Memo

HAMMOND RIVER HOLDINGS

To: Mike Cormier, P.Eng. – Director, Authorizations Branch, New Brunswick Department of Environment and Local Government

From: Dan Guest, Hammond River Holdings Ltd.

Cc: Paul Vanderlaan, P.Eng. – Director of the Environmental Impact Assessment Branch, New Brunswick Department of Environment and Local Government

Date: February 24, 2021

Subject: Monthly Report – Upham East Gypsum Quarry, Surface Water Sampling – January 2021

Our File: File # 18-8346

Introduction

This monthly report details activities associated with the operation of the Upham East Gypsum Quarry for the month of January 2021, in accordance with conditions of the Approval to Operate I-10936. As required by the approval to operate, surface water sampling of the watercourse that crosses the site and in the Hammond River began immediately. Refer to the December 2019, and January through December 2020 reports for previous water quality results.

Weekly compliance monitoring in January was conducted as per the following:

- Week 1: January 5, 2021
- Week 2: January 12, 2021
- Week 3: January 21, 2021
- Week 4: January 27, 2021

In January there was one additional sampling event within a day of heavy rain events where there was 25 mm or more of rain over a 24-hour period. This sampling event occurred on January 17, 2021.

Surface Water Sampling – Field Methods

Field parameters were measured using a calibrated turbidity meter and probe. Field parameters are temperature, conductivity, and turbidity. These parameters were measured at three sampling locations as per the Environmental Management Plan (EMP) for Operation (Dillon 2020). All samples were submitted for lab analysis of total suspended solids (TSS).

Surface water samples were collected from three locations (**Figure 1**). They are as follows:

- PDP-1 was collected at the discharge point from the site, which is located before the confluence with the unnamed tributary to the Hammond River. This is the point of compliance;
- SW3 was the background sample. It was collected within the unnamed tributary approximately 100 m upstream from the PDP-1;
- SW5 was collected within the unnamed tributary approximately 100m downstream from PDP-1

Surface water samples were collected using laboratory supplied bottles. The bottles were rinsed three times in the watercourse and then submerged below the water surface. The samples were submitted to

the Research Productivity Council (RPC) in Fredericton, NB. RPC is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for each of the laboratory analytical methods utilized and have in-house QA/QC programs to govern sample analysis and analytical data quality assurance.

Compliance Monitoring Results

Results of the surface water compliance monitoring are provided in **Table 1**. Analytical certificates are attached. The monthly average of grab samples for TSS was calculated for each site, presented in **Table 2**. The monthly averages for TSS were all below the site-specific guideline for each site laid out in the Approval to Operate, displayed in **Figure 2**.

A QA/QC program was implemented to evaluate whether the data collected was of suitable quality to characterize the surface water conditions observed. This program required the collection of field duplicates and the calculation of the relative percent difference (RPD). The calculation method and acceptance level of 40% are discussed in CCME (2016). Two duplicate samples were collected during the January water sampling program on January 5 and 27, 2021. The RPD could not be calculated because all results were below detection (**Table 3**). Therefore, the data satisfies the quality objectives for the monitoring program.

Environmental Accidents and Malfunctions

During the January 2020 monitoring period there was one spill that occurred on January 26, 2021. The spill report is attached.

Ambient Air Quality Monitoring – Total Suspended Particulate

24-hour air samples are collected every 6 days in accordance with the National Air Pollution Surveillance (NAPS) schedule. The air quality monitor used to conduct the monitoring is a BGI PQ100 air sampler, a high-volume sampler for total suspended particulate matter. In January there were 5 air quality monitoring events, January 6, 12, 18, 24, and 30; the results are provided in **Table 4**. None of the air samples collected in January exceed the 120 µg/m^3 maximum permissible ground level concentration of total suspended particulate that is specified in Schedule B of the New Brunswick *Air Quality Regulation – Clean Air Act*.

Blasting

In January there were four blasts, January 8, 14, 15, and 25. There were no exceedances of Approval to Operate limits for maximum velocity and sound pressure. Blast reports are attached.

Public Complaints

Hammond River Holdings did not receive any public complaints during the January 2021 monitoring period.

Summary

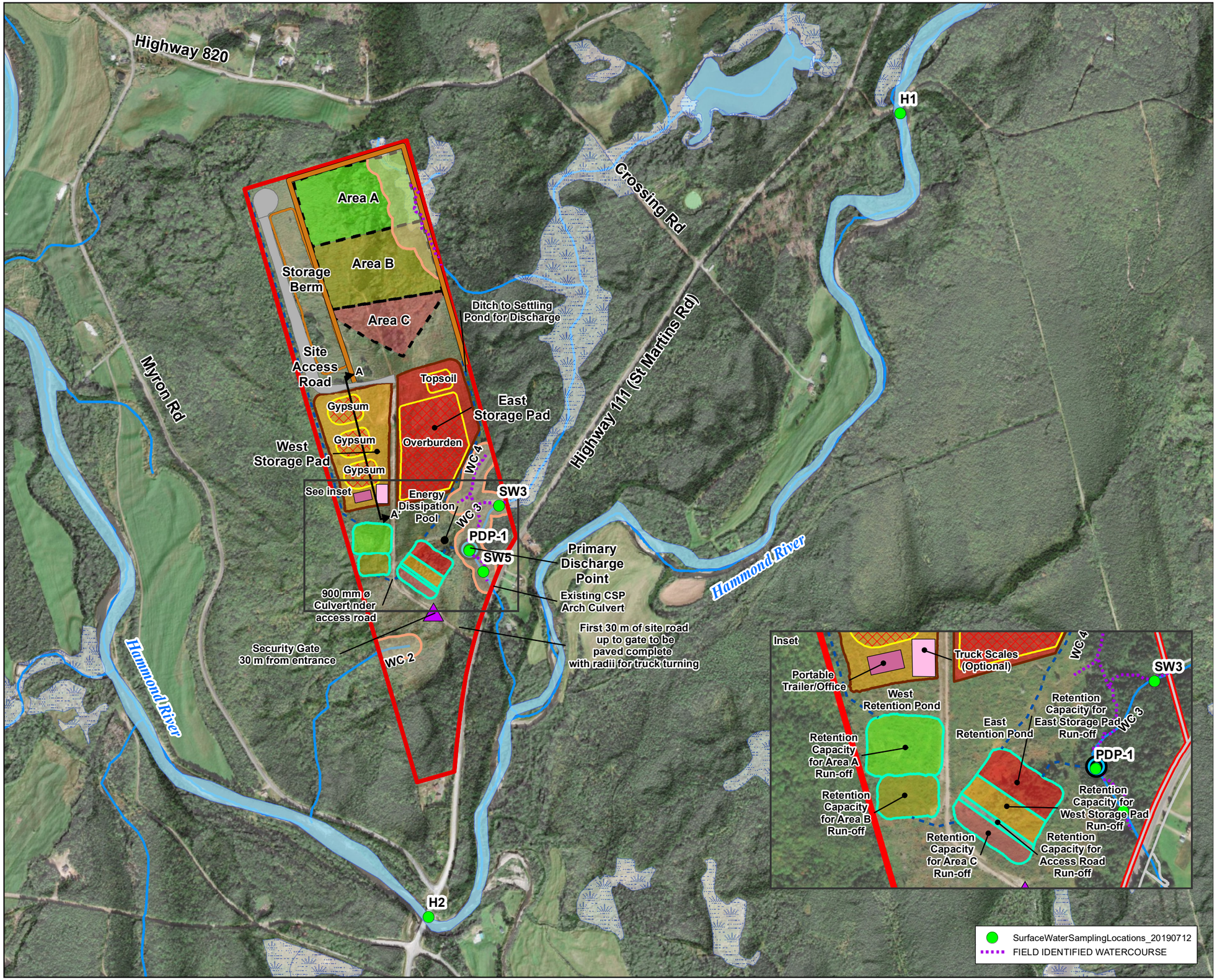
The water chemistry at the discharge point into WC3 is comparable to background. Based on the results provided in **Table 1**, the gypsum extraction activities being conducted on site have not had a negative impact on WC3 and subsequently the Hammond River. All air quality monitoring and blast monitoring returned results below the guidelines for each.

References

Canadian Council of Ministers of the Environment (CCME). 2015. Canadian environmental quality guidelines. Available online at: http://ceqg-rcqe.ccme.ca/en/index.html#void

Canadian Council of Ministers of the Environment (CCME). 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment: Volume 1 Guidance Manual. Canadian environmental quality guidelines. ISBN 978-1-77202-026-7.

Dillon (Dillon Consulting Limited). 2020 Environmental Management Plan (EMP) for Operation. Upham East Gypsum Quarry Project, Upham New Brunswick. Prepared for Hammond River Holdings Limited by Dillon Consulting Limited, Fredericton, New Brunswick. Project 18-8346. June 2020.



HAMMOND RIVER HOLDINGS LIMITED
PROPOSED UPHAM EAST GYPSUM QUARRY

SURFACE WATER SAMPLING LOCATIONS
FIGURE 1

- PROPERTY BOUNDARY
- PROJECT DEVELOPMENT AREA
- WATERBODY
- WATERCOURSE
- REGULATED WETLAND
- 30 METRE WETLAND/WATERCOURSE BUFFER

PROPOSED SITE FEATURES

- DITCH
- TRUCK SCALE (OPTIONAL)
- SITE AREAS
- DISCHARGE POINT
- SECURITY GATE
- PORTABLE TRAILER/OFFICE
- ACCESS ROAD
- STORAGE PAD
- STOCKPILE
- RETENTION POND
- CROSS SECTION
- QUARRY BERM CONSTRUCTED FROM TOPSOIL AND OVERBURDEN (OFFSET MINIMUM 7m FROM PROPERTY BOUNDARY)
- HATCHING INDICATES MATERIAL STOCKPILE AREA ON TOP OF STORAGE PAD

0 50 100 200 m

SCALE 1:8,500

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING LIMITED, CANVEC
SERVICE LAYER CREDITS: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISS TOPO, OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

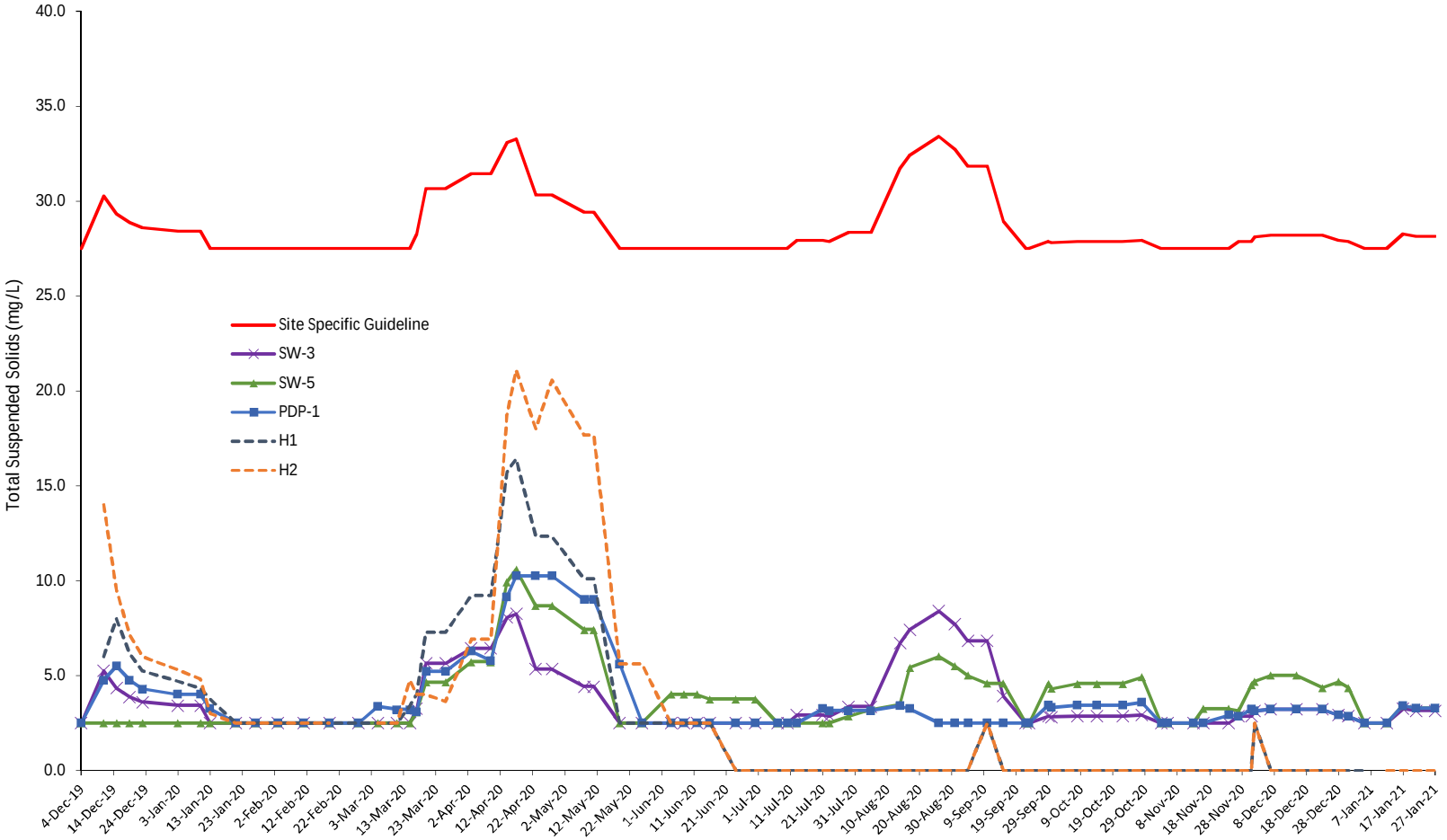
MAP CREATED BY: JH
MAP REVISED BY: JO
MAP CHECKED BY: GA
MAP PROJECTION: NAD_1983_CSRS_NEW_BRUNSWICK_STEREOGRAPHIC

FILE LOCATION: \\DILLON.CA\DILLON_DFS\FREDERICTON\FREDERICTON CAD\CAD\GIS\188346 UPHAM GYPSUM QUARRY\MXD

DILLON CONSULTING

PROJECT: 18-8346
STATUS: DRAFT
DATE: 2020/01/06

Figure 2: TSS Monthly Average



Notes:
The detection limit for TSS is 5 mg/L; for results <5 mg/L, half the detection limit was used.
Monthly average is calculated based on results from the previous 30 days.
Site specific guideline is 25 mg/L above the monthly average.

Table 1
Surface Water Monitoring
Upham East Gypsum Project
Upham, New Brunswick
Project No. 18-8346

Parameter		Ambient Air Temperature[a]	Precipitation 48 hours prior to sample collection[b]	Field Parameters			Laboratory Parameters
				Water Temperature	Specific Conductivity	Turbidity	Total Suspended Solids[c]
Units		°C	mm	°C	mS/cm	NTU	mg/L
Sample ID	Date						
SW-3	05-Jan-21	0.4	0.00	0.9	0.328	8.96	<5
PDP-1	05-Jan-21			0.8	0.400	9.83	<5
PDP-2 (FD)	05-Jan-21			0.8	0.400	9.83	<5
SW-5	05-Jan-21			0.8	0.381	9.71	<5
SW-3	12-Jan-21	-2.2	0.00	0.0	0.444	9.70	<5
PDP-1	12-Jan-21			0.0	0.432	9.88	<5
SW-5	12-Jan-21			0.0	0.433	14.06	<5
SW-3	17-Jan-21	2.60	1.20	0.0	0.798	3.50	7
PDP-1	17-Jan-21			0.0	0.142	2.71	8
SW-5	17-Jan-21			0.0	0.255	1.35	8
SW-3	21-Jan-21	-7.90	0.00	0.0	0.495	10.77	<5
PDP-1	21-Jan-21			0.0	0.435	7.78	<5
SW-5	21-Jan-21			0.4	0.542	5.33	<5
SW-3	27-Jan-21	-0.50	0.00	0.1	0.576	1.45	<5
SW-13 (FD)	27-Jan-21			0.1	0.576	1.45	<5
PDP-1	27-Jan-21			0.0	0.623	2.37	<5
SW-5	27-Jan-21			0.0	0.632	0.94	<5

a) Temperature based on data from the climate station at the Saint John airport. Temperature is the value recorded at 12:00pm on the day of sampling. Data available at: https://climate.weather.gc.ca/historical_data/search_historic_data_e.html

b) Preciptitation based on data from the climate station at the Saint John airport. Data available at: https://climate.weather.gc.ca/historical_data/search_historic_data_e.html

c) Site specific guideline, TSS cannot exceed 25 mg/L above the background monthly average.

SW3 is the background sample for Watercourse 3.

' - ' denotes no guideline, not analyzed, or not applicable; FD = field duplicate.

75 bold/shaded value denotes concentration exceeds CCME criteria or TSS background.

Table 2
Total Suspended Solids - Monthly Average
Upham East Gypsum Project
Upham, New Brunswick
Project No. 18-8346

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	SW5	PDP-1
04-Dec-19	27.5	-	-	2.5	2.5	2.5
11-Dec-19	30.3	6.0	14.0	5.3	2.5	4.8
15-Dec-19	29.3	8.0	9.5	4.3	2.5	5.5
19-Dec-19	28.9	6.2	7.2	3.9	2.5	4.8
23-Dec-20	28.6	5.3	6.0	3.6	2.5	4.3
3-Jan-20	28.4	4.7	5.3	3.4	2.5	4.0
10-Jan-20	28.4	4.3	4.8	3.4	2.5	4.0
13-Jan-20	27.5	3.8	3.0	2.5	2.5	3.3
21-Jan-20	27.5	2.5	2.5	2.5	2.5	2.5
27-Jan-20	27.5	2.5	2.5	2.5	2.5	2.5
3-Feb-20	27.5	2.5	2.5	2.5	2.5	2.5
11-Feb-20	27.5	2.5	2.5	2.5	2.5	2.5
19-Feb-20	27.5	2.5	2.5	2.5	2.5	2.5
28-Feb-20	27.5	2.5	0.0	2.5	2.5	2.5
5-Mar-20	27.5	2.5	2.5	2.5	2.5	3.4
11-Mar-20	27.5	2.5	2.5	2.5	2.5	3.2
15-Mar-20	27.5	3.4	4.8	2.5	2.5	3.2
17-Mar-20	28.3	4.0	4.0	3.3	3.1	3.1
20-Mar-20	30.6	7.3	4.0	5.6	4.6	5.2
26-Mar-20	30.6	7.3	3.6	5.6	4.6	5.2
3-Apr-20	31.4	9.2	6.9	6.4	5.7	6.3
9-Apr-20	31.4	9.2	6.9	6.4	5.7	5.8
14-Apr-20	33.1	15.7	18.8	8.1	9.9	9.1
17-Apr-20	33.3	16.4	21.1	8.3	10.6	10.3
23-Apr-20	30.3	12.3	18.0	5.3	8.7	10.3
28-Apr-20	30.3	12.3	20.6	5.3	8.7	10.3
8-May-20	29.1	9.0	15.5	4.1	6.7	8.1
11-May-20	29.1	9.0	15.5	4.1	6.7	8.1
19-May-20	27.5	2.5	5.1	2.5	2.5	5.1
26-May-20	27.5	2.5	5.1	2.5	2.5	2.5
4-Jun-20	27.5	2.5	2.5	2.5	10.0	2.5
8-Jun-20	27.5	2.5	2.5	2.5	2.5	2.5
12-Jun-20	27.5	2.5	2.5	2.5	2.5	2.5
16-Jun-20	27.5	2.5	2.5	2.5	2.5	2.5
24-Jun-20	27.5	-	-	2.5	2.5	2.5
30-Jun-20	27.5	-	-	2.5	2.5	2.5
7-Jul-20	27.5	-	-	2.5	2.5	2.5
10-Jul-20	27.5	-	-	2.5	2.5	2.5

Table 2
Total Suspended Solids - Monthly Average
Upham East Gypsum Project
Upham, New Brunswick
Project No. 18-8346

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	SW5	PDP-1
13-Jul-20	27.9	-	-	5.0	2.5	2.5
21-Jul-20	27.9	-	-	2.5	2.5	7.0
23-Jul-20	27.8	-	-	2.5	2.5	2.5
29-Jul-20	28.3	-	-	6	5	2.5
5-Aug-20	28.4	-	-	3.4	3.2	3.1
14-Aug-20	31.7	-	-	6.7	3.5	3.4
17-Aug-20	32.4	-	-	7.4	5.4	3.3
26-Aug-20	33.4	-	-	8.4	6.0	2.5
31-Aug-20	32.7	-	-	7.7	5.5	2.5
4-Sep-20	31.8	-	-	6.8	5.0	2.5
10-Sep-20	31.8	2.5	2.5	6.8	4.6	2.5
15-Sep-20	28.9	-	-	3.9	4.6	2.5
22-Sep-20	27.5	-	-	2.5	2.5	2.5
23-Sep-20	27.5	-	-	2.5	2.5	2.5
29-Sep-20	27.9	-	-	2.9	4.6	3.4
30-Sep-20	27.8	-	-	2.8	4.3	3.3
8-Oct-20	27.9	-	-	2.5	2.5	2.5
14-Oct-20	27.9	-	-	2.5	2.5	2.5
22-Oct-20	27.9	-	-	2.5	2.5	2.5
28-Oct-20	27.9	-	-	2.5	2.5	2.5
3-Nov-20	27.5	-	-	2.5	2.5	2.5
5-Nov-20	27.5	-	-	2.5	2.5	2.5
13-Nov-20	27.5	-	-	2.5	2.5	2.5
16-Nov-20	27.5	-	-	2.5	7.0	2.5
24-Nov-20	27.5	-	-	2.5	2.5	5.0
27-Nov-20	27.9	-	-	5	2.5	2.5
1-Dec-20	27.9	-	-	2.9	4.5	3.2
2-Dec-20	28.1	2.5	2.5	3.1	4.7	3.1
7-Dec-20	28.2	-	-	3.2	5.0	3.2
15-Dec-20	28.2	-	-	3.2	5.0	3.2
23-Dec-20	28.2	-	-	3.2	4.4	3.2
28-Dec-20	27.9	-	-	2.9	4.7	2.9
31-Dec-20	27.9	-	-	2.9	4.4	2.9
5-Jan-21	27.5	-	-	27.5	2.5	2.5
12-Jan-21	27.5	-	-	27.5	2.5	2.5
17-Jan-21	28.3	-	-	28.3	3.4	3.4
21-Jan-21	28.1	-	-	28.1	3.3	3.3
27-Jan-21	28.1	-	-	28.1	3.3	3.3

Notes:
The detection limit for TSS is 5 mg/L; for results <5 mg/L, half the detection limit was used.
Dashed line indicates monthly average could not be calculated.
Site specific guideline is 25 mg/L above the monthly average.
Monthly average is calculated based on results from the previous 30 days.
The background sample is SW3.
Samples above the site specific guideline are bolded in red.

Table 3
Surface Water Monitoring - QA/QC Results
Upham East Gypsum Project
Upham, New Brunswick
Project No. 18-8346

Parameter		Total Suspended Solids
Units		mg/L
Sample ID	Date	
PDP-1	05-Jan-21	<5
PDP-2	05-Jan-21	<5
RPD value		-
SW3	27-Jan-21	<5
SW13	27-Jan-21	<5
RPD value		-

RPD calculations and acceptance criteria based on CCME (2016).

' - ' denotes RPD could not be calculated because one or more parameters was below detection limit.

75 bold/shaded value denotes RPD above criteria of 40%.

Table 4
Air Quality Reporting
Upham East Gypsum Quarry

Test Start	Time	Duration	Flow Rate (L/min)	Air Volume (m^3)	Pressure (mm Hg)	Temperature (°C)	Initial Filter Weight (g)	Final Filter Weight (g)	TSP Mass (µg)	TSP (µg/m3)	Site Guideline (µg/m^3)
2020-07-22	14:51	24 hours	16.70	24.05	752	20.3	14.8415	14.8645	23000	39.848	120
2020-07-28	23:59	24 hours	16.46	23.70	747	24.4	14.8261	14.8278	1700	2.989	120
2020-08-04	13:55	24 hours	16.66	23.99	753	22.8	14.8264	14.8295	3100	5.384	120
2020-08-09	23:59	24 hours	16.74	24.10	752	21.2	14.8422	14.8444	2200	3.804	120
2020-08-15	23:59	24 hours	16.88	24.30	754	19.8	14.8243	14.8359	11600	19.890	120
2020-08-21	23:59	24 hours	16.87	24.30	749	17.9	14.8394	14.8415	2100	3.601	120
2020-08-27	23:59	24 hours	17.06	24.57	743	12.4	14.8233	14.8450	21700	36.800	120
2020-09-02	23:59	24 hours	16.75	24.12	747	18.8	14.8417	14.8614	19700	34.031	120
2020-09-08	23:59	24 hours	17.02	24.51	759	19.1	14.8585	14.8706	12100	20.570	120
2020-09-14	23:59	24 hours	17.62	25.37	756	8.0	14.8275	14.8368	9300	15.274	120
2020-09-20	23:59	24 hours	18.03	25.97	764	4.8	14.8349	14.8520	17100	27.436	120
2020-09-26	23:59	24 hours	17.10	24.62	753	15.3	14.8561	14.8594	3300	5.585	120
2020-10-02	23:59	24 hours	14.43	25.10	753	9.6	14.9721	14.9593	-12800	-21.248	120
2020-10-08	23:59	24 hours	17.69	25.48	748	3.8	14.8606	14.8894	28800	47.096	120
2020-10-14	23:59	24 hours	17.56	25.29	753	7.8	14.8828	14.8911	8300	13.675	120
2020-10-20	23:59	19:31	17.63	20.66	760	9.1	14.8749	14.8578	-17100	-34.487	120
2020-10-23	23:59	21:55	17.34	22.82	750	10.1	14.8592	14.8648	5600	11.195	120
2020-10-26	23:59	21:02	17.71	22.35	752	4.8	14.8541	14.8642	10100	21.519	120
2020-11-01	23:59	24 hours	17.19	24.75	732	5.9	14.8729	14.8802	7300	12.290	120
2020-11-07	23:59	24 hours	17.84	25.68	759	5.9	14.8692	14.8723	3100	5.030	120
2020-11-13	23:59	24 hours	17.79	25.62	748	1.9	14.8600	14.8606	600	0.976	120
2020-11-19	23:59	24 hours	17.63	25.22	756	7.3	14.8476	14.8498	2200	3.635	120
2020-11-25	23:59	24 hours	17.83	25.68	756	4.4	14.8496	14.8563	6700	10.871	120
2020-12-01	23:59	24 hours	17.48	25.18	748	7.0	14.8427	14.8610	18300	30.282	120
2020-12-07	23:59	24 hours	17.88	25.75	740	-2.1	14.8343	14.8362	1900	3.074	120
2020-12-13	23:59	24 hours	17.98	25.90	746	-1.3	14.8306	14.8389	8300	13.353	120
2020-12-19	23:59	24 hours	18.37	26.45	756	-3.6	14.8373	14.8430	5700	8.979	120
2020-12-25	23:59	24 hours	17.34[a]	22.82[a]	753[a]	12.3[a]	14.8400	14.8500	10000	18.259	120
2020-12-31	23:59	24 hours	18.58	26.76	759	-5.8	14.8452	14.8500	4800	7.474	120
2021-01-06	23:59	24 hours	18.00	24.73	744	-2.7	14.8360	14.8523	16300	27.463	120
2021-01-12	23:59	24 hours	16.70	24.74	749	-6.7	14.8542	14.8724	18200	30.652	120
2021-01-18	23:59	24 hours	17.52	25.52	737	-0.8	14.8681	14.8767	8600	14.041	120
2021-01-24	23:59	24 hours	16.70	24.03	737	-8.0	14.8231	14.8273	4200	7.283	120
2021-01-30	23:59	24 hours	16.70	24.03	750	-11.2	14.8290	14.8326	3600	6.242	120

Notes

24 hour sample collected by BGI PQ-100 air sampler every sixth day for the duration of the quarry operation each year.

a) Values were not recorded; temperature and pressure calculated based on Environment Canada data recorded at the Saint John airport weather station. Flow rate and Air Volume were approximated based on a previous day's recording with similar temperature and pressure.

SPILL REPORT FORM

IDENTIFICATION

Spill Date: 01. 26. 2021		**Time:** 8:18	
Location: UPHAM QUARRY			
Civic Address of Incident: 4119 ROUTE 111 UPPERTON NB			
Field Contact: RICK HATTY		**Phone Number:** (506) 647-3730	

SPILL NOTIFICATION

☑ **Supervisor** (During working hours) - **Name (specify):** RICK HATTY	
☐ **Department of Environment** (During working hours) **Saint John Region – 506.658.2558**	
☐ **Coast Guard – 800.565.1633**	

SPILL INFORMATION

Product Spilled:	☐ Transformer Oil ☑ Hydraulic Fluid ☐ Other (specify):	Quantity (L): Quantity (L): > 10L Quantity (L):	
Equipment:	☐ Pole-top transformer ☑ Heavy Equipment ☐ Vehicle ☐ Other (specify):	**Serial / ID1 Number:** BH 746 ROCK TRUCK ***Year of Manufacture:**	
Environmental Impact:		**YES**	**NO**
	Watercourse within 100 m	☐	☑
	Domestic well within 100 m	☐	☑
Cause and additional detail:	BLOWN HYDRAULIC HOSE		

Samples sent to RPC laboratory for analysis (Address: 921 College Hill Rd, Fredericton, 506.452.1212)

- ☐ Oil (from equipment): _____ ppm
- ☐ Soil (unable to sample equipment): _____ ppm
- ☐ Other (watercourse): _____ ppm

ADDITIONAL INFORMATION

	YES	NO
Is source of spill stopped?	☑	☐
Is spill contained?	☑	☐
Is spill cleaned-up?	☑	☐

EXTERNAL RESOURCES / INSPECTORS (if applicable)

	YES	NO	If "yes", indicate Name, Date and Time
Environment Inspector on-site	☐	☑	
Contractor used for clean-up	☑	☐	GULF OPERATORS
Site Professional used for remediation support	☐	☑	

APPROVAL AND REVIEW

Initiator DAN GUEST	Signature:	Date Prepared: 01.27.2021
Supervisor/Manager DAN GUEST	Signature: Comments: Spill kit and spill response supplies replenished?	Date Reviewed: 01.27.2021 ☑ YES ☐ NO
EMS Coordinator	Signature:	Date Completed:

Conquest Engineering
Experience commitment.
Geotechnical and Materials Engineers

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Bedford

January 10, 2021

Project No.: 21S003.00

Mr. Daniel Guest
Hammond River Holdings
Via email: Guest.Daniel@AtlanticWallboard.com

Re: Blast Vibration Monitoring – Blast No. 2021-01 – Upham East Gypsum Quarry, Upham, N.B.

Following are the results of the vibration monitoring carried out on behalf of Hammond River Holdings for the blast detonated at 14:07 on January 8, 2021. For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2021-01 – January 8, 2021

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4079 Route 111 (PW-09)	14:07	1,220 m S	< 0.5 mm/s	< 120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		795 m S	< 0.5 mm/s	< 120	
3. Civic No. 4150 Route 111 (PW-13)		621 m S	0.51 mm/s @ 57 Hz	112	-
4. Civic No. 2447 Route 820 (PW-07)		935 m NE	< 0.5 mm/s	< 120	Units were not triggered
5. PW-03 - Route 820		737 m N	< 0.5 mm/s	< 120	
6. Civic No. 2341 Route 820 (PW-05)		778 m NW	< 0.5 mm/s	< 120	
7. Civic No. 50 Myron Road (PW-15)		1,050 m NW	< 0.5 mm/s	< 120	
8. Civic No. 86 Myron Road (PW-16)		905 m W	0.51 mm/s @ 37 Hz	106	-
9. Civic No. 220 Myron Road (PW-01)		1,310 m S	< 0.5 mm/s	< 120	Units were not triggered
10. Civic No. 4140 Route 111 (PW-12)		732 m S	< 0.5 mm/s	< 120	
11. Civic No. 2337 Route 820 (PW-04)		861 m NW	< 0.5 mm/s	< 120	
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

The monitors did not detect any vibrations that exceeded the maximum allowable peak particle velocity of 12.5 mm/s (1.25 cm/s) or the maximum air overpressure of 128 dB(L) as established in the Approval to Operate (I-10936).

We trust this information is sufficient at this time. If you have any questions, please do not hesitate to contact us.

Best regards,
CONQUEST ENGINEERING LTD.

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Geotechnical Engineer

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'50.5" E 65º37'55.5"		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	4,787 tonnes
Weather at time of Blast:	Overcast	**Air Temp.:**	-3ºC
Est. Wind Speed :	≈15 km/h	**Wind Direction:**	SE
Cloud Cover:	Yes – Overcast	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	49	**Hole Diameter:**	4.5"
Average Depth:	4.4 – 5 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	2	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	42 ms
Initiation Method:	Non-electric		
Weight of Explosives per Delay:	Max.: 24 kg		
Type and weight of Explosives for Blast:	753 kg – BLASTGEL 1070		

Sketch of shot location, hole layout, timing sequence, free face etc. if available.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	621 m
Direction to the Nearest Structure:	Southeast
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	126.8

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

Reviewed By: Robert Y. Cyr, M.A.Sc., P.Eng.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	October 22, 2020
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,220 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	795 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	621 m South
Transverse Particle Velocity:	0.25 mm/s @ 17 Hz
Vertical Particle Velocity:	0.51 mm/s @ 57 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ 43 Hz
Peak Particle Velocity:	0.51 mm/s @ 57 Hz
Maximum Airblast:	112 dB(L)

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5960
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	935 m Northeast
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5676
Calibration Date:	February 26, 2020
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	737 m North
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	778 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	1,050 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	905 m West
Transverse Particle Velocity:	0.38 mm/s @ 18 Hz
Vertical Particle Velocity:	0.51 mm/s @ 37 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ 17 Hz
Peak Particle Velocity:	0.51 mm/s @ 37 Hz
Maximum Airblast:	106 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5372
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,310 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	732 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 8, 2021
Project No.:	21S003.00	**Time of Blast:**	14:07
Inspector:	L. Boyd	**Blast No.:**	2021-01
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5673
Calibration Date:	February 28, 2020
Location of seismograph:	Civic No. 2337 Route 820 (PW-04)
Distance and Direction from Blast:	861 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Blast and Seismograph Location Plan
Blast No: 2021-01
Upham East Gypsum Quarry, Upham, NB

Date: January 8, 2021
CEL Project No.: 21S003.00

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Event Report

Date/Time Vert at 14:07:18 January 8, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 120.0 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

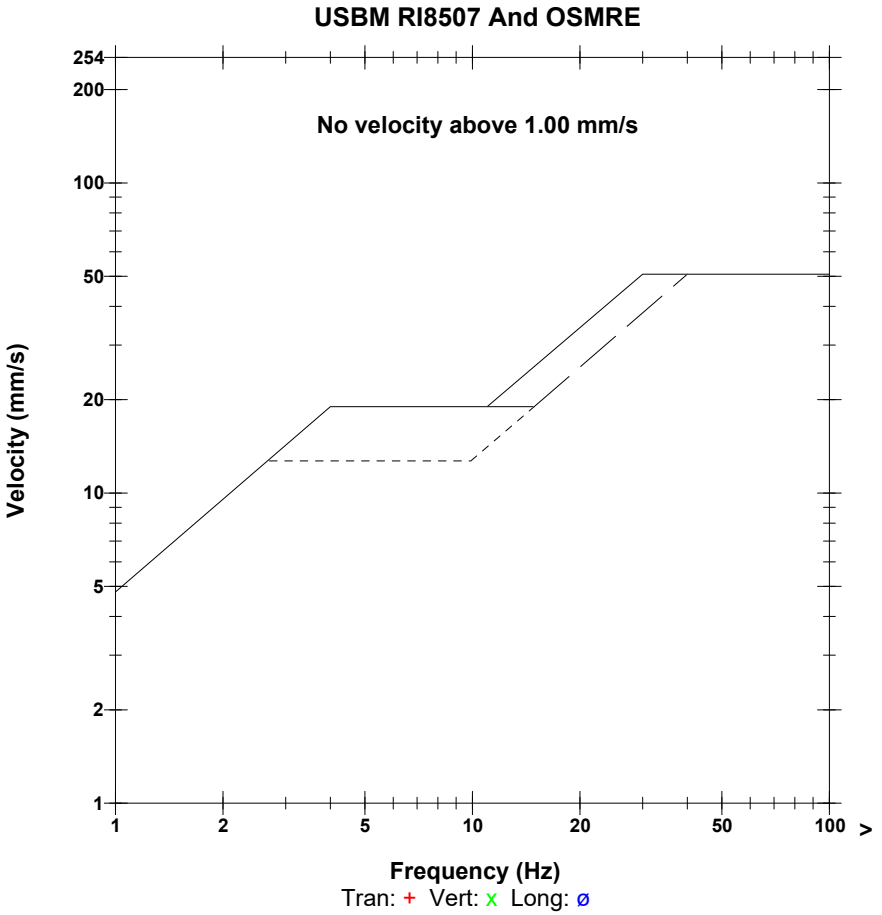
Notes
Location:
Client:
User Name:
Converted: January 8, 2021 16:35:03 (V8.01)

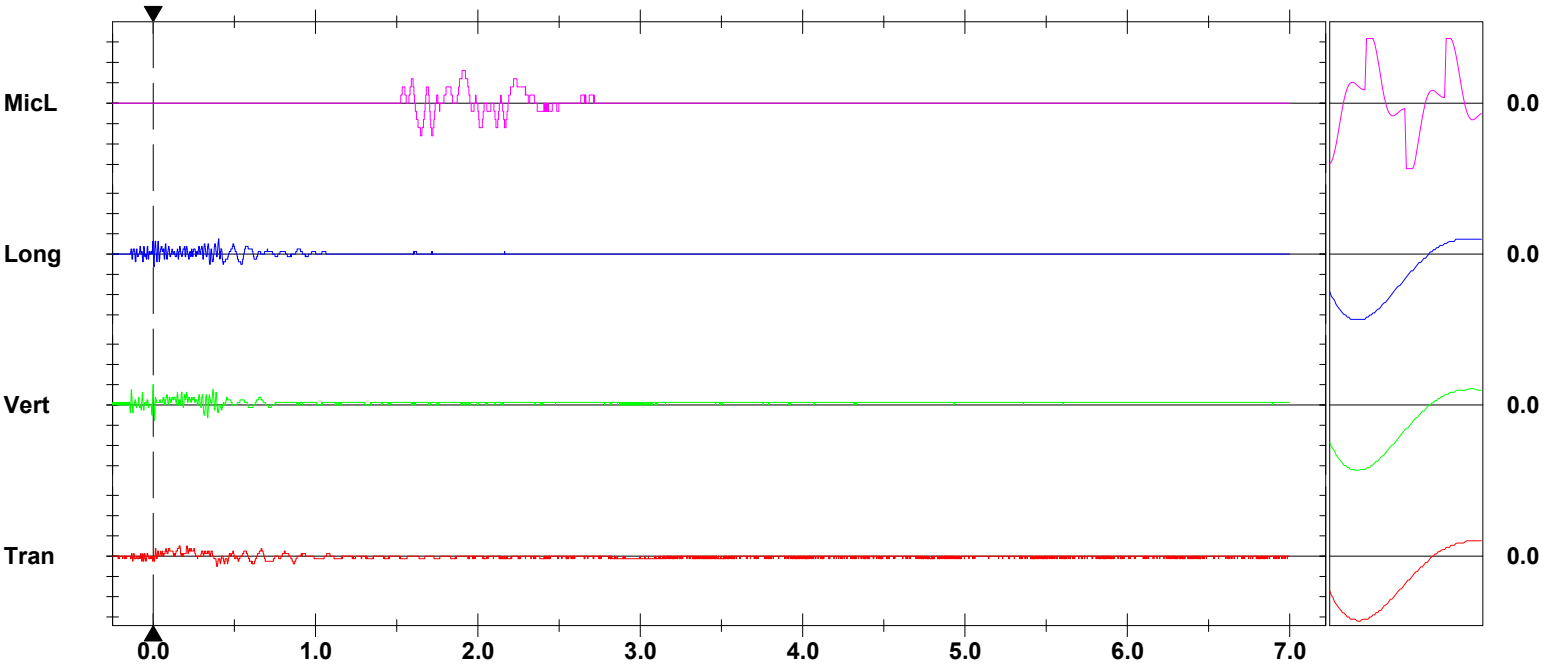
Serial Number 5489 V 2.61 MiniMate
Battery Level 5.9 Volts
Unit Calibration May 15, 2020 by Instantel
File Name G489ISTW.K60
Post Event Notes
Location of Seismograph: Civic Number 4150 Route 111 (PW-13)
Blast No.: 2021-01
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 1.647 sec
ZC Freq 8.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 270 mv)

	Tran	Vert	Long	
PPV	0.254	0.508	0.381	mm/s
ZC Freq	17	57	43	Hz
Time (Rel. to Trig)	0.160	0.001	0.403	sec
Peak Acceleration	0.013	0.020	0.020	g
Peak Displacement	0.001	0.001	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.7	7.8	Hz
Overswing Ratio	4.1	4.0	4.2	

Peak Vector Sum 0.572 mm/s at 0.000 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:07:11 January 8, 2021
Trigger Source Geo: 0.510 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps

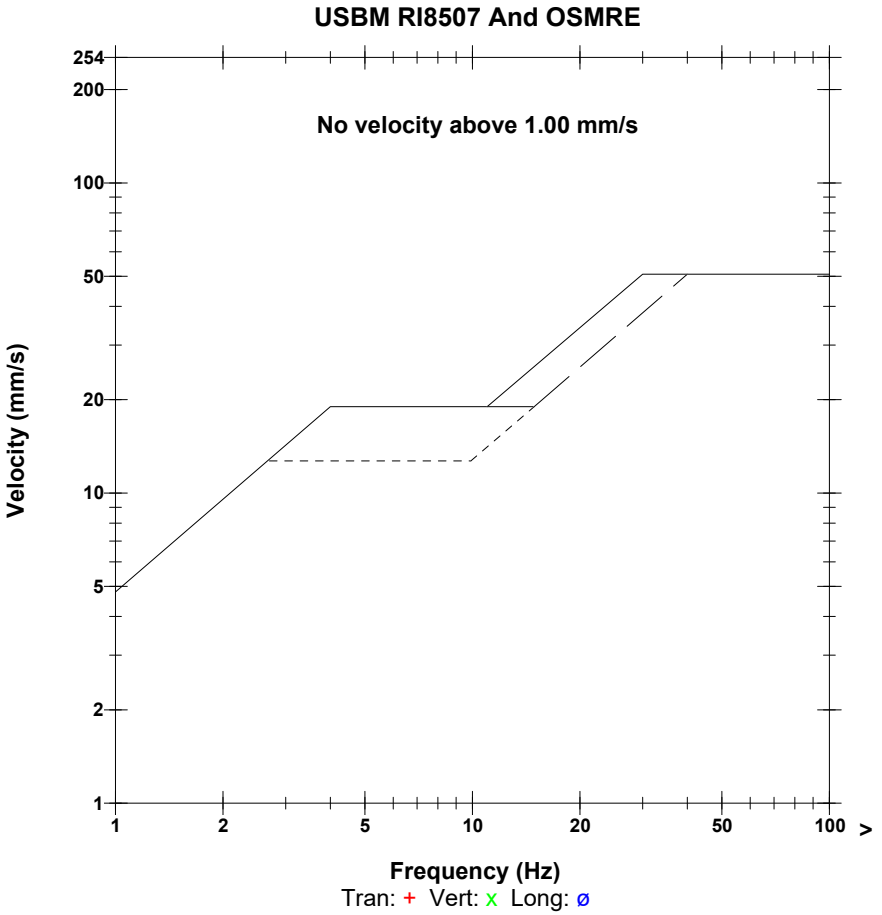
Notes

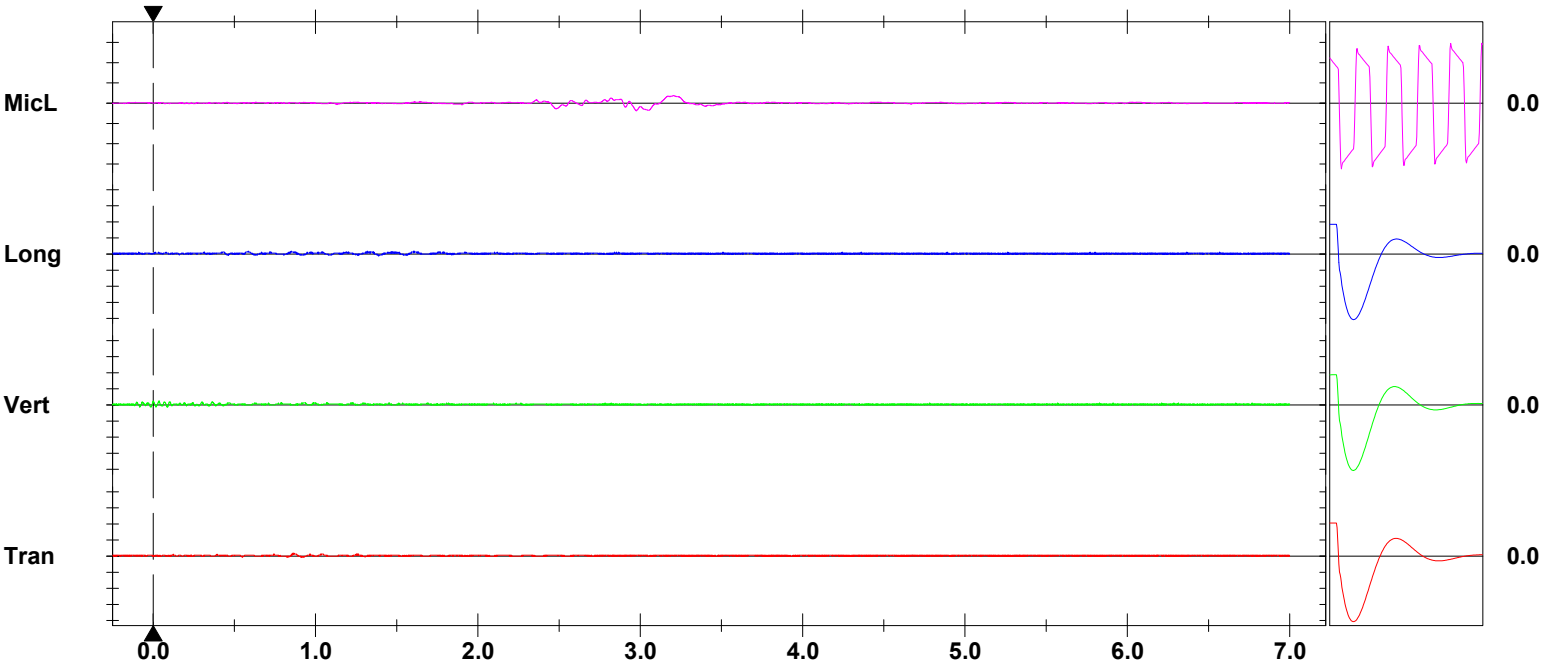
Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 5.9 Volts (Battery Low)
Unit Calibration June 12, 2020 by Instantel
File Name W348ISS1.VZ0
Post Event Notes
Location of Seismograph: Civic Number 86 Myron Road (PW-16)
Blast No.: 2021-01
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 105.5 dB(L) 3.750 pa.(L) at 2.975 sec
ZC Freq 3.5 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 758 mv)

	Tran	Vert	Long	
PPV	0.381	0.508	0.381	mm/s
ZC Freq	18	37	17	Hz
Time (Rel. to Trig)	0.859	0.000	0.586	sec
Peak Acceleration	0.013	0.027	0.027	g
Peak Displacement	0.004	0.002	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.7	7.3	Hz
Overswing Ratio	3.7	3.6	4.4	

Peak Vector Sum 0.524 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 Sensor Check
Trigger =

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January 14, 2021

Project No.: 21S003.00

Mr. Daniel Guest
Hammond River Holdings
Via email: Guest.Daniel@AtlanticWallboard.com

Re: Blast Vibration Monitoring – Blast No. 2021-02 – Upham East Gypsum Quarry, Upham, N.B.

Following are the results of the vibration monitoring carried out on behalf of Hammond River Holdings for the blast detonated at 14:00 on January 14, 2021. For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2021-02 – January 14, 2021

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4079 Route 111 (PW-09)	14:00	1,310 m S	< 0.5 mm/s	< 120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		905 m S	< 0.5 mm/s	< 120	
3. Civic No. 4150 Route 111 (PW-13)		758 m S	< 0.5 mm/s	< 120	
4. Civic No. 2447 Route 820 (PW-07)		936 m NE	< 0.5 mm/s	< 120	
5. PW-03 - Route 820		638 m N	< 0.5 mm/s	< 120	
6. Civic No. 2341 Route 820 (PW-05)		651 m NW	1.02 mm/s @ 51 Hz	112	-
7. Civic No. 50 Myron Road (PW-15)		899 m NW	0.64 mm/s @ 43 Hz	114	-
8. Civic No. 86 Myron Road (PW-16)		794 m W	0.64 mm/s @ 32 Hz	112	-
9. Civic No. 220 Myron Road (PW-01)		1,320 m S	< 0.5 mm/s	< 120	Units were not triggered
10. Civic No. 4140 Route 111 (PW-12)		851 m S	< 0.5 mm/s	< 120	
11. Civic No. 2337 Route 820 (PW-04)		724 m NW	< 0.5 mm/s	< 120	
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

The monitors did not detect any vibrations that exceeded the maximum allowable peak particle velocity of 12.5 mm/s (1.25 cm/s) or the maximum air overpressure of 128 dB(L) as established in the Approval to Operate (I-10936).

We trust this information is sufficient at this time. If you have any questions, please do not hesitate to contact us.

Best regards,
CONQUEST ENGINEERING LTD.

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Geotechnical Engineer

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'53.3" E 65º38'01.4"		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	13,525 tonnes
Weather at time of Blast:	Overcast	**Air Temp.:**	1ºC
Est. Wind Speed :	≈5 km/h	**Wind Direction:**	W
Cloud Cover:	Yes – Overcast	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	91	**Hole Diameter:**	5.5"
Average Depth:	4.2 – 7.3 m	**Spacing:**	12 ft x 12 ft
No. Holes per Delay:	2	**Collar Length:**	8 ft
Delay between Holes:	25 ms	**Delay between Rows:**	84 ms
Initiation Method:	Non-electric		
Weight of Explosives per Delay:	Max.: 98 kg		
Type and weight of Explosives for Blast:	4,702 kg – Titan XL 1000		

Sketch of shot location, hole layout, timing sequence, free face etc. if available.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	638 m
Direction to the Nearest Structure:	North
Structure Type:	Cottage
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	64.4

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No
If Yes, Describe:	
Misfire (yes or no):	No

Reviewed By: Robert Y. Cyr, M.A.Sc., P.Eng.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	October 22, 2020
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,310 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	905 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5676
Calibration Date:	February 26, 2020
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	758 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	936 m Northeast
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	March 26, 2020
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	638 m North
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5673
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	651 m Northwest
Transverse Particle Velocity:	0.51 mm/s @ 34 Hz
Vertical Particle Velocity:	1.02 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ 24 Hz
Peak Particle Velocity:	1.02 mm/s @ 51 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	899 m Northwest
Transverse Particle Velocity:	0.64 mm/s @ 43 Hz
Vertical Particle Velocity:	0.64 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 64 Hz
Peak Particle Velocity:	0.64 mm/s @ 43 Hz
Maximum Airblast:	114 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	794 m West
Transverse Particle Velocity:	0.25 mm/s @ >100 Hz
Vertical Particle Velocity:	0.64 mm/s @ 32 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ 51 Hz
Peak Particle Velocity:	0.64 mm/s @ 32 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5372
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,320 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5960
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	851 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 14, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	L. Boyd	**Blast No.:**	2021-02
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	June 24, 2020
Location of seismograph:	Civic No. 2337 Route 820 (PW-04)
Distance and Direction from Blast:	724 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Blast and Seismograph Location Plan
Blast No: 2021-02
Upham East Gypsum Quarry, Upham, NB

Date: January 14, 2021
CEL Project No.: 21S003.00

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Event Report

Date/Time Vert at 14:00:14 January 14, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 120.0 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

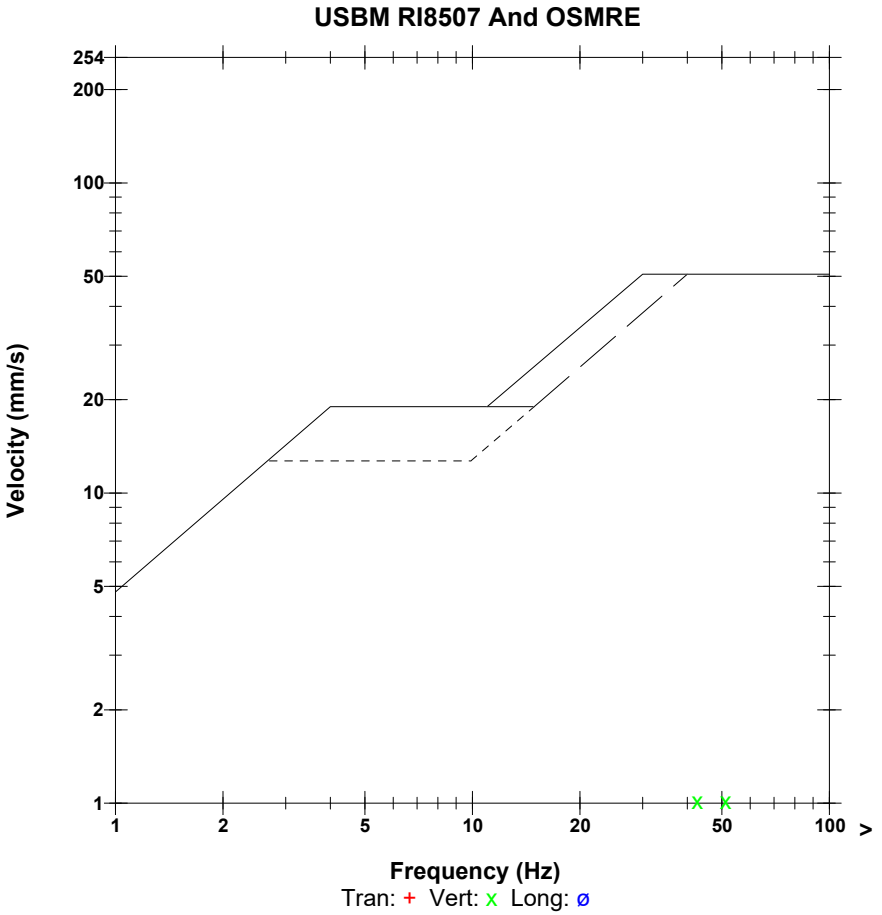
Notes
Location:
Client:
User Name:
Converted: January 14, 2021 17:13:59 (V8.01)

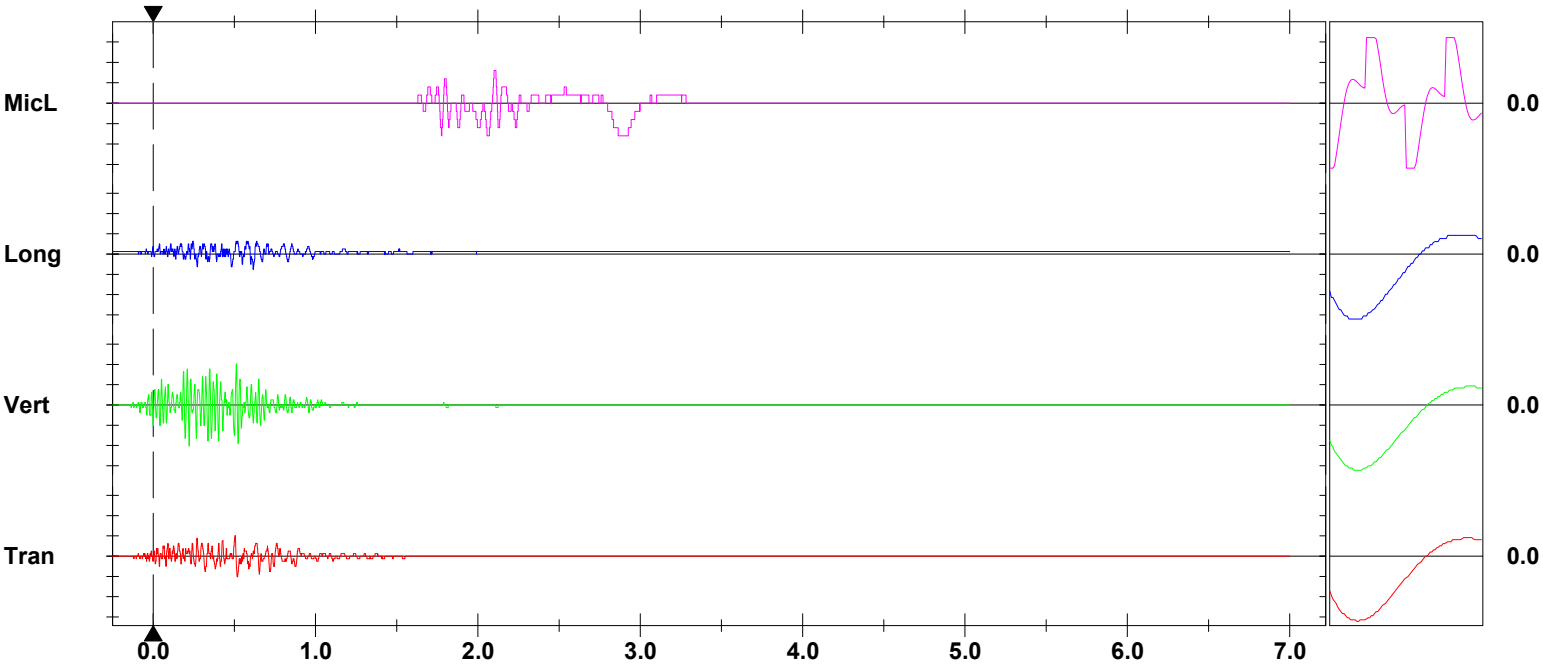
Serial Number 5673 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration February 28, 2020 by Instantel
File Name G673IT50.8E0
Post Event Notes
Location of Seismograph: Civic Number 2341 Route 820 (PW-05)
Blast No.: 2021-02
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 1.776 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	0.508	1.016	0.381	mm/s
ZC Freq	34	51	24	Hz
Time (Rel. to Trig)	0.505	0.223	0.617	sec
Peak Acceleration	0.013	0.033	0.013	g
Peak Displacement	0.003	0.004	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	8.0	8.5	Hz
Overswing Ratio	3.7	3.6	3.8	

Peak Vector Sum 1.080 mm/s at 0.514 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:00:10 January 14, 2021
Trigger Source Geo: 0.510 mm/s
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps

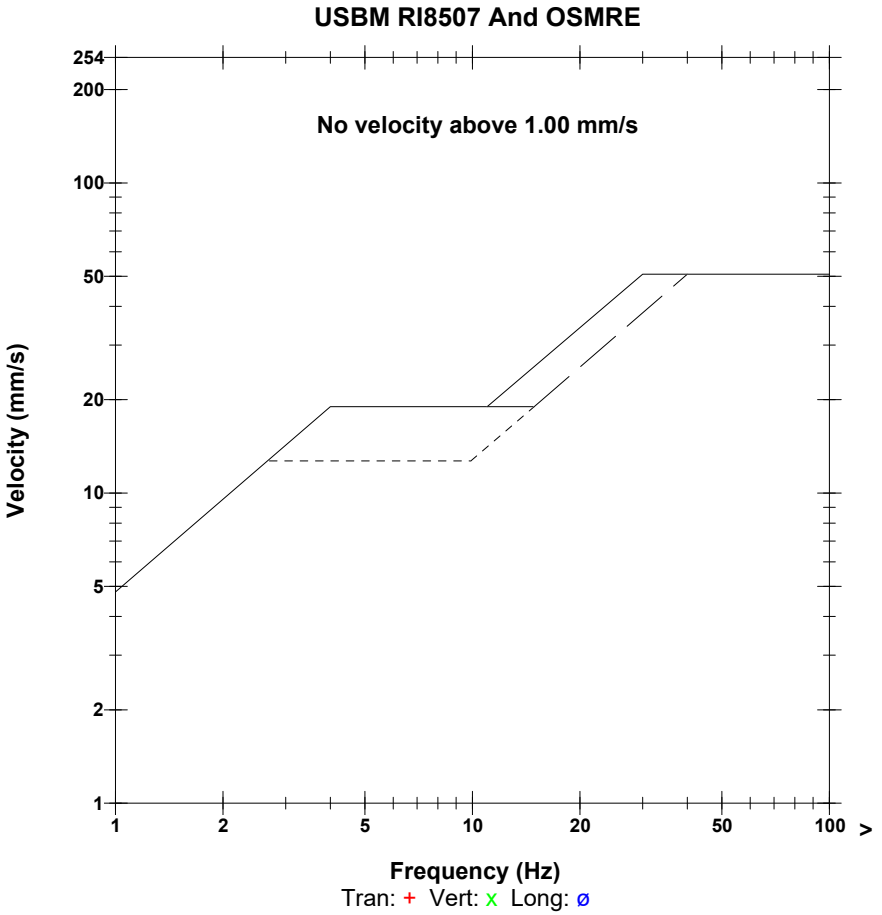
Notes

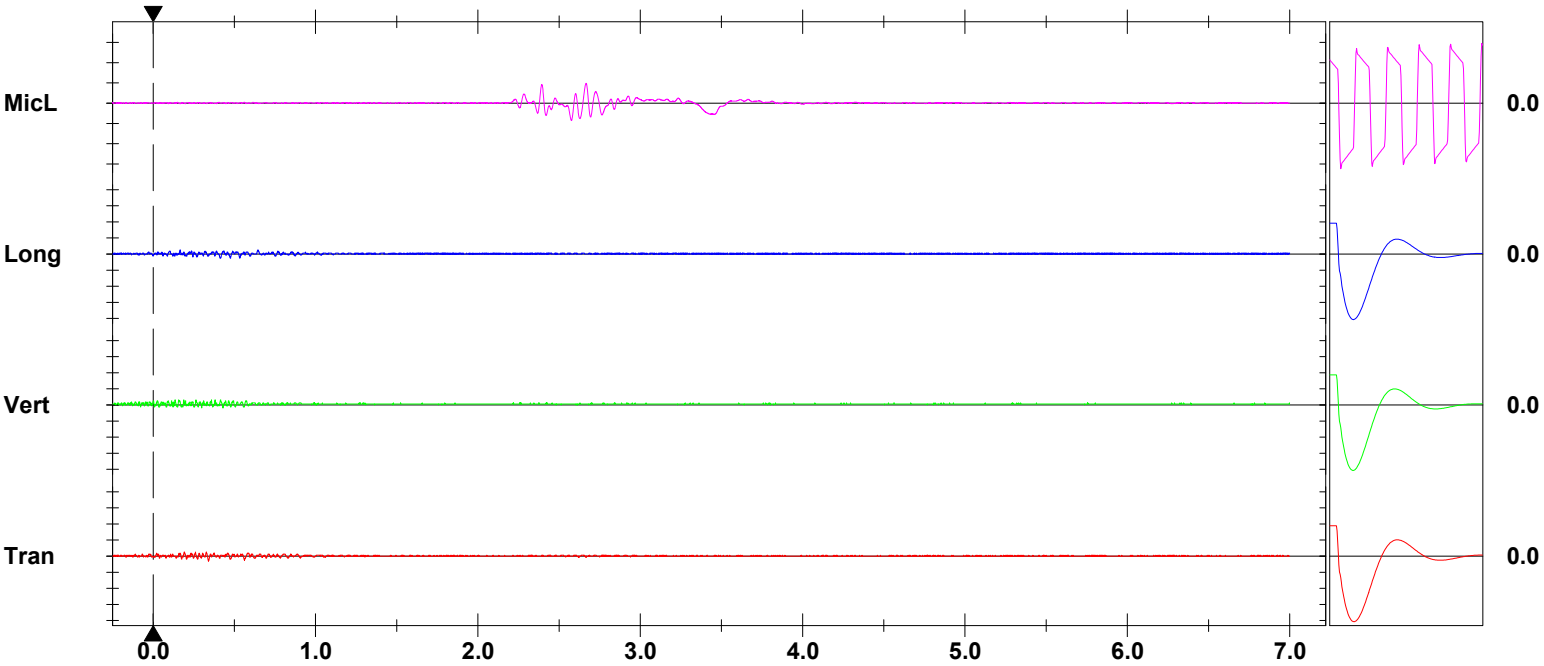
Serial Number BE21349 V 10.72-1.1 Minimate Blaster
Battery Level 6.1 Volts
Unit Calibration June 12, 2020 by Instantel
File Name W349IT35.KA0
Post Event Notes
Location of Seismograph: Civic Number 50 Myron Road (PW-15)
Blast No.: 2021-02
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 113.8 dB(L) 9.750 pa.(L) at 2.665 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	0.635	0.635	0.508	mm/s
ZC Freq	43	51	64	Hz
Time (Rel. to Trig)	0.340	0.135	0.165	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.002	0.003	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.6	7.3	Hz
Overswing Ratio	4.0	4.1	4.4	

Peak Vector Sum 0.823 mm/s at 0.414 sec





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 Vert at 13:59:42 January 14, 2021
Trigger Source Geo: 0.510 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps

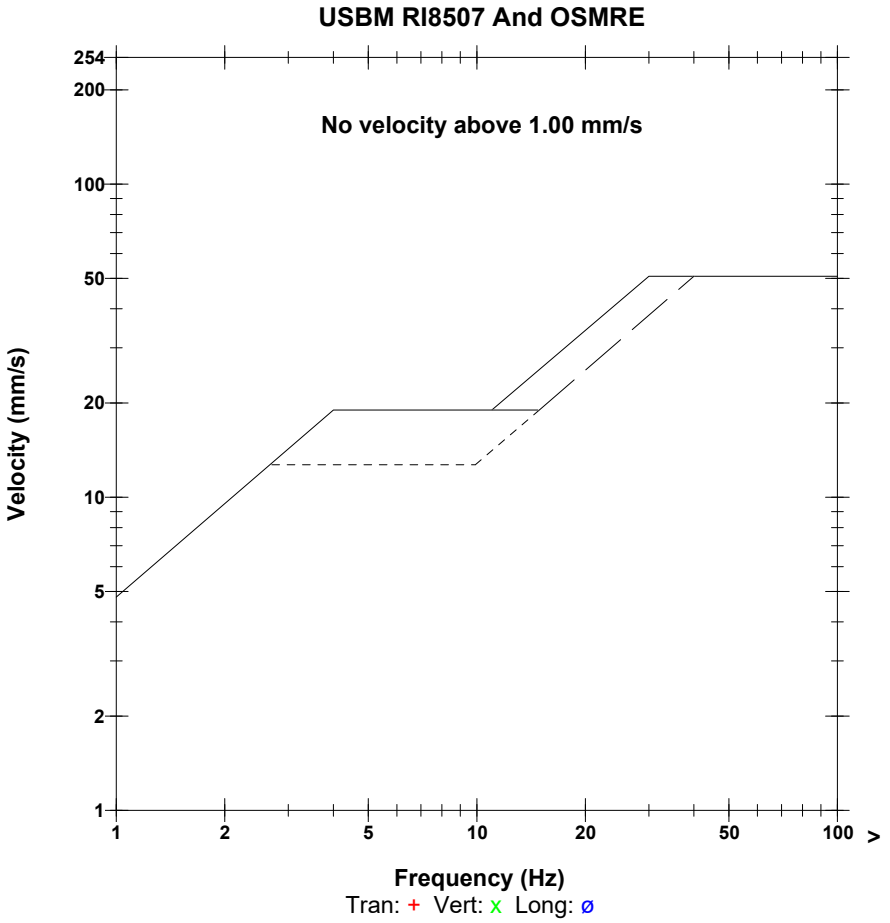
Notes

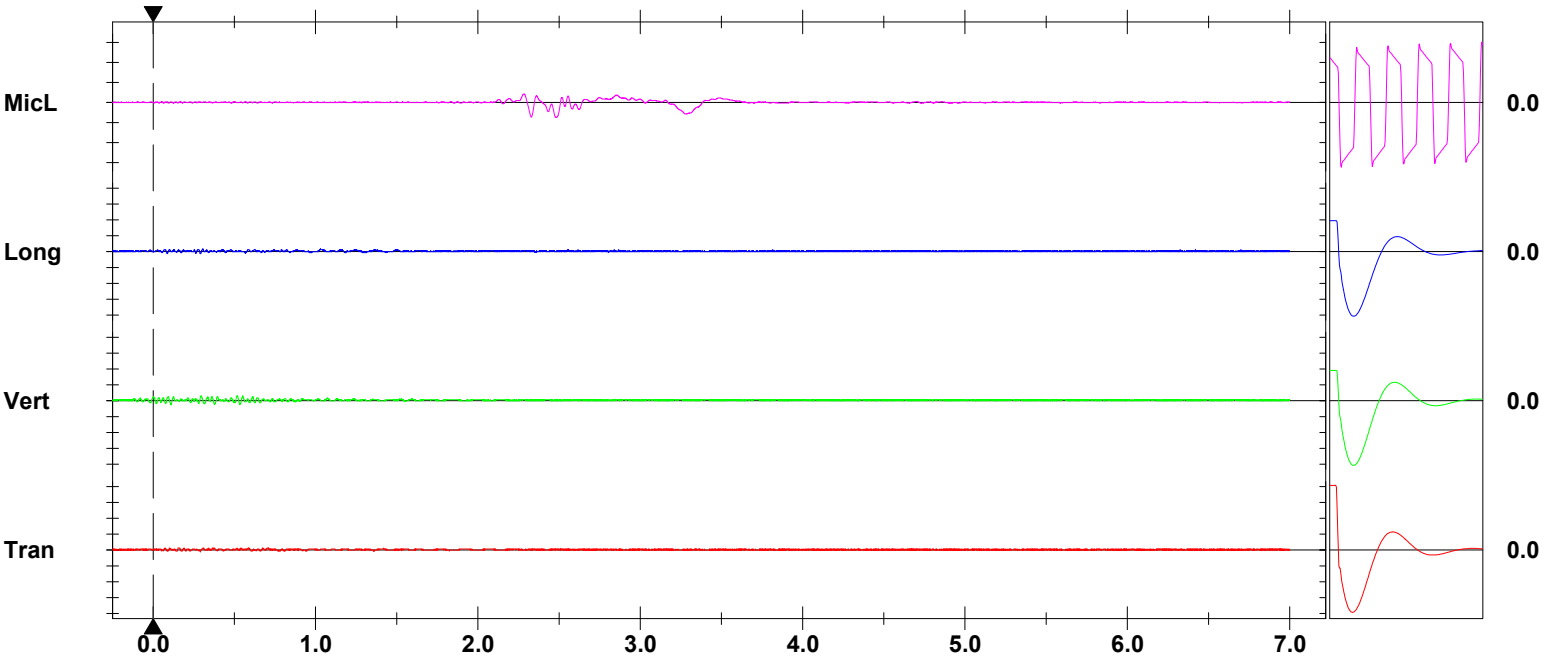
Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 5.9 Volts
Unit Calibration June 12, 2020 by Instantel
File Name W348IT35.JI0
Post Event Notes
Location of Seismograph: Civic Number 86 Myron Road (PW-16)
Blast No.: 2021-02
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 111.5 dB(L) 7.500 pa.(L) at 2.479 sec
ZC Freq 4.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 667 mv)

	Tran	Vert	Long	
PPV	0.254	0.635	0.381	mm/s
ZC Freq	>100	32	51	Hz
Time (Rel. to Trig)	0.072	0.294	0.306	sec
Peak Acceleration	0.013	0.027	0.027	g
Peak Displacement	0.001	0.004	0.003	mm
Sensor Check	Check	Passed	Passed	
Frequency	7.9	7.6	7.2	Hz
Overswing Ratio	3.4	3.5	4.4	

Peak Vector Sum 0.684 mm/s at 0.517 sec





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

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January 17, 2021

Project No.: 21S003.00

Mr. Daniel Guest
Hammond River Holdings
Via email: Guest.Daniel@AtlanticWallboard.com

Re: Blast Vibration Monitoring – Blast No. 2021-03 – Upham East Gypsum Quarry, Upham, N.B.

Following are the results of the vibration monitoring carried out on behalf of Hammond River Holdings for the blast detonated at 14:00 on January 15, 2021. For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2021-03 – January 15, 2021

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4079 Route 111 (PW-09)	14:00	1,310 m S	< 0.5 mm/s	< 120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		863 m S	1.14 mm/s @ 43 Hz	114	-
3. Civic No. 4150 Route 111 (PW-13)		709 m S	0.70 mm/s @ 57 Hz	116	-
4. Civic No. 2447 Route 820 (PW-07)		901 m NE	1.02 mm/s @ 37 Hz	114	-
5. PW-03 - Route 820		671 m N	0.89 mm/s @ 15 Hz	118	-
6. Civic No. 2341 Route 820 (PW-05)		702 m NW	0.95 mm/s @ 23 Hz	120	-
7. Civic No. 50 Myron Road (PW-15)		973 m NW	< 0.5 mm/s	< 120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		868 m W	1.27 mm/s @ 30 Hz	115	See note 1
9. Civic No. 220 Myron Road (PW-01)		1,350 m S	< 0.5 mm/s	< 120	Unit was not triggered
10. Civic No. 4140 Route 111 (PW-12)		793 m S	1.72 mm/s @ 51 Hz	117	-
11. Civic No. 2337 Route 820 (PW-04)		790 m NW	< 0.5 mm/s	< 120	Unit was not triggered
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

Note 1: due technical difficulties, the blast event report couldn't be downloaded from the unit

The monitors did not detect any vibrations that exceeded the maximum allowable peak particle velocity of 12.5 mm/s (1.25 cm/s) or the maximum air overpressure of 128 dB(L) as established in the Approval to Operate (I-10936).

We trust this information is sufficient at this time. If you have any questions, please do not hesitate to contact us.

Best regards,
CONQUEST ENGINEERING LTD.

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Geotechnical Engineer

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'53.3" E 65º38'01.4"		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	14,092 tonnes
Weather at time of Blast:	Sunny with few clouds	**Air Temp.:**	2ºC
Est. Wind Speed :	≈5 km/h	**Wind Direction:**	N
Cloud Cover:	Few	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	59	**Hole Diameter:**	5.5"
Average Depth:	6 – 7.6 m	**Spacing:**	14 ft x 14 ft
No. Holes per Delay:	2	**Collar Length:**	8 ft
Delay between Holes:	25 ms	**Delay between Rows:**	17 & 42 ms
Initiation Method:	Non-electric		
Weight of Explosives per Delay:	Max.: 170 kg		
Type and weight of Explosives for Blast:	4,129 kg – Titan XL 1000		

Sketch of shot location, hole layout, timing sequence, free face etc. if available.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	671 m
Direction to the Nearest Structure:	North
Structure Type:	Cottage
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	51.5

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No
If Yes, Describe:	
Misfire (yes or no):	No

Reviewed By: Robert Y. Cyr, M.A.Sc., P.Eng.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	October 22, 2020
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,310 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	863 m South
Transverse Particle Velocity:	0.25 mm/s @ 26 Hz
Vertical Particle Velocity:	1.14 mm/s @ 43 Hz
Longitudinal Particle Velocity:	0.32 mm/s @ 51 Hz
Peak Particle Velocity:	1.14 mm/s @ 43 Hz
Maximum Airblast:	114 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5676
Calibration Date:	February 26, 2020
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	709 m South
Transverse Particle Velocity:	0.45 mm/s @ 64 Hz
Vertical Particle Velocity:	0.70 mm/s @ 57 Hz
Longitudinal Particle Velocity:	0.32 mm/s @ 85 Hz
Peak Particle Velocity:	0.70 mm/s @ 57 Hz
Maximum Airblast:	116 dB(L)

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	901 m Northeast
Transverse Particle Velocity:	1.02 mm/s @ 37 Hz
Vertical Particle Velocity:	0.45 mm/s @ 64 Hz
Longitudinal Particle Velocity:	0.70 mm/s @ 43 Hz
Peak Particle Velocity:	1.02 mm/s @ 37 Hz
Maximum Airblast:	114 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	June 24, 2020
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	671 m North
Transverse Particle Velocity:	0.64 mm/s @ 22 Hz
Vertical Particle Velocity:	0.83 mm/s @ 32 Hz
Longitudinal Particle Velocity:	0.89 mm/s @ 15 Hz
Peak Particle Velocity:	0.89 mm/s @ 15 Hz
Maximum Airblast:	118 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5673
Calibration Date:	February 28, 2020
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	702 m Northwest
Transverse Particle Velocity:	0.95 mm/s @ 23 Hz
Vertical Particle Velocity:	0.51 mm/s @ 30 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 22 Hz
Peak Particle Velocity:	0.95 mm/s @ 23 Hz
Maximum Airblast:	120 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	973 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	868 m West
Transverse Particle Velocity:	0.63 mm/s @ 12 Hz
Vertical Particle Velocity:	1.27 mm/s @ 30 Hz
Longitudinal Particle Velocity:	0.63 mm/s @ 9 Hz
Peak Particle Velocity:	1.27 mm/s @ 30 Hz
Maximum Airblast:	115 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5372
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,350 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5960
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	793 m South
Transverse Particle Velocity:	0.38 mm/s @ 27 Hz
Vertical Particle Velocity:	1.72 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.32 mm/s @ 43 Hz
Peak Particle Velocity:	1.72 mm/s @ 51 Hz
Maximum Airblast:	117 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 15, 2021
Project No.:	21S003.00	**Time of Blast:**	14:00
Inspector:	S. Byers	**Blast No.:**	2021-03
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	March 26, 2020
Location of seismograph:	Civic No. 2337 Route 820 (PW-04)
Distance and Direction from Blast:	790 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Blast and Seismograph Location Plan
Blast No: 2021-03
Upham East Gypsum Quarry, Upham, NB

Date: January 15, 2021
CE Project No.: 21S003.00

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Event Report

Date/Time Vert at 14:00:45 January 15, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 15, 2021 16:41:44 (V 10.74)

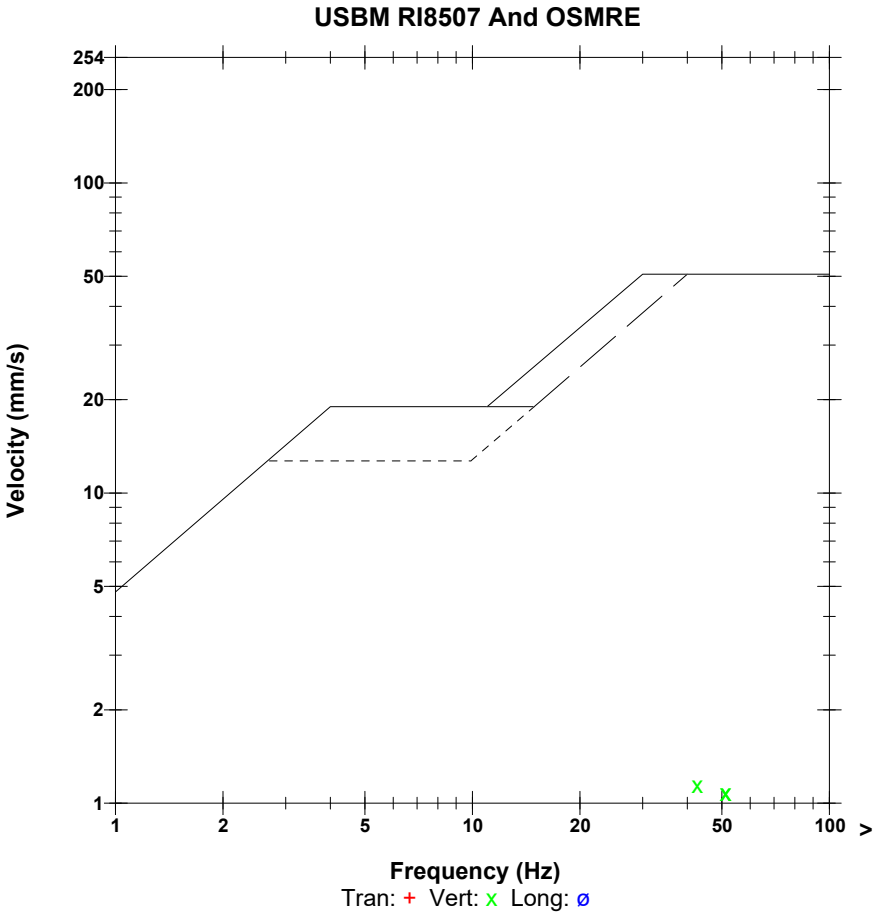
Extended Notes

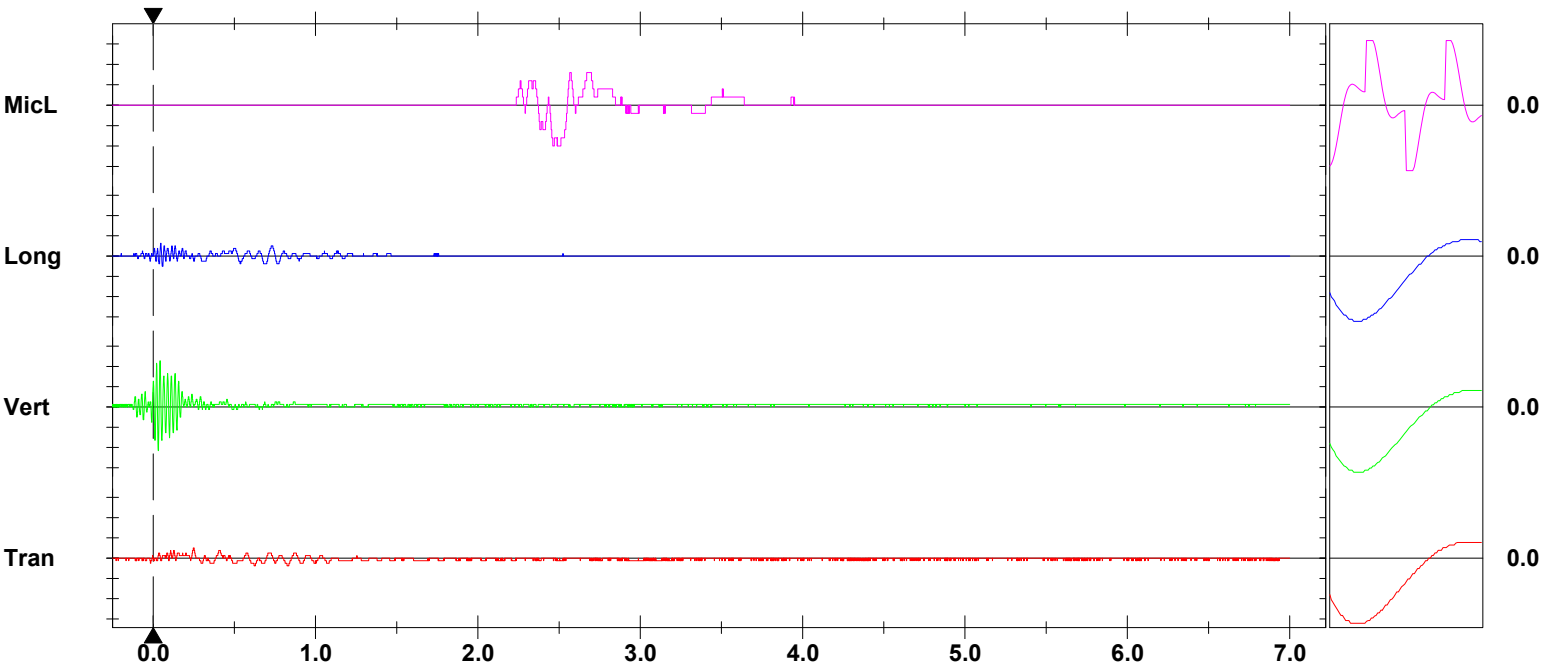
Microphone Linear Weighting
PSPL 114.0 dB(L) 10.000 pa.(L) at 2.462 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 271 mv)

	Tran	Vert	Long	
PPV	0.254	1.143	0.318	mm/s
ZC Freq	26	43	51	Hz
Time (Rel. to Trig)	0.248	0.043	0.047	sec
Peak Acceleration	0.007	0.033	0.013	g
Peak Displacement	0.001	0.004	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.7	7.8	Hz
Overswing Ratio	3.8	4.0	4.0	

Peak Vector Sum 1.159 mm/s at 0.044 sec

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration May 15, 2020 by Instantel
File Name G489IT6U.X90
Post Event Notes
Location of Seismograph: Civic Number 4126 Route 111 (PW-10)
Blast No.: 2021-03
CEL Project No.: 21S003.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:00:46 January 15, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 15, 2021 17:02:43 (V 10.74)

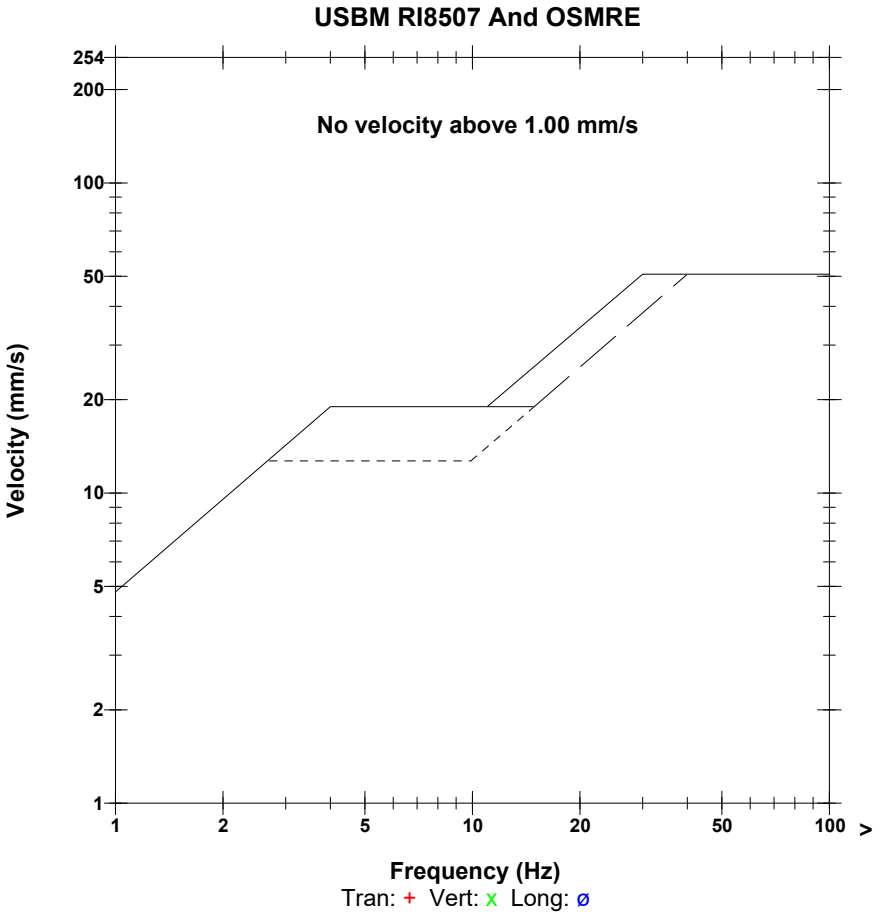
Extended Notes

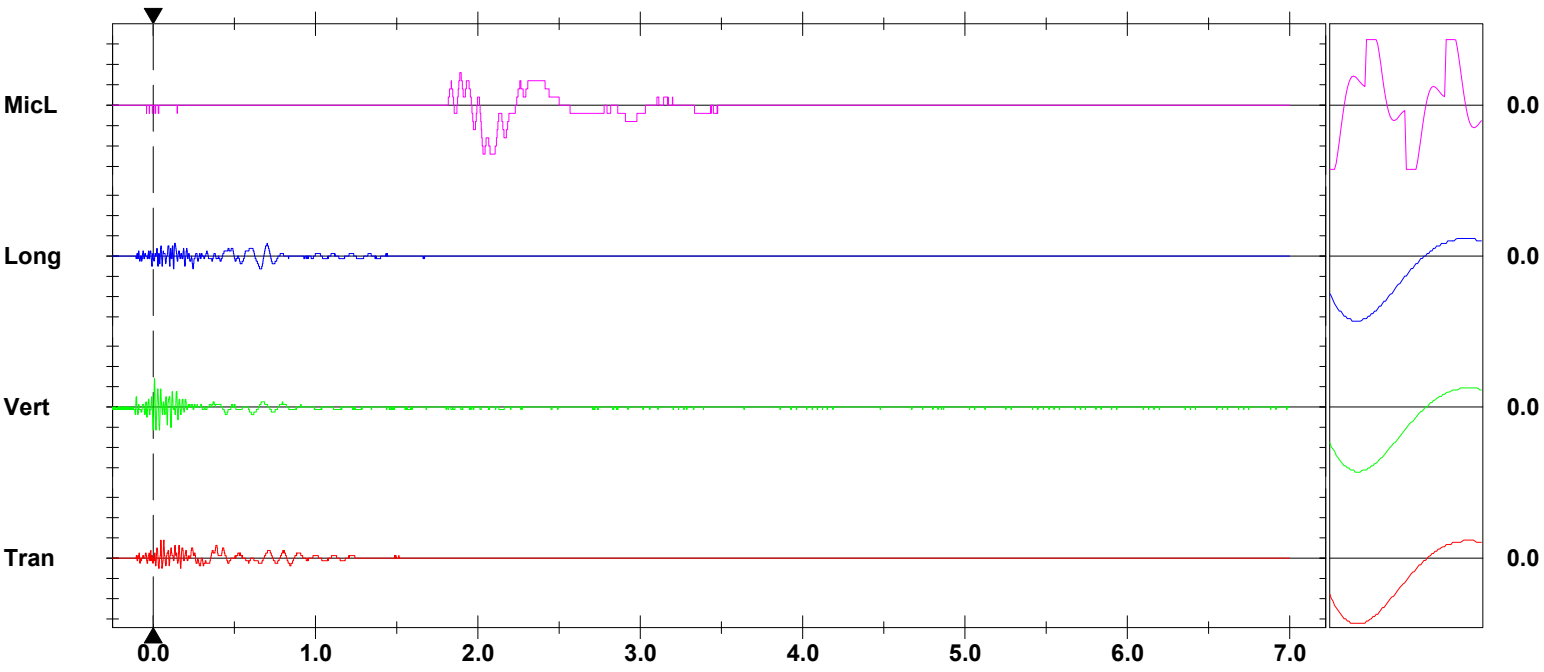
Serial Number 5676 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration February 26, 2020 by Instantel
File Name G676IT6U.XA0
Post Event Notes
Location of Seismograph: Civic Number 4150 Route 111 (PW-13)
Blast No.: 2021-03
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 2.032 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 296 mv)

	Tran	Vert	Long	
PPV	0.445	0.699	0.318	mm/s
ZC Freq	64	57	85	Hz
Time (Rel. to Trig)	0.049	0.009	0.126	sec
Peak Acceleration	0.020	0.027	0.013	g
Peak Displacement	0.002	0.002	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	8.0	8.1	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.714 mm/s at 0.009 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Long at 14:00:48 January 15, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 15, 2021 17:04:51 (V 10.74)

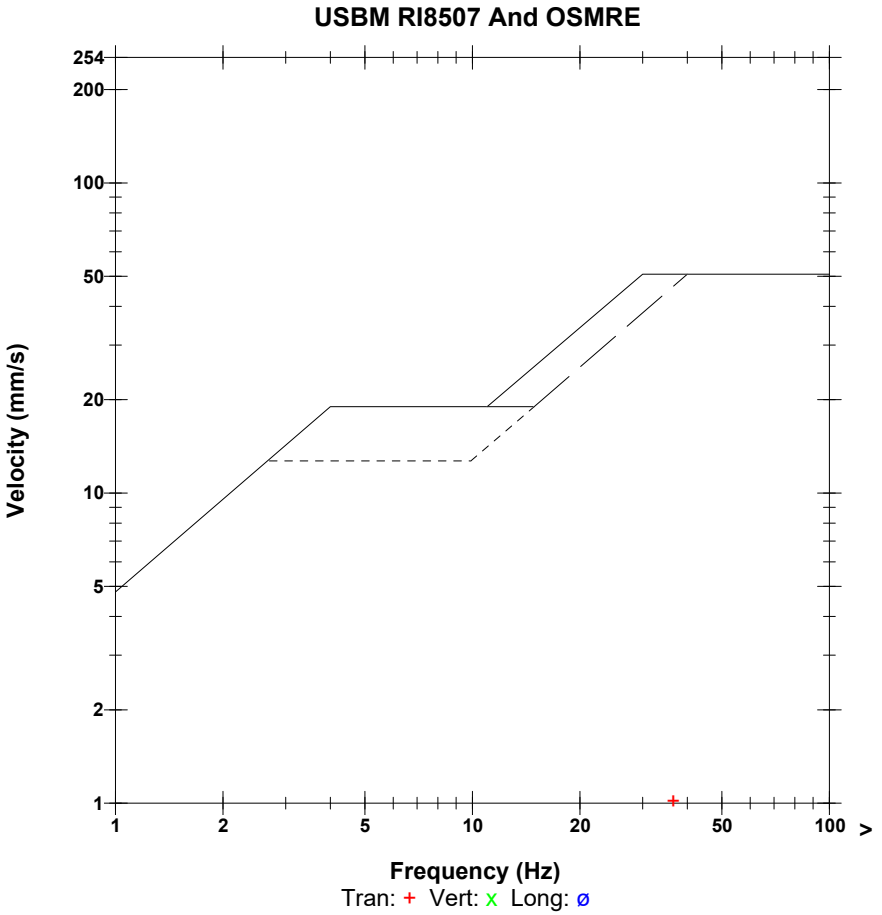
Serial Number 5635 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration March 26, 2020 by Instantel
File Name G635IT6U.XC0
Post Event Notes
Location of Seismograph: Civic Number 2447 Route 820 (PW-07)
Blast No.: 2021-03
CEL Project No.: 21S003.00

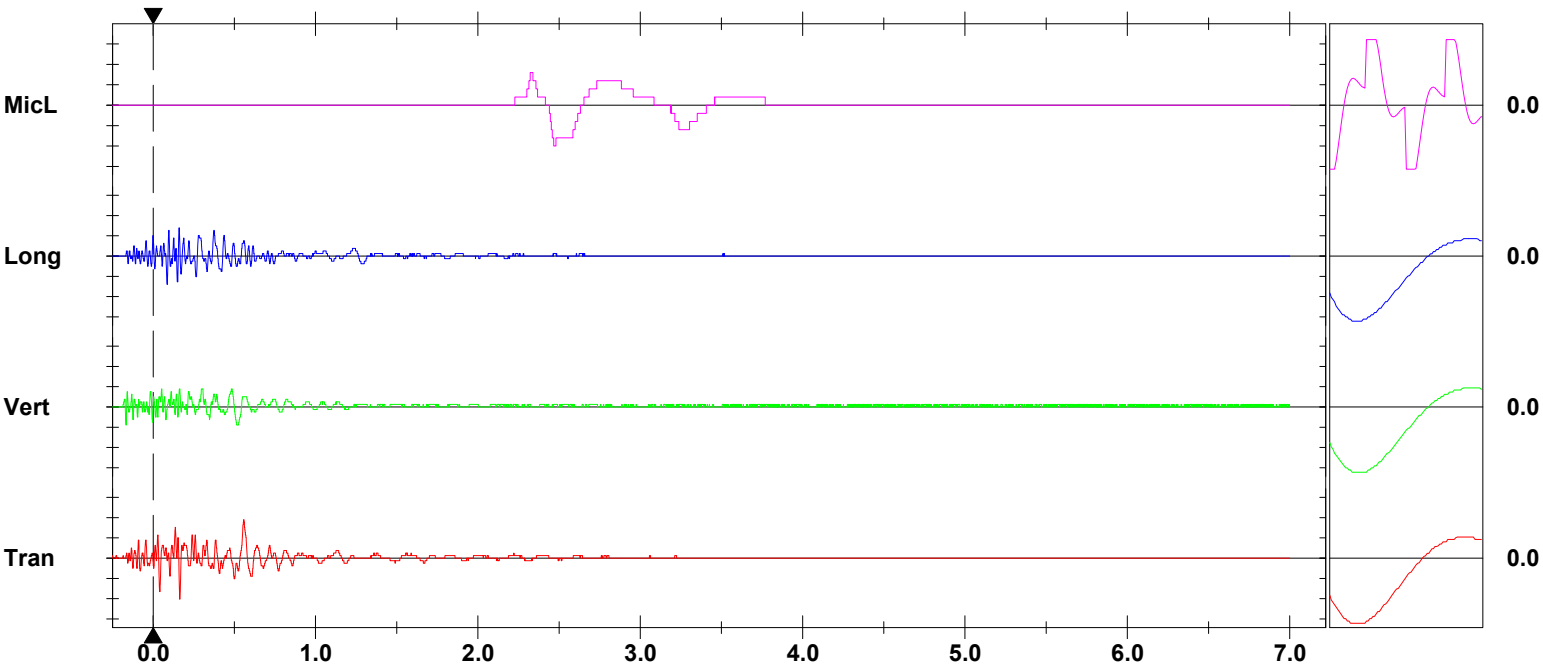
Extended Notes

Microphone Linear Weighting
PSPL 114.0 dB(L) 10.000 pa.(L) at 2.468 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 298 mv)

	Tran	Vert	Long	
PPV	1.016	0.445	0.699	mm/s
ZC Freq	37	64	43	Hz
Time (Rel. to Trig)	0.165	-0.165	0.086	sec
Peak Acceleration	0.027	0.020	0.020	g
Peak Displacement	0.011	0.006	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.3	7.8	7.8	Hz
Overswing Ratio	3.3	3.6	3.8	

Peak Vector Sum 1.159 mm/s at 0.165 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:00:49 January 15, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 15, 2021 17:08:11 (V 10.74)

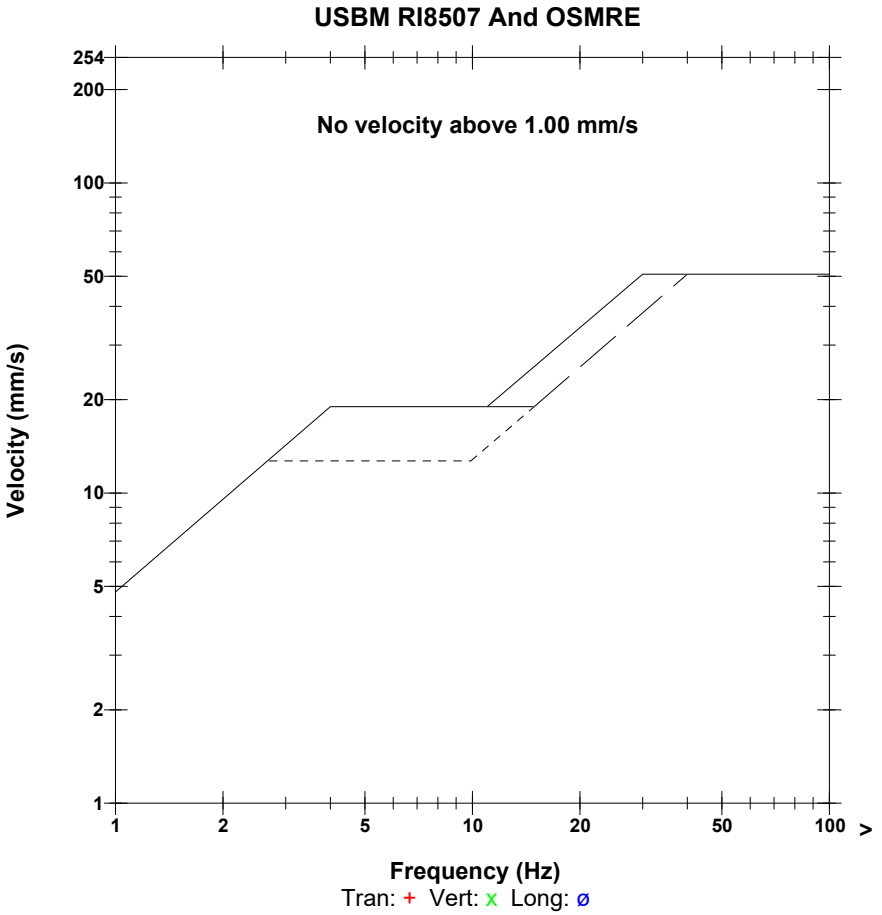
Extended Notes

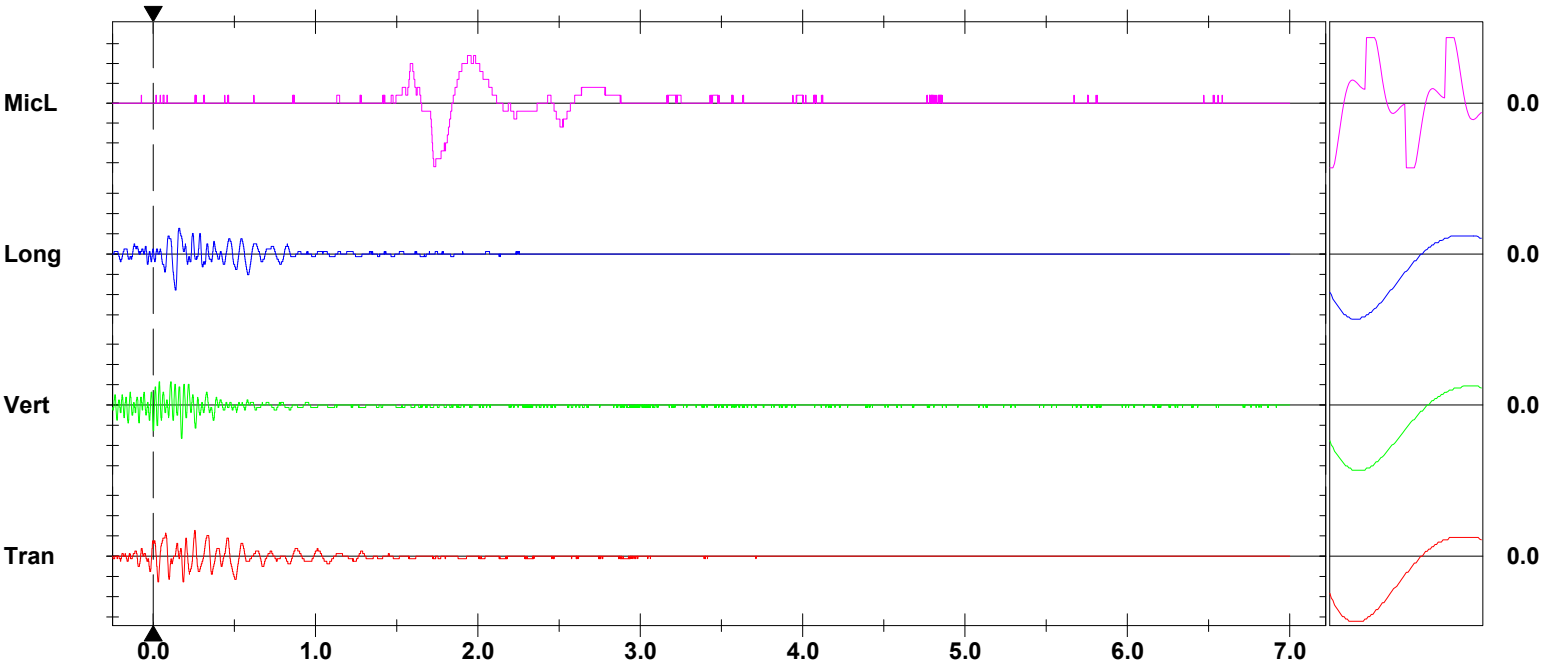
Serial Number 5371 V 2.61 MiniMate
Battery Level 6.2 Volts
Unit Calibration June 24, 2020 by Instantel
File Name G371IT6U.XD0
Post Event Notes
Location of Seismograph: Cottage - Route 820 (PW-03)
Blast No.: 2021-03
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 118.1 dB(L) 16.00 pa.(L) at 1.729 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 304 mv)

	Tran	Vert	Long	
PPV	0.635	0.826	0.889	mm/s
ZC Freq	22	32	15	Hz
Time (Rel. to Trig)	0.030	0.175	0.137	sec
Peak Acceleration	0.013	0.020	0.013	g
Peak Displacement	0.009	0.004	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.3	7.8	8.3	Hz
Overswing Ratio	3.6	3.6	3.7	

Peak Vector Sum 1.032 mm/s at 0.137 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:00:44 January 15, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 15, 2021 17:01:15 (V 10.74)

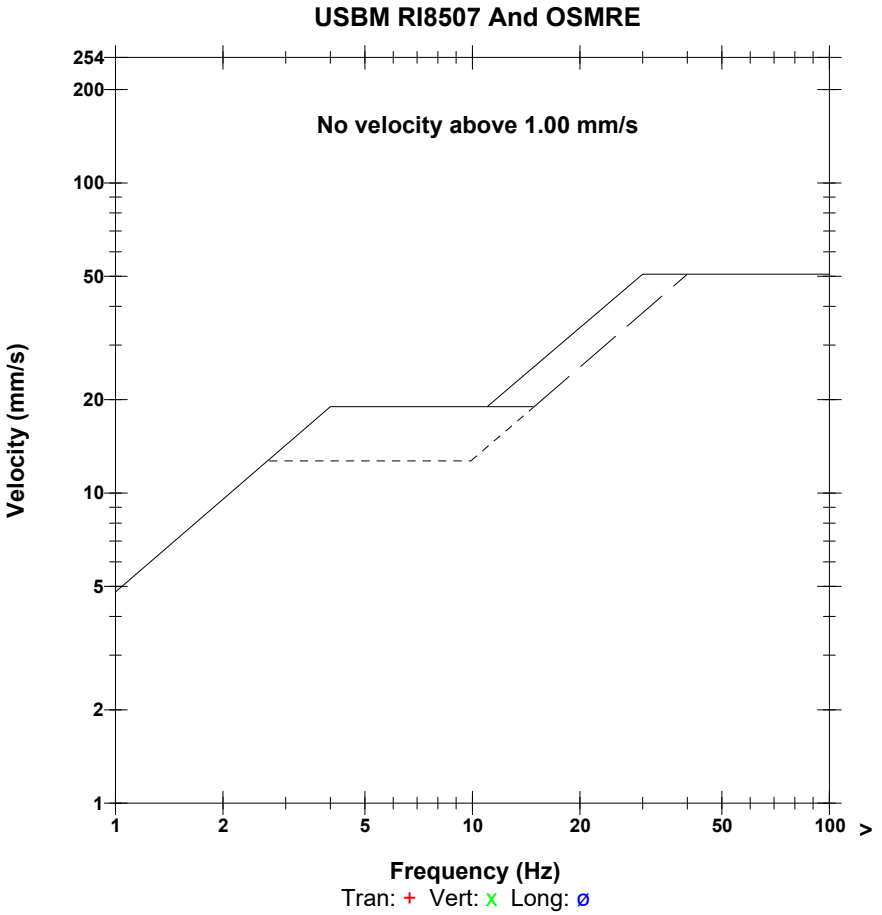
Extended Notes

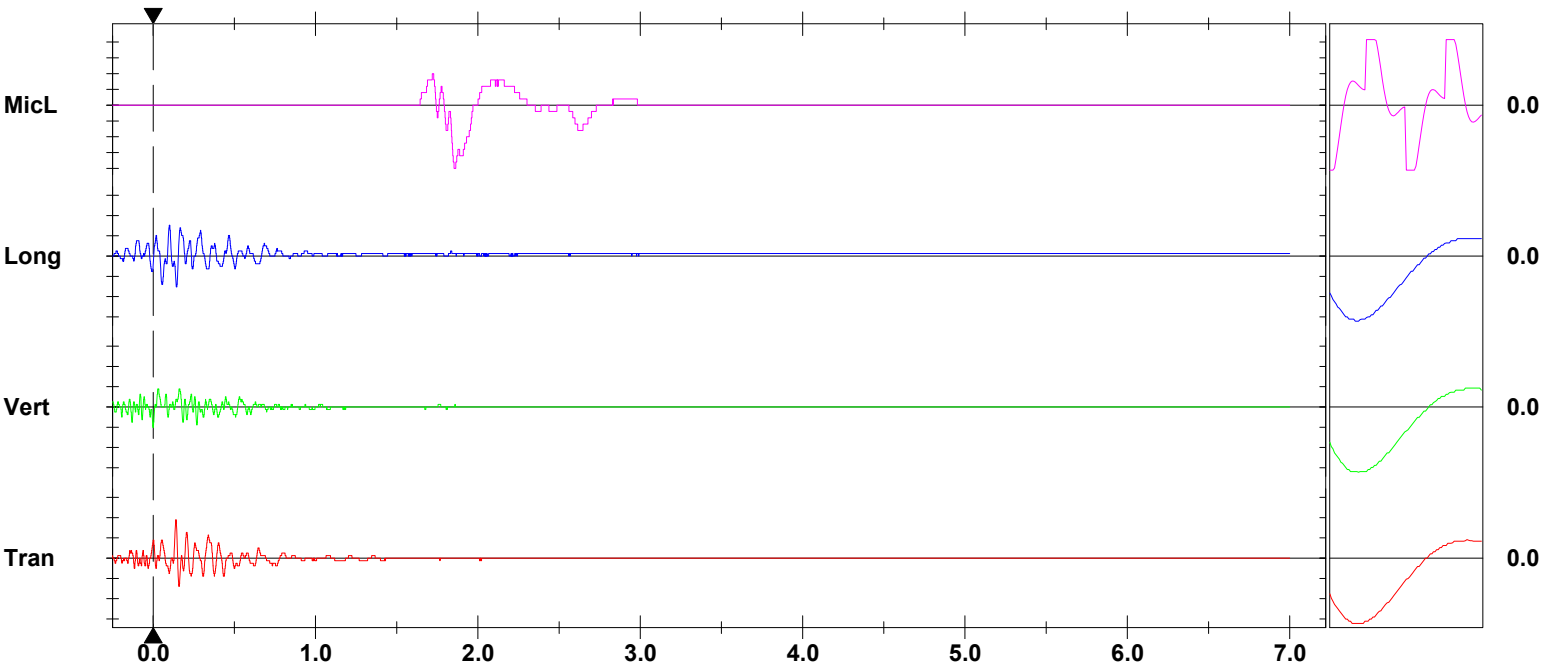
Microphone Linear Weighting
PSPL 120.0 dB(L) 20.00 pa.(L) at 1.854 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 306 mv)

	Tran	Vert	Long	
PPV	0.953	0.508	0.762	mm/s
ZC Freq	23	30	22	Hz
Time (Rel. to Trig)	0.142	0.000	0.100	sec
Peak Acceleration	0.020	0.013	0.013	g
Peak Displacement	0.008	0.003	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	7.8	8.0	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 1.191 mm/s at 0.144 sec

Serial Number 5673 V 2.61 MiniMate
Battery Level 6.0 Volts
Unit Calibration February 28, 2020 by Instantel
File Name G673IT6U.X80
Post Event Notes
Location of Seismograph: Civic Number 2341 Route 820 (PW-05)
Blast No.: 2021-03
CEL Project No.: 21S003.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:00:44 January 15, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 15, 2021 16:59:04 (V 10.74)

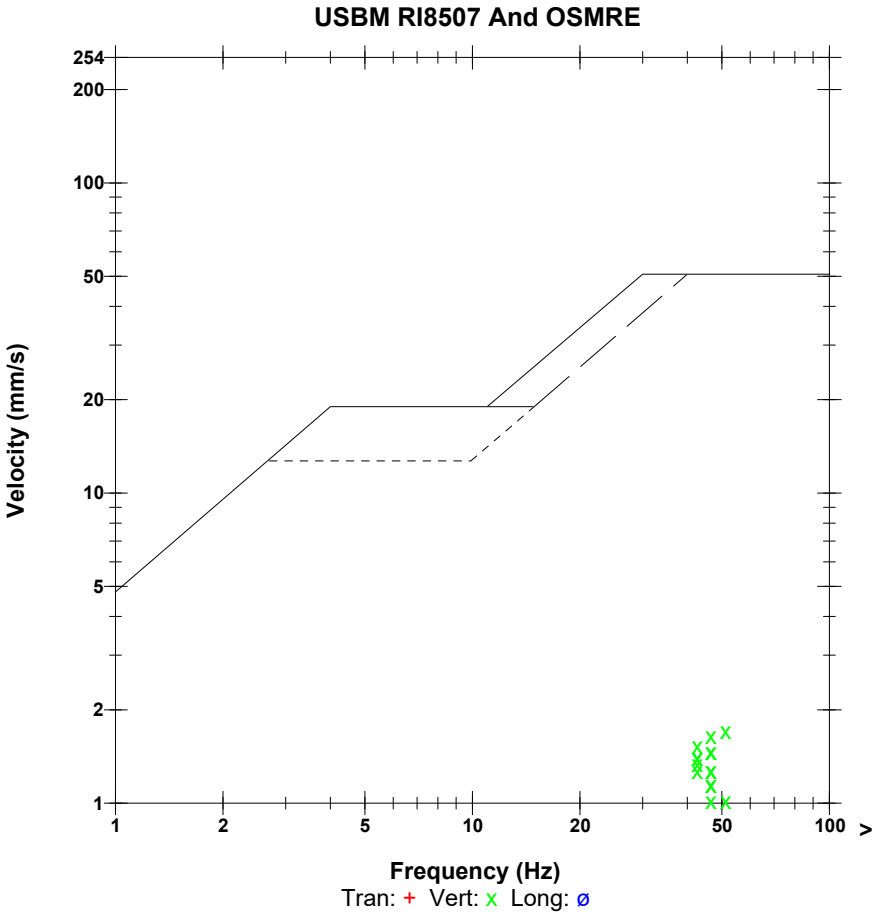
Extended Notes

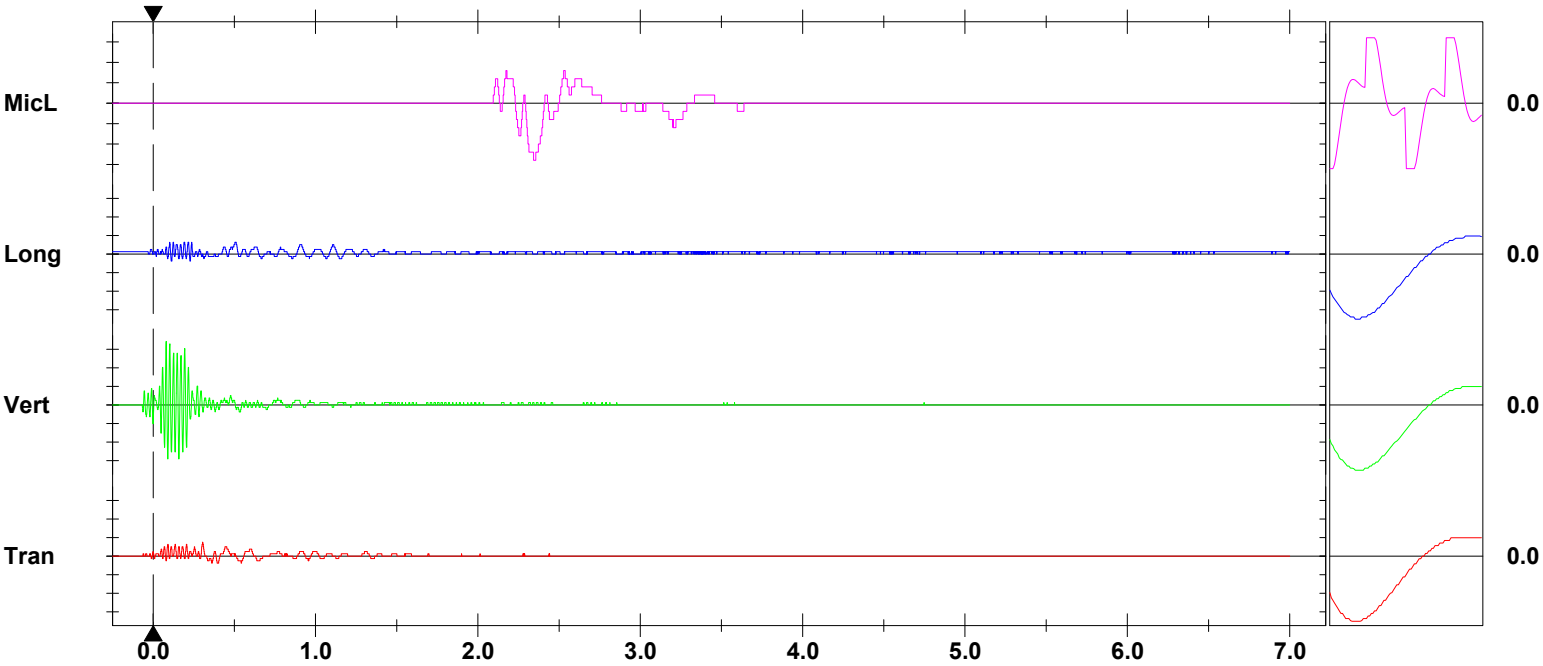
Serial Number 5960 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration May 15, 2020 by Instantel
File Name G960IT6U.X80
Post Event Notes
Location of Seismograph: Civic Number 4140 Route 111 (PW-12)
Blast No.: 2021-03
CEL Project No.: 21S003.00

Microphone Linear Weighting
PSPL 116.9 dB(L) 14.00 pa.(L) at 2.344 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	0.381	1.715	0.318	mm/s
ZC Freq	27	51	43	Hz
Time (Rel. to Trig)	0.306	0.080	0.103	sec
Peak Acceleration	0.013	0.053	0.013	g
Peak Displacement	0.002	0.006	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.7	7.7	Hz
Overswing Ratio	4.0	3.7	4.1	

Peak Vector Sum 1.730 mm/s at 0.080 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

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January 25, 2021

Project No.: 21S003.00

Mr. Daniel Guest
Hammond River Holdings
Via email: Guest.Daniel@AtlanticWallboard.com

Re: Blast Vibration Monitoring – Blast No. 2021-04 – Upham East Gypsum Quarry, Upham, N.B.

Following are the results of the vibration monitoring carried out on behalf of Hammond River Holdings for the blast detonated at 14:41 on January 25, 2021. For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2021-04 – January 21, 2021

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4079 Route 111 (PW-09)	14:41	1,270 m S	< 0.5 mm/s	< 120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		858 m S	0.51 mm/s @ 57 Hz	115	-
3. Civic No. 4150 Route 111 (PW-13)		707 m S	1.08 mm/s @ 85 Hz	118	-
4. Civic No. 2447 Route 820 (PW-07)		951 m NE	< 0.5 mm/s	< 120	Unit was not triggered
5. PW-03 - Route 820		688 m N	< 0.5 mm/s	< 120	Unit was not triggered
6. Civic No. 2341 Route 820 (PW-05)		691 m NW	0.89 mm/s @ 51 Hz	118	-
7. Civic No. 50 Myron Road (PW-15)		946 m NW	1.02 mm/s @ 37 Hz	118	-
8. Civic No. 86 Myron Road (PW-16)		815 m W	0.95 mm/s @ 32 Hz	118	-
9. Civic No. 220 Myron Road (PW-01)		1,310 m S	< 0.5 mm/s	< 120	Unit was not triggered
10. Civic No. 4140 Route 111 (PW-12)		809 m S	0.51 mm/s @ 85 Hz	117	-
11. Civic No. 2337 Route 820 (PW-04)		768 m NW	< 0.5 mm/s	< 120	Unit was not triggered
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

The monitors did not detect any vibrations that exceeded the maximum allowable peak particle velocity of 12.5 mm/s (1.25 cm/s) or the maximum air overpressure of 128 dB(L) as established in the Approval to Operate (I-10936).

We trust this information is sufficient at this time. If you have any questions, please do not hesitate to contact us.

Best regards,
CONQUEST ENGINEERING
A Division of CBCL Limited

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Geotechnical Engineer

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'51.9" E 65º38'00.4"		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	16,681 tonnes
Weather at time of Blast:	Sunny with few clouds	**Air Temp.:**	-3ºC
Est. Wind Speed :	≈20 km/h	**Wind Direction:**	SE
Cloud Cover:	Few	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	114	**Hole Diameter:**	5.5"
Average Depth:	4.2 – 9.0 m	**Spacing:**	12 ft x 12 ft
No. Holes per Delay:	3	**Collar Length:**	8 ft
Delay between Holes:	25 ms	**Delay between Rows:**	34 & 42 ms
Initiation Method:	Non-electric		
Weight of Explosives per Delay:	Max.: 180 kg		
Type and weight of Explosives for Blast:	5,739 kg – Titan XL 1000		

Sketch of shot location, hole layout, timing sequence, free face etc. if available.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	688 m
Direction to the Nearest Structure:	North
Structure Type:	Cottage
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	51.3

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No
If Yes, Describe:	
Misfire (yes or no):	No

Reviewed By: Robert Y. Cyr, M.A.Sc., P.Eng.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	October 22, 2020
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,270 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	858 m South
Transverse Particle Velocity:	0.25 mm/s @ >100 Hz
Vertical Particle Velocity:	0.51 mm/s @ 57 Hz
Longitudinal Particle Velocity:	0.25 mm/s @ >100 Hz
Peak Particle Velocity:	0.51 mm/s @ 57 Hz
Maximum Airblast:	115 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	707 m South
Transverse Particle Velocity:	0.51 mm/s @ 43 Hz
Vertical Particle Velocity:	1.08 mm/s @ 85 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 73 Hz
Peak Particle Velocity:	1.08 mm/s @ 85 Hz
Maximum Airblast:	118 dB(L)

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5960
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	951 m Northeast
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5676
Calibration Date:	February 26, 2020
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	688 m North
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	691 m Northwest
Transverse Particle Velocity:	0.38 mm/s @ 27 Hz
Vertical Particle Velocity:	0.89 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.06 mm/s @ NA Hz
Peak Particle Velocity:	0.89 mm/s @ 51 Hz
Maximum Airblast:	118 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	946 m Northwest
Transverse Particle Velocity:	0.38 mm/s @ 57 Hz
Vertical Particle Velocity:	1.02 mm/s @ 37 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 39 Hz
Peak Particle Velocity:	1.02 mm/s @ 37 Hz
Maximum Airblast:	118 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	May 15, 2020
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	815 m West
Transverse Particle Velocity:	0.45 mm/s @ 9 Hz
Vertical Particle Velocity:	0.95 mm/s @ 32 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ 34 Hz
Peak Particle Velocity:	0.95 mm/s @ 32 Hz
Maximum Airblast:	118 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5372
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,310 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5673
Calibration Date:	February 28, 2020
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	809 m South
Transverse Particle Velocity:	0.19 mm/s @ >100 Hz
Vertical Particle Velocity:	0.51 mm/s @ 85 Hz
Longitudinal Particle Velocity:	0.25 mm/s @ 51 Hz
Peak Particle Velocity:	0.51 mm/s @ 85 Hz
Maximum Airblast:	117 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	January 25, 2021
Project No.:	21S003.00	**Time of Blast:**	14:41
Inspector:	L. Boyd	**Blast No.:**	2021-04
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	March 26, 2020
Location of seismograph:	Civic No. 2337 Route 820 (PW-04)
Distance and Direction from Blast:	768 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Blast and Seismograph Location Plan
Blast No: 2021-04
Upham East Gypsum Quarry, Upham, NB

Date: January 25, 2021
CE Project No.: 21S003.00

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Event Report

Date/Time Vert at 14:40:58 January 25, 2021
Trigger Source Geo: 0.510 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps

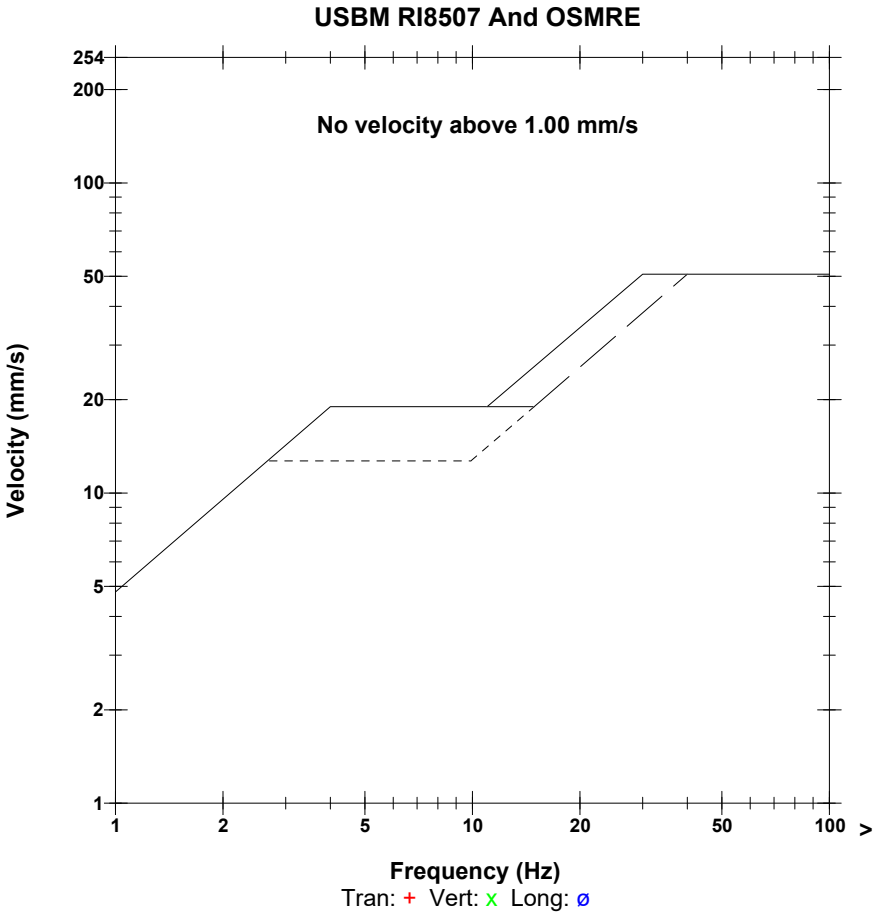
Notes

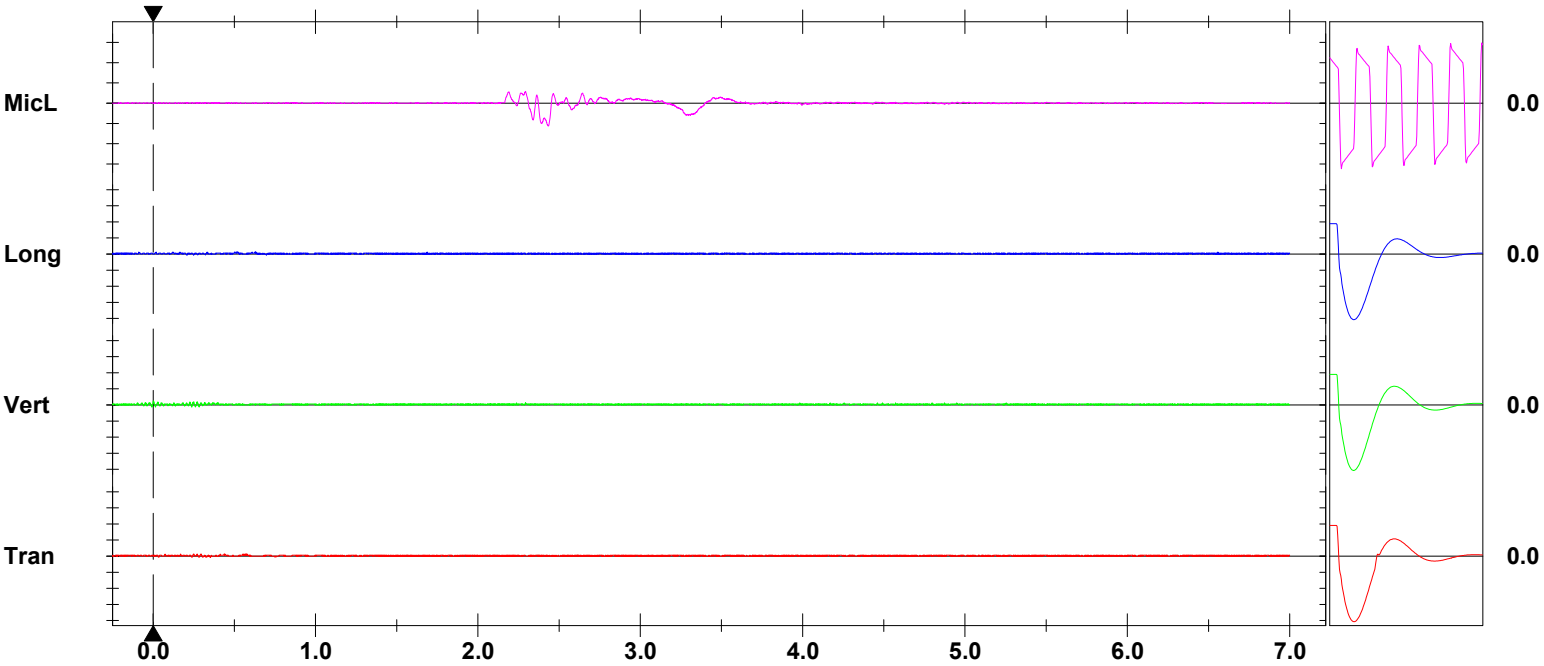
Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration June 12, 2020 by Instantel
File Name W348ITNK.SA0
Post Event Notes
Location of Seismograph: Civic No. 4126 Route 111 (PW-10)
Blast No.: 2021-04
CE Project No.: 21S003.00

Microphone Linear Weighting
PSPL 115.0 dB(L) 11.25 pa.(L) at 2.433 sec
ZC Freq 6.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 711 mv)

	Tran	Vert	Long	
PPV	0.254	0.508	0.254	mm/s
ZC Freq	>100	57	>100	Hz
Time (Rel. to Trig)	0.073	0.000	-0.089	sec
Peak Acceleration	0.013	0.027	0.027	g
Peak Displacement	0.001	0.002	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.7	7.2	Hz
Overswing Ratio	3.8	3.5	4.3	

Peak Vector Sum 0.508 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 Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:41:00 January 25, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 25, 2021 17:04:45 (V 10.74)

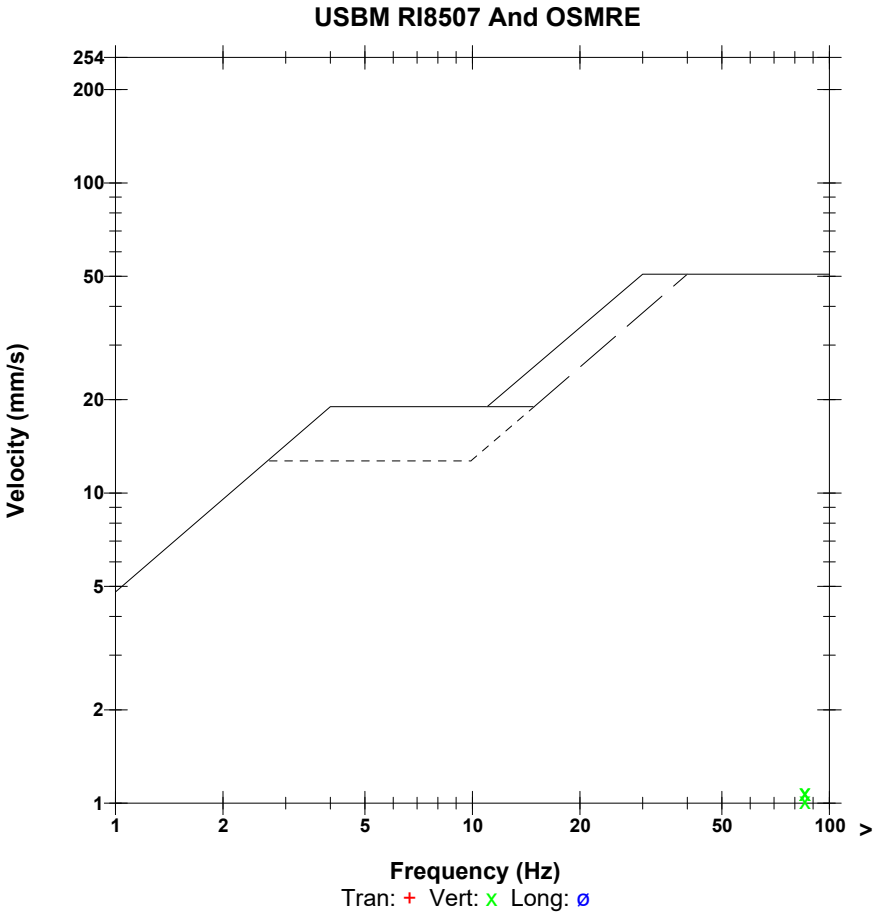
Extended Notes

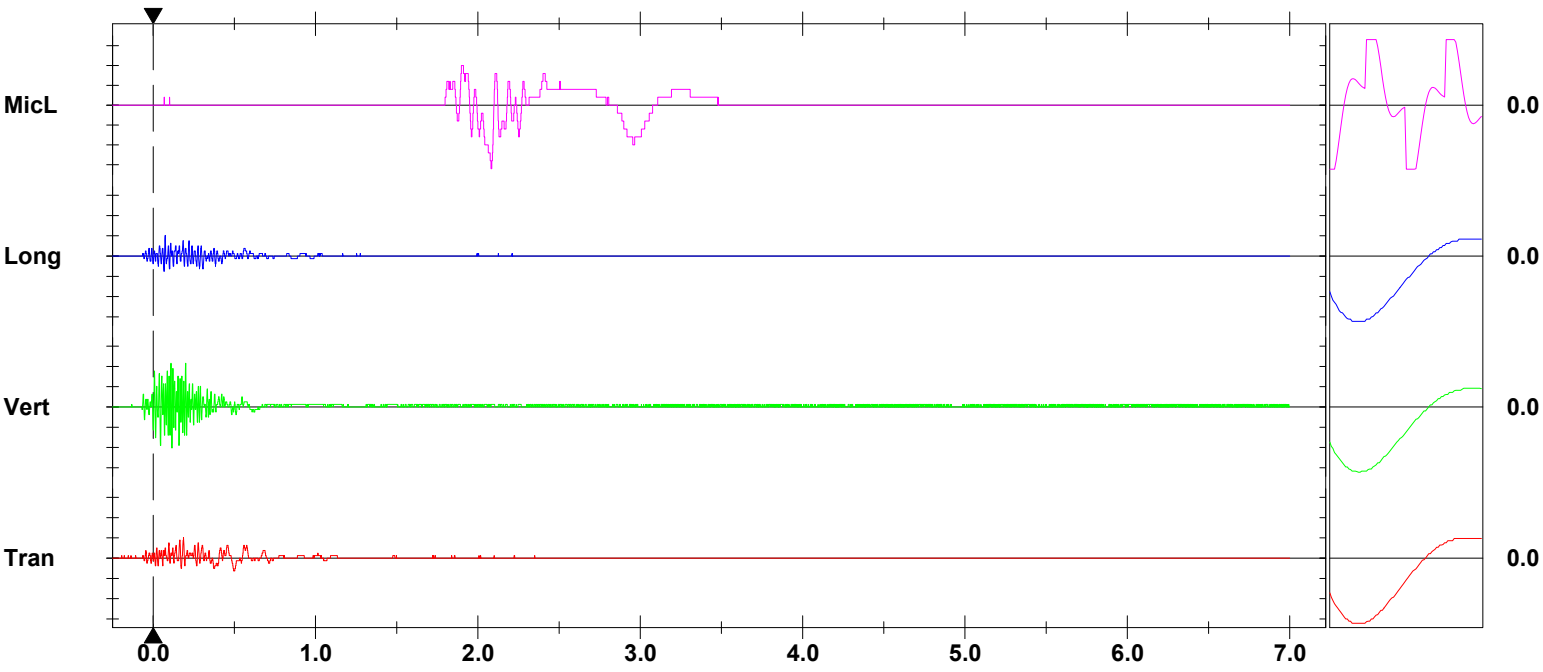
Microphone Linear Weighting
PSPL 118.1 dB(L) 16.00 pa.(L) at 2.082 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 299 mv)

	Tran	Vert	Long	
PPV	0.508	1.080	0.508	mm/s
ZC Freq	43	85	73	Hz
Time (Rel. to Trig)	0.188	0.109	0.074	sec
Peak Acceleration	0.013	0.053	0.020	g
Peak Displacement	0.003	0.002	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.8	7.8	Hz
Overswing Ratio	3.2	3.6	3.9	

Peak Vector Sum 1.127 mm/s at 0.109 sec

Serial Number 5635 V 2.61 MiniMate
Battery Level 6.5 Volts
Unit Calibration March 26, 2020 by Instantel
File Name G635ITPF.GC0
Post Event Notes
Location of Seismograph: Civic No. 4150 Route 111 (PW-13)
Blast No.: 2021-04
CE Project No.: 21S003.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:41:01 January 25, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 25, 2021 17:02:19 (V 10.74)

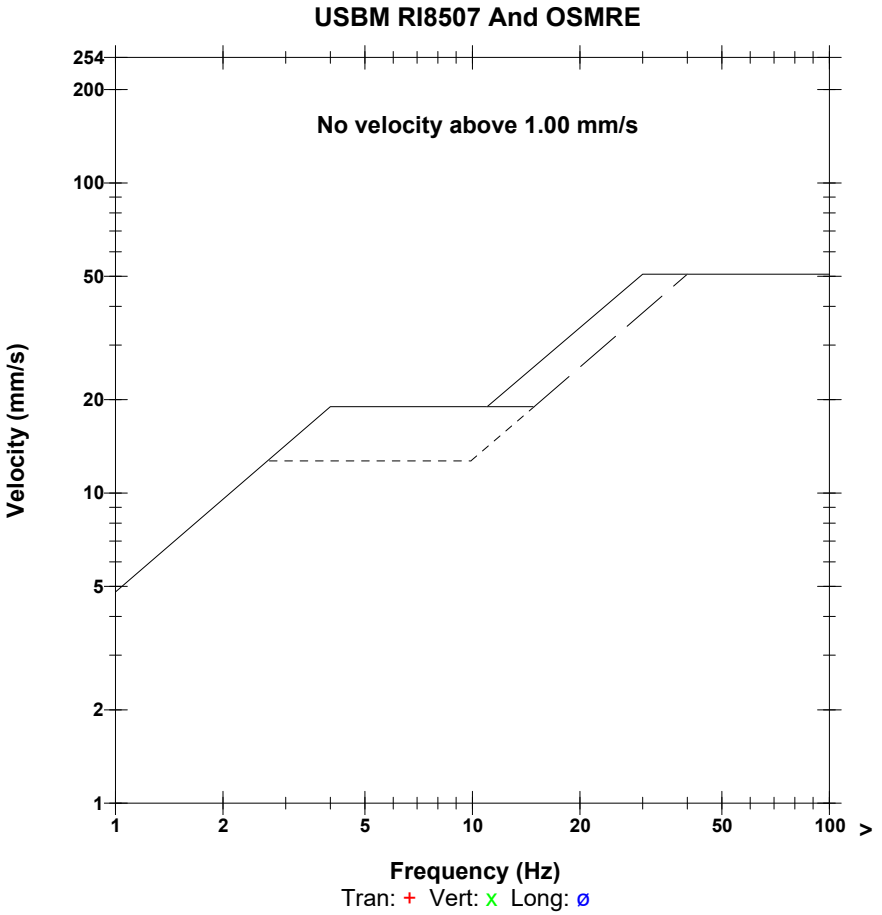
Extended Notes

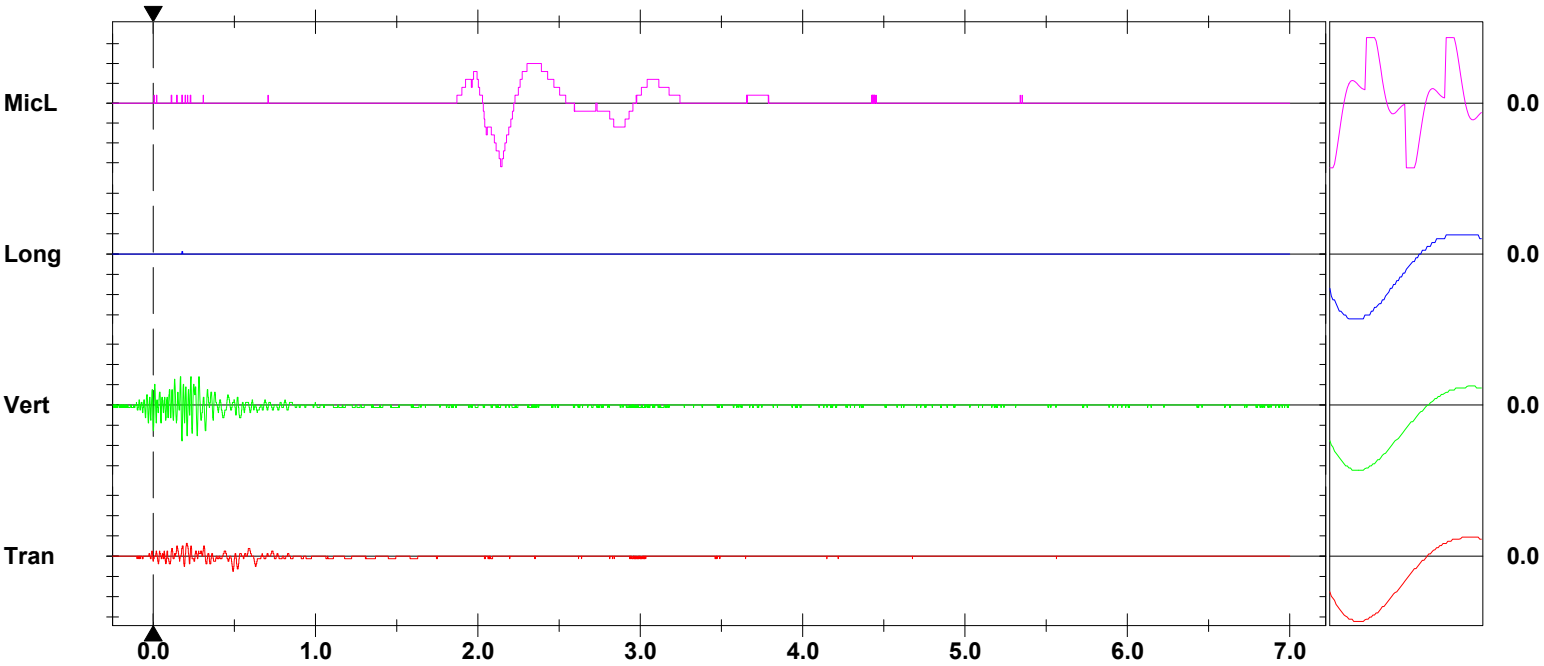
Microphone Linear Weighting
PSPL 118.1 dB(L) 16.00 pa.(L) at 2.141 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	0.381	0.889	0.064	mm/s
ZC Freq	27	51	N/A	Hz
Time (Rel. to Trig)	0.493	0.178	0.178	sec
Peak Acceleration	0.013	0.033	0.007	g
Peak Displacement	0.002	0.003	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	7.8	8.5	Hz
Overswing Ratio	3.6	3.6	3.6	

Peak Vector Sum 0.905 mm/s at 0.178 sec
N/A: Not Applicable

Serial Number 5371 V 2.61 MiniMate
Battery Level 5.8 Volts
Unit Calibration June 24, 2020 by Instantel
File Name G371ITPF.GD0
Post Event Notes
Location of Seismograph: Civic No. 2341 Route 820 (PW-05)
Blast No.: 2021-04
CE Project No.: 21S003.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:40:59 January 25, 2021
Trigger Source Geo: 0.510 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps

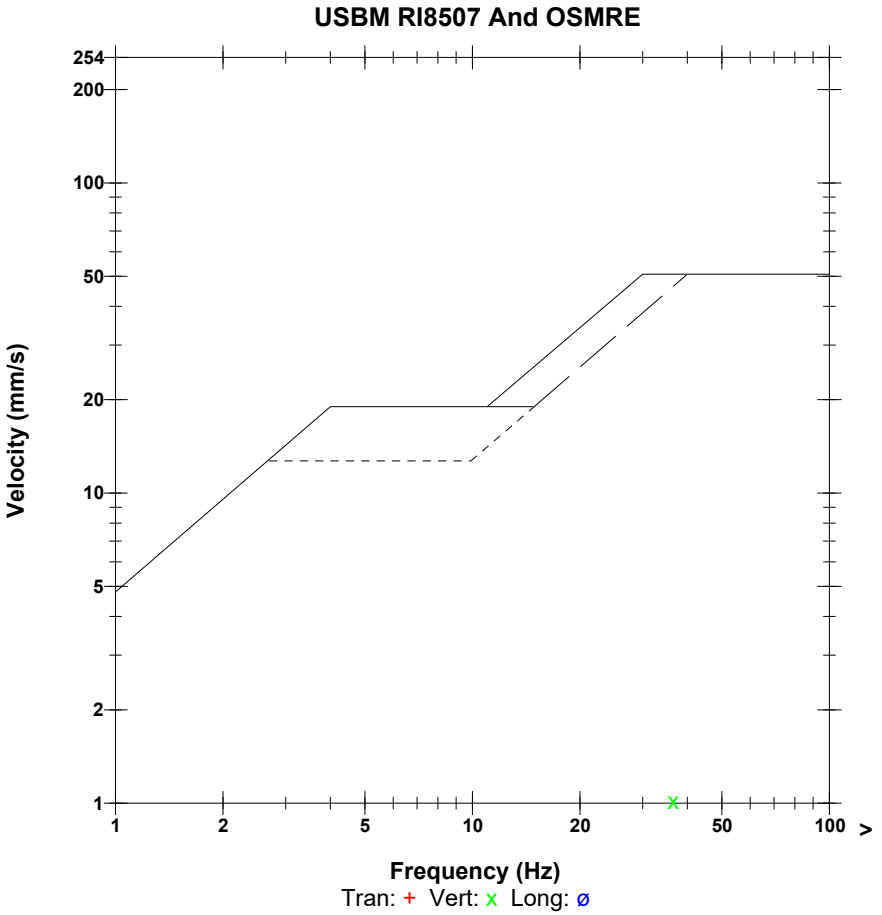
Notes

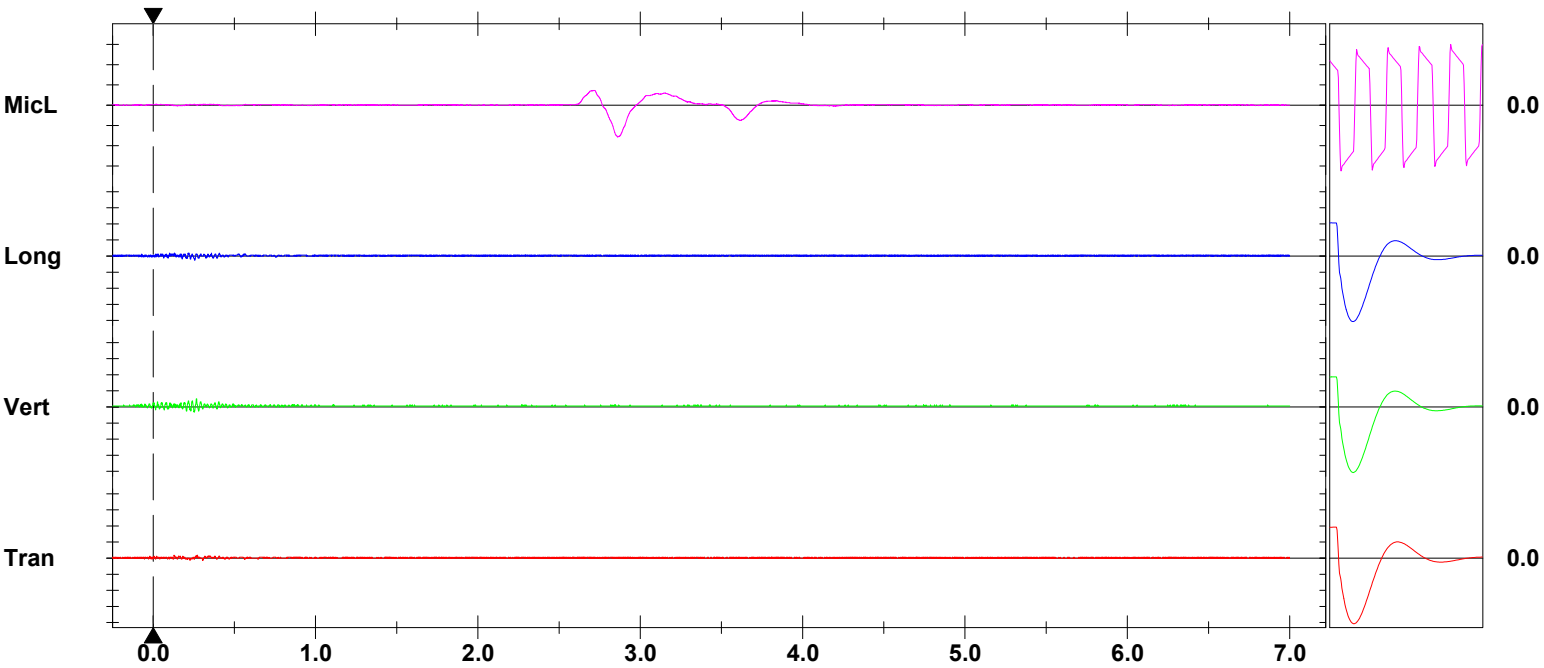
Serial Number BE21349 V 10.72-1.1 Minimate Blaster
Battery Level 5.9 Volts (Battery Low)
Unit Calibration June 12, 2020 by Instantel
File Name W349ITNK.SB0
Post Event Notes
Location of Seismograph: Civic No. 50 Myron Road (PW-15)
Blast No.: 2021-04
CE Project No.: 21S003.00

Microphone Linear Weighting
PSPL 117.9 dB(L) 15.75 pa.(L) at 2.861 sec
ZC Freq 2.5 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 717 mv)

	Tran	Vert	Long	
PPV	0.381	1.016	0.508	mm/s
ZC Freq	57	37	39	Hz
Time (Rel. to Trig)	0.129	0.266	0.255	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.001	0.004	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.5	Hz
Overswing Ratio	4.1	4.2	4.3	

Peak Vector Sum 1.078 mm/s at 0.266 sec





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 Vert at 14:41:00 January 25, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 25, 2021 17:03:37 (V 10.74)

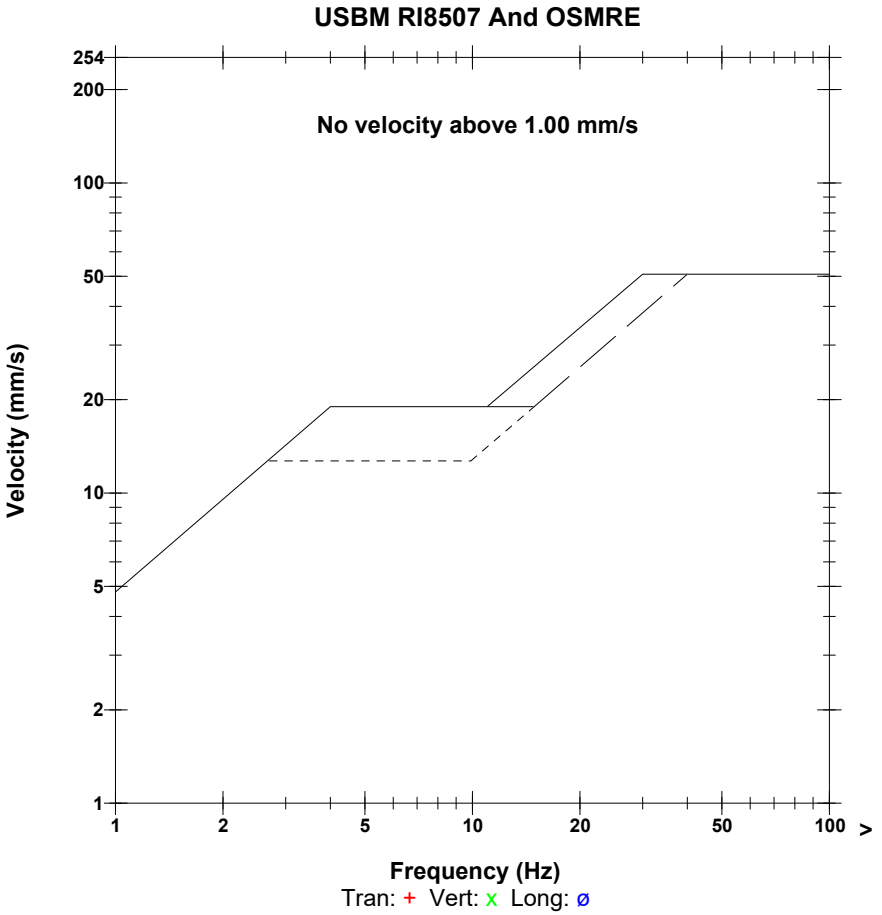
Extended Notes

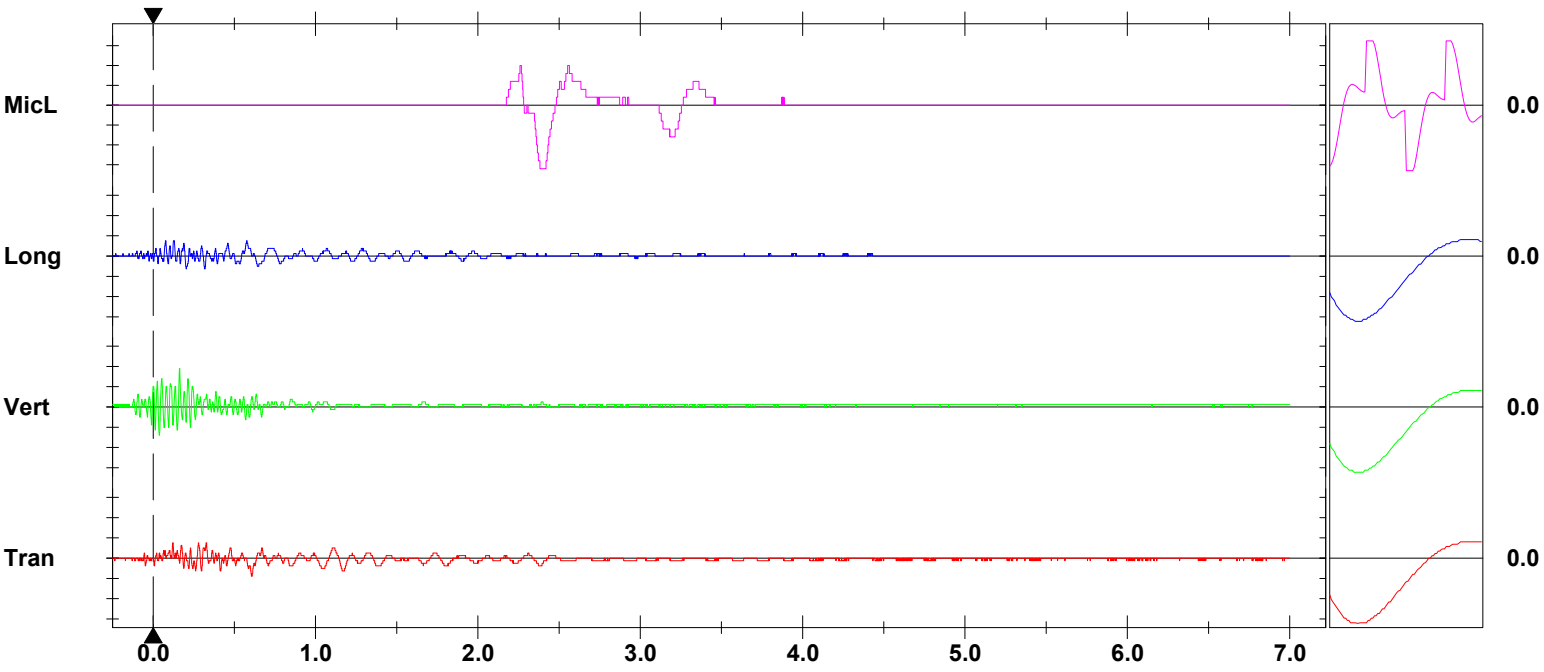
Microphone Linear Weighting
PSPL 118.1 dB(L) 16.00 pa.(L) at 2.383 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 271 mv)

	Tran	Vert	Long	
PPV	0.445	0.953	0.381	mm/s
ZC Freq	9.0	32	34	Hz
Time (Rel. to Trig)	0.605	0.163	0.076	sec
Peak Acceleration	0.013	0.020	0.013	g
Peak Displacement	0.004	0.004	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.7	7.8	Hz
Overswing Ratio	3.9	4.0	4.0	

Peak Vector Sum 0.968 mm/s at 0.163 sec

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.0 Volts
Unit Calibration May 15, 2020 by Instantel
File Name G489ITPF.GC0
Post Event Notes
Location of Seismograph: Civic No. 86 Myron Road (PW-16)
Blast No.: 2021-04
CE Project No.: 21S003.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:40:59 January 25, 2021
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: January 25, 2021 17:01:20 (V 10.74)

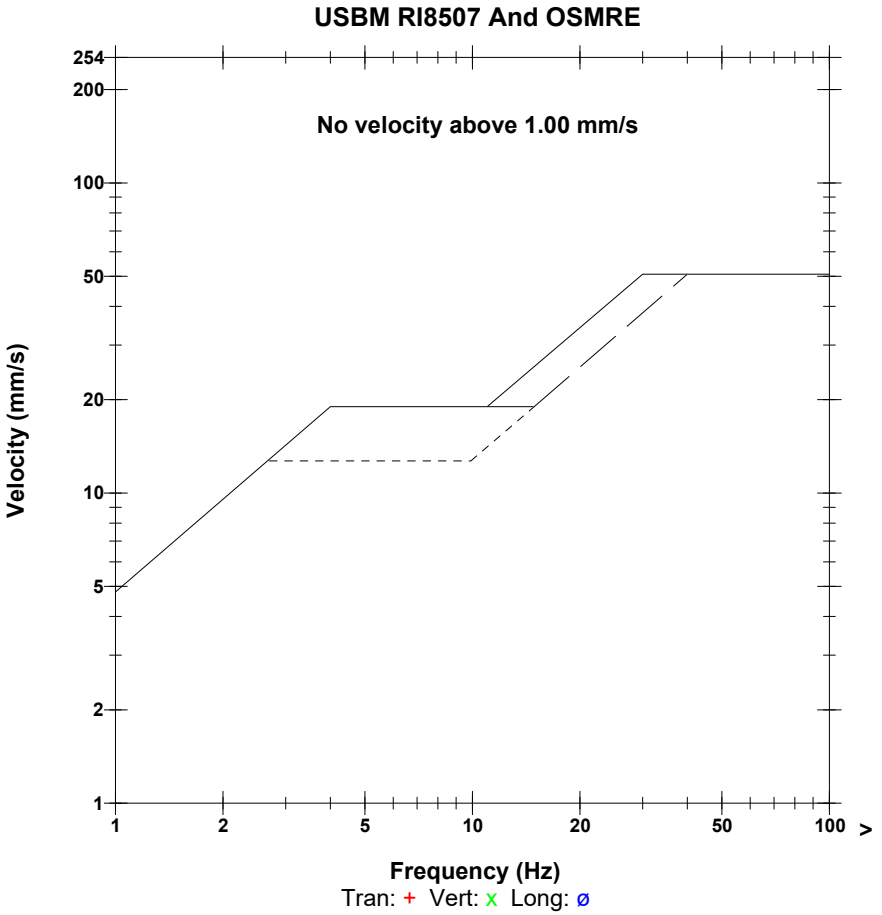
Serial Number 5673 V 2.61 MiniMate
Battery Level 5.7 Volts
Unit Calibration February 28, 2020 by Instantel
File Name G673ITPF.GB0
Post Event Notes
Location of Seismograph: Civic No. 4140 Route 111 (PW-12)
Blast No.: 2021-04
CE Project No.: 21S003.00

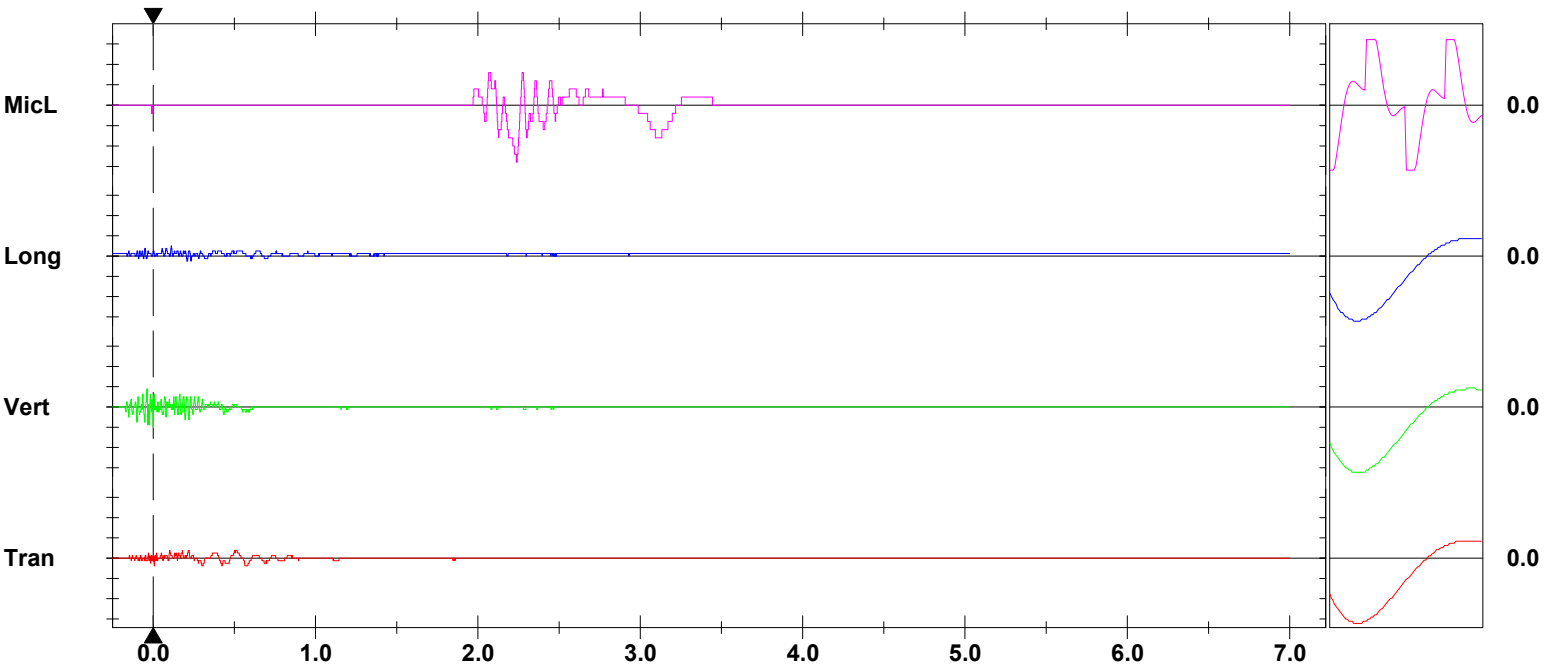
Extended Notes

Microphone Linear Weighting
PSPL 116.9 dB(L) 14.00 pa.(L) at 2.237 sec
ZC Freq 6.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 304 mv)

	Tran	Vert	Long	
PPV	0.191	0.508	0.254	mm/s
ZC Freq	>100	85	51	Hz
Time (Rel. to Trig)	0.007	0.001	0.112	sec
Peak Acceleration	0.007	0.027	0.007	g
Peak Displacement	0.000	0.001	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	7.8	8.0	Hz
Overswing Ratio	3.9	3.6	3.8	

Peak Vector Sum 0.524 mm/s at 0.001 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Report ID: 380986-IAS
Report Date: 13-Jan-21
Date Received: 07-Jan-21

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
30 Jervis Lane
Saint John, NB E2J 0A9

rpc
921 College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			380986-1	380986-2	380986-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			5-Jan-21	5-Jan-21	5-Jan-21
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem.
Director
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 380986-IAS
Report Date: 13-Jan-21
Date Received: 07-Jan-21

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
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Saint John, NB E2J 0A9

rpc
921 College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Methods

Analyte	RPC SOP #	Method Reference	Method Principle
Solids - Total Suspended	4.M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 381759-IAS
Report Date: 25-Jan-21
Date Received: 14-Jan-21

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
30 Jervis Lane
Saint John, NB E2J 0A9

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921 College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			381759-1	381759-2	381759-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			12-Jan-21	12-Jan-21	12-Jan-21
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem.
Director
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 381759-IAS
Report Date: 25-Jan-21
Date Received: 14-Jan-21

CERTIFICATE OF ANALYSIS

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Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
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Methods

Analyte	RPC SOP #	Method Reference	Method Principle
Solids - Total Suspended	4.M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 382434-IAS
Report Date: 29-Jan-21
Date Received: 20-Jan-21

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
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Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
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Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			382434-1	382434-2	382434-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			17-Jan-21	17-Jan-21	17-Jan-21
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	7	8	8

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem.
Director
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 382434-IAS
Report Date: 29-Jan-21
Date Received: 20-Jan-21

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Fax: 506.452.0594
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Methods

Analyte	RPC SOP #	Method Reference	Method Principle
Solids - Total Suspended	4.M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 383176-IAS
Report Date: 05-Feb-21
Date Received: 27-Jan-21

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
30 Jervis Lane
Saint John, NB E2J 0A9

rpc
921 College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			383176-1	383176-2	383176-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			22-Jan-21	22-Jan-21	22-Jan-21
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem.
Director
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 383176-IAS
Report Date: 05-Feb-21
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Methods

Analyte	RPC SOP #	Method Reference	Method Principle
Solids - Total Suspended	4.M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 383460-IAS
Report Date: 08-Feb-21
Date Received: 29-Jan-21

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
30 Jervis Lane
Saint John, NB E2J 0A9

rpc
921 College Hill Rd
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Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.0594
www.rpc.ca

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			383460-1	383460-2	383460-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			27-Jan-21	27-Jan-21	27-Jan-21
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem.
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Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 383460-IAS
Report Date: 08-Feb-21
Date Received: 29-Jan-21

CERTIFICATE OF ANALYSIS

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Methods

Analyte	RPC SOP #	Method Reference	Method Principle
Solids - Total Suspended	4.M05	APHA 2540 D	Filtration, Gravimetry