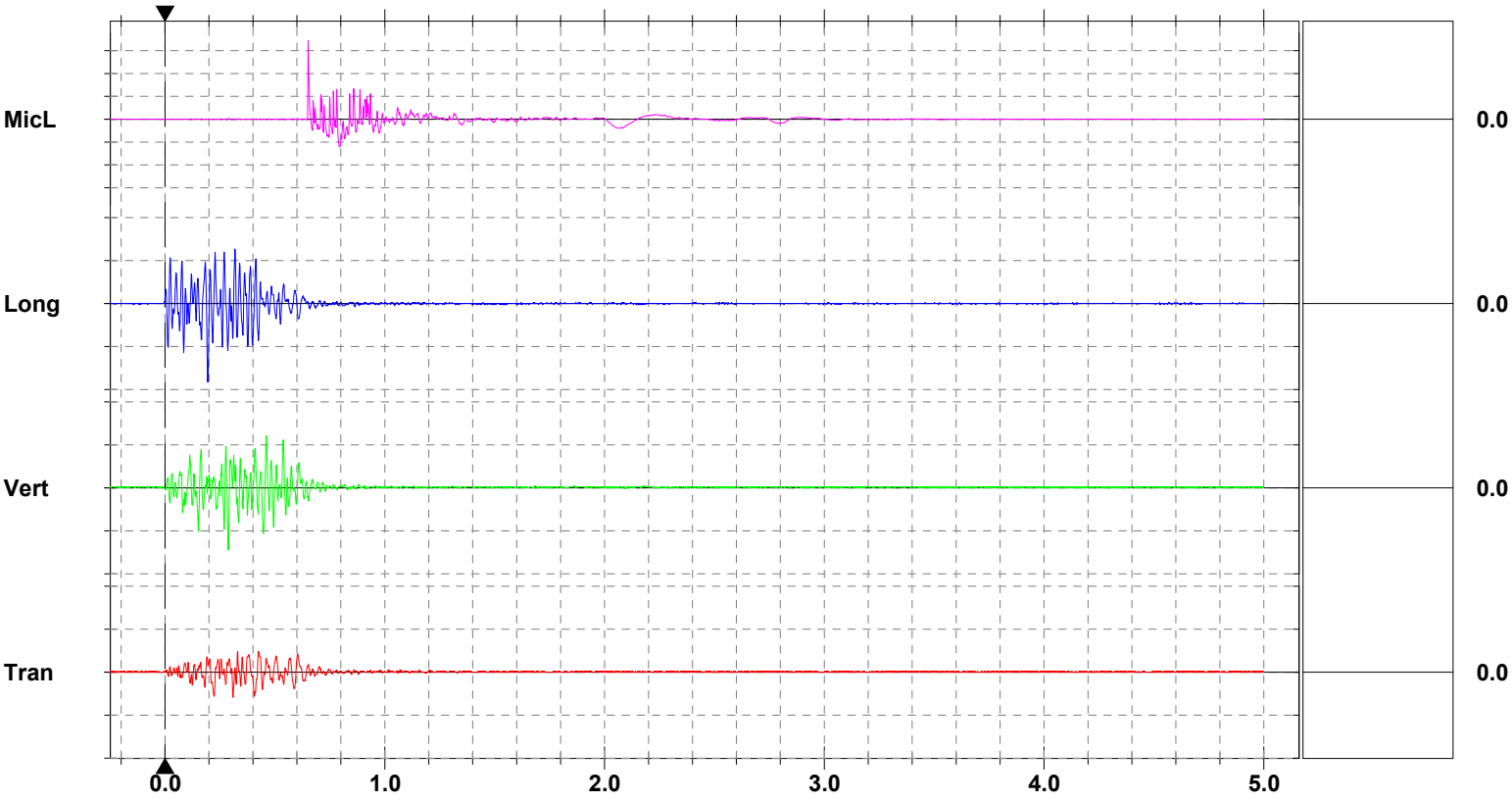
Combo Mode April 7, 2021 10:34:17
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	144.7 dB(L) at 0.651 sec
ZC Freq	37 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	2.921	7.239	9.144	mm/s
ZC Freq	47	47	39	Hz
Time (Rel. to Trig)	0.309	0.288	0.194	sec
Peak Acceleration	0.106	0.239	0.212	g
Peak Displacement	0.019	0.025	0.033	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 9.223 mm/s at 0.194 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 100.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 12:45:50 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator/micromate front.mmb

Serial Number	UM13270 V 10-90 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	February 18, 2021 by Instantel
File Name	UM13270_20210407124550.IDFW

Notes

Location:	9-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to Ground

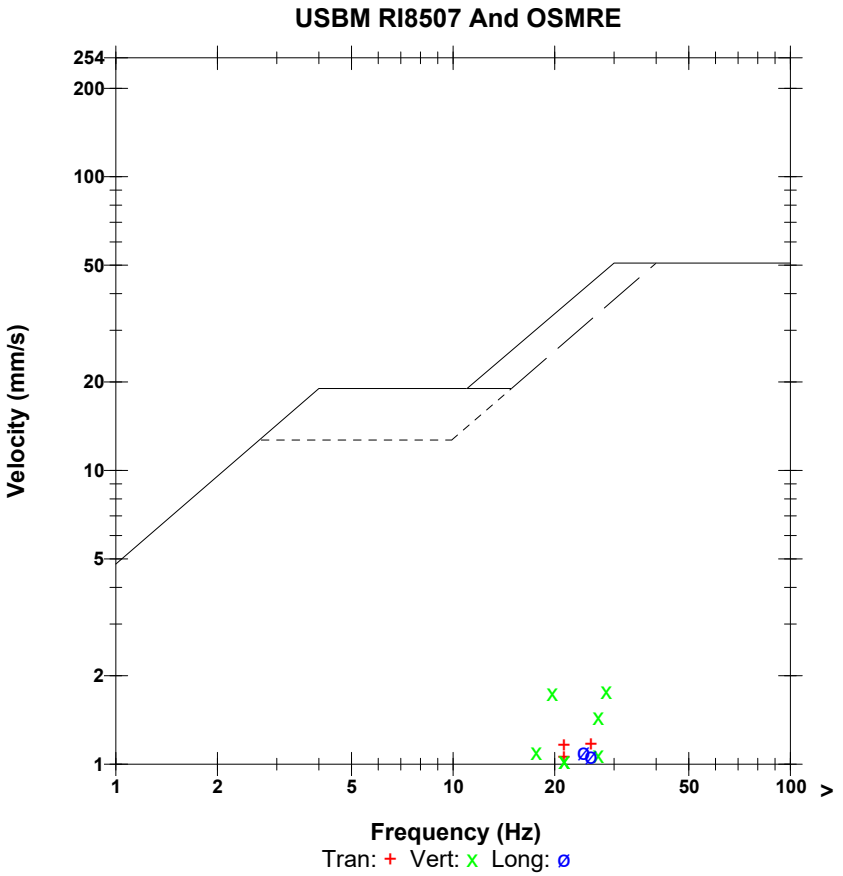
Extended Notes

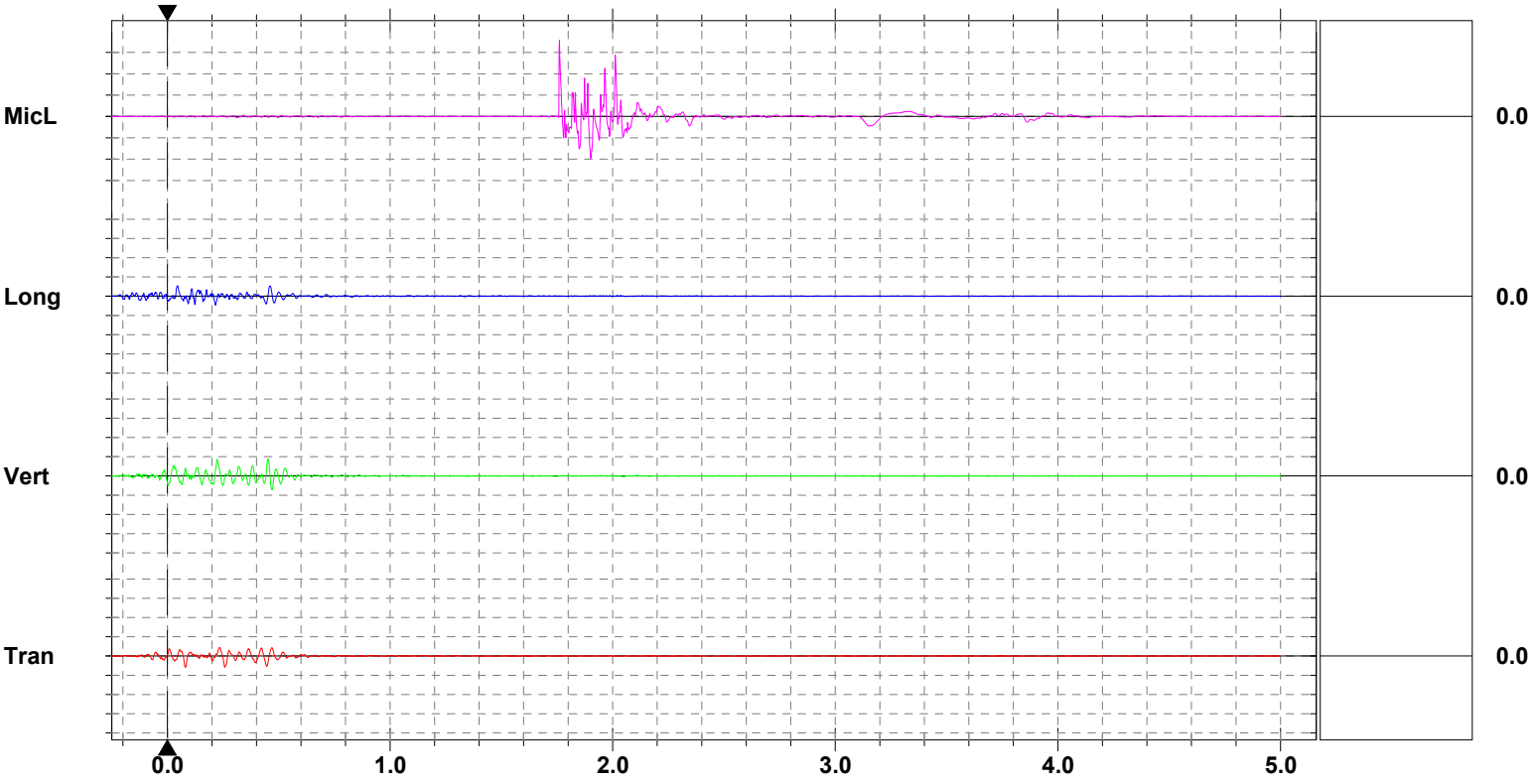
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	131.1 dB(L) at 1.761 sec
ZC Freq	32 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	1.174	1.781	1.103	mm/s
ZC Freq	26	28	24	Hz
Time (Rel. to Trig)	0.081	0.451	0.046	sec
Peak Acceleration	0.021	0.032	0.029	g
Peak Displacement	0.008	0.012	0.007	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 1.948 mm/s at 0.450 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check

Trigger = ▶——◀

Event Report

Date/Time	Long at 12:45:58 April 7, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15255 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	March 30, 2021 by Instantel
File Name	Q255IXCR.GM0

Notes

Location: 5-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

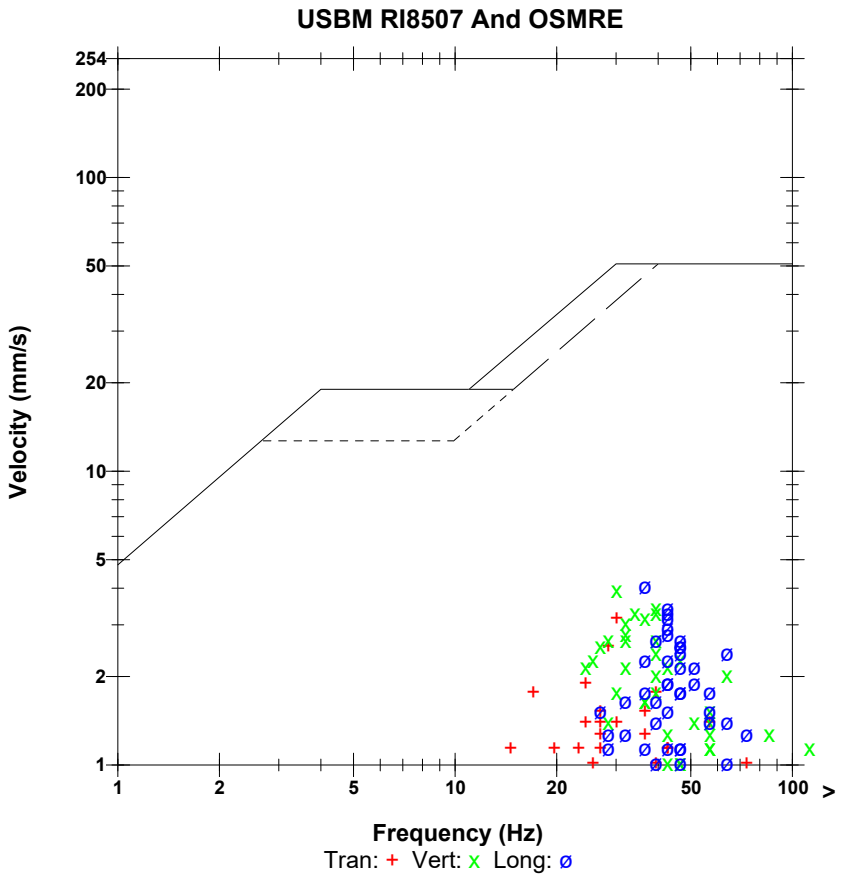
Extended Notes

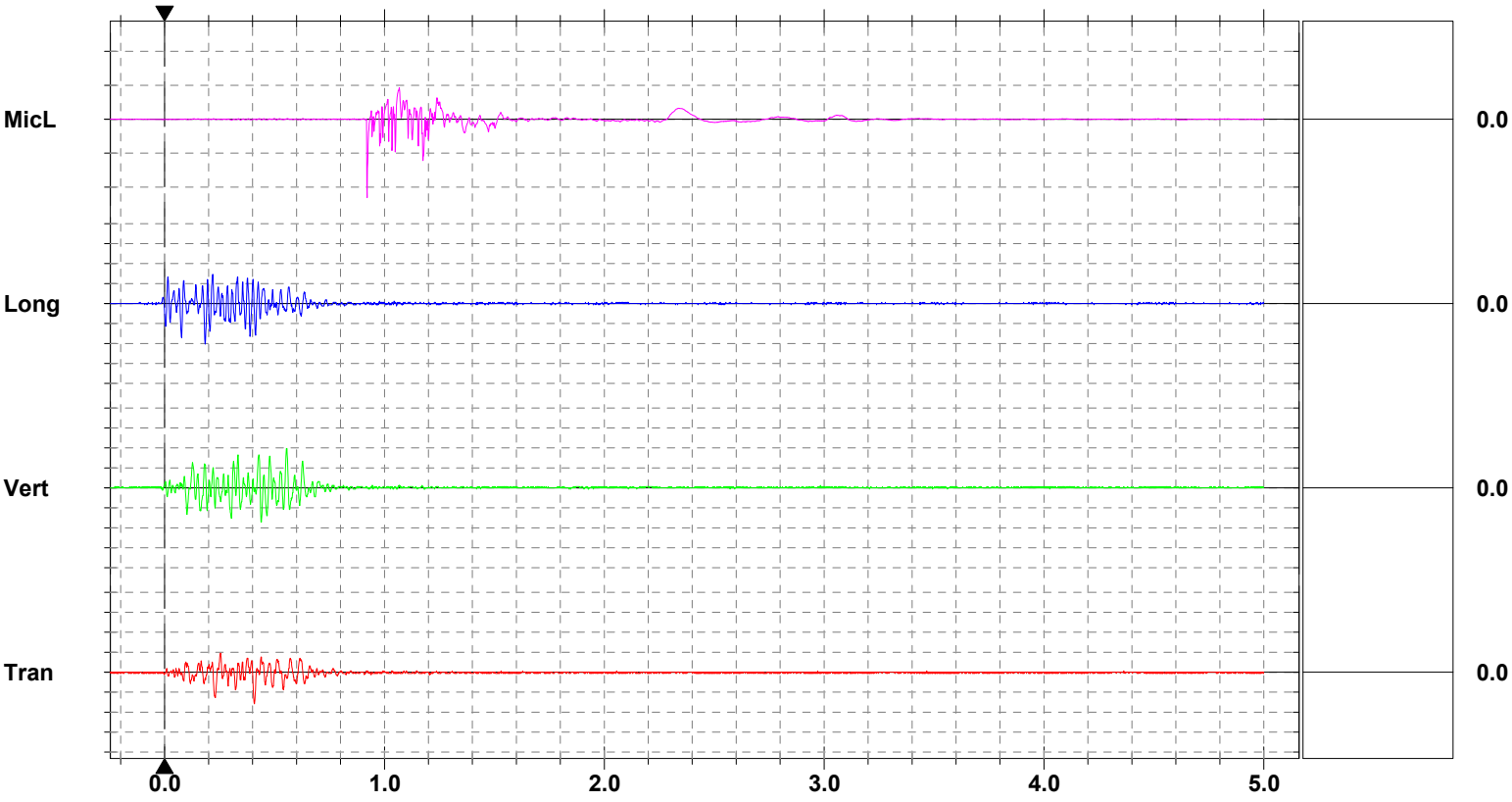
Combo Mode April 7, 2021 10:35:51
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	141.3 dB(L) at 0.921 sec
ZC Freq	34 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	3.175	3.937	4.064	mm/s
ZC Freq	30	30	37	Hz
Time (Rel. to Trig)	0.408	0.554	0.185	sec
Peak Acceleration	0.066	0.133	0.106	g
Peak Displacement	0.016	0.020	0.016	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 4.706 mm/s at 0.185 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 100.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:43 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE10846 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	May 11, 2020 by Instantel
File Name	L846IXEJ.XV0

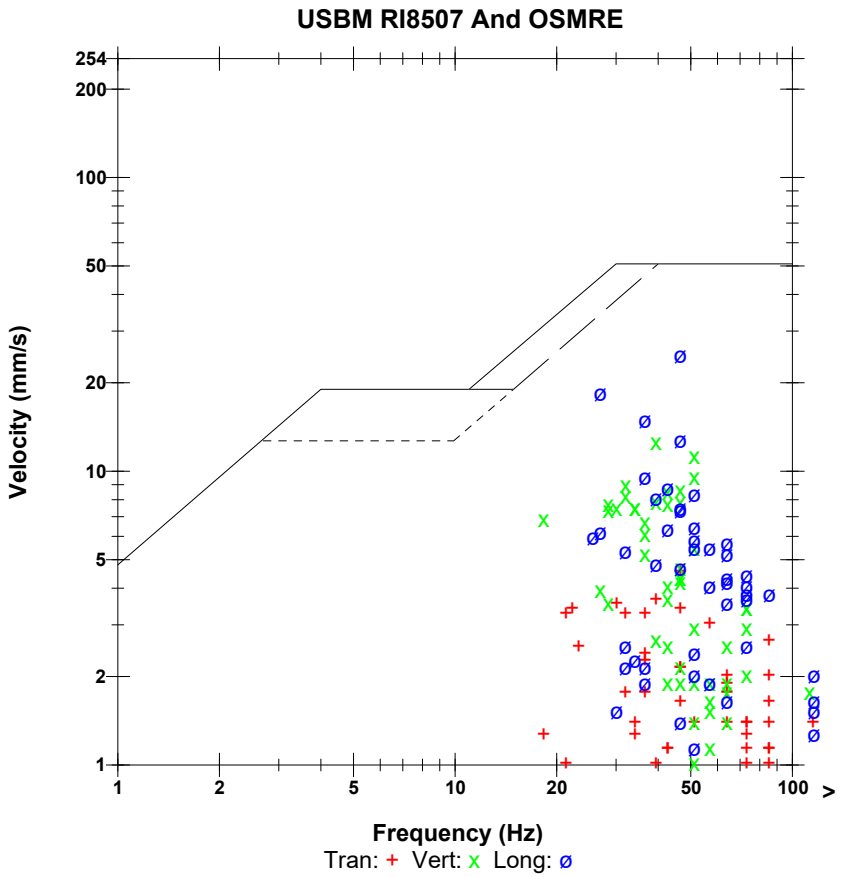
Notes
Location: 3-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

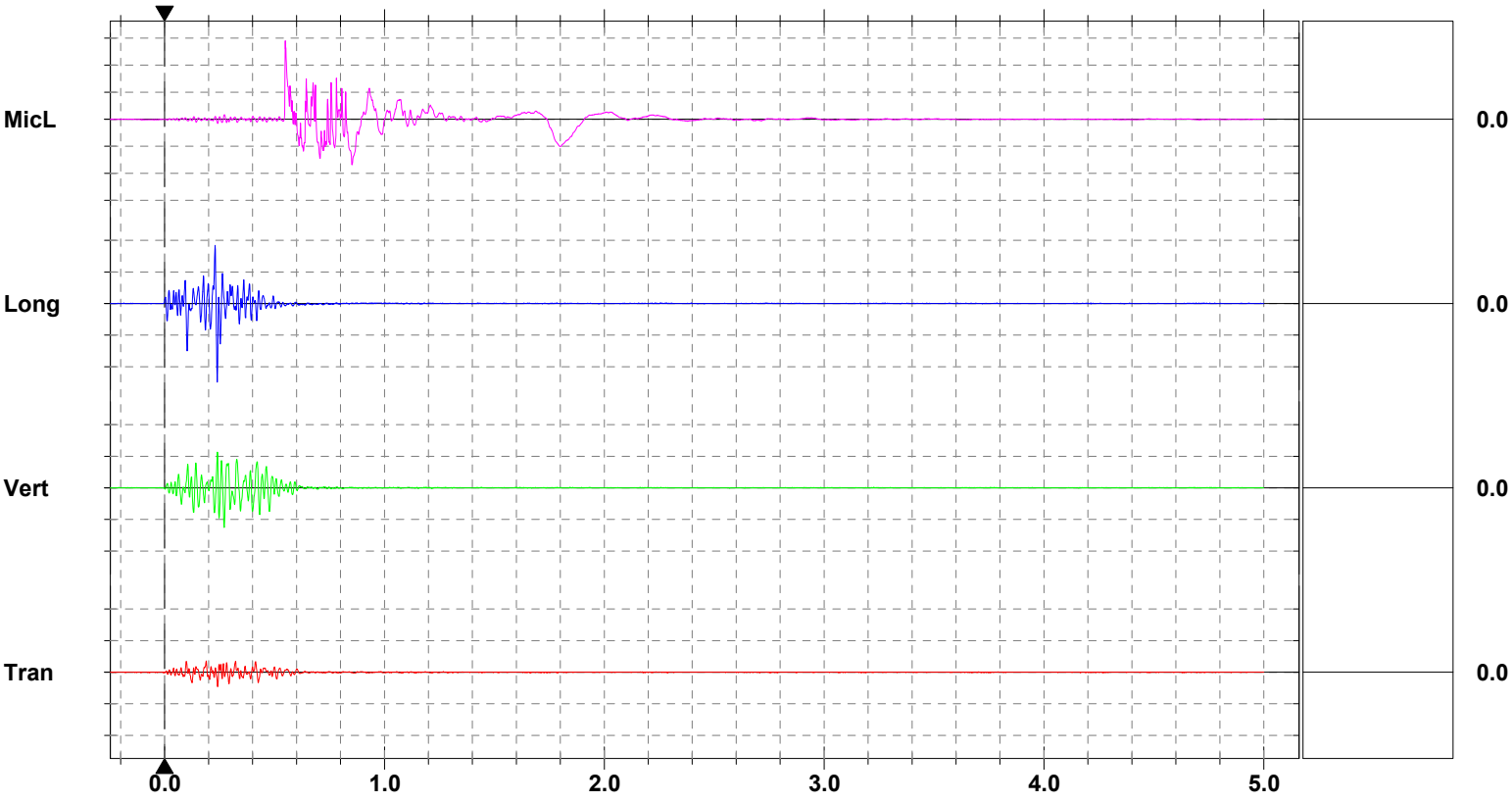
Extended Notes
Combo Mode April 8, 2021 10:03:32
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	137.2 dB(L) at 0.549 sec
ZC Freq	13 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	4.572	12.57	24.89	mm/s
ZC Freq	47	39	47	Hz
Time (Rel. to Trig)	0.240	0.271	0.239	sec
Peak Acceleration	0.225	0.451	0.650	g
Peak Displacement	0.017	0.051	0.075	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 27.35 mm/s at 0.239 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 10.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:44 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15255 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	March 30, 2021 by Instantel
File Name	Q255IXEJ.XW0

Notes

Location: 5-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

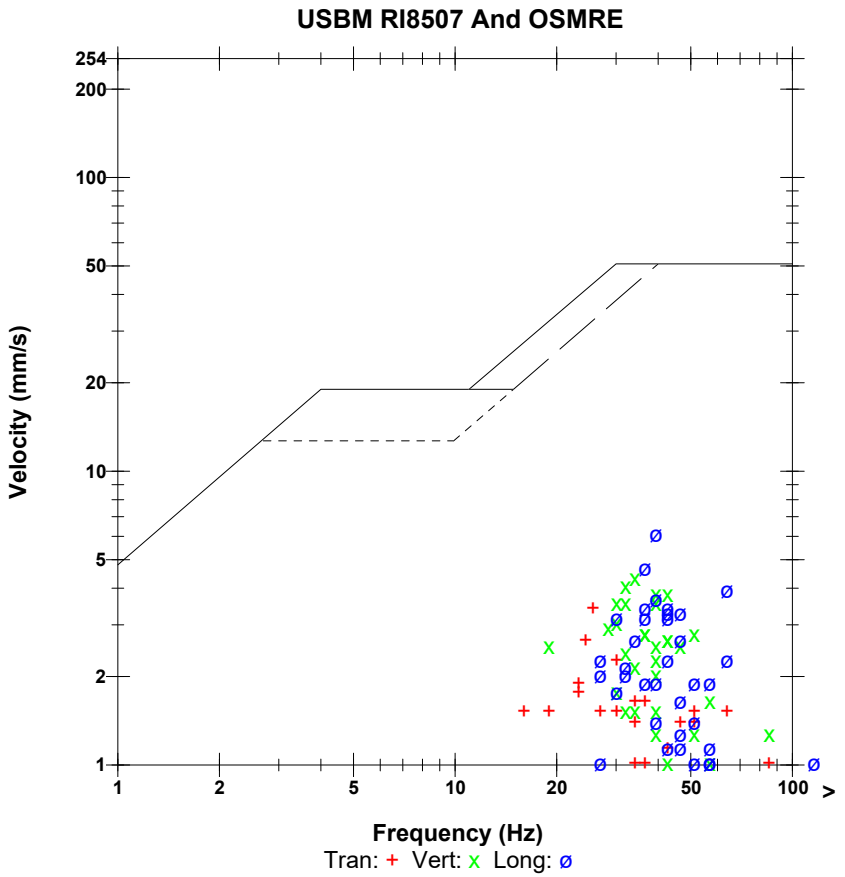
Extended Notes

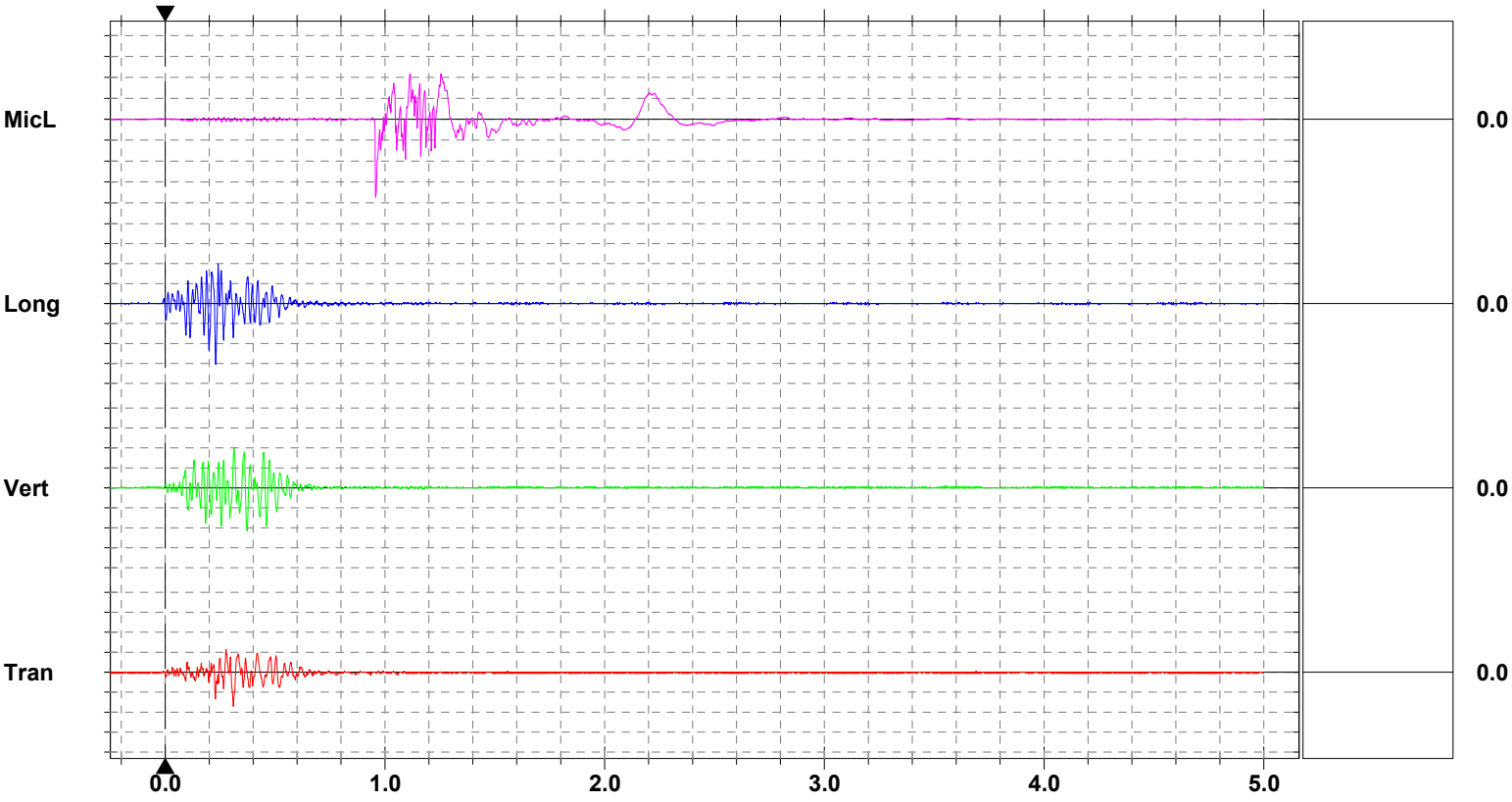
Combo Mode April 8, 2021 09:54:33
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	131.5 dB(L) at 0.958 sec
ZC Freq	11 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	3.429	4.318	6.096	mm/s
ZC Freq	26	34	39	Hz
Time (Rel. to Trig)	0.310	0.372	0.229	sec
Peak Acceleration	0.093	0.119	0.159	g
Peak Displacement	0.019	0.020	0.023	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 6.515 mm/s at 0.229 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:44 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE15257 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	March 30, 2021 by Instantel
File Name	Q257IXEJ.XW0

Notes

Location:	6-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General	Coupled to Ground

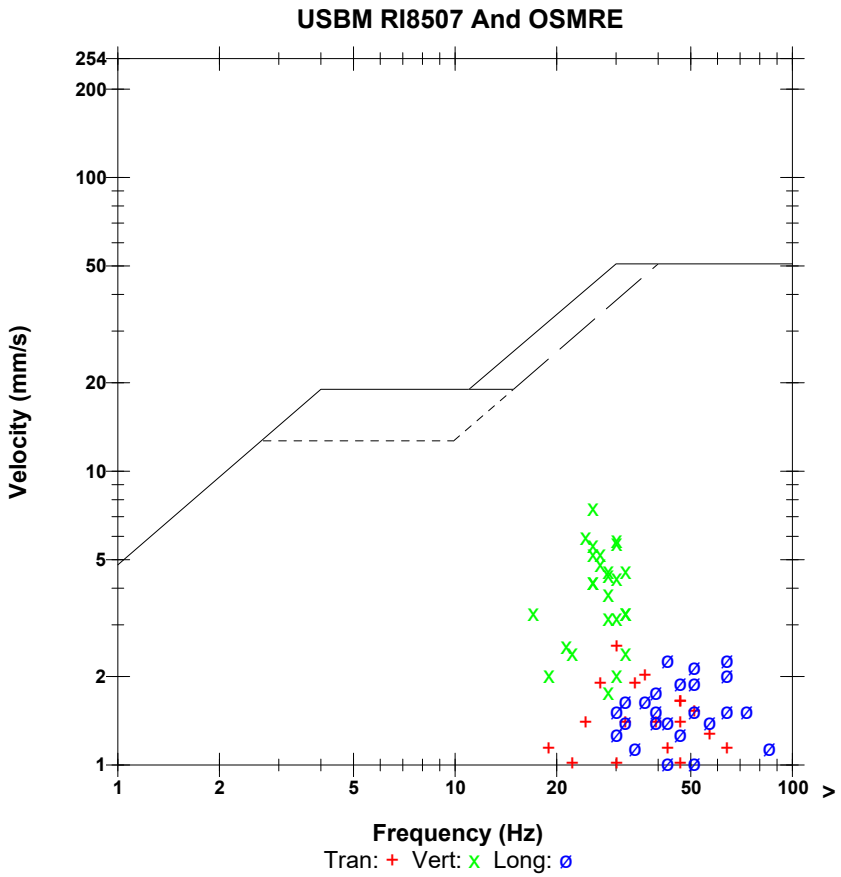
Extended Notes

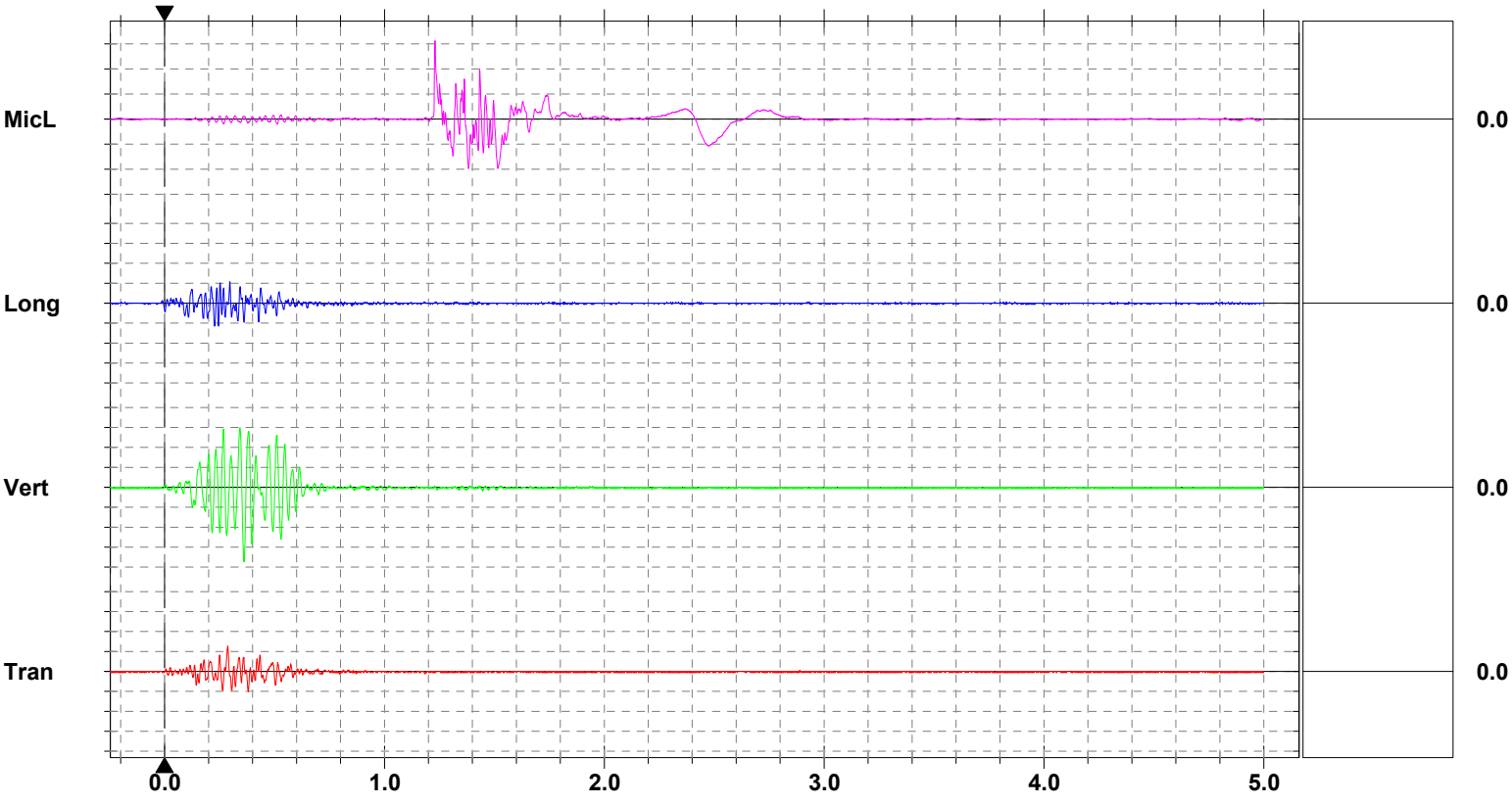
Combo Mode April 8, 2021 09:50:31
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	129.9 dB(L) at 1.230 sec
ZC Freq	9.5 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	2.540	7.493	2.286	mm/s
ZC Freq	30	26	43	Hz
Time (Rel. to Trig)	0.287	0.361	0.227	sec
Peak Acceleration	0.066	0.146	0.106	g
Peak Displacement	0.011	0.045	0.009	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 7.782 mm/s at 0.361 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:45 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415

Serial Number	BE14197 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	May 29, 2020 by Instantel
File Name	P197IXEJ.XX0

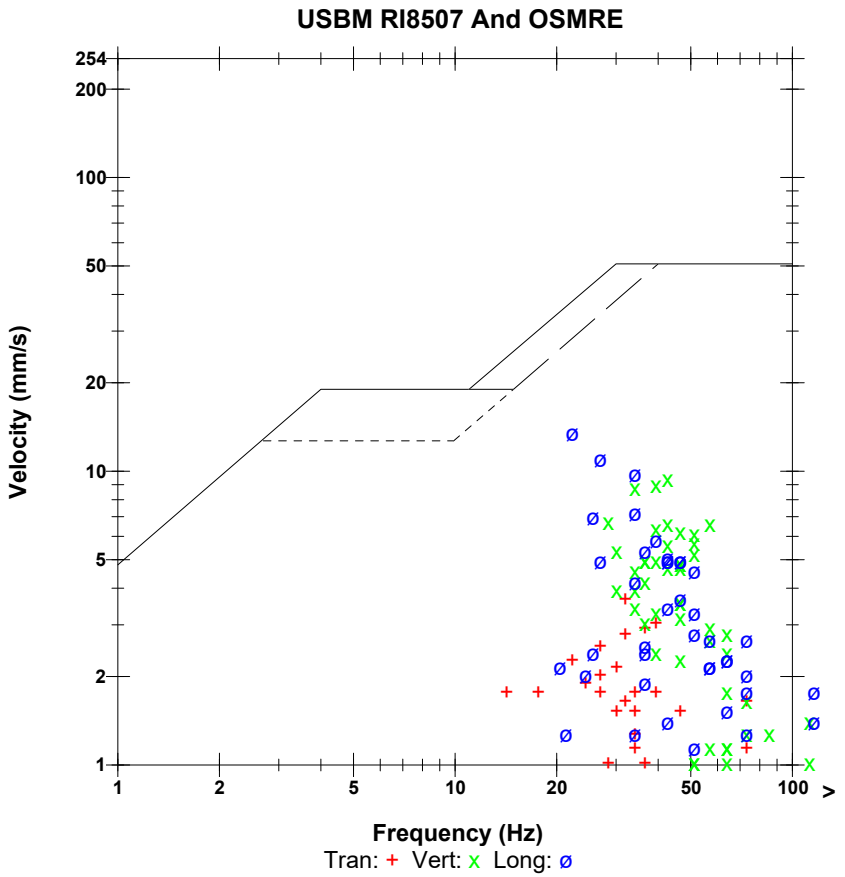
Notes
Location: 4-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

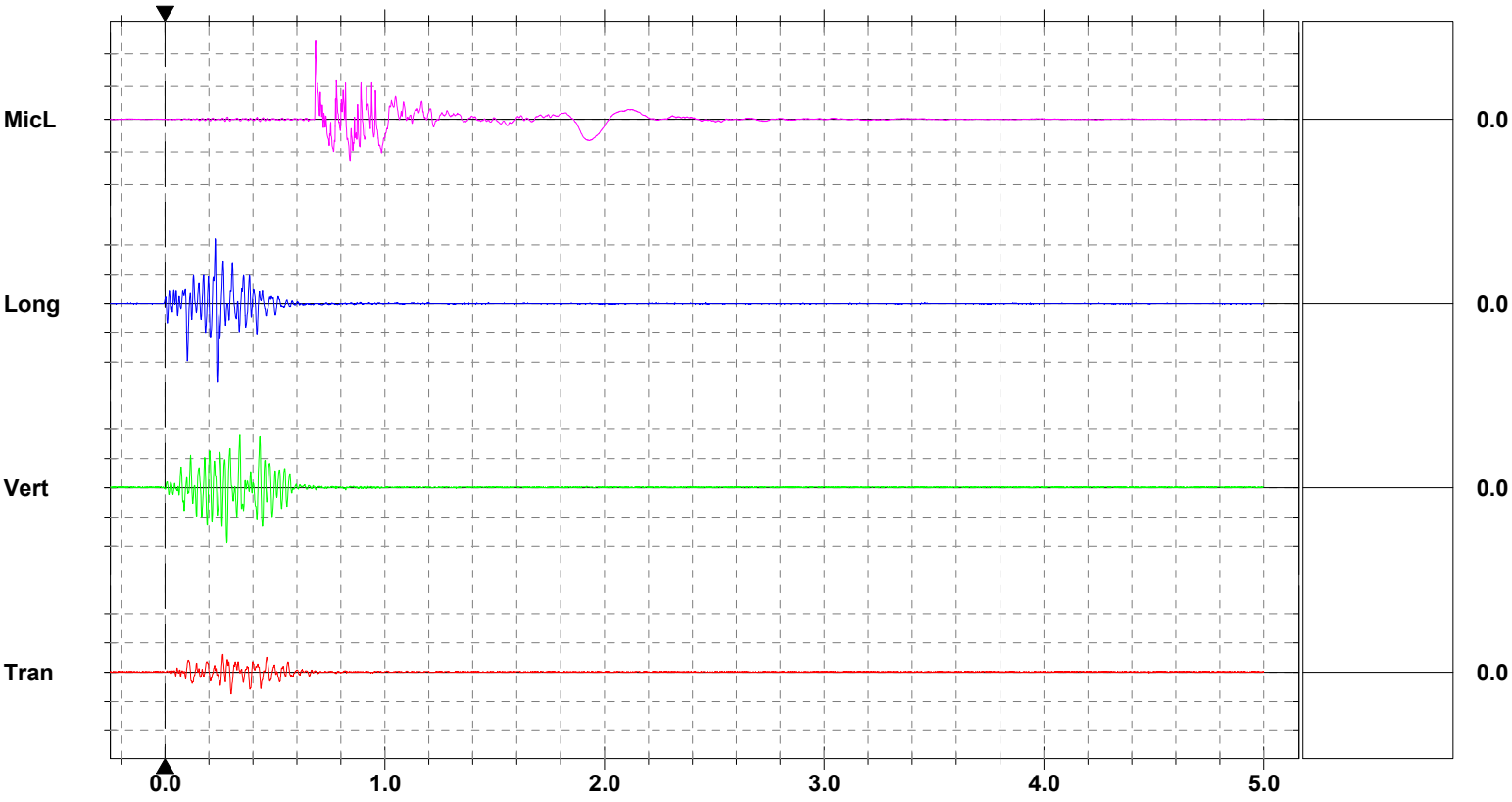
Extended Notes
Combo Mode April 8, 2021 09:59:13
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	135.5 dB(L) at 0.685 sec
ZC Freq	13 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	3.683	9.398	13.46	mm/s
ZC Freq	32	43	22	Hz
Time (Rel. to Trig)	0.300	0.281	0.237	sec
Peak Acceleration	0.093	0.278	0.451	g
Peak Displacement	0.017	0.037	0.068	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 14.23 mm/s at 0.237 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Long at 11:58:45 April 8, 2021
Trigger Source Geo: 0.750 mm/s
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps
Job Number: 8415

Serial Number BE15256 V 10.72-8.17 MiniMate Plus
Battery Level 6.3 Volts
Unit Calibration March 30, 2021 by Instantel
File Name Q256IXEJ.XX0

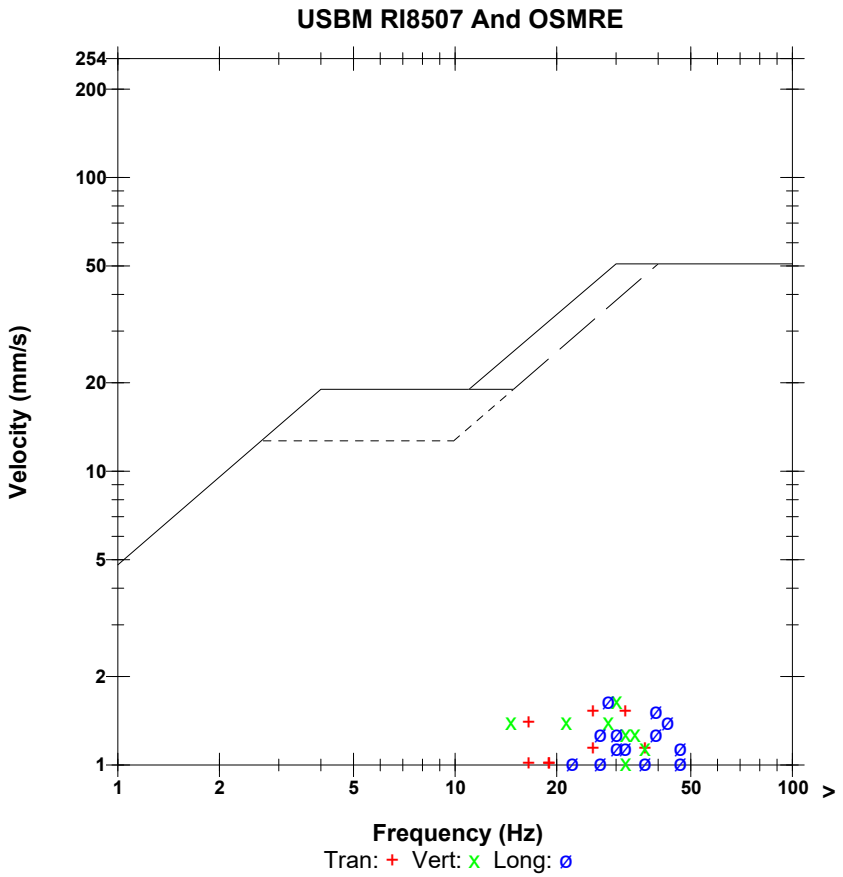
Notes
Location: 7-F
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General Coupled to Ground

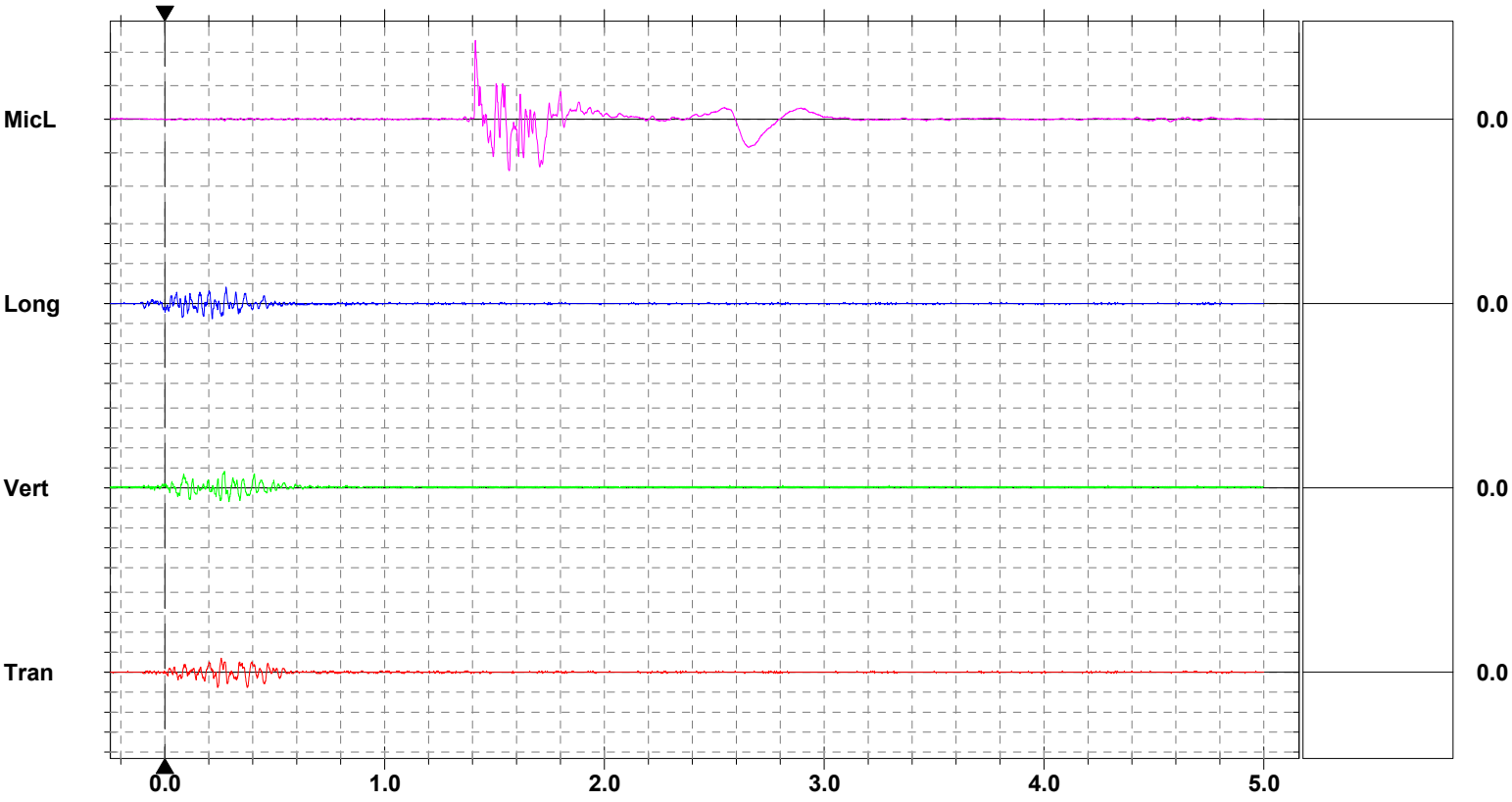
Extended Notes
Combo Mode April 8, 2021 09:45:31
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone Linear Weighting
PSPL 127.4 dB(L) at 1.412 sec
ZC Freq 11 Hz
Channel Test Disabled

	Tran	Vert	Long	
PPV	1.524	1.651	1.651	mm/s
ZC Freq	32	30	28	Hz
Time (Rel. to Trig)	0.239	0.271	0.278	sec
Peak Acceleration	0.053	0.066	0.053	g
Peak Displacement	0.012	0.012	0.009	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 2.136 mm/s at 0.257 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 11:58:49 April 8, 2021
Trigger Source	Geo: 0.750 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator/10F.MMB

Serial Number	UM10656 V 10-90 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	March 16, 2021 by Instantel
File Name	UM10656_20210408115849.IDFW

Notes

Location:	10-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to Ground

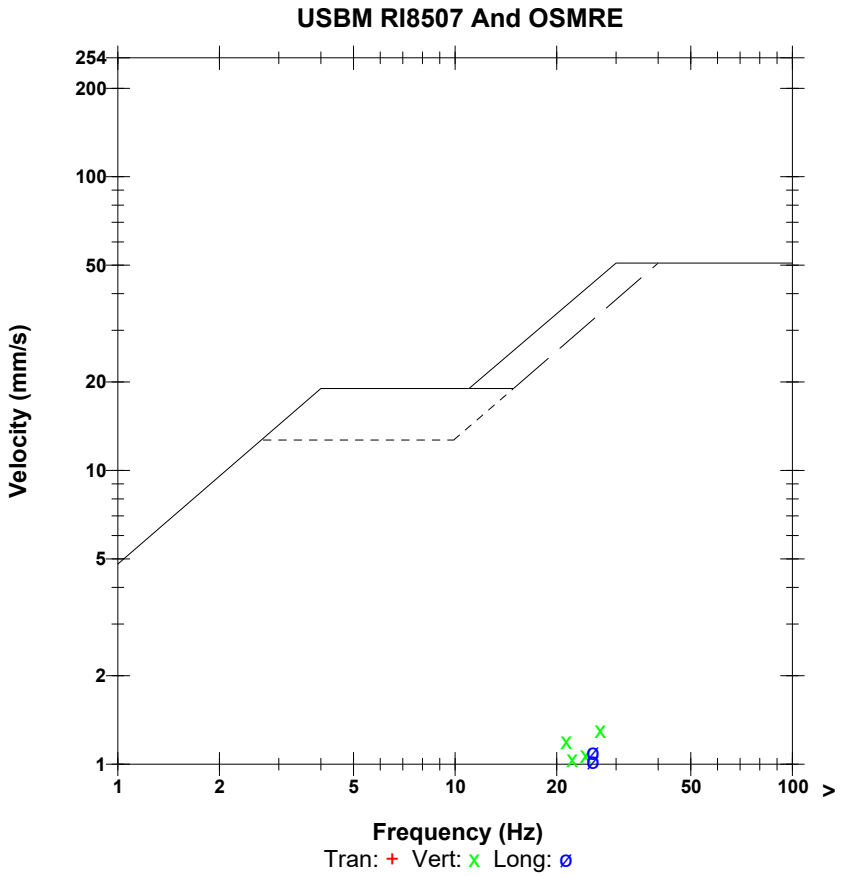
Extended Notes

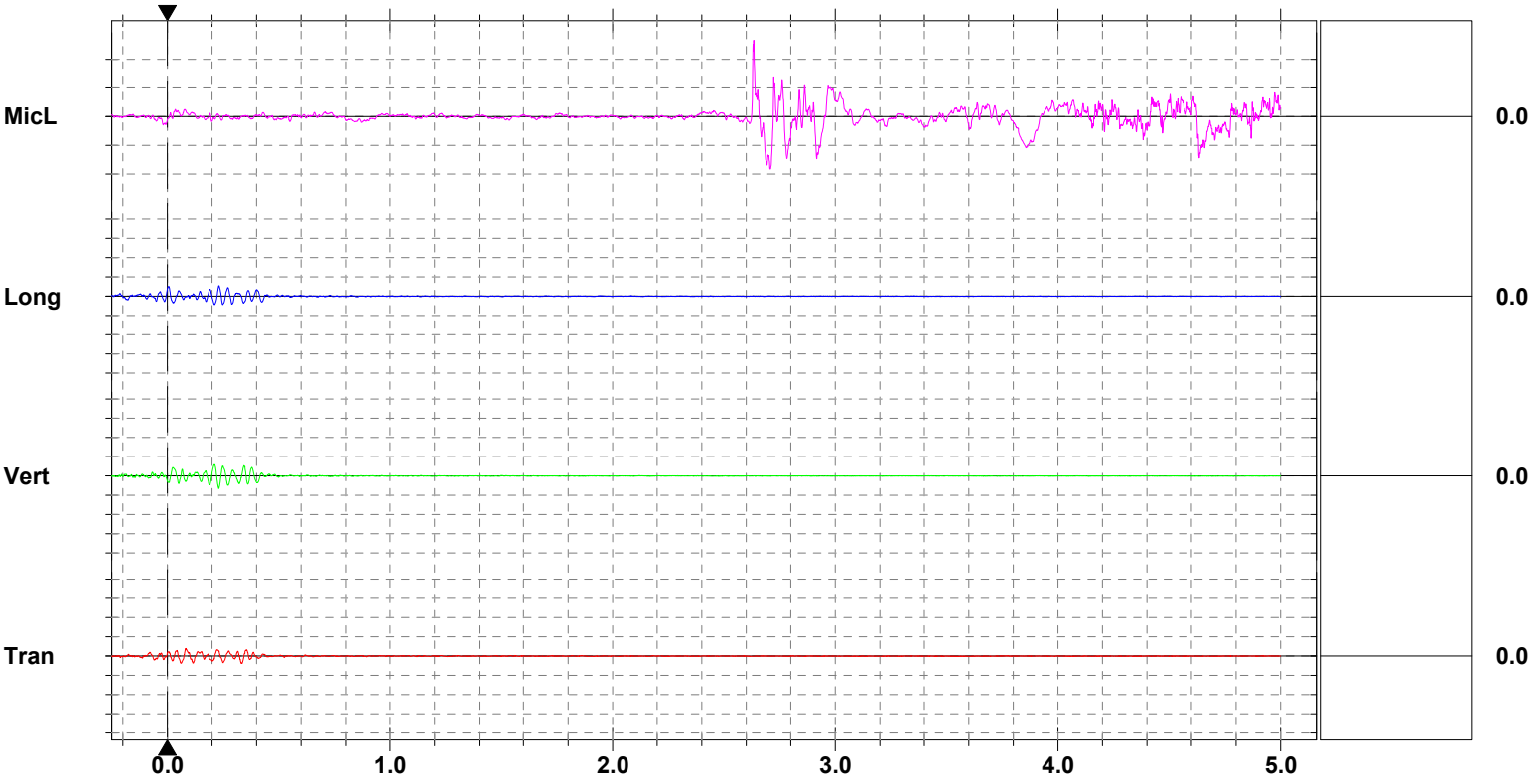
Unit is setup in front of the blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	116.5 dB(L) at 2.634 sec
ZC Freq	15 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	0.780	1.308	1.103	mm/s
ZC Freq	19	27	26	Hz
Time (Rel. to Trig)	0.082	0.230	0.231	sec
Peak Acceleration	0.026	0.030	0.020	g
Peak Displacement	0.006	0.009	0.007	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 1.782 mm/s at 0.230 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check

Trigger =

Event Report

Date/Time	Long at 11:58:49 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator/8F.MMB

Serial Number	UM11714 V 10-89 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	May 6, 2020 by Instantel
File Name	UM11714_20210408115849.IDFW

Notes

Location:	8-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to Ground

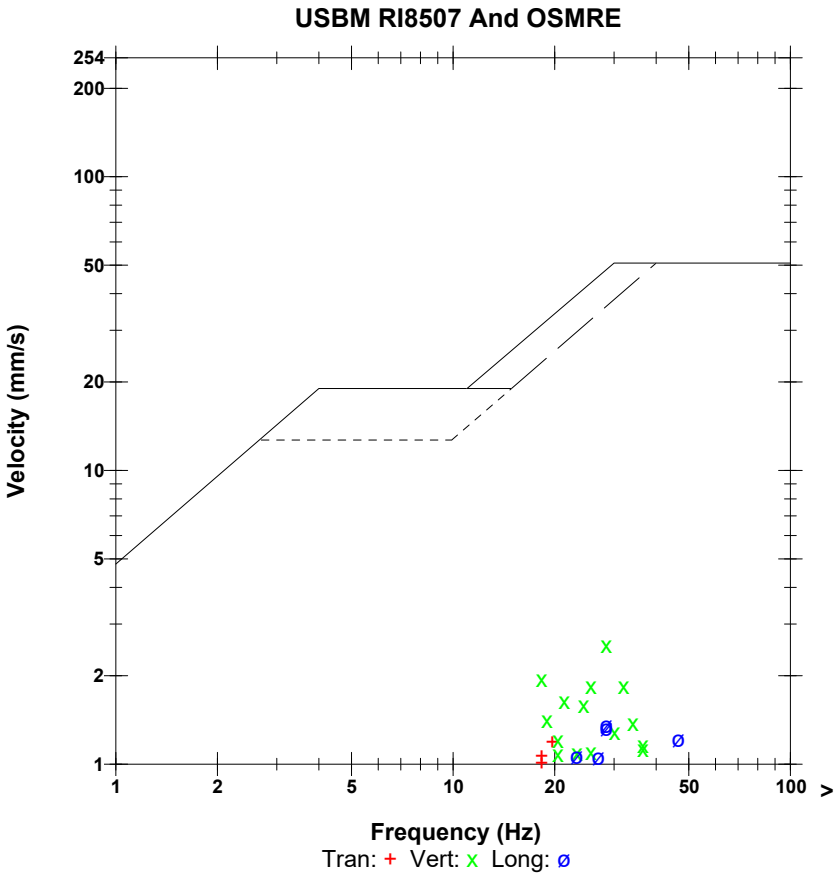
Extended Notes

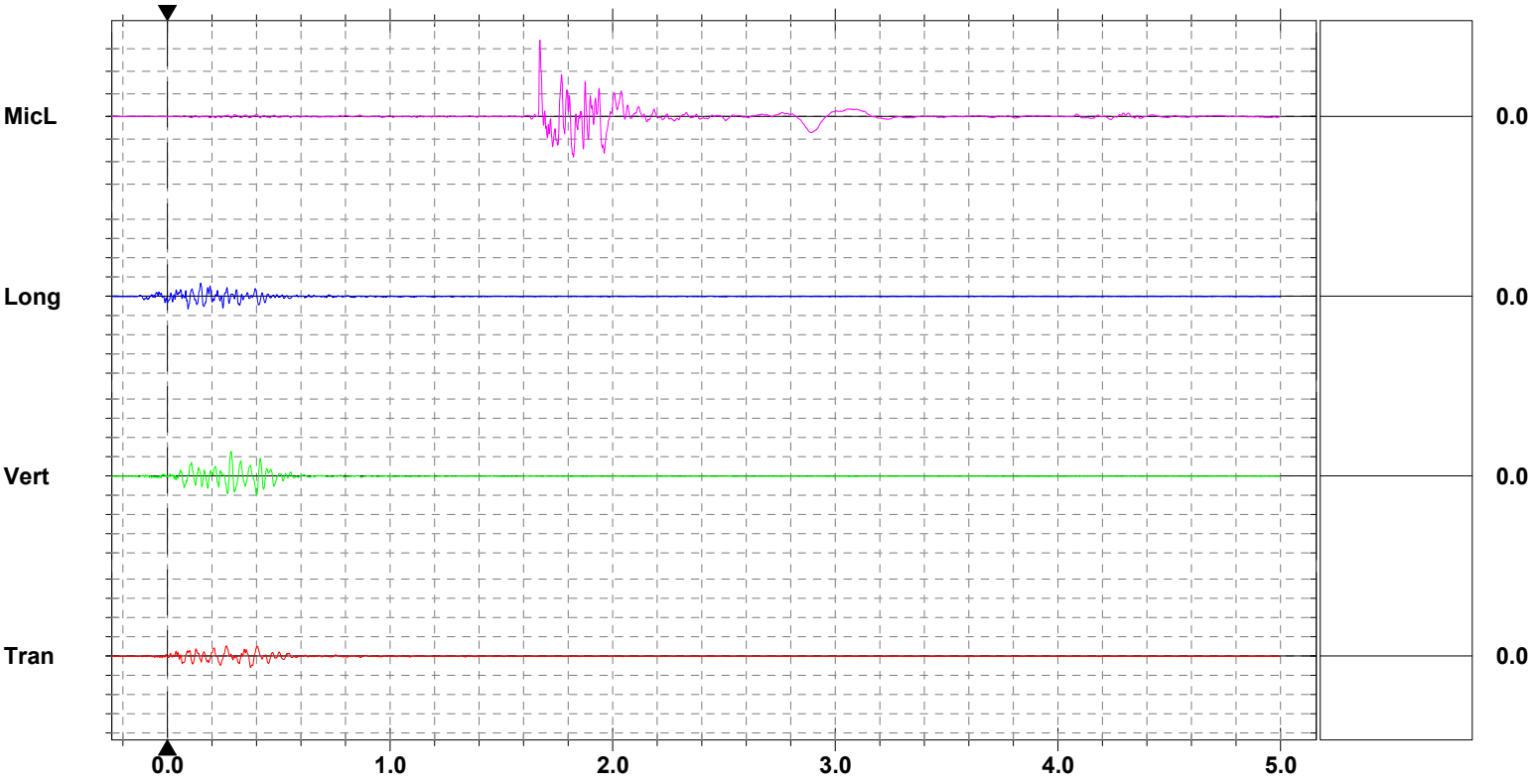
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	124.6 dB(L) at 1.674 sec
ZC Freq	23 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	1.190	2.554	1.356	mm/s
ZC Freq	20	28	28	Hz
Time (Rel. to Trig)	0.373	0.285	0.149	sec
Peak Acceleration	0.038	0.095	0.065	g
Peak Displacement	0.010	0.015	0.007	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 2.568 mm/s at 0.285 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check

Trigger = ▶——◀

Event Report

Date/Time	Vert at 11:58:49 April 8, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator/micromate front.mmb

Serial Number	UM13270 V 10-90 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	February 18, 2021 by Instantel
File Name	UM13270_20210408115849.IDFW

Notes

Location:	9-F
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to Ground

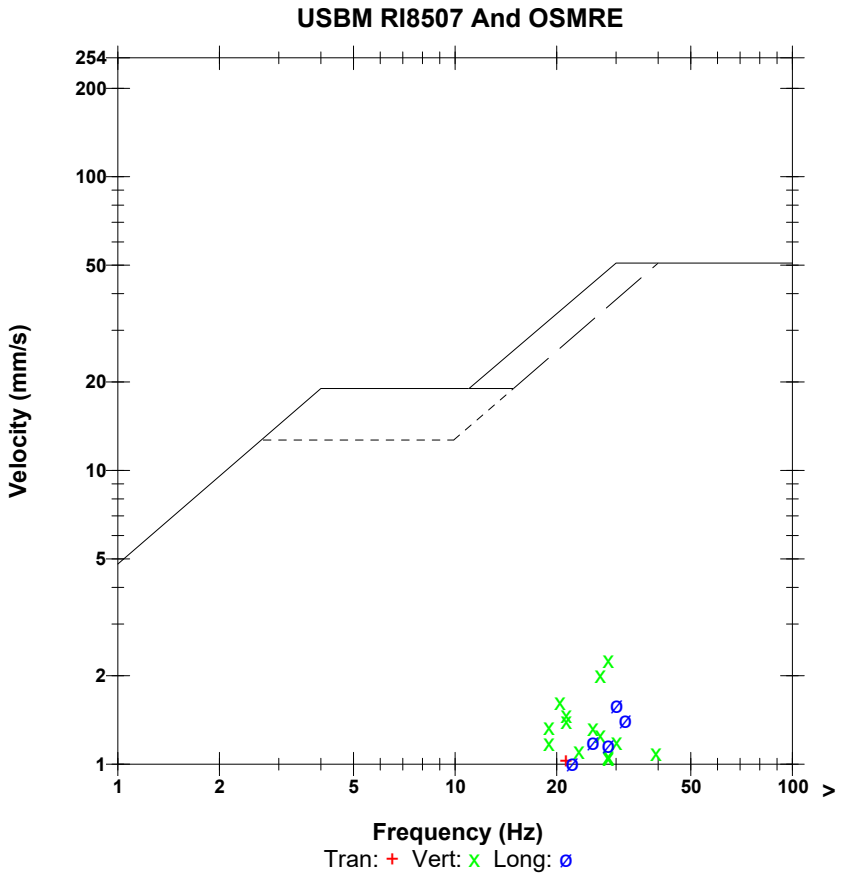
Extended Notes

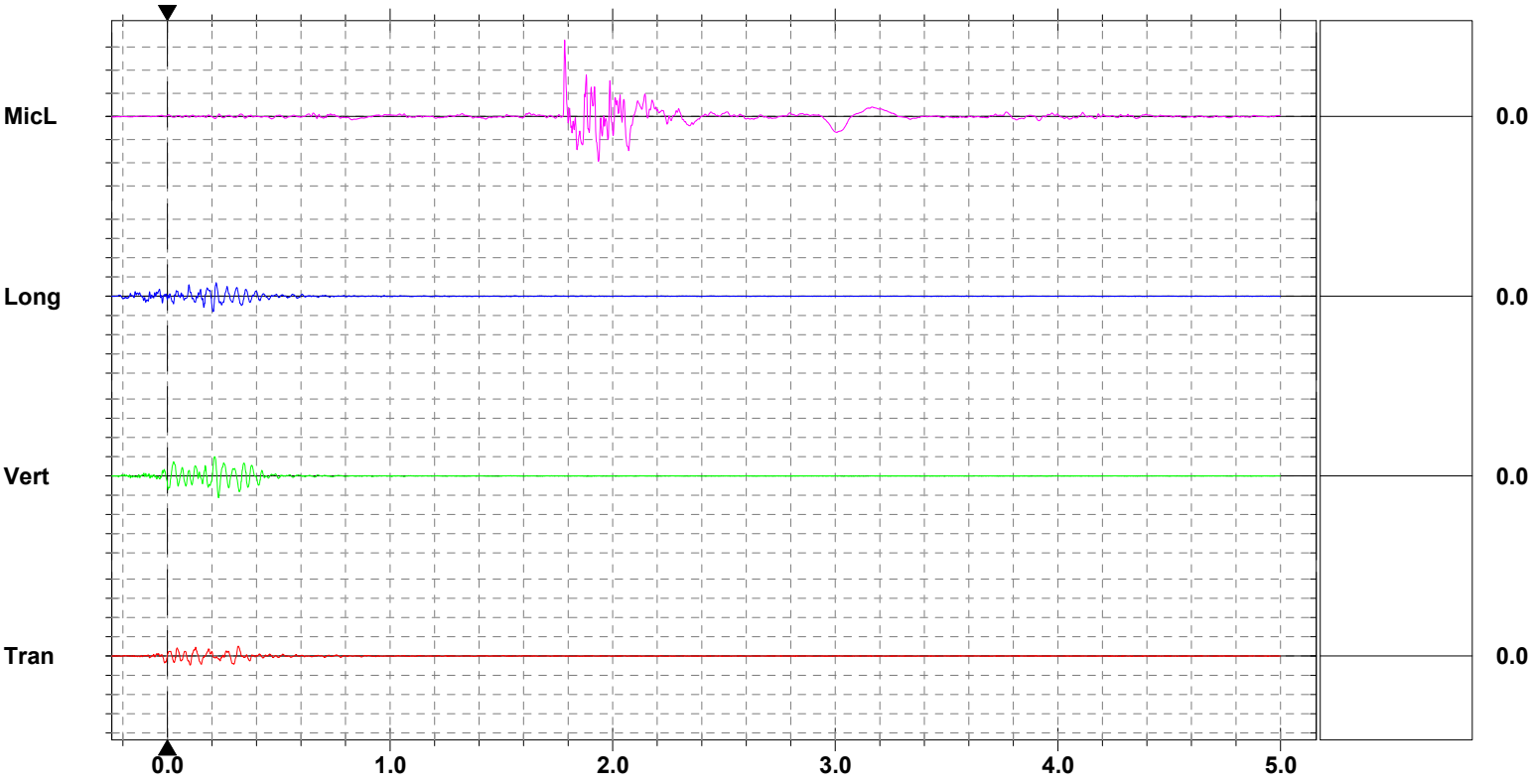
Unit is setup in front of blast for attenuation study for the West Carleton Quarry extension using standard practice methods.

Microphone	Linear Weighting
PSPL	124.3 dB(L) at 1.784 sec
ZC Freq	23 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	1.025	2.262	1.592	mm/s
ZC Freq	21	28	30	Hz
Time (Rel. to Trig)	0.317	0.229	0.205	sec
Peak Acceleration	0.039	0.049	0.073	g
Peak Displacement	0.007	0.013	0.008	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 2.289 mm/s at 0.229 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check

Trigger = ▶——◀

Event Report

Date/Time Long at 10:15:35 July 23, 2021
Trigger Source Geo: 0.750 mm/s
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps
Job Number: 8415

Serial Number BE9330 V 10.72-8.17 MiniMate Plus
Battery Level 6.3 Volts
Unit Calibration July 23, 2020 by Instantel
File Name K330J2UP.TZ0

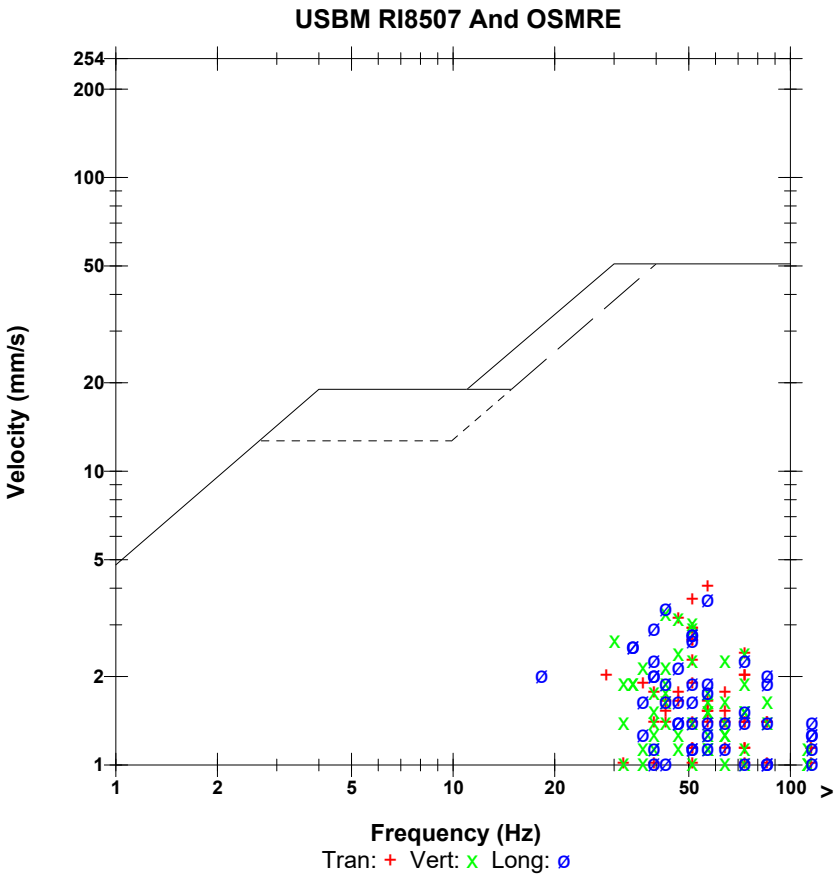
Notes
Location: F2
Client: M8415A - Cavanagh
User Name: Explotech Engineering Ltd.
General: Coupled to ground

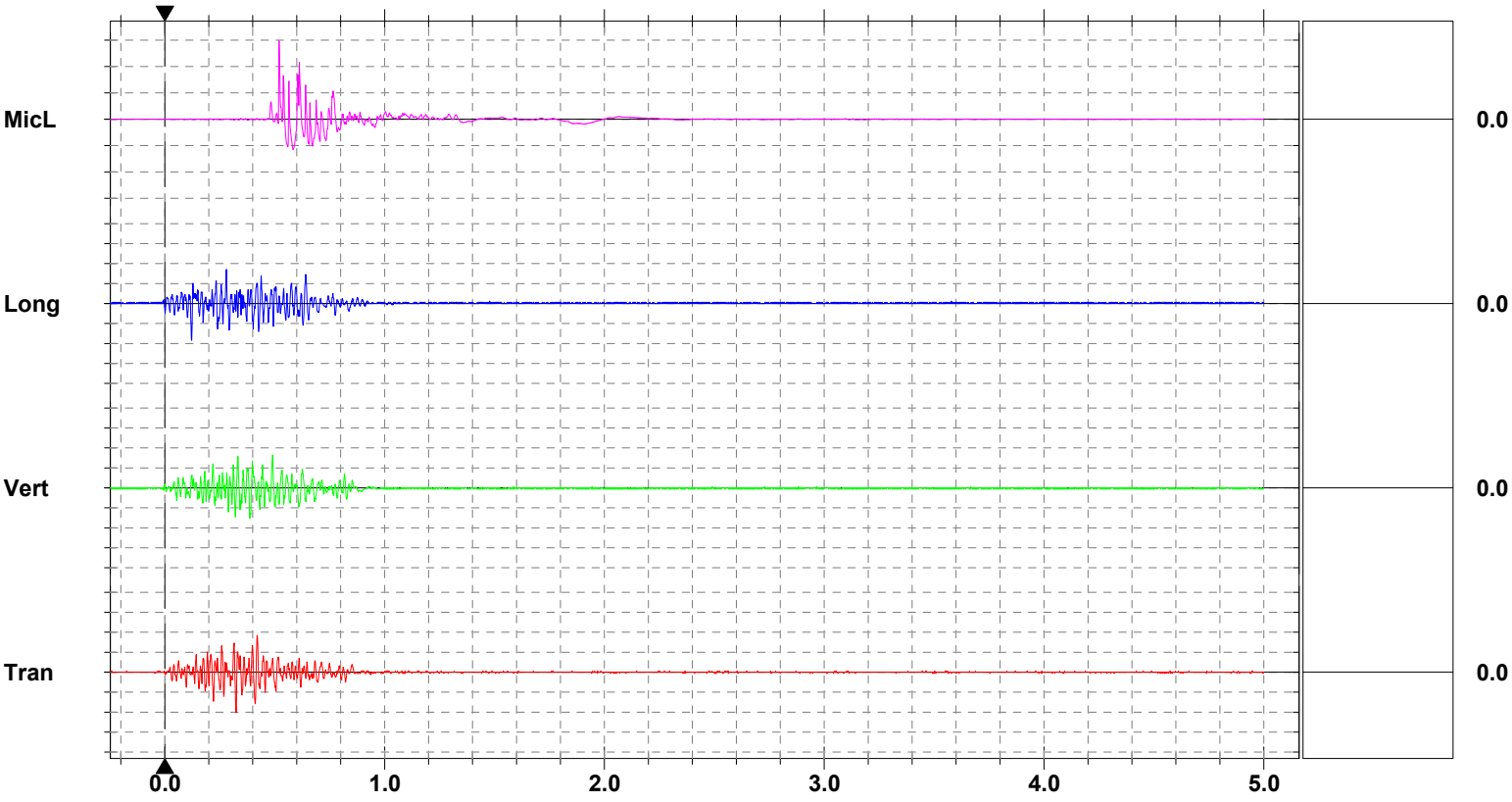
Extended Notes
Combo Mode July 23, 2021 08:57:40
Unit is setup behind the blast for attenuation study for the West Carleton Quarry Extension using standard practice methods.

Microphone Linear Weighting
PSPL 137.4 dB(L) at 0.520 sec
ZC Freq 32 Hz
Channel Test Disabled

	Tran	Vert	Long	
PPV	4.064	3.302	3.683	mm/s
ZC Freq	57	43	57	Hz
Time (Rel. to Trig)	0.324	0.490	0.122	sec
Peak Acceleration	0.172	0.119	0.133	g
Peak Displacement	0.012	0.011	0.011	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 4.239 mm/s at 0.324 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 10:15:47 July 23, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	AMA/M8415A - Front .nsb

Serial Number	MP13282 V 10-73 Minimate Pro 4
Battery Level	4.1 Volts
Unit Calibration	Uninitialized
Geo1 Calibration	SE12641, March 3, 2021 by Instantel
Mic Calibration	SL12571, March 18, 2021 by Instantel
File Name	MP13282_20210723101547.IDFW

Notes

Location:	F6
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to ground

Extended Notes

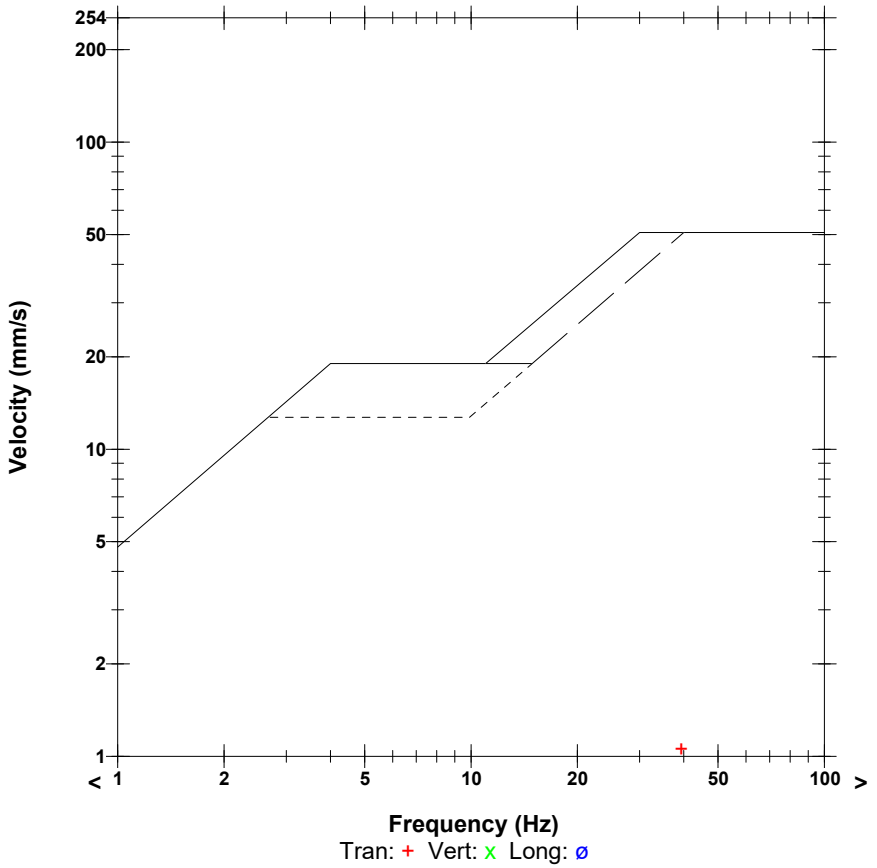
Unit is setup in front of the blast for attenuation study for the West Carleton Quarry Extension using standard practice methods.

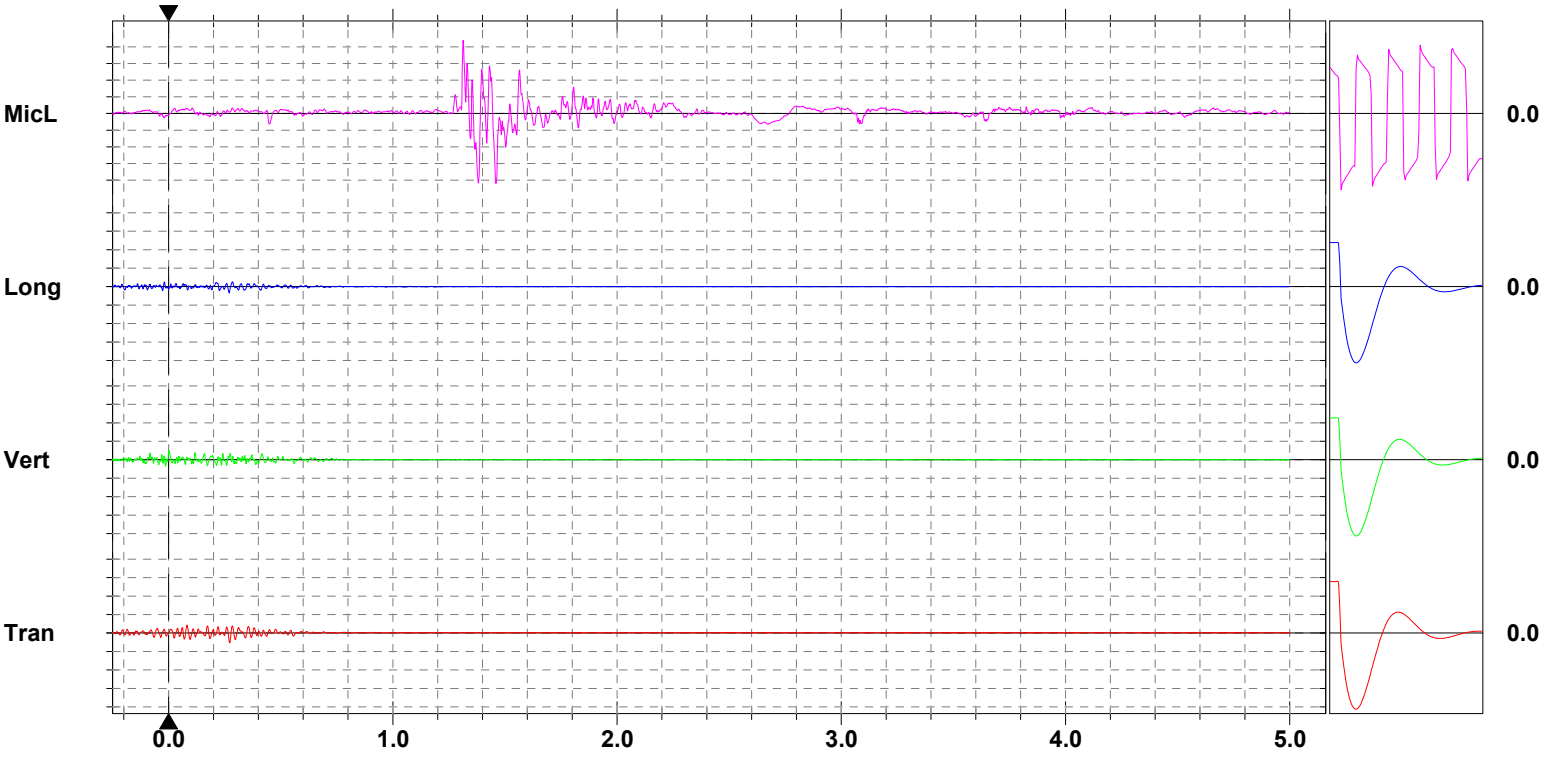
Microphone	Linear Weighting
PSPL	120.8 dB(L) at 1.313 sec
ZC Freq	6.8 Hz
Channel Test	Passed (Freq = 20.4 Hz Amp = 1622 mv)

	Tran	Vert	Long	
PPV	1.056	0.985	0.686	mm/s
ZC Freq	39	39	39	Hz
Time (Rel. to Trig)	0.272	0.002	0.270	sec
Peak Acceleration	0.026	0.035	0.019	g
Peak Displacement	0.032	0.004	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.3	Hz
Overswing Ratio	3.6	3.7	3.8	

Peak Vector Sum 1.240 mm/s at 0.272 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check

Trigger =

Event Report

Date/Time	Long at 10:15:47 July 23, 2021
Trigger Source	Geo: 0.750 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps
Job Number:	8415
Operator/Setup:	Operator 1/M8415A - Pro .nsb

Serial Number	MP13427 V 10-72 Minimate Pro 4 XM
Battery Level	4.1 Volts
Unit Calibration	October 30, 2020 by Instantel
Geo1 Calibration	SE12643, November 9, 2020 by Instantel
Mic Calibration	SL12601, March 18, 2021 by Instantel
File Name	MP13427_20210723101547.IDFW

Notes

Location:	F7
Client:	M8415A - Cavanagh
User Name:	Explotech Engineering Ltd.
General:	Coupled to ground

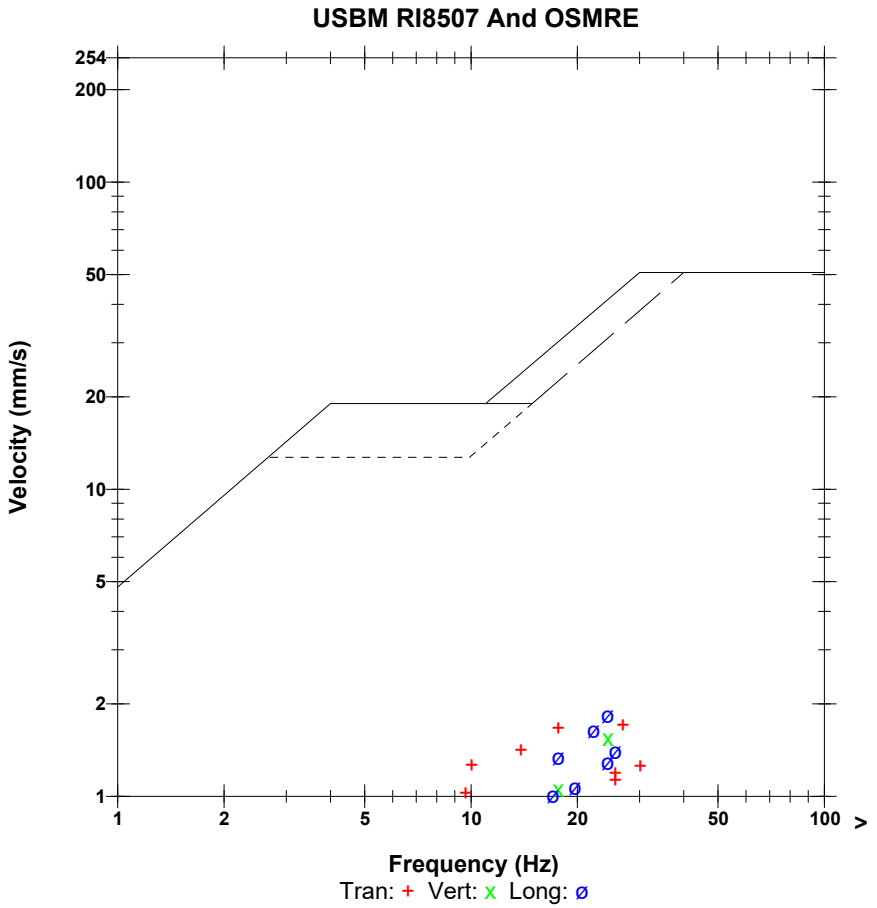
Extended Notes

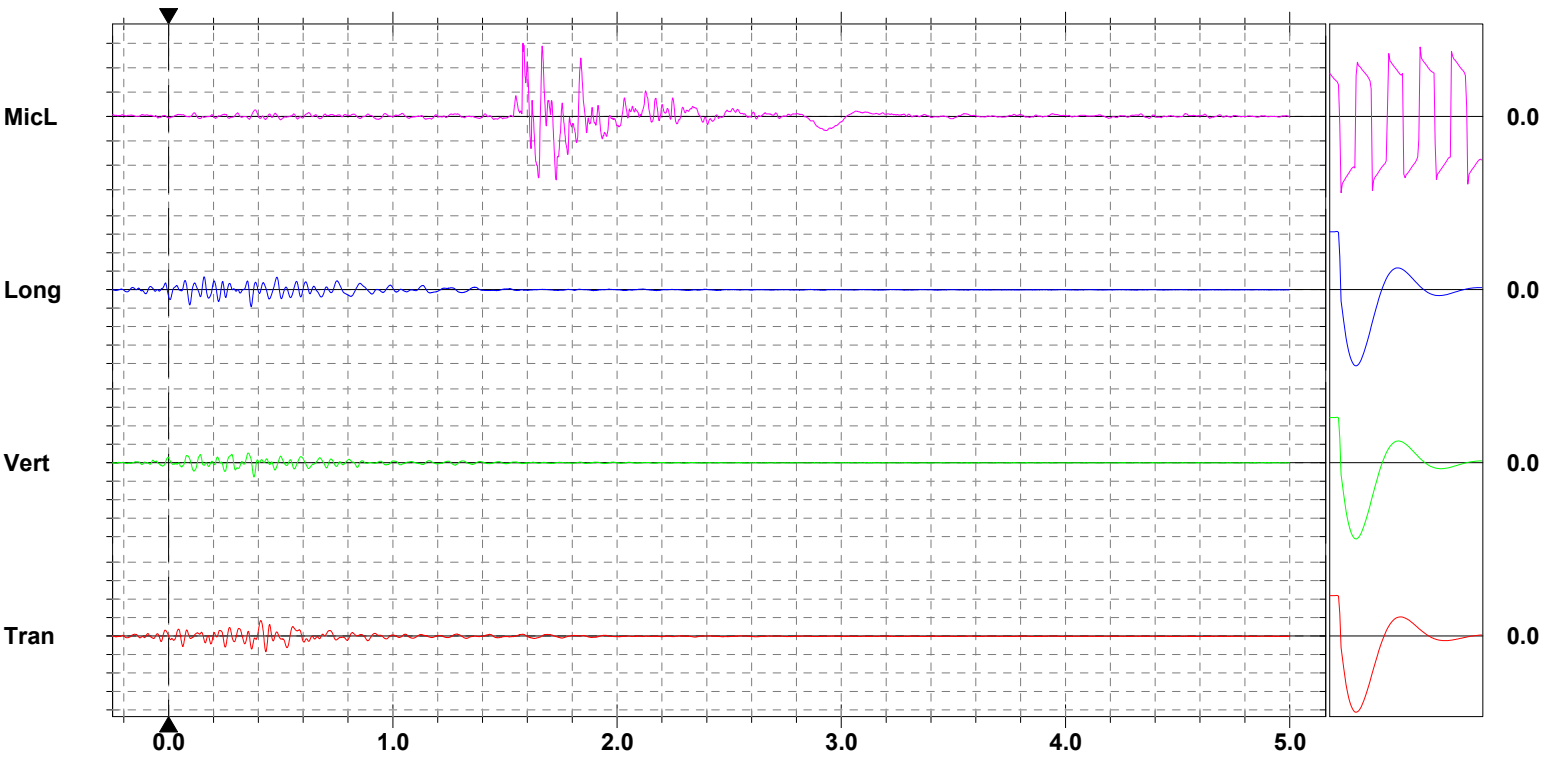
Unit is setup in front of the blast for attenuation study for the West Carleton Quarry Extension using standard practice methods.

Microphone	Linear Weighting
PSPL	117.5 dB(L) at 1.580 sec
ZC Freq	6.9 Hz
Channel Test	Passed (Freq = 20.4 Hz Amp = 1676 mv)

	Tran	Vert	Long	
PPV	1.702	1.545	1.836	mm/s
ZC Freq	27	24	24	Hz
Time (Rel. to Trig)	0.434	0.381	0.368	sec
Peak Acceleration	0.028	0.022	0.028	g
Peak Displacement	0.017	0.010	0.014	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.7	Hz
Overswing Ratio	4.0	3.5	3.5	

Peak Vector Sum 2.279 mm/s at 0.368 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check

Trigger =

BLAST REPORT SUMMARY

Blast#	Date	Time	Weather	Wind From	Wind Velocity	Max Kg /Delay	Hole Dia. (in.)	# Of Rows	# Of Holes	Ave Hole Depth	Total Tons	Location	Monitor 1 (mm/s)	Monitor 1 (dbl.)	Monitor 1 Distance	Monitor 2 Location	Monitor 2 (mm/s)	Monitor 2 (dbl.)	Monitor 2 Distance	Monitor 2 Location	Monitor 2 (mm/s)	Monitor 2 (dbl.)	Monitor 2 Distance
17001	Jun 9/17	12:30	Cloudy	NE	20-30	75.3	3.5	7	127	9.45	32380.2	1331 Dwire Hill	1.6	113.0	1198.2	1550 Dwire Hill	DNT	DNT	1344.5	3950 March	DNT	DNT	1344.5
17002	Jun 20/17	12:00	Clear	S	20-35	73.90	3.5	8	108	9.14	???	1331 Dwire Hill	DNT	DNT	1236.0	1550 Dwire Hill	1.53	111.0	1318.3	3950 March	1.53	111.0	1318.3
17003	Jul 31/17	10:00	Cloudy	SSW	0-5	91.4	4	6	60	9.14	17706.3	1331 Dwire Hill	DNT	DNT	1463.3	1550 Dwire Hill	2.73	114	826.92	3950 March	1.426	116	1097.28
17004	Aug 01/17	12:00	Clear	WSW	0-5	175.1	4	5	112	16.46	66103.2	1331 Dwire Hill	1.5	116.0	1576.7	1550 Dwire Hill	3.49	119	885.75	3950 March	2.416	113	1135.08
17005	Aug 10/17	13:07	Cloudy	SSW	15-25	173.8	4	5	115	16.76	66125.2	1331 Dwire Hill	4.5	127.7	1617.3	1550 Dwire Hill	1.81	119	860.15	3950 March	0.58	124	1093.93
17006	Sep 13/17	12:50	Clear	SW	0.00	144.70	3.75	5	125	16.61	55166.2	1331 Dwire Hill	3.5	116.0	1662.4	1550 Dwire Hill	4.11	122	???	3950 March	0.52	117	1103.07
17007	Sep 25/16	15:00	Clear	SSW	10-May	79	3.5	6	180	10.06	49593.8	1331 Dwire Hill	DNT	DNT	1459.7	1550 Dwire Hill	2.93	112	767.79	3950 March	0.31	113	1033.58
17008	Oct 04/17	13:00	Part Cloud	WSW	15-25	77.30	3.5	6	180	10.06	49593.8	1331 Dwire Hill	DNT	DNT	1499.6	1550 Dwire Hill	2.37	110.0	742.8	3950 March	0.25	115.0	995.5
18001	Mar 14/18	14:45	Heavy Snow	NE	0-5	91.60	4	5	112	3.66	9745.8	1331 Dwire Hill	DNT	DNT	1351.8	1550 Dwire Hill	1.29	108	990.9				
18002	Mar 16/18	10:20	Part Cloud	NE	35-50	29.40	4	4	63	3.66	5738.1	1331 Dwire Hill	DNT	DNT	1380.4	1550 Dwire Hill	0.22	119.0	969.6				
18003	Apr 2/18	16:30	Cloudy	NNE	0-5	36.50	4	4	86	3.96	8091.0	1331 Dwire Hill	DNT	DNT	1422.5	1550 Dwire Hill	0.22	119.0	1004.0				
18004	Apr 3/18	10:15	Cloudy	NNE	0-5	31.60	4	8	79	3.96	7005.6	1331 Dwire Hill	DNT	DNT	1434.7	1550 Dwire Hill	DNT	DNT	929.6				
18005	May 22/18	13:00	Light Rain	WSW	0-5	182.80	4	4	84	17.22	51872.2	1331 Dwire Hill	1.5	117.0	1647.8	1550 Dwire Hill	4.1	116.0	926.0	3950 March	1.82	113.0	1161.3
18006	May 29/18	17:00	Hazy Hot & Humid	S	0-5	189.10	4	8	94	17.83	60102.8	1331 Dwire Hill	1.9	115.0	1669.1	1550 Dwire Hill	5.15	116.0	949.2				
18007	Jun 1/18	12:00	Hazy Hot & Humid	S	0-1	21.30	3.5	15	182	3.44	15609.8	1331 Dwire Hill	DNT	DNT	1393.6	1550 Dwire Hill	DNT	DNT	1139.7				
18008	Jun 1/18	14:30	Light Rain	S	0-3	140.40	4	5	97	17.68	46752.0	1331 Dwire Hill	DNT	DNT	1669.1	1550 Dwire Hill	3.58	115.0	936.7				
18009	Sep 7/18	12:04	Clear	W	0-5	77.80	3.75	6	112	9.75	29777.6	1331 Dwire Hill	DNT	DNT	1454.5	1550 Dwire Hill	4.56	116.0	668.7				
18010	Sep 11/18	11:30	Overcast	N	0-2	77.40	3.75	5	129	9.75	34343.8	1331 Dwire Hill	2.6	93.0	1477.7	1550 Dwire Hill	4.51	117.0	670.6				
18011	Sep 13/18	12:17	Clear	E	3--6	79.20	3.75	4	191	9.75	59272.3	1331 Dwire Hill	2.4	105.0	1472.8	1550 Dwire Hill	3.34	114.0	634.3				
18012	Oct 15/18	11:00	Light Rain	NE	2--12	77.93	3.5	4	120	10.06	35514.4	1331 Dwire Hill	0.1	105.0	1548.0	1550 Dwire Hill	0.13	111.0	764.0				
18013	Oct 26/18	10:15	Partly cloudy	NW	4--6	75.70	4	5	150	10.06	40272.8	1331 Dwire Hill	2.1	110.0	1505.7	1550 Dwire Hill	2.74	115.0	680.3				
18014	Nov 2/18	13:15	Light Rain	N	0-5	77.90	4	6	109	9.14	35740.4	1331 Dwire Hill	DNT	DNT	1237.5	1550 Dwire Hill	DNT	DNT	1346.3				
18015	Nov 9/18	13:40	Heavy Snow	NE	10--15	95.80	4	5	95	9.14	31149.8	1331 Dwire Hill	***1.606	108.4	1199.7	1550 Dwire Hill	DNT	DNT	1336.6				
18016	Dec 1/18	10:05	Clear	SSW	2--14	83.50	4	7	89	9.45	29474.5	1331 Dwire Hill	DNT	114.0	1172.3	1550 Dwire Hill	DNT	DNT	1355.5				
18016	Dec 4/18	13:30	Part Cloud	N	5--10	82.20	4	5	106	9.45	34221.2	1331 Dwire Hill	0.2	118.0	1210.7	1550 Dwire Hill	2.3	114.0	1372.5				
19001	Apr 12/19	10:50	Cloudy	S	10--15	163.10	4	5	75	17.53	43992.4	1331 Dwire Hill	DNT	DNT	1618.2	1550 Dwire Hill	DNT	DNT	830.3				
19002	Apr 15/19	11:00	Light Rain	N	0-5	163.50	4	5	75	17.53	43992.4	1331 Dwire Hill	DNT	DNT	1680.1	1550 Dwire Hill	4.62	106.0	902.5				
19003	Apr 17/19	11:00	Clear	S	0-5	182.50	4	5	45	18.44	26450.1	1331 Dwire Hill	DNT	DNT	1663.3	1550 Dwire Hill	3.37	117.0	882.7				
19004	Jul 26/19	10:14	Clear	S	0-1	91.40	4	5	179	9.60	59906.1	1331 Dwire Hill	1.5	96.0	1571.6	1550 Dwire Hill	3.06	118.0	776.3				
19005	Jul 30/19	12:36	Light Rain	W	2--5	91.50	4	5	180	9.75	62955.5	1331 Dwire Hill	1.4	115.0	1592.3	1550 Dwire Hill	4.18	97.0	789.1				
19006	Sep 6/19	10:29	Clear	ESE	4--8	164.00	4	6	77	17.68	48812.4	1331 Dwire Hill	1.6	94.0	1677.3	1550 Dwire Hill	2.91	117.0	919.6				
19007	Sep 9/19	10:49	Clear	W	0-3	155.50	4	6	78	17.62	58459.1	1331 Dwire Hill	1.4	94.0	1699.6	1550 Dwire Hill	3.61	114.0	929.3				
19008	Sep 11/19	12:59	Clear	W	2--4	159.80	4	4	38	17.98	24504.4	1331 Dwire Hill	2.9	99.0	1737.1	1550 Dwire Hill	1.18	122.0	981.5				
19009	Oct 7/19	10:50	Cloudy	W	5--10	82.10	4	5	110	9.14	36068.2	1331 Dwire Hill	***4.239	97.5	1210.7	1550 Dwire Hill	***0.925	114.2	1372.5				
19010	Oct 10/19	10:43	Clear	E	3--7	87.20	4	5	115	9.14	37707.7	1331 Dwire Hill	DNT	DNT	1231.4	1550 Dwire Hill	3.28	88.0	1377.7				
19011	Oct 15/19	10:25	Clear	W	3--7	82.70	4	4	113	8.84	27272.1	1331 Dwire Hill	2.0	117.0	1240.8	1550 Dwire Hill	1.21	94.0	1407.6				
19012	Nov 13/19	12:15	Clear	N	8--14	69.40	3.5	7	136	9.45	31294.1	1331 Dwire Hill	1.4	117.0	1266.4	1550 Dwire Hill	1.28	94.0	1428.0				
19013	Nov 20/19	15:56	Partly cloudy	N	1--3	72.40	3.5	8	115	9.45	26435.1	1331 Dwire Hill	1.9	98.0	1277.7	1550 Dwire Hill	1.83	109.0	1439.0				
19014	Nov 21/19	16:00	Partly cloudy	S	2--5	68.10	3.5	7	97	9.45	22823.4	1331 Dwire Hill	1.7	108.0	1283.8	1550 Dwire Hill	1.28	106.0	1405.4				
19015	Dec 2/19	11:33	Partly cloudy	NE	20--30	65.60	4	4	81	9.45	18117.5	1331 Dwire Hill	1.0	99.0	1298.1	1550 Dwire Hill	1.73	108.0	1432.6				
19016	Dec 4/19	13:59	Light Snow	SW	2--5	66.10	3.5	5	57	9.14	12979.0	1331 Dwire Hill	1.9	104.0	1303.0	1550 Dwire Hill	DNT	DNT	1424.6				
19017	Dec 10/19	9:31	Partly cloudy	N	4--9	56.80	3.5	5	56	9.14	12751.3	1331 Dwire Hill	0.2	113.0	1286.9	1550 Dwire Hill	1.88	88.0	1390.5				
19018	Dec 13/19	9:59	Partly cloudy	SW	5--7	64.80	3.5	6	72	9.14	16394.6	1331 Dwire Hill	1.4	88.0	1289.0	1550 Dwire Hill	0.22	111.0	1363.7				
20-001	Apr 1/20	9:00	Clear	E	2--5	69.30	3.5	7	55	8.53	13729.1	1331 Dwire Hill	DNT	DNT	1620.0	1550 Dwire Hill	3.23	104.0	811.4				
20-002	Apr 2/20	10:12	Clear	NW	5--9	138.70	3.25	3	69	17.98	29555.8	1331 Dwire Hill	0.2	121.0	1693.2	1550 Dwire Hill	5.27	119.0	875.4				
20-003	Apr 6/20	10:27	Clear	S	0--3	139.90	3.5	3	73	17.98	32451.0	1331 Dwire Hill	0.2	115.0	1661.2	1550 Dwire Hill	3.07	120.0	843.7				
20-004	Apr 8/20	12:30	Cloudy	SE	3---10	175.20	4	3	73	17.98	34499.9	1331 Dwire Hill	DNT	DNT	1669.4	1550 Dwire Hill	4.97	113.0	846.1				
20-005	Sep 22/20	10:31	Clear	S	4--9	169.80	4	4	61	18.59	37410.1	1331 Dwire Hill	0.3	119.0	1690.4	1550 Dwire Hill	1.38	119.0	911.7				
20-006	Sep 25/20	11:31	Cloudy	S	3---6	140.40	3.5	5	66	18.44	30307.3	1331 Dwire Hill	DNT	DNT	1715.1	1550 Dwire Hill	1.50	115.0	924.2				
20-007	Sep 28/20	11:33	Clear	S	25-30	137.50	3.5	3	84	17.98	36273.2	1331 Dwire Hill	DNT	DNT	1676.4	1550 Dwire Hill	2.80	117.0	845.5				
20-008	Oct 28/20	13:17	Partly cloudy	SW	7--9	71.50	3.5	9	117	9.45	27529.3	1331 Dwire Hill	1.7	112.0	1320.1	1550 Dwire Hill	0.55	116.0	1419.2				
20-009	Oct 30/20	12:16	Clear	NW	3--6	78.00	3.5	5	126	9.75	30603.3	1331 Dwire Hill	0.3	111.0	1297.2	1550 Dwire Hill	DNT	DNT	1309.7				
20-010	Nov 2/20	10:58	Cloudy	NW	25-31	72.90	3.5	9	108	9.45	25411.7	1331 Dwire Hill	1.4	115.0	1306.4	1550 Dwire Hill	DNT	DNT	1371.9				
20-011	Nov 9/20	10:30	Clear	S	3--5	75.60	3.5	5	120	9.45	28235.3	1331 Dwire Hill	2.0	109.0	1339.9	1550 Dwire Hill	DNT	DNT	1351.2				

*** Corrected vibration information. Blast report contained incorrect vibration data, further review of the forwarded seismograph event reports confirmed correct vibrations

Executed by Explotech for the purpose of West Carleton Quarry Extension

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-01 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 06/09/2017 12:30 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - SEISMOGRAPH 1

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	06/09/17	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.635 mm/s	28.0 Hz
Time:	12:30	Calibration Date:	03/06/17		Vertical:	1.397 mm/s	21.0 Hz
Distance From Blast:	1,198.17 m	Calibration Signal:			Longitudinal:	1.397 mm/s	21.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	--- Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	--- Hz		Acoustic:	113 dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	1.555 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	William Coleman, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	06/09/17	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	12:30	Calibration Date:	03/06/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,344.47 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	N	Geophone Min. Freq.:	--- Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	--- Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	William Coleman, Austin Powder						

No Trigger

Event Report: Monitor Log - Minimate Blaster # BE15020-Compliance

1550 Dwyer Hill Rd.

Start Time	End Time	Status
		SERIAL NUMBER: BE15020
May 31 /17 11:26:04		Start Monitoring Trigger Level: Geo: 1.70 mm/s
May 31 /17 11:55:04	May 31 /17 11:55:09	Event recorded. Trigger Level Long: 1.70 mm/s
May 31 /17 11:55:23	May 31 /17 12:28:36	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s
Jun 9 /17 11:34:55	Jun 9 /17 12:45:03	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s

Instantel

Event Report

Date/Time	Vert at 12:29:02 June 9, 2017
Trigger Source	Geo: 1.230 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q589GXFU.OE0

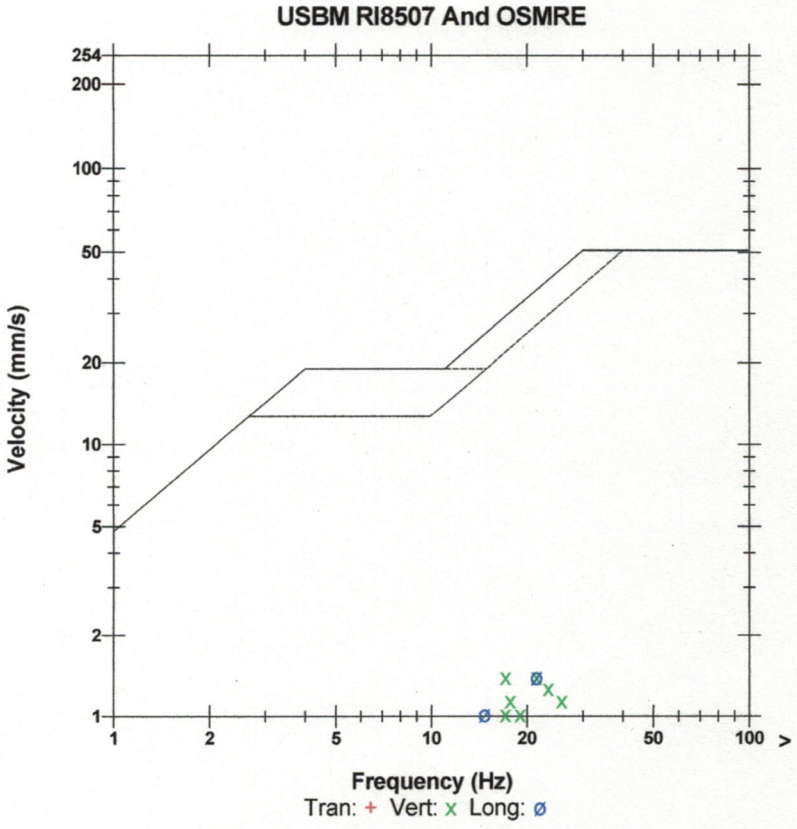
Post Event Notes
set up at 1331 Dwire Hill rd, geo spiked and wieght bagged.

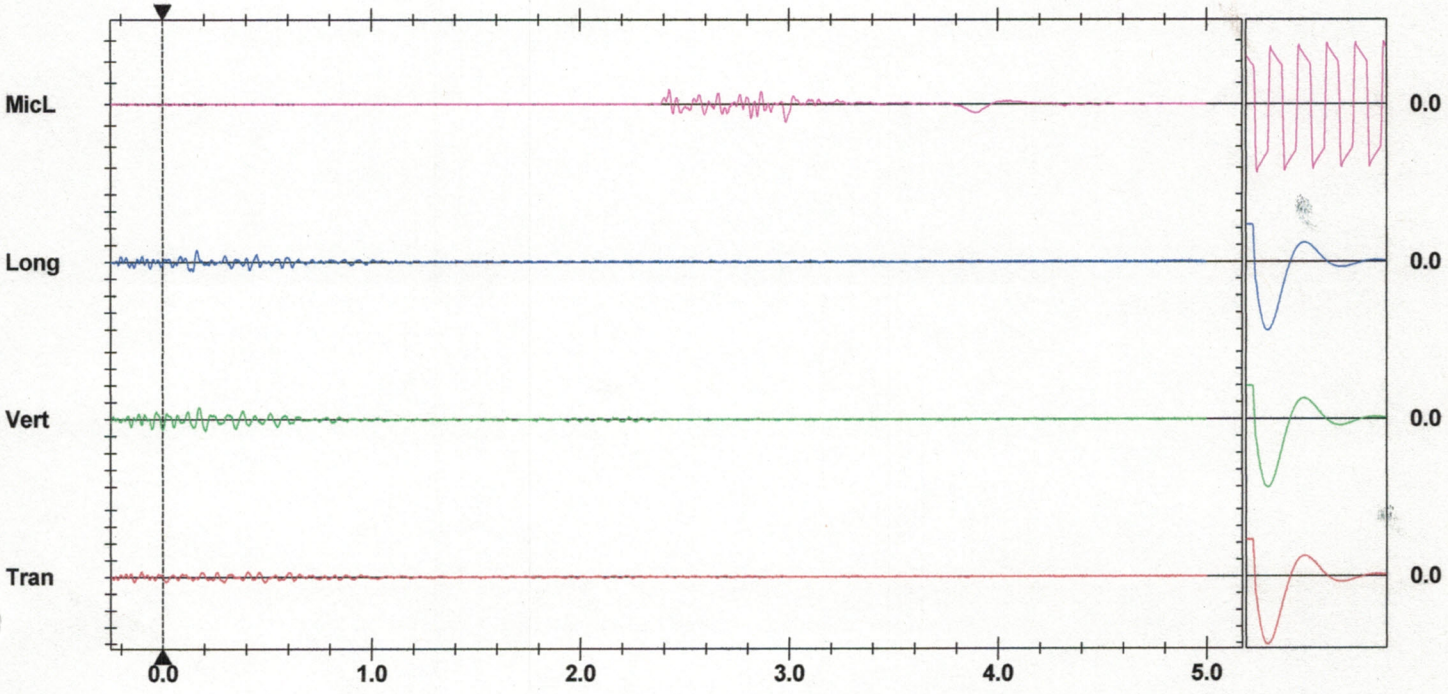
Extended Notes

Microphone	Linear Weighting
PSPL	112.6 dB(L) at 2.983 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 517 mv)

	Tran	Vert	Long	
PPV	0.635	1.397	1.397	mm/s
ZC Freq	28	21	21	Hz
Time (Rel. to Trig)	-0.141	0.172	0.161	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.006	0.013	0.013	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.9	7.8	Hz
Overswing Ratio	3.4	3.4	3.6	

Peak Vector Sum 1.555 mm/s at 0.170 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger =

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-02 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 06/20/2017 12:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - SEISMOGRAPH 1

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	06/20/17	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	12:30	Calibration Date:	03/06/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,235.96 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	--- Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	--- Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	06/20/17	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.016 mm/s	28.0 Hz
Time:	12:30	Calibration Date:	03/06/17		Vertical:	1.016 mm/s	47.0 Hz
Distance From Blast:	1,318.26 m	Calibration Signal:			Longitudinal:	1.27 mm/s	27.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	--- Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz		Acoustic:	111 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	1.529 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

Instantel

Event Report

2

Date/Time	Long at 12:00:54 June 20, 2017
Trigger Source	Geo: 1.200 mm/s
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q020GY06.PI0

Notes
Location:
Client:
User Name:
General:

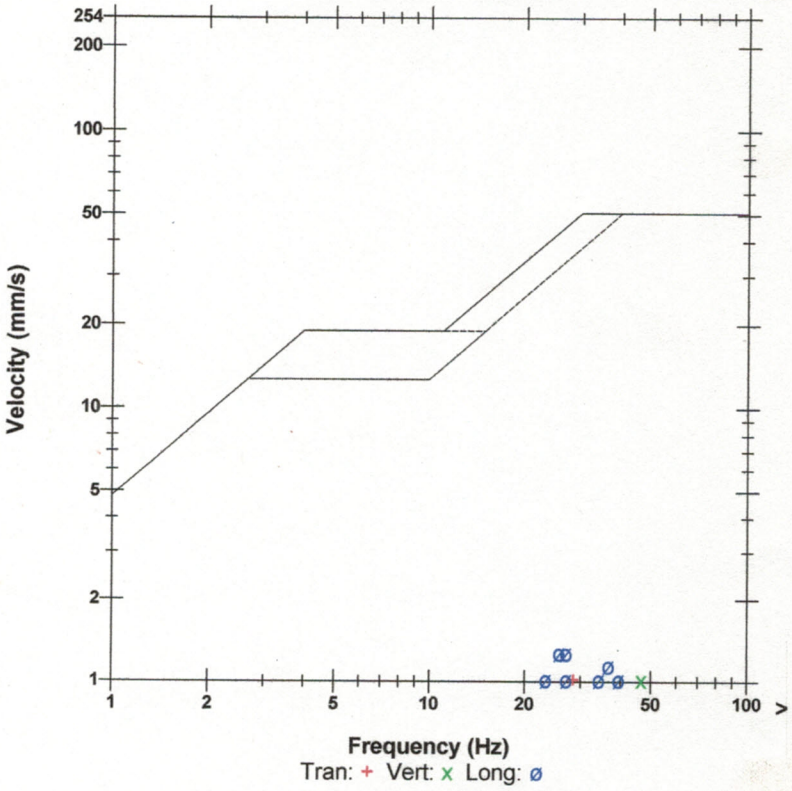
Extended Notes

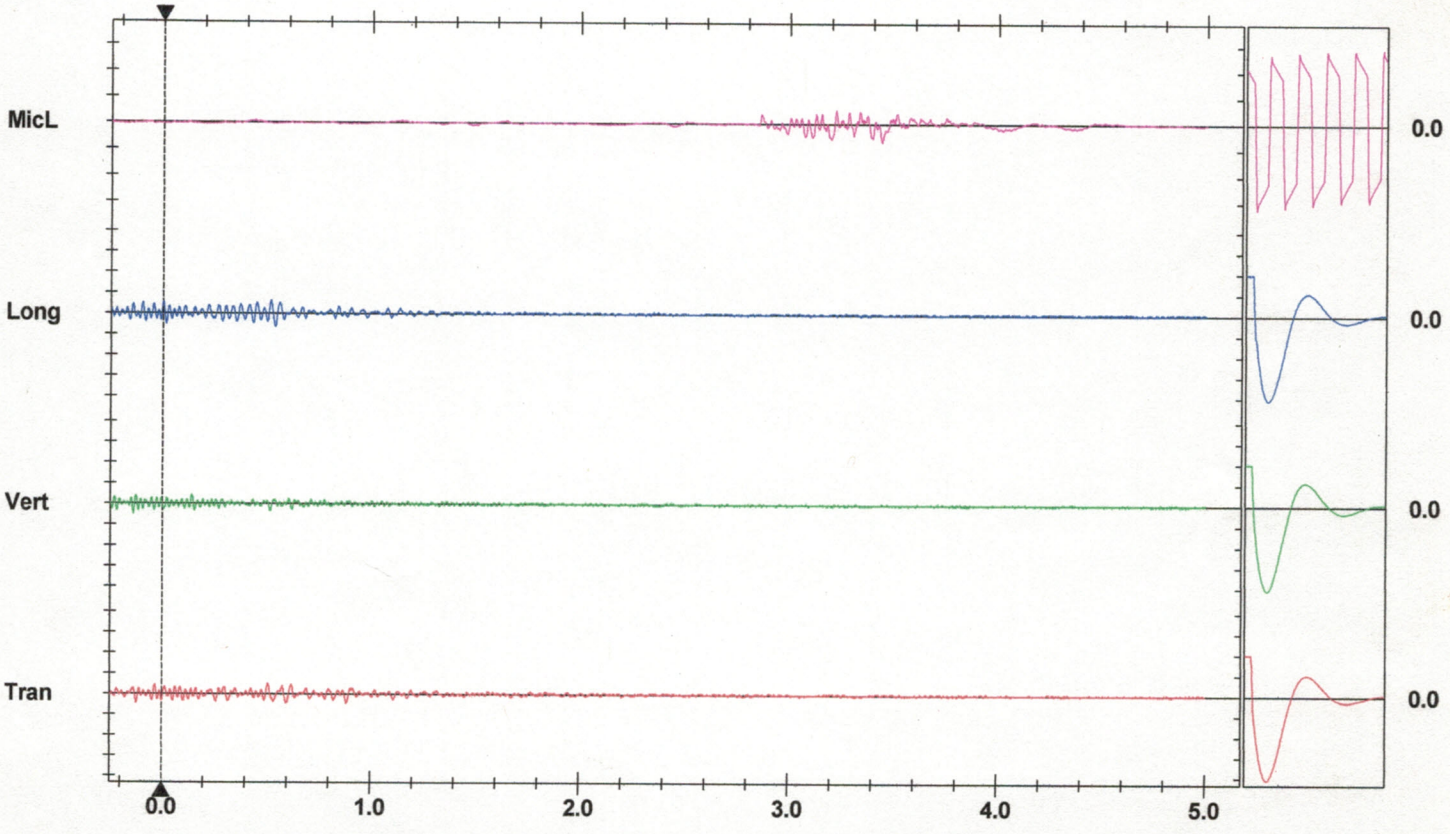
Microphone	Linear Weighting
PSPL	110.9 dB(L) at 3.440 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 511 mv)

	Tran	Vert	Long	
PPV	1.016	1.016	1.270	mm/s
ZC Freq	28	47	27	Hz
Time (Rel. to Trig)	0.506	-0.141	0.516	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.006	0.004	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.4	Hz
Overswing Ratio	3.9	3.5	3.7	

Peak Vector Sum 1.529 mm/s at 0.534 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶----------◀

3

No Trigger

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE19637
Jun 9 /17 11:38:05	Jun 9 /17 12:47:26	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s
Jun 12 /17 13:03:53	Jun 12 /17 14:32:51	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s
Jun 14 /17 12:45:53		Start Monitoring Trigger Level: Geo: 1.70 mm/s
Jun 14 /17 13:46:47	Jun 14 /17 13:46:53	Event recorded. Trigger Level Vert: 1.70 mm/s
Jun 14 /17 13:47:06	Jun 14 /17 14:08:23	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s
Jun 19 /17 11:45:10		Start Monitoring Trigger Level: Geo: 1.70 mm/s
Jun 19 /17 12:28:36	Jun 19 /17 12:28:41	Event recorded. Trigger Level Vert: 1.70 mm/s
Jun 19 /17 12:28:55	Jun 19 /17 12:51:59	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s
Jun 20 /17 11:00:37	Jun 20 /17 12:22:43	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-03 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 07/31/2017 10:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 07/31/17 Trigger Level: 1.23 mm/s Off dB
Time: 10:00 Calibration Date: 03/06/17
Distance From Blast: 826.92 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	2.413 mm/s	30.0 Hz
Vertical:	2.159 mm/s	47.0 Hz
Longitudinal:	2.286 mm/s	21.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	114 dB	
Vector Sum:	2.73 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 07/31/17 Trigger Level: 1.23 mm/s Off dB
Time: 10:00 Calibration Date: 03/06/17
Distance From Blast: 1,463.34 m Calibration Signal:
Direction From Blast: E Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	--- mm/s	--- Hz
Vertical:	--- mm/s	--- Hz
Longitudinal:	--- mm/s	--- Hz
PPV:	--- mm/s	--- Hz
Acoustic:	--- dB	
Vector Sum:	--- mm/s	

SEISMOGRAPH 3 - 3950 MARCH RD

Data Type: Seismic Record Seismograph Type: Instantell
Date: 07/31/17 Trigger Level: --- mm/s --- dB
Time: 10:00 Calibration Date: 03/06/17
Distance From Blast: 1,097.28 m Calibration Signal:
Direction From Blast: NNE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in Driveway of 3950 march Rd. Geo spiked and wqeight bagged.
Lat./Long.: 45° 16' 10.000" N 76° 7' 28.000" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	0.635 mm/s	26.0 Hz
Vertical:	0.635 mm/s	34.0 Hz
Longitudinal:	1.397 mm/s	18.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	116 dB	
Vector Sum:	1.426 mm/s	

No Trigger

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE19637
Jul 26 /17 12:14:13		Start Monitoring Trigger Level: Geo: 1.70 mm/s Mic: 114.0 dB(L)
Jul 26 /17 13:41:50	Jul 26 /17 13:42:06	Event recorded. Trigger Level Vert: 1.70 mm/s
Jul 26 /17 13:42:20		Start Monitoring Trigger Level: Geo: 1.70 mm/s Mic: 114.0 dB(L)
Jul 26 /17 13:43:08	Jul 26 /17 13:43:25	Event recorded. Trigger Level MicL: 114.0 dB(L)
Jul 26 /17 13:43:38	Jul 26 /17 14:37:00	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s Mic: 114.0 dB(L)
Jul 31 /17 09:15:19	Jul 31 /17 10:44:14	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s Mic: 114.0 dB(L)

Instantel

Event Report

Date/Time Long at 10:02:29 July 31, 2017
Trigger Source Geo: 1.230 mm/s, Mic: 114.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 16.0 sec at 1024 sps

Notes

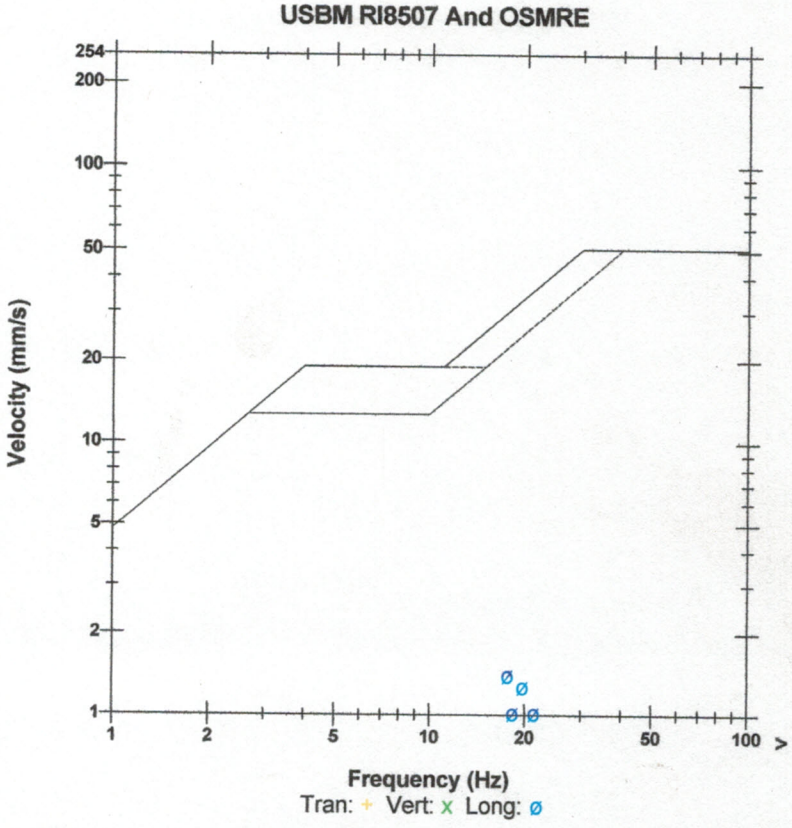
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration March 6, 2017 by Instantel
File Name Q589H03Y.K50
Post Event Notes
Set up in drivewqay of 3950 march Rd, geo spiked and weight bagged.

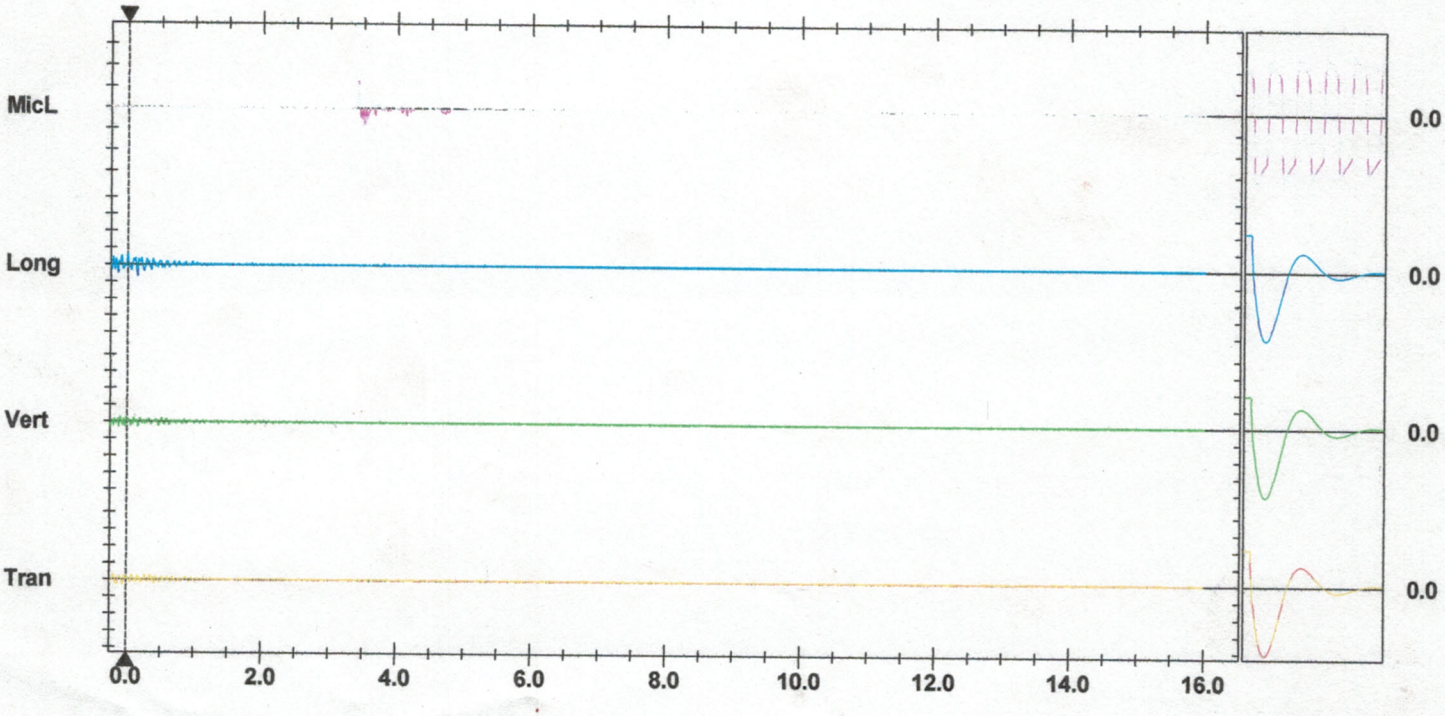
Extended Notes

Microphone Linear Weighting
PSPL 116.1 dB(L) at 3.417 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 482 mv)

	Tran	Vert	Long	
PPV	0.635	0.635	1.397	mm/s
ZC Freq	26	34	18	Hz
Time (Rel. to Trig)	-0.195	-0.245	0.141	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.005	0.005	0.014	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.9	7.8	Hz
Overswing Ratio	3.4	3.4	3.6	

Peak Vector Sum 1.426 mm/s at 0.143 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

Instantel

Event Report

Date/Time Vert at 10:02:15 July 31, 2017
Trigger Source Geo: 1.200 mm/s, Mic: 103.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 15.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration March 6, 2017 by Instantel
File Name Q020H03Y.JR0
Post Event Notes
set up in driveway of 1550 Dwire Hill rd. Geo spiked and weight baggged.

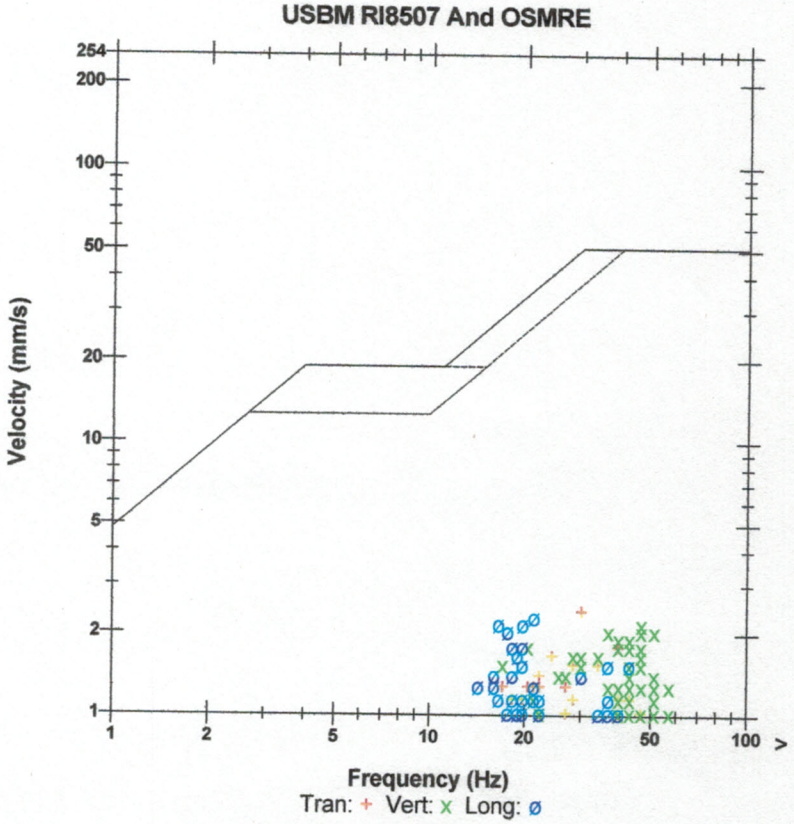
Notes
Location:
Client:
User Name:
General:

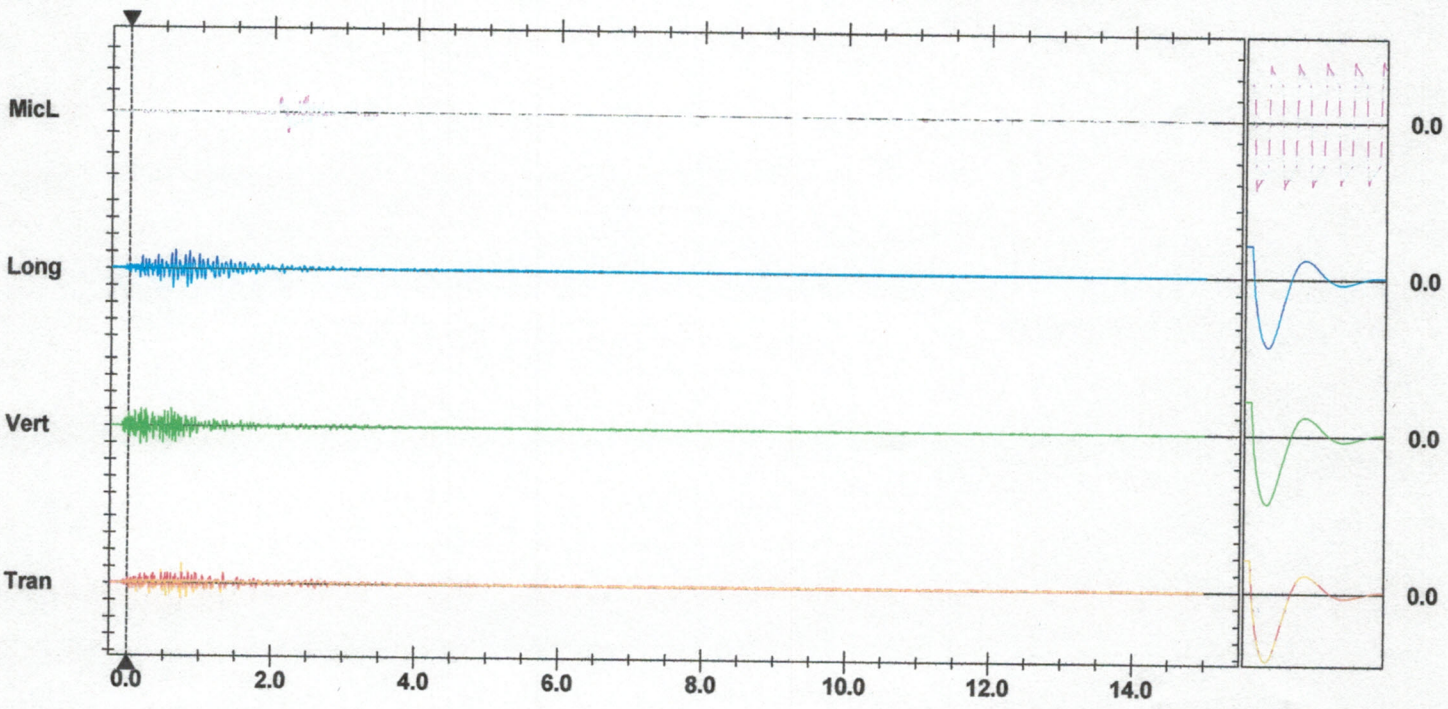
Extended Notes

Microphone Linear Weighting
PSPL 113.8 dB(L) at 2.198 sec
ZC Freq 7.9 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 517 mv)

	Tran	Vert	Long	
PPV	2.413	2.159	2.286	mm/s
ZC Freq	30	47	21	Hz
Time (Rel. to Trig)	0.758	0.165	0.609	sec
Peak Acceleration	0.053	0.080	0.053	g
Peak Displacement	0.013	0.011	0.018	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.6	Hz
Overswing Ratio	3.9	3.6	3.6	

Peak Vector Sum 2.730 mm/s at 0.612 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-04 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 08/01/2017 12:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 08/01/17 Trigger Level: 1.23 mm/s Off dB
Time: 12:02 Calibration Date: 03/06/17
Distance From Blast: 1,576.73 m Calibration Signal:
Direction From Blast: E Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	1.27 mm/s	16.0 Hz
Vertical:	1.016 mm/s	18.0 Hz
Longitudinal:	0.99 mm/s	27.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	116 dB	
Vector Sum:	1.54 mm/s	

SEISMOGRAPH 2 - 3950 MARCH RD

Data Type: Seismic Record Seismograph Type: Instantell
Date: 08/01/17 Trigger Level: 1.70 mm/s 113.00 dB
Time: 12:02 Calibration Date: 03/06/17
Distance From Blast: 1,135.08 m Calibration Signal:
Direction From Blast: NNE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in Driveway of 3950 march Rd. Geo spiked and wqeight bagged.
Lat./Long.: 45° 16' 10.000" N 76° 7' 28.000" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm:

Transverse:	2.032 mm/s	18.0 Hz
Vertical:	1.27 mm/s	20.0 Hz
Longitudinal:	1.778 mm/s	18.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	113 dB	
Vector Sum:	2.416 mm/s	

SEISMOGRAPH 3 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 08/01/17 Trigger Level: 1.23 mm/s Off dB
Time: 12:02 Calibration Date: 03/06/17
Distance From Blast: 885.75 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	2.667 mm/s	21.0 Hz
Vertical:	1.651 mm/s	37.0 Hz
Longitudinal:	3.429 mm/s	24.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	119 dB	
Vector Sum:	3.49 mm/s	

Instantel

Event Report

Date/Time	Vert at 12:02:46 August 1, 2017
Trigger Source	Geo: 1.200 mm/s, Mic: 103.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	15.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q020H05Y.SM0

Post Event Notes
Set up in driveway of 1550 Dwire Hill Rd, geo spiked and weight bagged.

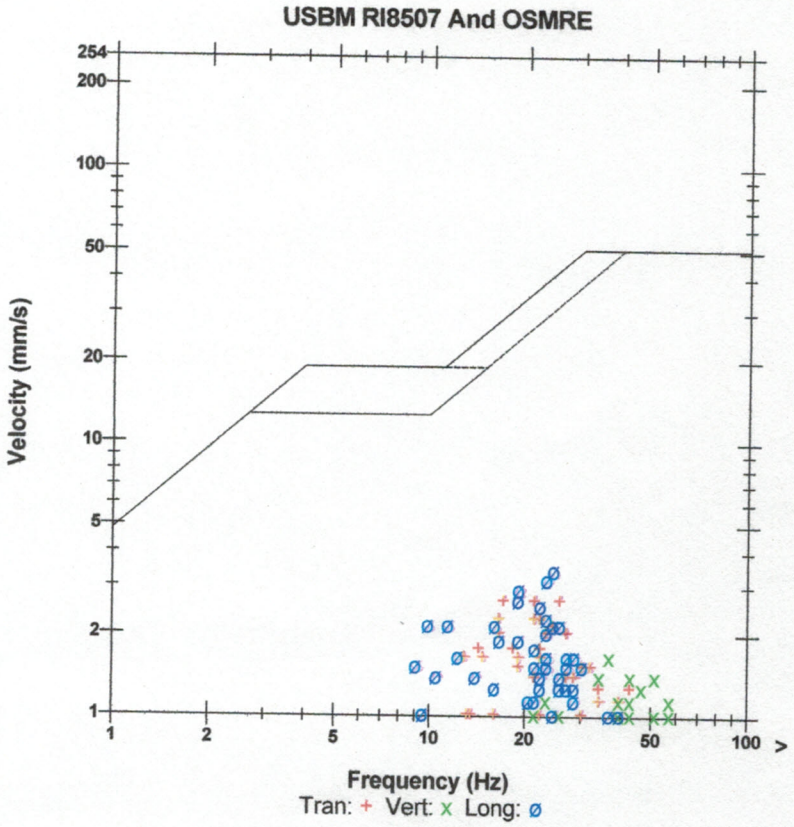
Notes
Location:
Client:
User Name:
General:

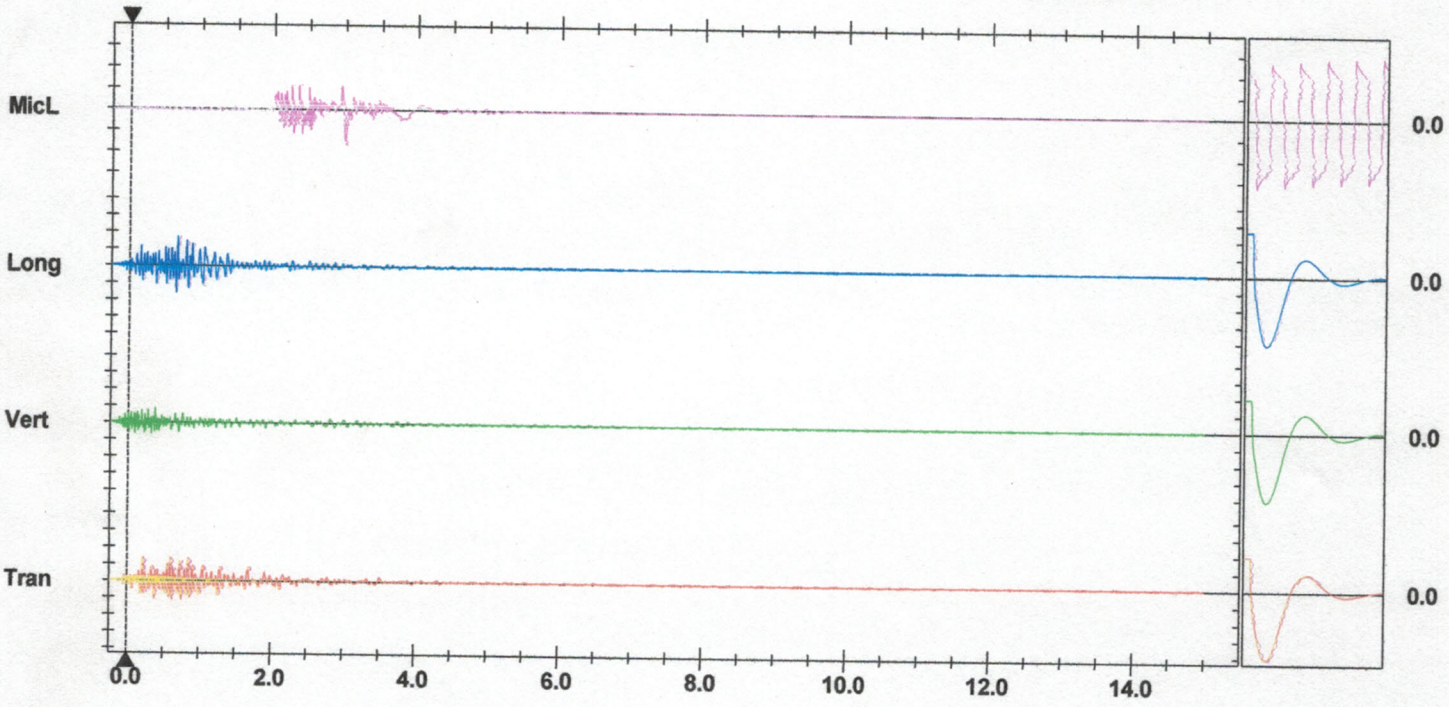
Extended Notes

Microphone	Linear Weighting
PSPL	118.6 dB(L) at 2.979 sec
ZC Freq	8.3 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 447 mv)

	Tran	Vert	Long	
PPV	2.667	1.651	3.429	mm/s
ZC Freq	21	37	24	Hz
Time (Rel. to Trig)	0.217	0.376	0.670	sec
Peak Acceleration	0.053	0.053	0.066	g
Peak Displacement	0.024	0.009	0.030	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.6	Hz
Overswing Ratio	3.9	3.5	3.7	

Peak Vector Sum 3.490 mm/s at 0.652 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger =

Sensor Check

Instantel

Event Report

Date/Time	Tran at 12:03:02 August 1, 2017
Trigger Source	Geo: 1.230 mm/s, Mic: 114.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	16.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q589H05Y.T20

Post Event Notes

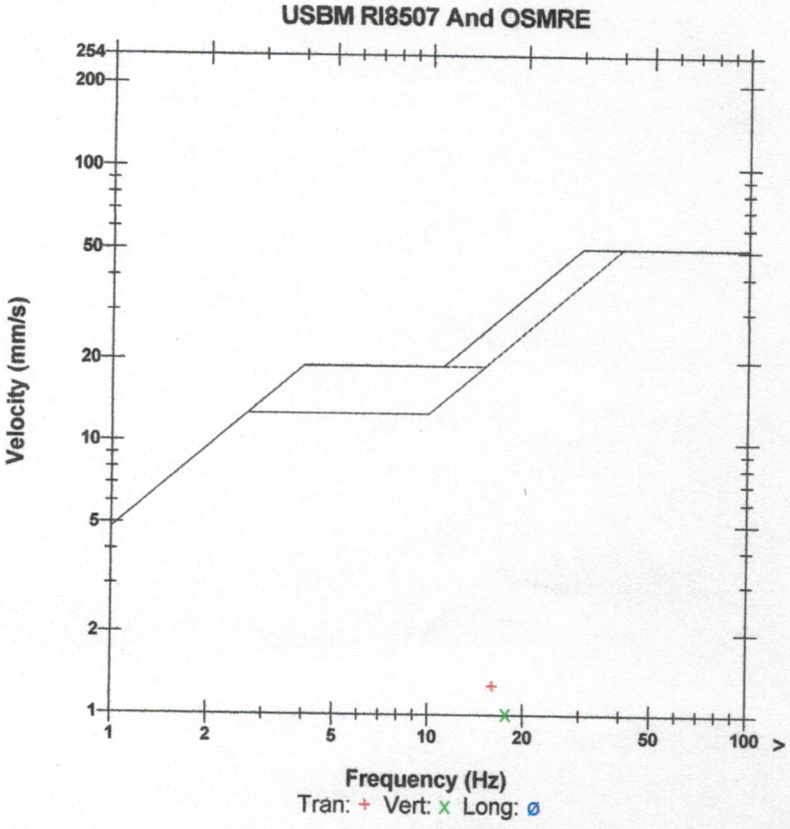
Set up in driveway at 1331 Drire Hill Rd. Geo spiked and weight bagged.

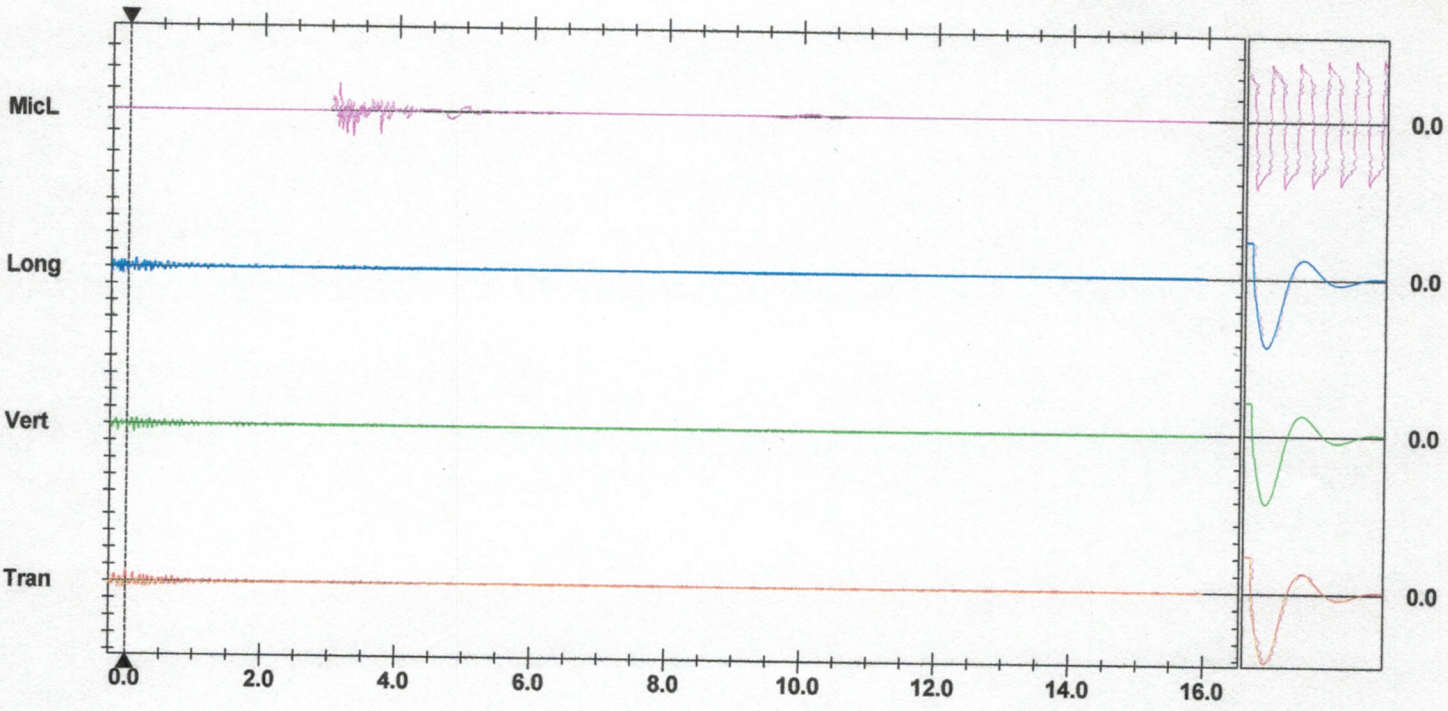
Extended Notes

Microphone	Linear Weighting
PSPL	116.3 dB(L) at 3.115 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 438 mv)

	Tran	Vert	Long	
PPV	1.270	1.016	0.889	mm/s
ZC Freq	16	18	27	Hz
Time (Rel. to Trig)	0.000	0.107	-0.081	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.012	0.009	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.9	7.8	Hz
Overswing Ratio	3.4	3.3	3.5	

Peak Vector Sum 1.540 mm/s at 0.112 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶----------◀

Sensor Check

Instantel

Event Report

Date/Time	Long at 12:02:38 August 1, 2017
Trigger Source	Geo: 1.700 mm/s, Mic: 114.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	15.0 sec at 1024 sps

Notes

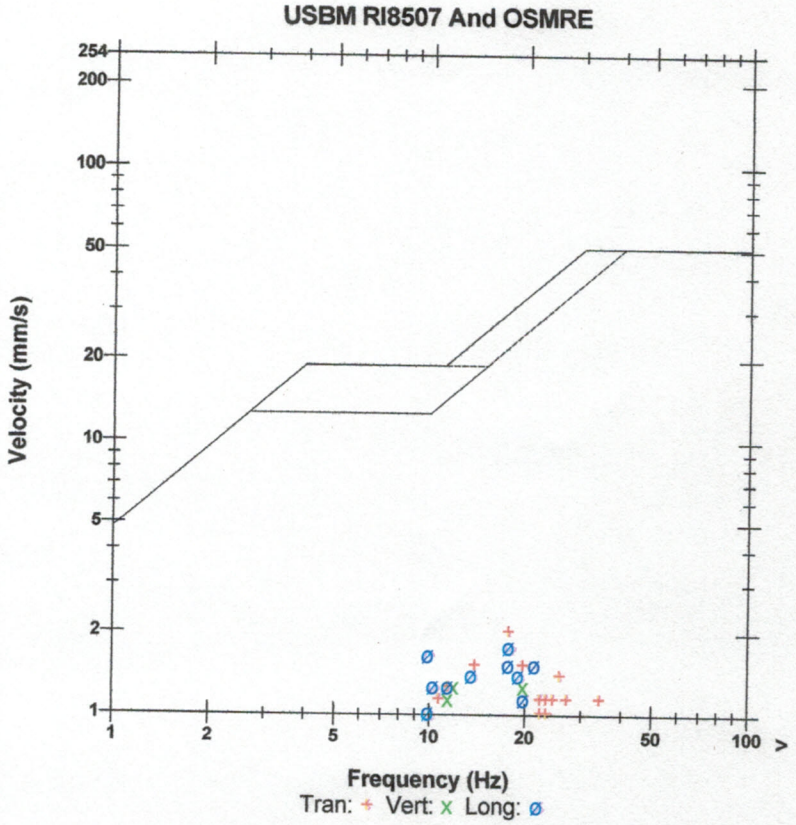
Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.5 Volts
Unit Calibration	September 9, 2016 by Instantel
File Name	U637H05Y.SE0

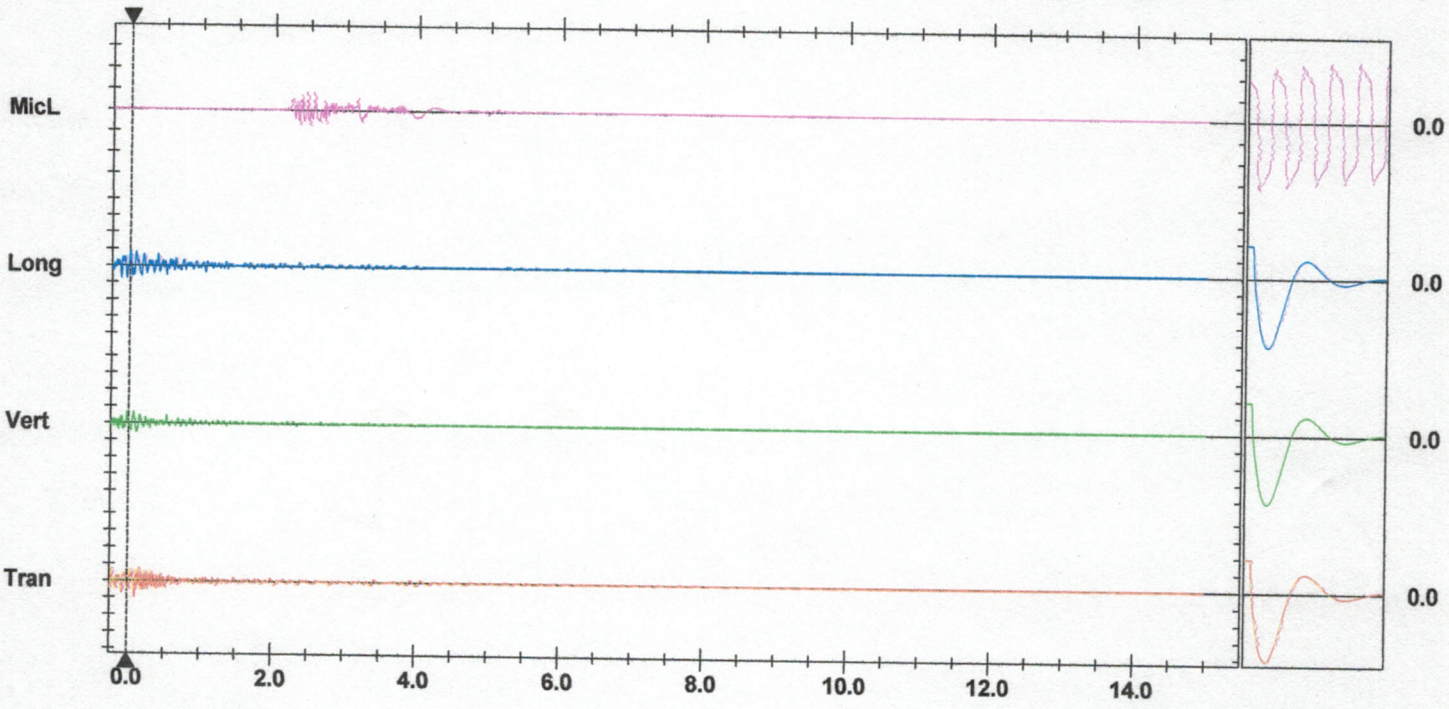
Post Event Notes
Set up in driveway of 3950 March Rd. Geo spiked and weight bagged.

Microphone	Linear Weighting
PSPL	112.8 dB(L) at 2.441 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 546 mv)

	Tran	Vert	Long	
PPV	2.032	1.270	1.778	mm/s
ZC Freq	18	20	18	Hz
Time (Rel. to Trig)	0.098	-0.022	0.001	sec
Peak Acceleration	0.040	0.027	0.027	g
Peak Displacement	0.017	0.016	0.022	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.7	3.6	3.7	

Peak Vector Sum 2.416 mm/s at 0.100 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-05 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 08/10/2017 13:07 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North Deep

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 08/10/17 Trigger Level: 1.23 mm/s Off dB
Time: 13:04 Calibration Date: 03/06/17
Distance From Blast: 860.15 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	1.297 mm/s	17.0 Hz
Vertical:	1.524 mm/s	15.0 Hz
Longitudinal:	1.27 mm/s	18.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	119 dB	
Vector Sum:	1.805 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 08/10/17 Trigger Level: 1.23 mm/s Off dB
Time: 13:03 Calibration Date: 03/06/17
Distance From Blast: 1,617.27 m Calibration Signal:
Direction From Blast: ESE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	4.191 mm/s	18.0 Hz
Vertical:	2.54 mm/s	43.0 Hz
Longitudinal:	3.937 mm/s	19.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	128 dB	
Vector Sum:	4.49 mm/s	

SEISMOGRAPH 3 - 3950 MARCH RD

Data Type: Seismic Record Seismograph Type: Instantell
Date: 08/10/17 Trigger Level: 1.70 mm/s 113.00 dB
Time: 13:03 Calibration Date: 03/06/17
Distance From Blast: 1,093.93 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in Driveway of 3950 march Rd. Geo spiked and wqeight bagged.
Lat./Long.: 45° 16' 10.000" N 76° 7' 28.000" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	0.508 mm/s	9.7 Hz
Vertical:	0.254 mm/s	57.0 Hz
Longitudinal:	0.381 mm/s	12.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	124 dB	
Vector Sum:	0.582 mm/s	

Instantel

Event Report

Date/Time	MicL at 13:03:53 August 10, 2017
Trigger Source	Geo: 1.700 mm/s, Mic: 114.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	15.0 sec at 1024 sps

Notes

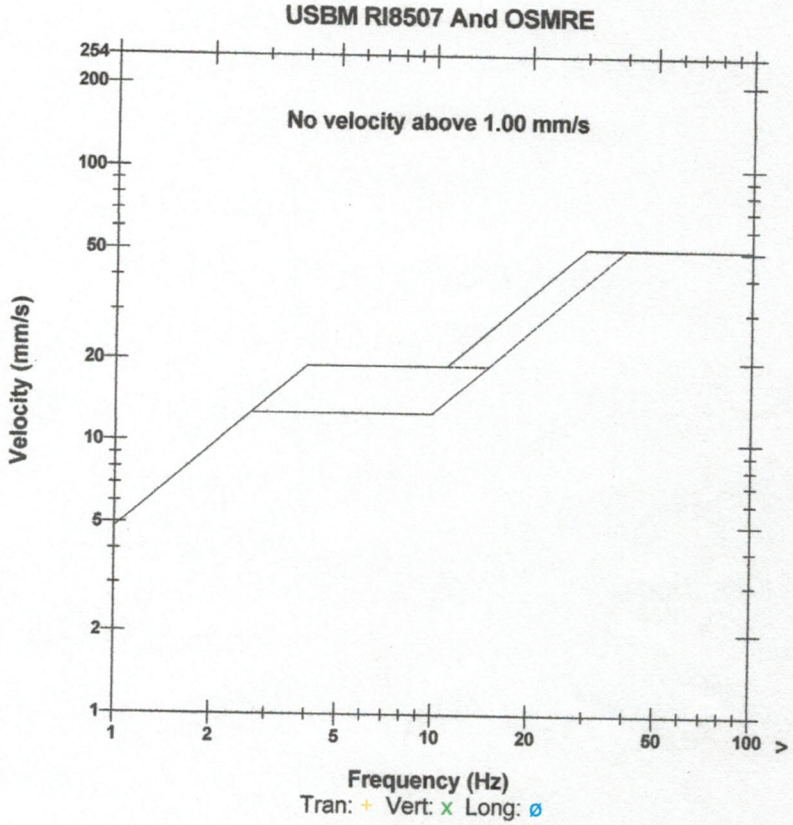
Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	September 9, 2016 by Instantel
File Name	U637H0MP.MH0

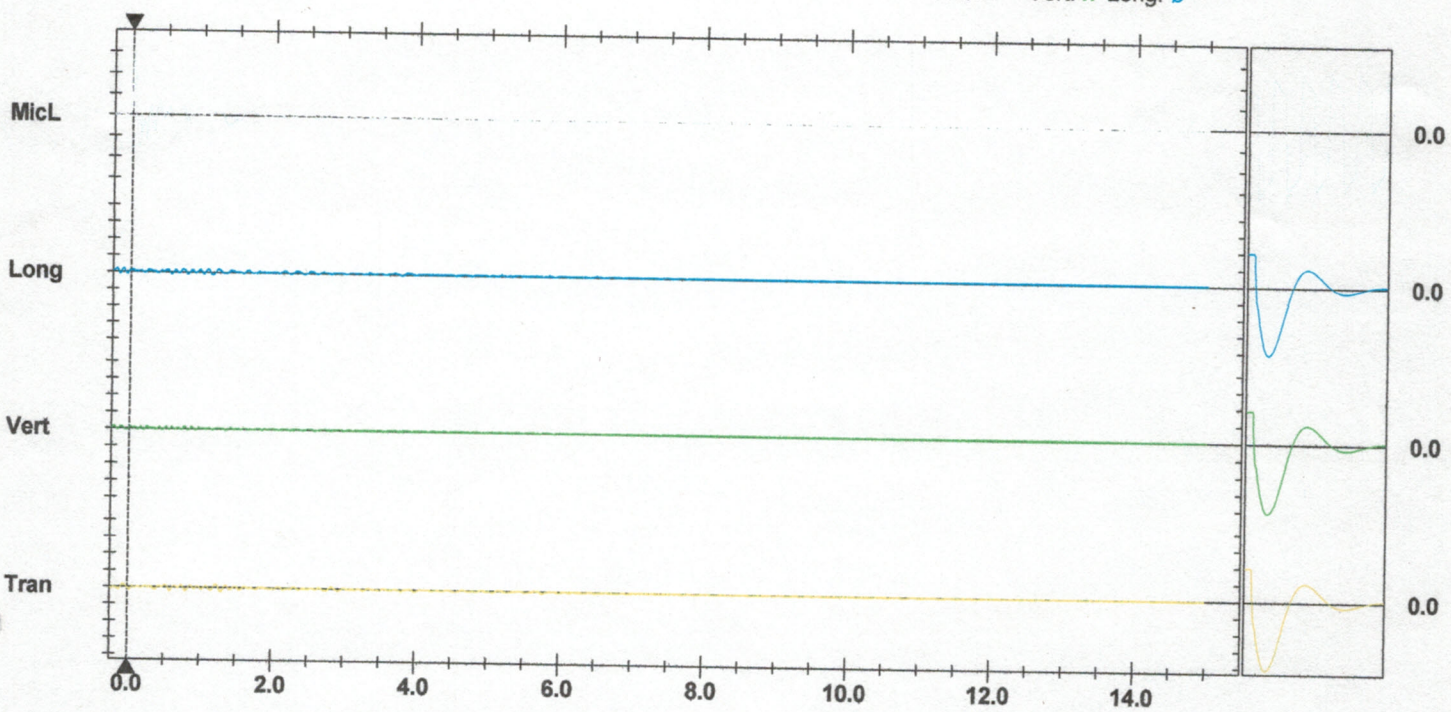
Post Event Notes
Set up in Driveway of 3950 March Rd. Geo spiked and weight bagged.

Microphone	Linear Weighting
PSPL	124.0 dB(L) at 0.011 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	0.508	0.254	0.381	mm/s
ZC Freq	9.7	57	12	Hz
Time (Rel. to Trig)	0.582	-0.226	-0.203	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.009	0.003	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.3	7.5	Hz
Overswing Ratio	3.7	3.7	3.7	

Peak Vector Sum 0.582 mm/s at 0.809 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

Instantel

Event Report

Date/Time	Tran at 13:04:29 August 10, 2017
Trigger Source	Geo: 1.000 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q589H0MP.NH0

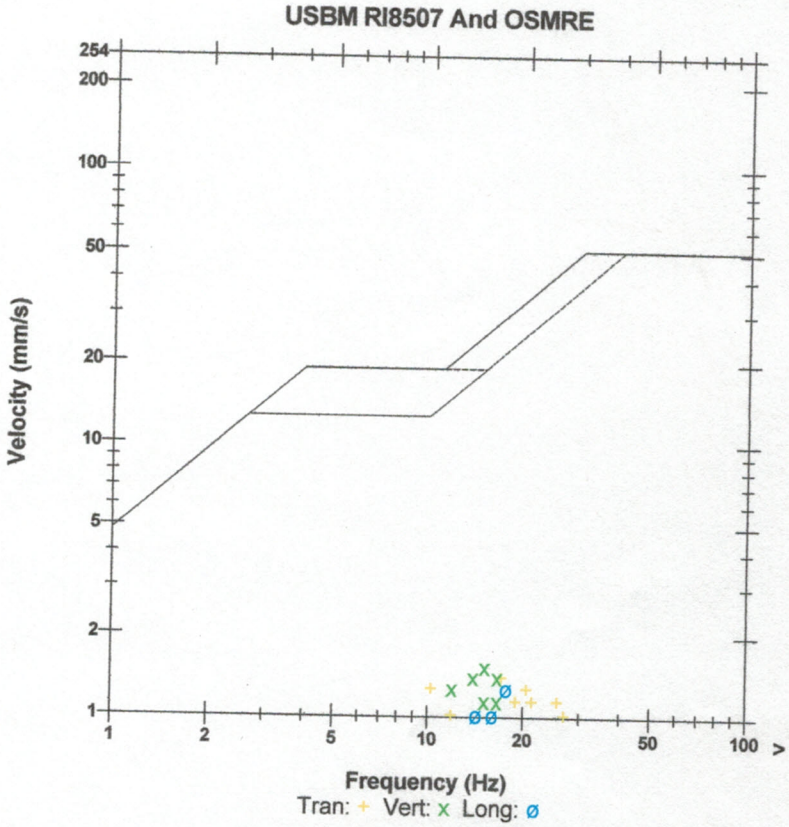
Post Event Notes
Set up at gate of 1550 Drire Hill Rd. Geo spiked and weight bagged.

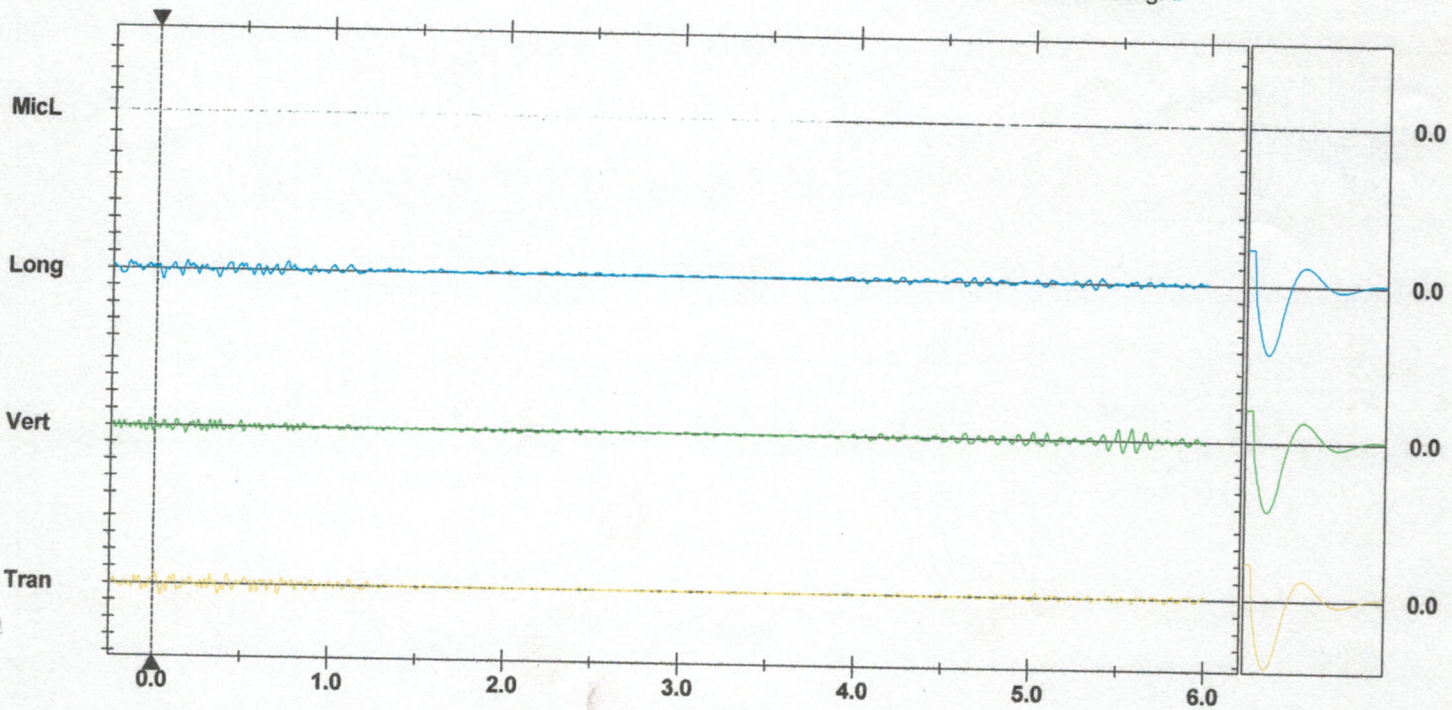
Extended Notes

Microphone	Linear Weighting
PSPL	119.0 dB(L) at 3.855 sec
ZC Freq	6.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 495 mv)

	Tran	Vert	Long	
PPV	1.397	1.524	1.270	mm/s
ZC Freq	17	15	18	Hz
Time (Rel. to Trig)	0.040	5.573	0.032	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.017	0.016	0.014	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.9	7.8	7.7	Hz
Overswing Ratio	3.4	3.3	3.6	

Peak Vector Sum 1.805 mm/s at 0.040 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——————◀

Sensor Check

Printed: August 10, 2017 (V 10.72 - 10.72)

Instantel

Event Report

Date/Time	Vert at 13:03:58 August 10, 2017
Trigger Source	Geo: 1.000 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q020H0MP.MM0

Post Event Notes
Set up in driveway of 1331 Drire Hill Rd

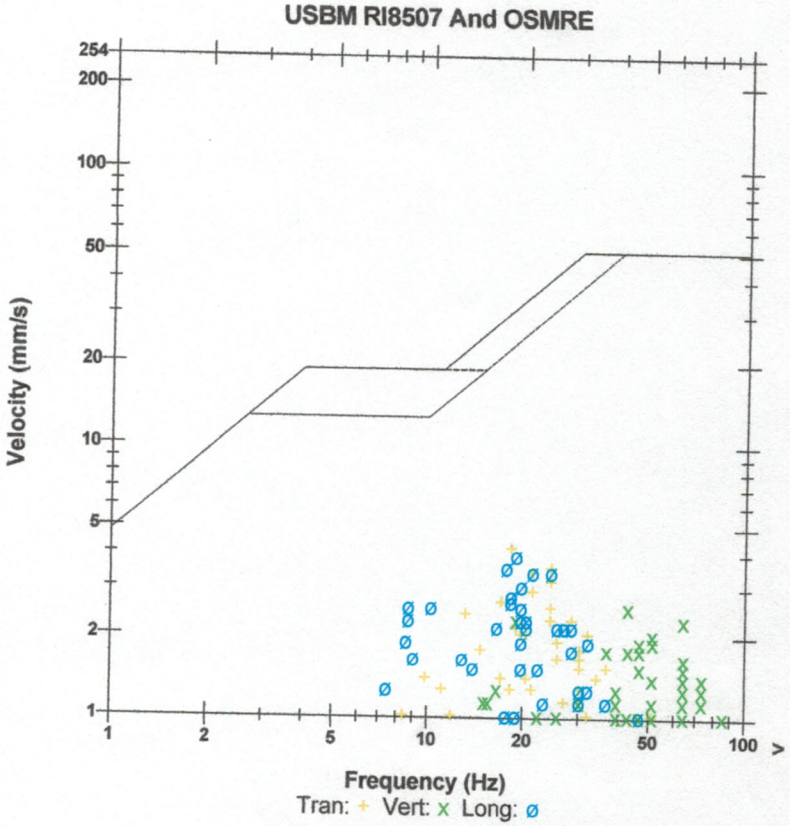
Notes
Location:
Client:
User Name:
General:

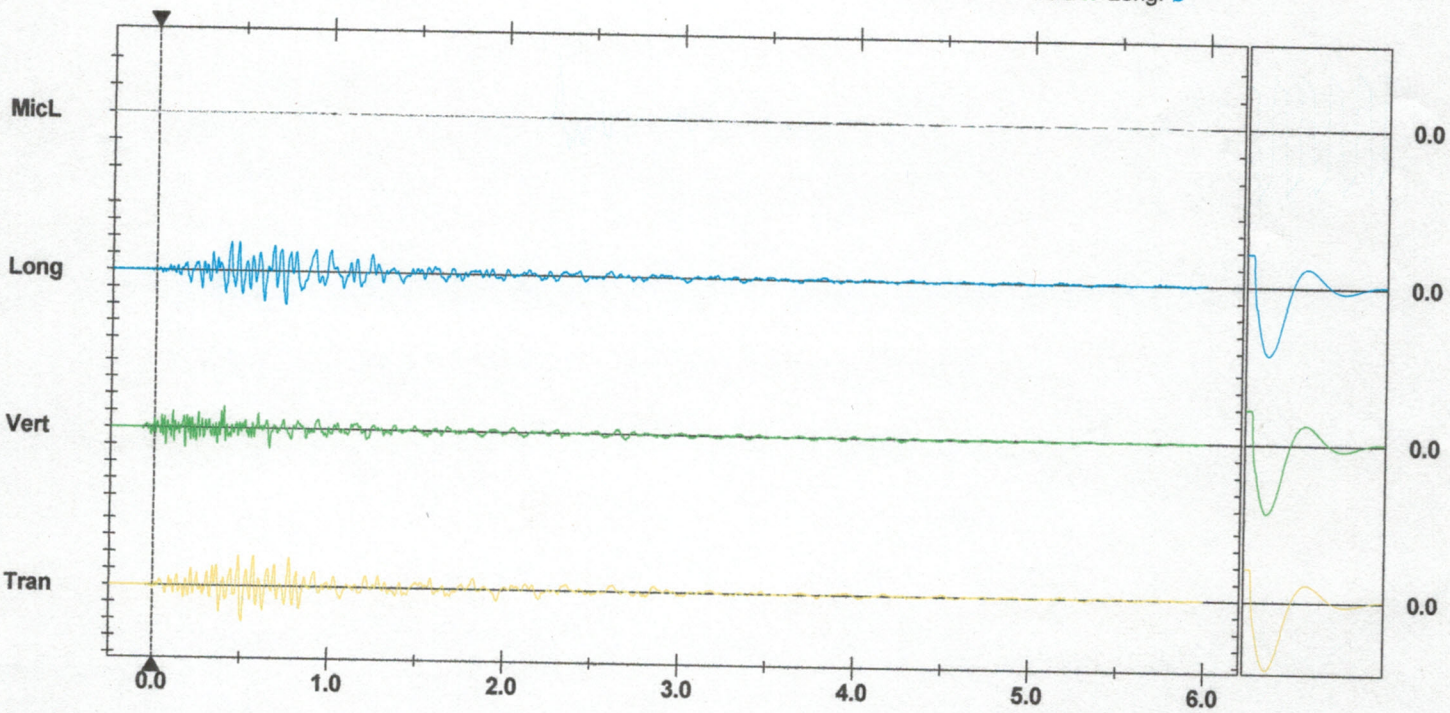
Extended Notes

Microphone	Linear Weighting
PSPL	127.7 dB(L) at 2.273 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 539 mv)

	Tran	Vert	Long	
PPV	4.191	2.540	3.937	mm/s
ZC Freq	18	43	19	Hz
Time (Rel. to Trig)	0.506	0.396	0.734	sec
Peak Acceleration	0.093	0.080	0.066	g
Peak Displacement	0.037	0.014	0.041	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.4	Hz
Overswing Ratio	3.9	3.5	3.6	

Peak Vector Sum 4.490 mm/s at 0.488 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 20.00 pa.(L)/div

Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-06 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/13/2017 12:50 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - 1331 UPPER DWYERHILL RD

Data Type:	Seismic Record	Seismograph Type:	Instantel					
Date:	09/13/17	Trigger Level:	1.23 mm/s	--- dB		Transverse:	1.397 mm/s	20.0 Hz
Time:	12:46	Calibration Date:	03/06/17			Vertical:	1.27 mm/s	23.0 Hz
Distance From Blast:	1,662.38 m	Calibration Signal:				Longitudinal:	1.016 mm/s	24.0 Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	--- Hz			PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz			Acoustic:	116 dB	
Location:	1331 Upper DwyerHill Rd					Vector Sum:	1.529 mm/s	
U.T.M.:	18N 412595 mE 5012191 mN							
Reader and Firm:	Dave Klingspor, AUSTIN POWDER							
Analyst and Firm:								
Installer and Firm:								

SEISMOGRAPH 2 - 1550 UPPER DWYERHILL RD

Data Type:	Seismic Record	Seismograph Type:	Instantel					
Date:	09/13/17	Trigger Level:	1.23 mm/s	112.00 dB		Transverse:	2.413 mm/s	16.0 Hz
Time:	12:49	Calibration Date:	03/06/17			Vertical:	1.905 mm/s	51.0 Hz
Distance From Blast:	30,479.70 m	Calibration Signal:				Longitudinal:	3.683 mm/s	23.0 Hz
Direction From Blast:	SE	Geophone Min. Freq.:	--- Hz			PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz			Acoustic:	122 dB	
Location:	1550 Upper DwyerHill Rd					Vector Sum:	4.107 mm/s	
U.T.M.:	18N 5013178 mE 411774 mN							
Reader and Firm:	Dave Klingspor, AUSTIN POWDER							
Analyst and Firm:								
Installer and Firm:								

SEISMOGRAPH 3 - 3950 MARCH RD

Data Type:	Seismic Record	Seismograph Type:	Instantel					
Date:	09/13/17	Trigger Level:	--- mm/s	--- dB		Transverse:	0.127 mm/s	0.0 Hz
Time:	12:49	Calibration Date:	09/09/16			Vertical:	0.381 mm/s	14.0 Hz
Distance From Blast:	1,103.07 m	Calibration Signal:				Longitudinal:	0.508 mm/s	9.1 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	--- Hz			PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz			Acoustic:	117 dB	
Location:	3950 March Rd					Vector Sum:	0.524 mm/s	
U.T.M.:	18N 411792 mE 5013511 mN							
Reader and Firm:	Dave Klingspor, AUSTIN POWDER							
Analyst and Firm:								
Installer and Firm:								

Instantel

3950 March Rd

Date/Time	MicL at 12:49:42 PM September 13, 2017
Trigger Source	Geo: 1.700 mm/s, Mic: 114.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 9, 2016 by Instantel
File Name	__TEMP.EVT

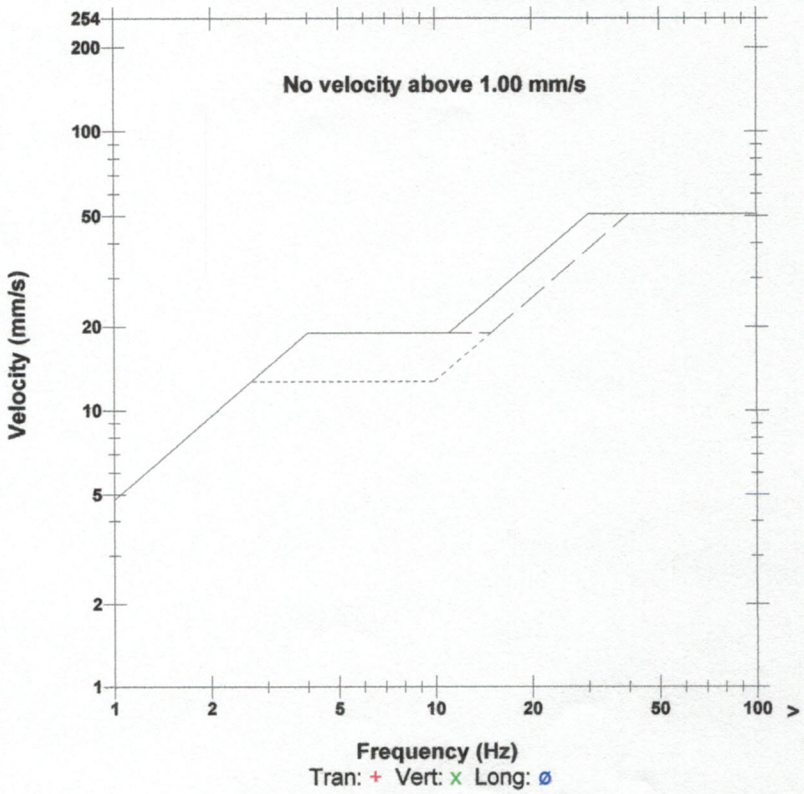
Notes

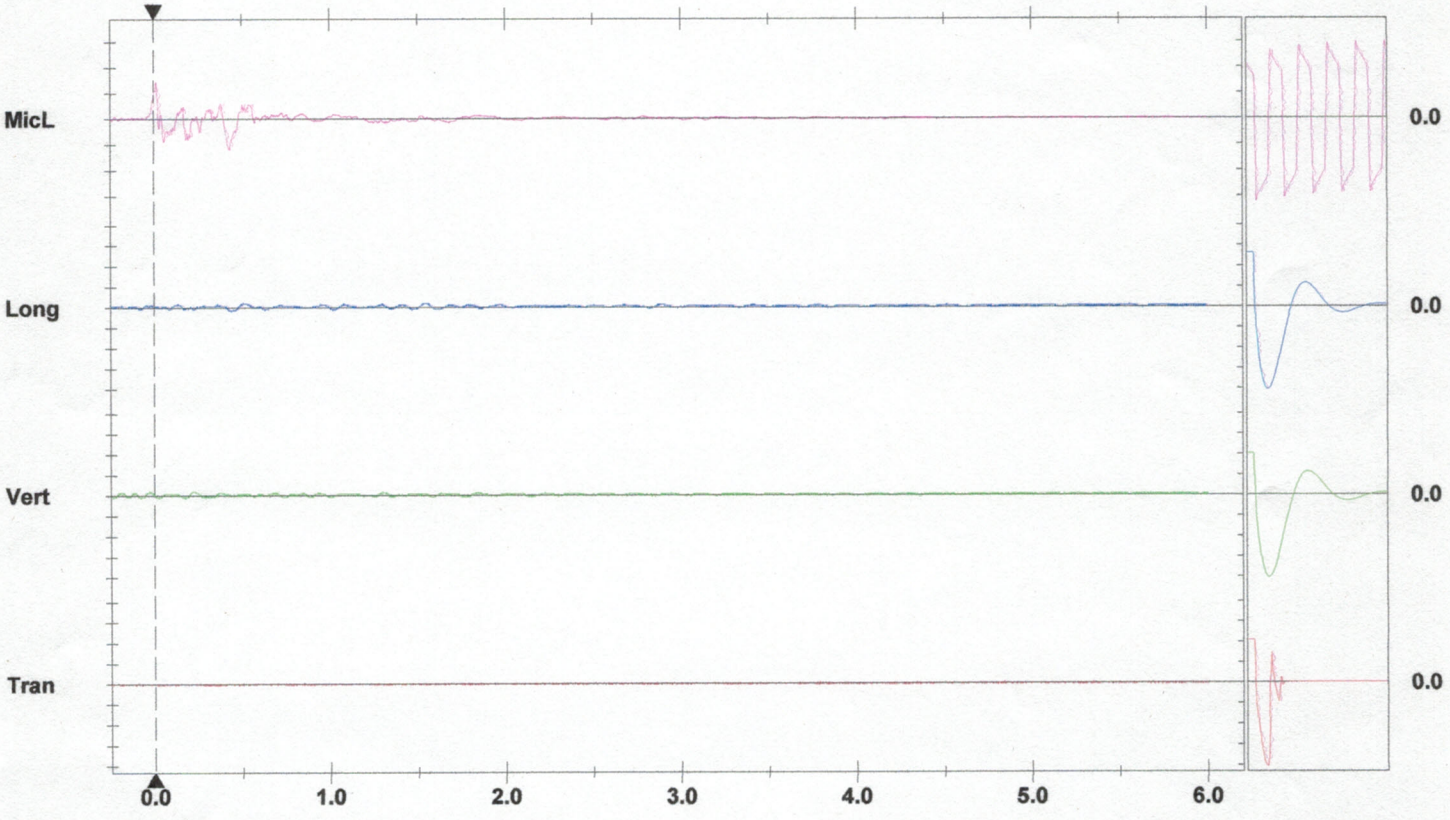
Microphone	Linear Weighting
PSPL	117.2 dB(L) at 0.013 sec
ZC Freq	7.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 493 mv)

	Tran	Vert	Long	
PPV	0.127	0.381	0.508	mm/s
ZC Freq	>100	14	9.1	Hz
Time (Rel. to Trig)	-0.249	-0.034	0.508	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.000	0.007	0.009	mm
Sensor Check	Check	Passed	Passed	
Frequency	18.6	7.4	7.7	Hz
Overswing Ratio	2.8	3.7	3.6	

Peak Vector Sum 0.524 mm/s at 0.508 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶——◀

Instantel

1331 Upper Dwyerhill Rd

Date/Time	Tran at 12:46:46 PM September 13, 2017
Trigger Source	Geo: 1.230 mm/s
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	__TEMP.EVT

Notes

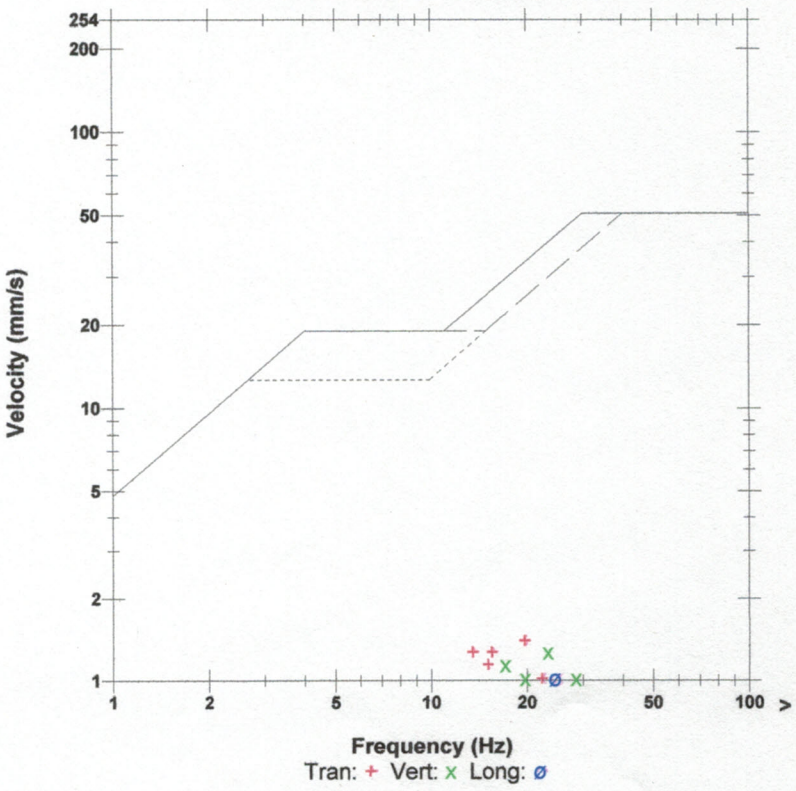
Extended Notes

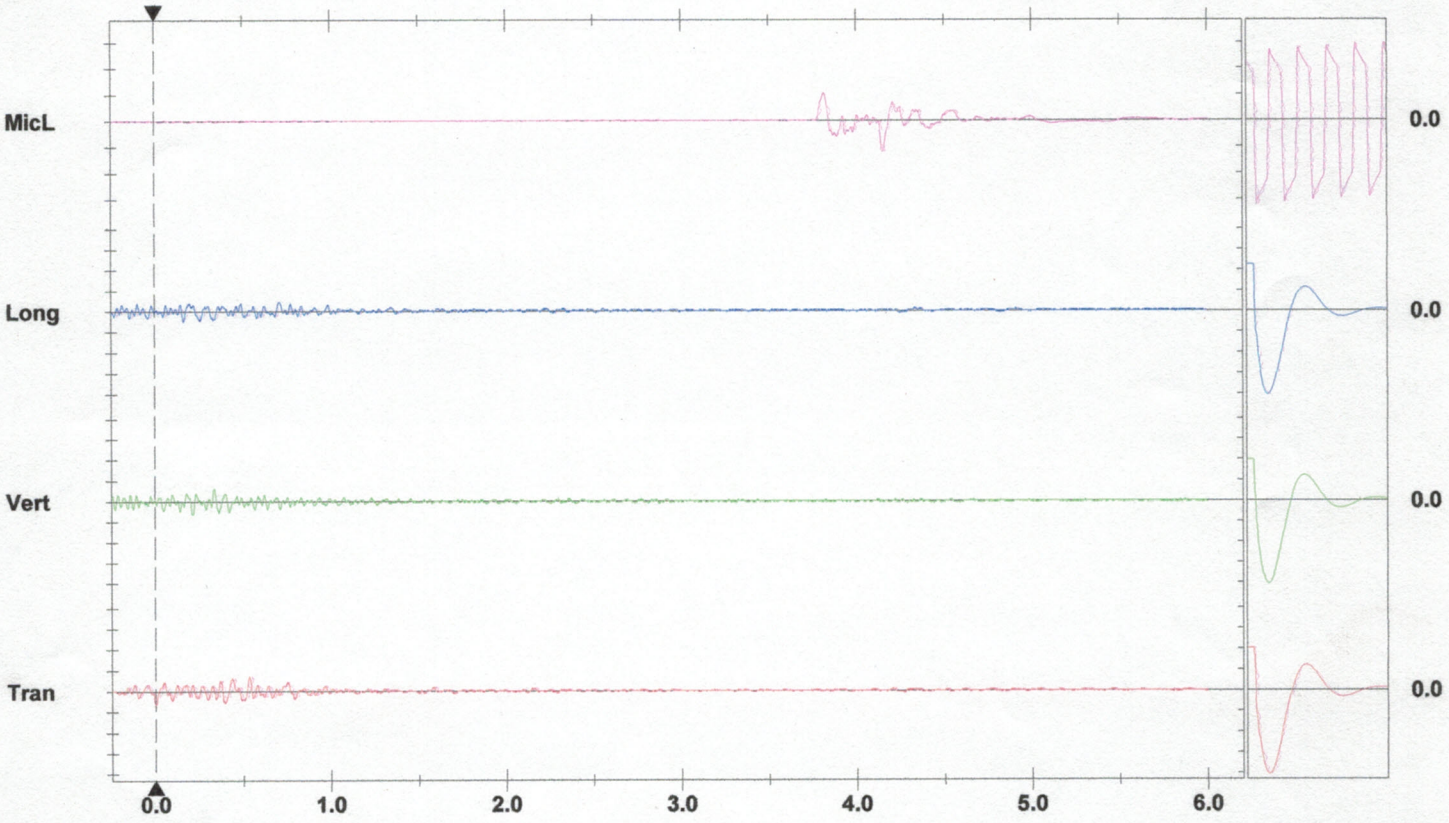
Microphone	Linear Weighting
PSPL	115.6 dB(L) at 4.152 sec
ZC Freq	9.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 510 mv)

	Tran	Vert	Long	
PPV	1.397	1.270	1.016	mm/s
ZC Freq	20	23	24	Hz
Time (Rel. to Trig)	0.531	0.211	0.164	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.015	0.010	0.013	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.8	Hz
Overswing Ratio	3.4	3.4	3.6	

Peak Vector Sum 1.529 mm/s at 0.338 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

Instantel

1550 Upper Dwyerhill Rd

Date/Time	Vert at 12:49:11 PM September 13, 2017
Trigger Source	Geo: 1.230 mm/s, Mic: 112.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	__TEMP.EVT

Notes
Location:
Client:
User Name:
General:

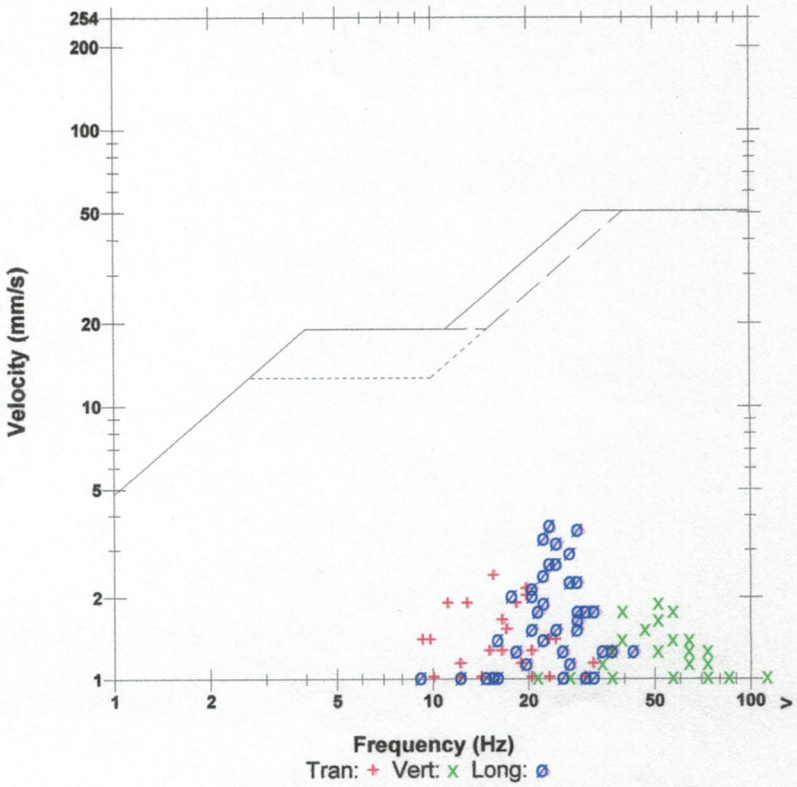
Extended Notes

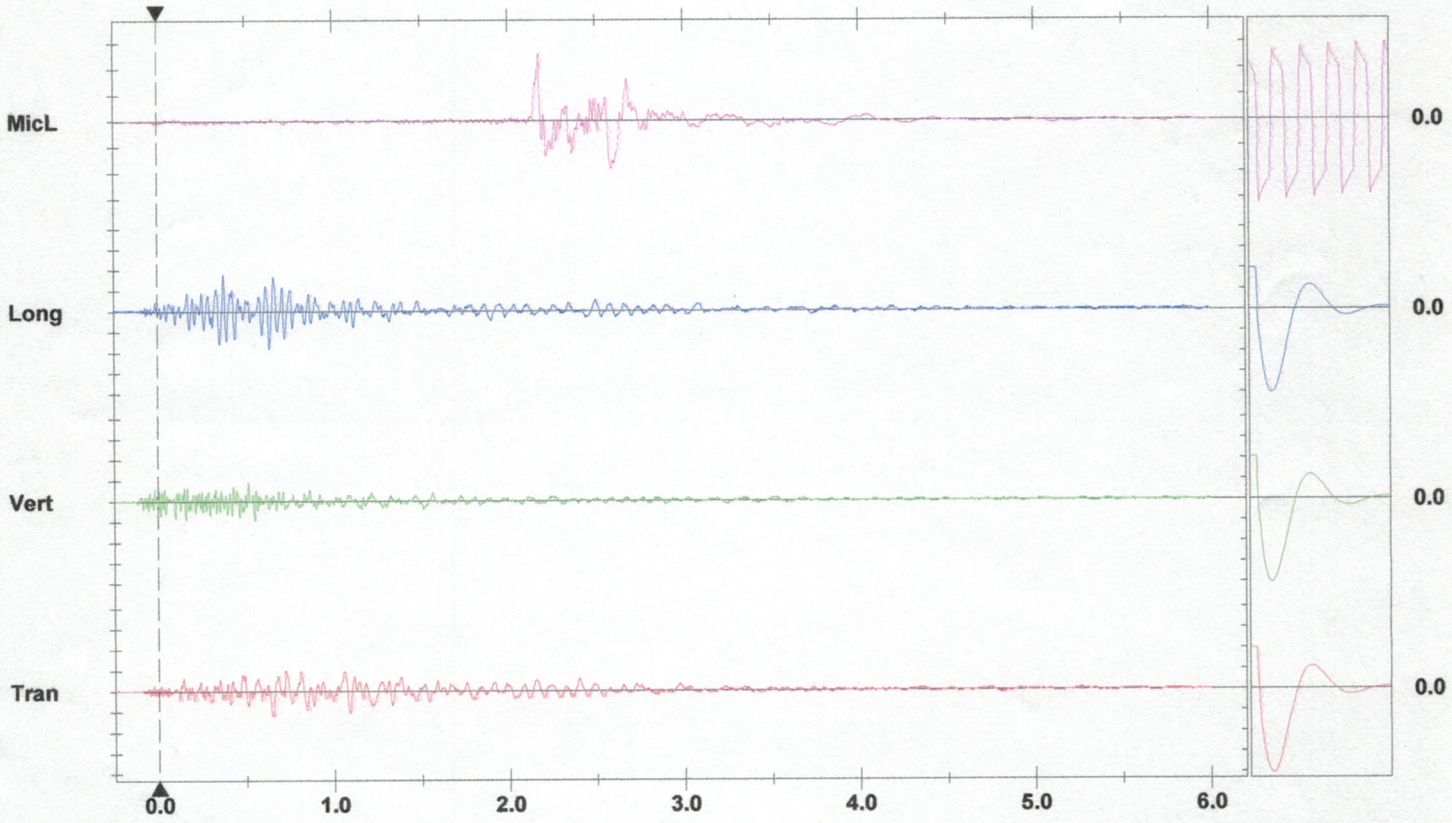
Microphone	Linear Weighting
PSPL	122.3 dB(L) at 2.174 sec
ZC Freq	7.1 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 494 mv)

	Tran	Vert	Long	
PPV	2.413	1.905	3.683	mm/s
ZC Freq	16	51	23	Hz
Time (Rel. to Trig)	0.643	0.549	0.638	sec
Peak Acceleration	0.040	0.066	0.066	g
Peak Displacement	0.026	0.009	0.024	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 4.107 mm/s at 0.638 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2017-07 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/25/2017 15:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: March Rd Lower Bench

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/25/17	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.794 mm/s	32.0 Hz
Time:	15:00	Calibration Date:	03/06/17		Vertical:	1.905 mm/s	43.0 Hz
Distance From Blast:	767.79 m	Calibration Signal:			Longitudinal:	1.524 mm/s	34.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	112 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	2.927 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 3950 MARCH RD

Data Type:	Seismic Record	Seismograph Type:	Instantell				
Date:	09/25/17	Trigger Level:	1.70 mm/s	113.00 dB	Transverse:	0.254 mm/s	--- Hz
Time:	15:00	Calibration Date:	03/06/17		Vertical:	0.127 mm/s	--- Hz
Distance From Blast:	1,033.58 m	Calibration Signal:			Longitudinal:	0.254 mm/s	--- Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	113 dB	
Location:	Set up in Driveway of 3950 march Rd. Geo spiked and wqeight bagged.				Vector Sum:	0.311 mm/s	
Lat./Long.:	45° 16' 10.000" N		76° 7' 28.000" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 3 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	09/25/17	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	15:00	Calibration Date:	03/06/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,459.69 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

False Trigger

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15589
Sep 14 /17 13:22:19	Sep 14 /17 15:10:54	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s
Sep 15 /17 11:32:11	Sep 15 /17 13:34:53	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s
Sep 18 /17 12:11:11		Start Monitoring Trigger Level: Geo: 1.23 mm/s
Sep 18 /17 12:57:16	Sep 18 /17 12:57:22	Event recorded. Trigger Level Tran: 1.23 mm/s
Sep 18 /17 12:57:36	Sep 18 /17 13:25:17	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s
Sep 19 /17 11:16:20		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Sep 19 /17 12:02:42	Sep 19 /17 12:02:48	Event recorded. Trigger Level Tran: 1.23 mm/s
Sep 19 /17 12:03:01	Sep 19 /17 12:17:43	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 110.0 dB(L)
Sep 25 /17 14:11:50		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Sep 25 /17 14:11:55	Sep 25 /17 14:12:01	Event recorded. Trigger Level Vert: 1.23 mm/s
Sep 25 /17 14:12:14		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Sep 25 /17 14:45:38	Sep 25 /17 14:45:44	Event recorded. Trigger Level Vert: 1.23 mm/s
Sep 25 /17 14:45:58		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Sep 25 /17 15:18:54	Sep 25 /17 15:19:00	Event recorded. Trigger Level Vert: 1.23 mm/s
Sep 25 /17 15:19:13	Sep 25 /17 15:22:11	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 110.0 dB(L)

Instantel

Event Report

Date/Time	MicL at 15:01:01 September 25, 2017
Trigger Source	Geo: 1.700 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

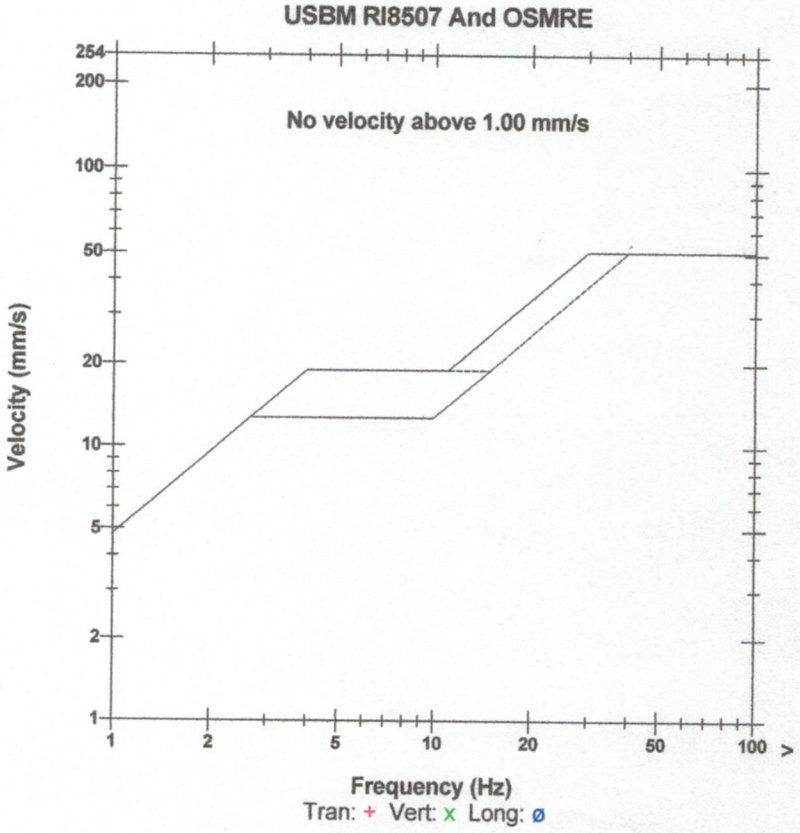
Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.5 Volts
Unit Calibration	September 21, 2017 by Instantel
File Name	U637H301.PP0

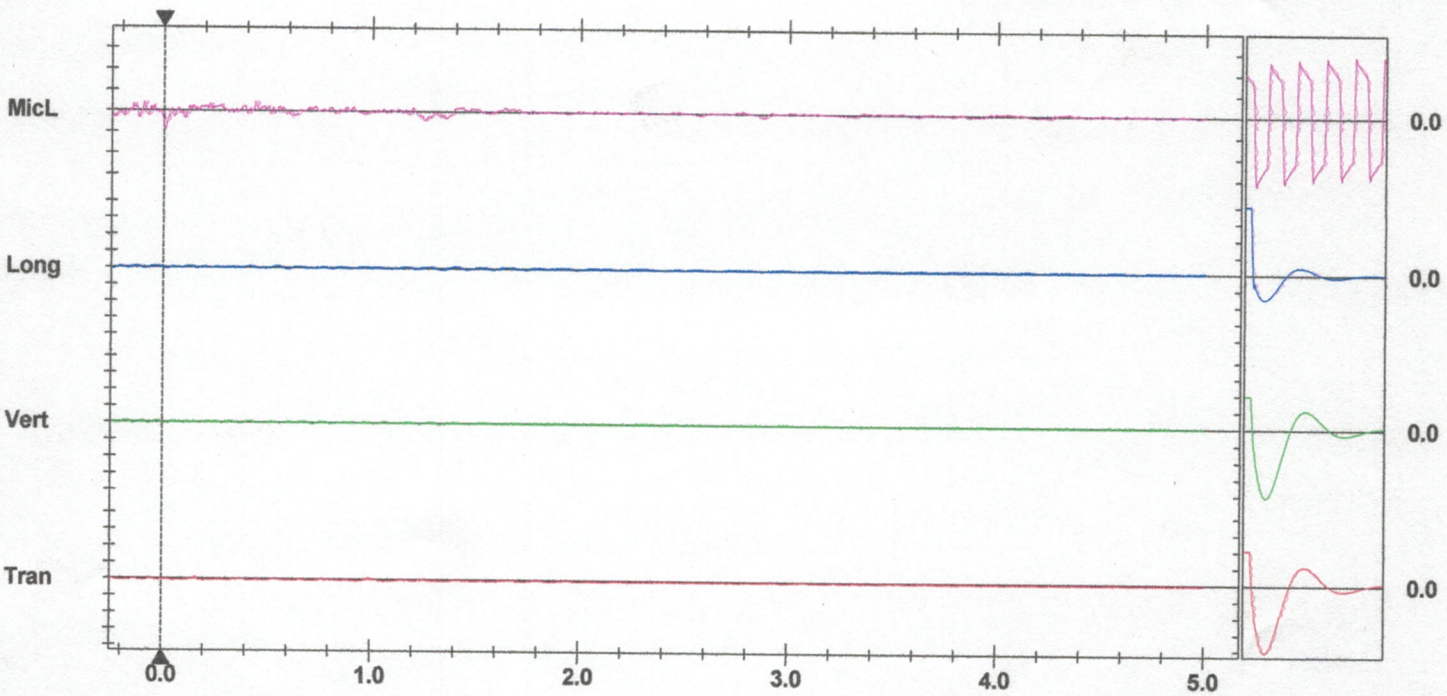
Post Event Notes
Set up 3950 March Rd. Geo spiked and weight bagged.

Microphone	Linear Weighting
PSPL	113.1 dB(L) at 0.006 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 472 mv)

	Tran	Vert	Long	
PPV	0.254	0.127	0.254	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.093	-0.235	-0.132	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Check	
Frequency	7.5	7.4	8.5	Hz
Overswing Ratio	3.6	3.6	3.4	

Peak Vector Sum 0.311 mm/s at -0.034 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶----------◀

Sensor Check

Instantel

Event Report

Date/Time	Tran at 15:00:18 September 25, 2017
Trigger Source	Geo: 1.230 mm/s, Mic: 112.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q020H301.OI0

Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged.

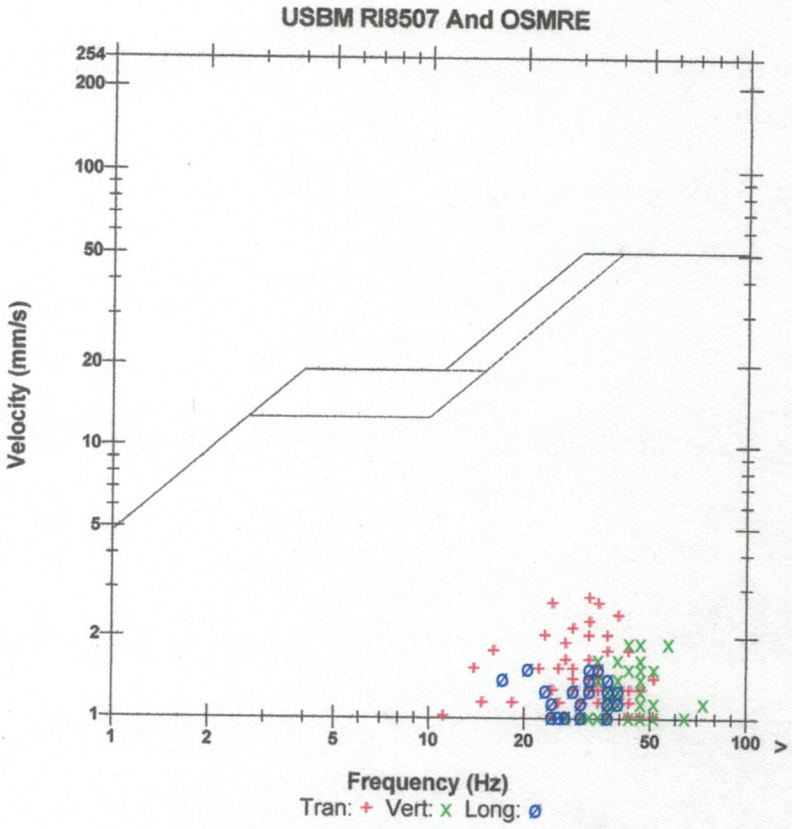
Notes
Location:
Client:
User Name:
General:

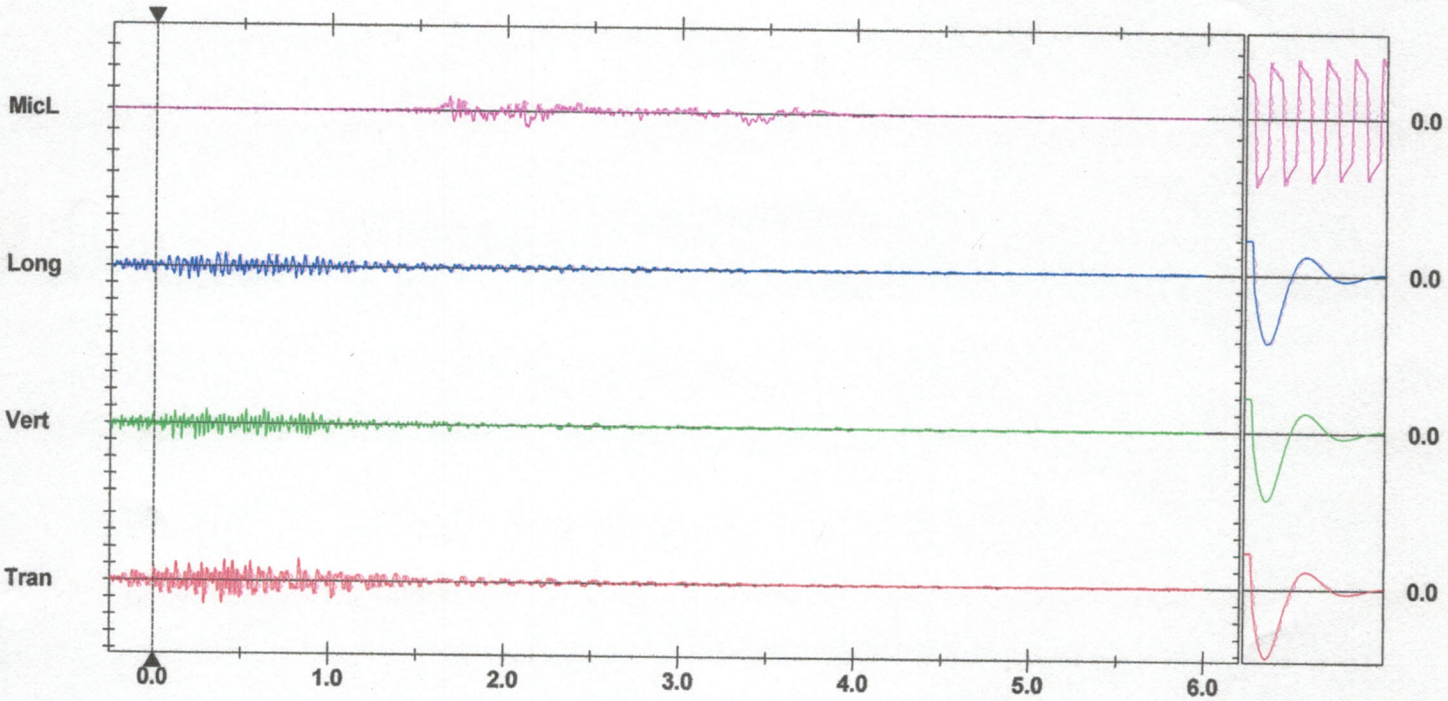
Extended Notes

Microphone	Linear Weighting
PSPL	111.8 dB(L) at 2.123 sec
ZC Freq	7.4 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 503 mv)

	Tran	Vert	Long	
PPV	2.794	1.905	1.524	mm/s
ZC Freq	32	43	34	Hz
Time (Rel. to Trig)	0.290	0.109	0.191	sec
Peak Acceleration	0.066	0.066	0.040	g
Peak Displacement	0.019	0.008	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.4	Hz
Overswing Ratio	3.9	3.5	3.6	

Peak Vector Sum 2.927 mm/s at 0.830 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶----------◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-08
Blast Type: Stone Quarry/Stone Mine - Development/ Site Development
Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)
Date/Time: 10/04/2017 13:00
Pit/Permit: WEST CARLETON QUARRY / ARA-4085
Location: Lower level, near scale house.

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: No Trigger
Seismograph Type: instantel
Date: 10/04/17
Trigger Level: 1.23 mm/s Off dB
Time: 13:00
Calibration Date: 03/06/17
Distance From Blast: 1,499.62 m
Calibration Signal:
Direction From Blast: ESE
Geophone Min. Freq.: 2.0 Hz
Readout:
Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	--- mm/s	--- Hz
Vertical:	--- mm/s	--- Hz
Longitudinal:	--- mm/s	--- Hz
PPV:	--- mm/s	--- Hz
Acoustic:	--- dB	
Vector Sum:	--- mm/s	

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type: Seismic Record
Seismograph Type: instantel
Date: 10/04/17
Trigger Level: 1.23 mm/s Off dB
Time: 13:00
Calibration Date: 03/06/17
Distance From Blast: 742.80 m
Calibration Signal:
Direction From Blast: NE
Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy
Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	1.905 mm/s	37.0 Hz
Vertical:	1.397 mm/s	51.0 Hz
Longitudinal:	2.159 mm/s	32.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	110 dB	
Vector Sum:	2.366 mm/s	

SEISMOGRAPH 3 - 3950 MARCH RD

Data Type: Seismic Record
Seismograph Type: Instantell
Date: 10/04/17
Trigger Level: 1.70 mm/s 113.00 dB
Time: 13:00
Calibration Date: 03/06/17
Distance From Blast: 995.48 m
Calibration Signal:
Direction From Blast: NNE
Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy
Mic. Min. Freq.: 2.0 Hz
Location: Set up in Driveway of 3950 march Rd. Geo spiked and wqeight bagged.
Lat./Long.: 45° 16' 10.000" N 76° 7' 28.000" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	0.127 mm/s	--- Hz
Vertical:	0.127 mm/s	--- Hz
Longitudinal:	0.254 mm/s	--- Hz
PPV:	--- mm/s	--- Hz
Acoustic:	115 dB	
Vector Sum:	0.254 mm/s	

No Trigger

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15589
Oct 4 /17 12:15:46		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Oct 4 /17 12:15:48	Oct 4 /17 12:15:54	Event recorded. Trigger Level Vert: 1.23 mm/s
Oct 4 /17 12:16:08		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Oct 4 /17 12:52:41	Oct 4 /17 12:52:47	Event recorded. Trigger Level Vert: 1.23 mm/s
Oct 4 /17 12:53:01		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Oct 4 /17 13:17:07	Oct 4 /17 13:17:13	Event recorded. Trigger Level Vert: 1.23 mm/s
Oct 4 /17 13:17:27	Oct 4 /17 13:22:31	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 110.0 dB(L)

Instantel Event Report

Date/Time	MicL at 13:01:05 October 4, 2017
Trigger Source	Geo: 1.700 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

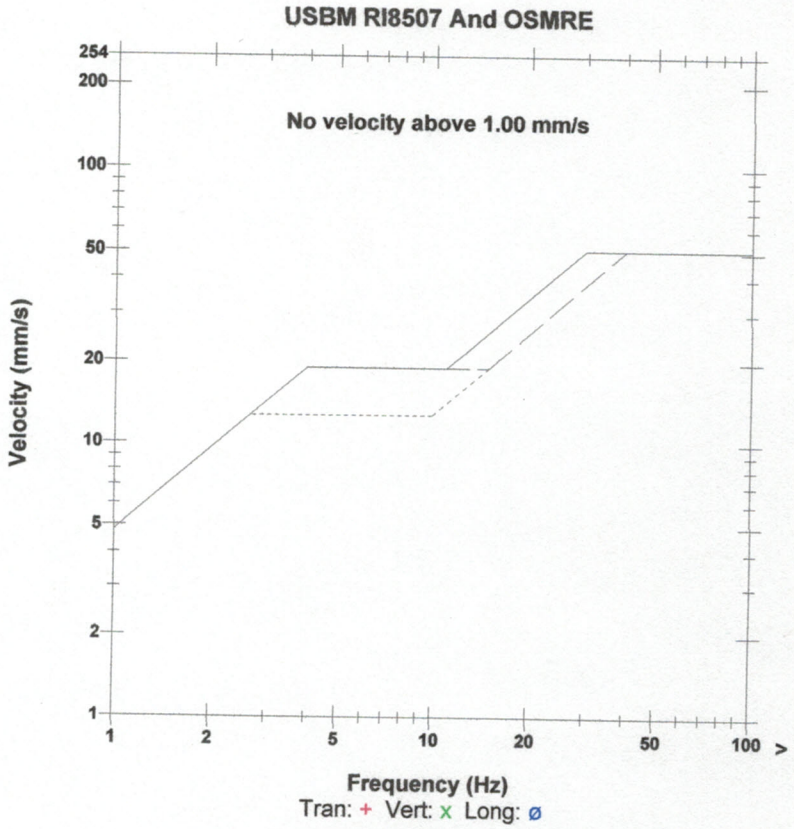
Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	September 21, 2017 by Instantel
File Name	U637H3GK.5T0

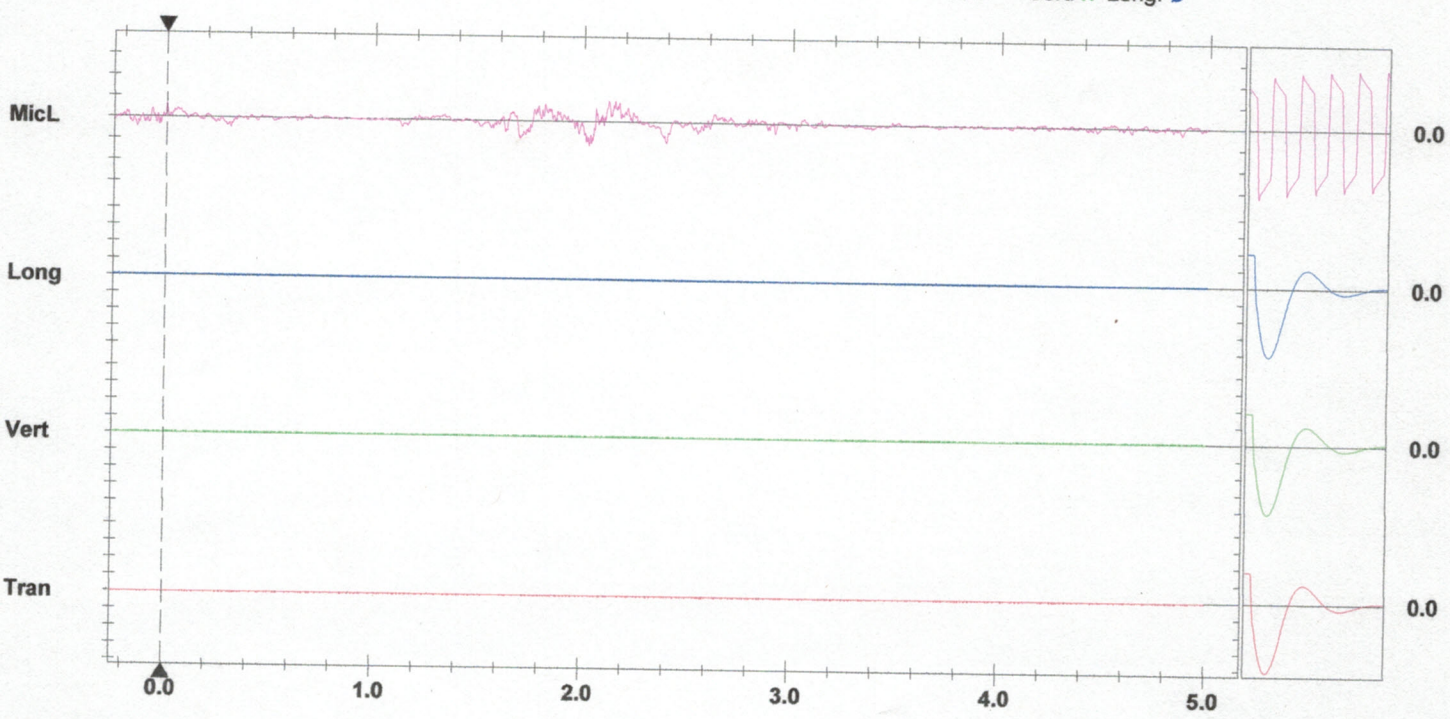
Post Event Notes
Set up at 3950 March Road in driveway. geo spiked and weight bagged.

Microphone	Linear Weighting
PSPL	115.0 dB(L) at 2.025 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 582 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.254	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.249	-0.248	2.868	sec
Peak Acceleration	0.013	0.013	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.6	Hz
Overswing Ratio	3.6	3.6	3.7	

Peak Vector Sum 0.254 mm/s at 2.868 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

Instantel Event Report

Date/Time	Tran at 12:59:06 October 4, 2017
Trigger Source	Geo: 1.230 mm/s, Mic: 112.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	March 6, 2017 by Instantel
File Name	Q020H3GK.2I0

Post Event Notes
Set up at 1550 Drire Hill Rd. Geo spiked and weight bagged.

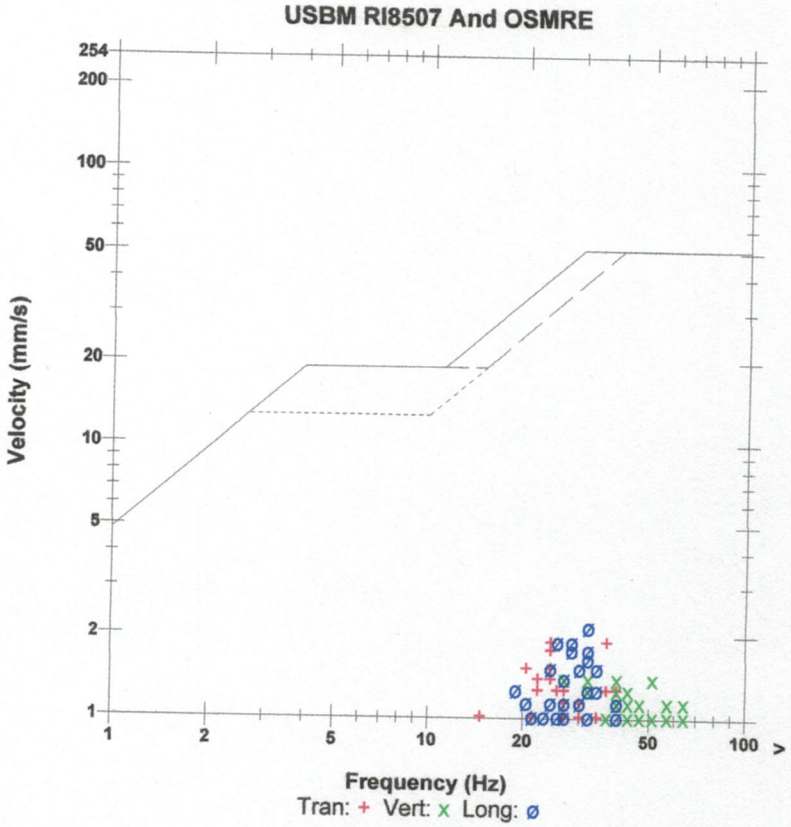
Notes
Location:
Client:
User Name:
General:

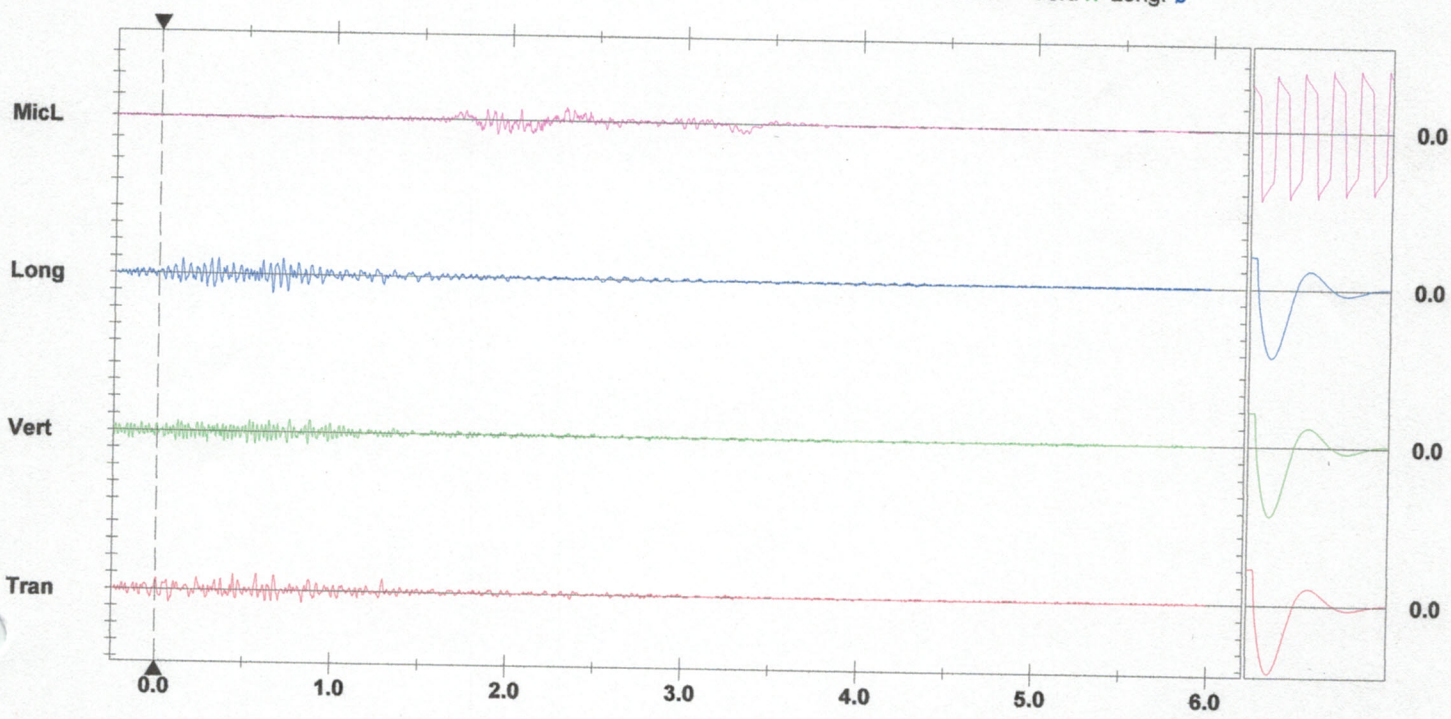
Extended Notes

Microphone	Linear Weighting
PSPL	110.2 dB(L) at 1.917 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 596 mv)

	Tran	Vert	Long	
PPV	1.905	1.397	2.159	mm/s
ZC Freq	37	51	32	Hz
Time (Rel. to Trig)	0.443	0.513	0.647	sec
Peak Acceleration	0.040	0.053	0.053	g
Peak Displacement	0.012	0.009	0.013	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.5	Hz
Overswing Ratio	4.0	3.6	3.7	

Peak Vector Sum 2.366 mm/s at 0.648 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-01 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 03/14/2018 14:45 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	03/14/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.726 mm/s	28.0 Hz
Time:	14:31	Calibration Date:	09/21/17		Vertical:	0.381 mm/s	51.0 Hz
Distance From Blast:	990.90 m	Calibration Signal:			Longitudinal:	1.27 mm/s	27.0 Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	108 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on snowy wet ground.				Vector Sum:	1.291 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	03/14/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	14:31	Calibration Date:	10/27/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,351.79 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

No Trigger
Set up at end of driveway of 1331 Dwire Hill Rd
Wieght bagged on wet ground

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
----------	----------	SERIAL NUMBER: BE15589
Mar 13 /18 13:50:42		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 13 /18 13:50:46	Mar 13 /18 13:50:51	Event recorded. (Keyboard Exit) Trigger Level Vert: 1.23 mm/s
Mar 14 /18 13:36:41		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 14 /18 13:55:24	Mar 14 /18 13:55:29	Event recorded. Trigger Level Tran: 1.23 mm/s
Mar 14 /18 13:55:42		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 14 /18 14:19:40	Mar 14 /18 14:19:45	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 14 /18 14:19:59	Mar 14 /18 14:48:53	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)

Instantel Event Report

Date/Time	Long at 14:31:34 March 14, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

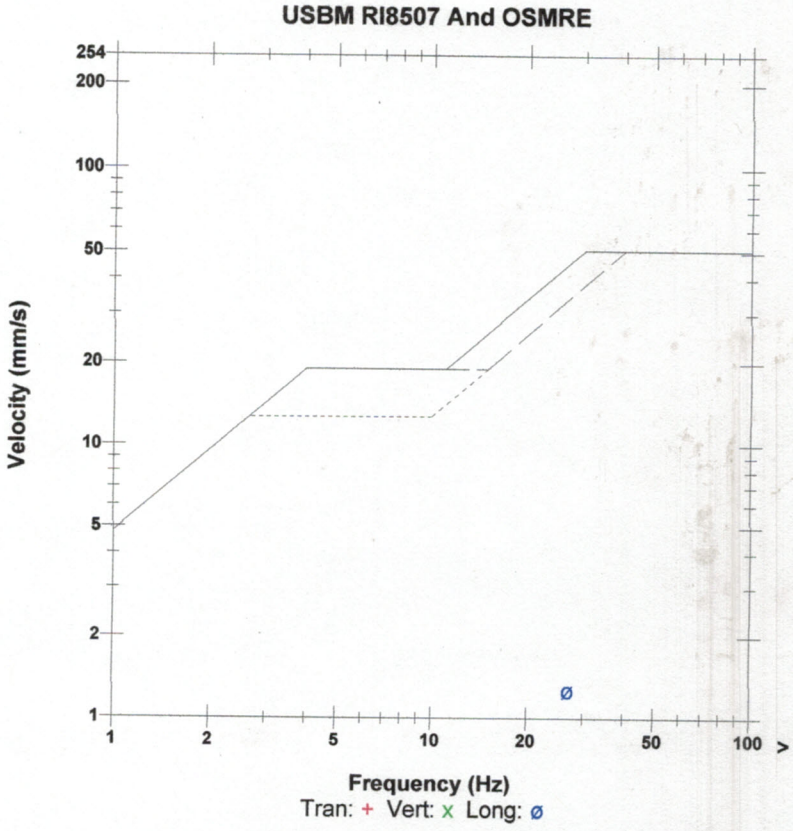
Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	September 21, 2017 by Instantel
File Name	U637HBQT.OM0

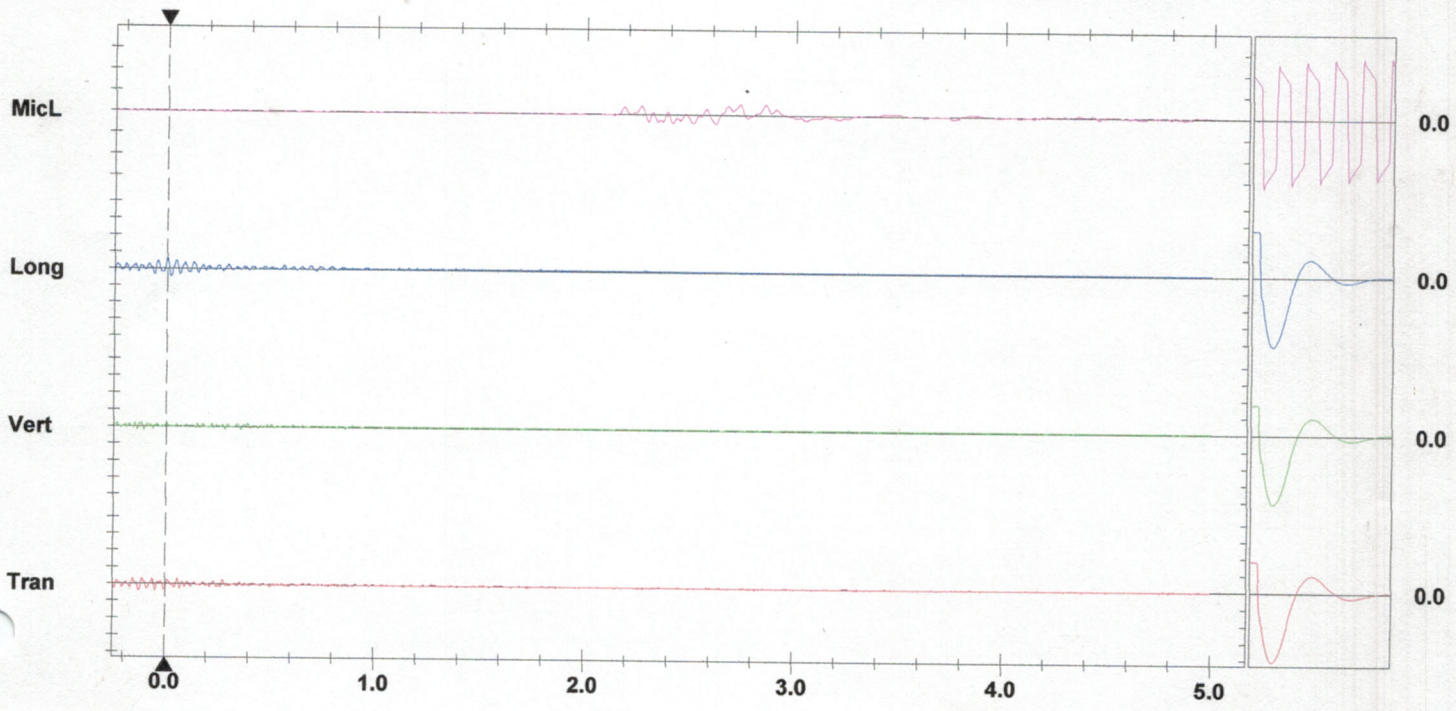
Post Event Notes
Set up at end of driveway of 1550 Dwire Hill Rd. Geo spiked and weight bagged on snowy, wet ground.

Microphone	Linear Weighting
PSPL	108.4 dB(L) at 2.856 sec
ZC Freq	3.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 769 mv)

	Tran	Vert	Long	
PPV	0.762	0.381	1.270	mm/s
ZC Freq	28	51	27	Hz
Time (Rel. to Trig)	-0.126	-0.235	0.000	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.005	0.003	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.8	Hz
Overswing Ratio	3.9	3.9	3.8	

Peak Vector Sum 1.391 mm/s at 0.000 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-02 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 03/16/2018 10:20 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: West Wall, short bench

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	False Trigger	Seismograph Type:	instantel				
Date:	03/16/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	10:05	Calibration Date:	09/21/17		Vertical:	0.127 mm/s	--- Hz
Distance From Blast:	969.57 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	119 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on snowy wet ground. False Trigger, triggered 15mins before blast.				Vector Sum:	0.22 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	03/16/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	10:20	Calibration Date:	10/27/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,380.44 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

No Trigger
False Trigger, very windy cold day.
Wieght bagged on wet ground

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
---	---	SERIAL NUMBER: BE19637
Mar 15 /18 11:12:26	Mar 15 /18 12:28:07	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:17:47		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:20:26	Mar 16 /18 09:20:31	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:20:45		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:22:34	Mar 16 /18 09:22:39	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:22:53		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:46:02	Mar 16 /18 09:46:07	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:46:21		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:48:29	Mar 16 /18 09:48:34	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:48:48		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:49:37	Mar 16 /18 09:49:42	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:49:55		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:56:08	Mar 16 /18 09:56:13	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:56:26		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 09:57:03	Mar 16 /18 09:57:08	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 09:57:22		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 10:00:47	Mar 16 /18 10:00:53	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 10:01:06		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 10:02:29	Mar 16 /18 10:02:34	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 10:02:47		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Mar 16 /18 10:04:26	Mar 16 /18 10:04:31	Event recorded. Trigger Level MicL: 119.0 dB(L)
Mar 16 /18 10:04:45	Mar 16 /18 10:35:39	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)

Instantel Event Report

Date/Time MicL at 10:05:29 March 16, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

Notes

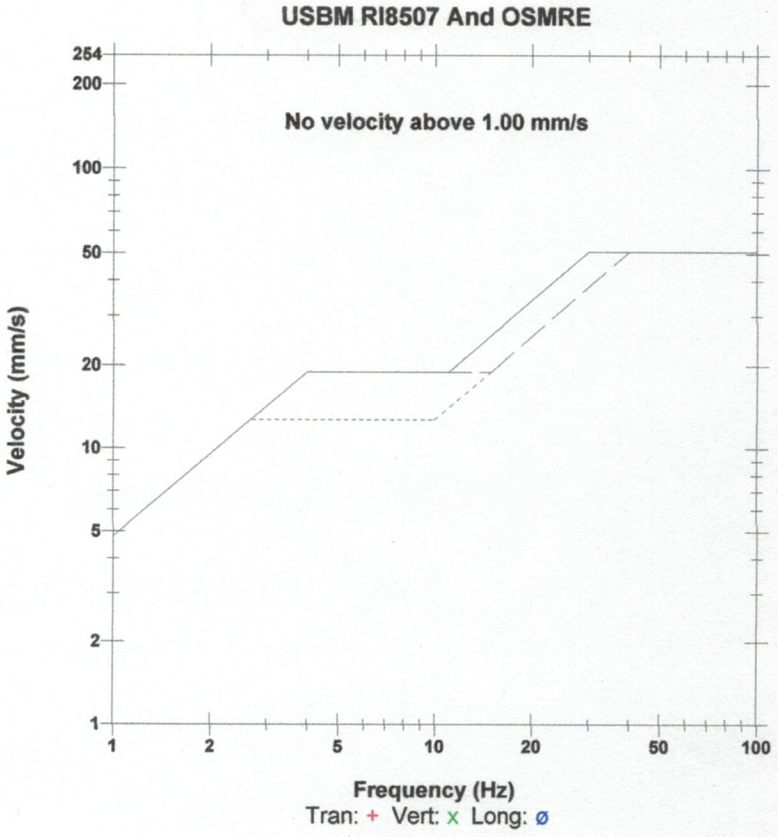
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration October 27, 2017 by Instantel
File Name Q589HBU6.P50
Post Event Notes
Set up on roadside of 1550 Dwire Hill Rd
False Trigger, set up on roadside, possible snow plow, very cold and windy day.

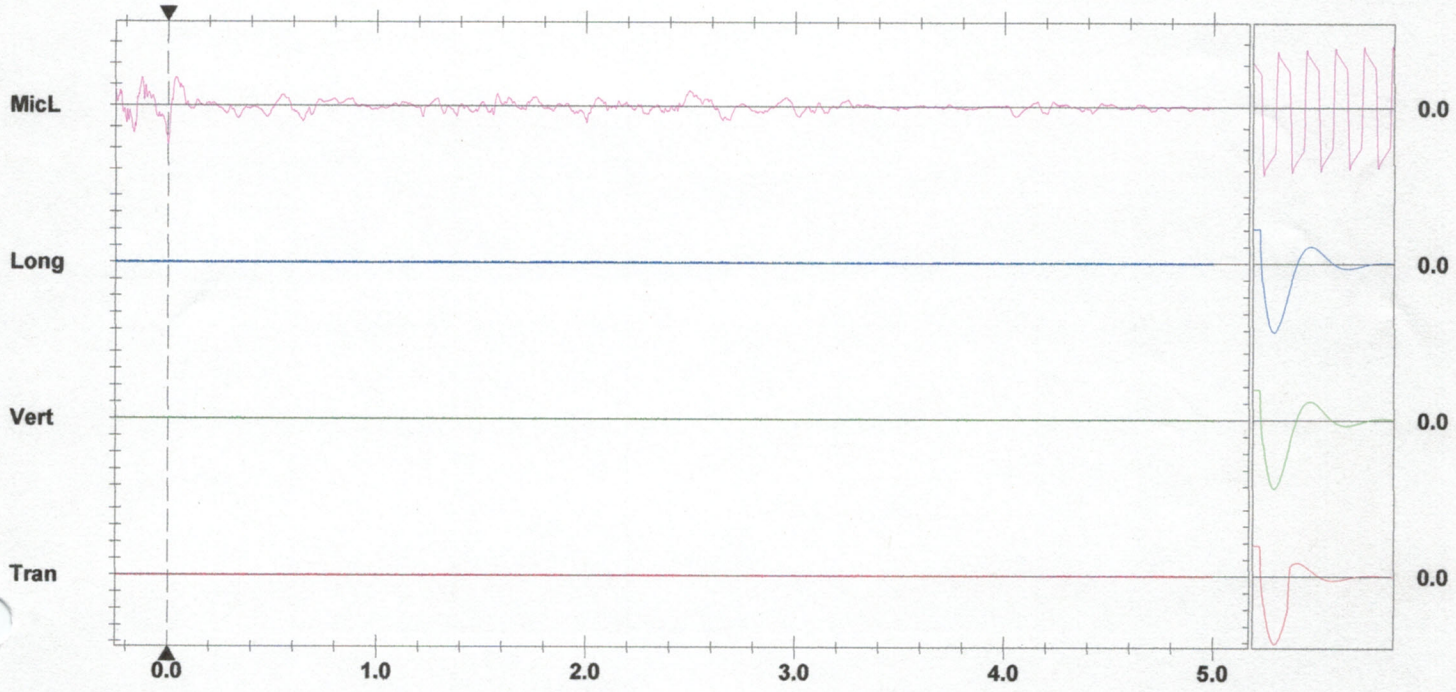
Extended Notes

Microphone Linear Weighting
PSPL 119.3 dB(L) at 0.001 sec
ZC Freq 6.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 740 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.234	-0.083	-0.247	sec
Peak Acceleration	0.027	0.027	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Check	Passed	Passed	
Frequency	9.9	7.9	7.8	Hz
Overswing Ratio	4.9	3.6	3.9	

Peak Vector Sum 0.220 mm/s at -0.063 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-03 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/02/2018 16:30 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: Lower Bench

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	04/02/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	16:19	Calibration Date:	09/21/17		Vertical:	0.127 mm/s	--- Hz
Distance From Blast:	1,004.01 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	119 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.				Vector Sum:	0.22 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	04/02/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	16:30	Calibration Date:	10/27/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,422.50 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

No Trigger
Set up at 1331 Drire Hill rd
Wieght bagged on frozen ground, near Rd

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
----------	----------	SERIAL NUMBER: BE19637
Apr 2 /18 12:09:54		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Apr 2 /18 12:28:33	Apr 2 /18 12:28:38	Event recorded. Trigger Level Tran: 1.23 mm/s
Apr 2 /18 12:28:51	Apr 2 /18 12:39:54	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)
Apr 2 /18 15:37:51	Apr 2 /18 16:46:58	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)
Apr 3 /18 09:35:55	Apr 3 /18 10:37:25	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)

Instantel

Event Report

Date/Time	MicL at 16:29:45 April 2, 2018
Trigger Source	Geo: 1.100 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE19638 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	February 5, 2018 by Instantel
File Name	U638HCQ5.TL0

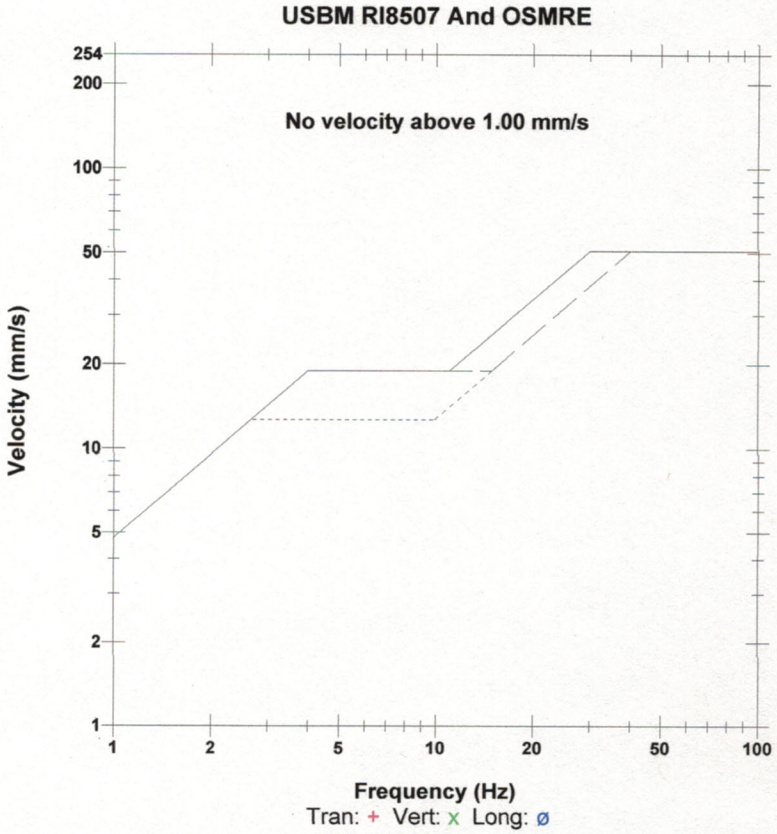
Notes
Location:
Client:
User Name:
General:

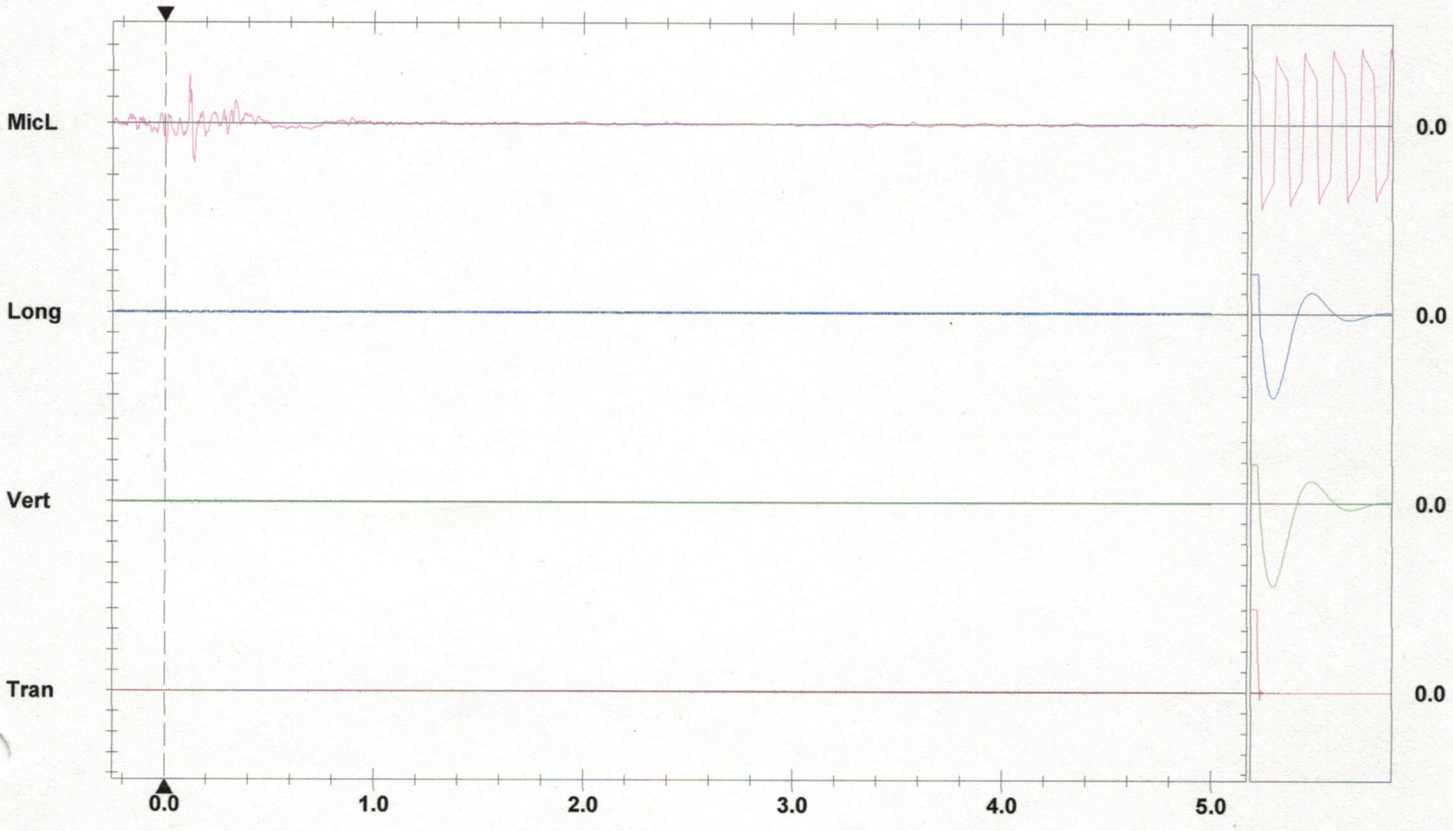
Extended Notes

Microphone	Linear Weighting
PSPL	119.4 dB(L) at 0.118 sec
ZC Freq	26 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 717 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	>100	>100	N/A	Hz
Time (Rel. to Trig)	0.020	-0.188	-0.250	sec
Peak Acceleration	0.013	0.013	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Check	Passed	Passed	
Frequency	44.5	7.6	7.5	Hz
Overswing Ratio	2.0	3.7	3.9	

Peak Vector Sum 0.220 mm/s at 2.789 sec
N/A: Not Applicable





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-04 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/03/2018 10:15 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: Lower Bench

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 04/03/18 Trigger Level: 1.23 mm/s Off dB
Time: 10:15 Calibration Date: 09/21/17
Distance From Blast: 929.64 m Calibration Signal:
Direction From Blast: NNE Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	--- mm/s	--- Hz
Vertical:	--- mm/s	--- Hz
Longitudinal:	--- mm/s	--- Hz
PPV:	--- mm/s	--- Hz
Acoustic:	--- dB	
Vector Sum:	--- mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 04/03/18 Trigger Level: 1.23 mm/s Off dB
Time: 10:15 Calibration Date: 10/27/17
Distance From Blast: 1,434.69 m Calibration Signal:
Direction From Blast: E Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	--- mm/s	--- Hz
Vertical:	--- mm/s	--- Hz
Longitudinal:	--- mm/s	--- Hz
PPV:	--- mm/s	--- Hz
Acoustic:	--- dB	
Vector Sum:	--- mm/s	

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-05 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 05/22/2018 13:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 05/22/18 Trigger Level: 1.23 mm/s Off dB
Time: 12:56 Calibration Date: 09/21/17
Distance From Blast: 925.98 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	3.556 mm/s	16.0 Hz
Vertical:	1.397 mm/s	20.0 Hz
Longitudinal:	3.683 mm/s	22.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	116 dB	
Vector Sum:	4.113 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 05/22/18 Trigger Level: 1.23 mm/s Off dB
Time: 12:58 Calibration Date: 10/27/17
Distance From Blast: 1,647.75 m Calibration Signal:
Direction From Blast: E Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	1.397 mm/s	21.0 Hz
Vertical:	1.016 mm/s	27.0 Hz
Longitudinal:	1.143 mm/s	15.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	117 dB	
Vector Sum:	1.454 mm/s	

SEISMOGRAPH 3 - 3950 MARCH RD

Data Type: Seismic Record Seismograph Type: Instantell
Date: 05/22/18 Trigger Level: 1.70 mm/s 113.00 dB
Time: 12:52 Calibration Date: 09/21/17
Distance From Blast: 1,161.29 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in Driveway of 3950 march Rd. Geo spiked and wqeight bagged.
Lat./Long.: 45° 16' 10.000" N 76° 7' 28.000" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Wyatt Cliffton, Austin Powder

Transverse:	1.524 mm/s	11.0 Hz
Vertical:	1.016 mm/s	16.0 Hz
Longitudinal:	1.651 mm/s	17.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	113 dB	
Vector Sum:	1.823 mm/s	

Instantel Event Report

Date/Time Tran at 12:58:16 May 22, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

Notes

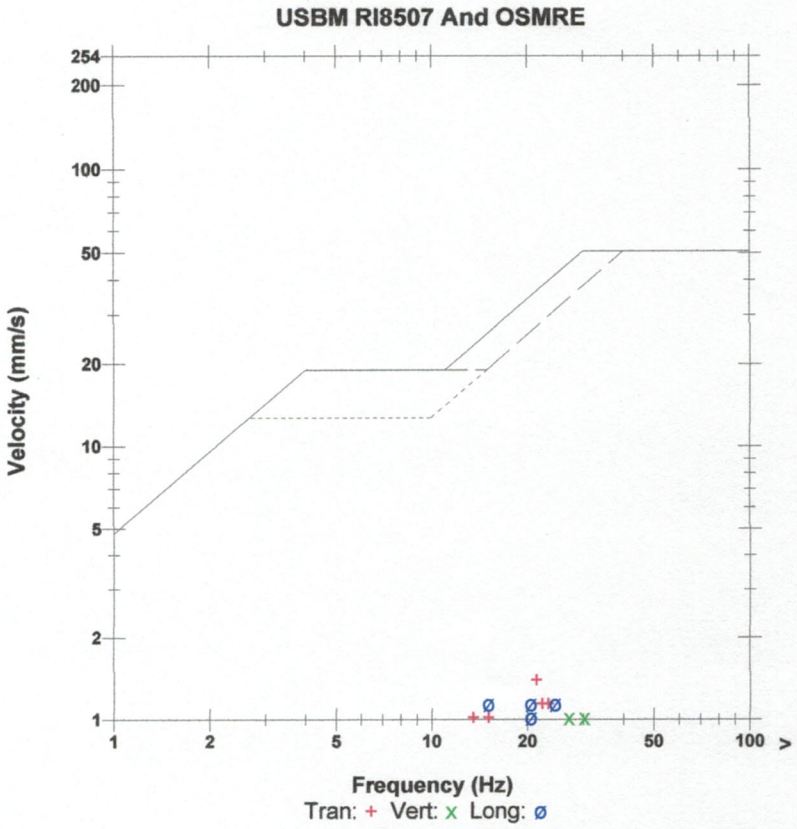
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 27, 2017 by Instantel
File Name Q589HFAH.D40
Post Event Notes
Set up at end of driveway of 1331 Dwire Hill rd. Geo spiked and weight bagged.

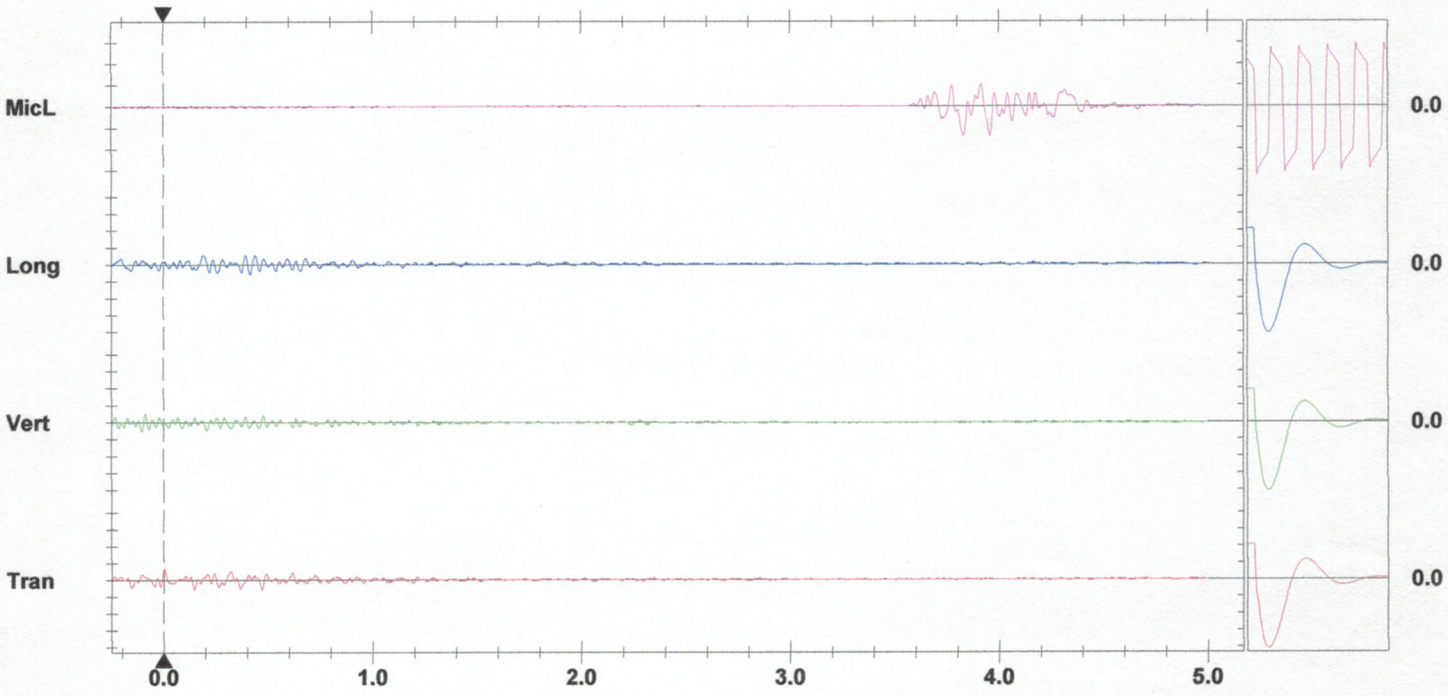
Extended Notes

Microphone Linear Weighting
PSPL 116.9 dB(L) at 3.958 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 582 mv)

	Tran	Vert	Long	
PPV	1.397	1.016	1.143	mm/s
ZC Freq	21	27	15	Hz
Time (Rel. to Trig)	0.002	-0.106	0.188	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.011	0.007	0.013	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.8	Hz
Overswing Ratio	3.5	3.4	3.6	

Peak Vector Sum 1.454 mm/s at 0.002 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel

Event Report

Date/Time Long at 12:56:42 May 22, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration March 19, 2018 by Instantel
File Name Q020HFAH.AI0
Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

Notes
Location:
Client:
User Name:
General:

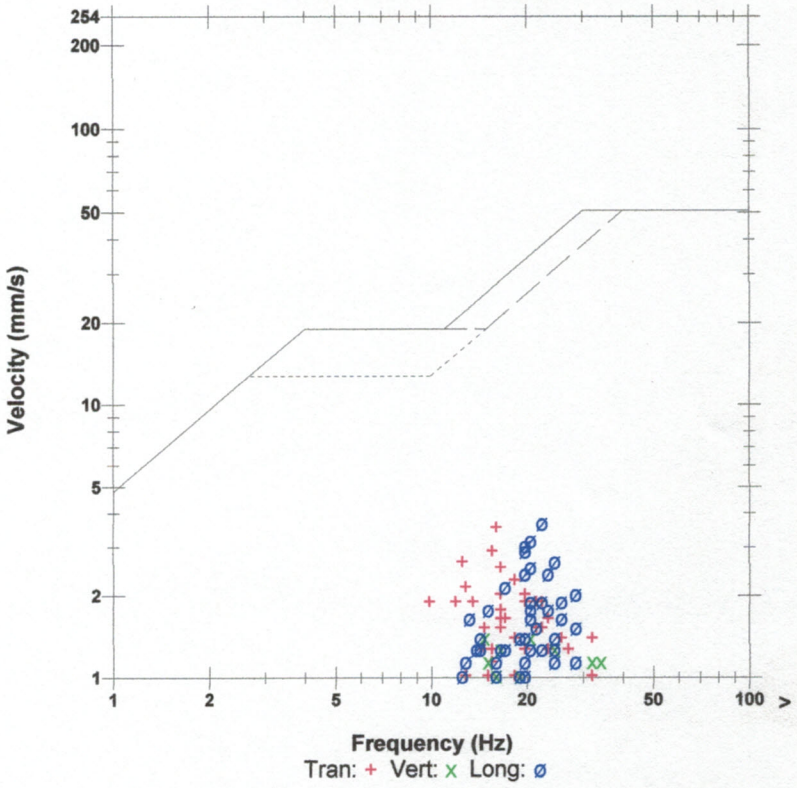
Extended Notes

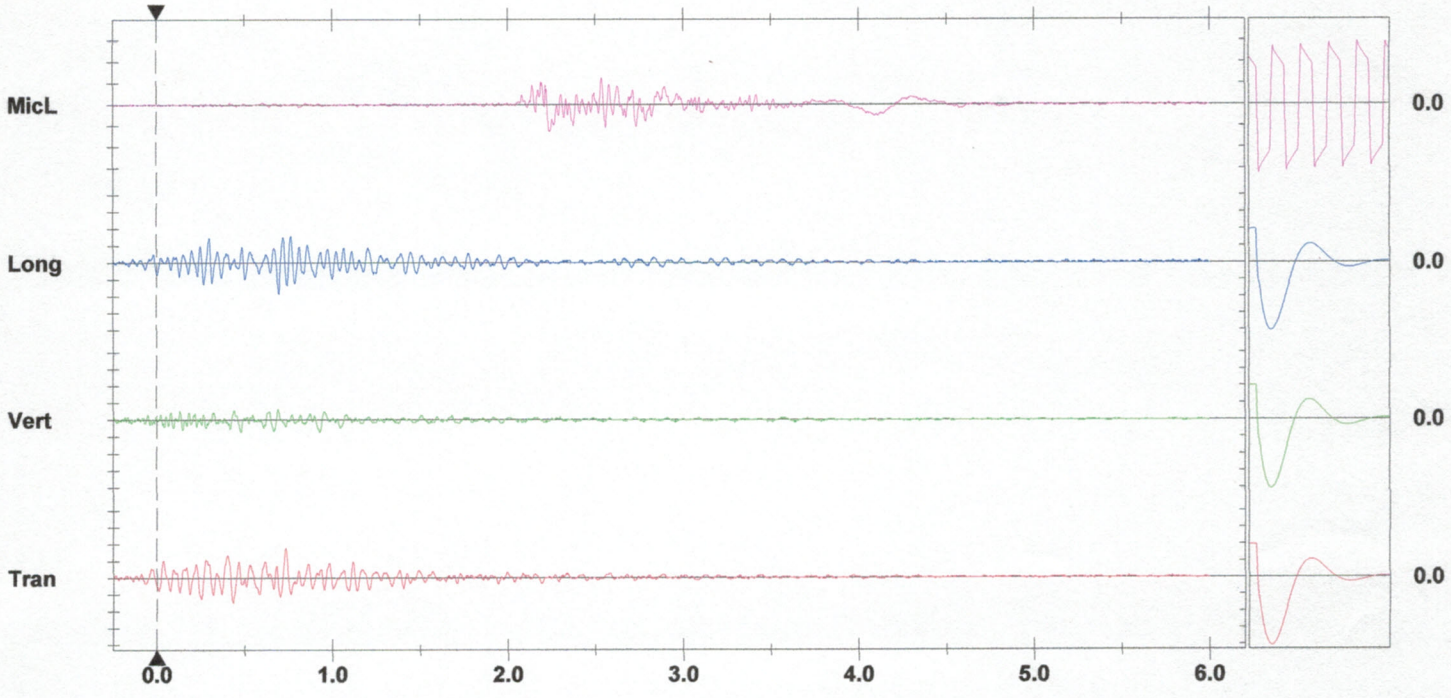
Microphone Linear Weighting
PSPL 116.1 dB(L) at 2.240 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 576 mv)

	Tran	Vert	Long	
PPV	3.556	1.397	3.683	mm/s
ZC Freq	16	20	22	Hz
Time (Rel. to Trig)	0.730	0.479	0.693	sec
Peak Acceleration	0.040	0.040	0.066	g
Peak Displacement	0.035	0.015	0.025	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.3	Hz
Overswing Ratio	3.9	3.6	3.8	

Peak Vector Sum 4.113 mm/s at 0.694 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel

Event Report

Date/Time Tran at 12:52:55 May 22, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

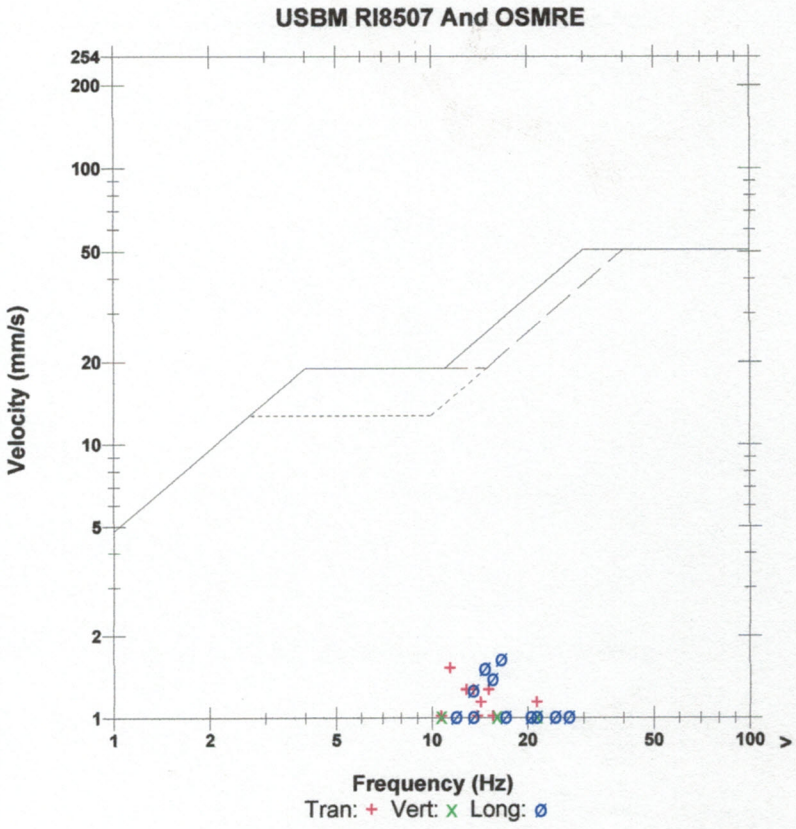
Notes

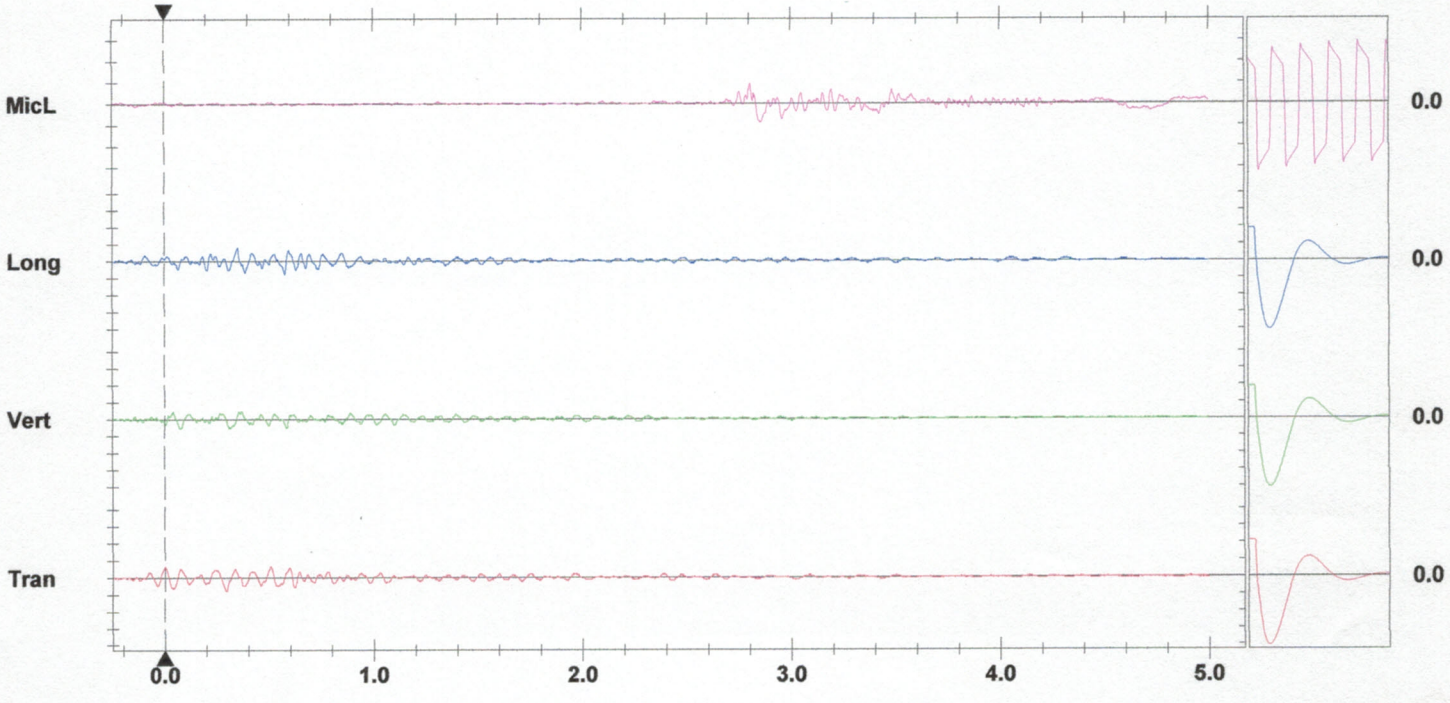
Serial Number BE19637 V 10.72-8.17 MiniMate Plus
Battery Level 6.4 Volts
Unit Calibration September 21, 2017 by Instantel
File Name U637HFAH.470
Post Event Notes
Set up at end of driveway of 3950 March Rd. Geo spiked and weight bagged on thick ditch grass.

Microphone Linear Weighting
PSPL 113.3 dB(L) at 2.806 sec
ZC Freq 9.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 534 mv)

	Tran	Vert	Long	
PPV	1.524	1.016	1.651	mm/s
ZC Freq	11	16	17	Hz
Time (Rel. to Trig)	0.290	0.071	0.351	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.019	0.016	0.014	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.5	Hz
Overswing Ratio	3.6	3.7	3.7	

Peak Vector Sum 1.823 mm/s at 0.353 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-06 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 05/28/2018 17:00 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North West High Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	05/29/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	3.048 mm/s	18.0 Hz
Time:	17:11	Calibration Date:	09/21/17		Vertical:	2.286 mm/s	28.0 Hz
Distance From Blast:	949.15 m	Calibration Signal:			Longitudinal:	4.826 mm/s	20.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	116 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.				Vector Sum:	5.145 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	05/29/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.524 mm/s	20.0 Hz
Time:	17:13	Calibration Date:	10/27/17		Vertical:	1.524 mm/s	28.0 Hz
Distance From Blast:	1,669.08 m	Calibration Signal:			Longitudinal:	1.016 mm/s	21.0 Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	115 dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.				Vector Sum:	1.871 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

Instantel Event Report

Date/Time Long at 17:11:39 May 28, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration March 19, 2018 by Instantel
File Name Q020HFLX.3F0

Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on normal lawn.

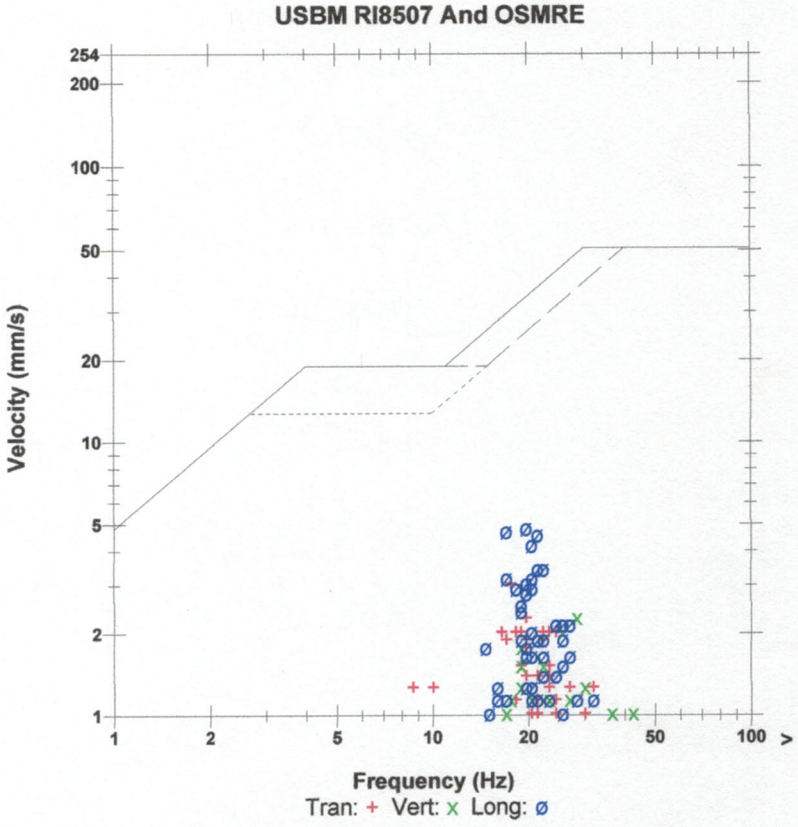
Notes
Location:
Client:
User Name:
General:

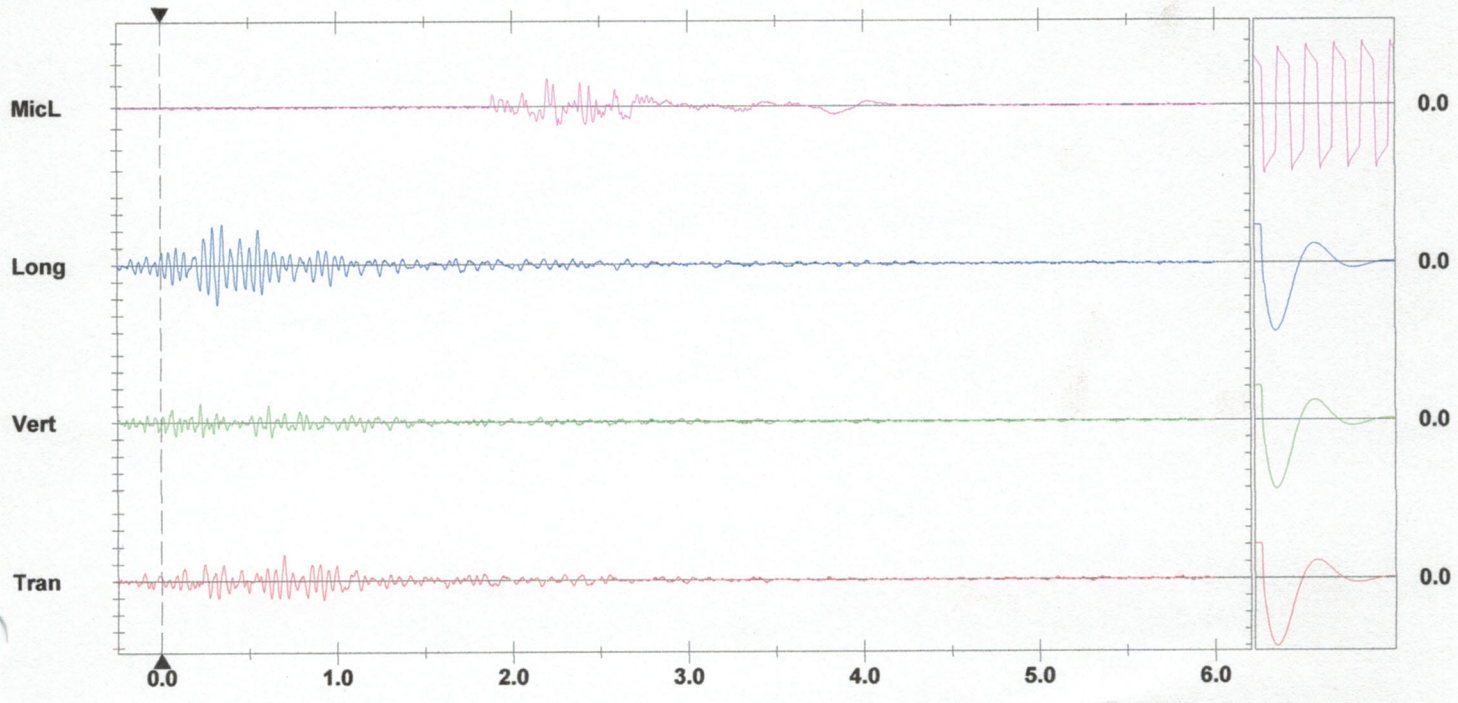
Extended Notes

Microphone Linear Weighting
PSPL 116.3 dB(L) at 2.201 sec
ZC Freq 8.3 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 569 mv)

	Tran	Vert	Long	
PPV	3.048	2.286	4.826	mm/s
ZC Freq	18	28	20	Hz
Time (Rel. to Trig)	0.693	0.223	0.347	sec
Peak Acceleration	0.040	0.040	0.066	g
Peak Displacement	0.026	0.016	0.040	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.6	7.5	Hz
Overswing Ratio	3.9	3.5	3.6	

Peak Vector Sum 5.145 mm/s at 0.321 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel

Event Report

Date/Time	Vert at 17:13:23 May 28, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 27, 2017 by Instantel
File Name	Q589HFLX.6B0

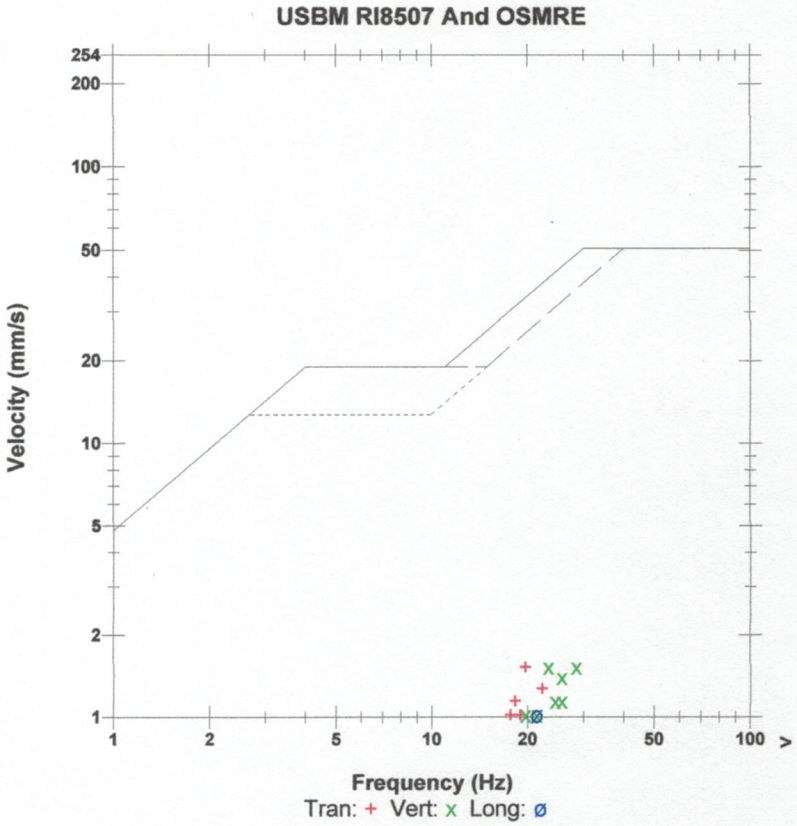
Post Event Notes
Set up at end of driveway of 1331 Dwire Hill rd. Geo spiked and weight bagged on mossy gravel.

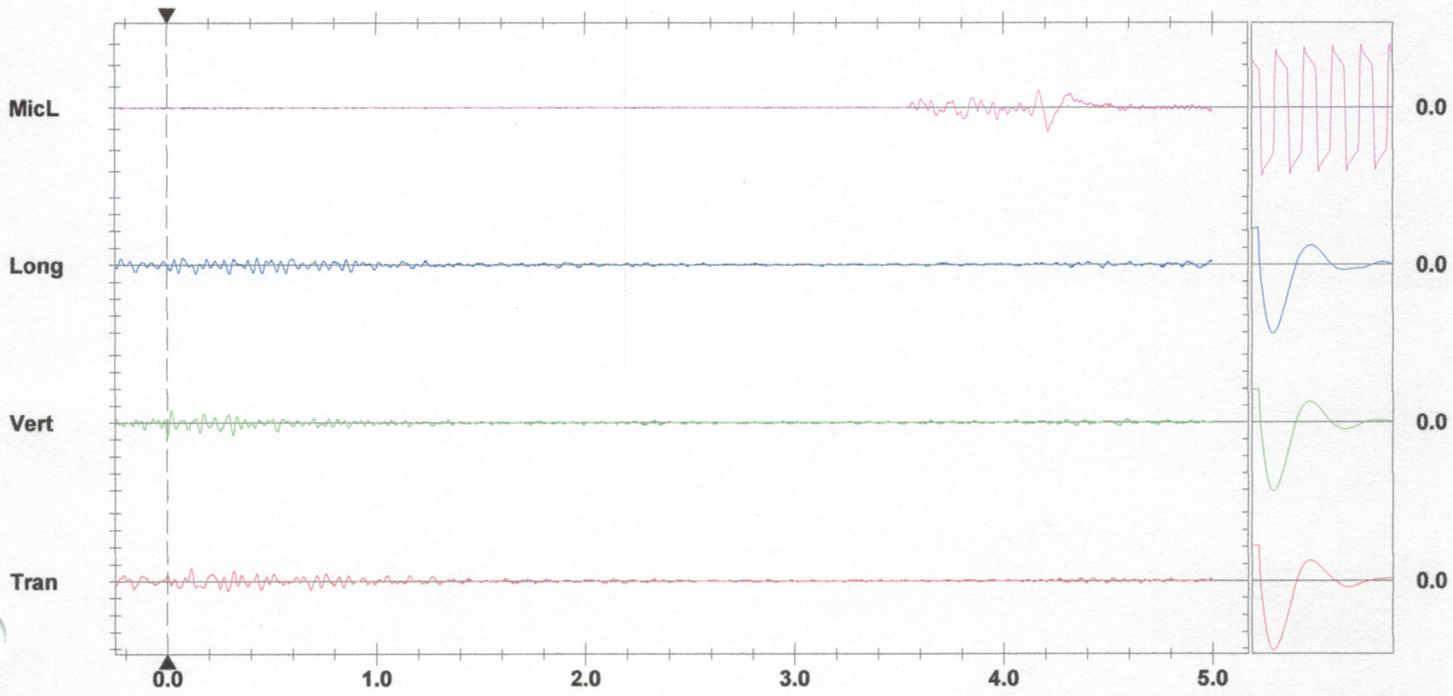
Extended Notes

Microphone	Linear Weighting
PSPL	115.2 dB(L) at 4.212 sec
ZC Freq	6.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 541 mv)

	Tran	Vert	Long	
PPV	1.524	1.524	1.016	mm/s
ZC Freq	20	28	21	Hz
Time (Rel. to Trig)	0.113	0.002	0.137	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.016	0.010	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.8	Hz
Overswing Ratio	3.4	3.3	3.6	

Peak Vector Sum 1.871 mm/s at 0.316 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-07 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 06/01/2018 12:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: Lower level

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	06/01/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	12:00	Calibration Date:	09/21/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,139.65 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	06/01/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	12:00	Calibration Date:	10/27/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,393.55 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-08 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 06/01/2018 14:30 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North West Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	06/01/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.413 mm/s	20.0 Hz
Time:	14:28	Calibration Date:	09/21/17		Vertical:	1.778 mm/s	20.0 Hz
Distance From Blast:	936.65 m	Calibration Signal:			Longitudinal:	3.175 mm/s	18.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	115 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.				Vector Sum:	3.579 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	06/01/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	14:30	Calibration Date:	10/27/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,669.08 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

Instantel Event Report

Date/Time	Long at 14:28:08 June 1, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	March 19, 2018 by Instantel
File Name	Q020HFT4.6W0

Post Event Notes
Set up at end of driveway of 1550 Dwire Hill Rd.

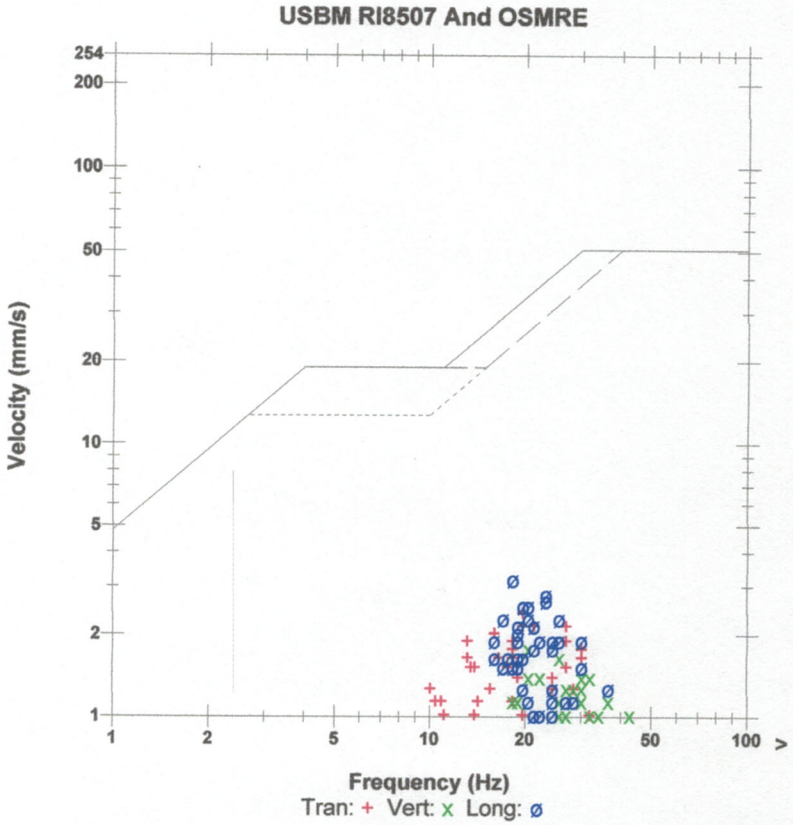
Notes
Location:
Client:
User Name:
General:

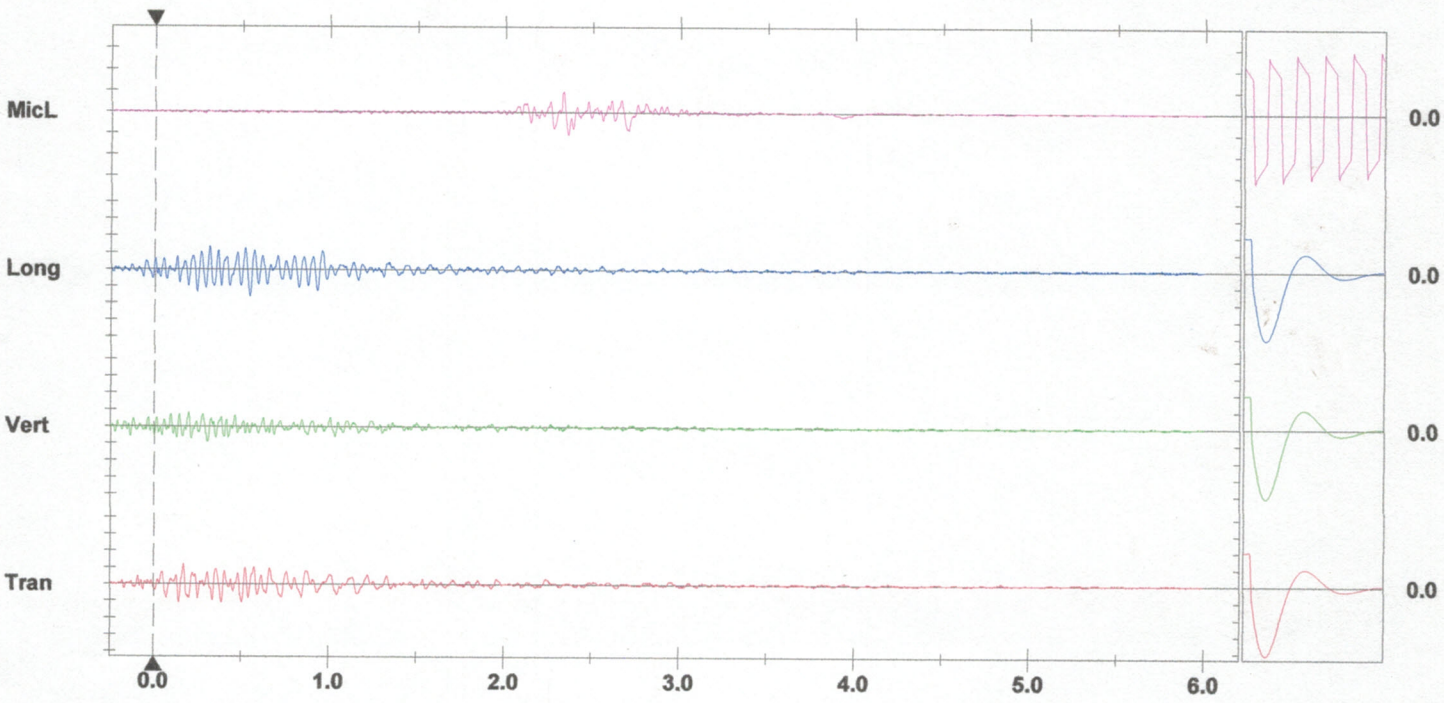
Extended Notes

Microphone	Linear Weighting
PSPL	114.6 dB(L) at 2.358 sec
ZC Freq	9.1 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 585 mv)

	Tran	Vert	Long	
PPV	2.413	1.778	3.175	mm/s
ZC Freq	20	20	18	Hz
Time (Rel. to Trig)	0.171	0.305	0.544	sec
Peak Acceleration	0.053	0.040	0.053	g
Peak Displacement	0.020	0.014	0.027	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.4	Hz
Overswing Ratio	3.9	3.5	3.7	

Peak Vector Sum 3.579 mm/s at 0.544 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger =

False Trigger's
Set up at end of driveway of 1331 Dwire Hill Rd.

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
----------	----------	SERIAL NUMBER: BE15589
Jun 1 /18 10:34:40		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 10:34:44	Jun 1 /18 10:34:49	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 10:35:02		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 10:39:23	Jun 1 /18 10:39:28	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 10:39:41		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 11:12:45	Jun 1 /18 11:12:50	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 11:13:04		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 11:16:33	Jun 1 /18 11:16:38	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 11:16:52		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 11:17:40	Jun 1 /18 11:17:45	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 11:17:59		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 11:36:20	Jun 1 /18 11:36:26	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 11:36:39		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 12:45:48	Jun 1 /18 12:45:53	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 12:46:07		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 13:35:08	Jun 1 /18 13:35:13	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 13:35:27		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 13:45:14	Jun 1 /18 13:45:19	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 13:45:33		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 13:48:42	Jun 1 /18 13:48:47	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 13:49:01		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 13:55:03	Jun 1 /18 13:55:08	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 13:55:22		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 119.0 dB(L)
Jun 1 /18 14:50:30	Jun 1 /18 14:50:35	Event recorded. Trigger Level Vert: 1.23 mm/s
Jun 1 /18 14:50:48	Jun 1 /18 14:50:51	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-09 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/07/2018 12:04 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: Near Scale House

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/07/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	4.445 mm/s	21.0 Hz
Time:	12:03	Calibration Date:	10/10/17		Vertical:	1.524 mm/s	30.0 Hz
Distance From Blast:	668.73 m	Calibration Signal:			Longitudinal:	2.54 mm/s	32.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	116 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on frozen ground.				Vector Sum:	4.561 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel				
Date:	09/07/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	--- mm/s	--- Hz
Time:	12:00	Calibration Date:	10/27/17		Vertical:	--- mm/s	--- Hz
Distance From Blast:	1,454.51 m	Calibration Signal:			Longitudinal:	--- mm/s	--- Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:		Mic. Min. Freq.:	2.0 Hz		Acoustic:	--- dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged. frozen ground.				Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Patrick Garlic, Austin Powder						

Instantel

Event Report

Date/Time	Tran at 12:03:16 September 7, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	March 19, 2018 by Instantel
File Name	Q020HKUE.TG0

Post Event Notes
Set up beside driveway of 1550 Dwire Hill Rd. Geo spiked and weight baggged on nice lawn.

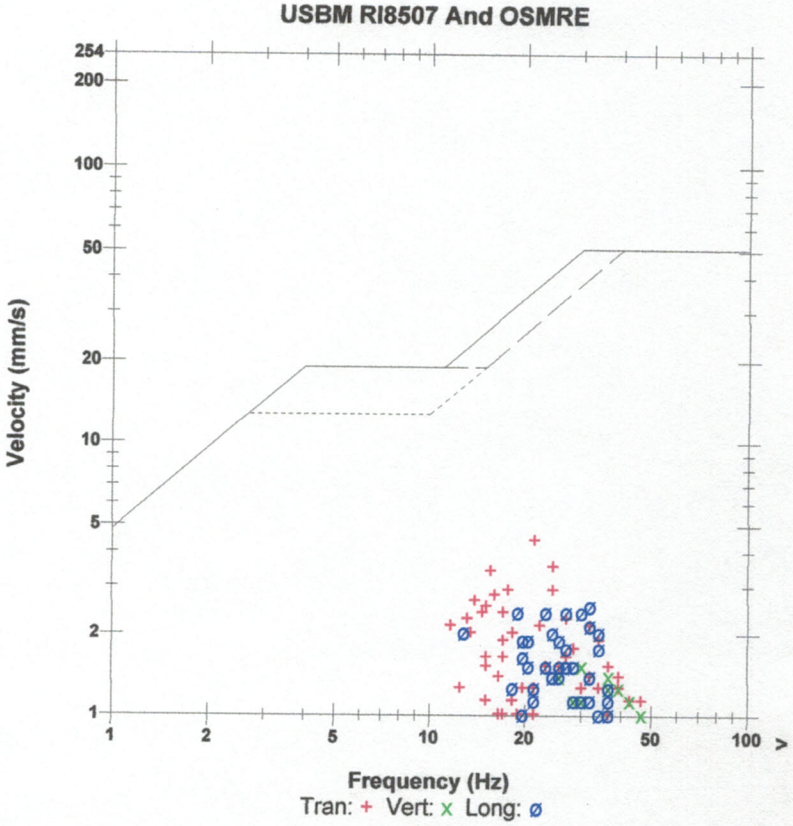
Notes
Location:
Client:
User Name:
General:

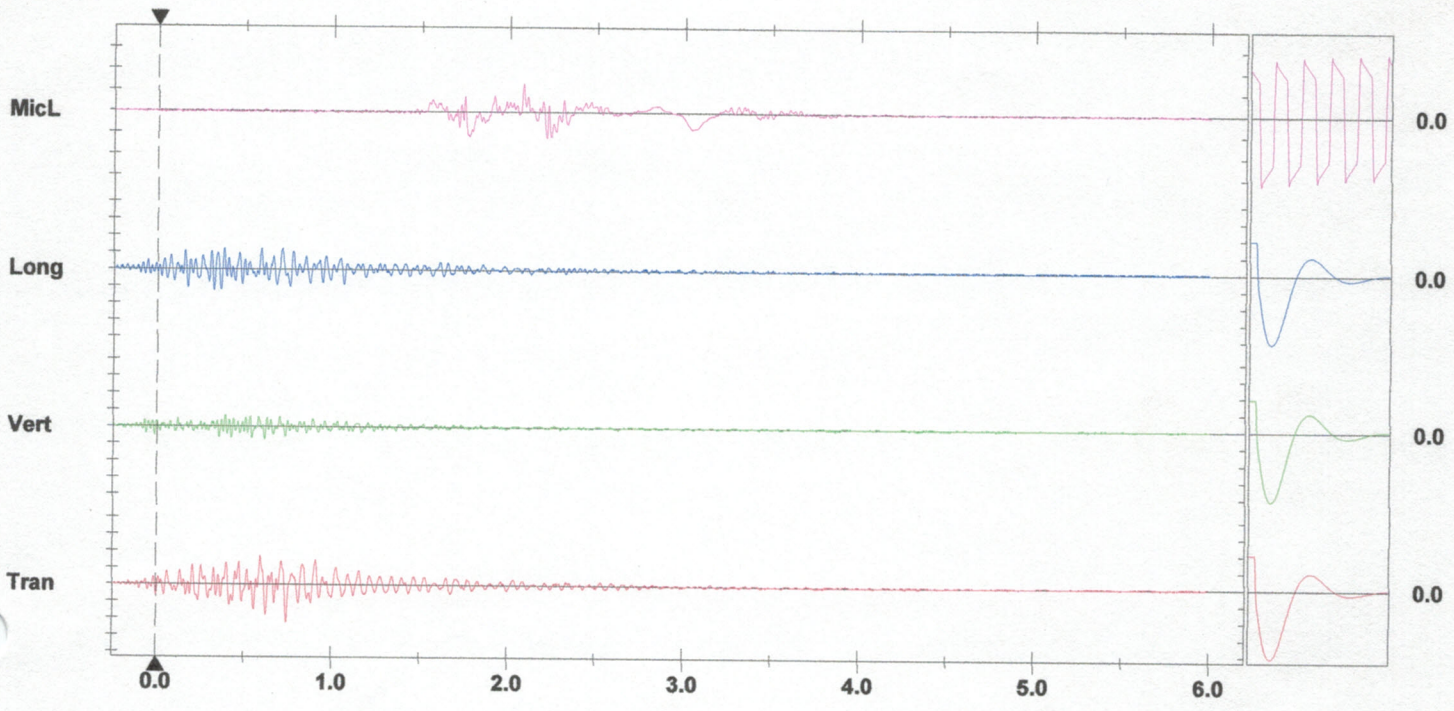
Extended Notes

Microphone	Linear Weighting
PSPL	116.4 dB(L) at 2.079 sec
ZC Freq	7.3 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 503 mv)

	Tran	Vert	Long	
PPV	4.445	1.524	2.540	mm/s
ZC Freq	21	30	32	Hz
Time (Rel. to Trig)	0.742	0.616	0.323	sec
Peak Acceleration	0.066	0.040	0.053	g
Peak Displacement	0.031	0.007	0.020	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.4	Hz
Overswing Ratio	4.0	3.6	3.8	

Peak Vector Sum 4.561 mm/s at 0.744 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

No Trigger
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged.

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15589
Sep 7 /18 11:12:13	Sep 7 /18 12:23:32	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 119.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-10 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/11/2018 11:30 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 09/11/18 Trigger Level: 1.23 mm/s Off dB
Time: 11:34 Calibration Date: 10/10/17
Distance From Blast: 670.56 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on lawn.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Patrick Garlic, Austin Powder

Transverse:	3.683 mm/s	20.0 Hz
Vertical:	1.651 mm/s	37.0 Hz
Longitudinal:	2.921 mm/s	20.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	117 dB	
Vector Sum:	4.512 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 09/11/18 Trigger Level: 1.23 mm/s Off dB
Time: 11:29 Calibration Date: 10/27/17
Distance From Blast: 1,477.67 m Calibration Signal:
Direction From Blast: ESE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Patrick Garlic, Austin Powder

Transverse:	2.023 mm/s	16.0 Hz
Vertical:	1.397 mm/s	16.0 Hz
Longitudinal:	1.651 mm/s	16.0 Hz
PPV:	--- mm/s	--- Hz
Acoustic:	93 dB	
Vector Sum:	2.572 mm/s	

Instantel

Event Report

Date/Time	Tran at 11:29:08 September 11, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 27, 2017 by Instantel
File Name	Q589HL1R.WK0

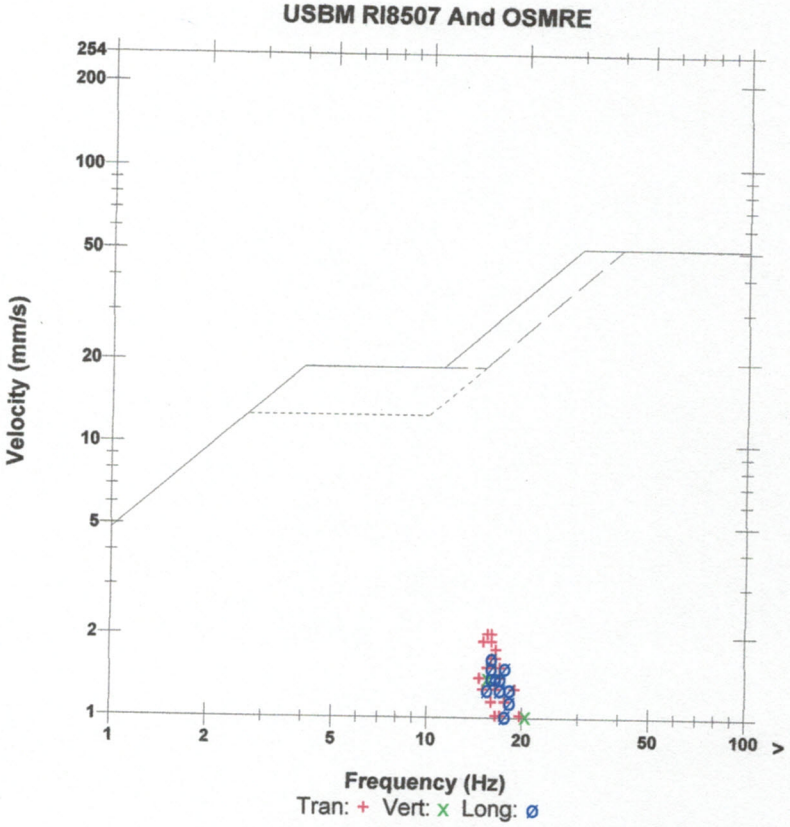
Post Event Notes
Set up in flower bed at end of driveway of 1331 Dwire Hill Rd. Geo spiked and weight bagged on soft, lose, soil.

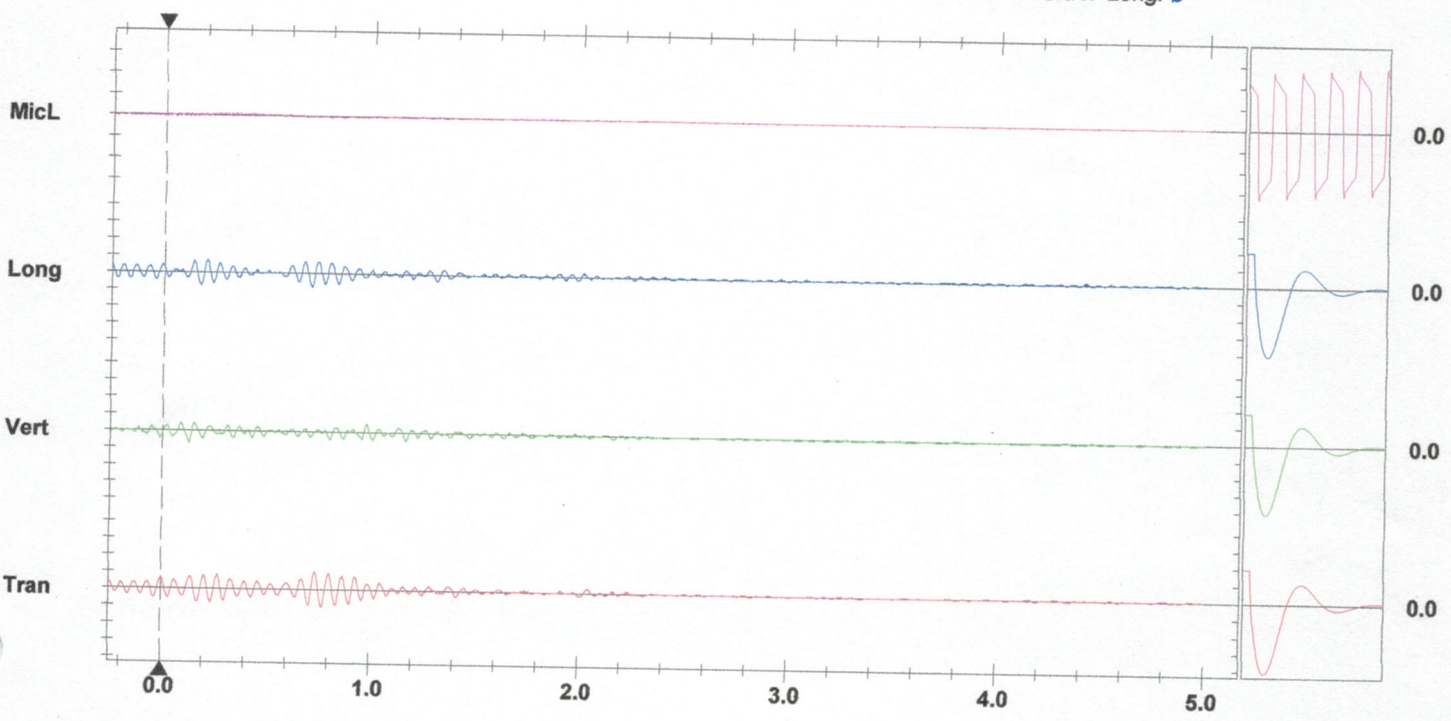
Extended Notes

Microphone	Linear Weighting
PSPL	93.98 dB(L) at -0.231 sec
ZC Freq	64 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 588 mv)

	Tran	Vert	Long	
PPV	2.032	1.397	1.651	mm/s
ZC Freq	16	16	16	Hz
Time (Rel. to Trig)	0.739	0.128	0.708	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.021	0.013	0.016	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.8	Hz
Overswing Ratio	3.5	3.4	3.6	

Peak Vector Sum 2.572 mm/s at 0.708 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

Instantel Event Report

Date/Time	Tran at 11:34:57 September 11, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General:

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	March 19, 2018 by Instantel
File Name	Q020HL1S.690

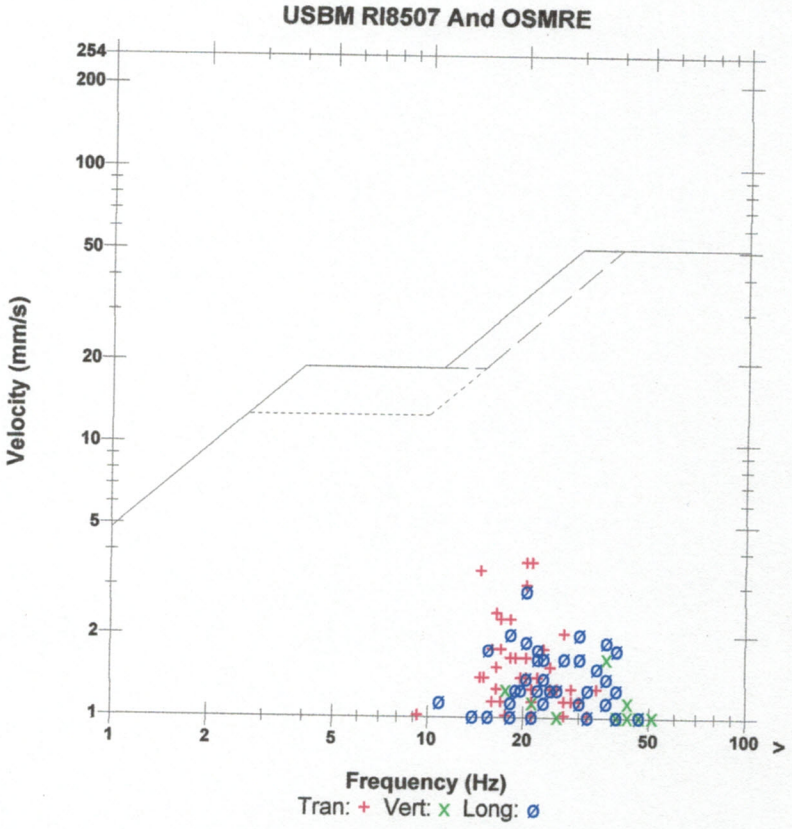
Post Event Notes
Set up at end of driveway of 1550 Dwire Hill Rd. Geo spiked and weight bagged on lawn.

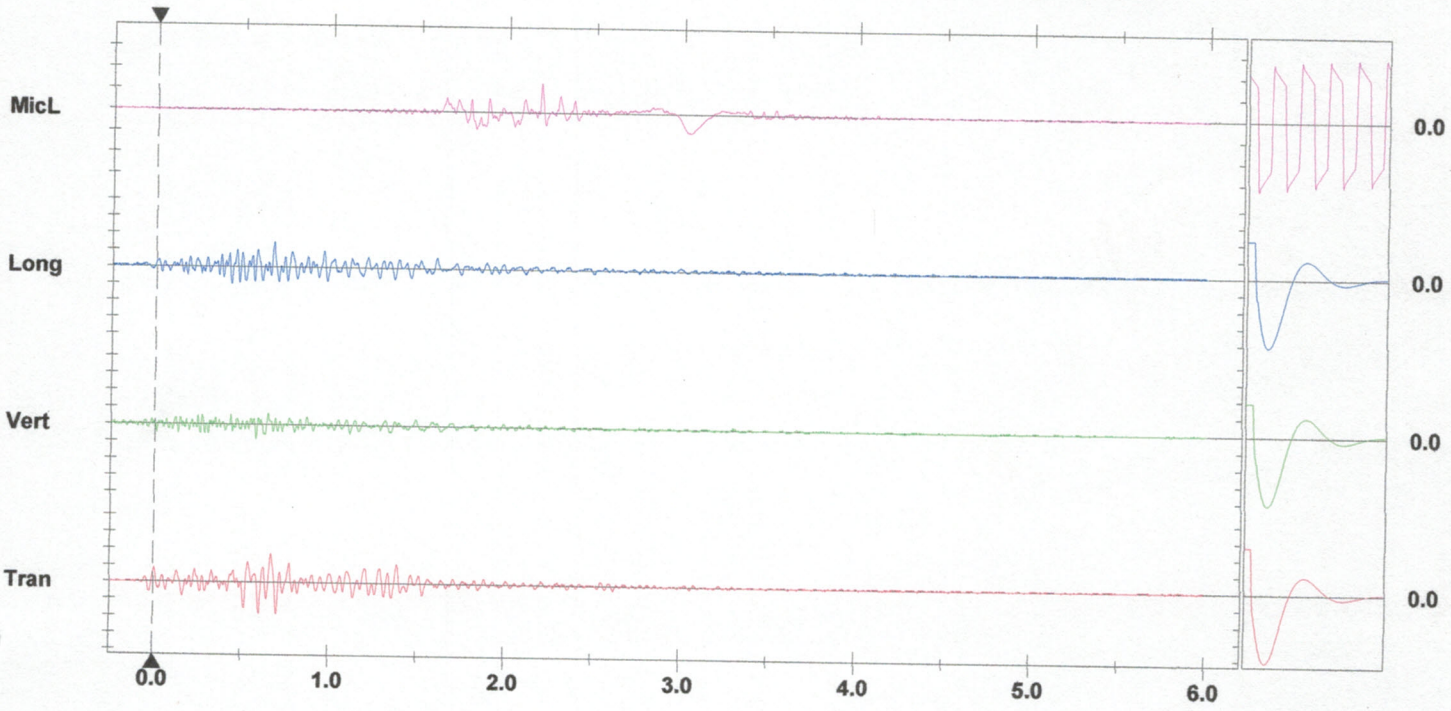
Extended Notes

Microphone	Linear Weighting
PSPL	116.6 dB(L) at 2.187 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 632 mv)

	Tran	Vert	Long	
PPV	3.683	1.651	2.921	mm/s
ZC Freq	20	37	20	Hz
Time (Rel. to Trig)	0.604	0.579	0.670	sec
Peak Acceleration	0.053	0.040	0.053	g
Peak Displacement	0.034	0.010	0.021	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.5	7.6	Hz
Overswing Ratio	3.9	3.6	3.7	

Peak Vector Sum 4.512 mm/s at 0.672 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-11 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/13/2018 12:17 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North East Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/13/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.413 mm/s	24.0 Hz
Time:	12:14	Calibration Date:	10/10/17		Vertical:	1.397 mm/s	51.0 Hz
Distance From Blast:	634.29 m	Calibration Signal:			Longitudinal:	3.175 mm/s	28.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	114 dB	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on lawn.				Vector Sum:	3.336 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Wyatt Cliffton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/13/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.143 mm/s	30.0 Hz
Time:	12:13	Calibration Date:	10/27/17		Vertical:	2.286 mm/s	28.0 Hz
Distance From Blast:	1,472.79 m	Calibration Signal:			Longitudinal:	1.143 mm/s	24.0 Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz		PPV:	--- mm/s	--- Hz
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	105 dB	
Location:	Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	2.376 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Patrick Garlic, Austin Powder						

Instantel Event Report

Date/Time	Vert at 12:13:56 September 13, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	October 27, 2017 by Instantel
File Name	Q589HL5J.B80

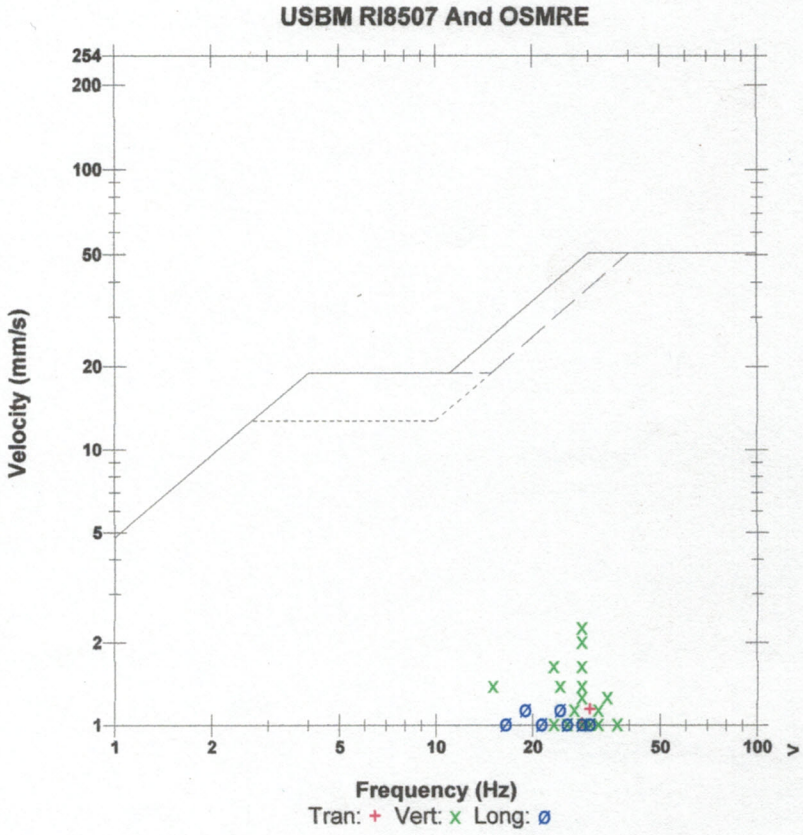
Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged in flower bed at end of driveway.

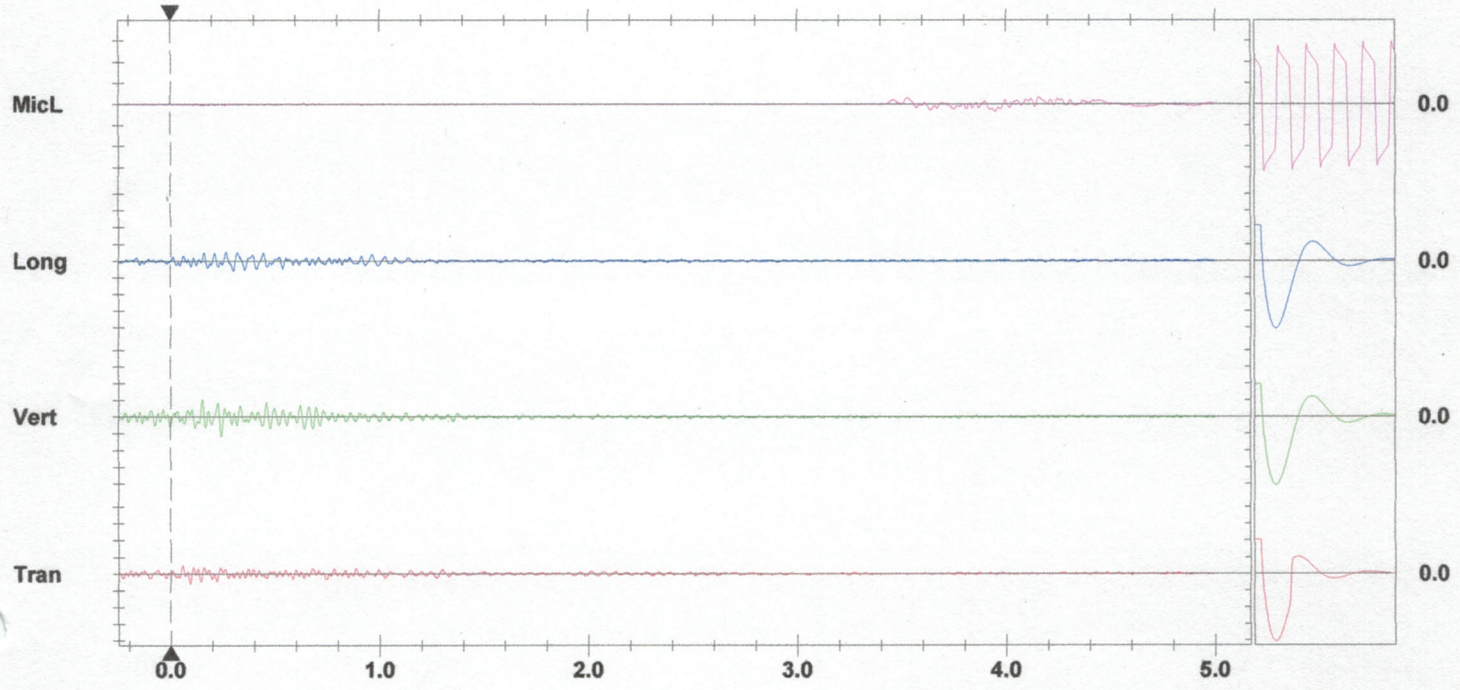
Extended Notes

Microphone	Linear Weighting
PSPL	104.9 dB(L) at 3.948 sec
ZC Freq	6.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 532 mv)

	Tran	Vert	Long	
PPV	1.143	2.286	1.143	mm/s
ZC Freq	30	28	24	Hz
Time (Rel. to Trig)	0.093	0.242	0.268	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.008	0.013	0.009	mm
Sensor Check	Check	Passed	Passed	
Frequency	9.8	7.9	7.7	Hz
Overswing Ratio	4.0	3.4	3.6	

Peak Vector Sum 2.376 mm/s at 0.242 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger = ▶— — —◀

Instantel

Event Report

Date/Time Vert at 12:14:54 September 13, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration March 19, 2018 by Instantel
File Name Q020HL5J.CU0
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged at end of driveway.

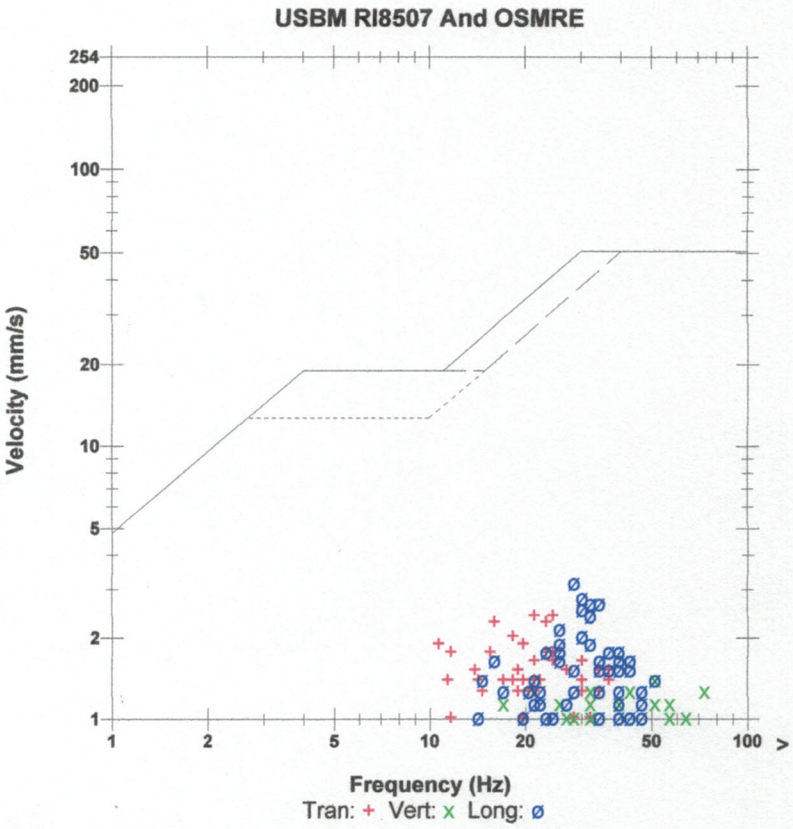
Notes
Location:
Client:
User Name:
General:

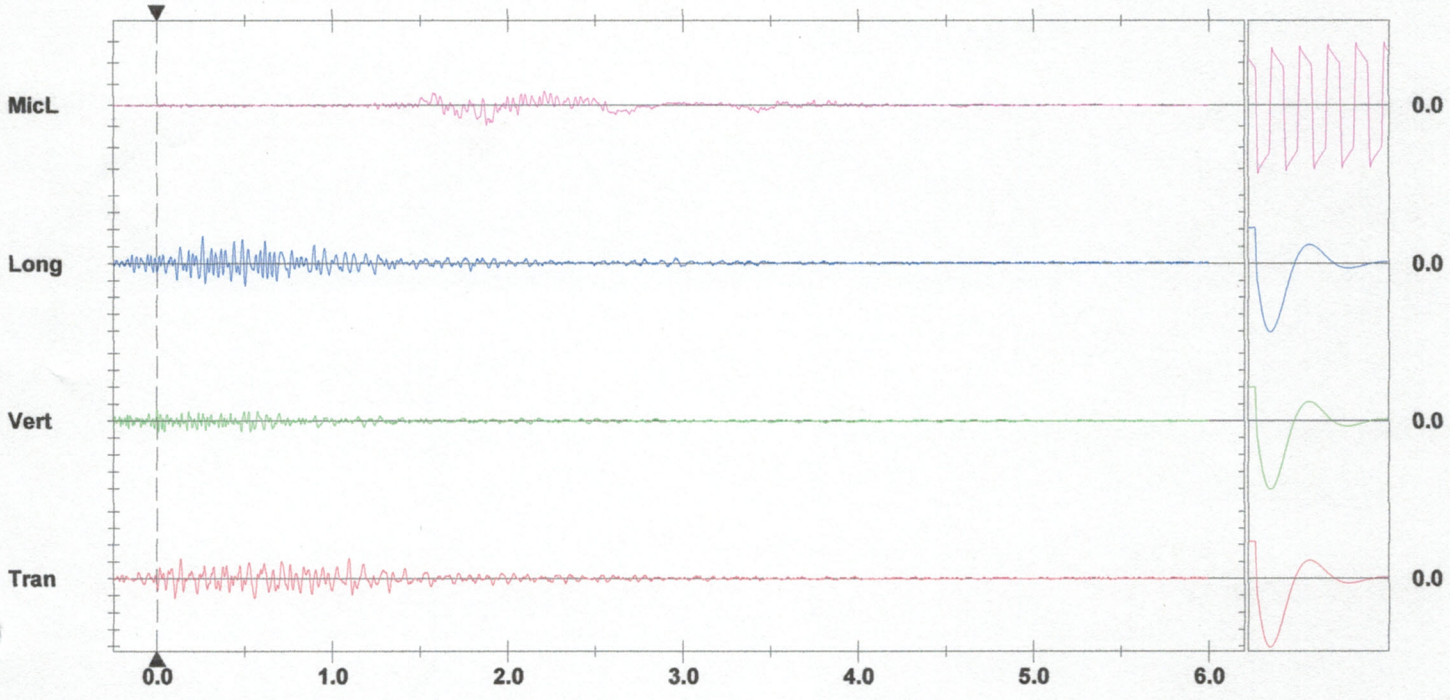
Extended Notes

Microphone Linear Weighting
PSPL 113.5 dB(L) at 1.881 sec
ZC Freq 8.4 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 544 mv)

	Tran	Vert	Long	
PPV	2.413	1.397	3.175	mm/s
ZC Freq	24	51	28	Hz
Time (Rel. to Trig)	0.135	0.000	0.261	sec
Peak Acceleration	0.053	0.053	0.080	g
Peak Displacement	0.022	0.009	0.018	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.4	Hz
Overswing Ratio	3.8	3.6	3.7	

Peak Vector Sum 3.336 mm/s at 0.261 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-12 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 10/15/2018 11:00 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North West Wall

SEISMOGRAPH 1 - 1550 DWYER HILL RD

Data Type:	Seismic Record	Seismograph Type:	Instantel				
Date:	10/15/18	Trigger Level:	0.07 in/s	114.00 dB	Transverse:	0.085 in/s	22.0 Hz
Time:	10:59	Calibration Date:	08/01/18		Vertical:	0.05 in/s	43.0 Hz
Distance From Blast:	2,507.00 ft	Calibration Signal:			Longitudinal:	0.125 in/s	32.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	--- Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz		Acoustic:	111 dB	--- Hz
Location:	1550 Dwyer Hill Rd, Set Up In Yard, Geo Spiked and Weight Bagged on Lawn				Vector Sum:	0.128 in/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	Matt Gordon, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Patrick Garlick / Austin Powder						

SEISMOGRAPH 2 - 1331 DWYER HILL RD

Data Type:	Seismic Record	Seismograph Type:	Instantel				
Date:	10/15/18	Trigger Level:	0.07 in/s	114.00 dB	Transverse:	0.03 in/s	34.0 Hz
Time:	10:59	Calibration Date:	03/19/18		Vertical:	0.05 in/s	34.0 Hz
Distance From Blast:	5,079.00 ft	Calibration Signal:			Longitudinal:	0.03 in/s	34.0 Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	--- Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz		Acoustic:	105 dB	--- Hz
Location:	1331 Dwyer Hill Rd Set up In Yard, Geo Spiked and Weight Bagged				Vector Sum:	0.058 in/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	Matt Gordon, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Patrick Garlick / Austin Powder						

Event Report

Date/Time Long at 10:59:16 October 15, 2018
Trigger Source Geo: 1.700 mm/s, Mic: 110.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

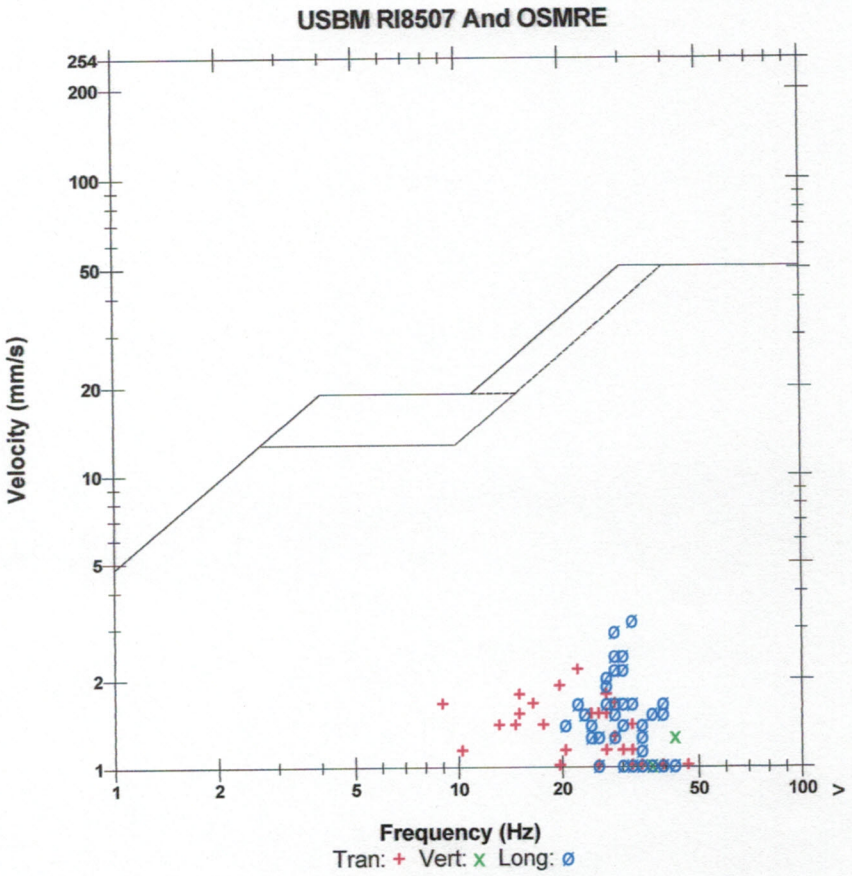
Notes

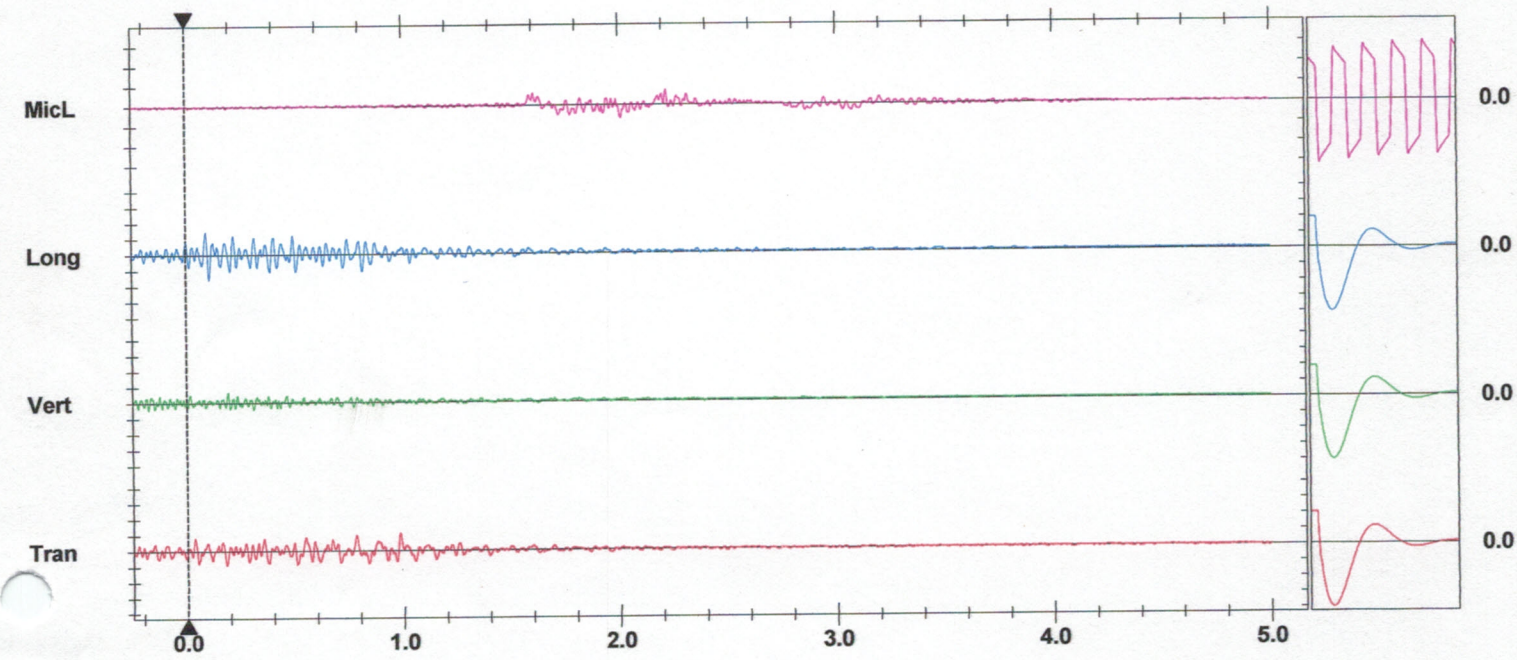
Serial Number BE19636 V 10.72-8.17 MiniMate Plus
Battery Level 6.3 Volts
Unit Calibration August 1, 2018 by Instantel
File Name U636HMSP.6S0
Post Event Notes
1550 Dwyer Hill Rd
Set Up In Yard
Geo Spiked and Weight Bagged On Damp Lawn

Microphone Linear Weighting
PSPL 111.5 dB(L) at 2.221 sec
ZC Freq 27 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 645 mv)

	Tran	Vert	Long	
PPV	2.159	1.270	3.175	mm/s
ZC Freq	22	43	32	Hz
Time (Rel. to Trig)	0.981	0.191	0.108	sec
Peak Acceleration	0.040	0.040	0.066	g
Peak Displacement	0.018	0.005	0.016	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.3	7.5	Hz
Overswing Ratio	3.8	3.8	3.9	

Peak Vector Sum 3.248 mm/s at 0.109 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

Instantel

Event Report

Date/Time Vert at 10:59:41 October 15, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.1 Volts
Unit Calibration March 19, 2018 by Instantel
File Name Q020HMSP.7H0
Post Event Notes
1331 Dwyer Hill Rd
Set Up In Yard
Geo Spiked and Weight Bagged On Damp Lawn

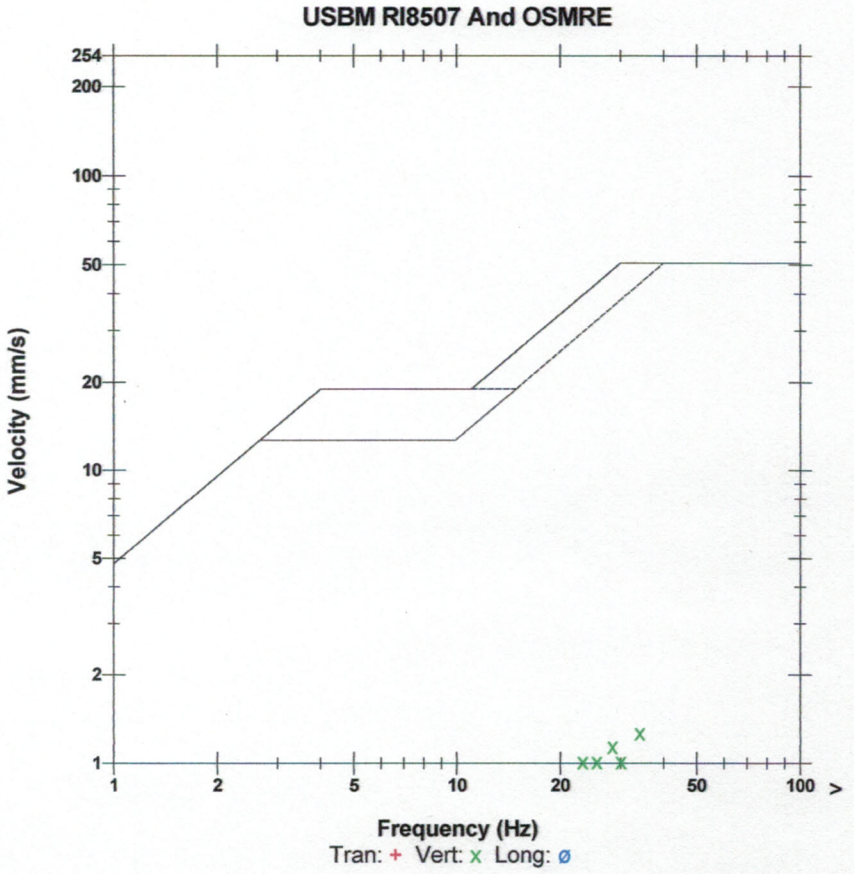
Notes
Location:
Client:
User Name:
General:

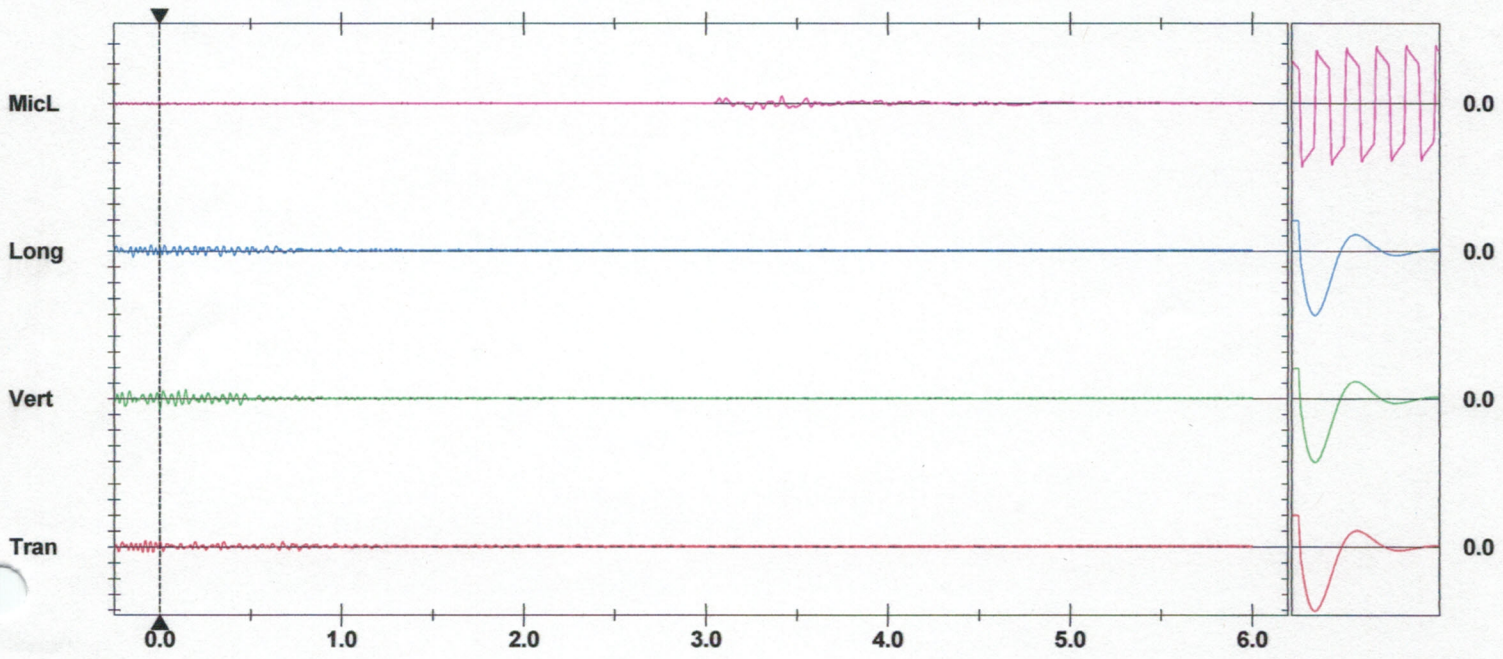
Extended Notes

Microphone Linear Weighting
PSPL 105.5 dB(L) at 3.417 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 657 mv)

	Tran	Vert	Long	
PPV	0.762	1.270	0.762	mm/s
ZC Freq	34	34	34	Hz
Time (Rel. to Trig)	-0.082	0.000	-0.146	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.004	0.007	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.4	Hz
Overswing Ratio	4.1	3.7	3.8	

Peak Vector Sum 1.470 mm/s at 0.000 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-13 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 10/26/2018 10:15 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: S.E Wall

SEISMOGRAPH 1 - 1550 DWYER HILL RD

Data Type: Seismic Record Seismograph Type: Instantel
Date: 10/26/18 Trigger Level: 1.70 mm/s 114.00 dB
Time: 12:15 Calibration Date: 08/01/18
Distance From Blast: 680.31 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: --- Hz
Readout: Printed Copy Mic. Min. Freq.: --- Hz
Location: 1550 Dwyer Hill Rd, Set Up In Yard, Geo Spiked and Weight Bagged on Lawn
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: Matt Gordon, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Patrick Garlick / Austin Powder

Transverse:	1.905 mm/s	20.0 Hz
Vertical:	1.397 mm/s	47.0 Hz
Longitudinal:	2.54 mm/s	23.0 Hz
Acoustic:	115 dB	--- Hz
Vector Sum:	2.739 mm/s	

SEISMOGRAPH 2 - 1331 DWYER HILL RD

Data Type: Seismic Record Seismograph Type: Instantel
Date: 10/26/18 Trigger Level: 1.70 mm/s 114.00 dB
Time: 12:15 Calibration Date: 10/16/18
Distance From Blast: 1,505.71 m Calibration Signal:
Direction From Blast: ESE Geophone Min. Freq.: --- Hz
Readout: Printed Copy Mic. Min. Freq.: --- Hz
Location: 1331 Dwyer Hill Rd Set up In Yard, Geo Spiked and Weight Bagged
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: Matt Gordon, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Patrick Garlick / Austin Powder

Transverse:	0.889 mm/s	22.0 Hz
Vertical:	1.905 mm/s	24.0 Hz
Longitudinal:	0.762 mm/s	27.0 Hz
Acoustic:	110 dB	--- Hz
Vector Sum:	2.08 mm/s	

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-14 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 11/02/2018 13:15 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South East Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 11/02/18 Trigger Level: 1.23 mm/s Off dB
Time: 13:15 Calibration Date: 10/16/18
Distance From Blast: 1,237.49 m Calibration Signal:
Direction From Blast: ENE Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: William Coleman, Austin Powder

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 11/02/18 Trigger Level: 1.23 mm/s Off dB
Time: 13:15 Calibration Date: 09/27/18
Distance From Blast: 1,346.30 m Calibration Signal:
Direction From Blast: N Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on lawn.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Patrick Garlic, Austin Powder

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-15 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 11/09/2018 13:40 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/09/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	38.71 mm/s	30.0 Hz
Time:	13:40	Calibration Date:	10/16/18		Vertical:	16.129 mm/s	37.0 Hz
Distance From Blast:	1,199.69 m	Calibration Signal:			Longitudinal:	29.032 mm/s	23.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	108 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	40.792 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Patrick Garlic, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	11/09/18	Trigger Level:	1.23 mm/s	Off dB
Time:	13:40	Calibration Date:	09/27/18	
Distance From Blast:	1,336.55 m	Calibration Signal:		
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on lawn.			
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Patrick Garlic, Austin Powder			

Instantel Event Report

Date/Time	Tran at 13:40:08 November 9, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General:

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	March 19, 2018 by Instantel
File Name	Q020HO37.AW0

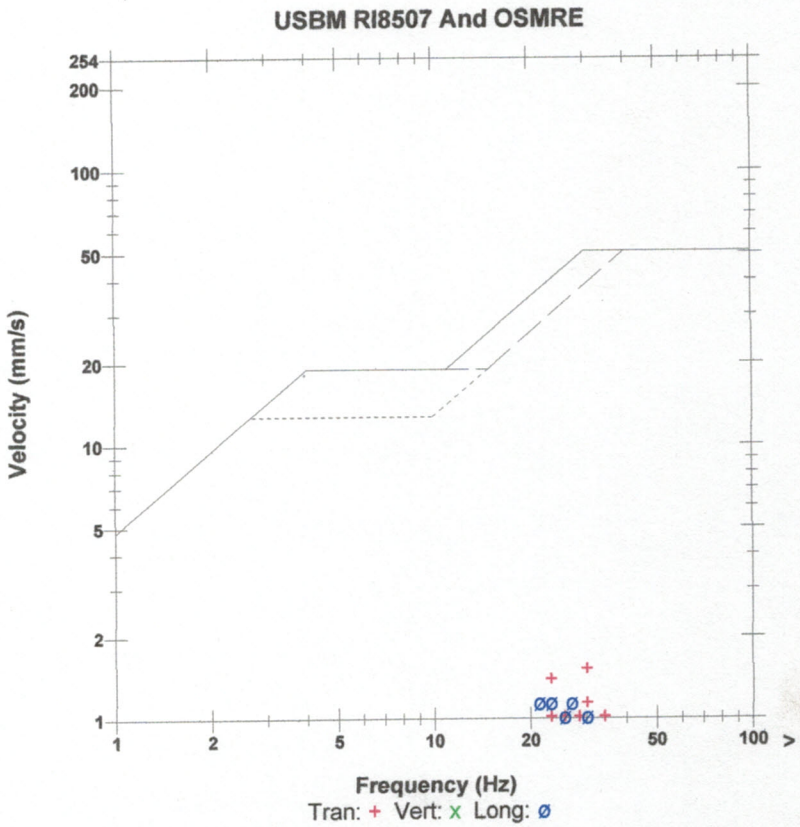
Post Event Notes
Set up in backyard of 1331 Dwire Hill Rd. Geo spiked and weight bagged on wet Lawn.

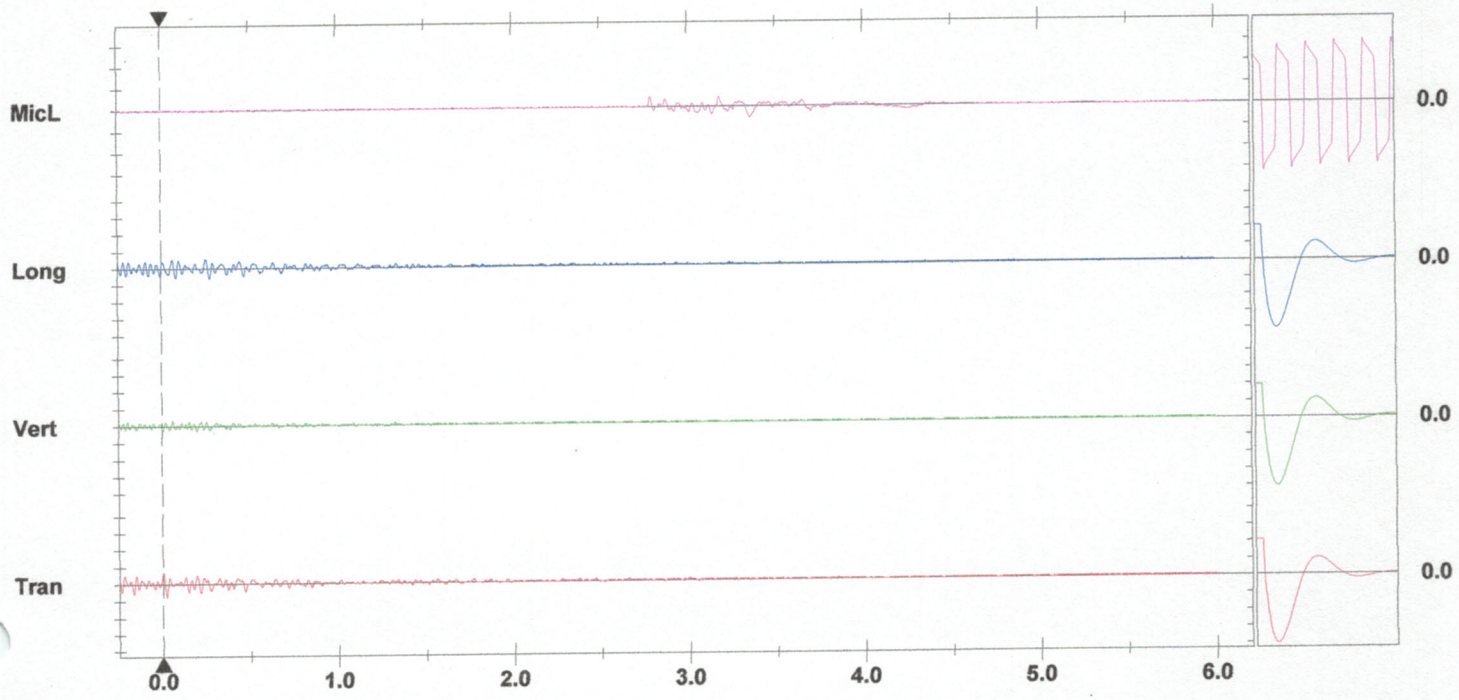
Extended Notes

Microphone	Linear Weighting
PSPL	108.4 dB(L) at 3.358 sec
ZC Freq	8.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 769 mv)

	Tran	Vert	Long	
PPV	1.524	0.635	1.143	mm/s
ZC Freq	30	37	23	Hz
Time (Rel. to Trig)	0.021	0.061	0.063	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.010	0.003	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.4	Hz
Overswing Ratio	4.1	3.7	4.0	

Peak Vector Sum 1.606 mm/s at 0.021 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger =

No Trigger
Set up on front lawn of 1550 Dwire Hill Rd.

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15589
Nov 9 /18 12:59:08		Start Monitoring Trigger Level: Geo: 1.23 mm/s Mic: 110.0 dB(L)
Nov 9 /18 13:17:45	Nov 9 /18 13:17:50	Event recorded. Trigger Level MicL: 110.0 dB(L)
Nov 9 /18 13:18:04	Nov 9 /18 14:03:29	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 110.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-16 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 12/01/2018 10:05 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South Wall

SEISMOGRAPH 1 - 1331 DWYER HILL RD

Data Type:	Seismic Record	Seismograph Type:	Instantel			
Date:	12/01/18	Trigger Level:	1.70 mm/s 114.00 dB	Transverse:	1.905 mm/s	23.0 Hz
Time:	10:05	Calibration Date:	10/16/18	Vertical:	1.397 mm/s	37.0 Hz
Distance From Blast:	1,172.26 m	Calibration Signal:		Longitudinal:	1.778 mm/s	28.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	--- Hz			
Readout:	Printed Copy	Mic. Min. Freq.:	--- Hz	Acoustic:	114 dB	--- Hz
Location:	1331 Dwyer Hill Rd Set up In Yard, Geo Spiked and Weight Bagged			Vector Sum:	--- mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W			
Reader and Firm:	Matt Gordon, AUSTIN POWDER					
Analyst and Firm:						
Installer and Firm:	Matt Gordon / Austin Powder					

SEISMOGRAPH 2 - 1550 DWYER HILL RD

Data Type:	No Trigger	Seismograph Type:	Instantel
Date:	12/01/18	Trigger Level:	1.70 mm/s 114.00 dB
Time:	10:05	Calibration Date:	08/01/18
Distance From Blast:	1,355.45 m	Calibration Signal:	
Direction From Blast:	N	Geophone Min. Freq.:	--- Hz
Readout:		Mic. Min. Freq.:	--- Hz
Location:	1550 Dwyer Hill Rd, Set Up In Yard, Geo Spiked and Weight Bagged on Lawn		
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W
Reader and Firm:	Matt Gordon, AUSTIN POWDER		
Analyst and Firm:			
Installer and Firm:	Matt Gordon / Austin Powder		

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2018-17 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 12/04/2018 13:30 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/04/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	13:00	Calibration Date:	10/16/18		Vertical:	0.127 mm/s	--- Hz
Distance From Blast:	1,210.67 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	118 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. snow covered lawn.				Vector Sum:	0.22 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/04/18	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.778 mm/s	15.0 Hz
Time:	13:29	Calibration Date:	09/27/18		Vertical:	0.762 mm/s	--- Hz
Distance From Blast:	1,372.51 m	Calibration Signal:			Longitudinal:	1.651 mm/s	13.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	114 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on snow covered lawn.				Vector Sum:	2.261 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Patrick Garlic, Austin Powder						

Event Report

Date/Time MicL at 13:30:07 December 4, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

Notes

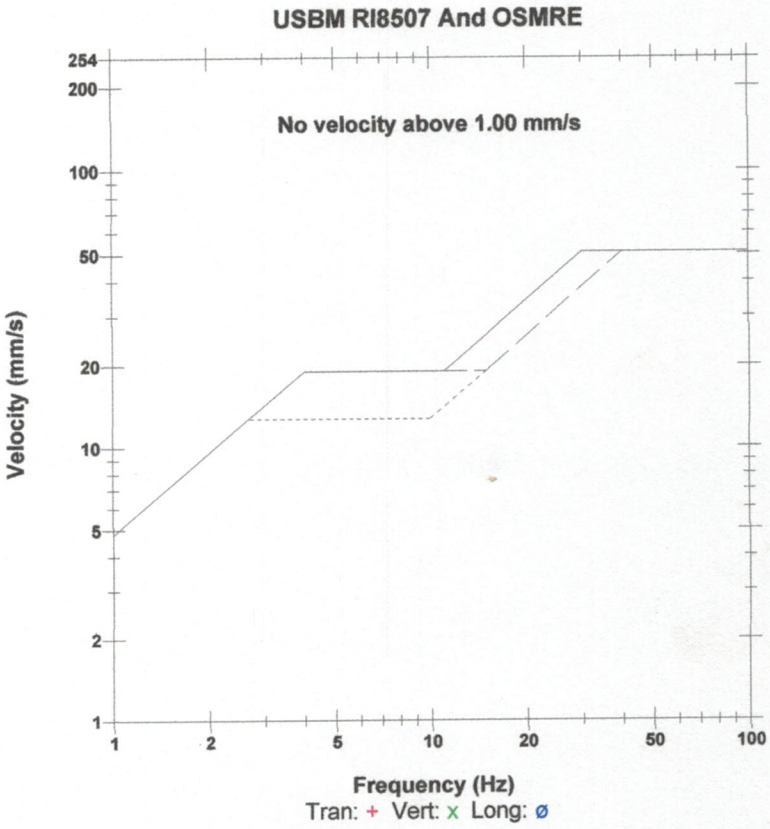
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration October 16, 2018 by Instantel
File Name Q589HPDH.I70
Post Event Notes
Set up in back yard of 1330 Dwire Hill Rd. Geo spiked and wieght bagged on snow covered lawn.

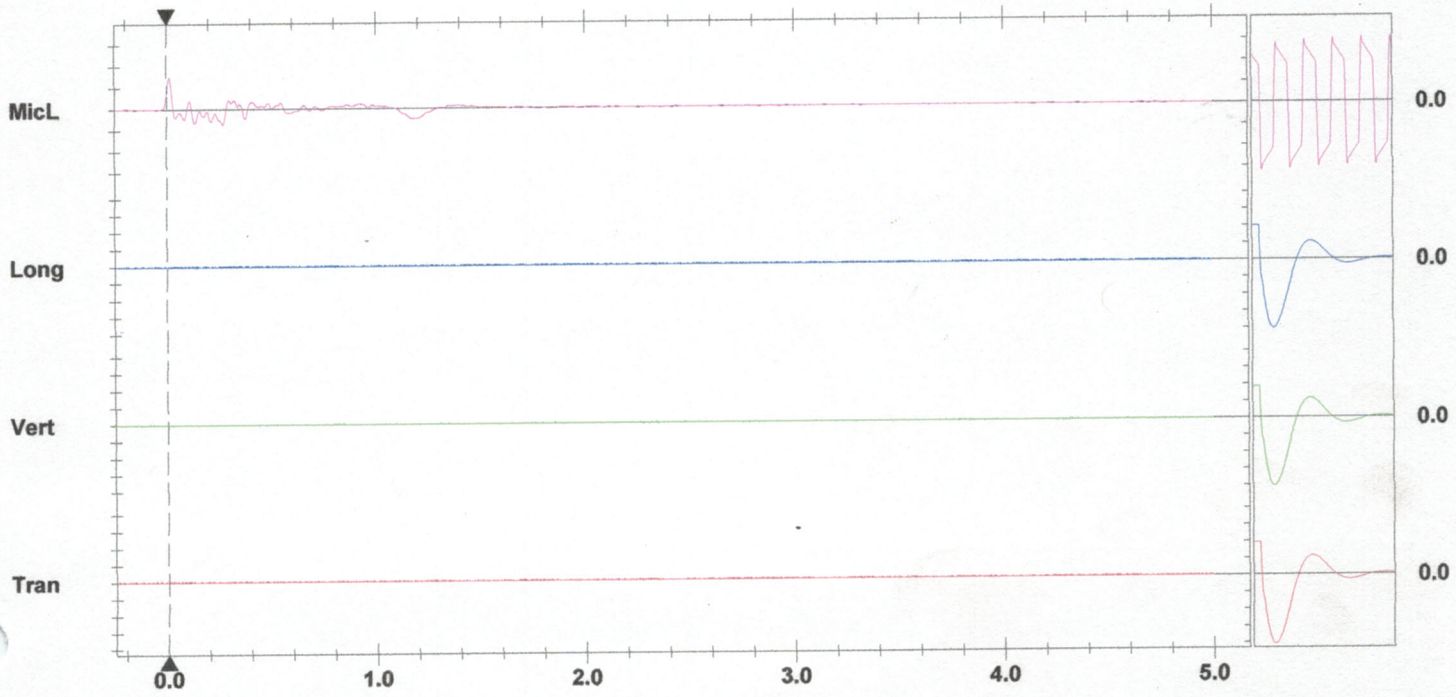
Extended Notes

Microphone Linear Weighting
PSPL 117.5 dB(L) at 0.014 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 778 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.238	-0.128	-0.230	sec
Peak Acceleration	0.013	0.027	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.7	Hz
Overswing Ratio	3.7	3.6	3.9	

Peak Vector Sum 0.220 mm/s at 0.838 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel Event Report

Date/Time	Tran at 13:29:08 December 4, 2018
Trigger Source	Geo: 1.230 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	March 19, 2018 by Instantel
File Name	Q020HPDH.GK0

Post Event Notes
Set up in fron yard of 1550 Dwire Hill Rd. Geo spiuked and weight bagged on snow covered lawn.

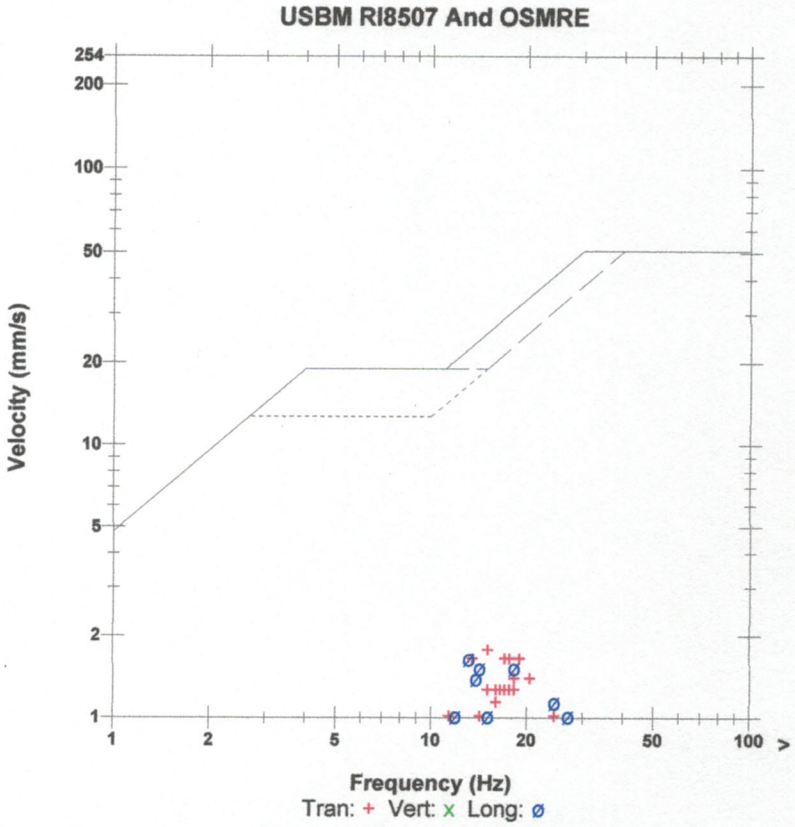
Notes
Location:
Client:
User Name:
General:

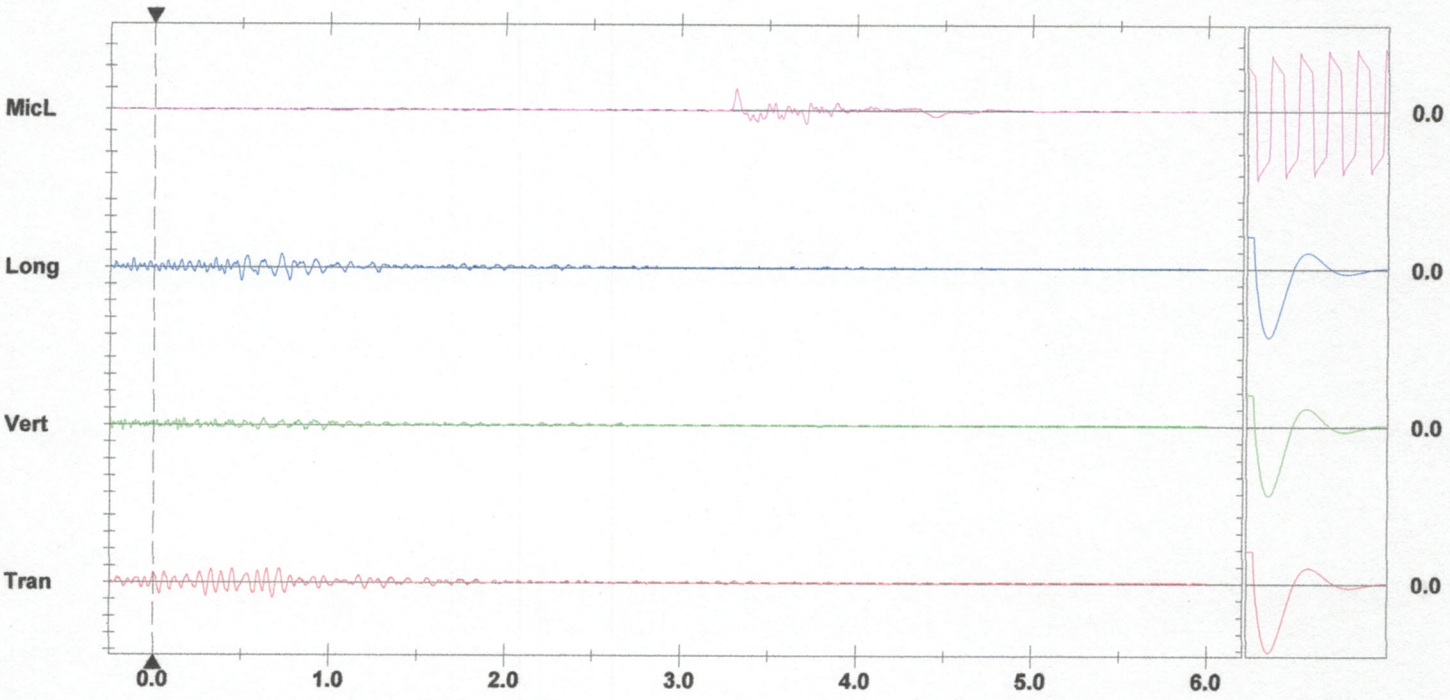
Extended Notes

Microphone	Linear Weighting
PSPL	114.2 dB(L) at 3.313 sec
ZC Freq	8.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 741 mv)

	Tran	Vert	Long	
PPV	1.778	0.762	1.651	mm/s
ZC Freq	15	N/A	13	Hz
Time (Rel. to Trig)	0.675	-0.247	0.724	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.021	0.007	0.020	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.4	Hz
Overswing Ratio	4.2	3.8	4.1	

Peak Vector Sum 2.261 mm/s at 0.722 sec
N/A: Not Applicable





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-01 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/12/2019 10:50 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	04/12/19	Trigger Level:	1.23 mm/s	Off dB
Time:	10:50	Calibration Date:	09/27/18	
Distance From Blast:	830.28 m	Calibration Signal:		
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.			
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Patrick Garlic, Austin Powder			

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	04/12/19	Trigger Level:	1.23 mm/s	Off dB
Time:	10:50	Calibration Date:	10/16/18	
Distance From Blast:	1,618.18 m	Calibration Signal:		
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.			
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Patrick Garlic, Austin Powder			

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-02 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/15/2019 11:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location:

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	04/15/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.921 mm/s	13.0 Hz
Time:	11:00	Calibration Date:	09/27/18		Vertical:	4.429 mm/s	19.0 Hz
Distance From Blast:	902.51 m	Calibration Signal:			Longitudinal:	4.064 mm/s	18.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	106 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.				Vector Sum:	4.618 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	04/15/19	Trigger Level:	1.23 mm/s	Off dB
Time:	11:00	Calibration Date:	10/16/18	
Distance From Blast:	1,680.06 m	Calibration Signal:		
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.			
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Joel McNamee, Austin Powder			

Instantel

Event Report

Date/Time Long at 11:00:46 April 15, 2018
Trigger Source Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020HDDT.9A0

Notes
Location:
Client:
User Name:
General:

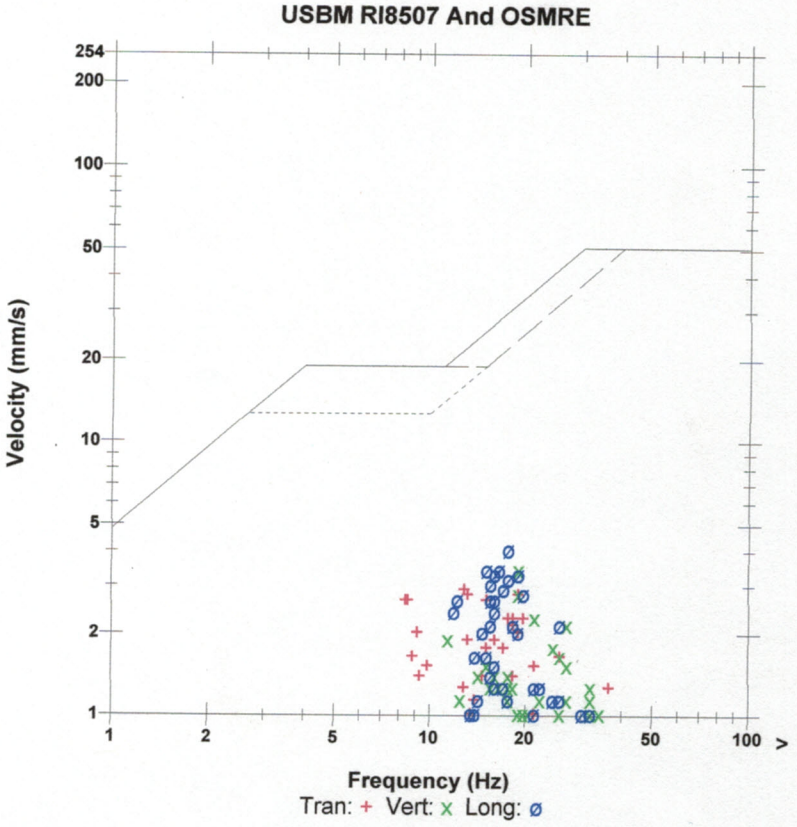
Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on super saturated lawn. Yard flooded.

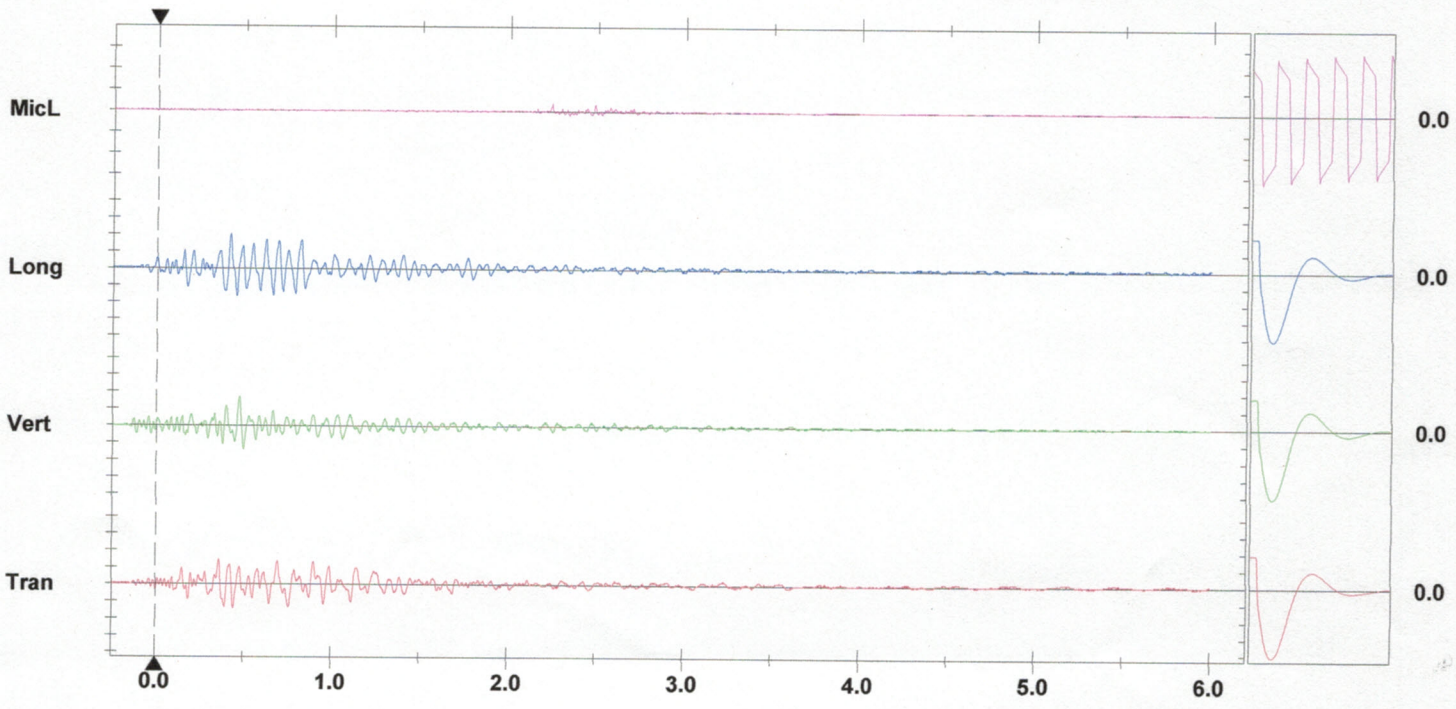
Extended Notes

Microphone Linear Weighting
PSPL 106.0 dB(L) at 2.240 sec
ZC Freq 19 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 756 mv)

	Tran	Vert	Long	
PPV	2.921	3.429	4.064	mm/s
ZC Freq	13	19	18	Hz
Time (Rel. to Trig)	0.361	0.471	0.415	sec
Peak Acceleration	0.053	0.053	0.053	g
Peak Displacement	0.038	0.028	0.035	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.6	7.5	Hz
Overswing Ratio	4.1	3.6	3.9	

Peak Vector Sum 4.618 mm/s at 0.417 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

No Trigger
Set up at 1331 Dwire Hill Rd.

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15589
Apr 12 /19 10:10:25	Apr 12 /19 11:12:31	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 118.0 dB(L)
Apr 15 /19 10:20:47	Apr 15 /19 11:29:28	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 118.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-03 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/17/2019 11:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 04/17/19 Trigger Level: 1.23 mm/s Off dB
Time: 10:56 Calibration Date: 09/27/18
Distance From Blast: 882.70 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Joel McNamee, Austin Powder

Transverse:	2.413 mm/s	14.0 Hz
Vertical:	1.905 mm/s	39.0 Hz
Longitudinal:	3.302 mm/s	24.0 Hz
Acoustic:	117 dB	--- Hz
Vector Sum:	3.372 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 04/17/19 Trigger Level: 1.23 mm/s Off dB
Time: 11:00 Calibration Date: 10/16/18
Distance From Blast: 1,663.29 m Calibration Signal:
Direction From Blast: ESE Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Joel McNamee, Austin Powder

Blast ID: ru00342905-10501 (10498) Version: 7.6.1.1

Print Date: 4/18/2019

Instantel

Event Report

Date/Time	Vert at 10:56:20 April 17, 2019
Trigger Source	Geo: 1.230 mm/s, Mic: 118.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 16, 2018 by Instantel
File Name	Q589HW9F.PW0

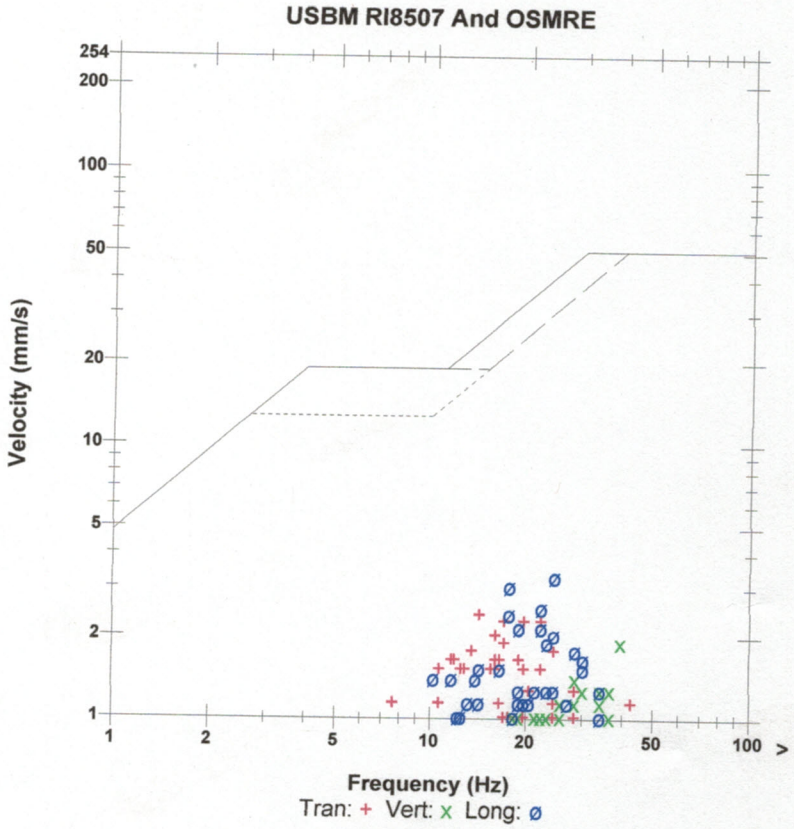
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged on saturated lawn.

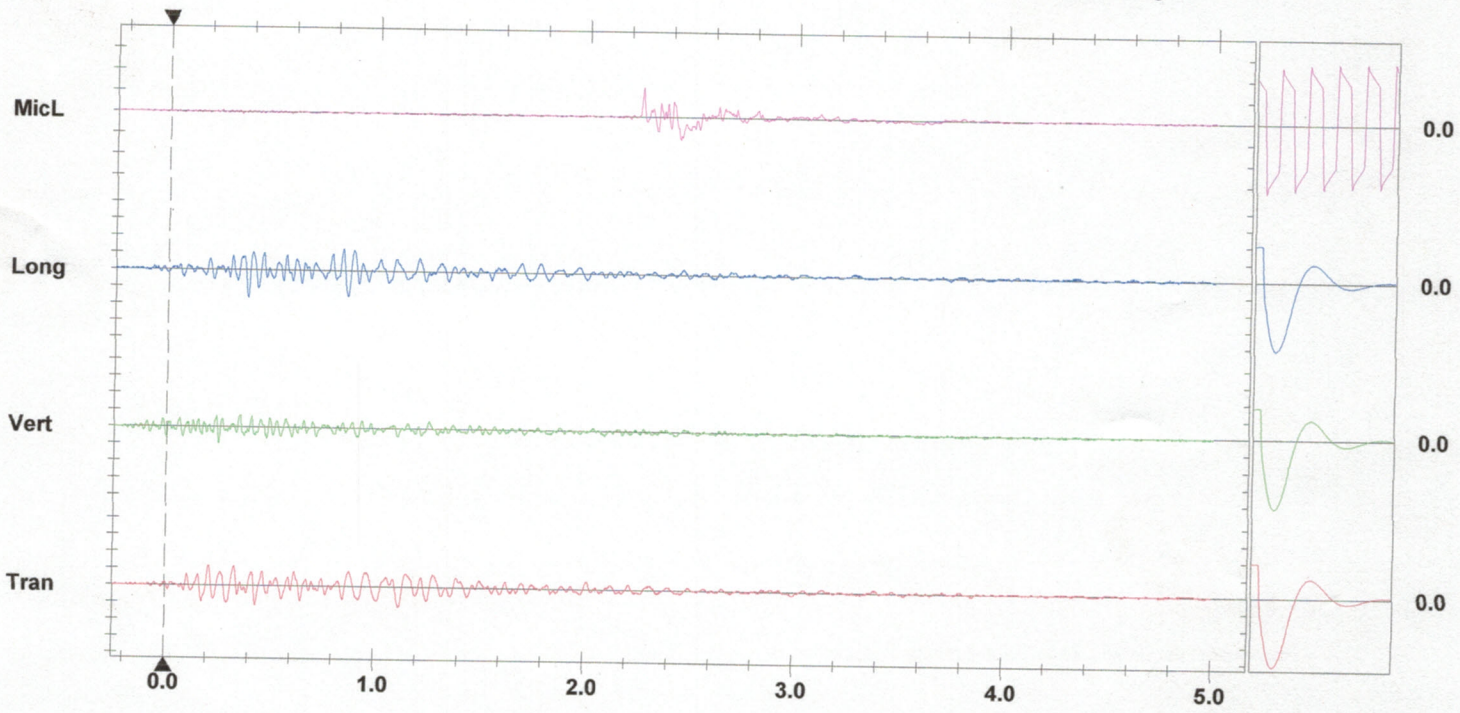
Extended Notes

Microphone	Linear Weighting
PSPL	116.7 dB(L) at 2.257 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 616 mv)

	Tran	Vert	Long	
PPV	2.413	1.905	3.302	mm/s
ZC Freq	14	39	24	Hz
Time (Rel. to Trig)	1.118	0.251	0.383	sec
Peak Acceleration	0.040	0.040	0.053	g
Peak Displacement	0.027	0.009	0.028	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.8	Hz
Overswing Ratio	3.6	3.5	3.8	

Peak Vector Sum 3.372 mm/s at 0.383 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

No Trigger
Set up at 1331 Dwire Hill Rd.

Event Report: Monitor Log - Minimate Blaster # BE15020-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15020
Apr 17 /19 10:23:43	Apr 17 /19 11:39:53	No events recorded. (Keyboard Exit) Geo: 1.23 mm/s Mic: 110.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-04 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 07/26/2019 10:14 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	07/26/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.921 mm/s	18.0 Hz
Time:	10:14	Calibration Date:	09/27/18		Vertical:	1.651 mm/s	47.0 Hz
Distance From Blast:	776.33 m	Calibration Signal:			Longitudinal:	2.54 mm/s	32.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	118 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.				Vector Sum:	3.064 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	07/26/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.016 mm/s	15.0 Hz
Time:	10:14	Calibration Date:	10/16/18		Vertical:	1.397 mm/s	26.0 Hz
Distance From Blast:	1,571.55 m	Calibration Signal:			Longitudinal:	1.016 mm/s	13.0 Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	96 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	1.454 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Austin Harrison, Austin Powder						

Instantel Event Report

Date/Time Tran at 10:14:08 July 26, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General:

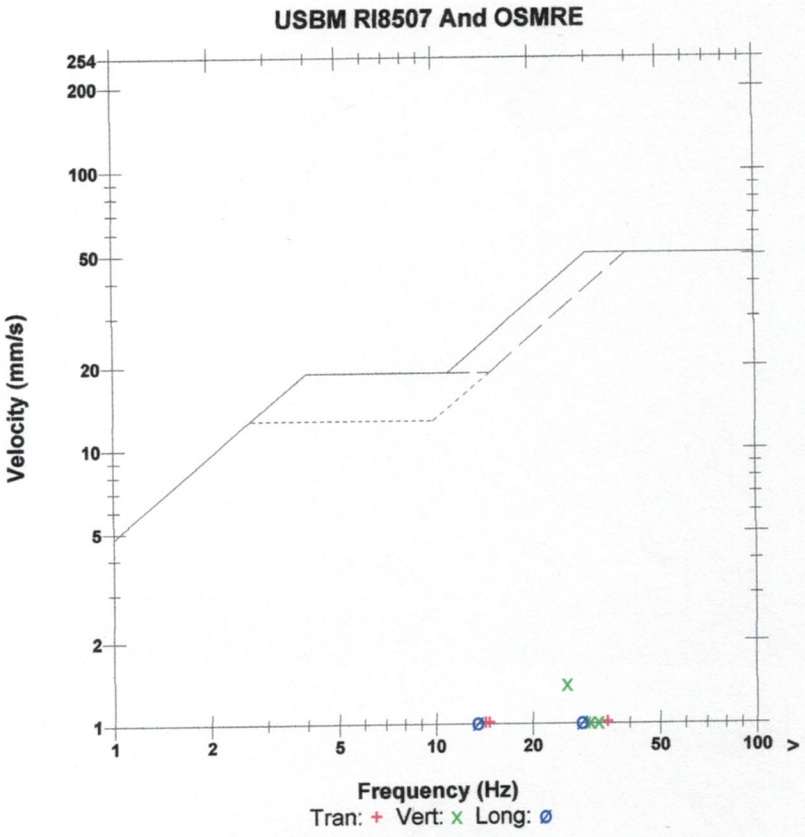
Extended Notes

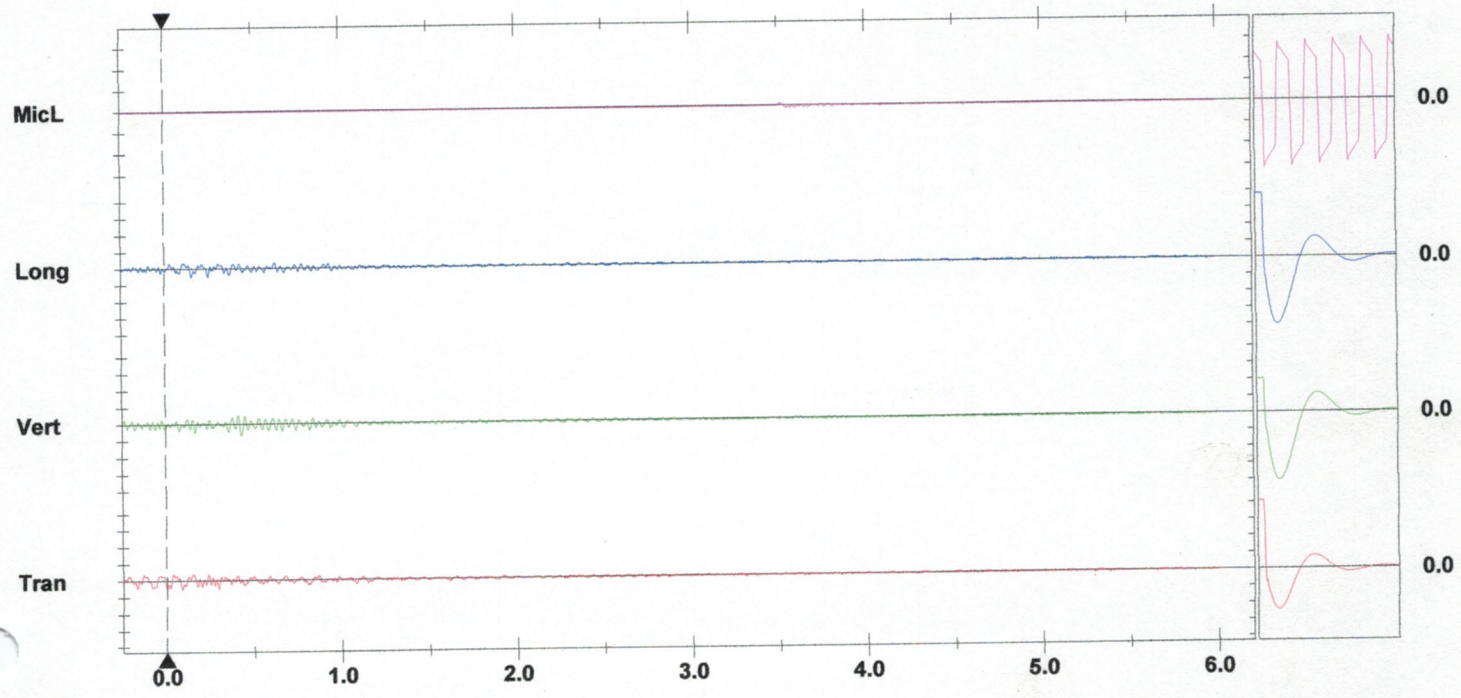
Microphone Linear Weighting
PSPL 95.92 dB(L) at 3.518 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 440 mv)

	Tran	Vert	Long	
PPV	1.016	1.397	1.016	mm/s
ZC Freq	15	26	13	Hz
Time (Rel. to Trig)	0.003	0.432	0.155	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.012	0.009	0.010	mm
Sensor Check	Check	Passed	Passed	
Frequency	8.2	7.4	7.7	Hz
Overswing Ratio	3.3	3.7	3.5	

Peak Vector Sum 1.454 mm/s at 0.432 sec

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020I1EK.FK0
Post Event Notes
Set up in back yard of 1331 Dwire Hill Rd, geo spiked and weight bagged on lawn.





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

Event Report

Date/Time	Vert at 10:14:33 July 26, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 118.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 16, 2018 by Instantel
File Name	Q589I1EK.G90

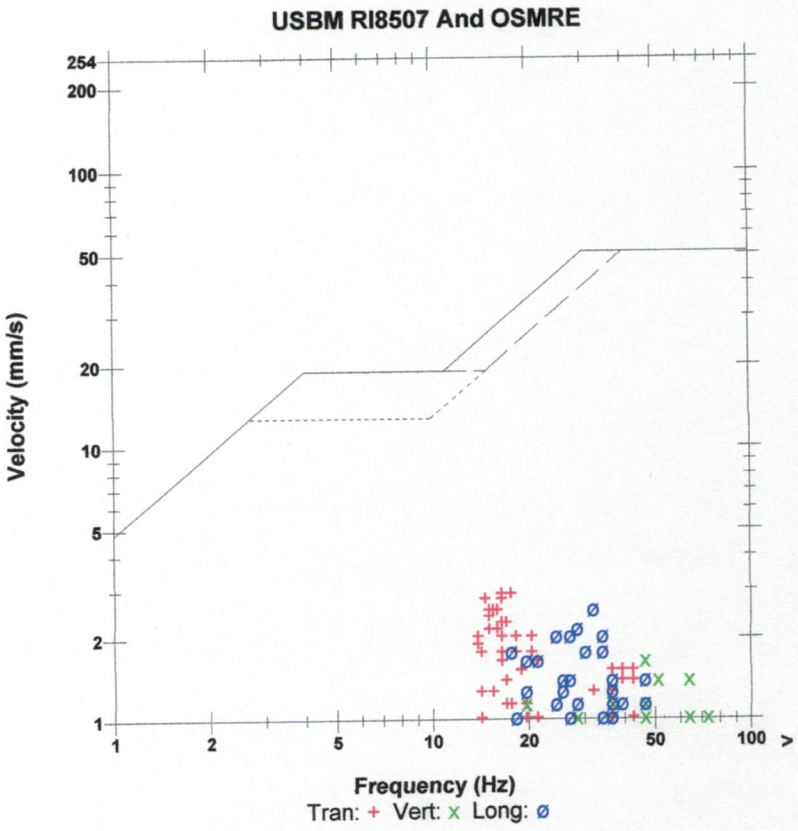
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and wight bagged on lawn.

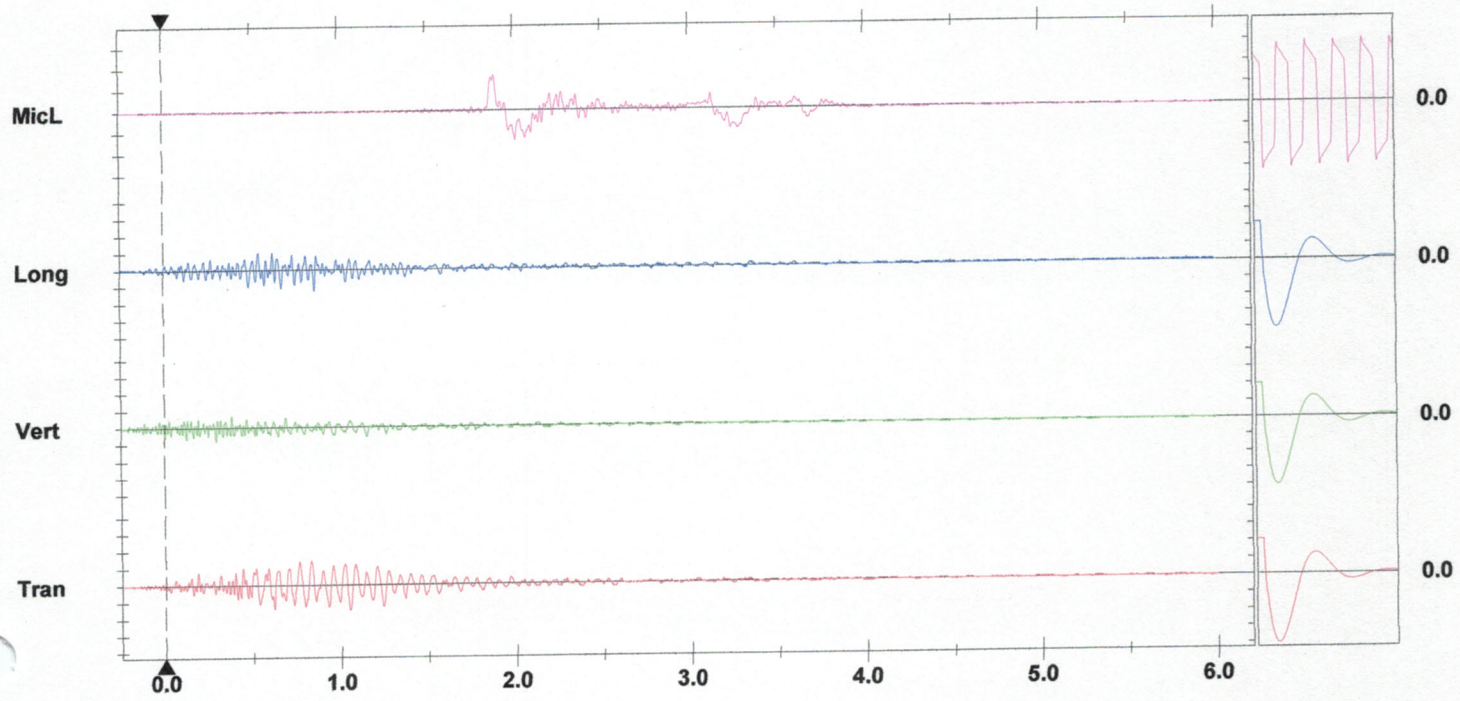
Extended Notes

Microphone	Linear Weighting
PSPL	118.3 dB(L) at 1.895 sec
ZC Freq	4.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 530 mv)

	Tran	Vert	Long	
PPV	2.921	1.651	2.540	mm/s
ZC Freq	18	47	32	Hz
Time (Rel. to Trig)	0.831	0.294	0.860	sec
Peak Acceleration	0.053	0.053	0.053	g
Peak Displacement	0.029	0.009	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.9	7.8	Hz
Overswing Ratio	3.4	3.4	3.6	

Peak Vector Sum 3.064 mm/s at 0.831 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-05 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 07/30/2019 12:36 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	07/30/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	4.064 mm/s	16.0 Hz
Time:	12:36	Calibration Date:	09/27/18		Vertical:	1.651 mm/s	28.0 Hz
Distance From Blast:	789.13 m	Calibration Signal:			Longitudinal:	2.413 mm/s	23.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	97 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.				Vector Sum:	4.178 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Ross Scott, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	07/30/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.27 mm/s	20.0 Hz
Time:	12:36	Calibration Date:	10/16/18		Vertical:	1.016 mm/s	26.0 Hz
Distance From Blast:	1,592.28 m	Calibration Signal:			Longitudinal:	0.508 mm/s	32.0 Hz
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	115 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	1.442 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Ross Scott, Austin Powder						

Instantel

Event Report

Date/Time Tran at 12:36:25 July 30, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General:

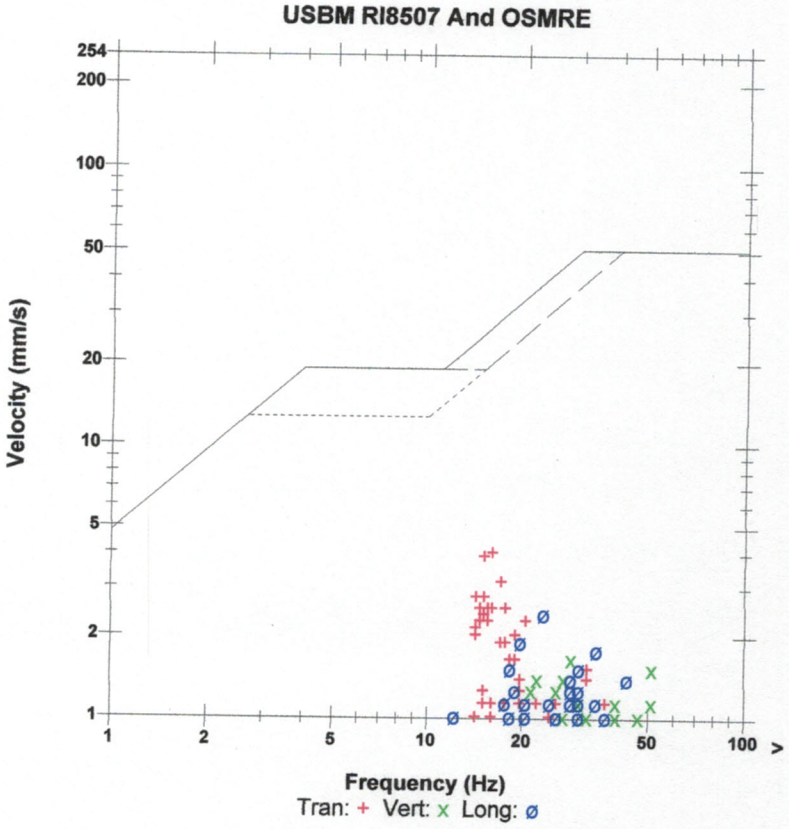
Extended Notes

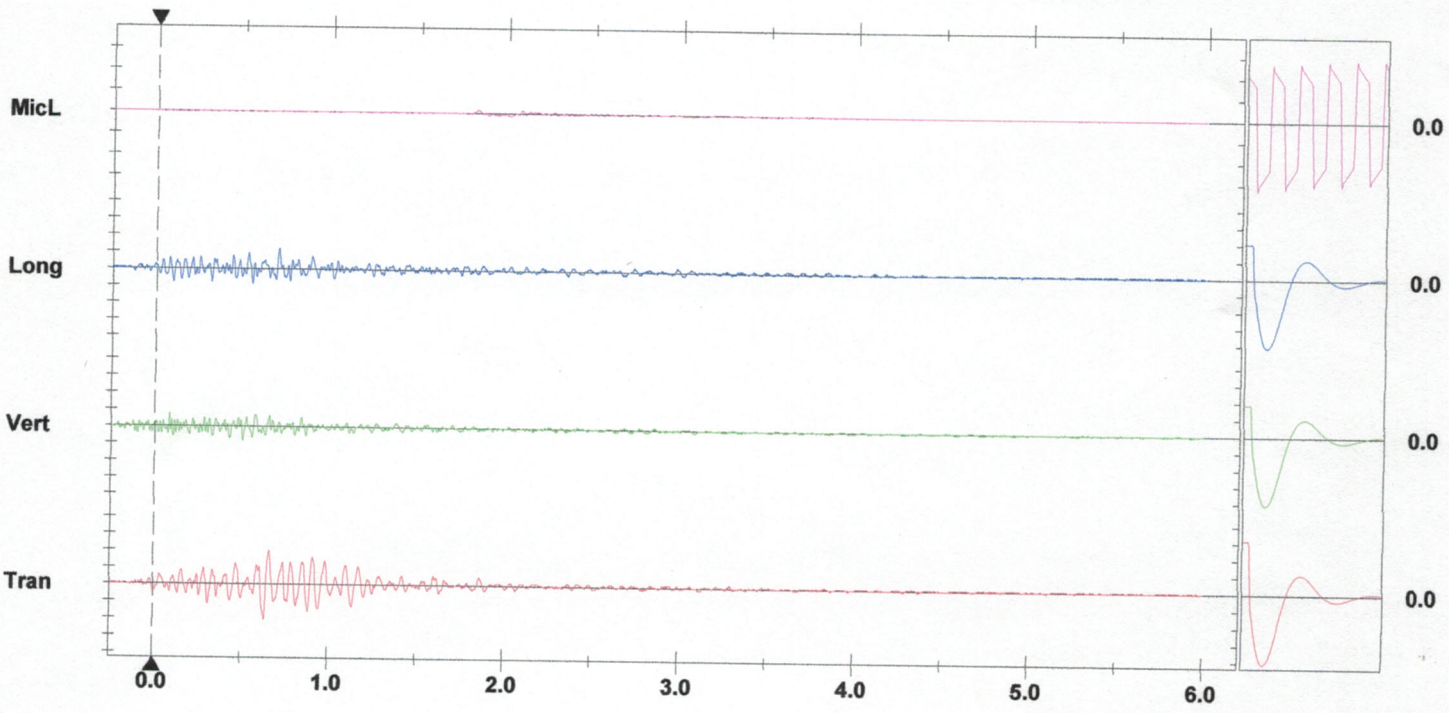
Microphone Linear Weighting
PSPL 97.50 dB(L) at 1.822 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 561 mv)

	Tran	Vert	Long	
PPV	4.064	1.651	2.413	mm/s
ZC Freq	16	28	23	Hz
Time (Rel. to Trig)	0.635	0.504	0.699	sec
Peak Acceleration	0.066	0.053	0.040	g
Peak Displacement	0.043	0.010	0.016	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.4	7.5	Hz
Overswing Ratio	3.4	3.7	3.5	

Peak Vector Sum 4.178 mm/s at 0.635 sec

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020I1M5.OP0
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged onfront lawn.





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

Instantel

Event Report

Date/Time	Vert at 12:36:58 July 30, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 118.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 16, 2018 by Instantel
File Name	Q589I1M5.PM0

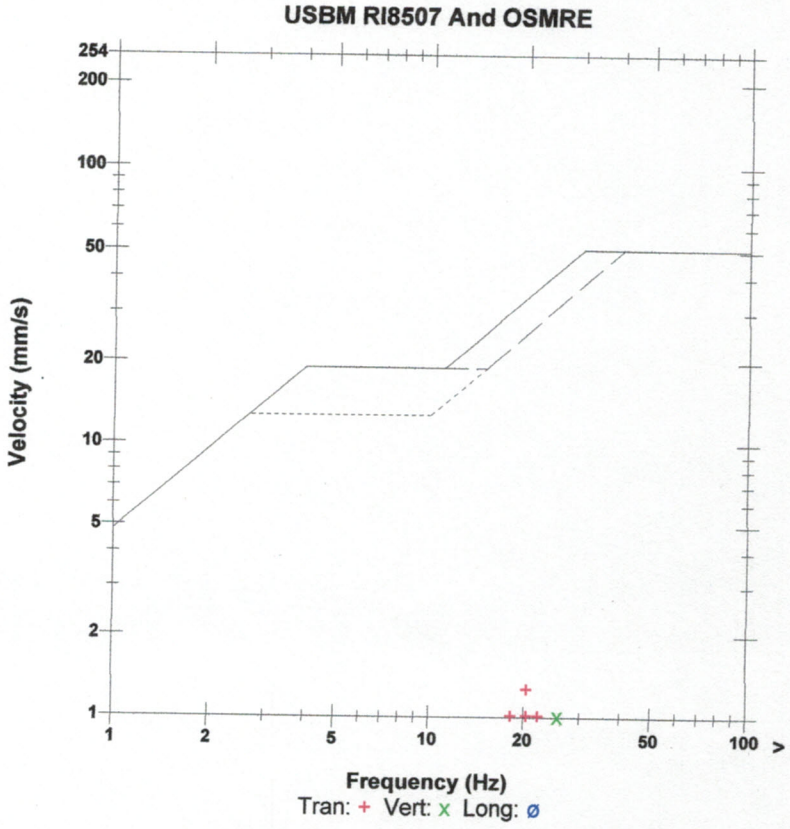
Post Event Notes
Set up at 1331 Dwire Hill rd. Geo spiked and weight bagged on roadside near fence.

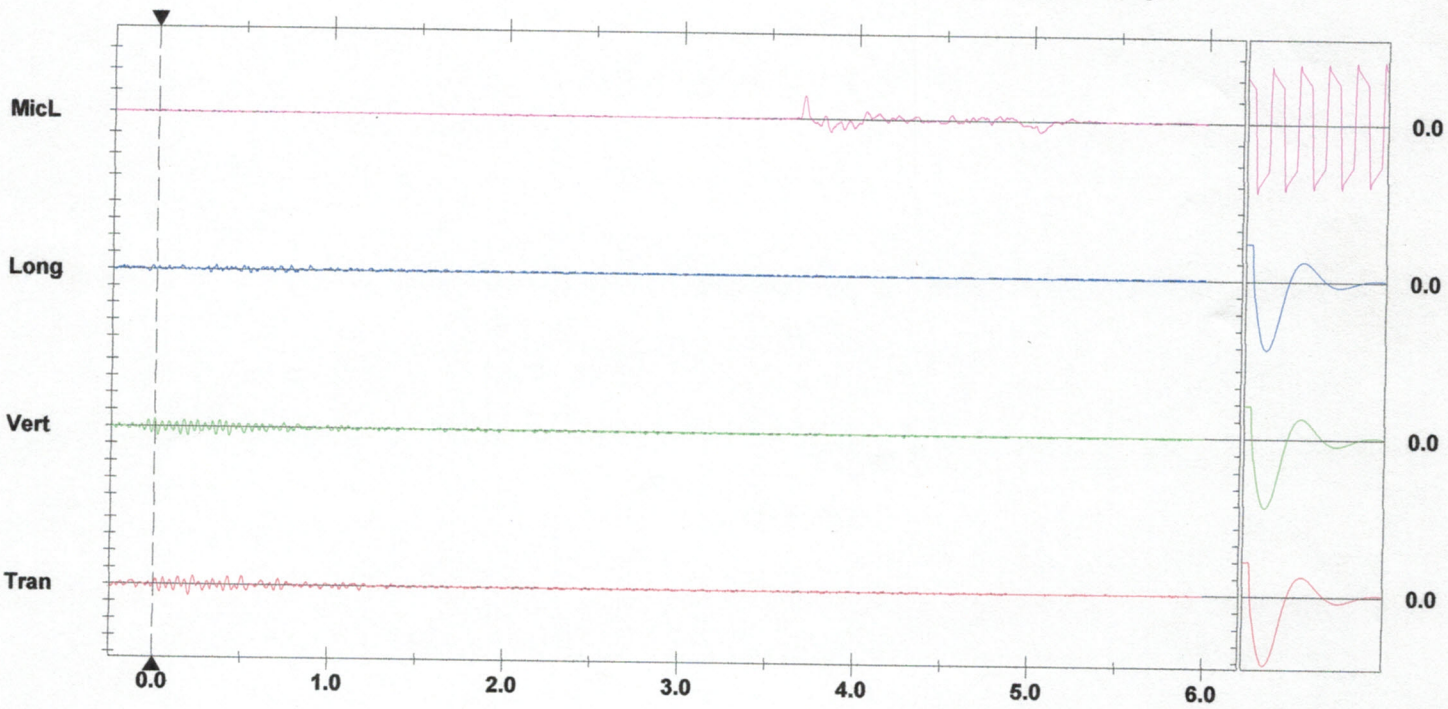
Extended Notes

Microphone	Linear Weighting
PSPL	114.8 dB(L) at 3.694 sec
ZC Freq	8.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 542 mv)

	Tran	Vert	Long	
PPV	1.270	1.016	0.508	mm/s
ZC Freq	20	26	32	Hz
Time (Rel. to Trig)	0.202	0.014	0.339	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.010	0.007	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.9	Hz
Overswing Ratio	3.5	3.3	3.5	

Peak Vector Sum 1.442 mm/s at 0.428 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-06 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/06/2019 10:29 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/06/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.635 mm/s	13.0 Hz
Time:	10:29	Calibration Date:	03/21/19		Vertical:	1.78 mm/s	18.0 Hz
Distance From Blast:	919.58 m	Calibration Signal:			Longitudinal:	2.667 mm/s	20.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	117 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.				Vector Sum:	2.907 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/06/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.016 mm/s	19.0 Hz
Time:	10:29	Calibration Date:	10/16/18		Vertical:	1.143 mm/s	21.0 Hz
Distance From Blast:	1,677.31 m	Calibration Signal:			Longitudinal:	1.016 mm/s	17.0 Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	94 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	1.581 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel

Event Report

Date/Time	Vert at 10:29:48 September 6, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 118.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 16, 2018 by Instantel
File Name	Q589I3KD.5O0

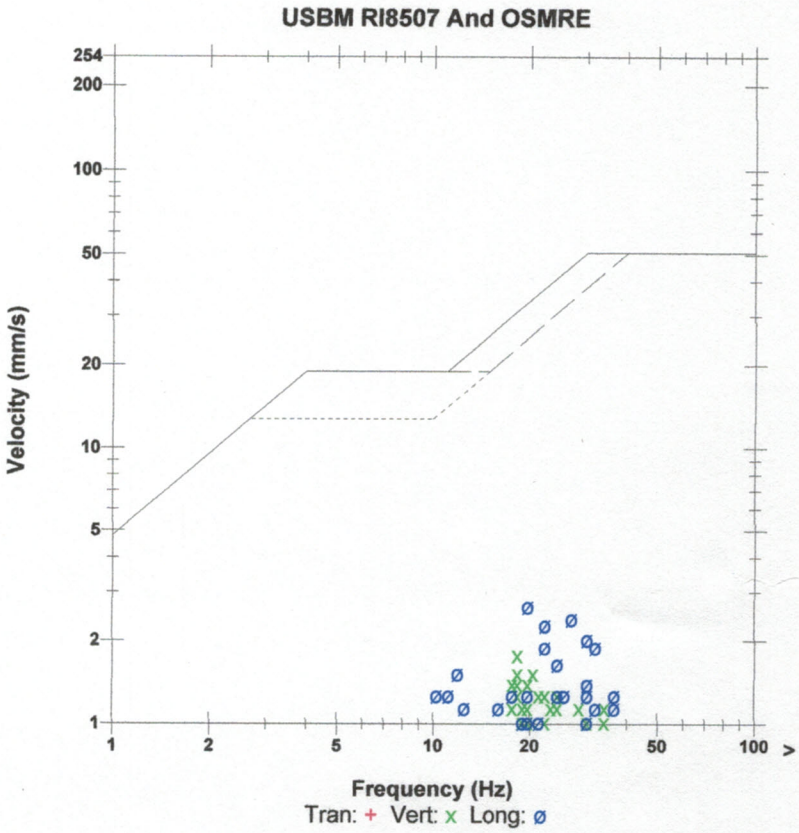
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged on front lawn.

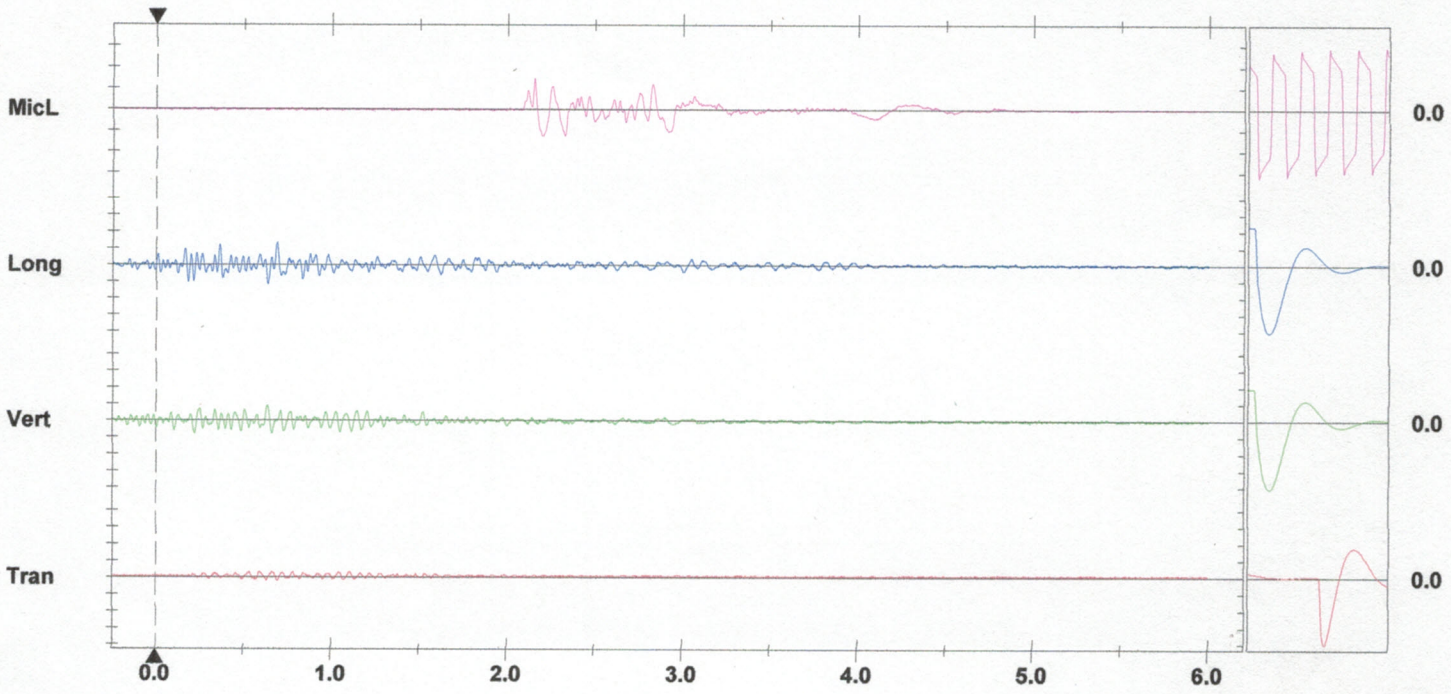
Extended Notes

Microphone	Linear Weighting
PSPL	117.2 dB(L) at 2.151 sec
ZC Freq	6.2 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 595 mv)

	Tran	Vert	Long	
PPV	0.635	1.778	2.667	mm/s
ZC Freq	13	18	20	Hz
Time (Rel. to Trig)	0.532	0.632	0.684	sec
Peak Acceleration	0.013	0.027	0.040	g
Peak Displacement	0.008	0.015	0.021	mm
Sensor Check	Check	Passed	Passed	
Frequency	14.0	7.9	8.1	Hz
Overswing Ratio	2.2	3.4	3.6	

Peak Vector Sum 2.907 mm/s at 0.634 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

Instantel

Event Report

Date/Time Long at 10:29:14 September 6, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.1 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020I3KD.4Q0
Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged on shoulder of driveway.

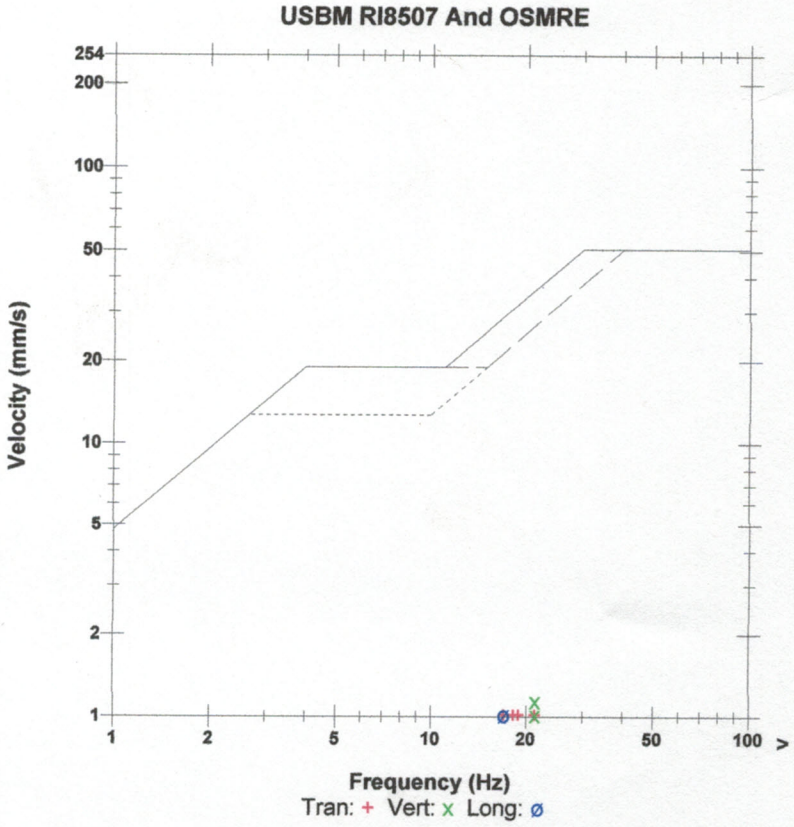
Notes
Location:
Client:
User Name:
General:

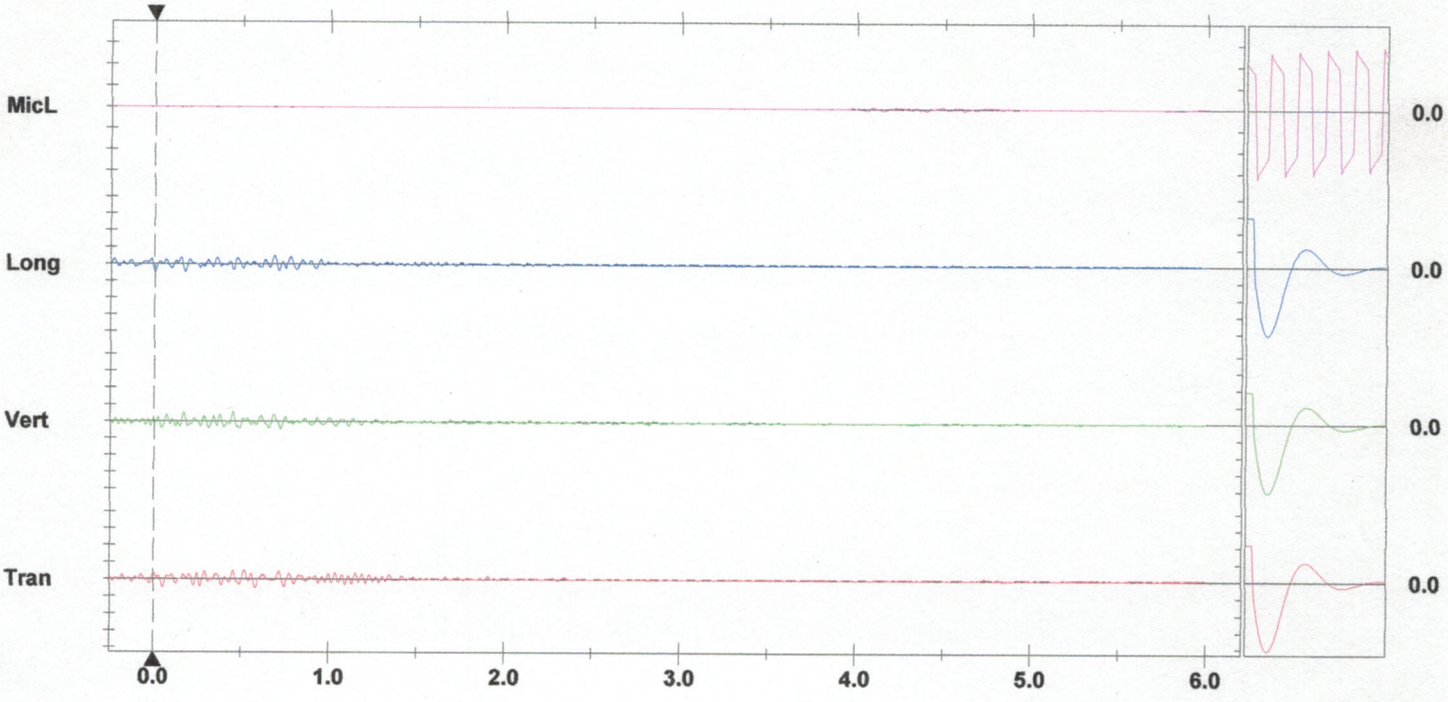
Extended Notes

Microphone Linear Weighting
PSPL 93.98 dB(L) at 4.393 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 617 mv)

	Tran	Vert	Long	
PPV	1.016	1.143	1.016	mm/s
ZC Freq	19	21	17	Hz
Time (Rel. to Trig)	0.054	0.450	0.682	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.010	0.010	0.010	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.6	Hz
Overswing Ratio	3.6	3.8	3.6	

Peak Vector Sum 1.581 mm/s at 0.451 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-07
Blast Type: Stone Quarry/Stone Mine - Production
Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)
Date/Time: 09/09/2019 10:49
Pit/Permit: WEST CARLETON QUARRY / ARA-4085
Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record
Seismograph Type: instantel
Date: 09/09/19
Trigger Level: 1.23 mm/s Off dB
Time: 10:49
Calibration Date: 03/21/19
Distance From Blast: 929.34 m
Calibration Signal:
Direction From Blast: NE
Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy
Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Joel McNamee, Austin Powder

Transverse:	3.302 mm/s	15.0 Hz
Vertical:	1.905 mm/s	18.0 Hz
Longitudinal:	2.667 mm/s	17.0 Hz
Acoustic:	114 dB	--- Hz
Vector Sum:	3.606 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: Seismic Record
Seismograph Type: instantel
Date: 09/09/19
Trigger Level: 1.23 mm/s Off dB
Time: 10:48
Calibration Date: 10/16/18
Distance From Blast: 1,699.56 m
Calibration Signal:
Direction From Blast: E
Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy
Mic. Min. Freq.: 2.0 Hz
Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm:

Transverse:	1.143 mm/s	17.0 Hz
Vertical:	1.016 mm/s	28.0 Hz
Longitudinal:	0.762 mm/s	14.0 Hz
Acoustic:	94 dB	--- Hz
Vector Sum:	1.426 mm/s	

Event Report

Date/Time	Vert at 10:48:51 September 9, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I3PY.1F0

Post Event Notes
Set up on 1331 Dwire Hill Rd. Geo spiked and weight bagged at end of driveway.

Notes
Location:
Client:
User Name:
General:

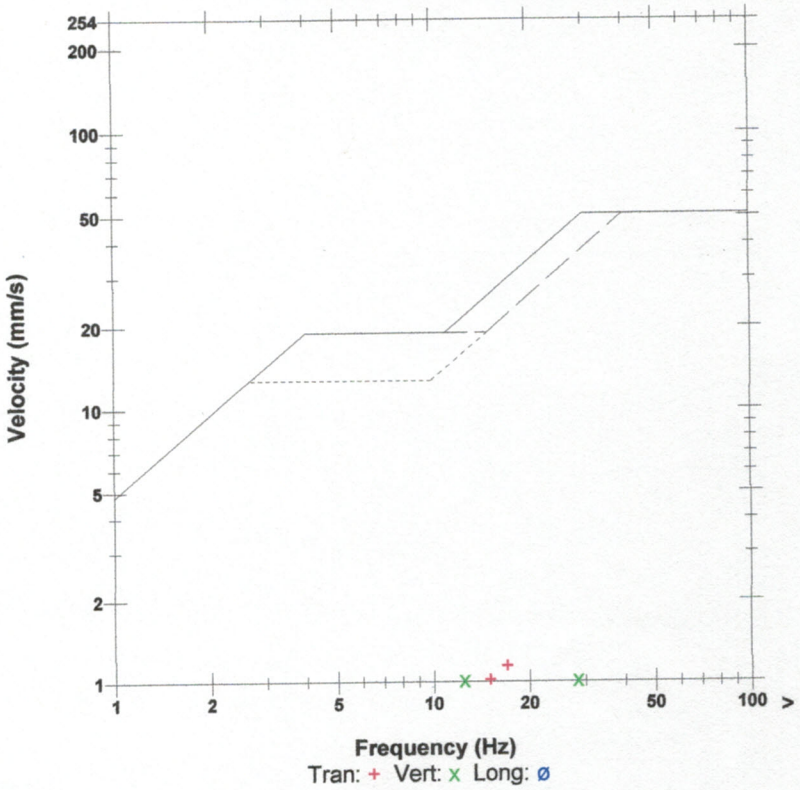
Extended Notes

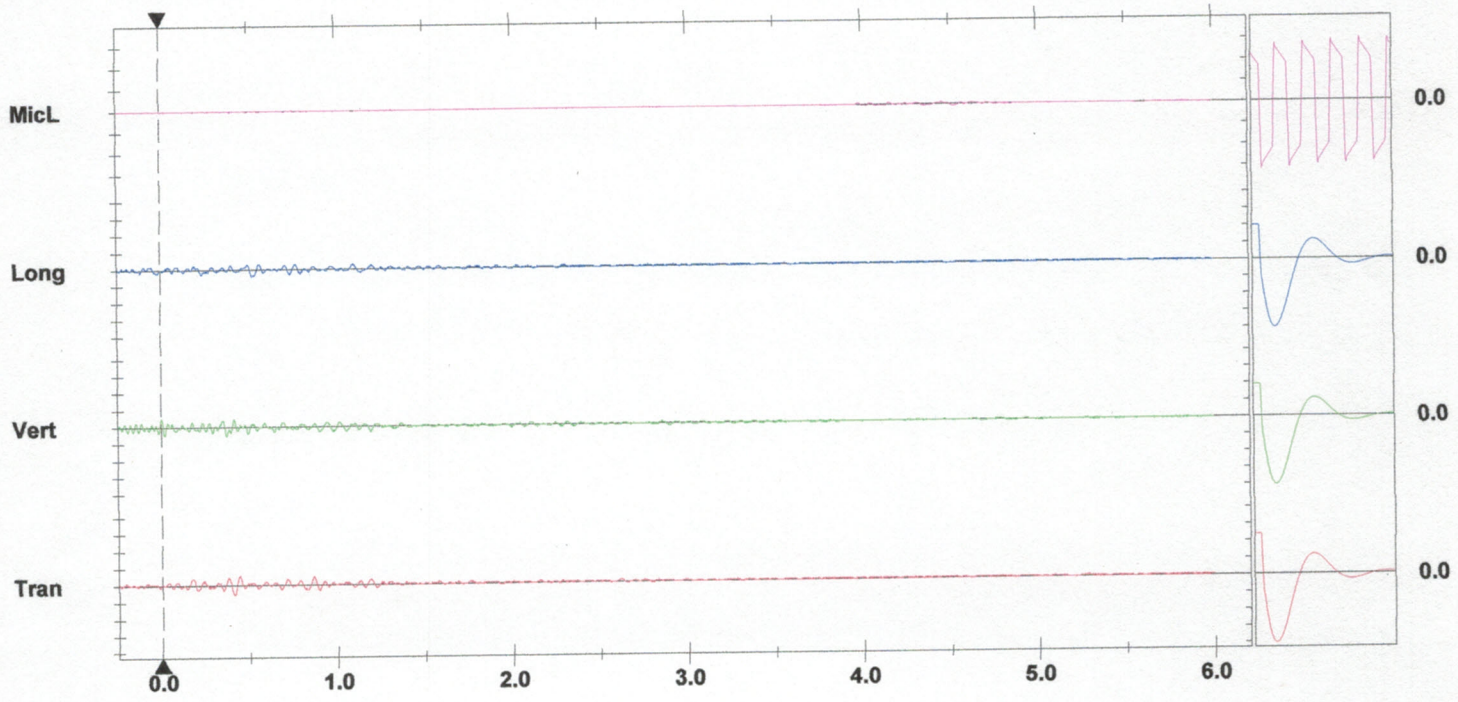
Microphone	Linear Weighting
PSPL	93.98 dB(L) at 4.461 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 570 mv)

	Tran	Vert	Long	
PPV	1.143	1.016	0.762	mm/s
ZC Freq	17	28	14	Hz
Time (Rel. to Trig)	0.406	0.001	0.521	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.012	0.011	0.010	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.4	7.4	Hz
Overswing Ratio	3.6	3.9	3.6	

Peak Vector Sum 1.426 mm/s at 0.410 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

Event Report

Date/Time Long at 10:49:30 September 9, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 118.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Notes

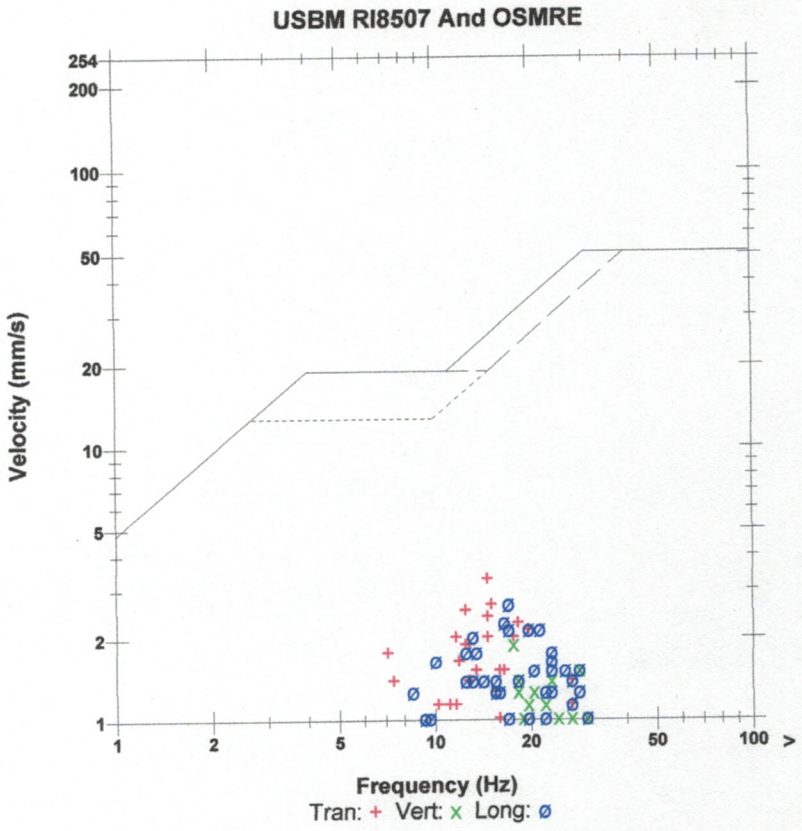
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration October 16, 2018 by Instantel
File Name Q589I3PY.2I0
Post Event Notes
Set up in front lawn of 1550 Dwire Hill Rd. Geo spiked and weight bagged on moist lawn.

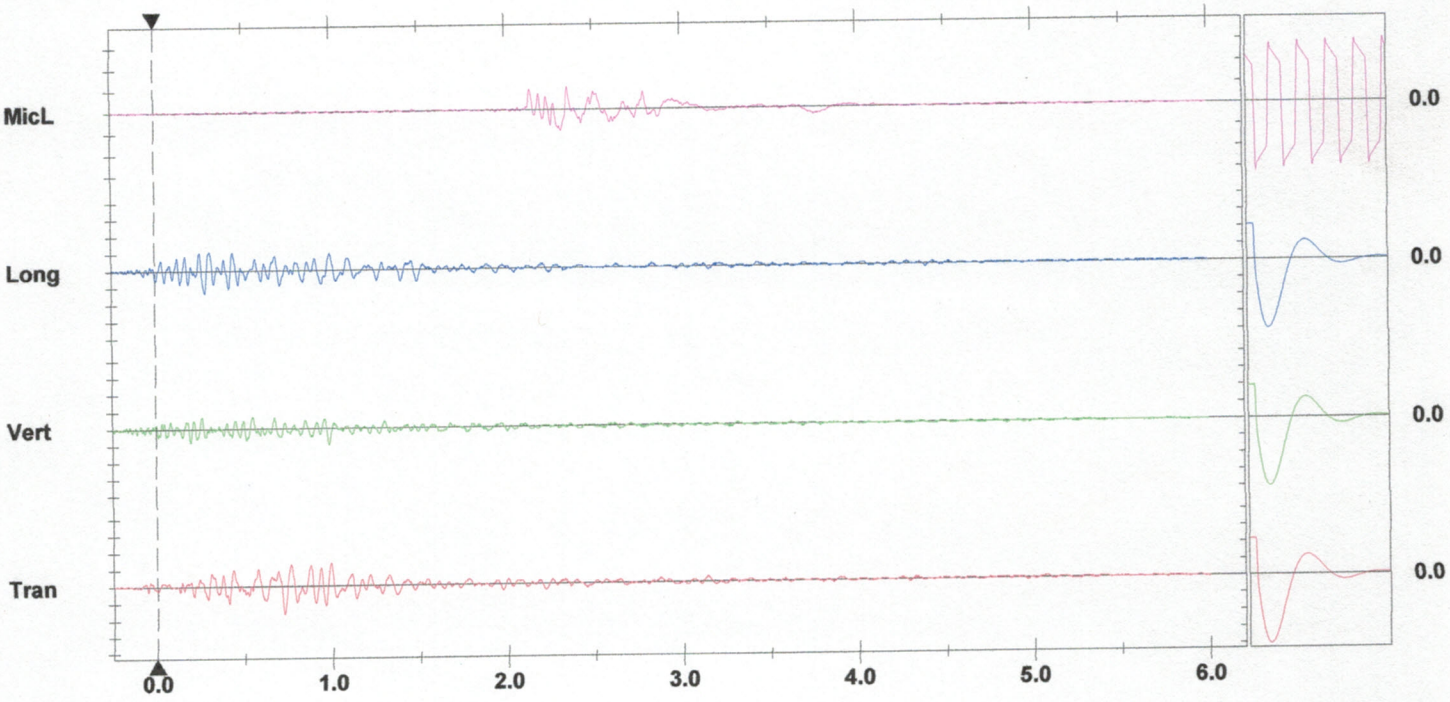
Extended Notes

Microphone Linear Weighting
PSPL 114.4 dB(L) at 2.360 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	3.302	1.905	2.667	mm/s
ZC Freq	15	18	17	Hz
Time (Rel. to Trig)	0.721	0.985	0.283	sec
Peak Acceleration	0.040	0.040	0.053	g
Peak Displacement	0.034	0.017	0.026	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.9	7.9	7.8	Hz
Overswing Ratio	3.5	3.5	3.7	

Peak Vector Sum 3.606 mm/s at 0.989 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-08 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 09/11/2019 12:59 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/11/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.635 mm/s	28.0 Hz
Time:	12:59	Calibration Date:	03/21/19		Vertical:	1.143 mm/s	24.0 Hz
Distance From Blast:	981.46 m	Calibration Signal:			Longitudinal:	0.635 mm/s	26.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Display Only	Mic. Min. Freq.:	2.0 Hz		Acoustic:	122 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.				Vector Sum:	1.178 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/11/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.667 mm/s	17.0 Hz
Time:	12:59	Calibration Date:	10/16/18		Vertical:	0.889 mm/s	32.0 Hz
Distance From Blast:	1,737.06 m	Calibration Signal:			Longitudinal:	2.921 mm/s	22.0 Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	99 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	2.9 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Event Report

Date/Time	Vert at 12:59:20 September 11, 2019
Trigger Source	Geo: 1.030 mm/s, Mic: 118.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes

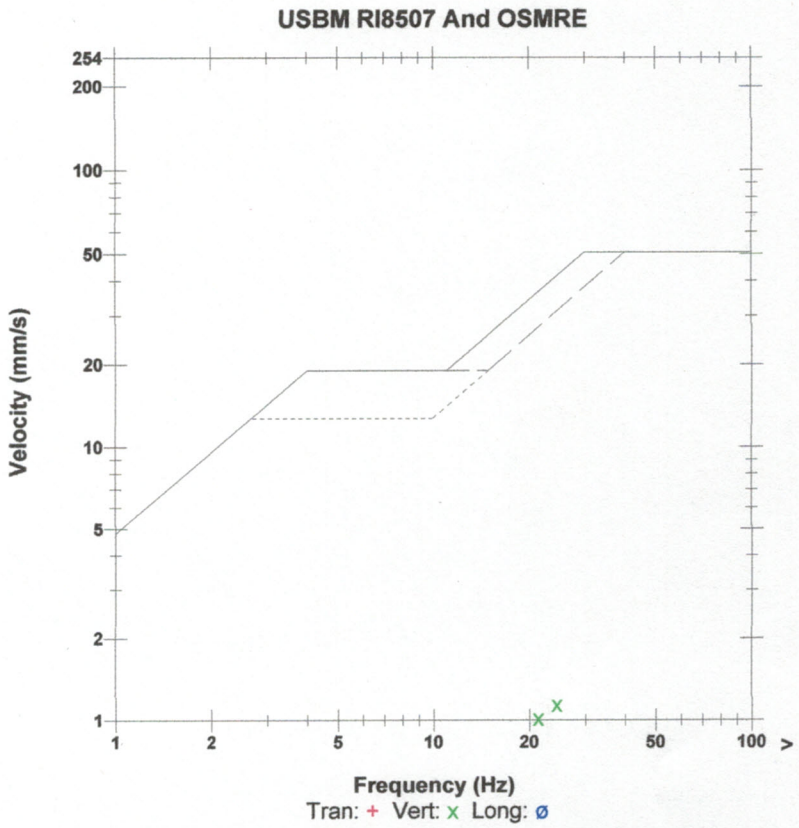
Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 25, 2018 by Instantel
File Name	U637I3TT.EW0

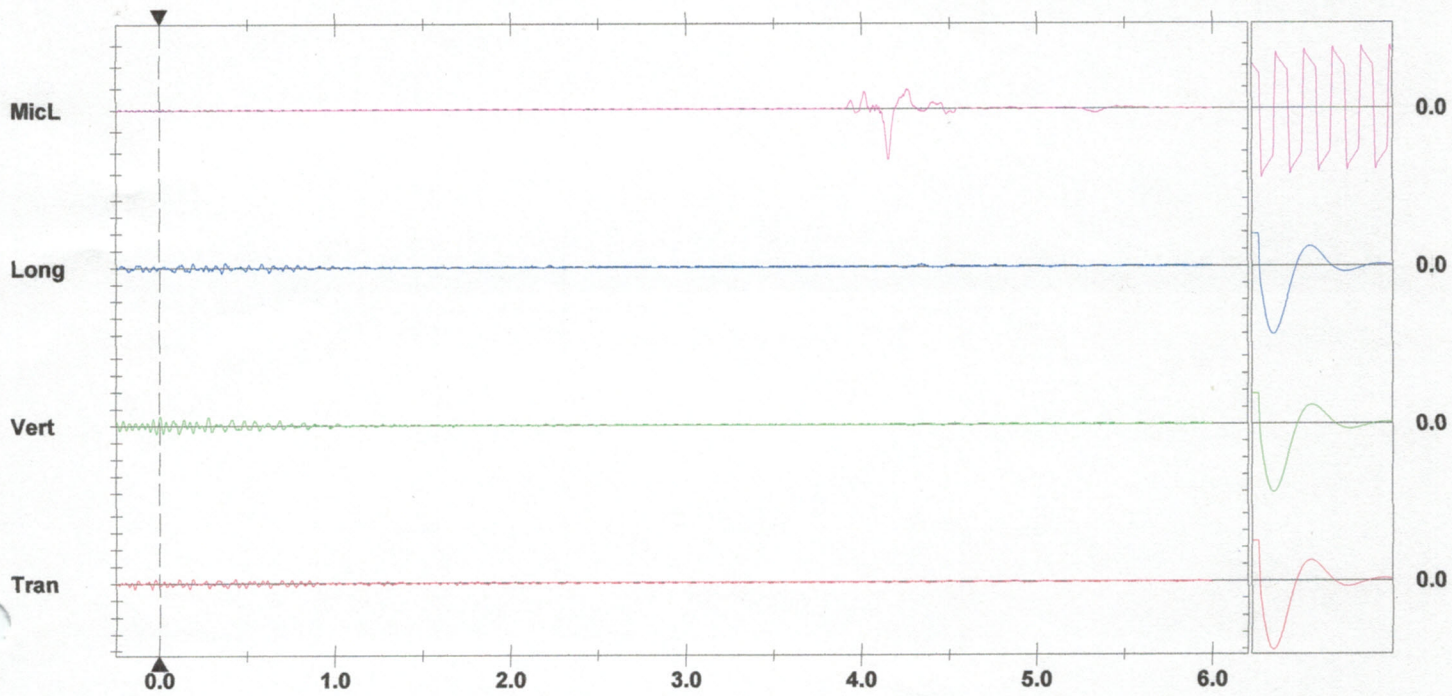
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged on front lawn.

Microphone	Linear Weighting
PSPL	121.5 dB(L) at 4.151 sec
ZC Freq	5.9 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 605 mv)

	Tran	Vert	Long	
PPV	0.635	1.143	0.635	mm/s
ZC Freq	28	24	26	Hz
Time (Rel. to Trig)	-0.146	0.002	0.189	sec
Peak Acceleration	0.027	0.027	0.013	g
Peak Displacement	0.004	0.008	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.4	3.7	3.6	

Peak Vector Sum 1.178 mm/s at 0.003 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

Instantel

Event Report

Date/Time	Long at 12:59:09 September 11, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I3TT.EL0

Post Event Notes
Set up in driveway of 1331 Dwire Hill rd. Geo spiked and weight bagged on packed gravel.

Notes
Location:
Client:
User Name:
General:

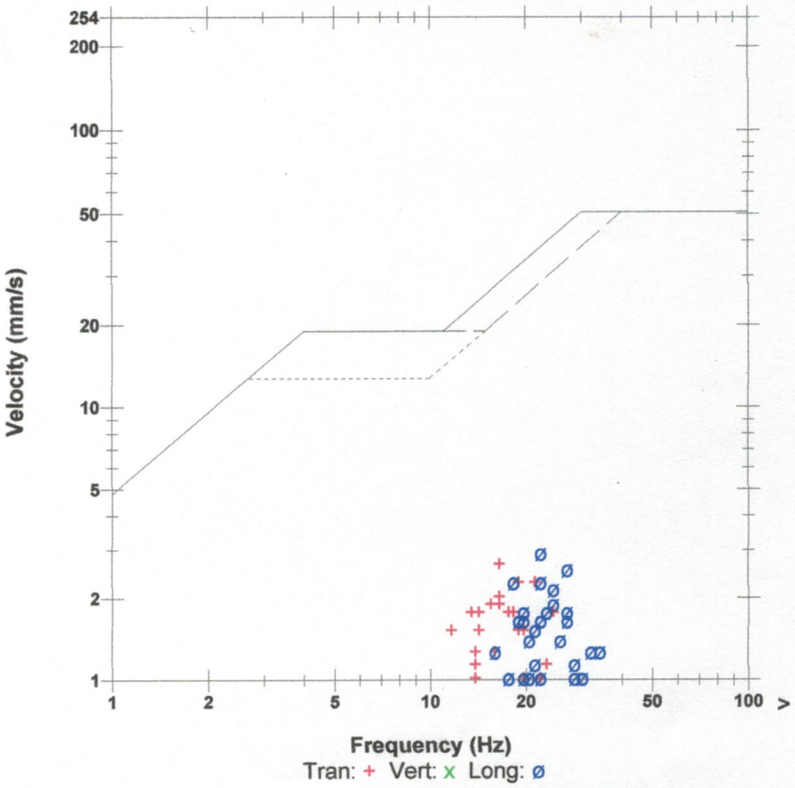
Extended Notes

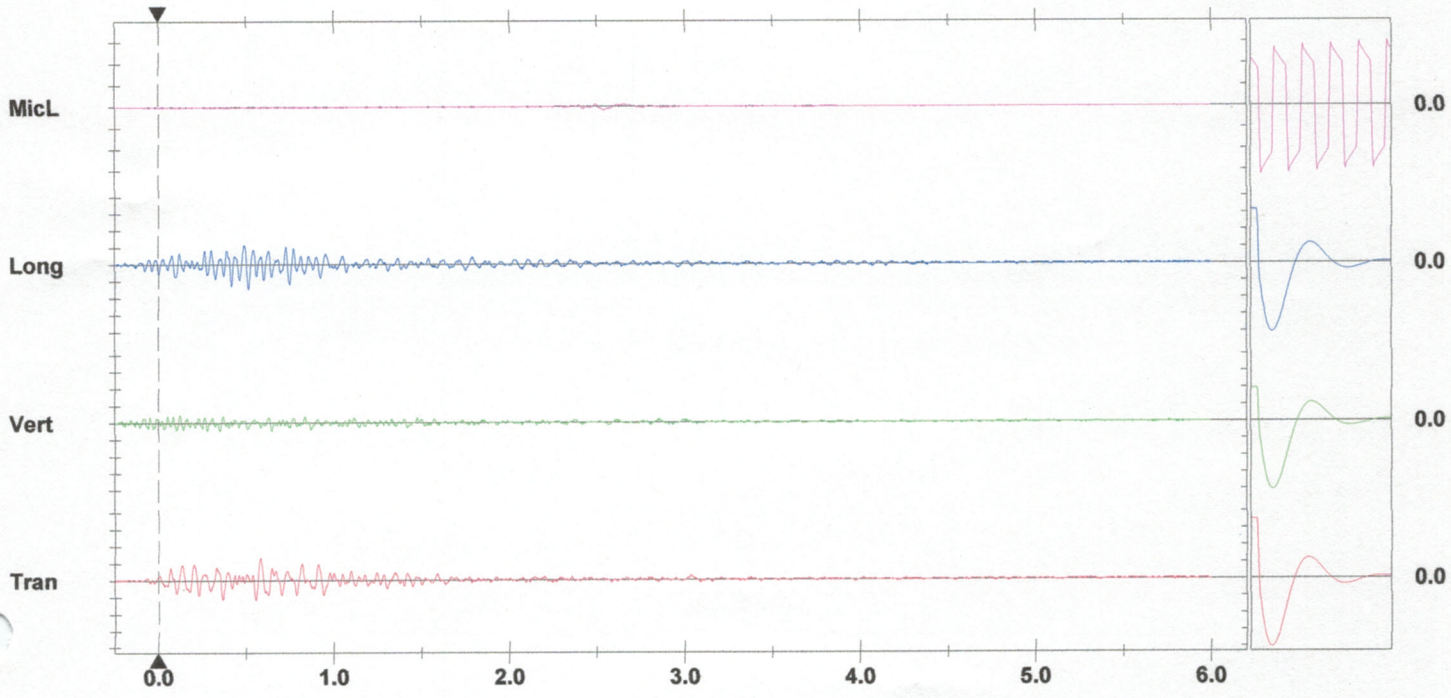
Microphone	Linear Weighting
PSPL	98.84 dB(L) at 2.540 sec
ZC Freq	6.0 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 568 mv)

	Tran	Vert	Long	
PPV	2.667	0.889	2.921	mm/s
ZC Freq	17	32	22	Hz
Time (Rel. to Trig)	0.578	0.121	0.514	sec
Peak Acceleration	0.040	0.027	0.040	g
Peak Displacement	0.026	0.007	0.021	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.9	7.4	7.7	Hz
Overswing Ratio	3.4	3.8	3.5	

Peak Vector Sum 2.976 mm/s at 0.514 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-09 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 10/07/2019 10:50 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/07/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	106.451 mm/s	17.0 Hz
Time:	10:49	Calibration Date:	10/16/18		Vertical:	77.419 mm/s	18.0 Hz
Distance From Blast:	1,210.67 m	Calibration Signal:			Longitudinal:	74.193 mm/s	16.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	97 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	107.671 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/07/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	3.226 mm/s	--- Hz
Time:	10:51	Calibration Date:	03/21/19		Vertical:	16.129 mm/s	18.0 Hz
Distance From Blast:	1,372.51 m	Calibration Signal:			Longitudinal:	22.581 mm/s	22.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	114 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet covered lawn.				Vector Sum:	23.495 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel Event Report

Date/Time Tran at 10:49:32 October 7, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.1 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020I55S.QK0
Post Event Notes
Set up in driveway of 1331 Dwire Hill Rd. Geo spiked and weight bagged on lawn.

Notes
Location:
Client:
User Name:
General:

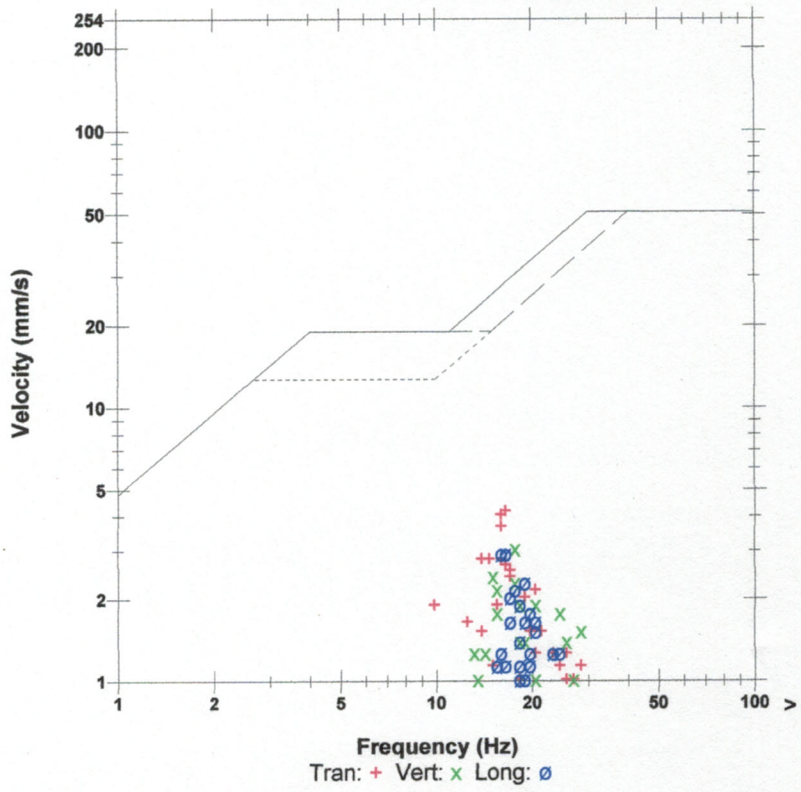
Extended Notes

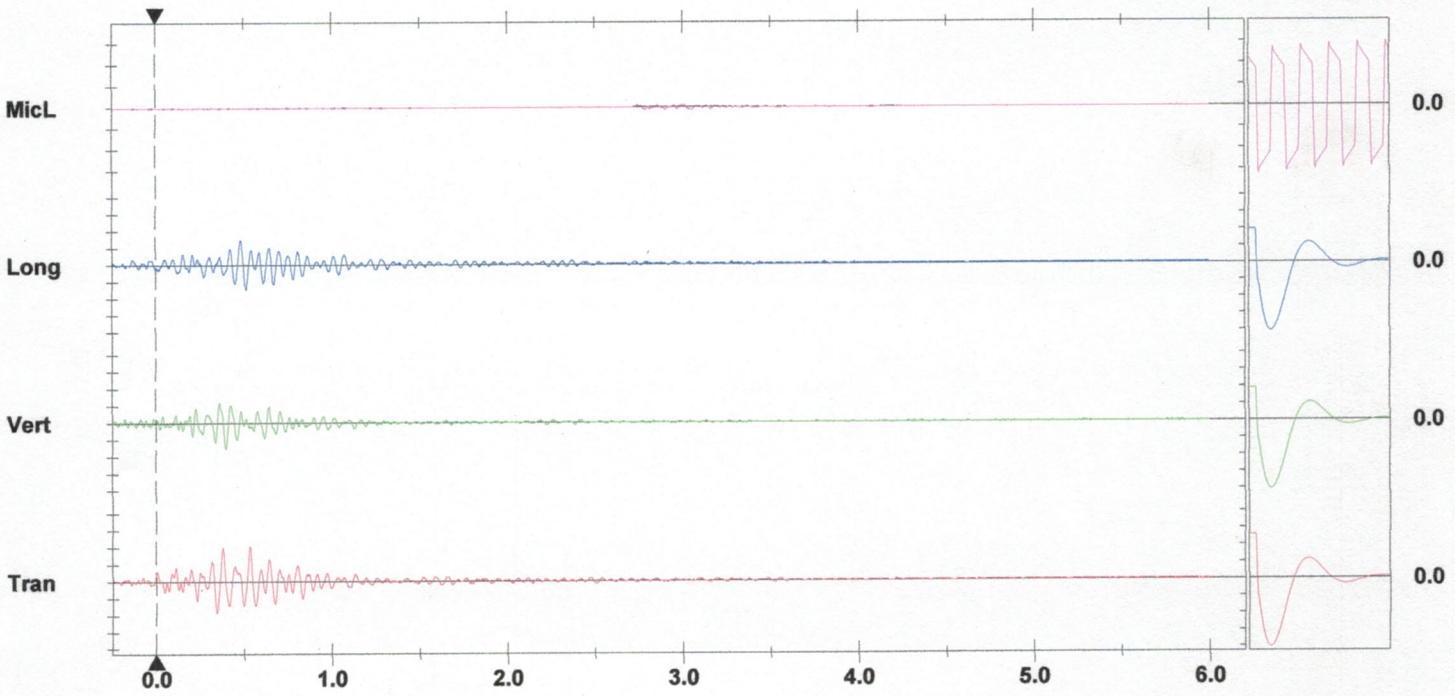
Microphone Linear Weighting
PSPL 97.50 dB(L) at 2.903 sec
ZC Freq 28 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 589 mv)

	Tran	Vert	Long	
PPV	4.191	3.048	2.921	mm/s
ZC Freq	17	18	16	Hz
Time (Rel. to Trig)	0.530	0.397	0.481	sec
Peak Acceleration	0.053	0.040	0.040	g
Peak Displacement	0.038	0.027	0.029	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.4	7.5	Hz
Overswing Ratio	3.6	3.9	3.5	

Peak Vector Sum 4.239 mm/s at 0.532 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel Event Report

Date/Time	Long at 10:51:01 October 7, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 118.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	October 16, 2018 by Instantel
File Name	Q589I55S.T10

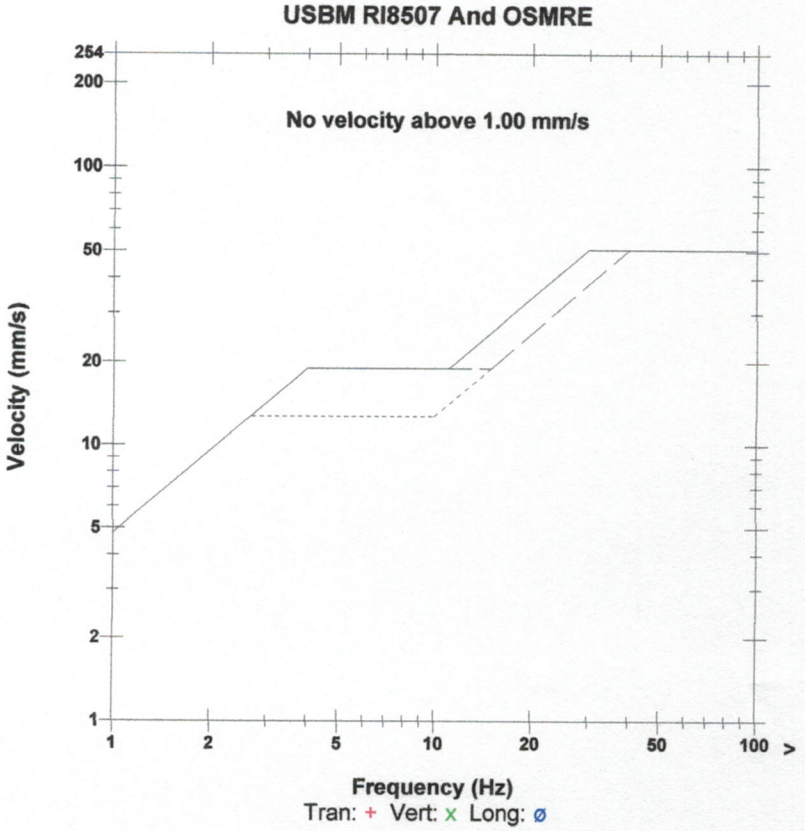
Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

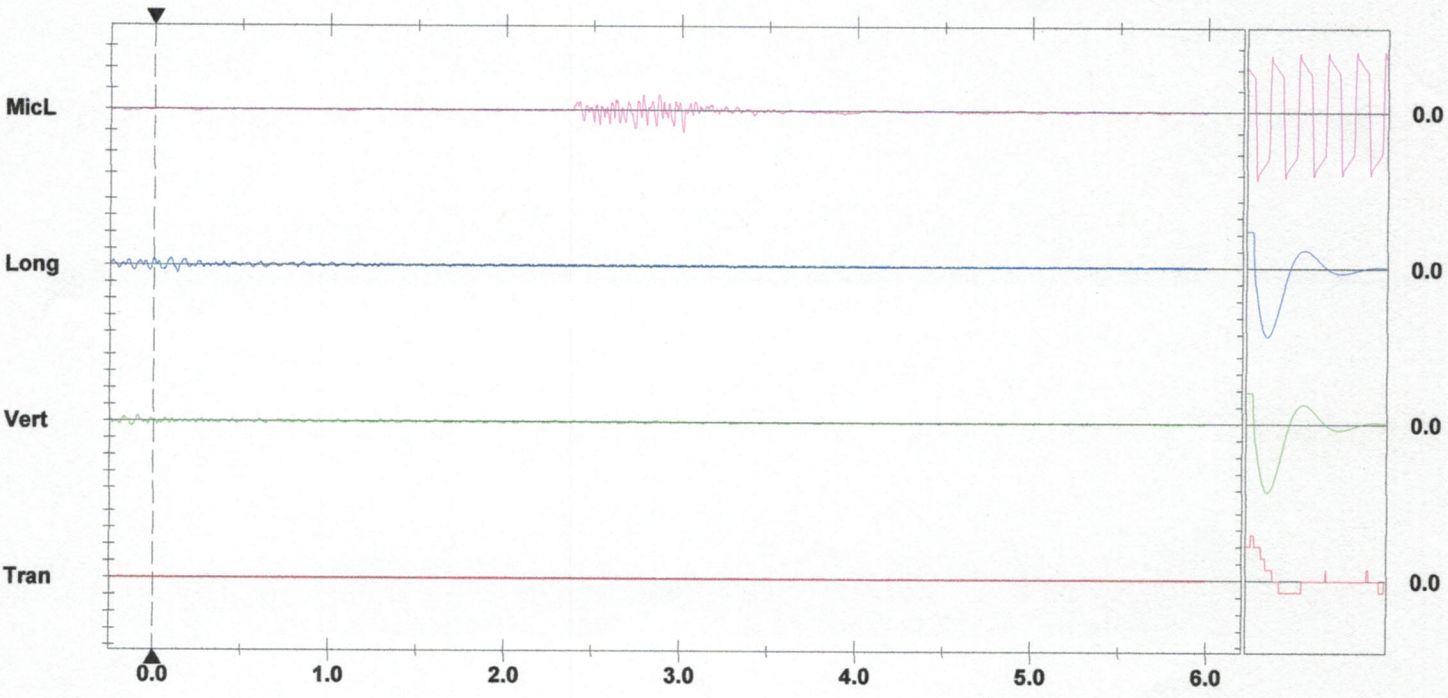
Extended Notes

Microphone	Linear Weighting
PSPL	114.2 dB(L) at 3.010 sec
ZC Freq	21 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	0.127	0.635	0.889	mm/s
ZC Freq	N/A	18	22	Hz
Time (Rel. to Trig)	-0.250	-0.124	0.000	sec
Peak Acceleration	0.013	0.013	0.027	g
Peak Displacement	0.000	0.006	0.009	mm
Sensor Check	Check	Passed	Passed	
Frequency	113.8	7.9	7.9	Hz
Overswing Ratio	0.0	3.5	3.7	

Peak Vector Sum 0.925 mm/s at 0.098 sec
N/A: Not Applicable





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-10 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 10/10/2019 10:43 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Wall

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel		
Date:	10/10/19	Trigger Level:	1.23 mm/s	Off dB	
Time:	10:43	Calibration Date:	09/20/19		
Distance From Blast:	1,231.39 m	Calibration Signal:			
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz		
Readout:		Mic. Min. Freq.:	2.0 Hz		
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W		
Reader and Firm:	William Coleman, AUSTIN POWDER				
Analyst and Firm:					
Installer and Firm:					

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/10/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.794 mm/s	17.0 Hz
Time:	10:42	Calibration Date:	03/21/19		Vertical:	1.524 mm/s	16.0 Hz
Distance From Blast:	1,377.70 m	Calibration Signal:			Longitudinal:	2.794 mm/s	20.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	88 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet lawn.				Vector Sum:	3.277 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel Event Report

Date/Time	Tran at 10:42:23 October 10, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I5BC.EN0

Post Event Notes
Set up in at end of driveway of 1550 Dwire Hill Rd. Geo spiked and weight bagged near gate.

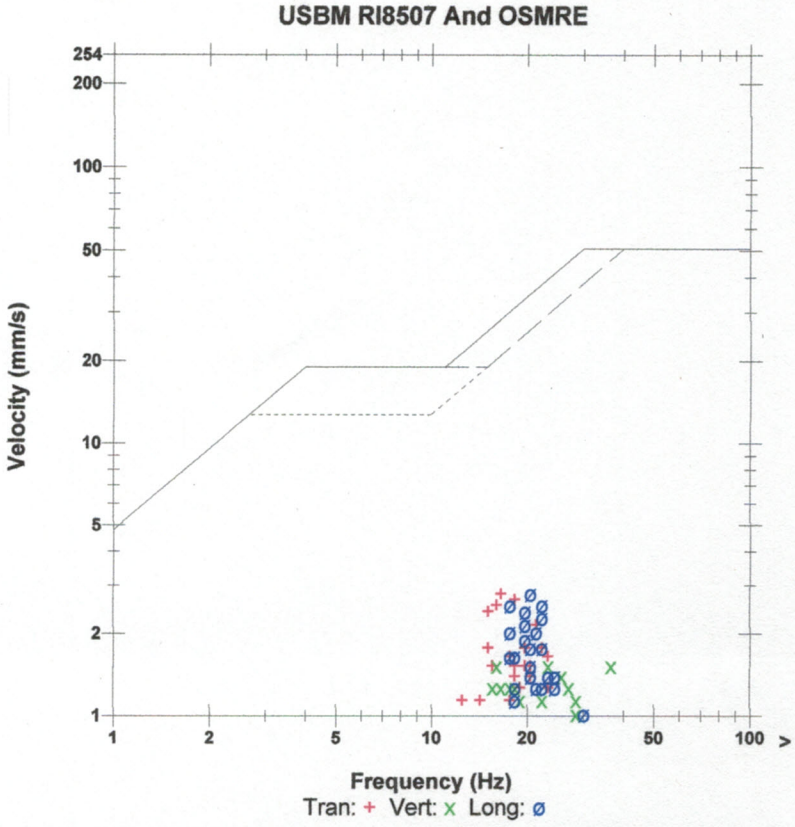
Notes
Location:
Client:
User Name:
General:

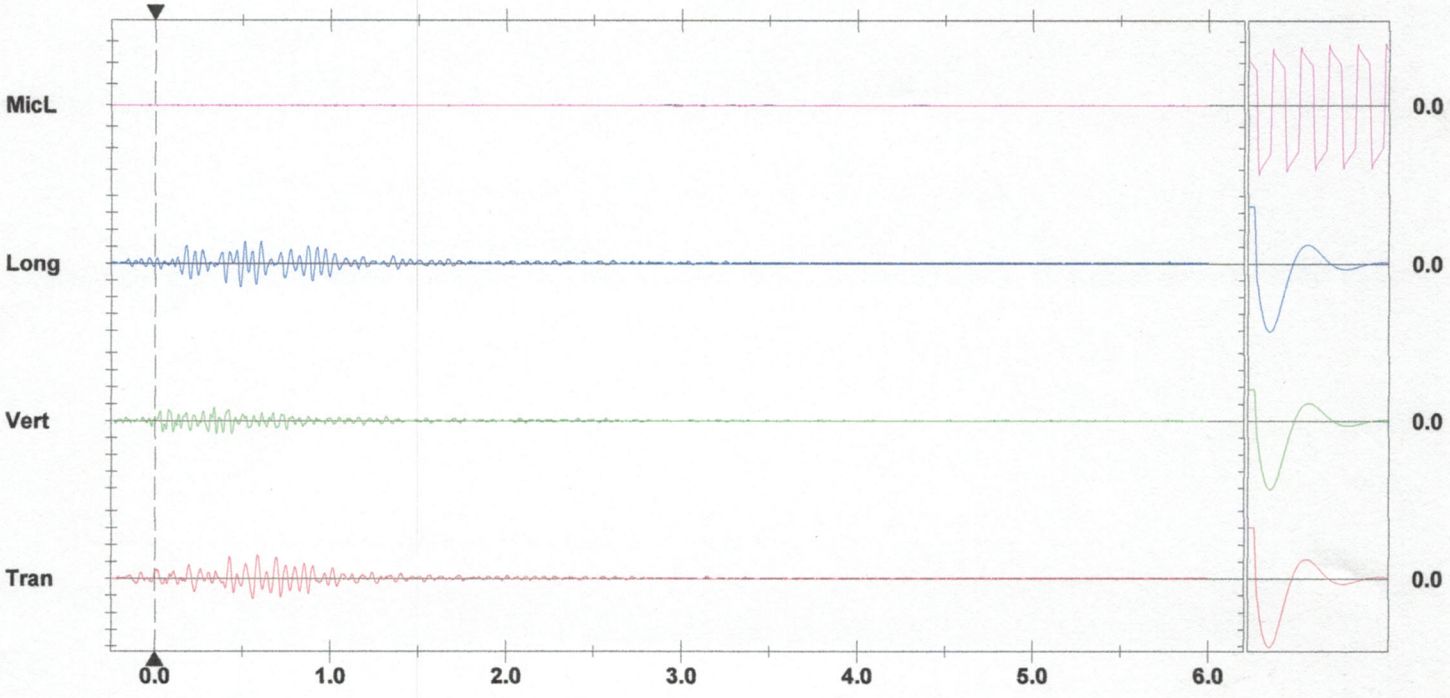
Extended Notes

Microphone	Linear Weighting
PSPL	<88 dB(L)
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 639 mv)

	Tran	Vert	Long	
PPV	2.794	1.524	2.794	mm/s
ZC Freq	17	16	20	Hz
Time (Rel. to Trig)	0.584	0.337	0.487	sec
Peak Acceleration	0.040	0.040	0.040	g
Peak Displacement	0.028	0.014	0.022	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.4	7.7	Hz
Overswing Ratio	3.6	3.9	3.6	

Peak Vector Sum 3.277 mm/s at 0.582 sec
N/A: Not Applicable





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

No Trigger
1331 Dwire Hill Rd.

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE19637
Oct 10 /19 10:18:35	Oct 10 /19 11:05:36	No events recorded. (Keyboard Exit) Geo: 1.70 mm/s Mic: 121.9 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-11 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 10/15/2019 10:25 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/15/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.524 mm/s	24.0 Hz
Time:	10:25	Calibration Date:	09/20/19		Vertical:	0.762 mm/s	39.0 Hz
Distance From Blast:	1,240.84 m	Calibration Signal:			Longitudinal:	1.905 mm/s	26.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	117 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	2.048 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/15/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.016 mm/s	17.0 Hz
Time:	10:23	Calibration Date:	03/21/19		Vertical:	0.508 mm/s	30.0 Hz
Distance From Blast:	1,407.57 m	Calibration Signal:			Longitudinal:	0.889 mm/s	27.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	94 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet lawn.				Vector Sum:	1.205 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel Event Report

Date/Time	Long at 10:23:21 October 15, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I5KK.UX0

Post Event Notes
Set up at 1550 Dwire Hill rd. Geo spiked and weight bagged on front lawn.

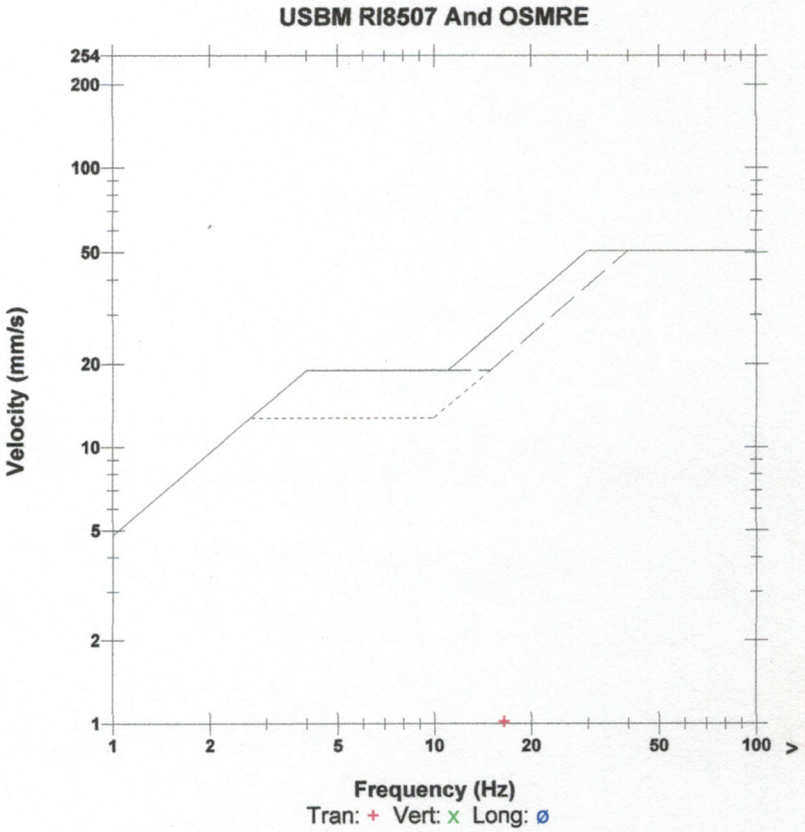
Notes
Location:
Client:
User Name:
General:

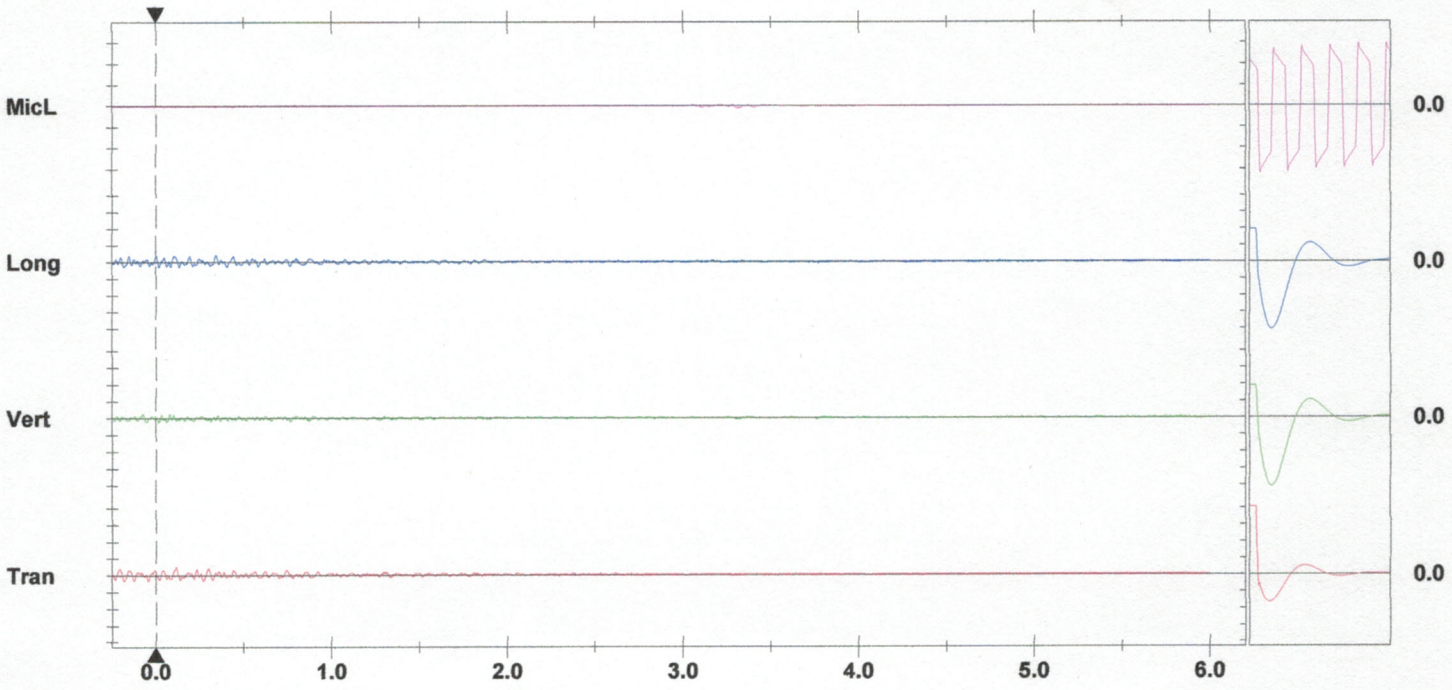
Extended Notes

Microphone	Linear Weighting
PSPL	93.98 dB(L) at 3.307 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 617 mv)

	Tran	Vert	Long	
PPV	1.016	0.508	0.889	mm/s
ZC Freq	17	30	27	Hz
Time (Rel. to Trig)	0.113	-0.078	0.000	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.010	0.003	0.008	mm
Sensor Check	Check	Passed	Passed	
Frequency	8.5	7.5	7.5	Hz
Overswing Ratio	3.3	3.9	3.6	

Peak Vector Sum 1.205 mm/s at 0.113 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger = ▶— — —◀

Instantel

Event Report

Date/Time	Long at 10:25:54 October 15, 2019
Trigger Source	Geo: 1.700 mm/s, Mic: 121.9 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 25, 2019 by Instantel
File Name	U637I5KK.Z60

Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged on lawn beside house.

Notes
Location:
Client:
User Name:
General:

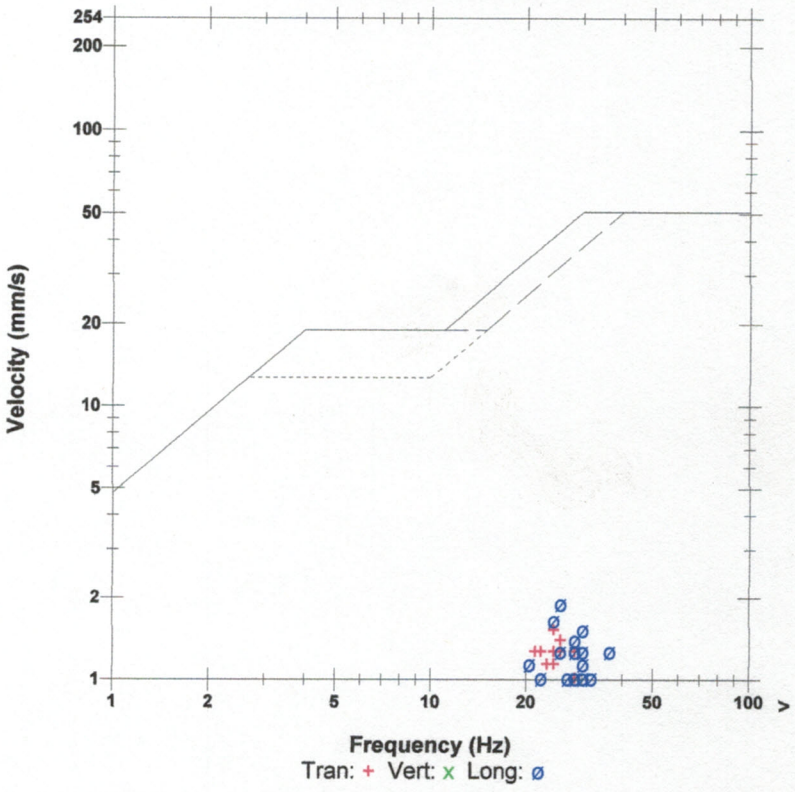
Extended Notes

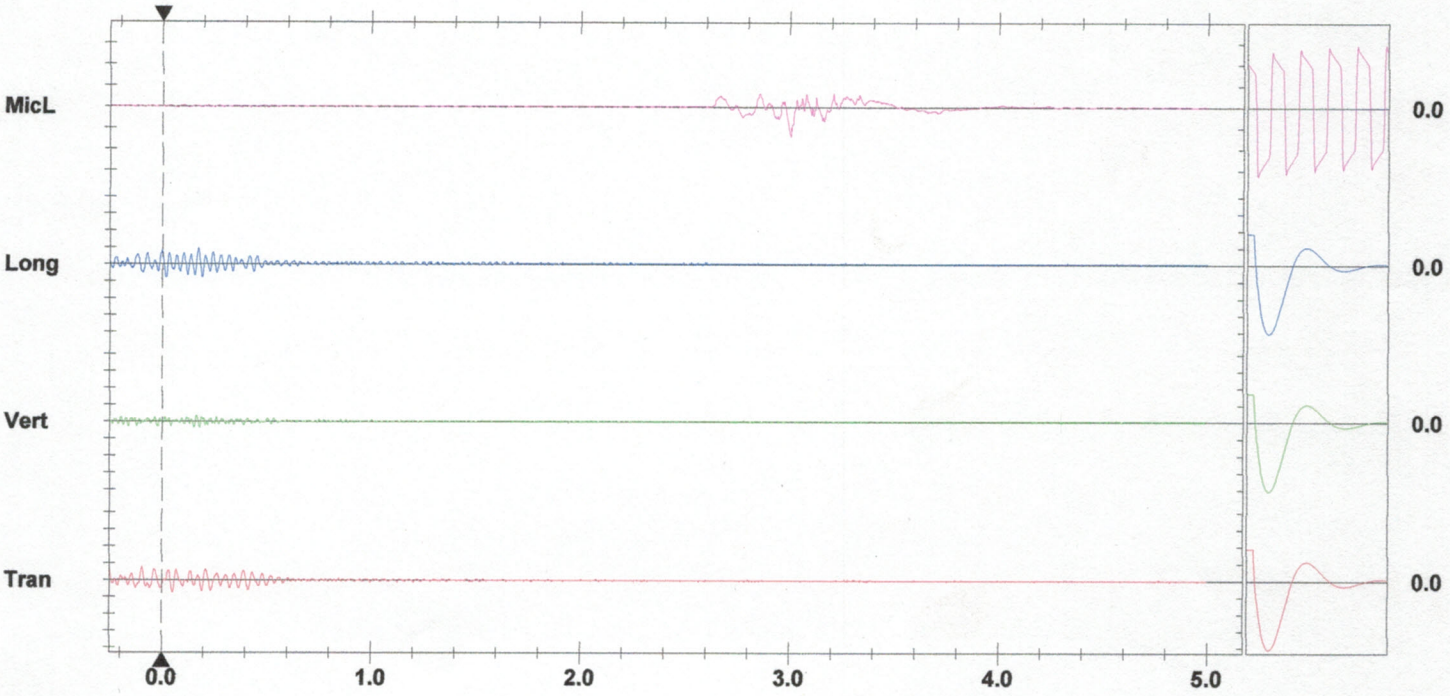
Microphone	Linear Weighting
PSPL	116.9 dB(L) at 3.004 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 691 mv)

	Tran	Vert	Long	
PPV	1.524	0.762	1.905	mm/s
ZC Freq	24	39	26	Hz
Time (Rel. to Trig)	-0.093	0.166	0.175	sec
Peak Acceleration	0.040	0.027	0.040	g
Peak Displacement	0.011	0.003	0.011	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	3.6	3.8	3.8	

Peak Vector Sum 2.048 mm/s at 0.192 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-12 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 11/13/2019 12:15 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/13/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.254 mm/s	--- Hz
Time:	12:14	Calibration Date:	03/21/19		Vertical:	1.016 mm/s	39.0 Hz
Distance From Blast:	1,427.99 m	Calibration Signal:			Longitudinal:	1.27 mm/s	19.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	94 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet lawn.				Vector Sum:	1.283 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/13/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.889 mm/s	37.0 Hz
Time:	12:15	Calibration Date:	09/20/19		Vertical:	0.762 mm/s	47.0 Hz
Distance From Blast:	1,266.44 m	Calibration Signal:			Longitudinal:	1.27 mm/s	39.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	117 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	1.35 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel Event Report

Date/Time	Vert at 12:14:01 November 13, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General:

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I72F.BD0

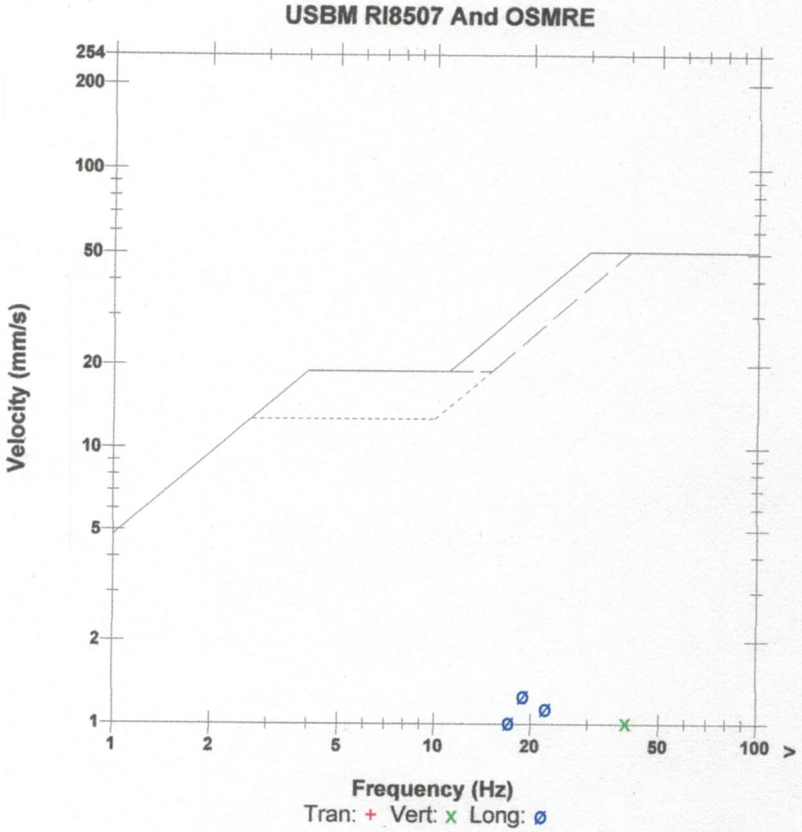
Post Event Notes
Set up in front yard of 1550 Dwire Hille Rd. Geo spiked and weight bagged on frozen ground.

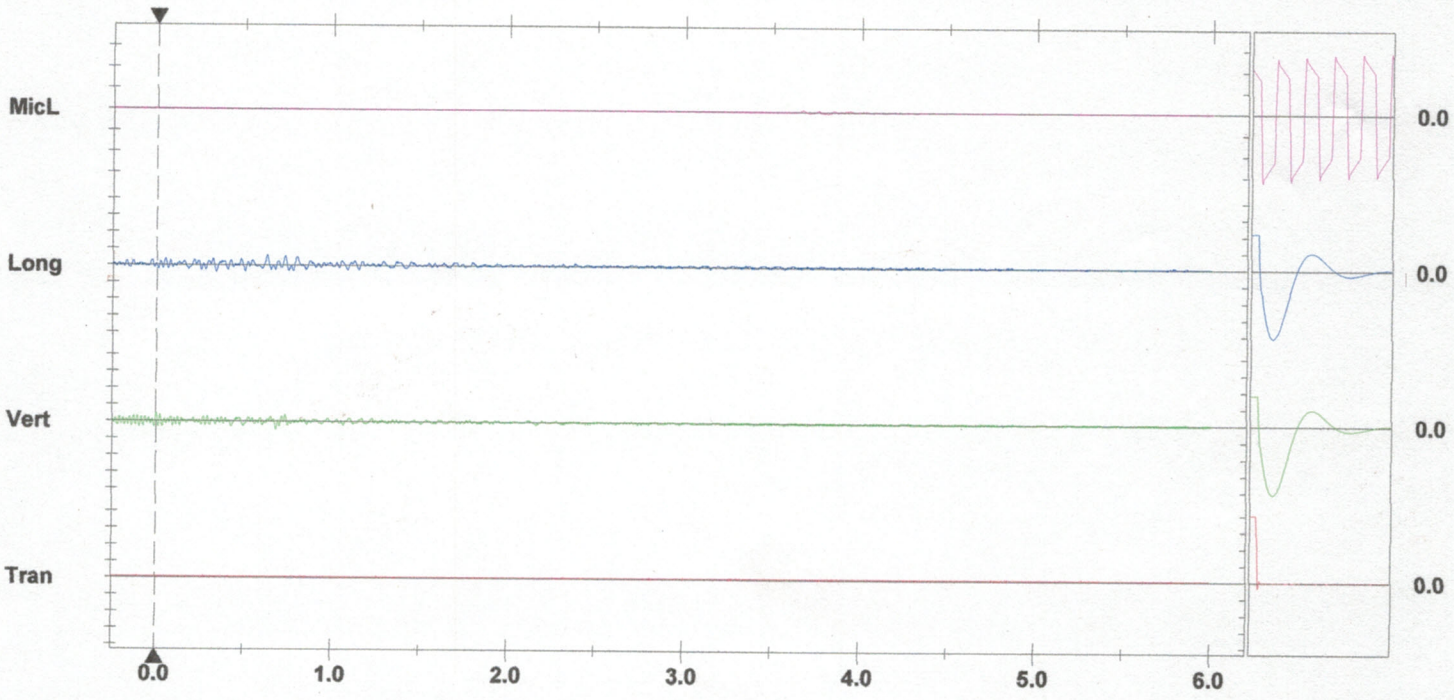
Extended Notes

Microphone	Linear Weighting
PSPL	93.98 dB(L) at 3.667 sec
ZC Freq	18 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 758 mv)

	Tran	Vert	Long	
PPV	0.254	1.016	1.270	mm/s
ZC Freq	>100	39	19	Hz
Time (Rel. to Trig)	-0.103	0.002	0.627	sec
Peak Acceleration	0.013	0.027	0.027	g
Peak Displacement	0.000	0.005	0.010	mm
Sensor Check	Check	Passed	Passed	
Frequency	2.3	7.3	7.5	Hz
Overswing Ratio	1.0	4.1	3.8	

Peak Vector Sum 1.283 mm/s at 0.627 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——◀

Sensor Check

Instantel

Event Report

Date/Time	Long at 12:15:19 November 13, 2019
Trigger Source	Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589I72F.DJ0

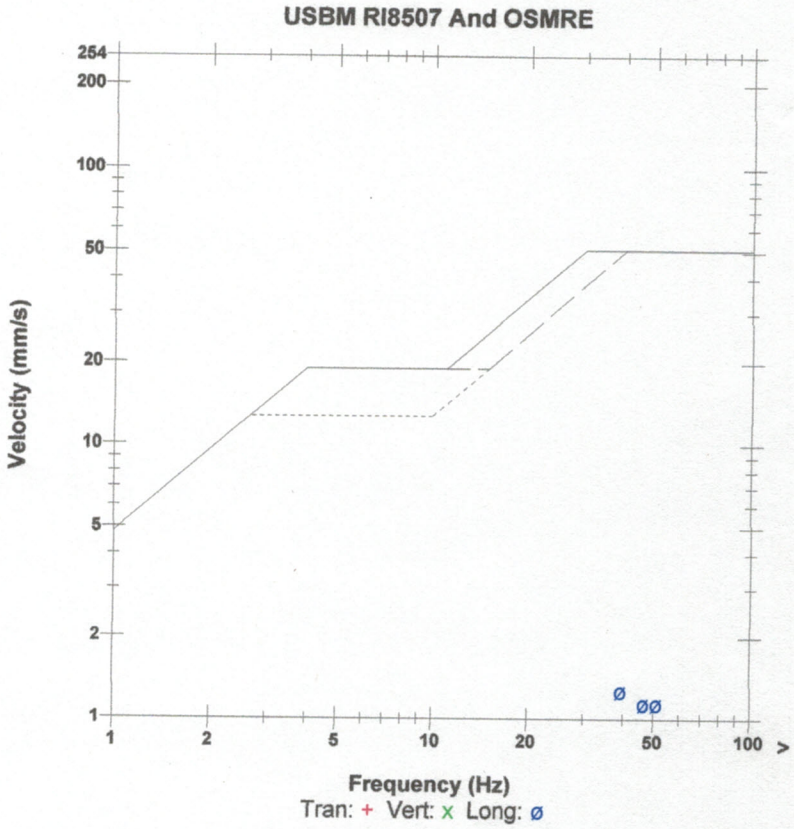
Post Event Notes
Set up in yard of 1331 Dwire Hill Rd. Geo spiked and weight bagged on frozen ground.

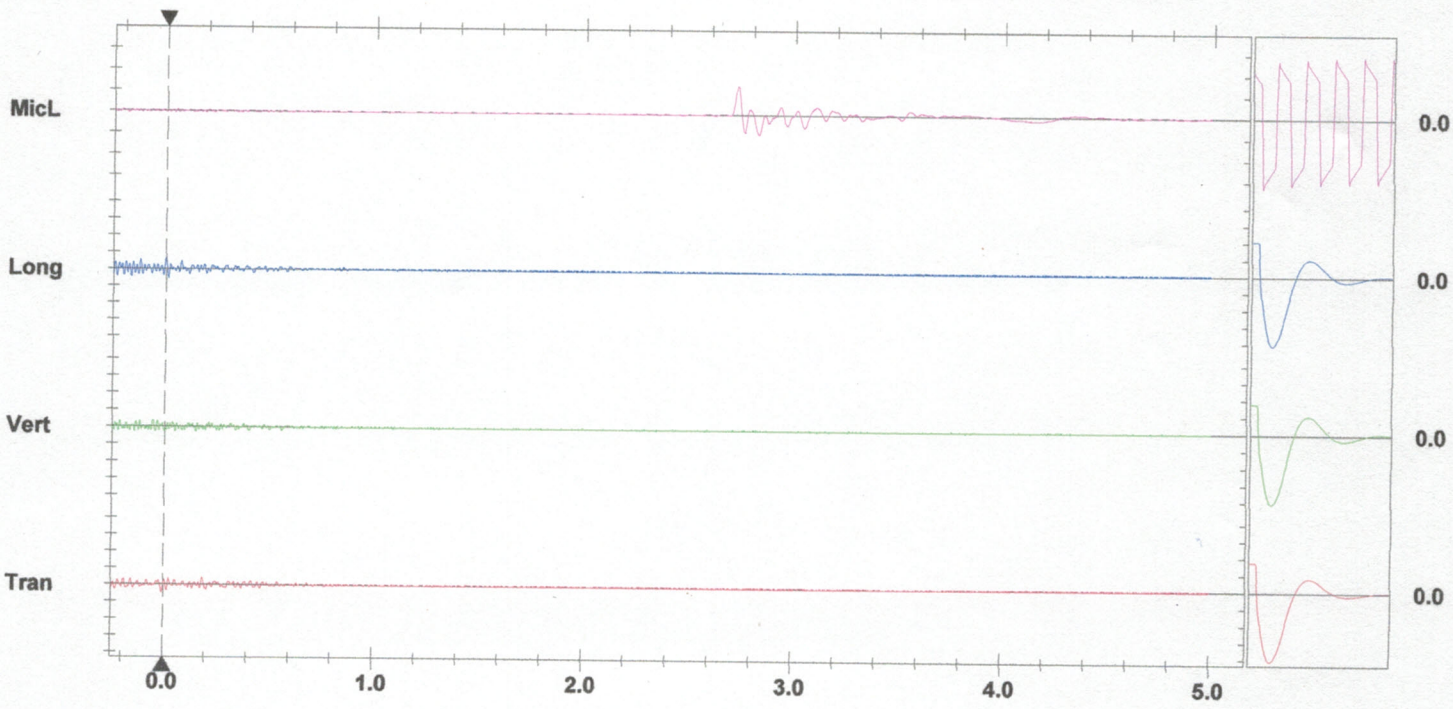
Extended Notes

Microphone	Linear Weighting
PSPL	116.7 dB(L) at 2.725 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 739 mv)

	Tran	Vert	Long	
PPV	0.889	0.762	1.270	mm/s
ZC Freq	37	47	39	Hz
Time (Rel. to Trig)	-0.007	-0.056	0.000	sec
Peak Acceleration	0.027	0.027	0.040	g
Peak Displacement	0.004	0.003	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.9	7.8	Hz
Overswing Ratio	4.8	3.6	3.8	

Peak Vector Sum 1.350 mm/s at 0.001 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-13 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 11/20/2019 15:56 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/20/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.524 mm/s	27.0 Hz
Time:	15:56	Calibration Date:	09/20/19		Vertical:	0.508 mm/s	73.0 Hz
Distance From Blast:	1,277.72 m	Calibration Signal:			Longitudinal:	1.397 mm/s	43.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	98 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	1.943 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/20/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.778 mm/s	17.0 Hz
Time:	15:55	Calibration Date:	03/21/19		Vertical:	1.016 mm/s	37.0 Hz
Distance From Blast:	1,438.96 m	Calibration Signal:			Longitudinal:	1.27 mm/s	21.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	109 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet lawn.				Vector Sum:	1.892 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Event Report

Date/Time	Long at 15:56:12 November 20, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I7FO.9O0

Post Event Notes
Set up in yard of 1331 Dwire Hill Rd. Geo spiked and weight bagged on snow covered lawn.

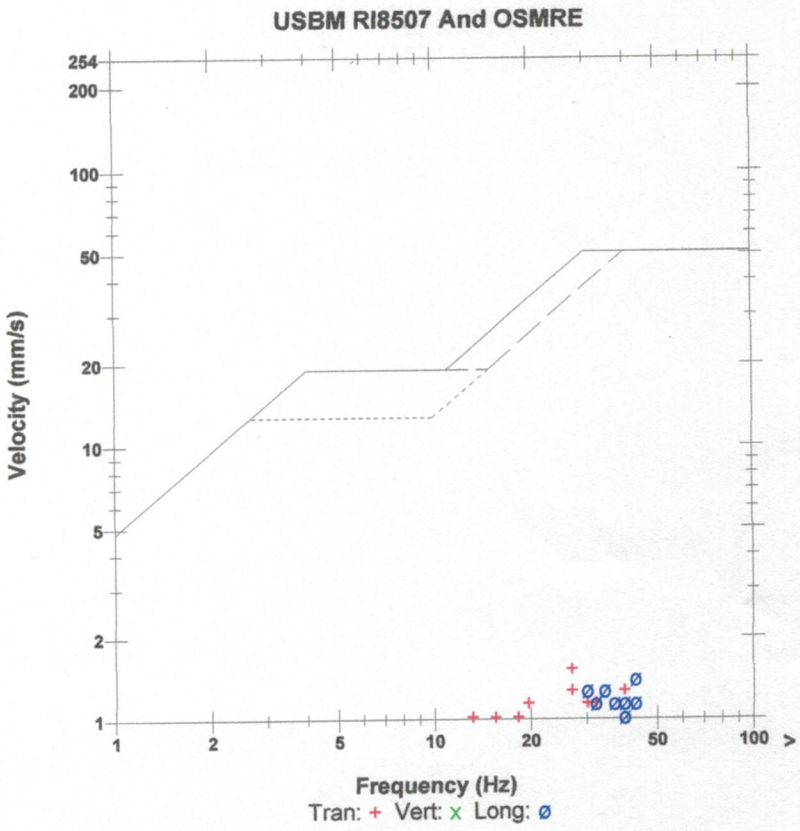
Notes
Location:
Client:
User Name:
General:

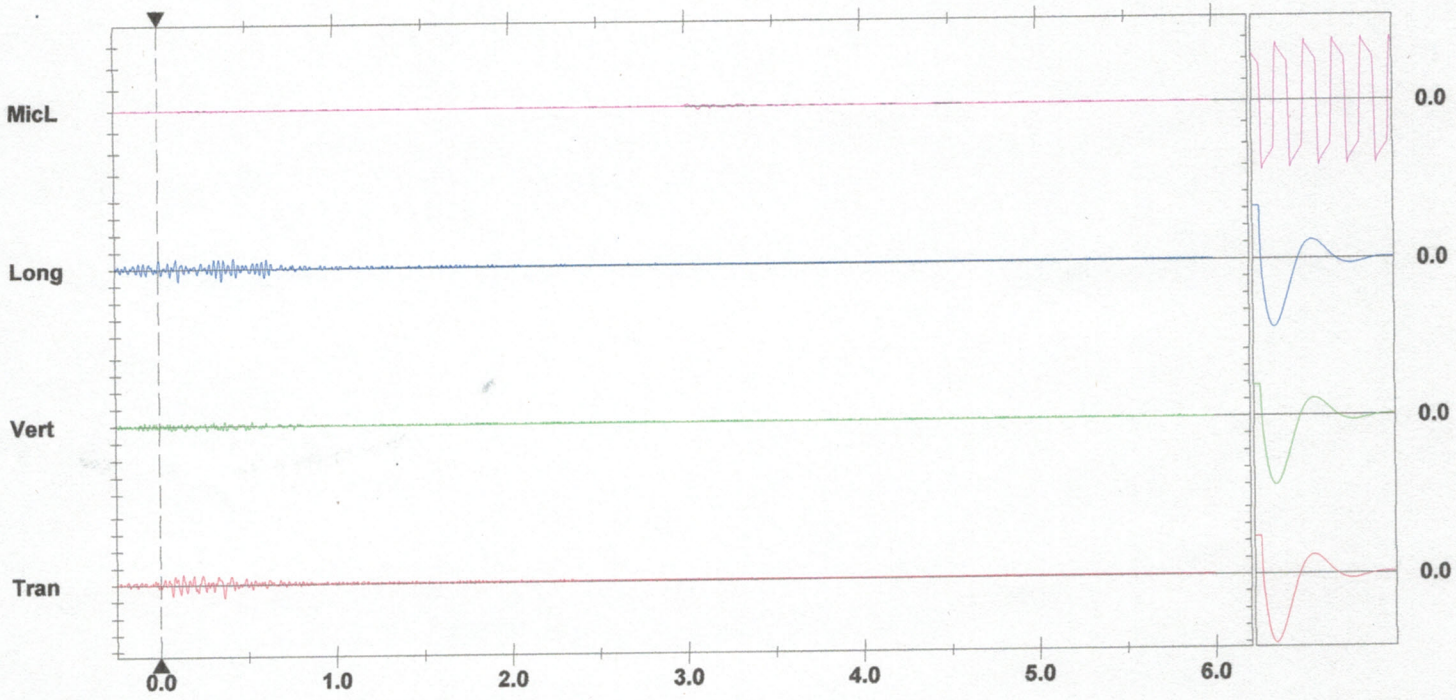
Extended Notes

Microphone	Linear Weighting
PSPL	97.50 dB(L) at 3.075 sec
ZC Freq	19 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 766 mv)

	Tran	Vert	Long	
PPV	1.524	0.508	1.397	mm/s
ZC Freq	27	73	43	Hz
Time (Rel. to Trig)	0.361	-0.086	0.111	sec
Peak Acceleration	0.040	0.027	0.040	g
Peak Displacement	0.010	0.002	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.4	7.7	Hz
Overswing Ratio	3.7	4.0	3.7	

Peak Vector Sum 1.943 mm/s at 0.361 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

Instantel

Event Report

Date/Time	Tran at 15:55:55 November 20, 2019
Trigger Source	Geo: 1.200 mm/s, Mic: 116.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 25, 2019 by Instantel
File Name	U637I7FO.970

Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on snow covered lawn.

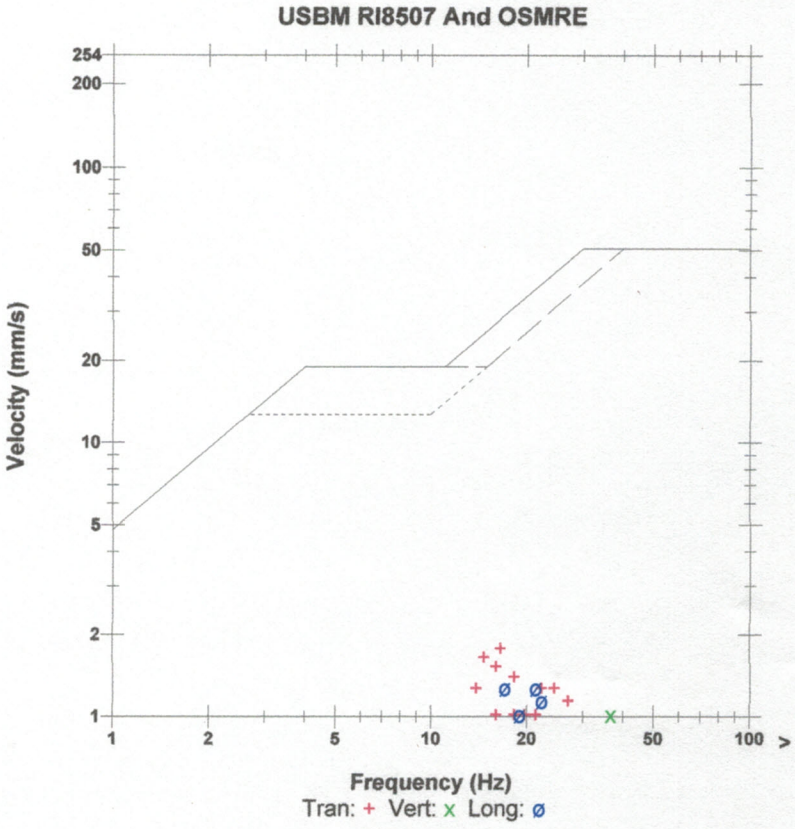
Notes
Location:
Client:
User Name:
General:

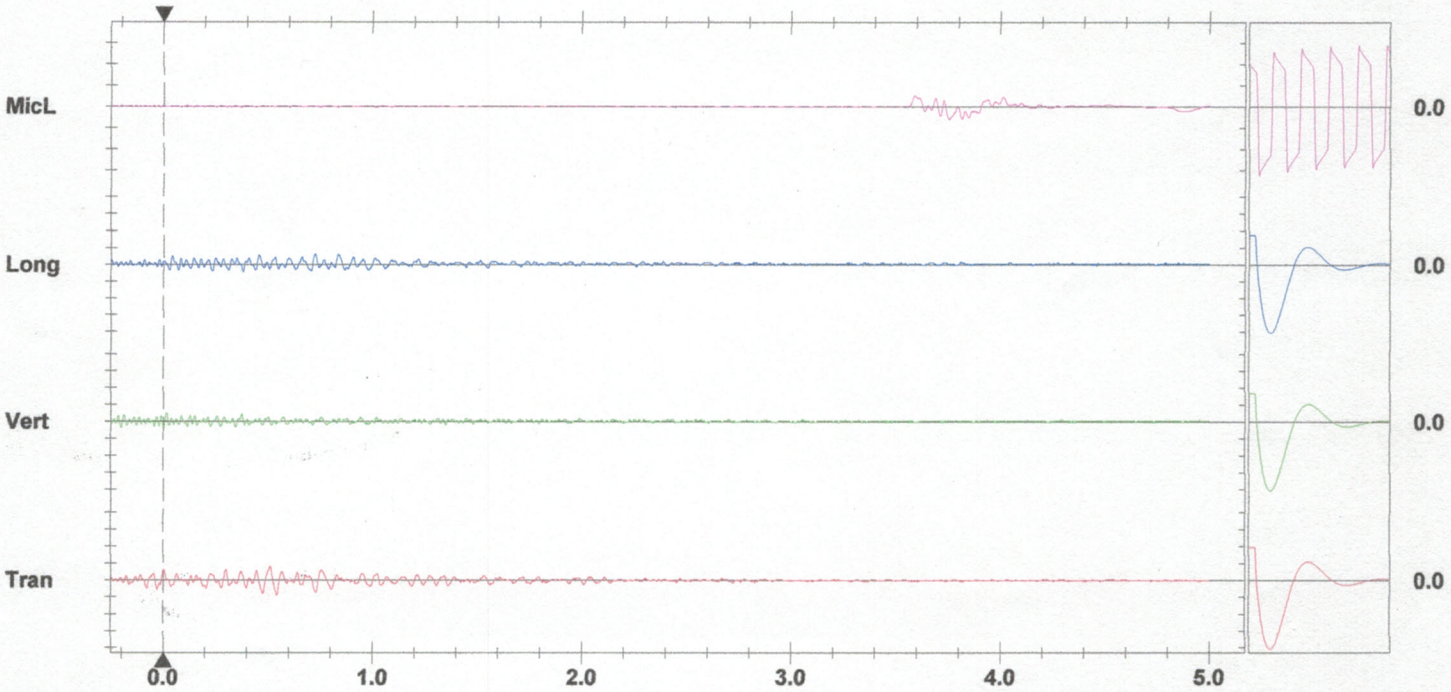
Extended Notes

Microphone	Linear Weighting
PSPL	109.2 dB(L) at 3.754 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 660 mv)

	Tran	Vert	Long	
PPV	1.778	1.016	1.270	mm/s
ZC Freq	17	37	21	Hz
Time (Rel. to Trig)	0.545	0.015	0.728	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.017	0.007	0.011	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.6	7.6	Hz
Overswing Ratio	3.7	3.9	3.8	

Peak Vector Sum 1.892 mm/s at 0.728 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-14 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 11/21/2019 16:00 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/21/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.651 mm/s	20.0 Hz
Time:	15:58	Calibration Date:	09/20/19		Vertical:	0.508 mm/s	34.0 Hz
Distance From Blast:	1,283.82 m	Calibration Signal:			Longitudinal:	0.889 mm/s	28.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	108 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	1.694 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	11/21/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.016 mm/s	21.0 Hz
Time:	15:59	Calibration Date:	03/21/19		Vertical:	0.508 mm/s	28.0 Hz
Distance From Blast:	1,405.43 m	Calibration Signal:			Longitudinal:	1.143 mm/s	21.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	106 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet lawn.				Vector Sum:	1.276 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel Event Report

Date/Time	Long at 15:59:59 November 21, 2019
Trigger Source	Geo: 1.100 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE19636 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	July 31, 2019 by Instantel
File Name	U636I7HJ.3Z0

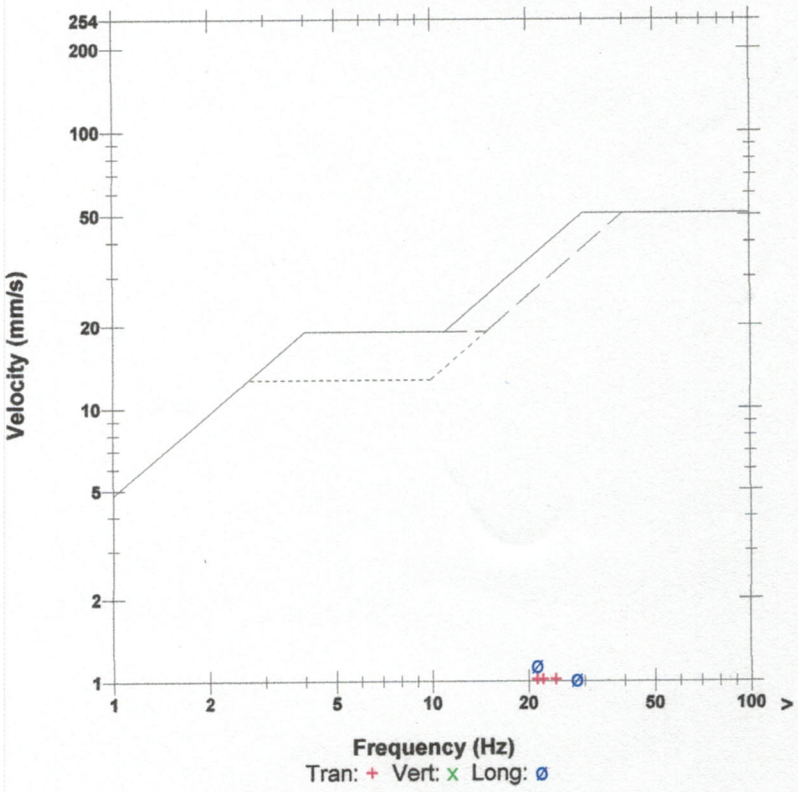
Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

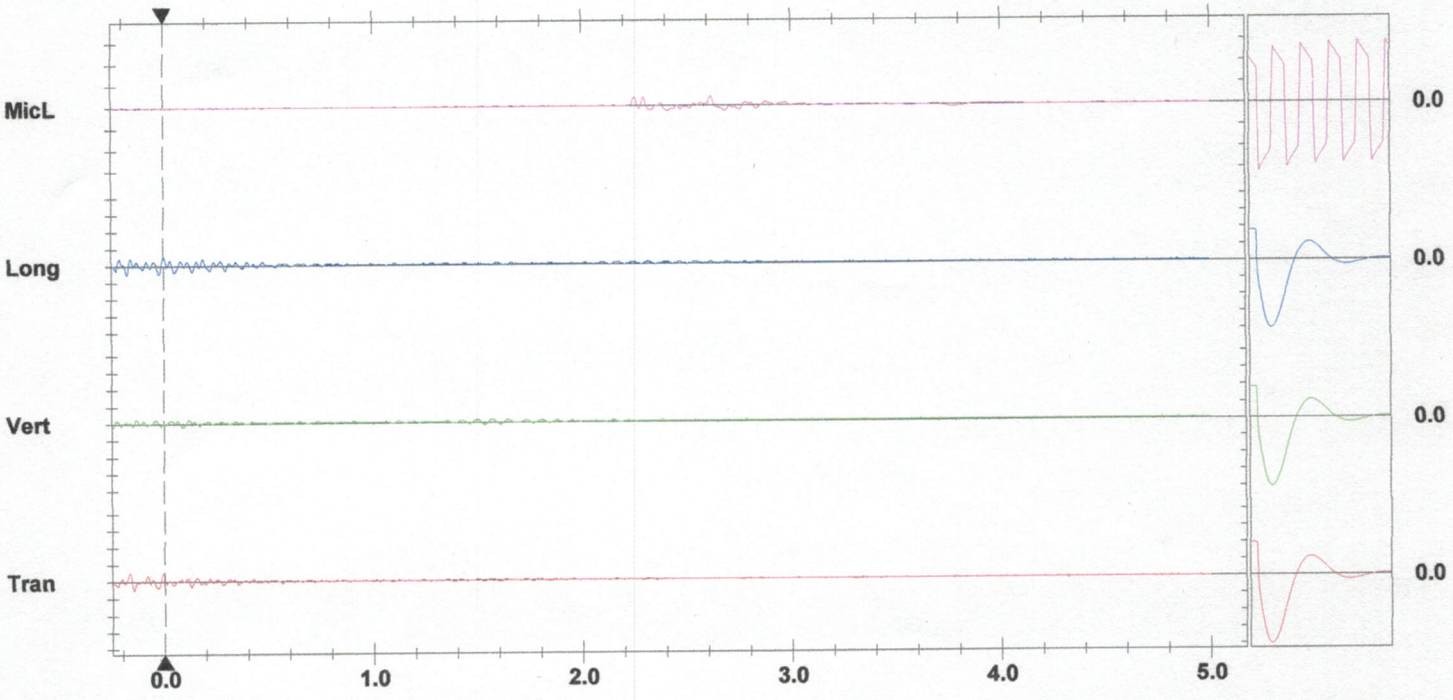
Microphone	Linear Weighting
PSPL	106.5 dB(L) at 2.619 sec
ZC Freq	6.3 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 691 mv)

	Tran	Vert	Long	
PPV	1.016	0.508	1.143	mm/s
ZC Freq	21	28	21	Hz
Time (Rel. to Trig)	-0.169	-0.135	0.000	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.008	0.005	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.5	Hz
Overswing Ratio	3.8	3.9	3.9	

Peak Vector Sum 1.276 mm/s at -0.173 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger =

Instantel

Event Report

Date/Time Tran at 16:58:02 November 21, 2019
Trigger Source Geo: 1.100 mm/s, Mic: 110.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

Serial Number BE19638 V 10.72-8.17 MiniMate Plus
Battery Level 6.2 Volts
Unit Calibration March 27, 2019 by Instantel
File Name U638I7HL.SQ0

Post Event Notes
Geo spiked and weight bagged at end of driveway of 1331 Dwire Hill Rd.

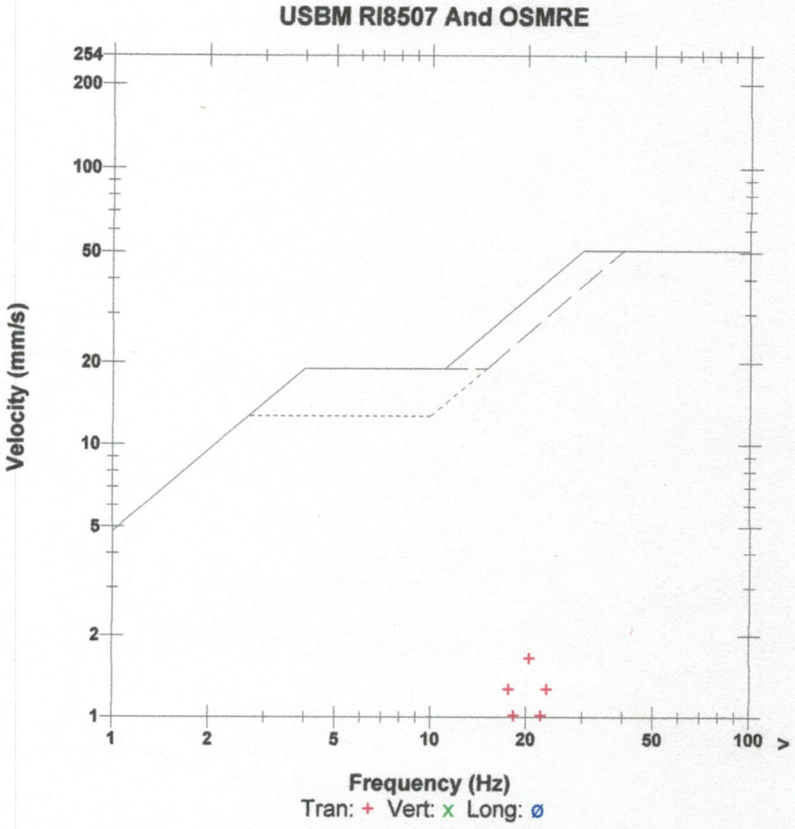
Notes
Location:
Client:
User Name:
General:

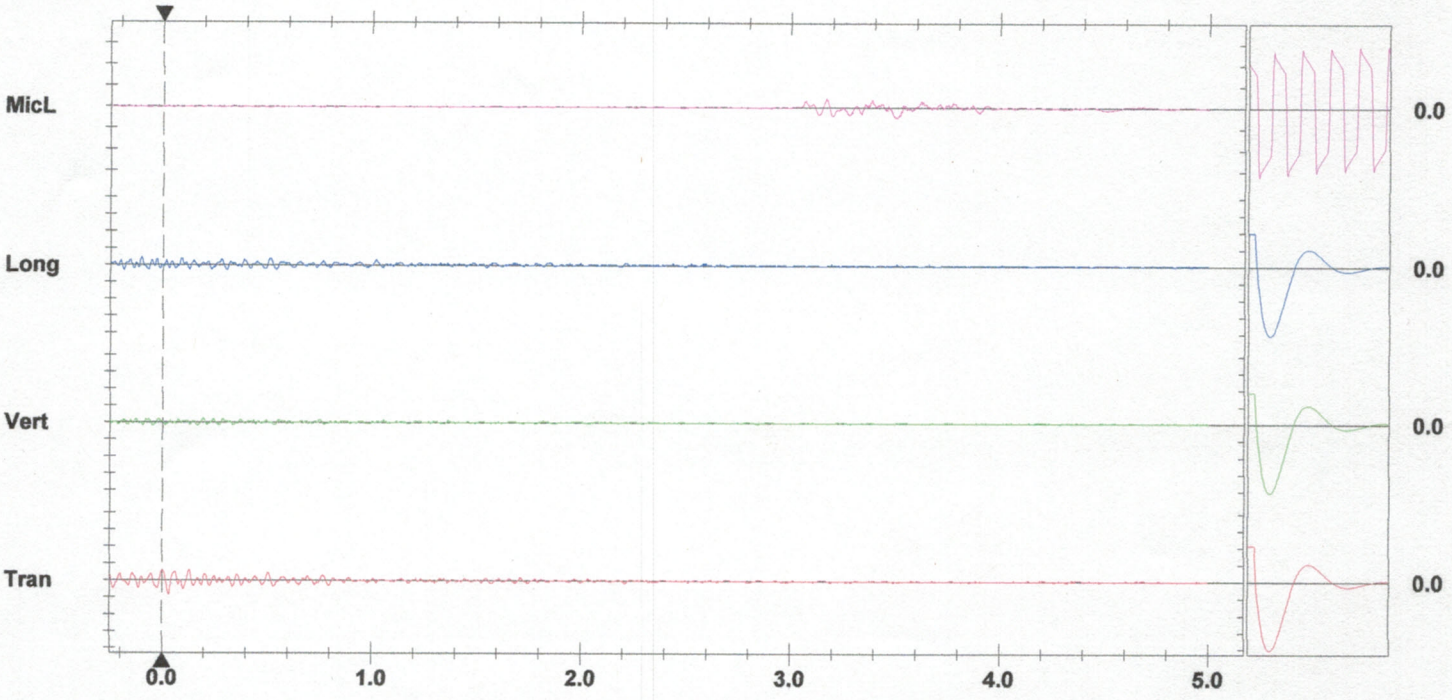
Extended Notes

Microphone Linear Weighting
PSPL 107.5 dB(L) at 3.499 sec
ZC Freq 8.8 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 647 mv)

	Tran	Vert	Long	
PPV	1.651	0.508	0.889	mm/s
ZC Freq	20	34	28	Hz
Time (Rel. to Trig)	0.031	0.198	-0.102	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.013	0.003	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.5	7.4	Hz
Overswing Ratio	3.8	3.7	3.9	

Peak Vector Sum 1.694 mm/s at 0.031 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-15 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 12/02/2019 11:33 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/02/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.889 mm/s	26.0 Hz
Time:	11:34	Calibration Date:	09/20/19		Vertical:	0.381 mm/s	--- Hz
Distance From Blast:	1,298.14 m	Calibration Signal:			Longitudinal:	0.508 mm/s	34.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	99 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. wet lawn.				Vector Sum:	0.976 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/02/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.651 mm/s	18.0 Hz
Time:	11:36	Calibration Date:	03/21/19		Vertical:	0.635 mm/s	39.0 Hz
Distance From Blast:	1,432.56 m	Calibration Signal:			Longitudinal:	0.635 mm/s	30.0 Hz
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	108 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on wet lawn.				Vector Sum:	1.727 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel

Event Report

Date/Time Tran at 11:34:52 December 2, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.1 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020I81K.640
Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged in yard on lawn.

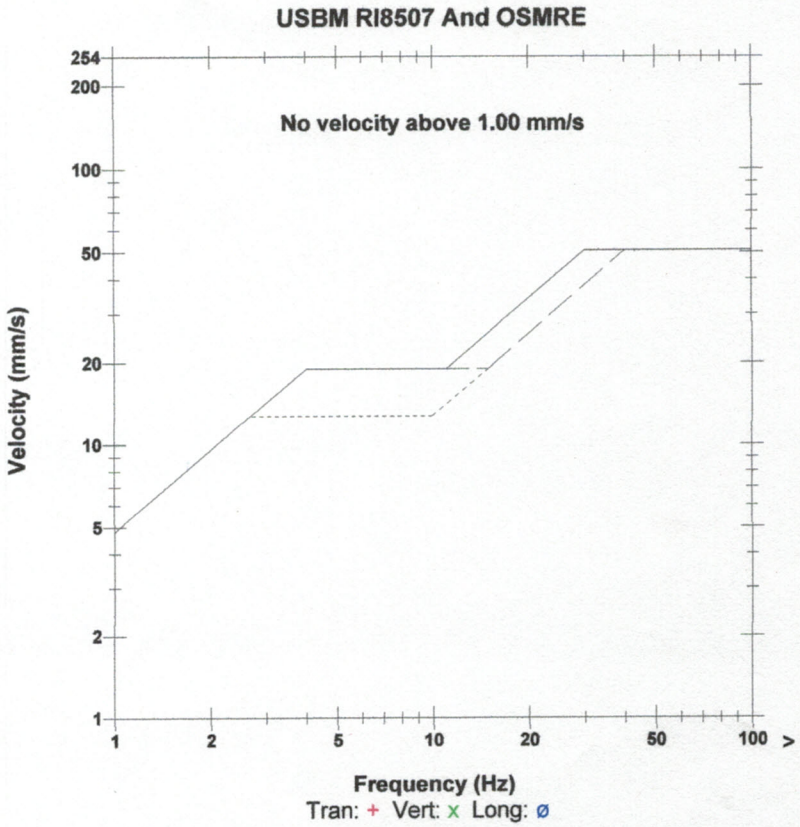
Notes
Location:
Client:
User Name:
General:

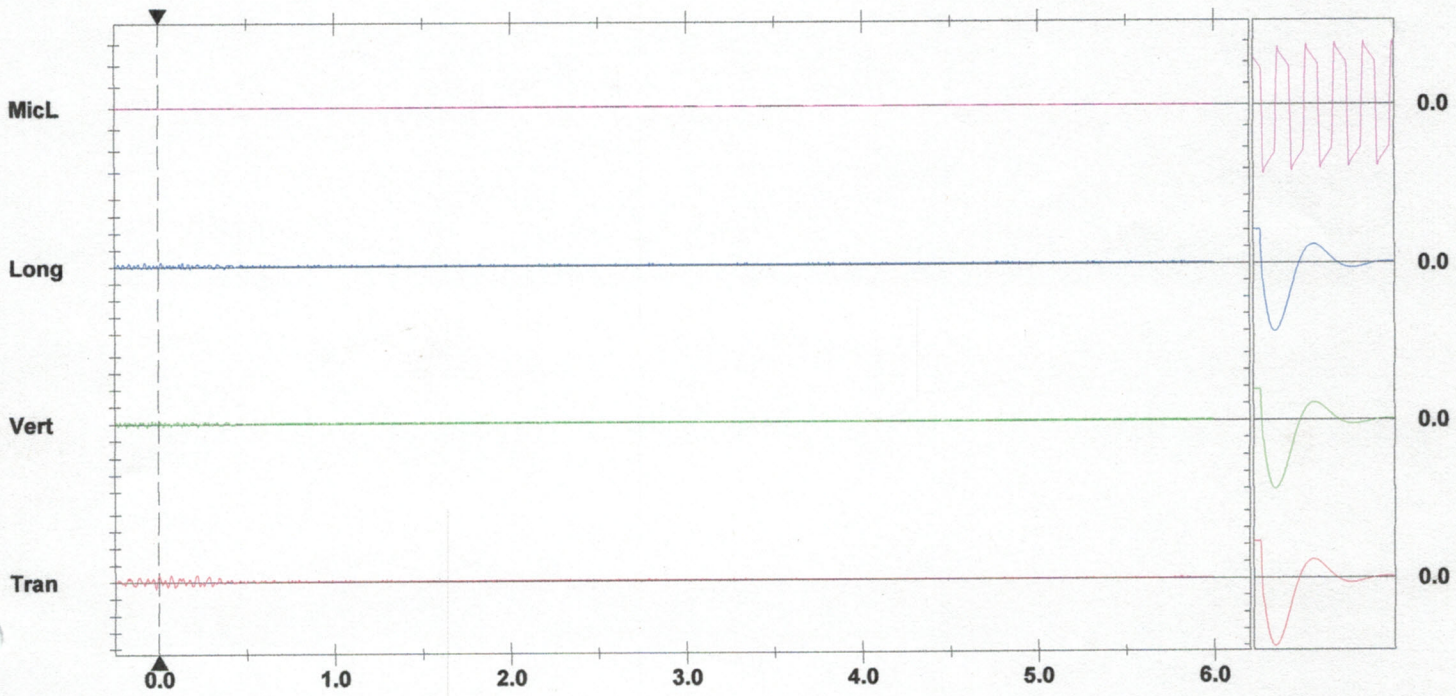
Extended Notes

Microphone Linear Weighting
PSPL <88 dB(L)
ZC Freq >100 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 673 mv)

	Tran	Vert	Long	
PPV	0.889	0.381	0.508	mm/s
ZC Freq	26	>100	34	Hz
Time (Rel. to Trig)	0.000	-0.183	-0.166	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.007	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.5	Hz
Overswing Ratio	3.8	4.0	3.8	

Peak Vector Sum 0.976 mm/s at 0.220 sec
N/A: Not Applicable





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel

Event Report

Date/Time	Tran at 11:36:41 December 2, 2019
Trigger Source	Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589I81K.950

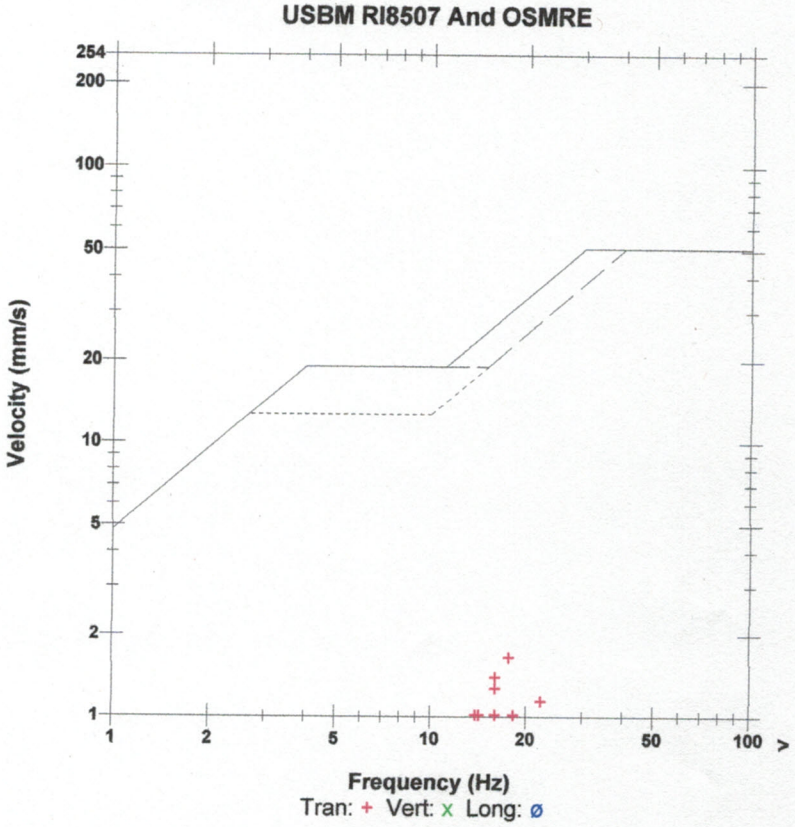
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged on front lawn.

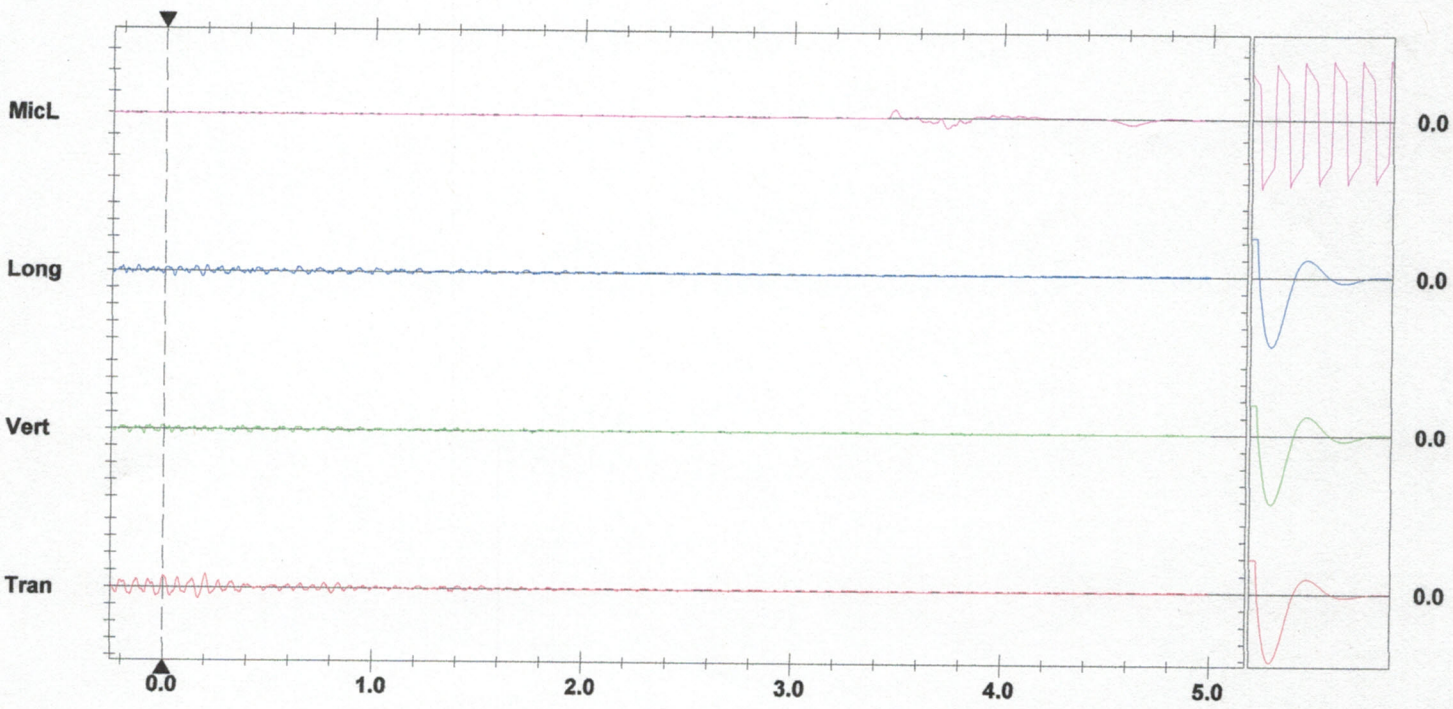
Extended Notes

Microphone	Linear Weighting
PSPL	107.5 dB(L) at 3.729 sec
ZC Freq	3.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 742 mv)

	Tran	Vert	Long	
PPV	1.651	0.635	0.635	mm/s
ZC Freq	18	39	30	Hz
Time (Rel. to Trig)	0.205	-0.094	-0.126	sec
Peak Acceleration	0.027	0.013	0.027	g
Peak Displacement	0.014	0.004	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.9	8.1	Hz
Overswing Ratio	4.6	3.6	3.8	

Peak Vector Sum 1.727 mm/s at 0.205 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-16 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 12/04/2019 13:59 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/04/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.905 mm/s	18.0 Hz
Time:	13:59	Calibration Date:	09/20/19		Vertical:	0.635 mm/s	26.0 Hz
Distance From Blast:	1,303.02 m	Calibration Signal:			Longitudinal:	1.143 mm/s	20.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	104 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. snow covered lawn.				Vector Sum:	1.926 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	12/04/19	Trigger Level:	1.23 mm/s	Off dB
Time:	14:00	Calibration Date:	03/21/19	
Distance From Blast:	1,424.64 m	Calibration Signal:		
Direction From Blast:	N	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on snow covered lawn.			
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Joel McNamee, Austin Powder			

Instantel Event Report

Date/Time	Tran at 13:59:15 December 4, 2019
Trigger Source	Geo: 1.100 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	7.0 sec at 1024 sps

Notes

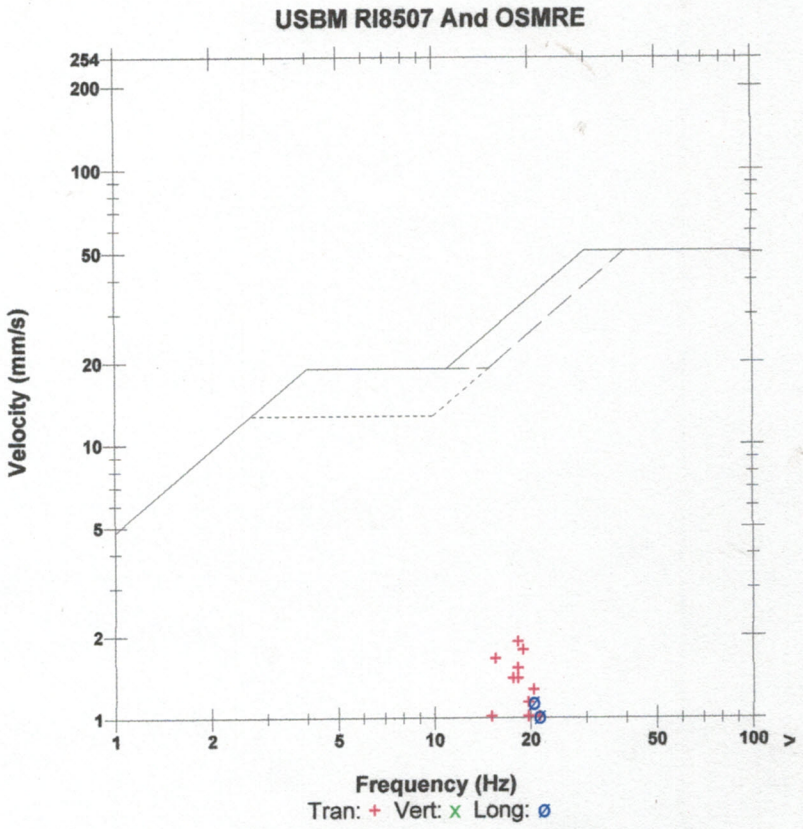
Serial Number	BE19636 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	July 31, 2019 by Instantel
File Name	U636I85G.6R0

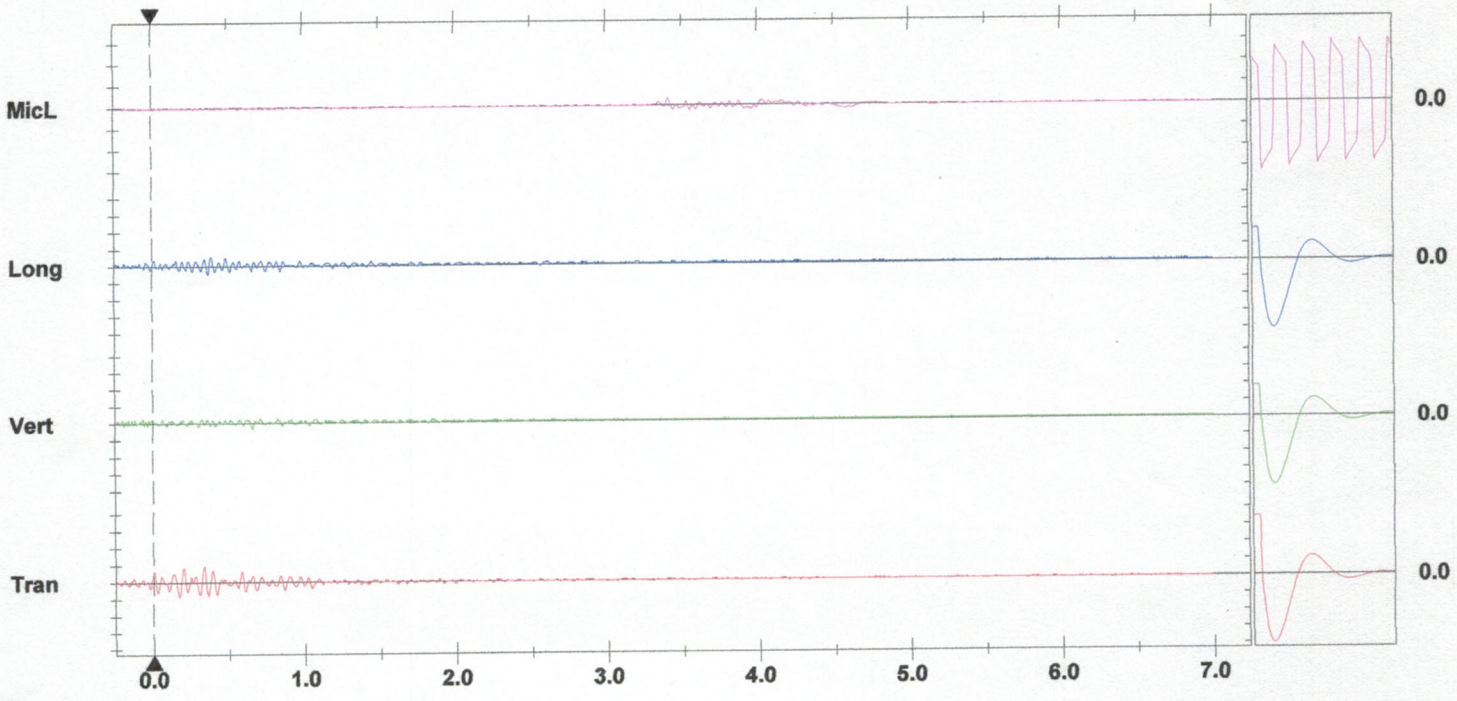
Post Event Notes
Set up at 1330 Dwire Hill Rd. Geo spiked and weight bagged on snow covered lawn.

Microphone	Linear Weighting
PSPL	104.2 dB(L) at 3.412 sec
ZC Freq	15 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 684 mv)

	Tran	Vert	Long	
PPV	1.905	0.635	1.143	mm/s
ZC Freq	18	26	20	Hz
Time (Rel. to Trig)	0.335	0.660	0.390	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.017	0.005	0.010	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.4	7.5	Hz
Overswing Ratio	3.7	3.9	3.9	

Peak Vector Sum 1.926 mm/s at 0.200 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

No Trigger
1550 Dwire Hill Rd

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE19637
Dec 4 /19 09:47:26		Start Monitoring Trigger Level: Geo: 1.20 mm/s Mic: 116.0 dB(L)
Dec 4 /19 10:30:30	Dec 4 /19 10:30:36	Event recorded. Trigger Level MicL: 116.0 dB(L)
Dec 4 /19 10:30:49	Dec 4 /19 10:50:34	No events recorded. (Keyboard Exit) Geo: 1.20 mm/s Mic: 116.0 dB(L)
Dec 4 /19 13:09:52	Dec 4 /19 14:16:19	No events recorded. (Keyboard Exit) Geo: 1.20 mm/s Mic: 116.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-17 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 12/10/2019 09:31 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 12/10/19 Trigger Level: 1.23 mm/s Off dB
Time: 09:32 Calibration Date: 09/20/19
Distance From Blast: 1,286.87 m Calibration Signal:
Direction From Blast: ENE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. snow covered lawn.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Joel McNamee, Austin Powder

Transverse:	0.127 mm/s	--- Hz
Vertical:	0.127 mm/s	--- Hz
Longitudinal:	0.127 mm/s	--- Hz
Acoustic:	113 dB	--- Hz
Vector Sum:	0.22 mm/s	

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 12/10/19 Trigger Level: 1.23 mm/s Off dB
Time: 09:30 Calibration Date: 03/21/19
Distance From Blast: 1,390.50 m Calibration Signal:
Direction From Blast: N Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on snow covered lawn.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Joel McNamee, Austin Powder

Transverse:	1.651 mm/s	20.0 Hz
Vertical:	0.508 mm/s	26.0 Hz
Longitudinal:	0.889 mm/s	14.0 Hz
Acoustic:	88 dB	--- Hz
Vector Sum:	1.875 mm/s	

Instantel Event Report

Date/Time	Tran at 09:30:19 December 10, 2019
Trigger Source	Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	6.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	April 1, 2019 by Instantel
File Name	Q020I8G7.QJ0

Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

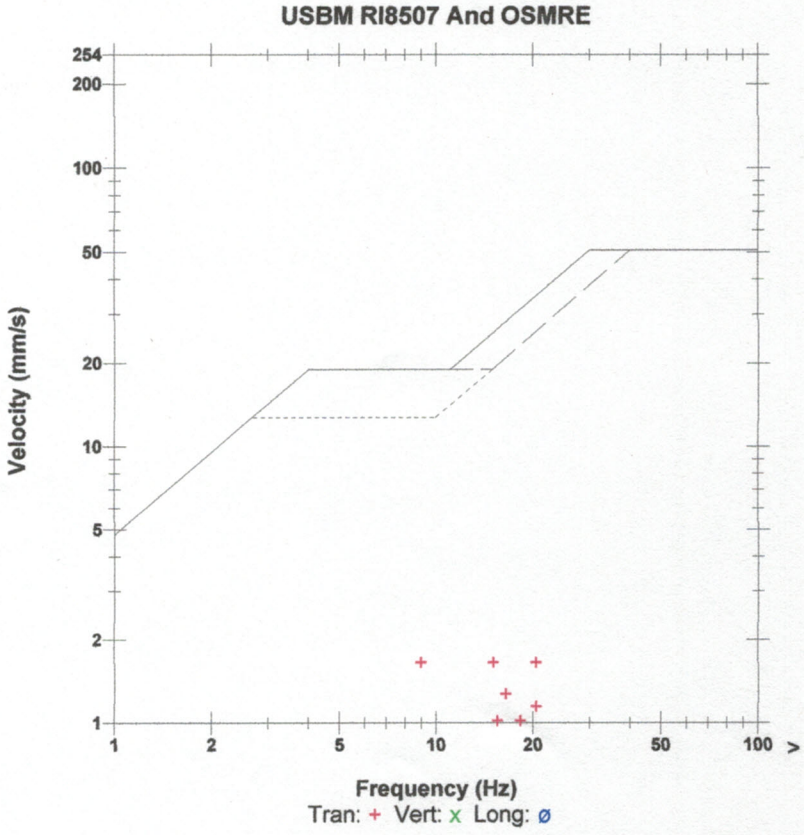
Notes
Location:
Client:
User Name:
General:

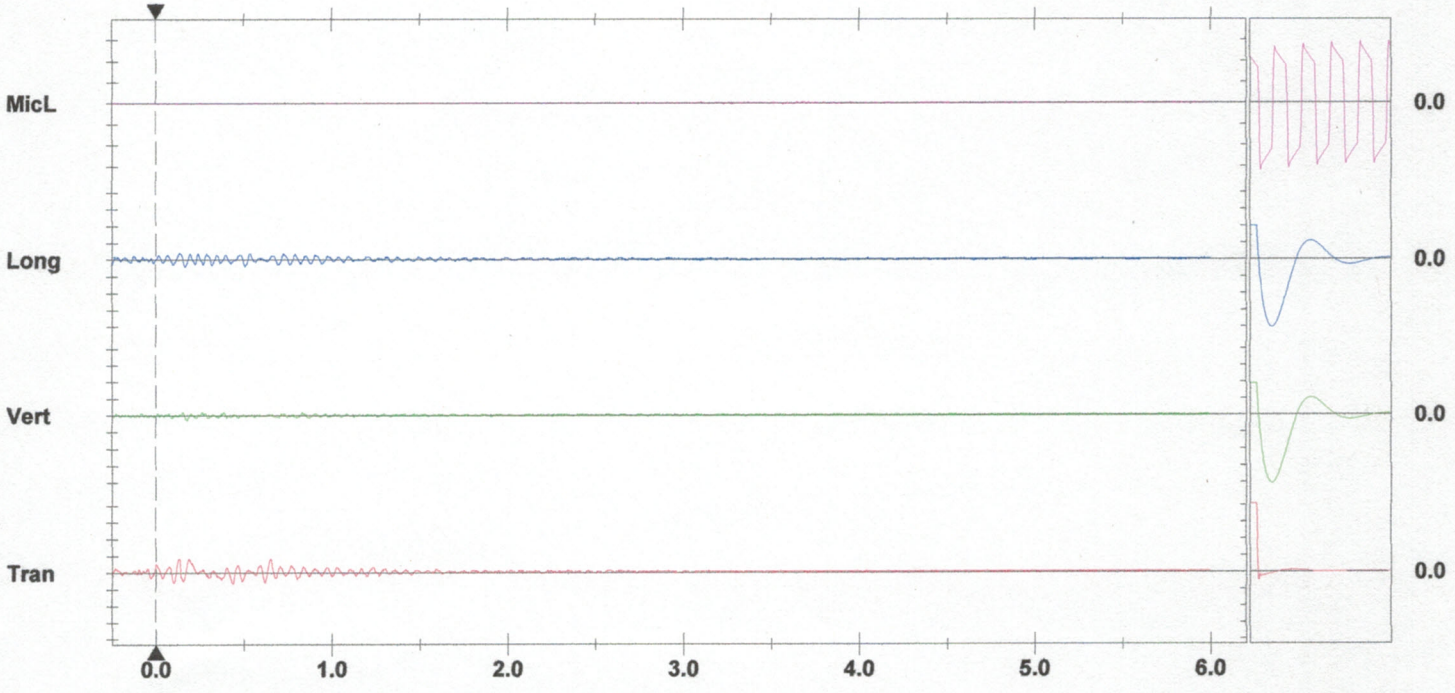
Extended Notes

Microphone	Linear Weighting
PSPL	<88 dB(L)
ZC Freq	>100 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 656 mv)

	Tran	Vert	Long	
PPV	1.651	0.508	0.889	mm/s
ZC Freq	20	26	14	Hz
Time (Rel. to Trig)	0.130	0.176	0.136	sec
Peak Acceleration	0.080	0.013	0.027	g
Peak Displacement	0.027	0.004	0.011	mm
Sensor Check	Check	Passed	Passed	
Frequency	13.7	7.3	7.5	Hz
Overswing Ratio	6.7	4.0	3.7	

Peak Vector Sum 1.875 mm/s at 0.136 sec
N/A: Not Applicable





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

Instantel Event Report

Date/Time	MicL at 09:32:24 December 10, 2019
Trigger Source	Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589I8G7.U00

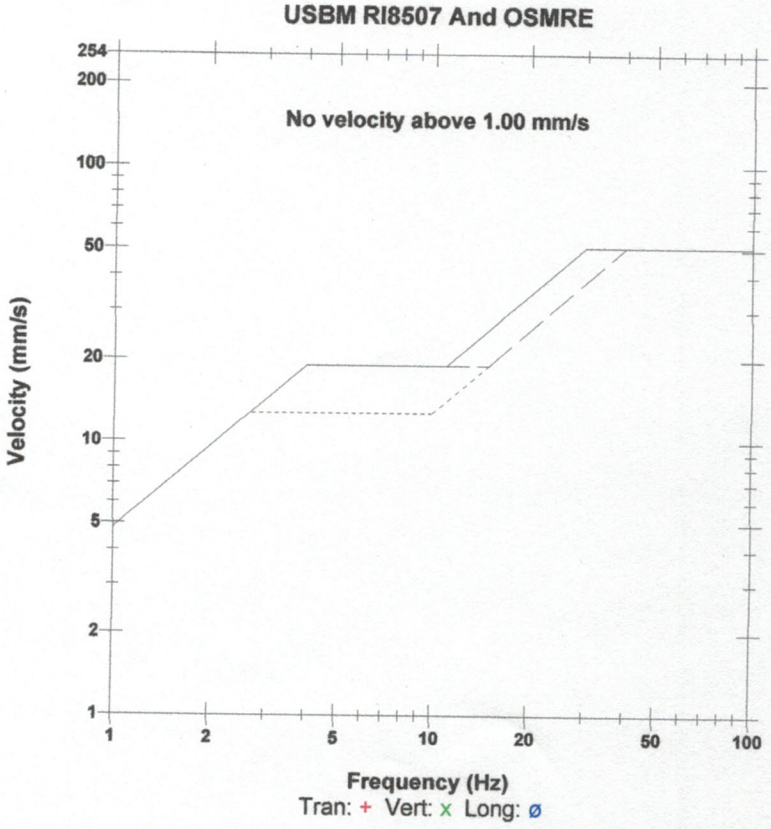
Post Event Notes
Set up in backyard of 1331 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

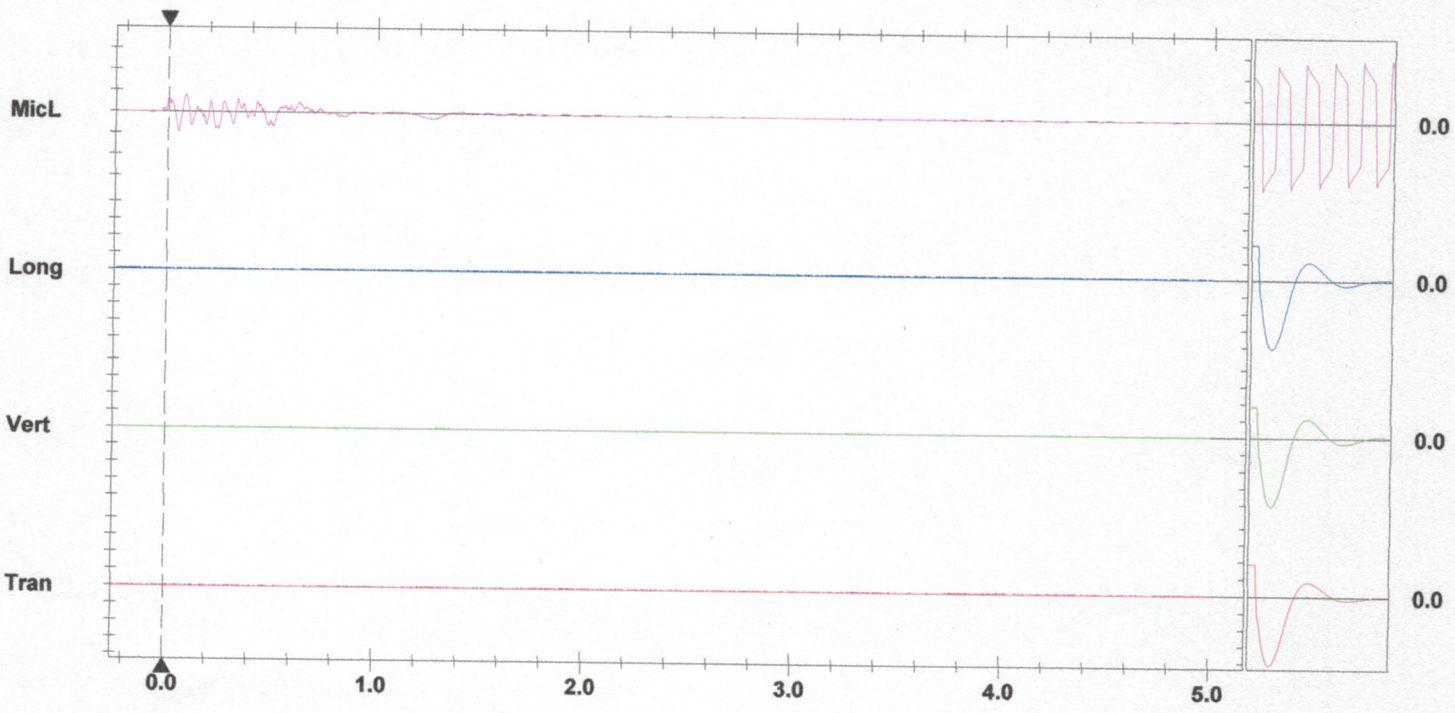
Extended Notes

Microphone	Linear Weighting
PSPL	113.3 dB(L) at 0.051 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 703 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.241	-0.212	-0.236	sec
Peak Acceleration	0.013	0.013	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.9	7.9	Hz
Overswing Ratio	4.8	3.6	3.8	

Peak Vector Sum 0.220 mm/s at 0.321 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2019-18 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 12/13/2019 09:59 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/13/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	09:59	Calibration Date:	03/21/19		Vertical:	0.127 mm/s	--- Hz
Distance From Blast:	1,363.68 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	111 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged on snow covered lawn.				Vector Sum:	0.22 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	12/13/19	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.27 mm/s	21.0 Hz
Time:	09:57	Calibration Date:	09/20/19		Vertical:	0.635 mm/s	30.0 Hz
Distance From Blast:	1,289.00 m	Calibration Signal:			Longitudinal:	0.762 mm/s	23.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	88 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged. snow covered lawn.				Vector Sum:	1.426 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel Event Report

Date/Time	MicL at 09:59:27 December 13, 2019
Trigger Source	Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589I8LT.330

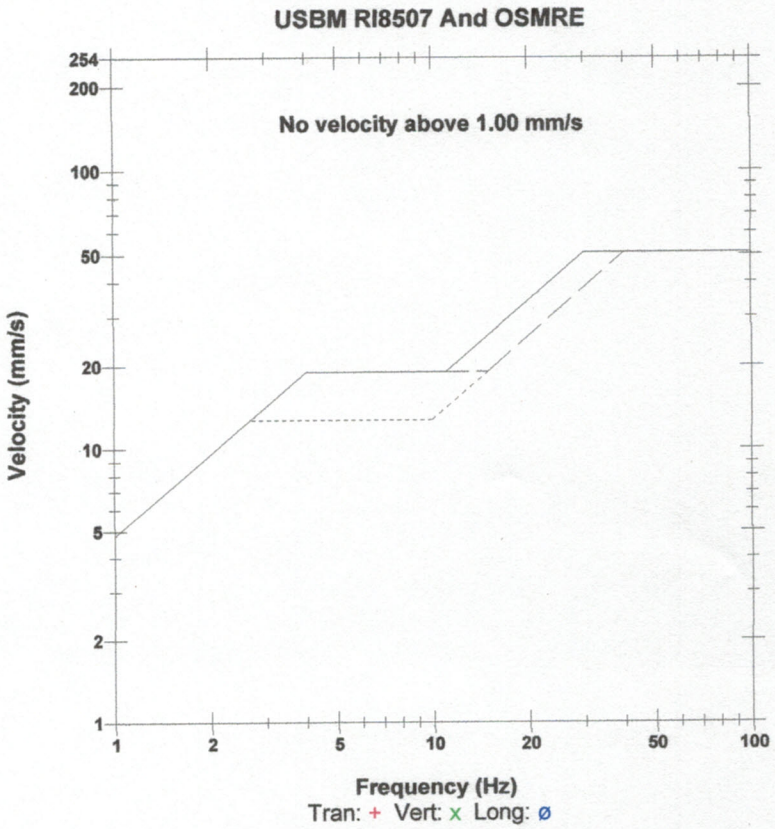
Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged on frozen lawn.

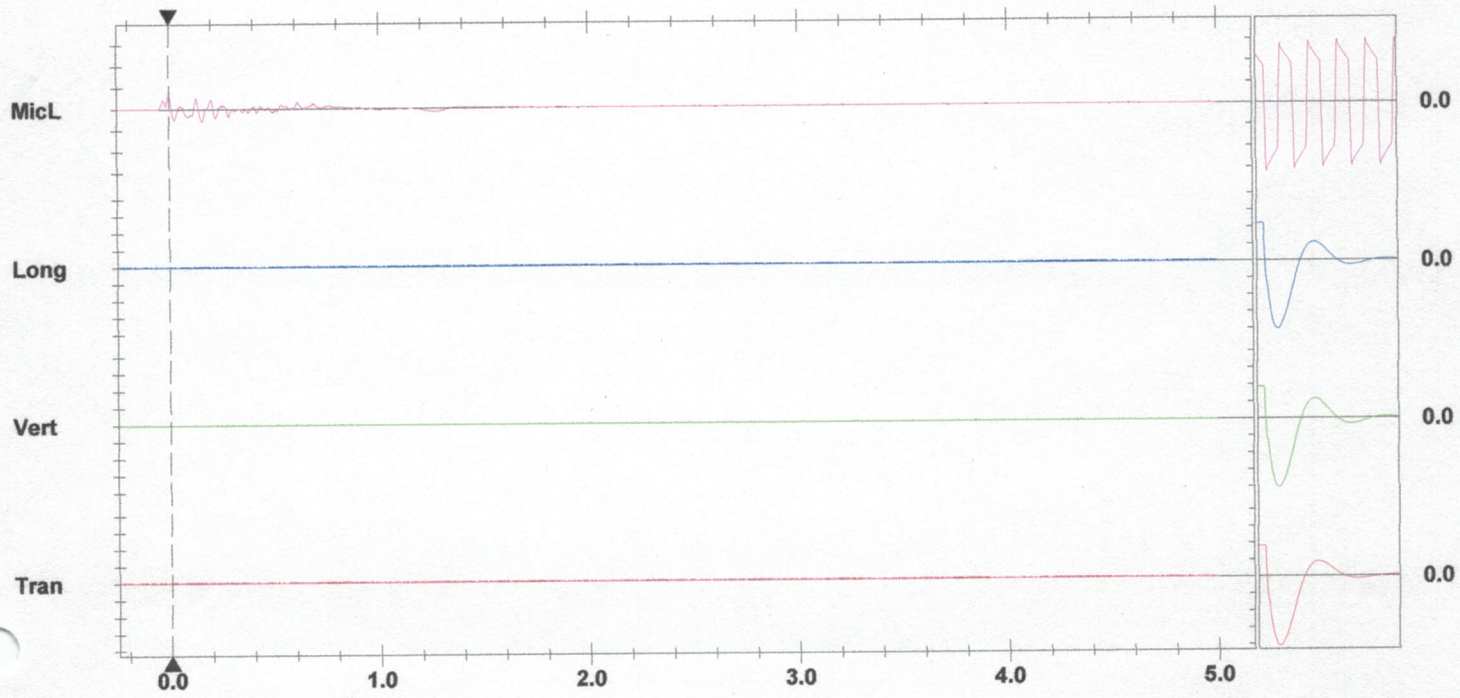
Extended Notes

Microphone	Linear Weighting
PSPL	110.6 dB(L) at 0.001 sec
ZC Freq	8.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 691 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.248	-0.240	-0.249	sec
Peak Acceleration	0.027	0.013	0.027	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.9	7.9	Hz
Overswing Ratio	4.8	3.6	3.8	

Peak Vector Sum 0.220 mm/s at 0.123 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

Instantel

Event Report

Date/Time Tran at 09:57:17 December 13, 2019
Trigger Source Geo: 0.930 mm/s, Mic: 119.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 6.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.1 Volts
Unit Calibration April 1, 2019 by Instantel
File Name Q020I8LS.ZH0
Post Event Notes
Set up at 1550 Dwire Hill Rd. Geo spiked and weight bagged on frozen lawn.

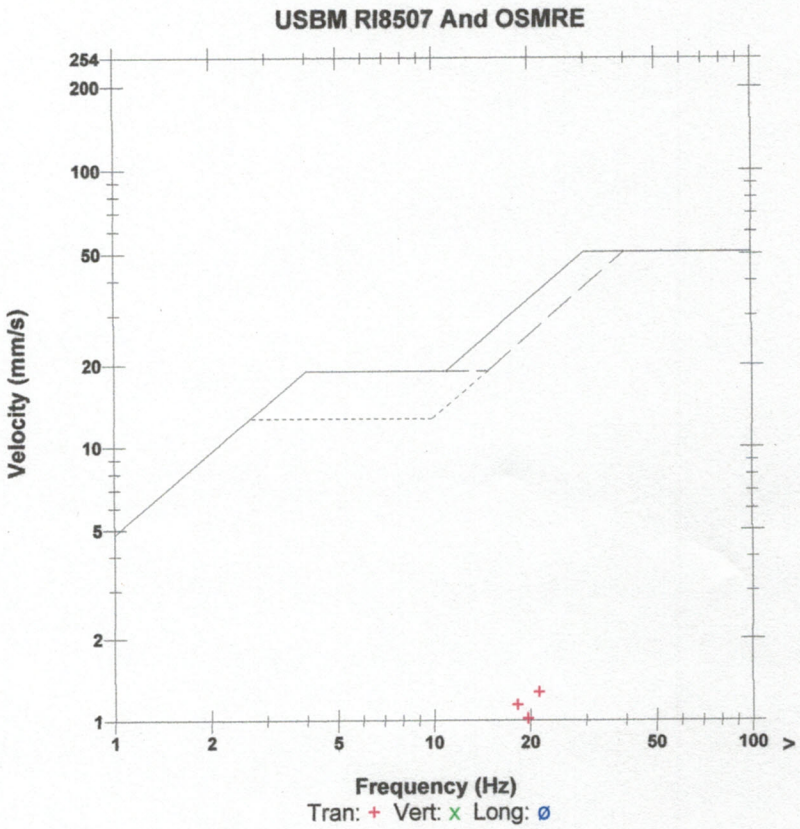
Notes
Location:
Client:
User Name:
General:

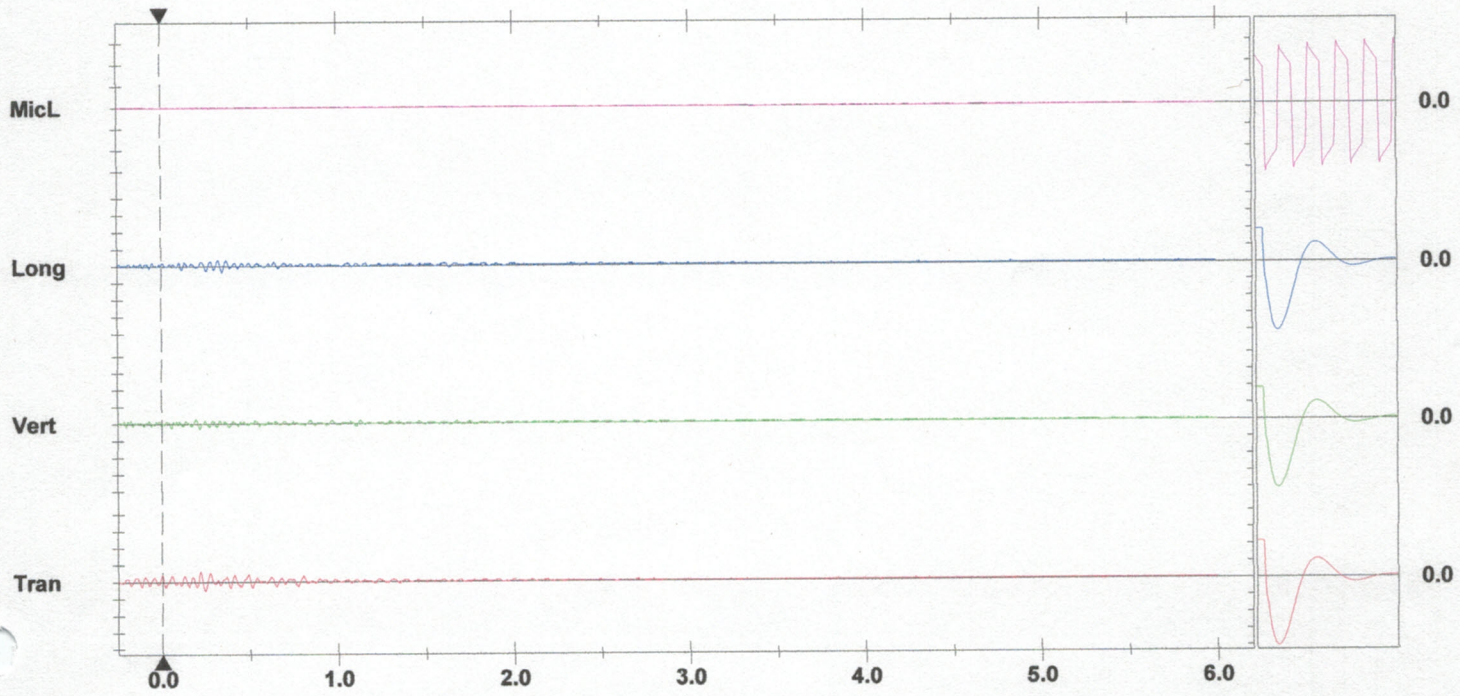
Extended Notes

Microphone Linear Weighting
PSPL <88 dB(L)
ZC Freq >100 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	1.270	0.635	0.762	mm/s
ZC Freq	21	30	23	Hz
Time (Rel. to Trig)	0.218	0.218	0.322	sec
Peak Acceleration	0.027	0.027	0.013	g
Peak Displacement	0.010	0.004	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.5	Hz
Overswing Ratio	3.8	4.0	3.7	

Peak Vector Sum 1.426 mm/s at 0.218 sec
N/A: Not Applicable





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-01 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/01/2020 09:00 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	04/01/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.032 mm/s	22.0 Hz
Time:	09:00	Calibration Date:	09/23/19		Vertical:	1.524 mm/s	43.0 Hz
Distance From Blast:	811.38 m	Calibration Signal:			Longitudinal:	2.794 mm/s	26.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	104 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	3.228 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	04/01/20	Trigger Level:	1.23 mm/s	Off dB
Time:	09:00	Calibration Date:	09/20/19	
Distance From Blast:	1,620.01 m	Calibration Signal:		
ction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.			
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Joel McNamee, Austin Powder			

Instantel

Event Report

Date/Time	Vert at 09:00:47 April 1, 2020
Trigger Source	Geo: 1.200 mm/s, Mic: 116.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 25, 2019 by Instantel
File Name	U637IE9F.PB0

Post Event Notes
Set up at 1550 Drire Hill Rd. Geo spiked and weight bagged on wet lawn.

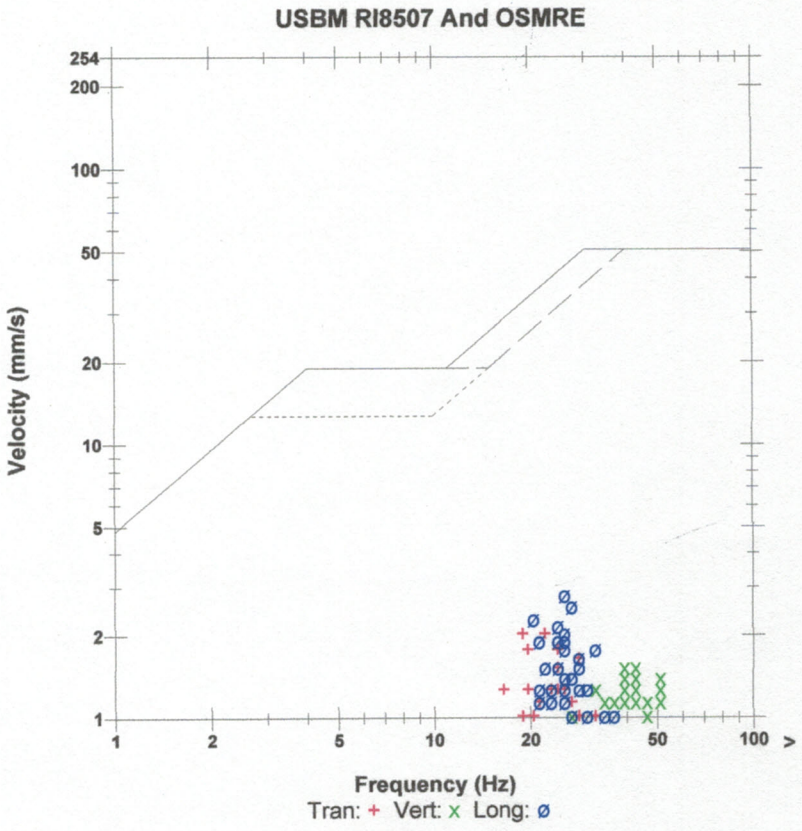
Notes
Location:
Client:
User Name:
General:

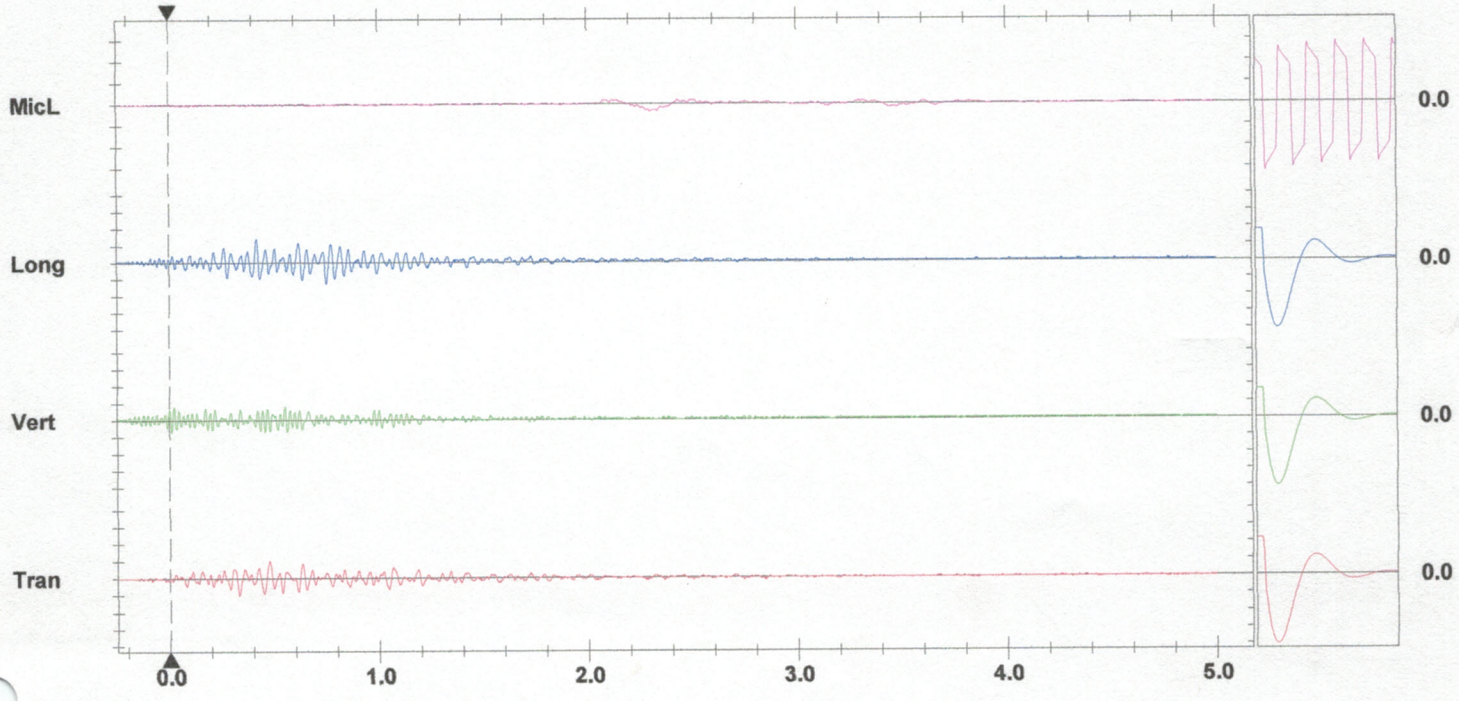
Extended Notes

Microphone	Linear Weighting
PSPL	104.2 dB(L) at 2.300 sec
ZC Freq	2.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 648 mv)

	Tran	Vert	Long	
PPV	2.032	1.524	2.794	mm/s
ZC Freq	22	43	26	Hz
Time (Rel. to Trig)	0.329	0.021	0.417	sec
Peak Acceleration	0.040	0.040	0.053	g
Peak Displacement	0.017	0.007	0.018	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.6	7.6	Hz
Overswing Ratio	3.6	3.9	3.8	

Peak Vector Sum 3.228 mm/s at 0.419 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-02 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/02/2020 10:12 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North West Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	04/02/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	3.556 mm/s	17.0 Hz
Time:	10:11	Calibration Date:	09/23/19		Vertical:	1.905 mm/s	34.0 Hz
Distance From Blast:	875.39 m	Calibration Signal:			Longitudinal:	5.08 mm/s	24.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	119 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	5.27 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	04/02/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	10:12	Calibration Date:	09/20/19		Vertical:	0.127 mm/s	--- Hz
Distance From Blast:	1,693.16 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
ction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	121 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	0.22 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Joel McNamee, Austin Powder						

Instantel

Event Report

Date/Time	MicL at 10:12:16 April 2, 2020
Trigger Source	Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589IEBD.OG0

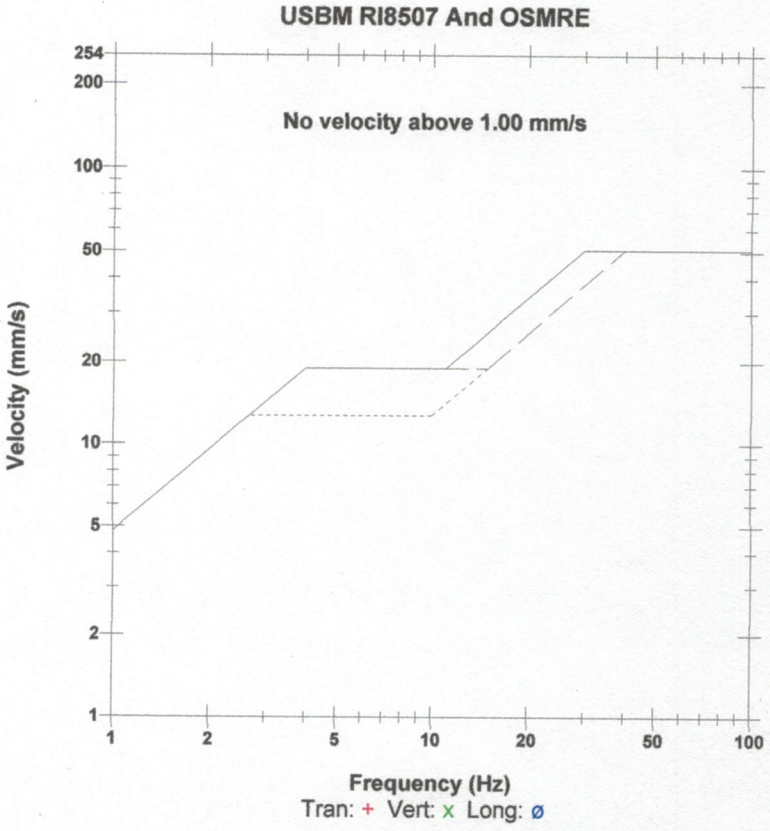
Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged on Wet gravel.

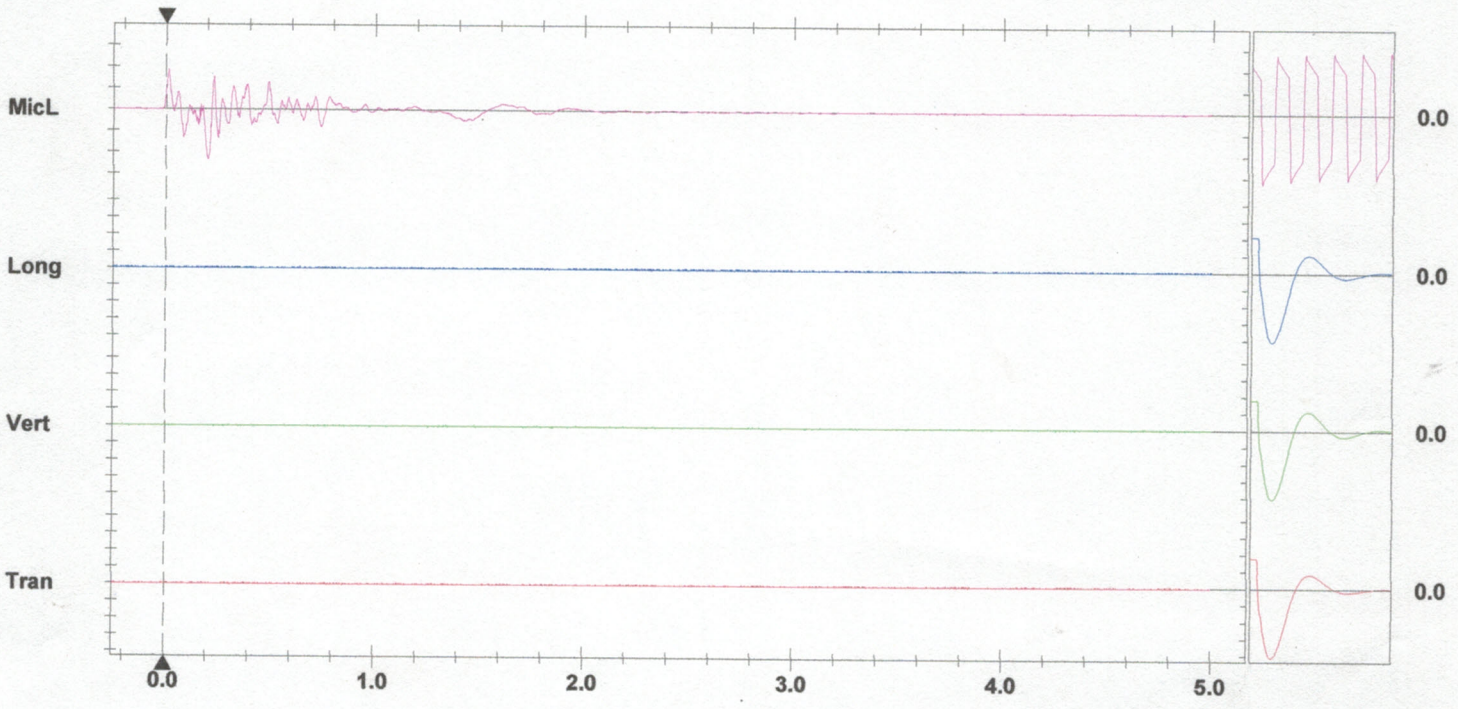
Extended Notes

Microphone	Linear Weighting
PSPL	121.3 dB(L) at 0.201 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 662 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.245	-0.167	-0.247	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.9	7.9	Hz
Overswing Ratio	4.8	3.6	3.8	

Peak Vector Sum 0.220 mm/s at 0.782 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger = ▶———◀

Instantel

Event Report

Date/Time Vert at 10:11:50 April 2, 2020
Trigger Source Geo: 1.200 mm/s, Mic: 116.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

Serial Number BE19637 V 10.72-8.17 MiniMate Plus
Battery Level 6.3 Volts
Unit Calibration September 25, 2019 by Instantel
File Name U637IEBD.NQ0
Post Event Notes
Set up at 1551 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

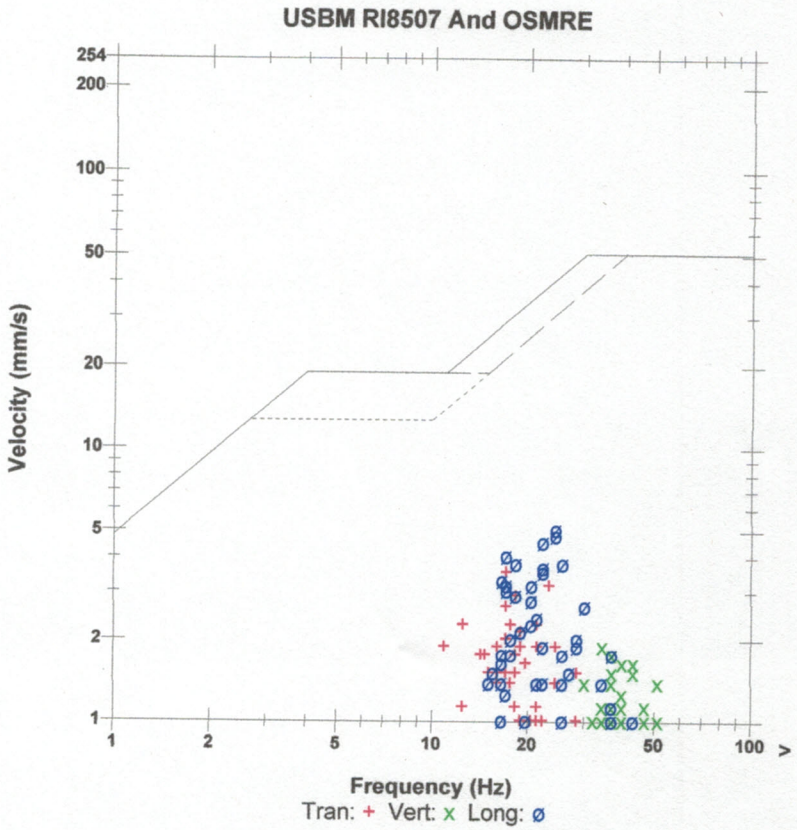
Notes
Location:
Client:
User Name:
General:

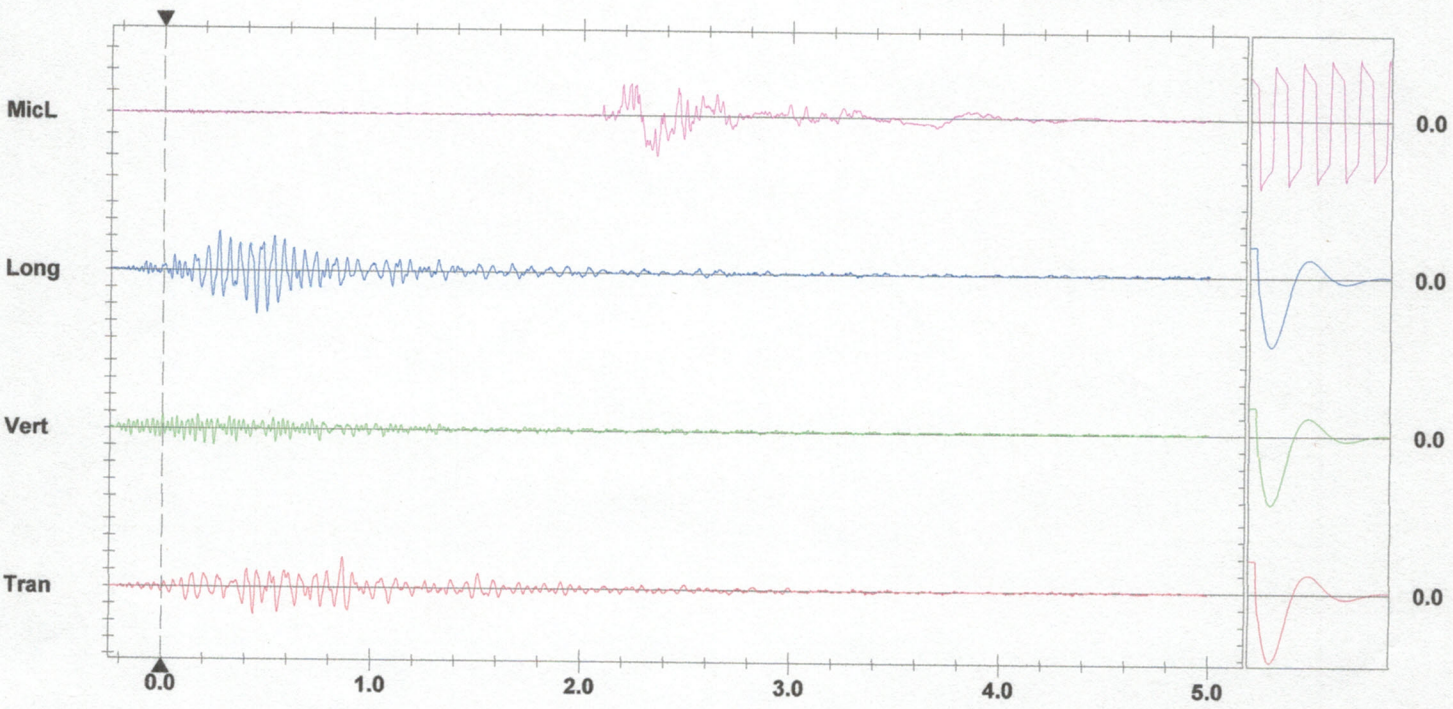
Extended Notes

Microphone Linear Weighting
PSPL 119.4 dB(L) at 2.353 sec
ZC Freq 5.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 609 mv)

	Tran	Vert	Long	
PPV	3.556	1.905	5.080	mm/s
ZC Freq	17	34	24	Hz
Time (Rel. to Trig)	0.862	0.248	0.445	sec
Peak Acceleration	0.053	0.053	0.080	g
Peak Displacement	0.030	0.008	0.036	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.6	7.6	Hz
Overswing Ratio	3.6	3.8	3.8	

Peak Vector Sum 5.270 mm/s at 0.445 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-03 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONSTRUCTION (THO1100-002)

Date/Time: 04/06/2020 10:27 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North West Wall

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 04/06/20 Trigger Level: 1.23 mm/s Off dB
Time: 10:27 Calibration Date: 09/23/19
Distance From Blast: 843.69 m Calibration Signal:
Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Austin Harrison, Austin Powder

Transverse:	2.667 mm/s	15.0 Hz
Vertical:	1.27 mm/s	39.0 Hz
Longitudinal:	3.048 mm/s	26.0 Hz
Acoustic:	120 dB	--- Hz
Vector Sum:	3.069 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 04/06/20 Trigger Level: 1.23 mm/s Off dB
Time: 10:27 Calibration Date: 09/20/19
Distance From Blast: 1,661.16 m Calibration Signal:
Direction From Blast: ESE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Austin Harrison, Austin Powder

Transverse:	0.127 mm/s	--- Hz
Vertical:	0.127 mm/s	--- Hz
Longitudinal:	0.127 mm/s	--- Hz
Acoustic:	115 dB	--- Hz
Vector Sum:	0.22 mm/s	

Instantel

Event Report

Date/Time	Vert at 10:27:25 April 6, 2020
Trigger Source	Geo: 1.200 mm/s, Mic: 116.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General

Extended Notes

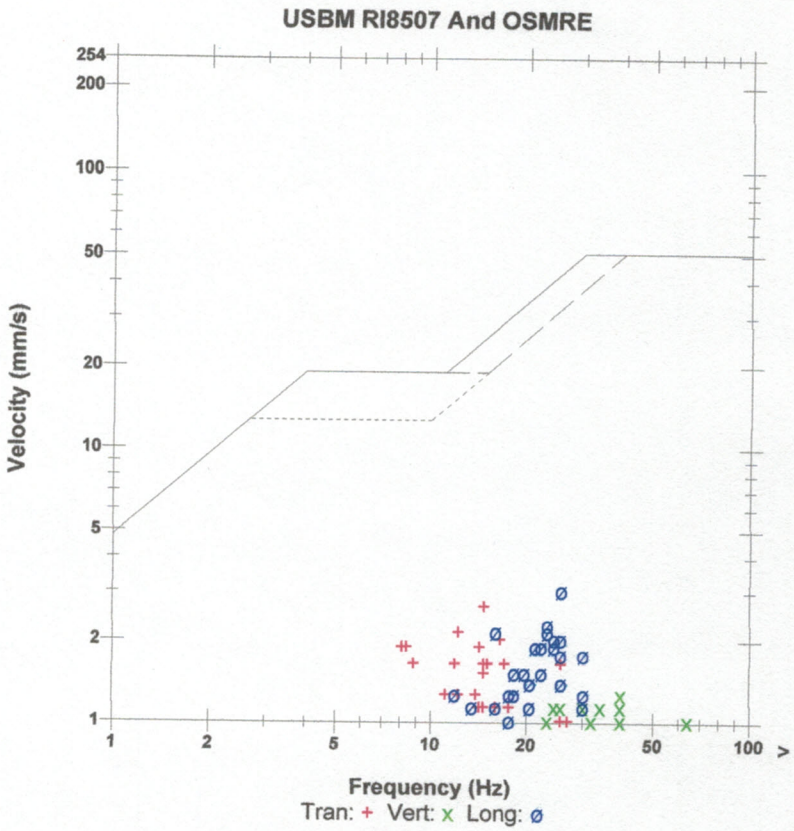
Microphone	Linear Weighting
PSPL	120.5 dB(L) at 2.131 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 637 mv)

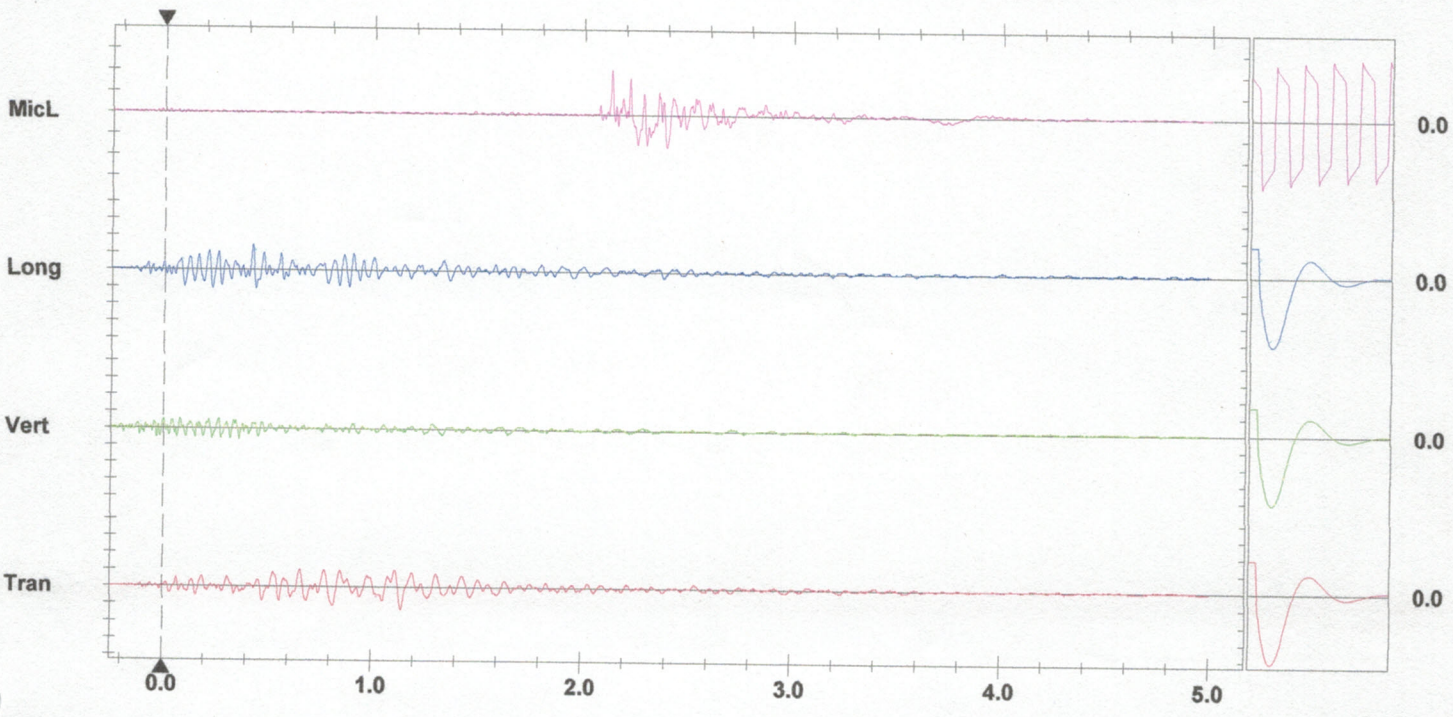
	Tran	Vert	Long	
PPV	2.667	1.270	3.048	mm/s
ZC Freq	15	39	26	Hz
Time (Rel. to Trig)	1.143	0.364	0.422	sec
Peak Acceleration	0.027	0.040	0.053	g
Peak Displacement	0.032	0.008	0.020	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.6	Hz
Overswing Ratio	3.6	3.8	3.7	

Peak Vector Sum 3.069 mm/s at 0.422 sec

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 25, 2019 by Instantel
File Name	U637IEIT.1P0

Post Event Notes
Set up on front lawn of 1550 Dwire Hill Rd. Geo spiked and weight bagged on saturated lawn.





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

Instantel

Event Report

Date/Time	MicL at 10:27:58 April 6, 2020
Trigger Source	Geo: 1.230 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589IEIT.2M0

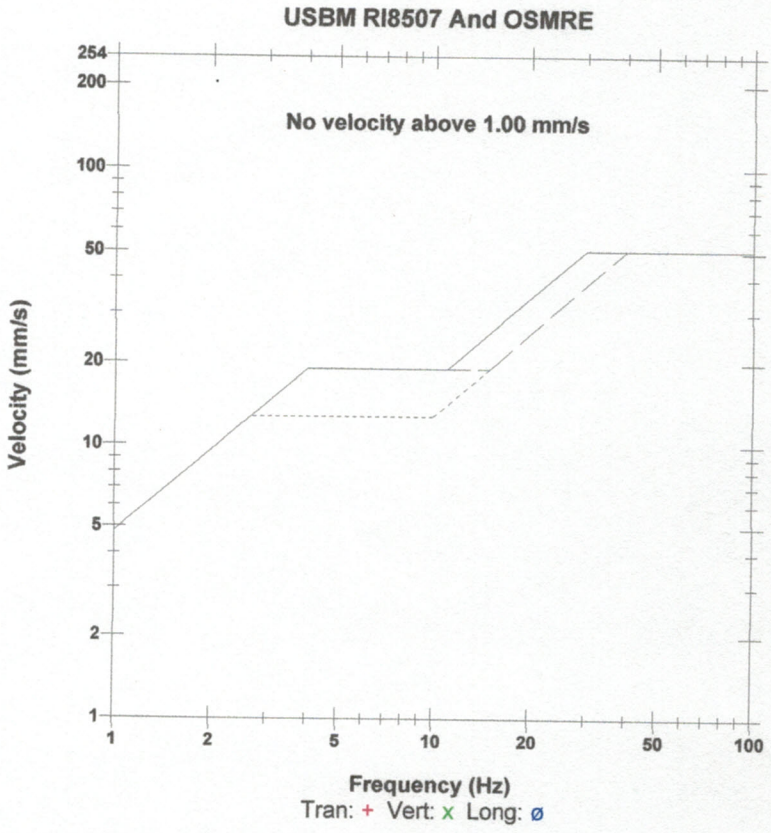
Post Event Notes
Set up at end of driveway of 1331 Dwire Hill Rd. Geo spiked and weight bagged on wet grass.

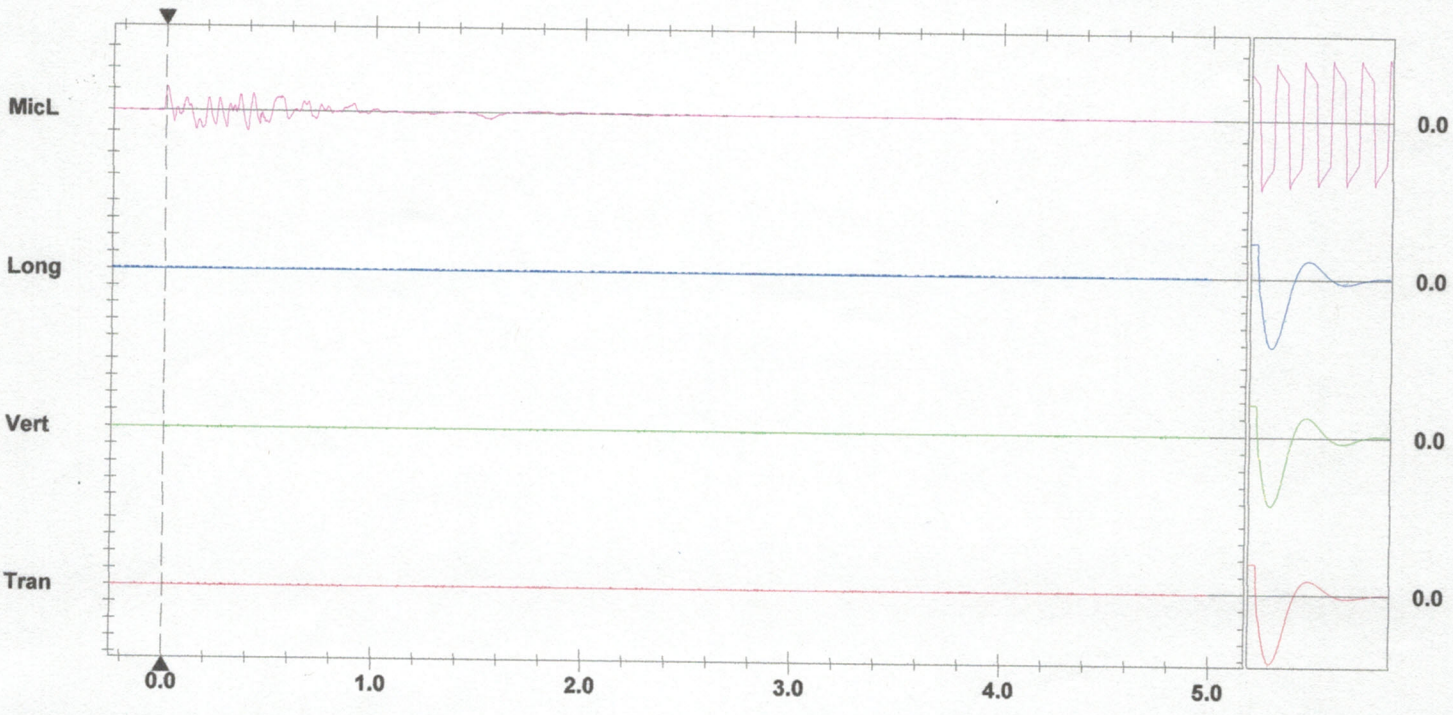
Extended Notes

Microphone	Linear Weighting
PSPL	114.8 dB(L) at 0.006 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 594 mv)

	Tran	Vert	Long	
PPV	0.127	0.127	0.127	mm/s
ZC Freq	N/A	>100	N/A	Hz
Time (Rel. to Trig)	-0.250	-0.232	-0.250	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.9	7.8	Hz
Overswing Ratio	4.8	3.5	3.7	

Peak Vector Sum 0.220 mm/s at 0.213 sec
N/A: Not Applicable





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——————◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-04 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 04/08/2020 12:30 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel

Date: 04/08/20 Trigger Level: 1.23 mm/s Off dB

Time: 12:30 Calibration Date: 09/23/19

Distance From Blast: 846.12 m Calibration Signal:

Direction From Blast: NE Geophone Min. Freq.: 2.0 Hz

Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz

Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.

Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W

Reader and Firm: William Coleman, AUSTIN POWDER

Analyst and Firm:

Installer and Firm: Austin Harrison, Austin Powder

Transverse:	4.572 mm/s	16.0 Hz
Vertical:	1.778 mm/s	57.0 Hz
Longitudinal:	2.921 mm/s	19.0 Hz
Acoustic:	113 dB	--- Hz
Vector Sum:	4.968 mm/s	

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel

Date: 04/08/20 Trigger Level: 1.23 mm/s Off dB

Time: 12:30 Calibration Date: 09/20/19

Distance From Blast: 1,669.39 m Calibration Signal:

Direction From Blast: ESE Geophone Min. Freq.: 2.0 Hz

Readout: Mic. Min. Freq.: 2.0 Hz

Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.

Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W

Reader and Firm: William Coleman, AUSTIN POWDER

Analyst and Firm:

Installer and Firm: Austin Harrison, Austin Powder

Event Report

Date/Time	Vert at 12:30:04 April 8, 2020
Trigger Source	Geo: 1.100 mm/s, Mic: 110.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	7.0 sec at 1024 sps

Notes

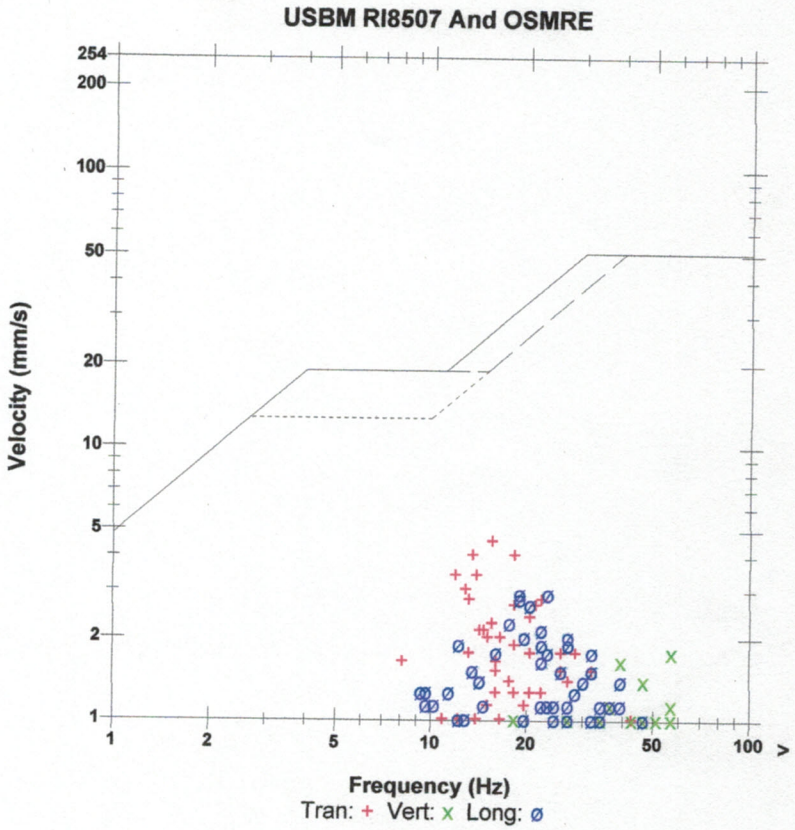
Serial Number	BE19636 V 10.72-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	July 31, 2019 by Instantel
File Name	U636IEMO.240

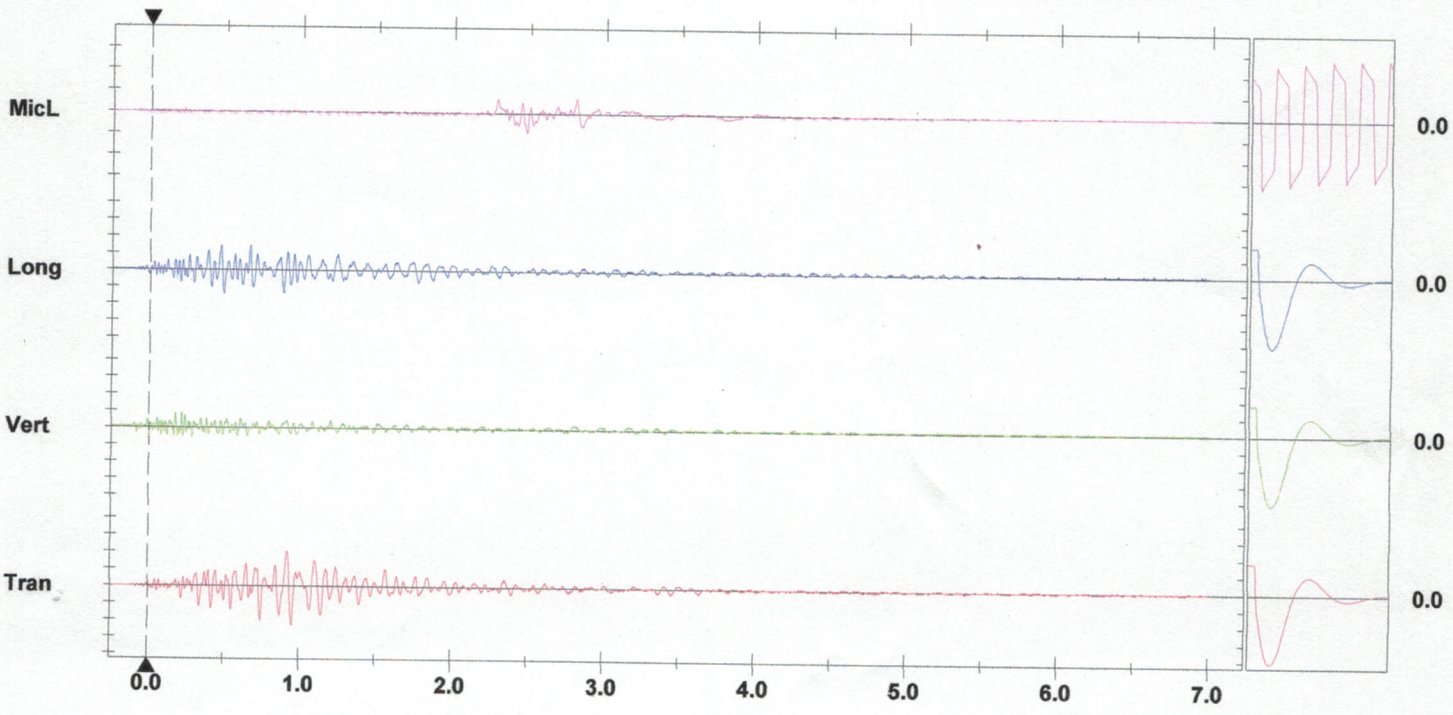
Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo spiked and weight bagged on wet lawn.

Microphone	Linear Weighting
PSPL	113.1 dB(L) at 2.476 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 632 mv)

	Tran	Vert	Long	
PPV	4.572	1.778	2.921	mm/s
ZC Freq	16	57	19	Hz
Time (Rel. to Trig)	0.948	0.218	0.467	sec
Peak Acceleration	0.053	0.066	0.053	g
Peak Displacement	0.048	0.013	0.024	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.4	Hz
Overswing Ratio	3.8	3.8	3.9	

Peak Vector Sum 4.968 mm/s at 0.951 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

No Trigger
1331 Dwire Hill Rd

Event Report: Monitor Log - MiniMate Plus # BE19637-Compliance

Start Time	End Time	Status
Apr 8 /20 11:55:30	Apr 8 /20 12:42:29	SERIAL NUMBER: BE19637 No events recorded. (Keyboard Exit) Geo: 1.20 mm/s Mic: 116.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-05 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 09/22/2020 10:31 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/22/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.397 mm/s	19.0 Hz
Time:	10:31	Calibration Date:	04/17/20		Vertical:	1.016 mm/s	27.0 Hz
Distance From Blast:	911.66 m	Calibration Signal:			Longitudinal:	2.286 mm/s	20.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	119 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	1.376 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Cory Bragan, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/22/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	10:31	Calibration Date:	10/23/19		Vertical:	0.254 mm/s	--- Hz
Distance From Blast:	1,690.42 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
Direction From Blast:	E	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	119 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	0.284 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:							

Event Report

Date/Time	MicL at 10:31:46 September 22, 2020
Trigger Source	Geo: 1.000 mm/s, Mic: 115.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	12.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.3 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589IN7R.WY0

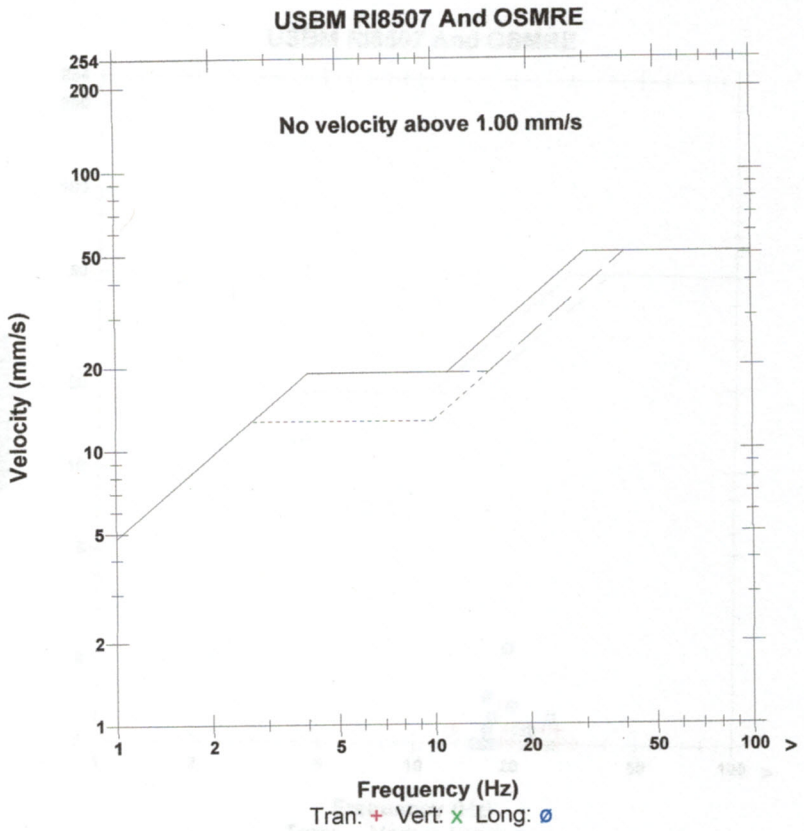
Post Event Notes
Set up at end of driveway of 1331 Dwire Hill Rd. Geo spiked and weight bagged on packed gravel.

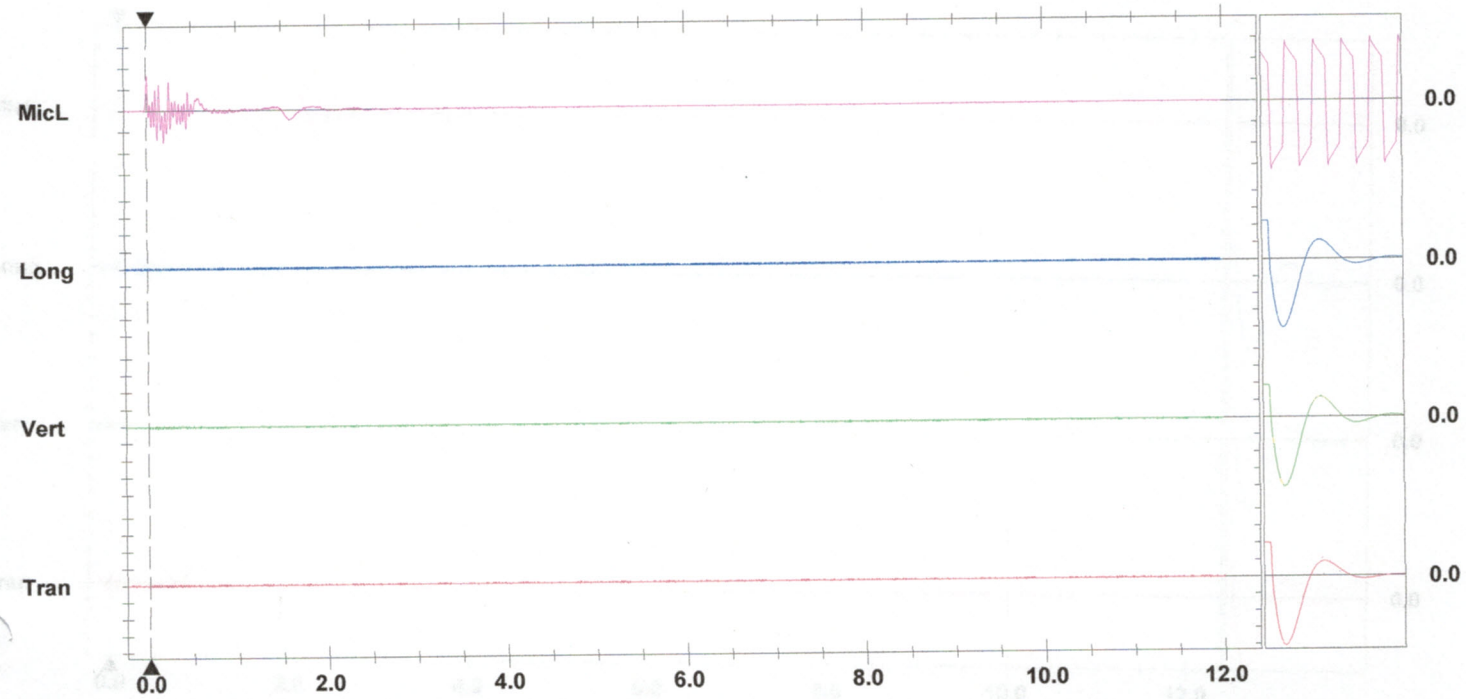
Extended Notes

Microphone	Linear Weighting
PSPL	118.5 dB(L) at 0.008 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 623 mv)

	Tran	Vert	Long	
PPV	0.127	0.254	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.201	0.108	-0.243	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.9	7.9	Hz
Overswing Ratio	4.8	3.5	3.7	

Peak Vector Sum 0.284 mm/s at 0.108 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Sensor Check

Trigger =

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-06 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 09/25/2020 11:31 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/25/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.397 mm/s	16.0 Hz
Time:	11:31	Calibration Date:	04/17/20		Vertical:	1.016 mm/s	57.0 Hz
Distance From Blast:	924.15 m	Calibration Signal:			Longitudinal:	1.016 mm/s	39.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	115 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	1.497 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Cory Bragan, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	09/25/20	Trigger Level:	1.23 mm/s	Off dB
Time:	11:31	Calibration Date:	10/23/19	
Distance From Blast:	1,715.11 m	Calibration Signal:		
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.			
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Cory Bragan, Austin Powder			

Instantel

Event Report

Date/Time Vert at 11:31:03 September 25, 2020
Trigger Source Geo: 1.000 mm/s, Mic: 115.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 12.0 sec at 1024 sps

Notes

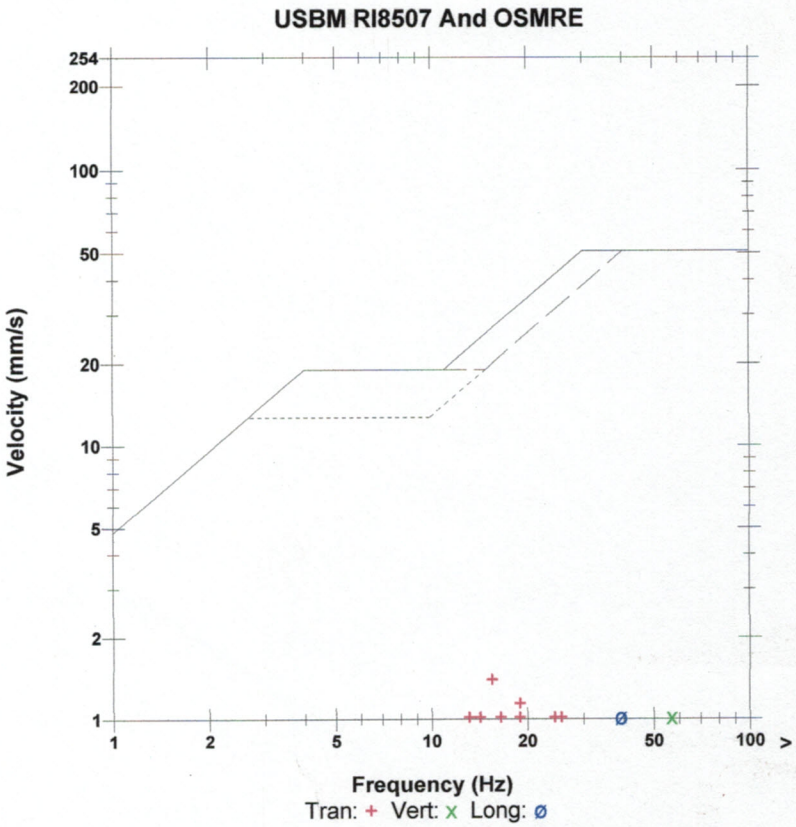
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 23, 2019 by Instantel
File Name Q589INDE.NR0
Post Event Notes
Geo spiked and weight bagged in front yard of 1550 Dwire Hill Rd.

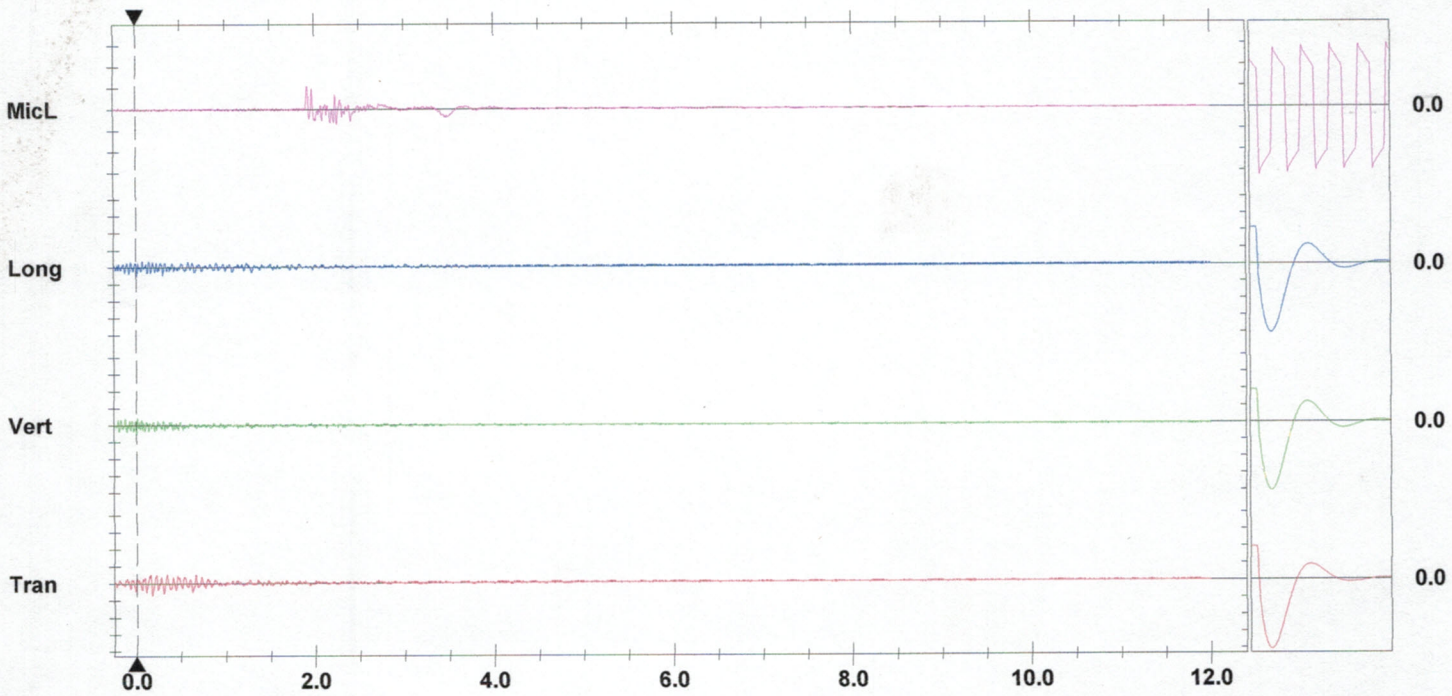
Extended Notes

Microphone Linear Weighting
PSPL 114.6 dB(L) at 1.921 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	1.397	1.016	1.016	mm/s
ZC Freq	16	57	39	Hz
Time (Rel. to Trig)	0.168	0.000	0.009	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.013	0.004	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	8.1	7.8	Hz
Overswing Ratio	4.8	3.4	3.7	

Peak Vector Sum 1.497 mm/s at 0.302 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——————◀

Sensor Check

No Trigger.

Event Report: Monitor Log - Minimate Blaster # BE15020-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15020
Sep 25 /20 08:58:47	Sep 25 /20 11:54:59	No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 113.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-07 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 09/28/2020 11:33 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: North West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	09/28/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	2.794 mm/s	14.0 Hz
Time:	11:33	Calibration Date:	10/23/19		Vertical:	1.143 mm/s	47.0 Hz
Distance From Blast:	845.52 m	Calibration Signal:			Longitudinal:	2.159 mm/s	26.0 Hz
Direction From Blast:	NE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	117 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	2.797 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Robert Turton, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	09/28/20	Trigger Level:	1.23 mm/s	Off dB
Time:	11:33	Calibration Date:	04/17/20	
ance From Blast:	1,676.40 m	Calibration Signal:		
Direction From Blast:	ESE	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.			
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Rob Turton, Austin Powder			

Instantel Event Report

Date/Time	Vert at 11:33:19 September 28, 2020
Trigger Source	Geo: 1.000 mm/s, Mic: 115.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	12.0 sec at 1024 sps

Notes

Serial Number	BE15589 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	October 23, 2019 by Instantel
File Name	Q589INIY.RJ0

Post Event Notes
Set up in front yard of 1550 Dwire Hill Rd. Geo siked and weight bagged on front lawn.

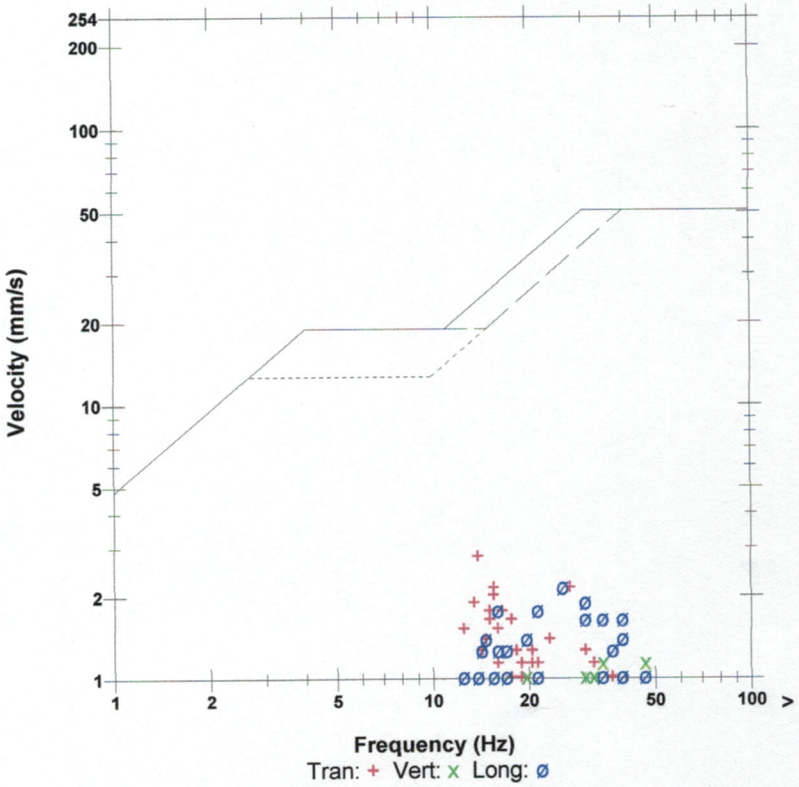
Extended Notes

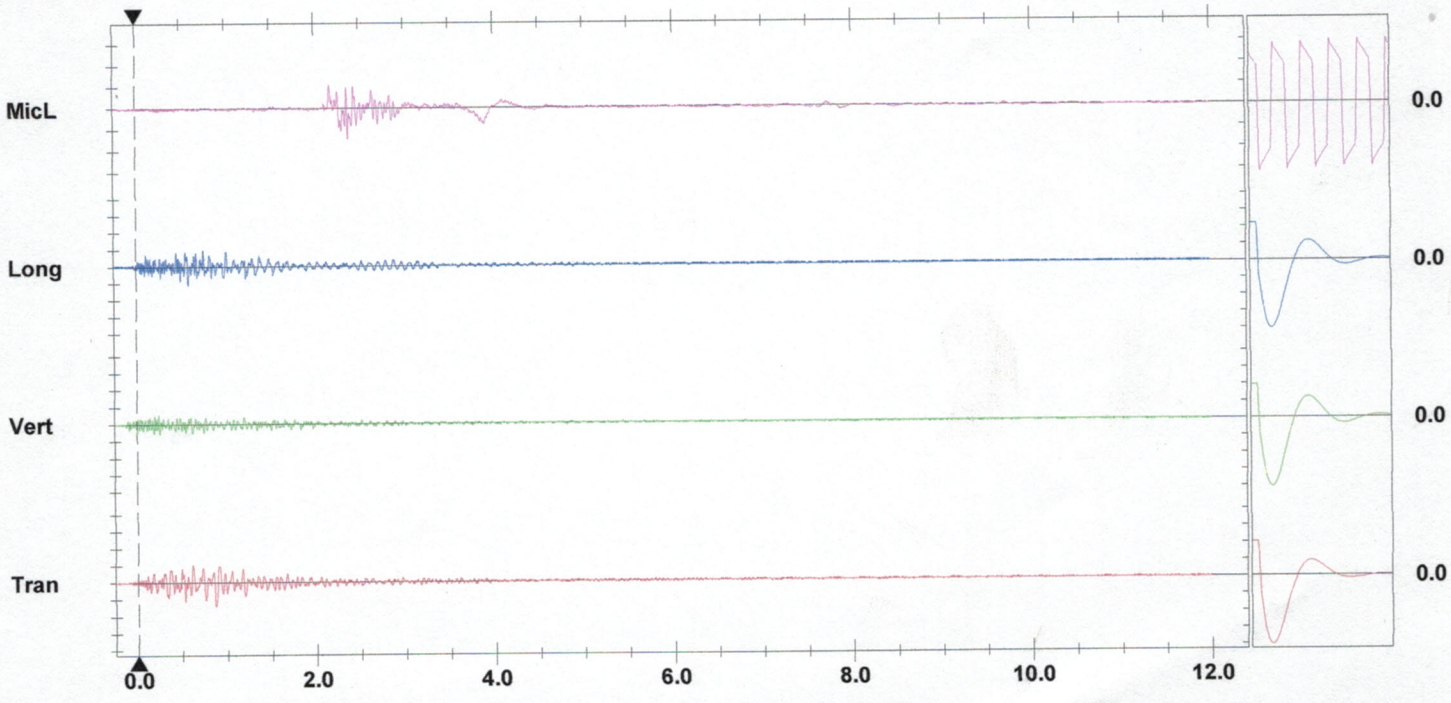
Microphone	Linear Weighting
PSPL	117.1 dB(L) at 2.380 sec
ZC Freq	8.3 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 562 mv)

	Tran	Vert	Long	
PPV	2.794	1.143	2.159	mm/s
ZC Freq	14	47	26	Hz
Time (Rel. to Trig)	0.867	0.001	0.585	sec
Peak Acceleration	0.040	0.040	0.053	g
Peak Displacement	0.035	0.008	0.016	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.9	7.8	Hz
Overswing Ratio	4.7	3.4	3.6	

Peak Vector Sum 2.797 mm/s at 0.867 sec

USBM RI8507 And OSMRE





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

No Trigger.

Event Report: Monitor Log - Minimate Blaster # BE15020-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15020
Sep 25 /20 08:58:47	Sep 25 /20 11:54:59	No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 113.0 dB(L)
Sep 28 /20 10:31:55	Sep 28 /20 12:05:49	No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 113.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-08 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 10/28/2020 13:17 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1550 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/28/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.381 mm/s	19.0 Hz
Time:	13:18	Calibration Date:	04/17/20		Vertical:	0.381 mm/s	27.0 Hz
Distance From Blast:	1,419.15 m	Calibration Signal:			Longitudinal:	0.381 mm/s	17.0 Hz
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	116 dB	--- Hz
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	0.554 mm/s	
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	William Coleman, Austin Powder						

SEISMOGRAPH 2 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/28/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	1.397 mm/s	15.0 Hz
Time:	13:17	Calibration Date:	04/17/20		Vertical:	0.635 mm/s	47.0 Hz
Distance From Blast:	1,320.09 m	Calibration Signal:			Longitudinal:	0.762 mm/s	20.0 Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	112 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	1.67 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	William Coleman, Austin Powder						

Instantel

Event Report

Date/Time Tran at 13:17:33 October 28, 2020
Trigger Source Geo: 1.000 mm/s, Mic: 109.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 12.0 sec at 1024 sps

Serial Number BE19638 V 10.72-8.17 MiniMate Plus
Battery Level 6.2 Volts
Unit Calibration February 7, 2020 by Instantel
File Name U638IP2N.L90

Post Event Notes
Set up at driveway of 1331 Dwire Hill Rd. Geo spiked and weight bagged on soggy ground.

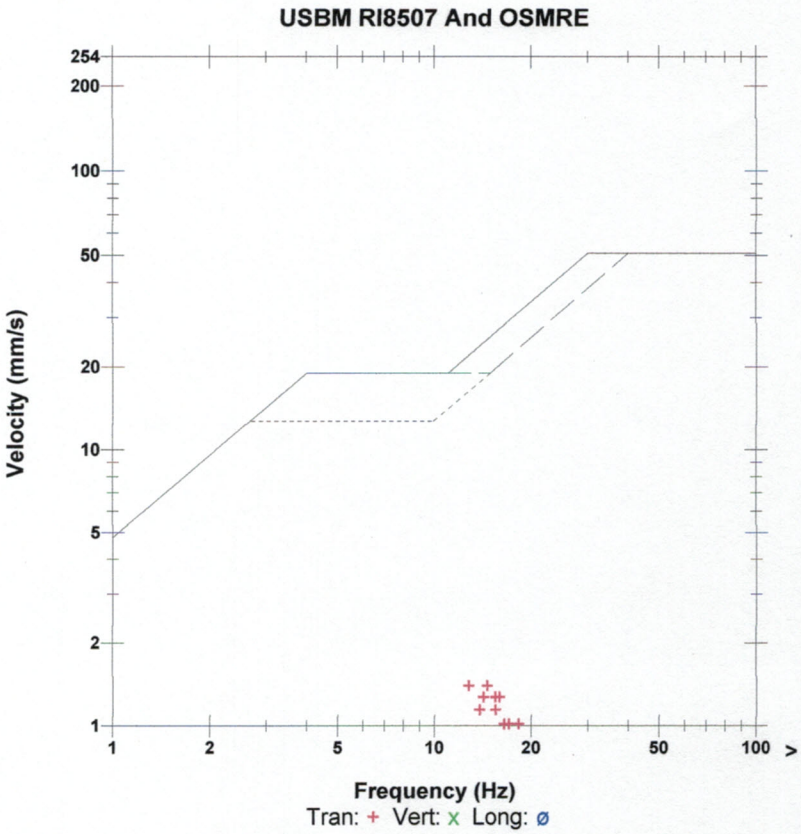
Notes
Location:
Client:
User Name:
General:

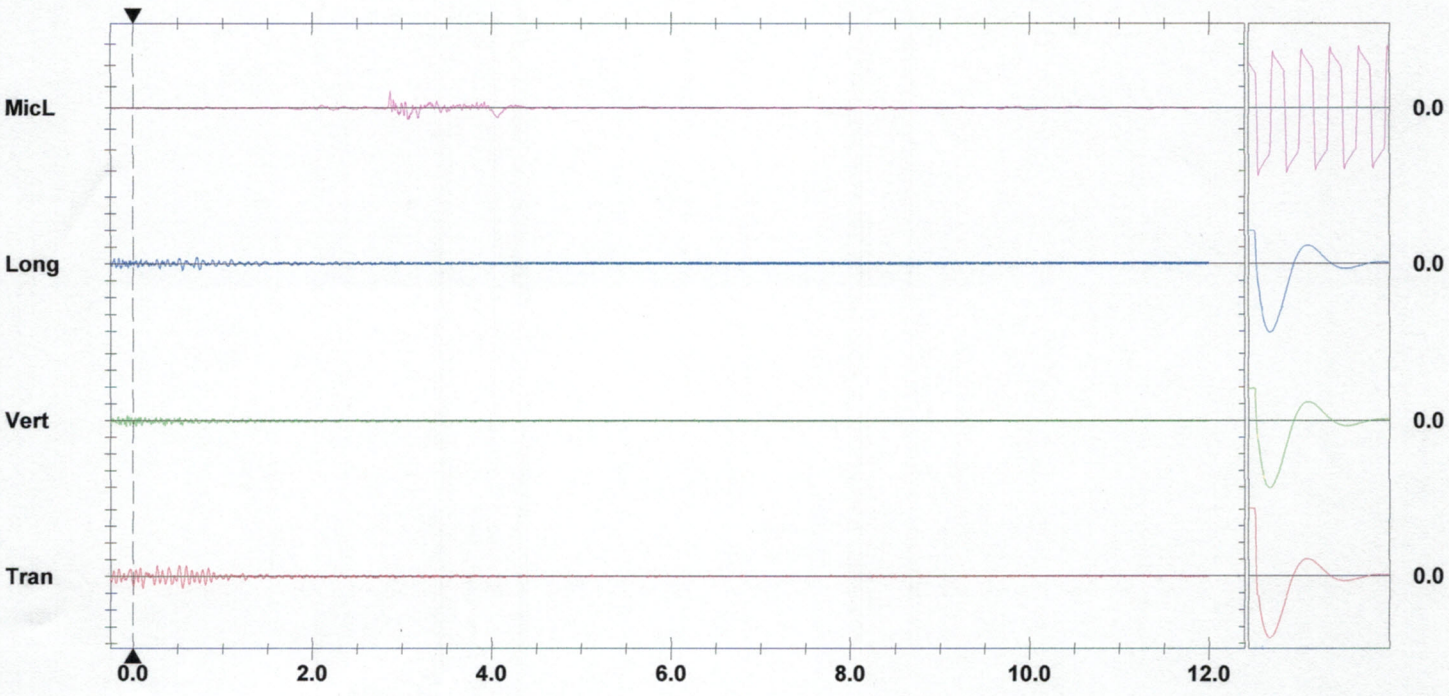
Extended Notes

Microphone Linear Weighting
PSPL 112.0 dB(L) at 2.874 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 633 mv)

	Tran	Vert	Long	
PPV	1.397	0.635	0.762	mm/s
ZC Freq	15	47	20	Hz
Time (Rel. to Trig)	0.109	-0.076	0.556	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.016	0.003	0.009	mm
Sensor Check	Check	Passed	Passed	
Frequency	7.7	7.6	7.6	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 1.670 mm/s at 0.558 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger = ▶— — —◀

Instantel Event Report

Date/Time MicL at 13:18:19 October 28, 2020
Trigger Source Geo: 1.000 mm/s, Mic: 113.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 12.0 sec at 1024 sps

Serial Number BE15020 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration April 17, 2020 by Instantel
File Name Q020IP2N.MJ0
Post Event Notes
geo spiked and weight bagged in front of 1550 Dwire Hill Rd, on wet lawn.

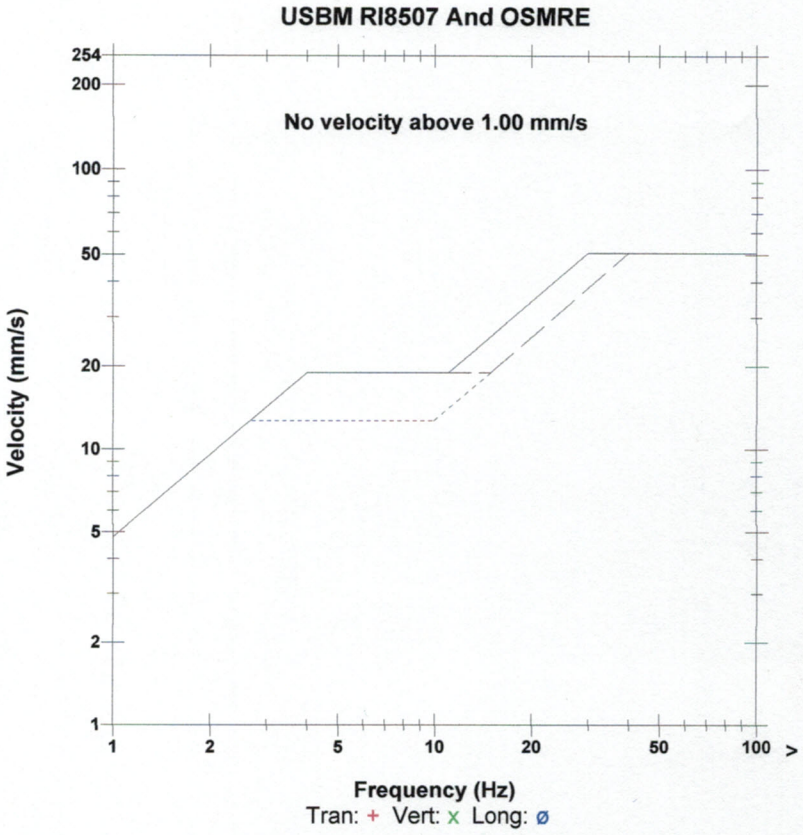
Notes
Location:
Client:
User Name:
General:

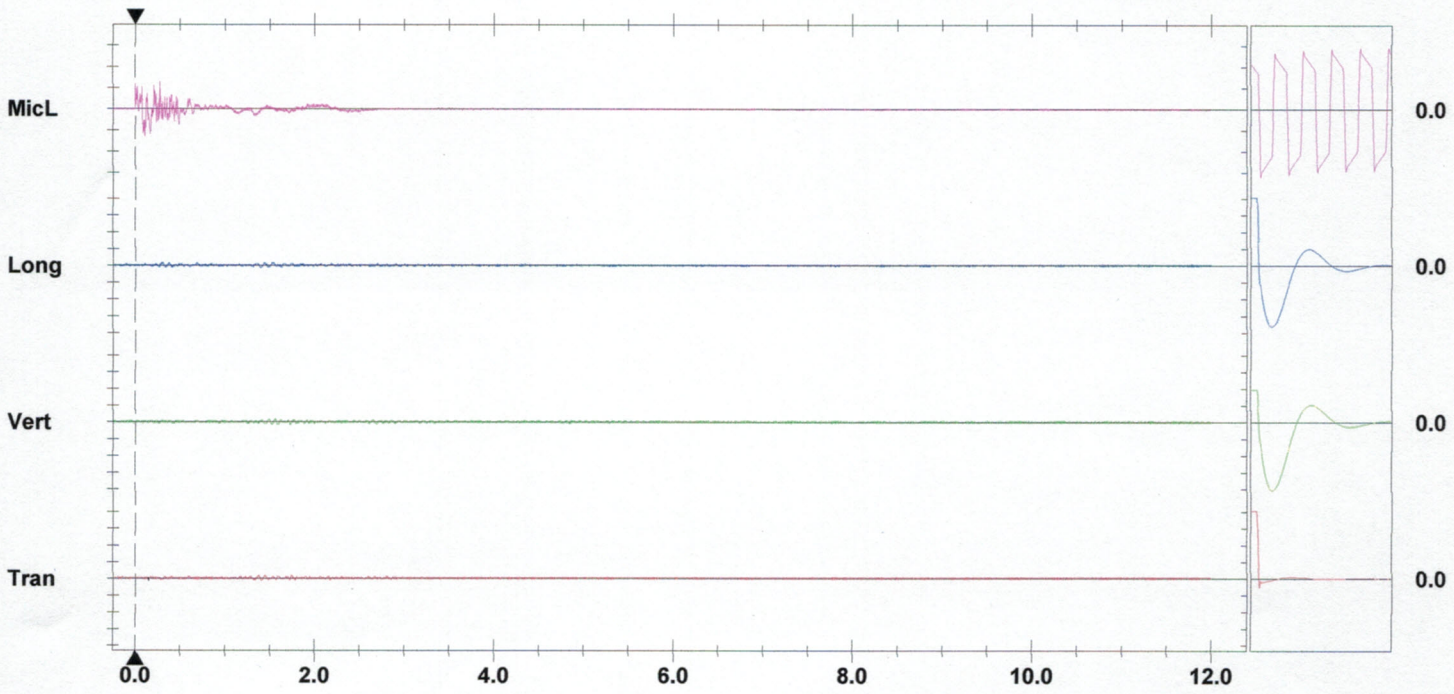
Extended Notes

Microphone Linear Weighting
PSPL 116.3 dB(L) at 0.105 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 651 mv)

	Tran	Vert	Long	
PPV	0.381	0.381	0.381	mm/s
ZC Freq	19	27	17	Hz
Time (Rel. to Trig)	1.374	1.493	0.293	sec
Peak Acceleration	0.013	0.027	0.013	g
Peak Displacement	0.004	0.003	0.006	mm
Sensor Check	Check	Passed	Check	
Frequency	14.4	7.4	7.8	Hz
Overswing Ratio	7.0	4.0	3.7	

Peak Vector Sum 0.554 mm/s at 1.443 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-09 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 10/30/2020 12:16 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type:	Seismic Record	Seismograph Type:	instantel				
Date:	10/30/20	Trigger Level:	1.23 mm/s	Off dB	Transverse:	0.127 mm/s	--- Hz
Time:	12:16	Calibration Date:	04/17/20		Vertical:	0.254 mm/s	--- Hz
Distance From Blast:	1,297.23 m	Calibration Signal:			Longitudinal:	0.127 mm/s	--- Hz
Direction From Blast:	ENE	Geophone Min. Freq.:	2.0 Hz				
Readout:	Printed Copy	Mic. Min. Freq.:	2.0 Hz		Acoustic:	111 dB	--- Hz
Location:	Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.				Vector Sum:	0.254 mm/s	
Lat./Long.:	45° 15' 27.900" N		76° 6' 50.100" W				
Reader and Firm:	William Coleman, AUSTIN POWDER						
Analyst and Firm:							
Installer and Firm:	Matt Gordon, Austin Powder						

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type:	No Trigger	Seismograph Type:	instantel	
Date:	10/30/20	Trigger Level:	1.23 mm/s	Off dB
Time:	12:16	Calibration Date:	04/17/20	
Distance From Blast:	1,309.73 m	Calibration Signal:		
Direction From Blast:	NNE	Geophone Min. Freq.:	2.0 Hz	
Readout:		Mic. Min. Freq.:	2.0 Hz	
Location:	Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.			
Lat./Long.:	45° 15' 59.300" N		76° 7' 28.700" W	
Reader and Firm:	William Coleman, AUSTIN POWDER			
Analyst and Firm:				
Installer and Firm:	Matt Gordon, Austin Powder			

Event Report

Date/Time	MicL at 12:16:23 October 30, 2020
Trigger Source	Geo: 1.700 mm/s, Mic: 108.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.2 Volts
Unit Calibration	September 26, 2020 by Instantel
File Name	U637IP6A.3B0

Post Event Notes
1331 Dwire Hill Rd. Set up on lawn near house.

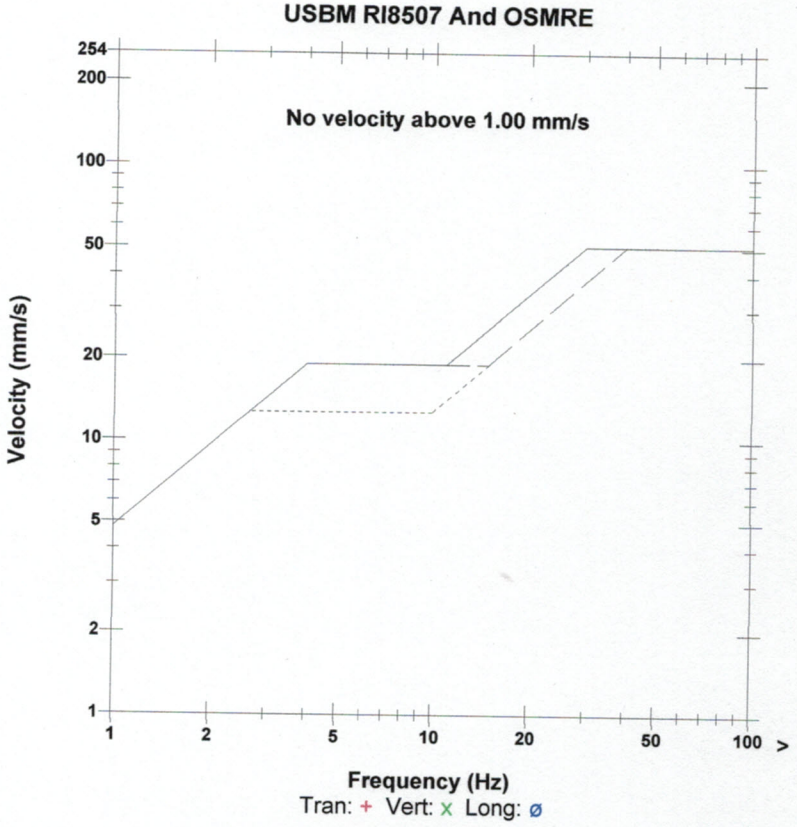
Notes
Location:
Client:
User Name:
General:

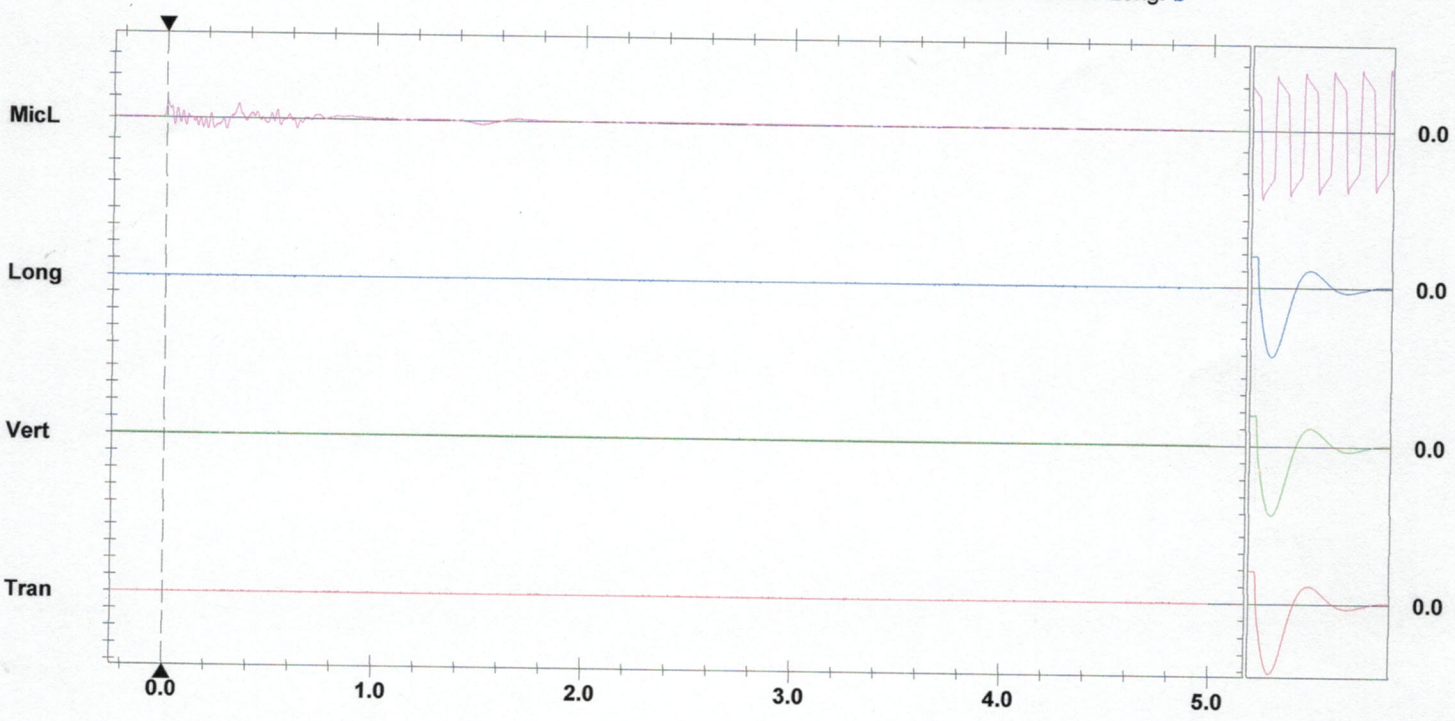
Extended Notes

Microphone	Linear Weighting
PSPL	110.9 dB(L) at 0.005 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 723 mv)

	Tran	Vert	Long	
PPV	0.127	0.254	0.127	mm/s
ZC Freq	>100	>100	>100	Hz
Time (Rel. to Trig)	-0.115	0.550	-0.225	sec
Peak Acceleration	0.027	0.027	0.013	g
Peak Displacement	0.000	0.000	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.6	Hz
Overswing Ratio	3.8	3.8	3.9	

Peak Vector Sum 0.254 mm/s at 0.550 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——◀

Sensor Check

No Trigger

Event Report: Monitor Log - Minimate Blaster # BE15020-Compliance

Start Time	End Time	Status
Oct 30 /20 11:21:48	Oct 30 /20 12:41:12	SERIAL NUMBER: BE15020 No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 113.0 dB(L)

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-10 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 11/02/2020 10:58 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel

Date: 11/02/20 Trigger Level: 1.23 mm/s Off dB

Time: 10:58 Calibration Date: 04/17/20

Distance From Blast: 1,306.37 m Calibration Signal:

Direction From Blast: ENE Geophone Min. Freq.: 2.0 Hz

Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz

Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.

Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W

Reader and Firm: William Coleman, AUSTIN POWDER

Analyst and Firm:

Installer and Firm: Matt Gordon, Austin Powder

Transverse:	1.27 mm/s	28.0 Hz
Vertical:	0.762 mm/s	47.0 Hz
Longitudinal:	0.762 mm/s	28.0 Hz
Acoustic:	115 dB	--- Hz
Vector Sum:	1.368 mm/s	

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel

Date: 11/02/20 Trigger Level: 1.23 mm/s Off dB

Time: 10:58 Calibration Date: 04/17/20

Distance From Blast: 1,371.90 m Calibration Signal:

Direction From Blast: NNE Geophone Min. Freq.: 2.0 Hz

Readout: Mic. Min. Freq.: 2.0 Hz

Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.

Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W

Reader and Firm: William Coleman, AUSTIN POWDER

Analyst and Firm:

Installer and Firm: Matt Gordon, Austin Powder

Wind Triggers

Event Report: Monitor Log - Minimate Blaster # BE15589-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15589
Nov 2 /20 11:01:44		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:02:59	Nov 2 /20 11:03:04	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:03:18		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:04:40	Nov 2 /20 11:04:45	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:04:59		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:18:51	Nov 2 /20 11:18:56	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:19:09		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:36:55	Nov 2 /20 11:37:00	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:37:13		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:50:59	Nov 2 /20 11:51:04	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:51:17		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:51:35	Nov 2 /20 11:51:40	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:51:54		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 11:59:33	Nov 2 /20 11:59:38	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 11:59:51		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 12:03:24	Nov 2 /20 12:03:29	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 12:03:43		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 12:15:32	Nov 2 /20 12:15:37	Event recorded. Trigger Level MicL: 115.0 dB(L)
Nov 2 /20 12:15:51	Nov 2 /20 12:16:44	No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 12:36:03		Start Monitoring Trigger Level: Geo: 1.000 mm/s Mic: 115.0 dB(L)
Nov 2 /20 15:12:15	Nov 2 /20 15:12:20	Event recorded. Trigger Level Long: 1.000 mm/s
Nov 2 /20 15:12:33	Nov 2 /20 15:26:39	No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 115.0 dB(L)

Instantel Event Report

Date/Time	Tran at 10:58:32 November 2, 2020
Trigger Source	Geo: 1.000 mm/s, Mic: 113.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	12.0 sec at 1024 sps

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.4 Volts
Unit Calibration	April 17, 2020 by Instantel
File Name	Q020IPBQ.HK0

Notes
Location:
Client:
User Name:
General:

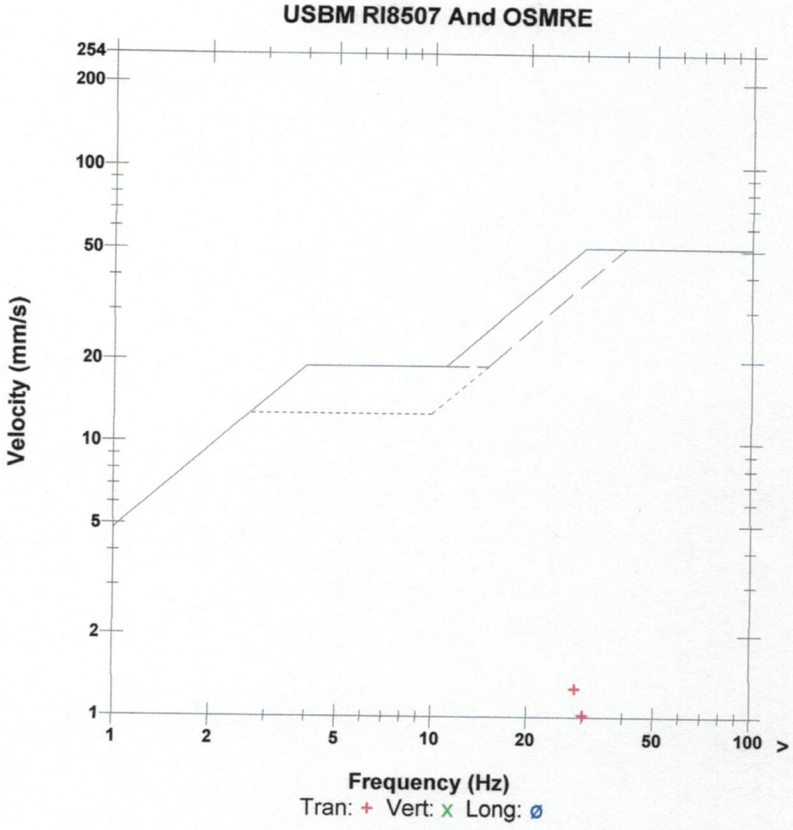
Post Event Notes
Set up in yard of 1331 Dwire Hill Rd. Geo spiked and weight bagged on lawn.

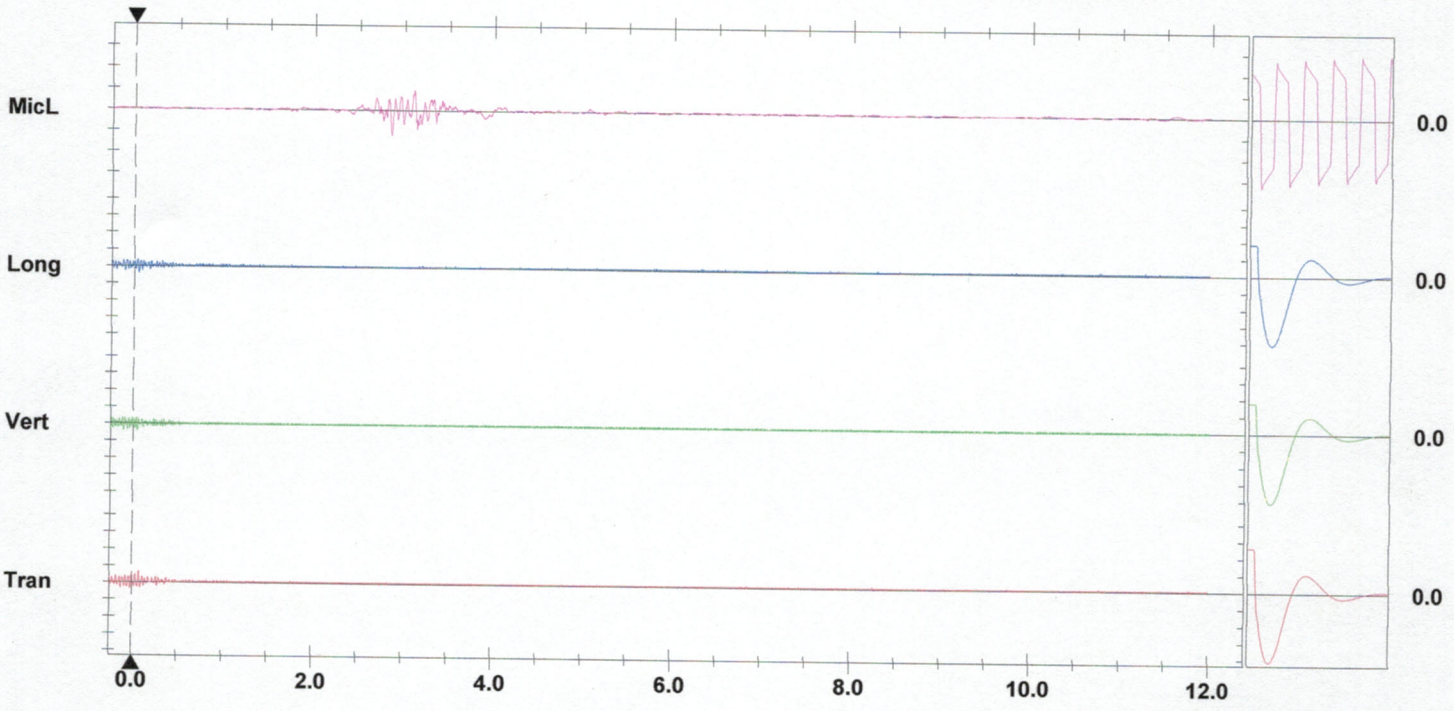
Extended Notes

Microphone	Linear Weighting
PSPL	115.4 dB(L) at 2.858 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 672 mv)

	Tran	Vert	Long	
PPV	1.270	0.762	0.762	mm/s
ZC Freq	28	47	28	Hz
Time (Rel. to Trig)	0.078	-0.103	0.038	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.007	0.003	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.4	7.4	Hz
Overswing Ratio	3.6	4.0	3.7	

Peak Vector Sum 1.368 mm/s at 0.078 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶——◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-11 Blast Type: Stone Quarry/Stone Mine - Production Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 11/09/2020 10:30 Pit/Permit: WEST CARLETON QUARRY / ARA-4085 Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: Seismic Record Seismograph Type: instantel
Date: 11/09/20 Trigger Level: 1.23 mm/s Off dB
Time: 10:35 Calibration Date: 04/17/20
Distance From Blast: 1,339.90 m Calibration Signal:
Direction From Blast: ENE Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy Mic. Min. Freq.: 2.0 Hz
Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Robert Turton, Austin Powder

Transverse:	1.27 mm/s	43.0 Hz
Vertical:	0.762 mm/s	51.0 Hz
Longitudinal:	1.524 mm/s	39.0 Hz
Acoustic:	109 dB	--- Hz
Vector Sum:	2.048 mm/s	

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type: No Trigger Seismograph Type: instantel
Date: 11/09/20 Trigger Level: 1.23 mm/s Off dB
Time: 11:35 Calibration Date: 04/17/20
Distance From Blast: 1,351.18 m Calibration Signal:
Direction From Blast: NNE Geophone Min. Freq.: 2.0 Hz
Readout: Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Robert Turton, Austin Powder

Event Report

Date/Time	Long at 10:35:15 November 9, 2020
Trigger Source	Geo: 1.000 mm/s, Mic: 113.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	12.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
General:

Extended Notes

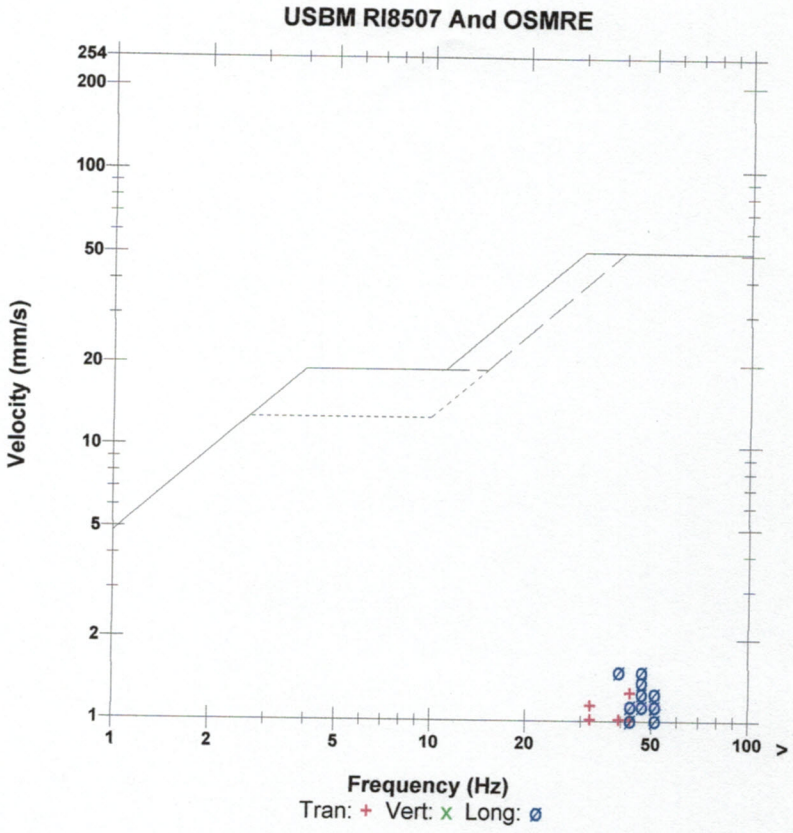
Microphone	Linear Weighting
PSPL	109.2 dB(L) at 3.195 sec
ZC Freq	6.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 610 mv)

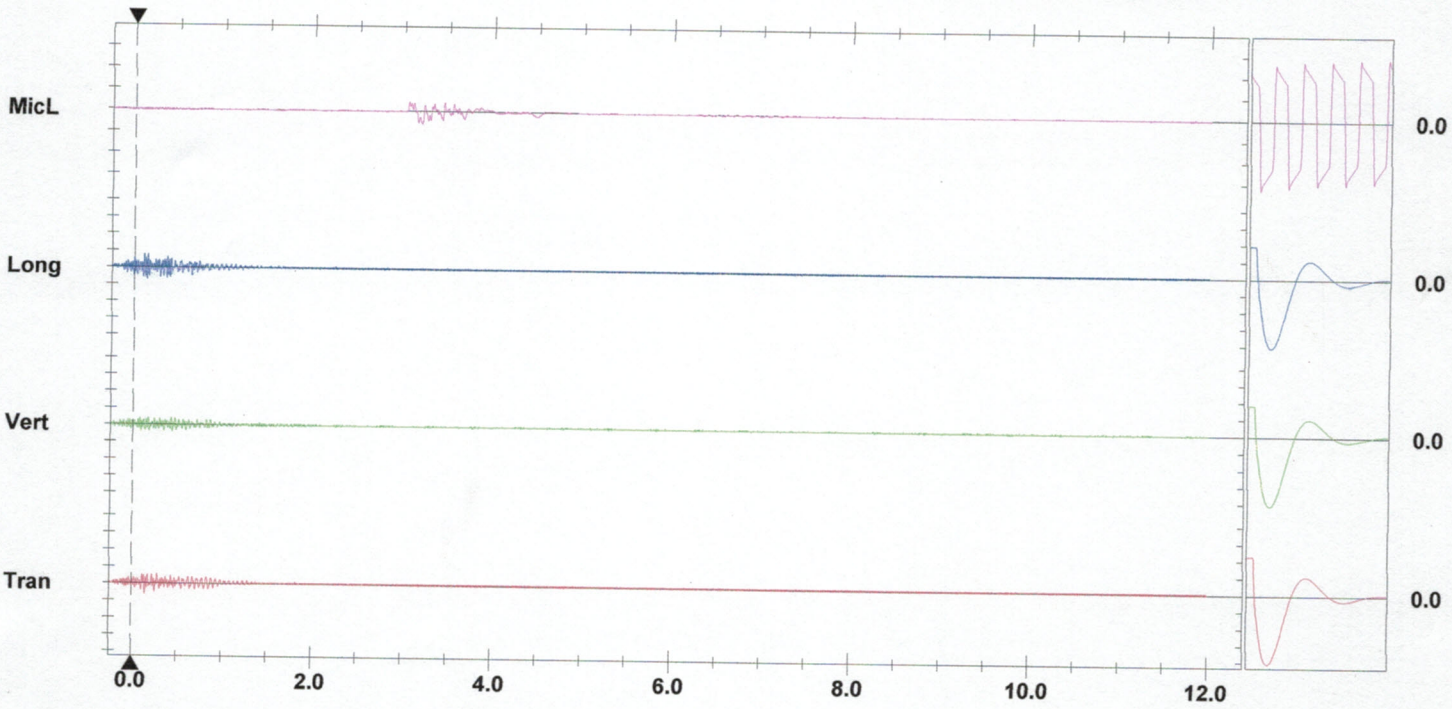
	Tran	Vert	Long	
PPV	1.270	0.762	1.524	mm/s
ZC Freq	43	51	39	Hz
Time (Rel. to Trig)	0.151	0.081	0.108	sec
Peak Acceleration	0.040	0.027	0.053	g
Peak Displacement	0.007	0.003	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.3	7.5	Hz
Overswing Ratio	3.6	3.9	3.6	

Peak Vector Sum 2.048 mm/s at 0.151 sec

Serial Number	BE15020 V 10.72-1.1 Minimate Blaster
Battery Level	6.5 Volts
Unit Calibration	April 17, 2020 by Instantel
File Name	Q020IPOO.2R0

Post Event Notes
Set up at 1331 Dwire Hill Rd. Geo spiked and weight bagged on lawn.





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶——◀

Sensor Check

Instantel

Event Report

Date/Time	MicL at 11:29:13 November 9, 2020
Trigger Source	Geo: 1.700 mm/s, Mic: 108.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	5.0 sec at 1024 sps

Serial Number	BE19637 V 10.72-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 26, 2020 by Instantel
File Name	U637IPOQ.KP0

Post Event Notes
Probably false trigger. 1550 Dwire Hill Rd, on front lawn.

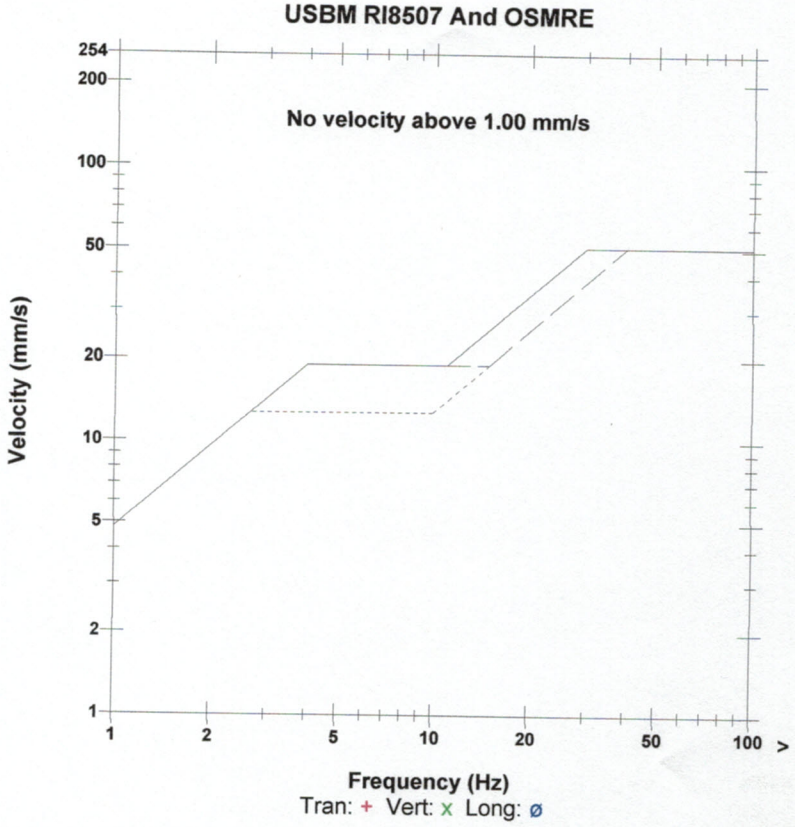
Notes
Location:
Client:
User Name:
General:

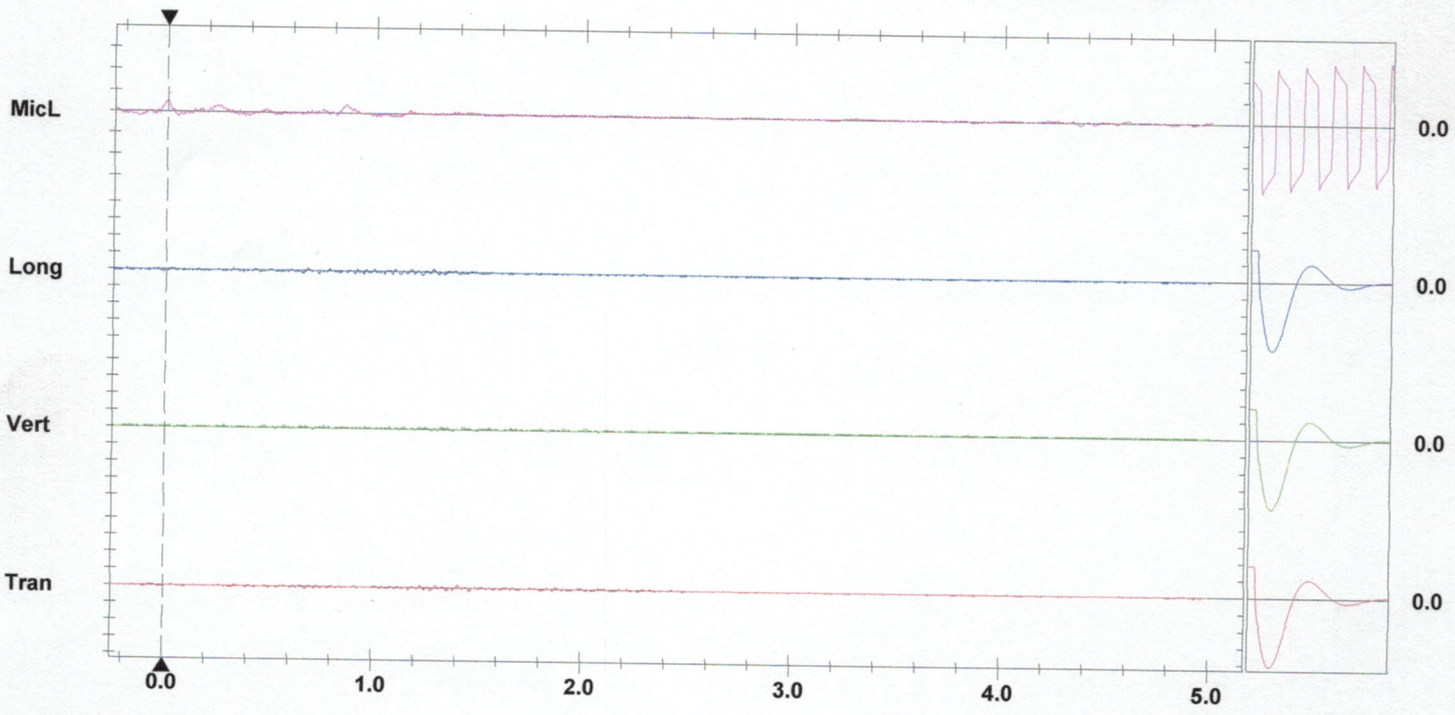
Extended Notes

Microphone	Linear Weighting
PSPL	108.4 dB(L) at 0.000 sec
ZC Freq	7.4 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 653 mv)

	Tran	Vert	Long	
PPV	0.381	0.381	0.381	mm/s
ZC Freq	51	73	47	Hz
Time (Rel. to Trig)	1.279	0.767	0.733	sec
Peak Acceleration	0.013	0.027	0.027	g
Peak Displacement	0.001	0.002	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.8	3.7	3.8	

Peak Vector Sum 0.475 mm/s at 1.229 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶———◀

Sensor Check

AUSTIN POWDER LTD.
BLAST REPORT

330-Lanark
ON, Lanark, Canada K0G I- K0

Blast No.: 2020-12 | Blast Type: Stone Quarry/Stone Mine - Production | Customer: THOMAS CAVANAGH CONST.-W. CARLTON (THO1100-002)

Date/Time: 12/16/2020 10:34 | Pit/Permit: WEST CARLETON QUARRY / ARA-4085 | Location: South West Corner

SEISMOGRAPH 1 - 1331 DWIRE HILL RD

Data Type: No Trigger | Seismograph Type: instantel
Date: 12/16/20 | Trigger Level: 1.23 mm/s | Off dB
Time: 10:25 | Calibration Date: 04/17/20
Distance From Blast: 1,321.31 m | Calibration Signal:
Direction From Blast: ENE | Geophone Min. Freq.: 2.0 Hz
Readout: | Mic. Min. Freq.: 2.0 Hz
Location: Set up in back yard of 1331 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 27.900" N 76° 6' 50.100" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Andrew Tysick, Austin Powder

SEISMOGRAPH 2 - 1550 DWIRE HILL RD

Data Type: Seismic Record | Seismograph Type: instantel
Date: 12/16/20 | Trigger Level: 1.23 mm/s | Off dB
Time: 10:25 | Calibration Date: 04/17/20
Distance From Blast: 1,376.78 m | Calibration Signal:
Direction From Blast: NNE | Geophone Min. Freq.: 2.0 Hz
Readout: Printed Copy | Mic. Min. Freq.: 2.0 Hz
Location: Set up in driveway of 1550 Dwire Hill Rd, geo spiked and wieght bagged.
Lat./Long.: 45° 15' 59.300" N 76° 7' 28.700" W
Reader and Firm: William Coleman, AUSTIN POWDER
Analyst and Firm:
Installer and Firm: Andrew Tysick, Austin Powder

Transverse:	29.032 mm/s	17.0 Hz
Vertical:	9.677 mm/s	64.0 Hz
Longitudinal:	19.355 mm/s	22.0 Hz
Acoustic:	108 dB	--- Hz
Vector Sum:	29.921 mm/s	

Instantel

Event Report

Date/Time Tran at 10:25:37 December 16, 2020
Trigger Source Geo: 1.000 mm/s, Mic: 115.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 5.0 sec at 1024 sps

Notes

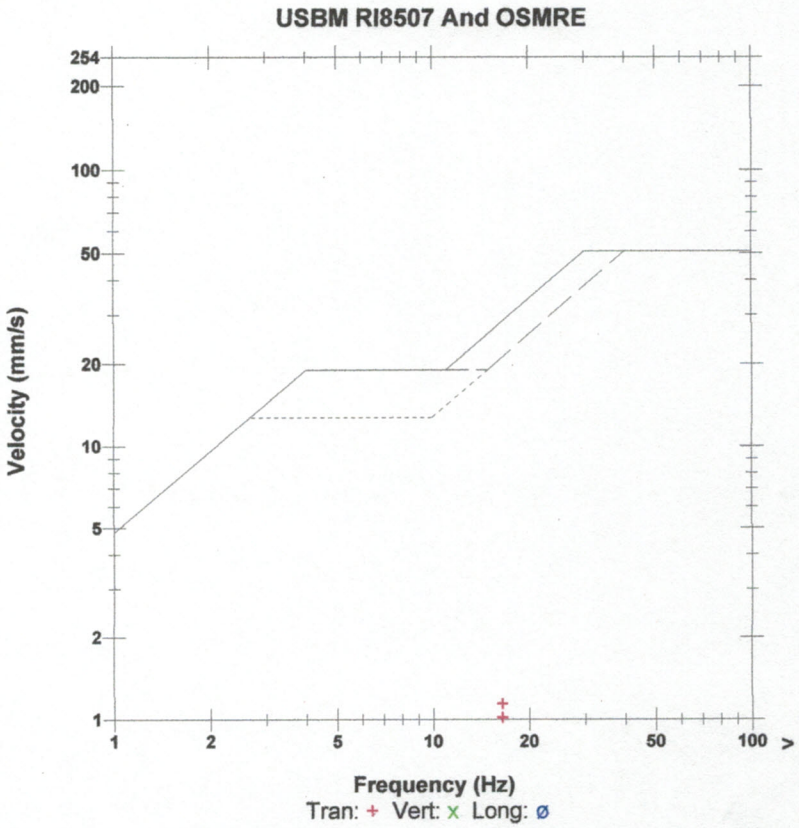
Serial Number BE15589 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration October 28, 2020 by Instantel
File Name Q589IRL6.AP0
Post Event Notes
Geo spiked and weight bagged on frozen front lawn of 1550 Dwire Hill Rd.

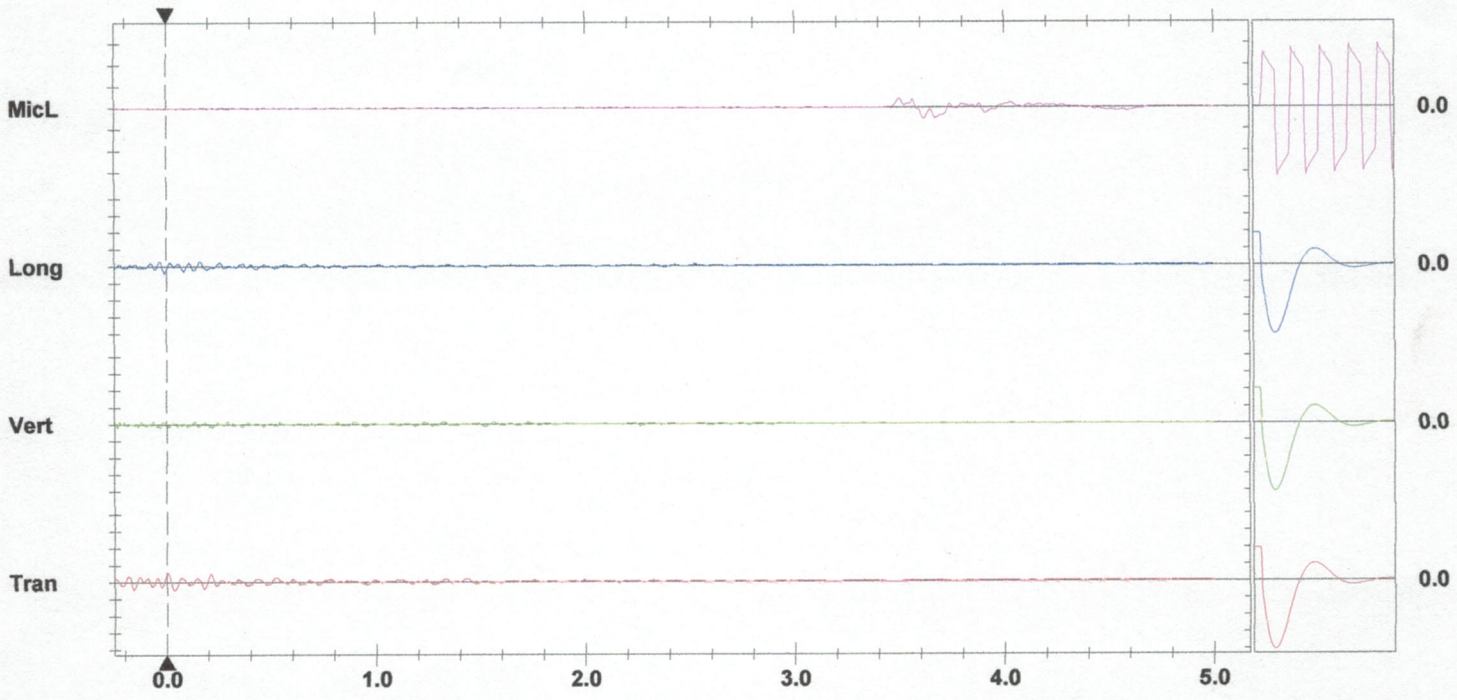
Extended Notes

Microphone Linear Weighting
PSPL 108.4 dB(L) at 3.616 sec
ZC Freq 3.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 583 mv)

	Tran	Vert	Long	
PPV	1.143	0.381	0.762	mm/s
ZC Freq	17	64	22	Hz
Time (Rel. to Trig)	0.003	-0.235	-0.008	sec
Peak Acceleration	0.013	0.013	0.027	g
Peak Displacement	0.011	0.003	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.3	Hz
Overswing Ratio	4.0	4.1	4.5	

Peak Vector Sum 1.178 mm/s at 0.003 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶———◀

Sensor Check

No Trigger

Event Report: Monitor Log - Minimate Blaster # BE15020-Compliance

Start Time	End Time	Status
		SERIAL NUMBER: BE15020
Dec 16 /20 09:21:51	Dec 16 /20 10:43:02	No events recorded. (Keyboard Exit) Geo: 1.000 mm/s Mic: 113.0 dB(L)

Appendix D

EXPLOTECH

Specialists in Explosives, Blasting and Vibration
Consulting Engineers

Robert J. Cyr, P. Eng.

Principal, Explotech Engineering Ltd.

EDUCATION

Bachelor of Applied Science,
Civil Engineering, Queen's University

PROFESSIONAL AFFILIATIONS

Association of Professional Engineers of Ontario (APEO)
Association of Professional Engineers and Geoscientists of BC (APEG)
Association of Professional Engineers, Geologists and Geophysicists of Alberta
Association of Professional Engineers and Geoscientists of New Brunswick
Association of Professional Engineers of Nova Scotia
Association of Professional Engineers and Geoscientists Manitoba
Professional Engineers and Geoscientists Newfoundland and Labrador
International Society of Explosives Engineers (ISEE)
Aggregate Producers Association of Ontario (APAO)
Surface Blaster Ontario Licence 450109

SUMMARY OF EXPERIENCE

Over thirty years experience in many facets of the construction and mining industry has provided the expertise and experience required to efficiently and accurately address a comprehensive range of engineering and construction conditions. Sound technical training is reinforced by formidable practical experience providing the tools necessary for accurate, comprehensive analysis and application of feasible solutions. Recent focus on vibration analysis, blast monitoring, blast design, damage complaint investigation for explosives consumers and specialized consulting to various consulting engineering firms.

PROFESSIONAL RECORD

2001 – Present	-Principal, Explotech Engineering Ltd.
1996 – 2001	-Leo Alarie & Sons Limited - Project Engineer/Manager
1993 – 1996	-Rideau Oxford Developments Inc. – Project Manager
1982 – 1993:	-Alphe Cyr Ltd. – Project Coordinator/Manager

EXPLOTECH

Specialists in Explosives, Blasting and Vibration
Consulting Engineers

Mitch Malcomson, P.Eng.

Explotech Engineering Ltd.

EDUCATION

Bachelor of Engineering,
Civil Engineering with Concentration in Business Management,
Carleton University

PROFESSIONAL AFFILIATIONS

Association of Professional Engineers of Ontario (APEO)
International Society of Explosives Engineers (ISEE)

SUMMARY OF EXPERIENCE

A Civil Engineer and Project Organizer for Explotech Engineering Ltd. Mitch holds a Bachelor of Engineering degree from Carleton University in Civil Engineering with a Concentration in Business Management. Mitch has strong analytical, technical, business and leadership skills. Recent projects have focused on vibration analysis and the drilling and blasting portions of mining, quarrying and construction projects across Canada.

PROFESSIONAL RECORD

2008 – Present - Engineer / Project Manager, Explotech Engineering Ltd.

EXPLOTECH

Specialists in Explosives, Blasting and Vibration
Consulting Engineers

Mark Morelli, B.Eng.

Explotech Engineering Ltd.

EDUCATION

Bachelor of Engineering,
Civil Engineering, Carleton University

PROFESSIONAL AFFILIATIONS

International Society of Explosives Engineers (ISEE)

SUMMARY OF EXPERIENCE

A technician working for Explotech Engineering Ltd., Mark holds a Bachelor of Engineering degree in Civil Engineering and has strong technical, leadership, interpersonal, communication, and presentation skills. Recent focus on blast monitoring, data management, scheduling, job estimations, vibration analysis, damage complaint investigation and attenuation anlysis.

PROFESSIONAL RECORD

2006 – Present - Technician, Explotech Engineering Ltd.

2003 – 2004 - Labourer, Hydracorp Canada Ltd.

2002 – 2003 - Labourer, Quad Construction

Appendix E

EXPLOTECH

Blasting Terminology

ANFO:	Ammonium Nitrate and Fuel Oil – explosive product
ANFO WR:	Water resistant ANFO
Blast Pattern:	Array of blast holes
Body hole:	Those blast holes behind the first row of holes (Face Holes)
Burden:	Distance between the blast hole and a free face
Column:	That portion of the blast hole above the required grade
Column Load:	The portion of the explosive loaded above grade
Collar:	That portion of the blast hole above the explosive column, filled with inert material, preferably clean crushed stone
Face Hole:	The blast holes nearest the free face
Overpressure:	A compressional wave in air caused by the direct action of the unconfined explosive or the direct action of confining material subjected to explosive loading.
Peak Particle Velocity:	The rate of change of amplitude, usually measured in mm/s or in/s. This is the velocity or excitation of the particles in the ground resulting from vibratory motion.
Scaled distance:	An equation relating separation distance between a blast and receptor to the energy (usually expressed as explosive weight) released at any given instant in time.
Sensitive Receptor:	Sensitive land use may include recreational uses which are deemed by the municipality or provincial agency to be sensitive; and/or any building or associated amenity area (i.e. may be indoor or outdoor space) which is not directly associated with the industrial use, where humans or the natural environment may be adversely affected by emissions generated by the operation of a nearby industrial facility. For example, the building or amenity area may be associated with residences, senior citizen homes, schools,

	day care facilities, hospitals, churches and other similar institutional uses, or campgrounds.
Spacing:	Distance between blast holes
Stemming:	Inert material, preferably clean crushed stone applied into the blast hole from the surface of the rock to the surface of the explosive in the blast hole.
Sub-grade:	That portion of the blast hole drilled band loaded below the required grade
Toe Load:	The portion of explosive loaded below grade

EXPLOTECH

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