



South Coast Concrete Crushing and Recycling Pty Ltd

Annual Environmental Management Report

July 2018 - June 2019

Name of mine: - NOWRA BRICKWORKS & FLAT ROCK Quarries

Titles/Mining Leases: - ML 5087 / ML 6322 / ML 531

MOP Commencement Date: - 01/09/2015 MOP Completion Date 31/08/2021

AEMR Commencement Date: - 1/07/2018 AEMR End Date 30/06/2019

Name of leaseholder: - Abib Pty Ltd

Name of mine operator: - South Coast Concrete Crushing and Recycling P/L

Reporting Officer: - Budd Green
Title: - Manager

Signature

A handwritten signature in black ink, appearing to be 'Budd Green', is written over a white rectangular box.

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1. INTRODUCTION.

This AEMR has been prepared to cover a period from 1st July 2018 to 30th June 2019.

The operation of this mine is controlled by the Mining Operations Plan (MOP) which covers mining operations from September 2015 – 2021. The current MOP provides the relevant information on the mining, processing and rehabilitation operations necessary for compliance with the collective conditions imposed upon the mining development at the Nowra Brickworks Quarry by the applicable mineral authorities and other licences required to be held by SCCCR.

This report should be read in conjunction with the current mining operations plan.

1.1 Consents, Leases and Licences

1.1.1 Mineral Authorities.

Table 1 - Mineral Leases

Title	Act	Expiry Date	Area (ha)	Group
ML 5087	1906	08 January 2041	7.36	Group 5
ML 6322	1906	08 March 2041	14.67	Group 5
ML 531	1906	05 Nov 2019	16.68	Group 5

The area covered by these mineral authorities is referred to hereafter as “the quarry site”.

NO ACTIVITIES WERE CARRIED OUT IN FLAT ROCK QUARRY DURING THE REPORTING PERIOD

1.1.2 Licences

The Nowra Brickworks Quarry is operated in accordance with Environment Protection Licence No. 11765. This licence covers “Hard-Rock Gravel Quarrying” of between 100 000t and 500000t per annum and “Crushing, Grinding or Separating Works” between 100 000t and 500 000t per annum.

1.1.3 Development Consents

Development Consent under Section 75J of The Environmental Planning and Assessment Act 1979. Application No. 07_0123. Approved by the Minister for Planning 1st December 2009. MOD 1 approved June 2013. MOD 2 approved 21st June 2018.

1.2 Mine Contacts

SCCCR personnel responsible for operational and environmental performance at the Nowra Brickworks Quarry and their relevant contact details are as follows.

- John Green – Mine Manager and sole director of SCCCR, retains overall responsibility for all activities and performance on site. Contact: 02 4421 7766. Fax 02 4421 7988. Postal Address PO Box 192, OAK FLATS NSW 2529
- Budd Green – Production Manager of SCCCR. Contact: 02 4421 7766. Fax 02 4421 7988. Postal Address PO Box 192, OAK FLATS NSW 2529
- Genaya Shephard/Angela Thorley – Allocations and Processing of SCCCR. Contact: 02 4421 7766. Fax 02 4421 7988.

1.3 Actions Required at Previous AEMR Review

- NIL identified
- Flat Rock Quarry
 - Submit a **Mining Operations Plan** in accordance with the DRE guidelines which will include an inspection and monitoring/maintenance program for this site.
 - Assessment of site access and potentially use of additional measures to minimise illegal site access (site access restricted)
 - Ongoing review of erosion and repair/management as required.
- Site Inspection undertaken on 28th March 2019
 - Actions – Improvement of general housekeeping in general laydown area.
 - Area was further improved to improve housekeeping with removal of old/spare tyres. Disused spare parts and scrap metal.
 - Action – weed management (ongoing care and maintenance required)
 - Outside weed management engaged on 6 monthly basis to maintain and manage onsite weeds.



2. Operations/Activities During Reporting Period

2.1 Exploration

No exploration was carried out within the mine area during the period.

2.2 Land Preparation

No Land preparation was required during the reporting period.

2.3 Construction

During the July 2018 – June 2019 AEMR reporting period no new permanent structures were built; however the wheelwash was upgraded to incorporate a mobile osmosis plant for treatment of the site mineral water. This work was completed in June 2019.

2.4 Mining - Extraction

All mining activities were carried out in accordance with the current MOP 2015-2021.

During the reporting period, ongoing extraction of minerals was carried out. This was carried out using standard excavating procedures (ripping and excavating) of the subsoil/overburden. The harder material was blasted as per approved methods.

Mining Methods (ref section 2.3.3 MOP 2015-2021)

"Weathered shale material would be extracted from below the base of the subsoil to a depth where the material becomes too hard to be extracted using an excavator. The weathered shale material would be loaded into trucks for transportation to customers, stockpiled for subsequent sale and despatch, or used for rehabilitation-related purposes within the quarry. Once the hardness of the shale becomes too great to be ripped, drill and blast techniques would be used to extract the material which would be direct loaded into the processing plant using an excavator. All drilling and blasting-related activities will be conducted in accordance with the Drilling and Blasting procedures set out in the EMS (GHD 2010)".

2.5 Mineral Processing

All materials mined were processed in accordance with the current MOP 2015-2021.

From MOP 2.3.5 Mineral Processing

The quarry maintains the following infrastructure to carry out its operations:

- Three mobile crushers (jaw, cone and impact);
- Four excavators (three 35t excavators and one 21t Excavator);
- Three mobile screens
- Two Front end loaders.

The shale extracted from the quarry undergoes crushing, shaping, screening and blending with imported construction waste material.)

2.5.1 Importation of material for Blending

The following materials were imported and stockpiled for re-use in processing or backfilling to existing quarry void: for processing and blending into recycled and reusable products.

- Virgin Excavated Natural Material (VENM) for blending and processing into quarry products
- VENM, top-soil, subsoil and weathered shale for quarry backfilling operations
- Blending materials, such as crusher dust and road base, for processing into quarry products
- Recyclable materials, such as masonry construction waste (brick, cement roof tiles), concrete and asphalt.

In accordance with the mining leases, mining is planned to a depth of 30 metres with the maximum amount of shale material to be extracted while ensuring no resource sterilisation. The extraction area would then be backfilled with VENM to create a final, rehabilitated landform that would mimic the adjacent environment.

All material imported onto the quarry will be as per the Importation and use of Virgin Excavated Natural Material procedures as set out in our **EMS GHD (2010)**.

“VENM/ENM is to be imported to the site for processing and blending to produce quarry products. VENM/ENM not used to make quarry products will also be placed within the ‘exhausted’ extraction area for rehabilitation purposes and to ultimately establish a final landform which mimics the pre-extraction landform.”

The use of VENM as part of the rehabilitation process will be restricted to the use of VENM as defined in the NSW Protection of the Environment Operations Act 1997,

“Natural material (e.g. clay, gravel, sand, soil and rock) that is not mixed with any waste that:

- a) *has been excavated from areas that are not contaminated, as the result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphidic ores or soils, or*

b) consists of excavated natural materials that meet such criteria as may be approved by the EPA”

2.5.2 VENM/ENM Certificate and Receipt Procedures

- All imported VENM will be certified at its source and certification verified by the Mine Manager (or delegated authority) on receipt in accordance with relevant guidelines current at the time of VENM importation. This is likely to include a visual inspection for signs of contamination and the presence of any other waste material.
- A VENM certification sheet will be prepared, dated and signed by the person certifying the material.
- The history of the site from which the material is to be excavated will be determined and recorded on the VENM certificate sheet. The following procedures will be implemented depending on the previous land uses.
 - Where the site has been used for commercial, industrial, mining or agricultural purposes at any time, or if the site contains fill material, or there is potential for chemical contamination from past or current uses, a testing regime will be implemented to establish that the material sourced from the site can be classified as VENM.
 - Where the site is, and has always been, used for residential or agricultural purposes then excavated material from the site, except for surface layers that may be contaminated with physical debris, vegetation, chemicals, fertilisers or asbestos, will be presumed to be classified as VENM.
- Upon arrival, the Mine Manager (or delegated authority) will require the drivers delivering the VENM material to complete and sign a VENM record sheet. The Mine Manager (or delegated authority) will direct the driver to the receipt area where the load will be inspected to ensure it corresponds with the description of the material included on the certificate sheet before it is accepted.
- Any unsuitable loads (i.e. loads that do not meet the description of VENM) will not be accepted and the supplier/driver will be advised to deliver the load to a licensed waste facility.

2.5.3 VENM Stockpiling

When VENM is being processed, it will be placed in the stockpiling and processing area.

The environmental management measures for stockpiles detailed in Section 9 of the EMS will be applied.

- All surface waters will be diverted into the water storage or sump within the extraction area.

2.5.4 VENM Placement and Compaction

- When VENM is to be used to backfill the quarry, the following procedures will be undertaken:
- Compaction of VENM will not occur within approximately 3.5m of the proposed final landform.
- Between approximately 3.5 m and 1.0 m of the final landform VENM comprising weathered material is to be placed without compaction.
- Between 1.0 and 0.5 below the final landform, weathered shale material will be placed

- without compaction.*
- *Sub-soil and top-soil will be placed over the VENM/weathered shale in accordance with the Landscape and Biodiversity Management Plan.*
 - *Soils will be handled only when they are moist (neither wet, nor dry) to minimise the risk of soil structural decline.*

2.5.5 VENM On-site Operations

- *Water sprays and water trucks will be used in all areas of potential dust lift-off to minimise potential dust emissions.*
- *A maximum speed limit of 10 km/hour will be maintained within the quarry site.*
- *The width of haul roads will be limited to that which is safe for heavy vehicle passage to minimise soil erosion hazards.*

2.5.6 Monitoring and Reporting

- *During all VENM importation operations, records will be kept for each site where imported VENM is to be sourced and for each load of material received.*
- *Record sheets must be filled out at the source of VENM for transport to the quarry, and at the quarry for the receiving of VENM. Completed record sheets are to be stored and filed in a suitable location to facilitate the reporting, auditing, and “access to information” requirements specified in the Project Approval and EPL.*

During the reporting period a total of 90574.8t of material was imported and placed within the void. All records have been kept and are referenced within Appendix K. the plan of the location of the placement of the VENM/ENM has been provided in Appendix L.

2.6 Waste Management

As the facility is designed to minimise waste production long term there is minimal waste produced at the facility however the following waste is dealt with onsite and managed in accordance with current environmental guidelines

2.6.1 Scrap steel (ferrous metal) from concrete recycling.

The bulk scrap steel from the concrete is separated during pre-processing of the concrete, this material is then stored in bulk storage bins. During final processing of the concrete the steel is separated using a magnet to remove the final small amounts and stored in the same bulk storage bins. Once full the bin is replaced with an empty bin and the full bin is taken to the metal recyclers.

2.6.2 Waste timber, plastic, non-ferrous metals

During processing of imported concrete and brick/masonry products there can be other unwanted products in the final processed material, such as plastic, timber, ferrous and non-ferrous metals. However, there is an allowable amount of this type of material in the final processed product (RTA T276 – Foreign Material content of Recycled Crushed concrete). With our products, we endeavour to have 100% of foreign material removed from our finished product, we do this by a process of

machine sorting and hand picking prior to crushing and sorting and picking after crushing. These materials are then sorted into various non-ferrous metal bins (copper, aluminium, steel) and or a rubbish bin. The recycled metal products are transported to the metal recyclers for recycling while the rubbish (plastic, timber etc.) is removed by Cleanaway and disposed of at an approved waste disposal facility.

2.6.3 Lunch Waste and Food Scraps

All lunch waste and food scraps are placed in bins around the facility, those bins are then consolidated into a waste bin provided by Cleanaway. This bin is then removed and disposed of by Cleanaway.

2.6.4 Asbestos Materials

All materials imported to site for disposal are handled per our asbestos management guidelines.

1. The load is visually checked at the weighbridge for signs of asbestos contamination. **If any asbestos is detected the load is refused and sent away. The date, time, truck and rego are all recorded.** If no asbestos is identified the truck is permitted to tip onsite subject to another inspection after tipping.
2. The load is then taken down to the unloading station in preparation for tipping.
3. The load is then directed for tipping away from the main stockpile of material to be processed, to prevent any cross contamination.
4. The load is then tipped in the presence of quarry personnel who again inspect the tipped load for any signs of potential asbestos. **If any asbestos is detected the load is reloaded and sent away. The date, time, truck and rego are all recorded.**
5. The tipped load is then pulled up into the main stockpile while again checking for any signs of asbestos.
6. Further to this our guidelines have also been updated to comply with the "Standards for managing construction waste in NSW" introduced by the EPA on the 15th May 2019.

2.6.5 Ablutions

Currently utilise medium sized ablution facility that is for all staff currently onsite. This has male and female amenities. This pump out is regularly maintained and serviced by offsite contractor.

2.6.6 Waste Oils, Batteries

Waste oil from servicing is stored in two, 205L drums located in the sea container bund within the maintenance area. These drums are pumped out regularly with local oil recycling contractors. Batteries that are no longer functioning are removed and stored on pallets. A local recycling contractor for batteries attends site and disposes of the batteries.

2.7 Ore and Product Stockpiles

All stockpiled material is managed in 4000t stockpiles. These stockpiles are situated on the floor of the current blasting area. All sales are managed and loaded from the stockpile floor. This area is not exposed to winds and dust generation. There are numerous stockpiles onsite that are stored in preparation for sales in meeting client demand.

2.8 Water Management

Any water that accumulates from the main extraction zone is pumped up to the main water storage buffer dam.

2.9 Hazardous Material Management

No hazardous materials are stored on the mine site.

- Fuel for machinery is brought to site as required, all refuelling is serviced via a dedicated plant refuelling truck.
- The blasting contractor only brings explosives to site on the day required.

Thus, eliminating the need to store any hazardous materials onsite.

2.10 Production Quantities and VENM/ENM importation for Emplacement in Void

Cumulative Production (all cubic metres)

Table 2 - Production and Waste Summary

Process	Start of Reporting Period (July 2018)	At end of Reporting Period (June 2019)	End of next reporting (estimated)
Topsoil Stripped	22,680	22,680	22,680
Topsoil Used/Spread	22,680	22,680	22,680
Waste Rock	Nil	Nil	Nil
Ore	1,404,572	1,545,471	1,696,471
Processing Waste	15	18	21
Product	1,404,572	1,545,471	1,696,471
VENM importation (tonnes)	61784.57	152359.37	352359t

Table 3 - Stored Water

	Volumes held (cubic metres)		
	Start of Reporting Period	At end, of Reporting Period	Storage Capacity
Clean water	10000 est.	10000 est.	103000
Dirty water	Nil	Nil	Nil
Controlled discharge water	N/A	N/A	N/A
Contaminated water	N/A	N/A	N/A



3. ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 Blasting Monitoring

Ten blasts were carried out in the AEMR reporting period 1st July 2018 through to 30th June 2019. All blasts were monitored in accordance with the blast management plan, blast controls and project approval. No results were recorded outside the approved limits for vibration and overpressure. All results were analysed at the completion of each blast and forwarded to the DECCW information and verification. See tables and charts below and results attached in appendix C


Blasting controls include the following.

- The police, Shoalhaven City Council, NSW Roads and Traffic Authority, Environmental Protection Agency and the resident occupying the house immediately to the south of the quarry site are notified verbally at least 24 hours prior to the initiation of each blast.
- The drill hole spacing, burden distance, stemming length, maximum instantaneous charge is carefully designed and implemented by the blasting contractor to ensure that ground vibration and air blast do not exceed the Project Approval Controls criteria and that there is no danger to motorists using the Princes Highway.
- Each blast is monitored at the nearest residence, adjacent to jail, adjacent to commercial premises and north of brickworks and subsequent blast designs are modified if required considering the blast monitoring.
- Records of each blast monitored have been stored for future reference, and are attached to this report.
- All blast monitors are downloaded and the results analysed at the completion of each blast. Checking for any exceedances of the reporting criteria. Precision Drill and Blast rely on this information for future blasting design and this information enables them to determine if any modifications to the MIC (Maximum Instantaneous Charge), drill pattern and overall blast design are required. (See attached letter and blast reports in Appendix C)
- All drilling and blasting-related activities will be supervised by a suitably qualified and experienced blasting engineer or shot-firer

As per **Section 14.3.1 of our EMS (GHD 2010)**

Blasting is to be designed to:

- *Achieve the required degree of fragmentation;*
- *Satisfy all environmental criteria (especially noise and vibration,)*

- 
- *Contain all blast fly rock within the nominated blast envelope.*
 - *Blast emissions will be quantified using a portable blast emissions monitor (measurement of air blast and vibration, which will be positioned at the nearest potentially affected residences and other blast emission sensitive receivers to the plant operations as identified in the Project Approval. Blast monitoring instrumentation will be employed to meet the primary specifications presented in the Noise Monitoring Program/Blast management Plan.*
 - *The Blast Design Record Sheet is to be filled in for individual blast events.*



3.1.1 Blasting Analysis (Ground Vibration)

Table 4 - Blasting Ground Vibration Results

July2017 – June2018 AEMR Ground Vibration – Results – Residential			
Date	Corrective Services	Goodsell Residence	Peak Vector Sum Reporting Limit
24/09/2018	4.79	2.5	5
9/11/2018	1.2	4.43	5
26/11/2018	4.58	2.48	5
13/12/2018	1.54	2.25	5
31/01/2019	2.31	4.95	5
21/02/2019	2.3	4.03	5
19/03/2019	1.51	1.14	5
8/04/2019	2.34	2.23	5
13/05/2019	0.317	3.23	5
7/06/2019	0.69	4.5	5

July2018 – June2019 AEMR Ground Vibration – Results – Commercial

Date	North of Brickworks	Commercial Premises	Peak Vector Sum Reporting Limit
24/09/2018	0.566	2.2	25
9/11/2018	0.332	3.53	25
26/11/2018	0.556	2.2	25
13/12/2018	0.35	1.42	25
31/01/2019	0.658	0.956	25
21/02/2019	0.527	2.3	25
19/03/2019	0.278	1.39	25
8/04/2019	0.313	2.47	25
13/05/2019	2.06	5.4	25
7/06/2019	0.325	3.28	25

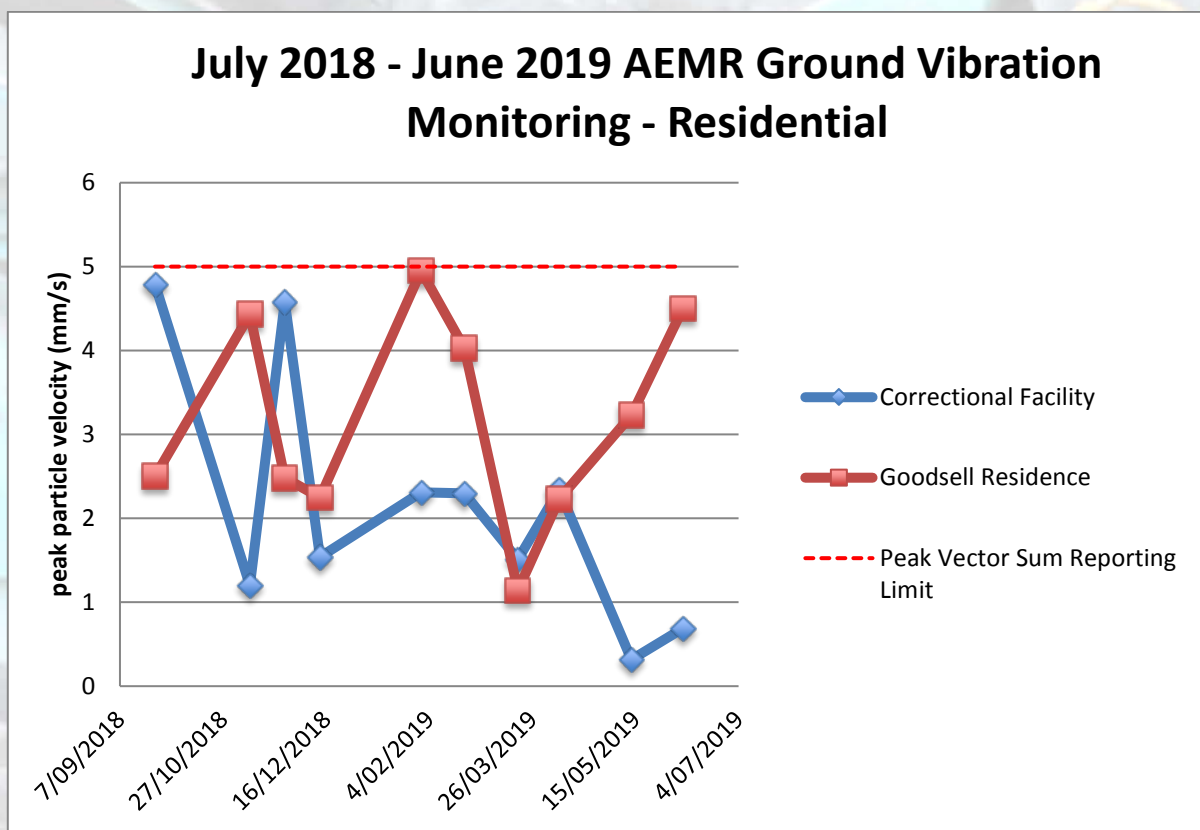


Chart 1 - Residential Ground Vibration

July 2018 - June 2019 AEMR Ground Vibration Monitoring - Commercial

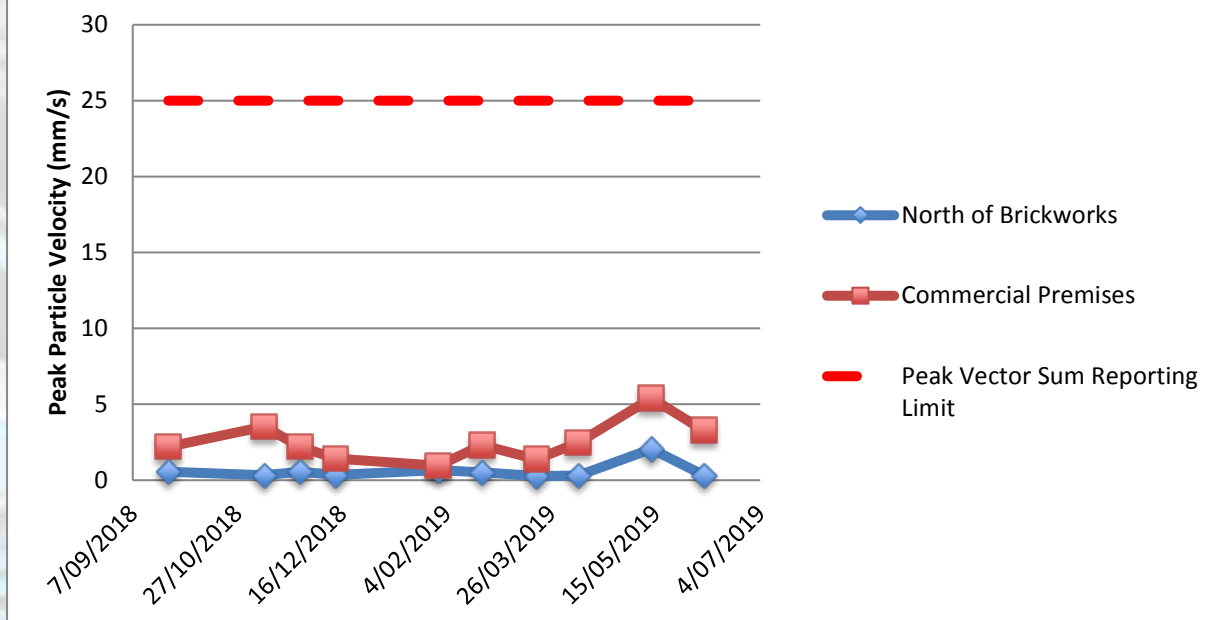


Chart 2 - Commercial Ground Vibration

3.1.2 Blasting Analysis (Air Blast Overpressure)

Table 5 - Residential Overpressure

July 2017 – June 2018 AEMR Air Blast Overpressures – Residential			
Date	Corrective Services	Goodsell Residence	Peak Vector Sum Reporting Limit
24/09/2018	113.9	108.8	115
9/11/2018	110.4	113.5	115
26/11/2018	113.6	109.6	115
13/12/2018	113.1	113.5	115
31/01/2019	107	109.9	115
21/02/2019	111.5	104.2	115
19/03/2019	111.8	107.5	115
8/04/2019	113.6	114.2	115
13/05/2019	107.5	114.1	115
7/06/2019	113.5	104.9	115

Table 6 - Commercial Overpressures

July 2017 – June 2018 AEMR Air Blast Overpressures – Commercial

Date	North of Brickworks	Commercial Premises	Peak Vector Sum Reporting Limit
24/09/2018	101.3	119.2	125
9/11/2018	110.6	120.4	125
26/11/2018	101.1	118.8	125
13/12/2018	101	112.3	125
31/01/2019	100	116.1	125
21/02/2019	109.2	113.8	125
19/03/2019	116.6	115.7	125
8/04/2019	112.3	120	125
13/05/2019	117.4	112.6	125
7/06/2019	107	116.7	125

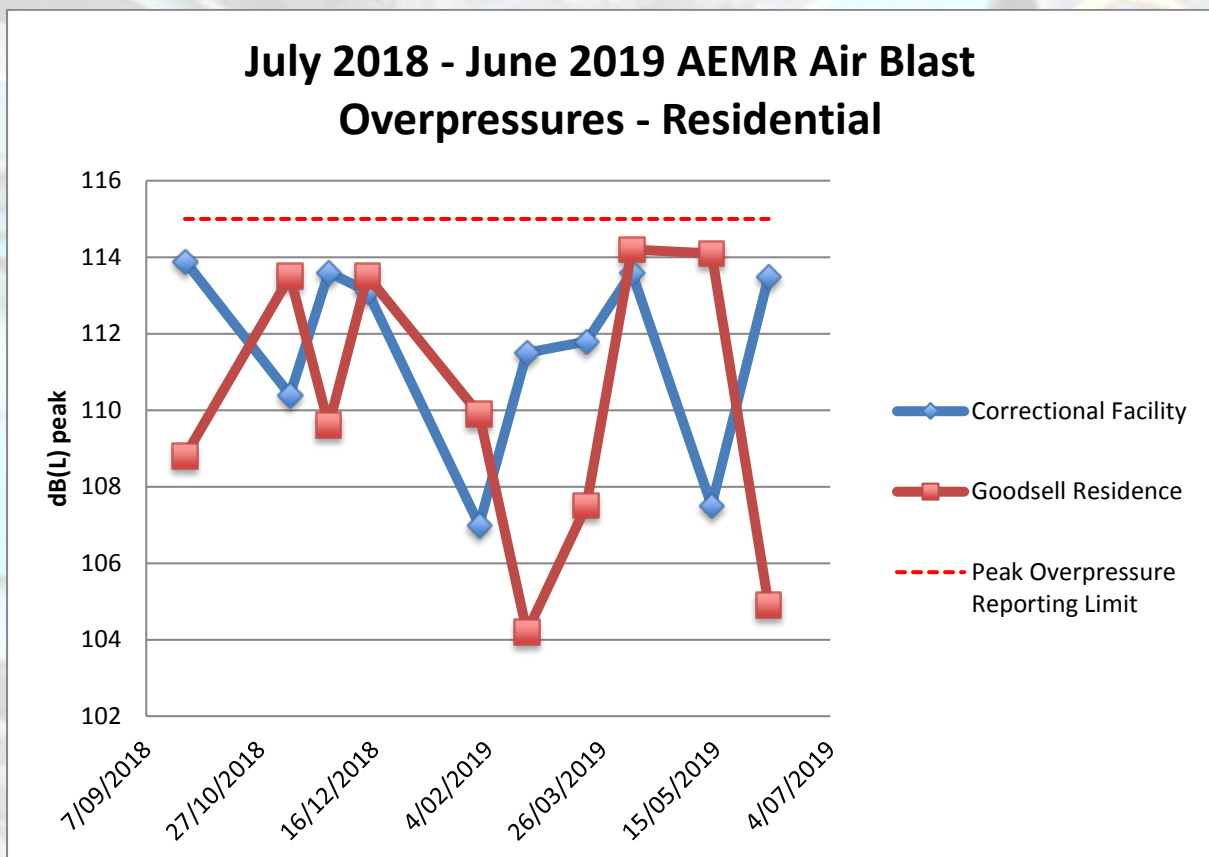


Chart 3 - Residential Overpressure

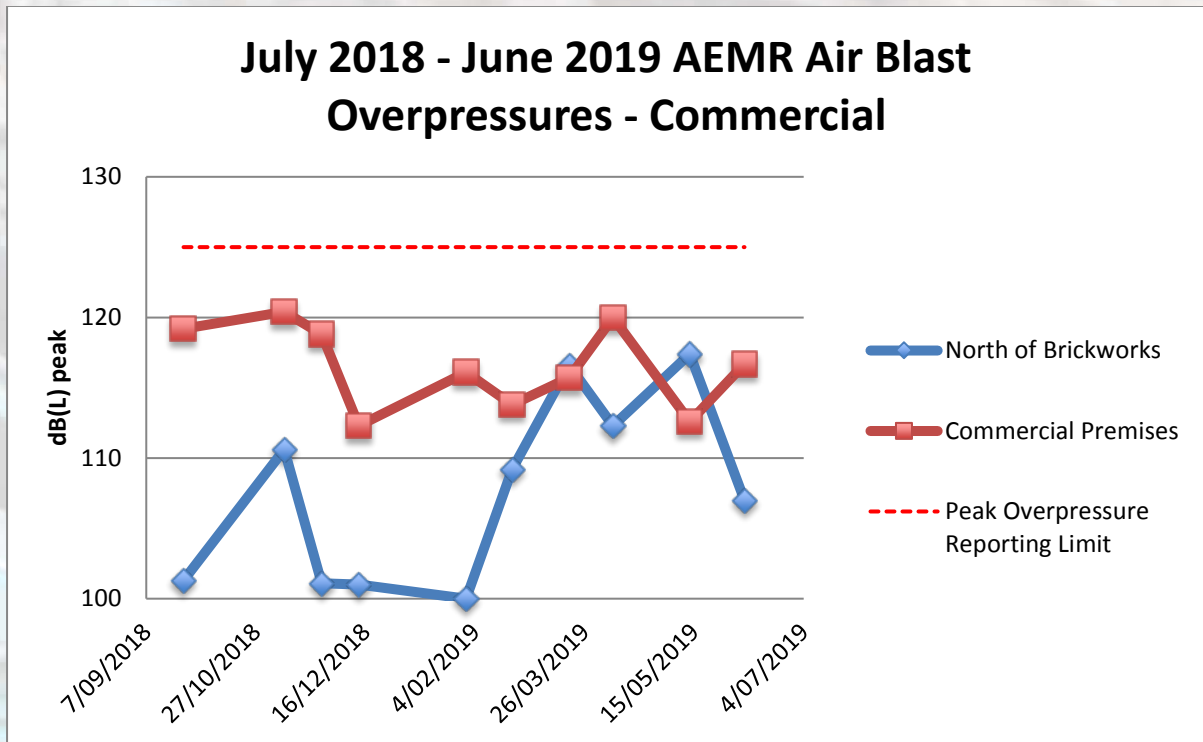


Chart 4 - Commercial Overpressure

3.1.3 Blasting Summary

The blasting program has been successful over this reporting period. This is based on maintaining small blasts onsite and ensuring the project criteria (ground vibration and overpressure) had not been exceeded during this reporting period. The results will continue to be closely monitored after each blast to assess blasting requirements for future blasts. We have now shown 5 consecutive AEMR reporting periods of blasting that we have been able to maintain project compliance with the use of small blasts. The number of blasts this reporting period increased from 8 blasts to 10. The number of blasts in the period was below the forecast 1 per month with slightly less demand. We anticipate that we will be in the range of 8-12 blasts in the next reporting period. This would still fall well within our project approval with permission to blast weekly. All blasts will continue to be kept small to keep air blast overpressures and ground vibration to a minimum.

3.2 Noise Monitoring

Noise monitoring was not undertaken during this reporting period. This was an operational oversight and has been rectified for the future reporting period. Monitoring has been booked for all upcoming quarters to avoid this issue in the future.

3.2.1. Noise Summary

Noise monitoring was not carried out and there are no results to attach to this report.

3.3 Air Monitoring

Airborne dust within the quarry site is generated predominantly through crushing and screening activities, vehicle movement on haul roads, stockpiles and exposed surfaces on the site.

A range of air quality controls are currently undertaken at the Nowra Brickworks Quarry and will continue to be implemented for the term of approval.

- The processing plant is currently fitted with dust suppression equipment and this equipment would continue to be used whenever the plant is operational.
- On-site roads, hardstand areas, stockpiles and exposed surfaces are and will continue to be regularly watered using a water cart or sprinklers. Water for this purpose is sourced from water within the extraction area or the Water Storage Dam.
- The loads of trucks carrying material to or from the quarry site on public roads are and will continue to be covered.
- An automated wheel wash has been in conjunction with shaker grid has been improved and utilises several sprays on all vehicles exiting site.

See appendix E with attached results. These have been analysed and collated in the following charts and tables DDG, TsP and Pm10.

3.3.1 Dust Deposition Gauges (DDG)

The DDG reporting criteria of 4 g/m².month was not exceeded during the July 2018 – June 2019 AEMR reporting period.

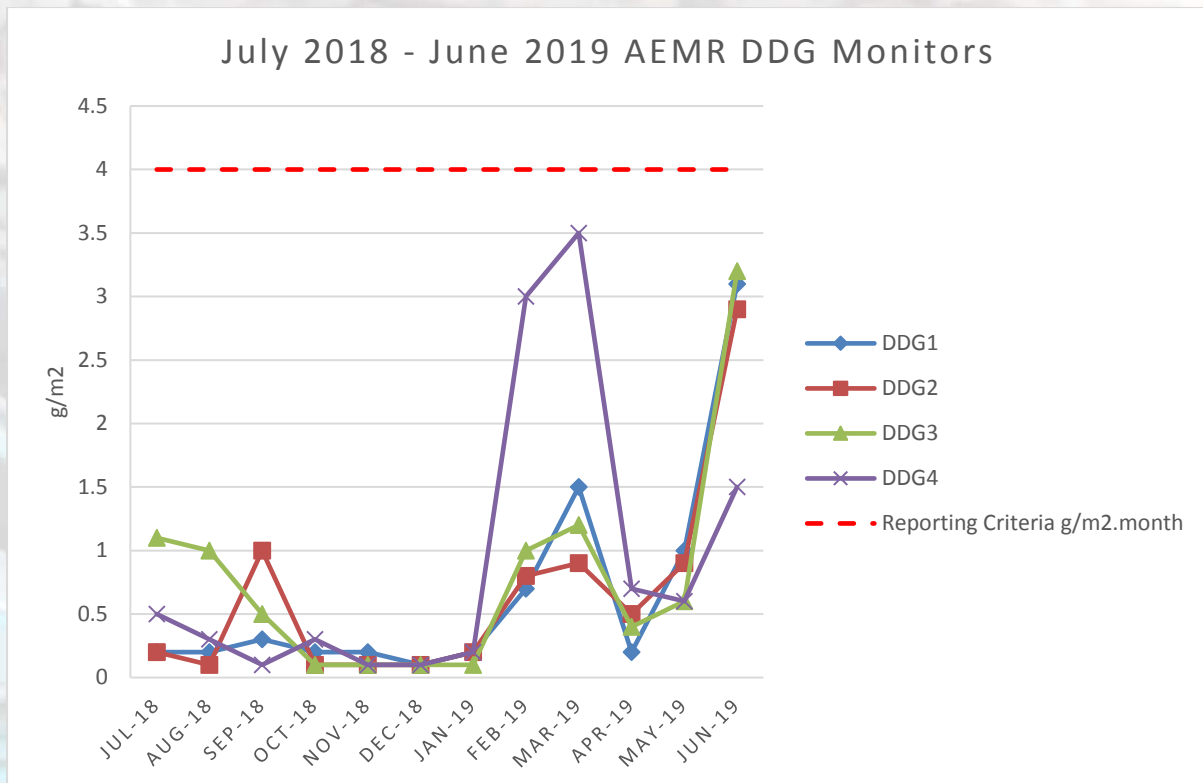


Chart 5- DDG

Table 7 - DDG Collected Data

		Ash Content		Combustible Matter		Total Insoluble Matter	
		g/m2.month	mg	g/m2.month	mg	g/m2.month	mg
July	DDG1	0.1	2	0.1	2	0.2	4
	DDG2	0.1	2	0.1	1	0.2	3
	DDG3	0.3	6	0.8	14	1.1	20
	DDG4	0.2	4	0.3	5	0.5	9
August	DDG1	0.1	1	0.1	3	0.2	4
	DDG2	0.1	1	0.1	1	0.1	2
	DDG3	0.6	11	0.4	7	1	18
	DDG4	0.1	2	0.2	3	0.3	5
September	DDG1	0.1	1	0.2	4	0.3	5
	DDG2	2.2	8	0.8	5	1	5
	DDG3	0.2	4	0.3	4	0.5	8
	DDG4	0.1	2	0.1	1	0.1	2
October	DDG1	0.1	2	0.1	2	0.2	4
	DDG2	0.1	2	0.1	1	0.1	2
	DDG3	0.1	2	0.1	1	0.1	2
	DDG4	0.3	5	0.1	1	0.3	6
November	DDG1	0.1	1	0.2	3	0.2	3
	DDG2	0.1	1	0.1	2	0.1	2
	DDG3	0.1	1	0.1	2	0.1	2
	DDG4	0.1	1	0.1	1	0.1	1

December	DDG1	0.1	1	0.1	1	0.1	1
	DDG2	0.1	1	0.1	1	0.1	1
	DDG3	0.1	1	0.1	1	0.1	1
	DDG4	0.1	1	0.1	1	0.1	1
January	DDG1	0.1	1	0.2	4	0.2	5
	DDG2	0.1	2	0.1	2	0.2	4
	DDG3	0.1	1	0.1	1	0.1	2
	DDG4	0.1	2	0.1	4	0.2	6
February	DDG1	0.7	11	0.1	1	0.7	12
	DDG2	0.7	12	0.1	1	0.8	13
	DDG3	1	16	0.1	1	1	16
	DDG4	1.6	26	1.4	23	3	49
March	DDG1	1.3	23	0.2	3	1.5	26
	DDG2	0.9	16	0.1	1	0.9	16
	DDG3	0.9	16	0.3	5	1.2	21
	DDG4	1.9	33	1.6	26	3.5	59
April	DDG1	0.2	3	0.1	1	0.2	3
	DDG2	0.4	7	0.1	1	0.5	8
	DDG3	0.3	5	0.1	2	0.4	7
	DDG4	0.4	6	0.3	6	0.7	12
May	DDG1	1	17	0.1	1	1	18
	DDG2	0.7	13	0.2	3	0.9	16
	DDG3	0.5	8	0.1	2	0.6	10
	DDG4	0.4	7	0.2	3	0.6	10
June	DDG1	2.8	29	0.3	5	3.1	54
	DDG2	2.7	47	0.2	5	2.9	52
	DDG3	2.8	50	0.4	7	3.2	57
	DDG4	1.1	20	0.4	7	1.5	27

3.3.2 TsP High Volume Samplers

The TsP Annual Average limit (90ug/m3) was not exceeded during the reporting period (July 2018 – June 2019)

July 2018 - June 2019

TsP Annual Average – South (8.6 ug/m3) an increase of 2.6 ug/m3 from the previous reporting period.

TsP Annual Average – North (8.5 ug/m3) an increase of 2.6 ug/m3 from the previous reporting period

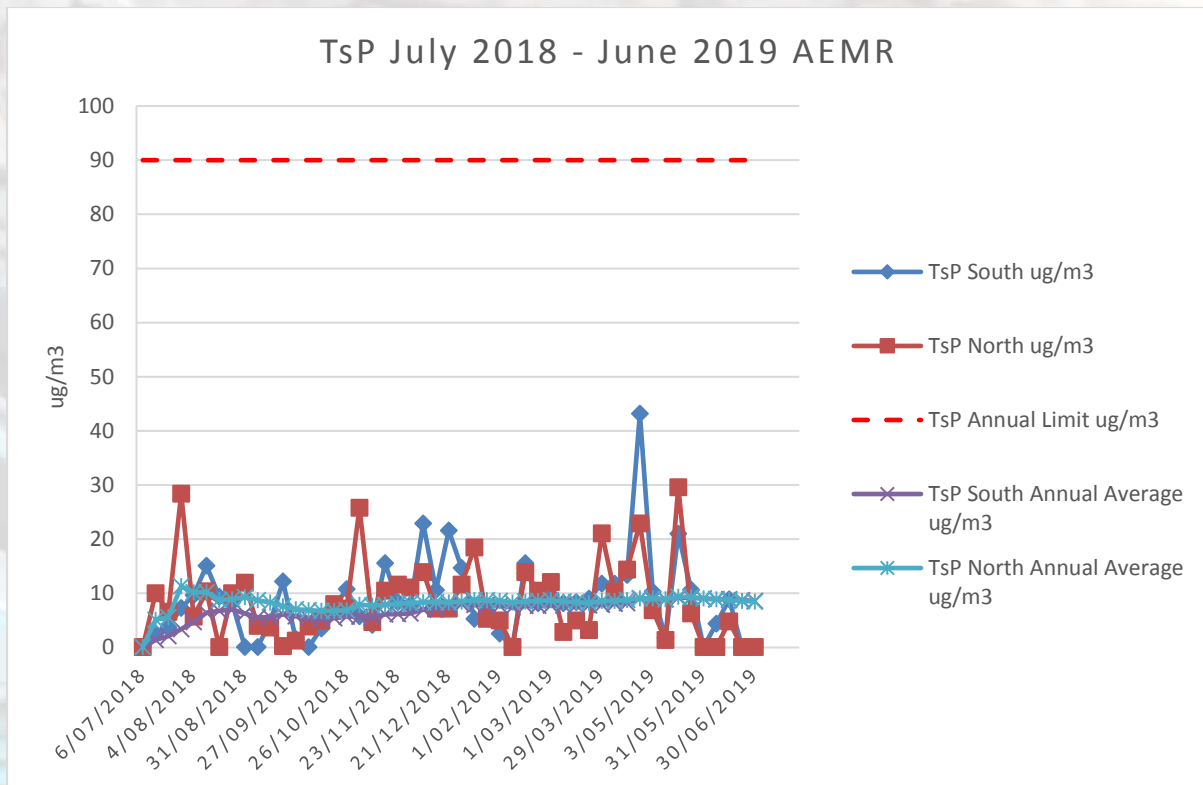


Chart 6 - TsP

3.3.3. Pm10 High Volume Samplers

The Pm10 Annual Average limit (30ug/m3) and the 24hr limit (50ug/m3) were not exceeded during monitoring during this reporting period.

The maximum values recorded for North and south were 20.3ug/m3 and 26.7ug/m3 which is well below the 50ug/m3 allowable limit.

July2018 - June2019

Pm10 Annual – South (7.5 ug/m3) an increase of 2.1ug/m3 for the reporting period.

Pm10 Annual – North (6.9 ug/m3) an increase of 0.2ug/m3 for the reporting period.

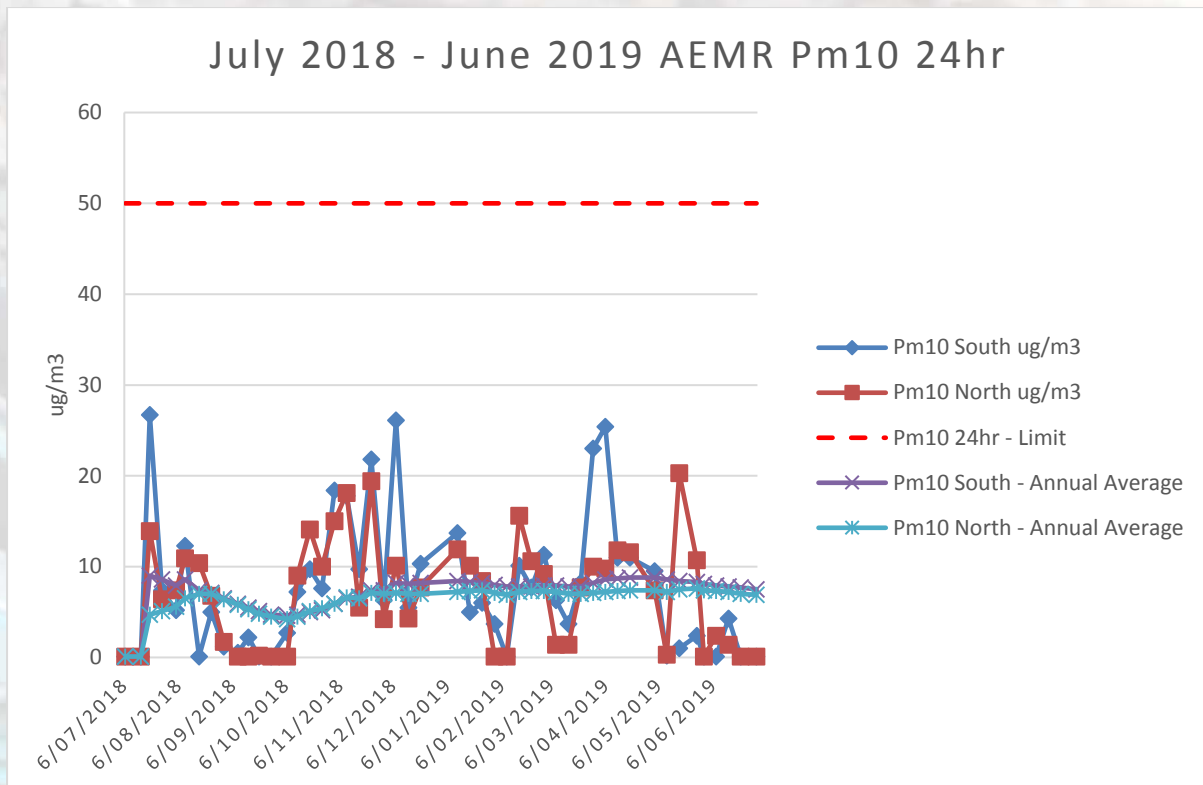


Chart 7 - Pm10 24hr and annual average

3.3.4. Dust Summary

For the majority of the operations during the reporting period there were no adverse effects in regards to generating additional dust during quarrying operations. There were no complaints during the reporting period.

The Pm10 and TsP annual average limits are still currently well below the approval limits and there were not any spot exceedences during the reporting period.

3.4 Erosion and Sediment Control Monitoring

3.4.1 Nowra Brickworks Quarry

Erosion and sedimentation control at the Nowra Brickworks Quarry revolves around:

- diversion of 'clean' surface water runoff away from disturbed areas; and
- capture and retention of 'dirty' water flowing from disturbed areas of the quarry site.
- Sedimentation fencing around soil stockpiles
- Sedimentation fencing to Nowra Creek Riparian protection zone

Attached in appendix F is the sedimentation monitoring logs for the AEMR monitoring period.

3.4.2 Flat Rock Quarry

Nil works were conducted at flat rock quarry during the reporting period.

- A site visit was conducted with Mineral resources with a view to moving towards an exit plan in relation to the mining operation at the site.
- Currently existing sedimentation pond is working well however regular review needs to occur to ensure that there are no unchecked changes occurring. An interim sediment and erosion control plan has been implemented.
- A review of this plan is underway along with an updated MOP and rehabilitation and completion of the final landform.

3.5 Landscape and Biodiversity Monitoring

3.5.1 Weed Management

Primary and continuous secondary weed management was carried out by Proust Land Services in October 2018 - March 2019.

Common Name	Control	Location / density
Asparagus Fern	Hand dug crown (bag crown & remove off site).	Southern & eastern boundary / scattered seedlings
Blackberry	Cut/paint & manual.	Eastern boundary / scattered small plants
Bitou Bush	Hand dug, cut/paint the occasional seedlings and saplings.	Western boundary / bigger patch on adjoining property
Camphor Laurel	Cut/paint & stem inject larger plants	Eastern boundary / 3 saplings
Castor Oil Plant	Hand pull seedlings, Cut/paint larger plants.	Eastern boundary / scattered with medium patches
Cestrum	Cut/paint / Hand dug	Eastern boundary / small patch
Crofton Weed	Hand pull seedlings, Cut/paint larger plants & spray dense patches on western boundary	All boundaries / sparse with dense patches
Lantana	Hand pull seedlings, Cut/paint larger plants & spray dense patches on western boundary	All boundaries / sparse with dense patches
Senna	Cut/paint / Hand pull	Eastern boundary / scattered seedlings
Spear Thistle	Cut/paint / spray	Southern & eastern boundary / scattered
Tobacco Bush	Cut/paint / Hand dug	All boundaries / scattered
Annuals such as Fleabane, Paddy's Lucerne	Spray	All areas

3.5.2 Site Reference Photos

Site Reference photos were taken in June 2017. Future site reference photos will be taken in November 2018 and May 2019.

All photos attached in appendix F

June 2018



Figure 1

May 2019



Figure 2





Figure 3



Figure 4

3.5.3 Landscape and Biodiversity Summary

The site is generally in healthy condition. Control activities will continue during the July 2019-June 2020 AEMR reporting period and the site will be monitored every 6 months for any new or increase in weed populations.

Site reference photos will continue to be taken and catalogued for future reference.

3.6 Aboriginal heritage monitoring.

No requirement for any specific aboriginal monitoring work was required the AEMR reporting period.

3.7 Surface water monitoring

Surface water monitoring was carried out in accordance with the EMS throughout the AEMR monitoring period from the 1st July 2018 to 30th June 2019. Previous analysis of the baseline data by SEEC concluded that the quarry had no impact on the existing Nowra creek with high readings occurring at the control location (C1) and most data had no correlation to the surface water tested within the quarry at locations S4 and S5. As reported in last 2017-2018 AEMR further extrapolation of the results in this AEMR reporting period continue to show no correlation between water results between the quarry and Nowra Creek. The results continue to show a large difference between the water found within the extraction area of the quarry (S5) and those within the creek (C1, C2 and C10). The results of the surface water runoff of the quarry (S4) are similar to those within the creek as it is a result of overland water flow. Generally, the results are higher at the control point C1 for the creek compared to those of S4.

3.7.1 pH

The pH of the water within the quarry extraction area (S5) was found to be in the 8.07- 8.26 range which is consistent with previous collected baseline data, while water within the creek had results ranging from 6.69 – 7.68. Both results occurred at C1 which is the southernmost location of the creek. (see chart below).

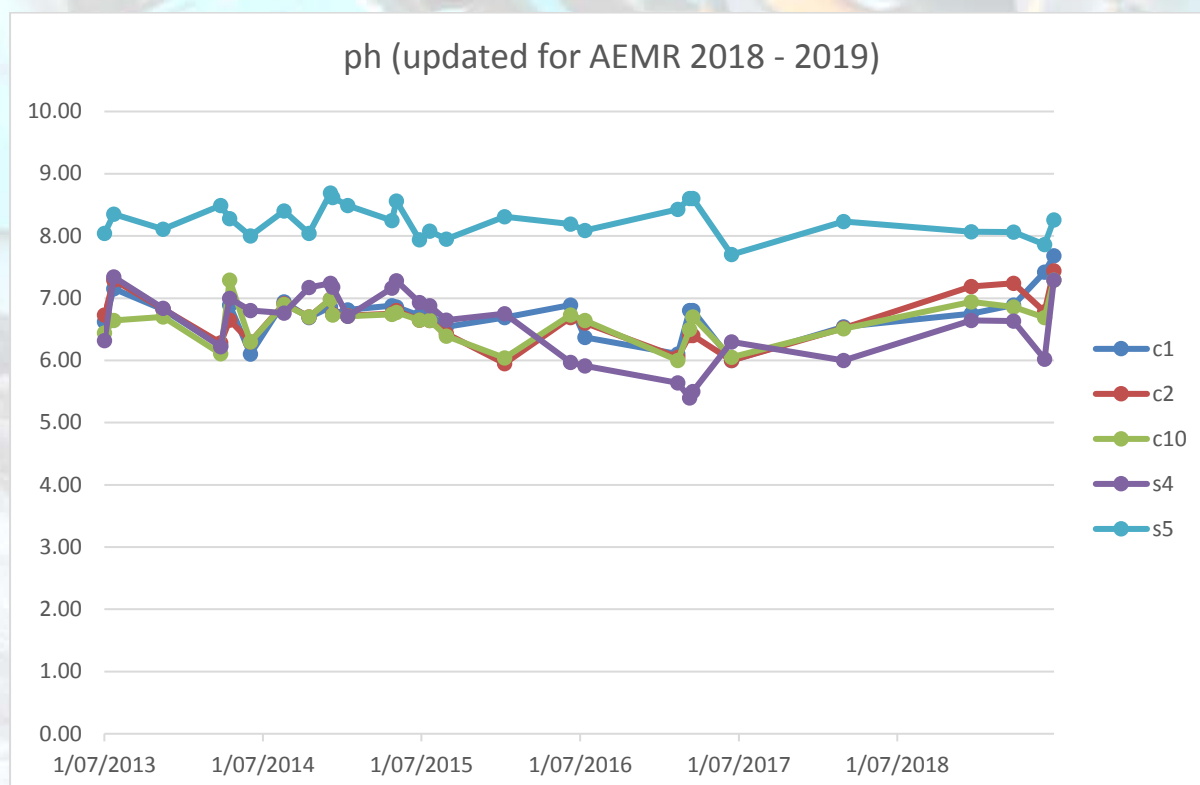


Chart 8 - Surface Water pH

3.7.2 Electrical Conductivity

Electrical conductivity of the water within the quarry (test location S5) recorded EC values up to 7410 us/cm. The results in the creek (177-280) were found to be very low and show no correlation with the water within the quarry. (see chart below)

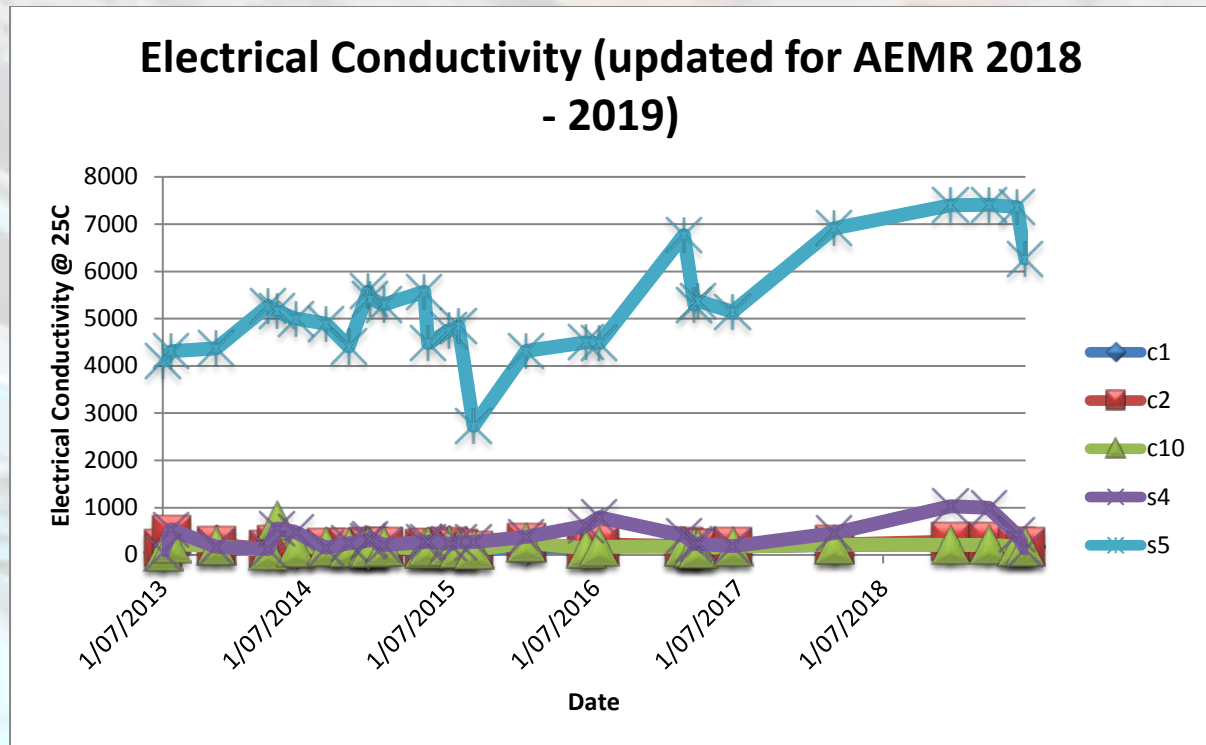


Chart 9 - Surface Water EC

3.7.3 Iron

Iron readings have remained consistent throughout the AEMR (2018-2019) reporting period with results maintaining previous baseline levels. The main water body within the quarry has zero detectable limits of iron.

3.7.4 Aluminium

Aluminium readings recorded were similar to that of iron with low readings recorded in the main quarry water body (S5) either at zero or well below all other results during the reporting period (2018-2019). The creek results are again correlated closely with those of the control location (C1) for the creek.

3.7.5 Arsenic

As with previous reporting Arsenic recorded zero or negligible results for all locations.

3.7.6 Zinc

The results within the creek are closely following the creek control point (C1). Latest results are below the reporting limit of 0.015. The highest results were recorded at the control point C1 with results very similar downstream.

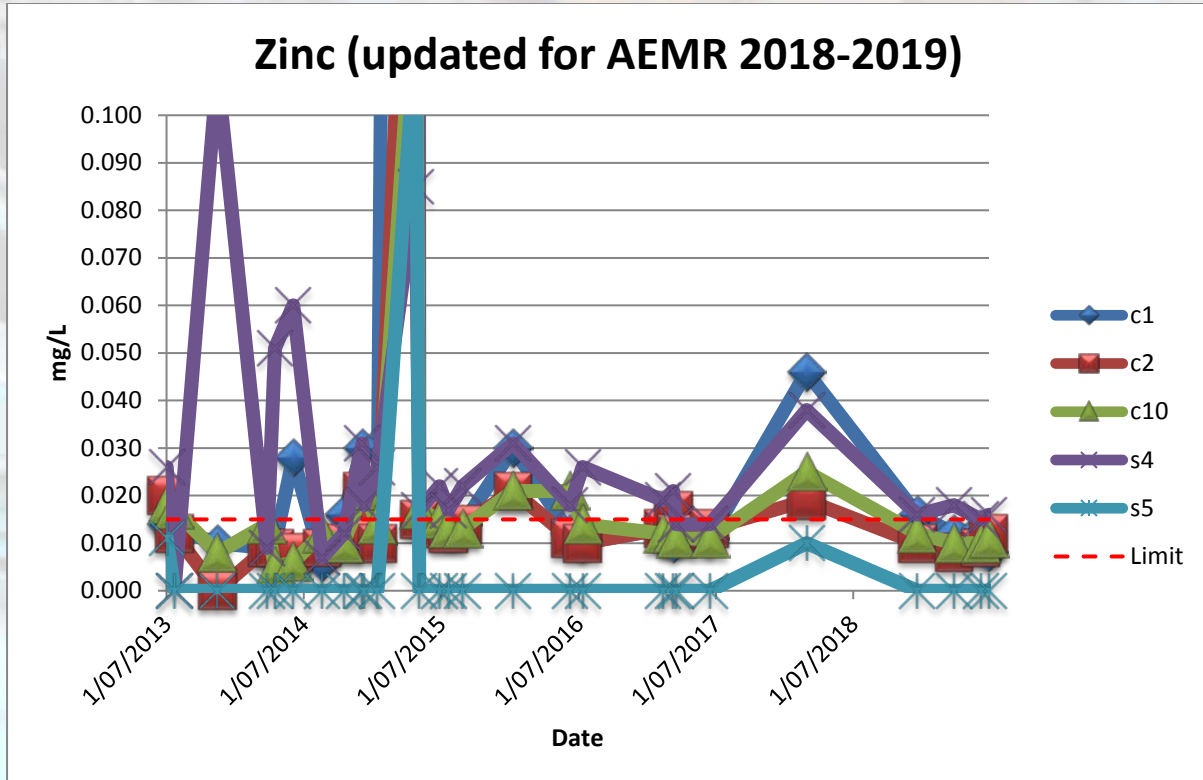


Chart 10 - Surface Water Zinc

3.7.7 Nitrate

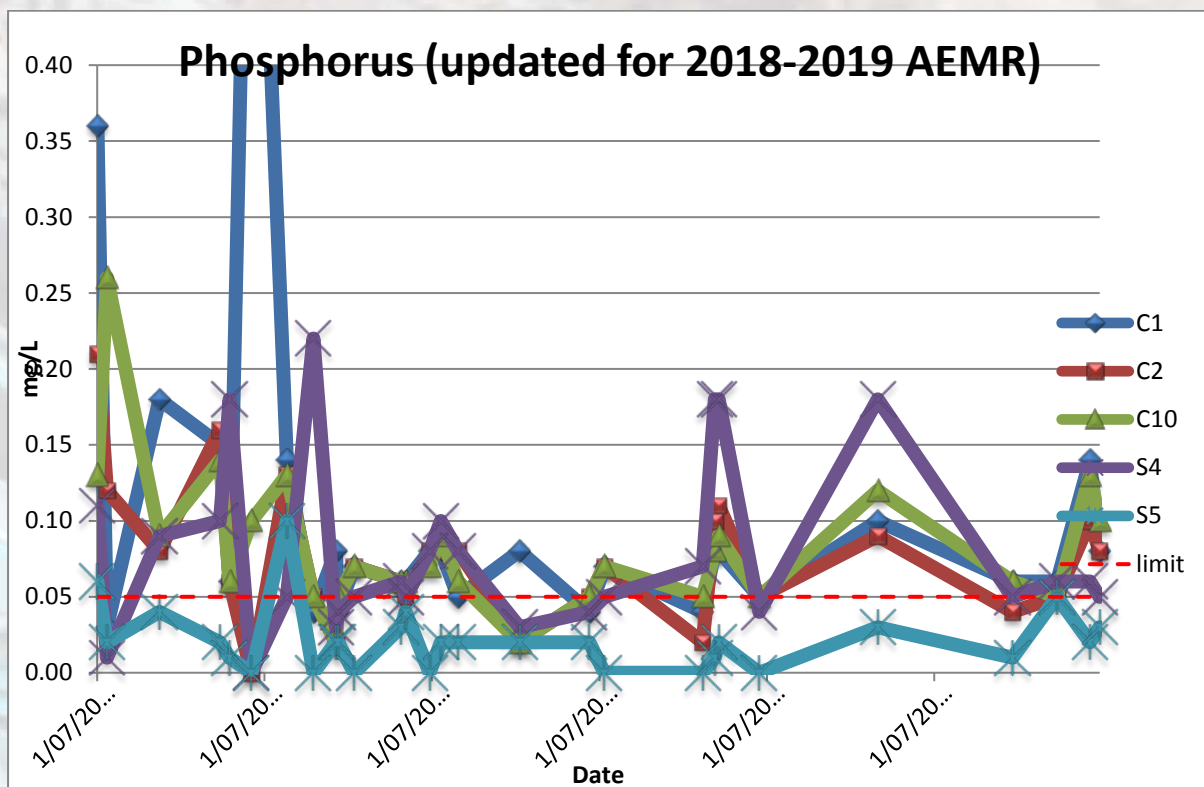
As with previous AEMR results Nitrate values recorded in the creek were within the accepted guidelines there where high levels recorded in the main quarry body (generally lower than previous results) but these had no effect on the surface water runoff into the creek.

3.7.8 Ammonia

Ammonia recorded minimal levels at all monitoring locations but had a reading of 0.5 in the main quarry body but all values in the creek (0.01-0.08) were well below the reportable levels of 0.9.

3.7.9 Phosphorus

Highest recorded results in the reporting period were identified at C1. The main water body within the quarry S5 was below the reporting threshold while C1, C2 and C10 were all closely correlated with C2 being the lower value but above the reporting threshold.



3.7.10 Surface Water Summary

As with SEEC's report "Review of Water Quality Monitoring" from AEMR (2014-2015) the results are consistent in this reporting period and the quarry is having little to no impact on the water health of Nowra creek with no correlation between water tested within the quarry and that of Nowra creek. Monitoring will continue as per our EMS (GHD 2010).

3.8 Ground water monitoring

Samples of Chart results for groundwater monitoring carried out during the AEMR reporting period (2018-2019). The results have been included with the baseline charts to allow ease of analysis showing change over time

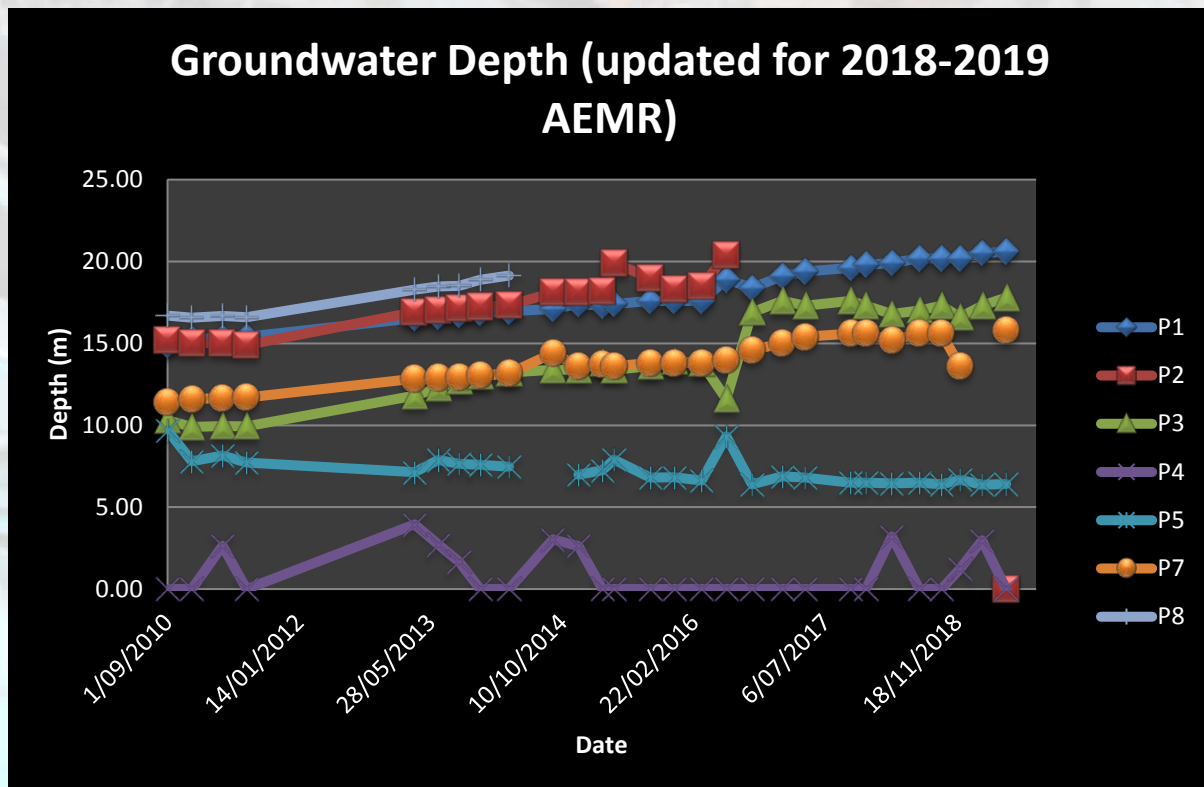


Chart 12 - Groundwater Depth

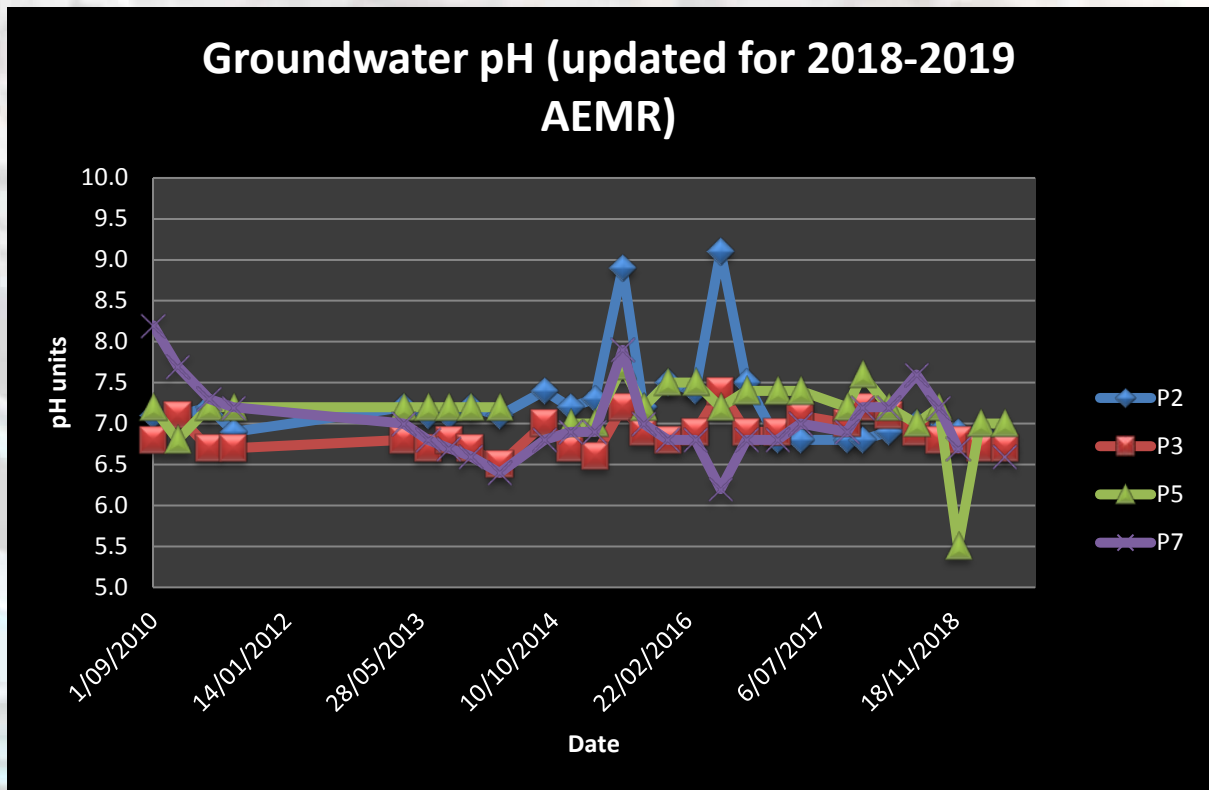


Chart 13 - Groundwater pH

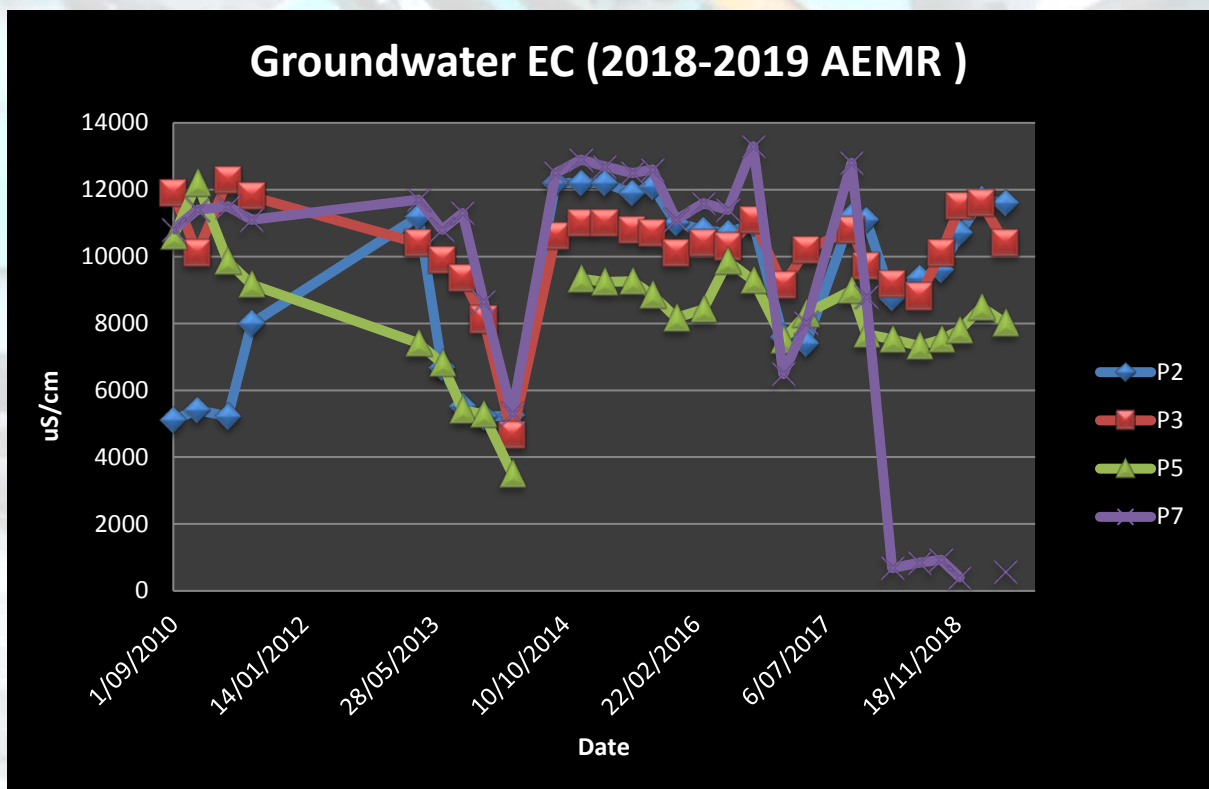


Chart 14 - Groundwater EC

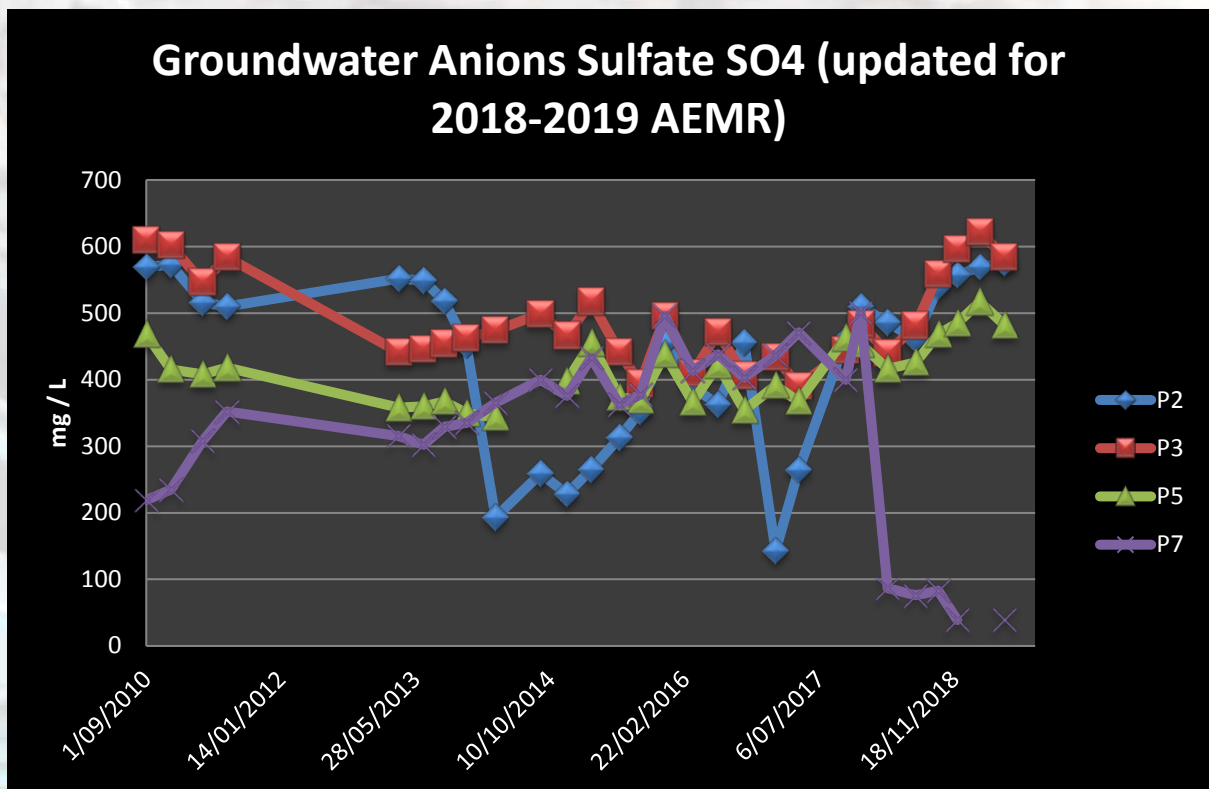


Chart 15 - Groundwater Sulfate Anions

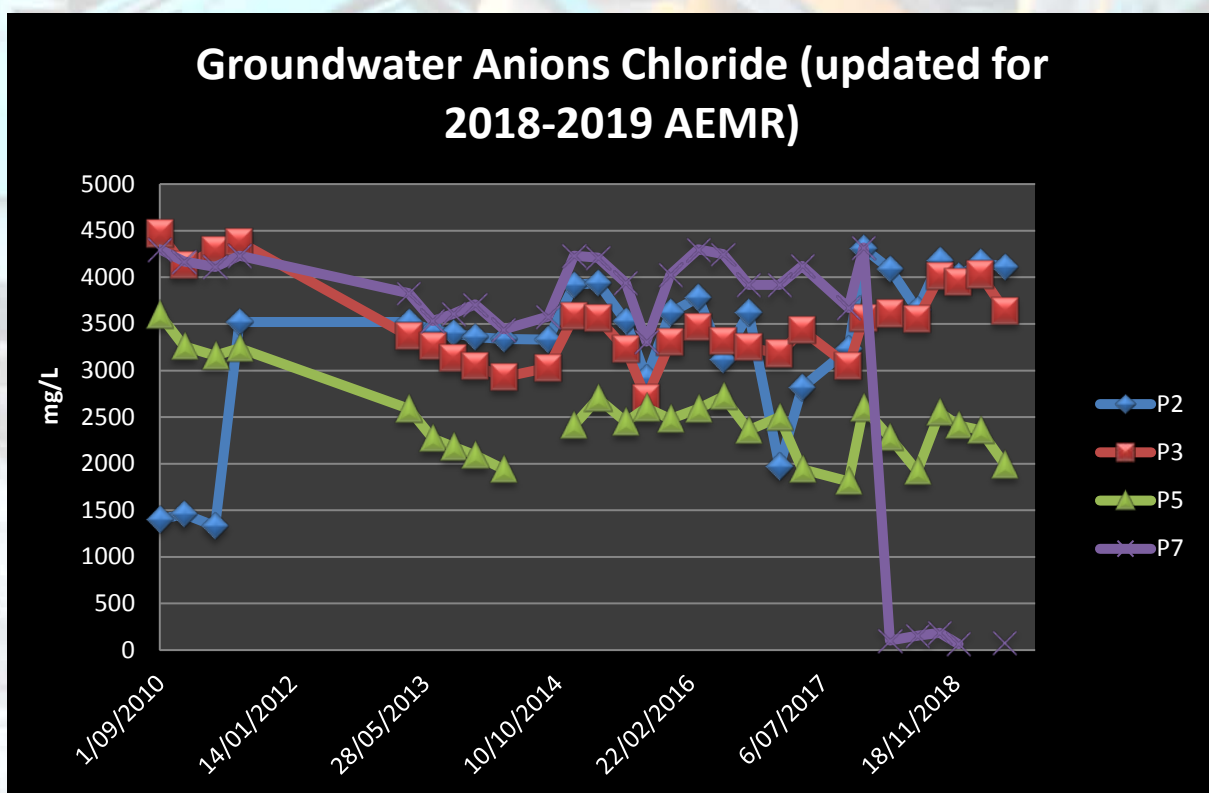


Chart 16 - Groundwater Chloride Anions

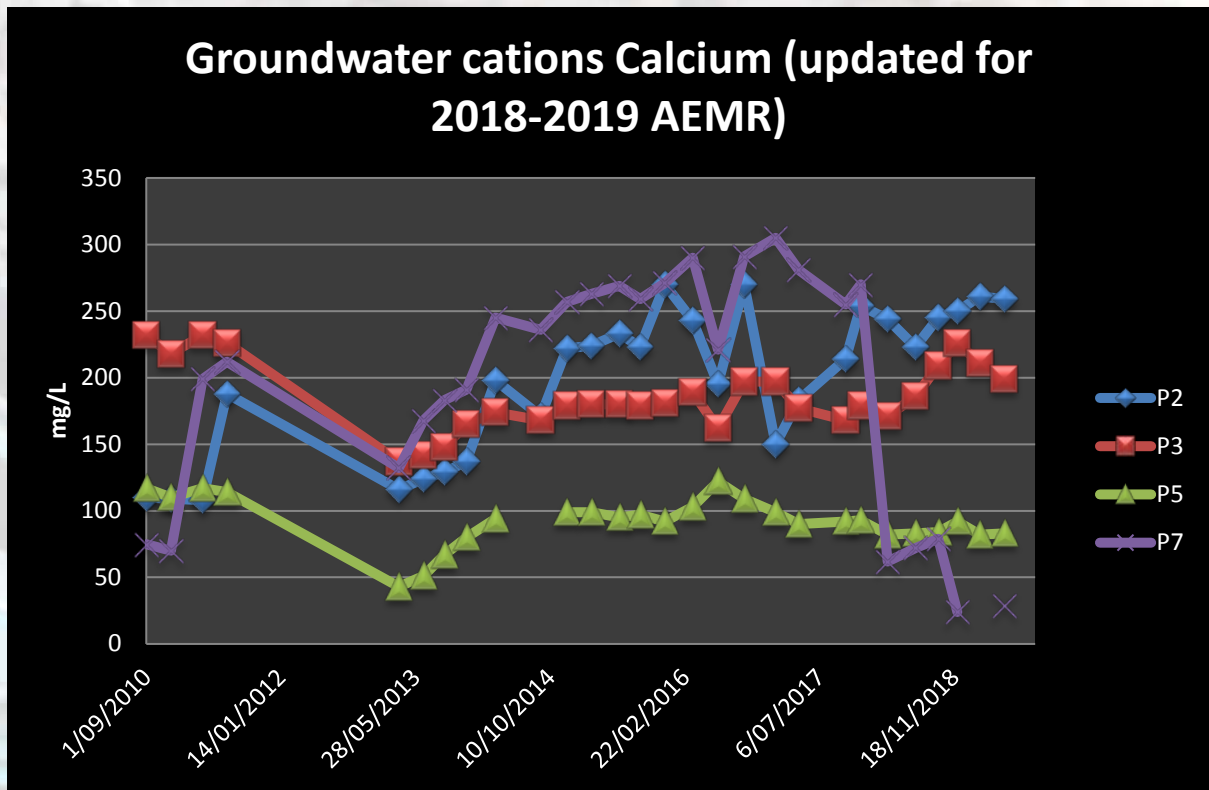


Chart 17 - Groundwater Calcium Cations

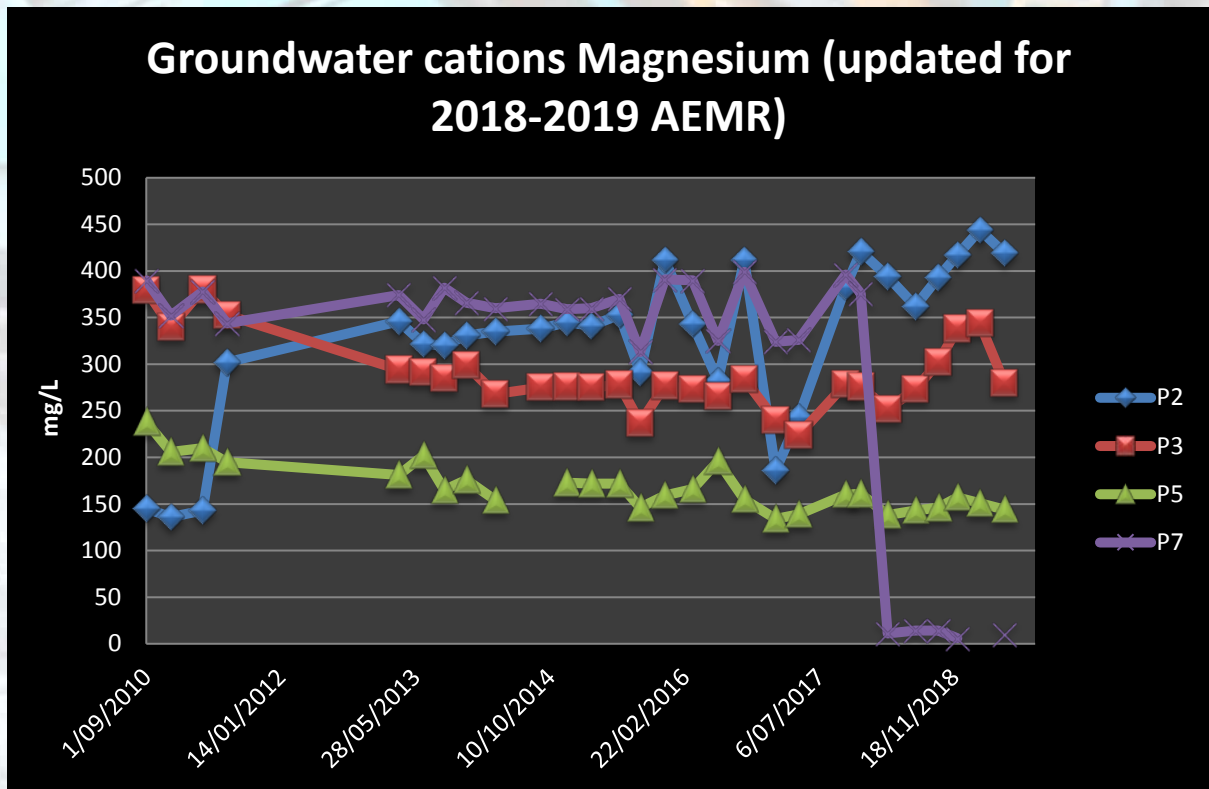


Chart 18 – Groundwater Magnesium Cations

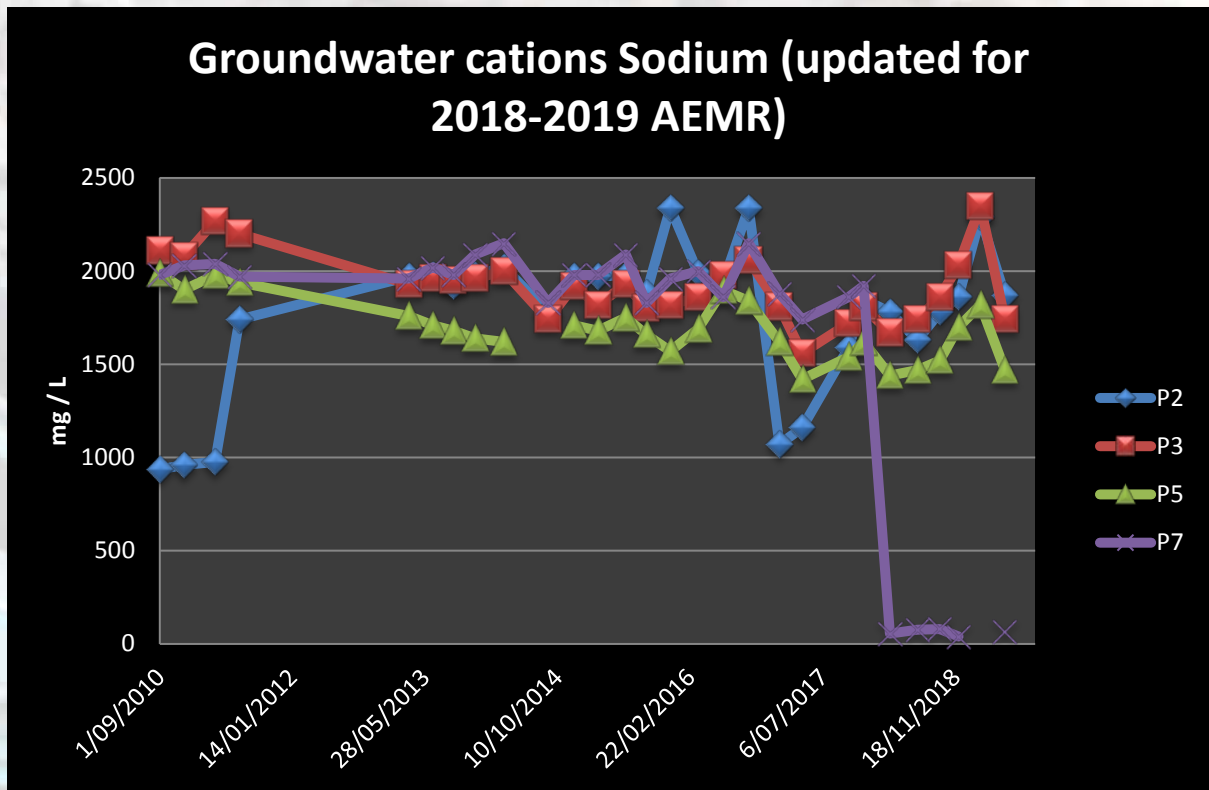


Chart 19 - Groundwater Sodium Cations

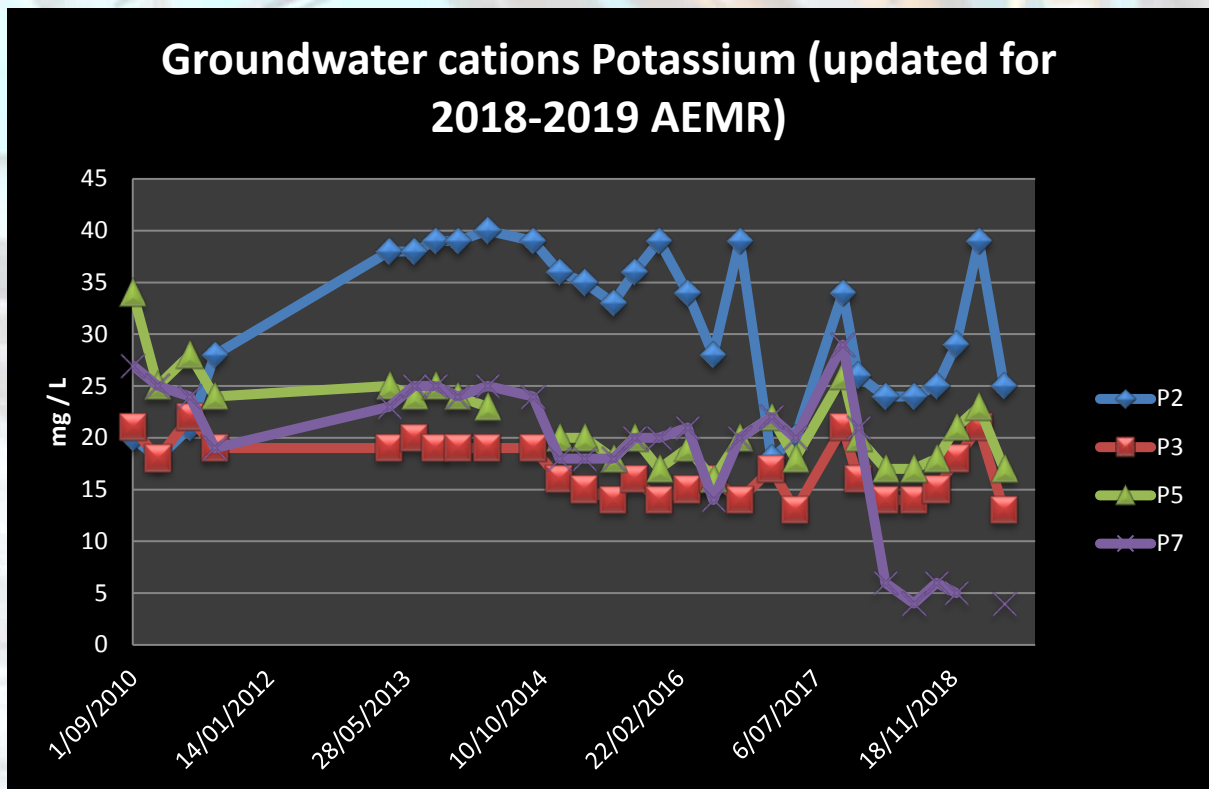


Chart 20 - Groundwater Potassium Cations

3.8.1 Groundwater Monitoring summary

Groundwater monitoring results remain consistent with previous baseline analysis except for the salt content of P7 remaining at lower than normal levels. This was identified in the previous AEMR (2017-2018) further investigations have shown that P7 has been damaged potentially around the time of change in the salt results. Arrangements have been made to rectify this bore for ongoing monitoring requirements. Ongoing monitoring will continue as per the EMS (GHD). Results will continued to be graphed for ongoing analysis and ease of reference for any correlation in change.

3.9 Nowra Creek Health monitoring

During sampling for surface water monitoring, photos are taken at monitoring locations C1, C2 and C10. These are for ongoing assessment of Nowra Creek Health Monitoring.

3.9.1 Health Monitoring Photos 18th Dec 2018



Figure 5 - Monitoring Location C1 - 18th Dec 2018



Figure 6 - Monitoring Location C2 - 18th December 2018



Figure 7 - Monitoring Location C10 - 18th December 2018

3.9.2 Health monitoring photos 5th June 2019



Figure 8 - Monitoring Location C1 5th June 2019



Figure 9 - Monitoring Location C2 5th June 2019



Figure 10 - Monitoring Location C10 5th June 2019

3.9.4 Creek Health Monitoring Summary

The creek has had no visible changes at any of the three monitoring locations C1, C2 and C10 during the reporting period. There are no signs of increased scour, contamination or any other adverse effect occurring at these locations.

3.10 Aboriginal Heritage

Also, included in section 3.6

3.11 Natural Heritage

No Natural artefacts were found or identified during the reporting period.

3.12 Spontaneous Combustion

Not applicable to mine

3.13 Bushfire

The following bushfire-specific management controls have been implemented and enforced.

- On-site bushfire fighting facilities have been provided and maintained.
- Bushfire fighting equipment is operational for fire fighting purposes at all times.
- Firebreaks and fire tracks have been maintained.
- Sufficient water resources have been maintained within the quarry site for fire fighting purposes.

Fuel loads are monitored and fuel reduction programs will be implemented where necessary.

3.14 Mine subsidence

No signs of mine subsidence were evident during the reporting period.

3.15 Hydrocarbon contamination

Management controls for preventing or minimising hydrocarbon contamination of water and/or land were carried out in accordance with the MOP and our updated PIRMP as per EPA guidelines and requirements. This document is available on our website as per EPA requirements also.

(From MOP...

Existing and Additional Control Strategies

- *Control strategies to manage hydrocarbon contamination at the quarry are defined in the following sections of GHD (2010):*

- 4 – Emergency Response; and
- 10.2 – Loading, Despatch and Transportation.
- The main controls to reduce the impacts of hydrocarbon contamination from site activities are:
- Implementation of a Nowra Brickworks Quarries Mine Safety Plan;
- Training of employees in the Safety Plan;
- Notification of environmental harm to the DECCW hotline; and
- Maintenance of all mobile equipment to manufacturer's specifications.)

(EMS GHD 2010...

4. Emergency Response

Response to an emergency is to be in accordance with the Nowra Brickworks Quarries Mine Safety Plan, prepared in accordance with the NSW Mine Health and Safety Act 2004. Emergency procedures are located in the SCCR main office.

The following procedures relate to environmental emergencies which are not covered by the quarry's emergency plan and procedures, i.e. spills and environmental harm.

4.1 Spills

The principal potential sources of soil or land contamination at the quarry is from spills or leaks of hydrocarbons (fuel, oil, grease, etc.). The following pollution control measures will be implemented during the life of the Project:

- Employees will read the quarry's Environmental Response Plan for fuel and oil spills, and will refer to the Material Safety Data Sheets (MSDS) located next to the first aid kit located in SCCR main office.
- During fuelling, the following will be observed: – Fuelling will be undertaken carefully to minimise drips on the ground;
 - Fuelling will be undertaken in a suitable area away from access areas and drainage lines or water courses;
 - Persons undertaking the fuelling will remain present during the entire fuelling operation; – If necessary, the emergency shut off switch for plant and machinery is to be used; – A spill kit will be kept at or near each fuelling area and on the fuel truck; – Spills and dirty absorbent materials will be cleaned up; – Fuelling equipment will be inspected for cracks, leaks, corrosion or failure; and – Small equipment will be fuelled over a paved or concrete area, away from any
- Stormwater drains or ditches, and a funnel will be used when pouring fuel from a portable can.
- Any affected stormwater drains on site will be located and blocked. Spilled fuel will be prevented from reaching drains or waterways.
- Any spills will be cleaned up thoroughly and promptly. The Dry Method (refer to the Emergency Response Plan will be used for cleaning up fuel spills (diesel or kerosene).
- If fuels are leaking or have spilled on an impermeable surface, the nearest down gradient drain will be diked or bermed to prevent fluids from flowing. Absorbent material from the spill kit will be applied on the spill area, and after cleaning up the contaminated absorbent material will be swept up, and the berm or dike will be removed from the stormwater drain.
- If fluids are leaking or have spilled on a permeable surface, the area will be marked and assistance will be sought to clean up.
- Spills or leaks will never be hosed down.
- Any spill kit materials will be disposed of in accordance with EPA guidelines.
- Any spill or discharge of any pollutant will be reported to the Mine Manager. If a spill or leaks of a hazardous substance that exceeds 500 mL, is an unknown substance of any amount, or a spill is too great to control, the NSW Fire Brigade will be called on 000.
- All applicable employees will be trained in general water pollution prevention and spill response, and a record of the employees trained will be kept.
- A current copy of the Spill Response Plan will be maintained in the SCCR main office.

3.16 Methane drainage/ventilation

Not applicable

3.17 Public safety

The Nowra Brickworks Quarry is located in an area with extensive industrial development and adjacent to a major public road. As a result, public safety, including the safety of employees and contract truck drivers, is an important issue for the proper management of the quarry. The following management controls have been implemented and enforced to manage this safety issue.

- The front gate is locked outside the hours of operation and whenever the quarry site is not occupied.
- The perimeter bunding is maintained to ensure that the only vehicular access to the quarry site is via the front gate.
- Infrared and Motion sensing cameras have been installed at the weighbridge and front entrance gates, as well as within the vehicle maintenance compound. These are then programmed to send warning messages to appropriate quarry officer outside the approved hours of operation.
- Warning signs will continue to be prominently displayed around the perimeter and within the quarry site.
- Concrete blocks will continue to be placed adjacent to the perimeter of the extraction area in areas where vehicles or people may be working.
- 10km/h speed signs have been erected and site management enforces speed limits.
- All employees and contractors working within the quarry site will be required to complete a site induction.
- Visitors are required to complete a visitor's induction and sign a visitor's book indicating their time of arrival and departure.
- All employees, contractors and visitors are required to wear personal protective equipment, namely hard hats, safety glasses, steel cap boots and reflective vests. This equipment will be supplied to individuals who do not have their own.
- All communication between mobile equipment within the quarry site is by UHF radio. All mobile equipment owned or operated by SCCCR is fitted with a UHF radio. A handheld UHF radio is supplied to any transport contractor who does not have a UHF radio fitted to their vehicle.
- No truck drivers are permitted to leave the cab of their truck while the vehicle is within the extraction or processing areas. A designated area for covering loads will continue to be provided.
- All trucks carrying material to or from the quarry site on public roads will have their loads covered to prevent material falling from trucks.
- The quarry entrance and adjoining highway shoulder are continually monitored and any spillage is removed immediately.

The Company maintains a register of any complaints it receives from the public, such as speeding trucks or generally unsafe or discourteous driving or quarry vehicles.

3.20 Other issues and risks

No other issues or risks were identified during the reporting period.



4. COMMUNITY RELATIONS

4.1. Community Consultative Committee (CCC)

As per the previous AEMR no Community Consultative Committee has been formed as there had been no interest from external parties. We have heavily advertised when our previous mod2 project approval was undertaken. No requests have been made since to form a committee, nor any responses to our permanent expressions of interest link located on our website. As such there were no meetings during the reporting period. SCCCR will continue to advertise on our website for interested parties to form a CCC.

4.2. Complaints

We received no complaints during the reporting period.



5. REHABILITATION

During this reporting period works commenced within the stage 3 of the project Staging plan with backfilling of the void well underway in stage 2. VENM and ENM has continued to be imported throughout the reporting period and the void has been progressively filled. Unusable overburden material containing tree roots was also used to fill the existing void. Appendix L contains the VENM / ENM certificates and importation records for the material imported to the void. Appendix M contains the plan of the VENM/ENM emplacement during the reporting period.

As per section 7 Rehabilitation of the 2015-2021 MOP it is anticipated that only the section of Domain 6 (voids) will undergo progressive rehabilitation as the area is filled.

Table 8 - Mine Rehabilitation Summary

Cumulative Area Affected (hectares)			
	To date	Last report	Next Report (estimated)
A: MINE LEASE AREA			
A1 Mine Lease(s) Area	22.028ha		
B: DISTURBED AREAS			
B1 Infrastructure area other disturbed areas to be rehabilitated at closure including facilities, roads	2.4 ha	2.4 ha	2.4 ha
B2: Active Mining Area excluding items B3 - B5 below	9.2 ha	8.4 ha	9.2 ha
B3 Waste emplacements, active/unshaped/in or out-of-pit	0.7 ha	0.7 ha	0.7 ha
B4 Tailings emplacements, active/unshaped/uncapped. These areas currently sit within active mining area B1	1.40 ha	1.40 ha	2.00 ha
B5 Shaped waste emplacement (awaits final vegetation)	0.70 ha	0.60 ha	0.70 ha
ALL DISTURBED AREAS	14.4 ha	13.5 ha	15.0 ha
C REHABILITATION PROGRESS			
C1 Total Rehabilitated area (completed)	4.85 ha	4.85 ha	4.85 ha
D: REHABILITATION ON SLOPES			
D1 10 to 18 degrees	Nil	Nil	Nil
D2 Greater than 18 degrees	Nil	Nil	Nil
E: SURFACE OF REHABILITATED LAND			
E1 Pasture and grasses			
E2 Native forest/ecosystems	4.85 ha	4.85 ha	4.85 ha
E3 Plantations and crops			
E4 Other (include non-vegetative outcomes)	1.1 ha	1.1 ha	1.1 ha

Table 9 - Maintenance Activities on Rehabilitated Land

NATURE OF TREATMENT	Area Treated (ha)		Comment/control strategies/ treatment detail
	Report period	Next period	
Additional erosion control works (drains re-contouring, rock protection)			None required at this stage
Re-covering (detail - further topsoil, subsoil sealing etc.)			No new rehabilitation areas will be undertaken during this AEMR period
Soil treatment (detail - fertiliser, lime, gypsum etc.)			Nil
Treatment/Management (detail - grazing, cropping, slashing etc.)			No treatment will be required
Re-seeding/Replanting (detail - species density, season etc.)	4.85 ha	4.85 ha	Bunds near weighbridge revegetated, July 2018 On going weed management of all rehabilitated areas
Adversely Affected by Weeds (detail - type and treatment)			Spreadsheet provided in table 3.5.1
Feral animal control (detail - additional fencing, trapping, baiting etc.)			No feral animals have been observed on the site

(This period's activities and activities proposed in the next reporting period)



6. ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

During the next proposed AEMR period the works proposed to be carried out will be consistent with the current approved MOP (2015-2021). No works are proposed that will require any amendments to the MOP.

Figure 3 (attached in appendix L) from the Approved MOP shows the Project Development sequence for the overall project. With the current MOP, it is intended to transition from Stage 1 through to Stage 2 of the project. We have already commenced the filling component of stage 2 highlighted in blue and moving towards increasing the extraction area to that shown in Stage 2. Currently our extraction area is at the extent as shown in Stage 2 and Stage 3.

Appendix A – Project Approval

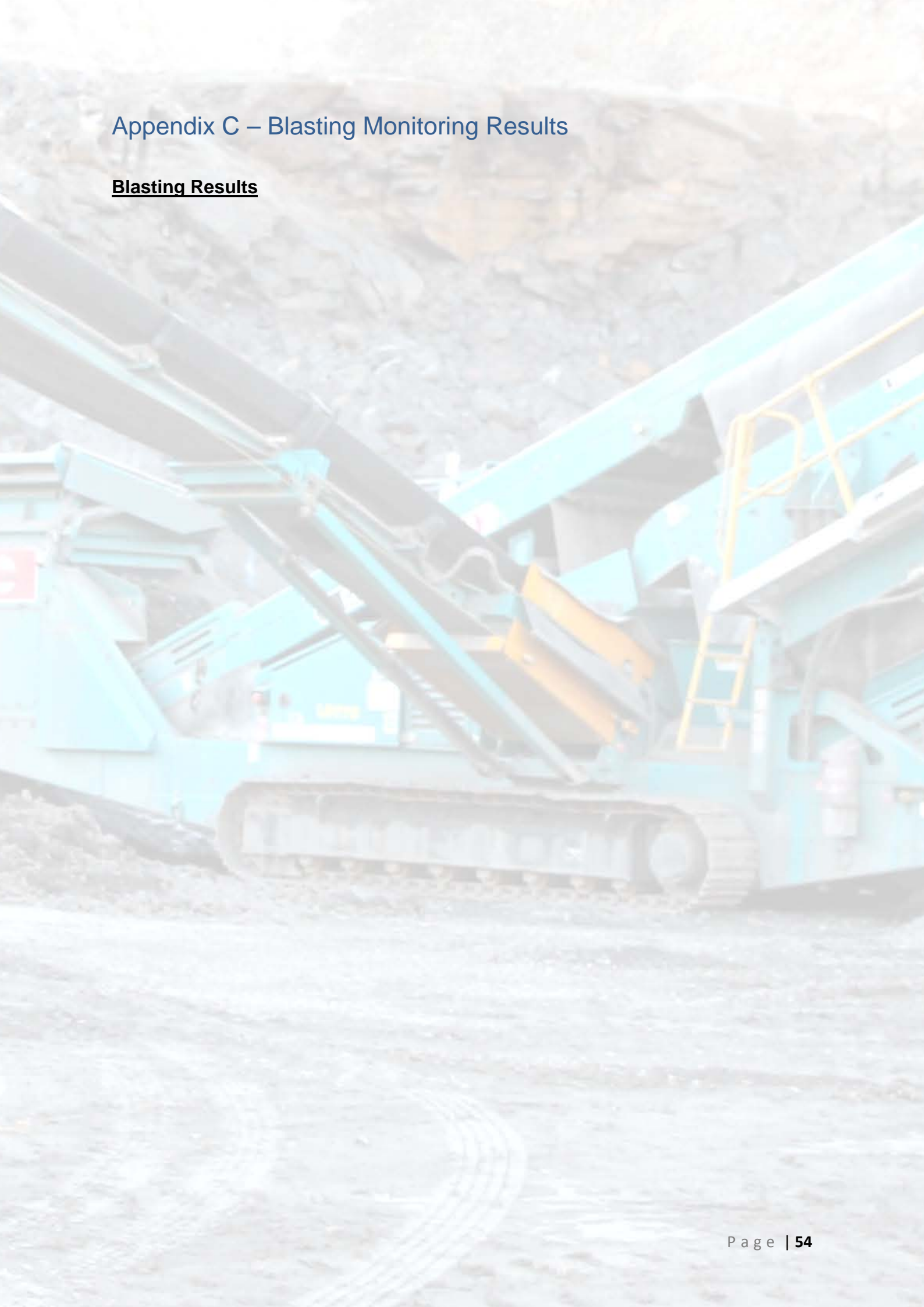


Appendix B – EMS



Appendix C – Blasting Monitoring Results

Blasting Results



Appendix D – Noise monitoring results



Appendix E – Air monitoring results

DDG results

TsP results

Pm10 results



Appendix F – Erosion and Sediment Control Log



Appendix G – Landscape and Biodiversity Monitoring



Appendix H – Surface water monitoring



Appendix I – Ground Water Monitoring



Appendix J – Contour Plans of Brickworks Quarry



Appendix J – Complaints Register



Appendix K – VENM

Attached VENM certificates



Appendix L – Plans

SCCCR Rehab Plan - Mining Activities Plan

Monitoring Locations Plan

VENM emplacement Plan

Flat Rock Yalwal AEMR updated plan

MOP Staging Plan

Appendix A – Project Approval



Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I approve the project referred to in schedule 1, subject to the conditions in schedules 2 to 5.

These conditions are required to:

- prevent and/or minimise adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Sam Haddad
Director-General
as delegate for the Minister for Planning

Sydney

2009

SCHEDULE 1

Application No:

07_0123

Proponent:

South Coast Concrete Crushing and Recycling

Approval Authority:

Minister for Planning

Land:

[Lot 30, DP 1169494](#)

Project:

Nowra Brickworks Quarry

MOD 1 July 2013 – shown in red
MOD 2 June 2018 – shown in blue

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DEFINITIONS

Aboriginal object or place	Have the same meaning as the definitions of the terms in section 5 of the NP&W Act
Annual Review	The review required by condition 12 of Schedule 5
BCA	Building Code of Australia
CCC	Community Consultative Committee
Conditions of this approval	Conditions contained in Schedules 2 to 5 (inclusive) of this document
Council	Shoalhaven City Council
Day	The period from 7 am to 6 pm on Monday to Saturday, and 8 am to 6 pm on Sundays and Public Holidays
Department	NSW Department of Planning and Environment
Demolition	The deconstruction and removal of buildings, sheds and other structures on the site
DRG	Division of Resources and Geoscience within the Department
Dol Water	Department of Industry – Crown Lands and Water Division
EA	Environmental Assessment titled <i>Environmental Assessment for the Continuation and Expansion of Extractive Operations at the Nowra Brickworks Quarry, South Nowra</i> , prepared by R.W. Corkery & Co Pty Ltd and City Plan Services, dated February 2009, and associated Response to Submissions prepared by City Plan Services and dated August 2009
EA (Mod 1)	Environmental Assessment titled <i>Section 75W Modification Application to Major Project (MP07_0123) for the Continuation of Extractive Operations</i> , prepared by City Plan Services and dated 3 May 2013
EA (Mod 2)	Environmental Assessment titled <i>MP 07_0123 / Nowra Brick Quarry / Proposed S75W Modification</i> prepared by City Plan Services and dated 1 March 2018
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPL	Environment Protection Licence under the POEO Act
Evening	The period from 6 pm to 10 pm
ENM	Excavated Natural Material, as defined in Section 1 of the EPA's <i>Excavated Natural Material Order 2014</i> , or latest version
Feasible	What is possible and practicable in the circumstances
Imported materials	Recycling materials, blending materials, VENM and ENM as described in the EA and EA (Mod 2)
Incident	An occurrence or set of circumstances that: <ul style="list-style-type: none"> causes or threatens to cause material harm to the environment; and/or breaches or exceeds the limits or performance measures/criteria in this approval
Land	Has the same meaning as the definition of the term in section 4 of the EP&A Act, except where the term is used in the noise and air quality conditions in Schedules 3 and 4 of this approval, where it is defined as the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
m	Metres
Material harm	Is unauthorised harm that: <ul style="list-style-type: none"> involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the project
Minister	Minister for Planning, or delegate
Mitigation	Activities associated with reducing the impacts of the project prior to or during those impacts occurring
Modification 2	The modifications to the project, as described in EA (Mod 2)
Night	The period from 10 pm to 7 am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
NP&W Act	<i>National Parks and Wildlife Act 1974</i>
OEH	Office of Environment and Heritage
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Privately-owned land	Land that is not owned by a public agency or a mining, petroleum or extractive industry company (or its subsidiary)
Project	The development described in the documents listed in condition 2 of Schedule 2

Project layout	The plan in Appendix 1 of this approval
Proponent	South Coast Concrete Crushing and Recycling Pty Ltd (or its successors) or any person carrying out any development to which this approval applies
Public infrastructure	Linear and other infrastructure that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc.
Quarrying operations	The: <ul style="list-style-type: none"> • extraction, processing, stockpiling and transportation of extractive materials carried out on the site and the associated removal and/or emplacement of vegetation, topsoil and overburden; and • processing, stockpiling, blending and transportation of imported materials carried out on the site
Quarry products	Includes all saleable quarry products, including products which have been blended with imported materials, but excludes tailings, other wastes and rehabilitation material for use on the site
Registered Aboriginal Parties	As described in the <i>National Parks and Wildlife Regulation 2009</i>
Rehabilitation	The restoration of land disturbed by the project to a good condition, to ensure it is safe, stable and non-polluting
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
RMS	NSW Roads and Maritime Services
Secretary	Secretary of the Department, or nominee
Site	The land defined in Schedule 1 and the project layout
Statement of Commitments	The Proponent's commitments in Appendix 2
VENM	Virgin Excavated Natural Material, as defined in Schedule 1 of the POEO Act
Waste	Has the same meaning as defined in the Dictionary to the POEO Act

SCHEDULE 2 ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. In addition to meeting the specific performance measures and criteria established under this approval, the Proponent must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the project, and any rehabilitation required under this approval.

Terms of Approval

2. The Proponent must carry out the project generally in accordance with the:
 - (a) EA;
 - (b) EA (Mod 1);
 - (c) EA (Mod 2);
 - (d) project layout; and
 - (e) Statement of Commitments.
- 2A. The Proponent must carry out the project in accordance with the conditions of this approval.
3. The conditions of this approval and directions of the Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document referenced in condition 2 of this Schedule. In the event of an inconsistency, ambiguity or conflict between any of the documents referenced in condition 2 of this Schedule, the most recent document prevails.

Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of approval or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.
4. Consistent with the requirements of this approval, the Secretary may make written directions to the Proponent in relation to:
 - (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this approval, including those that are required to be, and have been, approved by the Secretary; and
 - (b) the implementation of any actions or measures contained in any such document referred to in (a) above.

Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of consent or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.
5. The Proponent must prepare revisions of any strategies, plans or programs required under this approval if directed to do so by the Secretary. Such revisions must be prepared to the satisfaction of, and within a timeframe approved by, the Secretary.
6. By 30 June 2010, the Proponent must surrender all existing development consents for the site to the relevant consent authority, to the satisfaction of the Secretary.

Limits of Approval

7. The Proponent may undertake quarrying operations on the site until 31 December 2039.

Note: Under this approval, the Proponent is required to decommission and rehabilitate the site and carry out additional requirements. Consequently, this approval will continue to apply in all respects other than to permit the carrying out of quarrying operations, until the rehabilitation of the site and those requirements and undertakings have been carried out to the required standard.
8. The Proponent must not:
 - (a) extract more than 364,000 tonnes per year of clay/shale, structural clay and associated materials (in total) from the site;
 - (b) import more than 50,000 tonnes per year of recycling materials to the site;
 - (c) import more than 125,000 tonnes per year of blending materials to the site;
 - (d) import more than 200,000 tonnes per year of VENM/ENM (in total) to the site; or
 - (e) despatch more than 500,000 tonnes per year of quarry products from the site.
- 8A. The Proponent may receive up to three unladen trucks at the site between:
 - (a) 6.00 am and 7.00 am Monday to Saturday; and
 - (b) 6.00 pm and 8.00 pm Monday to Friday; and
 - (c) 4.00 pm and 6.00 pm Saturday.

Note: Operating hours for arrival and despatch of trucks are also controlled under condition 1 of Schedule 3.

9. Deleted.

Structural Adequacy

10. The Proponent **must** ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:

- Under Part 6 of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.
- Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.

Demolition

11. The Proponent **must** ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

12. The Proponent **must** ensure that all plant and equipment used on site is:
- (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

Protection of Public Infrastructure

13. Unless the Proponent and the applicable authority agree otherwise the Proponent must:
- (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.

Note: This condition does not apply to damage to roads caused as a result of general road usage or otherwise addressed by contributions required by condition 33 of Schedule 3.

Compliance

14. The Proponent must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this approval relevant to activities they carry out in respect of the project.

Applicability of Guidelines

15. References in the conditions of this approval to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, standards or policies in the form they are in as at the date of this approval.

However, consistent with the conditions of this approval and without altering any limits or criteria in this approval, the Secretary may, when issuing directions under this approval in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, standard or policy, or a replacement of them.

SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Hours of Operation

1. The Proponent must comply with the operating hours set out in Table 1.

Table 1: Operating hours

Activity	Permissible Hours
Quarrying operations	7.00 am to 6.00 pm Monday to Friday
	7.00 am to 4.00 pm Saturday
	At no time on Sundays or public holidays

Note: Limited truck movements are permitted outside of the permissible hours for quarrying operations, as specified in condition 8A of Schedule 2.

- 1A. The following activities may be carried out outside the hours specified in condition 1 of this Schedule:
 - (a) activities that are inaudible at residences on privately-owned land;
 - (b) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; or
 - (c) emergency work to avoid the loss of life, property or to prevent material harm to the environment.

In such circumstances, the Proponent must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

Operational Noise Criteria

2. The Proponent must ensure that operational noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2: Operational noise criteria dB(A)

Receiver	Location	Day <i>L_{Aeq} (15 min)</i>	Evening <i>L_{Aeq} (15 min)</i>	Night <i>L_{Aeq} (15 min)</i>
1	80 Links Road	39	35	NA
2	371 Old Southern Road	45	35	35
4	243 Princes Highway	49	38	38
5	South Coast Correctional Facility	51	37	37

Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the *NSW Industrial Noise Policy*. Appendix 6 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, the noise criteria in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

Note: Receiver locations are shown in Appendix 3.

Noise Operating Conditions

3. The Proponent must:
 - (a) implement all reasonable and feasible noise mitigation measures to minimise the noise impacts of the project;
 - (b) investigate ways to reduce the noise generated by the project;
 - (c) take all reasonable steps to minimise the noise impacts of the project during meteorological conditions when the noise criteria in this approval do not apply (see Appendix 6);
 - (d) carry out regular noise monitoring in accordance with Appendix 6 to determine whether the project is complying with the relevant conditions of this approval; and

- (e) modify or stop operations on the site to comply with the relevant conditions of this approval.

Noise Monitoring Program

4. The Proponent **must** prepare a Noise Monitoring Program for the project to the satisfaction of the **Secretary**. The Program must:
- be prepared in consultation with **EPA** and be submitted to the **Secretary** for approval within 6 months of the date of this approval;
 - include annual attended noise monitoring;
 - describe the proposed noise management system; and
 - include a noise monitoring program that:
 - is capable of evaluating the performance of the project;
 - includes a protocol for determining any exceedances of the relevant conditions of this approval; and
 - effectively supports the noise management system.

The Proponent must implement the Noise Monitoring Program as approved by the Secretary.

BLASTING AND VIBRATION

Airblast Overpressure Limits

5. The Proponent **must** ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 3.

Table 3: Airblast overpressure impact assessment criteria

Receiver	Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
Residential & South Coast Correctional Facility	115	5% of the total number of blasts in any 12 month period
	120	0%
Commercial	125	0%

Ground Vibration Impact Assessment Criteria

6. The Proponent **must** ensure that the ground vibration level from blasting at the project does not exceed the levels in Table 4.

Table 4: Ground vibration impact assessment criteria

Receiver	Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
Residential & South Coast Correctional Facility	115	5% of the total number of blasts in any 12 month period
	120	0%
Commercial	125	0%

7. The Proponent **must** carry out blasting on site only between 9 am and 3 pm Monday to Friday. No blasting is allowed on weekends and Public Holidays.
8. The Proponent **must** not carry out more than one blast per week on site.

Note: In the case of a documented misfire, the Proponent may carry out a second blast in the relevant week.

Blast Operating Conditions

9. The Proponent **must** not undertake blasting within 200 metres of any privately-owned land, unless suitable arrangements have been made with the landowner and any tenants to minimise the risk of flyrock-related impact to the property and to human safety to the satisfaction of the **Secretary**.

Property Inspections

10. Prior to 30 June 2010, the Proponent **must** advise all landowners within 500 m of proposed blasting activities, and any other landowner nominated by the **Secretary**, that they are entitled to a property inspection to establish the baseline condition of the property.

11. If the Proponent receives a written request for a property inspection from any such landowner, the Proponent **must**:
 - (a) commission a suitably qualified person, whose appointment has been approved by the **Secretary**, to inspect and report on the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and
 - (b) give the landowner a copy of this property inspection report.

Note: It is preferable for the property inspection to be carried out prior to the commencement of blasting activities on the site, and the Proponent should facilitate this occurring wherever possible.

Property Investigations

12. If any landowner within 500 m of proposed blasting activities, or any other landowner nominated by the **Secretary**, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting at the project, the Proponent **must** within 3 months of receiving this request:
 - (a) commission a suitably qualified person whose appointment has been approved by the **Secretary** to investigate the claim and prepare a property investigation report; and
 - (b) give the landowner a copy of the report.

If this independent investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent **must** repair the damage to the satisfaction of the **Secretary**.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the **Secretary** for resolution.

Blast Management Plan

13. Prior to 30 June 2010, the Proponent **must** prepare a detailed Blast Management Plan for the project to the satisfaction of the **Secretary**. The Plan must:
 - (a) be prepared in consultation with EPA;
 - (b) substantiate blast design to ensure compliance with blast criteria;
 - (c) include protocols for communicating with all neighbouring landholders regarding scheduled blasts;
 - (d) include details of how and at what locations blasting performance would be monitored; and
 - (e) include a blast monitoring protocol for evaluating compliance with the blast criteria in this approval.

The Proponent must implement the Blast Management Plan as approved by the **Secretary**.

AIR QUALITY

Air Quality Impact Assessment Criteria

14. The Proponent must ensure that particulate matter emissions generated by the project do not cause exceedances of the criteria in Table 5 at any residence on privately-owned land.

Table 5: Air quality criteria

<i>Pollutant</i>	<i>Averaging Period</i>	<i>Criterion</i>
Particulate matter < 10 µm (PM ₁₀)	Annual	a,c 30 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	24 hour	b 50 µg/m ³
Total suspended particulates (TSP)	Annual	a,c 90 µg/m ³

Notes to Table 5:

a Cumulative impact (ie increase in concentrations due to the project plus background concentrations due to all other sources).

b Incremental impact (ie increase in concentrations due to the project alone, with zero allowable exceedances of the criteria over the life of the project).

*c Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the **Secretary**.*

Air Quality Operating Conditions

15. The Proponent must:

- (a) implement all reasonable and feasible dust mitigation measures to minimise the dust impacts of the project;
- (b) investigate ways to reduce the dust generated by the project;
- (c) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d under Table 5);
- (d) monitor and report on compliance with the relevant air quality conditions in this approval; and
- (e) minimise the area of surface disturbance and undertake progressive rehabilitation of the site, to the satisfaction of the Secretary.

Air Quality Management Plan

16. The Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with EPA;
 - (b) be submitted to the Secretary for approval within 3 months of the determination of Modification 2;
 - (c) describe the proposed air quality management system;
 - (d) describe the measures to be implemented to ensure:
 - compliance with the air quality criteria and operating conditions of this approval;
 - best practice management is being employed; and
 - the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and
 - (e) include an air quality monitoring program that:
 - includes a protocol for determining any exceedances of the relevant conditions of this approval; and
 - effectively supports the air quality management system.

The Proponent must implement the Air Quality Management Plan as approved by the Secretary.

Meteorological Monitoring

- 16A. For the life of the project, the Proponent must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* guideline.

WATER MANAGEMENT

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Proponent is required to obtain all necessary approvals and/or water licences for the project.

Discharge

17. Except as may be expressly provided for by an EPL, the Proponent **must** comply with section 120 of the *Protection of the Environment Operations Act 1997* during the carrying out of the project.
18. The Proponent **must** manage on-site sewage to the satisfaction of the Council and EPA. The facility must comply with the requirements of the *Environment and Health Protection Guidelines – On-site Sewage Management for Single Households (1998)*.

Soil and Water Management Plan

19. The Proponent **must** prepare a Soil and Water Management Plan for the project to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with EPA and DoI Water, and be submitted to the Secretary for approval prior to 30 June 2010; and
 - (b) include a:
 - Site Water Balance;
 - Erosion and Sediment Control Plan;
 - Surface Water Monitoring Program;
 - Ground Water Monitoring Program; and
 - Surface and Groundwater Response Plan.

The Proponent must implement the Soil and Water Management Plan as approved by the Secretary.

Site Water Balance

20. The Site Water Balance must:
- include details of:
 - sources and security of water supply;
 - water make and use on site;
 - water management on site;
 - any off-site water transfers; and
 - reporting procedures; and
 - investigate and describe measures to minimise water use by the project.

Erosion and Sediment Control

21. The Erosion and Sediment Control Plan must:
- be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (Landcom);
 - identify activities that could cause soil erosion and generate sediment;
 - describe measures to minimise soil erosion and the potential for the transport of sediment downstream in Nowra Creek;
 - describe the location, function, and capacity of erosion and sediment control structures; and
 - describe what measures would be implemented to maintain the structures over time.

Surface Water Monitoring

22. The Surface Water Monitoring Program must include:
- detailed baseline data on surface water flows and quality in Nowra Creek and any other waterbodies that could potentially be affected by the project;
 - surface water and stream health impact assessment criteria;
 - a program to monitor the impact of the project on surface water flows in Nowra Creek, water quality and stream health, including monitoring for major cations and anions; and
 - reporting procedures for the results of the monitoring program.

Groundwater Monitoring

23. The Ground Water Monitoring Program must include:
- detailed baseline data on ground water levels and quality, based on statistical analysis;
 - ground water impact assessment criteria, including trigger levels for investigating any potentially adverse ground water impacts;
 - a program to monitor ground water levels and quality;
 - a protocol for further ground water modelling to confirm the limits to excavation depth across the site would not adversely affect ground water availability for the environment or local users; and
 - a protocol for the investigation, notification and mitigation of identified exceedances of the ground water impact assessment criteria.

Surface and Groundwater Response Plan

24. The Surface and Groundwater Response Plan must describe the measures and/or procedures that would be implemented to:
- investigate, notify and mitigate any exceedances of the surface water, stream health and ground water impact assessment criteria, including an increase in salinity levels for Nowra Creek; and
 - mitigate and/or offset any adverse impacts on groundwater dependent ecosystems or riparian vegetation.

REHABILITATION AND LANDSCAPE MANAGEMENT

Biodiversity Offset Strategy

25. The Proponent [must](#):
- review its proposed Biodiversity Offset Strategy (see Table 8), in consultation with OEH and the [Secretary](#), to seek to identify a replacement for the proposed Southern Biodiversity Offset Area that:
 - is located in the vicinity;
 - is not affected by identified future public infrastructure proposals; and
 - has equivalent (or better) biodiversity values;
 - implement the Biodiversity Offset Strategy (as amended under (a) above, if applicable);
 - ensure that adequate resources are dedicated towards the implementation of the strategy;
 - provide appropriate long term security for the offset areas; and

- (e) provide a timetable for the implementation of the offset strategy prior to the clearing of any forested area of the site, or as otherwise agreed by the [Secretary](#), to the satisfaction of the [Secretary](#).

Table 8: Biodiversity Offset Strategy

Offset Areas	Minimum Size
Northern Biodiversity Offset Area	21.5 hectares
Southern Biodiversity Offset Area	16.19 hectares
Total	37.69 hectares

Landscape and Biodiversity Management Plan

26. The Proponent [must](#) prepare a Landscape and Biodiversity Management Plan for the project to the satisfaction of the [Secretary](#). This plan must:
- be prepared by suitably qualified person(s), approved by the [Secretary](#);
 - be submitted to the [Secretary](#) for approval prior to the 30 June 2010; and
 - include a:
 - Rehabilitation and Biodiversity Offset Strategy Management Plan; and
 - Long Term Management Strategy.

[The Proponent must implement the Landscape and Biodiversity Management Plan as approved by the Secretary.](#)

Note: The Department accepts that the initial Landscape and Biodiversity Management Plan may not include the detailed Long Term Management Strategy. However, a conceptual strategy must be included in the initial plan, along with a timetable for augmentation of the strategy with each subsequent review of the plan.

27. The Rehabilitation and Biodiversity Offset Strategy Management Plan must include:
- the rehabilitation objectives for the site and offset areas;
 - a description of the measures that would be implemented to:
 - rehabilitate and stabilise the site;
 - minimise the removal of mature trees;
 - implement the Biodiversity Offset Strategy; and
 - manage the remnant vegetation and habitat on the site and in the offset areas;
 - detailed performance and completion criteria for the rehabilitation and stabilisation of the site;
 - a detailed description of how the performance of the rehabilitation of the quarry areas would be monitored over time to achieve the stated objectives;
 - a detailed description of what measures would be implemented to rehabilitate and manage the landscape of the site including the procedures to be implemented for:
 - progressively rehabilitating and stabilising areas disturbed by quarrying;
 - implementing revegetation and regeneration within the disturbance areas;
 - protecting areas outside the disturbance areas, including the Biodiversity Offset Strategy areas;
 - vegetation clearing protocols, including a protocol for clearing any trees containing hollows and the relocation of hollows from felled trees;
 - managing impacts on fauna, in particular threatened species;
 - controlling weeds and pests;
 - controlling access;
 - bushfire management; and
 - reducing the visual impacts of the project;
 - a description of the potential risks to successful rehabilitation and a description of the contingency measures that would be implemented to mitigate these risks; and
 - details of who is responsible for monitoring, reviewing, and implementing the plan.
28. The Long Term Management Strategy must:
- define the objectives and criteria for quarry closure and post-extraction management;
 - be prepared in consultation with [Dol Water](#), [DRG](#) and Council;
 - investigate and/or describe options for the future use of the site;
 - describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
 - describe how the performance of these measures would be monitored over time.

Rehabilitation

29. Backfilling of the quarry void and water storage facility is restricted to the use of materials which are [VENM or ENM](#), to the satisfaction of the [Secretary](#). The Proponent must consult with the Council to identify the proposed alignment of the link road from Warra Warra Road to the Flinders Industrial Estate.

Backfilling within the proposed alignment must use materials and a compaction standard suitable for the future construction of the link road, to the satisfaction of the [Secretary](#).

Note: the conceptual final landform is shown in Appendix 4.

HERITAGE

Aboriginal Cultural Heritage Management Plan

30. The Proponent [must](#) prepare and implement an Aboriginal Cultural Heritage Management Plan to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with OEH and [Registered Aboriginal Parties](#);
 - (b) be submitted to the Secretary for approval prior to 30 June 2010; and
 - (c) include a description of the measures that would be implemented to:
 - (i) manage the discovery of previously unidentified Aboriginal objects or Aboriginal places on the site; and
 - (ii) facilitate ongoing consultation with and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site.

The Proponent must implement the Aboriginal Cultural Heritage Management Plan as approved by the Secretary.

- 30A. If human remains are discovered on the site, then all work in the area surrounding the discovery must cease, and the area must be secured. The Proponent must immediately notify NSW Police Force and OEH, and work must not recommence in the area until authorised by NSW Police Force and OEH.
- 30B. If any potential Aboriginal object or Aboriginal place is identified on the site, or suspected to be on the site:
- (a) all work in the immediate vicinity of the object or place must cease immediately;
 - (b) a 10 m buffer area around the object or place must be cordoned off; and
 - (c) OEH must be contacted immediately.
- 30C. Work in the immediate vicinity of a potential Aboriginal object or Aboriginal place may only recommence if:
- (a) the object or place is confirmed by OEH upon consultation with the Registered Aboriginal Parties not to be an Aboriginal object or Aboriginal Place;
 - (b) the Aboriginal Cultural Heritage Management Plan is revised to include the object or place and appropriate measures in respect of it; or
 - (c) the Secretary is satisfied with the measures to be implemented in respect of the object or place and makes a written direction in that regard.

VISUAL

31. The Proponent [must](#) minimise the visual impacts of the project to the satisfaction of the [Secretary](#).

WASTE MANAGEMENT

- 31A. Except as expressly permitted in an EPL and/or the conditions of this approval, the Proponent must not receive waste on the site for storage, treatment, processing, reprocessing or disposal.

Note: Under the POEO Act, the Proponent is required to obtain an EPL variation to permit the importation of ENM for blending purposes.

- 31B. The Proponent must:
- (a) maintain accurate records of all imported materials received at the site (including the type, source, date, time and quantity received and details of the transport contractor); and
 - (b) include a copy of this data in the Annual Review.
32. The Proponent [must](#) minimise the amount of waste generated by the project to the satisfaction of the [Secretary](#).

TRAFFIC AND TRANSPORT

33. The Proponent [must](#) make a monetary contribution of \$174,000 to the [RMS](#) for the construction of the following elements of the proposed Princes Highway upgrade between Central Avenue and Warra Warra Road:
- the central median for a length of 60m; and
 - a left turn deceleration lane on the southbound approach to the quarry access road.

34. The Proponent **must** pay the monetary contribution required by condition 33 according to the following schedule:
- (a) \$54,000 paid prior to 30 June 2010; and
 - (b) \$40,000 paid prior to 30 June in each of the years 2011, 2012 and 2013,
- unless the **RMS** commences the proposed upgrade prior to the completion of these payments, in which case any remainder of the contribution not yet paid is payable immediately.
35. The Proponent **must** upgrade the access to the development and land **must** be dedicated generally in accordance with the **RMS's** preliminary concept design (see Appendix 5) to ensure the access accommodates swept paths for B-doubles and the future Princes Highway alignment, prior to the completion of the proposed Princes Highway upgrade and to the satisfaction of the **RMS**.

Road Haulage

36. The Proponent **must** ensure that:
- (a) all loaded vehicles entering or leaving the site are covered;
 - (b) all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site; and
 - (c) a truck wheel wash facility is constructed on the site prior to ~~to~~ 30 June 2010, to the satisfaction of the **Secretary**.

EMERGENCY AND HAZARDS MANAGEMENT

Dangerous Goods

37. The Proponent **must** ensure that the storage, handling, and transport of fuels and dangerous goods are conducted in accordance with the relevant *Australian Standards*, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

Safety

38. The Proponent **must** secure the project to ensure public safety to the satisfaction of the **Secretary**.

Bushfire Management

39. The Proponent **must**:
- (a) ensure that the project is suitably equipped to respond to any fires on-site; and
 - (b) assist the rural fire service and emergency services **to the extent practicable if there is a fire in the vicinity of the site**.

PRODUCTION DATA

40. The Proponent **must**:
- (a) provide calendar year annual quarry production data to DRG using the standard form for that purpose; and
 - (b) include a copy of this data in the Annual Review.

SCHEDULE 4 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing:
 - (a) an exceedance of any criteria in Schedule 3, the Proponent must notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria; and
 - (b) an exceedance of any air quality criteria in Schedule 3, the Proponent must send a copy of the NSW Health fact sheet entitled “Mine Dust and You” (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).

INDEPENDENT REVIEW

2. If a landowner considers the project to be exceeding the relevant criteria in Schedule 3, they may ask the Secretary in writing for an independent review of the impacts of the project on their land.

If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.

If the Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Secretary and the landowner, of the Secretary's decision, the Proponent must:

- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the project is complying with the relevant criteria in Schedule 3; and
 - if the project is not complying with these criteria, then identify measures that could be implemented to ensure compliance with the relevant criteria;
- (b) give the Secretary and landowner a copy of the independent review; and
- (c) comply with any written requests made by the Secretary to implement any findings of the review.

SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Proponent must prepare an Environmental Management Strategy for the project to the satisfaction of the Secretary. This strategy must:
 - (a) be submitted to the Secretary for approval within 6 months of the determination of Modification 2, unless otherwise agreed by the Secretary;
 - (b) provide the strategic framework for environmental management of the project;
 - (c) identify the statutory approvals that apply to the project;
 - (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
 - (e) describe the procedures to be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
 - receive, record, handle and respond to complaints;
 - resolve any disputes that may arise during the course of the project;
 - respond to any non-compliance; and
 - respond to emergencies; and
 - (f) include:
 - references to any strategies, plans and programs approved under the conditions of this approval; and
 - a clear plan depicting all the monitoring to be carried out under the conditions of this approval.

The Proponent must implement any Environmental Management Strategy as approved by the Secretary.

Evidence of Consultation

2. Where the conditions of this approval require consultation with an identified party, the Proponent must:
 - (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and
 - (b) provide details of the consultation undertaken, including:
 - a description of how matters raised by those consulted have been resolved; and
 - details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed any unresolved matters.

However, if the Secretary agrees, a strategy, plan or program may be prepared without consultation being undertaken with an identified party required under a condition of this approval.

Management Plan Requirements

3. The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:
 - (a) a summary of relevant background or baseline data;
 - (b) a description of:
 - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - any relevant limits or performance measures/criteria; and
 - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
 - (c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
 - (d) a program to monitor and report on the:
 - impacts and environmental performance of the development; and
 - effectiveness of any management measures (see (c) above);
 - (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
 - (f) a program to investigate and implement ways to improve the environmental performance of the project over time;
 - (g) a protocol for managing and reporting any:
 - incidents;
 - complaints; and
 - non-compliances with statutory requirements;

- (h) a protocol for periodic review of the plan; and
- (i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.

Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Application of Existing Strategies, Plans and Programs

- 4. The Proponent must continue to apply existing management plans, strategies or monitoring programs approved prior to the approval of Modification 2, until the approval of a similar plan, strategy or program following the approval of Modification 2.

Revision of Strategies, Plans & Programs

- 5. Within 3 months of:
 - (a) the submission of an incident report under condition 10 below;
 - (b) the submission of an Annual Review under condition 12 below;
 - (c) the submission of an Independent Environmental Audit report under condition 14 below; and
 - (d) the approval any modifications to this approval,
 the Proponent must review the suitability of all strategies, plans and programs required under this approval. Where this review leads to revisions in any such document, then within 6 weeks of the review the revised document must be submitted for the approval of the Secretary.

Notes:

- *The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the project.*
- *In the event of an inconsistency between condition 5(d) above and any condition in Schedule 3 of this approval, the latter prevails.*

Updating and Staging of Strategies, Plans or Programs

- 6. With the approval of the Secretary, the Proponent may:
 - (a) prepare and submit any strategy, plan or program required by this approval on a staged basis (if a clear description is provided as to the specific stage and scope of the project to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);
 - (b) combine any strategy, plan or program required by this approval (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and
 - (c) update any strategy, plan or program required by this approval (to ensure the strategies, plans and programs required under this approval are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the project).

Adaptive Management

- 7. The Proponent must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

Where any exceedance of these criteria and/or performance measures has occurred, the Proponent must as soon as becoming aware of any exceedance:

- (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not reoccur;
 - (b) consider all reasonable and feasible options for remediation (where relevant);
 - (c) within 14 days of the exceedance occurring, submit a report to the Secretary describing these remediation options and any preferred remediation measures or other course of action; and
 - (d) implement remediation measures as directed by the Secretary;
- to the satisfaction of the Secretary.

COMMUNITY CONSULTATIVE COMMITTEE

- 8. If directed by the Secretary, the Proponent must establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Secretary. Any such CCC must be operated in general accordance with the Department's *Community Consultative Committee Guidelines, November 2016* (or later version).

Notes:

- *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval.*
- *In accordance with the guidelines, the Committee should comprise an independent chair and appropriate representation from the Proponent, Council and the local community.*
- *The Proponent may, with the approval of the Secretary, combine the function of this CCC with the functions of other CCCs in the area.*

REPORTING

Incident Reporting

9. The Proponent must immediately notify the Secretary (using the contact name, email address and phone number provided by the Department from time to time) and any other relevant agencies of any incident.
10. Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested. This report must include the time and date of the incident, details of the incident, measures implemented to prevent re-occurrence and must identify any non-compliance with this approval.

Regular Reporting

11. The Proponent must provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.

Annual Review

12. By the end of March each year, or other timing as may be agreed by the Secretary, the Proponent must submit a review to the Department reviewing the environmental performance of the project to the satisfaction of the Secretary. This review must:
 - (a) describe the project (including any progressive rehabilitation) that was carried out in the previous calendar year, and the project that is proposed to be carried out over the current calendar year;
 - (b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - requirements of any plan or program required under this approval;
 - monitoring results of previous years; and
 - relevant predictions in the documents listed in condition 2 of Schedule 2;
 - (c) evaluate and report on:
 - the effectiveness of the air quality and noise management systems; and
 - compliance with the performance measures, criteria and operating conditions in this approval.
 - (d) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;
 - (e) identify any trends in the monitoring data over the life of the project;
 - (f) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
 - (g) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.

The Proponent must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 8 of Schedule 5) and any interested person upon request.

INDEPENDENT ENVIRONMENTAL AUDIT

13. Within 3 years of the date of this approval, and every 3 years thereafter, unless the Secretary directs otherwise, the Proponent must commission, commence and pay the full cost of an Independent Environmental Audit of the project. This audit must:
 - (a) be led and conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
 - (b) include consultation with the relevant agencies and the CCC;
 - (c) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval and any relevant EPL or necessary water licences for the project (including any assessment, strategy, plan or program required under these approvals);
 - (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals;

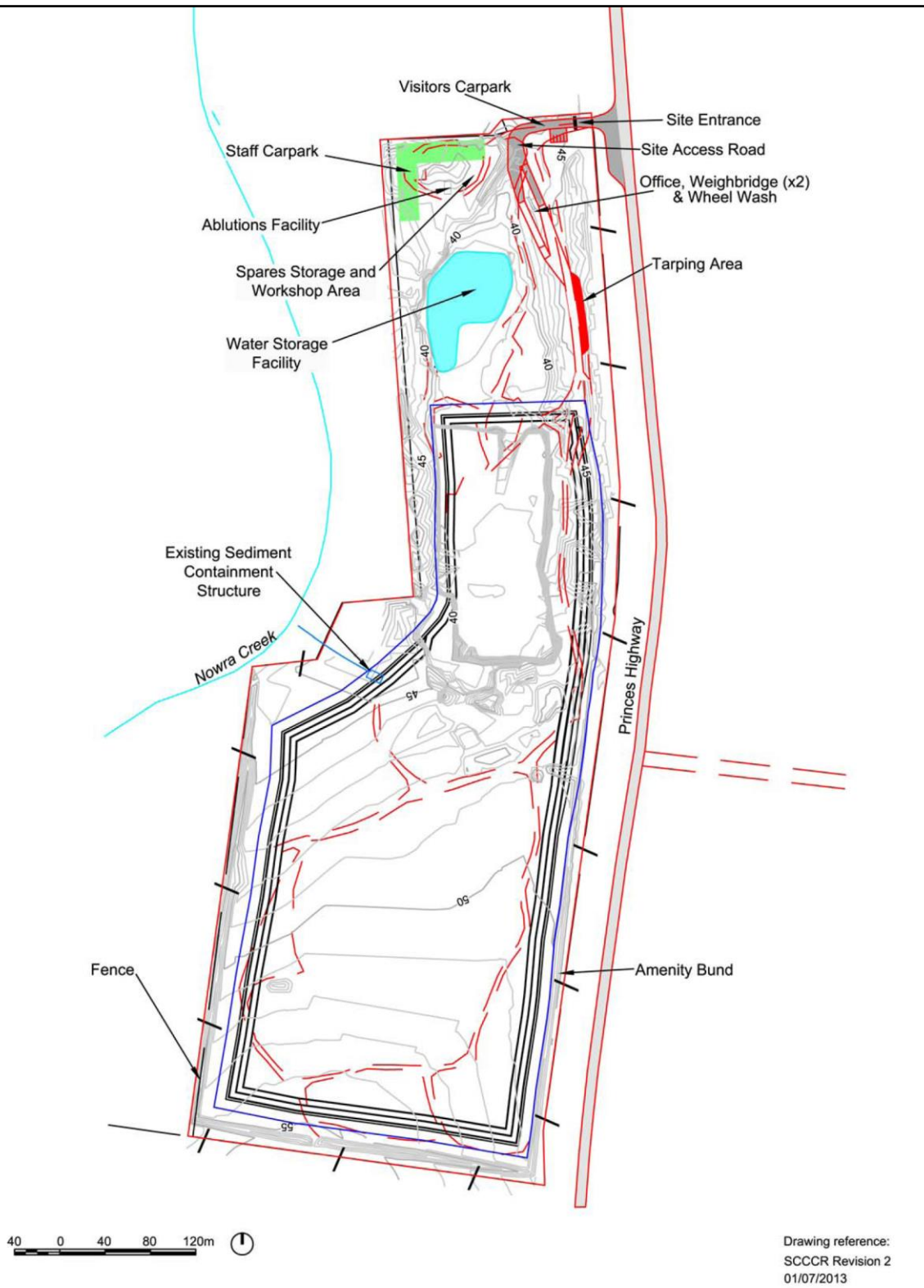
- (e) recommend appropriate measures or actions to improve the environmental performance of the project, and/or any assessment, strategy, plan or program required under the abovementioned approvals; and
 - (f) be conducted and reported to the satisfaction of the Secretary.
14. Within 12 weeks of commencing this audit, or as otherwise agreed by the Secretary, the Proponent must submit a copy of the audit report to the Secretary and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of these recommendations as required. The Proponent must implement these recommendations, to the satisfaction of the Secretary.

ACCESS TO INFORMATION

15. Within 3 months of the determination of Modification 2, until the completion of all works, including rehabilitation and remediation, the Proponent must:
- (a) make the following information publicly available on its website:
 - the documents listed in condition 2 of Schedule 2;
 - current statutory approvals for the project;
 - all approved strategies, plans and programs required under the conditions of this approval;
 - regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval;
 - a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs;
 - summary of the current stage and progress of the project;
 - contact details to enquire about the project or to make a complaint;
 - a complaints register, updated at least monthly;
 - the Annual Reviews of the project;
 - any Independent Environmental Audit as described in condition 13 above, and the Proponent's response to the recommendations in any audit; and
 - any other matter required by the Secretary; and
 - (b) keep this information up-to-date, to the satisfaction of the Secretary.

APPENDIX 1

PROJECT LAYOUT PLAN



**APPENDIX 2
STATEMENT OF COMMITMENTS**

Final Statement of Commitments for the Nowra Brickworks Quarry

Page 1 of 10

Desired Outcome	Action	Timing
1. Environmental Management		
Compliance with all conditional requirements in all approvals, licences and leases.	1.1 Comply with all commitments recorded in Table 5.1 1.2 Comply with all conditional requirements included in the: Project Approval; Environment Protection Licence; Mining Leases; and any other approvals.	Continuous and as required.
All operations conducted in accordance with all relevant documentation.	1.3 Undertake all activities in accordance with the accepted Mining Operations Plan, environmental procedures, safety management plan and/or site-specific documentation. 1.4 provide annual production data to DRG	Continuous and as required.
2. Area of Activities		
All approved activities are undertaken generally in the location(s) nominated on the figures shown in Sections 2 and 4.	2.1 Mark, and where appropriate, survey the boundaries of the areas of proposed disturbance.	Prior to the commencement of the relevant activity.
3. Hours of Operation		
All operations are undertaken within the approved operating hours.	3.1 Extraction, processing and VENM/ ENM backfilling-related activities. <ul style="list-style-type: none"> 7:00am to 6:00pm, Monday to Friday. 7:00am to 4:00pm, Saturday 3.2 Product despatch. <ul style="list-style-type: none"> 7:00am to 6:00pm, Monday to Saturday. Up to three unladen trucks would arrive at the Project Site between 6:00am and 7:00am, Monday to Saturday and may return to the Project Site between 6:00pm and 8:00pm, Monday to Friday and between 4:00pm and 6:00pm Saturday. 3.3 Maintenance-related activities <ul style="list-style-type: none"> 7:00am to 6:00pm, Monday to Saturday. 	Continuous

Desired Outcome	Action	Timing
4. Hydrology (Surface Water and Groundwater)		
All surface water and ground water managed such that water to be discharged from the Project Site complies with all assessment criteria	4.1 Maintain and progressively relocate the existing surface water diversion and sediment containment structures.	As required
	4.2 Construct, maintain and relocate, as required, surface water diversion structures to ensure that all surface water flows within disturbed sections of the Project Site are directed to the extraction area. The maximum catchment area would be required to be less than 5.9ha. To achieve this, the Proponent would ensure that progressive rehabilitation is undertaken as soon as practicable on sections of the Project Site no longer required for extraction-related operations.	
	4.3 Construct temporary surface water diversion structures on the upslope side of all soil stockpiles or other disturbed areas to limit erosion.	
	4.4 Install sediment fencing adjacent to the down-slope toe of all soil stockpiles or other disturbed areas.	
	4.5 Regularly inspect all surface water and sediment control structures for adequacy and repair or upgrade, where required.	Six monthly and following significant rainfall events
	4.6 Install and maintain a suitably sized sump within the active extraction area to collect all surface water runoff and groundwater inflows to the extraction area.	Following receipt of project approval
	4.7 Preferentially use water within the extraction area sump for dust suppression-related activities. Surplus water within the extraction area sump would be pumped to the water storage facility.	As required
	4.8 Preferentially use water within the water storage facility for rehabilitation-related activities or for irrigation within the irrigation area.	
	4.9 Construct 'grassed buffer areas' adjacent to the site access road and other sealed sections of the Project Site.	Within 6 months of receipt of project approval

Desired Outcome	Action	Timing
5. Ecology		
Minimise Project-related impacts on flora and fauna within and surrounding the Project Site.	5.1 Stage extraction activities such that they preferentially progress from disturbed sections of the Project Site to undisturbed sections.	Continuous
	5.2 Remove native vegetation only from those areas required for operational purposes during the subsequent 12 months.	
	5.3 Mark hollow-bearing trees to ensure they are readily identifiable.	
	5.4 Mark the boundaries of areas of native vegetation to be cleared.	Prior to clearing operations
	5.5 Erect cage traps in the vicinity of hollow-bearing trees for three consecutive nights.	
	5.6 Keep any trapped animal in captivity by animal for the period of clearing of native vegetation.	During clearing operations
	5.7 Clear non-hollow-bearing trees before clearing other vegetation.	During clearing operations
	5.8 Ensure a qualified fauna consultant is present during clearing of hollow-bearing trees.	
	5.9 Release any trapped animal adjacent to the Project Site.	Following clearing operations
	5.10 Break or cut cleared vegetation into manageable sections to be placed on areas undergoing rehabilitation or within other areas of native vegetation surrounding the Project Site.	Following clearing operations
	5.11 Undertake weed control programs within the Project Site.	Annually
	5.12 Strip, stockpile and spread topsoil and subsoil in accordance with Section 2.3.5.	During soil stripping programs
	5.13 Progressively rehabilitate all areas of disturbance no longer required for extraction or placement activities.	Following completion of extraction operations
	5.14 Implement the proposed biodiversity offset strategy	

Desired Outcome	Action	Timing
6. Traffic and Transportation		
Limit the impact of Project-related traffic	6.1. Adhere to the approved hours of operation.	Continuous
	6.2. Adhere to all speed limits.	
Allow concerned residents or motorists to report any traffic-related incidents, unsafe operation or general concerns.	6.3. Establish a complaints register, advertised in the local telephone directory.	On receipt of project approval
	6.4. Investigate all complaints and act decisively on substantiated incidents.	
Ensure all weight restrictions are adhered to	6.5. Weigh all entering and exiting laden trucks.	Continuous
Limit the tracking of material onto the Princes Highway to minimise dust, particulate matter and debris emissions.	6.6. Seal a 150m section of the site access road from the entrance gate and construct a wheel wash facility.	Prior to the amount of quarry products despatched from the Project Site exceeding 250 000t per year
	6.7. Ensure all loads are covered.	Continuous
	6.8. Provide a safe area for covering loads.	
Ensure all drivers adhere to the Projects Code of Conduct	6.9. Require all truck drivers to sign a Driver's Code of Conduct.	Prior to each driver leaving site for the first time
7. Air Quality		
Site activities are undertaken without exceeding EPA air quality criteria or goals.	7.1. Utilise water sprays and water trucks in all areas of potential dust lift-off to minimise potential dust emissions.	Continuous
	7.2. Utilise a chemical dust lift-off suppression system along unsealed roads, tracks and working areas, as well as with the mobile processing plant(s).	
	7.3. Utilise efficient mist sprays and wind sheltering equipment on processing equipment.	
	7.4. Maintain a maximum speed limit within the Project Site of 10km/h.	
	7.5. Stabilise the unsealed shoulders of the site access road.	Prior to the amount of quarry products despatched from the Project Site exceeding 250 000t per year
	7.6. Install a wheel wash on the site access road to limit tracking of material onto the Princes Highway	
	7.7. Disturb only the minimum area required for operation of the quarry during the subsequent 12 months.	Continuous
	7.8. Stabilise soil stockpiles to be in place for more than 10 days through the application of cleared vegetation, hydroseeding, hydromulching or equivalent.	Following soil stripping activities

Desired Outcome	Action	Timing
7. Air Quality (Cont'd)		
Site activities are undertaken without exceeding EPA air quality criteria or goals. (Cont'd)	7.9. Minimise the creation of minor roads and access tracks.	Continuous
	7.10. Utilise dust aprons, dust extraction systems and/or water injection or sprays during drilling operations.	During drilling operations
	7.11. Adequately stem all blast holes with aggregates.	During blasting operations
	7.12. Commence rehabilitation as soon as practicable.	Once an area is no longer required for extraction or placement-related operations
8. Noise		
Project-related noise impacts on surrounding residences minimised.	8.1. Adhere to the approved hours of operation.	Continuous
	8.2. Use noise-mitigated mobile and processing equipment.	
	8.3. Undertake all processing operations within the deepest section of the quarry.	
	8.4. Maintain all mobile and processing equipment in accordance with the manufacturer's specifications.	
	8.5. Preferential selection of equipment with lower sound power levels over equipment with higher sound power levels.	As equipment renewal is required
	8.6. Progressively install frequency modulated reversing alarms on mobile equipment.	
9. Blasting		
Project-related blasting impacts within assessment guidelines.	9.1. Design and implement blasts by a suitably qualified blasting engineer and experienced shot-firer.	Each blast
	9.2. Design blasts to ensure the assessment criteria described in Section 4.7.4.5 are complied with at all residential and commercial receivers.	
	9.3. Modify blast designs, mitigation measures and operating procedures on the basis of monitoring results.	As required
	9.4. Limit blasting operations to between the hours of 9:00am and 4:00pm, Monday to Saturday.	Each blast
	9.5. Negotiate an appropriate arrangement with the owner of Residence A.	Prior to completion of Stage 1 of the Project

Desired Outcome	Action	Timing
9. Blasting (Cont'd)		
Project-related blasting impacts within assessment guidelines. (Cont'd)	9.6. Notify the following organisations verbally of each blast. <ul style="list-style-type: none">Shoalhaven City Council.NSW Police.NSW Roads and Maritime Services.The owner of Residence A.Environment Protection Authority.The South Coast Correctional Facility (when constructed).	On the working day prior to the blast being initiated
	9.7. Maintain the existing main telephone number (02 4421 7766) for the quarry as an environmental complaints line.	Continuous
	9.8. Maintain a register of complaints.	
	9.9. Respond promptly to any issue of concern.	
10. Aboriginal Cultural Heritage		
Unidentified Aboriginal sites are not disturbed by the Proponent's activities.	10.1. Ensure representatives of the Aboriginal community are present during activities that would disturb the upper 10cm of soil in the area marked on Figure 5.1 .	During soil stripping operations in the area indicated
	10.2. Cease all work in the event that an item of suspected Aboriginal cultural heritage is discovered, establish a 20m x 20m buffer around the item and consult with the Department of Environment, Climate Change and Water.	As required
	10.3. Cease all work in the event that suspected human remains are discovered, establish a 50m x 50m buffer around the item(s) and consult with NSW Police and the Department of Environment, Climate Change and Water.	As required
11. Soils		
The Proponent's activities do not result in soil degradation or loss.	11.1. Strip soils only when they are moist.	During soil stripping operations
	11.2. Strip topsoils using a scraper, excavator or bulldozer to a depth of between 180mm and 250mm below the surface.	
	11.3. Strip subsoils to a depth of between 175mm and 500mm below the base of the topsoil.	
	11.4. Place soils directly on areas undergoing progressive rehabilitation, where practicable.	During rehabilitation operations

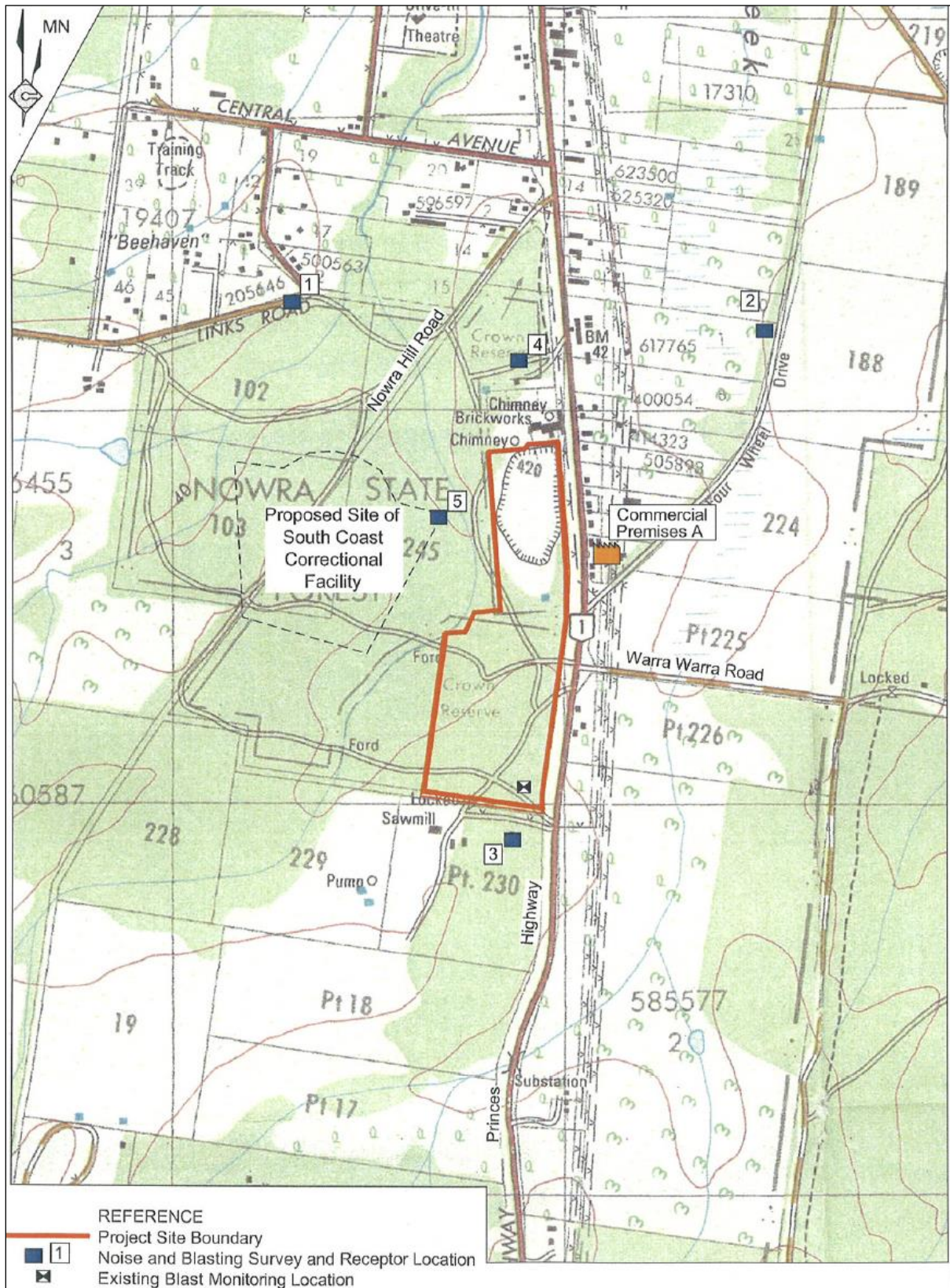
Desired Outcome	Action	Timing
11. Soils (Cont'd)		
The Proponent's activities do not result in soil degradation or loss. (Cont'd)	11.5. Place VENM/ENM in the manner described in Section 2.9.5.	During VENM/ENM placement operations
	11.6. Place subsoil over the VENM/ENM to a thickness of approximately 250mm.	During soil placement operations
	11.7. Place topsoil to a thickness of approximately 200mm.	
	11.8. Apply biosolids to the topsoil at a rate of less than 20 dry tonnes per hectare.	
	11.9. Spread between 20mm to 40mm of mulched native vegetation, broken tree debris or bitumen sprayed straw mulch over the topsoil.	
	11.10. Locate soil stockpiles, where required, at least 2m from existing vegetation, areas of concentrated surface water flows, roads or other hazardous areas.	During soil stockpiling operations
	11.11. Construct soil stockpiles as low (less than 2m high), flat, elongated mounds with side slopes no greater than 1:3(V:H). Where practicable, topsoil stockpiles would be less than 1m high.	
	11.12. Stabilise stockpiles to be in place for more than 10 days through the application of mulched or broken vegetation, hydroseeding, hydromulching or equivalent.	During soil stockpiling operations
	11.13. Erect a sediment fence approximately 1m from the toe on the downslope side of soil stockpiles.	
	11.14. Use stockpiled soil material for rehabilitation-related operations within 6 months of being stockpiled.	
Ensure sediment-laden surface water is not permitted to flow off site.	11.15. Maintain and relocate an earth bank to divert all 'clean' surface water to a sediment retention structure and level spreader.	Continuous
	11.16. Divert all surface water flows from disturbed areas to the water storage facility where practicable.	
	11.17. Divert all other potentially sediment-laden surface water flows to a sump within the extraction area.	

Desired Outcome	Action	Timing
11. Soils (Cont'd)		
Ensure sediment-laden surface water is not permitted to flow off site. (Cont'd)	11.18. Preferentially use water from the extraction area sump for dust suppression and watering of roads and other areas.	
	11.19. Construct a bio-infiltration facility in accordance with the specifications in Section 4.9.3.	Prior to discharge of surface water to Nowra Creek
	11.20. Preferentially use water within the water storage facility for rehabilitation-related activities.	Continuous
	11.21. Pump excess water from the extraction are sump to the water storage facility.	As required
	11.22. Pump water from the water storage facility to a bio-infiltration facility when the concentration of total suspended solids within the water storage facility is less than 50mg/L.	
	11.23. Pump water from the bio-infiltration facility to Nowra Creek.	
12. Visibility		
Limit impacts to the visual amenity of the area surrounding the Project Site.	12.1. Maintain the existing perimeter bunds.	Continuous
	12.2. Maintain the existing mature trees on the eastern boundary of the Project Site.	
	12.3. Adopt a high standard of house keeping.	
13. Socio-Economic		
Ensure Project-related adverse impacts are minimised and benefits are maximised.	13.1. Give preference to suppliers of equipment, services or consumables located within the Shoalhaven Local Government Area or Illawarra Region, where ever practicable.	Continuous
	13.2. Give preference, where reasonable to do so, when engaging new employees to candidates who live within the Shoalhaven Local Government Area.	
	13.3. Continue to support local junior sporting clubs through sponsorship or in kind support.	
	13.4. Review any request by a community organisation for support or assistance during the life of the Project.	As required

Desired Outcome	Action	Timing
13. Socio-Economic (Cont'd)		
Ensure Project-related adverse impacts are minimised and benefits are maximised. (Cont'd)	13.5. Consult with the residents and community surrounding the Project Site.	Continuous
	13.6. Advertise and maintain a community complaints telephone line.	
	13.7. Develop and maintain a Complaints Management Plan to ensure prompt response to issues identified by the public.	
14. Environmental Monitoring		
Ongoing monitoring of surface and groundwater-related impacts.	14.1. Monitor groundwater levels within Piezometers P1 to P8 (Figure 5.1).	Monthly.
	14.2. Monitor and record groundwater quality within piezometers P2, P3, P5, P6 and P7 (Figure 5.1).	Quarterly
	14.3. Monitor and record groundwater seepage on rock faces. To be undertaken by a geotechnical engineer.	Six monthly
	14.4. Monitor and record surface water quality within the extraction area sump, the water storage facility, the sediment containment structure and within Nowra Creek upstream and downstream of the Project-site discharge point.	Monthly
	14.5. Determine and record the quality of water pumped from the water storage facility to the bio-infiltration facility.	During each pumping campaign
	14.6. Determine and record the quality of water discharged from the bio-infiltration facility to Nowra Creek.	
	14.7. Determine and record the quality of water flowing from the sediment containment structure to Nowra Creek.	During or immediately following significant rainfall events
	14.8. Determine, using in-line meters, and record the volumes of water pumped: <ul style="list-style-type: none">from the extraction area sump to the water storage facility;from the water storage facility to the bio-infiltration facility; andfrom the bio-infiltration facility to Nowra Creek.	During pumping programs

Desired Outcome	Action	Timing
14. Environmental Monitoring (Cont'd)		
Ongoing monitoring of surface and groundwater-related impacts. (Cont'd)	14.9. Determine and record the volume of water used for extraction, processing, placement and rehabilitation-related operations.	Daily
Ongoing monitoring of ecology-related impacts.	14.10. Undertake regular monitoring of areas undergoing rehabilitation to determine the success or otherwise of the management, mitigation and ameliorative measures and the rehabilitation programs.	Six monthly
	14.11. Take photographs from fixed points to document activities within the Project Site, including rehabilitation progress.	Six monthly
	14.12. Undertake weed inspection programs.	Annually
Ongoing monitoring of air quality-related impacts.	14.13. Maintain the existing network of deposited dust monitoring gauges and determine and record dust deposition rates.	Monthly
	14.14. Establish a meteorological station capable of measuring temperature at the surface and at a height of 10m, wind direction and speed and rainfall.	Within 3 months of receipt of project approval
Ongoing monitoring of blasting-related impacts.	14.15. Monitor all blasts at the blast monitoring locations indicated on Figure 5.1 .	Each blast
15. Environmental Documentation		
A systematic set of documents are in place to guide the planning and implementation of all environmental management strategies.	15.1. Incorporate the environmental procedures in an on-site management system.	Prior to relevant activity.
	15.2. Update the Mining Operations Plan.	As required.
	15.3. Incorporate relevant environmental data / information in Annual Environmental Management Reports.	Annually.
	15.4. Prepare the following environmental plans for the Project. <ul style="list-style-type: none"> – Air Quality Monitoring Program. – Noise Monitoring Program. – Blast Monitoring Program. – Flora and Fauna Management Plan. – Site Water Management Plan. – Groundwater Management Plan. – Rehabilitation and Landscape Management Plan 	Variously.
	15.5. Incorporate the environmental procedures in an on-site management system.	Prior to relevant activity.

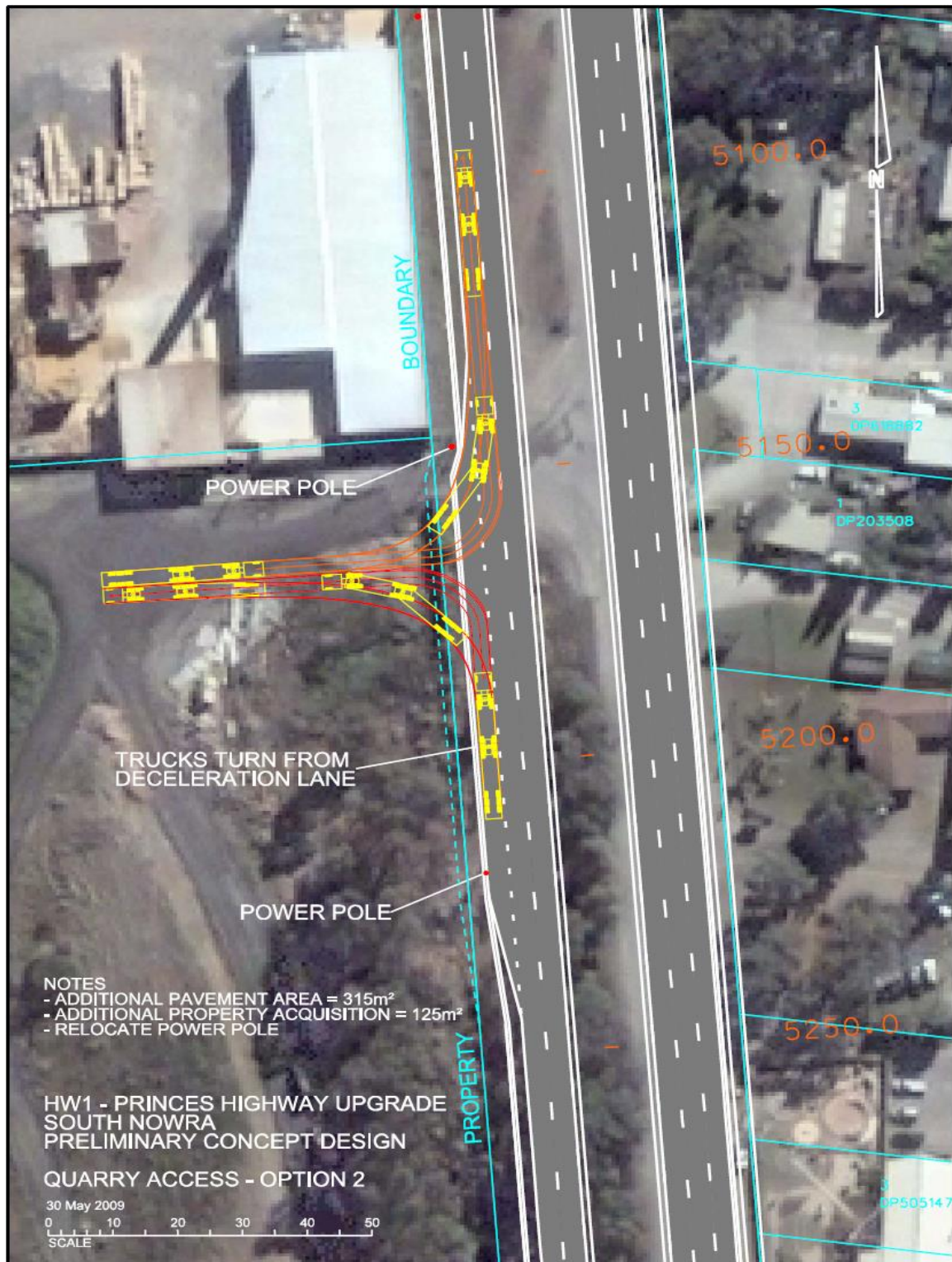
APPENDIX 3 NOISE AND DUST MONITORING LOCATIONS



APPENDIX 4 CONCEPTUAL FINAL LANDFORM



APPENDIX 5 **QUARRY ACCESS – RMS PRELIMINARY CONCEPT DESIGN**



APPENDIX 6 NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 2 are to apply under all meteorological conditions except the following:
 - (a) wind speeds greater than 3 m/s at 10 m above ground level; or
 - (b) temperature inversion conditions between 1.5°C and 3°C/100 m and wind speed greater than 2 m/s at 10 m above ground level; or
 - (c) temperature inversion conditions greater than 3°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station required under condition 16A of Schedule 3.

Compliance Monitoring

3. A noise compliance assessment must be undertaken within six months of the approval of Modification 2. The assessment must be conducted by a suitably qualified and experienced acoustical practitioner and must assess compliance with the noise criteria in Table 2. A report must be provided to the Secretary and EPA within 1 month of the assessment.
4. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
 - (a) monitoring locations for the collection of representative noise data;
 - (b) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment;
 - (c) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration; and
 - (d) the use of an appropriate modifying factor for low frequency noise to be applied during compliance testing at any individual residence if low frequency noise is present (in accordance with the *NSW Industrial Noise Policy*) and before comparison with the specified noise levels in the approval.

Appendix B – EMS





South Coast Concrete Crushing and Recycling

Nowra Brickworks Quarry Environmental Management Strategy

June 2010





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- I Air Quality Management Plan
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- K Record Sheets
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Abbreviations

AEMR	Annual Environmental Monitoring Report
CCC	Community Consultative Committee
DA	Development Application
DDG	Dust Deposition Gauges
EMS	Environmental Management Strategy
EOI	Expression of interest
DECCW	Department of Environment, Climate Change and Water
dB(A)	Decibels (A—weighted filter)
EPA	Protection Authority
EPL	Environmental Protection Licence
HVAS	High Volume Air Sampler
MSDS	Material Safety Data Sheets
NOW	NSW Office of Water
NSW	New South Wales
PM	Particulate Matter
SCCCR	South Coast Concrete Crushing and Recycling
TSP	Total Suspended Particulate
VENM	Virgin Excavated Natural Material

1. Introduction

1.1 Background

The Nowra Brickworks Quarry (the quarry) is located in South Nowra, approximately five kilometres south of the central business district, next to the Princes Highway (Figure 1-1). South Coast Concrete Crushing and Recycling (SCCCR) have operated the quarry since 2002, carrying out the following operations:

- ▶ Extraction of weathered and unweathered shale material;
- ▶ Importation of construction, concrete and waste bitumen material for crushing and recycling;
- ▶ Importation of quarry products from other quarries for blending operations;
- ▶ Crushing, screening and blending of extracted, recycling and blending materials to produce general and specialised quarry products;
- ▶ Stockpiling, loading and despatching quarry products; and
- ▶ Progressive rehabilitation of areas no longer required for extraction-related purposes.

The Minister for Planning approved the continuation and expansion of extractive operations at the quarry pursuant to section 75J of the *Environmental Planning and Assessment Act 1979* on 1 December 2009 (the Project Approval).

This Environmental Management Strategy (EMS) has been prepared to satisfy Schedule 5 Condition 1 of the Project Approval (refer to Section 1.3), attached as Appendix A.

1.2 Summary of the Project

The Project is the continuation and expansion of the extractive operations at the quarry and includes the following operations and works (Corkery and City Plan Services 2009):

- i. Continued operation of the quarry and its expansion to the south;
- ii. Realignment and sealing of the section of the site access road from the site entrance from the Princes Highway for a distance of 150 metres;
- iii. Construction of a wheel-wash facility, dual weighbridge and office and a sealed visitor carpark;
- iv. Extract more than 364,000 tonnes per year of clay/shale (using drill and blast methods), structural clay and associated materials (in total) from the site using an excavator for direct sale to customers or stockpiling for later sale without processing;
- v. Importation and stockpiling of up to approximately 50,000 tonnes per year of recycling materials;
- vi. Importation and stockpiling of up to approximately 125,000 tonnes per year of blending materials;
- vii. Processing and blending of extracted, recycling and blending material to produce general and specialised products using a mobile processing plant;
- viii. Stockpiling of quarry products;
- ix. Loading, sale and despatch of an average of approximately 300,000 tonnes per year, to a maximum of approximately 500,000 tonnes per year, of quarry products using road registered heavy vehicles;

- x. Importation and placement of up to 200,000 tonnes per year of Virgin Excavated Natural Material (VENM). A proportion of this material may be processed and blended with other materials to produce saleable products. The remainder will be placed within completed sections of the extraction area to establish a final landform that mimics the pre-extraction landform within the Project site; and
- xi. Progressive rehabilitation of areas no longer required for extraction or VENM placement-related activities.

1.3 Project Approval Conditions

The Minister for Planning approved the continuation and expansion of extractive operations at the Nowra Brickworks Quarry in South Nowra pursuant to section 75J of the *Environmental Planning and Assessment Act 1979* on 1 December 2009 (the Part 3A Approval). In accordance with Schedule 5, Conditions 1 and 4 of the Part 3A Approval, SCCCR is required to prepare and implement an Environmental Management Strategy (EMS) for the project. Condition 1 of Schedule 5 states:

"The Proponent will prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must:

- a) be submitted to the Director-General for approval by 30 June 2010;*
- b) provide the strategic framework for environmental management of the project;*
- c) identify the statutory approvals that apply to the project;*
- d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;*
- e) describe the procedures that will be implemented to:*
 - keep the local community and relevant agencies informed of the operation and environmental performance of the project;*
 - receive, handle, respond to, and record complaints;*
 - resolve any disputes that may arise during the course of the project;*
 - respond to any non-compliance; and*
 - respond to emergencies; and*
- f) include:*
 - copies of the various strategies, plans and programs that are required under the conditions of this approval once they have been approved; and*
 - a clear plan depicting all the monitoring currently being carried out within the project area."*

1.4 The Quarry's Environmental Management Strategy (EMS)

1.4.1 Objectives and Scope

The EMS has been developed to specifically address the requirements of Schedule 5, Condition 1 of the Project Approval (refer to Section 1.3 above). It describes the management procedures associated with the quarry relevant to managing the project's impact on the environment and incorporates matters required to be implemented or documented as well as the various strategies, plans and programs, and reporting mechanisms required by the Project Approval. Specifically the objectives of the EMS are to:

- ▶ Provide the strategic framework for environmental management of the project;
- ▶ Identify the statutory approvals that apply to the project; and
- ▶ Describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
- ▶ Describe the procedures that would be implemented to:
 - Keep the local community and relevant agencies informed about the operation and environmental performance of the project;
 - Receive, handle, respond to, and record complaints;
 - Resolve any disputes that may arise during the course of the project;
 - Respond to any non-compliance; and
 - Respond to emergencies.

In addition, the Project Approval required the preparation of a number of strategies, plans and programs relevant to environmental management of the quarry. Consequently, the EMS incorporates these in their entirety and by summary of actionable items, as follows:

- ▶ Environmental Response Plan (attached as Appendix C);
- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix D);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Surface Water and Groundwater Monitoring and Response Plan (attached as Appendix F);
- ▶ Site Water Balance Report (attached as Appendix G);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H);
- ▶ Air Quality Management Plan (attached as Appendix I); and
- ▶ Aboriginal Heritage Management Plan (attached as Appendix J).

This EMS, in concert with the above plans, provides for the environmental management of the operation of the quarry for use by the Mine Manager. Table 1-1 outlines how the specific environmental aspects relate to each activity and hence where they are addressed by the EMS.

Table 1-1 EMS Organisation Matrix

Key activities associated with the operations at the quarry	EMS section	Environmental Plans and Reports							Community consultation	Environmental monitoring	Reporting
		Noise and Blast	Erosion and Sediment Control	Surface Water and Groundwater	Landscape and Biodiversity	Air Quality	Aboriginal Heritage	Emergency and hazards			
Community Consultation	3	✓				✓			✓		✓
Emergency Response	4							✓			✓
Vegetation removal and soil stripping	5	✓	✓		✓	✓	✓			✓	✓
Soil placement and stockpiling (post-stripping)	6	✓	✓		✓	✓					
Drilling and blasting	7	✓				✓			✓	✓	✓
Extracting, importing and processing	8	✓	✓			✓					
Stockpiling	9	✓	✓		✓	✓					
Loading, dispatch and transportation	10	✓	✓			✓					
Importation and use VENM	11	✓	✓		✓	✓				✓	✓
Soil and Water management and use	12		✓	✓						✓	✓
Rehabilitation	13	✓	✓		✓	✓				✓	✓
Environmental Monitoring	14	✓	✓	✓	✓	✓	✓			✓	✓
Reporting	15	✓	✓	✓	✓	✓	✓		✓	✓	

1.4.2 Framework of EMS

The quarry is a small operation with a limited number of operation personnel. This EMS will be implemented by the Mine Manager, and as such the EMS has been structured to focus on the environmental management as it relates to operational activities at the quarry.

1.4.3 Commencement and implementation of the EMS

The EMS is to commence when all existing development consents for the site have been surrendered to Shoalhaven City Council (anticipated to be prior to 30 June 2010).

The EMS is to be implemented through the following means:

- ▶ The preparation of detailed work instructions which address the environmental requirements of the EMS;
- ▶ Assigning individual responsibilities for implementing, maintaining, monitoring, and reporting each environmental requirements and safeguards;
- ▶ Ensuring that all works are conducted in compliance with the EMS, legislative requirements, and the site's Environment Protection Licence and Project Approval;
- ▶ Ensuring appropriate monitoring, corrective actions and reporting of environmental incidents; and
- ▶ Ensuring that all employees conduct their work in accordance with the requirements of the EMS.

1.5 Management Responsibilities

1.5.1 Roles and Responsibilities

The Mine Manager is responsible for the implementation of this EMS. The Mine Manager's authority has been provided for by the leaseholder (Abib Pty Ltd) and the Mine Operator (South Coast Concrete Crushing and Recycling Pty Ltd).

The Mine Manager, in the implementation of the EMS, will be accountable to the Mine Operator, Department of Mineral Resources (NSW Dept of Industry and Investment) and the Department of Planning.

1.6 Distribution

The EMS is to be distributed in accordance with Table 1-2.

Table 1-2 EMS Distribution

Organisation	No of copies	Timing
SCCCR Mine Manager	1	Within one month of receipt of approval of the EMS
Shoalhaven City Council	1	
Land and Property Management Authority (formerly Department of Land)	1	
Members of the Community Consultative Committee	1 per member	
DECCW	1 copy	

The document will also be available at the quarry.

1.7 Review of the EMS

The EMS is a perpetual document that can be reviewed and amended or updated as needed to take account of changes occurring from time to time. In addition, a review of the EMS will be conducted at least every two years to promote opportunities for continual improvement. Further reviews and alterations to the EMS may also be required in the circumstances listed in Table 1-3 below.

Table 1-3 Circumstances that may require alterations to the EMS

Circumstance	Potential changes required
New Environmental Protection Licence issued	Any licence conditions will be incorporated into the EMS.
Water Access Licence obtained (Part 2, <i>Water Act 1912</i>)	
Aquifer Interference Licence obtained (Part 5, <i>Water Act 1912</i>)	
After each Independent Environmental Audit	The EMS may be changed, where appropriate, to reflect the audit's review of the adequacy of any strategy/plan/program required under the Part 3A Approval and reflected in the EMS.
Exceedance of limits/performance criteria in the Project Approval / EMS	Additional measures to address an exceedance/incident may be incorporated into the EMS.

2. Statutory Approvals

2.1 Project Approval Conditions

The *Continuation and Expansion of the Extractive Operations at the Nowra Brickworks Quarry, South Nowra* (the project) was given conditional approval by the Director-General as Delegate for the Minister for Planning on 1 December 2009 (Project Application No: 07_0123) (attached as Appendix A).

Approval for the project was subject to conditions in Schedules 2 to 5 of the Project Approval. These conditions require that the operation be conducted to:

- ▶ Prevent and/or minimise adverse environmental impacts;
- ▶ Set standards and performance measures for acceptable environmental performance;
- ▶ Require regular monitoring and reporting; and
- ▶ Provide for the ongoing environmental management of the Project.

Schedule 2, Condition 2 requires that the project be carried out generally in accordance with the:

- ▶ Environmental Assessment submitted as part of the Major Projects Application (Corkery and City Plan Services 2009);
- ▶ Statement of Commitments (attached as Appendix 2 to the Project Approval); and
- ▶ The Project Approval.

This EMS provides guidance only on the implementation and reporting required by the environmental strategies, plans and programs. The strategies, plans and programs are attached as appendices to this EMS and should be referred to regularly and when updating the EMS.

2.2 Relevant Environmental Legislation

Other relevant Acts that operate independently of the Project Approval and which are of relevance to the quarry operations are listed in Table 2-1 below. The quarry's Mine Manager must be cognisant of the requirements of each of these Acts.

Table 2-1 Environmental legislation relevant to the quarry operations

Act	Requirement
<i>Environmental Planning and Assessment Act 1979</i>	All activities are to be carried out in accordance with the Project Approval.
<i>Protection of the Environment Operations Act 1997 (Chapter 5)</i>	<p>Except as provided by EPL, the operations of the quarry will not:</p> <ul style="list-style-type: none"> ▶ Dispose of waste or cause any leak or spill or similar in a matter that causes harms or likely to harm the environment. ▶ Result in land, air, or water pollution. ▶ Result in noise pollution. <p>Pollution incidents causing or threatening material harm must be reported to the EPA.</p>
<i>Noxious Weeds Act 1993 (Part 3)</i>	The quarry must control any plant declared noxious in the Shoalhaven Local Government Area in accordance with the relevant control order (refer to http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed).
<i>Rural Fires Act 1994 (Part 4)</i>	It is the duty of the owner or occupier of land to take steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of bush fires on or from, that land.
<i>National Parks and Wildlife Act 1974 (Part 6)</i>	A permit, granted pursuant to the provision of this Act, must be obtained to disturb or move any Aboriginal object within the quarry land.
<i>Waste Avoidance and Resource Recovery Act 2001</i>	<p>The Act encourages the most efficient use of resources, to minimise the consumption of natural resources and the final disposal of waste, and to reduce environmental harm in accordance with the principles of ecologically sustainable development.</p> <p>Resource management options should be considered against a hierarchy of the following order:</p> <ul style="list-style-type: none"> (i) Avoidance of unnecessary resource consumption; (ii) Resource recovery (including reuse, reprocessing, recycling and energy recovery); and then (iii) Disposal. <p>Avoid unnecessary water consumption in buildings and grounds maintenance. Recycle water where appropriate.</p>

2.3 Other Statutory Approvals and Licences

In addition to meeting the conditions set out in the Project Approval, the project requires additional statutory instruments to carry out certain activities. These are listed in Table 2-2 below and further described in subsequent sections.

Each licence and/or approval contains various conditions that need to be adhered to. An amendment to the existing EPL to increase the annual extraction limit to 500,000 tonnes has been submitted to DECCW. Through the review process outlined in Section 1.6, any additional

environmental strategies, conditions, monitoring and reporting requirements specified in these licences/approvals will be incorporated into the EMS, when received.

Table 2-2 Statutory Approvals and Licences

Licence / Approval and Relevant Legislation	Relevant Authority	When is it required?	Responsibility
Environmental Protection Licence (EPL) <i>Protection of the Environment Operations Act 1997</i>	NSW Environmental Protection Authority (within the DECCW)	An EPL is required for a maximum extraction of 500,000 T and processing a maximum of 500,000 T of quarrying material annually. A review of the EPL is required either: <ul style="list-style-type: none">▶ When existing EPL is to be reviewed (07 April 2011), or▶ When operations are expected to exceed current extraction limit	Mine Manager
Water Access Licence <i>Water Act 1912 (Part 5)</i>	NSW Office of Water (within the DECCW)	A water access licence is required to extract water from the dam.	Mine Manager
Aquifer Interference Approval <i>Water Act 1912 (Part 2)</i>	NSW Office of Water (within the DECCW)	An Aquifer interference Approval is required for quarry pit dewatering and groundwater interception.	Mine Manager

2.3.1 Environment Protection Licence

Under the NSW *Protection of the Environment Operations Act 1997* (POEO Act) the project activities require an Environment Protection Licence (EPL) for the following “Scheduled Activities” as listed in Schedule 1 of the POEO Act:

- ▶ Crushing, Grinding or Separating; and
- ▶ Extractive activities.

The Quarry operates under EPL No. 11765 (attached as Appendix B). This EPL covers “Hard-Rock Gravel Quarrying” of between 50,000 tonnes and 100,000 tonnes per annum and “Crushing, Grinding or Separating Works” between 30,000 tonnes and 100,000 tonnes per annum.

The project requires a modification to the EPL to reflect the increased extraction and processing tonnages.

2.3.2 Water Access Licences

The maximum harvestable right dam capacity for the property has been calculated by the NSW Office of Water (NOW) as 2.15 ML megalitres. This is based on the understanding that the Nowra Brickworks lease is 21.5 hectares in area and is located in a rainfall runoff area with a multiplier of 0.10 ML/ha.

As the 50 ML storage dam is in excess of the property's harvestable right and the intention is to extract water from the dam for onsite reuse (ie approx 50 ML/year) for the purposes of dust suppression and material processing, a licence under Part 2, Section 10 of the *Water Act 1912* is required for this dam. This licence would authorise the storage dam and associated pump for the stated purposes.

Groundwater inflows need to be accounted for separately. Based on the estimated inflows of 0.04 ML/day, this equates to approximately 14.6 ML/year. A Licence under Part 5 of the *Water Act 1912* is required for quarry pit dewatering and groundwater interception.

The site contains eight existing piezometers which are licensed under the *Water Act 1912* with Licence Number 10BL602172. Any new piezometers will also be required to be licensed accordingly.

2.4 Inconsistencies and Discrepancies

In accordance with Schedule 2, Condition 3 of the Project Approval, in the event of an inconsistency between the documents listed in section 2.1 above, the conditions of the Project Approval will prevail to the extent of any inconsistency.

Where there is consistency between the conditions contained within the Project Approval, EPL and the Water Access Licences, the more stringent conditions will apply.

3. Community Consultation

In accordance with Schedule 5, Condition 1(e) of the Project Approval, a community consultation strategy will be implemented by the SCCCR to:

- Keep the local community and relevant agencies informed about the operation and environmental performance of the project;
- Receive, handle, respond to, and record complaints;
- Resolve any disputes that may arise during the course of the project;
- Respond to any non-compliance; and
- Respond to any emergencies.

The quarry's strategy for keeping the local community and relevant agencies informed is provided below and summarised in Figure 3-1 with the community consultation schedule provided as Table 3-1.

3.1 Local Community

The primary community notification mediums that will be used include the *South Coast Register* (local newspaper) and the Nowra Brickworks Quarry website. Notification of nearby landowners of planned activities such as blasting will be by written correspondence, telephone call or personal visit to inform them of the date and time of the intended blast.

Regular articles will be submitted to the *South Coast Register* for publishing. These articles will provide updates on the operations at the quarry including the ongoing implementation of environmental strategies, plans and monitoring.

A Nowra Brickworks Quarry Website will be established. Information will be made available on the Website and will include:

- An overview of the operations at the quarry;
- Information on the environmental management of the quarry;
- A summary of environmental monitoring results;
- Copies of the Annual Environmental Management Reports; and
- Copies of the completed audits.

Note: Nowra Brickworks Quarry, in accordance with Schedule 3 (Condition 10) of the Project Approval, advised landowners within 500 metres of the proposed blasting activities that they are entitled to a property inspection to establish the baseline condition of the property. Some responses were received and the property inspections have been undertaken.

3.1.1 Community Consultative Committee

A Community Consultative Committee (CCC) is to be established for the project to the satisfaction of the Director-General and in accordance with the Department's *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects*. The CCC will provide a forum for open discussion on issues directly relating to the quarry's operations, environmental performance and community relations. Items to be discussed at CCC meetings will include:

- ▶ Implementation of conditions of approval, the mining operations plan and other plans;
- ▶ The results of environmental monitoring;
- ▶ Annual environmental management reports (AEMRs);
- ▶ Outcomes of audit reports; and
- ▶ Community concerns and resolution of complaints.

The CCC will comprise:

- ▶ An independent chairperson to be appointed by the Director-General;
- ▶ Three to five representatives of the local community and other stakeholders. These representatives will be appointed by the Director-General, following advertisement in the *South Coast Register* and direct invitation to the Department of Corrective Services, NSW Department of Industry and Investment, NSW Department of Planning and immediate landowners and businesses;
- ▶ One representative from the Shoalhaven City Council; and
- ▶ The Mine Manager.

At the inaugural meeting of the CCC, the committee will determine the frequency of its meetings. The Department's Guideline suggests that the committee meet at least four times per year during the first two years following commencement of operations. After the first two years of operations under the Project Approval, it is suggested that the committee will meet at least twice per year.

Minutes of all meetings will be kept and will record issues raised and actions to be undertaken, who is responsible for taking those actions and by when.

3.1.2 Access to information

Copies of the strategies, plans, programs, completed audits and AEMRs would be provided to the relevant agencies and the CCC. In addition, copies of the relevant documents will be made publicly available at the quarry.

A summary of the monitoring results will be made publicly available at the quarry, and will be updated on a regular basis (quarterly).

COMMUNITY NOTIFICATION STRATEGY

Consultation management

Keeping the local community and relevant agencies informed about the operation and environmental performance

Exceedance of environmental monitoring criteria

Notify the Director-General and other relevant agencies, affected landowners and tenants

Provide written report within 6 days to the Department and relevant agencies

Describe the date, time and nature of the exceedance

Identify the cause (or likely cause) of the exceedance

Describe what action has been taken to date

Describe the proposed measures to address the exceedance

Provide quarterly monitoring results to Director-General, affected landowners and tenants until compliance with relevant criteria

Community Consultative Committee (CCC)

Creation and operation of CCC according to Department's Guidelines

Minutes to be kept

Quarterly updates and provision of information

Copies of information provided to relevant agencies and members of general public on request

Copies of relevant information made publicly available on site at the quarry

Creation and thereafter quarterly updates to website

Include information on environmental management, strategies, plans, monitoring results, AEMRs and completed audits

Include contact telephone line

Notification of planned blasting activities

The following people will be notified on the working day prior to the blast being initiated:

- Shoalhaven City Council
- NSW Police
- NSW Roads and Traffic Authority
- The resident of 243 Princes Highway
- EPA (of the DECCW)
- The South Coast Correctional Facility

Response management

Receive, handle, record and respond to complaints, any non-compliance, and emergencies

Emergency management

Complaint management

Complaints telephone line

Complaint made

Mine Manager

Initial response within 24 hours

Record date and time of complaint, nature of complaint, date and time of response, initial response and follow-up action taken in log book

Not resolved Resolved

Director-General

Not resolved Resolved

Independent dispute resolution process

Non-compliance management

Non-compliance identified

Mine Manager for resolution and appropriate steps to ensure compliance is maintained in the future

Annual Environmental Monitoring Report

Table 3-1 Program for community consultation

Consultation Requirement	Timing	Action and Responsibility
Pre-blasting property inspections	Prior to any blasting activities undertaken under the Project Approval and this EMS	Consultation was undertaken prior to blasting in accordance with the Project Approval. Responsibility of the Mine Manager
Establish a complaints register	Prior to the commencement of this EMS (refer to Section 3.3)	Complaints received are to be recorded in the complaints register Responsibility of the Mine Manager
Website development	Prior to the commencement of this EMS (refer to Section 3.1)	Responsibility of the Mine Manager
Establish Community Consultation Committee.		Effort has been made to establish the CCC, however there was a lack of response (early 2010). Responsibility of the Mine Manager
<ul style="list-style-type: none"> ▶ A further advertisement calling for expressions of interested to be placed in the <i>South Coast Register</i> ▶ Circulation of newsletter to surrounding landowners to advise of the difficulty in finding representatives for the CCC (including an invitation to submit an EOI for CCC membership) ▶ Forward the newsletter to when distributed to the Department of Planning and advise the Department of the progress of CCC membership applications. 	<p>August 2010</p> <p>30 September 2010</p>	
<p>The following people will be notified on the working day prior to the blast being initiated:</p> <ul style="list-style-type: none"> – Shoalhaven City Council – NSW Police – NSW Roads and Traffic Authority – The resident of 243 Princes Highway – EPA (of the DECCW) – The South Coast Correctional Facility 	Prior to blasting	Responsibility of the Mine Manager



3.2 Relevant Agencies

The reporting program, detailed in Section 15 of this EMS, is to be implemented to inform relevant agencies about the operation and environmental performance of the project.

3.3 Complaints and Dispute Resolution

The quarry will maintain a community complaints telephone line and complaint register. The telephone number will be advertised in the Yellow Pages, on signage at the entrance to the quarry and on their website.

Complaints will be received by the quarry Mine Manager. The Mine Manager will:

- ▶ Receive, log, track and respond to complaints in the complaint register.
- ▶ Record the following:
 - The date and time of complaint.
 - The method by which the complaint was made.
 - Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect.
 - The nature of the complaint.
 - The action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant (including the date of response).
 - If no action was taken, the reasons why no action was taken.

The record of a complaint will be kept for at least four years after the complaint was made.

The quarry will endeavour, as far as possible, to resolve any disputes arising out of the implementation of the Project Approval with relevant public authorities or landowners. In the instance that an agreeable outcome (by all concerned parties) cannot be reached, the matter will be referred to the Director-General for resolution. If the matter cannot be resolved within 21 days, the Director-General will refer the matter to an Independent Dispute Resolution Process.

3.4 Non-compliance and Corrective Actions

If the results of environmental monitoring (provided in Section 14) identify that impacts generated by the project are greater than the relevant impact assessment criteria, then the Mine Manager will notify the Director-General and affected landowners and tenants, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the relevant criteria.

4. Emergency Response

Response to an emergency is to be in accordance with the *Nowra Brickworks Quarries Mine Safety Plan*, prepared in accordance with the *NSW Mine Health and Safety Act 2004*. Emergency procedures are located in the SCCCR main office.

The following procedures relate to environmental emergencies which are not covered by the quarry's emergency plan and procedures, *i.e.* spills and environmental harm.

4.1 Spills

The principal potential sources of soil or land contamination at the quarry is from spills or leaks of hydrocarbons (fuel, oil, grease, etc). The following pollution control measures will be implemented during the life of the Project:

- ▶ Employees will read the quarry's Environmental Response Plan (attached as Appendix C) for fuel and oil spills, and will refer to the Material Safety Data Sheets (MSDS) located next to the first aid kit located in SCCCR main office.
- ▶ During fuelling, the following will be observed:
 - Fuelling will be undertaken carefully to minimise drips on the ground;
 - Fuelling will be undertaken in a suitable area away from access areas and drainage lines or water courses;
 - Persons undertaking the fuelling will remain present during the entire fuelling operation;
 - If necessary, the emergency shut off switch for plant and machinery is to be used;
 - A spill kit will be kept at or near each fuelling area and on the fuel truck;
 - Spills and dirty absorbent materials will be cleaned up;
 - Fuelling equipment will be inspected for cracks, leaks, corrosion or failure; and
 - Small equipment will be fuelled over a paved or concrete area, away from any stormwater drains or ditches, and a funnel will be used when pouring fuel from a portable can.
- ▶ Any stormwater drains on site will be located and blocked. Spilled fuel will be prevented from reaching drains or waterways.
- ▶ Any spills will be cleaned up thoroughly and promptly. The Dry Method (refer to the Emergency Response Plan attached as Appendix C) will be used for cleaning up fuel spills (diesel or kerosene).
- ▶ If fuels are leaking or have spilled on an impermeable surface, the nearest down gradient drain will be diked or bermed to prevent fluids from flowing. Absorbent material from the spill kit will be applied on the spill area, and after cleaning up the contaminated absorbent material will be swept up, and the berm or dike will be removed from the stormwater drain.

- ▶ If fluids are leaking or have spilled on a permeable surface, the area will be marked and assistance will be sought to clean up.
- ▶ Spills or leaks will never be hosed down.
- ▶ Any spill kit materials will be disposed of in accordance with EPA guidelines.
- ▶ Any spill or discharge of any pollutant will be reported to the Mine Manager. If a spill or leak is of a hazardous substance that exceeds 500 mL, is an unknown substance of any amount, or a spill is too great to control, the NSW Fire Brigade will be called on 000.
- ▶ All applicable employees will be trained in general water pollution prevention and spill response, and a record of the employees trained will be kept.
- ▶ A current copy of the Spill Response Plan will be maintained in the SCCCR main office.

4.2 Notification of Environmental Harm

The EPA will be notified of incidents causing or threatening material harm to the environment as soon as practicable after the event. The definition of material harm is:

- (i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or*
- (ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations)*

Notifications will be made by telephoning the EPA's Pollution Line services on 131 555.

Additional reporting requirements, as required by the EPL (attached as Appendix B), will also be undertaken.

5. Vegetation Removal and Soil Stripping

5.1 Description of Activity

Vegetation removal and soil stripping is required to allow the expansion of the quarry extraction area. Vegetation suitable for commercial timber or firewood and not required for rehabilitation will be harvested and removed from site. Removal of the remaining larger vegetation will be undertaken using a bulldozer. Once felled, logs and branches to be retained for rehabilitation are to be either cut or broken into manageable lengths or coarsely mulched and placed on areas undergoing progressive rehabilitation or stockpiled for later use during rehabilitation. Smaller vegetation will be removed during soil stripping operations.

Top soils will be stripped using a scraper, excavator or bulldozer to a depth of between 180 mm and 250 mm below the surface. Subsoils will be stripped to a depth of between 175 mm and 500 mm below the base of the top soil. Stripped soils will then be either stockpiled or placed directly on areas undergoing progressive rehabilitation.

5.2 Environmental Management and Safeguards

All vegetation removal and soil stripping operations will be undertaken in accordance with the following plans and programs:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix D);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H);
- ▶ Air Quality Management Plan (attached as Appendix I); and
- ▶ Aboriginal Heritage Management Plan (attached as Appendix J).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to any land preparation, vegetation removal or soil stripping operations. In the event of an inconsistency, the plan (as attached) shall prevail.

5.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 5-1 below along with the controls, monitoring and reporting mechanisms that are to be undertaken to mitigate these risks. Further details are provided in subsequent sections.

Table 5-1 Vegetation Removal and Stripping Key Environmental Issues and Risks

Issue	Risk	Controls
Fauna	Death or injury through clearing of hollow-bearing trees	Implementation of environmental safeguards identified below.
Aboriginal objects	Unknown objects may be damaged through the actions of scrapers, excavators and/or bulldozers.	Implementation of environmental safeguards identified below.
Air quality	Dust and particulates may result in health issues or air pollution.	Dust suppression techniques and implementation of the environmental safeguards identified below.
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	Implementation of environmental safeguards identified below.

5.2.2 General Restrictions

The following general restrictions apply to any land preparation, vegetation removal and soil stripping activities undertaken at the quarry:

- ▶ All operations will be limited to the area required for extraction-related activities for the next 12 months. The boundaries will be clearly marked and no additional areas of vegetation or soils will be disturbed or removed prior to the implementation of the Landscape and Biodiversity Management Plan (refer to Appendix H).
- ▶ Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- ▶ Cleared land is to be stripped within 10 days of vegetation clearing occurring or else a temporary vegetative cover need be applied to lower C-factors to 0.1 within 20 days (refer to Appendix E).
- ▶ Native vegetation and soils within the Biodiversity Offset Areas (refer to Figure 16-1 and Appendix L) will not be impacted by any land preparation and vegetation removal activities.
- ▶ Surface water and sediment and erosion controls will be installed prior to or during vegetation removal or soil stripping activities in accordance with the quarry's Erosion and Sediment Control Plan (attached as Appendix E).
- ▶ Where practicable, vegetation is to be cleared during winter months to limit the potential for nesting or roosting fauna to be impacted.
- ▶ All mobile equipment is to be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels is preferential.
- ▶ Progressively install frequency modulated reversing alarms on mobile equipment.

5.2.3 Preparatory Activities

Ecological Conservation

Prior to vegetation removal the following activities are to occur:

1. The footprint of the approved extraction/vegetation removal area is to be surveyed and clearly marked with concrete blocks (approximately 0.5 m³) placed at 50 m intervals and painted to be highly visible.
2. Hollow-bearing trees (including those previously marked) within the clearing area will be inspected by a suitably qualified ecological consultant for nesting or roosting fauna. Any fauna found will be relocated by the consultant to a suitable location in the vicinity of the area to be cleared.
3. In circumstances where the inspection of hollows is not immediately followed by vegetation removal, works will be undertaken to exclude fauna re-entering the hollows.
4. Cage traps will be set in the vicinity of hollow-bearing trees for three consecutive nights prior to clearing of native vegetation. Any trapped animals will be kept in captivity by animal carers for the period of clearing. Animals are then to be released within native vegetation after the completion of clearing activities.
5. Representatives of the Nowra Local Aboriginal Land Council (LALC) and Durgan Consultancy will be contacted prior to vegetation removal and soil stripping operations in the area marked as "Area to be monitored" in Figure 16-2 (refer also to Appendix L).

5.2.4 Operations

Vegetation and Ecological Management

- ▶ Vegetation suitable for commercial timber or firewood and not required for rehabilitation will be harvested and removed from the site.
- ▶ Removal of larger vegetation is to be undertaken by a bulldozer, with the blade positioned just above the ground to minimise soil disturbance.
- ▶ Any clearing of hollow-bearing trees will be conducted during a time that is outside the breeding season for birds and microbats.
- ▶ Vegetation removal and soil stripping will be completed sequentially as listed in the Landscape and Biodiversity Management Plan (attached as Appendix H). This includes the removal of non-hollow-bearing trees first, where practicable, to allow any remaining nesting or roosting animals to leave the area to be disturbed prior to removing hollow-bearing trees.
- ▶ A qualified fauna consultant is to be commissioned and brought on to the site to observe the removal of hollow-bearing trees to rescue any remaining nesting or roosting fauna. The management of rescued animals, either injured or not, will be in accordance with the Landscape and Biodiversity Management Plan (attached as Appendix H).

- ▶ Hollow-bearing trees will be tapped by an excavator prior to removal in an attempt to make resident fauna vacate hollows, trees will then be lowered to the ground and any wildlife found will be managed by a qualified fauna consultant.
- ▶ Once felled, logs and branches to be retained for rehabilitation will be cut or broken into manageable lengths or coarsely mulched and placed on areas undergoing progressive rehabilitation or stockpiled for later use.
- ▶ No vegetation is to be burnt or removed from the site other than that to be used for firewood or commercial timber.
- ▶ No wood piles will be located within 100m of infrastructure to assist in bushfire management.
- ▶ Vegetation stockpiles will be kept manageable to assist in bushfire management.

Erosion and Sediment Control

- ▶ Soils will be placed and stockpiled in accordance with Section 9 (Stockpiling) of this EMS.
- ▶ Works will be planned so that, where practicable, the amount of time that soils are exposed to the forces of erosion is minimised.
- ▶ Sediment fencing (in accordance with the Erosion and Sediment Control Plan in Appendix E) will be installed at the downhill edge of cleared areas and in other areas of potential erosion to retain the coarse sediment fraction.
- ▶ Soils will only be handled when they are moist (not wet, nor dry) to minimise the risk of soil structural decline.

Air Quality

- ▶ Water sprays and water trucks will be utilised in all areas of potential dust lift-off.
- ▶ Soils will be stripped only when they are moist enough to preserve their structure and not cause excessive dust generation.
- ▶ During windy weather, unprotected areas (including haul roads) will be kept moist (not wet) by sprinkling with water to reduce wind erosion (or use an alternative spray-applied wind-erosion control measure).

5.3 Monitoring and Reporting

The Vegetation Removal and Soil Stripping Record Sheet (attached as Appendix K) has been developed to assist with the preparation and submission of the Annual Environmental Management Report (AEMR) and the independent environmental audit required by the Project Approval. This record sheet is to be filled out prior to any vegetation removal. Completed record sheets are to be filed in a suitable location to facilitate the reporting, auditing, and “access to information” requirements specified in the Project Approval.



Any vegetation removal or soil stripping operations within the area marked as “area to be monitored” in Figure 16-2 (refer also to Appendix L) will be monitored by representatives of the Nowra LALC and Durgan Consultancy.

In addition, noise, air, landscape and biodiversity, and erosion and sediment control monitoring and recording (in accordance with Section 14 and 15 of this EMS) is to be undertaken and records kept.

6. Soil Placement and stockpiling (post-stripping)

6.1 Description of Activity

Soils derived from the stripping operations are to either be placed directly on to areas undergoing progressive filling and rehabilitation or stockpiled for later use. Placement and compaction of this material is to be undertaken as described in the SEEC Morse McVey (2007) report

6.2 Environmental Management and Safeguards

All post soil-stripping stockpiling operations are to be undertaken in accordance with the following plans:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix D);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H); and
- ▶ Air Quality Management Plan (attached as Appendix I).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to any soil placement and stockpile operations. In the event of an inconsistency, the plan (as attached) shall prevail.

6.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 6-1 below along with the controls, monitoring and reporting mechanisms that are to be undertaken to mitigate these risks. Further details are described in subsequent sections.

Table 6-1 Soil Placement and Stockpiling Key Environmental Issues and Risks

Issue	Risk/s	Controls
Noise	Complaints from adjacent community	<ul style="list-style-type: none"> ▶ Complaints register and response ▶ Hours of operations restrictions ▶ Use of noise-mitigated mobile and processing equipment ▶ Implementation of environmental safeguards identified below

Issue	Risk/s	Controls
Air quality	Complaints from adjacent community Excessive dust generation Dust and particulates may result in health issues.	<ul style="list-style-type: none"> Utilisation of water sprays, mist sprays and wind sheltering equipment. Implementation of environmental safeguards identified below
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	<ul style="list-style-type: none"> Implementation of environmental safeguards identified below.

6.2.2 General Restrictions

The following general restrictions apply to any post soil-stripping placement and stockpiling operations undertaken at the quarry:

- Native vegetation and soils within the Biodiversity Offset Areas (as shown in Figure 16-1 and Appendix L) will not be impacted by any soil stockpiling activities.
- Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- All mobile equipment is to be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels is preferential.
- Frequency modulated reversing alarms on mobile equipment will be progressively installed.

6.2.3 Operations

Air Quality

- Water sprays and water trucks will be utilised in all areas of potential dust-lift off to minimise dust emissions.
- A maximum speed limit of 10 km/hour is to be maintained within the quarry site.
- Wherever possible, soil is to be placed directly on areas undergoing progressive rehabilitation. The environmental management measures for rehabilitation of soils detailed in Section 13 of this EMS apply.

Erosion and Sediment Control

- In all areas subject to disturbance and requiring permanent vegetative stabilisation, topsoil and subsoil will be replaced to a minimum depth of 250 mm and 200 mm respectively.
- Following placement of subsoil materials, the surface will be left in a loose, rough condition to promote moisture infiltration and the keying-in of the topsoil layer.
- Topsoil will be left in a scarified or ploughed condition once replaced to help moisture infiltration and reduce the risk of soil erosion.

- ▶ Compaction of recently topsoiled areas will be avoided, and barrier fencing will be established if necessary to keep vehicles out.
- ▶ Works will be planned so that, where practicable, the amount of time that soils are exposed to the forces of erosion is minimised.
- ▶ In situations where direct placement of stripped soils is not possible, soils will be stockpiled in accordance with Section 9 of this EMS.
- ▶ Soils will only be handled when they are moist (not wet, nor dry) to minimise the risk of soil structural decline.

6.3 Monitoring and Reporting

Noise, air, landscape and biodiversity, and erosion and sediment control monitoring and reporting (in accordance with Sections 14 and 15 of this EMS) will be undertaken.

7. Drilling and Blasting

7.1 Description of Activity

Drilling activities will be undertaken using a hydraulic drill rig which will drill vertical holes of the same length or slightly greater than the proposed face height (approximately 10 m). The drill rig will be equipped with dust and noise suppression equipment, including dust aprons, dust extraction equipment and sound dampened engine compartments. The drilling pattern will be determined by a suitably qualified and experienced blasting engineer to meet specified blasting criteria.

Blasting is to be undertaken by a suitably qualified and experienced blasting engineer or shot-firer. Typically each blast will break between 12,000 and 24,000 bank cubic metres of shale material. Explosives will continue to be brought to the site on the day of the blast by the blasting operator. No explosives are to be stored on the site.

7.2 Environmental Management and Safeguards

All drilling and blasting operations are to be undertaken in accordance with the Quarry's Noise Monitoring Program/Blast Management Plan (attached as Appendix D). The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to any drilling and blasting operations. In the event of an inconsistency, the plan (as attached) shall prevail.

All drilling and blasting operations are also to be undertaken in accordance with the following plans:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix D); and
- ▶ Air Quality Management Plan (attached as Appendix I).

7.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 7-1 below along with the controls, monitoring and reporting mechanisms that will be undertaken to mitigate these risks. Further details are described in subsequent sections.

Table 7-1 Drilling and Blasting Key Environmental Issues and Risks

Issue	Risk	Controls
Fly-rock	Broken rock could be projected in an unexpected manner towards persons, equipment or buildings.	<ul style="list-style-type: none"> Each blast will be designed to contain all fly-rock within the nominated blast envelope Blasting will be undertaken by appropriately qualified and experienced blasting engineer or shot-firer Implementation of environmental safeguards identified below.
Noise and vibration	Structural damage and community complaints	<ul style="list-style-type: none"> Complaints register and responses Noise and vibrations register Community and neighbour consultation Implementation of environmental safeguards identified below.
Air quality	Dust and particulates	Dust suppression techniques and implementation of the environmental safeguards identified below.

7.2.2 Preparatory Activities for Blasting

Prior to blasting, the following activities will occur:

- Suitable arrangements will be made with land owners or tenants on private land within 200 m of the blast site in order to minimise the risk of flyrock-related impact to life and property. These arrangements will be submitted for approval to the Director-General prior to any blasting.
- Appropriate arrangements with the owners and occupiers of 243 Princes Highway will be arranged.
- The following people will be notified on the working day prior to the blast being initiated:
 - Shoalhaven City Council
 - NSW Police
 - NSW Roads and Traffic Authority
 - The resident of 243 Princes Highway
 - EPA (of the DECCW)
 - The South Coast Correctional Facility
- All mobile equipment is to be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels is preferential.
- Frequency modulated reversing alarms on mobile equipment will be progressively installed.

7.2.3 General Restrictions

- ▶ Standard hours of operations, as specified in the Project Approval (attached as Appendix A) and Section 14.4, will be observed for drilling activities.
- ▶ Blasting hours of operation, as specified in the Project Approval (attached as Appendix A), will be observed as described below:
 - Monday to Friday: 9:00 am to 3:00 pm
 - Saturday, Sunday and Public Holidays: No blasting
 - Note: Only one blast per week is permitted. In the case of documented misfire, a second blast within the week may be carried out.

7.2.4 Operation

Blasting Requirements

- ▶ All drilling and blasting-related activities will be supervised by a suitably qualified and experienced blasting engineer or shot-firer. Blasting is to be designed to:
 - Achieve the required degree of fragmentation
 - Satisfy all environmental criteria (especially noise and vibration, refer to Section 14)
 - Contain all blast flyrock within the nominated blast envelope

Air Quality

- ▶ Dust aprons, dust extraction systems and/or water injections or sprays will be used during drilling operations.
- ▶ All blast holes will be adequately stemmed with aggregates.

7.3 Monitoring and Reporting

The Blast Design Record Sheet (attached as Appendix K) has been developed to assist with the preparation and submission of the Annual AEMR, the Annual Return Documents required by the EPL, and the independent environmental audit required by the Project Approval. This record sheet is to be filled out prior to drilling and blasting.

Completed record sheets are to be stored and filed in a suitable location to facilitate the reporting, auditing, and “access to information” requirements specified in the Project Approval and EPL.

A register of complaints in accordance with Section 3 of this EMS is also to be kept after each blasting event. On the basis of the noise, vibration, and complaints monitoring subsequent blast designs, mitigation measures and operating procedures may need to be modified (if necessary). The register is to be stored in the SCCCR main office in accordance with the EPL and the Community Consultation Strategy (as described in Section 3).

Air monitoring and reporting, in accordance with Section 14 and 15 of this EMS, will be undertaken.

8. Extraction, Importing and Processing

8.1 Description of Activity

Following blasting, fragmented material will be directly loaded into the mobile crushing and processing plant using an excavator. The excavator will then load extracted, recycling and blending materials into the crushing and processing plant in the appropriate proportions to produce quarry products with the required specifications.

The mobile processing plant will be located immediately adjacent to the active extraction area to allow an excavator to directly load extracted, recycling and blending materials in appropriate proportions into one or more primary jaw crushers. A proportion of the crushed material will require further processing and will be stockpiled for use as select fill or other purposes. The remaining crushed material will be transferred to the secondary cone crusher for further crushing and shaping and then a screening plant for final sizing.

Each component of the mobile crushing plant will continue to be equipped with dust and noise suppression equipment to limit the generation of airborne dust and reduce the potential for adverse noise impacts on the surrounding community.

8.2 Environmental Management and Safeguards

All vegetation removal and soil stripping operations are to be undertaken in accordance with the following plans and programs:

- Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- Erosion and Sediment Control Plan (attached as Appendix E); and
- Air Quality Management Plan (attached as Appendix I).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to any land preparation, vegetation removal or soil stripping operations. In the event of an inconsistency, the plan (as attached) shall prevail.

8.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 8-1 below along with the controls, monitoring and reporting mechanisms that are to be undertaken to mitigate these risks. Further details are described in subsequent sections.

Table 8-1 Extraction, Importing and Processing Key Environmental Issues and Risks

Issue	Risk/s	Controls
Noise	Complaints from community	<ul style="list-style-type: none"> Complaints register and response Hours of operations restrictions Use of noise-mitigated mobile and processing equipment Implementation of environmental safeguards identified below
Air quality	Complaints from adjacent community Excessive dust generation Dust and particulates may result in health issues.	<ul style="list-style-type: none"> Utilisation of water sprays, mist sprays and wind sheltering equipment. Implementation of environmental safeguards identified below
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	<ul style="list-style-type: none"> Implementation of environmental safeguards identified below.
Traffic	Complaints from community Excessive dust generation	<ul style="list-style-type: none"> Complaints register and response Hours of operations restrictions Implementation of environmental safeguards identified below.

8.2.2 General Restrictions

The following general restrictions apply to any extraction, importation and processing operations undertaken within the quarry:

- ▶ All activities will be limited to the area required for extraction-related activities for the next 12 months. The boundaries will be clearly marked and no additional areas of vegetation and soils will be disturbed or removed.
- ▶ Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- ▶ All processing operations will be undertaken within the deepest section of the quarry.
- ▶ All mobile and processing equipment will be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels is preferential.
- ▶ Frequency modulated reversing alarms on mobile equipment will be progressively installed.

8.2.3 Operations

Air Quality

A combination of some and/or all of these measures will be used during operation:

- ▶ Water sprays and water trucks will be used in all areas of potential dust-lift off to minimise dust emissions.
- ▶ Efficient mist sprays and wind sheltering equipment will be used on processing equipment.
- ▶ A maximum speed limit of 10 km/hour is to be maintained within the quarry site.
- ▶ A chemical dust lift-off suppression system will be used with mobile processing plants.

Erosion and Sediment Control

- ▶ Quarry products and material to be processing into quarry products will be stockpiled, as far as practicable, within the processing and extraction area. The management measures for stockpiles as detailed in Section 9 of this EMS will be applied.
- ▶ Soils will only be handled when they are moist (neither wet, nor dry) to minimise the risk of soil structural decline.

8.3 Monitoring and Reporting

Noise, air quality and erosion and sediment control monitoring and reporting (in accordance with Section 14 and 15 of this EMS) will also be undertaken.

9. Stockpiling

9.1 Description of Activity

The following materials are likely to be stockpiled:

- ▶ Virgin Excavated Natural Material (VENM) for blending and processing into quarry products
- ▶ VENM, top-soil, subsoil and weathered shale for quarry backfilling operations
- ▶ Blending materials, such as crusher dust and road base, for processing into quarry products
- ▶ Recyclable materials, such as select construction waste, concrete and bitumen for processing and blending into quarry products
- ▶ Quarry products

As far as practicable, all stockpiling will be undertaken within the extraction area.

9.2 Environmental Management and Safeguards

All stockpiling operations will be undertaken in accordance with the following plans:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H); and
- ▶ Air Quality Management Plan (attached as Appendix I).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to and whilst undertaking stockpile. In the event of an inconsistency, the plan (as attached) shall prevail.

9.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 9-1 below along with the controls, monitoring and reporting mechanisms that will be undertaken to mitigate the risks. Further details are described in subsequent sections.

Table 9-1 Stockpiling Key Environmental Issues and Risks

Issue	Risks	Controls
Noise	Complaints from adjacent community	<ul style="list-style-type: none"> Complaints register and response Hours of operations restrictions Use of noise-mitigated mobile equipment Implementation of environmental safeguards identified below.
Air quality	Complaints from adjacent community Excessive dust generation Dust and particulates may result in health issues.	<ul style="list-style-type: none"> Use of water sprays, mist sprays and wind sheltering equipment. Implementation of dust suppression techniques and implementation of the environmental safeguards identified below.
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	Implementation of environmental safeguards identified below.

9.2.2 General Restrictions

The following general restrictions apply to any stockpiling operations undertaken within the quarry:

- Native vegetation and soils within the Biodiversity Offset Areas (refer to Figure 16-1 and Appendix H) will not to be impacted by any stockpiling activities.
- Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- Surface water and sediment and erosion controls will be installed prior to or during soil stockpiling activities in accordance with the *Erosion and Sediment Control Plan* (attached as Appendix E).
- All mobile equipment will be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels is preferred.
- Progressively install frequency modulated reversing alarms on mobile equipment.

9.2.3 Operations

Air Quality

- Water sprays and water trucks will be used in all areas of potential dust-lift off to minimise dust emissions.
- A maximum speed limit of 10 km/hour is to be maintained within the quarry site.

- ▶ Soils will be handled only when they are moist (neither wet, nor dry) to minimise the risk of soil structural decline.

Erosion and Sediment Control

- ▶ Quarry products and material to be processed into quarry products will be stockpiled, as far as practicable, within the processing and extraction area (refer to Section 9).
- ▶ Non-recyclable wastes (e.g. from construction materials) will be extracted and disposed of at a licensed waste facility.
- ▶ Wherever possible, soil and VENM is to be placed directly on areas undergoing progressive rehabilitation. Soil placement procedures outlined in Section 13 of the EMS are to be followed.
- ▶ Topsoil and subsoil will be stockpiled separately and the details of each stockpile recorded appropriately.
- ▶ In situations where direct placement of topsoil is not possible, topsoil will be stockpiled in accordance with the following:
 - Any soil stockpiles will be located at least 2 m from existing vegetation, areas of likely concentrated or high-velocity surface water flows (e.g. creeks, swales, diversion drains etc.), and roads and other hazardous areas such as the margins of the extraction area.
 - Topsoil and subsoil stockpiles will be low (less than 2 m high), flat, elongated mounds with side slopes no steeper than 1(V):2(H) on eastern and southern faces and 1(V):3(H) on western and northern faces. Wherever practicable, top soil stockpiles will be less than 1m high.
 - A sediment fence, approximately 1m from the toe of the downslope side of soil stockpiles is to be erected.
 - Any soil stockpiles anticipated to be in place for more than ten days will be stabilised through the application of mulched or broken vegetation, hydro-seeding, hydro-mulching or equivalent.
 - Any stockpiled soil material is to be utilised for rehabilitation-related operations within six months of stripping and stockpiling.
- ▶ Plan works so that, where practicable, the amount of time that soils are exposed to the forces of erosion is minimised.

9.3 Monitoring and Reporting

Noise, air quality, erosion and sediment control, and landscape and biodiversity management monitoring and reporting (in accordance with Section 14 and 15 of this EMS) will be undertaken.

10. Loading, Dispatch and Transportation

10.1 Description of Activity

Quarry product is to be loaded and dispatched using road registered heavy vehicles. An average of approximately 300,000 tonnes per year, to a maximum of approximately 500,000 tonnes per year, of quarry products will be dispatched from the site.

10.2 Environmental Management and Safeguards

All quarry product loading, dispatch and transportation operations will be undertaken in accordance with the following plans and programs:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E); and
- ▶ Air Quality Management Plan (attached as Appendix I).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to undertaking any loading, dispatch or transportation. In the event of an inconsistency, the plan (as attached) shall prevail.

10.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 10-1 below along with the controls, monitoring and reporting mechanisms that are to be undertaken to mitigate these risks. Further details are described in subsequent sections.

Table 10-1 Loading, Dispatch and Transportation Key Environmental Issues and Risks

Issue	Risk	Controls
Noise	Complaints from adjacent community	<ul style="list-style-type: none"> ▶ Complaints register and response ▶ Hours of operations restrictions ▶ Use of noise-mitigated mobile and processing equipment ▶ Implementation of environmental safeguards identified below
Air quality	Dust and particulates	<ul style="list-style-type: none"> ▶ Dust suppression techniques and implementation of the environmental safeguards identified below.

Issue	Risk	Controls
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	<ul style="list-style-type: none"> Implementation of environmental safeguards identified below.
Traffic	Complaints from community Excessive dust generation	<ul style="list-style-type: none"> Complaints register and response Hours of operations restrictions Implementation of environmental safeguards identified below.

10.2.2 General Restrictions

- ▶ All mobile equipment will be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels is preferred.
- ▶ Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- ▶ Frequency modulated reversing alarms on mobile equipment will be progressively install.

10.2.3 Operations

Air Quality

- ▶ Water sprays and water trucks will be used in all areas of potential dust lift-off.
- ▶ Operation of a wheel-wash facility, to limit tracking of material onto the Princes Highway;
- ▶ A maximum speed limit of 10 km/hour is to be maintained within the quarry site.
- ▶ The creation of minor roads and access tracks will be minimised.

Erosion and Sediment Control

- ▶ The width of haul roads will be limited to that which is safe for heavy vehicle passage to minimise soil erosion hazards.
- ▶ During windy weather, unprotected areas (including haul roads) will be kept moist (not wet) by spraying with water to reduce wind erosion (or use an alternative spray-applied wind-erosion control measure).

10.3 Monitoring and Reporting

Noise, air quality, and erosion and sediment control monitoring and reporting (in accordance with Section 14 and 15 of this EMS) will be undertaken.

11. Importation and use of Virgin Excavated Natural Material (VENM)

11.1 Description of Activity

VENM is to be imported to the site for processing and blending to produce quarry products. VENM not used to make quarry products will also be placed within the 'exhausted' extraction area for rehabilitation purposes and to ultimately establish a final landform which mimics the pre-extraction landform.

11.2 Environmental Management and Safeguards

Importation and use of VENM is to be undertaken in accordance with the following plans:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H); and
- ▶ Air Quality Management Plan (attached as Appendix I).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to the importation of VENM. In the event of an inconsistency, the plan (as attached) shall prevail.

11.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 11-1 below along with the controls, monitoring and reporting mechanisms that will be undertaken to mitigate these risks. Further details are described in subsequent sections.

Table 11-1 Importation and Use of VENM Key Environmental Issues and Risks

Issue	Risk	Controls
Contaminated materials	Importation of contaminated soils to site and materials originating from industrial, commercial, mining or agricultural activities, manufactured chemicals and sulphidic ores or soils.	VENM confirmation, certification and record procedures and implementation of environmental safeguards identified below.
Air quality	Dust and particulates degrading water quality.	Dust suppression techniques and implementation of the environmental safeguards identified below.
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	Implementation of environmental safeguards identified below.

Issue	Risk	Controls
Traffic	Complaints from community Excessive dust generation	<ul style="list-style-type: none"> Complaints register and response Hours of operations restrictions Implementation of environmental safeguards identified below.

11.2.2 General Restrictions

The following general restrictions apply to the importation and use of VENM:

- Surface water and sediment and erosion controls for the importation, stockpiling, and use of VENM will be implemented in accordance with the Quarry's Erosion and Sediment Control Plan (attached as Appendix E).
- Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- The use of VENM as part of the rehabilitation process will be restricted to the use of VENM as defined in the NSW *Protection of the Environment Operations Act 1997*, i.e.:

Natural material (e.g. clay, gravel, sand, soil and rock) that is not mixed with any waste that:

- a) *has been excavated from areas that are not contaminated, as the result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphidic ores or soils, or*
 - b) *consists of excavated natural materials that meet such criteria as may be approved by the EPA"*
- All mobile equipment will be maintained in accordance with the manufacturer's specifications. The selection of equipment with lower sound power levels over higher sound power levels will be preferred.
 - Frequency modulated reversing alarms on mobile equipment will be progressively install.

11.2.3 Certificate and Receipt Procedures

- All imported VENM will be certified at its source and certification verified by the Mine Manager (or delegated authority) on receipt in accordance with relevant guidelines current at the time of VENM importation. This is likely to include a visual inspection for signs of contamination and the presence of any other waste material.
- A VENM certification sheet (referred to in Section 11.3 and attached as Appendix K) will be prepared, dated and signed by the person certifying the material.
- The history of the site from which the material is to be excavated will be determined and recorded on the VENM certificate sheet. The following procedures will be implemented depending on the previous land uses (Corkery and City Plan Services 2009):

- Where the site has been used for commercial, industrial, mining or agricultural purposes at any time, or if the site contains fill material, or there is potential for chemical contamination from past or current uses, a testing regime will be implemented to establish that the material sourced from the site can be classified as VENM.
- Where the site is, and has always been, used for residential or agricultural purposes then excavated material from the site, with the exception of surface layers that may be contaminated with physical debris, vegetation, chemicals, fertilisers or asbestos, will be presumed to be classified as VENM.
- ▶ Upon arrival, the Mine Manager (or delegated authority) will require the drivers delivering the VENM material to complete and sign a VENM record sheet. The Mine Manager (or delegated authority) will direct the driver to the receival where the load will be inspected to ensure it corresponds with the description of the material included on the certificate sheet before it is accepted.
- ▶ Any unsuitable loads (*i.e.* loads that do not meet the description of VENM) will not be accepted and the supplier/driver will be advised to deliver the load to a licensed waste facility.

11.2.4 VENM Stockpiling

- ▶ When VENM is being processed, it will be placed in the stockpiling and processing area. The environmental management measures for stockpiles detailed in Section 9 of this EMS will be applied.
- ▶ All surface waters will be diverted into the water storage or sump within the extraction area.

11.2.5 VENM Placement and Compaction

When VENM is to be used to backfill the quarry, the following procedures will be undertaken:

- ▶ Compaction of VENM will not occur within approximately 3.5 m of the proposed final landform (refer to Figure 16-4 and Appendix L).
- ▶ Between approximately 3.5 m and 1.0 m of the final landform VENM comprising weathered material is to be placed without compaction.
- ▶ Between 1.0 and 0.5 below the final landform, weathered shale material will be placed without compaction.
- ▶ Sub-soil and top-soil will be placed over the VENM/weathered shale in accordance with the Landscape and Biodiversity Management Plan (attached as Appendix H).
- ▶ Soils will be handled only when they are moist (neither wet, nor dry) to minimise the risk of soil structural decline.



11.2.6 VENM On-site Operations

- ▶ Water sprays and water trucks will be used in all areas of potential dust lift-off to minimise potential dust emissions.
- ▶ A maximum speed limit of 10 km/hour will be maintained within the quarry site.
- ▶ The width of haul roads will be limited to that which is safe for heavy vehicle passage to minimise soil erosion hazards.

11.3 Monitoring and Reporting

During all VENM importation operations, records will be kept for each site where imported VENM is to be sourced and for each load of material received. VENM Certificate Record Sheets templates are provided in Appendix K to record each delivery of VENM (and the necessary information). Record sheets must be filled out at the source of VENM for transport to the quarry, and at the quarry for the receiving of VENM. Completed record sheets are to be stored and filed in a suitable location to facilitate the reporting, auditing, and “access to information” requirements specified in the Project Approval and EPL.

Noise, air quality, landscape and biodiversity, and erosion and sediment control monitoring and reporting (in accordance with Section 14 and 15 of this EMS) will be undertaken.

12. Soil and Water Management and Use

12.1 Description of Activity

The surface waters within the quarry are controlled by the perimeter bunds and site topography. Surface waters from the undisturbed areas are diverted to Nowra Creek.

In the more disturbed sections of the quarry site (extraction and other operational areas), surface waters, and groundwater seepage within the extraction area, will drain into a sump within the active extraction area or in the water storage facility. This water, which is not permitted to flow directly off-site, will be used for dust suppression and rehabilitation. Irrigation areas will also be established within the undisturbed and rehabilitation areas to remove excess water within the water storage facility and to facilitate rehabilitation processes.

12.2 Environmental Management and Safeguards

The management of soils and water, and the use of surface and groundwater is to be undertaken in accordance with the following plans:

- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Surface Water and Groundwater Monitoring and Response Plan (attached as Appendix F); and
- ▶ Site Water Balance Report (attached as Appendix G).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed for quarry soil and water management and use and will be reviewed regularly. In the event of an inconsistency, the plan (as attached) shall prevail.

12.2.1 Key Environmental Issues and Risks

The key issues and risks related to this activity are listed in Table 12-1 below along with the controls, monitoring and reporting mechanisms that will be undertaken to mitigate the risks. Further details are described in subsequent sections.

Table 12-1 Soil and Water Management and Use Key Environmental Issues and Risks

Issue	Risk	Controls
Groundwater	Extraction operations intercept aquifer.	Water diversion into sump and water storage facility to be used for irrigation or for extraction-related purposes. Obtain Aquifer Interference Approval and Water Access Licence from the NSW Office of Water (refer to Section 2 of this EMS).

Issue	Risk	Controls
Surface water	Discharge of sediment laden water into Nowra creek.	Surface water diversion structures, sediment containment structures, water storage areas, irrigation systems implementation of the environmental safeguards identified below.
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	Implementation of environmental safeguards identified below.

12.2.2 General Requirements

The following general restrictions apply to the management and use of surface and groundwater:

- ▶ Contractors will ensure that all soil and water management works as instructed in this document and following the guidelines in the *Guideline Soils and Construction Managing Urban Stormwater* (Landcom 2004) as described in the attached Erosion and Sediment Control Plan (Appendix E).
- ▶ Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- ▶ All workers will be informed of their responsibility for minimising the potential for soil erosion and pollution to downstream areas.
- ▶ Ongoing changes will be made to this EMS and Erosion and Sediment Control Plan (Appendix E) as works proceed, taking into consideration the area of disturbance at any one time.
- ▶ All erosion and sediment control works will remain in place until lands are rehabilitated and successfully stabilised.
- ▶ Surface water and sediment and erosion controls will be installed prior to or during vegetation removal or soil stripping activities in accordance with the Erosion and Sediment Control Plan (Appendix E).

12.2.3 Erosion and Sediment Control

The following erosion and sediment control measures will be implemented during the life of the Project:

- ▶ The soil erosion hazard on the site will be kept as low as practical by minimising the overall area of disturbance. This will be achieved by the following.
 - Works will be staged so that only lands to be quarried in the following 12 months are cleared and stripped.
 - Access will be limited to minimise the area of disturbance and limit the amount of land requiring regular applications of water for dust-control.

- The width of the haul roads will be limited to that which is safe for heavy vehicle passage.
- Barrier fencing (note that this can simply be tape wound around star pickets) will be established to delineate no-go areas (i.e. areas that are outside of the regular works zone at that time) and minimise the risk of accidental entry.
- ▶ Works will be planned so that, where practicable, the amount of time that soils are exposed to the forces of erosion is minimised.
- ▶ Stockpiles will be constructed and managed according to Section 9 of this EMS.
- ▶ Lands cleared for the following 12 months of quarrying operations will be stripped within 10 days of vegetation clearing occurring or else a temporary cover will be applied to lower C-factors to 0.1 within 20 days (refer to Table 1 of the Erosion and Sediment Control Plan (Appendix E)). Measures to ensure that the C-factor is not exceeded are provided in the Erosion and Sediment Control Plan (Appendix E).
- ▶ During windy weather, unprotected areas (including haul roads) will be kept moist (not wet) by sprinkling with water to reduce wind erosion (or use an alternative spray-applied wind-erosion control measure).
- ▶ Soils will be handled only when they are moist (neither wet, nor dry) to minimise the risk of soil structural decline.
- ▶ Sediment fencing will be installed along the toe of any newly formed perimeter bunds, at the downhill edge of cleared areas and in other areas of potential erosion to retain the coarse sediment fraction.
- ▶ Areas of localised soil erosion will be identified and appropriate preventive measures implemented, as outlined in the Erosion and Sediment Control Plan (Appendix E).
- ▶ Any areas of localised poor drainage will be identified and appropriate remedial action taken, as outlined in the Erosion and Sediment Control Plan (Appendix E).
- ▶ Sediment removed from any trapping device will be disposed of within the area of active backfill within the Extraction Area.
- ▶ Waste receptacles will be emptied as necessary. Non-processed wastes will be disposed of at an approved facility.

12.2.4 Water Management

The following water management measures will be implemented during the life of the Project.

- ▶ Runoff from the undisturbed areas in the south of the site (mostly “clean”) will be diverted into local watercourses with a minimum of treatment.
- ▶ Potentially sediment-laden runoff from cleared areas (i.e. those lands to be quarried in the following 12 months) is to be diverted into sediment retention structures. Note that sediment basin(s) can be sited in the quarry pit if so desired and runoff directed into it. Sediment

retention structure and sediment basin(s) will be constructed in accordance with the Erosion and Sediment Control Plan (Appendix E).

- ▶ Basic diversion drains, earth bank diversions, temporary earth diversion drains, berms and pipes will be installed as required, and in accordance with the Erosion and Sediment Control Plan (Appendix E)
- ▶ Water for dust suppression and processing will be drawn primarily from the storage pond (i.e. when sufficient volume is available).

12.3 Monitoring and Reporting

Erosion and sediment control, and surface water and groundwater monitoring and reporting (in accordance with Section 14 and 15 of this EMS) will be undertaken.

The NSW Office of Water (NOW) has requested that annual reports also be referred to NOW for consideration and review.

13. Rehabilitation

13.1 Description of Activity

Areas no longer required for extraction-related activities will be rehabilitated in order to minimise the risk of erosion and sedimentation on the environment surrounding the Project Site. Short term rehabilitation activities will include the stabilisation of all earthworks, drainage lines and disturbed areas.

Low maintenance, stable and safe landform that mimics the pre-extraction landform will be progressively applied as part of longer term rehabilitation objectives. These works will include the re-establishment of land capabilities through the establishment of vegetation communities similar to communities in relatively undisturbed areas adjacent to and surrounding the Project Site.

13.2 Environmental Management and Safeguards

All vegetation removal and soil stripping operations will be undertaken in accordance with the following plans and programs:

- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H); and
- ▶ Air Quality Management Plan (attached as Appendix I).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and prior to any land preparation, vegetation removal and soil stripping. In the event of an inconsistency, the plan (as attached) shall prevail.

Table 13-1 Rehabilitation Key Environmental Issues and Risks

Issue	Risk	Controls
Surface water	Discharge of sediment laden water into Nowra creek.	Surface water diversion structures, sediment containment structures, water storage areas, irrigation systems implementation of the environmental safeguards identified below.
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	Implementation of environmental safeguards identified below.
Weed incursion	Introduction and/or spread of weeds.	Implementation of environmental safeguards identified below.

Issue	Risk	Controls
Contaminated materials	Importation of contaminated soils to site and materials originating from industrial, commercial, mining or agricultural activities, manufactured chemicals and sulphidic ores or soils.	VENM confirmation, certification and record procedures and implementation of environmental safeguards identified below.
Air quality	Dust and particulates degrading water quality.	Dust suppression techniques and implementation of the environmental safeguards identified below.
Erosion and sedimentation	Pollution of Nowra Creek degrading water quality.	Implementation of environmental safeguards identified below.
Traffic	Complaints from community Excessive dust generation	<ul style="list-style-type: none"> Complaints register and response Hours of operations restrictions Implementation of environmental safeguards identified below.

13.2.1 General Requirements

- Standard hours of operations, as specified in the Project Approval and Section 14.4, will be observed.
- Progressively rehabilitate disturbed areas as works are completed. Sediment control structures will remain in place until rehabilitated lands have successfully stabilised and will be removed at the end of the quarry's operation.
- Clearly visible barriers will be installed to limit access to the rehabilitation areas.
- Rehabilitation works to take place sequentially south of the water storage facility will be undertaken in accordance with the Landscape and Biodiversity Management Plan (attached as Appendix H).
- The control of weeds and pests will be undertaken in accordance with the Landscape and Biodiversity Management Plan (attached as Appendix H).

13.2.2 Operations

Placement of Soils

- Soils will be handled only when they are moist (neither wet, nor dry) to minimise the risk of soil structural decline.
- In all areas subject to disturbance and requiring permanent vegetative stabilisation, topsoil and subsoil will be replaced to a minimum depth of 250 mm and 200 mm respectively, following the completion of placement activities and the constructed landform.
- Following placement of subsoil materials, the surface will be left in a loose, rough condition to promote moisture infiltration and the keying-in of topsoil layer.

- ▶ Topsoil will be left in a scarified or ploughed condition once replaced to help moisture infiltration and reduce the risk of soil erosion.
- ▶ Compaction of recently topsoiled areas will be avoided, and barrier fencing will be established if necessary to keep vehicles out.
- ▶ Final landscaping will be undertaken as soon as possible and within 15 working days from placement of topsoil in a particular area. This will include primary revegetation/mulching to provide a quick, temporary cover before a more permanent cover of native vegetation is established. The final contours will follow closely to those presented in Figure 16-4.

Revegetation

- ▶ Seed for use during final revegetation operations will be collected in the vicinity, generally during summer and autumn. Collected seed will be broadcast over each area to be revegetated, generally during autumn.
- ▶ A temporary cover crop of suitable annual cereal species may be used on areas being revegetated with native species to give natives time to establish and help out-compete weeds. This will be used in conjunction with native mulch (stockpiled from clearing activities in the south of the site) to allow diversion of surface waters away from the extraction area.
- ▶ Selection of vegetation for direct planting and seeding will be in accordance with the Landscape and Biodiversity Management Plan (attached as Appendix H). This is particularly in reference to progressive rehabilitation of bunds, existing storage piles, future storage piles, and final site restoration.
- ▶ Tube stock may be planted to supplement direct seeding and natural revegetation.
- ▶ Species used during final revegetation will be a mixture of indigenous lower, mid and upper storey species.
- ▶ Supplementary planting and inoculation of native species will be undertaken if required (i.e. if the soil seed store is not adequate to re-establish native vegetation).
- ▶ Any areas of concentrated surface water flow will be stabilised with a suitable grass species (not Kikuyu) capable of withstanding concentrated flows. Reinforced turf is recommended for post-construction (i.e. final stabilisation) activities where the flow velocity will not exceed 1.8 m/s in the 100-year ARI storm event.
- ▶ Areas not satisfactorily revegetated will be investigated to determine the reason for failure. Appropriate remedial action, including replacing any lost topsoil and re-sowing the site will then be undertaken.
- ▶ Revegetation areas will be watered regularly until an effective cover has properly established and plants are growing vigorously. Extensive watering will be required to assist in the establishment of vegetation in rehabilitation areas if rainfall is insufficient to promote germination and growth. Adequate fertilising will also be maintained in revegetated areas.

Management of Remnant Vegetation

- ▶ The stand of mature vegetation in the north-western section of ML6322 adjacent to Nowra Creek will be avoided. Earthen bunds will not be piled against the trunks of mature trees and the areas of native vegetation to be cleared will be clearly marked.
- ▶ The Southern Biodiversity Offset Area will be managed for at least the term of the lease of the land for the purposes of nature conservation and enhancement of the biodiversity values of the land. Specific biodiversity management measures to be implemented are provided in the Landscape and Biodiversity Management Plan (attached as Appendix H).
- ▶ To assist in the mitigation of bushfires, the siting of all fixed infrastructure (weighbridge and office) is to be more than 70 m from the boundary of mature vegetation.

Reducing Visual Impacts

- ▶ The existing perimeter bund along the eastern, southern and western boundaries of the Project Site is to be retained and enhanced. The existing vegetated buffer within the Nowra Creek riparian zone will also be retained and enhanced to limit views of the Project Site from the South Coast Correctional Facility.
- ▶ The existing line of mature trees adjacent to the eastern Project Site boundary will be retained and enhanced, where appropriate. Additional planting of tubestock may be undertaken to augment natural revegetation. Soil from bunding is not to be placed against the trunks of trees.
- ▶ A high standard of housekeeping to achieve a visually attractive site is to be adopted. The Project Site is to be kept clean, tidy and rubbish free at all times.

Air Quality

- ▶ Water sprays and water trucks will be used in all areas of potential dust lift-off.

13.3 Monitoring and Reporting

Noise, air, landscape and biodiversity, and erosion and sediment control monitoring and recording (in accordance with Section 14 and 15 of this EMS) is to be undertaken and records kept.

14. Environmental Monitoring

14.1 Overview

This chapter addresses the environmental monitoring requirements for the quarry, which have been outlined in the following:

- Environmental Assessment (Corkery and City Plan Services 2009);
- Project Approval (Appendix A);
- Environment Licences and Approvals (Appendix B);
- Quarry's Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- Erosion and Sediment Control Plan (Appendix E);
- Surface Water and Groundwater Monitoring and Response Plan (Appendix F);
- Landscape and Biodiversity Management Plan (Appendix H);
- Air Quality Management Plan (Appendix I); and
- Aboriginal Heritage Management Plan (Appendix J).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and whilst undertaking environmental reporting activities. In the event of an inconsistency, the plan (as attached) shall prevail.

14.2 Record Sheets

Table 14-1 outlines the record sheets which will be completed when required (as indicated).

Table 14-1 Summary of Record Sheets

Record Sheet	When to be used	Where to be stored
Vegetation Removal and Soil Stripping Record Sheet	Every vegetation removal and soil stripping operation	Filed in a suitable location
Blast Design Record Sheet	Every drilling and blasting operation	Filed in a suitable location
VENM Source Certification Record Sheet	Each load retrieved at the VENM source.	Filed in a suitable location
VENM Receiving Certification Record Sheet	Each load of material received	Filed in a suitable location

The completion of these record sheets will assist with the preparation and submission of the AEMR and the independent environmental audit required by the Project Approval. Copies of record sheets are provided in Appendix K.

14.3 Blasting Monitoring Criteria and Levels

14.3.1 Methodology

Blasting is to be designed to:

- ▶ Achieve the required degree of fragmentation;
- ▶ Satisfy all environmental criteria (especially noise and vibration, see below); and
- ▶ Contain all blast flyrock within the nominated blast envelope.

Blast emissions will be quantified using a portable blast emissions monitor (measurement of airblast and vibration) (refer to Appendix C), which will be positioned at the nearest potentially affected residences and other blast emission sensitive receivers to the plant operations as identified in the Project Approval. Blast monitoring instrumentation will be employed to meet the primary specifications presented in the Noise Monitoring Program/Blast management Plan (Appendix C).

The Blast Design Record Sheet (attached as Appendix K) is to be filled in for individual blast events.

14.3.2 Location and Frequency

A portable blast emissions monitor (to measure air blast and vibration) will be positioned at the following receivers (with reference to Table 1, Schedule 3 of the Project Approval) (refer to Appendix D and Figure 16-3 of Appendix L):

- a) At the South Coast Correctional Facility (Location 5); and
- b) At Location 1,2 or 4, depending upon which is closest to the blast; and
- c) At the nearest commercial premises (Commercial Premises A in Appendix 3 of the Project Approval); and
- d) At the nearest residence, if this residence is closer to the blast location than those identified in b).

14.3.3 Specific Personnel

All blasting-related activities will be supervised by a suitably qualified and experienced blasting engineer or shot-firer.

14.3.4 Performance Targets

Airblast overpressure levels and ground vibration level from blasting should not exceed the criteria in Table 14-2 and Table 14-3, respectively.

Table 14-2 Airblast overpressure impact assessment criteria

Receiver	Airblast overpressure level (dB(Lin Peak))	Allowable exceedances
Residential	115	5% of the total number of blasts in any 12 month period
South Coast Correctional Facility	120	0%
Commercial	125	0%

Table 14-3 Ground Vibration Impact Assessment Criteria

Receiver	Peak particle velocity (mm/s)	Allowable exceedances
Residential	5	5% of the total number of blasts in any 12 month period
South Coast Correctional Facility	10	0%
Commercial	25	0%

14.4 Noise Monitoring

14.4.1 Methodology

Intrusive noise emissions from quarrying, processing and transportation operations will be monitored by operator-attended noise measurements and recordings. The maximum (LA_{max}) and the average ($LA_{eq(15minute)}$) intrusive noise levels from quarrying and processing operations will be quantified and characterised over a 15 minute measurement period, as well as the overall levels of ambient noise.

During the attended noise measures, the operator will record any significant quarry generated noise sources and collect information regarding the operating equipment and machinery, as well as obtaining copies of the relevant fixed plant and mobile quarrying equipment operating shift logs.

14.4.2 Location and Frequency

Noise measurements will be carried out at the closest monitoring location identified in Table 14-4.

Intrusive noise levels and ambient noise will be monitored at the start of operations. Noise measurements will be conducted annually after all components of the project are operating. Noise monitoring may be discontinued if compliance with the nominated criteria is demonstrated at all four monitoring locations on three consecutive noise surveys.

14.4.3 Performance Targets

Standard hours of operation, as specified in the Project Approval, will apply, *i.e.*:

Monday to Friday: 7:00 am to 6.00 pm

Saturday: 7:00 am to 4:00 pm

Sunday and Public Holidays: No works

Note: Maintenance activities may be conducted outside weekday hours provided that the activities are not audible at any privately-owned residence, or until 6:00 pm on Saturdays. This is subject to the approval of the Mine Manager.

In accordance with the Project Approval, Noise emissions are not to exceed the criteria in Table 14-4.

Table 14-4 Operational Noise Impact Assessment Criteria

Location and Locality	Day L_{Aeq} (15 min) (dBA)	Evening L_{Aeq} (15min) (dBA)	Night L_{Aeq} (15 min) (dBA)
1 - 80 Links Road	39	35	35
2 - 371 Old Southern Road	45	35	35
3 - 243 Princes Highway	49	38	38
4 - South Coast Correctional Facility	51	37	37

14.5 Meteorological Monitoring

14.5.1 Methodology

To assist in noise monitoring, the automatic weather station will be programmed to continuously record the meteorological parameters in Table 14-5.

Table 14-5 Meteorological Measurement Parameters

Measured Parameter	Unit	Sample Interval
Mean wind speed	km/hr (or m/s)	15 minute
Mean wind direction	Degrees	15 minute
Sigma-theta	-	15 minute
Aggregate rainfall	mm	15 minute
Mean air temperature	°C	15 minute
Mean relative humidity	%RH	15 minute

14.5.2 Location and Frequency

The weather station is to be located on-site. Records will be taken every 15 minutes.

14.5.3 Performance Targets

The weather station is to be configured with an alarm and/or telemetry notification system to advise the Mine Manager when winds exceed 8 m/s.

14.6 Air Quality Monitoring

14.6.1 Methodology

Air quality is to be monitored through:

- ▶ Dust deposition monitoring using Dust Deposition Gauges (DDGs)
- ▶ Total Suspended Particulate (TSP) monitoring using High Volume Air Sampler (HVAS)
- ▶ Particulate Matter (PM₁₀) monitoring using HVAS fitted with size selective inlet

Monitoring is to be carried out in accordance with the NSW DECCW document *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* and the Quarry's Air Quality Monitoring Program (attached as Appendix I).

14.6.2 Location and Frequency

Air quality monitoring locations are shown in Figure 16-3 of Appendix L.

Dust Deposition Gauges will be exposed for 30 days (+/- 2 days) to insoluble solids and ash residues. HVAS monitoring of TSP and PM₁₀ will be conducted on a one-day-in-six cycle for a period of at least one year and at maximum quarry throughput.

14.6.3 Performance Targets

Standard hours of operation, as specified in the Project Approval, will apply, *i.e.*:

Monday to Friday: 7:00 am to 6.00 pm

Saturday: 7:00 am to 4:00 pm

Sunday and Public Holidays: No works

Note: Maintenance activities may be conducted outside weekday hours provided that the activities are not audible at any privately-owned residence, or until 6:00 pm on Saturdays. This is subject to the approval of the Mine Manager.

Deposited dust levels should not exceed the maximum increase in deposited dust level as illustrated in Table 14-6. PM₁₀ levels should not exceed the 24-hour PM₁₀ criteria (Table 14-7) attributable to the Nowra Brickworks Quarry occur during this period. Long term impact assessment criteria for TSP matter and particulate matter should not exceed the annual criteria in Table 14-8.

Table 14-6 Long term impact assessment criterion for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	annual	2 g/m ² /month	4 g/m ² /month

Table 14-7 Short term impact assessment criterion for particulate matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Table 14-8 Long term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
TSP matter	Annual	90 µg/m ³
Particulate matter < µm (PM ₁₀)	Annual	30 µg/m ³

14.7 Erosion and Sediment Control Monitoring

14.7.1 Methodology

During the Erosion and Sediment Control Monitoring, observation of the following will be noted:

- ▶ Removal of spilled soil or other materials from near hazard areas;
- ▶ Removal of trapped sediment from sediment fences;
- ▶ The stability of all sediment fences;
- ▶ Whether barrier fencing is maintained and exclusion zones are being observed by all site workers and contractors;
- ▶ Whether progressive and prompt rehabilitation of lands has effectively reduced the erosion hazard (and initiate upgrading or repair as appropriate);
- ▶ Whether additional erosion and/or sediment control works are necessary to ensure the desired water control is achieved, i.e. make ongoing changes to the Surface Water Management Plan; and
- ▶ Whether erosion and sediment control measures are in a functioning condition until such time as all earthwork activities are complete and the site is rehabilitated.

A rain gauge will be installed at the site and is to be monitored by the Mine Manager to determine the severity of any rain events.

All basin outlets will be checked for stability, as well as the operation of all pumps.

14.7.2 Location and Frequency

An internal auditing program to monitor erosion and sediment controls is to undertaken at the site. The Mine Manager will inspect the site at least fortnightly and maintain a log of inspections.

14.8 Landscape and Biodiversity Monitoring

14.8.1 Methodology

Biodiversity Offset area monitoring of the Northern and Southern Biodiversity Offset areas will be undertaken, and will involve the observation of any negative impacts on these sites, together with photos taken at permanent photo points, which will be included in the AEMR.

Photos from photographic reference points will also be taken to document activities within the Project Site, including rehabilitation progress.

Areas undergoing rehabilitation will be monitored to determine the success or otherwise of the management, mitigation and ameliorative measures and the rehabilitation programs.

The annual weed inspection will enable weed control activities to be planned and implemented for the following 12 months.

Routine records are to be maintained for following activities:

- Species of weeds treated and the method and timing of control;
- Chemical and quantity used;
- Species of seed collected and timing of collection; and
- Species, quantities, methods and location of revegetation programs.

A Vegetation Removal and Soil Stripping Record Sheet (attached as Appendix K) will be filled out prior to any vegetation removal and soil stripping events.

VENM Certificate Record Sheets (attached as Appendix K) will be filled out at VENM source and receipt.

14.8.2 Location and Frequency

The following landscape and biodiversity monitoring will be implemented:

- Biodiversity Offset area monitoring on an annual basis for the Northern and Southern Biodiversity Offset areas;
- Rehabilitation areas will be monitored on a six month basis;
- Documentation of photographs from a set of photographic reference points will be taken on a six month basis within the Project Site, including rehabilitation progress; and
- Annual weed inspection within the operational area and biodiversity offset areas.

14.8.3 Specific Personnel

As part of Biodiversity Offset area monitoring, the Southern Biodiversity Offset area is to be monitored by the operators of the Nowra Correction Facility.

14.9 Aboriginal Heritage Monitoring

14.9.1 Methodology

If any Aboriginal relics are located the following procedures are to be implemented:

- STEP 1: Stop all earth disturbing works
- STEP 2: Create buffer of 20m x 20m around the relic. No unauthorised entry of earth disturbance is to be permitted within the buffer zone
- STEP 3: Commission an archaeologist to assess the discovery and obtain necessary permits (to destroy, damage or move)

If an Aboriginal object or Aboriginal place is likely to be destroyed, damaged or defaced, an Aboriginal Heritage Impact Permit (AHIP) will need to be applied for under Section 90 of the *NPWS Act*.

14.9.2 Location and Frequency

Aboriginal heritage monitoring is required for every event where vegetation removal or soil stripping operations occur within the area marked as “area to be monitored” in Figure 16-2 (refer also to Appendix L).

14.9.3 Specific Personnel

Representatives of the Nowra LALC and Durgan Consultancy will be required to be present during vegetation removal or soil stripping operations within the area marked as “area to be monitored”.

14.10 Surface Water Monitoring

14.10.1 Methodology

Five locations (S1, S4, C1, C2 and C10) are the location of on-going monitoring and are shown in Figure 16-3 of Appendix L. Further sampling sites will be required within the new extraction areas (similar to the current extraction area sites S1 and S2) as the quarrying activities progress towards the southern boundary of the Project Site (Stage 5 of the project).

Five campaigns will be completed annually after significant rainfall events (i.e. 50 mm or more over 5 days or less) spread uniformly throughout the year.

14.10.2 Location and Frequency

Surface Water Monitoring is required to determine if the quarrying activities are causing possible water quality changes over time. All sampling campaigns will be conducted and reported in accordance with protocols discussed in ANZECC & ARMCANZ (2000).

At all locations, field water quality tests for pH, EC, DO, ORP and temperature will be completed. Laboratory testing and analysis of samples obtained from all locations will also be completed, and analytes will include pH, EC, TSS, major cations and anions, TKN, NO_x nitrogen, ammonia nitrogen, Total-P, Reactive P, and metalloids. A list of the analytes to be monitored and tests as part of a long term monitoring framework will be determined after review of baseline data collected over the initial 12-month period.

Water samples collected from the piezometers will be stored in de-contaminated plastic bottles (charged with appropriate preservatives when required) supplied by a NATA-accredited testing laboratory. The collected samples will be stored at 4°C at all times prior to dispatch to a NATA-accredited laboratory for analysis.

14.10.3 Performance Targets

Trigger levels have been assigned, which when exceeded will indicate potential impact to the water quality of Nowra Creek, and are outlined in Table 14-9. Actions and follow-up actions, as outlined in the Surface Water and Groundwater Monitoring and Response Plan (Appendix F), will be required when trigger levels are exceeded.

Table 14-9 Trigger Levels for Surface Water Quality

Indicator	Trigger Levels
pH	A 'significant' decrease i.e. pH < 6.5 or a change of 1 pH unit is observed over the baseline data
EC	An increase of 20% or more than that observed in the background monitoring site (C1)
Cation/anion concentrations	An increase of 20% or more than that observed in the background monitoring site (C1)

Indicator	Trigger Levels
Nitrate nitrogen	0.7 mg/L
Ammonia nitrogen	0.9 mg/L
Total phosphorus	0.05 mg/L
Arsenic (III form)	0.94 mg/L
Arsenic (V form)	0.42 mg/L
Aluminium	0.080 mg/L
Zinc	0.015 mg/L
Dissolved iron	Insufficient data to set a guideline value based on health conditions

* Derived from ANZECC & ARMICANZ (2000) for the protection of 90% of all freshwater species in slightly disturbed lowland rivers of south-east Australia. Where baseline data for certain assessment indicator values are already higher than the ANZECC/ARMICANZ (2000) values it will be more appropriate to use stable (averaged over a 12-month period) baseline values as background or control values for comparison purposes.

14.11 Nowra Creek Health Monitoring

14.11.1 Methodology

Photographs of the creek section adjacent to the Project Site (between Sampling Sites C1 and C2 - Figure 16-3 of Appendix L) will be taken and kept as records of the visual inspections. These photographs will be used to monitor any changes that occur with time in Nowra Creek, and will be used to deduce if the observed changes relate to quarrying activities at the Site. Any evidence of changes in Nowra Creek will be investigated.

The following Nowra Creek health indicators will be observed:

- ▮ Colour and appearance of water
- ▮ Water surface condition, water flow and level
- ▮ Presence of odour or frothing
- ▮ Presence of floating debris or grease
- ▮ Presence of oily films on surface or on shoreline
- ▮ Presence of nuisance organisms (e.g. macrophytes, Phytoplankton scums, algal mats)
- ▮ Appearance of sediment plumes
- ▮ Evidence of erosion and scouring
- ▮ Loss of vegetation
- ▮ Channel width and depth

14.11.2 Location and Frequency

Visual inspections of the Nowra Creek will be undertaken regularly. These inspections will be conducted during and after rainfall events exceeding 50 mm over 5 days or less.

14.11.3 Specific Personnel

A qualified consultant will be contracted by Nowra Brickworks Quarry to investigate if the changes have arisen from the quarrying activities at the site, and will propose remedial and mitigation measures as appropriate.

14.12 Groundwater Monitoring

A number of groundwater monitoring programs are required, as follows:

- ▶ Groundwater level monitoring
- ▶ Groundwater rockface seepage monitoring
- ▶ Groundwater quality monitoring
- ▶ Groundwater inflow into the extraction area

14.12.1 Methodology

Each sampling campaign is to be conducted and reported in accordance with protocols laid down in National Water Quality Management Strategy, No 7, *Australian Guidelines for Water Quality Monitoring and Reporting* (ANZECC & ARMCANZ, 2000); NSW EPA Guidelines for Solid Waste Landfills, 1996).

Groundwater level monitoring

Monitoring of water level changes over time is required to assist in determining if the proposed quarry operations are impacting on groundwater level. During monitoring, standing water level, ambient temperature, atmospheric pressure and rainfall will be obtained.

Groundwater rockface seepage monitoring

Inspection of groundwater seepage from rockfaces is required.

Groundwater quality monitoring

Groundwater quality monitoring is required to determine if quarrying activities are impacting on groundwater quality over time.

Field water quality tests for pH, EC, DO, ORP and temperature will be completed. Laboratory testing and analysis of samples obtained will also be completed and parameters will include pH, EC, TDS, alkalinity, major cations and anions, TKN, NO_x-nitrogen, ammonia-nitrogen, Total-P, Reactive P, and metals. A list of the analytes to be monitored and tests to be conducted in the long term monitoring framework will be determined after review of baseline data collected over the initial 12-month monitoring period.

Water samples collected from the piezometers will be stored in de-contaminated plastic bottles (charged with appropriate preservatives when required) supplied by a NATA accredited testing laboratory. All samples will be stored at 4°C at all times prior to and during transport to a NATA-accredited laboratory for analysis.

Groundwater inflow into the extraction area

Water balance calculations using regular surveys are required from the extraction area pit to determine groundwater inflow into the extraction area. During monitoring, the area and depth of water in the extraction area pit is required.

14.12.2 Location and Frequency

Groundwater level monitoring

Groundwater level will be monitored at piezometers P1, P2, P3, P4, P5, P7 and P8 (refer Figure 16-3 of Appendix L). It should be noted that piezometer P6 has been lost due to quarrying activities and monitoring is not required at this location. Water level monitoring is required on a three monthly basis initially and is to be reviewed after the collection of the initial 12-month monitoring period.

Groundwater rockface seepage monitoring

Inspection of groundwater seepage on rockfaces within the operation area.

Groundwater quality monitoring

Groundwater level will be monitored at piezometer locations P2, P3, P5, P7 (refer Figure 16-3 of Appendix L). Sampling will be undertaken every three months, and the frequency of sampling will be reviewed after the initial 12-month monitoring period.

Groundwater inflow into the extraction area

Monitoring of the extraction area pit is required regularly or following rain events or sudden increase in water level.

14.12.3 Specific Personnel

Groundwater rockface seepage monitoring

Inspection of groundwater seepage on rockfaces is required to be conducted every six months by a geotechnical engineer.

14.12.4 Performance Targets

Groundwater level monitoring

Further actions and follow-up actions (refer to the Surface Water and Groundwater Monitoring and Response Plan, attached as Appendix F) will be required in the event that significant change is noted and water level triggers are exceeded. These triggers include:

- ▶ A 'significant' decrease in water level over time or that occurs over a much shorter period in any one or a number of onsite piezometers.
- ▶ A 'significant' decrease is defined as water level decreases of 1.5 m in any of the piezometers over a six month period. This decrease represents a 50% change in the maximum water level decrease observed in the current baseline data. This water level trigger value will be reviewed when data have been collected over a 12-month period.

Groundwater rockface seepage monitoring

If seepage is noted on rockfaces, actions and follow-up actions will be required, as discussed in the Surface Water and Groundwater Monitoring and Response Plan (attached as Appendix F).

Groundwater quality monitoring

Trigger levels for the indication of groundwater quality change are indicated as a 'significant' deterioration in the water quality and increase of pollutant level. 'Significant' refers to decreasing pH (<6.0), increasing EC, TSS and major cation/anion concentrations over time (an increase of >20% of the corresponding baseline data) or sudden increases between quarterly datasets. The water quality trigger levels will be reviewed when data have been collected over a 12-month period.

Actions and follow-up actions will be required when trigger levels are exceeded, and are listed in the Surface Water and Groundwater Monitoring and Response Plan (attached as Appendix F).

Groundwater inflow into the extraction area

If the groundwater inflow is calculated as greater than 14 ML/year, actions and follow-up actions will be required as listed in the Surface Water and Groundwater Monitoring and Response Plan (attached as Appendix F).

14.13 Environmental Monitoring Summary

Table 14-10 outlines the environmental monitoring required for the duration of quarry operation.

Table 14-10 Event based Environmental Monitoring Summary

Monitoring	Frequency/Event	Location	Monitoring procedures	Personnel	Recording requirements	Additional Information
Blasting events						
Air blast overpressure and ground vibration	During blasting events	a) South Coast Correctional Facility (Location 5) b) At Location 1, 2 or 4, depending upon which is closest to the blast c) At the nearest commercial premises (Commercial Premises A) d) At the nearest residence, is this residence is closer to the blast location than those identified in b) (refer Figure 16-3 of Appendix L)	Monitor air blast overpressure and ground vibration	Mine Manager to employ a suitably qualified and experienced blasting engineer or shot-firer	Complete a Blast Design Record Sheet (Appendix K)	Section 7
vegetation removal or soil stripping						
Vegetation removal and soil stripping	When undertaking vegetation removal or soil stripping	Within the area scheduled to be cleared	Complete the Vegetation Removal and Soil Stripping Record Sheet prior to commencement of the event (Appendix K)	Mine Manager	Complete the Vegetation Removal and Soil Stripping Record Sheet (Appendix K)	Section 5
Aboriginal heritage monitoring	When undertaking vegetation removal or soil stripping	Within the area identified as the South Western Section in Figure 16-2 of Appendix L	Monitor events for Aboriginal relics	Mine Manager and representatives from the Nowra LALC and Durgan Consultancy	Complete the Vegetation Removal and Soil Stripping Record Sheet (Refer to Section 5.3)	Section 5
Fauna in hollow-bearing trees	When undertaking vegetation removal or soil stripping	Within the area scheduled to be cleared	Relocate native fauna and/or care for injured fauna	The commissioned fauna consultant	Complete the Vegetation Removal and Soil Stripping Record Sheet prior to commencement of the event (Appendix K)	Section 5
General						
Meteorological Monitoring	Every 15 minutes	On-site monitoring station	Automatic record of parameters	Mine Manager	Automatic records of meteorological parameters	Section 14.5
Dust deposition monitoring	Every 30 (+/-2) days	DDG 1, DDG 2, DDG 3 and DDG 4 (refer Figure 16-3 of Appendix L)	Record of g/m ² /month of dust deposition	Mine Manager	To be recorded as g/m ² /month	Section 14.6
Total Suspended Particulate (TSP) monitoring	One-day-in-six cycle for a period of at least on year and at maximum quarry throughput	HVAS North and South (refer Figure 16-3 of Appendix L)	Record of µ/m ² of TSP for short-term and long-term monitoring	Mine Manager	To be recorded as µ/m ²	Section 14.6
Particulate Matter (PM ₁₀) monitoring	One-day-in-six cycle for a period of at least on year and at maximum quarry throughput	HVAS North and South (refer Figure 16-3 of Appendix L)	Record of µ/m ² of PM ₁₀ for long-term monitoring	Mine Manager	To be recorded as µ/m ²	Section 14.6
Erosion and Sediment Control Monitoring	At least fortnightly	Where appropriate across the site	Maintain a log of the effectiveness of the erosion and sediment control systems in place	Mine Manager	Record of inspections to be kept	Section 14.7
Importation and use of VENM	During weighing, sourcing, placement and VENM verification	At the source of the VENM and receipt at the quarry	Weigh, inspect, and determine source of VENM Certify that the excavated material can be classified as VENM (refer to Section 11)	VENM supplier at the source; VENM driver upon delivery to the quarry; Mine Manager or delegated authority during the unloading of the VENM	Complete VENM Certificate Record Sheets (Section 11.3)	Section 11

Monitoring	Frequency/Event	Location	Monitoring procedures	Personnel	Recording requirements	Additional Information
Rain gauging	After rain events	Where rain gauge is installed	Record of severity of any rain events	Mine Manager	Records to be kept	Section 14.7
Basin outlets and pump operation	None allocated	Where installed	Stability of basin outlets and operation of all pumps to be checked	Mine Manager	Record of inspections and maintained on site	Section 14.7
Surface Water Monitoring	During five campaigns over 12 months	S1, S4, C1, C2 and C10 (refer Figure 16-3 of Appendix L)	Field water quality tests, and laboratory testing and analysis	Mine Manager	Water quality results to be kept	Section 14.9
Nowra Creek Health Monitoring	During and after rainfall events exceeding 50 mm over 5 days or less	Nowra Creek, between Sites C1 and C2 (refer Figure 16-3 of Appendix L)	Photographs and records and dates of visual inspections of Nowra Creek	Mine Manager	Photographs and records to be kept	Section 14.11
Groundwater Inflow into the Extraction Area Monitoring	Regularly or following rain events or sudden increase in water level	Extraction area pit	Area (and depth) of water in the extraction area pit	Mine Manager	Records to be kept on site	Section 14.12
General - Quarterly						
Landscape Progress	Routine (no further information specified)	Where appropriate	Written details of weed management (species, methodology, timing, chemicals and quantity), seed collection (species and timing), revegetation programs (species, quantities, methods and location)	Mine Manager	Written records to be kept	Section 14.8
Groundwater Level Monitoring	Every three months	P1, P2, P3, P4, P5, P7, P8 (refer Figure 16-3 of Appendix L)	Standing water level, ambient temperature, atmospheric pressure, rainfall	Mine Manager	Groundwater information to be kept	Section 14.12
Groundwater Quality Monitoring	Every three months	P2, P3, P5, P7 (refer Figure 16-3 of Appendix L)	Field water quality tests, and laboratory testing and analysis	Mine Manager	Groundwater results to be kept	Section 14.12
General - Biannually						
Rehabilitation areas	Every six months	Rehabilitation areas	Monitoring of success of the management, mitigation and ameliorative measures and the rehabilitation programs.	Mine Manager	Monitoring records to be kept	Section 14.8
Activities with the Project Site, including rehabilitation areas	Every six month	Reference points, within the Project Site	Take photos from photographic reference points	Mine Manager	Photos to be kept	Section 14.8
Groundwater Rockface Seepage Monitoring	Every six months	Rockfaces	Inspection of water seepage on rockfaces	Geotechnical Engineer	Written records of inspection to be kept	Section 14.12
General - Annually						
Operator-attended Noise Survey	At the start of operations and annually after all components of the project are in operation	At the closest monitoring location to the operations	Maximum and average intrusive noise levels, and ambient noise over a 15 minute measurement period	Mine Manager	To be recorded as LA _{max} and LA _{eq(15minute)}	Section 14.4
Biodiversity offset area monitoring	Annually	Northern and Southern biodiversity offset area reference points	Take photos from photographic reference points for both areas	Mine Manager and the Operators of the Nowra Correction Facility (Southern biodiversity offset area)	Photos to be kept	Section 14.8
Weed inspection	Annually	Areas of operation and the biodiversity offset areas	Inspect weeds to enable weed control activities to be planned and implemented for the following 12 months	Mine Manager	Written records to be kept	Section 14.8

15. Reporting

15.1 Overview

This chapter addresses the reporting requirements for the quarry, which have been outlined in the following:

- ▶ Environmental Assessment (Corkery and City Plan Services 2009);
- ▶ Project Approval (Appendix A);
- ▶ Environment Licences and Approvals (Appendix B);
- ▶ Noise Monitoring Program/Blast Management Plan (attached as Appendix C);
- ▶ Erosion and Sediment Control Plan (attached as Appendix E);
- ▶ Surface Water and Groundwater Monitoring and Response Plan (attached as Appendix F);
- ▶ Landscape and Biodiversity Management Plan (attached as Appendix H);
- ▶ Air Quality Management Plan (attached as Appendix I); and
- ▶ Aboriginal Heritage Management Plan (Appendix J).

The EMS is based on the content of the plans, programs and reports in the appendices attached. Although the following describes the strategy for compliance with the Project Approval and these plans, the plans should be reviewed regularly and whilst undertaking environmental reporting activities. In the event of an inconsistency, the plan (as attached) shall prevail.

15.2 Scheduled Reports

Scheduled Reports required by the Project Approval and EPL are outlined in Table 15-1 below.

Table 15-1 Scheduled Environmental Reports

When	What	Relevant Agency	Information required
Every six months	Update Website	None	Summary of monitoring results required under the Project Approval.
April each year ¹	Environmental Protection Licence 'Annual Return'	EPA	The licensee must complete and supply to the EPA an Annual Return in the approved form and in accordance with reporting conditions contained with the licence (attached as Appendix B).
Prior to 1 December annually	Annual Environmental Management Report (AEMR)	Director-General, Department of Planning DECCW NOW	<ul style="list-style-type: none"> ▶ The standards and performance measures that apply to the project ▶ Works carried out in the last 12 months, and the works that will be carried out in the next 12 months ▶ Summary of complaints received in the past year and a comparison of complaints received in the previous year ▶ Summary of all the monitoring results (refer to Section 14) ▶ An analysis of the monitoring results against:



When	What	Relevant Agency	Information required
			<ul style="list-style-type: none"> – The impact assessment criteria/limits – Monitoring results from previous years – Predictions in the Environmental Assessment <ul style="list-style-type: none"> ▶ Any observable trends in the monitoring results over the life of the project ▶ Any non-compliance during the year ▶ Any actions taken to ensure compliance
Within three years of the first AEMR and every three years thereafter	Independent Environmental Audit Report	Director-General Department of Planning	Refer to Schedule 5 Condition 1 of the Project Approval (attached as Appendix A)

¹ *The Annual Return reporting period means the period of 12 months after the issue of the EPL, and each subsequent period of 12 months. As a result, the scheduled date for the Annual Return specified above may change when a new licence is issued.*

15.3 Event Reporting

Reports have to be prepared for any event listed in Table 15-2.



Table 15-2 Event Reporting

Event	Reporting Required	Person responsible	Relevant Agency
Environmental Harm Incident	<p>Call the EPA's Pollution Line service on 131 555. The Mine Manager must also provide written details of the notification to the EPA within seven days of the incident.</p> <p>The Department of Planning and other relevant agencies must also be notified within 24 hours of the incident.</p>	Mine Manager and any of SCCCR's employees.	EPA and the Department of Planning.
Blasting event	<p>Written notification and submission of a copy of the completed Blast Design Record Sheet (attached as Appendix K) within seven days of the blasting event.</p> <p>The landowner/occupier of any residence within two kilometres of the quarry pit who registers an interest in being notified about the blasting schedule on site prior to blasting.</p> <p>Develop a notification process to alert residents at least 24 hours before any blast.</p> <p>Operate a blasting hotline and keep public informed.</p>	<p>Mine Manager</p> <p>Mine Manager</p>	<p>EPA</p> <p>Landowner/occupier of residences within two kilometres</p>
Any exceedance of ground vibration and/or airblast overpressure limits (refer to Section 14.3)	<p>Telephone call followed up by written notification and submission of the completed Blast Monitoring Record Sheet of the event (attached as Appendix K), as soon as practicable.</p> <p>Provide notification to affected landowners and tenants.</p>	<p>Mine Manager</p> <p>Mine Manager</p>	<p>EPA and the Department of Planning.</p> <p>Affect landowners and tenants.</p>
Any exceedance of noise, operation hours and/or air quality limits (refer to Sections 14.4 and 14.6)	<p>Telephone call within 24 hours of the exceedance event followed up by written report within six days that:</p> <ul style="list-style-type: none"> Describes the date, time, and nature of the exceedance Identifies the cause of the exceedance Describes what preparation actions have been taken Describes the proposed measures to address the exceedance <p>Provide subsequent quarterly monitoring results until results show that project is complying.</p> <p>Provide notification to affected landowners and tenants.</p>	<p>Mine Manager</p> <p>Mine Manager</p>	<p>Department of Planning, Director-General.</p> <p>Affect landowners and tenants.</p>
Exceedance of Surface Water and Groundwater Trigger Values (refer to Sections 14.10 and 14.12)	Further reporting on shorter timescales (monthly, quarterly, six-monthly etc.) and consultation with DECCW.	Mine Manager	DECCW
Demonstration of a 'significant' impact to a distant bore user in relation to groundwater level change.	Further reporting on shorter timescales (monthly, quarterly, six-monthly etc.) and consultation with DECCW.	Mine Manager	DECCW
Receipt of complaints from community	<p>Receive, log, track and respond to complaints in the complaints register.</p> <p>Information to be recorded includes date and time of complaint, method complaint was made by, personal details of the complainant, nature of the complaint, action taken by the licensee in relation to the complaint, and in the event that no action was taken, the reasons why.</p> <p>The record of a complaint will be kept for at least four years after the complaint was made.</p> <p>In the instance that an agreeable outcome (by all concerned parties) cannot be reached, the matter will be referred to the Director-General for resolution. If the matter cannot be resolved within 21 days, the Director-General will refer the matter to an Independent Dispute Resolution Process.</p>	Mine Manager	<p>Relevant public authority or landowner</p> <p>Director-General if dispute cannot be resolved</p>



16. References

ANZECC & ARMCANZ, 2000. National Water Quality Management Strategy, No 4A, An Introduction to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality

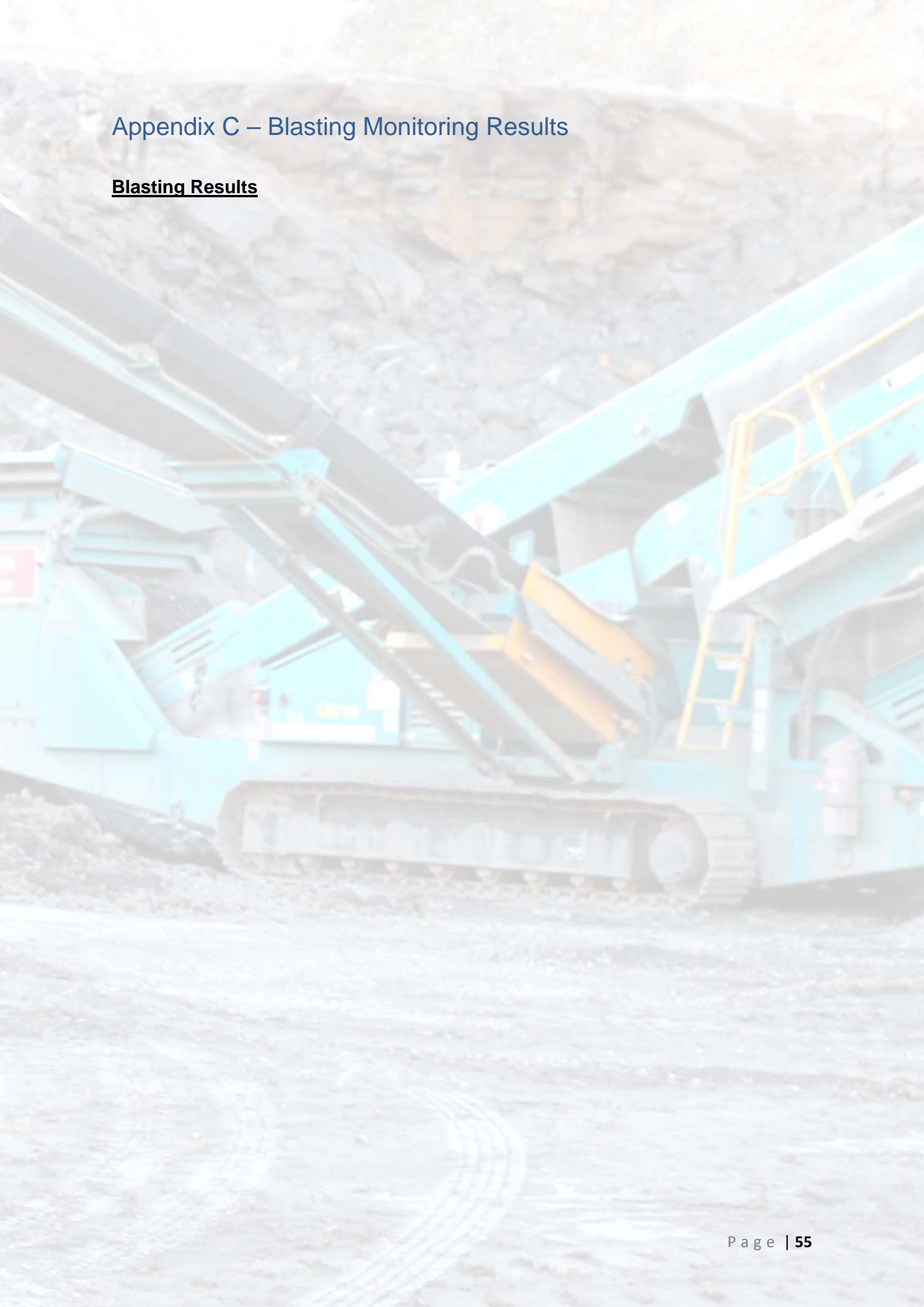
Corkery and City Plan Services (R.W. Corkery and Co. Pty Ltd and City Plan Services), 2009. Environmental Assessment for the Continuation and Expansion of Extractive Operations at the Nowra Brickworks Quarry, South Nowra. Report prepared for South Coast Concrete Crushing and Recycling Pty Ltd for Major Project Application No. 07-0123.

Landcom, 2004. Guideline Soils and Construction Managing Urban Stormwater. Landcom.

SEEC Morse McVey, 2007. Erosion and Sediment Control Plan, prepared on behalf of South Coast Concrete Crushing and Recycling Pty Ltd (Part 7B of the Specialist Consultant Studies Compendium).

Appendix C – Blasting Monitoring Results

Blasting Results



Date/Time Vert at 11:59:29 September 24, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

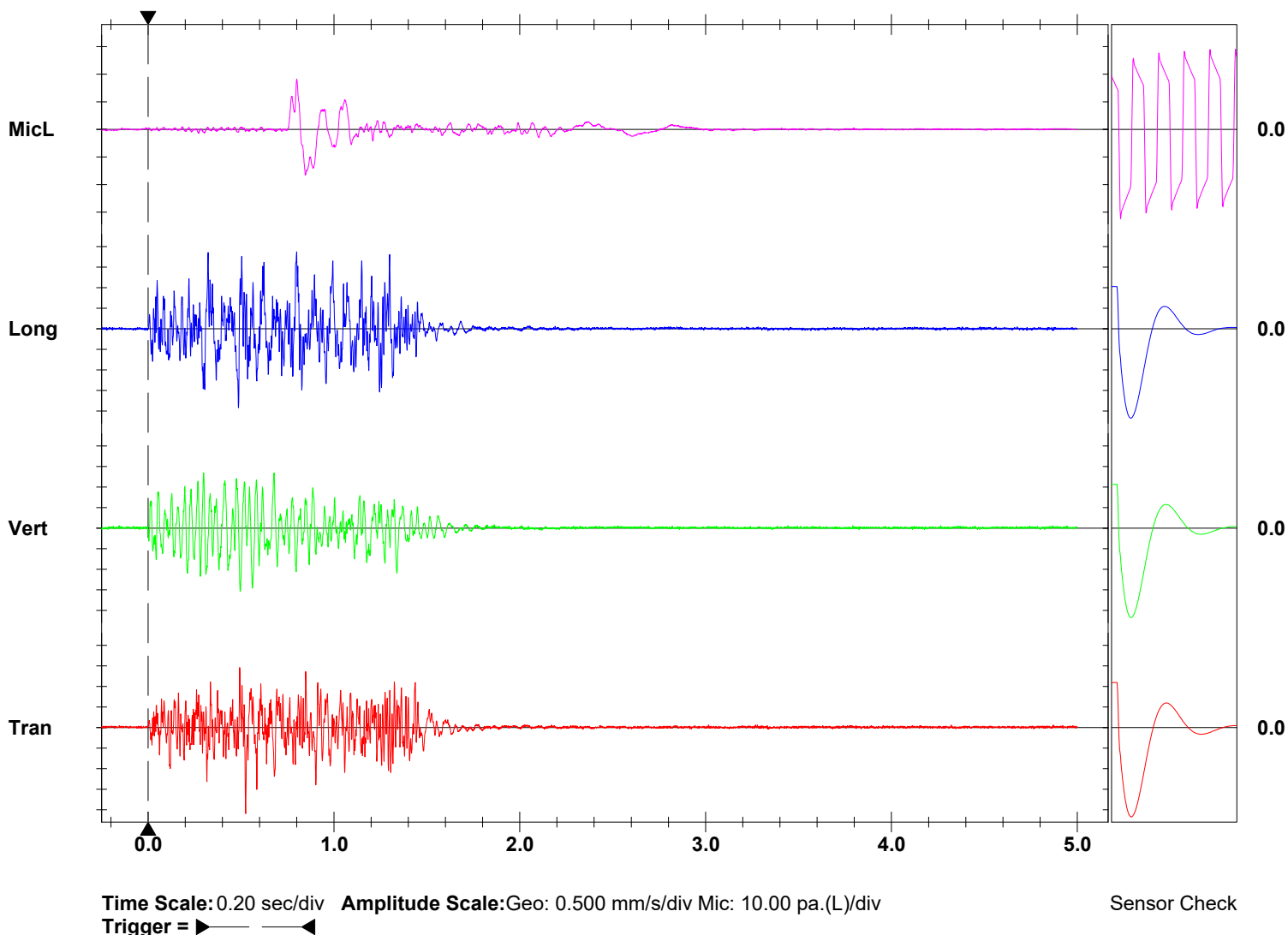
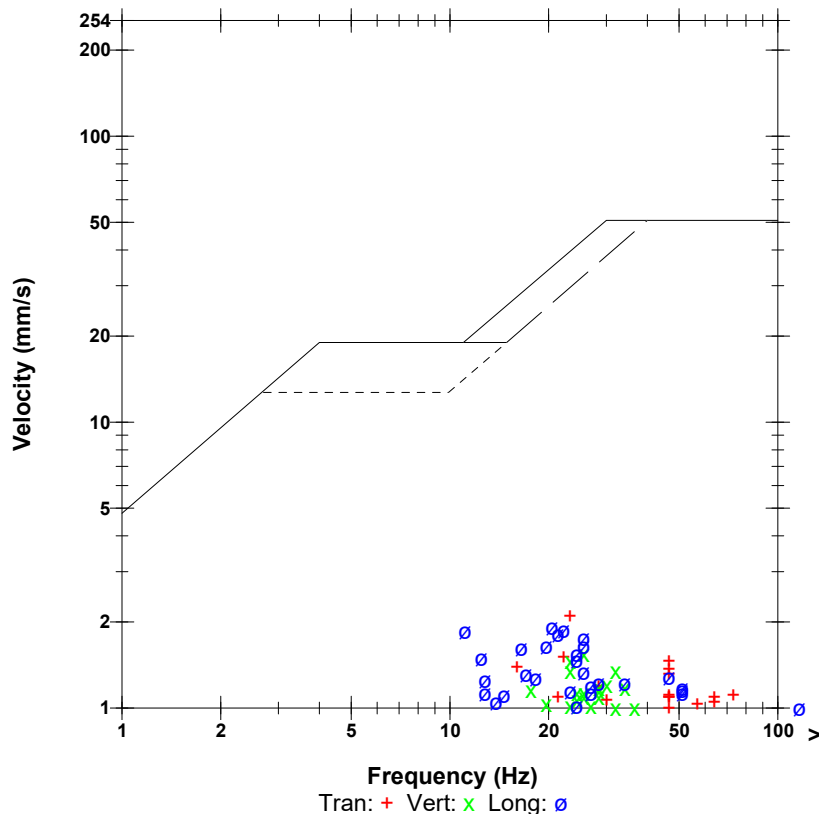
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.6 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q569HLPV.Z50

Microphone Linear Weighting
PSPL 119.2 dB(L) at 0.800 sec
ZC Freq 7.3 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 590 mv)

	Tran	Vert	Long	
PPV	2.10	1.54	1.92	mm/s
ZC Freq	23	26	20	Hz
Time (Rel. to Trig)	0.525	0.496	0.486	sec
Peak Acceleration	0.0696	0.0464	0.0679	g
Peak Displacement	0.00864	0.00926	0.0150	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 2.20 mm/s at 0.585 sec

USBM RI8507 And OSMRE



Date/Time Vert at 11:59:29 September 24, 2018
Trigger Source Geo: 0.130 mm/s, Mic: 134 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Notes 1

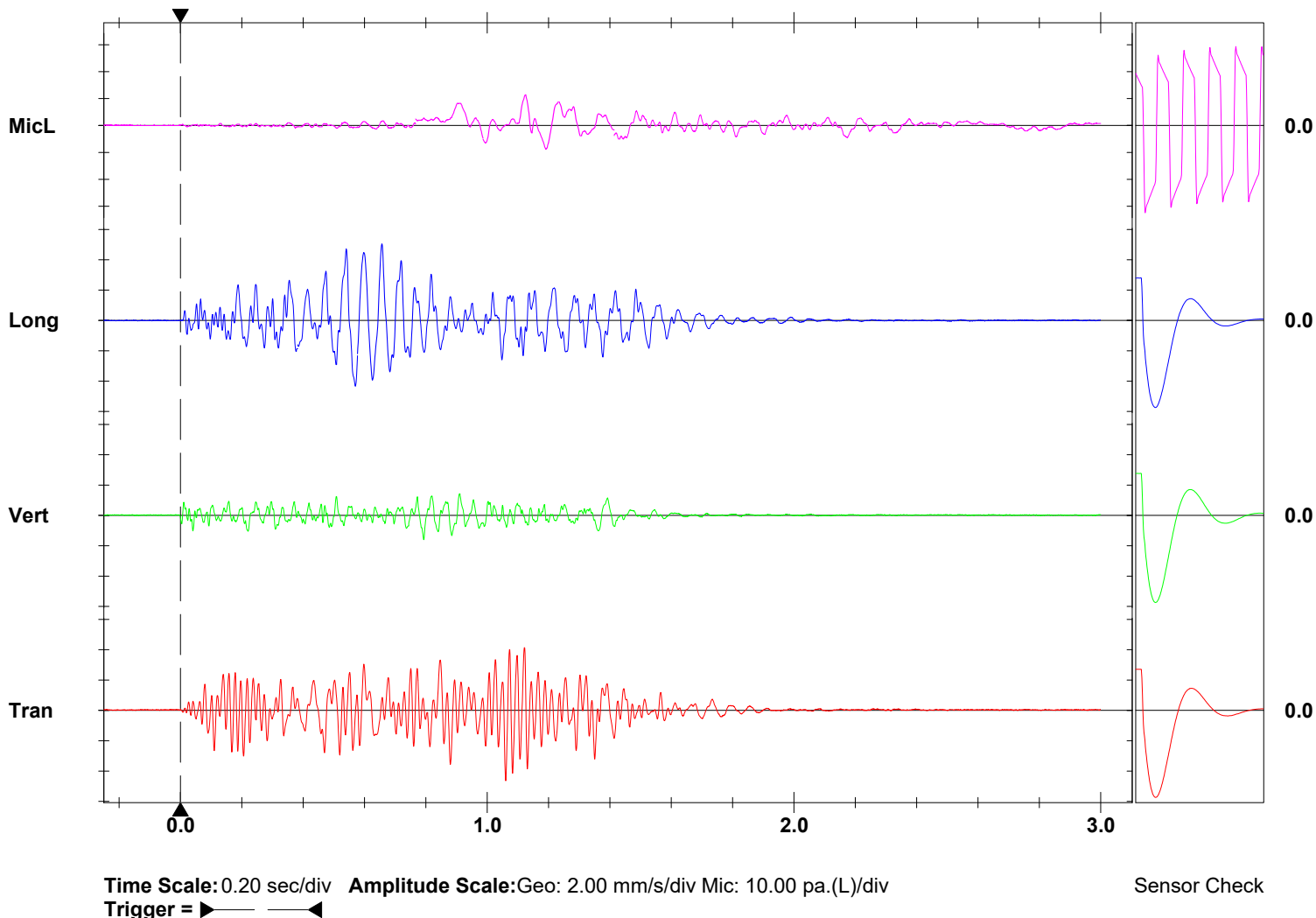
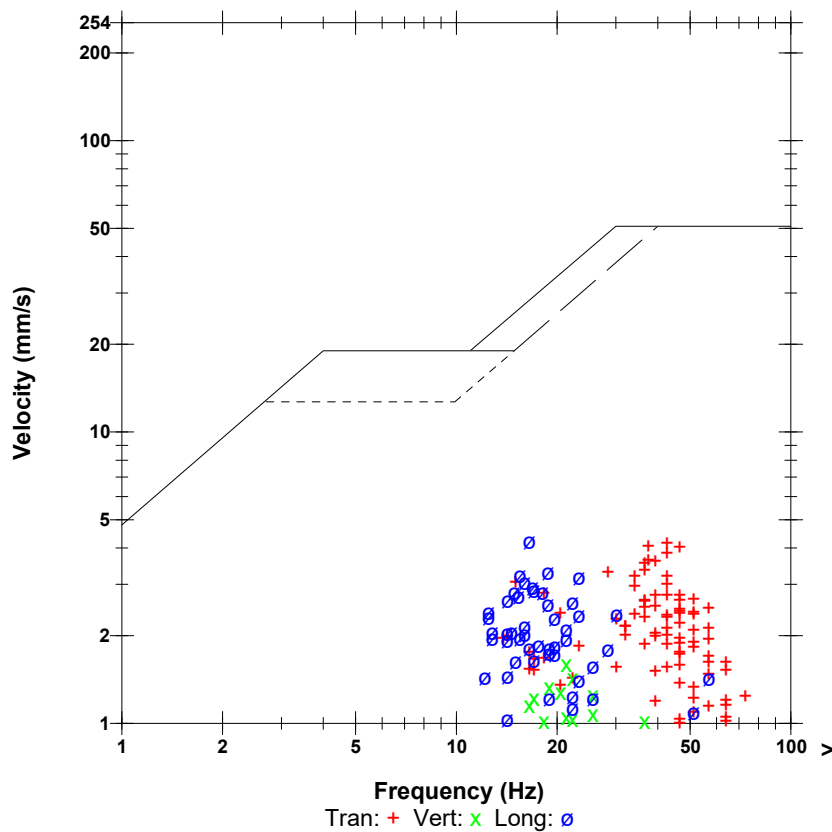
Serial Number BE15777 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q777HLPV.Z50

Microphone Linear Weighting
PSPL 113.9 dB(L) at 1.190 sec
ZC Freq 9.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 665 mv)

	Tran	Vert	Long	
PPV	4.64	1.60	5.54	mm/s
ZC Freq	39	21	19	Hz
Time (Rel. to Trig)	1.061	0.793	0.656	sec
Peak Acceleration	0.149	0.0398	0.0812	g
Peak Displacement	0.0229	0.0102	0.0467	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.5	Hz
Overswing Ratio	4.0	3.4	4.0	

Peak Vector Sum 4.79 mm/s at 0.598 sec

USBM RI8507 And OSMRE



Date/Time Vert at 11:59:30 September 24, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

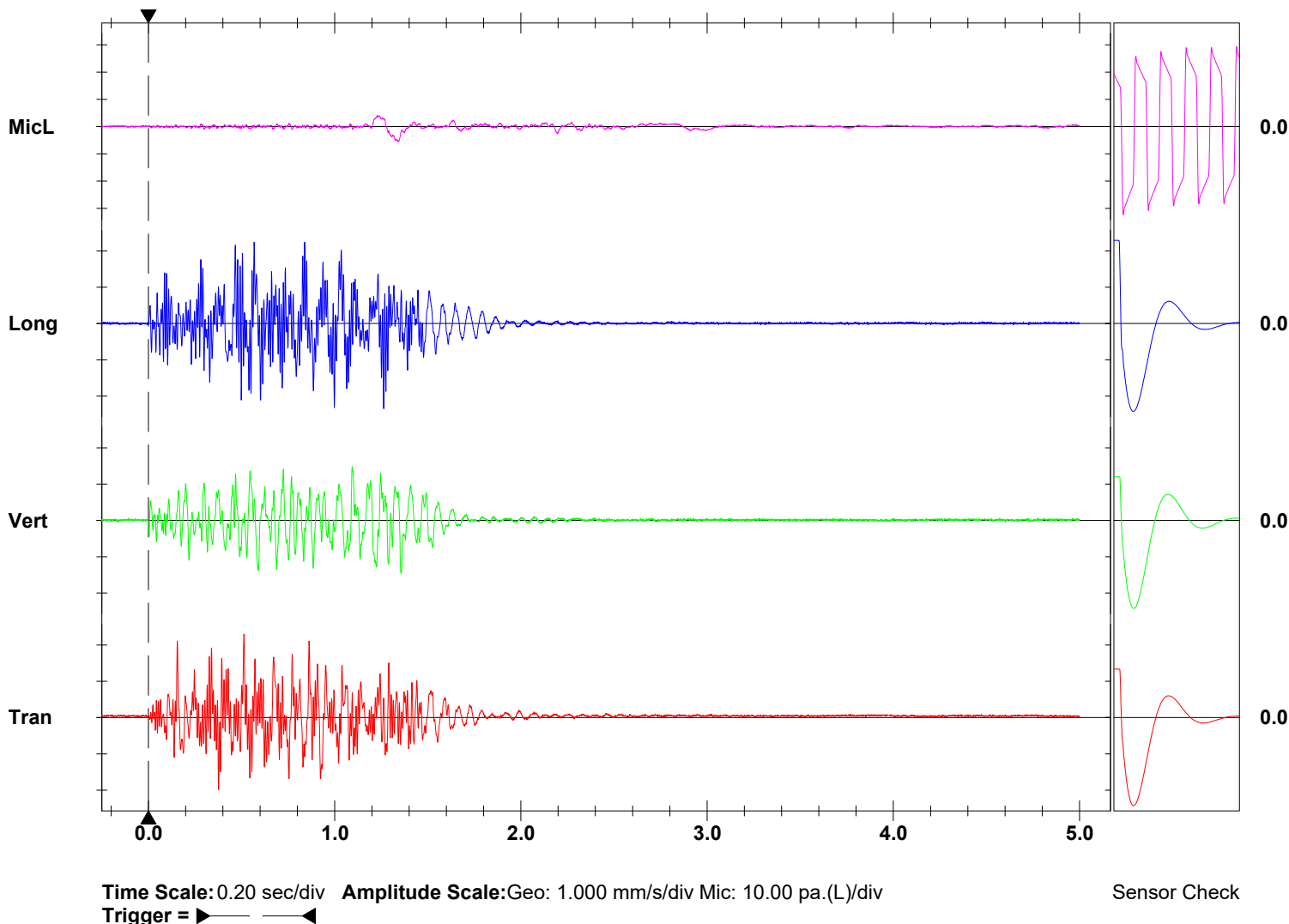
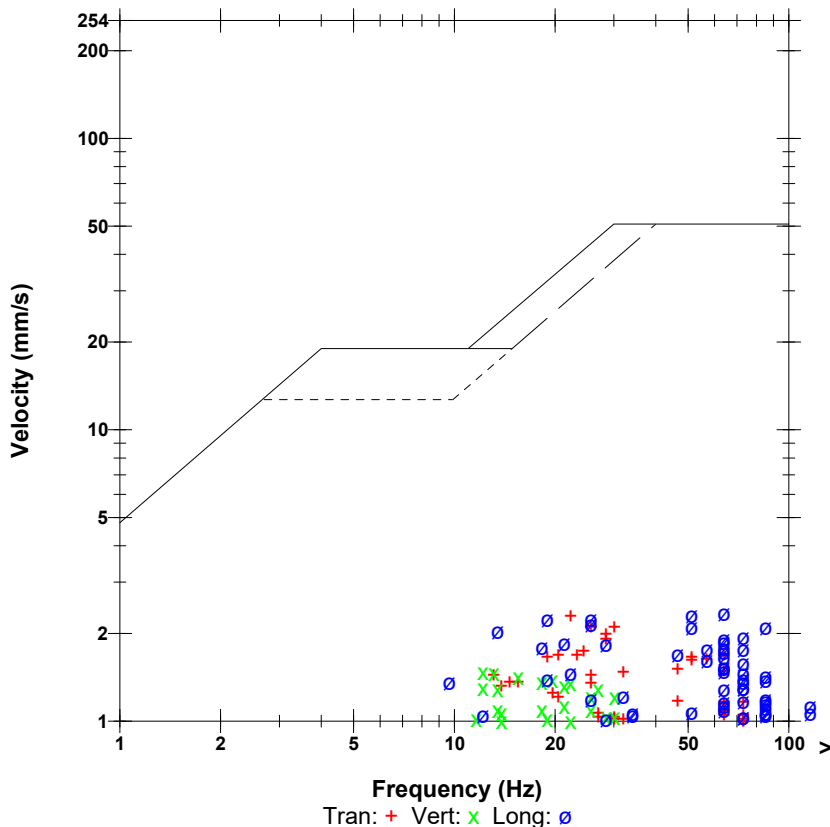
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q377HLPV.Z60

Microphone Linear Weighting
PSPL 108.8 dB(L) at 1.339 sec
ZC Freq 4.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 623 mv)

	Tran	Vert	Long	
PPV	2.30	1.48	2.35	mm/s
ZC Freq	22	12	64	Hz
Time (Rel. to Trig)	0.513	1.094	1.264	sec
Peak Acceleration	0.0746	0.0365	0.104	g
Peak Displacement	0.0131	0.0152	0.0180	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.1	3.4	4.0	

Peak Vector Sum 2.50 mm/s at 0.839 sec

USBM RI8507 And OSMRE



Date/Time Tran at 11:59:29 September 24, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

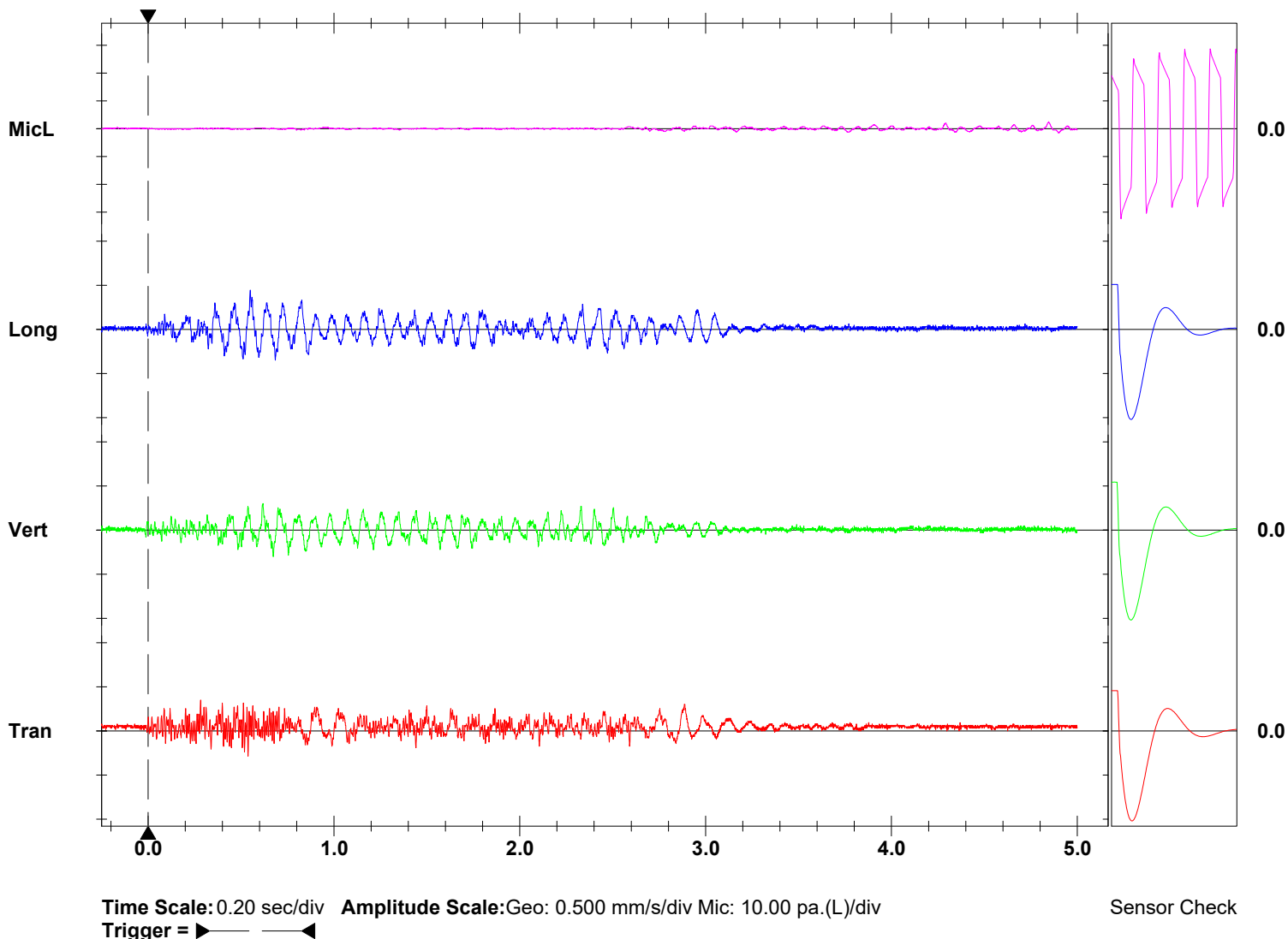
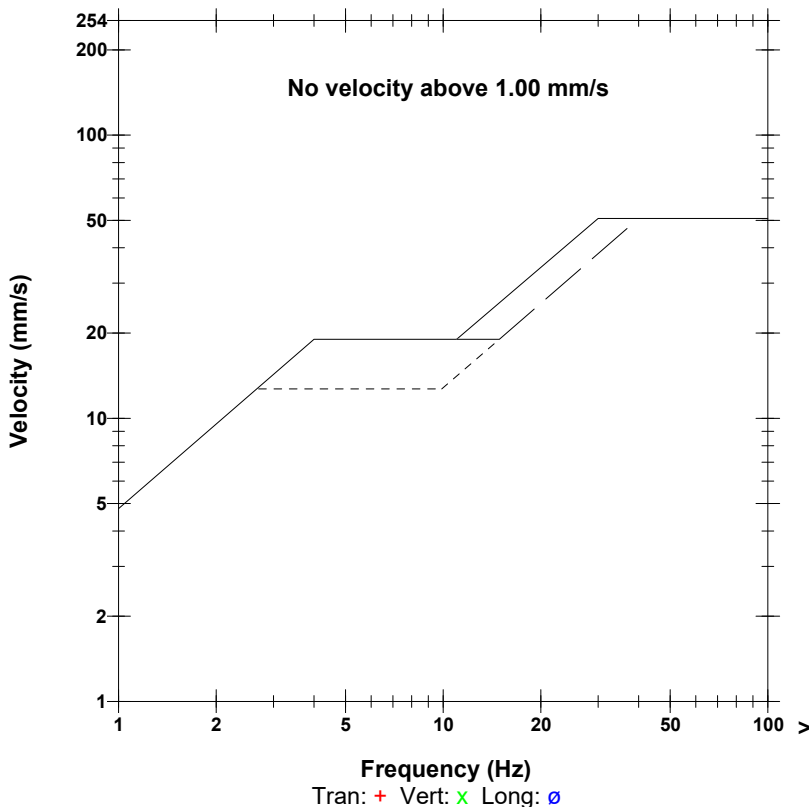
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name R020HH8S.2U0

Microphone Linear Weighting
PSPL 101.3 dB(L) at 4.838 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 616 mv)

	Tran	Vert	Long	
PPV	0.348	0.304	0.443	mm/s
ZC Freq	50	21	11	Hz
Time (Rel. to Trig)	0.283	0.618	0.548	sec
Peak Acceleration	0.0148	0.00828	0.00993	g
Peak Displacement	0.00513	0.00282	0.00456	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.3	Hz
Overswing Ratio	4.0	3.8	4.0	

Peak Vector Sum 0.566 mm/s at 0.548 sec

USBM R18507 And OSMRE



Date/Time Vert at 13:00:00 November 9, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

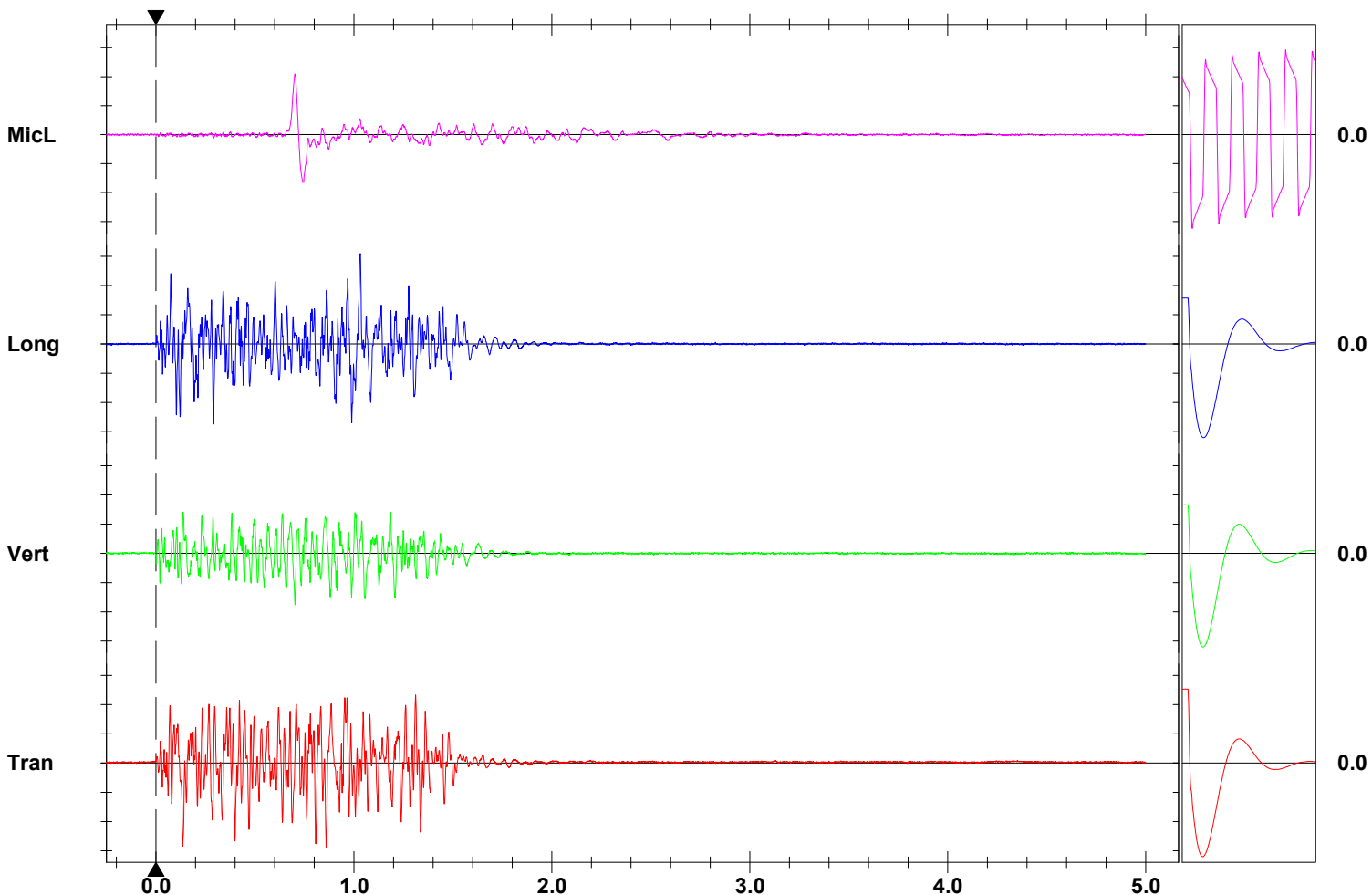
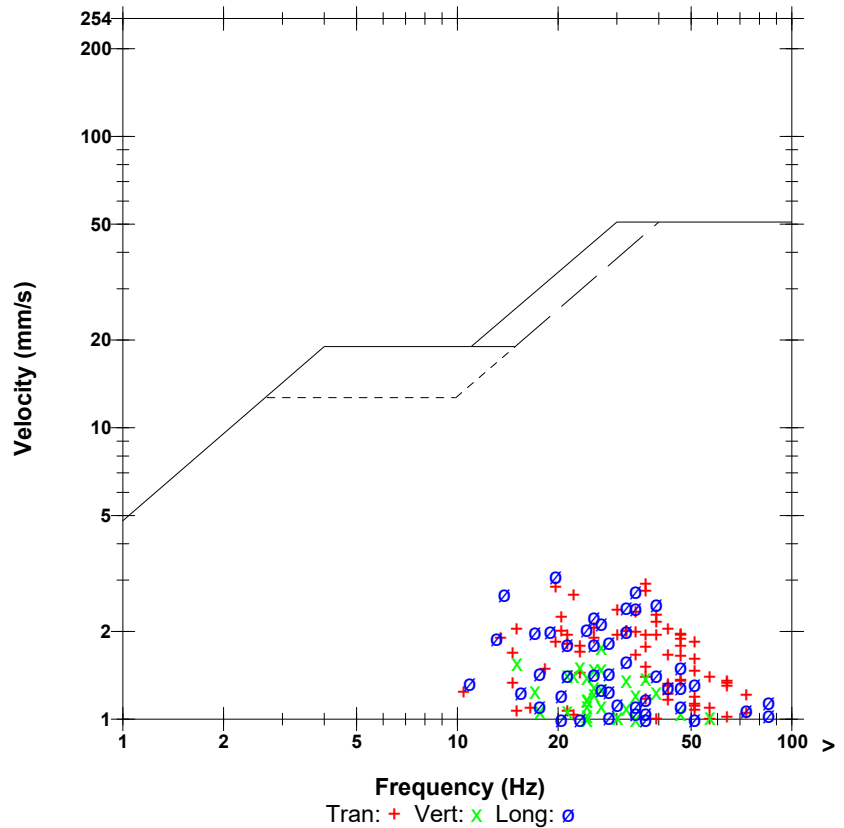
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q377HO35.G00

Microphone Linear Weighting
PSPL 120.4 dB(L) at 0.702 sec
ZC Freq 7.6 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 494 mv)

	Tran	Vert	Long	
PPV	2.91	1.76	3.10	mm/s
ZC Freq	37	27	20	Hz
Time (Rel. to Trig)	0.860	0.702	1.031	sec
Peak Acceleration	0.0845	0.0663	0.0779	g
Peak Displacement	0.0186	0.0116	0.0230	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.7	7.2	Hz
Overswing Ratio	3.9	3.2	3.8	

Peak Vector Sum 3.53 mm/s at 0.861 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 13:00:00 November 9, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

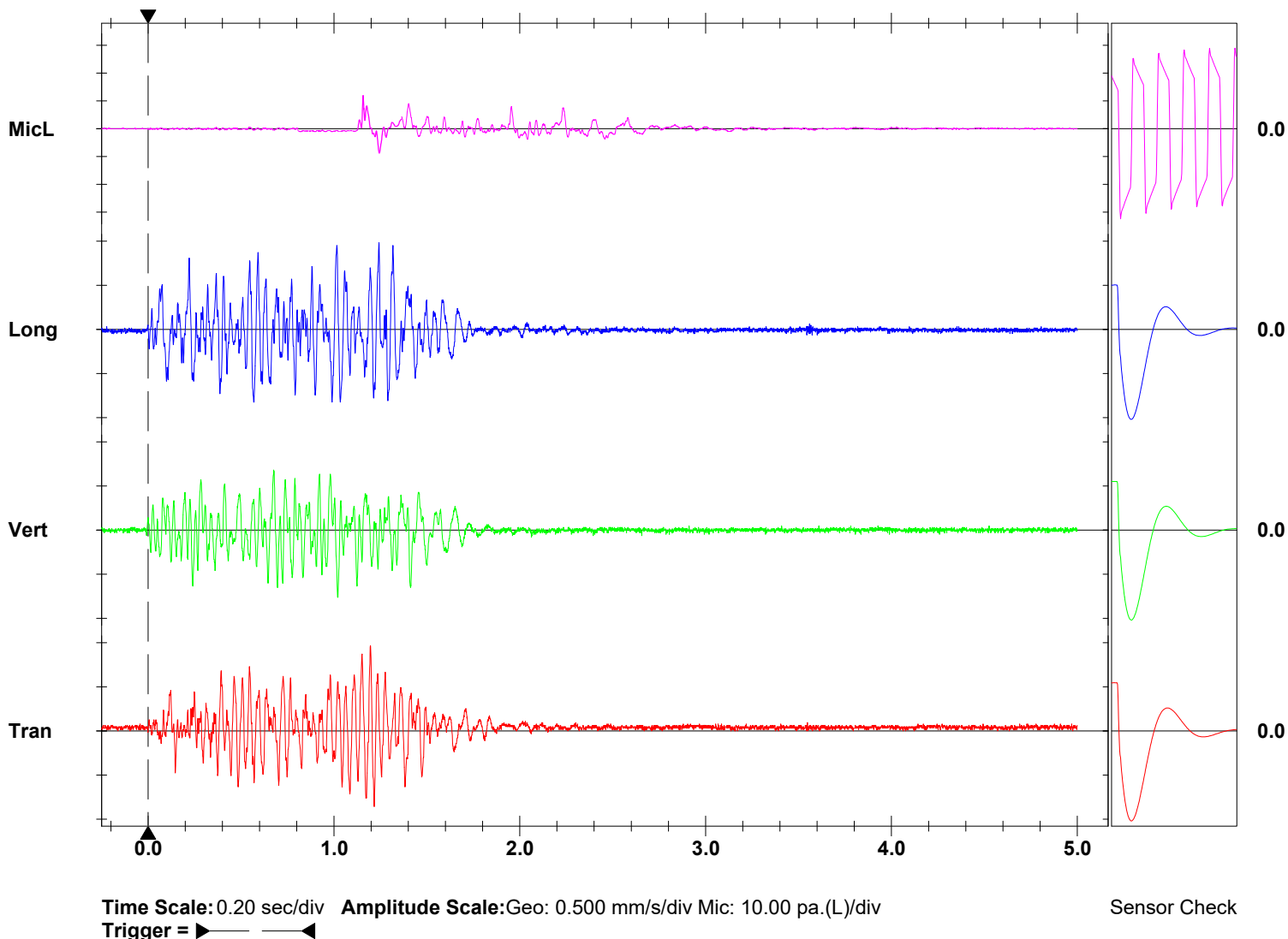
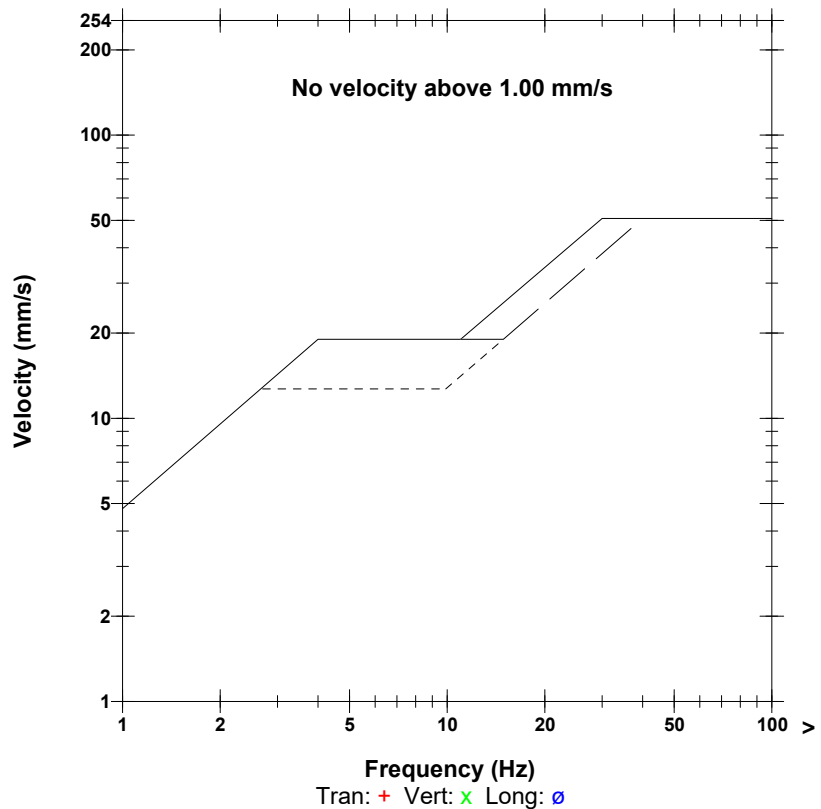
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name R020HO35.G00

Microphone Linear Weighting
PSPL 110.4 dB(L) at 1.244 sec
ZC Freq 4.4 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 548 mv)

	Tran	Vert	Long	
PPV	0.968	0.762	0.984	mm/s
ZC Freq	27	22	23	Hz
Time (Rel. to Trig)	1.196	1.020	1.242	sec
Peak Acceleration	0.0215	0.0182	0.0232	g
Peak Displacement	0.00608	0.00611	0.00673	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.4	Hz
Overswing Ratio	3.9	3.8	4.0	

Peak Vector Sum 1.20 mm/s at 1.018 sec

USBM R18507 And OSMRE



Date/Time Vert at 13:00:00 November 9, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

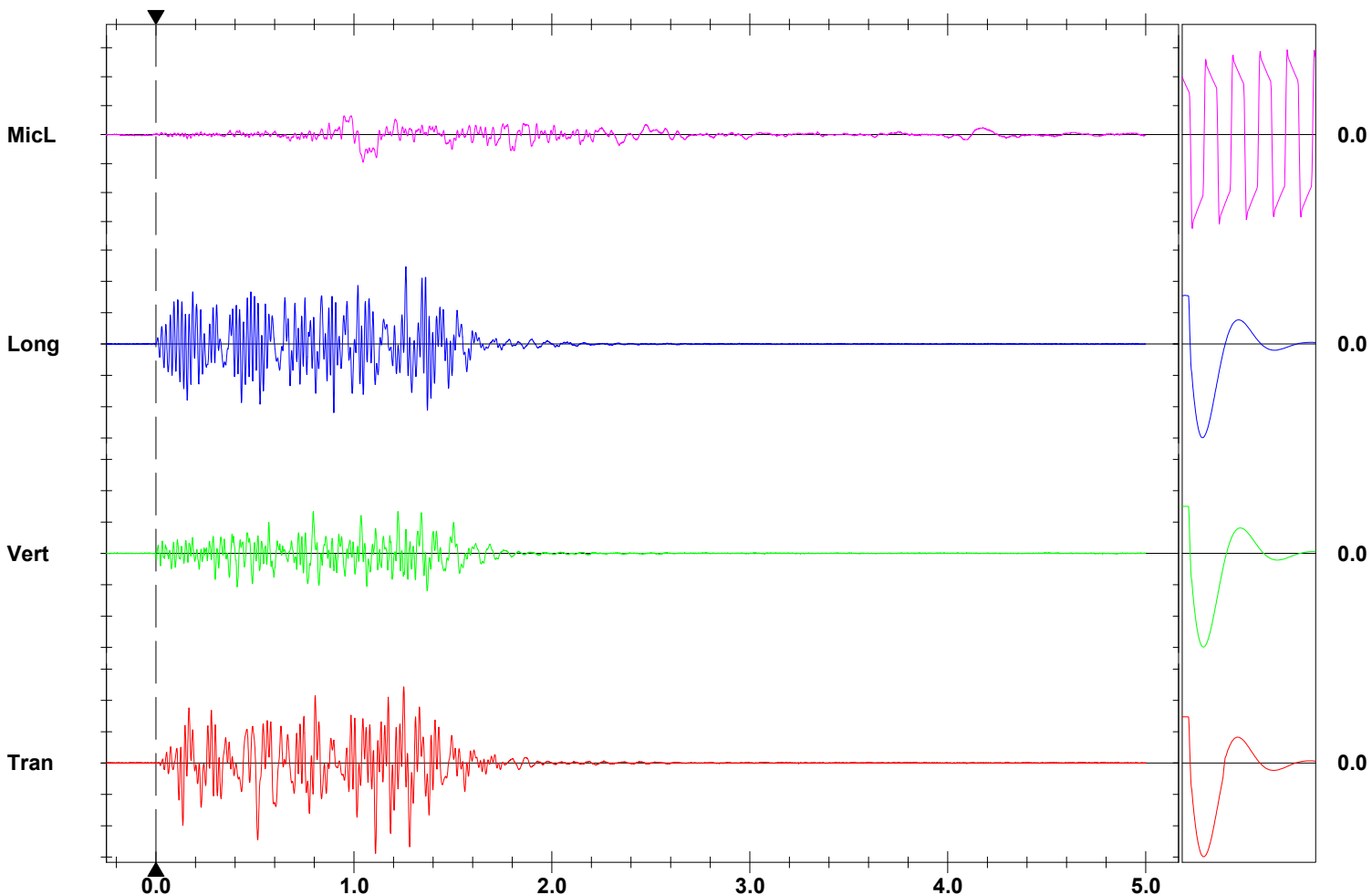
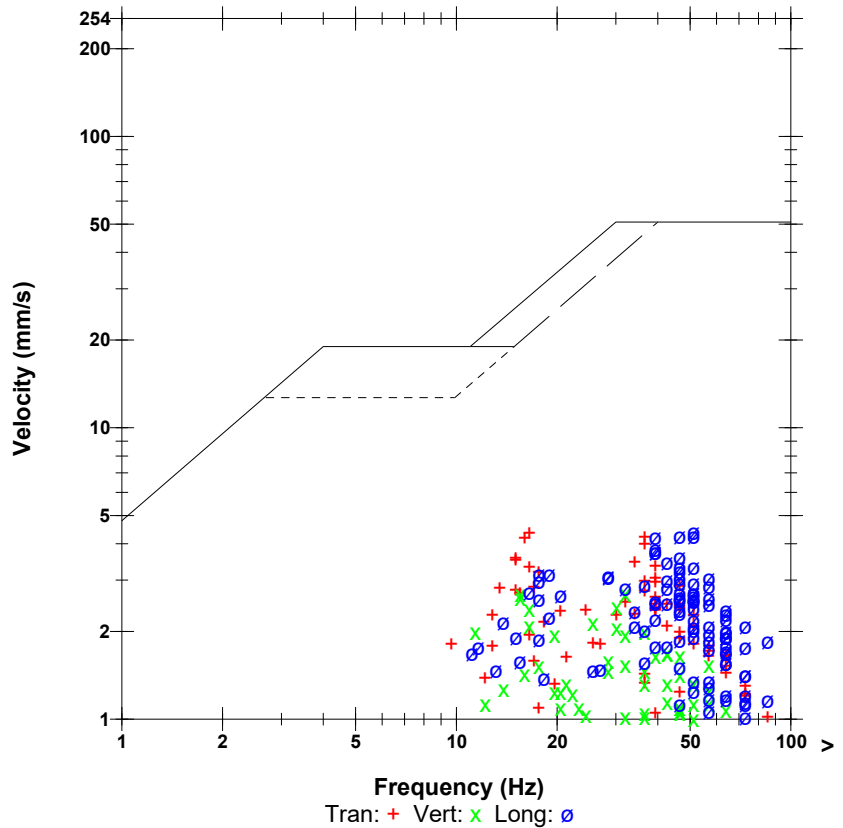
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q569HO35.G00

Microphone Linear Weighting
PSPL 113.5 dB(L) at 1.047 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 571 mv)

	Tran	Vert	Long	
PPV	4.36	2.68	4.34	mm/s
ZC Freq	30	16	32	Hz
Time (Rel. to Trig)	1.109	0.795	1.263	sec
Peak Acceleration	0.121	0.0713	0.146	g
Peak Displacement	0.0398	0.0215	0.0227	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.4	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 4.43 mm/s at 1.109 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 13:00:00 November 9, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

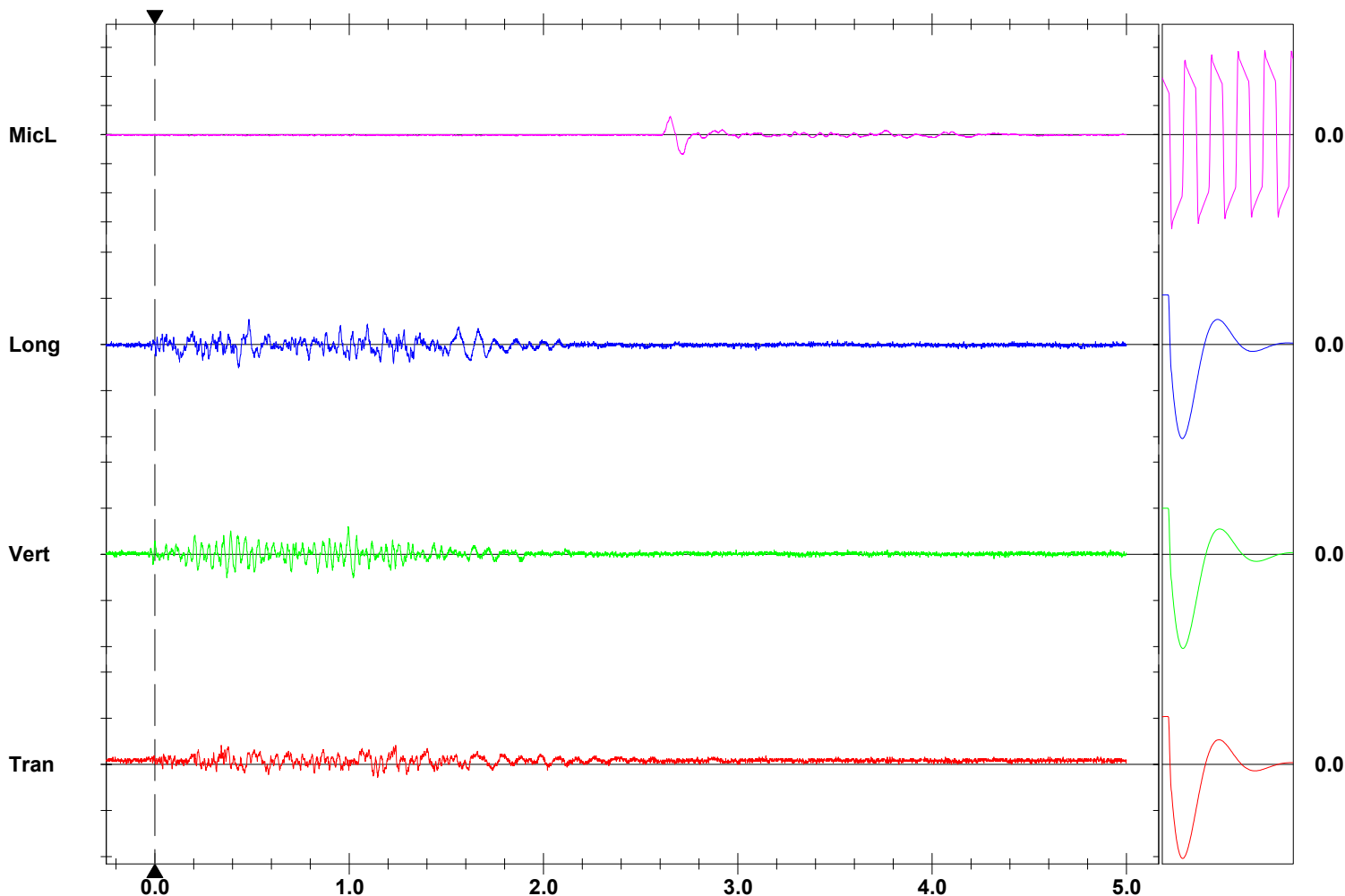
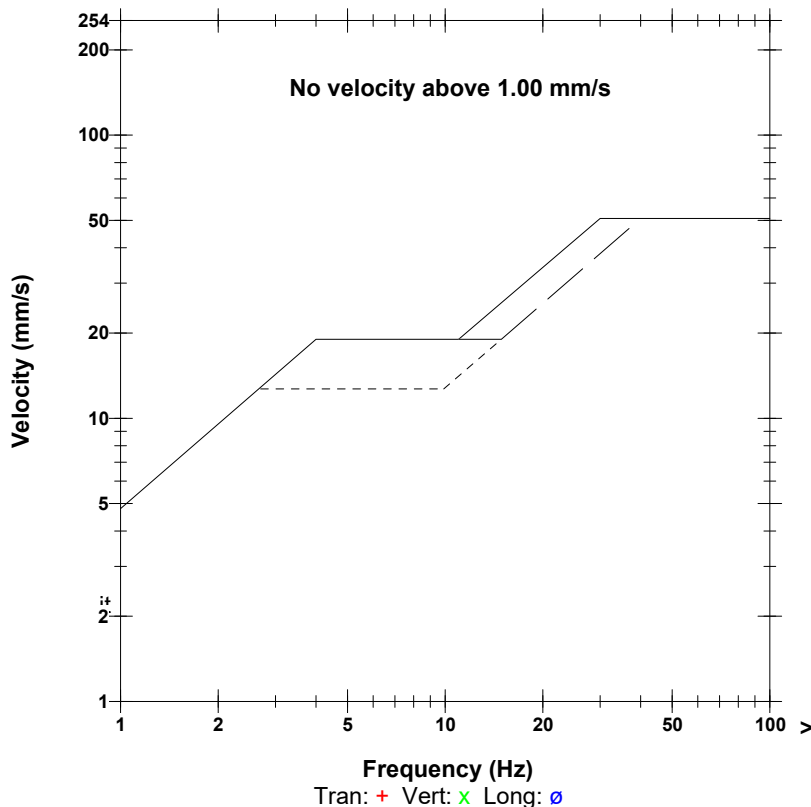
Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name R158HO35.G00

Microphone Linear Weighting
PSPL 110.6 dB(L) at 2.711 sec
ZC Freq 6.4 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 562 mv)

	Tran	Vert	Long	
PPV	0.206	0.302	0.270	mm/s
ZC Freq	15	20	17	Hz
Time (Rel. to Trig)	0.342	0.995	0.482	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00351	0.00184	0.00291	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.4	7.7	Hz
Overswing Ratio	3.8	3.7	3.8	

Peak Vector Sum 0.332 mm/s at 0.484 sec

USBM R18507 And OSMRE



Date/Time Vert at 12:00:01 November 26, 2018
Trigger Source Geo: 0.131 mm/s
Range Geo: 31.8 mm/s
Record Time 5.0 sec at 1024 sps
Notes

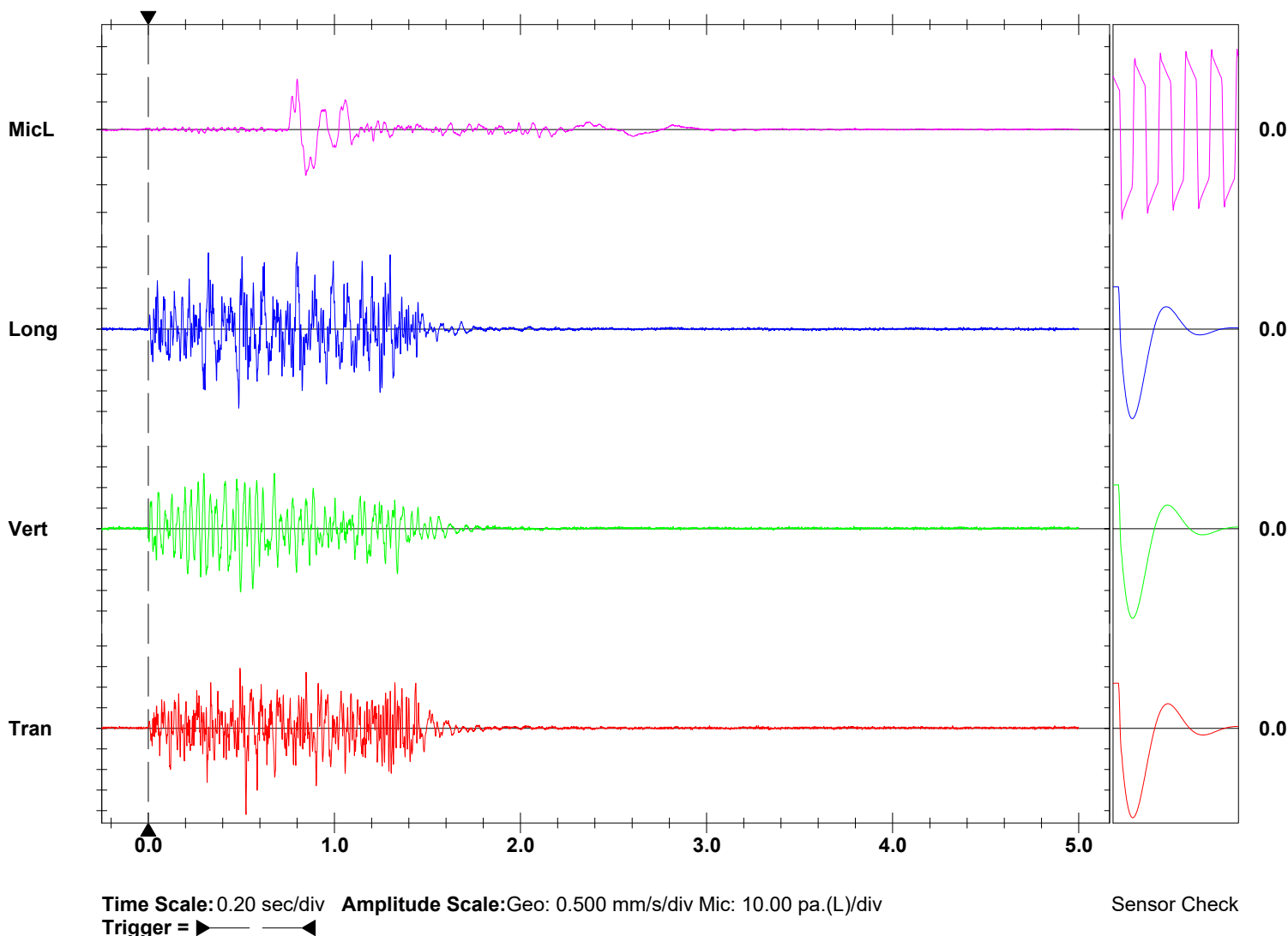
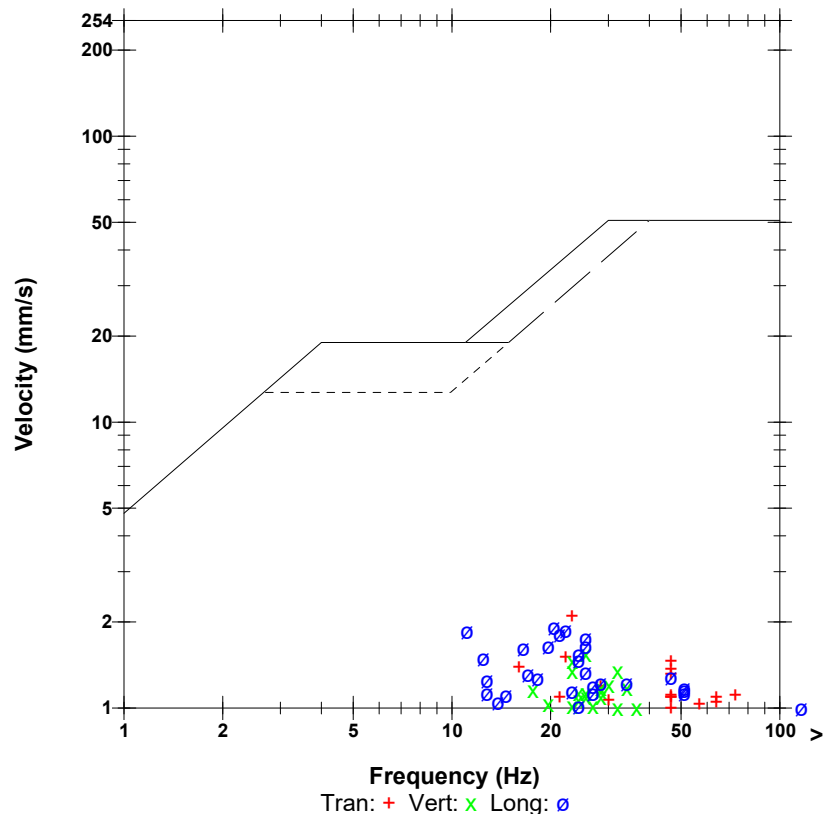
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.6 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q569HLPV.Z50

Microphone Linear Weighting
PSPL 118.8 dB(L) at 0.800 sec
ZC Freq 7.3 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 590 mv)

	Tran	Vert	Long	
PPV	2.11	1.53	1.91	mm/s
ZC Freq	22	27	21	Hz
Time (Rel. to Trig)	0.524	0.496	0.485	sec
Peak Acceleration	0.0695	0.0463	0.0678	g
Peak Displacement	0.00865	0.00925	0.0152	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 2.20 mm/s at 0.585 sec

USBM RI8507 And OSMRE



Date/Time Vert at 12:00:00 November 26, 2018
Trigger Source Geo: 0.131 mm/s, Mic: 134 dB(L)
Range Geo: 31.6 mm/s
Record Time 3.1 sec at 1024 sps
Notes

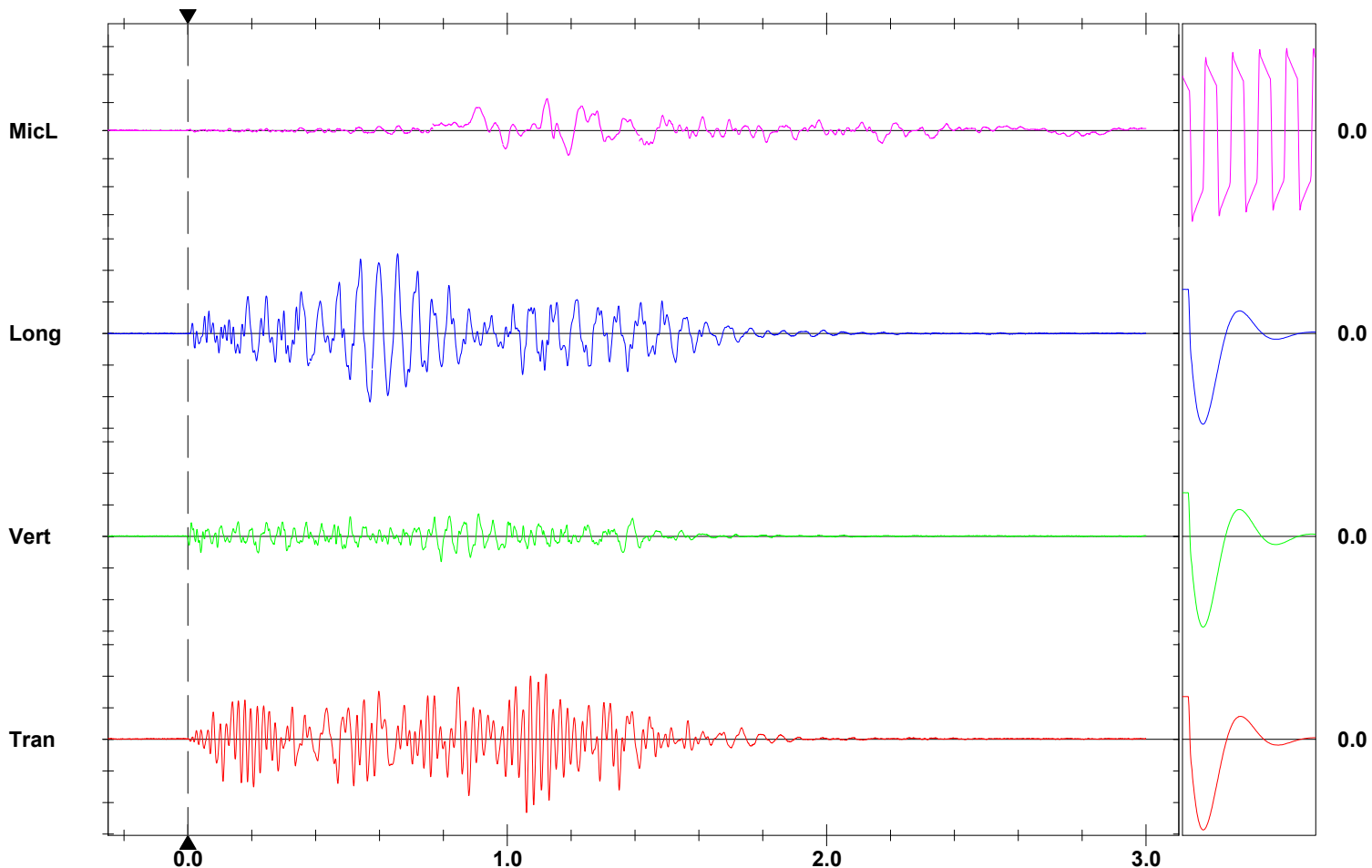
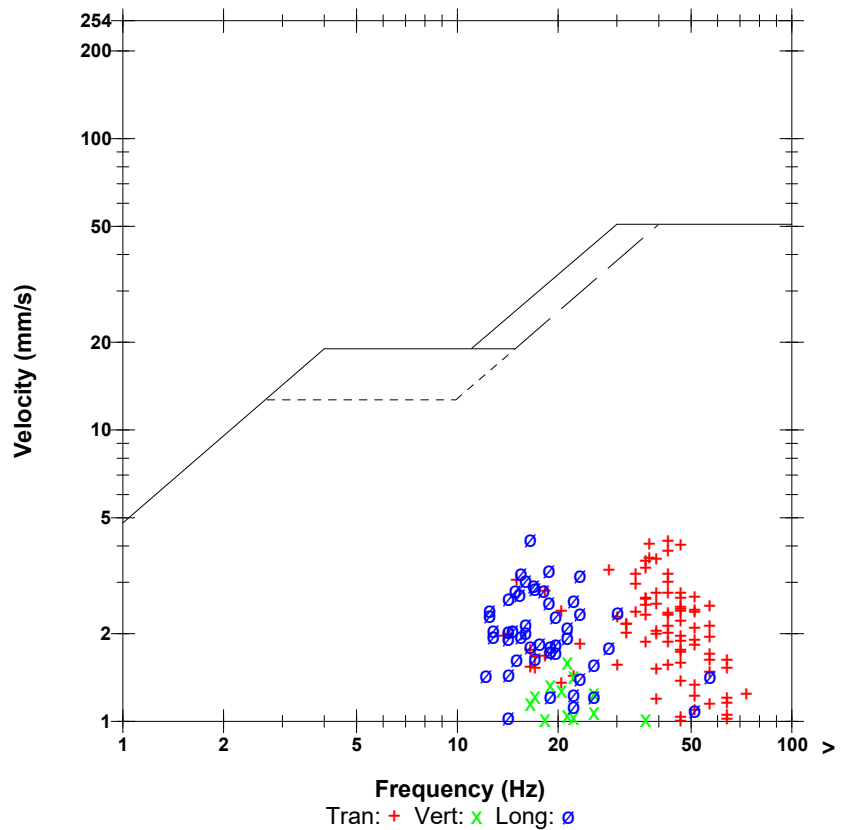
Serial Number BE15777 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q777HLPV.Z50

Microphone Linear Weighting
PSPL 113.6 dB(L) at 1.190 sec
ZC Freq 9.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 665 mv)

	Tran	Vert	Long	
PPV	4.63	1.61	5.53	mm/s
ZC Freq	38	22	18	Hz
Time (Rel. to Trig)	1.060	0.794	0.655	sec
Peak Acceleration	0.148	0.0397	0.0813	g
Peak Displacement	0.0228	0.0103	0.0466	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.7	7.6	Hz
Overswing Ratio	4.1	3.3	4.1	

Peak Vector Sum 4.58 mm/s at 0.598 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 12:00:01 November 26, 2018
Trigger Source Geo: 0.131 mm/s
Range Geo: 31.8 mm/s
Record Time 5.1 sec at 1024 sps
Notes

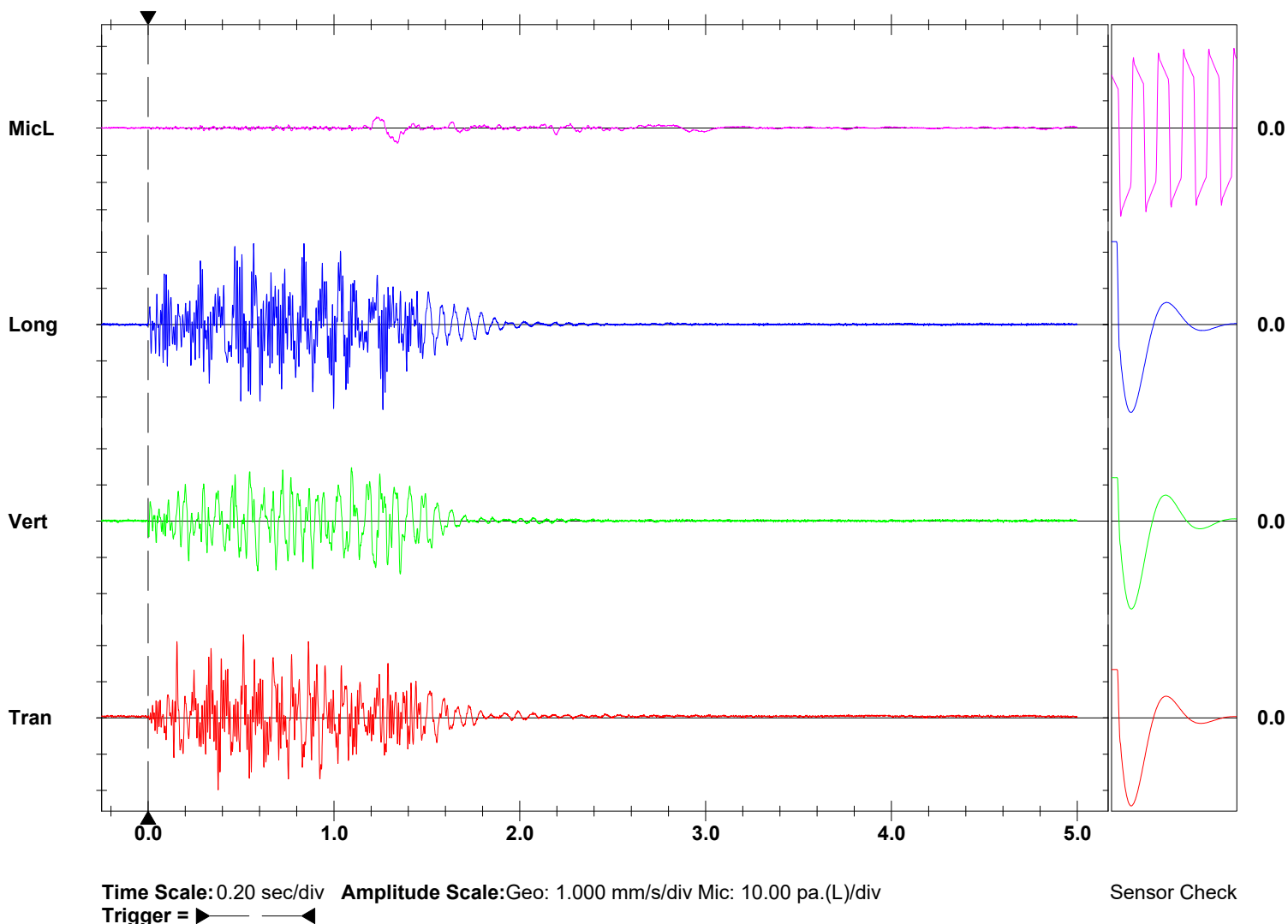
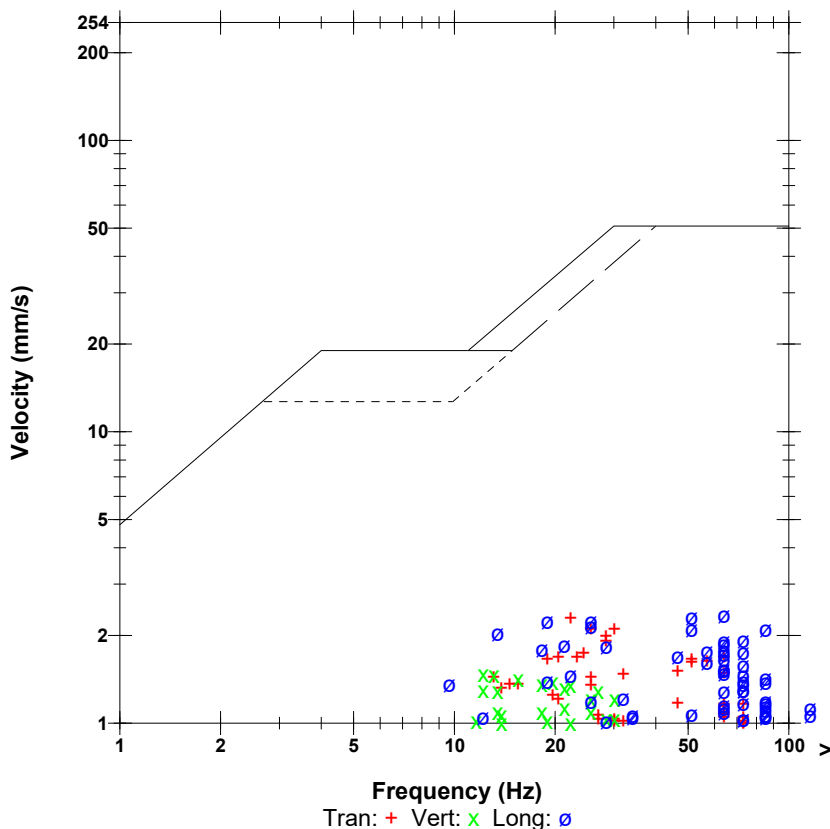
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name Q377HLPV.Z60

Microphone Linear Weighting
PSPL 109.6 dB(L) at 1.339 sec
ZC Freq 4.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 623 mv)

	Tran	Vert	Long	
PPV	2.31	1.47	2.36	mm/s
ZC Freq	21	13	63	Hz
Time (Rel. to Trig)	0.512	1.093	1.263	sec
Peak Acceleration	0.0745	0.0364	0.103	g
Peak Displacement	0.0130	0.0153	0.0181	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.4	Hz
Overswing Ratio	4.0	3.3	4.1	

Peak Vector Sum 2.48 mm/s at 0.839 sec

USBM RI8507 And OSMRE



Date/Time Tran at 12:00:00 November 26, 2018
Trigger Source Geo: 0.131 mm/s
Range Geo: 31.6 mm/s
Record Time 5.0 sec at 1024 sps
Notes

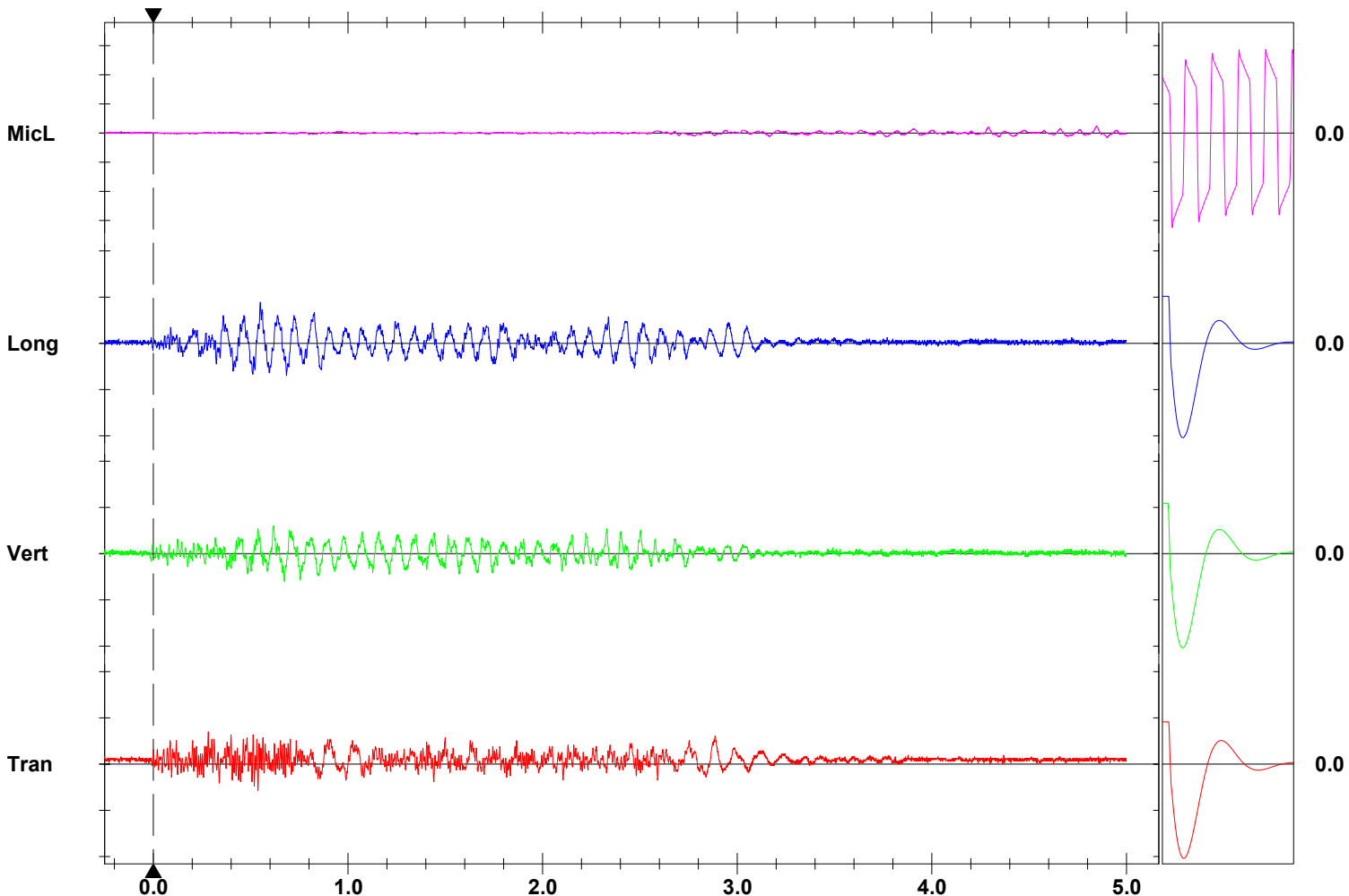
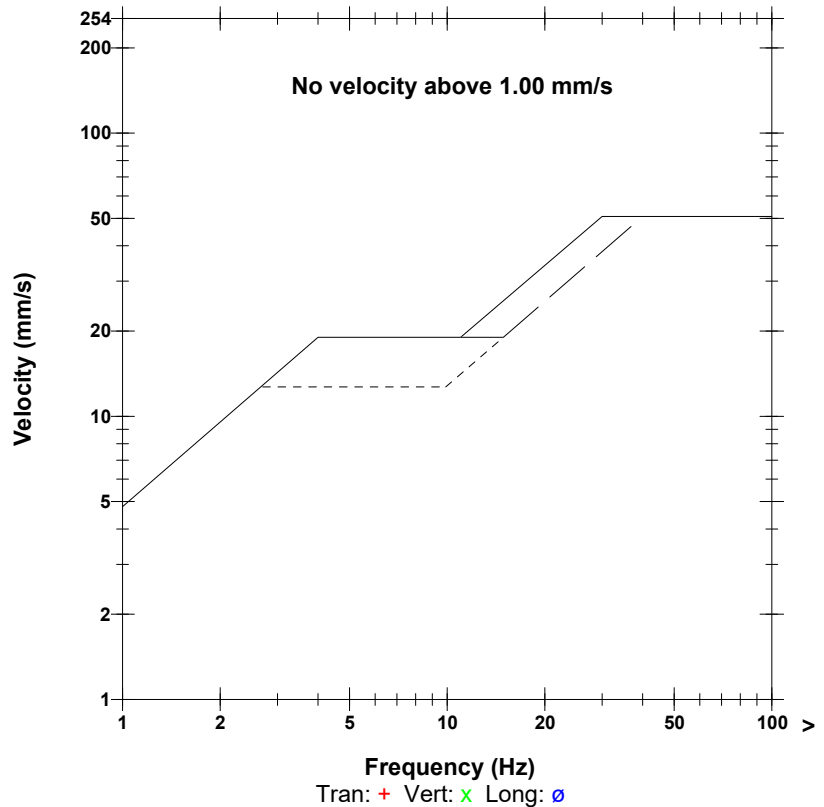
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration October 25, 2017 by Saros Int.
File Name R020HH8S.2U0

Microphone Linear Weighting
PSPL 101.1 dB(L) at 4.837 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 616 mv)

	Tran	Vert	Long	
PPV	0.347	0.303	0.444	mm/s
ZC Freq	51	20	10	Hz
Time (Rel. to Trig)	0.284	0.617	0.547	sec
Peak Acceleration	0.0147	0.00821	0.00992	g
Peak Displacement	0.00512	0.00281	0.00455	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.1	7.4	7.4	Hz
Overswing Ratio	4.1	3.9	4.1	

Peak Vector Sum 0.556 mm/s at 0.547 sec

USBM R18507 And OSMRE



Date/Time Vert at 13:00:02 December 13, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

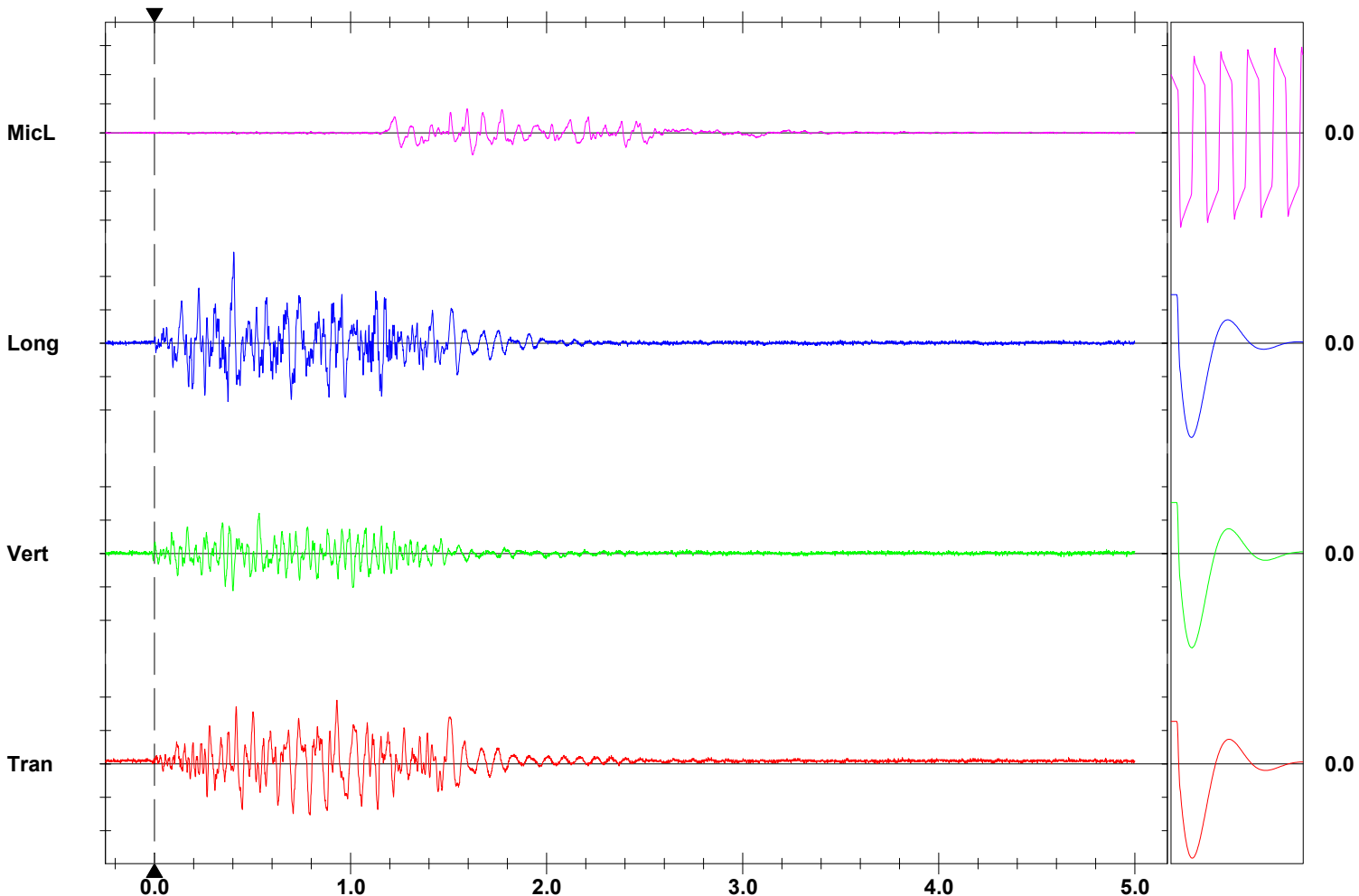
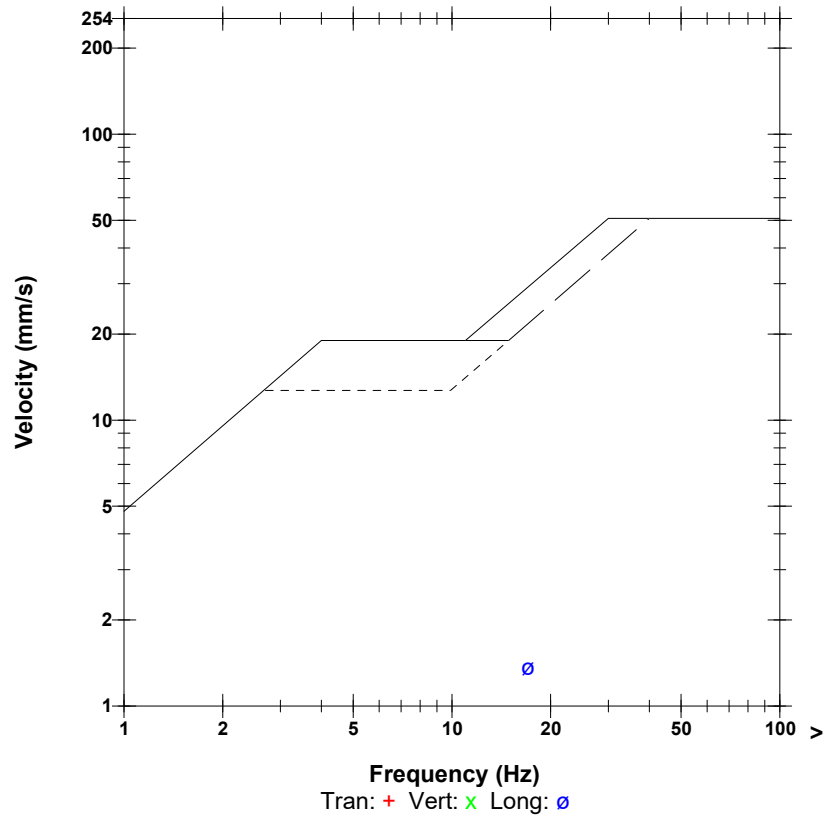
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros (Int)
File Name S020GYVU.Y20

Microphone Linear Weighting
PSPL 112.3 dB(L) at 1.594 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 528 mv)

	Tran	Vert	Long	
PPV	0.952	0.603	1.37	mm/s
ZC Freq	16	20	17	Hz
Time (Rel. to Trig)	0.930	0.534	0.404	sec
Peak Acceleration	0.0182	0.0133	0.0282	g
Peak Displacement	0.00950	0.00436	0.0105	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.9	3.8	4.0	

Peak Vector Sum 1.42 mm/s at 0.404 sec

USBM RI8507 And OSMRE



Sensor Check

Date/Time Vert at 13:00:02 December 13, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

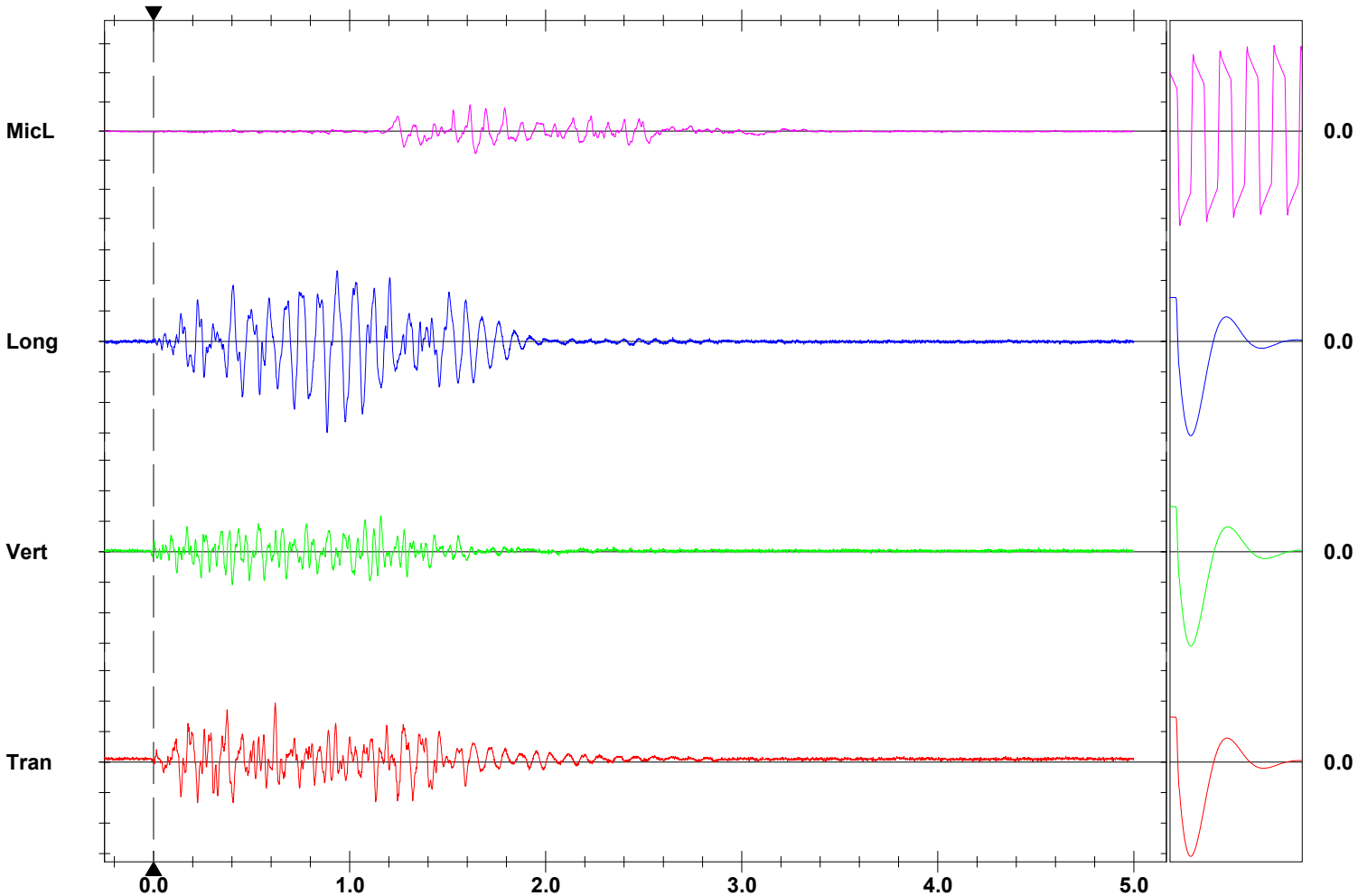
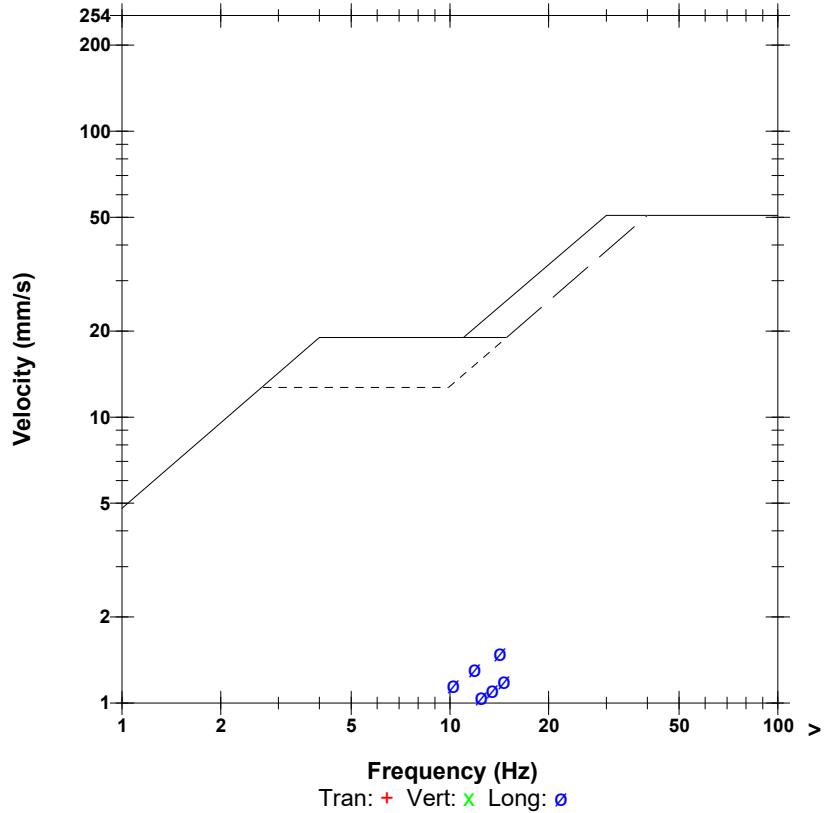
Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros (Int)
File Name S158GYVU.Y20

Microphone Linear Weighting
PSPL 113.1 dB(L) at 1.613 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 557 mv)

	Tran	Vert	Long	
PPV	0.968	0.587	1.49	mm/s
ZC Freq	23	23	14	Hz
Time (Rel. to Trig)	0.620	1.158	0.885	sec
Peak Acceleration	0.0182	0.0133	0.0182	g
Peak Displacement	0.00885	0.00441	0.0169	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.9	3.8	3.8	

Peak Vector Sum 1.54 mm/s at 0.886 sec

USBM RI8507 And OSMRE



Sensor Check

Date/Time Vert at 13:00:02 December 13, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

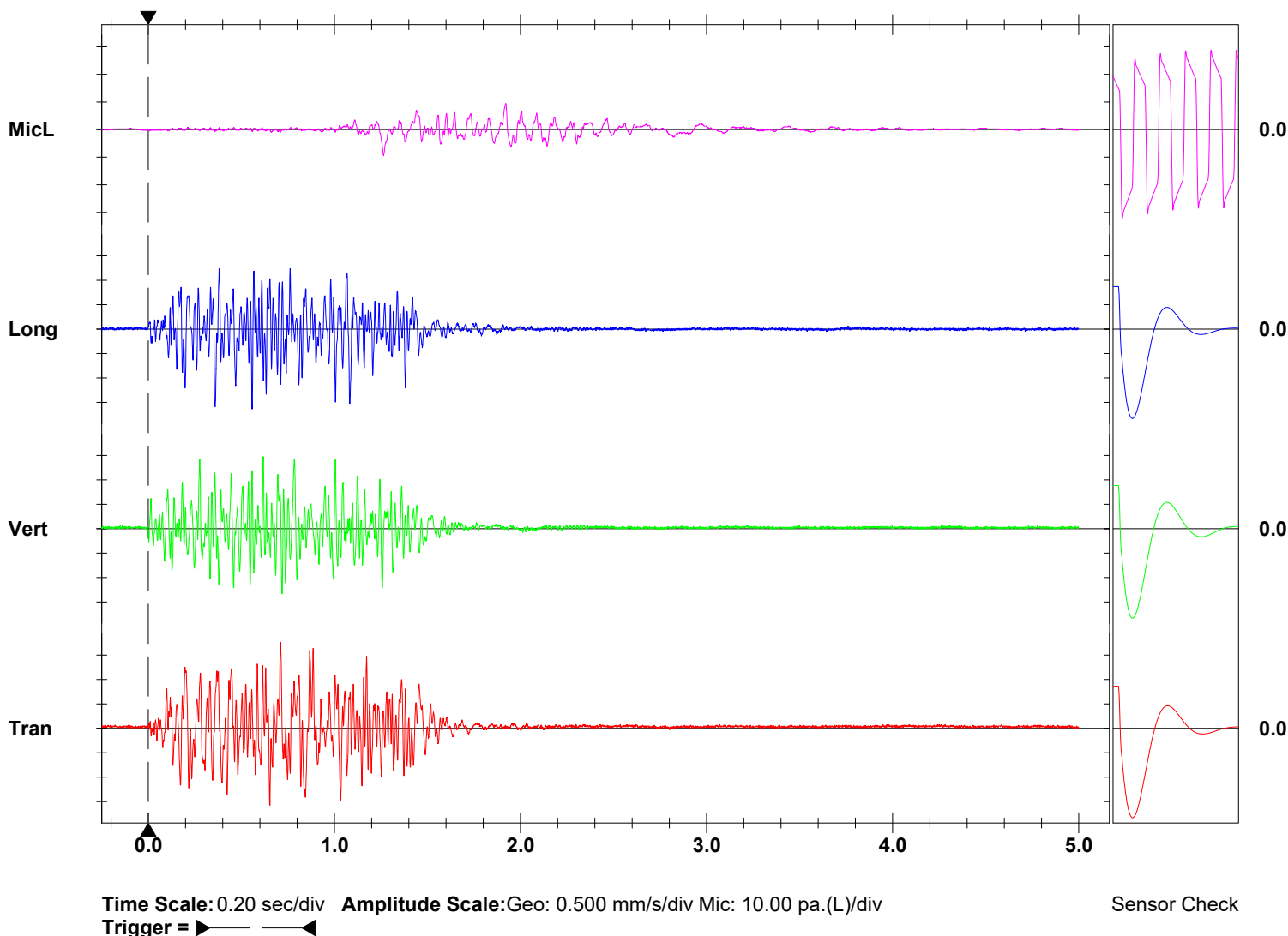
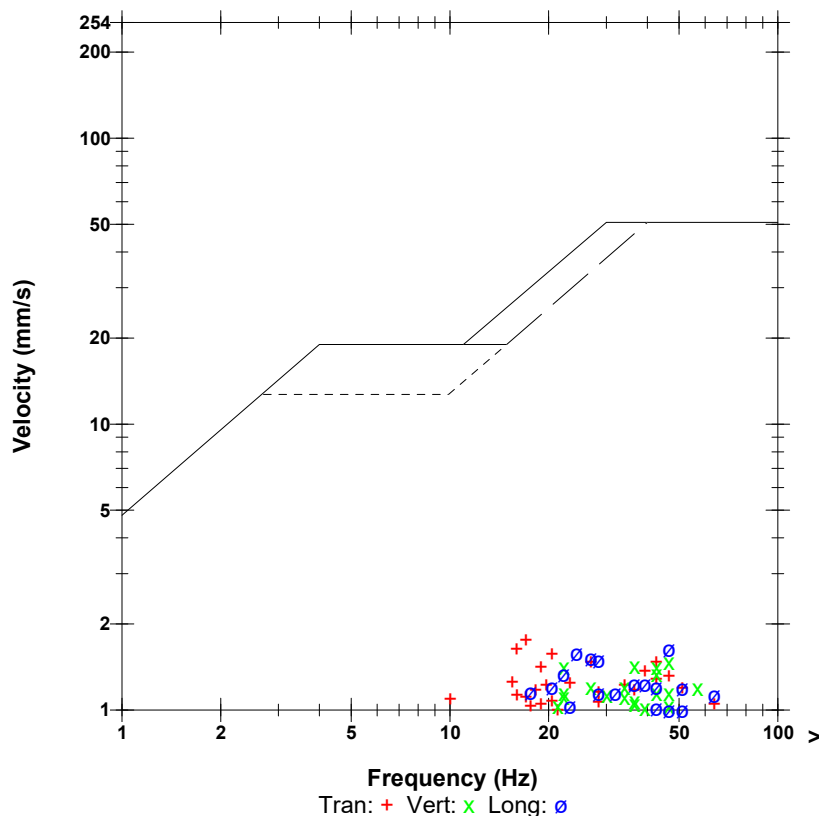
Serial Number BE15777 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros (Int)
File Name S777GYVU.Y20

Microphone Linear Weighting
PSPL 113.5 dB(L) at 1.265 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 606 mv)

	Tran	Vert	Long	
PPV	1.76	1.48	1.64	mm/s
ZC Freq	17	47	47	Hz
Time (Rel. to Trig)	0.711	0.617	0.558	sec
Peak Acceleration	0.0481	0.0431	0.0547	g
Peak Displacement	0.0146	0.00881	0.00795	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.5	Hz
Overswing Ratio	4.0	3.4	4.1	

Peak Vector Sum 2.25 mm/s at 1.006 sec

USBM RI8507 And OSMRE



Date/Time Vert at 13:00:01 December 13, 2018
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

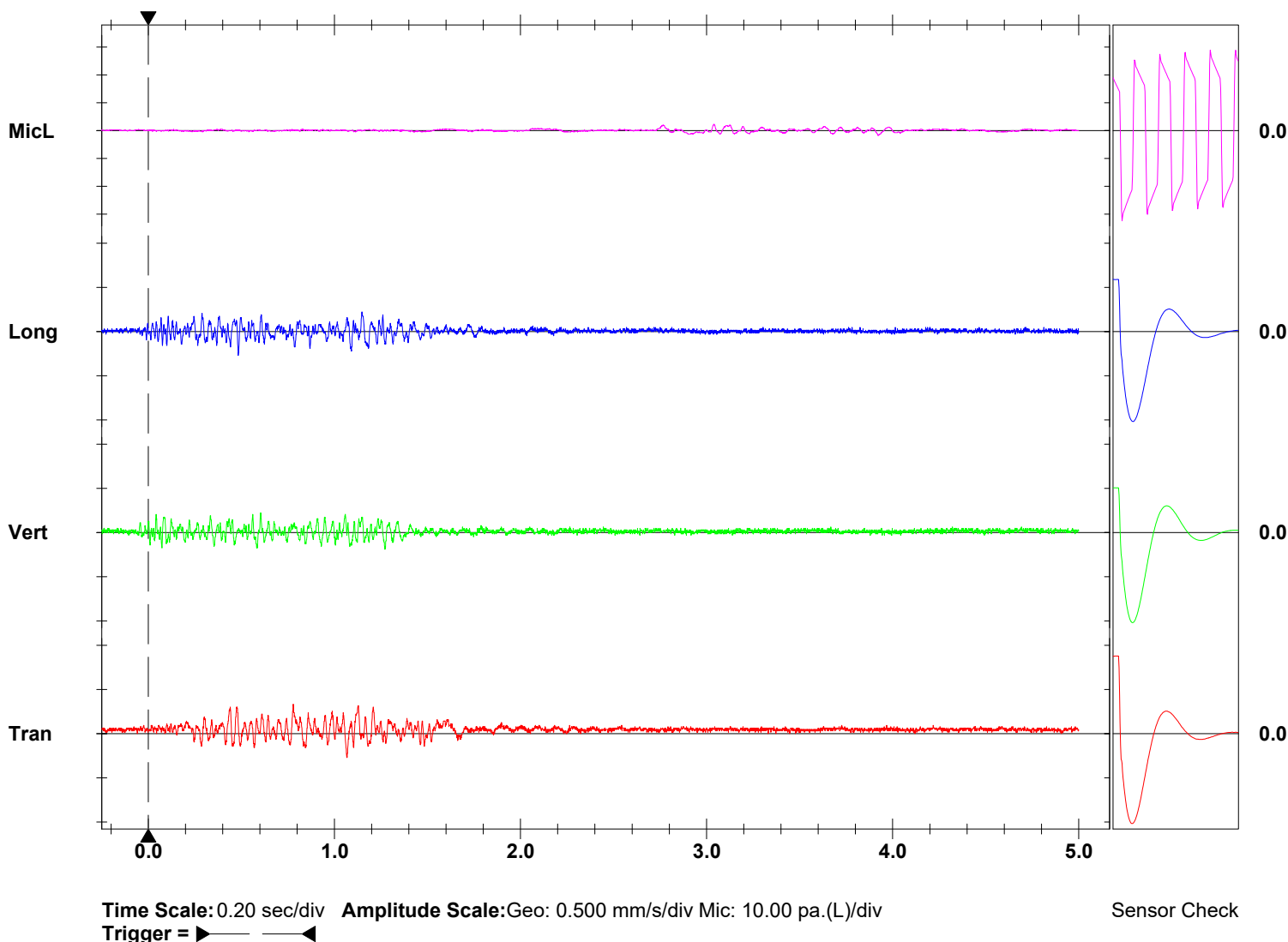
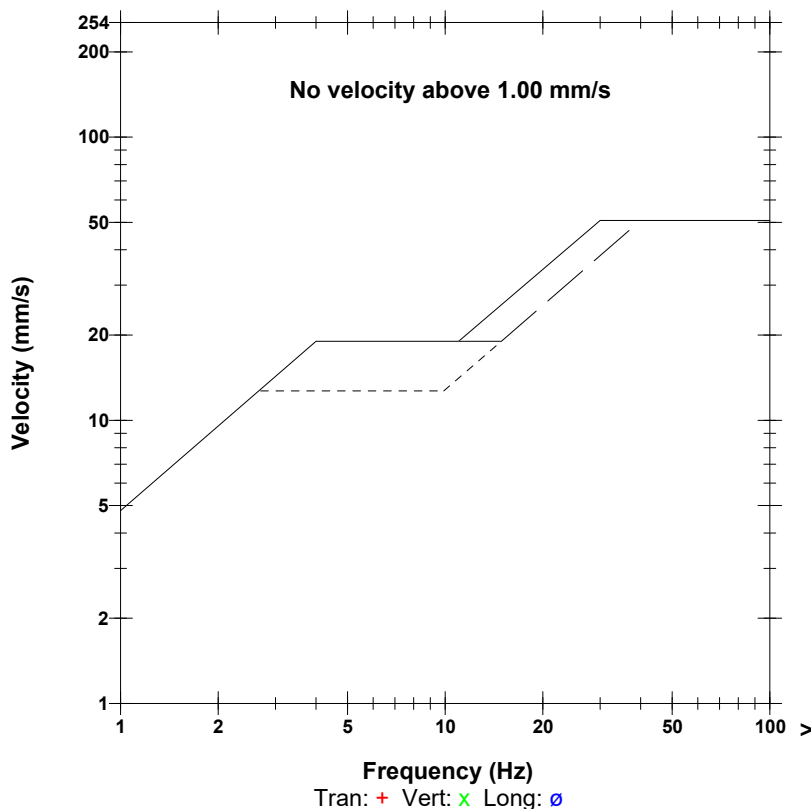
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros (Int)
File Name S377GYVU.Y10

Microphone Linear Weighting
PSPL 101.0 dB(L) at 3.038 sec
ZC Freq 21 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 567 mv)

	Tran	Vert	Long	
PPV	0.333	0.222	0.270	mm/s
ZC Freq	8.7	37	43	Hz
Time (Rel. to Trig)	0.779	0.603	0.483	sec
Peak Acceleration	0.00829	0.00829	0.00994	g
Peak Displacement	0.00564	0.00167	0.00174	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.6	7.2	Hz
Overswing Ratio	4.0	3.4	4.0	

Peak Vector Sum 0.350 mm/s at 0.440 sec

USBM RI8507 And OSMRE



Date/Time Vert at 12:00:05 January 31, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 100 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R158HSCS.050

Notes

Location:
 Client:
 User Name:
 General:

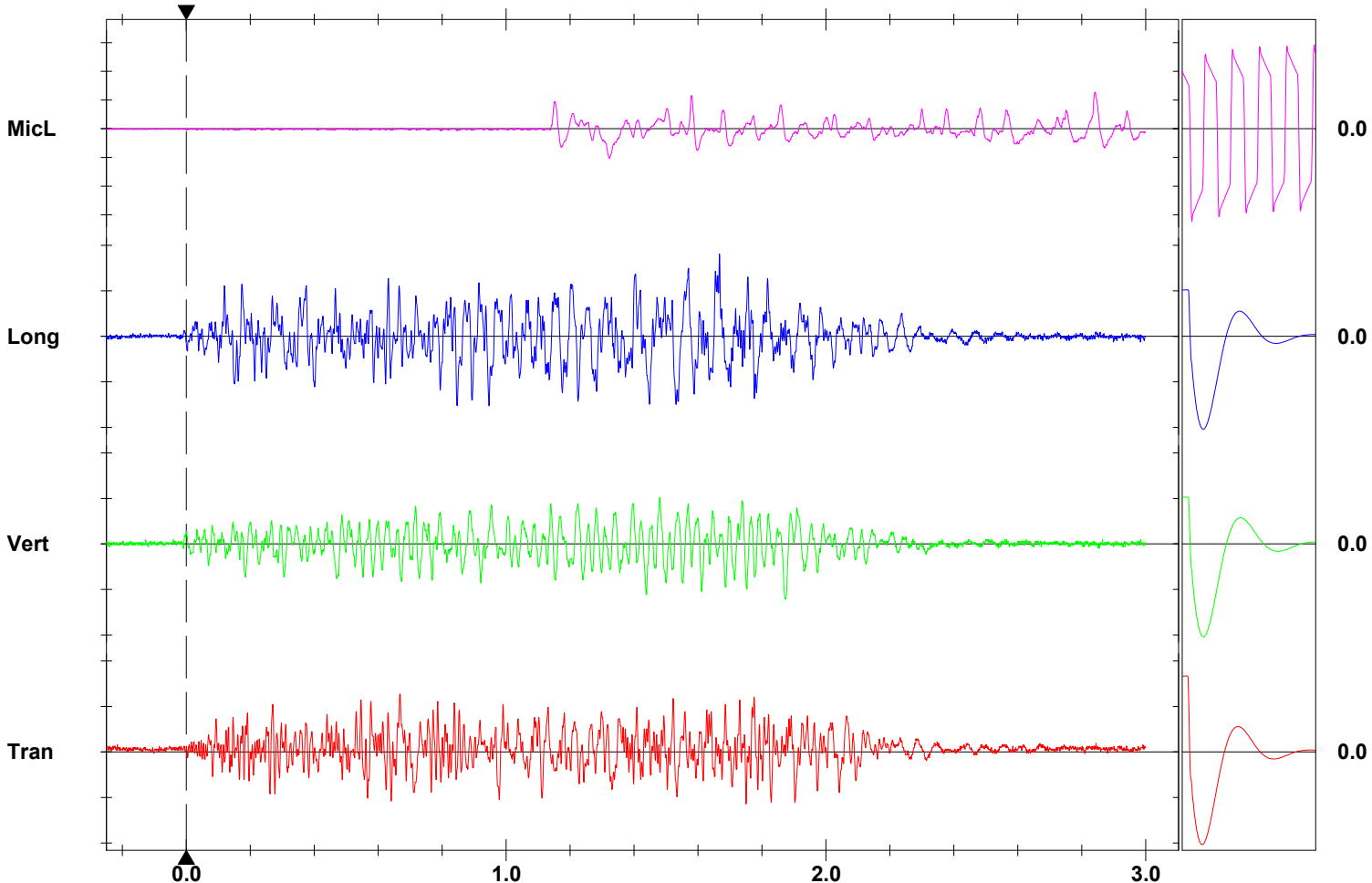
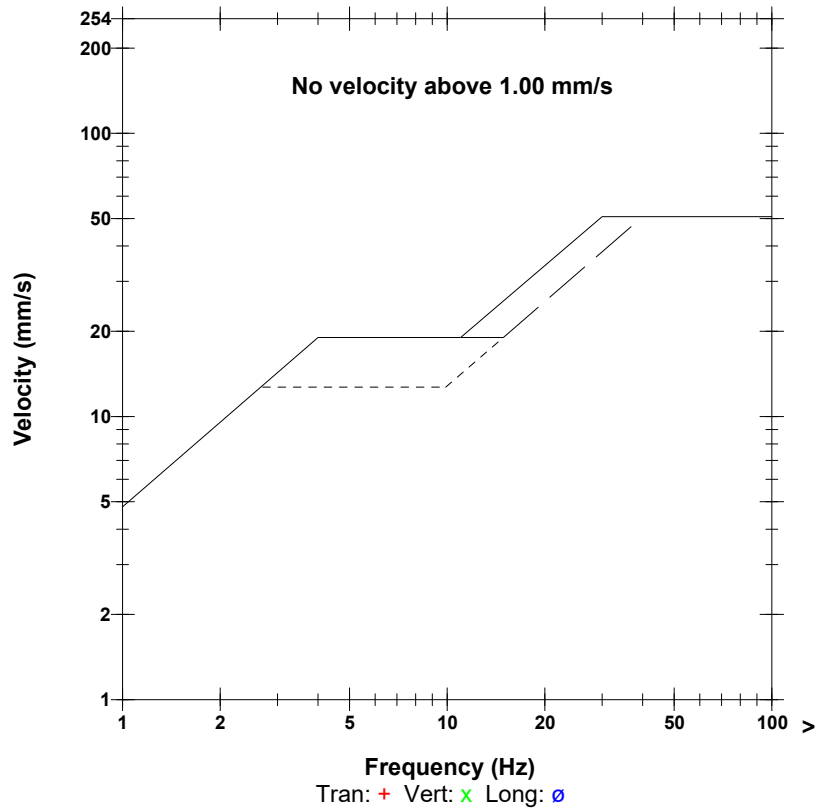
Extended Notes

Microphone Linear Weighting
PSPL 116.1 dB(L) at 2.841 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 468 mv)

	Tran	Vert	Long	
PPV	0.635	0.603	0.905	mm/s
ZC Freq	18	24	19	Hz
Time (Rel. to Trig)	0.667	1.872	1.667	sec
Peak Acceleration	0.0282	0.0166	0.0282	g
Peak Displacement	0.00405	0.00382	0.00643	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.4	7.5	Hz
Overswing Ratio	3.7	3.6	3.7	

Peak Vector Sum 0.956 mm/s at 1.776 sec

USBM R18507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 12:00:04 January 31, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 134 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE15777 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q777HSCS.040

Notes

Location: Saros labs
Client:
User Name: Final Calibration Check
General:

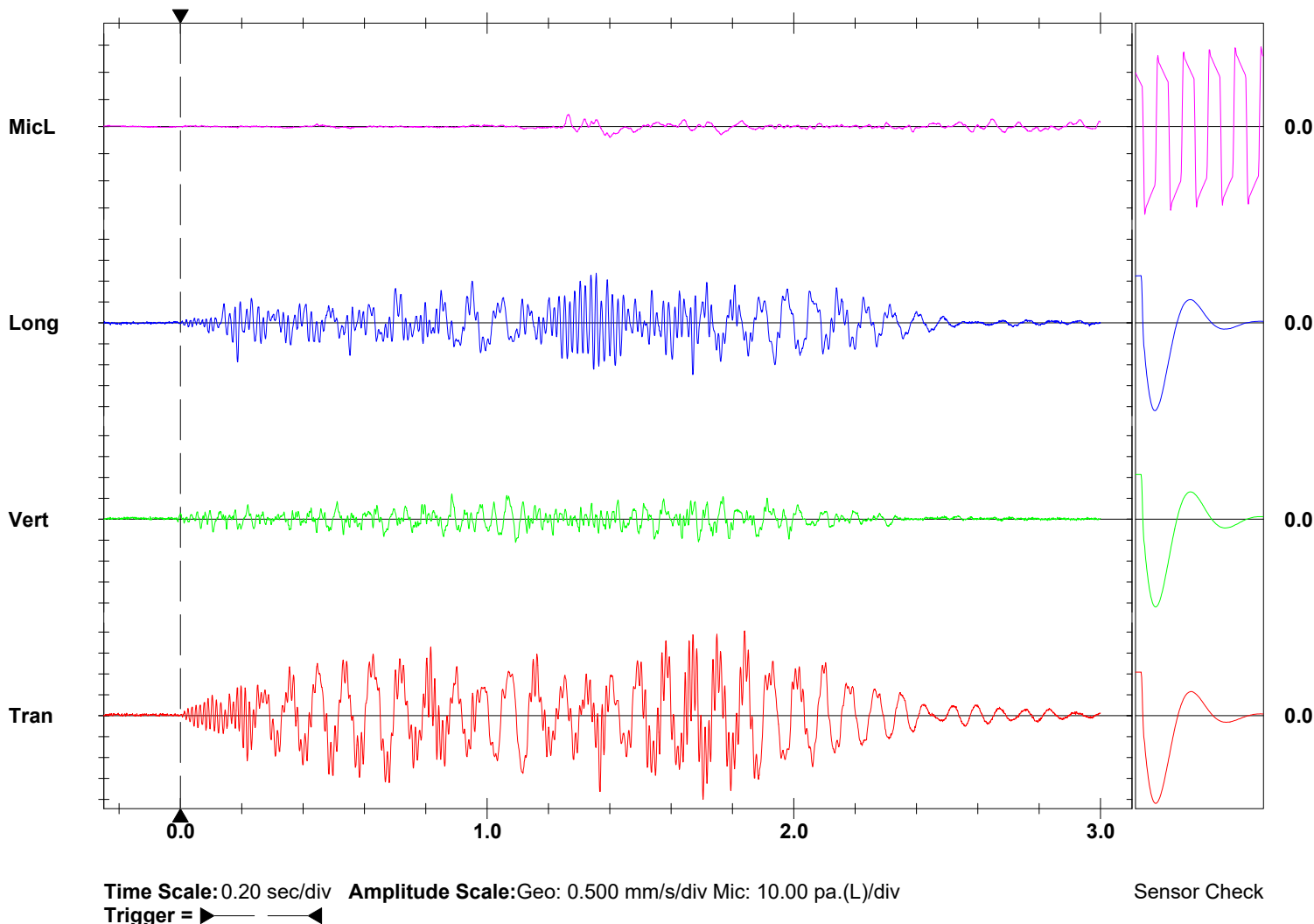
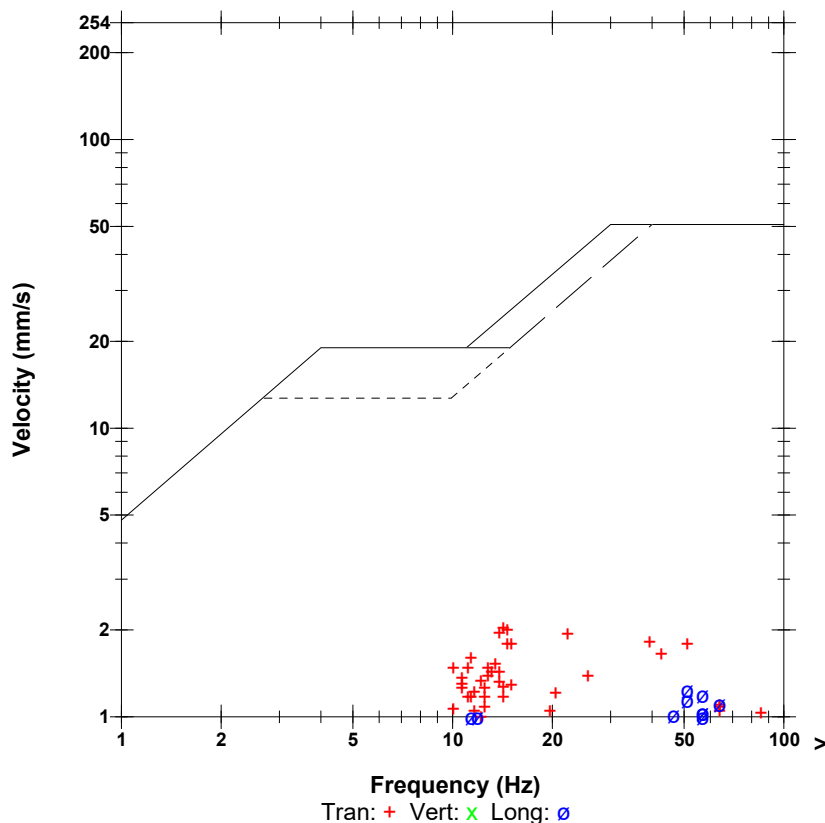
Extended Notes

Microphone Linear Weighting
PSPL 107.0 dB(L) at 1.266 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 470 mv)

	Tran	Vert	Long	
PPV	2.03	0.603	1.24	mm/s
ZC Freq	14	21	51	Hz
Time (Rel. to Trig)	1.840	0.885	1.671	sec
Peak Acceleration	0.0580	0.0215	0.0464	g
Peak Displacement	0.0209	0.00511	0.0108	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.7	3.2	3.8	

Peak Vector Sum 2.31 mm/s at 1.671 sec

USBM RI8507 And OSMRE



Date/Time Vert at 12:00:04 January 31, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

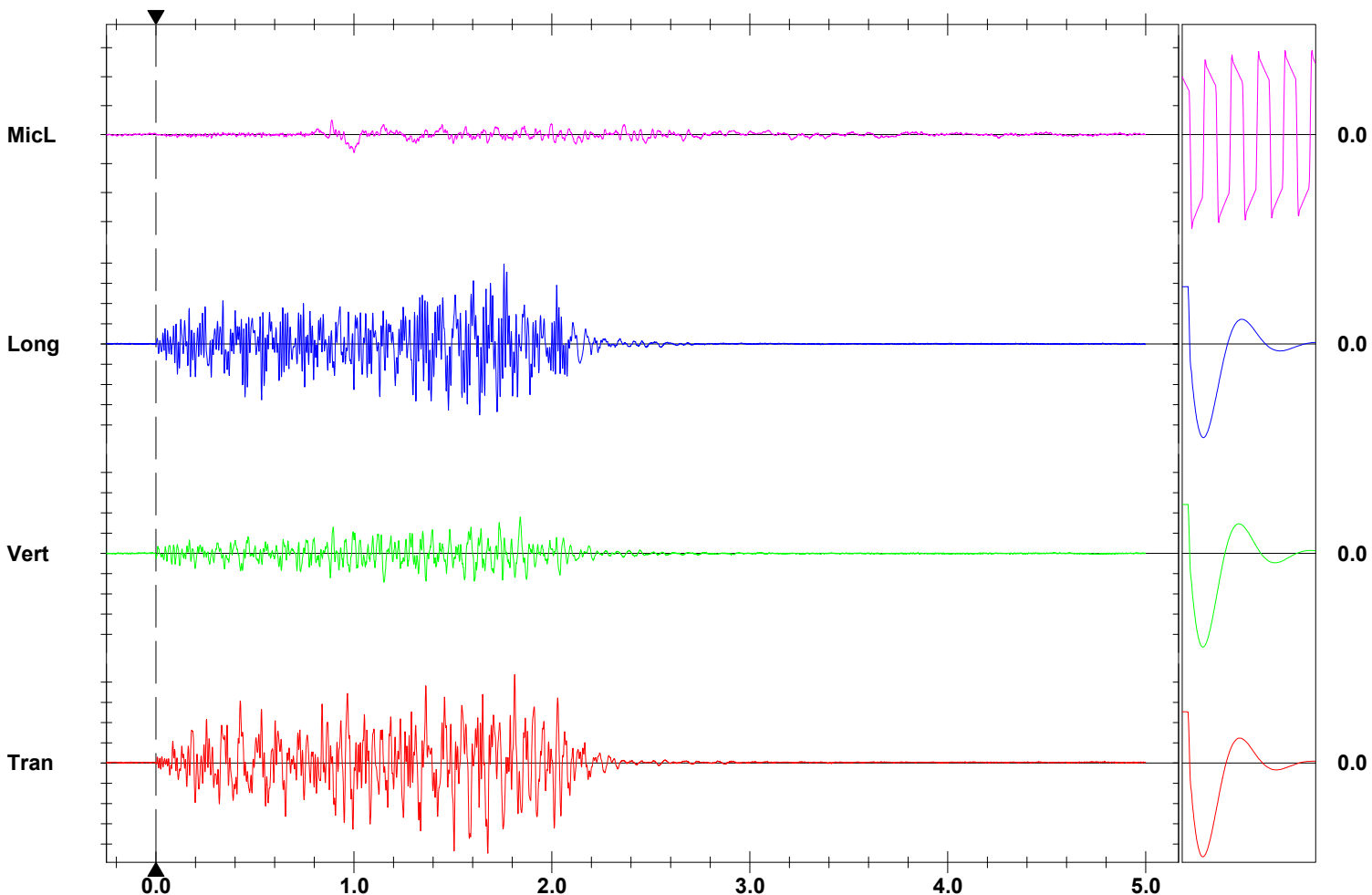
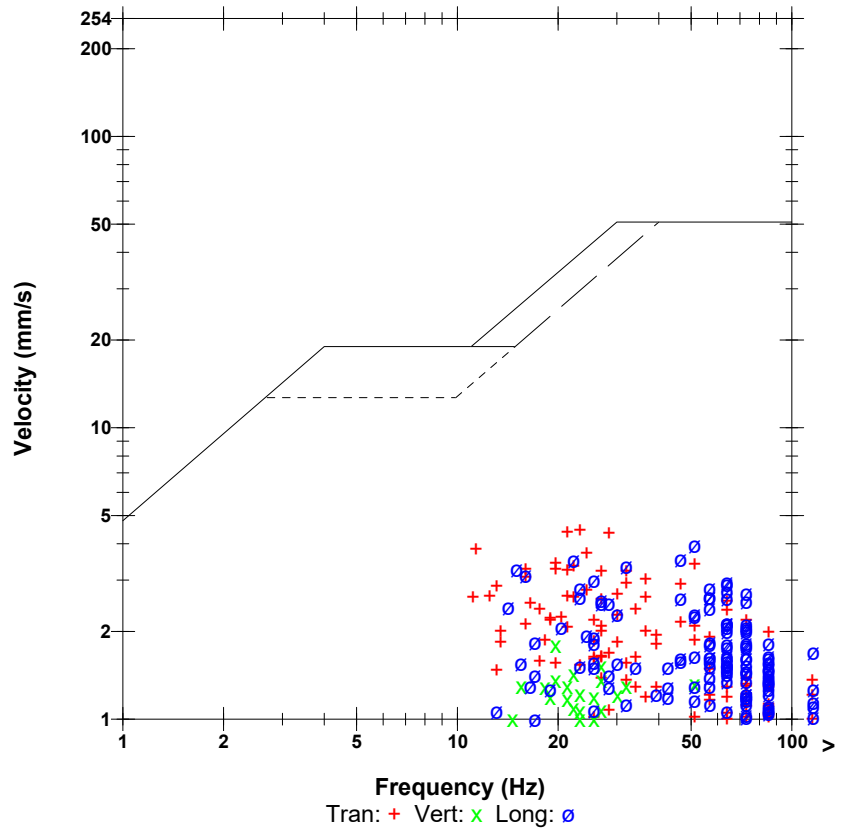
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q377HSCS.040

Microphone Linear Weighting
PSPL 109.9 dB(L) at 1.000 sec
ZC Freq 6.4 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 451 mv)

	Tran	Vert	Long	
PPV	4.46	1.79	3.95	mm/s
ZC Freq	23	20	51	Hz
Time (Rel. to Trig)	1.677	1.840	1.758	sec
Peak Acceleration	0.124	0.0514	0.131	g
Peak Displacement	0.0283	0.0120	0.0243	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.7	7.2	Hz
Overswing Ratio	3.8	3.2	3.8	

Peak Vector Sum 4.95 mm/s at 1.758 sec

USBM RI8507 And OSMRE



Date/Time Long at 12:00:05 January 31, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

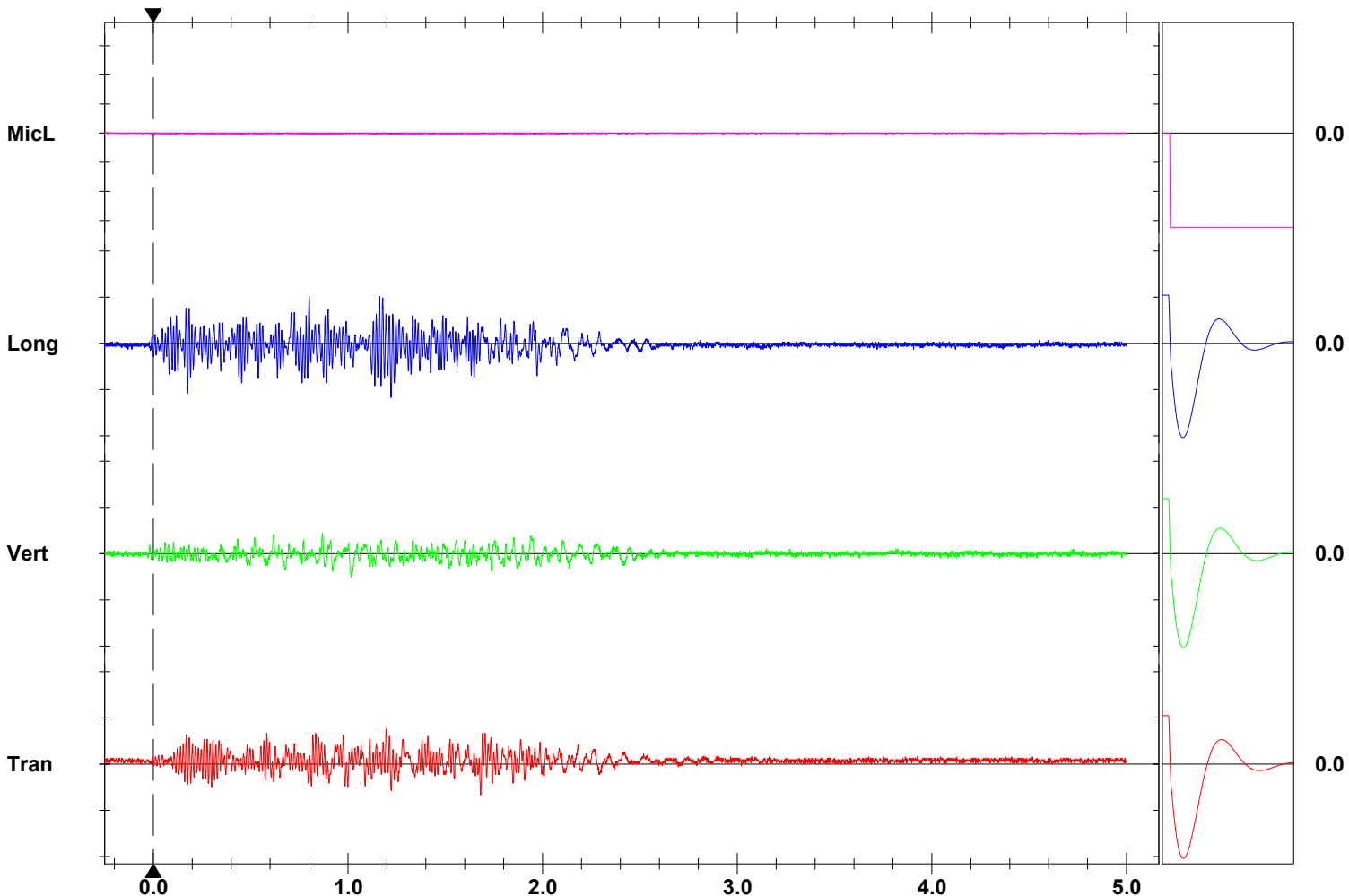
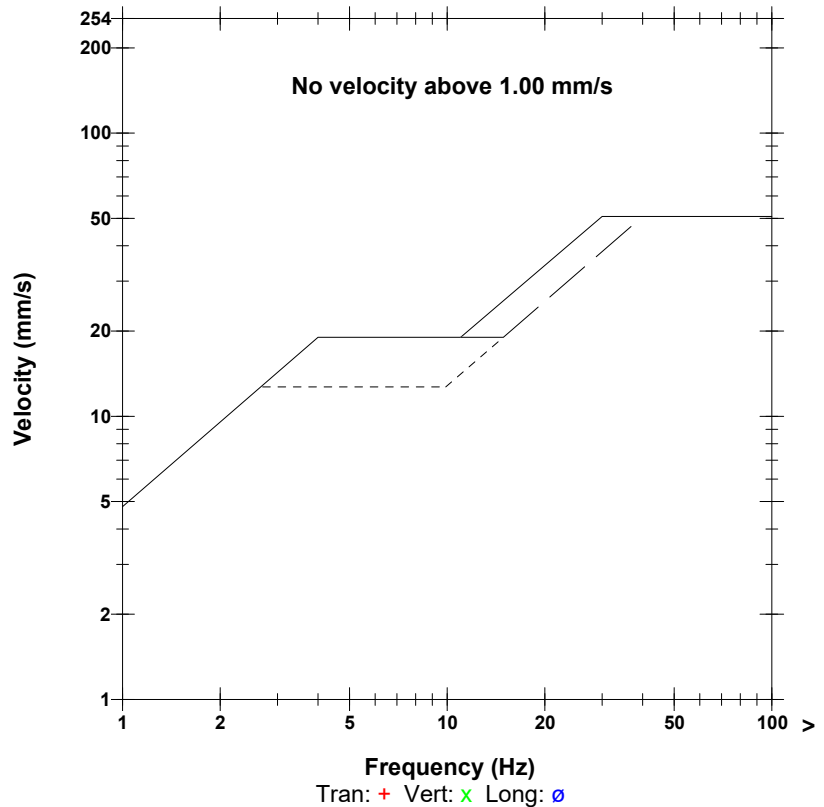
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R020HSCS.050

Microphone Linear Weighting
PSPL <88 dB(L) at 0.006 sec
ZC Freq N/A
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	0.381	0.254	0.587	mm/s
ZC Freq	43	19	47	Hz
Time (Rel. to Trig)	1.196	1.017	1.222	sec
Peak Acceleration	0.0133	0.00829	0.0215	g
Peak Displacement	0.00292	0.00202	0.00207	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.1	7.3	7.4	Hz
Overswing Ratio	3.9	3.7	3.9	

Peak Vector Sum 0.658 mm/s at 1.222 sec
N/A: Not Applicable

USBM R18507 And OSMRE



Date/Time Vert at 12:15:02 February 21, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

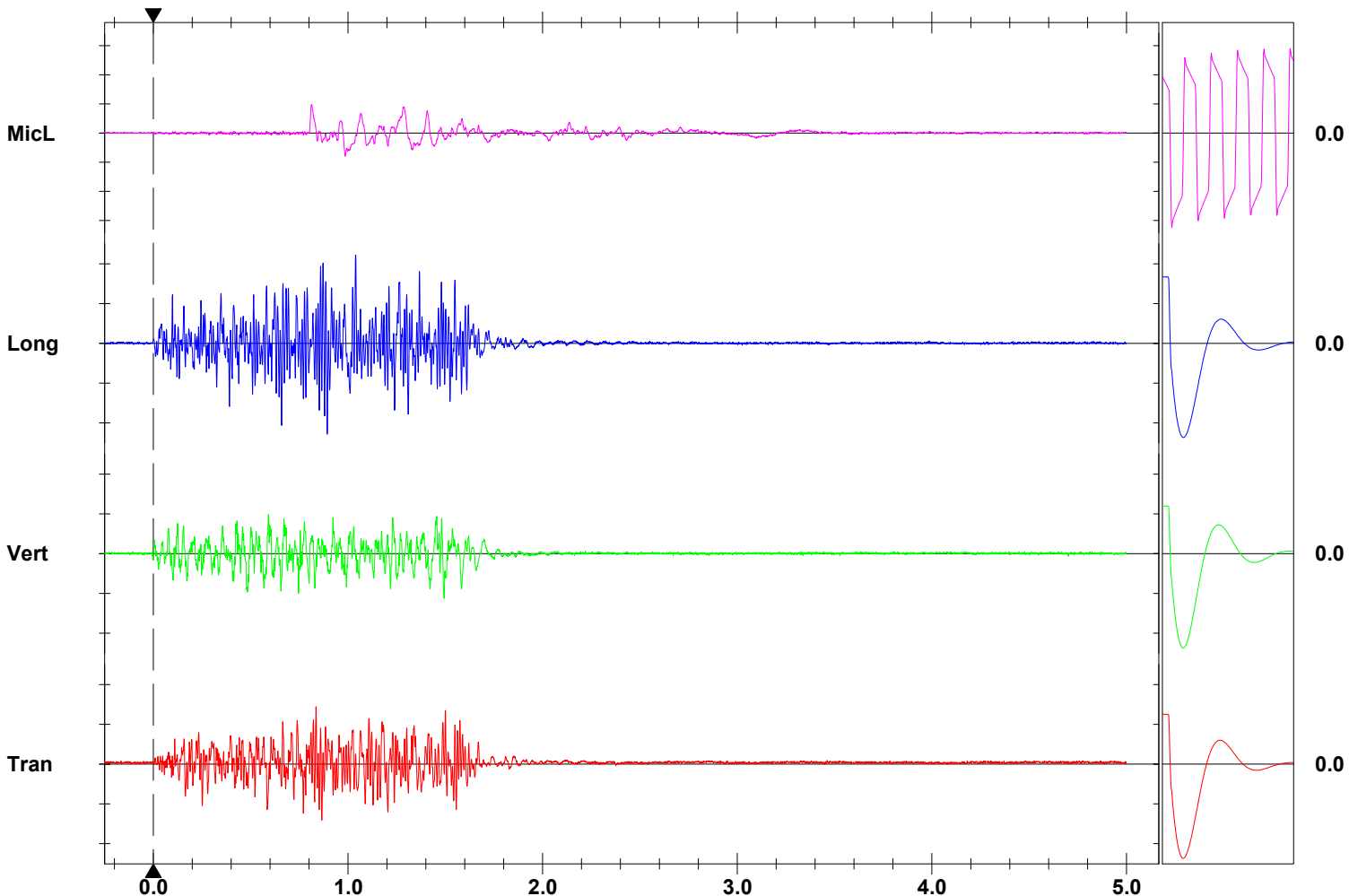
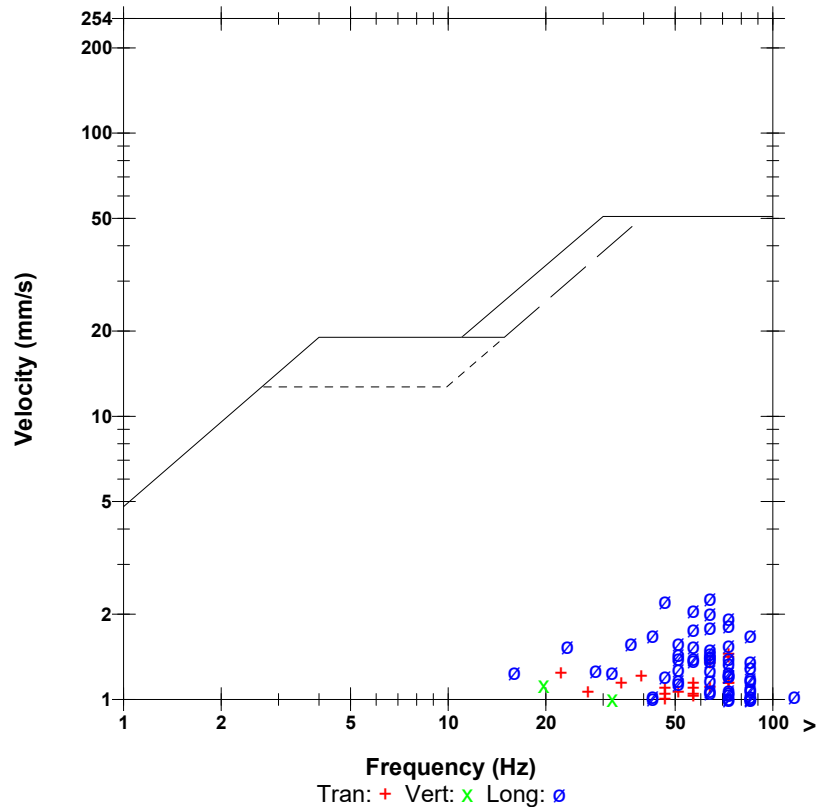
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q377HTFO.P20

Microphone Linear Weighting
PSPL 113.8 dB(L) at 0.812 sec
ZC Freq 14 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 578 mv)

	Tran	Vert	Long	
PPV	1.44	1.13	2.29	mm/s
ZC Freq	73	20	64	Hz
Time (Rel. to Trig)	0.836	1.494	0.894	sec
Peak Acceleration	0.0613	0.0547	0.0928	g
Peak Displacement	0.00700	0.00686	0.00973	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.2	Hz
Overswing Ratio	4.0	3.3	3.9	

Peak Vector Sum 2.30 mm/s at 0.894 sec

USBM R18507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 12:15:01 February 21, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

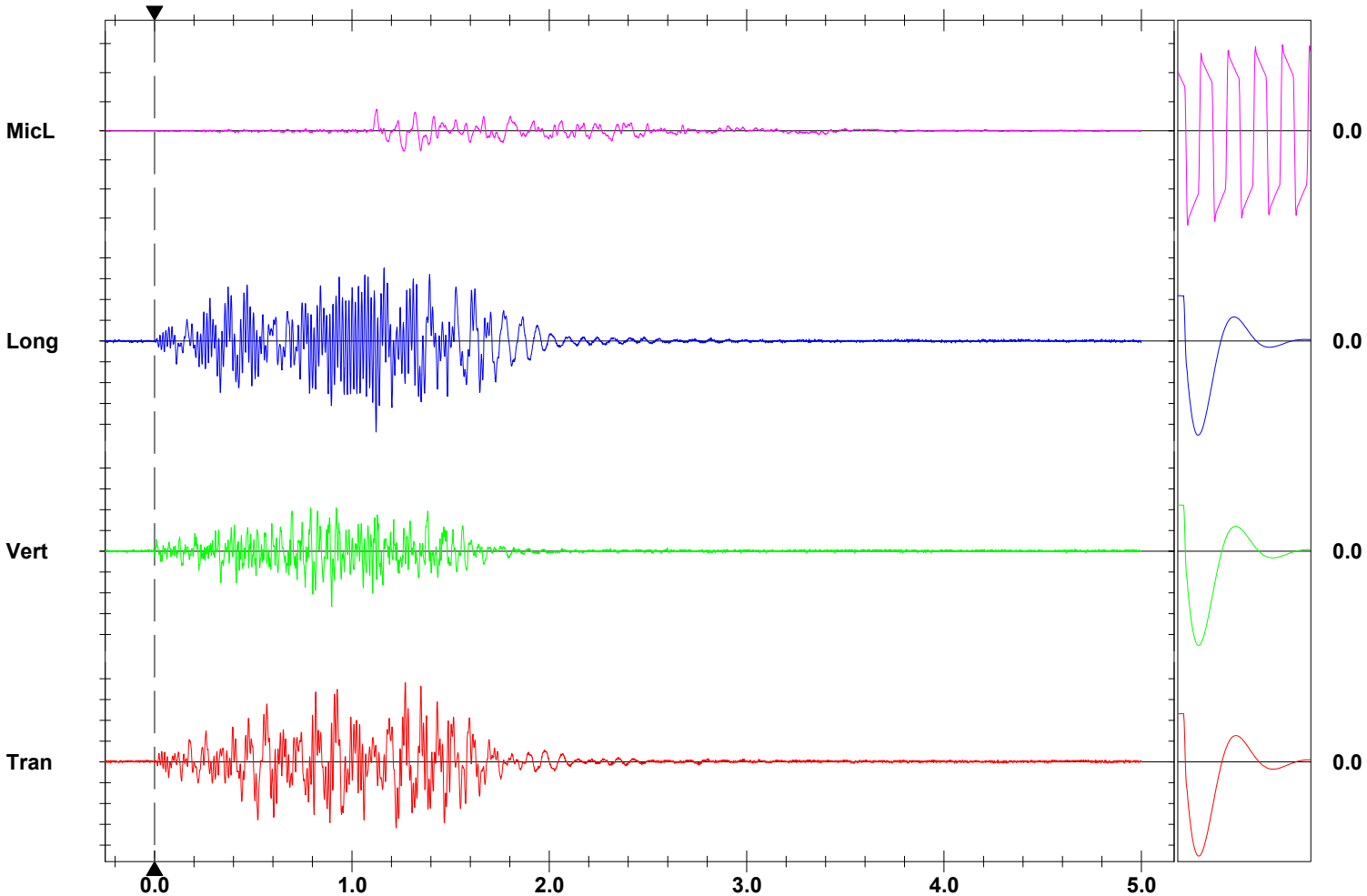
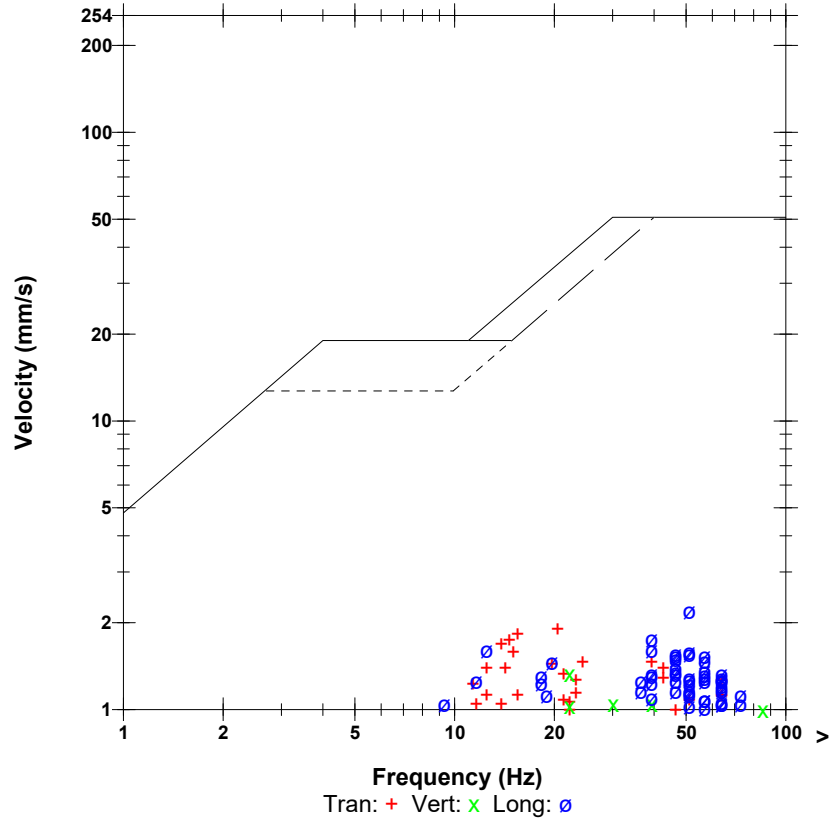
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q569HTFO.P10

Microphone Linear Weighting
PSPL 111.5 dB(L) at 1.125 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 575 mv)

	Tran	Vert	Long	
PPV	1.90	1.33	2.19	mm/s
ZC Freq	20	22	51	Hz
Time (Rel. to Trig)	1.270	0.897	1.122	sec
Peak Acceleration	0.0563	0.0563	0.0613	g
Peak Displacement	0.0158	0.00642	0.0144	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.6	3.8	3.9	

Peak Vector Sum 2.30 mm/s at 1.351 sec

USBM RI8507 And OSMRE



Sensor Check

Date/Time Vert at 12:15:02 February 21, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 100 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.5 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R158HTFO.P20

Notes

Location:
 Client:
 User Name:
 General:

Extended Notes

Microphone Linear Weighting
PSPL 104.2 dB(L) at 1.098 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 559 mv)

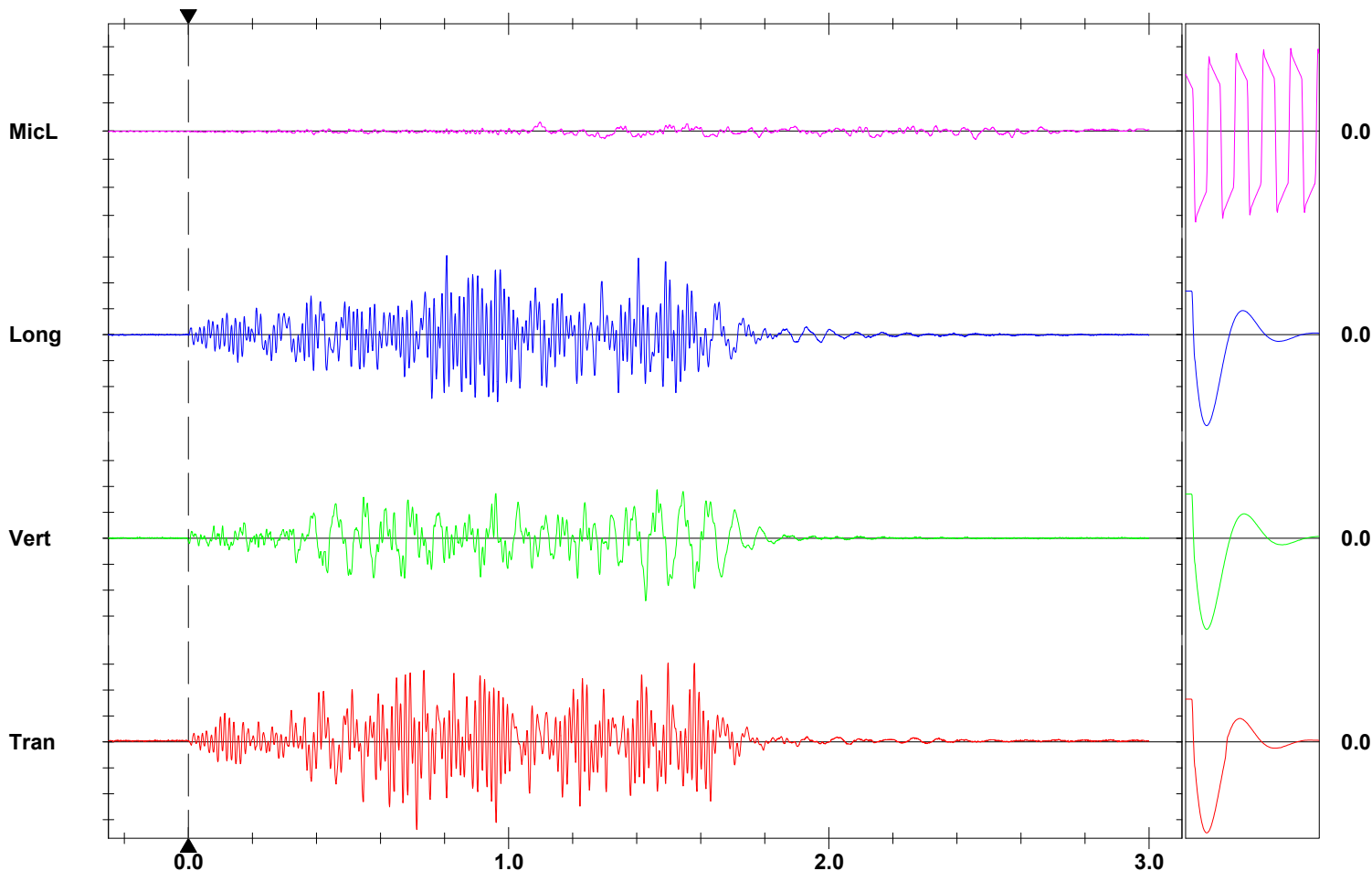
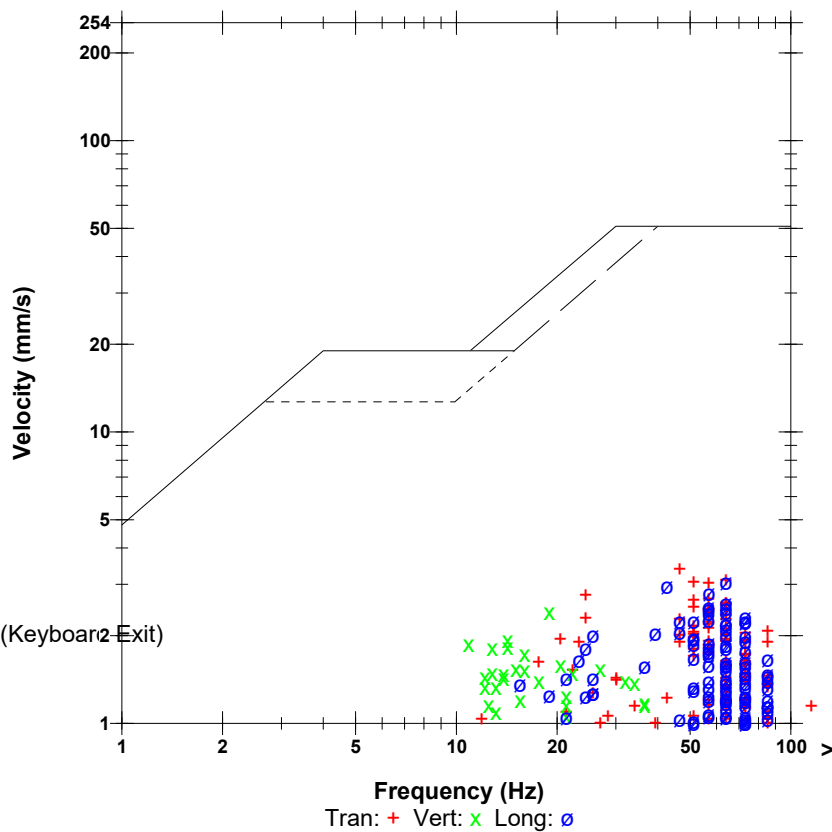
	Tran	Vert	Long	
PPV	3.38	2.41	3.05	mm/s
ZC Freq	47	19	64	Hz
Time (Rel. to Trig)	0.713	1.428	0.806	sec
Peak Acceleration	0.113	0.0481	0.113	g
Peak Displacement	0.0123	0.0195	0.0105	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.4	7.5	Hz
Overswing Ratio	3.9	3.7	3.8	

Peak Vector Sum 4.03 mm/s at 0.960 sec

Monitor Log

Feb 21 /19 12:14:19 Feb 21 /19 12:15:05 Event recorded. (Keyboard Exit)

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Tran at 12:15:03 February 21, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

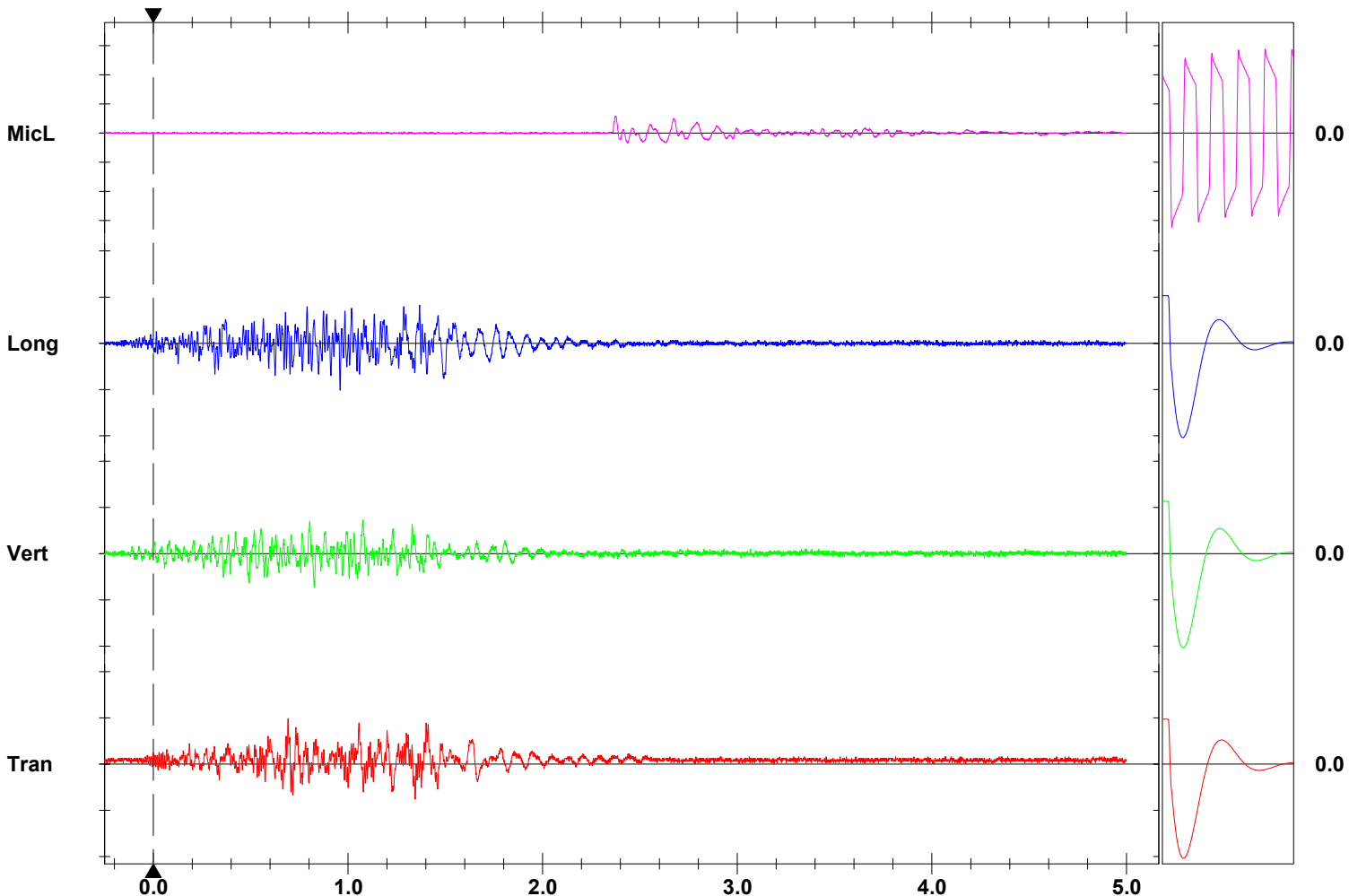
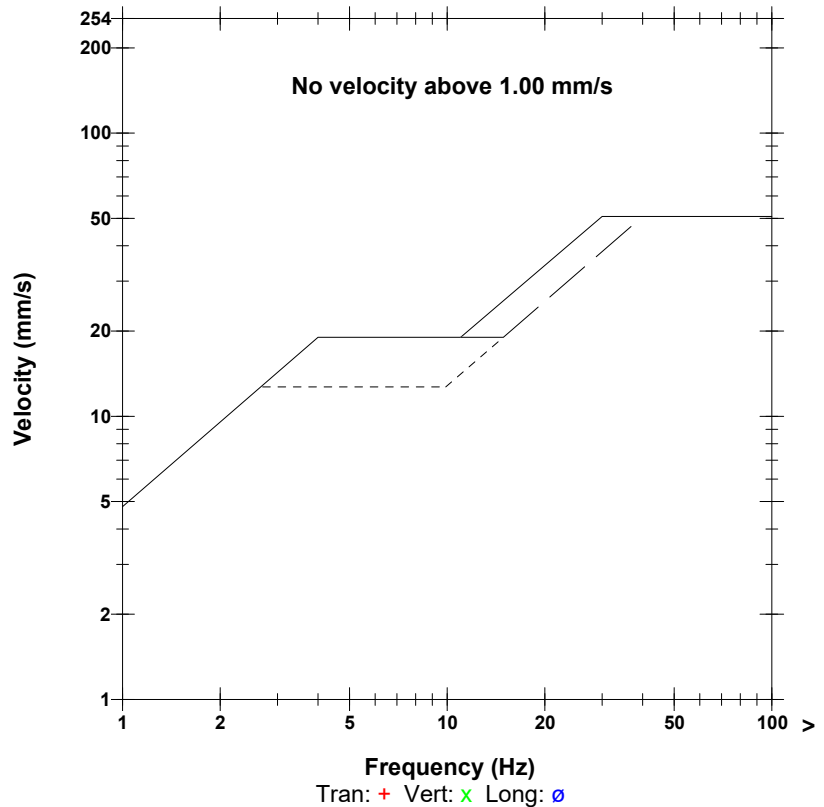
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R020HTFO.P30

Microphone Linear Weighting
PSPL 109.2 dB(L) at 2.372 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 596 mv)

	Tran	Vert	Long	
PPV	0.492	0.365	0.508	mm/s
ZC Freq	20	32	57	Hz
Time (Rel. to Trig)	0.692	0.826	0.959	sec
Peak Acceleration	0.0149	0.0149	0.0182	g
Peak Displacement	0.00420	0.00234	0.00353	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.1	7.4	7.4	Hz
Overswing Ratio	3.9	3.7	4.0	

Peak Vector Sum 0.527 mm/s at 1.058 sec

USBM RI8507 And OSMRE



Date/Time Vert at 13:00:07 March 19, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

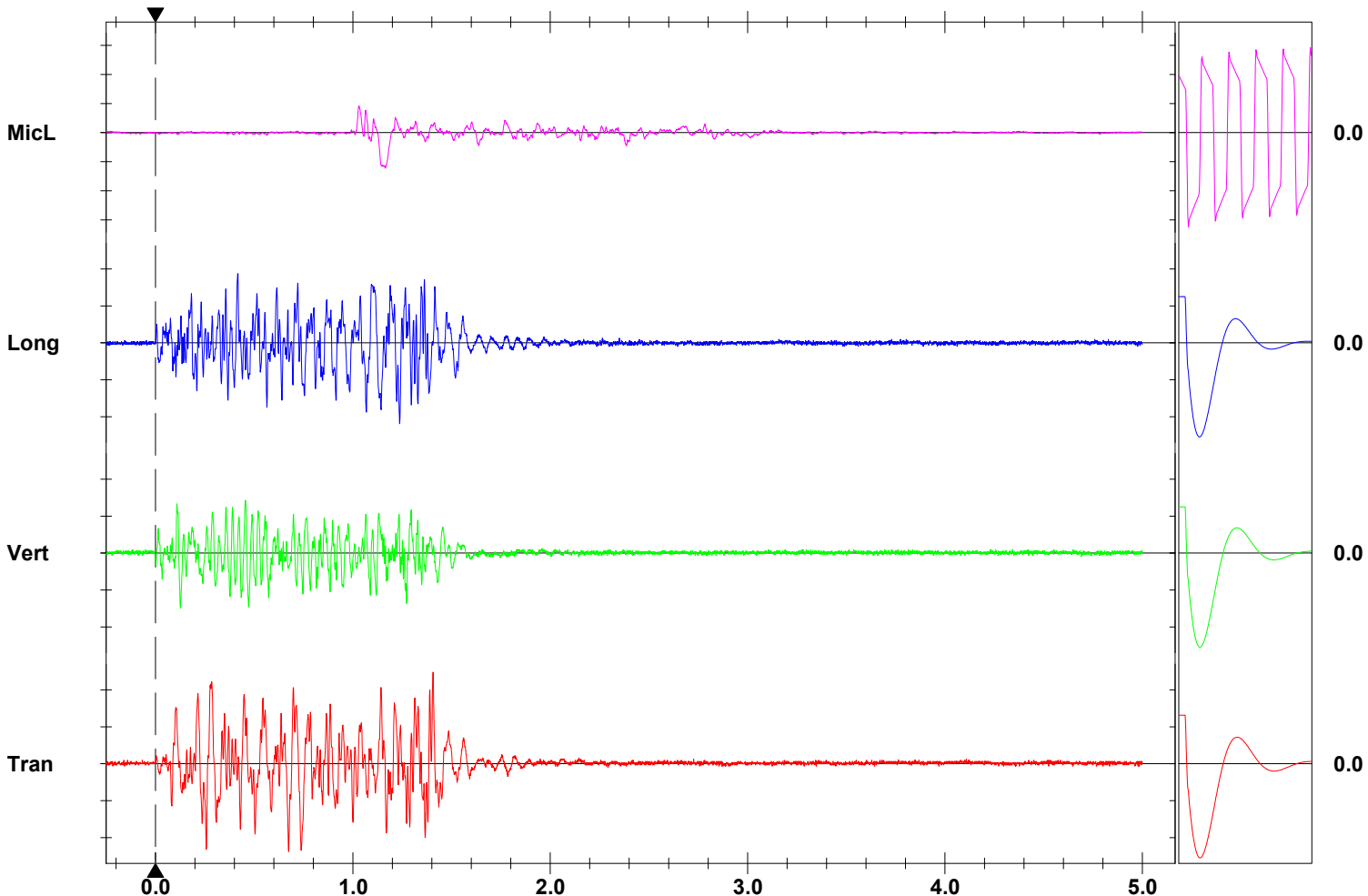
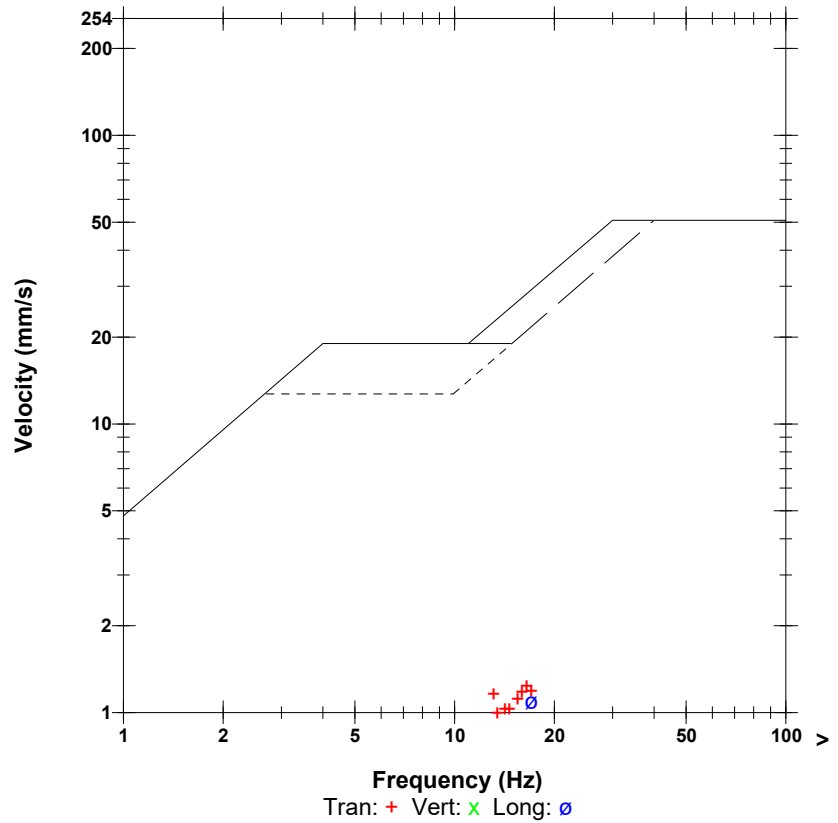
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.6 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q569HURW.470

Microphone Linear Weighting
PSPL 115.7 dB(L) at 1.165 sec
ZC Freq 7.3 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 570 mv)

	Tran	Vert	Long	
PPV	1.24	0.746	1.10	mm/s
ZC Freq	17	27	17	Hz
Time (Rel. to Trig)	1.405	0.127	1.237	sec
Peak Acceleration	0.0298	0.0232	0.0282	g
Peak Displacement	0.0107	0.00427	0.0104	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.6	3.8	3.9	

Peak Vector Sum 1.39 mm/s at 1.143 sec

USBM RI8507 And OSMRE



Sensor Check

Date/Time Vert at 13:00:07 March 19, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 100 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R158HURW.470

Notes

Location:
 Client:
 User Name:
 General:

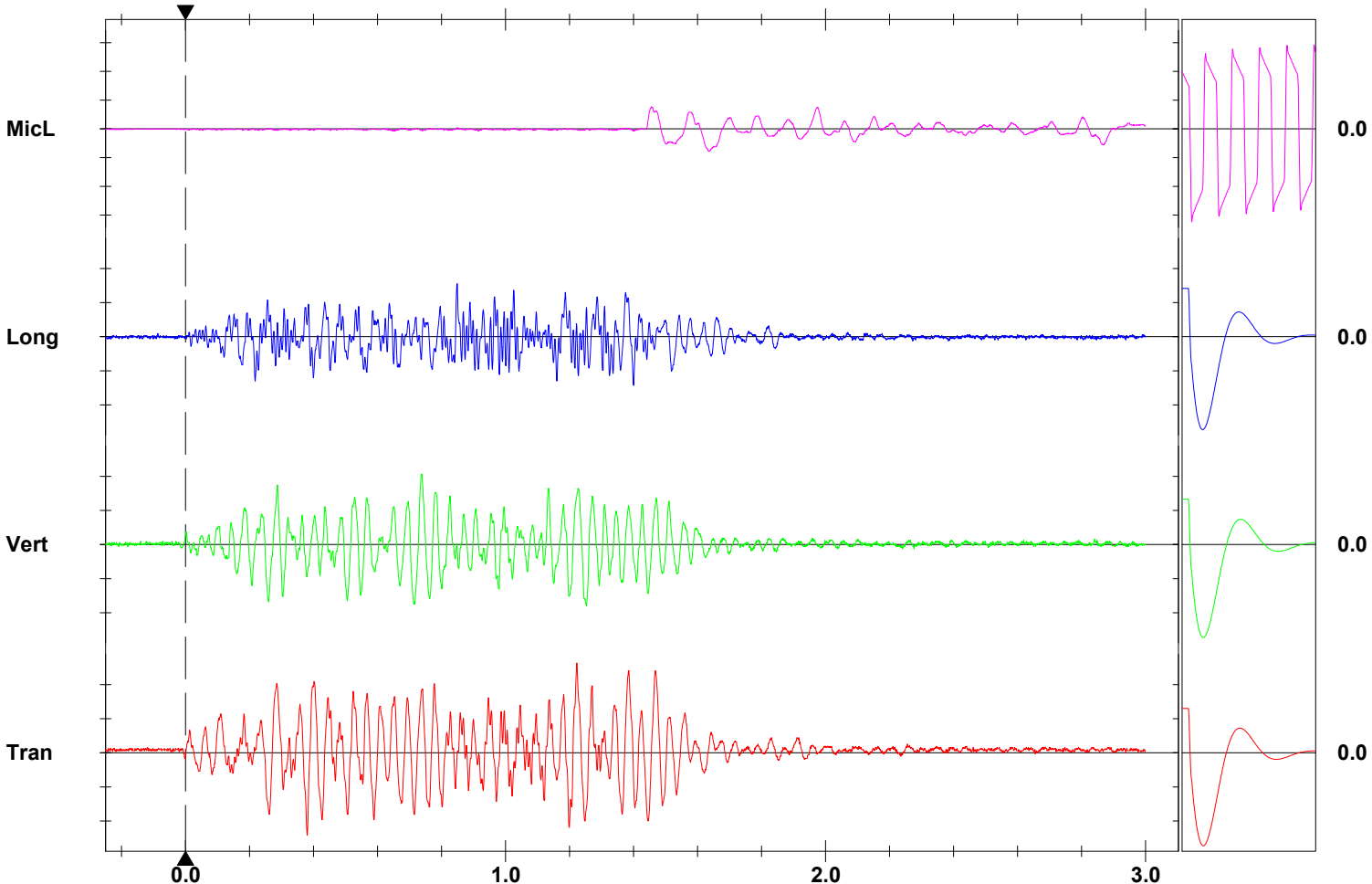
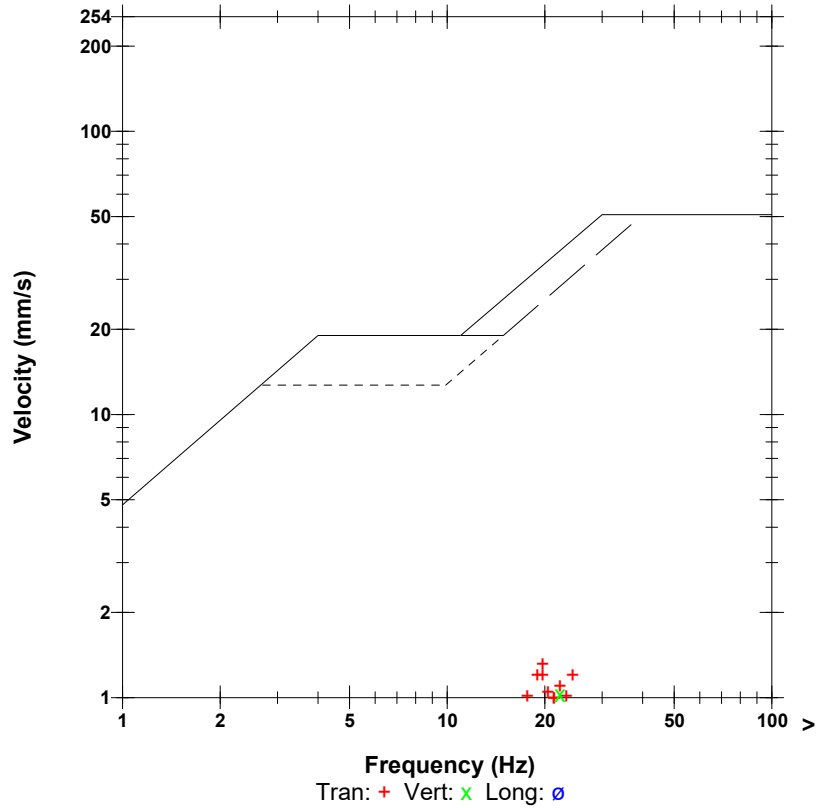
Extended Notes

Microphone Linear Weighting
PSPL 111.8 dB(L) at 1.456 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 572 mv)

	Tran	Vert	Long	
PPV	1.32	1.03	0.778	mm/s
ZC Freq	20	22	32	Hz
Time (Rel. to Trig)	1.223	0.736	0.848	sec
Peak Acceleration	0.0315	0.0199	0.0315	g
Peak Displacement	0.00950	0.00722	0.00496	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.8	3.7	3.8	

Peak Vector Sum 1.51 mm/s at 1.223 sec

USBM R18507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Tran at 13:00:07 March 19, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

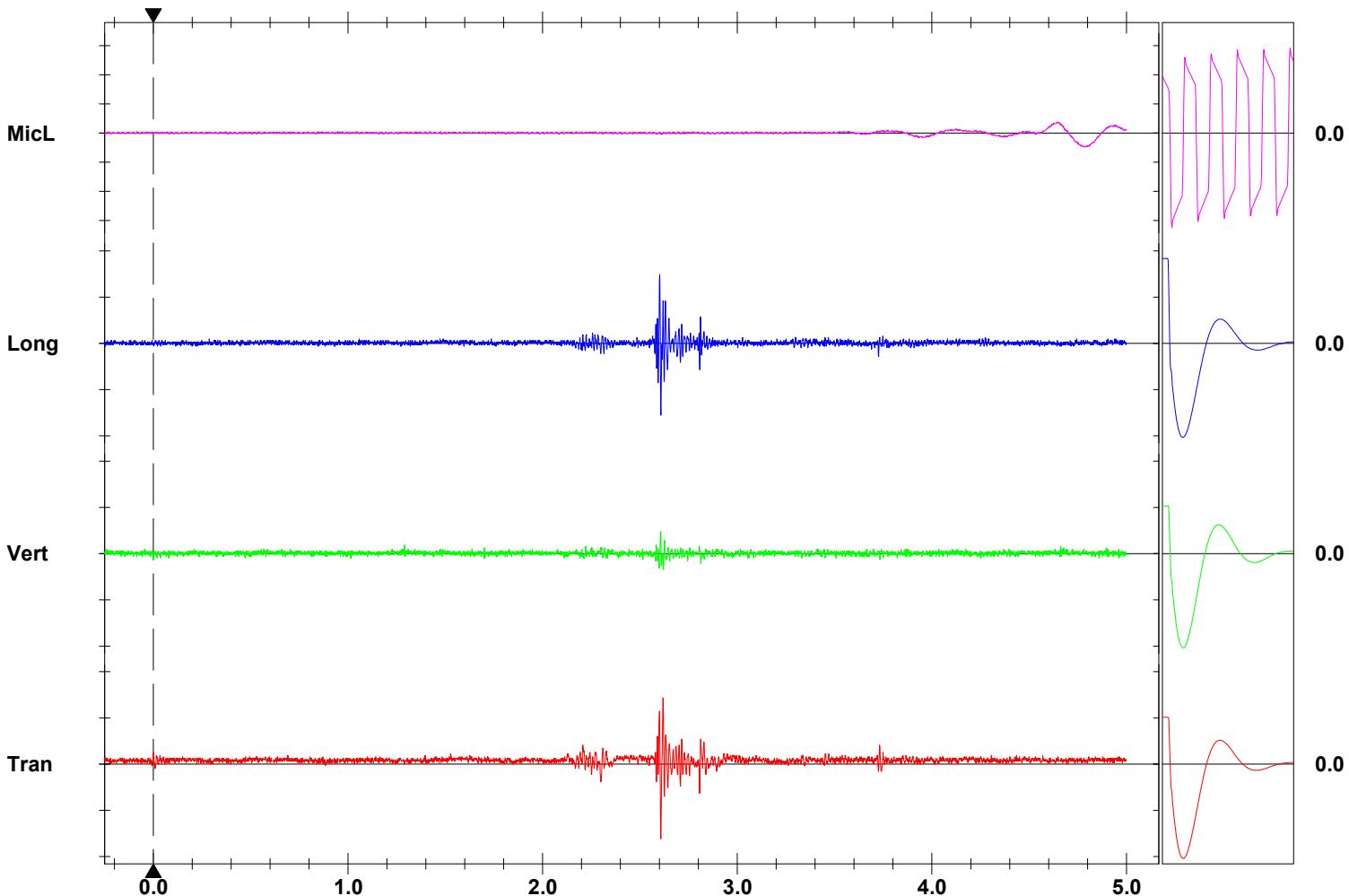
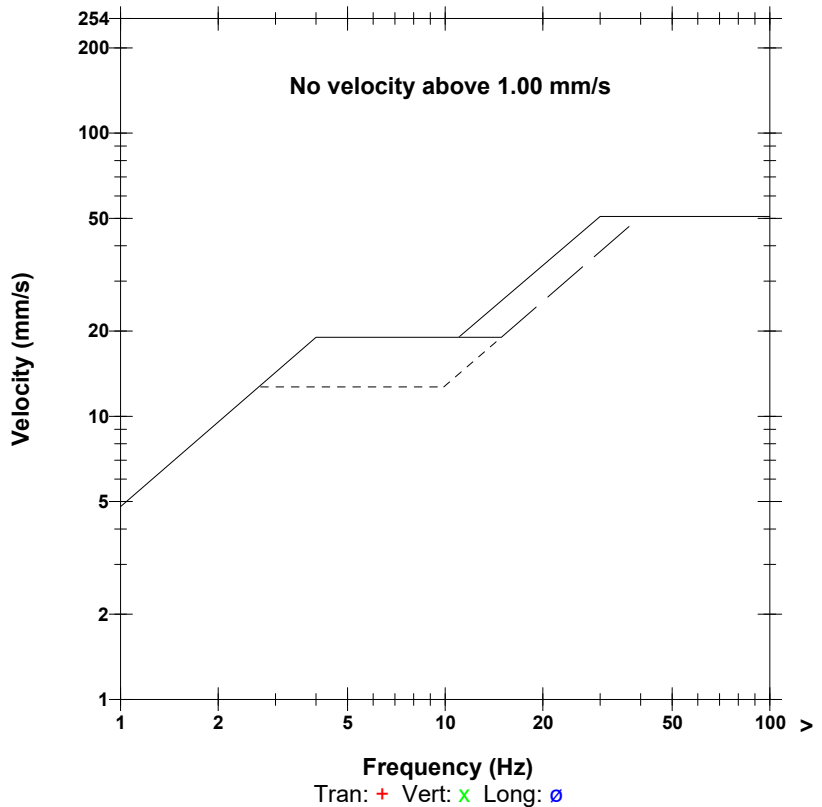
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q377HURW.290

Microphone Linear Weighting
PSPL 107.5 dB(L) at 4.776 sec
ZC Freq 3.1 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 561 mv)

	Tran	Vert	Long	
PPV	0.810	0.238	0.778	mm/s
ZC Freq	64	85	73	Hz
Time (Rel. to Trig)	2.607	2.605	2.607	sec
Peak Acceleration	0.0298	0.0182	0.0447	g
Peak Displacement	0.00309	0.00047	0.00171	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.3	Hz
Overswing Ratio	3.9	3.3	3.9	

Peak Vector Sum 1.14 mm/s at 2.607 sec

USBM RI8507 And OSMRE



Sensor Check

Date/Time Tran at 13:00:08 March 19, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

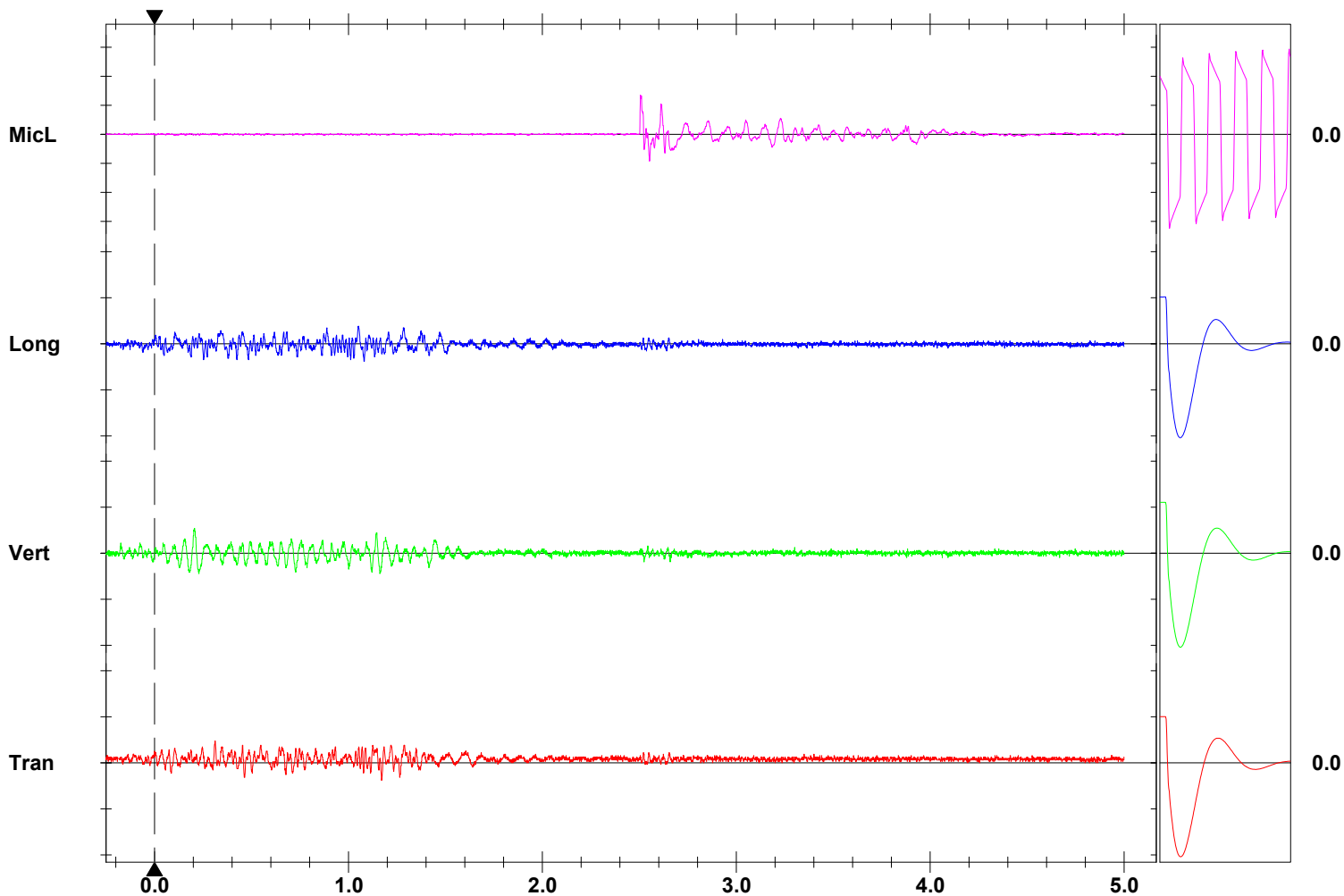
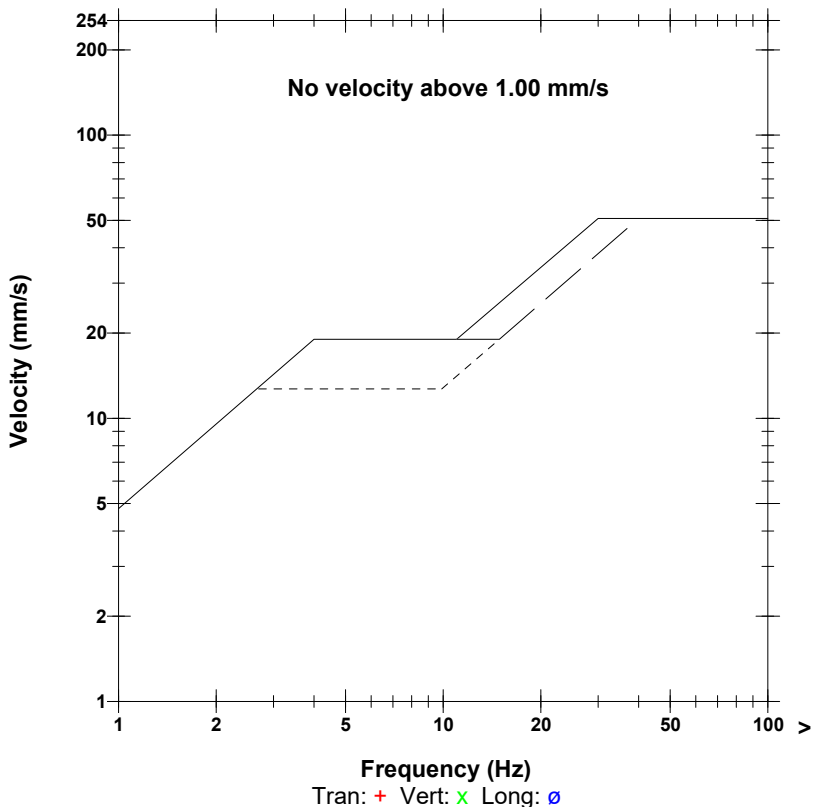
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.5 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R020HURW.480

Microphone Linear Weighting
PSPL 116.6 dB(L) at 2.506 sec
ZC Freq 23 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 519 mv)

	Tran	Vert	Long	
PPV	0.238	0.270	0.190	mm/s
ZC Freq	34	23	27	Hz
Time (Rel. to Trig)	0.312	0.205	1.051	sec
Peak Acceleration	0.00994	0.00829	0.00829	g
Peak Displacement	0.00224	0.00205	0.00163	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.5	Hz
Overswing Ratio	3.8	3.7	3.9	

Peak Vector Sum 0.278 mm/s at 0.205 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 13:00:04 April 8, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

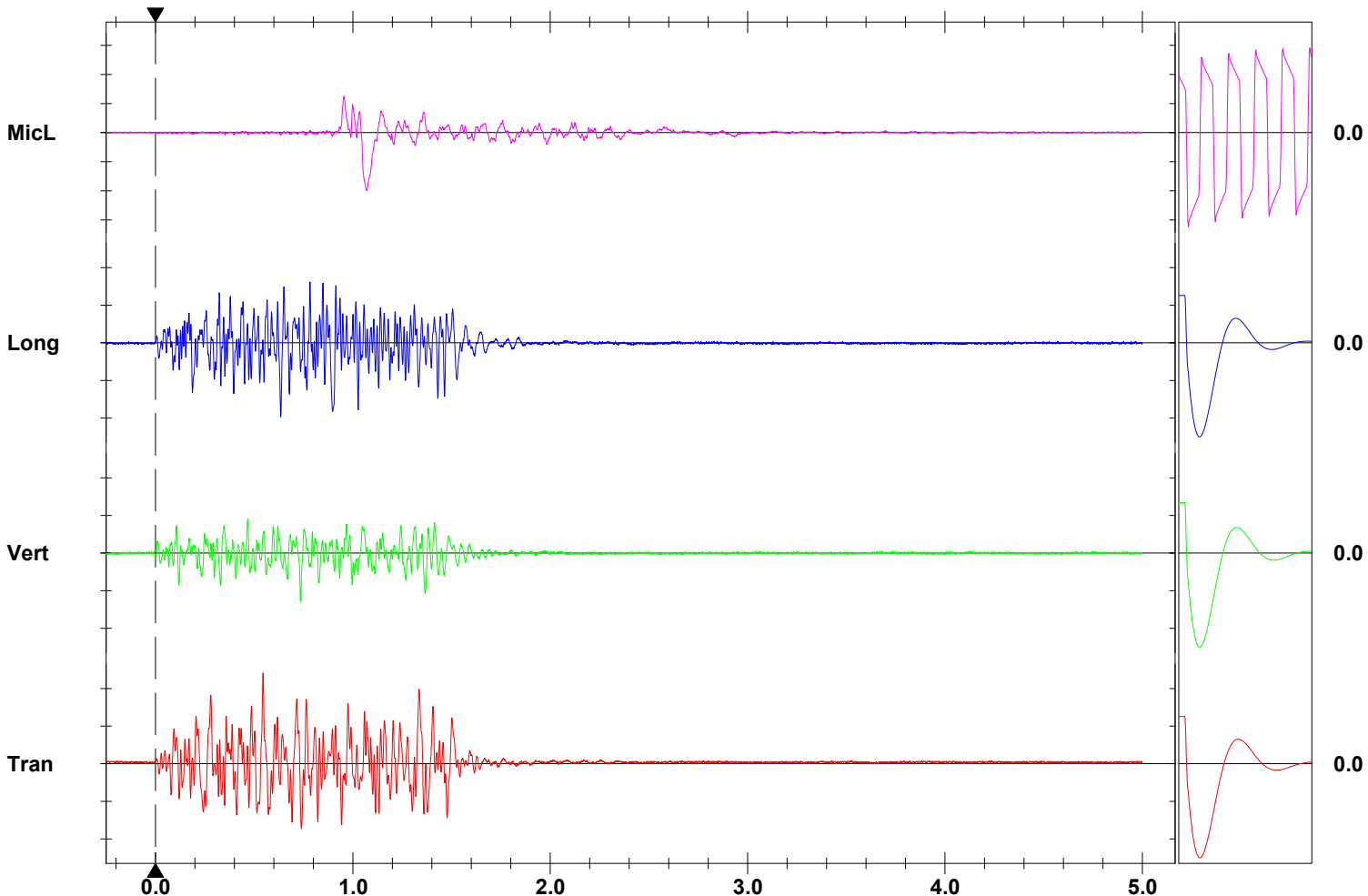
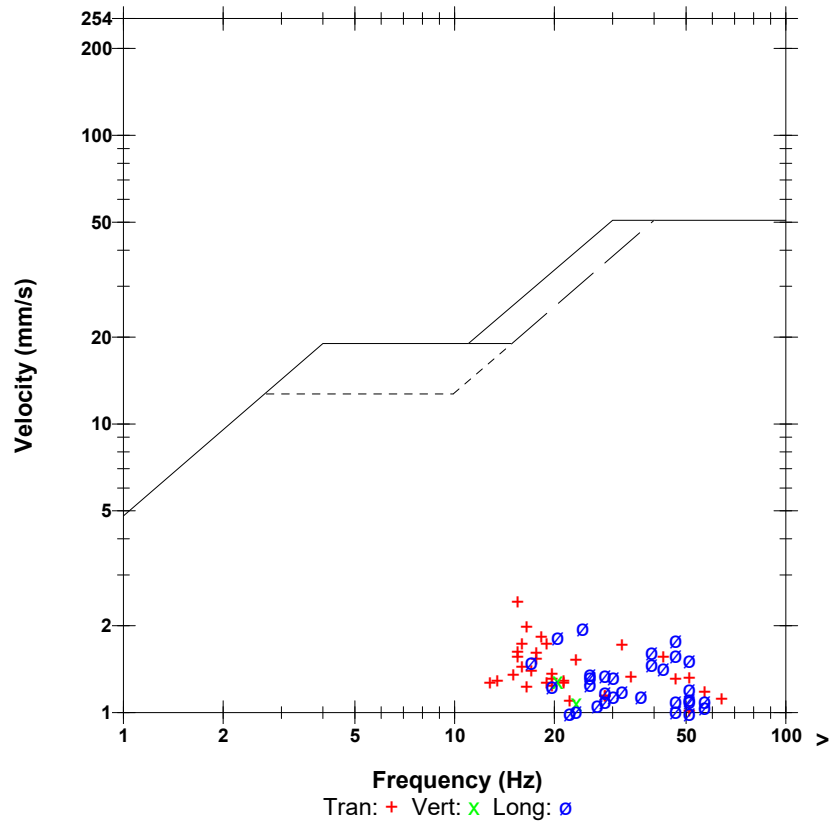
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R020HVSX.G40

Microphone Linear Weighting
PSPL 120.0 dB(L) at 1.070 sec
ZC Freq 6.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 504 mv)

	Tran	Vert	Long	
PPV	2.41	1.29	1.97	mm/s
ZC Freq	16	20	24	Hz
Time (Rel. to Trig)	0.545	0.735	0.635	sec
Peak Acceleration	0.0497	0.0265	0.0547	g
Peak Displacement	0.0167	0.00851	0.0158	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.5	Hz
Overswing Ratio	3.9	3.7	3.8	

Peak Vector Sum 2.47 mm/s at 0.545 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 13:00:04 April 8, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 134 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Notes

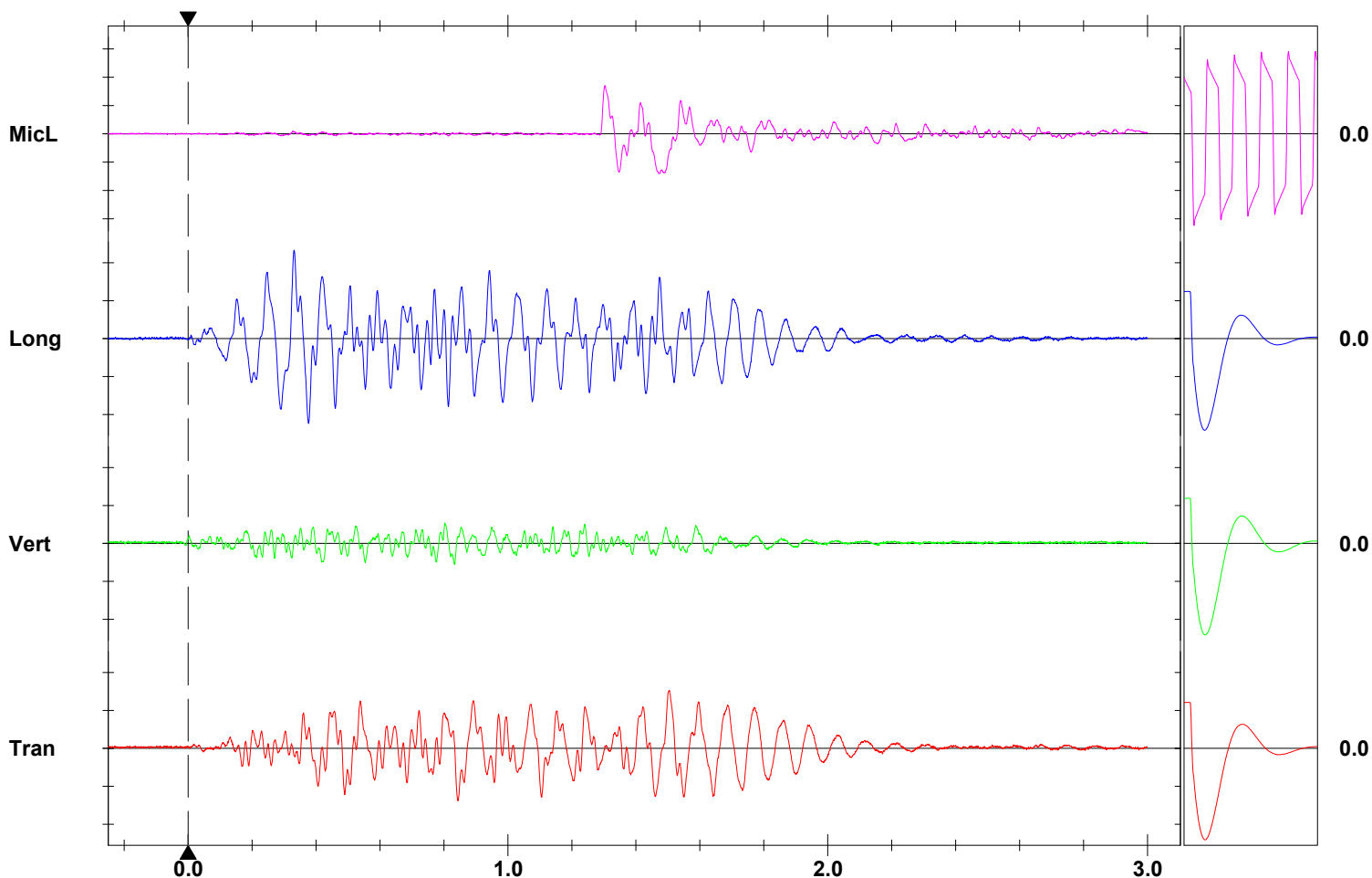
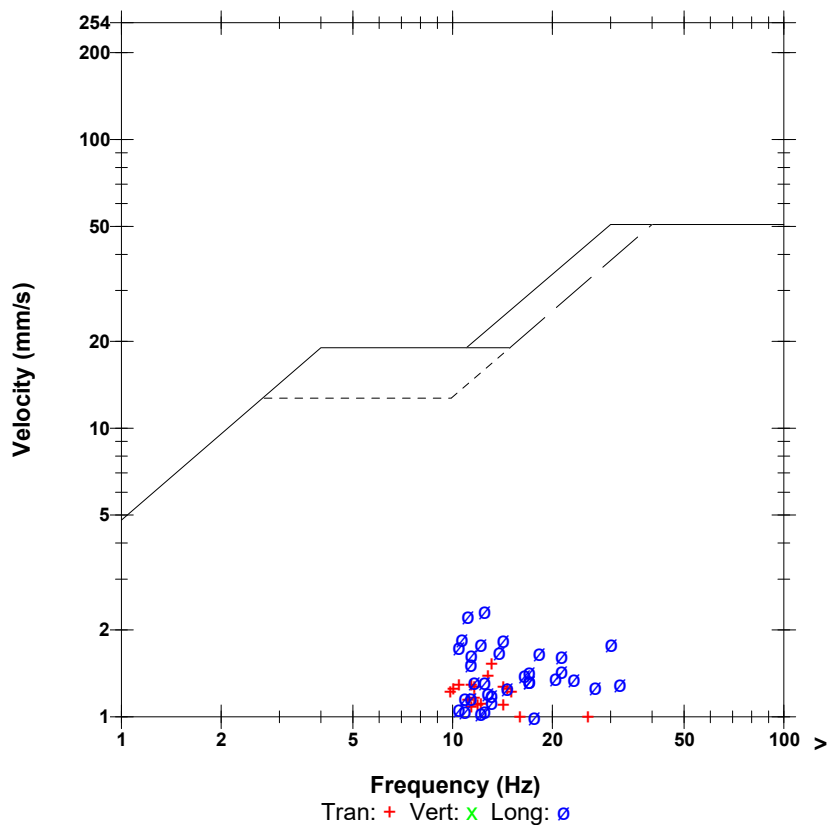
Serial Number BE15777 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q777HVSX.G40

Microphone Linear Weighting
PSPL 113.6 dB(L) at 1.303 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 500 mv)

	Tran	Vert	Long	
PPV	1.52	0.556	2.33	mm/s
ZC Freq	13	20	12	Hz
Time (Rel. to Trig)	1.504	0.833	0.331	sec
Peak Acceleration	0.0249	0.0166	0.0348	g
Peak Displacement	0.0158	0.00475	0.0239	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.8	3.3	3.9	

Peak Vector Sum 2.34 mm/s at 0.331 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 13:00:03 April 8, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 100 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Notes

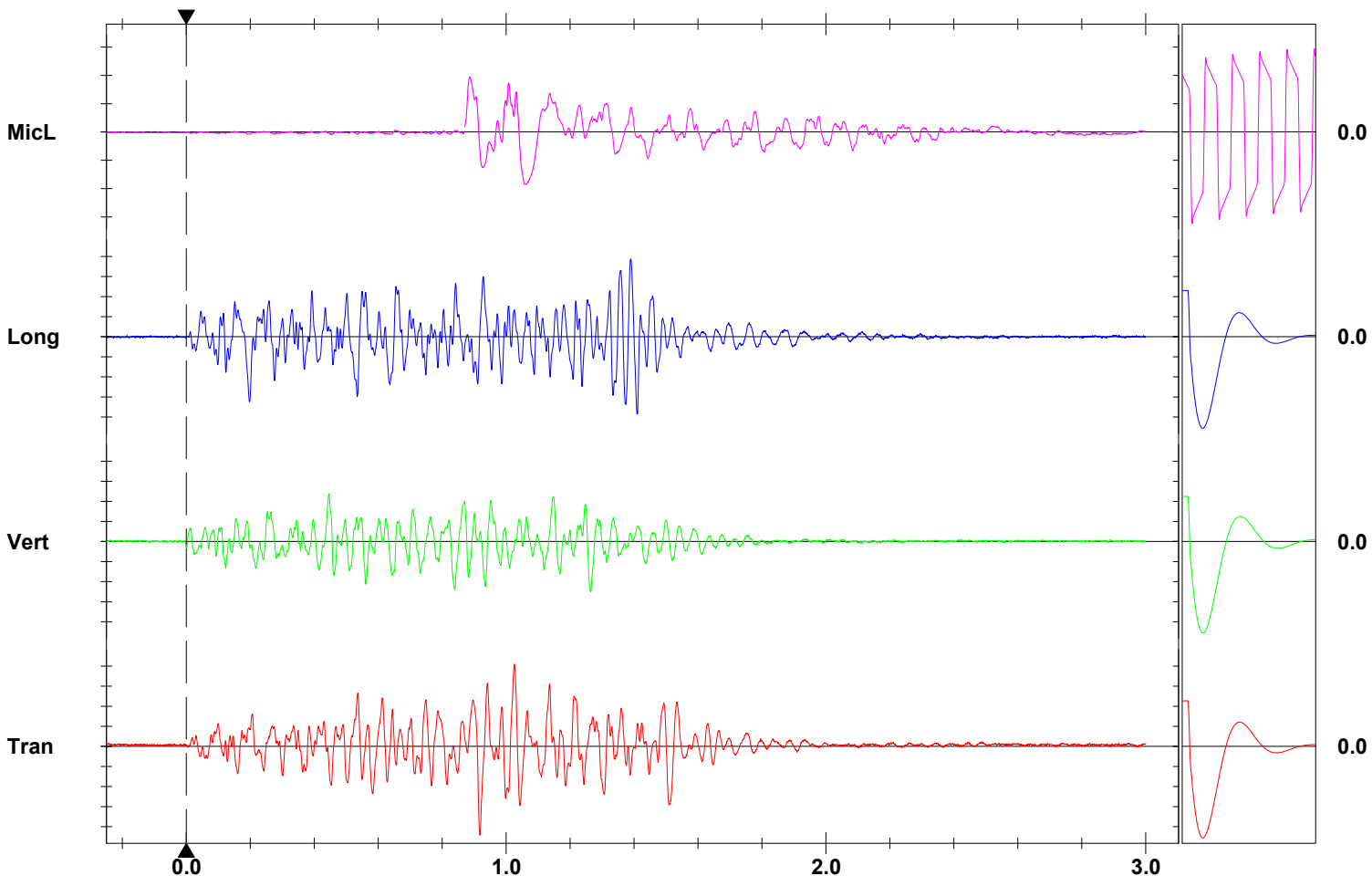
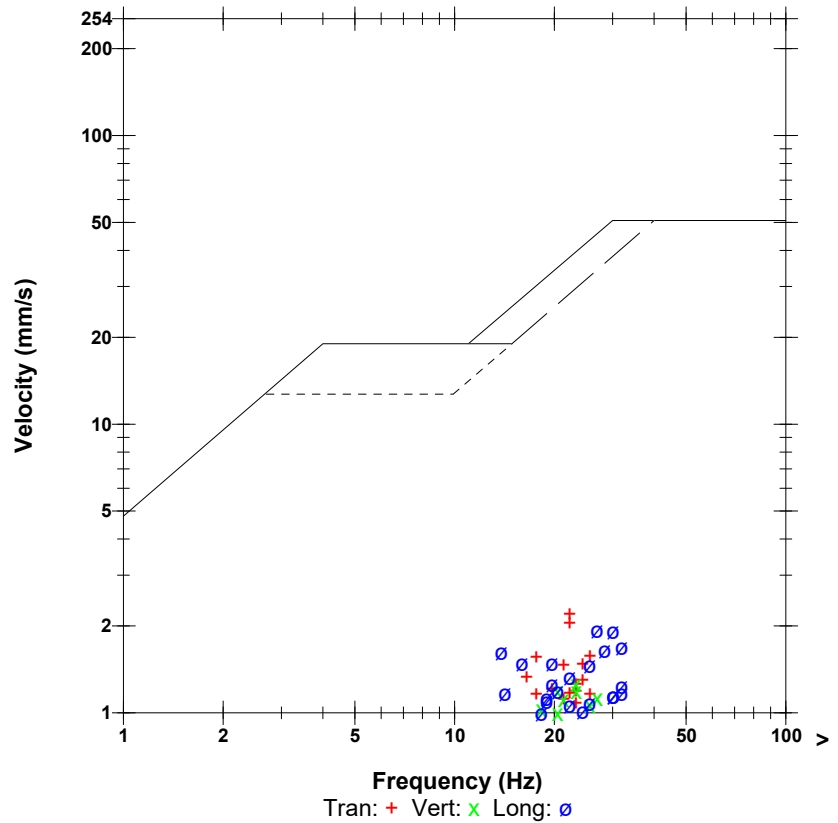
Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R158HVSX.G30

Microphone Linear Weighting
PSPL 114.2 dB(L) at 1.063 sec
ZC Freq 7.9 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 509 mv)

	Tran	Vert	Long	
PPV	2.21	1.25	1.94	mm/s
ZC Freq	22	23	27	Hz
Time (Rel. to Trig)	0.917	1.265	1.390	sec
Peak Acceleration	0.0398	0.0348	0.0447	g
Peak Displacement	0.0135	0.00853	0.0117	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.4	7.5	Hz
Overswing Ratio	3.8	3.7	3.8	

Peak Vector Sum 2.23 mm/s at 0.918 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div
Trigger =

Sensor Check

Date/Time Vert at 13:00:04 April 8, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

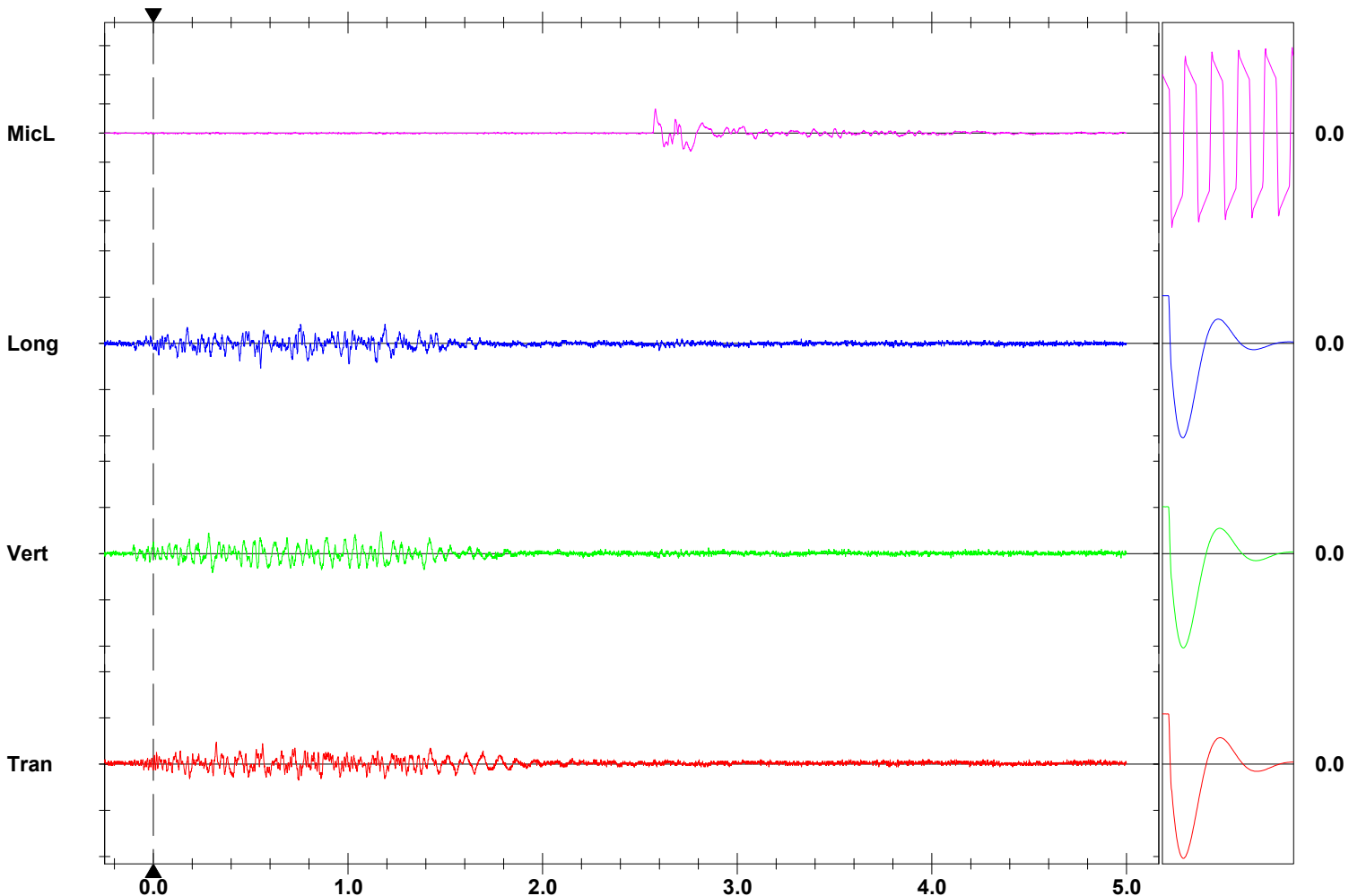
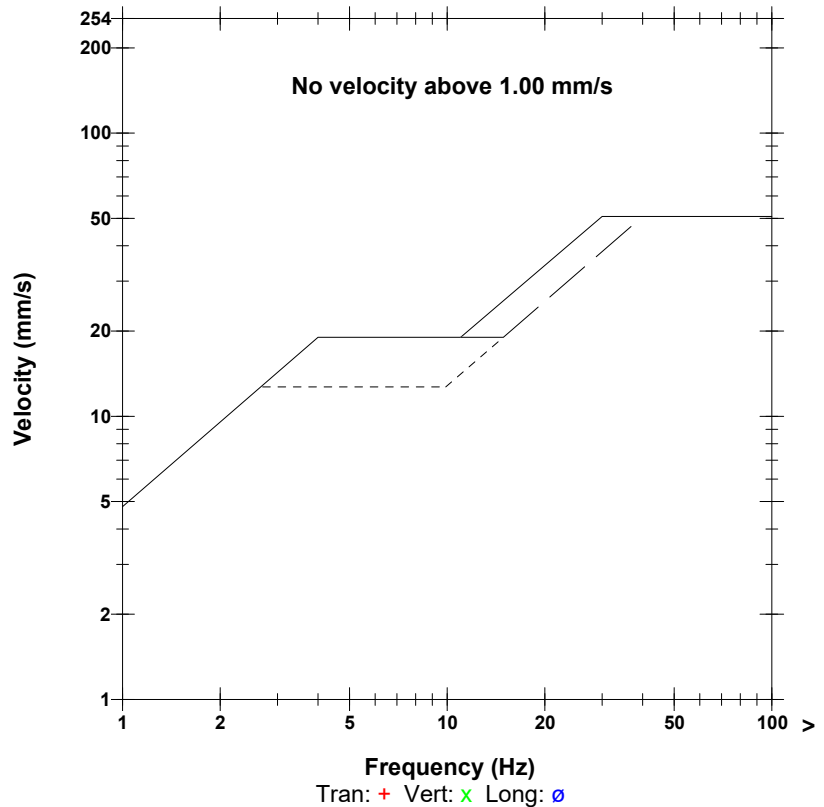
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q569HVSX.G40

Microphone Linear Weighting
PSPL 112.3 dB(L) at 2.578 sec
ZC Freq 11 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 481 mv)

	Tran	Vert	Long	
PPV	0.238	0.238	0.270	mm/s
ZC Freq	26	22	32	Hz
Time (Rel. to Trig)	0.324	1.169	0.552	sec
Peak Acceleration	0.00829	0.00994	0.00994	g
Peak Displacement	0.00171	0.00191	0.00143	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.313 mm/s at 0.552 sec

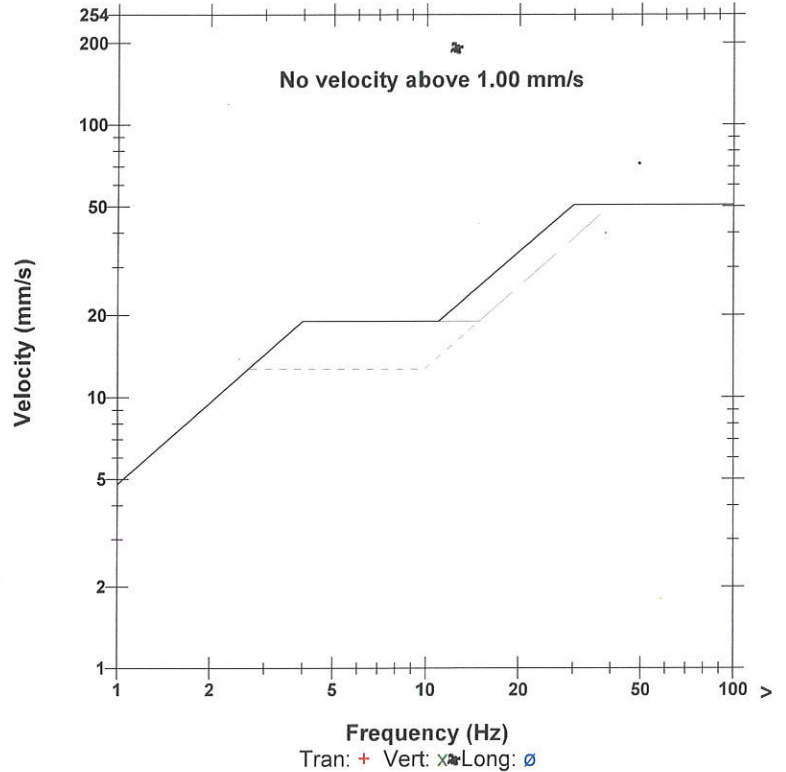
USBM R18507 And OSMRE



Date/Time Vert at 13:00:04 May 13, 2019
 Trigger Source Geo: 0.130 mm/s
 Range Geo: 31.7 mm/s
 Record Time 5.0 sec at 1024 sps
 Notes

Serial Number BE15377 V 10.72-1.1 Minimate Blaster
 Battery Level 6.3 Volts
 Unit Calibration December 4, 2018 by Saros Int.
 File Name Q377HXLQ.S40

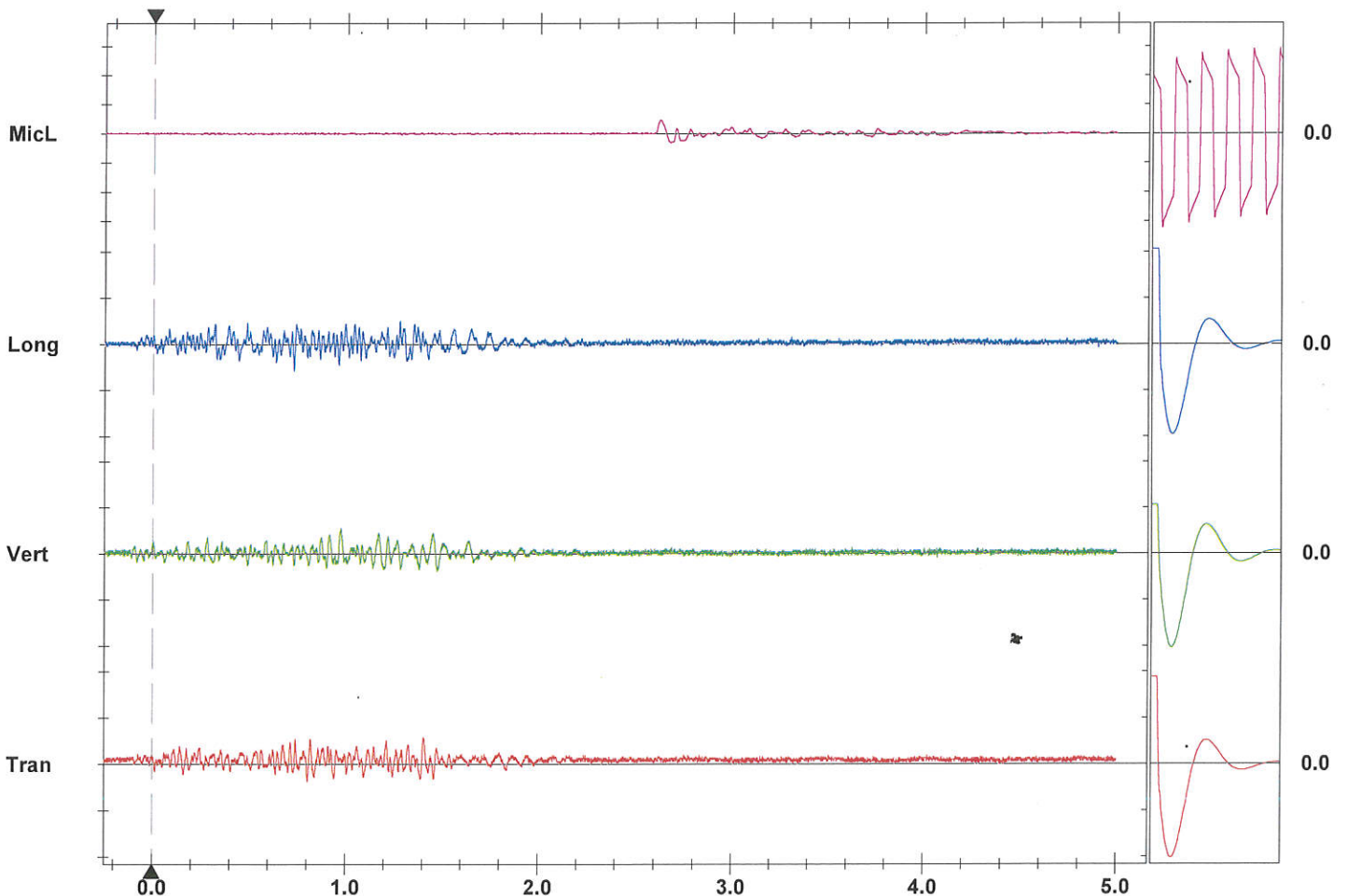
USBM RI8507 And OSMRE



Microphone Linear Weighting
 PSPL 107.5 dB(L) at 2.618 sec
 ZC Freq 9.8 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 580 mv)

	Tran	Vert	Long	
PPV	0.286	0.270	0.302	mm/s
ZC Freq	23	23	37	Hz
Time (Rel. to Trig)	1.402	0.971	0.725	sec
Peak Acceleration	0.00829	0.00663	0.00829	g
Peak Displacement	0.00515	0.00200	0.00228	mm
Sensor Check	Passed	Passed	Check	
Frequency	7.5	7.7	7.3	Hz
Overswing Ratio	4.0	3.3	3.8	

Peak Vector Sum 0.317 mm/s at 0.739 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div
 Trigger = ▶ ◀

Sensor Check

Date/Time Vert at 13:00:07 May 13, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

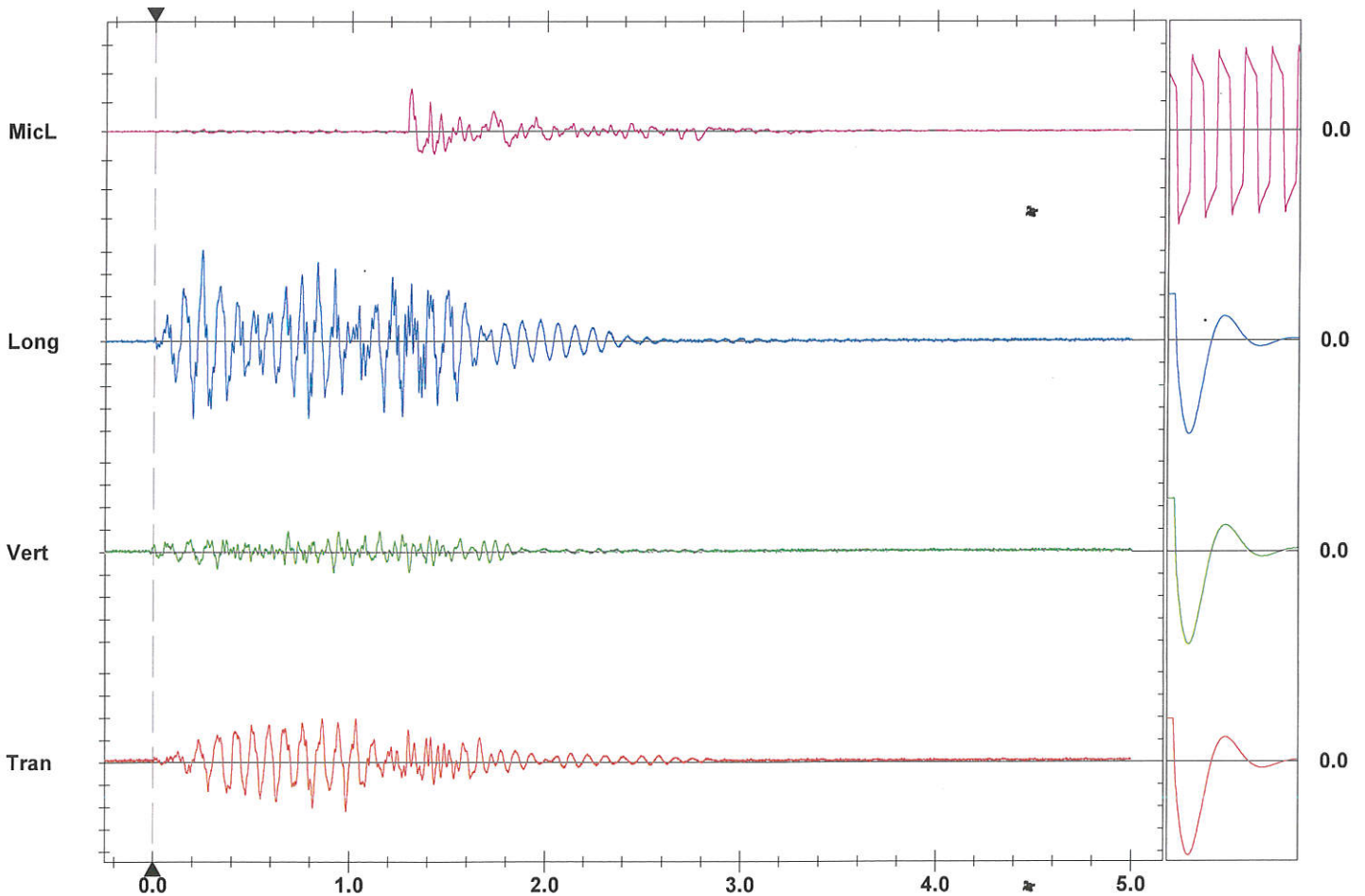
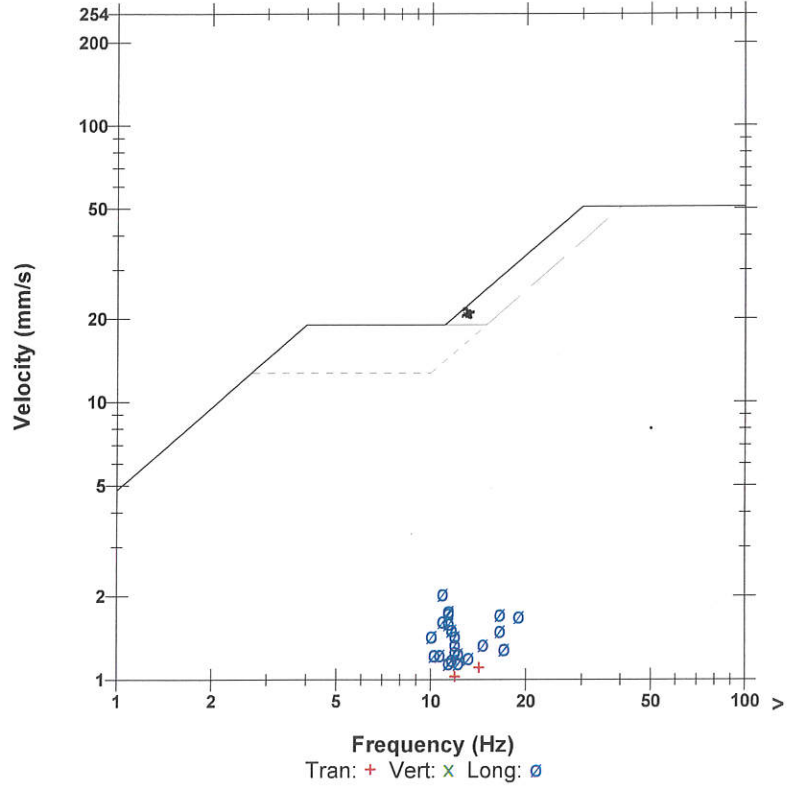
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R020HXLQ.S70

Microphone Linear Weighting
PSPL 117.4 dB(L) at 1.303 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	1.10	0.476	2.03	mm/s
ZC Freq	14	19	11	Hz
Time (Rel. to Trig)	0.985	0.915	0.242	sec
Peak Acceleration	0.0166	0.00994	0.0365	g
Peak Displacement	0.0125	0.00392	0.0206	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.1	7.3	7.4	Hz
Overswing Ratio	3.9	3.8	4.0	

Peak Vector Sum 2.06 mm/s at 0.242 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div
Trigger = 

Sensor Check

Date/Time Vert at 13:00:05 May 13, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

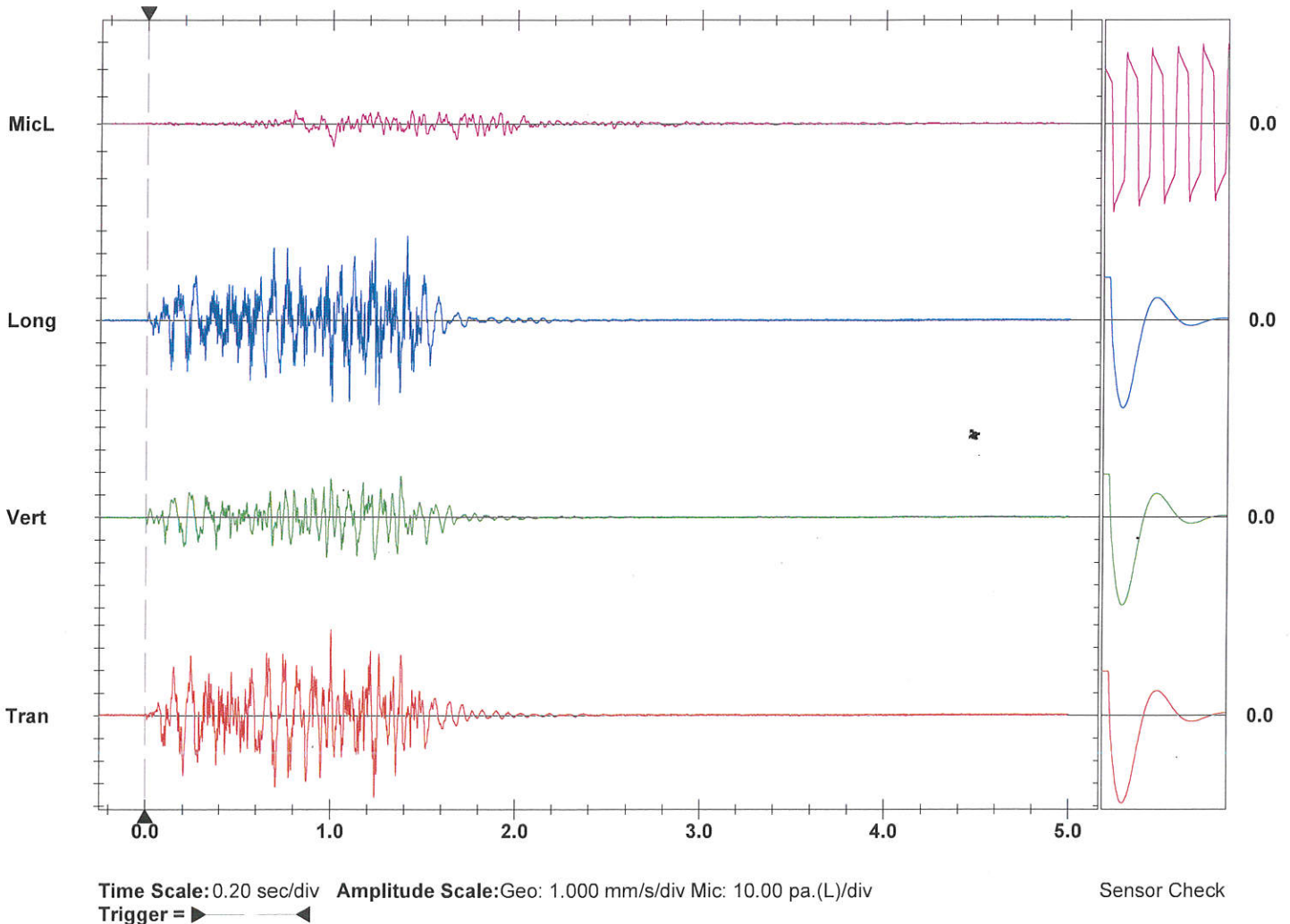
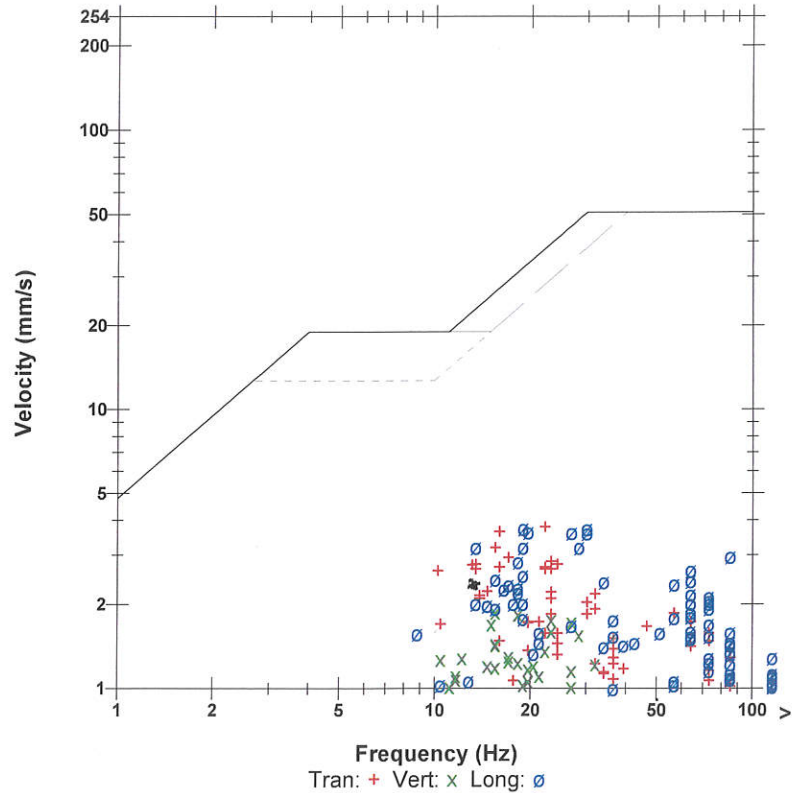
Serial Number BE15569 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q569HXLQ.S50

Microphone Linear Weighting
PSPL 112.6 dB(L) at 1.001 sec
ZC Freq 7.6 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 586 mv)

	Tran	Vert	Long	
PPV	3.78	1.87	3.75	mm/s
ZC Freq	22	16	19	Hz
Time (Rel. to Trig)	1.000	1.235	1.402	sec
Peak Acceleration	0.0945	0.0481	0.176	g
Peak Displacement	0.0284	0.0186	0.0231	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 5.40 mm/s at 1.000 sec

USBM RI8507 And OSMRE



Date/Time Vert at 13:00:06 May 13, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 100 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R158HXLQ.S60

Notes

Location:
 Client:
 User Name:
 General:

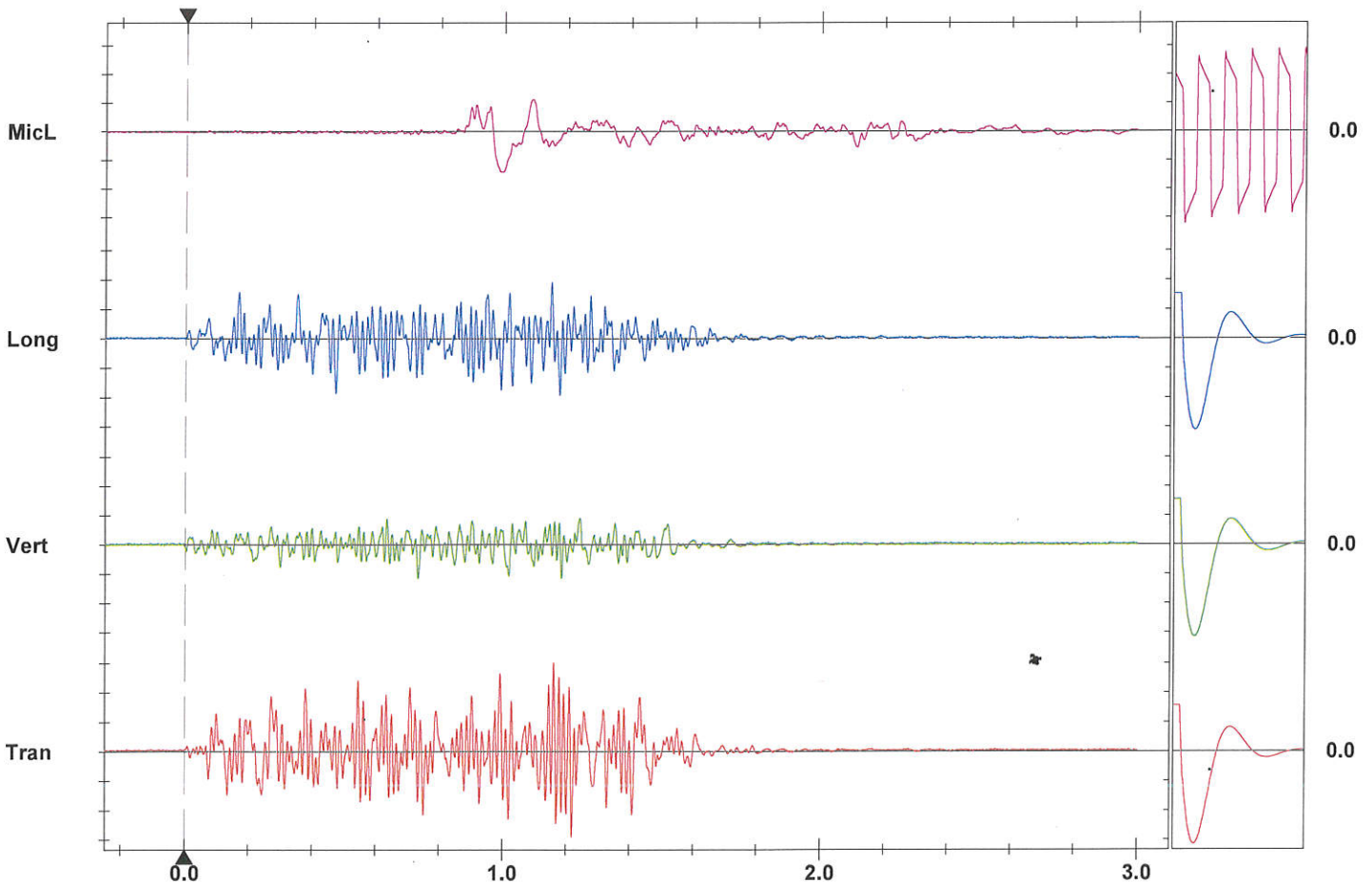
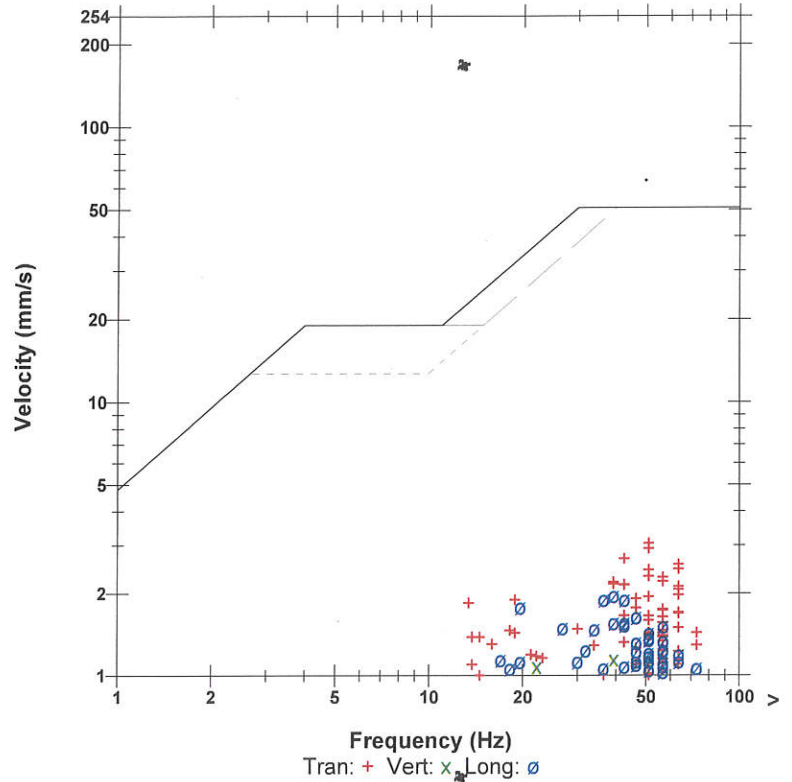
Extended Notes

Microphone Linear Weighting
PSPL 114.1 dB(L) at 0.985 sec
ZC Freq 5.2 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 474 mv)

	Tran	Vert	Long	
PPV	3.03	1.14	1.95	mm/s
ZC Freq	51	39	39	Hz
Time (Rel. to Trig)	1.159	0.731	1.175	sec
Peak Acceleration	0.108	0.0365	0.0530	g
Peak Displacement	0.0162	0.00702	0.00862	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.4	7.5	Hz
Overswing Ratio	3.9	3.7	3.8	

Peak Vector Sum 3.23 mm/s at 1.176 sec

USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div
 Trigger =

Sensor Check

Date/Time Vert at 12:00:01 June 7, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 134 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE15777 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q777HYVY.O10

Notes

Location: Saros labs
Client:
User Name: Final Calibration Check
General:

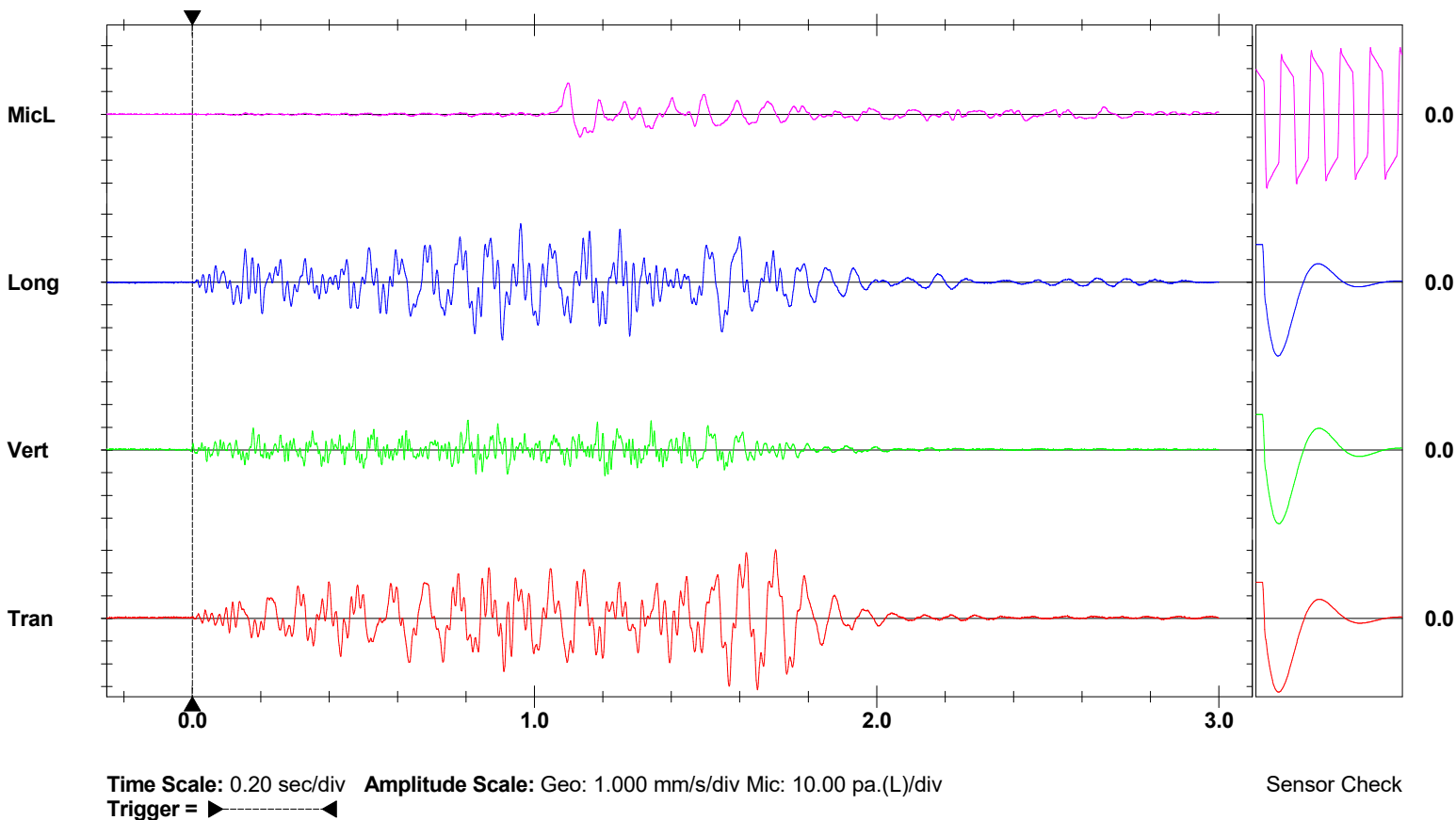
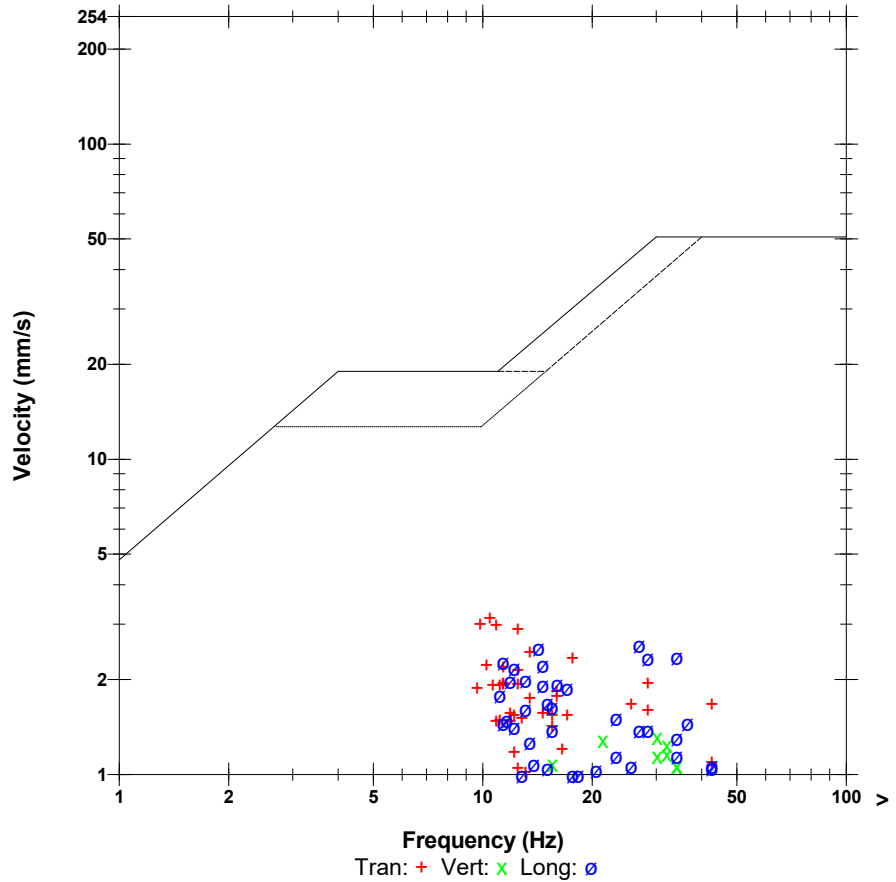
Extended Notes

Microphone Linear Weighting
PSPL 116.7 dB(L) at 1.097 sec
ZC Freq 7.1 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 604 mv)

	Tran	Vert	Long	
PPV	3.14	1.32	2.57	mm/s
ZC Freq	10	30	27	Hz
Time (Rel. to Trig)	1.651	0.806	0.959	sec
Peak Acceleration	0.0481	0.0530	0.0497	g
Peak Displacement	0.0392	0.00995	0.0253	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.9	3.4	4.0	

Peak Vector Sum 3.28 mm/s at 1.651 sec

USBM RI8507 And OSMRE



Date/Time Long at 12:00:02 June 7, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

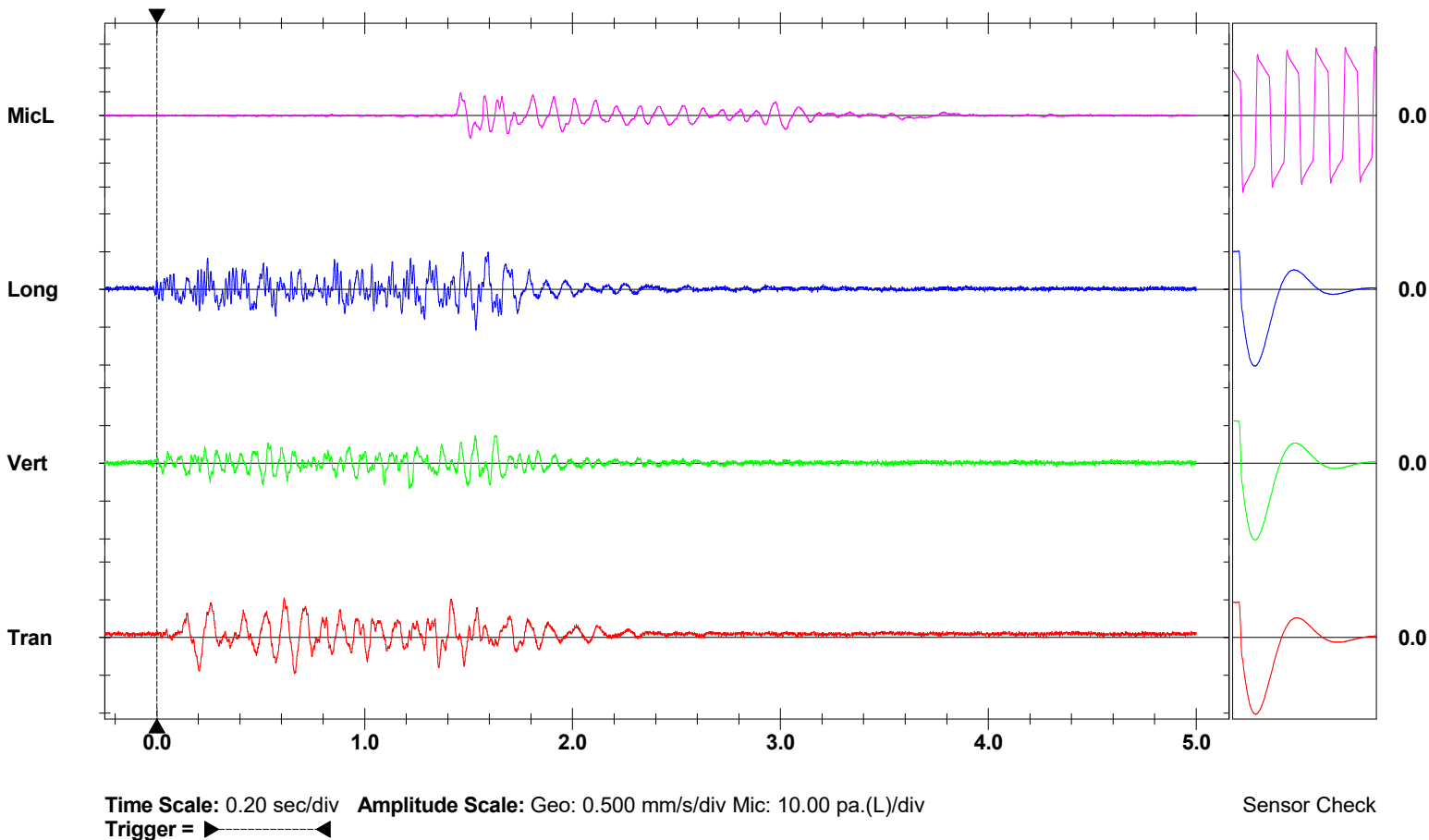
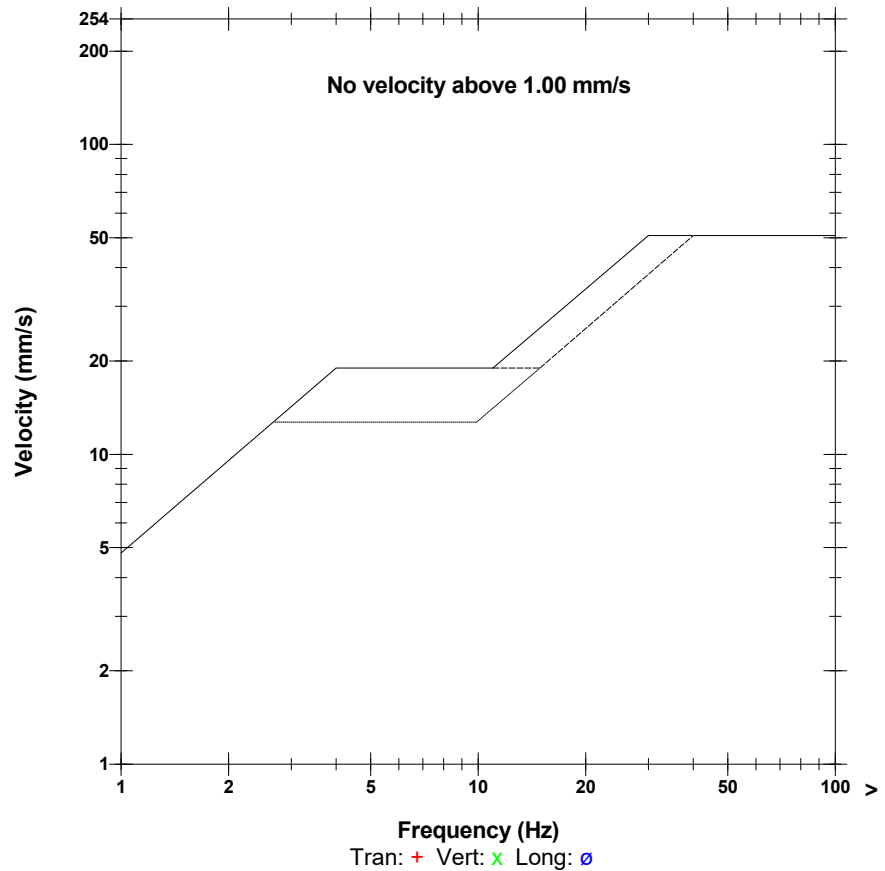
Serial Number BE16020 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R020HYVY.O20

Microphone Linear Weighting
PSPL 113.5 dB(L) at 1.460 sec
ZC Freq 9.3 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 574 mv)

	Tran	Vert	Long	
PPV	0.524	0.365	0.540	mm/s
ZC Freq	11	14	15	Hz
Time (Rel. to Trig)	0.612	1.531	1.535	sec
Peak Acceleration	0.00829	0.00829	0.0133	g
Peak Displacement	0.00819	0.00418	0.00597	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.5	Hz
Overswing Ratio	4.0	3.8	4.0	

Peak Vector Sum 0.690 mm/s at 1.536 sec

USBM RI8507 And OSMRE



Date/Time Vert at 12:00:01 June 7, 2019
Trigger Source Geo: 0.130 mm/s, Mic: 100 dB(L)
Range Geo: 31.7 mm/s
Record Time 3.0 sec at 1024 sps
Job Number: 1

Serial Number BE16158 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name R158HYVY.O10

Notes

Location:
 Client:
 User Name:
 General:

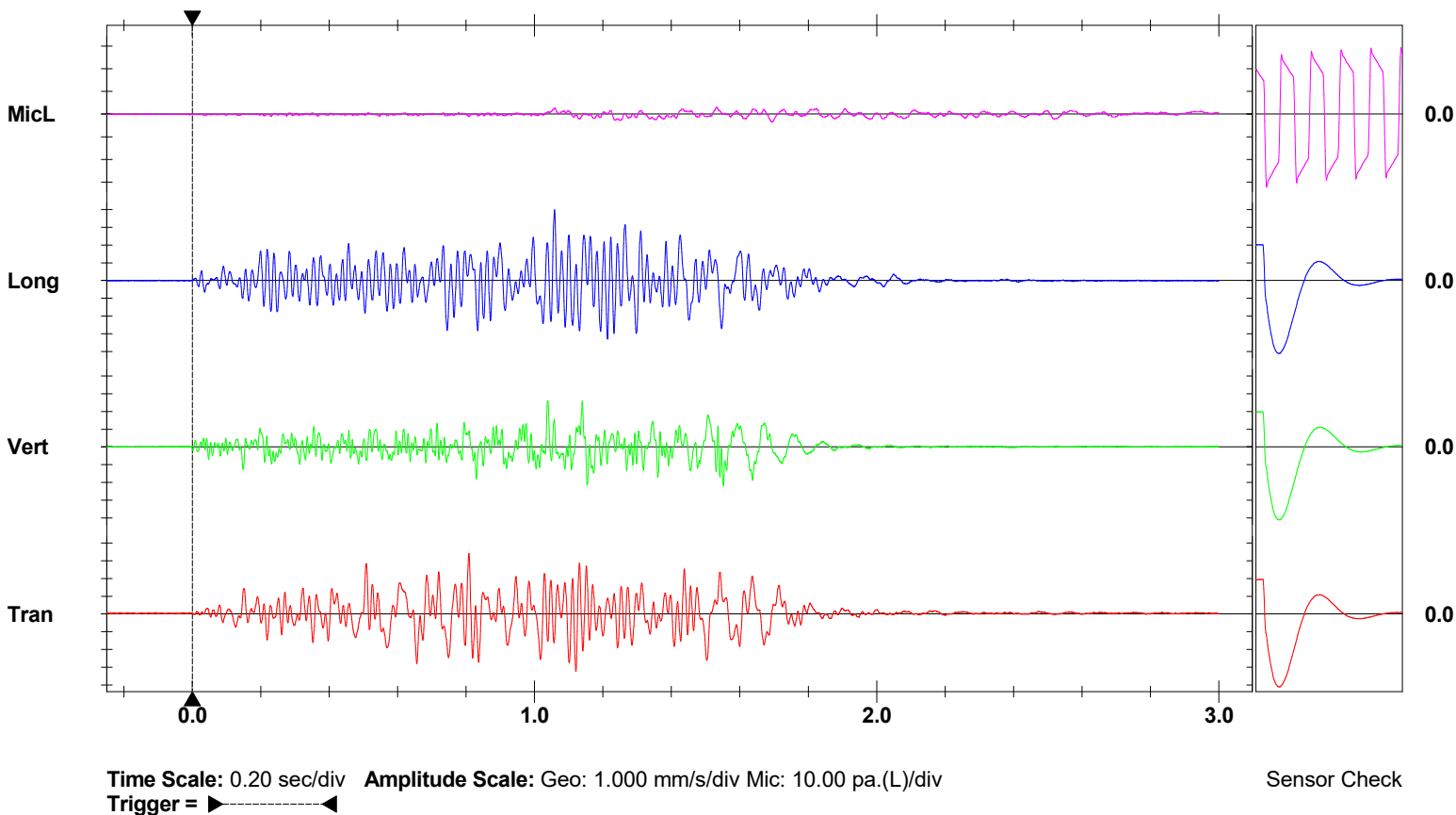
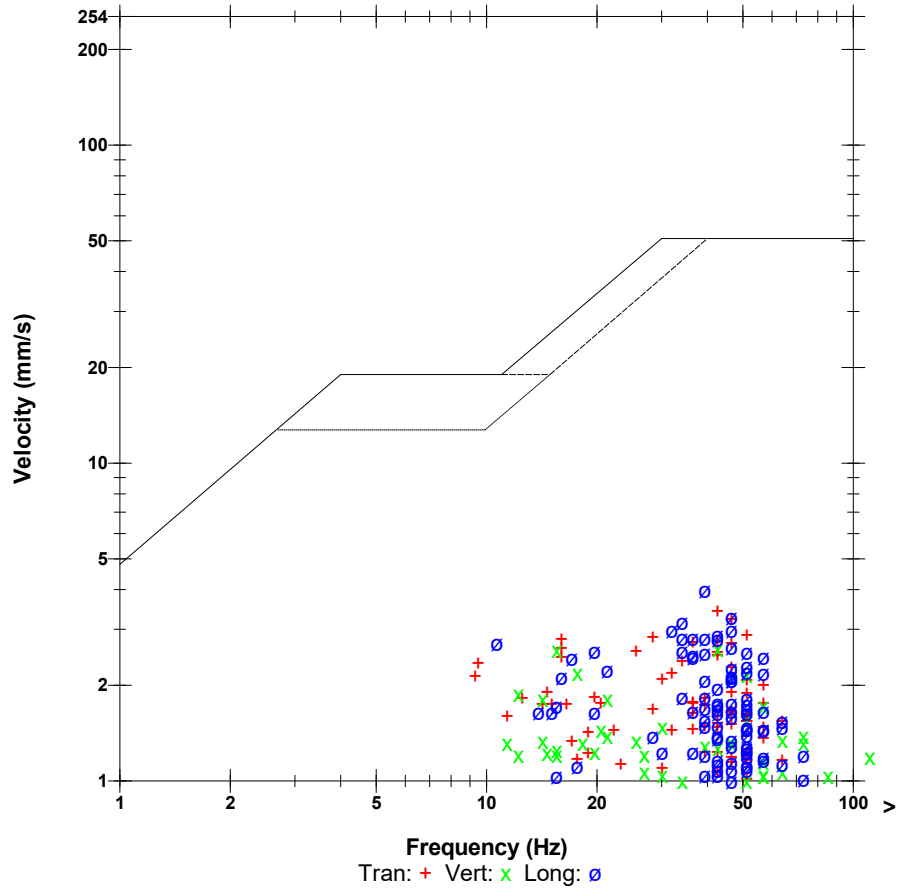
Extended Notes

Microphone Linear Weighting
PSPL 104.9 dB(L) at 1.693 sec
ZC Freq 18 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 602 mv)

	Tran	Vert	Long	
PPV	3.41	2.60	3.98	mm/s
ZC Freq	43	43	39	Hz
Time (Rel. to Trig)	0.809	1.038	1.059	sec
Peak Acceleration	0.0961	0.0795	0.0994	g
Peak Displacement	0.0228	0.0172	0.0201	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.5	Hz
Overswing Ratio	3.9	3.8	3.9	

Peak Vector Sum 4.50 mm/s at 1.058 sec

USBM RI8507 And OSMRE



Date/Time Long at 12:00:01 June 7, 2019
Trigger Source Geo: 0.130 mm/s
Range Geo: 31.7 mm/s
Record Time 5.0 sec at 1024 sps
Notes

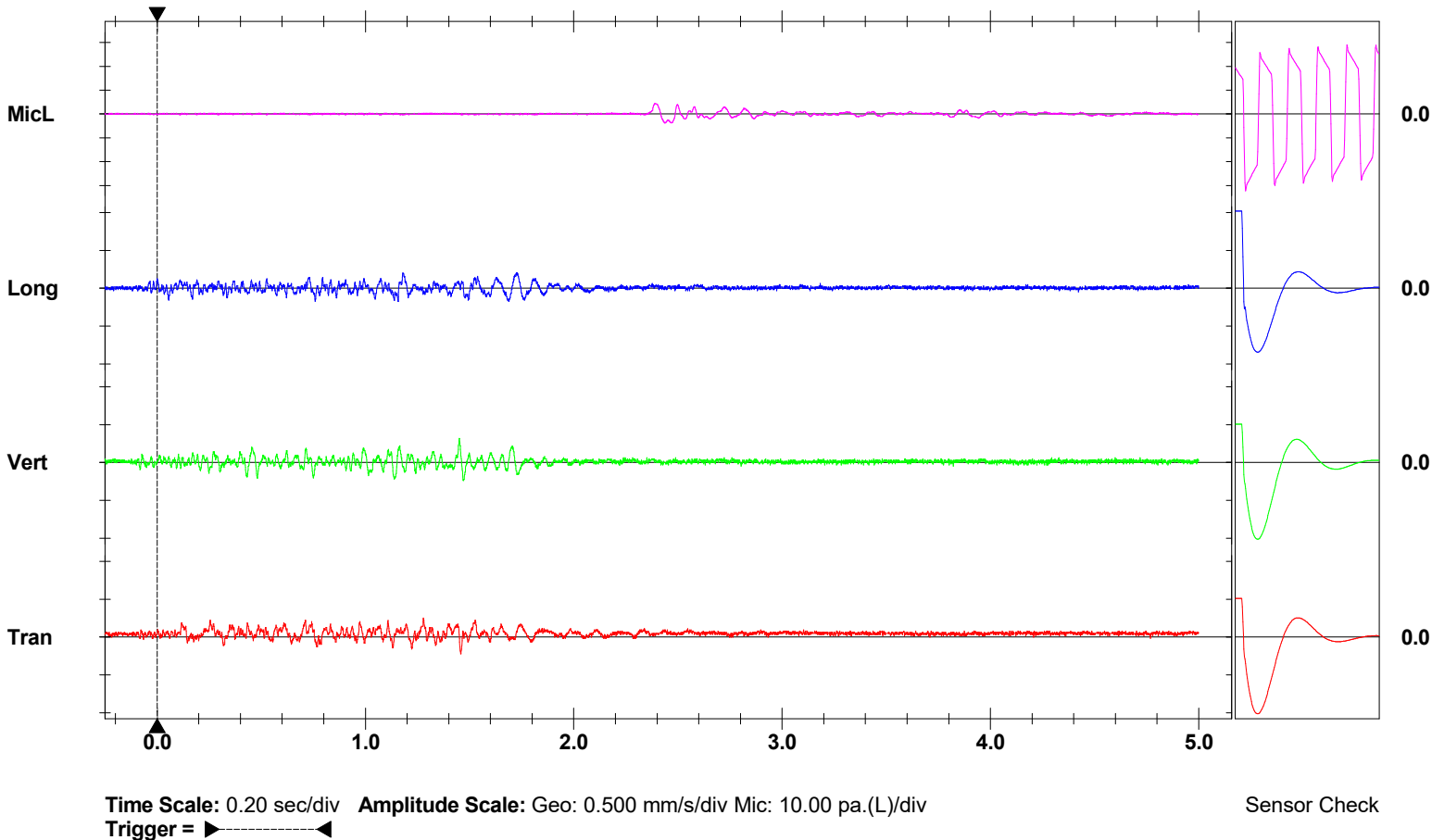
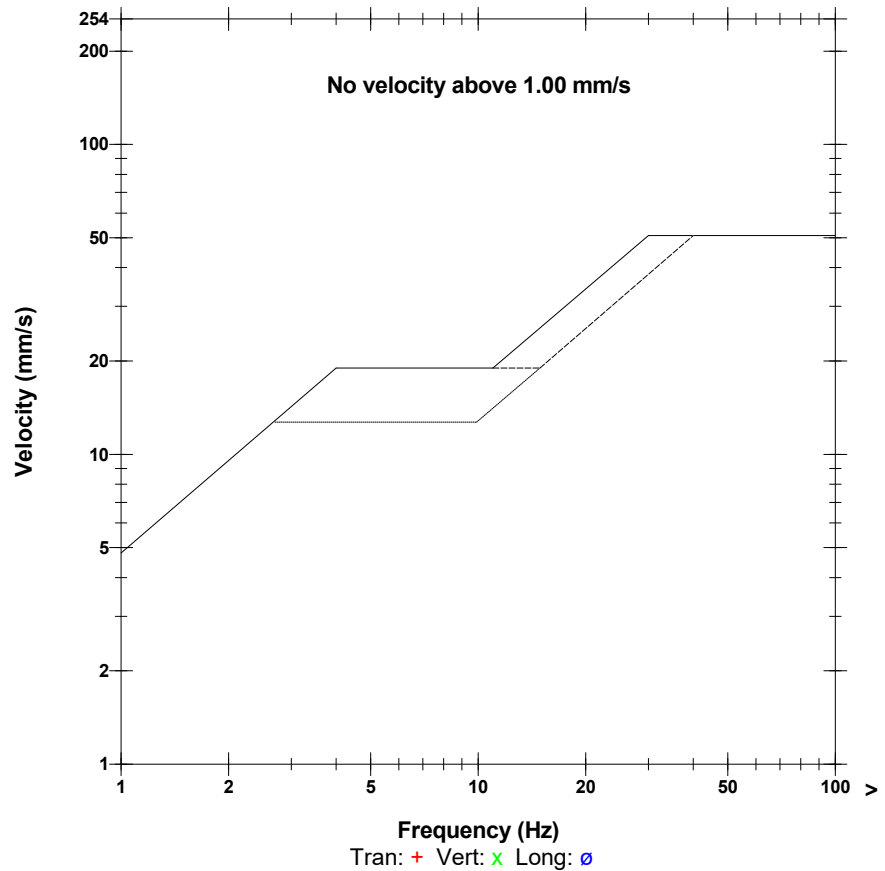
Serial Number BE15377 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration December 4, 2018 by Saros Int.
File Name Q377HYVY.O10

Microphone Linear Weighting
PSPL 107.0 dB(L) at 2.390 sec
ZC Freq 9.0 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 616 mv)

	Tran	Vert	Long	
PPV	0.254	0.317	0.206	mm/s
ZC Freq	13	17	13	Hz
Time (Rel. to Trig)	1.277	1.450	1.180	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00387	0.00220	0.00261	mm
Sensor Check	Passed	Passed	Check	
Frequency	7.4	7.7	7.4	Hz
Overswing Ratio	4.1	3.4	4.0	

Peak Vector Sum 0.325 mm/s at 1.450 sec

USBM RI8507 And OSMRE



Appendix D – Noise monitoring results



Appendix E – Air monitoring results

DDG results

TsP results

Pm10 results



CERTIFICATE OF ANALYSIS

Work Order : **EN1900935**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 12-Feb-2019

Issue Date : 15-Feb-2019 20:03



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Position

Accreditation Category

Dianne Blane

Laboratory Coordinator (2IC)

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 Ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 01/09/18 - 01/10/18	Station 2 01/09/18 - 01/10/18	Station 3 01/09/18 - 01/10/18	Station 4 01/09/18 - 01/10/18	----
Client sampling date / time				01-Oct-2018 00:00	01-Oct-2018 00:00	01-Oct-2018 00:00	01-Oct-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900935-001	EN1900935-002	EN1900935-003	EN1900935-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	2.2	0.2	0.1	----
Ash Content (mg)	----	1	mg	1	8	4	2	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.2	0.8	0.3	<0.1	----
Combustible Matter (mg)	----	1	mg	4	5	4	<1	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.3	1.0	0.5	0.1	----
Total Insoluble Matter (mg)	----	1	mg	5	5	8	2	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900937**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529
Telephone : +61 02 4421 7766
Project : Nowra Brickworks Quarry
Order number : SM10158
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division Newcastle
Contact : Kristy Boje
Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063
Date Samples Received : 08-Feb-2019 17:00
Date Analysis Commenced : 12-Feb-2019
Issue Date : 15-Feb-2019 20:04



Accreditation No. 825
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 ISO/IEC 17025 - Testing

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- General Comments
- Analytical Results

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Signatories

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 ~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 01/10/18 - 31/10/18	Station 2 01/10/18 - 31/10/18	Station 3 01/10/18 - 31/10/18	Station 4 01/10/18 - 31/10/18	----
Client sampling date / time				31-Oct-2018 00:00	31-Oct-2018 00:00	31-Oct-2018 00:00	31-Oct-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900937-001	EN1900937-002	EN1900937-003	EN1900937-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	0.1	0.1	0.3	----
Ash Content (mg)	----	1	mg	2	2	2	5	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	<0.1	<0.1	<0.1	----
Combustible Matter (mg)	----	1	mg	2	<1	<1	1	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.1	0.1	0.3	----
Total Insoluble Matter (mg)	----	1	mg	4	2	2	6	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900938**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 12-Feb-2019

Issue Date : 15-Feb-2019 20:05



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Signatories

Position

Accreditation Category

Dianne Blane

Laboratory Coordinator (2IC)

Newcastle - Inorganics, Mayfield West, NSW



General Comments

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- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 31/10/18 - 30/11/18	Station 2 31/10/18 - 30/11/18	Station 3 31/10/18 - 30/11/18	Station 4 31/10/18 - 30/11/18	----
Client sampling date / time				30-Nov-2018 00:00	30-Nov-2018 00:00	30-Nov-2018 00:00	30-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900938-001	EN1900938-002	EN1900938-003	EN1900938-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	<0.1	----
Ash Content (mg)	----	1	mg	<1	<1	<1	<1	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.2	0.1	0.1	<0.1	----
Combustible Matter (mg)	----	1	mg	3	2	2	<1	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.1	0.1	<0.1	----
Total Insoluble Matter (mg)	----	1	mg	3	2	2	<1	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900954**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 12-Feb-2019

Issue Date : 15-Feb-2019 20:03



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Signatories

Position

Accreditation Category

Dianne Blane

Laboratory Coordinator (2IC)

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
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 ~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- Sample exposure period is 21 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.1.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 30/11/18 - 21/12/18	Station 2 30/11/18 - 21/12/18	Station 3 30/11/18 - 21/12/18	Station 4 30/11/18 - 21/12/18	----
Client sampling date / time				21-Dec-2018 00:00	21-Dec-2018 00:00	21-Dec-2018 00:00	21-Dec-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900954-001	EN1900954-002	EN1900954-003	EN1900954-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	0.1	<0.1	0.1	----
Ash Content (mg)	----	1	mg	<1	1	<1	1	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	<0.1	<0.1	<0.1	----
Combustible Matter (mg)	----	1	mg	1	<1	<1	<1	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.1	0.1	<0.1	0.1	----
Total Insoluble Matter (mg)	----	1	mg	1	1	<1	1	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900955**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 12-Feb-2019

Issue Date : 15-Feb-2019 20:05



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- Sample exposure period is 41 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.1.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 21/12/18 - 31/01/19	Station 2 21/12/18 - 31/01/19	Station 3 21/12/18 - 31/01/19	Station 4 21/12/18 - 31/01/19	----
Client sampling date / time				31-Jan-2019 00:00	31-Jan-2019 00:00	31-Jan-2019 00:00	31-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit	EN1900955-001	EN1900955-002	EN1900955-003	EN1900955-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	0.1	<0.1	0.1	----
Ash Content (mg)	----	1	mg	1	2	1	2	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.2	0.1	0.1	0.1	----
Combustible Matter (mg)	----	1	mg	4	2	1	4	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.2	0.1	0.2	----
Total Insoluble Matter (mg)	----	1	mg	5	4	2	6	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804156**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **09-Oct-2018 15:00**
Date Analysis Commenced : **12-Oct-2018**
Issue Date : **17-Oct-2018 09:11**



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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 2.7.18-1.8.18	Station 2 2.7.18-1.8.18	Station 3 2.7.18-1.8.18	Station 4 2.7.18-1.8.18	----
Client sampling date / time				01-Aug-2018 00:00	01-Aug-2018 00:00	01-Aug-2018 00:00	01-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1804156-001	EW1804156-002	EW1804156-003	EW1804156-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	0.1	0.3	0.2	----
Ash Content (mg)	----	1	mg	2	2	6	4	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	0.1	0.8	0.3	----
Combustible Matter (mg)	----	1	mg	2	1	14	5	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.2	1.1	0.5	----
Total Insoluble Matter (mg)	----	1	mg	4	3	20	9	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804319**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Oct-2018 15:00
Date Analysis Commenced : 24-Oct-2018
Issue Date : 30-Oct-2018 08:38



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General Comments

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 1/8/18-1/9/18	Station 2 1/8/18-1/9/18	Station 3 1/8/18-1/9/18	Station 4 1/8/18-1/9/18	----
Client sampling date / time				01-Aug-2018 00:00	01-Aug-2018 00:00	01-Aug-2018 00:00	01-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1804319-001	EW1804319-002	EW1804319-003	EW1804319-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	0.1	0.6	0.1	----
Ash Content (mg)	----	1	mg	1	1	11	2	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	<0.1	0.4	0.2	----
Combustible Matter (mg)	----	1	mg	3	1	7	3	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.1	1.0	0.3	----
Total Insoluble Matter (mg)	----	1	mg	4	2	18	5	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901860**
Client : **SCCCR QUARRIES**
Contact : Genaya Shepherd
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Genaya Shepherd
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 10:37
Date Analysis Commenced : 06-May-2019
Issue Date : 17-Jul-2019 13:23



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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 Ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

Sub-Matrix: DEPOSITIONAL DUST (Matrix: AIR)				Client sample ID		Station 1 31.1.19 to 28.2.19	Station 2 31.1.19 to 28.2.19	Station 3 31.1.19 to 28.2.19	Station 4 31.1.19 to 28.2.19	----		
Client sampling date / time						28-Feb-2019 00:00	28-Feb-2019 00:00	28-Feb-2019 00:00	28-Feb-2019 00:00	----		
Compound	CAS Number	LOR	Unit	EW1901860-001		EW1901860-002		EW1901860-003		EW1901860-004		-----
				Result		Result		Result		Result		----
EA120: Ash Content												
Ash Content	----	0.1	g/m².month	0.7		0.7		1.0		1.6		----
Ash Content (mg)	----	1	mg	11		12		16		26		----
EA125: Combustible Matter												
Combustible Matter	----	0.1	g/m².month	<0.1		0.1		<0.1		1.4		----
Combustible Matter (mg)	----	1	mg	1		1		<1		23		----
EA141: Total Insoluble Matter												
Total Insoluble Matter	----	0.1	g/m².month	0.7		0.8		1.0		3.0		----
Total Insoluble Matter (mg)	----	1	mg	12		13		16		49		----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901861**
Client : **SCCCR QUARRIES**
Contact : Genaya Shepherd
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Genaya Shepherd
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 02-May-2019 10:46
Date Analysis Commenced : 08-May-2019
Issue Date : 17-Jul-2019 13:24



Accreditation No. 825
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- General Comments
- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 Ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 28.2.19 to 29.3.19	Station 2 28.2.19 to 29.3.19	Station 3 28.2.19 to 29.3.19	Station 4 28.2.19 to 29.3.19	----
Client sampling date / time				29-Mar-2019 00:00	29-Mar-2019 00:00	29-Mar-2019 00:00	29-Mar-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901861-001	EW1901861-002	EW1901861-003	EW1901861-004	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	1.3	0.9	0.9	1.9	----
Ash Content (mg)	----	1	mg	23	16	16	33	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.2	<0.1	0.3	1.6	----
Combustible Matter (mg)	----	1	mg	3	<1	5	26	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.5	0.9	1.2	3.5	----
Total Insoluble Matter (mg)	----	1	mg	26	16	21	59	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902371**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **GS10385**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **03-Jun-2019 16:12**
Date Analysis Commenced : **07-Jun-2019**
Issue Date : **13-Jun-2019 17:37**



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Signatories

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Signatories	Position	Accreditation Category
Jennifer Targett	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 1/5/19 to 31/5/19	Station 2 1/5/19 to 31/5/19	Station 3 1/5/19 to 31/5/19	Station 4 1/5/19 to 31/5/19	----
Client sampling date / time				31-May-2019 00:00	31-May-2019 00:00	31-May-2019 00:00	31-May-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902371-005	EW1902371-006	EW1902371-007	EW1902371-008	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	1.0	0.7	0.5	0.4	----
Ash Content (mg)	----	1	mg	17	13	8	7	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.2	0.1	0.2	----
Combustible Matter (mg)	----	1	mg	1	3	2	3	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.0	0.9	0.6	0.6	----
Total Insoluble Matter (mg)	----	1	mg	18	16	10	10	----



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP North 9577735	TSP South 9577734	PM10 North 9577736	PM10 South 9577737	----
Client sampling date / time				31-May-2019 00:00	30-May-2019 00:00	30-May-2019 00:00	31-May-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902371-001	EW1902371-002	EW1902371-003	EW1902371-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
Ø Total Suspended Particulates	----	0.1	µg/m³	<0.1	<0.1	----	----	----
Ø PM10	----	0.1	µg/m³	----	----	<0.1	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	<0.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902770**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number :
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : 1 of 4
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-Jul-2019 14:03
Date Analysis Commenced : 03-Jul-2019
Issue Date : 10-Jul-2019 17:36



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Signatories

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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in $\text{g}/\text{m}^2\cdot\text{mth}$ as sampling data was provided by the client.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 31/5/19 to 30/6/19	Station 2 31/5/19 to 30/6/19	Station 3 31/5/19 to 30/6/19	Station 4 31/5/19 to 30/6/19	----
Client sampling date / time				30-Jun-2019 00:00	30-Jun-2019 00:00	30-Jun-2019 00:00	30-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902770-005	EW1902770-006	EW1902770-007	EW1902770-008	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	2.8	2.7	2.8	1.1	----
Ash Content (mg)	----	1	mg	49	47	50	20	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.3	0.2	0.4	0.4	----
Combustible Matter (mg)	----	1	mg	5	5	7	7	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	3.1	2.9	3.2	1.5	----
Total Insoluble Matter (mg)	----	1	mg	54	52	57	27	----



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP North 9577752	TSP South 9577750	PM10 North 9577753	PM10 South 9577751	----
Client sampling date / time				28-Jun-2019 00:00	27-Jun-2019 00:00	28-Jun-2019 00:00	27-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902770-001	EW1902770-002	EW1902770-003	EW1902770-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
Ø Total Suspended Particulates	----	0.1	µg/m³	<0.1	----	----	<0.1	----
Ø PM10	----	0.1	µg/m³	----	<0.1	<0.1	----	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	----	----	<0.1	----
PM10 (mass per filter)	----	0.1	mg/filter	----	<0.1	<0.1	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902922**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **09-Jul-2019 14:23**
Date Analysis Commenced : **12-Jul-2019**
Issue Date : **18-Jul-2019 11:21**



Accreditation No. 825
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 ISO/IEC 17025 - Testing

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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in $\text{g}/\text{m}^2.\text{mth}$ as sampling data was provided by the client. Period sampled: 01/04/2019-30/04/2019.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.



Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST**
 (Matrix: **AIR**)

Client sample ID

				Station 1	Station 2	Station 3	Station 4	----
Client sampling date / time				01-Jul-2019 00:00	01-Jul-2019 00:00	01-Jul-2019 00:00	01-Jul-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902922-005	EW1902922-006	EW1902922-007	EW1902922-008	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	0.4	0.3	0.4	----
Ash Content (mg)	----	1	mg	3	7	5	6	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.1	0.1	0.3	----
Combustible Matter (mg)	----	1	mg	<1	1	2	6	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.5	0.4	0.7	----
Total Insoluble Matter (mg)	----	1	mg	3	8	7	12	----



Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9700052	TSP South 9700053	PM10 North 9700050	PM10 South 9700051	----
Client sampling date / time				04-Jul-2019 07:00	05-Jul-2019 07:00	04-Jul-2019 07:00	05-Jul-2019 07:00	----
Compound	CAS Number	LOR	Unit	EW1902922-001	EW1902922-002	EW1902922-003	EW1902922-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
Ø Total Suspended Particulates	----	0.1	µg/m³	5.5	7.9	----	----	----
Ø PM10	----	0.1	µg/m³	----	----	5.1	9.0	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	3.2	4.6	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	3.0	5.3	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900922**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:39



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Signatories

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9619587	TSP North 9619585	PM10 North 9619586	PM10 South 9619588	----
Client sampling date / time				24-Jan-2019 00:00	25-Jan-2019 00:00	25-Jan-2019 00:00	24-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit	EN1900922-001	EN1900922-002	EN1900922-003	EN1900922-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	6.8	5.3	----	----	----
ø PM10	----	0.1	µg/m³	----	----	8.4	6.0	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	4.2	3.3	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	5.2	3.7	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900924**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:45



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Signatories

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Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (Matrix: AIR)				Client sample ID			TSP South 9619581	TSP North 9619582	PM10 North 9619584	PM10 South 9619583	----			
Client sampling date / time							17-Jan-2019 00:00	18-Jan-2019 00:00	18-Jan-2019 00:00	17-Jan-2019 00:00	----			
Compound	CAS Number	LOR	Unit	EN1900924-001			EN1900924-002			EN1900924-003		EN1900924-004		-----
				Result			Result			Result		Result		----
EA143: Particulates in Air - HVAFs														
ø Total Suspended Particulates	----	0.1	µg/m³	5.3			18.5			----		----		----
ø PM10	----	0.1	µg/m³	----			----			10.1		5.0		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	3.3			11.5			----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----			----			6.3		3.1		----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900926**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 05:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:49



Accreditation No. 825
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- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9627655	TSP North 9619572	PM10 North 9627654	PM10 South 9619571	----
Client sampling date / time				10-Jan-2019 00:00	11-Jan-2019 00:00	11-Jan-2019 00:00	10-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit	EN1900926-001	EN1900926-002	EN1900926-003	EN1900926-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	14.7	11.6	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	11.9	13.7	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	9.1	7.2	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	7.4	8.5	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900927**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SN10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:45



Accreditation No. 825
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Signatories

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Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ^ = This result is computed from individual analyte detections at or above the level of reporting
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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9619573	TSP North 9619575	PM10 North 9619580	PM10 South 9619576	----
Client sampling date / time				20-Dec-2018 00:00	21-Dec-2018 00:00	21-Dec-2018 00:00	20-Dec-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900927-001	EN1900927-002	EN1900927-003	EN1900927-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	21.6	7.2	----	----	----
ø PM10	----	0.1	µg/m³	----	----	7.7	10.3	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	13.4	4.5	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	4.8	6.4	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900928**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:50



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ISO/IEC 17025 - Testing

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Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (Matrix: AIR)				Client sample ID		TSP South 9619574	TSP North 9619577	PM10 North 9619579	PM10 South 9619578	----		
Client sampling date / time				13-Dec-2018 00:00		14-Dec-2018 00:00		14-Dec-2018 00:00		13-Dec-2018 00:00		----
Compound	CAS Number	LOR	Unit	EN1900928-001		EN1900928-002		EN1900928-003		EN1900928-004		-----
				Result		Result		Result		Result		----
EA143: Particulates in Air - HVAFs												
ø Total Suspended Particulates	----	0.1	µg/m³	10.6		7.2		----		----		----
ø PM10	----	0.1	µg/m³	----		----		4.3		5.5		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	6.6		4.5		----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----		----		2.7		3.4		----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900929**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:50



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Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (Matrix: AIR)				Client sample ID			TSP South 9619590	TSP North 9619589	PM10 North 9660857	PM10 South 9660856	----			
Client sampling date / time				06-Dec-2018 00:00			07-Dec-2018 00:00			07-Dec-2019 00:00		06-Dec-2018 00:00		----
Compound	CAS Number	LOR	Unit	EN1900929-001			EN1900929-002			EN1900929-003		EN1900929-004		-----
				Result			Result			Result		Result		----
EA143: Particulates in Air - HVAFs														
ø Total Suspended Particulates	----	0.1	µg/m³	22.9			13.9			----		----		----
ø PM10	----	0.1	µg/m³	----			----			10.1		26.1		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	14.2			8.6			----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----			----			6.3		16.2		----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900930**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:41



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9619240	TSP North 9627636	PM10 North 9627640	PM10 South 9627637	----
Client sampling date / time				01-Nov-2018 00:00	02-Nov-2018 00:00	02-Nov-2018 00:00	01-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900930-001	EN1900930-002	EN1900930-003	EN1900930-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	5.8	25.8	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	15.0	18.4	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	3.6	16.0	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	9.3	11.4	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900931**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:41



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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Signatories

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Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9627641	TSP North 9627642	PM10 North 9627643	PM10 South 9627644	----
Client sampling date / time				08-Nov-2018 00:00	09-Nov-2018 00:00	09-Nov-2018 00:00	08-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900931-001	EN1900931-002	EN1900931-003	EN1900931-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	4.2	4.7	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	18.1	17.8	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	2.6	2.9	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	11.2	11.0	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900932**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:50



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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- Analytical Results

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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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 LOR = Limit of reporting
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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9627646	TSP North 9627645	PM10 North 9627648	PM10 South 9627647	----
Client sampling date / time				15-Nov-2018 00:00	16-Nov-2018 00:00	16-Nov-2018 00:00	15-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900932-001	EN1900932-002	EN1900932-003	EN1900932-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	15.6	10.5	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	5.5	9.7	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	9.7	6.5	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	3.4	6.0	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900933**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:46



Accreditation No. 825
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ISO/IEC 17025 - Testing

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9627653	TSP North 9627650	PM10 North 9627652	PM10 South 9627651	----
Client sampling date / time				22-Nov-2018 00:00	23-Nov-2018 00:00	23-Nov-2018 00:00	22-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900933-001	EN1900933-002	EN1900933-003	EN1900933-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	8.4	11.6	----	----	----
ø PM10	----	0.1	µg/m³	----	----	19.4	21.8	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.2	7.2	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	12.0	13.5	----

CERTIFICATE OF ANALYSIS

Work Order : **EN1900934**

Client : **SCCCR QUARRIES**

Contact : Steve Mitchell

Address : PO Box 121
Oak Flats 2529

Telephone : +61 02 4421 7766

Project : Nowra Brickworks Quarry

Order number : SM10158

C-O-C number : ----

Sampler : Steve Mitchell

Site : ----

Quote number : HVAS SY/466/10 V2

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 2

Laboratory : Environmental Division Newcastle

Contact : Kristy Boje

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : 02 4423 2063

Date Samples Received : 08-Feb-2019 17:00

Date Analysis Commenced : 14-Feb-2019

Issue Date : 14-Feb-2019 17:51



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Signatories

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Signatories

Position

Accreditation Category

Merrin Avery

Supervisor - Inorganic

Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP South 9660860	TSP North 9660858	PM10 North 9660861	PM10 South 9660859	----
Client sampling date / time				29-Nov-2018 00:00	30-Nov-2018 00:00	30-Nov-2018 00:00	29-Nov-2018 00:00	----
Compound	CAS Number	LOR	Unit	EN1900934-001	EN1900934-002	EN1900934-003	EN1900934-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	7.9	11.1	----	----	----
ø PM10	----	0.1	µg/m³	----	----	4.2	6.3	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	4.9	6.9	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	2.6	3.9	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1802861**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW
Telephone : **02 4423 2063**
Date Samples Received : **17-Jul-2018 14:36**
Date Analysis Commenced : **20-Jul-2018**
Issue Date : **23-Jul-2018 12:07**



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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9574729	TSP North 9574727	PM10 North 9574730	PM10 South 9574728	----
Client sampling date / time				05-Jul-2018 00:00	06-Jul-2018 00:00	06-Jul-2018 00:00	05-Jul-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1802861-001	EW1802861-002	EW1802861-003	EW1802861-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	<0.1	<0.1	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	<0.1	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	<0.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1802864**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW
Telephone : 02 4423 2063
Date Samples Received : 17-Jul-2018 14:41
Date Analysis Commenced : 20-Jul-2018
Issue Date : 23-Jul-2018 12:07



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID		TSP South 9574733	TSP North 9574731	PM10 North 9574734	PM10 South 9574732	----		
Client sampling date / time				12-Jul-2018 00:00		13-Jul-2018 00:00		13-Jul-2018 00:00		12-Jul-2018 00:00		----
Compound	CAS Number	LOR	Unit	EW1802864-001		EW1802864-002		EW1802864-003		EW1802864-004		-----
				Result		Result		Result		Result		----
EA143: Particulates in Air - HVAFs												
ø Total Suspended Particulates	----	0.1	µg/m³	2.6		10.0		----		----		----
ø PM10	----	0.1	µg/m³	----		----		<0.1		<0.1		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	1.5		5.8		----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----		----		<0.1		<0.1		----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803810**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **20-Sep-2018 12:57**
Date Analysis Commenced : **25-Sep-2018**
Issue Date : **25-Sep-2018 13:39**



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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9577813	TSP North 9537987	PM10 North 9577814	PM10 South 9537988	----
Client sampling date / time				16-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	16-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803810-001	EW1803810-002	EW1803810-003	EW1803810-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	9.4	<0.1	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	10.4	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.4	<0.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.0	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803811**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
 Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Sep-2018 13:02
Date Analysis Commenced : 25-Sep-2018
Issue Date : 25-Sep-2018 13:40



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9577811	TSP North 9577809	PM10 North 9577812	PM10 South 9577810	----
Client sampling date / time				09-Aug-2018 00:00	10-Aug-2018 00:00	08-Aug-2018 00:00	09-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803811-001	EW1803811-002	EW1803811-003	EW1803811-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	15.1	10.4	----	----	----
ø PM10	----	0.1	µg/m³	----	----	10.9	12.3	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	8.7	6.0	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.3	7.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803812**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
 Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Sep-2018 13:06
Date Analysis Commenced : 25-Sep-2018
Issue Date : 26-Sep-2018 09:11



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9578299	TSP North 9578297	PM10 North 9578300	PM10 South 9578298	----
Client sampling date / time				26-Jul-2018 00:00	27-Jul-2018 00:00	27-Jul-2018 00:00	26-Jul-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803812-001	EW1803812-002	EW1803812-003	EW1803812-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	7.3	28.4	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	6.4	7.4	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	4.2	16.4	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	3.7	4.3	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803815**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **20-Sep-2018 13:20**
Date Analysis Commenced : **25-Sep-2018**
Issue Date : **26-Sep-2018 09:10**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9578292	TSPNorth 9578293	PM10 North 9578295	PM10 South 9578296	----
Client sampling date / time				20-Sep-2018 00:00	20-Sep-2018 00:00	20-Sep-2018 00:00	20-Sep-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803815-001	EW1803815-002	EW1803815-003	EW1803815-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	3.7	6.6	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	13.9	26.7	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	2.3	4.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	8.6	16.5	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803816**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **20-Sep-2018 13:23**
Date Analysis Commenced : **25-Sep-2018**
Issue Date : **26-Sep-2018 09:10**



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 ISO/IEC 17025 - Testing

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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ~ = Indicates an estimated value.

- EA143-MF: Samples #1, 3 & 4 were pre-weighed January 2017. Filter integrity can vary with time & storage conditions. Results should be scrutinised accordingly.
- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9390831	TSP North 9577815	PM10 North 9390832	PM10 South 9390830	----
Client sampling date / time				23-Aug-2018 00:00	24-Aug-2018 00:00	24-Aug-2018 00:00	23-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803816-001	EW1803816-002	EW1803816-003	EW1803816-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	8.3	10.0	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	6.8	5.0	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	4.8	5.8	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	3.9	2.9	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803818**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Sep-2018 13:27
Date Analysis Commenced : 25-Sep-2018
Issue Date : 26-Sep-2018 09:10



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9577807	TSP North 9577805	PM10 North 9577808	PM10 South 9577806	----
Client sampling date / time				03-Aug-2018 00:00	04-Aug-2018 00:00	04-Aug-2018 00:00	03-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803818-001	EW1803818-002	EW1803818-003	EW1803818-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	9.7	5.7	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	7.4	5.2	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.6	3.3	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	4.3	3.0	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803820**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Sep-2018 13:31
Date Analysis Commenced : 25-Sep-2018
Issue Date : 26-Sep-2018 09:10



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- EA143-MF: Filters were pre-weighed January 2017. Filter integrity can vary with time & storage conditions. Results should be scrutinised accordingly.
- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9390835	TSP North 9390833	PM10 North 9390836	PM10 South 9390834	----
Client sampling date / time				30-Aug-2018 00:00	31-Aug-2018 00:00	31-Aug-2018 00:00	30-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803820-001	EW1803820-002	EW1803820-003	EW1803820-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	<0.1	12.0	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	1.7	1.2	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	6.9	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	1.0	0.7	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803821**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Sep-2018 13:34
Date Analysis Commenced : 25-Sep-2018
Issue Date : 26-Sep-2018 09:10



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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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 ~ = Indicates an estimated value.

- EA143-MF: Filters were pre-weighed January 2017. Filter integrity can vary with time & storage conditions. Results should be scrutinised accordingly.
- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9390839	TSP North 9390837	PM10 North 9390840	PM10 South 9390838	----
Client sampling date / time				07-Sep-2018 00:00	08-Sep-2018 00:00	08-Sep-2018 00:00	07-Sep-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803821-001	EW1803821-002	EW1803821-003	EW1803821-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	<0.1	4.0	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	<0.1	0.5	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	2.5	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	0.3	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1803823**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-Sep-2018 13:37
Date Analysis Commenced : 25-Sep-2018
Issue Date : 26-Sep-2018 09:10



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 Ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- EA143-MF: Filters were pre-weighed January 2017. Filter integrity can vary with time & storage conditions. Results should be scrutinised accordingly.
- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID	TSP South 9390843	TSP North 9390841	PM10 North 9390844	PM10 South 9390842	----
Client sampling date / time					13-Sep-2018 00:00	14-Sep-2018 00:00	14-Sep-2018 00:00	13-Sep-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1803823-001	EW1803823-002	EW1803823-003	EW1803823-004	-----	
				Result	Result	Result	Result		----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³	4.7	3.7	----	----		----
ø PM10	----	0.1	µg/m³	----	----	<0.1	2.2		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	2.9	2.3	----	----		----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	1.4		----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804153**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **09-Oct-2018 15:00**
Date Analysis Commenced : **16-Oct-2018**
Issue Date : **17-Oct-2018 09:11**



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Signatories

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID		TSP South 9619224	TSP North 9619225	PM10 North 9619227	PM10 South 9619226	----		
Client sampling date / time				05-Oct-2018 00:00		06-Oct-2018 00:00		06-Oct-2018 00:00		05-Oct-2018 00:00		----
Compound	CAS Number	LOR	Unit	EW1804153-001		EW1804153-002		EW1804153-003		EW1804153-004		-----
				Result		Result		Result		Result		----
EA143: Particulates in Air - HVAFs												
ø Total Suspended Particulates	----	0.1	µg/m³	<0.1		3.9		----		----		----
ø PM10	----	0.1	µg/m³	----		----		<0.1		2.7		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1		2.4		----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----		----		<0.1		1.7		----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804154**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **09-Oct-2018 11:18**
Date Analysis Commenced : **16-Oct-2018**
Issue Date : **17-Oct-2018 09:11**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9619221	TSP North 9619222	PM10 North 9390849	PM10 South 9619223	----
Client sampling date / time				27-Sep-2018 00:00	28-Sep-2018 00:00	28-Sep-2018 00:00	27-Sep-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1804154-001	EW1804154-002	EW1804154-003	EW1804154-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	1.6	1.3	----	----	----
ø PM10	----	0.1	µg/m³	----	----	<0.1	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	1.0	0.8	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804155**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 09-Oct-2018 15:00
Date Analysis Commenced : 16-Oct-2018
Issue Date : 17-Oct-2018 09:11



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID	TSP South 9390846	TSP North 9390845	PM10 North 9390848	PM10 South 9390847	----
Client sampling date / time					20-Sep-2018 00:00	20-Sep-2018 00:00	20-Sep-2018 00:00	20-Sep-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1804155-001	EW1804155-002	EW1804155-003	EW1804155-004	-----	
				Result	Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³	12.2	0.3	----	----	----	----
ø PM10	----	0.1	µg/m³	----	----	0.2	<0.1	----	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	7.6	0.2	----	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	0.1	<0.1	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804318**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **22-Oct-2018 10:00**
Date Analysis Commenced : **29-Oct-2018**
Issue Date : **30-Oct-2018 08:38**



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID		TSP South 9619228	TSP North 9619231	PM10 North 9619230	PM10 South 9619229	----		
Client sampling date / time				11-Oct-2018 00:00		12-Oct-2018 00:00		12-Oct-2018 00:00		11-Oct-2018 00:00		----
Compound	CAS Number	LOR	Unit	EW1804318-001		EW1804318-002		EW1804318-003		EW1804318-004		-----
				Result		Result		Result		Result		----
EA143: Particulates in Air - HVAFs												
ø Total Suspended Particulates	----	0.1	µg/m³	3.5		5.0		----		----		----
ø PM10	----	0.1	µg/m³	----		----		9.0		7.2		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	2.2		3.1		----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----		----		5.6		4.5		----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804451**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **SM9932**
C-O-C number : **----**
Sampler : **Steve Mitchell**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 30-Oct-2018 14:28
Date Analysis Commenced : 02-Nov-2018
Issue Date : 05-Nov-2018 14:22



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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9619236	TSP North 9619237	PM10 North 9619239	PM10 South 9619238	----
Client sampling date / time				25-Oct-2018 00:00	26-Oct-2018 00:00	26-Oct-2018 00:00	25-Oct-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1804451-001	EW1804451-002	EW1804451-003	EW1804451-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	10.8	7.2	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	10.0	7.6	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	6.7	4.5	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.2	4.7	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804452**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **SM9932**
C-O-C number : **----**
Sampler : **Steve Mitchell**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 30-Oct-2018 14:32
Date Analysis Commenced : 02-Nov-2018
Issue Date : 05-Nov-2018 14:22



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 ~ = Indicates an estimated value.

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- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9619232	TSP North 9619233	PM10 North 9619235	PM10 South 9619234	----
Client sampling date / time				18-Oct-2018 00:00	19-Oct-2018 00:00	19-Oct-2018 00:00	18-Oct-2018 00:00	----
Compound	CAS Number	LOR	Unit	EW1804452-001	EW1804452-002	EW1804452-003	EW1804452-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	7.4	8.0	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	14.1	9.7	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	4.6	5.0	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	8.7	6.0	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901863**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 11:15
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:06



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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID		TSP South 9618170	TSP North 9618171	PM10 North 9618173	PM10 South 9618172	----		
Client sampling date / time				18-Apr-2019 00:00		19-Apr-2019 00:00		19-Apr-2019 00:00		18-Apr-2019 00:00		----
Compound	CAS Number	LOR	Unit	EW1901863-001		EW1901863-002		EW1901863-003		EW1901863-004		-----
				Result		Result		Result		Result		----
EA143: Particulates in Air - HVAFs												
ø Total Suspended Particulates	----	0.1	µg/m³	43.2		22.9		----		----		----
ø PM10	----	0.1	µg/m³	----		----		11.6		11.0		----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	26.8		14.2		----		----		----
PM10 (mass per filter)	----	0.1	mg/filter	----		----		7.2		6.8		----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901864**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 11:22
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:07



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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID	TSP South 9618166	TSP North 9618169	PM10 North 9618167	PM10 South 9618168	----
Client sampling date / time					11-Apr-2019 00:00	12-Apr-2019 00:00	12-Apr-2019 00:00	11-Apr-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901864-001	EW1901864-002	EW1901864-003	EW1901864-004	-----	
				Result	Result	Result	Result	----	
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³	13.4	14.4	----	----	----	
ø PM10	----	0.1	µg/m³	----	----	11.8	11.0	----	
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	8.3	8.9	----	----	----	
PM10 (mass per filter)	----	0.1	mg/filter	----	----	7.3	6.8	----	

CERTIFICATE OF ANALYSIS

Work Order : **EW1901865**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 11:30
Date Analysis Commenced : 07-May-2019
Issue Date : 09-May-2019 15:07



Accreditation No. 825
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Signatories

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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9618164	TSP North 9618162	PM10 North 9618163	PM10 South 9618165	----
Client sampling date / time				04-Apr-2019 00:00	05-Apr-2019 00:00	05-Apr-2019 00:00	04-Apr-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901865-001	EW1901865-002	EW1901865-003	EW1901865-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	11.8	10.2	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	9.8	25.4	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	7.3	6.3	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.1	15.8	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901866**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 11:38
Date Analysis Commenced : 07-May-2019
Issue Date : 09-May-2019 15:06



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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9618160	TSP North 9623088	PM10 North 9618161	PM10 South 9623089	----
Client sampling date / time				28-Mar-2019 00:00	29-Mar-2019 00:00	29-Mar-2019 00:00	28-Mar-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901866-001	EW1901866-002	EW1901866-003	EW1901866-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	11.8	21.1	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	10.0	23.0	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	7.3	13.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.2	14.3	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901867**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 11:44
Date Analysis Commenced : 07-May-2019
Issue Date : 09-May-2019 15:07



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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9623093	TSP North 9623098	PM10 North 9623091	PM10 South 9623092	----
Client sampling date / time				21-Mar-2019 00:00	22-Mar-2019 00:00	22-Mar-2019 00:00	21-Mar-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901867-001	EW1901867-002	EW1901867-003	EW1901867-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	9.0	3.2	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	7.7	8.2	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.6	2.0	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	4.8	5.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901868**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 11:53
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:07



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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID	TSP South 9623090	TSP North 9623099	PM10 North 9623096	PM10 South 9623097	----
Client sampling date / time					14-Mar-2019 00:00	15-Mar-2019 00:00	15-Mar-2019 00:00	14-Mar-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901868-001	EW1901868-002	EW1901868-003	EW1901868-004	-----	
				Result	Result	Result	Result	----	----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³	8.4	5.0	----	----	----	----
ø PM10	----	0.1	µg/m³	----	----	1.4	3.7	----	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.2	3.1	----	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	0.9	2.3	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901869**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 12:03
Date Analysis Commenced : 07-May-2019
Issue Date : 09-May-2019 15:08



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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9623094	TSP North 9623100	PM10 North 9623095	PM10 South 9657205	----
Client sampling date / time				07-Mar-2019 00:00	08-Mar-2019 00:00	08-Mar-2019 00:00	07-Mar-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901869-001	EW1901869-002	EW1901869-003	EW1901869-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	8.2	2.9	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	6.3	1.4	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.1	1.8	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	3.9	0.9	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901870**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 12:07
Date Analysis Commenced : 07-May-2019
Issue Date : 09-May-2019 15:08



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Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9660875	TSP North 9623082	PM10 North 9623083	PM10 South 9660874	----
Client sampling date / time				28-Feb-2019 00:00	01-Mar-2019 00:00	01-Mar-2019 00:00	28-Feb-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901870-001	EW1901870-002	EW1901870-003	EW1901870-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	9.7	12.1	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	9.2	11.3	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	6.0	7.5	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	5.7	7.0	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901873**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 02-May-2019 13:04
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:07



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Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9623085	TSP North 9623086	PM10 North 9623087	PM10 South 9623084	----
Client sampling date / time				21-Feb-2019 00:00	22-Feb-2019 00:00	22-Feb-2019 00:00	21-Feb-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901873-001	EW1901873-002	EW1901873-003	EW1901873-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	8.2	10.5	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	10.6	7.7	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.1	6.5	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.6	4.8	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901874**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 02-May-2019 13:13
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:07



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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- General Comments
- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

Sub-Matrix: FILTER (TSP/RSP) (Matrix: AIR)				Client sample ID	TSP South 9660872	TSP North 9660870	PM10 North 9660871	PM10 South 9660873	----
Client sampling date / time					14-Feb-2019 00:00	15-Feb-2019 00:00	15-Feb-2019 00:00	14-Feb-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901874-001	EW1901874-002	EW1901874-003	EW1901874-004	-----	
				Result	Result	Result	Result	----	----
EA143: Particulates in Air - HVAFs									
ø Total Suspended Particulates	----	0.1	µg/m³	15.6	13.9	----	----	----	----
ø PM10	----	0.1	µg/m³	----	----	15.6	10.1	----	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	9.7	8.6	----	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	9.7	6.3	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901881**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 13:44
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:08



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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 LOR = Limit of reporting
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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9660868	TSP North 9660866	PM10 North 9660867	PM10 South 9660869	----
Client sampling date / time				07-Feb-2019 00:00	08-Feb-2019 00:00	08-Feb-2019 00:00	07-Feb-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901881-001	EW1901881-002	EW1901881-003	EW1901881-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	<0.1	<0.1	----	----	----
ø PM10	----	0.1	µg/m³	----	----	<0.1	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	<0.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1901884**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : Steve Mitchell
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-May-2019 13:48
Date Analysis Commenced : 08-May-2019
Issue Date : 09-May-2019 15:08



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Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP South 9660863	TSP North 9660862	PM10 North 9660865	PM10 South 9660864	----
Client sampling date / time				31-Jan-2019 00:00	01-Feb-2019 00:00	01-Feb-2019 00:00	31-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1901884-001	EW1901884-002	EW1901884-003	EW1901884-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	2.6	5.0	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	<0.1	3.7	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	1.6	3.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	2.3	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902171**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : John
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 20-May-2019 14:25
Date Analysis Commenced : 23-May-2019
Issue Date : 27-May-2019 16:42



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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP North 9618175	TSP South 9618174	PM10 North 9618178	PM10 South 9700068	----
Client sampling date / time				17-May-2019 00:00	16-May-2019 00:00	16-May-2019 00:00	17-May-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902171-001	EW1902171-002	EW1902171-003	EW1902171-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	21.0	29.6	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	20.3	1.0	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	12.8	18.2	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	12.4	0.6	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902276**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks
Order number : SM10308
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 27-May-2019 15:57
Date Analysis Commenced : 31-May-2019
Issue Date : 03-Jun-2019 15:52



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Signatories

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP North 9618177	TSP South 9700067	PM10 North 9618176	PM10 South 9700069	----
Client sampling date / time				27-May-2019 00:00	27-May-2019 00:00	27-May-2019 00:00	27-May-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902276-001	EW1902276-002	EW1902276-003	EW1902276-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	10.7	6.3	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	10.7	2.4	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	6.3	3.7	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	6.3	1.4	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902533**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **GS10385**
C-O-C number : **----**
Sampler : **BUDD GREEN**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 13-Jun-2019 10:33
Date Analysis Commenced : 18-Jun-2019
Issue Date : 18-Jun-2019 15:20



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Signatories

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Signatories	Position	Accreditation Category
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in $\text{g}/\text{m}^2\cdot\text{mth}$ as sampling data was provided by the client.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9577739	TSP South 9577738	PM10 North 9577741	PM10 South 9577740	----
Client sampling date / time				07-Jun-2019 00:00	06-Jun-2019 00:00	06-Jun-2019 00:00	07-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902533-001	EW1902533-002	EW1902533-003	EW1902533-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	4.4	<0.1	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	2.4	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	2.6	<0.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	1.4	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902610**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **GS10385**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **19-Jun-2019 13:29**
Date Analysis Commenced : **26-Jun-2019**
Issue Date : **27-Jun-2019 09:09**



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Signatories

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9577745	TSP South 9577742	PM10 North 9577743	PM10 South 9577744	----
Client sampling date / time				14-Jun-2019 00:00	13-Jun-2019 00:00	13-Jun-2019 00:00	14-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902610-001	EW1902610-002	EW1902610-003	EW1902610-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	8.9	4.8	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	1.4	4.3	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	5.2	2.8	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	0.8	2.5	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902696**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **GS10385**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **4**
No. of samples analysed : **4**

Page : **1 of 2**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **25-Jun-2019 15:36**
Date Analysis Commenced : **28-Jun-2019**
Issue Date : **01-Jul-2019 08:51**



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 ISO/IEC 17025 - Testing

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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 ~ = Indicates an estimated value.

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- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9577748	TSP South 9577749	PM10 North 9577746	PM10 South 9577747	----
Client sampling date / time				21-Jun-2019 00:00	20-Jun-2019 00:00	21-Jun-2019 00:00	20-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902696-001	EW1902696-002	EW1902696-003	EW1902696-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	$\mu\text{g}/\text{m}^3$	<0.1	<0.1	----	----	----
ø PM10	----	0.1	$\mu\text{g}/\text{m}^3$	----	----	<0.1	<0.1	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	<0.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	<0.1	<0.1	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902770**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number :
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : 1 of 4
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 01-Jul-2019 14:03
Date Analysis Commenced : 03-Jul-2019
Issue Date : 10-Jul-2019 17:36



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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in $\text{g}/\text{m}^2\cdot\text{mth}$ as sampling data was provided by the client.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1 31/5/19 to 30/6/19	Station 2 31/5/19 to 30/6/19	Station 3 31/5/19 to 30/6/19	Station 4 31/5/19 to 30/6/19	----
Client sampling date / time				30-Jun-2019 00:00	30-Jun-2019 00:00	30-Jun-2019 00:00	30-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902770-005	EW1902770-006	EW1902770-007	EW1902770-008	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	2.8	2.7	2.8	1.1	----
Ash Content (mg)	----	1	mg	49	47	50	20	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.3	0.2	0.4	0.4	----
Combustible Matter (mg)	----	1	mg	5	5	7	7	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	3.1	2.9	3.2	1.5	----
Total Insoluble Matter (mg)	----	1	mg	54	52	57	27	----



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)
 (Matrix: AIR)

Client sample ID

				TSP North 9577752	TSP South 9577750	PM10 North 9577753	PM10 South 9577751	----
Client sampling date / time				28-Jun-2019 00:00	27-Jun-2019 00:00	28-Jun-2019 00:00	27-Jun-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902770-001	EW1902770-002	EW1902770-003	EW1902770-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
Ø Total Suspended Particulates	----	0.1	µg/m³	<0.1	----	----	<0.1	----
Ø PM10	----	0.1	µg/m³	----	<0.1	<0.1	----	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	<0.1	----	----	<0.1	----
PM10 (mass per filter)	----	0.1	mg/filter	----	<0.1	<0.1	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902922**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks**
Order number : **----**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **HVAS SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **09-Jul-2019 14:23**
Date Analysis Commenced : **12-Jul-2019**
Issue Date : **18-Jul-2019 11:21**



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the $\mu\text{g}/\text{m}^3$ results.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in $\text{g}/\text{m}^2.\text{mth}$ as sampling data was provided by the client. Period sampled: 01/04/2019-30/04/2019.
- NATA accreditation is not held for results reported in $\mu\text{g}/\text{m}^3$. Air volume data was provided by the client.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				Station 1	Station 2	Station 3	Station 4	----
Client sampling date / time				01-Jul-2019 00:00	01-Jul-2019 00:00	01-Jul-2019 00:00	01-Jul-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1902922-005	EW1902922-006	EW1902922-007	EW1902922-008	-----
				Result	Result	Result	Result	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	0.4	0.3	0.4	----
Ash Content (mg)	----	1	mg	3	7	5	6	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.1	0.1	0.3	----
Combustible Matter (mg)	----	1	mg	<1	1	2	6	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.5	0.4	0.7	----
Total Insoluble Matter (mg)	----	1	mg	3	8	7	12	----



Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9700052	TSP South 9700053	PM10 North 9700050	PM10 South 9700051	----
Client sampling date / time				04-Jul-2019 07:00	05-Jul-2019 07:00	04-Jul-2019 07:00	05-Jul-2019 07:00	----
Compound	CAS Number	LOR	Unit	EW1902922-001	EW1902922-002	EW1902922-003	EW1902922-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
Ø Total Suspended Particulates	----	0.1	µg/m³	5.5	7.9	----	----	----
Ø PM10	----	0.1	µg/m³	----	----	5.1	9.0	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	3.2	4.6	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	3.0	5.3	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1903104**
Client : **SCCCR QUARRIES**
Contact : Mr Budd Green
Address : PO Box 121
 Oak Flats 2529

Telephone : ----
Project : Nowra Brickworks
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 22-Jul-2019 10:49
Date Analysis Commenced : 26-Jul-2019
Issue Date : 26-Jul-2019 17:19



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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



General Comments

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 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- No atmospheric corrections were used in the calculation of the µg/m³ results.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9583737	TSP South 9583735	PM10 North 9583738	PM10 South 9583736	----
Client sampling date / time				03-May-2019 00:00	02-May-2019 00:00	03-May-2019 00:00	02-May-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1903104-001	EW1903104-002	EW1903104-003	EW1903104-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	6.9	10.3	----	----	----
ø PM10	----	0.1	µg/m³	----	----	7.4	9.5	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	4.3	6.4	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	4.6	5.9	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1903105**
Client : **SCCCR QUARRIES**
Contact : Mr Budd Green
Address : PO Box 121
 Oak Flats 2529

Telephone : ----
Project : Nowra Brickworks
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : HVAS SY/466/10 V2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Kristy Boje
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 4423 2063
Date Samples Received : 22-Jul-2019 11:02
Date Analysis Commenced : 25-Jul-2019
Issue Date : 26-Jul-2019 17:19



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Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW



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 ~ = Indicates an estimated value.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: FILTER
 (Matrix: AIR)

Client sample ID

				TSP North 9639668	TSP South 9639669	PM10 North 9639667	PM10 South 9639666	----
Client sampling date / time				10-May-2019 00:00	09-May-2019 00:00	10-May-2019 00:00	09-May-2019 00:00	----
Compound	CAS Number	LOR	Unit	EW1903105-001	EW1903105-002	EW1903105-003	EW1903105-004	-----
				Result	Result	Result	Result	----
EA143: Particulates in Air - HVAFs								
ø Total Suspended Particulates	----	0.1	µg/m³	1.4	1.8	----	----	----
ø PM10	----	0.1	µg/m³	----	----	0.3	0.2	----
Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	0.9	1.1	----	----	----
PM10 (mass per filter)	----	0.1	mg/filter	----	----	0.2	0.1	----

Appendix F – Erosion and Sediment Control Log



Sediment and Erosion Control Log

Monitoring in Accordance with AEMR timeframe which coincides with the Project approval. 1e December to end of November each year

Inspections to be carried out fortnightly unless heavy rainfall occurs in the interim when sediment fences should be inspected following the heavy rain to check for signs of sediment buildup and functionality.



Monitoring Plan 1: July 2018 until June 2019

Inspection #	Location within Quarry	Date Inspected	Time Inspected	Inspected By	Reason for Inspection	Are sediment removed from fences	Are sediment fences stable	Are there any further erosion hazard	Are any further sediment control required	Are there any damage to sediment control structures	Are exclusion zones being maintained by all workers and subcontractors	Comments
460	Riparian Protection Zones	4/07/2018	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
461	Riparian Protection Zones	13/07/2018	6:00am	John Green	1.6mm Rainfall	NO	YES	NO	NO	NO	YES	
463	Riparian Protection Zones	2/08/2018	6:00am	John Green	2.4mm Rainfall	NO	YES	NO	NO	NO	YES	
464	Riparian Protection Zones	3/08/2018	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
465	Riparian Protection Zones	4/08/2018	6:00am	John Green	0.8mm Rainfall	NO	YES	NO	NO	NO	YES	
466	Riparian Protection Zones	6/08/2018	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
467	Riparian Protection Zones	24/08/2018	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
468	Riparian Protection Zones	25/08/2018	6:00am	John Green	2.0mm Rainfall	NO	YES	NO	NO	NO	YES	
470	Riparian Protection Zones	27/08/2018	6:00am	John Green	17.0mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence
471	Riparian Protection Zones	1/09/2018	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
472	Riparian Protection Zones	4/09/2018	6:00am	John Green	11.0mm Rainfall	NO	YES	NO	NO	NO	YES	
473	Riparian Protection Zones	5/09/2018	6:00am	John Green	2.6mm Rainfall	NO	YES	NO	NO	NO	YES	
474	Riparian Protection Zones	6/09/2018	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
475	Riparian Protection Zones	7/09/2018	6:00am	John Green	3.0mm Rainfall	NO	YES	NO	NO	NO	YES	
476	Riparian Protection Zones	8/09/2018	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
478	Riparian Protection Zones	24/09/2018	6:00am	John Green	2.8mm Rainfall	NO	YES	NO	NO	NO	YES	
479	Riparian Protection Zones	4/10/2018	6:00am	John Green	3.6mm Rainfall	NO	YES	NO	NO	NO	YES	
480	Riparian Protection Zones	5/10/2018	6:00am	John Green	35.4mm Rainfall	NO	YES	NO	NO	NO	YES	
481	Riparian Protection Zones	8/10/2018	6:00am	John Green	6.0mm Rainfall	NO	YES	NO	NO	NO	YES	
482	Riparian Protection Zones	9/10/2018	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
483	Riparian Protection Zones	10/10/2018	6:00am	John Green	10.6mm Rainfall	NO	YES	NO	NO	NO	YES	
484	Riparian Protection Zones	11/10/2018	6:00am	John Green	5.8mm Rainfall	NO	YES	NO	NO	NO	YES	
485	Riparian Protection Zones	12/10/2018	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
486	Riparian Protection Zones	13/10/2018	6:00am	John Green	1.8mm Rainfall	NO	YES	NO	NO	NO	YES	
487	Riparian Protection Zones	15/10/2018	6:00am	John Green	1.8mm Rainfall	NO	YES	NO	NO	NO	YES	
488	Riparian Protection Zones	16/10/2018	6:00am	John Green	1.6mm Rainfall	NO	YES	NO	NO	NO	YES	
489	Riparian Protection Zones	22/10/2018	6:00am	John Green	9.2mm Rainfall	NO	YES	NO	NO	NO	YES	
490	Riparian Protection Zones	31/12/2018	6:00am	John Green	1.8mm Rainfall	NO	YES	NO	NO	NO	YES	
491	Riparian Protection Zones	7/11/2018	6:00am	John Green	2.2mm Rainfall	NO	YES	NO	NO	NO	YES	
492	Riparian Protection Zones	8/11/2018	6:00am	John Green	20mm Rainfall	NO	YES	NO	NO	NO	YES	
493	Riparian Protection Zones	12/11/2018	6:00am	John Green	0.8mm Rainfall	NO	YES	NO	NO	NO	YES	
494	Riparian Protection Zones	14/12/2018	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
495	Riparian Protection Zones	15/12/2018	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
496	Riparian Protection Zones	16/11/2018	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
497	Riparian Protection Zones	19/11/2018	6:00am	John Green	0.8mm Rainfall	NO	YES	NO	NO	NO	YES	
498	Riparian Protection Zones	22/11/2018	6:00am	John Green	0.8mm Rainfall	NO	YES	NO	NO	NO	YES	
499	Riparian Protection Zones	26/12/2018	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
500	Riparian Protection Zones	28/12/2018	6:00am	John Green	30.6mm Rainfall	YES	NO	NO	NO	NO	YES	Removed Sediment from ALL Sediment Fences
501	Riparian Protection Zones	29/12/2018	6:00am	John Green	65.8mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence
502	Riparian Protection Zones	5/12/2018	6:00am	John Green	2.0mm Rainfall	NO	YES	NO	NO	NO	YES	
503	Riparian Protection Zones	11/12/2018	6:00am	John Green	4.2mm Rainfall	NO	YES	NO	NO	NO	YES	
504	Riparian Protection Zones	13/12/2018	6:00am	John Green	2.4mm Rainfall	NO	YES	NO	NO	NO	YES	
505	Riparian Protection Zones	14/12/2018	6:00am	John Green	32.6mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from ALL Sediment Fences
506	Riparian Protection Zones	15/12/2018	6:00am	John Green	15.20mm Rainfall	NO	YES	NO	NO	NO	YES	
507	Riparian Protection Zones	17/12/2018	6:00am	John Green	19.8mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence
508	Riparian Protection Zones	19/12/2018	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
509	Riparian Protection Zones	20/12/2018	6:00am	John Green	0.6mm Rainfall	NO	YES	NO	NO	NO	YES	
510	Riparian Protection Zones	7/01/2019	6:00am	John Green	26.8mm Rainfall	NO	YES	NO	NO	NO	YES	
511	Riparian Protection Zones	8/01/2019	6:00am	John Green	2.4mm Rainfall	NO	YES	NO	NO	NO	YES	
512	Riparian Protection Zones	9/01/2019	6:00am	John Green	21mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence
513	Riparian Protection Zones	10/01/2019	6:00am	John Green	5.0mm Rainfall	NO	YES	NO	NO	NO	YES	
514	Riparian Protection Zones	11/01/2019	6:00am	John Green	3.0mm Rainfall	NO	YES	NO	NO	NO	YES	
515	Riparian Protection Zones	12/01/2019	6:00am	John Green	7.6mm Rainfall	NO	YES	NO	NO	NO	YES	
516	Riparian Protection Zones	18/01/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
517	Riparian Protection Zones	19/01/2019	6:00am	John Green	1.8mm Rainfall	NO	YES	NO	NO	NO	YES	
518	Riparian Protection Zones	21/01/2019	6:00am	John Green	0.8mm Rainfall	NO	YES	NO	NO	NO	YES	
519	Riparian Protection Zones	29/01/2019	6:00am	John Green	1.0mm Rainfall	NO	YES	NO	NO	NO	YES	
520	Riparian Protection Zones	30/01/2019	6:00am	John Green	6.2mm Rainfall	NO	YES	NO	NO	NO	YES	
521	Riparian Protection Zones	1/02/2019	6:00am	John Green	1.6mm Rainfall	NO	YES	NO	NO	NO	YES	
522	Riparian Protection Zones	2/02/2019	6:00am	John Green	8.8mm Rainfall	NO	YES	NO	NO	NO	YES	
523	Riparian Protection Zones	4/02/2019	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
524	Riparian Protection Zones	5/02/2019	6:00am	John Green	5.2mm Rainfall	NO	YES	NO	NO	NO	YES	
525	Riparian Protection Zones	6/02/2019	6:00am	John Green	2.6mm Rainfall	NO	YES	NO	NO	NO	YES	
526	Riparian Protection Zones	7/02/2019	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
527	Riparian Protection Zones	8/02/2019	6:00am	John Green	6.2mm Rainfall	NO	YES	NO	NO	NO	YES	
528	Riparian Protection Zones	9/02/2019	6:00am	John Green	13.6mm Rainfall	NO	YES	NO	NO	NO	YES	
529	Riparian Protection Zones	21/02/2019	6:00am	John Green	5mm Rainfall	NO	YES	NO	NO	NO	YES	
530	Riparian Protection Zones	22/02/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
531	Riparian Protection Zones	13/03/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
532	Riparian Protection Zones	15/03/2019	6:00am	John Green	19.6mm Rainfall	NO	YES	NO	NO	NO	YES	
533	Riparian Protection Zones	16/03/2019	6:00am	John Green	10.2mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from ALL Sediment Fences
534	Riparian Protection Zones	18/03/2019	6:00am	John Green	56.2mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence
535	Riparian Protection Zones	19/03/2019	6:00am	John Green	0.6mm Rainfall	NO	YES	NO	NO	NO	YES	
536	Riparian Protection Zones	20/03/2019	6:00am	John Green	6.0mm Rainfall	NO	YES	NO	NO	NO	YES	
537	Riparian Protection Zones	21/03/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
538	Riparian Protection Zones	22/03/2019	6:00am	John Green	1.6mm Rainfall	NO	YES	NO	NO	NO	YES	
539	Riparian Protection Zones	25/03/2019	6:00am	John Green	16.8mm Rainfall	NO	YES	NO	NO	NO	YES	
540	Riparian Protection Zones	1/04/2019	6:00am	John Green	13.2mm Rainfall	NO	YES	NO	NO	NO	YES	
541	Riparian Protection Zones	2/04/2019	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
542	Riparian Protection Zones	4/04/2019	6:00am	John Green	25.8mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence
543	Riparian Protection Zones	5/04/2019	6:00am	John Green	0.8mm Rainfall	NO	YES	NO	NO	NO	YES	
544	Riparian Protection Zones	17/04/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
545	Riparian Protection Zones	29/04/2019	6:00am	John Green	0.6mm Rainfall	NO	YES	NO	NO	NO	YES	
546	Riparian Protection Zones	6/05/2019	6:00am	John Green	0.6mm Rainfall	NO	YES	NO	NO	NO	YES	
547	Riparian Protection Zones	13/05/2019	6:00am	John Green	1.0mm Rainfall	NO	YES	NO	NO	NO	YES	
548	Riparian Protection Zones	17/05/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	
549	Riparian Protection Zones	3/06/2019	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
550	Riparian Protection Zones	4/06/2019	6:00am	John Green	68mm Rainfall	NO	YES	NO	NO	NO	YES	
551	Riparian Protection Zones	5/06/2019	6:00am	John Green	20.8mm Rainfall	YES	YES	NO	NO	NO	YES	Removed Sediment from South West Fence - Replaced
552	Riparian Protection Zones	10/06/2019	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
553	Riparian Protection Zones	17/06/2019	6:00am	John Green	9.4mm Rainfall	NO	YES	NO	NO	NO	YES	
554	Riparian Protection Zones	18/06/2019	6:00am	John Green	1.2mm Rainfall	NO	YES	NO	NO	NO	YES	
555	Riparian Protection Zones	24/06/2019	6:00am	John Green	48.6mm Rainfall	NO	YES	NO	NO	NO	YES	
556	Riparian Protection Zones	25/06/2019	6:00am	John Green	5.6mm Rainfall	NO	YES	NO	NO	NO	YES	
557	Riparian Protection Zones	27/06/2019	6:00am	John Green	0.4mm Rainfall	NO	YES	NO	NO	NO	YES	
558	Riparian Protection Zones	28/06/2019	6:00am	John Green	0.2mm Rainfall	NO	YES	NO	NO	NO	YES	

Appendix G – Landscape and Biodiversity Monitoring



Site Reference Photos

30th November 2016















Site Reference Photos

31st May 2017

















Site Reference Photos
6th June 2019















Appendix H – Surface water monitoring



CERTIFICATE OF ANALYSIS

Work Order : **EW1902925**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks Quarry - Water**
Order number : **GS10521**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **Nowra Brickworks Quarry SY/466/10 V2**
No. of samples received : **5**
No. of samples analysed : **5**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Alexis Bell**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 42253125**
Date Samples Received : **09-Jul-2019 15:22**
Date Analysis Commenced : **10-Jul-2019**
Issue Date : **18-Jul-2019 16:14**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ashesh Patel	Senior Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EN055: Ionic Balance out of acceptable limits for sample 1 due to analytes not quantified in this report.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	C1	C2	C10	S4	S5
Client sampling date / time					18-Dec-2018 00:00	18-Dec-2018 00:00	18-Dec-2018 00:00	18-Dec-2018 00:00	18-Dec-2018 00:00
Compound	CAS Number	LOR	Unit		EW1902925-001	EW1902925-002	EW1902925-003	EW1902925-004	EW1902925-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.75	7.19	6.94	6.64	8.07
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		218	277	214	1030	7400
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		22	34	21	8	210
Total Alkalinity as CaCO3	----	1	mg/L		22	34	21	8	210
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		14	27	14	109	681
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		34	36	34	206	1400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		6	10	5	19	113
Magnesium	7439-95-4	1	mg/L		5	5	4	15	184
Sodium	7440-23-5	1	mg/L		28	31	26	129	1120
Potassium	7440-09-7	1	mg/L		4	3	4	4	15
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		1.72	0.96	1.46	0.10	<0.05
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		3.17	2.97	3.85	3.75	0.03
Arsenic	7440-38-2	0.001	mg/L		0.001	0.001	0.002	0.001	0.002
Zinc	7440-66-6	0.005	mg/L		0.016	0.010	0.012	0.016	<0.005
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.08	0.08	0.08	0.12	0.22
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	0.14
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.05	0.07	0.04	0.96	0.78
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.05	0.07	0.04	0.96	0.92
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.06	0.04	0.06	0.05	0.01



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				C1	C2	C10	S4	S5
Client sampling date / time				18-Dec-2018 00:00	18-Dec-2018 00:00	18-Dec-2018 00:00	18-Dec-2018 00:00	18-Dec-2018 00:00
Compound	CAS Number	LOR	Unit	EW1902925-001	EW1902925-002	EW1902925-003	EW1902925-004	EW1902925-005
Result				Result	Result	Result	Result	Result
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	1.69	2.26	1.67	8.24	57.9
∅ Total Cations	----	0.01	meq/L	2.03	2.34	1.81	7.90	69.9
∅ Ionic Balance	----	0.01	%	----	----	----	2.13	9.41

CERTIFICATE OF ANALYSIS

Work Order : **EW1801034**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks Quarry - Water**
Order number : **SM9530**
C-O-C number : **----**
Sampler : **Steve Mitchell**
Site : **----**
Quote number : **Nowra Brickworks Quarry SY/466/10 V2**
No. of samples received : **5**
No. of samples analysed : **5**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW
Telephone : **02 4423 2063**
Date Samples Received : **09-Mar-2018 11:23**
Date Analysis Commenced : **09-Mar-2018**
Issue Date : **19-Mar-2018 09:33**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S5	S4	C10	C1	C2
Client sampling date / time					27-Feb-2018 00:00	27-Feb-2018 00:00	27-Feb-2018 00:00	27-Feb-2018 00:00	27-Feb-2018 00:00
Compound	CAS Number	LOR	Unit		EW1801034-001	EW1801034-002	EW1801034-003	EW1801034-004	EW1801034-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		8.23	6.00	6.51	6.54	6.52
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		6910	464	220	209	218
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L		225	2	10	13	10
Total Alkalinity as CaCO ₃	----	1	mg/L		225	2	10	13	10
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L		648	33	16	12	16
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1740	110	43	42	44
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		119	2	4	4	4
Magnesium	7439-95-4	1	mg/L		193	4	3	4	3
Sodium	7440-23-5	1	mg/L		1170	72	30	26	30
Potassium	7440-09-7	1	mg/L		17	3	5	6	5
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		<0.05	0.42	0.65	0.71	0.68
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.14	7.11	1.81	1.19	1.34
Arsenic	7440-38-2	0.001	mg/L		0.002	0.002	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		0.010	0.038	0.025	0.046	0.019
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.08	<0.01	0.04	0.03	0.02
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		0.04	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		2.40	2.97	0.66	0.17	0.17
EK059G: Nitrite plus Nitrate as N (NO_x) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		2.44	2.97	0.66	0.17	0.17
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.03	0.18	0.12	0.10	0.09



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				S5	S4	C10	C1	C2
Client sampling date / time				27-Feb-2018 00:00	27-Feb-2018 00:00	27-Feb-2018 00:00	27-Feb-2018 00:00	27-Feb-2018 00:00
Compound	CAS Number	LOR	Unit	EW1801034-001	EW1801034-002	EW1801034-003	EW1801034-004	EW1801034-005
Result				Result	Result	Result	Result	Result
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	67.1	3.83	1.74	1.69	1.77
Total Cations	----	0.01	meq/L	73.1	3.64	1.88	1.81	1.88
Ionic Balance	----	0.01	%	4.34	2.58	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902926**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks Quarry - Water**
Order number : **GS10521**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **Nowra Brickworks Quarry SY/466/10 V2**
No. of samples received : **5**
No. of samples analysed : **5**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Alexis Bell**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 42253125**
Date Samples Received : **09-Jul-2019 15:33**
Date Analysis Commenced : **10-Jul-2019**
Issue Date : **18-Jul-2019 16:14**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Senior Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	C1	C2	C10	S4	S5
Client sampling date / time					25-Mar-2019 00:00	25-Mar-2019 00:00	25-Mar-2019 00:00	25-Mar-2019 00:00	25-Mar-2019 00:00
Compound	CAS Number	LOR	Unit		EW1902926-001	EW1902926-002	EW1902926-003	EW1902926-004	EW1902926-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.89	7.24	6.86	6.63	8.06
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		220	280	214	1000	7410
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L		24	33	21	7	204
Total Alkalinity as CaCO ₃	----	1	mg/L		24	33	21	7	204
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L		14	28	13	112	740
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		34	37	33	205	1410
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		6	10	5	20	112
Magnesium	7439-95-4	1	mg/L		4	5	4	15	185
Sodium	7440-23-5	1	mg/L		26	31	26	126	1120
Potassium	7440-09-7	1	mg/L		4	4	4	4	15
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		1.50	1.04	1.51	0.08	<0.05
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		2.77	2.57	3.01	4.80	0.02
Arsenic	7440-38-2	0.001	mg/L		0.001	<0.001	0.001	0.001	0.002
Zinc	7440-66-6	0.005	mg/L		0.012	0.008	0.010	0.018	<0.005
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.05	0.15	0.03	0.13	0.19
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	0.14
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.04	0.07	0.02	0.90	0.76
EK059G: Nitrite plus Nitrate as N (NO_x) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.04	0.07	0.02	0.90	0.90
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.06	0.05	0.05	0.06	0.05



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				C1	C2	C10	S4	S5
Client sampling date / time				25-Mar-2019 00:00	25-Mar-2019 00:00	25-Mar-2019 00:00	25-Mar-2019 00:00	25-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	EW1902926-001	EW1902926-002	EW1902926-003	EW1902926-004	EW1902926-005
				Result	Result	Result	Result	Result
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	1.73	2.29	1.62	8.25	59.2
∅ Total Cations	----	0.01	meq/L	1.86	2.36	1.81	7.82	69.9
∅ Ionic Balance	----	0.01	%	----	----	----	2.73	8.25

CERTIFICATE OF ANALYSIS

Work Order : **EW1902393**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks Quarry - Water**
Order number : **GS10385**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **Nowra Brickworks Quarry SY/466/10 V2**
No. of samples received : **5**
No. of samples analysed : **5**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Kristy Boje**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 4423 2063**
Date Samples Received : **05-Jun-2019 10:25**
Date Analysis Commenced : **06-Jun-2019**
Issue Date : **13-Jun-2019 17:22**



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Signatories

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Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW



General Comments

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

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~ = Indicates an estimated value.

- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	C1	C2	C10	S4	S5
Client sampling date / time					05-Jun-2019 09:19	05-Jun-2019 08:56	05-Jun-2019 08:44	05-Jun-2019 08:35	05-Jun-2019 08:30
Compound	CAS Number	LOR	Unit		EW1902393-001	EW1902393-002	EW1902393-003	EW1902393-004	EW1902393-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.42	6.78	6.69	6.02	7.86
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		192	183	180	430	7360
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L		13	12	9	<1	220
Total Alkalinity as CaCO ₃	----	1	mg/L		13	12	9	<1	220
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L		9	10	7	32	709
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		34	31	32	101	1320
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		6	5	4	5	107
Magnesium	7439-95-4	1	mg/L		4	3	4	6	178
Sodium	7440-23-5	1	mg/L		25	23	22	60	1060
Potassium	7440-09-7	1	mg/L		5	4	4	4	15
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		0.95	0.88	0.92	0.64	<0.05
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		2.06	2.49	2.31	6.51	0.20
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	0.002
Zinc	7440-66-6	0.005	mg/L		0.013	0.009	0.010	0.015	<0.005
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.02	0.01	0.04	0.11	0.50
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		0.02	<0.01	<0.01	<0.01	0.15
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.34	0.26	0.30	0.92	0.92
EK059G: Nitrite plus Nitrate as N (NO_x) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.36	0.26	0.30	0.92	1.07
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.14	0.10	0.13	0.06	0.02



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	C1	C2	C10	S4	S5
Client sampling date / time					05-Jun-2019 09:19	05-Jun-2019 08:56	05-Jun-2019 08:44	05-Jun-2019 08:35	05-Jun-2019 08:30
Compound	CAS Number	LOR	Unit		EW1902393-001	EW1902393-002	EW1902393-003	EW1902393-004	EW1902393-005
					Result	Result	Result	Result	Result
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		1.41	1.32	1.23	3.52	56.4
∅ Total Cations	----	0.01	meq/L		1.84	1.60	1.59	3.46	66.5
∅ Ionic Balance	----	0.01	%		----	----	----	0.86	8.21

CERTIFICATE OF ANALYSIS

Work Order : **EW1902715**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks Quarry - Water**
Order number : **GS10385**
C-O-C number : **----**
Sampler : **corey fox**
Site : **----**
Quote number : **Nowra Brickworks Quarry SY/466/10 V2**
No. of samples received : **5**
No. of samples analysed : **5**

Page : 1 of 4
Laboratory : Environmental Division NSW South Coast
Contact : Alexis Bell
Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : 02 42253125
Date Samples Received : 26-Jun-2019 15:44
Date Analysis Commenced : 27-Jun-2019
Issue Date : 05-Jul-2019 16:54



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	C1	C2	C10	S4	S5
Client sampling date / time					26-Jun-2019 02:50	26-Jun-2019 02:30	26-Jun-2019 02:20	26-Jun-2019 02:10	26-Jun-2019 02:00
Compound	CAS Number	LOR	Unit		EW1902715-001	EW1902715-002	EW1902715-003	EW1902715-004	EW1902715-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.68	7.44	7.29	7.29	8.26
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		178	184	177	1290	6270
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	16
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		22	25	24	37	204
Total Alkalinity as CaCO3	----	1	mg/L		22	25	24	37	220
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		10	16	10	44	780
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		35	35	37	147	1300
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		5	6	5	11	103
Magnesium	7439-95-4	1	mg/L		4	4	4	8	173
Sodium	7440-23-5	1	mg/L		24	25	24	92	1030
Potassium	7440-09-7	1	mg/L		4	4	4	4	15
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L		0.87	0.94	0.92	0.52	<0.05
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		1.11	2.70	2.09	3.94	0.13
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	0.001	0.001
Zinc	7440-66-6	0.005	mg/L		0.008	0.012	0.011	0.016	<0.005
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	<0.01	<0.01	0.01	0.12
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	0.14
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.24	0.19	0.21	0.80	0.68
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.24	0.19	0.21	0.80	0.82
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.08	0.08	0.10	0.05	0.03



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				C1	C2	C10	S4	S5
Client sampling date / time				26-Jun-2019 02:50	26-Jun-2019 02:30	26-Jun-2019 02:20	26-Jun-2019 02:10	26-Jun-2019 02:00
Compound	CAS Number	LOR	Unit	EW1902715-001	EW1902715-002	EW1902715-003	EW1902715-004	EW1902715-005
				Result	Result	Result	Result	Result
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	1.64	1.82	1.73	5.80	57.3
∅ Total Cations	----	0.01	meq/L	1.72	1.82	1.72	5.31	64.6
∅ Ionic Balance	----	0.01	%	----	----	----	4.42	5.95

Daily Rainfall (millimetres)

NOWRA RAN AIR STATION AWS

Station Number: 068072 · State: NSW · Opened: 2000 · Status: Open · Latitude: 34.95°S · Longitude: 150.54°E · Elevation: 109 m

2018	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1st	0.8	0	0	0	0.2	0	0	0	1.2	0	0	0
2nd	0	1.6	0	0	0	0	0	2.4	0	0	0	0
3rd	0.6	2.2	0.2	0.2	0	2.4	0	0.2	0	0	1.8	0
4th	0.6	0.8	0	0	0	1.0	0.2	0.8	11.0	3.6	0	0
5th	0	0	0.4	0	0	0.4	0	0	2.6	35.4	0	2.0
6th	0	0	4.6	0	0	5.2	0	0.2	0.4	0	0	0
7th	0	0	7.0	0	0	9.8	0	0	3.0	0	2.2	0
8th	2.2	0	0	0	0	0	0	0	0.4	6.0	20.0	0
9th	2.2	0	0	0	0	0.4	0	0	0.2	0.2	0	0
10th	38.4	1.4	0	0	0	2.2	0	0	0	10.6	0	0
11th	0	0.6	0	0	0	0.6	0	0	0	5.8	0.8	4.2
12th	0	0	0	0	7.4	0.6	0	0	0	1.2	0	0
13th	7.2	0.8	1.8	0	9.2	0	3.6	0	0	1.8	0	2.4
14th	12.4	0	0	3.0	0	0	0	0	0	0	0.4	32.6
15th	1.0	0	0	0	0	0	0	0	0	1.8	1.2	15.2
16th	0	0	0.4	0	0	0	0	0	0	1.6	0.2	10.0
17th	0	0	0	0	0.2	0	0	0	0	0	0	9.8
18th	0	0	0	0	0	0.8	0	0	0	0	0.8	0
19th	0	0	0	0	0.4	3.0	0	0	0	0	0	1.2
20th	0	20.0	0	4.4	0	13.0	0	0	0	0	0	0.6
21st	0	0	22.6	0.2	0	0.2	0	0	0	9.2	0	0
22nd	0	0	3.2	0	0	0	0	0	0	0	0.8	9.4
23rd	0	0	6.8	0.2	0	0	0	0	0	0	0	1.2
24th	1.0	0	0.2	0.2	0	0	0	1.2	2.8	0	0	0
25th	0.2	41.0	5.0	0	0	0	0	2.0	0	0	0.2	0
26th	0.6	52.2	0	0	0.2	0	0	0.2	0	0	0.2	0
27th	0	3.6	0	1.0	0.2	0	0	17.0	5.4	0	0	0
28th	1.0	0	0	1.0	0	3.4	0	0	0.2	0	80.6	0
29th	0		0	4.6	0	4.6	3.0	0	0	0	65.8	0
30th	0		0	22.6	4.0	0	0	0	0	0	0	0
31st	1.0		0		0		0	0		0		0
Highest daily	38.4	52.2	22.6	22.6	9.2	13.0	3.6	17.0	11.0	35.4	80.6	32.6
Monthly Total	69.2	124.2	52.2	37.4	21.8	47.6	6.8	24.0	27.2	77.2	175.0	88.6

Annual total for 2018 = **751.2mm**

↓ This day is part of an accumulated total

Quality control: 12.3 Done & acceptable, **12.3** Not completed or unknown

Product code: IDCJAC0009 reference: 50120261



Australian Government
Bureau of Meteorology

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<http://www.bom.gov.au/other/copyright.shtml>

Daily Rainfall (millimetres)

NOWRA RAN AIR STATION AWS

Station Number: 068072 · State: NSW · Opened: 2000 · Status: Open · Latitude: 34.95°S · Longitude: 150.54°E · Elevation: 109 m

Statistics for this station calculated over all years of data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	63.3	127.7	112.0	62.9	47.0	116.9	55.6	67.2	41.2	65.3	76.0	77.2
Median	60.5	116.7	70.8	40.2	26.8	79.0	47.0	35.1	39.9	52.2	70.1	62.8
Highest daily	77.2	125.2	158.0	79.6	39.2	159.4	61.6	208.0	73.2	72.2	80.6	74.4
Date of highest daily	29th 2013	12th 2007	25th 2014	22nd 2015	14th 2003	5th 2016	17th 2015	26th 2015	17th 2013	15th 2014	28th 2018	7th 2014

1) Calculation of statistics

Summary statistics, other than the Highest and Lowest values, are only calculated if there are at least 20 years of data available.

2) Gaps and missing data

Gaps may be caused by a damaged instrument, a temporary change to the site operation, or due to the absence or illness of an observer.

3) Further information

<http://www.bom.gov.au/climate/cdo/about/about-rain-data.shtml>.

Product code: IDCJAC0009 reference: 50120261 Created on Sat 24 Aug 2019 10:47:24 AM EST



Daily Rainfall (millimetres)

NOWRA RAN AIR STATION AWS

Station Number: 068072 · State: NSW · Opened: 2000 · Status: Open · Latitude: 34.95°S · Longitude: 150.54°E · Elevation: 109 m

2019	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1st	2.8	1.6	0	3.8	0	0	0	0				
2nd	0	8.8	0	1.2	0	0	0	0				
3rd	5.2	0.4	0	0	0	0.4	0	0				
4th	0	0	0	25.8	0	68.0	2.4	0				
5th	0	5.2	0	0.8	0.4	20.8	3.0	0				
6th	8.2	2.6	0	0	0.2	0	2.6	0				
7th	0	0.4	0	0	0	0	0	0				
8th	2.4	6.2	0	0	0	0	0	0				
9th	21.0	13.6	0	0	0	0.4	0	0				
10th	5.0	0	0	0	0	0	0	0				
11th	3.0	0	0	0	4.0	0	0	0				
12th	7.6	0	0	0	0	0	0	3.4				
13th	0	0	0.2	0	0	0	0	0				
14th	0	0	0	0	0	0	0	0				
15th	0	0	19.6	0	0	0	0	0				
16th		0	10.2	0	0	0	0	0				
17th	0	0	0	0.2	0.2	9.4	0	0				
18th	0.2	0	56.2	0	0	1.2	0	0				
19th	1.8	0	0.6	0	0	0	0	0				
20th	0.8	0	6.0	0.2	0	0	0	0				
21st	0	5.0	0.2	0	0	0	0	0				
22nd	0	0.2	1.6	0	0	0	0	0				
23rd	0	0	16.8	0	0	2.8	0	0				
24th	0	0	0	0.4	0	45.8	0	0				
25th	0	0	0	0	0	5.6	0					
26th	0	0	0	0	0	0	0					
27th	0	0	0	0	0	0.4	0					
28th	0	0	0	0	0	0.2	0					
29th	1.0		0	0	0	0.2	0					
30th	6.2		8.6	0	0	0	3.0					
31st	0		0.8		0		0					
Highest daily	21.0	13.6	56.2	25.8	4.0	68.0	3.0	3.4				
Monthly Total	65.2	44.0	120.8	32.4	4.8	155.2	11.0					

↓ This day is part of an accumulated total

Quality control: 12.3 Done & acceptable, 12.3 Not completed or unknown

Product code: IDCJAC0009 reference: 50120000



Australian Government
Bureau of Meteorology

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Contact us using details on <http://www.bom.gov.au/climate/how/contacts.shtml>.
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<http://www.bom.gov.au/other/copyright.shtml>

Daily Rainfall (millimetres)

NOWRA RAN AIR STATION AWS

Station Number: 068072 · State: NSW · Opened: 2000 · Status: Open · Latitude: 34.95°S · Longitude: 150.54°E · Elevation: 109 m

Statistics for this station calculated over all years of data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	63.3	127.7	112.0	62.9	47.0	116.9	55.6	67.2	41.2	65.3	76.0	77.2
Median	60.5	116.7	70.8	40.2	26.8	79.0	47.0	35.1	39.9	52.2	70.1	62.8
Highest daily	77.2	125.2	158.0	79.6	39.2	159.4	61.6	208.0	73.2	72.2	80.6	74.4
Date of highest daily	29th 2013	12th 2007	25th 2014	22nd 2015	14th 2003	5th 2016	17th 2015	26th 2015	17th 2013	15th 2014	28th 2018	7th 2014

1) Calculation of statistics

Summary statistics, other than the Highest and Lowest values, are only calculated if there are at least 20 years of data available.

2) Gaps and missing data

Gaps may be caused by a damaged instrument, a temporary change to the site operation, or due to the absence or illness of an observer.

3) Further information

<http://www.bom.gov.au/climate/cdo/about/about-rain-data.shtml>.

Product code: IDCJAC0009 reference: 50120000 Created on Sat 24 Aug 2019 10:27:41 AM EST



Appendix I – Ground Water Monitoring



CERTIFICATE OF ANALYSIS

Work Order : **EW1803497**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks - Bores**
Order number : **TBA**
C-O-C number : **----**
Sampler : **Duncan McIntosh**
Site : **----**
Quote number : **SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Jessica Foster**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 42253125**
Date Samples Received : **19-Sep-2018 13:59**
Date Analysis Commenced : **19-Sep-2018**
Issue Date : **27-Sep-2018 11:44**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Robert DaLio	Sampler	Laboratory - Wollongong, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EK071G: LOR raised for Reactive Phosphorus analysis on sample ID: P7, due to matrix interferences.
- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Field data supplied by ALS Wollongong.
- Field tests completed on day of sampling/receipt.
- Sampling completed by ALS Wollongong.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	P1	P2	P3	P4	P5
Client sampling date / time				19-Sep-2018 12:50	19-Sep-2018 00:00	19-Sep-2018 13:20	19-Sep-2018 00:00	19-Sep-2018 13:50	
Compound	CAS Number	LOR	Unit	EW1803497-001	EW1803497-002	EW1803497-003	EW1803497-004	EW1803497-005	
				Result	Result	Result	Result	Result	
EA005FD: Field pH									
pH	----	0.1	pH Unit	6.9	----	6.8	----	7.2	
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	9600	----	10100	----	7520	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	----	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	----	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	520	----	526	----	738	
Total Alkalinity as CaCO3	----	1	mg/L	520	----	526	----	738	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	539	----	558	----	468	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	4180	----	4010	----	2550	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	245	----	209	----	84	
Magnesium	7439-95-4	1	mg/L	393	----	302	----	146	
Sodium	7440-23-5	1	mg/L	1780	----	1860	----	1520	
Potassium	7440-09-7	1	mg/L	25	----	15	----	18	
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	140	----	135	----	96.4	
Total Cations	----	0.01	meq/L	123	----	116	----	82.8	
Ionic Balance	----	0.01	%	6.44	----	7.41	----	7.61	
EN67 PK: Field Tests									
Field Observations	----	0.01	--	----	Destroyed	----	Dry	----	
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m	20.2	----	17.3	----	6.40	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	P6	P7	P8	----	----
Client sampling date / time					19-Sep-2018 00:00	19-Sep-2018 12:20	19-Sep-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		EW1803497-006	EW1803497-007	EW1803497-008	-----	-----
				Result	Result	Result		----	----
EA005FD: Field pH									
pH	----	0.1	pH Unit		----	7.2	----	----	----
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm		----	932	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	134	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	134	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	83	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	185	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	79	----	----	----
Magnesium	7439-95-4	1	mg/L		----	14	----	----	----
Sodium	7440-23-5	1	mg/L		----	80	----	----	----
Potassium	7440-09-7	1	mg/L		----	6	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	9.62	----	----	----
Total Cations	----	0.01	meq/L		----	8.73	----	----	----
Ionic Balance	----	0.01	%		----	4.88	----	----	----
EN67 PK: Field Tests									
Field Observations	----	0.01	--	Not Accessible	----	Destroyed	----	----	----
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m		----	15.6	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1804603**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks - Bores**
Order number : **SM9947**
C-O-C number : **----**
Sampler : **Duncan McIntosh**
Site : **----**
Quote number : **SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Jessica Foster**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 42253125**
Date Samples Received : **29-Nov-2018 16:00**
Date Analysis Commenced : **29-Nov-2018**
Issue Date : **06-Dec-2018 08:45**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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- Analytical Results

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Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

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- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Field data supplied by ALS Wollongong.
- Field tests completed on day of sampling/receipt.
- Sampling completed by ALS Wollongong.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID				
Client sampling date / time				P1	P2	P3	P4	P5
Compound				CAS Number	LOR	Unit		
				29-Nov-2018 13:40	29-Nov-2018 00:00	29-Nov-2018 14:20	29-Nov-2018 14:00	29-Nov-2018 14:40
				EW1804603-001	EW1804603-002	EW1804603-003	EW1804603-004	EW1804603-005
				Result	Result	Result	Result	Result
EA005FD: Field pH								
pH	----	0.1	pH Unit	6.9	----	6.8	5.7	5.5
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	10700	----	11500	1880	7800
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	552	----	555	5	757
Total Alkalinity as CaCO ₃	----	1	mg/L	552	----	555	5	757
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	557	----	596	144	485
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4010	----	3950	561	2410
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	250	----	226	3	92
Magnesium	7439-95-4	1	mg/L	417	----	338	22	157
Sodium	7440-23-5	1	mg/L	1860	----	2030	424	1700
Potassium	7440-09-7	1	mg/L	29	----	18	<1	21
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	136	----	135	18.9	93.2
Total Cations	----	0.01	meq/L	128	----	128	20.4	92.0
Ionic Balance	----	0.01	%	2.76	----	2.69	3.76	0.65
EN67 PK: Field Tests								
Field Observations	----	0.01	--	----	Destroyed	----	----	----
FWI-EN/001: Groundwater Sampling - Depth								
Depth	----	0.01	m	20.2	----	16.6	1.24	6.67



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	P6	P7	P8	----	----
Client sampling date / time					29-Nov-2018 00:00	29-Nov-2018 13:00	29-Nov-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		EW1804603-006	EW1804603-007	EW1804603-008	-----	-----
					Result	Result	Result	----	----
EA005FD: Field pH									
pH	----	0.1	pH Unit		----	6.7	----	----	----
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm		----	406	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	42	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	42	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	39	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	64	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	24	----	----	----
Magnesium	7439-95-4	1	mg/L		----	6	----	----	----
Sodium	7440-23-5	1	mg/L		----	40	----	----	----
Potassium	7440-09-7	1	mg/L		----	5	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	3.46	----	----	----
Total Cations	----	0.01	meq/L		----	3.56	----	----	----
Ionic Balance	----	0.01	%		----	1.46	----	----	----
EN67 PK: Field Tests									
Field Observations	----	0.01	--		Destroyed	----	Destroyed	----	----
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m		----	13.6	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1900708**
Client : **SCCCR QUARRIES**
Contact : Steve Mitchell
Address : PO Box 121
 Oak Flats 2529

Telephone : +61 02 4421 7766
Project : Nowra Brickworks - Bores
Order number : SM10158
C-O-C number : ----
Sampler : Duncan McIntosh
Site : ----
Quote number : SY/466/10 V2
No. of samples received : 8
No. of samples analysed : 8

Page : 1 of 4
Laboratory : Environmental Division NSW South Coast
Contact : Jessica Foster
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : 02 42253125
Date Samples Received : 20-Feb-2019 15:43
Date Analysis Commenced : 20-Feb-2019
Issue Date : 28-Feb-2019 16:38



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EK071G: LOR raised for Reactive Phosphorus analysis on sample ID: P7, due to matrix interferences.
- Sampling and sample data supplied by ALS Wollongong.
- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Field data supplied by ALS Wollongong.
- Field tests completed on day of sampling/receipt.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	P1	P2	P3	P4	P5
Client sampling date / time				20-Feb-2019 11:00	20-Feb-2019 00:00	20-Feb-2019 11:30	20-Feb-2019 11:20	20-Feb-2019 12:00	
Compound	CAS Number	LOR	Unit	EW1900708-001	EW1900708-002	EW1900708-003	EW1900708-004	EW1900708-005	
				Result	Result	Result	Result	Result	
EA005FD: Field pH									
pH	----	0.1	pH Unit	6.9	----	6.7	5.9	7.0	
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	11700	----	11600	3710	8490	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	581	----	550	26	716	
Total Alkalinity as CaCO3	----	1	mg/L	581	----	550	26	716	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	569	----	622	210	517	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	4160	----	4030	1100	2360	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	261	----	211	9	82	
Magnesium	7439-95-4	1	mg/L	444	----	344	53	151	
Sodium	7440-23-5	1	mg/L	2290	----	2350	852	1820	
Potassium	7440-09-7	1	mg/L	39	----	21	2	23	
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	141	----	138	35.9	91.6	
Total Cations	----	0.01	meq/L	150	----	142	41.9	96.3	
Ionic Balance	----	0.01	%	3.22	----	1.42	7.71	2.46	
EN67 PK: Field Tests									
Field Observations	----	0.01	--	----	Destroyed	----	----	----	
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m	20.5	----	17.3	2.97	6.37	



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				P6	P7	P8	----	----
Client sampling date / time				20-Feb-2019 00:00	20-Feb-2019 10:30	20-Feb-2019 00:00	----	----
Compound	CAS Number	LOR	Unit	EW1900708-006	EW1900708-007	EW1900708-008	-----	-----
				Result	Result	Result	----	----
EN67 PK: Field Tests								
Field Observations	----	0.01	--	Not accessible	Dry - suspect bore filled with mud	Destroyed	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EW1902159**
Client : **SCCCR QUARRIES**
Contact : **MR BUDD GREEN**
Address : **PO Box 121**
Oak Flats 2529

Telephone : **+61 0421 235 308**
Project : **Nowra Brickworks - Bores**
Order number : **SM10308**
C-O-C number : **----**
Sampler : **Duncan McIntosh**
Site : **----**
Quote number : **SY/466/10 V2**
No. of samples received : **8**
No. of samples analysed : **8**

Page : **1 of 4**
Laboratory : **Environmental Division NSW South Coast**
Contact : **Jessica Foster**
Address : **1/19 Ralph Black Dr, North Wollongong 2500**
4/13 Geary Pl, North Nowra 2541
Australia NSW Australia
Telephone : **02 42253125**
Date Samples Received : **23-May-2019 15:02**
Date Analysis Commenced : **23-May-2019**
Issue Date : **29-May-2019 17:40**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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Signatories

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Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

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~ = Indicates an estimated value.

- EK071G: LOR raised for Reactive Phosphorus analysis on sample ID: P7, due to matrix interferences.
- Sampling and sample data supplied by ALS Wollongong.
- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Sampling completed as per EN/67.11 Groundwater Sampling.
- Field data supplied by ALS Wollongong.
- Field tests completed on day of sampling/receipt.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	P1	P2	P3	P4	P5
Client sampling date / time				23-May-2019 10:20	23-May-2019 00:00	23-May-2019 10:50	23-May-2019 10:45	23-May-2019 11:10	
Compound	CAS Number	LOR	Unit	EW1902159-001	EW1902159-002	EW1902159-003	EW1902159-004	EW1902159-005	
				Result	Result	Result	Result	Result	
EA005FD: Field pH									
pH	----	0.1	pH Unit	6.7	----	6.7	----	7.0	
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	11600	----	10400	----	8020	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	----	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	----	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	540	----	504	----	699	
Total Alkalinity as CaCO3	----	1	mg/L	540	----	504	----	699	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	575	----	584	----	482	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	4110	----	3640	----	1990	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	259	----	199	----	83	
Magnesium	7439-95-4	1	mg/L	419	----	280	----	144	
Sodium	7440-23-5	1	mg/L	1870	----	1740	----	1470	
Potassium	7440-09-7	1	mg/L	25	----	13	----	17	
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L	139	----	125	----	80.1	
∅ Total Cations	----	0.01	meq/L	129	----	109	----	80.4	
∅ Ionic Balance	----	0.01	%	3.47	----	6.80	----	0.14	
EN67 PK: Field Tests									
Field Observations	----	0.01	--	----	Destroyed	----	Dry	----	
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m	20.6	----	17.8	----	6.42	

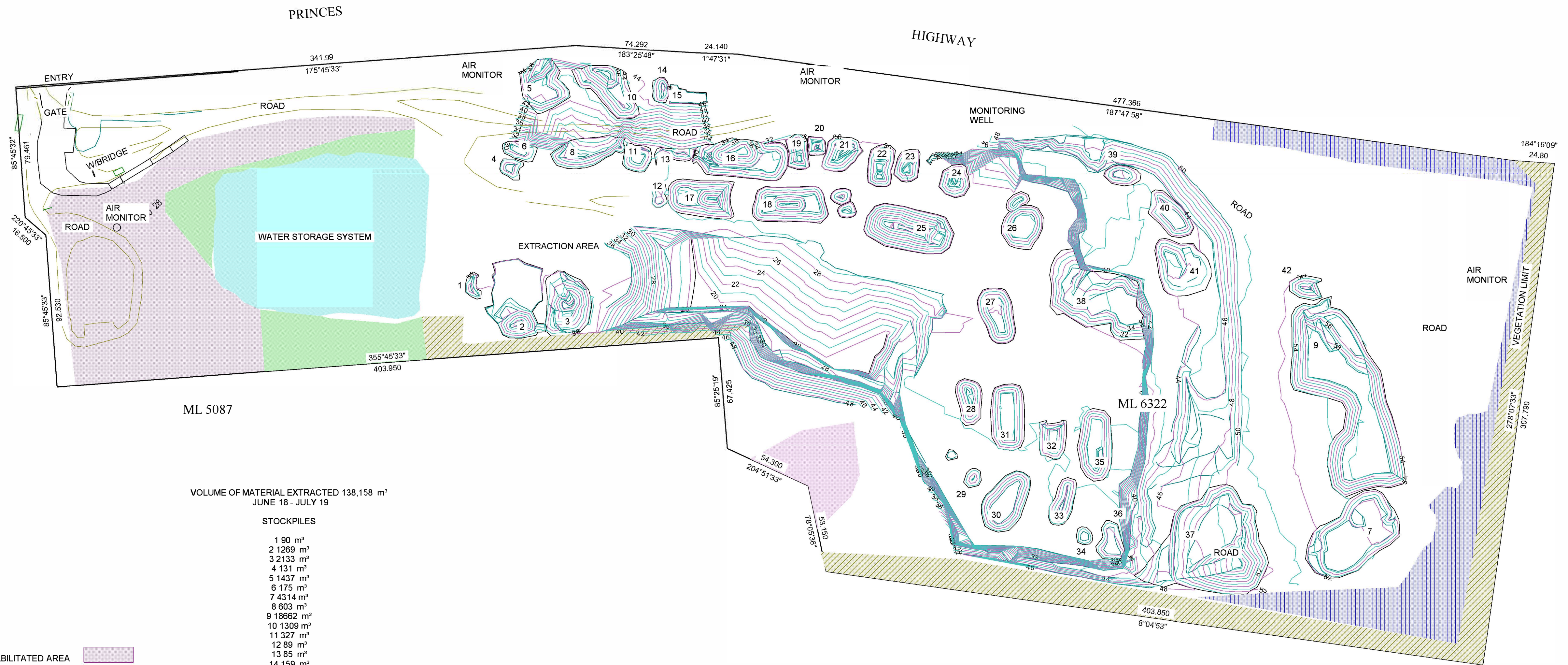
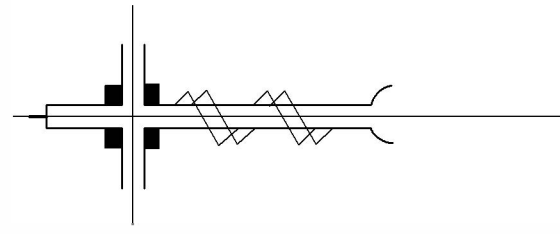


Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	P6	P7	P8	----	----
Client sampling date / time					23-May-2019 00:00	23-May-2019 09:40	23-May-2019 00:00	----	----
Compound	CAS Number	LOR	Unit		EW1902159-006	EW1902159-007	EW1902159-008	-----	-----
				Result	Result	Result		----	----
EA005FD: Field pH									
pH	----	0.1	pH Unit		----	6.6	----	----	----
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm		----	581	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L		----	<1	----	----	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L		----	<1	----	----	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L		----	92	----	----	----
Total Alkalinity as CaCO ₃	----	1	mg/L		----	92	----	----	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L		----	40	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	81	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	29	----	----	----
Magnesium	7439-95-4	1	mg/L		----	10	----	----	----
Sodium	7440-23-5	1	mg/L		----	65	----	----	----
Potassium	7440-09-7	1	mg/L		----	4	----	----	----
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		----	4.96	----	----	----
∅ Total Cations	----	0.01	meq/L		----	5.20	----	----	----
∅ Ionic Balance	----	0.01	%		----	2.40	----	----	----
EN67 PK: Field Tests									
Field Observations	----	0.01	--	Not accessible	----	Destroyed	----	----	----
FWI-EN/001: Groundwater Sampling - Depth									
Depth	----	0.01	m		----	15.8	----	----	----

Appendix J – Contour Plans of Brickworks Quarry





VOLUME OF MATERIAL EXTRACTED 138,158 m³
JUNE 18 - JULY 19

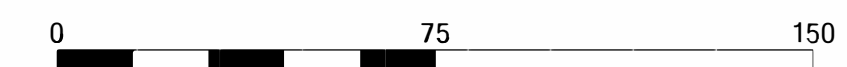
STOCKPILES

- 1 90 m³
- 2 1289 m³
- 3 2133 m³
- 4 131 m³
- 5 1437 m³
- 6 175 m³
- 7 4314 m³
- 8 603 m³
- 9 18662 m³
- 10 1309 m³
- 11 327 m³
- 12 89 m³
- 13 85 m³
- 14 159 m³
- 15 112 m³
- 16 4057 m³
- 17 2249 m³
- 18 2517 m³
- 19 388 m³
- 20 128 m³
- 21 701 m³
- 22 632 m³
- 23 461 m³
- 24 531 m³
- 25 4643 m³
- 26 1426 m³
- 27 1410 m³
- 28 663 m³
- 29 92 m³
- 30 2055 m³
- 31 1856 m³
- 32 623 m³
- 33 520 m³
- 34 77 m³
- 35 1947 m³
- 36 380 m³
- 37 12155 m³
- 38 7906 m³
- 39 299 m³
- 40 857 m³
- 41 1402 m³
- 42 341 m³
- 43 4314 m³

LEGEND

- PREVIOUS REHABILITATED AREA
- NEW REHABILITATED AREA
- SHAPED EMPLACEMENT AREA
- SLOPE OVER 10° AND UNDER 18°
- ACCESS ROAD
- UNDISTURBED LAND

CONTROL	EASTING	NORTHING	RL.
COORDINATE SYSTEM MGA 94			
HEIGHT DATUM A.H.D.			
SSM-27775	281129.905	6132761.466	47.18
SSM-103837	281113.781	6132952.428	46.16



DATE	01/07/2019	AMENDMENTS	SURVEY FILE
SURVEYOR	LC		DWG FILE
DRAWN	DM		
CHECKED	MS		

Appendix K – Complaints Register

AEMR - 2018 - 2019 (Nil complaints recieved)



Appendix M – Plans

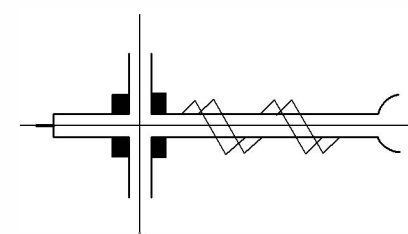
SCCCR Rehab Plan - Mining Activities Plan

Monitoring Locations Plan

VENM emplacement Plan

Flat Rock Yalwal AEMR updated plan

MOP Staging Plan



SCCCR Rehabilitation Plan

July 2018 - June 2019



VOLUME OF MATERIAL EXTRACTED 138,158 m³
JUNE 18 - JULY 19

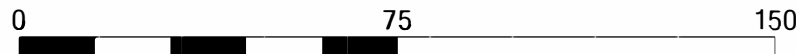
STOCKPILES

- 1 90 m³
- 2 1289 m³
- 3 2133 m³
- 4 131 m³
- 5 1437 m³
- 6 175 m³
- 7 4314 m³
- 8 603 m³
- 9 18862 m³
- 10 1309 m³
- 11 327 m³
- 12 89 m³
- 13 85 m³
- 14 159 m³
- 15 112 m³
- 16 4057 m³
- 17 2249 m³
- 18 2517 m³
- 19 388 m³
- 20 128 m³
- 21 701 m³
- 22 532 m³
- 23 461 m³
- 24 531 m³
- 25 4643 m³
- 26 1426 m³
- 27 1410 m³
- 28 663 m³
- 29 92 m³
- 30 2055 m³
- 31 1856 m³
- 32 623 m³
- 33 520 m³
- 34 77 m³
- 35 1947 m³
- 36 380 m³
- 37 12155 m³
- 38 7906 m³
- 39 299 m³
- 40 857 m³
- 41 1402 m³
- 42 341 m³
- 43 4314 m³

LEGEND

- Active Mining Area
- Infrastructure
- Shaped Waste Emplacement
- Tailings Emplacement
- E2 - Native Forest
- E4 - Other (Water Storage Dam)

CONTROL	EASTING	NORTHING	RL.
COORDINATE SYSTEM MGA 94			
HEIGHT DATUM A.H.D.			
SSM-27775	281129.905	6132761.466	47.18
SSM-103837	281113.781	6132952.428	46.16



DATE	01/07/2019	AMENDMENTS	SURVEY FILE
SURVEYOR	LC		DWG FILE
DRAWN	DM		
CHECKED	MS		

2018 - 2019 AEMR - Monitoring Locations

Quarry Boundary

DDG

TsP and Pm10

Ground Water

Surface Water

Blasting



North of Brickworks ♦

TSP and Pm10 North

C2

P5

DDG1

Correctional Facility

S5

DDG2

Commercial Properties

DDG3

P2

P1

DDG4

P7

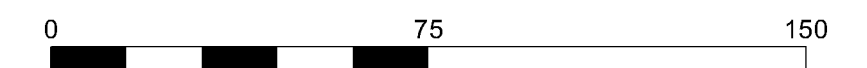
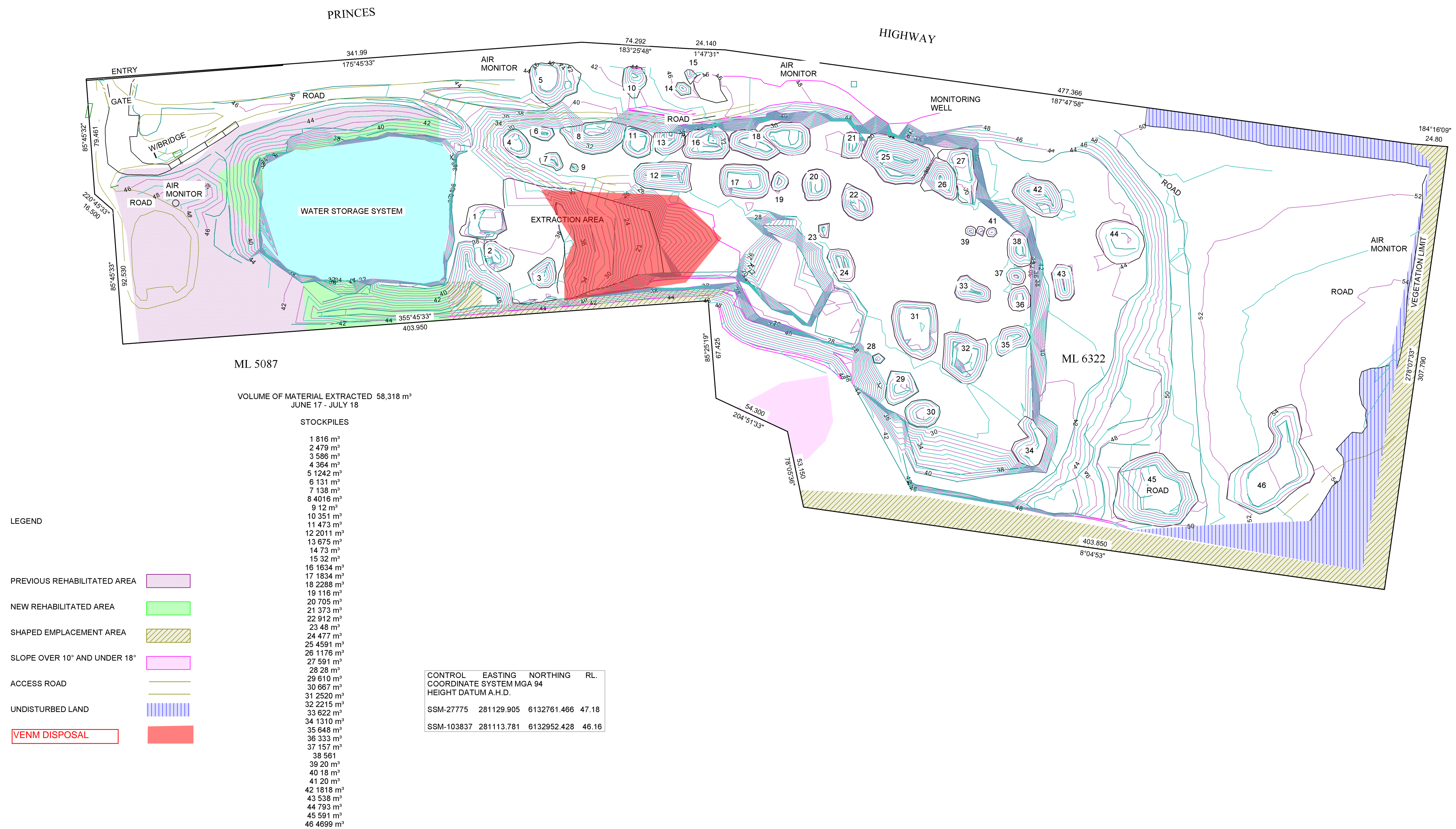
TsP and Pm10 South

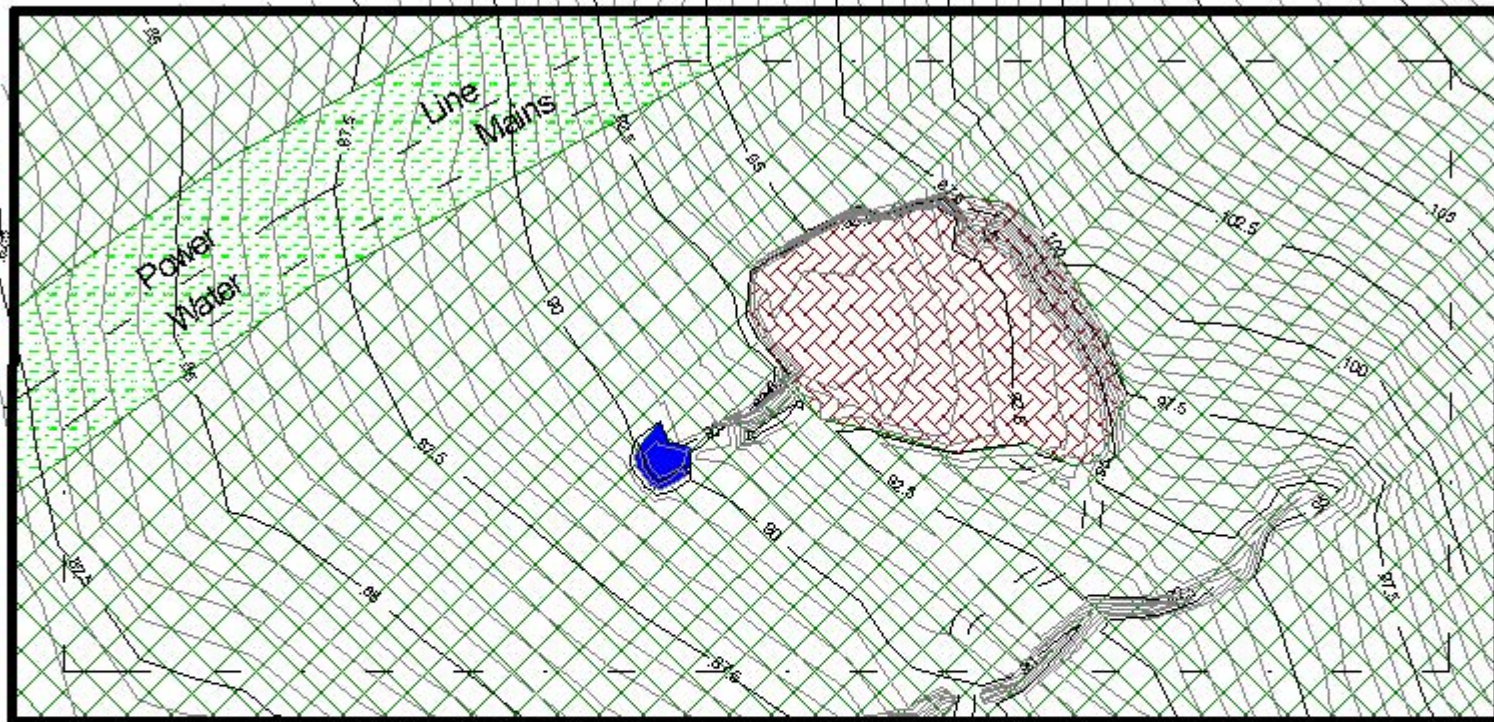
Goodsell Residence

1:9,028

0 100 200m

VENM DISPOSAL AEMR July 2018 - June 2019





— Lease Boundary
 - - - Limit Of Mining

 Native Grasses
 Native Endemic Forest
 Sedimentation Pond
 Disturbed Area

Scale 1:2500
 Datum Assumed
 Contour Interval 0.5m

AEMR Plan
 July 2018 - June 2019
 Mining Lease 531
 Flatrock Quarry
 Yalwal Rd

No Mining Activity Was Carried Out During The



Figure 3 Project Development Sequence