

Memo

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: March 25, 2021

Subject: Monthly Report – Upham East Gypsum Quarry, Surface Water Sampling – February 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 February 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, January through December 2020, and January 2021 reports for previous water quality results.

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

- Week 1: February 3, 2021
- Week 2: February 10, 2021
- Week 3: February 18, 2021
- Week 4: February 25, 2021

In February there was no additional sampling events for heavy precipitation, defined as more than 25 mm of rain over a 24-hour period.

Surface water was frozen during the February 18 and 25, 2021 sampling events. Therefore, field parameters were not able to be measured and samples were not collected.

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). Due to the surface water being frozen for two events in February, no duplicate samples were collected during the February monitoring program.

Environmental Accidents and Malfunctions

No spills occurred during the February 2021 monitoring period.

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, February 5, 11, 17, and 23; the results are provided in **Table 3**. None of the air samples collected in February exceed the 120 $\mu\text{g}/\text{m}^3$ 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 February there were two blasts, February 4 and 19. 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 February 2021 monitoring period.

Summary

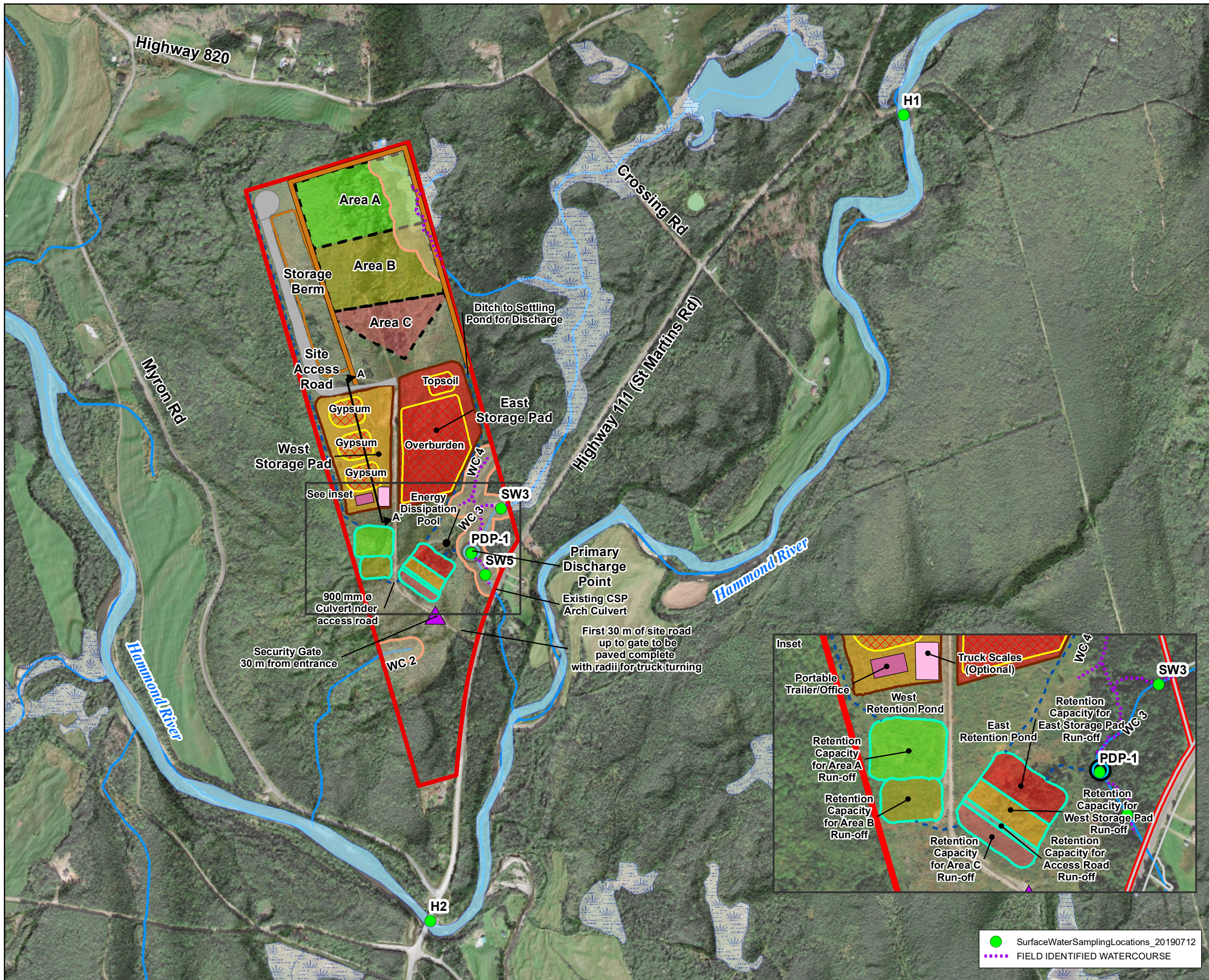
The water chemistry at the discharge point into WC3 is comparable to background. Based on the results provided in **Table 1**, the gypsum extraction activities being conducted on site have not had a negative impact on WC3 and subsequently the Hammond River. All air quality monitoring and blast monitoring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

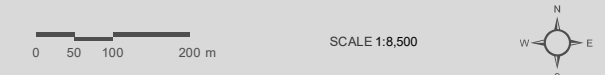
Dillon (Dillon Consulting Limited). 2020 Environmental Management Plan (EMP) for Operation. Upham East Gypsum Quarry Project, Upham New Brunswick. Prepared for Hammond River Holdings Limited by Dillon Consulting Limited, Fredericton, New Brunswick. Project 18-8346. June 2020.



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



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

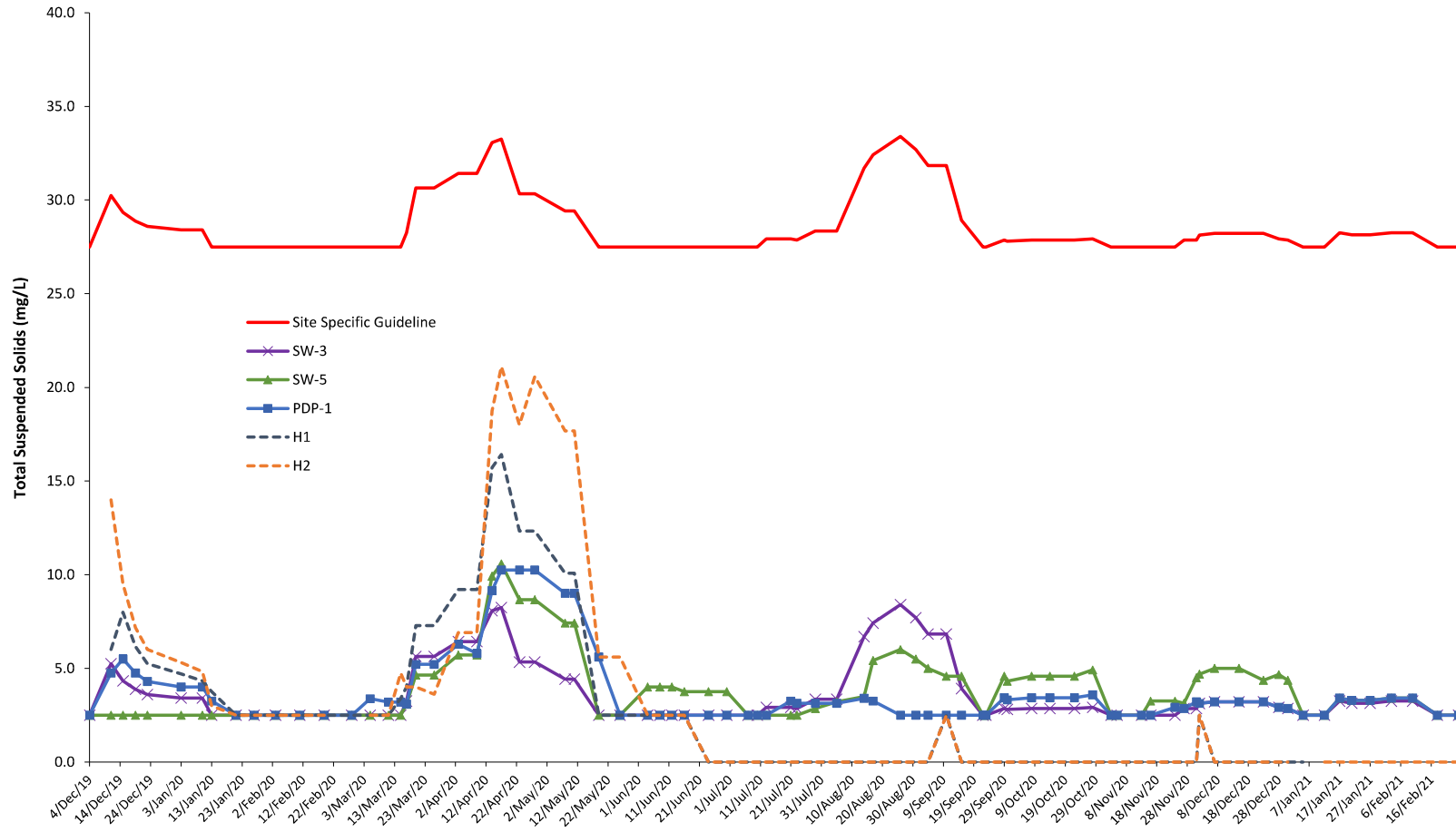
FILE LOCATION: \\DILLON.CAD\DILLON_DFS\FREDERICTON\FREDERICTON CAD\CAD\GIS\188346 UPHAM GYPSUM QUARRY\MXD



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

- SurfaceWaterSamplingLocations_20190712
- FIELD IDENTIFIED WATERCOURSE

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	Water Temperature	Specific Conductivity	Turbidity	Total Suspended Solids ^c
				°C	mS/cm	NTU	mg/L
Units		°C	mm	°C	mS/cm	NTU	mg/L
Sample ID	Date						
SW3	3-Feb-21	2.2	0.7	0.9	0.328	8.96	<5
PDP-1	3-Feb-21			0.8	0.4	9.83	<5
SW-5	3-Feb-21			0.8	0.381	9.71	<5
SW3	10-Feb-21	-7.5	0	0	0.444	9.7	<5
PDP-1	10-Feb-21			0	0.432	9.88	<5
SW5	10-Feb-21			0	0.433	14.06	<5
SW3	18-Feb-21	-7.50	0.00	Frozen No Sample Collected			
PDP-1	18-Feb-21						
SW5	18-Feb-21						
SW3	25-Feb-21	-1.60	1.60	Frozen No Sample Collected			
PDP-1	25-Feb-21						
SW-5	25-Feb-21						

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) Precipitation 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.

d) Canadian Council of Ministers of Environment (CCME) for the Protection of Aquatic Life.

SW3 is the background sample for Watercourse 3.

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

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	-	-	2.5	2.5	2.5
12-Jan-21	27.5	-	-	2.5	2.5	2.5
17-Jan-21	28.3	-	-	3.3	3.4	3.4
21-Jan-21	28.1	-	-	3.1	3.3	3.3
27-Jan-21	28.1	-	-	3.1	3.3	3.3
3-Feb-21	28.3	-	-	3.3	3.4	3.4
10-Feb-21	28.3	-	-	3.3	3.4	3.4
18-Feb-21	27.5	-	-	2.5	2.5	2.5
25-Feb-21	27.5	-	-	2.5	2.5	2.5

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
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/m ³)	Site Guideline (µg/m ³)
2020-07-22	14:51	24 hours	16.7	24.05	752	20.3	14.8415	14.8645	23000	39.848	120
2020-07-28	23:59	24 hours	16.46	23.7	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	24.1	752	21.2	14.8422	14.8444	2200	3.804	120
2020-08-15	23:59	24 hours	16.88	24.3	754	19.8	14.8243	14.8359	11600	19.89	120
2020-08-21	23:59	24 hours	16.87	24.3	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	14.845	21700	36.8	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	20.57	120
2020-09-14	23:59	24 hours	17.62	25.37	756	8	14.8275	14.8368	9300	15.274	120
2020-09-20	23:59	24 hours	18.03	25.97	764	4.8	14.8349	14.852	17100	27.436	120
2020-09-26	23:59	24 hours	17.1	24.62	753	15.3	14.8561	14.8594	3300	5.585	120
2020-10-02	23:59	24 hours	14.43	25.1	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	12.29	120
2020-11-07	23:59	24 hours	17.84	25.68	759	5.9	14.8692	14.8723	3100	5.03	120
2020-11-13	23:59	24 hours	17.79	25.62	748	1.9	14.86	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	14.8427	14.861	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	25.9	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	14.843	5700	8.979	120
2020-12-25	23:59	24 hours	17.34 ^a	22.82 ^a	753 ^a	12.3 ^a	14.84	14.85	10000	18.259	120
2020-12-31	23:59	24 hours	18.58	26.76	759	-5.8	14.8452	14.85	4800	7.474	120
2021-01-06	23:59	24 hours	18	24.73	744	-2.7	14.836	14.8523	16300	27.463	120
2021-01-12	23:59	24 hours	16.7	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	16.7	24.03	737	-8	14.8231	14.8273	4200	7.283	120
2021-01-30	23:59	24 hours	16.7	24.03	750	-11.2	14.829	14.8326	3600	6.242	120
2021-02-05	23:59	24 hours	17.9	25.8	744	-0.9	14.8504	14.8662	15800	25.5168	120
2021-02-11	23:59	24 hours	16.7	24.05	750	-12.6	14.829	14.8343	5300	9.1823	120
2021-02-17	9:59	24 hours	16.7	24.05	755	-9.9	14.818	14.8208	2800	4.8510	120
2021-02-23	23:59	24 hours	17.7	25.49	737	-0.6	14.8906	14.8966	6000	9.8078	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.

Report ID: 384102-IAS
Report Date: 11-Feb-21
Date Received: 05-Feb-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

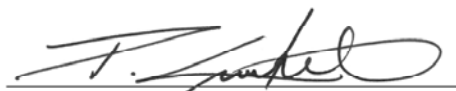
Location: Upham

Analysis of Water

RPC Sample ID:	384102-1	384102-2	384102-3
Client Sample ID:	SW3	SW5	PDP-1
Date Sampled:	3-Feb-21	3-Feb-21	3-Feb-21
Analytes	Units	RL	
Solids - Total Suspended	mg/L	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: 384102-IAS
Report Date: 11-Feb-21
Date Received: 05-Feb-21

CERTIFICATE OF ANALYSIS

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



921 College Hill Rd
Fredericton NB
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Fax: 506.452.0594
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Methods

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

Report ID: 384668-IAS
Report Date: 22-Feb-21
Date Received: 11-Feb-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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Fax: 506.452.0594
www.rpc.ca

Attention: Daniel Guest

Project #: 17-5121

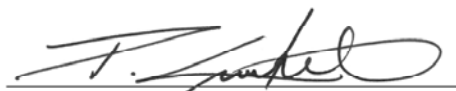
Location: Upham

Analysis of Water

RPC Sample ID:	384668-1	384668-2	384668-3
Client Sample ID:	SW3	SW5	PDP-1
Date Sampled:	10-Feb-21	10-Feb-21	10-Feb-21
Analytes	Units	RL	
Solids - Total Suspended	mg/L	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: 384668-IAS
Report Date: 22-Feb-21
Date Received: 11-Feb-21

CERTIFICATE OF ANALYSIS

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



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

Methods

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

February 5, 2021

Project No.: 21S003.00

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

Re: Blast Vibration Monitoring – Blast No. 2021-05 – 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 15:33 on February 4, 2021. For the monitoring we positioned nine (9) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2021-05 – February 4, 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)	15:33	1,290 m S	0.64 mm/s @ 57 Hz	112	-
2. Civic No. 4126 Route 111 (PW-10)		850 m S	1.97 mm/s @ 51 Hz	118	-
3. Civic No. 4150 Route 111 (PW-13)		665 m S	1.91 mm/s @ 64 Hz	120	-
4. Civic No. 2447 Route 820 (PW-07)		871 m NE	1.65 mm/s @ 5 Hz	123	-
5. PW-03 - Route 820		688 m N	1.40 mm/s @ 15 Hz	125	-
6. Civic No. 2341 Route 820 (PW-05)		727 m NW	1.65 mm/s @ 8 Hz	122	-
7. Civic No. 50 Myron Road (PW-15)		1,020 m NW	1.08 mm/s @ 15 Hz	120	-
8. Civic No. 86 Myron Road (PW-16)		915 m W	1.52 mm/s @ 6 Hz	118	-
9. Civic No. 220 Myron Road (PW-01)		1,380 m S	1.40 mm/s @ 47 Hz	114	-
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

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 4, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>15:33</u>
Inspector: <u>L. Boyd</u>	Blast No.: <u>2021-05</u>
Client: <u>Hammond River Holdings</u>	

IDENTIFICATION:

Blasting Contractor: <u>Gulf Operators Ltd.</u>	
Blaster's Certification No.: <u>1318</u>	Blaster's Name: <u>Daniel Blanchard</u>
Blast Location: <u>N 45°28'52.4" E 65°37'55.1"</u>	
Type of Rock: <u>Gypsum</u>	Est. Vol. or Tonnage: <u>29,167 tonnes</u>
Weather at time of Blast: <u>Overcast</u>	Air Temp.: <u>3°C</u>
Est. Wind Speed : <u>≈5 km/h</u>	Wind Direction: <u>S</u>
Cloud Cover: <u>Yes - Overcast</u>	Precipitation: <u>No</u>

BLAST DESIGN:

Total No. Holes: <u>125</u>	Hole Diameter: <u>5.5"</u>
Average Depth: <u>4.2 – 10.8 m</u>	Spacing: <u>12 ft x 12 ft</u>
No. Holes per Delay: <u>3</u>	Collar Length: <u>8 ft</u>
Delay between Holes: <u>25 ms</u>	Delay between Rows: <u>17, 34 & 42 ms</u>
Initiation Method: <u>Non-electric</u>	
Weight of Explosives per Delay: <u>Max.: 400 kg</u>	
Type and weight of Explosives for Blast: <u>12,211 kg – Titan XL 1000</u>	

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

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 4, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>15:33</u>
Inspector: <u>L. Boyd</u>	Blast No.: <u>2021-05</u>
Client: <u>Hammond River Holdings</u>	

BLAST MONITORING

Distance to the Nearest Structure:	<u>665 m</u>
Direction to the Nearest Structure:	<u>SE</u>
Structure Type:	<u>House</u>
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	<u>33.3</u>

SAFETY:

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

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

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 4, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>15:33</u>
Inspector: <u>L. Boyd</u>	Blast No.: <u>2021-05</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5632</u>
Calibration Date:	<u>October 22, 2020</u>
Location of seismograph:	<u>Civic Number 4079 Route 111 (PW-09)</u>
Distance and Direction from Blast:	<u>1,290 m South</u>
Transverse Particle Velocity:	<u>0.38 mm/s @ 6 Hz</u>
Vertical Particle Velocity:	<u>0.64 mm/s @ 57 Hz</u>
Longitudinal Particle Velocity:	<u>0.38 mm/s @ 18 Hz</u>
Peak Particle Velocity:	<u>0.64 mm/s @ 57 Hz</u>
Maximum Airblast:	<u>112 dB(L)</u>

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5635</u>
Calibration Date:	<u>March 26, 2020</u>
Location of seismograph:	<u>Civic Number 4126 Route 111 (PW-10)</u>
Distance and Direction from Blast:	<u>850 m South</u>
Transverse Particle Velocity:	<u>1.02 mm/s @ 12 Hz</u>
Vertical Particle Velocity:	<u>1.97 mm/s @ 51 Hz</u>
Longitudinal Particle Velocity:	<u>1.14 mm/s @ 34 Hz</u>
Peak Particle Velocity:	<u>1.97 mm/s @ 51 Hz</u>
Maximum Airblast:	<u>118 dB(L)</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 4, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>15:33</u>
Inspector: <u>L. Boyd</u>	Blast No.: <u>2021-05</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5673</u>
Calibration Date:	<u>February 28, 2020</u>
Location of seismograph:	<u>Civic Number 4150 Route 111 (PW-13)</u>
Distance and Direction from Blast:	<u>665 m South</u>
Transverse Particle Velocity:	<u>1.14 mm/s @ 16 Hz</u>
Vertical Particle Velocity:	<u>1.91 mm/s @ 64 Hz</u>
Longitudinal Particle Velocity:	<u>1.02 mm/s @ 51 Hz</u>
Peak Particle Velocity:	<u>1.91 mm/s @ 64 Hz</u>
Maximum Airblast:	<u>120 dB(L)</u>

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21349</u>
Calibration Date:	<u>June 12, 2020</u>
Location of seismograph:	<u>Civic Number 2447 Route 820 (PW-07)</u>
Distance and Direction from Blast:	<u>871 m Northeast</u>
Transverse Particle Velocity:	<u>1.65 mm/s @ 5 Hz</u>
Vertical Particle Velocity:	<u>1.14 mm/s @ 19 Hz</u>
Longitudinal Particle Velocity:	<u>1.40 mm/s @ 20 Hz</u>
Peak Particle Velocity:	<u>1.65 mm/s @ 5 Hz</u>
Maximum Airblast:	<u>123 dB(L)</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 4, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>15:33</u>
Inspector: <u>L. Boyd</u>	Blast No.: <u>2021-05</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5960</u>
Calibration Date:	<u>May 15, 2020</u>
Location of seismograph:	<u>PW-03 - Route 820</u>
Distance and Direction from Blast:	<u>688 m North</u>
Transverse Particle Velocity:	<u>0.83 mm/s @ 17 Hz</u>
Vertical Particle Velocity:	<u>0.95 mm/s @ 19 Hz</u>
Longitudinal Particle Velocity:	<u>1.40 mm/s @ 15 Hz</u>
Peak Particle Velocity:	<u>1.40 mm/s @ 15 Hz</u>
Maximum Airblast:	<u>125 dB(L)</u>

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21348</u>
Calibration Date:	<u>June 12, 2020</u>
Location of seismograph:	<u>Civic Number 2341 Route 820 (PW-05)</u>
Distance and Direction from Blast:	<u>727 m Northwest</u>
Transverse Particle Velocity:	<u>1.27 mm/s @ 22 Hz</u>
Vertical Particle Velocity:	<u>0.63 mm/s @ 37 Hz</u>
Longitudinal Particle Velocity:	<u>1.65 mm/s @ 8 Hz</u>
Peak Particle Velocity:	<u>1.65 mm/s @ 8 Hz</u>
Maximum Airblast:	<u>122 dB(L)</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 4, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>15:33</u>
Inspector: <u>L. Boyd</u>	Blast No.: <u>2021-05</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5676</u>
Calibration Date:	<u>February 26, 2020</u>
Location of seismograph:	<u>Civic Number 50 Myron Road (PW-15)</u>
Distance and Direction from Blast:	<u>1,020 m Northwest</u>
Transverse Particle Velocity:	<u>1.08 mm/s @ 15 Hz</u>
Vertical Particle Velocity:	<u>0.83 mm/s @ 27 Hz</u>
Longitudinal Particle Velocity:	<u>0.83 mm/s @ 9 Hz</u>
Peak Particle Velocity:	<u>1.08 mm/s @ 15 Hz</u>
Maximum Airblast:	<u>120 dB(L)</u>

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5489</u>
Calibration Date:	<u>May 15, 2020</u>
Location of seismograph:	<u>Civic Number 86 Myron Road (PW-16)</u>
Distance and Direction from Blast:	<u>915 m West</u>
Transverse Particle Velocity:	<u>1.52 mm/s @ 6 Hz</u>
Vertical Particle Velocity:	<u>1.08 mm/s @ 24 Hz</u>
Longitudinal Particle Velocity:	<u>1.27 mm/s @ 7 Hz</u>
Peak Particle Velocity:	<u>1.52 mm/s @ 6 Hz</u>
Maximum Airblast:	<u>118 dB(L)</u>

BLAST RECORD

Project Name:	<u>Upham Gypsum Quarry</u>	Date of Blast:	<u>February 4, 2021</u>
Project No.:	<u>21S003.00</u>	Time of Blast:	<u>15:33</u>
Inspector:	<u>L. Boyd</u>	Blast No.:	<u>2021-05</u>
Client:	<u>Hammond River Holdings</u>		

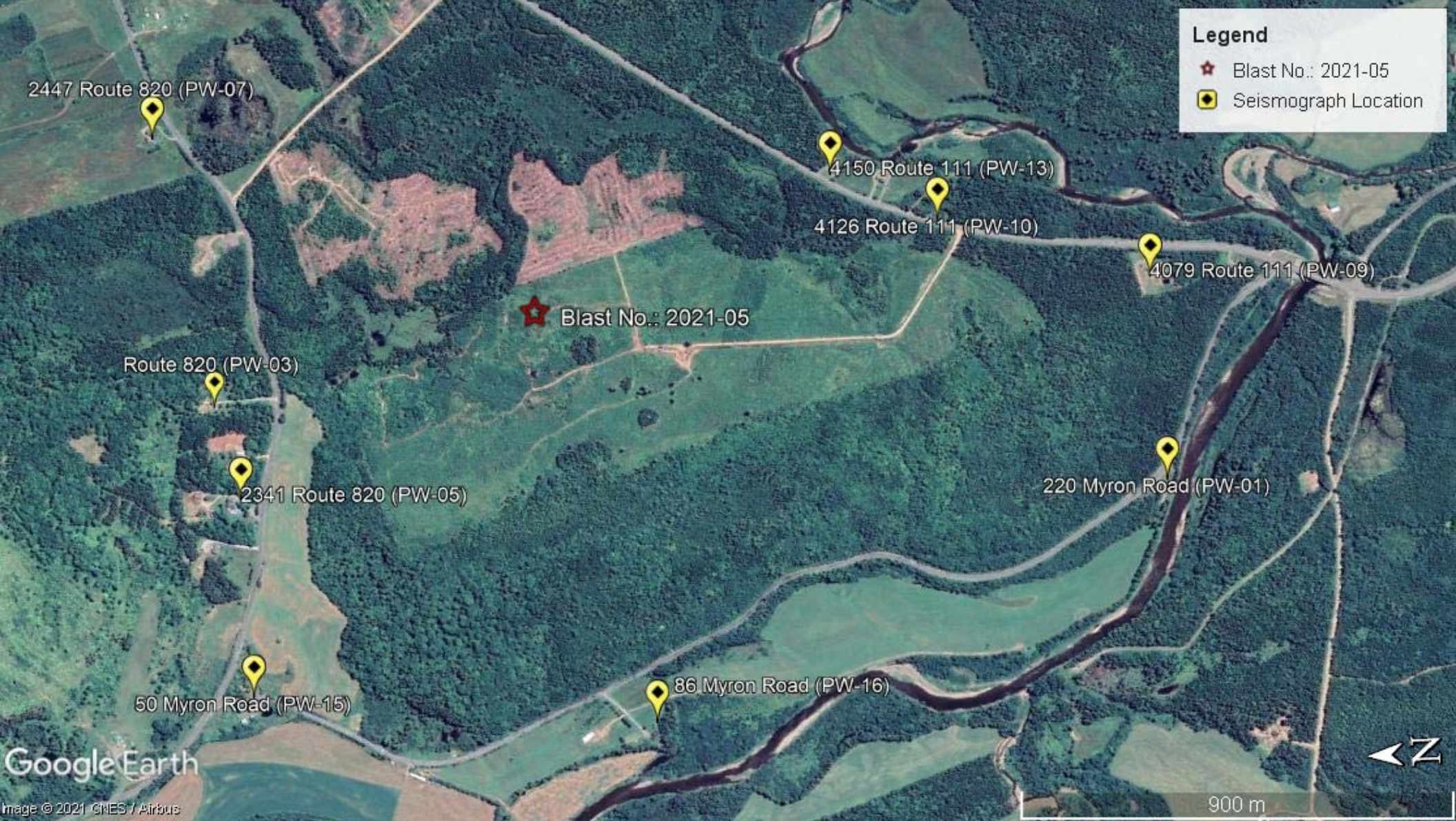
Data Collection – Seismometer #9

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial # 5371</u>
Calibration Date:	<u>June 24, 2020</u>
Location of seismograph:	<u>Civic Number 220 Myron Road (PW-01)</u>
Distance and Direction from Blast:	<u>1,380 m South</u>
Transverse Particle Velocity:	<u>0.32 mm/s @ 43 Hz</u>
Vertical Particle Velocity:	<u>1.40 mm/s @ 47 Hz</u>
Longitudinal Particle Velocity:	<u>0.45 mm/s @ 32 Hz</u>
Peak Particle Velocity:	<u>1.40 mm/s @ 47 Hz</u>
Maximum Airblast:	<u>114 dB(L)</u>

Blast and Seismograph Location Plan

Blast No: 2021-05

Upham East Gypsum Quarry, Upham, NB



Date: February 4, 2021
CE Project No.: 21S003.00

Date/Time Vert at 15:33:17 February 4, 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

Serial Number 5632 V 2.61 MiniMate
Battery Level 5.8 Volts
Unit Calibration October 22, 2020 by InstanTel
File Name G632IU80.JH0

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:42:05 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.4079 Route 111 (PW-09)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

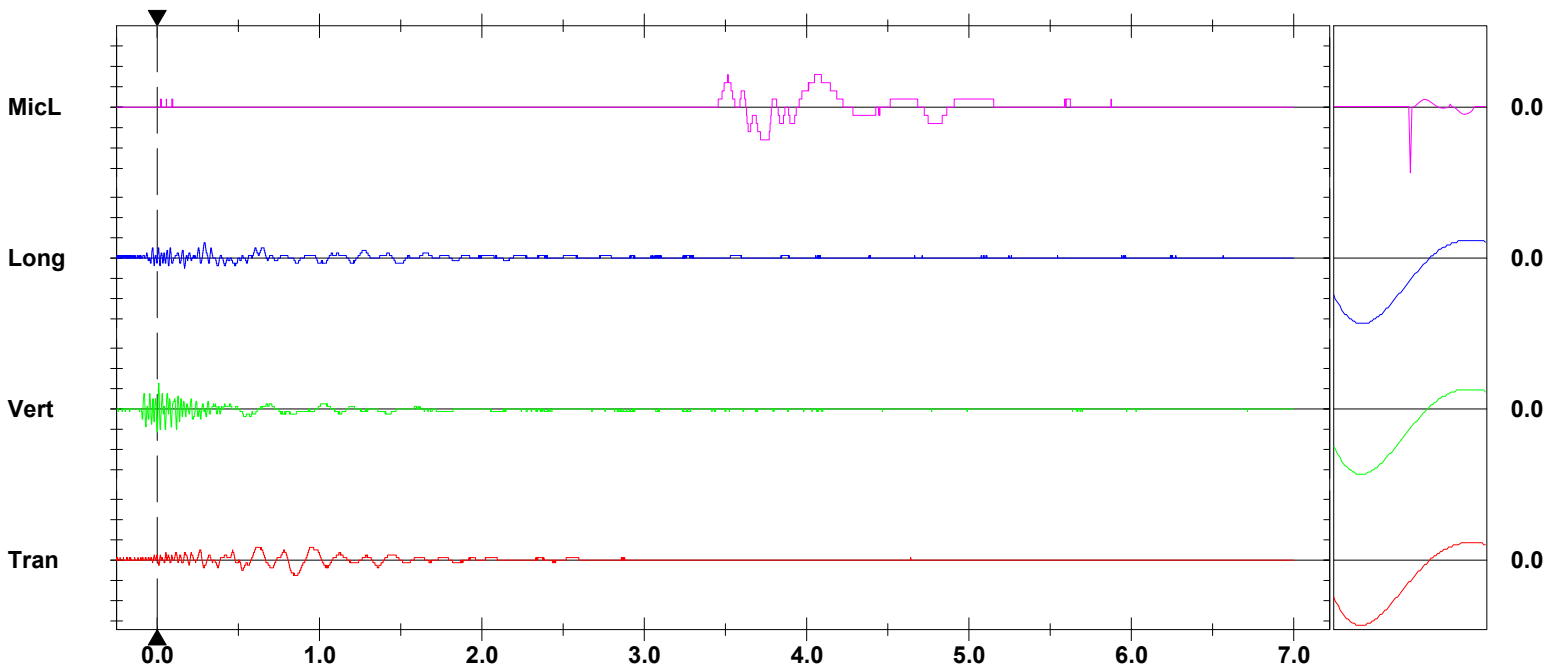
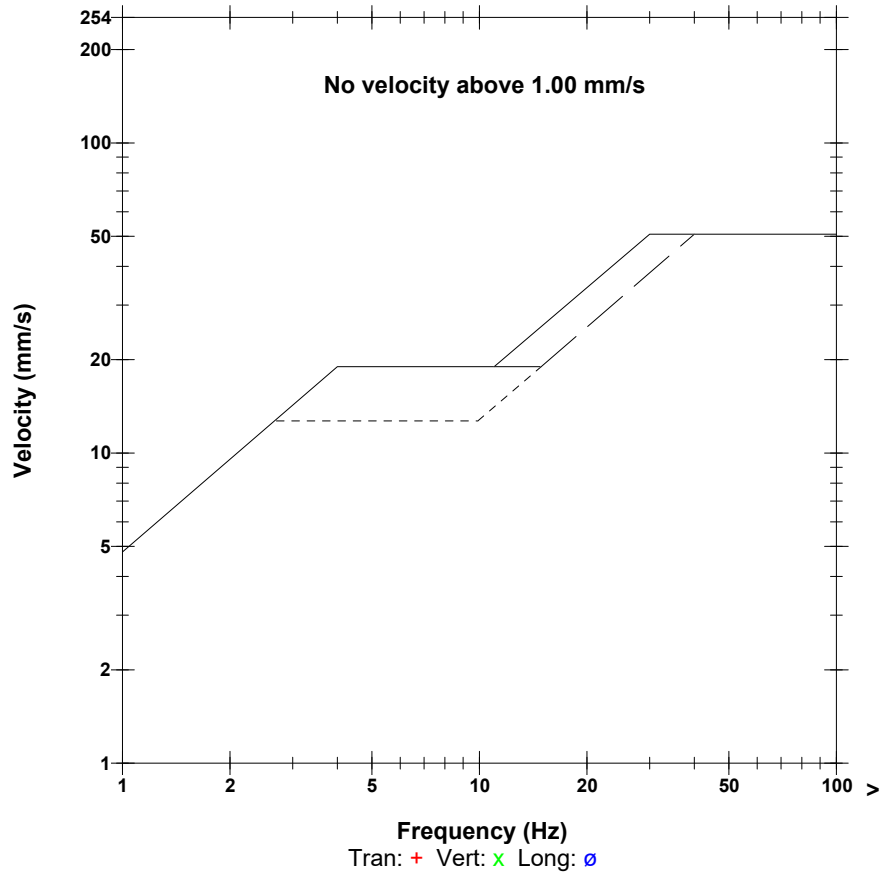
Extended Notes

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 3.515 sec
ZC Freq 5.0 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 307 mv)

	Tran	Vert	Long	
PPV	0.381	0.635	0.381	mm/s
ZC Freq	6.0	57	18	Hz
Time (Rel. to Trig)	0.842	0.010	0.289	sec
Peak Acceleration	0.007	0.027	0.007	g
Peak Displacement	0.011	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.2	8.1	Hz
Overswing Ratio	3.8	3.5	3.8	

Peak Vector Sum 0.699 mm/s at 0.010 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:18 February 4, 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

Serial Number 5635 V 2.61 MiniMate
Battery Level 6.2 Volts
Unit Calibration March 26, 2020 by InstanTel
File Name G635IU80.J10

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:29:17 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.4126 Route 111 (PW-10)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

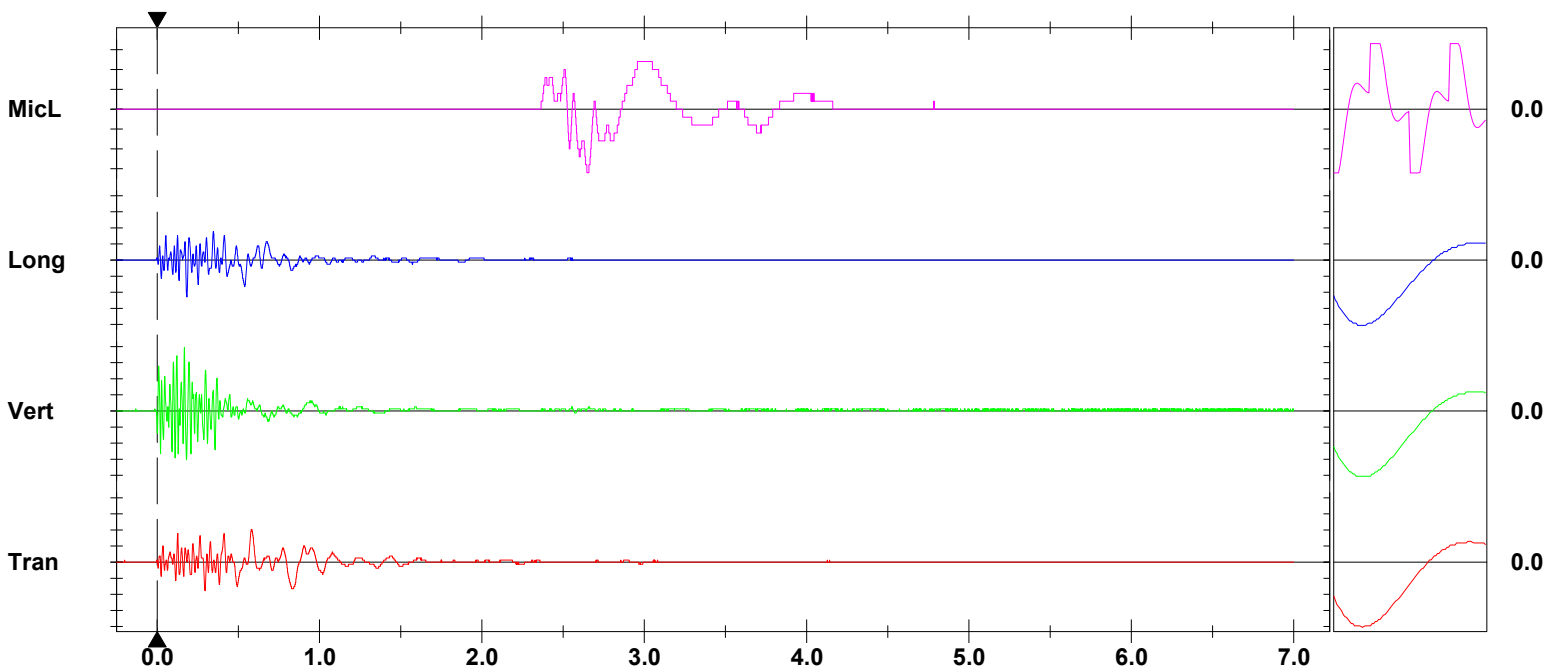
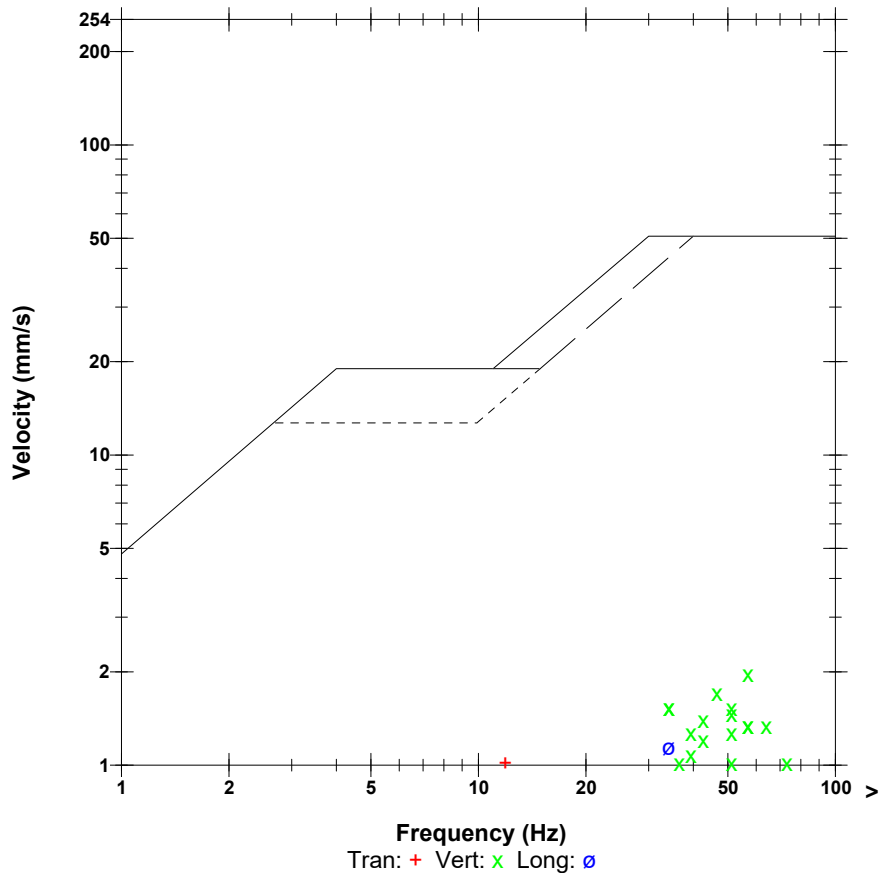
Extended Notes

Microphone Linear Weighting
PSPL 118.1 dB(L) 16.00 pa.(L) at 2.647 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 298 mv)

	Tran	Vert	Long	
PPV	1.016	1.969	1.143	mm/s
ZC Freq	12	51	34	Hz
Time (Rel. to Trig)	0.580	0.169	0.183	sec
Peak Acceleration	0.020	0.066	0.033	g
Peak Displacement	0.019	0.007	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.8	7.7	Hz
Overswing Ratio	3.1	3.6	3.9	

Peak Vector Sum 2.000 mm/s at 0.169 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:16 February 4, 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

Serial Number 5673 V 2.61 MiniMate
Battery Level 6.0 Volts
Unit Calibration February 28, 2020 by InstanTel
File Name G673IU80.JG0

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:45:24 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.4150 Route 111 (PW-13)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

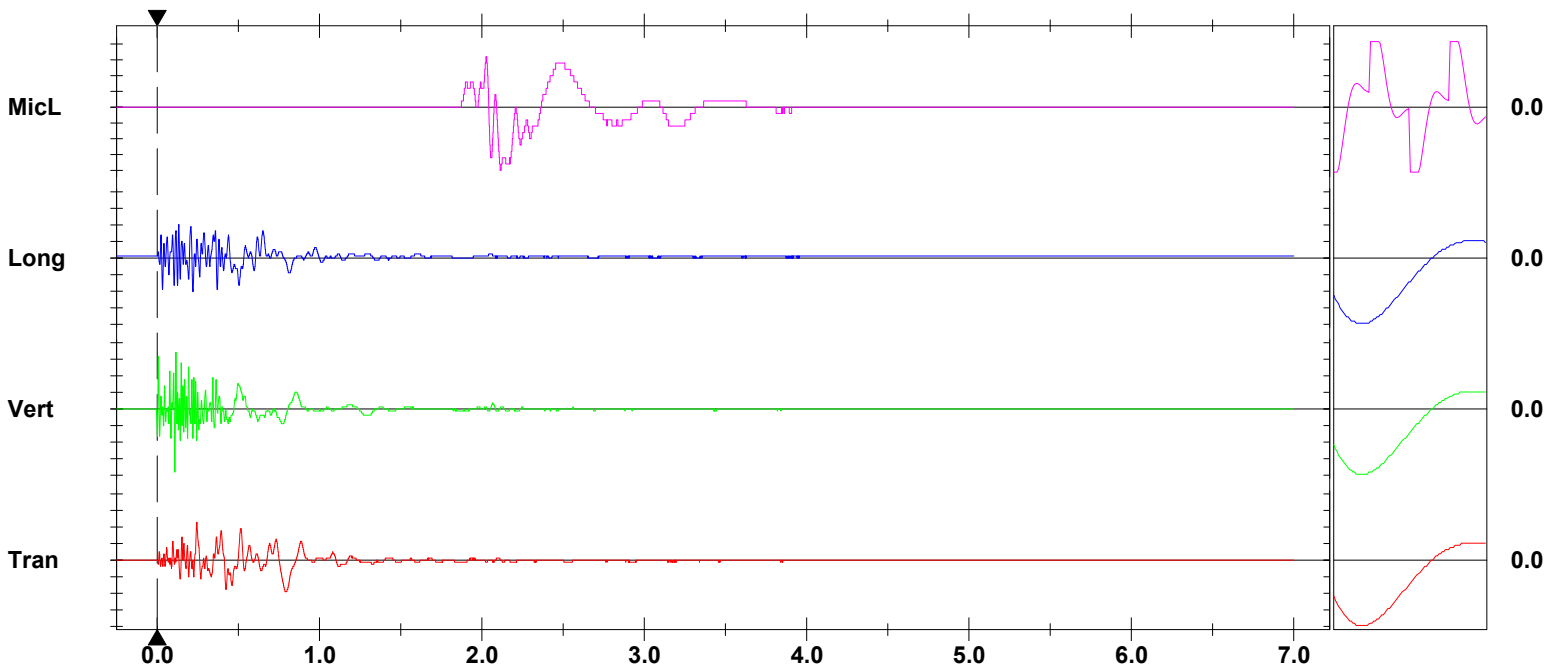
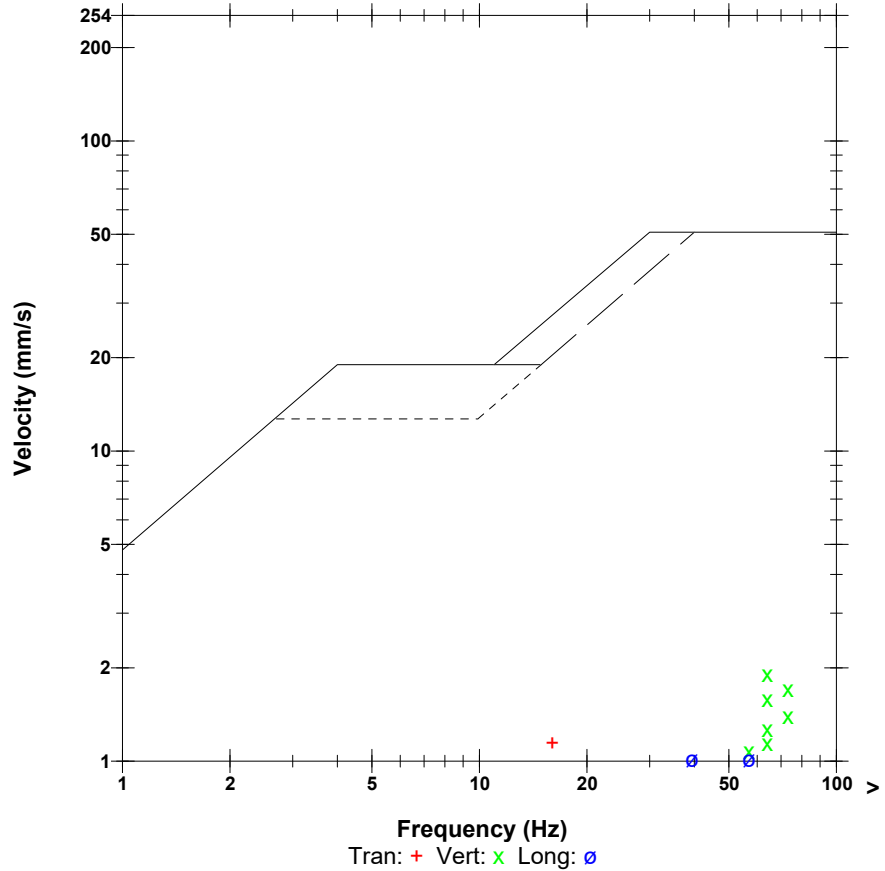
Extended Notes

Microphone Linear Weighting
PSPL 120.0 dB(L) 20.00 pa.(L) at 2.113 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	1.143	1.905	1.016	mm/s
ZC Freq	16	64	51	Hz
Time (Rel. to Trig)	0.245	0.109	0.134	sec
Peak Acceleration	0.020	0.086	0.033	g
Peak Displacement	0.025	0.016	0.014	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.8	7.8	Hz
Overswing Ratio	3.9	3.9	3.8	

Peak Vector Sum 1.921 mm/s at 0.109 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:17 February 4, 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

Serial Number BE21349 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration June 12, 2020 by InstanTel
File Name W349IU65.VH0

Notes

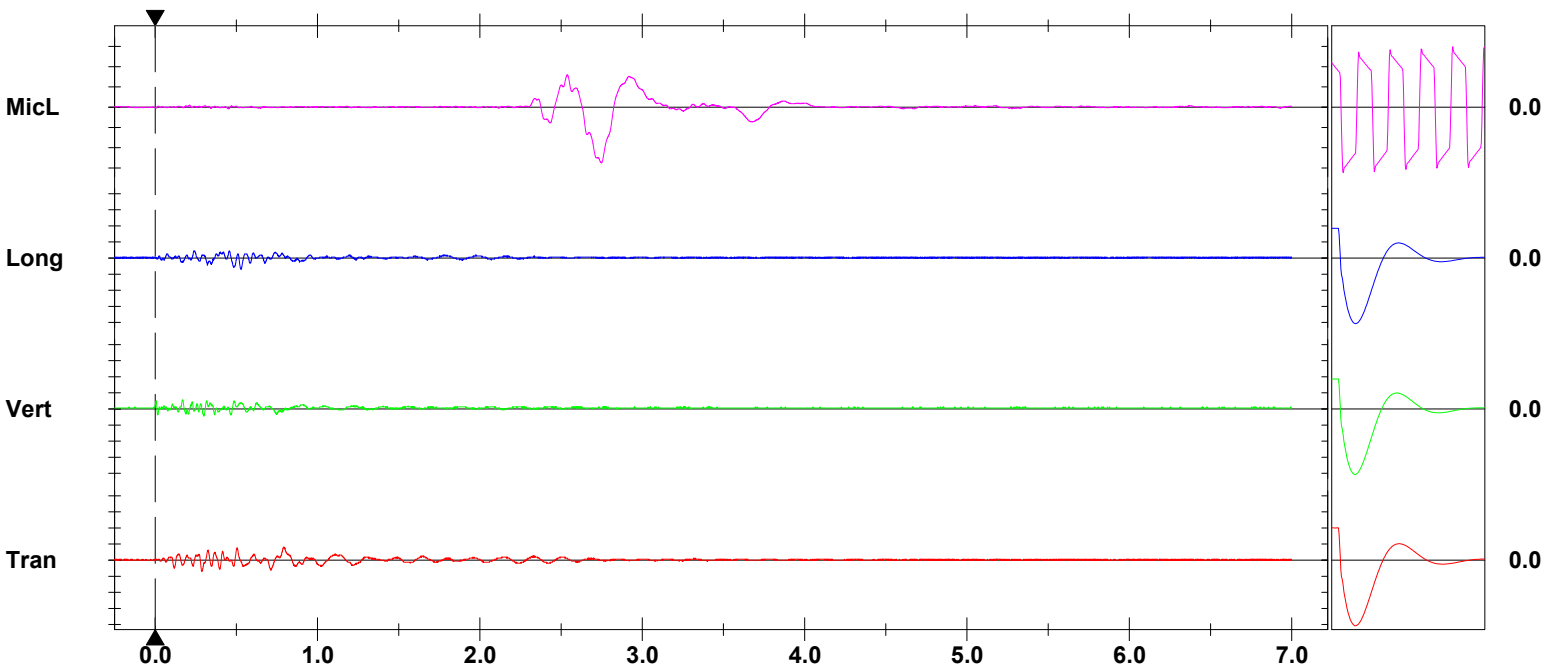
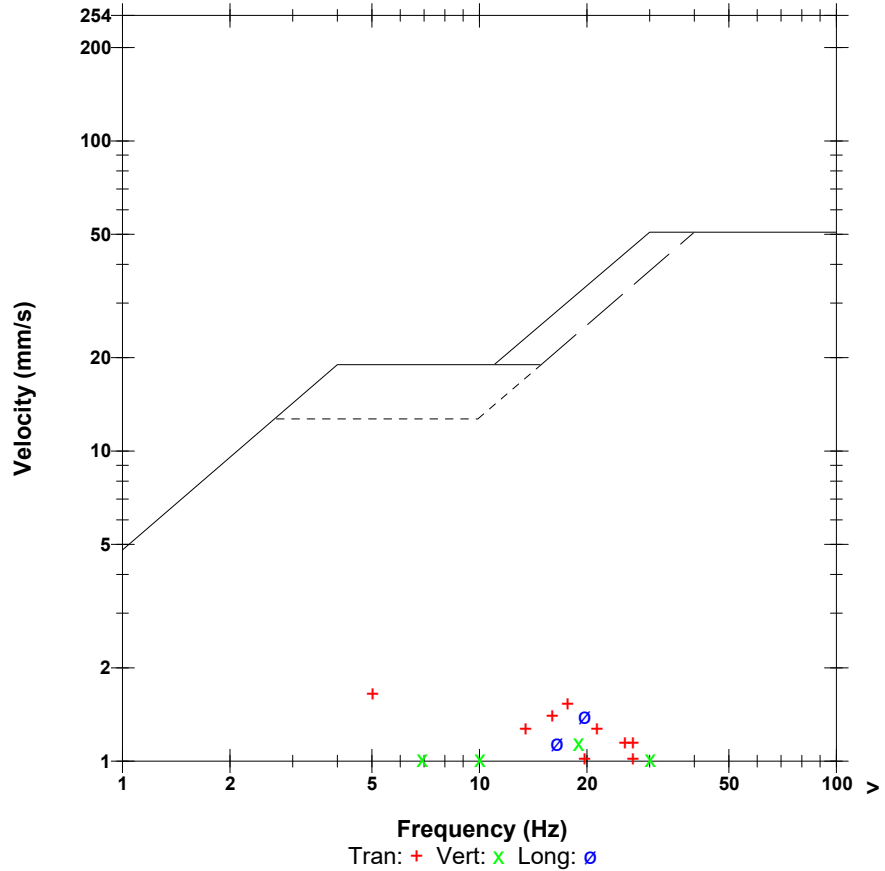
Post Event Notes
 Location of Seismograph: Civic No. 2447 Route 820 (PW-07)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

Microphone Linear Weighting
PSPL 122.8 dB(L) 27.50 pa.(L) at 2.747 sec
ZC Freq 2.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 715 mv)

	Tran	Vert	Long	
PPV	1.651	1.143	1.397	mm/s
ZC Freq	5.0	19	20	Hz
Time (Rel. to Trig)	0.792	0.167	0.526	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.037	0.020	0.015	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.0	4.1	4.4	

Peak Vector Sum 1.675 mm/s at 0.792 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:16 February 4, 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

Serial Number 5960 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration May 15, 2020 by InstanTel
File Name G960IU80.JG0

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:32:48 (V10.72.1)

Post Event Notes
 Location of Seismograph: Cottage - PW-03 - Route 820
 Blast No.: 2021-05
 CE Project No.: 21S003.00

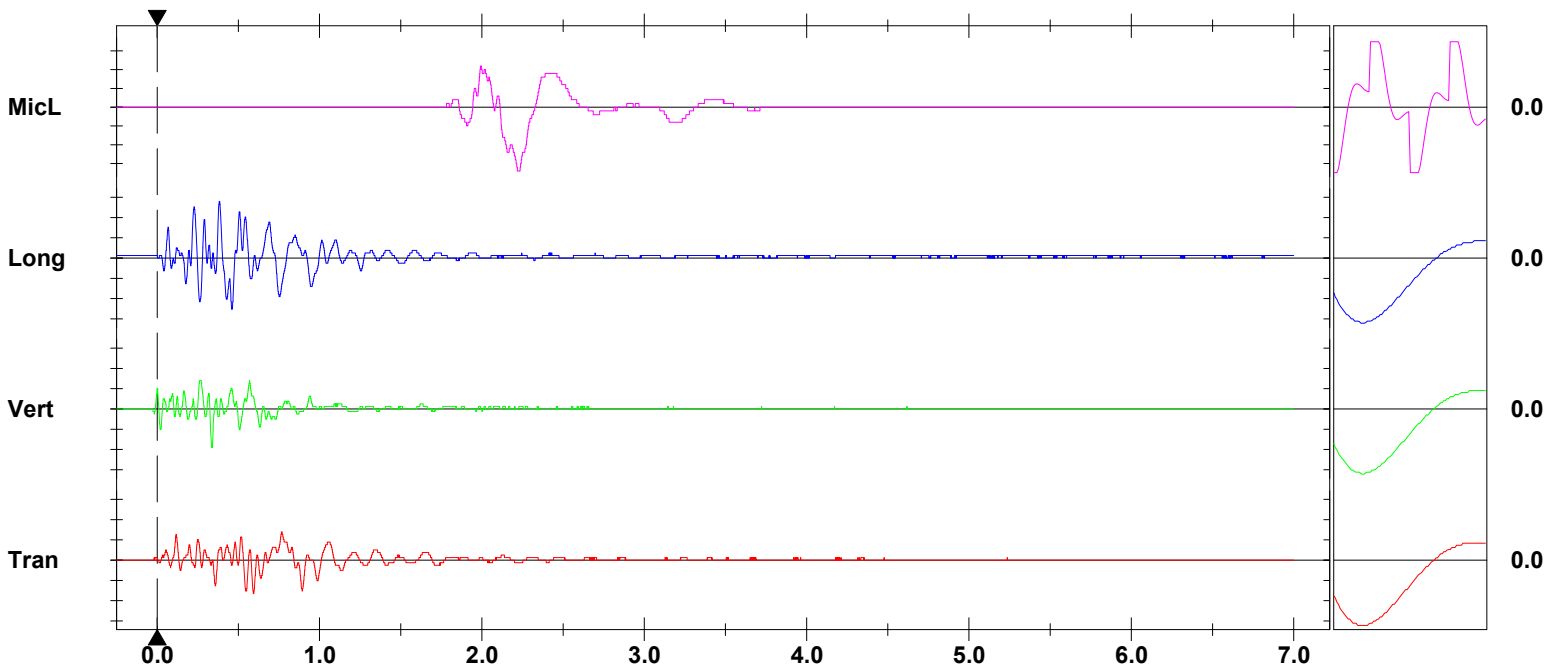
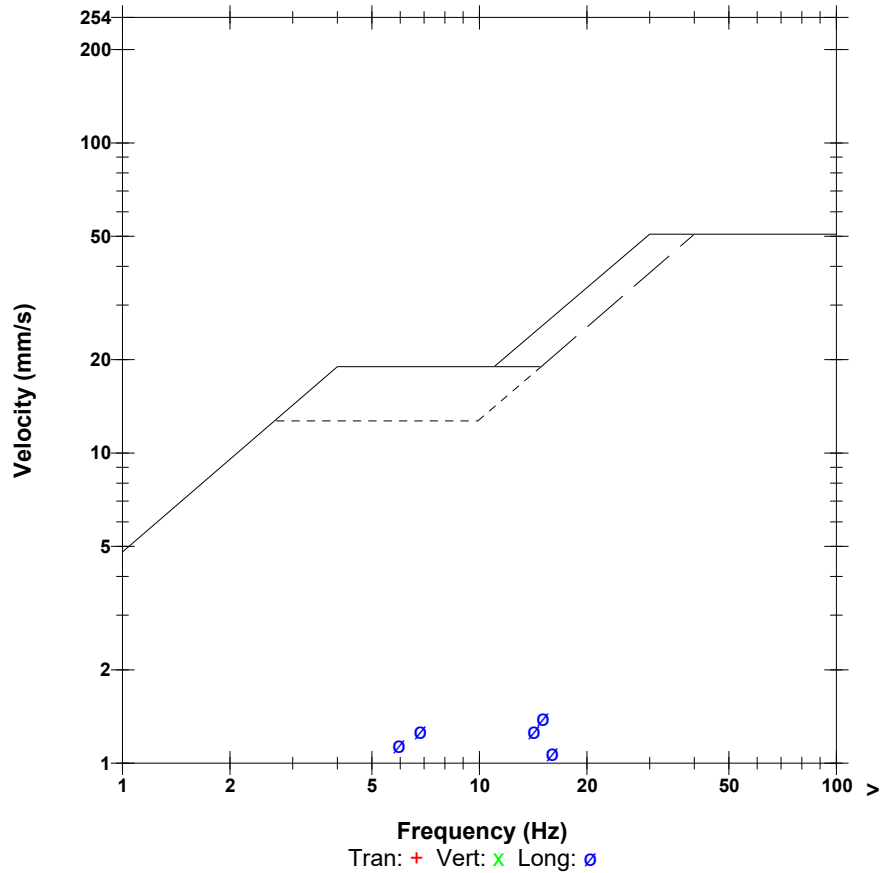
Extended Notes

Microphone Linear Weighting
PSPL 124.6 dB(L) 34.00 pa.(L) at 2.220 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	0.826	0.953	1.397	mm/s
ZC Freq	17	19	15	Hz
Time (Rel. to Trig)	0.593	0.336	0.383	sec
Peak Acceleration	0.013	0.013	0.020	g
Peak Displacement	0.022	0.011	0.026	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.7	7.5	Hz
Overswing Ratio	3.9	3.7	4.2	

Peak Vector Sum 1.429 mm/s at 0.383 sec

USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

Date/Time Long at 15:33:16 February 4, 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

Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration June 12, 2020 by InstanTel
File Name W348IU65.VG0

Notes

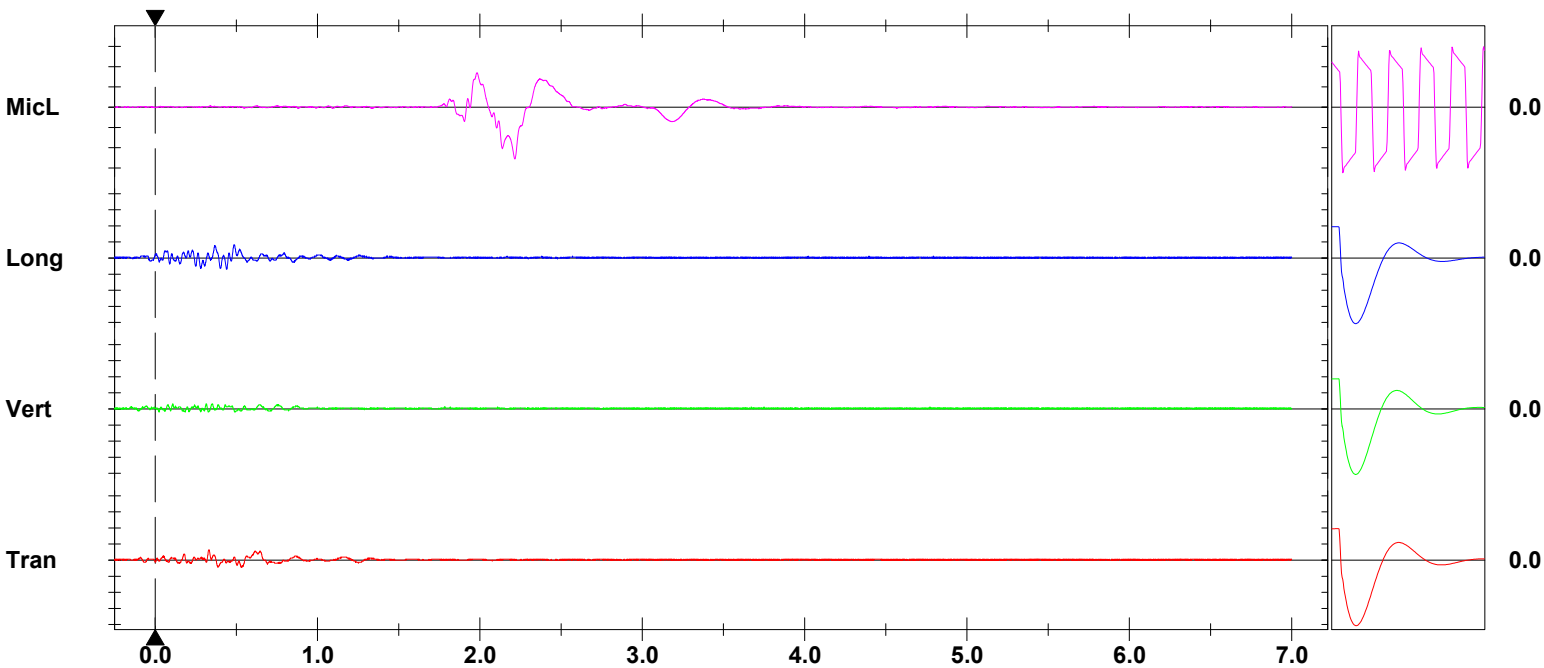
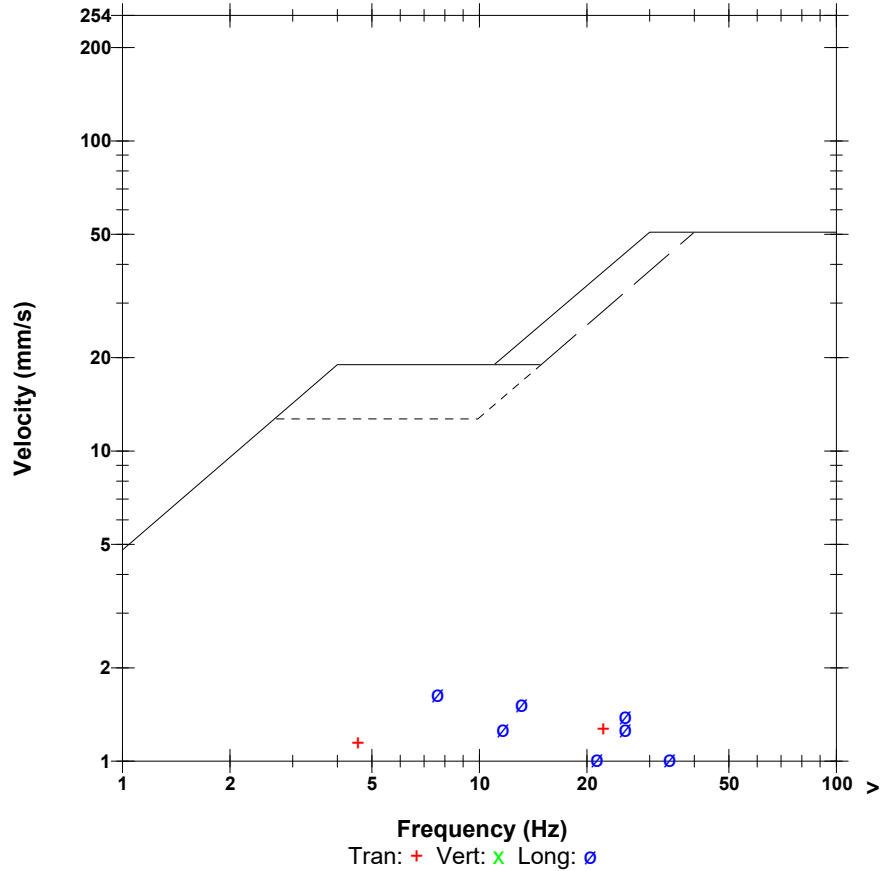
Post Event Notes
 Location of Seismograph: Civic No. 2341 Route 820 (PW-05)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

Microphone Linear Weighting
PSPL 122.1 dB(L) 25.50 pa.(L) at 2.214 sec
ZC Freq 2.2 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 712 mv)

	Tran	Vert	Long	
PPV	1.270	0.635	1.651	mm/s
ZC Freq	22	37	7.6	Hz
Time (Rel. to Trig)	0.328	0.106	0.484	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.037	0.009	0.027	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.2	Hz
Overswing Ratio	3.7	3.6	4.4	

Peak Vector Sum 1.737 mm/s at 0.488 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:18 February 4, 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

Serial Number 5676 V 2.61 MiniMate
Battery Level 6.0 Volts
Unit Calibration February 26, 2020 by InstanTel
File Name G676IU80.J10

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:37:36 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.50 Myron Road (PW-15)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

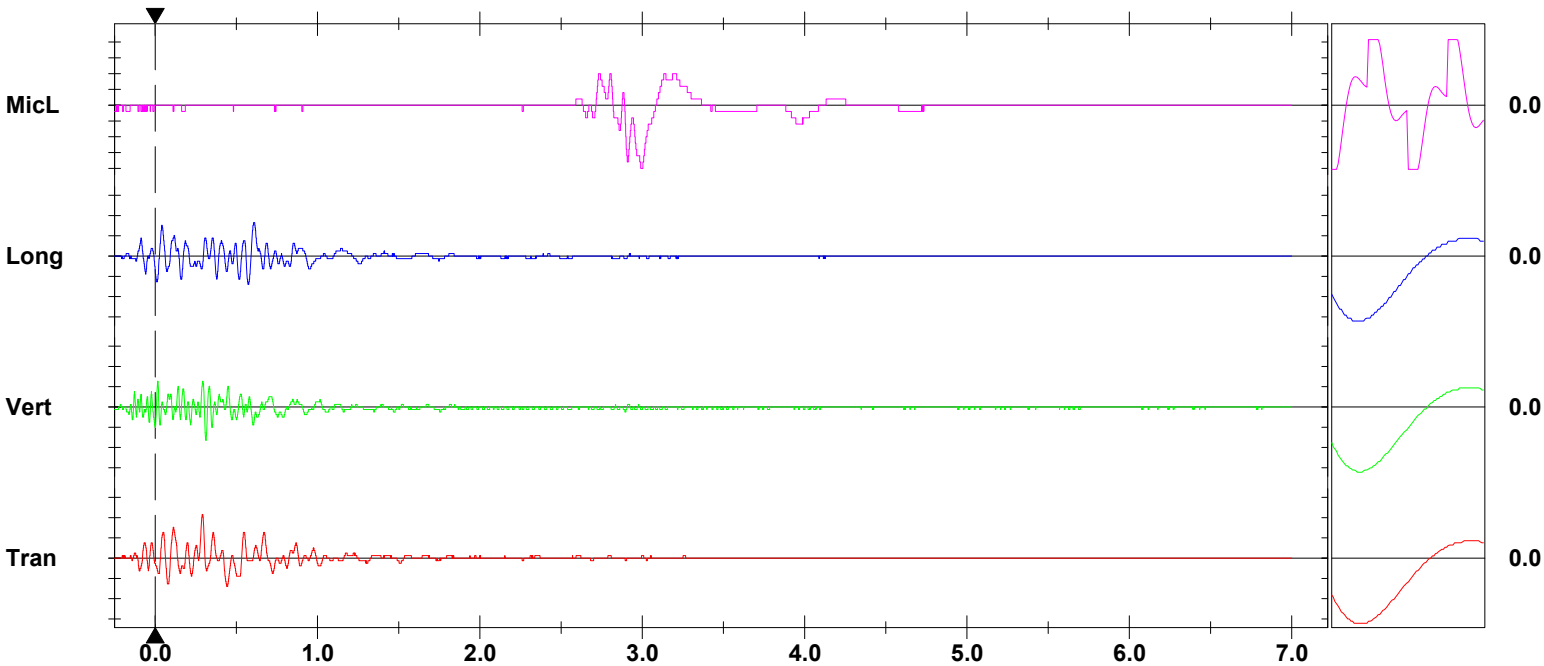
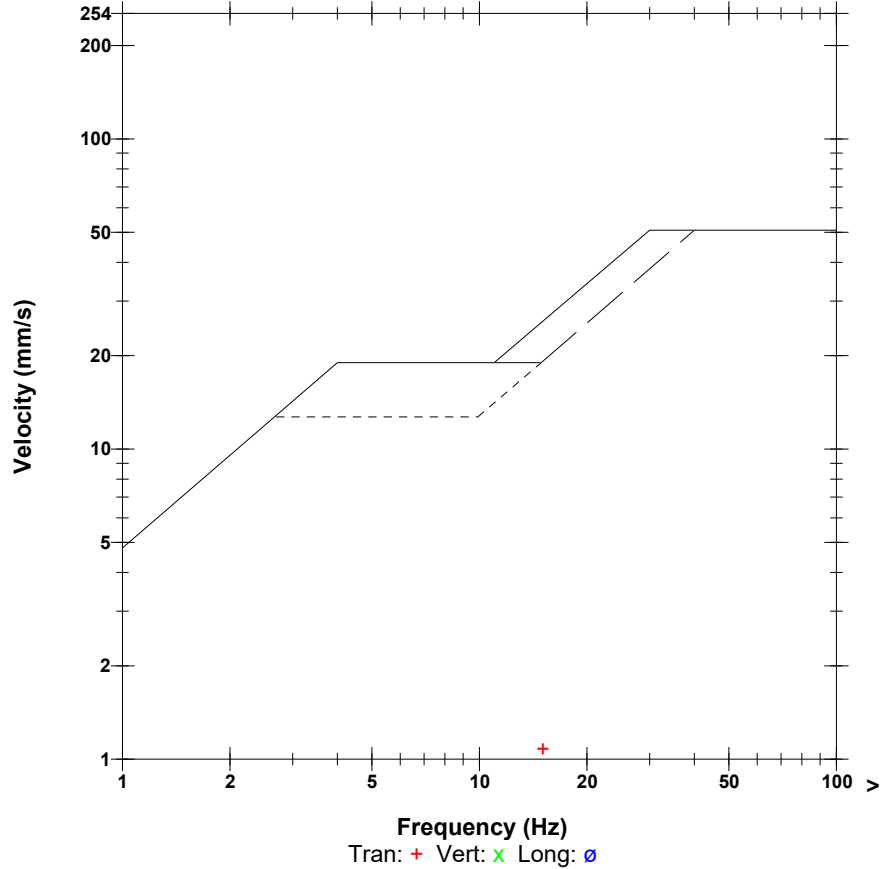
Extended Notes

Microphone Linear Weighting
PSPL 120.0 dB(L) 20.00 pa.(L) at 2.991 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	1.080	0.826	0.826	mm/s
ZC Freq	15	27	9.0	Hz
Time (Rel. to Trig)	0.290	0.312	0.606	sec
Peak Acceleration	0.013	0.013	0.013	g
Peak Displacement	0.011	0.005	0.010	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	8.1	8.1	Hz
Overswing Ratio	3.8	3.6	4.0	

Peak Vector Sum 1.286 mm/s at 0.293 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:18 February 4, 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

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.0 Volts
Unit Calibration May 15, 2020 by InstanTel
File Name G489IU80.J10

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:21:47 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.86 Myron Road (PW-16)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

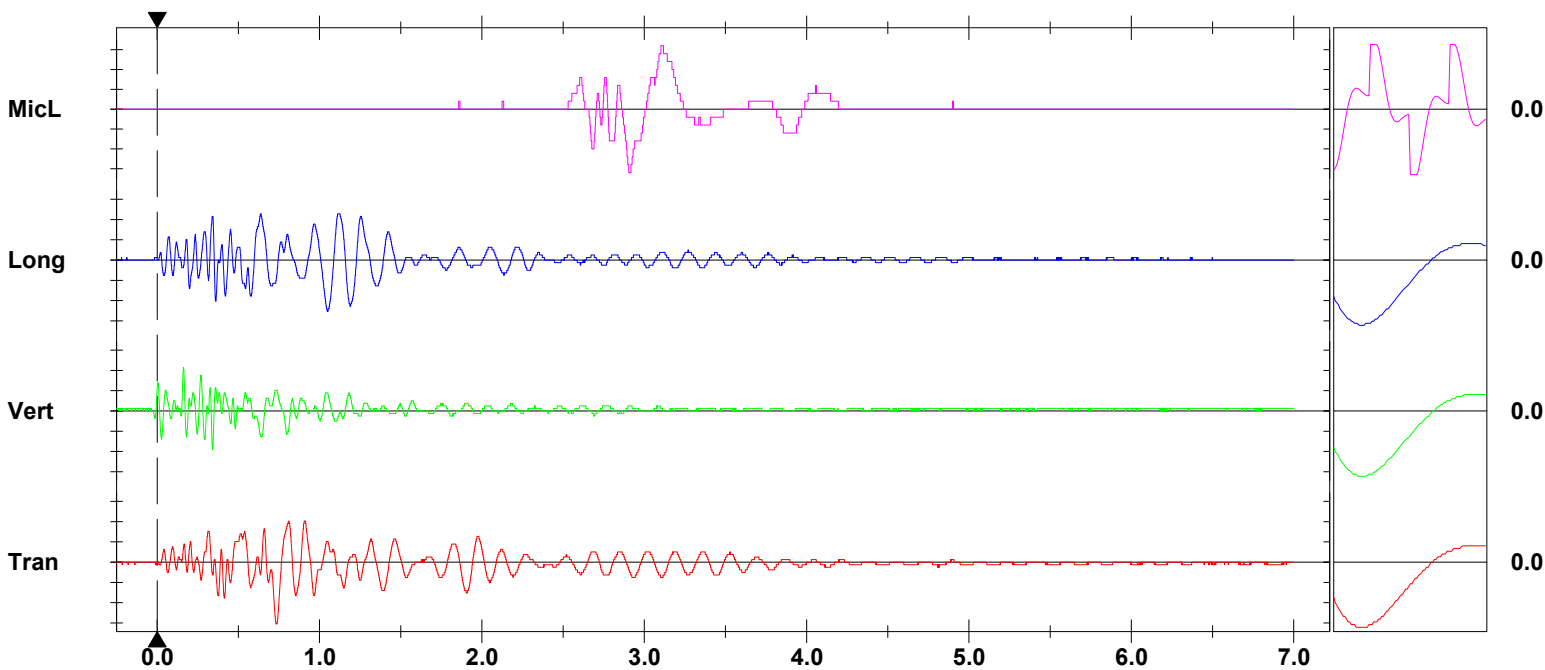
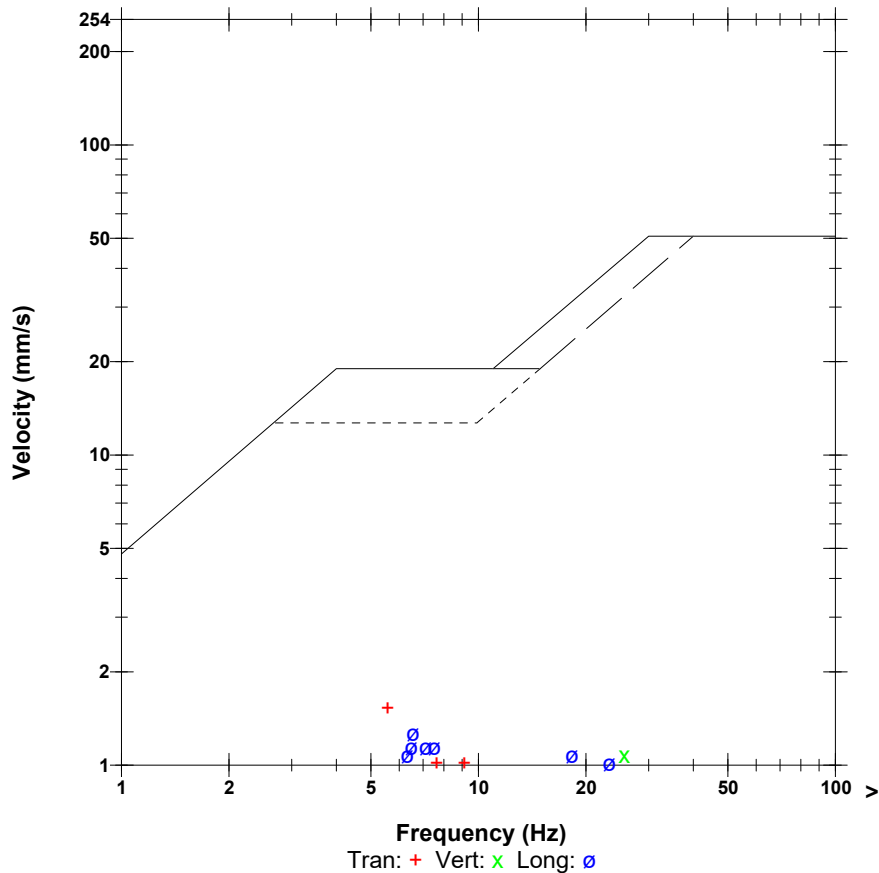
Extended Notes

Microphone Linear Weighting
PSPL 118.1 dB(L) 16.00 pa.(L) at 2.905 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 272 mv)

	Tran	Vert	Long	
PPV	1.524	1.080	1.270	mm/s
ZC Freq	6.0	24	7.0	Hz
Time (Rel. to Trig)	0.731	0.163	1.048	sec
Peak Acceleration	0.013	0.020	0.020	g
Peak Displacement	0.031	0.011	0.029	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.0	Hz
Overswing Ratio	3.7	4.0	4.0	

Peak Vector Sum 1.683 mm/s at 0.731 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 15:33:39 February 4, 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

Serial Number 5371 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration June 24, 2020 by InstanTel
File Name G371IU80.K30

Notes
 Location:
 Client:
 User Name:
 Converted: February 4, 2021 17:49:26 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.220 Myron Road (PW-01)
 Blast No.: 2021-05
 CE Project No.: 21S003.00

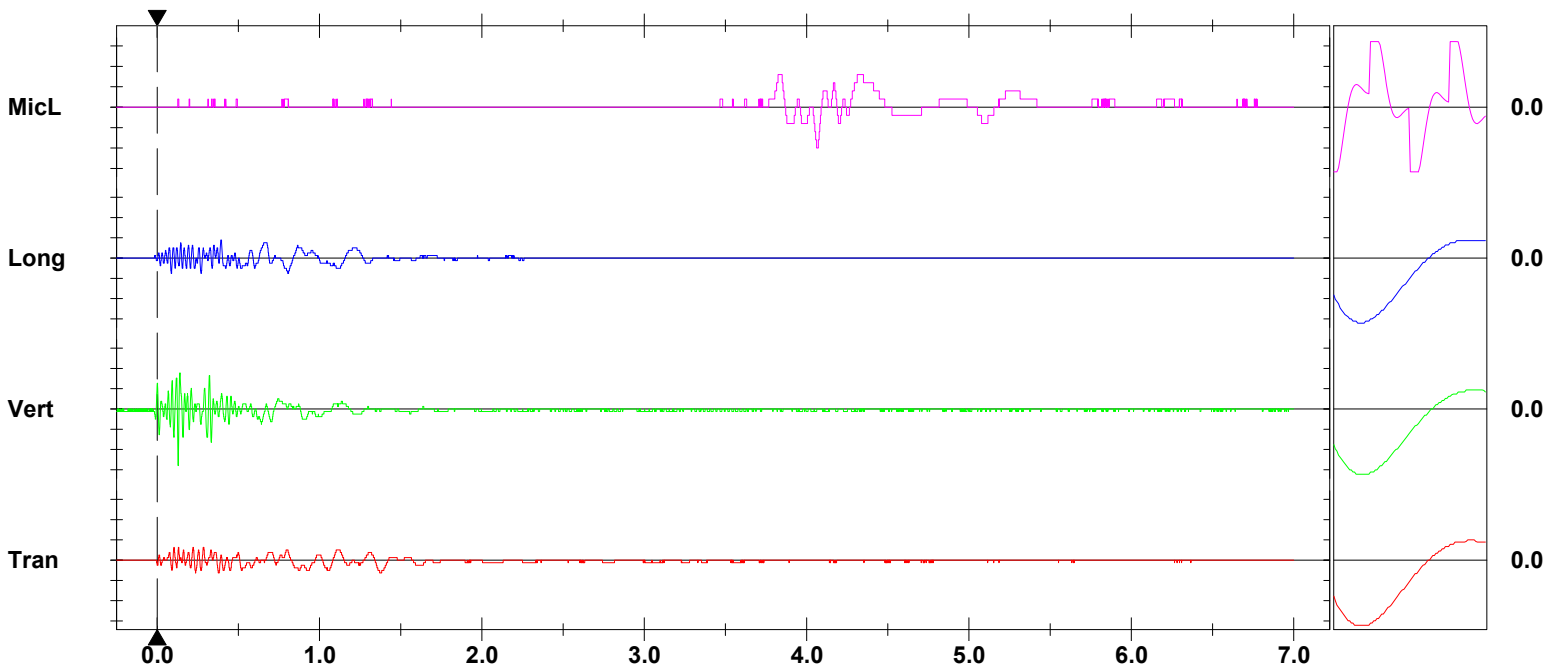
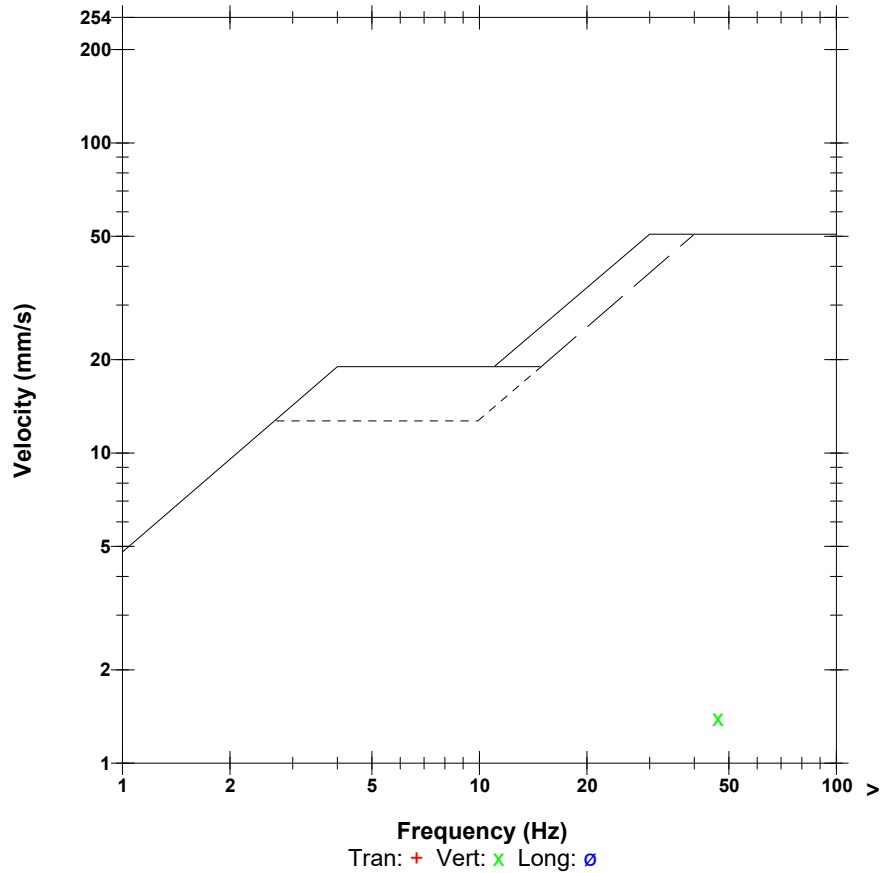
Extended Notes

Microphone Linear Weighting
PSPL 114.0 dB(L) 10.000 pa.(L) at 4.063 sec
ZC Freq 10 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	0.318	1.397	0.445	mm/s
ZC Freq	43	47	32	Hz
Time (Rel. to Trig)	0.104	0.130	0.393	sec
Peak Acceleration	0.007	0.040	0.013	g
Peak Displacement	0.005	0.005	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.8	8.1	Hz
Overswing Ratio	3.4	3.6	3.8	

Peak Vector Sum 1.429 mm/s at 0.131 sec

USBM RI8507 And OSMRE



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

Sensor Check

February 21, 2021

Project No.: 21S003.00

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

Re: Blast Vibration Monitoring – Blast No. 2021-06 – 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 14:33 on February 19, 2021. For the monitoring we positioned nine (9) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2021-06 – February 19, 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)	14:33	1,280 m S	< 1.0 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		832 m S	0.57 mm/s @ 47 Hz	116	-
3. Civic No. 4150 Route 111 (PW-13)		652 m S	0.70 mm/s @ 51 Hz	120	-
4. Civic No. 2447 Route 820 (PW-07)		906 m NE	0.57 mm/s @ 6 Hz	116	-
5. PW-03 - Route 820		723 m N	0.51 mm/s @ 7 Hz	112	-
6. Civic No. 2341 Route 820 (PW-05)		754 m NW	< 1.0 mm/s	<120	Unit was not triggered
7. Civic No. 50 Myron Road (PW-15)		1,020 m NW	< 1.0 mm/s	<120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		900 m W	1.08 mm/s @ 7 Hz	112	-
9. Civic No. 220 Myron Road (PW-01)		1,340 m S	< 1.0 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

BLAST RECORD

Project Name: <u>Upnam Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

IDENTIFICATION:

Blasting Contractor: <u>Gulf Operators Ltd.</u>	
Blaster's Certification No.: <u>1318</u>	Blaster's Name: <u>Daniel Blanchard</u>
Blast Location: <u>N 45°28'51.4" E 65°37'55.2"</u>	
Type of Rock: <u>Gypsum</u>	Est. Vol. or Tonnage: <u>15,846 tonnes</u>
Weather at time of Blast: <u>Sunny with few clouds</u>	Air Temp.: <u>-4°C</u>
Est. Wind Speed : <u>≈5 km/h</u>	Wind Direction: <u>N</u>
Cloud Cover: <u>Few</u>	Precipitation: <u>No</u>

BLAST DESIGN:

Total No. Holes: <u>65</u>	Hole Diameter: <u>5.5"</u>
Average Depth: <u>5 – 9 m</u>	Spacing: <u>12 ft x 12 ft</u>
No. Holes per Delay: <u>1</u>	Collar Length: <u>8 ft</u>
Delay between Holes: <u>25 ms</u>	Delay between Rows: <u>42 ms</u>
Initiation Method: <u>Electronic</u>	
Weight of Explosives per Delay: <u>Max.: 130 kg</u>	
Type and weight of Explosives for Blast: <u>5,059 kg – Titan XL 1000</u>	

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

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

BLAST MONITORING

Distance to the Nearest Structure:	<u>652 m</u>
Direction to the Nearest Structure:	<u>South</u>
Structure Type:	<u>House</u>
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	<u>57.2</u>

SAFETY:

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

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

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5960</u>
Calibration Date:	<u>May 15, 2020</u>
Location of seismograph:	<u>Civic Number 4079 Route 111 (PW-09)</u>
Distance and Direction from Blast:	<u>1,280 m South</u>
Transverse Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u><120 dB(L) – Unit was not triggered</u>

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5673</u>
Calibration Date:	<u>February 26, 2020</u>
Location of seismograph:	<u>Civic Number 4126 Route 111 (PW-10)</u>
Distance and Direction from Blast:	<u>832 m South</u>
Transverse Particle Velocity:	<u>0.51 mm/s @ 15 Hz</u>
Vertical Particle Velocity:	<u>0.57 mm/s @ 47 Hz</u>
Longitudinal Particle Velocity:	<u>0.32 mm/s @ 10 Hz</u>
Peak Particle Velocity:	<u>0.57 mm/s @ 47 Hz</u>
Maximum Airblast:	<u>116 dB(L)</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5372</u>
Calibration Date:	<u>February 8, 2021</u>
Location of seismograph:	<u>Civic Number 4150 Route 111 (PW-13)</u>
Distance and Direction from Blast:	<u>652 m South</u>
Transverse Particle Velocity:	<u>0.45 mm/s @ 11 Hz</u>
Vertical Particle Velocity:	<u>0.70 mm/s @ 51 Hz</u>
Longitudinal Particle Velocity:	<u>0.32 mm/s @ 11 Hz</u>
Peak Particle Velocity:	<u>0.70 mm/s @ 51 Hz</u>
Maximum Airblast:	<u>120 dB(L)</u>

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5489</u>
Calibration Date:	<u>May 15, 2020</u>
Location of seismograph:	<u>Civic Number 2447 Route 820 (PW-07)</u>
Distance and Direction from Blast:	<u>906 m Northeast</u>
Transverse Particle Velocity:	<u>0.57 mm/s @ 6 Hz</u>
Vertical Particle Velocity:	<u>0.25 mm/s @ 19 Hz</u>
Longitudinal Particle Velocity:	<u>0.32 mm/s @ 19 Hz</u>
Peak Particle Velocity:	<u>0.57 mm/s @ 6 Hz</u>
Maximum Airblast:	<u>116 dB(L)</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5635</u>
Calibration Date:	<u>March 26, 2020</u>
Location of seismograph:	<u>PW-03 - Route 820</u>
Distance and Direction from Blast:	<u>723 m North</u>
Transverse Particle Velocity:	<u>0.51 mm/s @ 7 Hz</u>
Vertical Particle Velocity:	<u>0.32 mm/s @ 16 Hz</u>
Longitudinal Particle Velocity:	<u>0.51 mm/s @ 20 Hz</u>
Peak Particle Velocity:	<u>0.51 mm/s @ 7 Hz</u>
Maximum Airblast:	<u>112 dB(L)</u>

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5632</u>
Calibration Date:	<u>October 22, 2020</u>
Location of seismograph:	<u>Civic Number 2341 Route 820 (PW-05)</u>
Distance and Direction from Blast:	<u>754 m Northwest</u>
Transverse Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u><120 dB(L) – Unit was not triggered</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21349</u>
Calibration Date:	<u>June 12, 2020</u>
Location of seismograph:	<u>Civic Number 50 Myron Road (PW-15)</u>
Distance and Direction from Blast:	<u>1,020 m Northwest</u>
Transverse Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u><120 dB(L) – Unit was not triggered</u>

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5371</u>
Calibration Date:	<u>June 24, 2020</u>
Location of seismograph:	<u>Civic Number 86 Myron Road (PW-16)</u>
Distance and Direction from Blast:	<u>900 m West</u>
Transverse Particle Velocity:	<u>0.57 mm/s @ 8 Hz</u>
Vertical Particle Velocity:	<u>0.57 mm/s @ 32 Hz</u>
Longitudinal Particle Velocity:	<u>1.08 mm/s @ 7 Hz</u>
Peak Particle Velocity:	<u>1.08 mm/s @ 7 Hz</u>
Maximum Airblast:	<u>112 dB(L)</u>

BLAST RECORD

Project Name: <u>Upham Gypsum Quarry</u>	Date of Blast: <u>February 19, 2021</u>
Project No.: <u>21S003.00</u>	Time of Blast: <u>14:33</u>
Inspector: <u>B. Fillmore</u>	Blast No.: <u>2021-06</u>
Client: <u>Hammond River Holdings</u>	

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial # 21348</u>
Calibration Date:	<u>June 24, 2020</u>
Location of seismograph:	<u>Civic Number 220 Myron Road (PW-01)</u>
Distance and Direction from Blast:	<u>1,340 m South</u>
Transverse Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u><0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u><120 dB(L) – Unit was not triggered</u>

Blast and Seismograph Location Plan
Blast No: 2021-06
Upham East Gypsum Quarry, Upham, NB



Date: February 19, 2021
CE Project No.: 21S003.00

Date/Time Vert at 14:33:43 February 19, 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

Serial Number 5673 V 2.61 MiniMate
Battery Level 6.2 Volts
Unit Calibration February 28, 2020 by InstanTel
File Name G673IUZP.S70

Notes
 Location:
 Client:
 User Name:
 Converted: February 19, 2021 16:30:28 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.4126 Route 111 (PW-10)
 Blast No.: 2021-06
 CE Project No.: 21S003.00

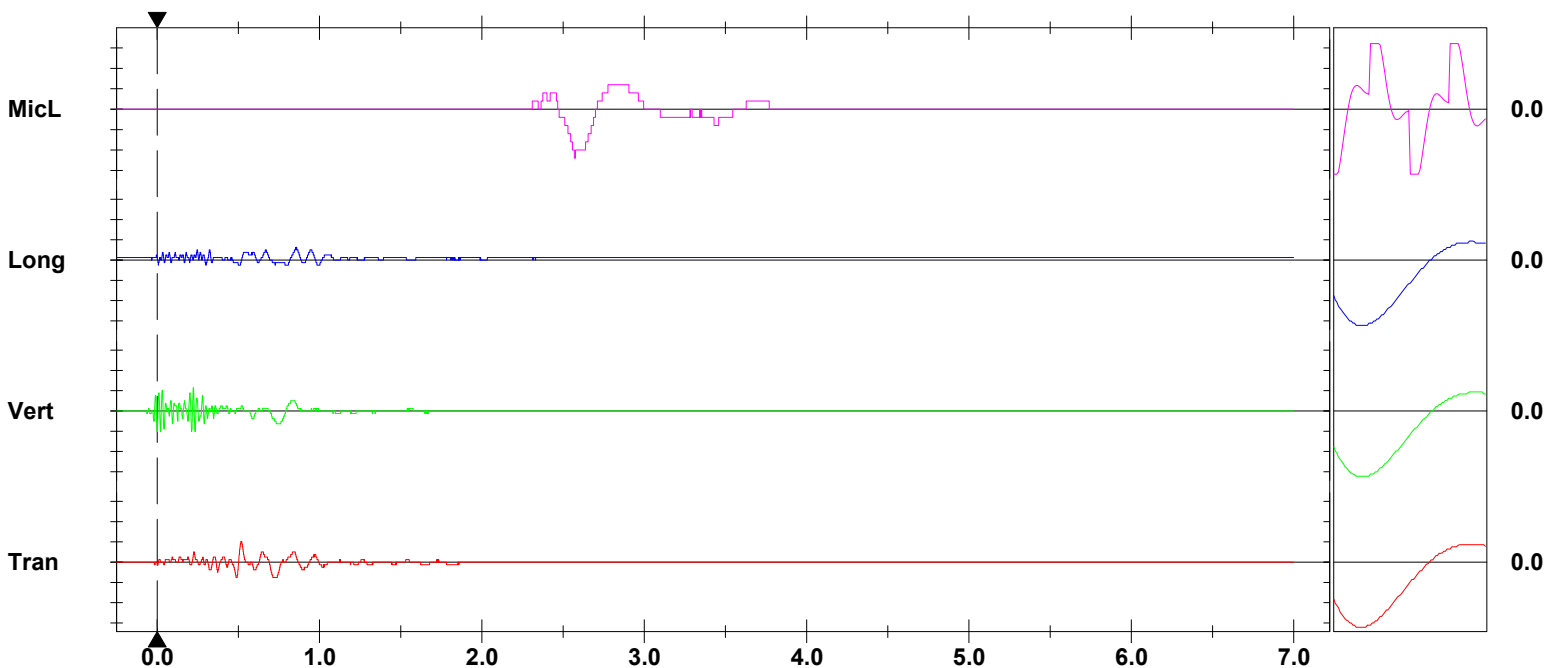
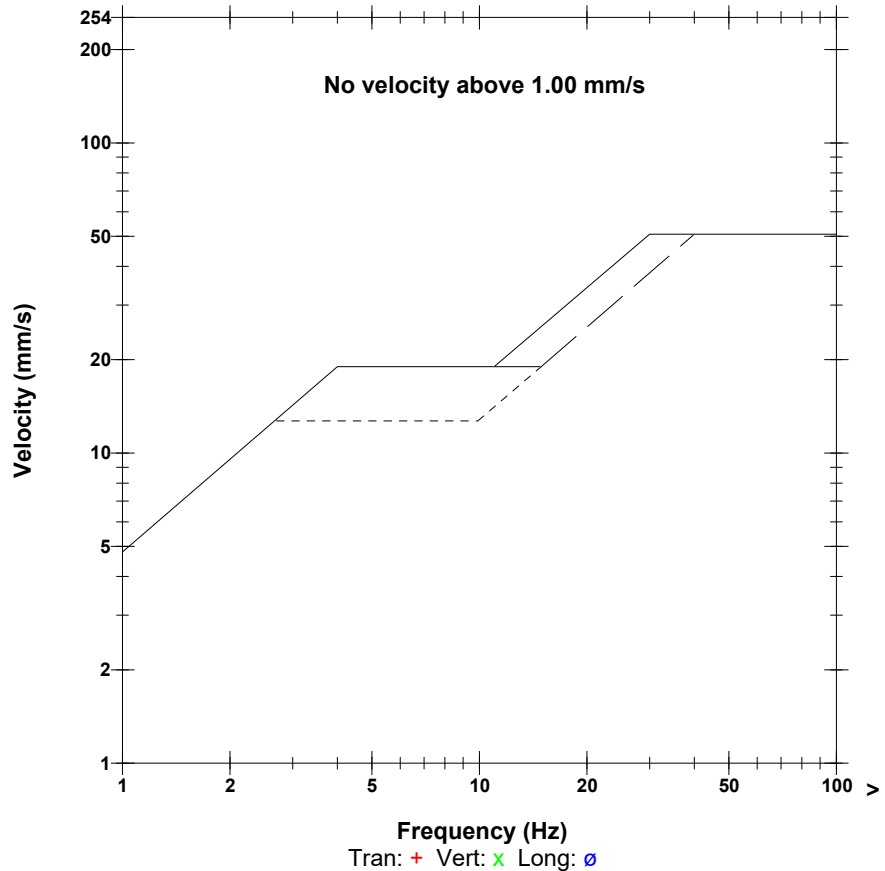
Extended Notes

Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 2.570 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 307 mv)

	Tran	Vert	Long	
PPV	0.508	0.572	0.318	mm/s
ZC Freq	15	47	10	Hz
Time (Rel. to Trig)	0.516	0.223	0.855	sec
Peak Acceleration	0.007	0.020	0.007	g
Peak Displacement	0.008	0.007	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.8	8.0	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.603 mm/s at 0.224 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 14:33:47 February 19, 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

Serial Number 5372 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration February 8, 2021 by InstanTel
File Name G372IUZP.SB0

Notes
 Location:
 Client:
 User Name:
 Converted: February 19, 2021 16:47:03 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.4150 Route 111 (PW-13)
 Blast No.: 2021-06
 CE Project No.: 21S003.00

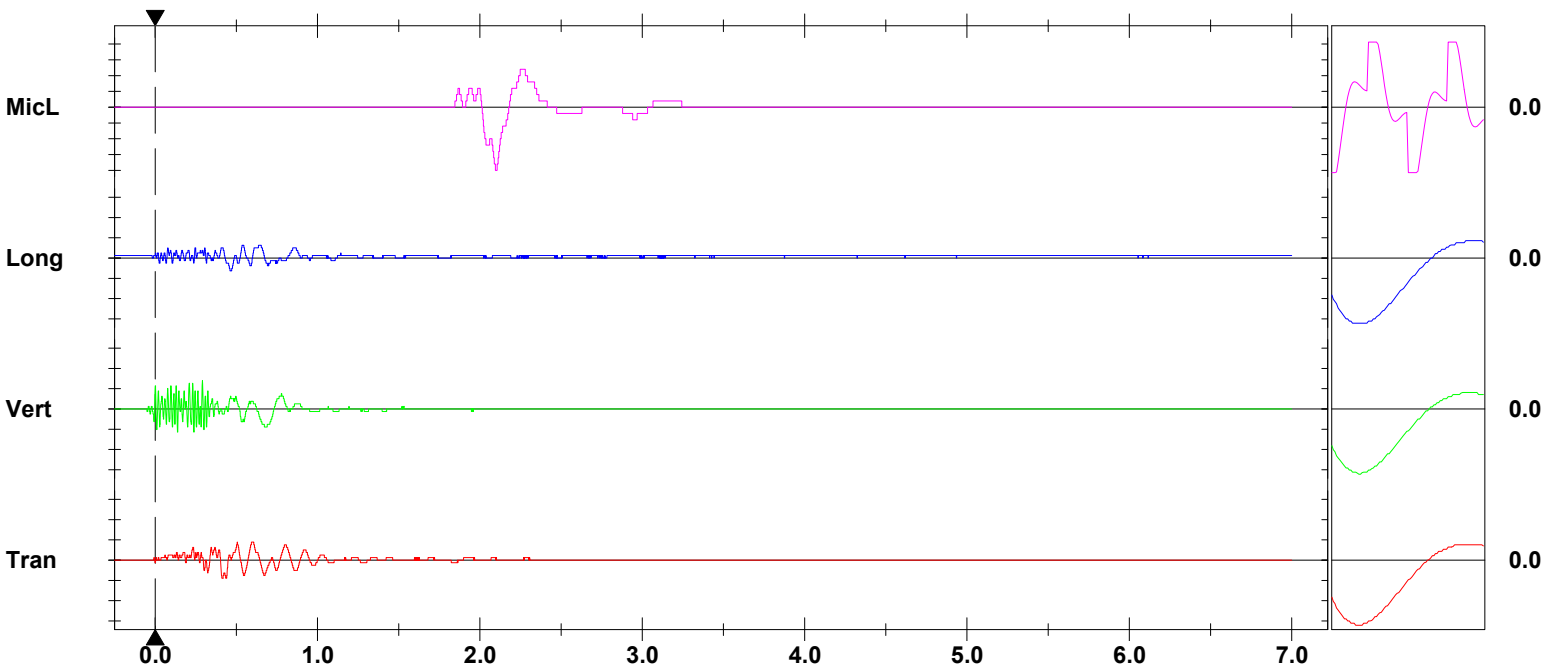
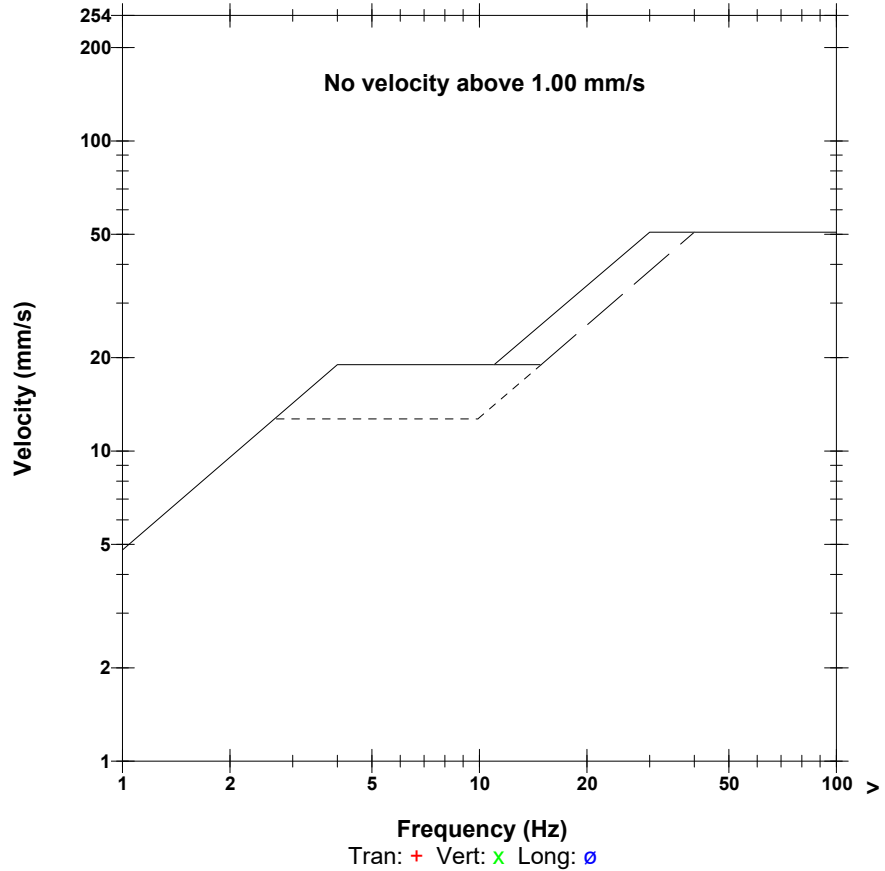
Extended Notes

Microphone Linear Weighting
PSPL 120.0 dB(L) 20.00 pa.(L) at 2.097 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 295 mv)

	Tran	Vert	Long	
PPV	0.445	0.699	0.318	mm/s
ZC Freq	11	51	11	Hz
Time (Rel. to Trig)	0.411	0.292	0.462	sec
Peak Acceleration	0.007	0.027	0.013	g
Peak Displacement	0.007	0.014	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.0	7.7	Hz
Overswing Ratio	3.7	3.6	4.2	

Peak Vector Sum 0.730 mm/s at 0.292 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Tran at 14:33:47 February 19, 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

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration May 15, 2020 by InstanTel
File Name G489IUZP.SB0

Notes
 Location:
 Client:
 User Name:
 Converted: February 19, 2021 16:25:00 (V10.72.1)

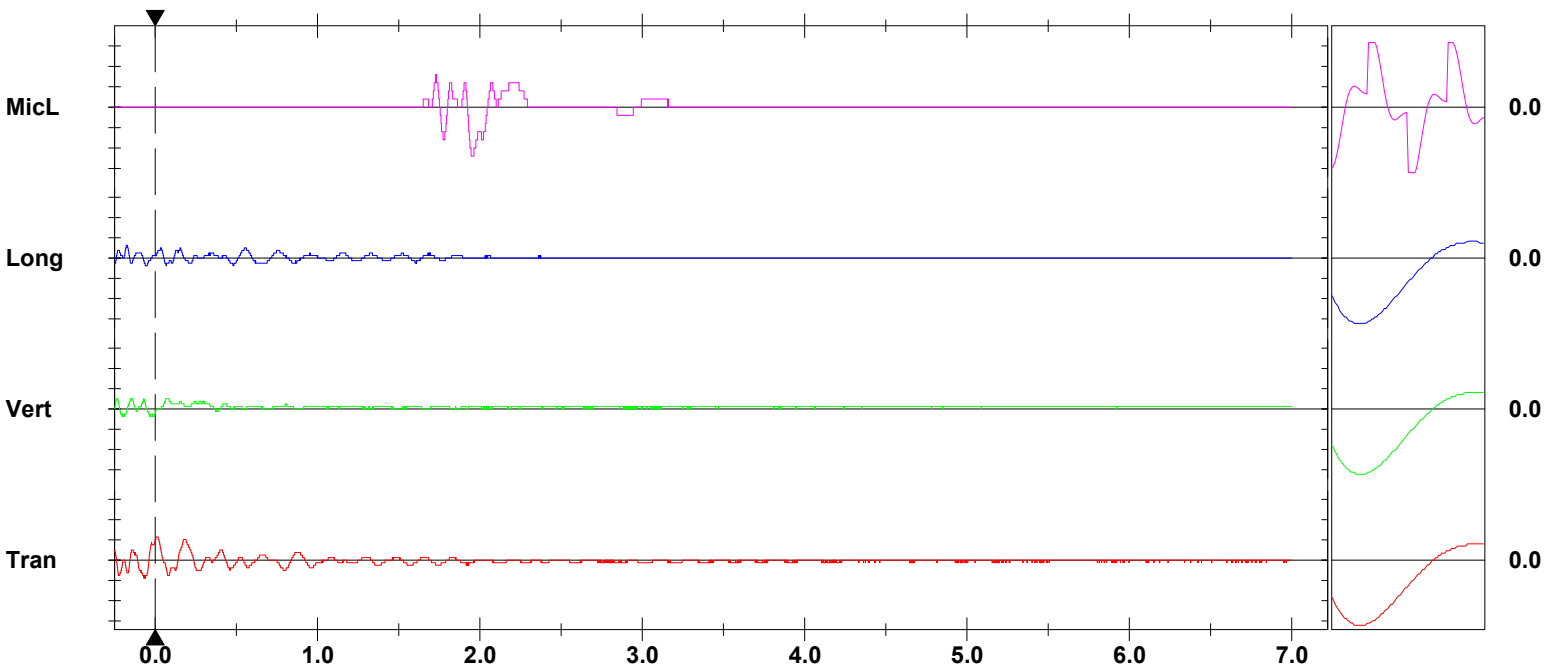
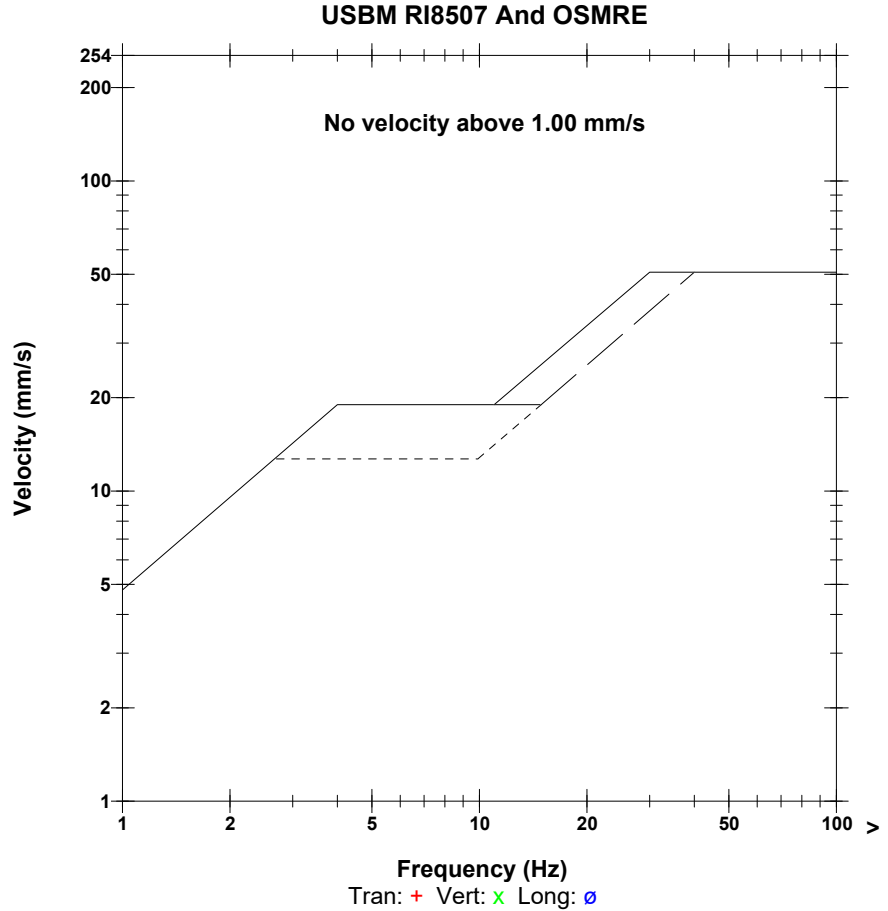
Post Event Notes
 Location of Seismograph: Civic No.2447 Route 820 (PW-07)
 Blast No.: 2021-06
 CE Project No.: 21S003.00

Extended Notes

Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 1.946 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 272 mv)

	Tran	Vert	Long	
PPV	0.572	0.254	0.318	mm/s
ZC Freq	6.0	19	19	Hz
Time (Rel. to Trig)	0.019	-0.068	-0.170	sec
Peak Acceleration	0.007	0.007	0.007	g
Peak Displacement	0.015	0.003	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.7	7.7	Hz
Overswing Ratio	3.8	4.0	3.9	

Peak Vector Sum 0.603 mm/s at 0.017 sec



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

Sensor Check

Date/Time Long at 14:33:48 February 19, 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

Serial Number 5635 V 2.61 MiniMate
Battery Level 5.9 Volts
Unit Calibration March 26, 2020 by InstanTel
File Name G635IUZP.SC0

Notes
 Location:
 Client:
 User Name:
 Converted: February 19, 2021 16:43:55 (V10.72.1)

Post Event Notes
 Location of Seismograph: Cottage - Route 820 (PW-03)
 Blast No.: 2021-06
 CE Project No.: 21S003.00

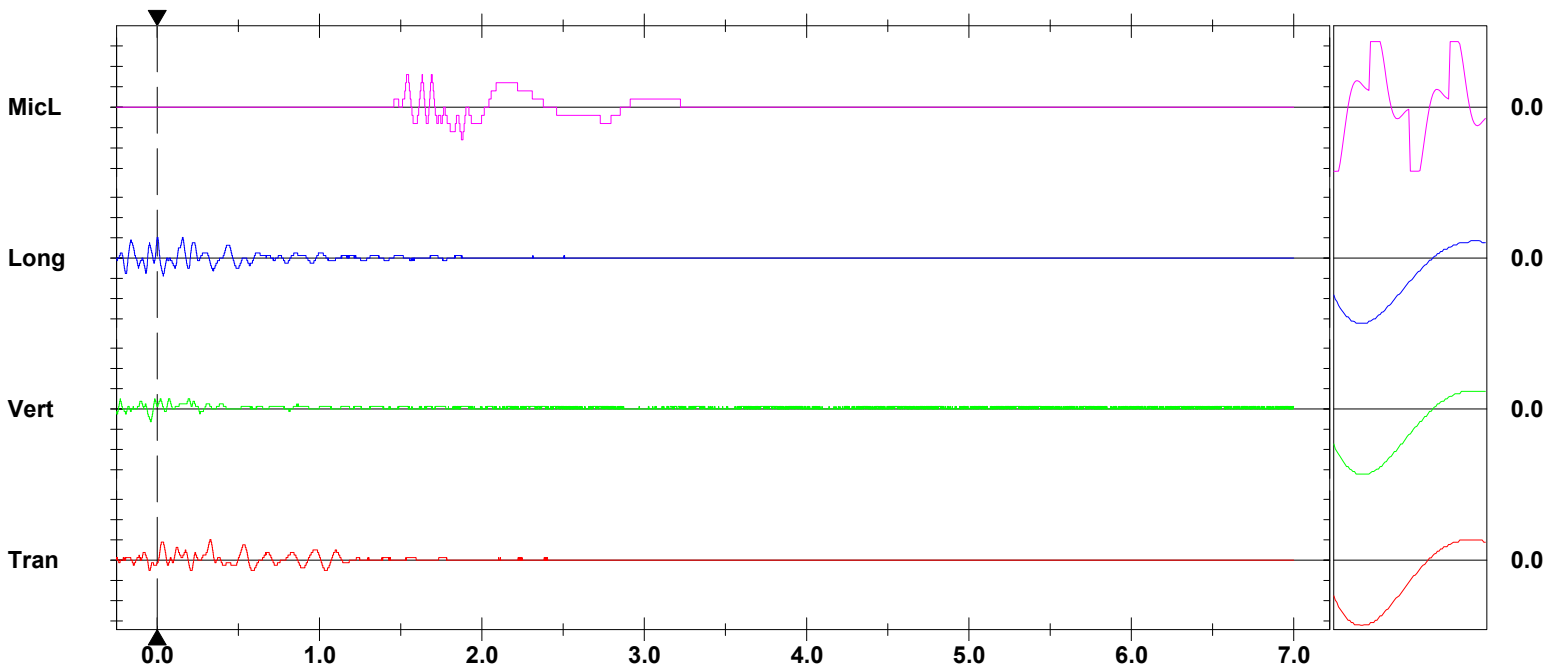
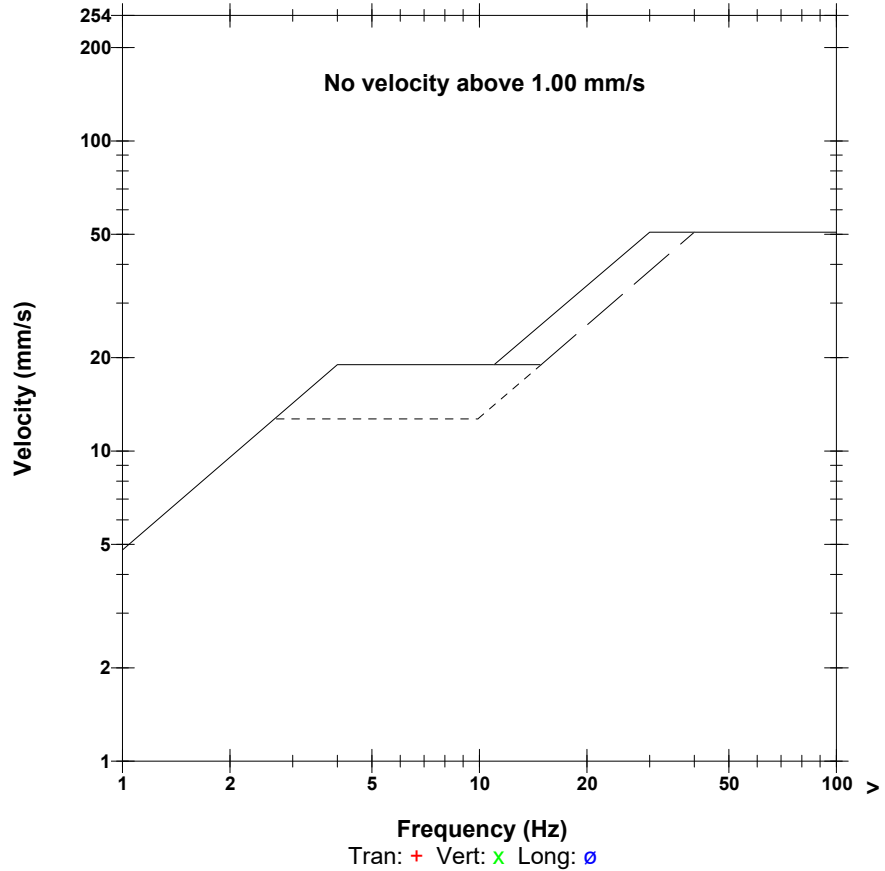
Extended Notes

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 1.536 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 299 mv)

	Tran	Vert	Long	
PPV	0.508	0.318	0.508	mm/s
ZC Freq	7.0	16	20	Hz
Time (Rel. to Trig)	0.325	-0.036	0.005	sec
Peak Acceleration	0.007	0.007	0.007	g
Peak Displacement	0.007	0.002	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.8	7.8	Hz
Overswing Ratio	3.4	3.6	3.8	

Peak Vector Sum 0.635 mm/s at 0.038 sec

USBM RI8507 And OSMRE



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

Sensor Check

Date/Time Vert at 14:33:50 February 19, 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

Serial Number 5371 V 2.61 MiniMate
Battery Level 5.9 Volts
Unit Calibration June 24, 2020 by InstanTel
File Name G371IUZP.SE0

Notes
 Location:
 Client:
 User Name:
 Converted: February 19, 2021 16:36:08 (V10.72.1)

Post Event Notes
 Location of Seismograph: Civic No.86 Myron Road (PW-16)
 Blast No.: 2021-06
 CE Project No.: 21S003.00

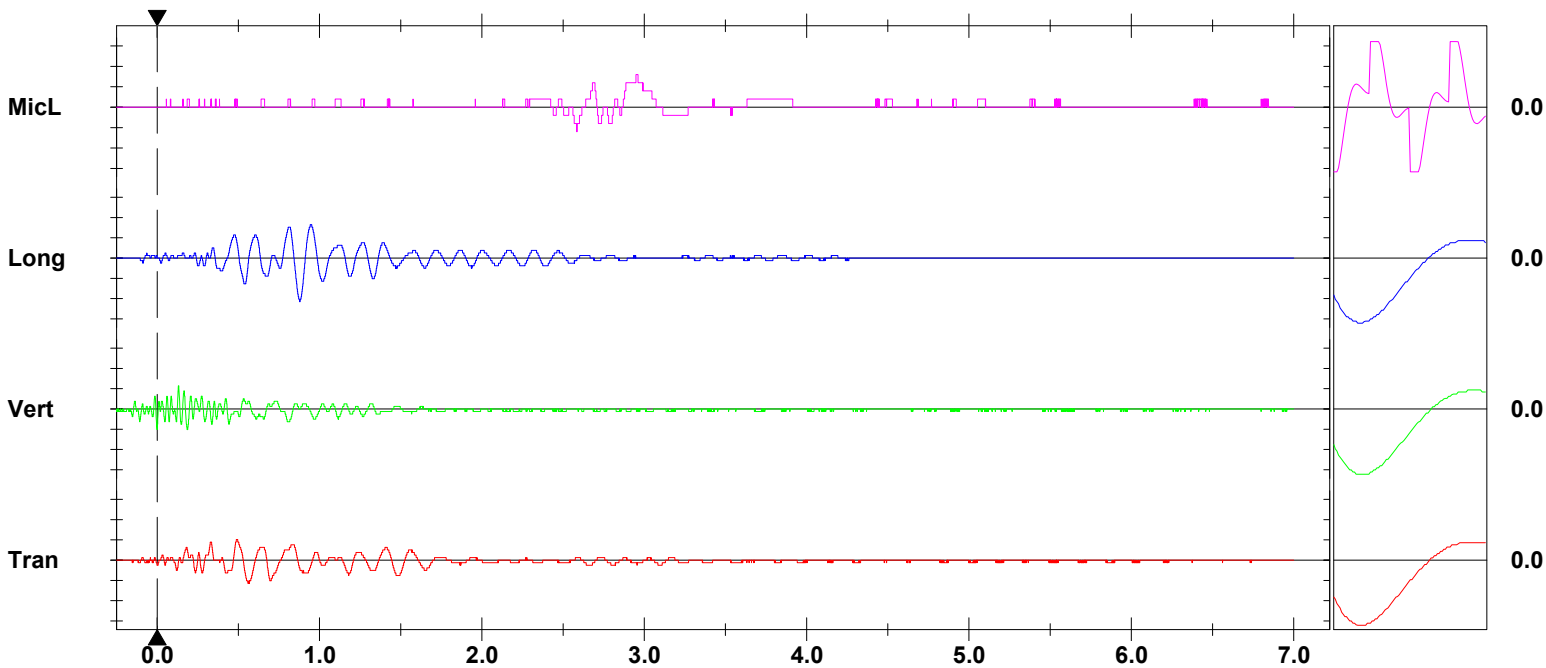
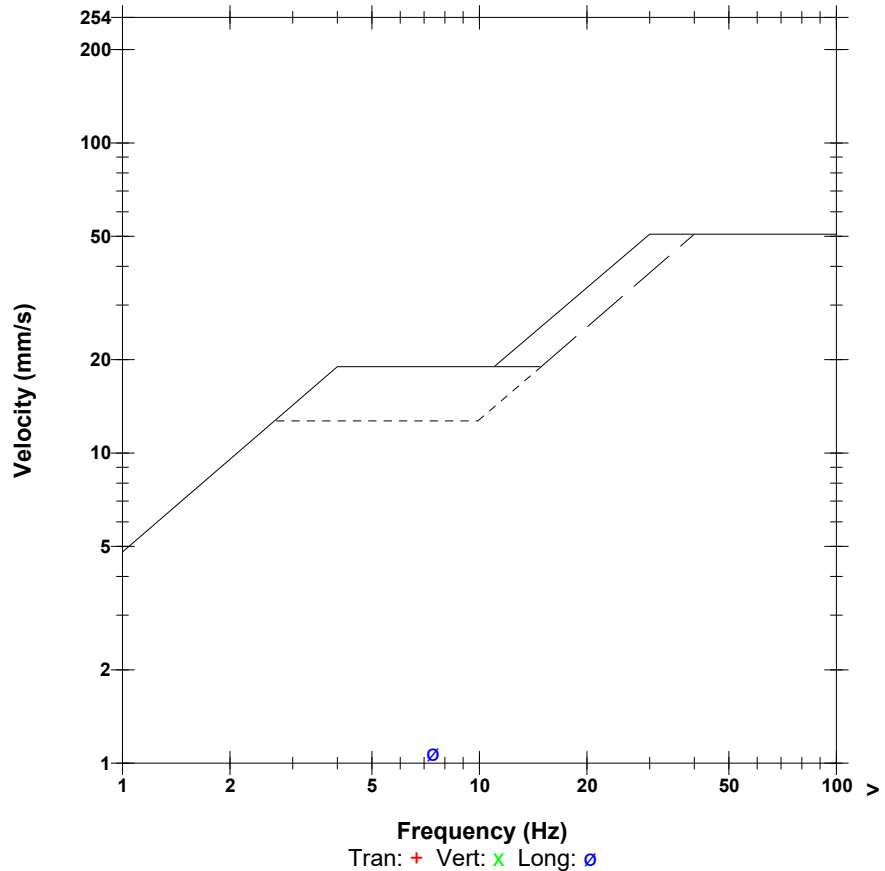
Extended Notes

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 2.950 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 306 mv)

	Tran	Vert	Long	
PPV	0.572	0.572	1.080	mm/s
ZC Freq	8.0	32	7.0	Hz
Time (Rel. to Trig)	0.559	0.132	0.878	sec
Peak Acceleration	0.007	0.013	0.007	g
Peak Displacement	0.012	0.004	0.022	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.0	8.2	Hz
Overswing Ratio	3.8	3.6	3.8	

Peak Vector Sum 1.111 mm/s at 0.880 sec

USBM RI8507 And OSMRE



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