HUNTER VALLEY
OPERATIONS

BLAST MANAGEMENT PLAN

DOCUMENT NUMBER
HVOOC-1797567310-408

STATUS
Approved

VERSION
4.0

EFFECTIVE
18/08/2025

REVIEW
18/08/2028

OWNER
Superintendent – Environment and Community

TABLE OF CONTENTS

1 | PURPOSE

The purpose of this Hunter Valley Operations (HVO) Blast Management Plan (BMP) is to:

- Provide reasonable and feasible measures to address potential blasting impacts at HVO, as identified in the HVO North and HVO South Approvals (collectively known as the 'Approvals'); and
- Satisfy the relevant conditions of these Approvals.

This BMP describes procedures required to help achieve compliance with the Approval conditions relating to blasting impacts. It also provides a mechanism for assessing blast monitoring results against the relevant blast impact assessment criteria.

This BMP was prepared by a suitably qualified and experienced person on behalf of HVO in accordance with Schedule 3, Condition 19 of the HVO North Approval, and Schedule 3, Condition 18 of the HVO South Approval.

2 | SCOPE

This BMP applies to the area within HVO North and HVO South boundaries, including:

- Operating Pits;
- Coal Preparation Plants (CPPs); and
- Loading Points.

This BMP is to be applied from the time of approval of this plan, during construction and operation activities at HVO to comply with the relevant blasting conditions of the Approvals and Environment Protection Licence (EPL 640).

3 | OBJECTIVES

The objectives of this BMP are to:

- meet the requirements of the Approvals and EPL;
- set out the notification procedure;
- describe the process for assessing real-time weather conditions prior to blasting;
- set out the hours of blasting;
- outline what blast design and evacuation procedures are in place to allow for safety from fly rock;
- set out a Road Closure Management Plan (see Appendix C);
- describe the monitoring program and how it will be implemented and maintained;
- detail the controls to be implemented to minimise blasting impacts off site;
- manage community complaints in a timely and effective manner; and
- detail the procedure for reporting blast criteria exceedances to relevant stakeholders.

The key elements of the mitigation strategies will be;

- To utilise blast design which incorporates controls so that blasting-induced vibration is within acceptable limits (this will also be addressed through monitoring); and

- Managing key environmental issues associated with air blast overpressure and vibration impacts as a result of operational activities that may affect:
    - Communities (Warkworth, Maison Dieu, Jerrys Plains, Knodlers Lane);
    - Residences within zone of affectation;
    - Residences beyond zone of affectation;
    - Neighbouring mines; and
    - Sensitive infrastructure.

4 | BACKGROUND

Hunter Valley Operations (HVO) is an open cut mining complex located approximately 24 kilometres north-west of Singleton, New South Wales (NSW). HVO is geographically divided by the Hunter River into HVO North and HVO South. While HVO is managed as one operation, HVO North and HVO South each have separate planning approvals.

HVO is generally bounded by Lemington Road and Jerrys Plains Road alongside its western boundary. The New England Highway is located to the north and east, with the Golden Highway and Wallaby Scrub Road to the south.

HVO is described in detail in environmental assessment documents outlined in Section 12 | of this BMP.

HVO is located in an area where mining is already a feature of the landscape. It is located in the Hunter Valley coalfields with surrounding mines and infrastructure including Mount Thorley Warkworth (MTW), United Wambo, Wambo and Ravensworth.

A blasting study was prepared as part of the Carrington West Wing (CWW) Environmental Assessment (EA) (EMGA Mitchell McLennan dated 1 October 2010) to assess potential blasting impacts.

Similarly, a blasting assessment was undertaken as part of the HVO South Modification 5 EA (EMM February 2017).

This BMP is the primary tool that will be utilised to reduce potential blasting impacts related to the Project.

4.1 | EXISTING CHARACTER

4.1.1 | HVO NORTH

The closest privately owned residences surrounding HVO North are west and south-west, and are located within the village of Jerrys Plains and along the Golden Highway.

There are no private residences located in close proximity to proposed blasting locations at HVO North which would ordinarily require precautionary consultation and arrangements prior to any blasts.

4.1.2 | HVO SOUTH

Privately owned residences in the vicinity of HVO South are located in the rural community of Maison Dieu to the east, and further to the southeast in the communities of Warkworth and Long Point.

5 | STATUTORY REQUIREMENTS AND GUIDELINES

This BMP was prepared to satisfy the requirements of:

- Development Consent DA 450-10-2003
- Project Approval PA 06_0261 and
- Environment Protection Licence EPL 640.

5.1 | PROJECT APPROVALS

HVO North was granted approval on 12 June 2004 (DA 450-10-2003) for HVO North by the Minister for Infrastructure and Planning and the Minister for Natural Resources (the HVO North Approval). The most recent modification was approved on 24 April 2025.

HVO South operates in accordance with the Project Approval granted on 24 March 2009 (PA 06_0261) by the Minister for Planning (the HVO South Approval). The most recent modification was approved on 6 February 2023.

Table 5-1 the consent conditions required to be covered by this BMP and the sections within this document in which they are addressed.

Table 5-2 shows where items in the Statement of Commitments (SOC) related to air quality impacts are addressed in this BMP.

Table 5-1 - Consent Conditions

<table>
<tr><th>Consent Number</th><th>Condition</th><th>Section within BMP which addresses this requirement</th></tr>
<tr><td colspan="3">HVO North Consent (DA 450-10-2003)</td></tr>
<tr><td>Sch 3,
Cond 12</td><td>Airblast Overpressure Limits
The Applicant must ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 14 [sic] at any residence on privately-owned land.
Table 12: Airblast overpressure impact assessment criteria
<table><tr><th>Airblast overpressure level (dB(Lin Peak))</th><th>Allowable exceedance</th></tr><tr><td>115</td><td>5% of the total number of blasts in a 12 month period</td></tr><tr><td>120</td><td>0%</td></tr></table></td><td>7.1, 8</td></tr>
<tr><td>Sch 3,
Cond 13</td><td>Ground Vibration Impact Assessment Criteria
The Applicant must ensure that the ground vibration level from blasting at the development does not exceed the criteria in Table 15 [sic] at any residence on privately-owned land.
Table 13: Ground vibration impact assessment criteria
<table><tr><th>Peak particle velocity (mm/s)</th><th>Allowable exceedance</th></tr><tr><td>5</td><td>5% of the total number of blasts in a 12 month period</td></tr><tr><td>10</td><td>0%</td></tr></table></td><td>7.1, 8</td></tr>
<tr><td>Sch. 3,</td><td>Blasting Hours</td><td>7.1</td></tr>
</table>

Consent Number	Condition	Section within BMP which addresses this requirement
Cond. 14	The Applicant must only carry out blasting at the development between 7 am and 6 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, Public Holidays or any other time without the written approval of the EPA.	
Sch. 3, Cond. 14A	**Blasting Frequency** The Applicant may carry out a maximum of: (a) 3 blasts a day, unless an additional blast is required following a blast misfire; and (b) 12 blasts a week, for all open cut mining operations at the HVO North mine. This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blasts required to ensure the safety of the mine or its workers. *Note: For the purposes of this condition, a blast refers to single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.*	7.1
Sch. 3, Cond. 15	**Interactions With Adjoining Mines** Prior to carrying out any mining or associated development within 500 metres of active mining areas at Ravensworth Operations, the Applicant must enter into an agreement with Ravensworth Operations Pty Ltd (or its assigns or successors in title) to address the potential interactions between the two mines. If during the course of entering into this agreement, or subsequently implementing this agreement, there is a dispute between the parties about any aspect of the agreement, then either party may refer the matter to the Secretary for resolution.	6.2 7.1
Sch. 3, Cond. 16	Prior to carrying out any mining or associated development within 500 metres of active mining areas at Cumnock No. 1 Colliery, the Applicant must enter into an agreement with Cumnock No. 1 Colliery Pty Ltd (or its assigns or successors in title) to address the potential interactions between the two mines. If during the course of entering into this agreement, or subsequently implementing this agreement, there is a dispute between the parties about any aspect of the agreement, then either party may refer the matter to the Secretary for resolution.	6.2 7.1
Sch. 3, Cond. 16A	**Property Inspections** If the Applicant receives a written request from the owner of any privately-owned land within 2 kilometres of the approved open cut mining pit/s on site for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection updated, then within 2 months of receiving this request the Applicant must: (a) provide the Secretary with a report that: • establishes the baseline condition of any buildings and other structures on the land, or updates the previous property inspection report; and • identifies measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and/or structures; and (b) provide the landowner a copy of the new or updated property inspection report. The report is to be prepared by a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Secretary for resolution.	8.3

Consent Number	Condition	Section within BMP which addresses this requirement
	If the Applicant considers that an extension of time is required to complete the report, the Applicant may apply in writing to the Secretary for an extension. The Applicant must provide a copy of the request and of the Secretary's decisions to the landowner.	
Sch. 3, Cond. 16B	If the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site or any other privately owned land where the Secretary is satisfied that an investigation is warranted, claims that buildings and/or structures on his/her land have been damaged as a result of blasting on the site, then within 2 months of receiving this claim the Applicant must: (a) provide the Secretary with a report that: • investigates the claim; and • identifies measures or works that should be implemented to rectify any blasting impacts of the development on these buildings and/or structures; and (b) provide the landowner a copy of the claim inspection report and recommendations. If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant must repair the damage to the satisfaction of the Secretary. The report must be prepared by a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the claim inspection report, either party may refer the matter to the Secretary for resolution. If the Applicant considers that an extension of time is required to complete the report, the Applicant may apply in writing to the Secretary for an extension. The Applicant must provide a copy of the request and of the Secretary's decision to the landowner.	8.4
Sch. 3, Cond. 17	**Blasting Operating Conditions** During mining operations on site, the Applicant must: (a) implement best management practice to: • protect the safety of people and livestock in the surrounding area; • protect public or private infrastructure/property in the surrounding area from any damage; and • minimise the dust and fume emissions of any blasting; (b) minimise the frequency and duration of any road closures, and avoid road closures during peak traffic periods; (c) co-ordinate the timing of blasting on site with the timing of blasting at nearby mines (including the Mt Thorley Warkworth, Wambo, Ravensworth and HVO South mines) to minimise the cumulative blasting impacts of these mines and HVO North mine; and (d) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Secretary.	7.1, 7.2, 5.5.2, 7.6, 6.2, 9.1.2
Sch. 3, Cond. 18	The Applicant must not undertake blasting on site within 500 metres of:	7.1, 7.6

Consent Number	Condition	Section within BMP which addresses this requirement
	(a) any public road without the approval of the appropriate road authority; or (b) any land outside the site that is not owned by the Applicant; unless • the Applicant has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Applicant has advised the Department in writing of the terms of this agreement, or • the Applicant has: • demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land.	
Sch. 3, Cond. 19(a)	**Blast Management Plan** The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Secretary. The plan must: be submitted to the Secretary for approval by the end of September 2013 unless otherwise agreed;	1, 7.1
Sch. 3, Cond. 19(b)	propose and justify any alternative ground vibration limits for any public infrastructure in the vicinity of the site;	5.6.2
Sch. 3, Cond. 19(c)	describe the measures that would be implemented to ensure: • best management practice is being employed; • compliance with the relevant conditions of this consent; • that blasting will not cause damage to the Carrington West Wing Groundwater Barrier (LPB) as described in Condition 23 of Schedule 4; and • that blasting in the Carrington West Wing does not cause damage or instability to the Carrington In Pit Fine Reject Emplacement embankment;	5.4, 7.5, 7.6
Sch. 3, Cond. 19(d)	include a road closure management plan for blasting within 500 metres of a public road, that has been prepared in consultation with the TfNSW and Council	7.6, 8, Appendix C
Sch. 3, Cond. 19(e)	include a specific blast fume management protocol to demonstrate how emissions will be minimised including risk management strategies if blast fumes are generated	7.1, Appendix B
Sch. 3, Cond. 19(f)	include a monitoring program for evaluating the performance of the development, including: • compliance with the applicable criteria; minimising the fume emissions from the site	8
Sch. 3, Cond. 19(g)	include a protocol that has been prepared in consultation with the owners of nearby mines (including the Mt Thorley Warkworth, Wambo, Ravensworth and HVO South mines) to minimise the cumulative blasting impacts of these mines and the HVO North mine The Applicant must implement the approved management plan as approved from time to time by the Secretary.	6.2
Sch. 3, Cond. 40A	**Aboriginal Heritage Site 37-2-1877 (CM-CD1)**	5.6, 7.1, 7.3

Consent Number	Condition	Section within BMP which addresses this requirement
	The Applicant must ensure that mining operations (including blasting) and associated activities do not cause any impact to Aboriginal heritage site 37-2-1877 (CM-CD1) and the Older Stratum.	
Sch. 5, Cond. 2(a)	**Management Plan Requirements** The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: detailed baseline data	5.5
Sch. 5, Cond. 2(b)	a description of: • the relevant statutory requirements (including any relevant consent, licence or lease conditions); • any relevant limits or performance measures/criteria; 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	5
Sch. 5, Cond. 2(c)	a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	7.1, 8
Sch. 5, Cond. 42(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)	8, 9
Sch. 5, Cond. 2(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;	7.7
Sch. 5, Cond. 2(f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	7.8
Sch. 5, Cond. 2(g)	a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and exceedances of the impact assessment criteria and/or performance criteria	9
Sch. 5, Cond. 2(h)	include a protocol for periodic review of the plan;	9
Sch. 5, Cond 2(i)	A document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the people who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.	12.3
Sch. 5, Cond. 4	**Revision of Strategies, Plans and Programs** Within 3 months of: (a) the submission of an incident report under Condition 7 below; (b) the submission of an annual review under Condition 9 below;	9.3

Consent Number	Condition	Section within BMP which addresses this requirement
	(c) the submission of an audit report under Condition 10 below; and (d) approval of a modification to this consent, the Applicant must review, and if necessary, revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary. Within 6 weeks of conducting any such review, the Applicant must advise the Secretary of the outcomes of the review and provide any documents that have been revised to the Secretary for review and approval. *Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.*	
Sch. 5, Cond. 7	**Incident Reporting** The Applicant must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	9.1.2
Sch. 5, Cond. 8	**Regular Reporting** The applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	9.1.2
Sch. 5, Cond. 9	**Annual Review** By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant must submit a report to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development 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 development over the previous calendar year, which includes a comparison of these results against the: • the relevant statutory requirements, limits or performance measures/criteria; • requirements of any plan or program required under this consent; • the monitoring results of previous years; and • the relevant predictions in the documents listed in condition 2 of Schedule 3; (c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development.	9.1.2

<table>
<tr><th>Consent Number</th><th>Condition</th><th>Section within BMP which addresses this requirement</th></tr>
<tr><td></td><td>The applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 6 of Schedule 6) and any intended person upon request.</td><td></td></tr>
<tr><td colspan="3">HVO South Consent (PA 06_0261)</td></tr>
<tr><td>Sch. 2
Cond. 15</td><td>Evidence of Consultation
Where conditions of this consent require a document to be prepared in consultation with an identified party, the Applicant must;
a) consult with the relevant party prior to submitting the subject document to the Planning Secretary for approval; and
b) provide details of the consultation undertaken including:
• a description of how matters raised by those consulted have been resolved to the satisfaction of both the Applicant and the party consulted; and
• details of any disagreement remaining between the party consulted and the Applicant, and how the Applicant has addressed the matters not resolved.</td><td>6.1, Appendix E</td></tr>
<tr><td>Sch. 3,
Cond. 7</td><td>Airblast Overpressure Impact Assessment Criteria
The Applicant must ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 6 at any residence on privately-owned land.
Table 6: Airblast overpressure impact assessment criteria
<table><tr><th>Airblast overpressure level (dB(Lin Peak))</th><th>Allowable exceedance</th></tr><tr><td>115</td><td>5% of the total number of blasts over a period of 12 months</td></tr><tr><td>120</td><td>0%</td></tr></table>
However, if the Applicant has a written negotiated blast agreement with the owner of the relevant residence on privately-owned land, and a copy of this agreement has been forwarded to the Department and EPA, then the Applicant may exceed the airblast overpressure level in Table 6 in accordance with the negotiated agreement.</td><td>7.1, 8</td></tr>
<tr><td>Sch. 3,
Cond. 8</td><td>Ground Vibration Impact Assessment Criteria
The Applicant must ensure that the ground vibration level from blasting at the development does not exceed the criteria in Table 7, at any residence on privately-owned land.
Table 7: Ground vibration impact assessment criteria
<table><tr><th>Peak particle velocity (mm/s)</th><th>Allowable exceedance</th></tr><tr><td>5</td><td>5% of the total number of blasts over a period of 12 months</td></tr><tr><td>10</td><td>0%</td></tr></table>Note: Vibration must be measured in accordance with applicable guidelines, including EPA's Assessing Vibration: A Technical Guideline (2006).
However, if the Applicant has a written negotiated blast agreement with the owner of the relevant residence on privately-owned land, and a copy of this agreement has been forwarded to the</td><td>7.1, 8</td></tr>
</table>

Consent Number	Condition	Section within BMP which addresses this requirement
	Department and EPA, then the Applicant may exceed the airblast overpressure level in Table 7 in accordance with the negotiated agreement.	
Sch. 3, Cond. 9	For St Philip's Church and the outbuildings at Archerfield, the Applicant must ensure that ground vibration peak particle velocity generated by the development does not exceed 5 mm/s, or as otherwise approved by the Planning Secretary.	5.6.2, 8.1
Sch. 3, Cond. 10	**Blasting Hours** The Applicant must only carry out blasting on site between 7 am and 6 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Planning Secretary.	7.1
Sch. 3, Cond. 11	**Operating Conditions** During mining operations on site, the Applicant must implement best blasting practice to: (a) protect the safety of people, property, public infrastructure, and livestock; (b) minimise the dust and fume emissions from blasting at the development; (c) minimise the frequency and duration of any road closures for blasting, and use all reasonable efforts to avoid closures during peak traffic periods; (d) use all reasonable efforts to co-ordinate the timing of blasting at the site with any nearby mines to minimise cumulative blasting impacts; and (e) carry out regular blast monitoring to determine whether the development is complying with the relevant conditions of this consent, to the satisfaction of the Planning Secretary.	7.1, 7.2, 8.1 Appendix C
Sch. 3, Cond. 12	The Applicant may carry out a maximum of: (a) 3 blasts a day; and (b) 15 blasts a week, on the site. This condition does not apply to blasts that generate ground vibration of 0.5mm/s or less at any residence on privately-owned land, or to blast misfires or blasts required to ensure the safety of the mine, its workers or the general public. Notes: • For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine • For the avoidance of doubt, should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast.	7.1
Sch. 3, Cond. 13	The Applicant must not undertake blasting within 500 metres of any public road or any land outside the site not owned by the Applicant, unless the Applicant has: (a) a written agreement with the owner/s of the relevant public road or land to allow blasting to be carried out closer to the public road or land, and the Applicant has advised the Department in writing of the terms of this agreement; or	7.1, 7.6

Consent Number	Condition	Section within BMP which addresses this requirement
	(b) demonstrated, to the satisfaction of the Planning Secretary, that the blasting can be carried out closer to the public road or land without compromising the safety of people or livestock or damaging the road or other buildings and structures, and updated the Blast Management Plan to include specific mitigation measures to be implemented while blasting is being carried out within 500 metres of the road or land.	
Sch. 3, Cond. 15	**Public Notice** During mining operations on site, the Applicant must: (a) notify the landowner/occupier of any residence within 2 kilometres of the mining area who registers an interest in being notified about the blasting schedule at the mine, or any other landowner nominated by the Planning Secretary; (b) operate a blasting hotline, or alternate system agreed to by the Planning Secretary, to enable the public to get up-to-date information on the blasting schedule at the development; (c) advertise the blasting hotline number in a local newspaper at least 4 times each year; and (d) publish an up-to-date blasting schedule on its website to the satisfaction of the Planning Secretary.	7.1, 9.1
Sch. 3, Cond. 16	**Property Inspections** At least 3 months prior to blasting within 2 kilometres of any privately-owned land, or any other landowner nominated by the Planning Secretary, the Applicant must advise applicable landowners that they are entitled to a structural property inspection. If the Applicant receives a written request for a structural property inspection from the landowner, the Applicant must within 2 months of receiving this request and prior to blasting within 2 kilometres of the property: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to inspect 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 the property inspection report. *Note: This condition does not operate so as to prevent blasting within the first 3 months of this consent as consents applying to the site contain similar provisions for the inspection or residences potentially affected by blasting operations.*	8.3
Sch. 3, Cond. 17	**Property Investigations** If any landowner of privately-owned land within 2 kilometres of blasting operations, or any other landowner nominated by the Planning Secretary, claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the development, the Applicant must within 3 months of receiving this claim: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to investigate the claim; and (b) give the landowner a copy of the property investigation report.	8.4

Consent Number	Condition	Section within BMP which addresses this requirement
	If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant must repair the damages to the satisfaction of the Planning Secretary. If the Applicant or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Planning Secretary for resolution. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Planning Secretary for resolution.	
Sch. 3, Cond. 18	**Blast Management Plan** The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) Be submitted to the Planning Secretary for approval within 3 months of the determination of Modification 5, unless otherwise agreed by the Planning Secretary; (b) be prepared in consultation with the EPA by a suitably qualified and experienced person/s; (c) describe the measures to be implemented to ensure compliance with the blasting criteria and conditions of this consent; (d) include a Road Closure Management Plan for any blasting within 500 metres of a public road, that has been prepared in consultation with relevant road authorities and includes provisions for: • minimising the duration of closures, both on a per event basis and a weekly basis; • avoiding peak traffic periods as far as reasonable; and • co-ordinating with nearby mines to minimise the cumulative of road closures; (e) propose and justify any agreed alternative ground vibration limits for public or private infrastructure in the vicinity of the site (if relevant); and (f) include a monitoring program for evaluating and reporting on compliance with the relevant conditions of this consent. The Applicant must implement the Blast Management Plan as approved by the Planning Secretary.	5.6.1 |, 5.6.2 | 6.1 |, 8 |, 8.1 | 9.1 | Appendix C Appendix F
Sch.4 Cond. 4	**Independent Review** If a landowner considers the development to be exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Planning Secretary in writing for an independent review of impacts of the development on his/her land. If the Planning Secretary is satisfied that an independent review is warranted, the Applicant must within 3 months of the Planning Secretary's decision: a) consult with the landowner to determine his/her concerns;	8.5

Consent Number	Condition	Section within BMP which addresses this requirement
	b) commission a suitably qualified, experience and independent person, whose appointment has been approved by the Planning Secretary, to conduct monitoring on the land, to: • determine whether the development is complying with the relevant impact assessment criteria in Schedule 3; and • identify the source(s) and scale of any impact on the land, and the development's contribution to this impact; and give the Planning Secretary and landowner a copy of the independent review.	
Sch.5 Cond. 1A (a)	**Management Plan Requirements** The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: a summary of relevant background or baseline data;	5.5
Sch.5 Cond. 1A (b)	a) 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;	Table 5-1, 8
Sch.5 Cond. 1A (c)	a description of the measures that would be implemented to comply with the relevant statutory requirement, limits, or performance measures/criteria;	7
Sch.5 Cond. 1A (d)	b) a program to monitor and report on the: • impacts and environmental performance of the development; and • effectiveness of any management measures (see paragraph (c) above);	8, 9
Sch.5 Cond. 1A (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;	7.7
Sch.5 Cond. 1A (f)	a program to investigate and implement ways to improve the environmental performance of the development over time	7.8
Sch.5 Cond. 1A (g)	g) a protocol for managing and reporting any: • Incidents; • Complaints; • Non-compliances with statutory requirements; and • Exceedances of the impact assessment criteria and/or performance criteria;	9
Sch.5 Cond. 1A (h)	a protocol for periodic review of the plan; and	9.3
Sch.5 Cond. 1A (i)	a document control table that includes version number, 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 Planning Secretary's approval.	12.3

Consent Number	Condition	Section within BMP which addresses this requirement
	Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	
Sch. 5, Cond 2	**Incident Notification** The Applicant must immediately notify the Department and any other relevant agencies after it becomes aware of an incident. The notification must be in writing via the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.	9.1.2
Sch. 5, Cond 3	**Non-Compliance Notification** Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing via the Department's Major Projects Website and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. *Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.*	9.1.2
Sch. 5, Cond 4	**Annual Review** By the end of March each year, the Applicant must review the environmental performance of the development to the satisfaction of the Planning Secretary. This review must: (a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year; (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against: • the relevant statutory requirements, limits or performance measures/criteria; • the requirements of any plan or program required under this consent; • the monitoring results of previous years; and • the relevant predictions in the documents listed in condition 2 of Schedule 2; (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; (f) describe what measures will be implemented over the next year to improve the environmental performance of the development; and g) evaluate and report on the effectiveness of environmental management of the development.	9.1.2
Sch. 5, Cond 9	**Access to Information** The Applicant must, for the life of the development: (a) make the following information publicly available on its website: • the documents listed in condition 2 of Schedule 2; • current statutory approvals for the development; • approved strategies, plans or programs required under the conditions of this consent;	9.1.2

Consent Number	Condition	Section within BMP which addresses this requirement
	• a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; • a summary of the current stage and progress of the development; • contact details to enquire about the development or to make a complaint; • a complaints register, which is to be updated on a monthly basis; • minutes of CCC meetings; • the last five annual reviews; • any independent environmental audit, and the Applicant's response to the recommendations in any audit; • any other matter required by the Planning Secretary; and (b) keep this information up to date, to the satisfaction of the Planning Secretary.	

Table 5-2 - Statement of Commitments

Consent Number	Condition	Section within BMP which addresses this requirement
HVO North Carrington West Wing Statement of Commitments, 04 March 2013		
Air quality	Blasting will be restricted during unfavourable weather conditions, where practicable	7.1
Traffic & transport	Blasting-related road closures will be managed in accordance with the relevant Coal & Allied procedures and a Road Closure Management Plan and Traffic Control Plan to be developed for Lemington Road	7.3, Appendices A, C and D.
Noise and vibration	Consultation and arrangements will be made with Receptor No. 10 in advance of any blasts within 900m of the residence.	NA – property now owned by HVO.
Noise and vibration	To achieve 10mm/s peak particle velocity at the Lemington road bridge (due to blasting), the charge mass must be approximately 5,400kg MIC or less, given a minimum separation distance of approximately 2,500m for the closest mining area in Year 1 of the proposal.	5.6.2

5.2 | ENVIRONMENT PROTECTION LICENCE (EPL) 640

The Protection of the Environment Operations Act 1997 (NSW) (PoEO Act) is the principal piece of legislation regulating pollution emissions in NSW. EPL 640 for HVO was issued on 29 September 2000 by the Environmental Protection Authority (EPA), under the PoEO Act.

Table 5-3 highlights the EPL conditions required to be covered by this BMP and the sections within this document in which they are addressed.

Table 5-3 - EPL640 Commitments

<table>
<tr><th>Consent Number</th><th>Condition</th><th>Section within BMP which addresses this requirement</th></tr>
<tr><td colspan="3">EPL640</td></tr>
<tr><td>P1.4</td><td>The following points referred to in the table below are identified in the licence for the purposes of weather and/or noise monitoring and/or setting limits for the emissions of noise from the premises.
<table>
<tr><th>EPA identification no.</th><th>Type of monitoring point</th><th>Location description</th></tr>
<tr><td>9</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor at Jerrys Plains, marked and shown as "9" on Figure 1.</td></tr>
<tr><td>11</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor at Warkworth, marked and shown as "11" on Figure 1.</td></tr>
<tr><td>18</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor at Moses Crossing, marked and shown as "18" on Figure 1.</td></tr>
<tr><td>21</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor at Maison Dieu, marked and shown as "21" on Figure 1.</td></tr>
</table></td><td>8</td></tr>
<tr><td>L6.1</td><td>Blasting in or on the premises must only be carried out between 07:00 hours and 18:00 hours, Monday to Saturday. Blasting in or on the premises must not take place on Sundays or Public Holidays without lawful approval.</td><td>7.1</td></tr>
<tr><td>L6.2</td><td>The airblast overpressure level from blasting operations in or on the premises must not exceed: 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 9,11,18 or 21.</td><td>5.6.1, 7.1, 8</td></tr>
<tr><td>L6.3</td><td>The airblast overpressure level from blasting operations in or on the premises must not exceed; 120 dB (Lin Peak) at any time; at either monitoring point 9,11,18 or 21.</td><td>5.6.1, 7.1, 8</td></tr>
<tr><td>L6.4</td><td>The ground vibration peak particle velocity from the blasting operations carried out in or on the premises must not exceed: 5mm/sec for more than 5% of the total number of blasts during each reporting period; at either monitoring point 9,11,18 or 21.</td><td>5.6.1, 7.1, 8</td></tr>
<tr><td>L6.5</td><td>The ground vibration peak particle velocity from the blasting operations carried out in or on the premises must not exceed: 10mm/sec at any time; at either monitoring point 9,11,18 or 21.</td><td>5.6.1, 7.1, 8</td></tr>
<tr><td>L6.6</td><td>Offensive blast fume must not be emitted from the premises.
Definition:
Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:
1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or
2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.</td><td>Appendix B</td></tr>
<tr><td>M1.2</td><td>All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.</td><td>8.6 |</td></tr>
<tr><td>M1.3</td><td>The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and</td><td>8.6 |</td></tr>
</table>

<table>
<tr><th>Consent Number</th><th>Condition</th><th>Section within BMP which addresses this requirement</th></tr>
<tr><td></td><td>d) the name of the person who collected the sample.</td><td></td></tr>
<tr><td>M8.1</td><td>To determine compliance with condition(s) L6.2, L6.3, L6.4 and L6.5:

(a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points 9,11,18 and 21 for the parameters specified in Column 1 of the table below; and

(b) The Licensee must use the units of measure, sampling method and sample at the frequency specified opposite in the other columns.

<table>
<tr><th>Parameter</th><th>Units of Measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Airblast Overpressure</td><td>Decibels (Linear Peak)</td><td>All blasts</td><td>Australian Standard AS 2187.2-2006</td></tr>
<tr><td>Ground Vibration Peak Particle Velocity</td><td>millimetres/second</td><td>All blasts</td><td>Australian Standard AS 2187.2-2006</td></tr>
</table>
</td><td>8</td></tr>
</table>

5.3 | DANGEROUS GOODS

Dangerous goods are regulated under the Work Health and Safety Act 2011 (NSW) and Explosives Act 2003 (NSW). HVO will endeavour to meet all regulatory requirements in relation to dangerous goods management. The storage of explosives or explosive precursors are to be managed in accordance with HVO's work instructions and site procedures such as *Shotfiring & Explosives Handling Hazard Management Plan*.

5.4 | GUIDELINES AND BEST MANAGEMENT PRACTICE

The Australian and New Zealand Environment and Conservation Council ANZECC 1990 *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* is followed as a guide to blasting practices at HVO.

Best management practice in this BMP is defined as practices used to manage blasting impacts that are consistent with the following:

- The measure should firstly aim to prevent blast and vibration impacts, and where that is not practicable, to generally reduce impacts to the environment as a whole;
- The measure is reasonably accessible and is developed on a scale which allows implementation in the Project, under economically and technically viable conditions, taking into consideration the costs and advantages; and
- deemed most effective of the options available in achieving a generally high level of protection of the environment as a whole.

HVO aims to meet best management practice by implementing the control measures described in Section 7 | of this BMP.

5.5 | BASELINE DATA

As detailed in the Hunter Valley Operations South Coal Project Environmental Assessment (EA) 2003 and Carrington West Wing Environmental Assessment (2010), blast design is actively managed by HVO, and hence corresponding air blast overpressure and ground vibration is minimised. HVO's existing blast management procedures ensure appropriate charge masses are used for blasting. Such MIC masses are presented in Table 5-4 (a and b). These were derived from 95% formulae in Blastronics Pty Limited publication 1994 for monitoring data collected at similar mines in the area.

Table 5-4 (a): Recommended Blast Charge Mass (HVO South)

Blast to Location Distance, m	MIC_{8ms} to Satisfy ANZECC 95% Overpressure Limit of 115 dB(Lin), kg	MIC_{8ms} to Satisfy ANZECC 95% Ground Vibration Limit of 5 mm/s (ppv), kg
1,500	163	745
2,000	386	1,324
2,500	753	2,069
3,000	1,302	2,980
4,000	3,088	5,299
5,000	6,031	8,279
6,000	10,422	11,922

1. These results are derived from equations contained in the Drill and Blast Study, Mount Pleasant prepared by Blastronics Pty Limited for CNA in September 1994.
2. In general, blast overpressure considerations limit MIC.

Table 5-5 (b): Recommended Blast Charge Mass (HVO South)

Receptor No.	Closest blast distance to proposed extension area, m	MIC to achieve limit, kg	Blastronics 95% noise overpressure, dBL	Blastronics 95% ground vibration, PPV, mm/s
1	3300	1734	**115.0**	2.9
2	2900	1177	**115.0**	2.7
3	2800	1059	**115.0**	2.6
4	3200	1581	**115.0**	2.9
5	9700	31160	113.8	**5.0**
6	9500	29888	113.9	**5.0**
7[1]	6800	15176	**115.0**	**5.0**
8[3]	4600	4697	**115.0**	3.7
10[2]	900	35	**115.0**	1.1
11[3]	3600	2251	**115.0**	3.1
13[4]	4200	3575	**115.0**	3.5
14[4]	5000	6030	**115.0**	4.0
39	9700	31160	113.8	**5.0**

1. *These private residences are currently inside a zone of affectation or subject to a private land holders agreement with mines other than HVO.*
2. *These private residences are currently inside a HVO zone of affectation or subject to a private land holders agreement.*
3. *Mine owned.*
4. *Additional Jerrys Plains locations were added to provide a better representation of the area.*

5.6 | IMPACT ASSESSMENT CRITERIA

5.6.1 | RESIDENCE ON PRIVATELY OWNED LAND

The Approvals and EPL 640 specify airblast overpressure and ground vibration impact assessment criteria for residences on privately-owned land as detailed in Table 5-1 and Table 5-3.

5.6.2 | PUBLIC INFRASTRUCTURE

Lemington Road Bridge (also known as Moses Crossing) is the only public infrastructure identified under the environmental noise and vibration study, prepared by EMGA Mitchell McLennan in 2010, as having the potential to be impacted upon by blasting at HVO North.

Since the assessment carried out in 2010, the crossing has been upgraded from a timber crossing to a concrete crossing which has increased its structural integrity.

The peak particle velocity at the crossing will be lower than 10mm/s as a natural consequence of measures that will be taken to protect other existing structures which are located in closer proximity to the mining area than the bridge.

Due to the distance between current active mining/blasting zones and St Philip's Church and the outbuildings at Archerfield there is currently no foreseeable risk of blast impacts at those sites. For that reason HVO does not currently make specific blast design considerations in respect of those sites. However, if HVO recommences operations in South Lemington Pit or Glider Pit, specific design rules considerate of impacts on St Phillips Church will be implemented to see that ground vibration peak particle velocity generated by the project does not exceed 5 mm/s unless varied with approval by the Planning Secretary.

A review of HVO vibration measurements collected between July 2013 and October 2017 in the vicinity of the Archerfield Outbuildings (Maison Dieu monitoring location) demonstrates no impact to the outbuildings. A total of 1267 vibration measurements have been collected, with zero instances of ground vibration above 1.75mm/sec. Furthermore, 94.7% of measurements recorded ground vibration <0.5mm/sec (or 10% of the impact assessment criterion).

Similarly, a review of vibration measurements from the Warkworth monitoring location demonstrates no impact at St. Phillips Church. A total of 1209 measurements have been collected, with zero instances of ground vibration above 2.5mm/sec (or half the impact assessment criterion). Further – 86.2% of measurements (1043 measurements) recorded ground vibration <0.5mm/sec (or 10% of the impact assessment criterion).

5.7 | HERITAGE SITE CM-CD1

Condition 40A of Schedule 3 of the HVO North Approval requires that HVO will endeavour to undertake mining operations (including blasting) and associated activities responsibly so as to not cause any impact to Aboriginal heritage site 37-2-1877 and the Older Stratum ('CM-CD1'). The location of this site is identified in Figure 8-2.

In the event blasting occurs within 500 meters of CM-CD1 HVO will, if necessary, explore management measures to protect CM-CD1. This site will be monitored, as outlined within the HVO North Heritage Management Plan.

5.8 | REVISION OF IMPACT ASSESSMENT CRITERIA AND DAMAGE CRITERIA

Criteria as listed in Section 5 | has been developed in consideration of existing requirements of the Approval and also through the completion of research in relation to the impacts of air blast overpressure and vibration on particular structures. On that basis, HVO may (in the future) alter the air blast overpressure and vibration criteria based on results of further detailed assessments and/or through further consultation with relevant government agencies and relevant infrastructure providers, which will then be provided to NSW Department of Planning, Housing and Infrastructure (DPHI) in writing.

6 | CONSULTATION

6.1 | GOVERNMENT AGENCIES

Condition 19(d), Schedule 3, of the HVO North Approval and Condition 18(d), Schedule 3, of the HVO South Approval requires a Road Closure Management Plan (which forms part of this BMP).

The Road Closure Management Plan is required to be prepared in consultation with relevant road authorities including, Singleton Council and the NSW Roads and Maritime Services (RMS).

RMS and Council road closure approvals (where applicable) are included in The HVO Road Closure Management Plans (Appendix C).

Correspondence undertaken in relation to the revision of the Blast Management Plan is presented in Table 6-1. A copy of the most recent consultation records are shown in Appendix E:

Table 6-1: External Stakeholder Consultation

Date	Consultation Undertaken
26/03/2018	correspondence was forwarded to the EPA inviting consultation on this BMP
18/06/2018	EPA advised HVO in writing that the EPA does not require HVO to consult with it regarding the development of plans required under planning consents including this Blast Management Plan (see Appendix F).
28/03/2019	HVO submit via email V3.3 revision of Blast Management Plan for review and approval by DP&E.
03/04/2019	HVO receive written approval from DP&E approving V3.3 of Blast Management Plan
07/04/2020	Confirmation received from DP&E portal following submission of BMP V 3.5 for review and approval
02/02/2021	HVO provided DP&E via email, V3.5 of the BMP detailing a minor revision
11/03/2021	HVO received written correspondence from DP&E requesting additional information for BMP V3.5
06/07/2022	DPE requested HVO to provide additional information before accepting V3.7 BMP.

6.2 | NEARBY MINES

Liaison with United Wambo mine to discuss cooperation options has been undertaken, HVO and United Wambo mine communicate daily blasting plans where relevant.

A cooperation agreement with Ravensworth and Cumnock No. 1 mines has been prepared in conjunction with those sites (both managed by Glencore as a single complex).

A blasting deed exists between HVO and United Wambo relating to blast co-operation. During times when blasting activities are within the prescribed 'Relevant Area', United Wambo will:

- Co-ordinate its blasting activities to minimise any interference with or impact on the Mining Operations, assets or activities of HVO South;
- In accordance with best practice mining procedures, undertake all usual safety precautions and procedures to ensure that risk or danger injury to the officers, employees, agents or damage to the property of HVO South is minimised and;
- Ensure that all Blasting within the 'Relevant Area' is undertaken in accordance with the HVO UWJV Blast Coordination Procedure.
- In the event that dust or fume impacts from Blasting at United can be reasonably foreseen to impact the operations of HVO South, then the operator of United must, as soon as is reasonably practicable, notify HVO South in accordance with the HVO UWJV Blast Coordination Procedure.

Potential safety risks related to ground vibration posed to United Wambo personnel are also managed by provision of daily notifications to United Wambo personnel for all blasts occurring in the Riverview Pit. Blast fume migration risks are managed through the HVO Blasting Permissions process.

A protocol between neighbouring mining companies has also been developed where personnel from each mine meet on a regular basis to discuss noise, blasting and air quality management at each site and methods to address cumulative impacts. The protocol was developed by Mt Owen Glendell Operations (MGO), Ravensworth, Ashton, Rixs' Creek and Integra Underground. The meeting is held quarterly, with representatives from the following mines invited to each meeting:

- HVO
- Ravensworth
- Ashton
- United Wambo
- Wambo
- MGO
- Rix's' Creek
- Integra Underground.

7 | IMPLEMENTATION

In order to mitigate any potential impacts from blasting activities, a number of management controls will be implemented throughout the life of HVO operations. These controls are detailed in Section 7.1 | below.

7.1 | OPERATIONAL CONTROLS

HVO will implement the following blast management practices over the life of the project:

- Blasting at HVO will occur within the hours of 7am and 6pm, Monday to Saturday;
- If blasting is deemed necessary outside of the hours of 7am and 6pm, Monday to Saturday, due to extraordinary circumstances such as safety or unfavourable meteorological conditions, HVO will secure written approval from the EPA and DPHI, as required by the relevant consents;

- Any requests for variation to the Department must be submitted in writing via the NSW Major Projects Portal Website and identify the development (including the development application number and name), set out the condition of the consent and the reasons for the variation in blasting.
- Blasting will be undertaken at a maximum of three blasts per day (unless an additional blast is required following a blast misfire) and no more than 12 blasts per week at HVO North and 15 blasts per week at HVO South, averaged out over a calendar year.
- However, this total number of blasts does not apply to:
    - blasts that generate ground vibration of 0.5mm/s or less at any residence on privately owned land, or
    - blasts required to ensure the safety of the mine, its workers or the general public.
- Detailed design is undertaken for each blast in order to maximise the blast efficiency, minimise dust, fumes, ground vibration, airblast overpressure and the potential for flyrock and to meet compliance with site specific blasting conditions;
- Blasts will be undertaken in accordance with various work instructions on blasting, which are internal documents that are updated regularly. The assessment process for blasting includes:
    - Undertaking meteorological assessments prior to blasting to assess if weather conditions are acceptable. In the event that unfavourable meteorological conditions are observed prior to the blast, the shot-firer will liaise with the appropriate senior official to determine whether to delay or postpone the blast;
    - review of the blasting permissions page (see example of typical permission page in Appendix A) which considers time of blast, wind speed and direction;
    - daily notifications are issued to confirm the blast monitors are operating;
    - notification to neighbouring mines, where the mine falls within an exclusion zone, for example; United will be notified of blasts in Riverview Pit and of the associated Golden Hwy road closure and Ravensworth will be notified where blasts are scheduled for within 500m of its operations or Lemington Road closures; and
    - documentation of the date, location of the blast and quantity of explosive used each day.
- Detailed monitoring of blasts over the life of HVO at relevant blast sensitive locations (refer to Section 8).
- In the event blasting occurs within 500 meters of the site CM-CD1, HVO North will consider what, if any, management measures to protect CM-CD1 may be necessary (CM-CD1 is shown on Figure 8-2).
- Training will be provided to all relevant personnel on environmental obligations in relation to blasting controls.
- Periodic internal reviews of blast management procedures to evaluate performance and identify corrective action if required.
- HVO will monitor blasts as mining progresses, in accordance with the existing blast monitoring system, so that blast prediction site laws can be further refined and future blast designs can be optimised based on more detailed site information. By adopting this approach, in conjunction with the adoption of improved blasting products and methods, as they are introduced, it is anticipated that blast emissions criteria can be met without imposing any significant constraints on the blast design throughout the operation of HVO.

- Land not owned by HVO and situated within 500 meters of planned blasting areas is shown in Appendix D.
    - Lands owned by Ravensworth and Cumnock are dealt with under Section 6.2 of this BMP and is subject to a written agreement;
    - Crown owned land dedicated as a travelling stock route (TSR 52974) has a Long Term Grazing Permit (LTP) held by a private permit holder through the Local Land Services. A written agreement is in place, as such if the blast exclusion zone or blasting emissions are expected to impact the TSR then HVO will make notification to the permit holder, Crown Lands and Local Land Services in advance of blasting;
    - Crown owned land adjacent the Hunter River is subject to the establishment of blast clearance zones that encapsulate the area. The area is bound by HVO owned land of which access is restricted; and
    - Land owned by Wambo Coal (Wambo/United) is subject to the establishment of blast clearance zones and communication with the landowner in relation to blasting times and exclusion zones.
- Blast design allowing for adequate burden on all faces. Where necessary face surveying techniques may be employed to measure overburden between the blast face and blast holes to ensure sufficient burden is present to prevent blowouts and blast anomalies.
- There may be circumstances where blasts may need to be fired in less than ideal weather conditions to protect the health and safety of employees and the public. Such decisions will be elevated up the organisational hierarchy, demonstrating the seriousness of such decisions.
- Fume is managed in accordance with the HVO Post Blast Fume Generation Mitigation and Management Plan to reduce fume on site (see Appendix B:).
- Controls for blasting within 500 metres of any public road are addressed in Section 7.6 |
- Notification procedures for nearby residents involving provision of the blast schedule and hotline number to enable the public to get up-to-date information on the blasting will be made available on HVO website (https://www.hvo.com.au/).
- Landowner(s)/occupier(s) of any residence within 2 kilometres of the HVO South mining area who registers an interest in being notified about the blasting schedule at the mine will be advised individually of upcoming blasts.
- The blasting hotline number (1800 888 733) will be advertised in a local newspaper at least 4 times each year.

7.2 | MANAGEMENT OF FLYROCK

The generation of fly rock is managed by incorporating appropriate controls in blast designs.

These controls include design of stemming lengths and stemming materials to minimise the potential for generating flyrock. Adequate burden, which is the distance from a charge to a free face, is maintained to minimise the risk of generating flyrock due to face bursting. These measures are used to control the risk to property, equipment or powerlines from flyrock.

Appropriate stemming will be used to improve stemming confinement and hence reduce the chance of flyrock and elevated airblast overpressure.

An appropriate exclusion zone will be established around each blast site in accordance with relevant mine safety regulations prior to firing a blast. Generally, the blast exclusion zone will be a minimum of 300 metres for equipment and 500 metres for personnel. The exclusion zone will be established beyond the expected range of any flyrock with an additional safety margin. The establishment of this zone will minimise the risk of any injuries to people or livestock due to flyrock.

Any unusual level of flyrock generated by blasting with the potential to cause a safety risk will be noted for each blast. This information will be used to continually re-assess the adequacy of blast design controls in reducing the generation of flyrock. The information will also be used to re-assess the size of the safety exclusion zone established for people and livestock in the vicinity of a blast.

7.3 | MANAGEMENT OF ABORIGINAL FEATURES

In accordance with Schedule 3 of Condition 40 of the HVO North Approval, regular visual monitoring to confirm that impacts have not been caused by blasting vibration will be implemented for the management of the CM-CD1 in accordance with the HVO North Heritage Management Plan

Although flyrock damage is considered a low risk, if necessary, management measures to protect CM-CD1 will be explored.

7.4 | CWW GROUNDWATER LOW PERMEABILITY BARRIER (LPB)

The LPB will be designed to the satisfaction of Water Group and the Secretary. A detailed design will be prepared and submitted for approval prior to construction in accordance with Schedule 3, Condition 23. An LPB Monitoring and Management Plan will also be prepared.

When HVO begins the required design and plan preparation processes this BMP will be reviewed, and if necessary, updated to allow for appropriate measures to be put in place so that the prescribed performance objectives and performance measures are not at risk as a result of blasting activities on site.

7.5 | CWW BLASTING IMPACTS TO CARRINGTON IN PIT FINE REJECT PLACEMENT

An assessment of blasting impacts from the CWW on the Carrington In Pit Fine Rejects Emplacement embankment will be undertaken prior to HVO commencing any activity in the CWW.

7.6 | ROAD CLOSURES

Blasting within 500 metres of a public road requires road closure during the blasting event.

Approval will be sought from Singleton Council to temporarily close roads for the purpose of blasting every 12 months on Lemington Road & Comleroi Road. This will be in the form of application for ‘works within a road reserve’ under the Roads Act.

Approval from RMS to temporarily close roads for the purpose of blasting will also be sought every six months. This will be in the form of an application for a ‘Road Occupancy Licence’.

The relevant Road Closure Plan will be updated following receipt of each new approval from either Council or RMS. The BMP will also be reviewed to ensure any updated commitments from revised Road Closure Plans are included. The latest relevant road closure plan will be addended to the BMP and as these approvals are granted by Singleton Council and Transport for NSW, will not be submitted to the Department for review prior to uploading to the website.

The frequency and duration of road closures will be minimised by closing the road only when necessary, and combining blasts that require closure of the same section of road where the mine plan allows. Road closures will be avoided during peak traffic periods where possible.

7.7 | MANAGEMENT OF UNPREDICTED IMPACTS

The HVO Post Blast Fume Generation Mitigation and Management Plan sets out a protocol for the mitigation and management of post blast NOx fumes from blasting operations at HVO. This Plan is used as a contingency plan to manage any unpredicted impacts and their consequence.

In the event that a blast event registers airblast overpressure or ground vibration results greater than the allowable limits, or significantly different from the predicted results (airblast overpressure), HVO will undertake a detailed investigation into the event. Where corrective actions are identified to prevent a recurrence, these will be tracked to completion

7.8 | CONTINUOUS IMPROVEMENT

HVO will look for ways to improve blasting performance by way of:

- yearly review of the BMP and associated monitoring program;
- Annual Review; periodic internal reviews of blast management procedures (Section 7.1 |); and
- investigation results from any blasting incident with the potential to cause a safety risk (assessment of the adequacy of blast design controls) (Section 7.2 |),

These will be used as a means of investigating and implementing ways to improve the environmental performance of the Project over time.

8 | MEASUREMENT AND EVALUATION

8.1 | BLAST MONITORING PROGRAM

Blast monitoring is conducted at five locations around HVO as shown in Table 8-1 and represented in Figure 8-1. Monitoring is undertaken in accordance with Australian Standard AS 2187.2- 2006.

Real-time meteorological data will also be collected in relation to blast monitoring data. This information shall include wind speed, direction and temperature inversions (where applicable at the site).

Monitoring locations are selected to be representative of private residences surrounding the monitor, the representation of these monitors in relation to the surrounding private receptors is shown in Figure 8-2.

The monitoring locations are subject to change and will be updated periodically to align with management needs and to accommodate progression of mining.

A protocol for evaluating compliance with the blast impact assessment criteria is included in Section 8.2 |.

Table 8-1 - Blast Monitoring Program

Parameter	Frequency	Monitor Location	Limit / Guideline	Sampling Method
Airblast Overpressure dB (Lin Peak)	All blasts	Jerrys Plains (EPL Point 9) Knodlers Lane Maison Dieu (EPL Point 21) Moses Crossing (EPL Point 18) Warkworth (EPL Point 11)	>115 dB (Lin Peak) (allowable exceedance of 5% over 12 months)[1] >120 dB (Lin Peak) (no allowable exceedance at any time)	Blast monitor. AS2187.2-2006
Ground Vibration (mm/s)	All blasts	Jerrys Plains (EPL Point 9) Knodlers Lane Maison Dieu (EPL Point 21) Moses Crossing (EPL Point 18) Warkworth (EPL Point 11)	>5 mm/s (ppv) (allowable exceedance of 5% over 12 months)[1] >10 mm/s (ppv) (no allowable exceedance at any time)	Blast monitor. AS2187.2-2006

[1] The 5% allowable exceedance criteria is assessed on a "per monitoring location" basis and is calculated against the performance criteria listed in each of the Approvals (calendar year basis) and EPL 640 (year on year, commencing at the anniversary date of the licence).

An additional ground vibration impact assessment criterion applies to the HVO South Approval, "For St Phillip's Church and the outbuildings at Archerfield, the Applicant must ensure that ground vibration peak particle velocity generated by the development does not exceed 5mm/s, or as otherwise approved by the Planning Secretary".

Blasting impacts on St Phillip's Church will be assessed through routine monitoring in the Warkworth Village area (Warkworth monitoring location), while blasting impacts on the outbuildings at Archerfield will be assessed through routine monitoring in the Maison Dieu area (Maison Dieu monitoring location).

8.2 | BLAST PARAMETERS AND PROTOCOL FOR EVALUATING COMPLIANCE

Blast parameters and compliance assessment is detailed below in Section 8.2.1 | and Section 8.2.2 |.

Measures to reduce fume emissions from the site are detailed in the Post Fume Generation Mitigation and Management Plan, Appendix C:.

8.2.1 | GROUND VIBRATION

When an explosive detonates, it creates a compression wave that spherically radiates out into the rock mass. When used in a mining context, the compression wave, in conjunction with several other factors, fragments the rock mass while the high pressure gases fluidize and heave the rock mass to its final resting place ready for excavation by mining equipment.

The ground vibration resulting from the blast has components in 3 planes – longitudinal (L), transverse (T) and vertical (V). The vibration waves in these planes are termed the Compression wave, Horizontal Shear wave and Vertical Shear wave respectively.

The velocities in each plane are combined mathematically to produce a single term that represents the total ground velocity. This term is known as the 'Peak Particle Velocity' 'PPV' or 'Resultant'. PPV is measured in millimetres per second.

The PPV measure of blast induced ground vibration is universally used in the context of measurement, reporting, and compliance. The Resultant measure is expressed in millimetres per second (mm/s).

Each blast monitor at the monitoring locations shown in Table 8-1, will capture a peak ground vibration in (mm/s) for all blast events initiated. The HVO Drill & Blast Engineer will assess the validity of the captured results by confirming that blast time and duration align with the results recorded by the blast monitoring system. The peak ground vibration level (mm/s) will then be directly compared to the ground vibration impact assessment criteria as specified in approvals and as detailed in Table 8-1. Monitoring results will be maintained for a period of 4 years as required by Environment Protection Licence 640.

Any blast exceeding the impact assessment criteria shall be referred for additional analysis and interpretation by an external specialist in blast consulting where the reason for the levels cannot be established by the Drill & Blast Engineer. This investigation will review blast monitoring results, blast parameters, location and prevailing weather conditions. The investigation analysis is specific to each individual exceedance but may include wavetrace inspection, wavefront pattern analysis, regression analysis, meteorological effect analysis etc.

The results of any blast exceeding the impact assessment criteria (0% Criteria) will be reported to the Planning Secretary as soon as practicable following confirmation of exceedance.

An assessment blast results against the 5% allowable Criteria will be undertaken at the end of the calendar year and reported in the Annual Review. Any exceedance of this criteria will be reported to the Planning Secretary as soon as practicable following confirmation of exceedance.

Any confirmed non-compliance will trigger an investigation of the cause/s of the non-compliance, adequacy of current controls and subsequent review of this Management Plan.

Where an investigation determines a measured result to be incorrect (wind affected, or not related to the blast event), an estimated result will be reported in place of the incorrect measurement.

8.2.2 | AIRBLAST

Airblast is an airborne shock wave resulting from the detonation of explosives. It may be caused by burden movement or the release of expanding gas into the air. Airblast may or may not be audible. Airblast can contain frequencies from below 2Hz to beyond 20KHz. Frequencies above approximately 20Hz are audible whilst those below 20 Hz are sub-audible. Generally, it is the sub-audible component of the airblast that causes effects such as rattling of windows and shaking of ornaments on shelves.

8.2.3 | AIR OVERPRESSURE

Air overpressure is the pressure in excess (either above or below) of ambient atmospheric pressure that occurs when an air blast wave passes a given position. The maximum excess pressure is known as the peak overpressure.

Noise and air overpressure results are both measured in decibels (dB). However, there is no frequency weighting applied to air overpressure measurements, which allows for assessment of the response of structures to air overpressure. Air overpressure is therefore measured in the linear weighting expressed as dB(L).

When air overpressure is presented graphically as a function of time, it is usual to present it in terms of absolute pressure or Pascals (Pa) rather than dB(L) because the physical dynamics of the air overpressure is more readily apparent when presented on a linear (Pa) rather than a logarithmic (dB) scale.

Each blast monitor at the monitoring locations shown in Table 8-1, will capture a peak overpressure result (dB(L)) for all blast events initiated. The HVO Drill & Blast Engineer will assess the validity of the captured results by confirming that blast time and duration align with the results recorded by the blast monitoring system. The peak overpressure result (dB(L)) will then be directly compared to the airblast overpressure impact assessment criteria as specified in approvals and as detailed in Table 8-1. Monitoring results will be maintained for a period of 4 years as required by Environment Protection Licence 640.

Any blast exceeding the impact assessment criteria shall be referred for additional analysis and interpretation by an external specialist in blast consulting where the reason for the levels cannot be established by the Drill & Blast Engineer. An external report shall be issued as soon as practicable. This investigation will review blast monitoring results, blast parameters, location and prevailing weather conditions. The investigation analysis is specific to each individual exceedance but may include wavetrace inspection, wavefront pattern analysis, regression analysis, meteorological effect analysis etc.

The results of any blast exceeding the impact assessment criteria (0% Criteria) will be reported to the Planning Secretary as soon as practicable following confirmation of exceedance.

An assessment of blast results against the 5% allowable Criteria will be undertaken at the end of the calendar year and reported in the Annual Review. Any exceedance of this criteria will be reported to the Planning Secretary as soon as practicable following confirmation of exceedance.

Any confirmed non-compliance will trigger an investigation of the cause/s of the non-compliance, adequacy of current controls and subsequent review of this Management Plan.

Where an investigation determines a measured result to be incorrect (wind affected, or not related to the blast event), an estimated result will be reported in place of the incorrect measurement.

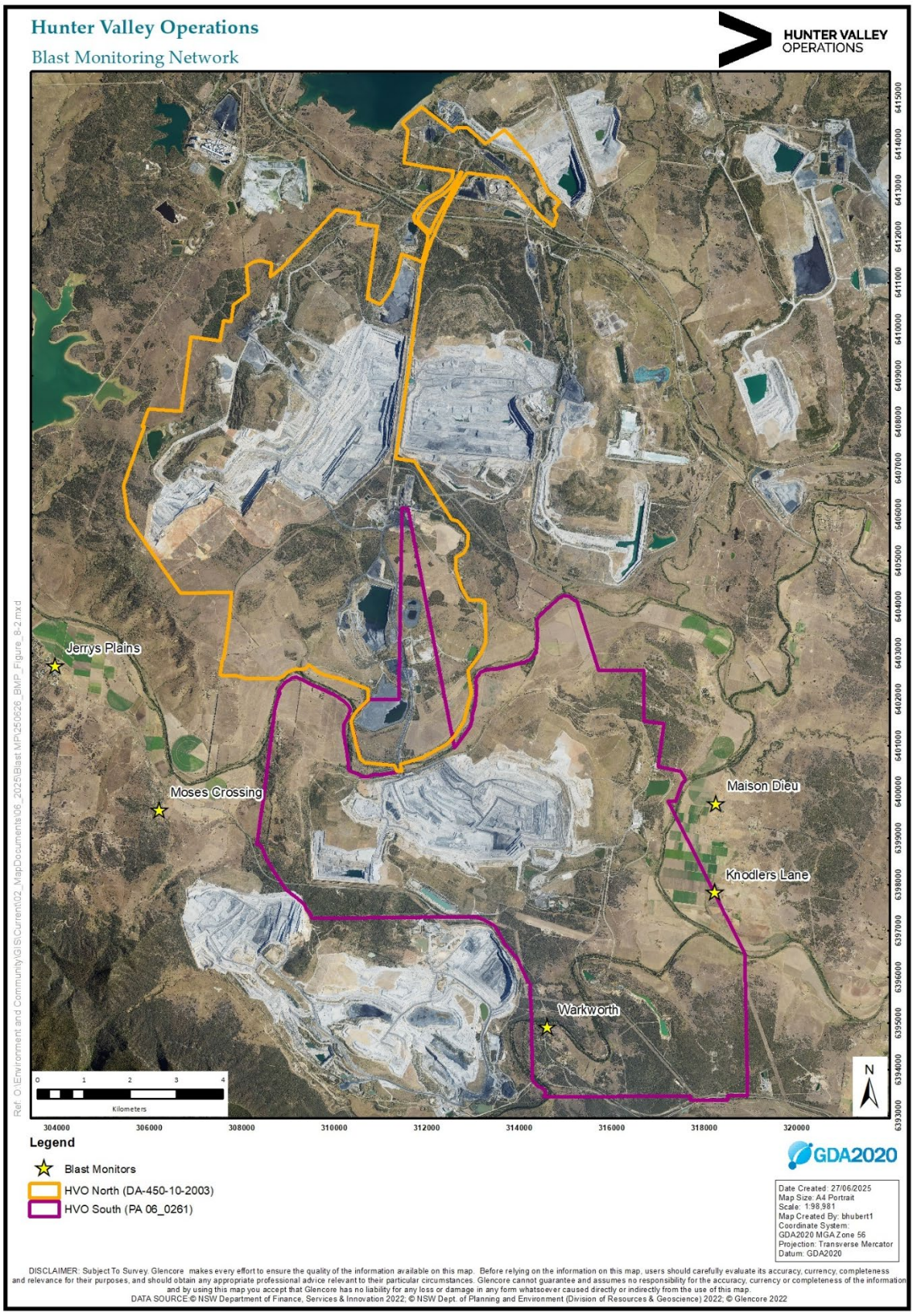


Figure 8-1: Blast Monitor Locations

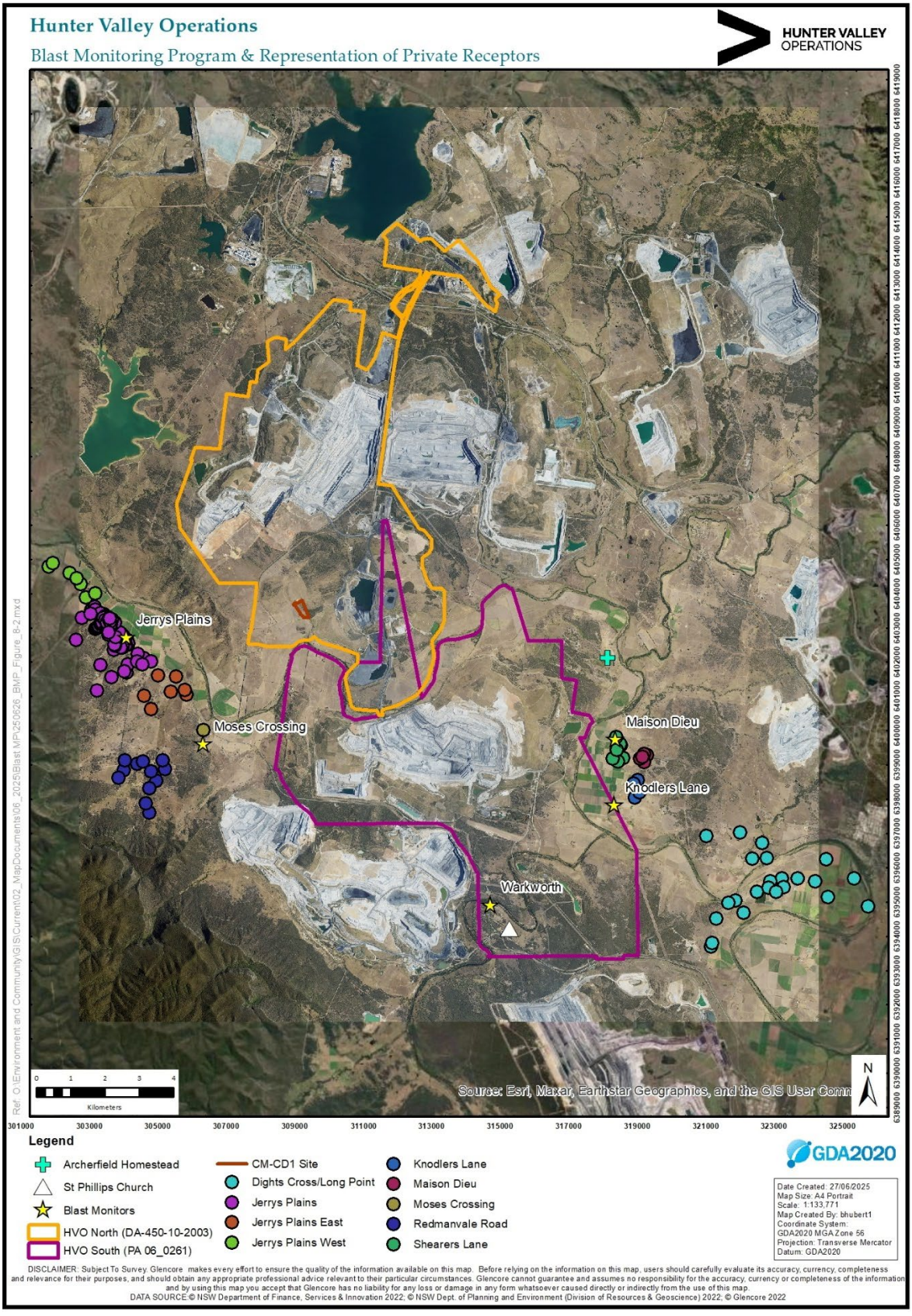


Figure 8-2: Blast Receptors

8.3 | PROPERTY INSPECTIONS

In accordance with Condition 1(a) of Schedule 4 of the HVO North Approval, HVO has notified all owners of privately-owned land within 2 kilometres of approved blasting operations that they are entitled to a structural property inspection to establish the baseline condition of any building or other structures on their property(ies). If a written request is received, HVO will undertake the works in accordance with Condition 16A of Schedule 3.

Similarly, in accordance with Condition 16 of Schedule 3 of the HVO South Approval, HVO has notified all landowners of privately-owned land within 2 kilometres of planned blasting, at least three (3) months in advance of the blasting taking place that they are entitled to a structural property inspection. If a written request is received HVO will undertake actions described in Condition 16 of Schedule 3 of the HVO South Approval.

8.4 | PROPERTY INVESTIGATIONS

If HVO receives a written claim that buildings and/or structures on a landowners' land have been damaged as a result of blasting on site then HVO will investigate the claim and, where the property investigation confirms the landowner's claim, repair the damage in accordance with Condition 16B, Schedule 3 of the HVO North Approval or Condition 17, Schedule 3 of the HVO South Approval, whichever is relevant.

8.5 | INDEPENDENT REVIEW AND LAND ACQUISITION PROCESS

Where the owner of privately-owned land has reasonable grounds to believe that HVO is exceeding blast criteria, they may request an independent review from the Planning Secretary, as per Conditions 4, 5 and 6 of Schedule 4 of the HVO North Approval or Conditions 4, 5 and 6 of Schedule 4 of the HVO South Approval.

If the independent review determines that HVO is not complying with the relevant project acquisition criteria, then upon receiving written request from the landowner, HVO will act in accordance with Conditions 7 and 8 of Schedule 4 of the HVO North Approval or Conditions 7, 8 and 9 of Schedule 4 of the HVO South Approval, whichever is relevant.

8.6 | MONITORING RECORDS

All blast monitoring records are maintained in accordance with EPL 640 and maintained on the premises for a period of 4 years using EMD. The following is recorded for each sample:

a. The date(s) on which the sample was taken;

b. The time(s) at which the sample was collected;

c. The point at which the sample was taken; and

d. The name of the person who collected the sample.

9 | REPORTING AND REVIEW

9.1 | REPORTING

9.1.1 | INTERNAL REPORTING

Determining exceedances of blasting criteria will be undertaken in accordance with the Section 8.2 |

The Environment and Community Superintendent (or Delegate) will report any potential or confirmed exceedance/non-compliance of blasting criteria to the Environment and Community Manager.

Non-compliance events will be investigated. Where additional controls are identified for implementation to reduce the risk of repeated non-compliance, these will be assigned to the relevant accountable person. Actions are tracked to completion.

9.1.2 | EXTERNAL REPORTING

DA 450-10-2003

The Environment & Community Superintendent (or Delegate) will immediately notify the Secretary and any other relevant agencies of any incident relating to blast as soon as practicable. Within 7 days of becoming aware of the incident, HVO will provide the Secretary and any other relevant agencies with an incident report via the NSW Major Projects Portal Website, and such further reports as may be requested.

PA 06_0261

The Environment & Community Superintendent (or Delegate) will immediately notify the Department and any other relevant agencies as soon as practicable after it becomes aware of an incident relating to blast. The notification will be in writing via the NSW Major Projects Portal Website and identify the development (including the development application number and name) and set out the location and nature of the incident. Within 7 days of becoming aware of a non-compliance, HVO will notify DPHI of the non-compliance. The notification will be in writing via the NSW Major Projects Portal Website and identify the development (including the development application number and name), set out the condition of this consent that the development in non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: *A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.*

Notifications will also be made to the EPA following any measured non-compliance with blasting criteria. Any non-compliance with blasting conditions of EPL 640 will be reported in the Annual Return.

Affected residence will be notified in writing in the event of a confirmed non-compliance of blasting criteria. Regular monitoring results will be provided to affected residences until the project is complying with the relevant criteria again.

The BMP and blast monitoring data collected in accordance with this BMP will be made publicly available on the HVO website (https://www.hvo.com.au/).

The Annual Review prepared each year for HVO will include detail of blast monitoring results and blasting complaints for the corresponding year.

A summary of blast monitoring results will be provided to the HVO Community Consultative Committee (CCC), which holds meetings four times per year.

HVO will also provide up-to-date information regarding the proposed blasting schedule via the process outlined below:

- notify neighbouring mining operations;
- advertisement in the Singleton Argus when a public road is to be closed, as well as identifying proposed blasting times on road signage;
- Providing up-to-date information to the Complaints and Blasting Hotline 1800 888 733.
- Landowner(s)/occupier(s) of any residence within 2 kilometres of the HVO South mining area who registers an interest in being notified about the blasting schedule at the mine will be advised individually of upcoming blasts; and
- The blasting hotline number will be advertised in a local newspaper at least 4 times each year.

9.2 | COMPLAINTS MANAGEMENT

Community Complaints are lodged via the Complaints and Blasting Hotline (1800 888 733). The hotline number will be prominently displayed on the HVO website, and regularly advertised in the local newspaper. The Community Complaints and Blasting Hotline will be in operation 24 hours per day, seven days a week.

Complaints will be recorded and investigated by HVO staff. All other complaints lodged via letter, in person or by fax, will also be recorded and investigated by Environment & Community department.

All complaints will be investigated, and, where the investigation identifies potential non-compliance with a consent or licence condition, mitigating action will be taken. Investigation into air quality complaints will generally involve a visual inspection of operating areas and a check of real time monitoring data to confirm dust levels at nearby sensitive receptors.

The details of all air quality complaints, and any mitigating actions taken, will be circulated to senior management. Where requested, follow-up correspondence with the complainant will be provided.

HVO will maintain a register of complaints in accordance with the conditions of EPL 640 relating to handling of pollution complaints. The register will be available on the HVO website and will be updated monthly.

9.3 | REVIEW OF THE BMP

The BMP will be reviewed within three months of the submission of the Annual Review and updated to the satisfaction of the Secretary of DPHI where necessary.

The BMP will also be reviewed within three months of the completion of an independent environmental audit, any exceedance of the Approvals' criteria or any modification to the conditions of the Approvals.

Within 6 weeks of conducting any such review, HVO will advise the Secretary of the outcomes and provide revised documents (where required) for review and approval.

Any major amendments to the BMP that affect its application will be undertaken in consultation with the appropriate regulatory authorities and stakeholders. Minor changes that don't affect performance criteria such as formatting, administrative edits, revision to road closure management plans and changes to supporting documents may be made with version control on the Applicant's website.

10 | ACCOUNTABILITIES

ROLES	ACCOUNTABILITIES
GENERAL MANAGER	Provide adequate resources for the implementation of the BMP Authorize the implementation of specific management measures to minimise blast impacts in accordance with this BMP
ENVIRONMENT AND COMMUNITY MANAGER	Oversee the implementation of the BMP Coordinate blast monitoring in accordance with this BMP Evaluate results of monitoring and report to relevant personnel Notify regulatory authorities and affected landholders of any blasting related exceedance and undertake associated reporting Manage all internal and external reporting requirements Publish copies of the BMP on the HVO website Develop and maintain a protocol to minimise the potential for simultaneous blasting with other nearby mines Coordinate periodic reviews of the BMP
ENVIRONMENT AND COMMUNITY OFFICER	Coordinate investigations of blasting exceedances, incidents or complaints with the Drill and Blast Engineer Coordinate and manage records and reporting of blast monitoring results Manage blasting related complaints in accordance with complaints management procedure receive daily notifications to confirm the blast monitors are operating
ENVIRONMENT AND COMMUNITY SUPERINTENDENT/DELEGATE	Implement and maintain the blast monitoring and real time environmental monitoring network Coordinate periodic review of monitoring data and subsequent reporting Coordinate weekly upload of HVO's blasting schedule to the HVO website Implement and maintain blasting permissions pages and predictive forecast tools
DRILL AND BLAST SPECIALIST ENGINEER	Assist the Environmental Officer with investigations into blasting exceedances, incidents or complaints

ROLES	ACCOUNTABILITIES
DRILL AND BLAST ENGINEER	Regularly review blast design parameters on the basis of blast monitoring records Design and undertake blasts to comply with the requirements of this BMP Advise the relevant personnel of weekly blasting schedule Maintain records for blasts initiated Update of the blasting hotline
DRILL AND BLAST SUPERINTENDENT	Liaise with the shot-firers to confirm blasting is being conducted under favourable metrological conditions.
SHOT FIRERS	Notify the Drill and Blast Engineer and Blasting Supervisor of any factors that may lead to non-compliance with this BMP Load and fire blasts in accordance with design supplied by the Drill and Blast Engineer Assess meteorological conditions prior to blasting to determine whether conditions are appropriate for blasting
DRILL AND BLAST SUPERVISOR	Advise relevant personnel of daily blasting schedule Confirm that the blast is loaded with the correct quantity and quality of explosive and stemmed in accordance with the blast design Assess meteorological conditions prior to blasting to determine whether conditions are appropriate for blasting Confirm drill pattern is drilled in accordance with the blast design
DRILLERS	Record drill status, including hole depths, pattern and relevant information

11 | DEFINITIONS

NAME/TITLE	DESCRIPTION

12 | DOCUMENT INFORMATION

Relevant legislation, standards and other reference information must be regularly reviewed and monitored for updates and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

12.1 | RELATED DOCUMENTS

Related documents, listed in Table below, are documents directly related to or referenced from within this document.

NUMBER	TITLE

12.2 | REFERENCE INFORMATION

Reference information, listed in Table below, is information that is directly referred to for the development of this document

REFERENCE	TITLE
	HVO North Development Consent DA 450-10-2003
	HVO South Coal Project Approval PA 06_0261
	Environnent Protection Licence - EPL 640
	EIS titled 'Hunter Valley Operations – West Pit Extension and Minor Modifications', dated October 2003, and prepared by Environmental Resources Management Australia
	Section 96(1A) modification application for the 'Hunter Valley Loading Point', dated 30 June 2005, and prepared by Matrix Consulting
	Carrington Pit Extended Statement of Environmental Effects', dated October 2005. prepared by Environmental Resources Management Australia
	Carrington West Wing Environmental Assessment', dated 1 October 2010, and prepared by EMGA Mitchell McLennan (CWW EA)

REFERENCE	TITLE
	Environmental assessment titled 'Hunter Valley Operations South Coal Project Environmental Assessment Report', Volumes 1, 2 and 3, dated January 2008, including the response to submissions
	Environmental Assessment titled 'Raising of Lake James Dam', dated October 2009, and the response to submissions (including its Statement of Commitments) dated November 2009
	Environmental Assessment titled 'Proposed Modification to HVO South Project', dated May 2010, and the response to submissions dated August 2010
	Environmental Assessment titled 'Hunter Valley Operations South Project Approval – Modification 4 – Administrative Omissions and Clarifications' [sic], dated 26 September 2012
	Environmental Assessment titled 'Hunter Valley Operations North Project Approval – Modification 4' – Dedication of Lands for Offsets [sic], dated 26 September 2012
	Environmental Assessment titled 'Hunter Valley Operations North Modification 5' – HVLP Sediment Basin and HVO North Communication Towers, dated November 2016
	The Environmental Assessment titled 'Hunter Valley Operations South - Modification 5 February 2017
	Environmental Planning and Assessment Act 1979 (NSW)
	Work Health and Safety Act 2011 (NSW)
	Explosives Act 2003 (NSW)
	Protection of Environmental Operations Act 1997 (NSW).
	Australian and New Zealand Environment and Conservation Council ANZECC. 1990. Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration
	HVO Shotfiring & Explosives Handling Hazard Management Plan.

REFERENCE	TITLE
	Pre Blast Environmental Checklist
	HVO Road Closure Management Plan Golden Highway
	HVO Road Closure Management Plan Lemington Road
	HVO Post Blast Fume Generation Mitigation and Management Plan
	Blastronics (1994) Drill & Blast Study, Mount Pleasant

12.3 | CHANGE INFORMATION

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in table below. Example detail shown below.

REGULATOR VERSION	HVO SHAREPOINT VERSION	DATE	CHANGE DETAILS	REVIEW TEAM	REGULATOR APPROVAL
1.0	-	27/09/2013	Original	Kelly O-Mullane (Approvals Specialist), Gerard Gleeson (Environment Specialist)	-
1.1	-	26/03/2014	Revised following feedback from DP&I on original submission	Kelly Adamthwaite (Approvals Specialist), Gerard Gleeson (Environment Specialist)	-
1.2	-	04/04/2014	Document finalised for publish	Gerard Gleeson (Environment Specialist), Andrew Speechly (Environment Manager)	04/04/2014

REGULATOR VERSION	HVO SHAREPOINT VERSION	DATE	CHANGE DETAILS	REVIEW TEAM	REGULATOR APPROVAL
1.3	-	30/05/2017	Revised following modification to HVO North Consent and to update Blast Fume Protocol. Monitoring Program revised to include minor changes to blast monitoring locations on included map.	Doug Fenton (Environment Advisor), Andrew Speechly (Environment Manager)	-
2.0	-	30/11/2017	Revision to align with new ownership management practices. Review following HVO North Mod. 7	Dominic Brown (Environment Specialist), Andrew Speechly (Environment Manager	-
3.0	-	25/05/2018	Revision following Modification 5 of HVO South Consent and Submission of 2017 Annual Review.	Dominic Brown (Environment Specialist), Andrew Speechly (Environment Manager	-
3.1	-	08/02/2019	Revision following feedback from DP&E on Version 3.0.	Dominic Brown (Environment & Community Coordinator), Andrew Speechly (Environment & Community Manager	-
3.2	-	27/02/2019	Revision following feedback from DP&E on Version 3.1	Dominic Brown (Environment & Community Coordinator), Andrew Speechly (Environment & Community Manager	-

REGULATOR VERSION	HVO SHAREPOINT VERSION	DATE	CHANGE DETAILS	REVIEW TEAM	REGULATOR APPROVAL
3.3	-	28/03/2019	Revision following feedback from DP&E on Version 3.1	Dominic Brown (Environment & Community Coordinator), Andrew Speechly (Environment & Community Manager	03/04/2019
3.4	-	13/09/2019	Update to HVO template, restructure and include GCAA protocols.	Dominic Brown (Environment & Community Coordinator), Andrew Speechly (Environment & Community Manager	-
3.5	-	2/04/2020	Update following submission of 2019 IEA Report and 2019 Annual Review.	Dominic Brown (Environment & Community Coordinator), Andrew Speechly (Environment & Community Manager	-
3.6	-	30/04/2021	Update following feedback from DPIE on Version 3.5	Keith Simkin (E&C Coordinator), Andrew Speechly (E&C Manager)	-
3.7	-	22/03/2022	Update following approval of PA 06_0261 Mod 6	Keith Simkin (E&C Coordinator), Andrew Speechly (E&C Manager)	-
4.0	-	04/08/2023	Update following approval of PA 06_0261 Mod 8, Annual Review and IEA	Brenton Hubert (E&C Superintendent), Andrew Speechly (E&C Manager)	-

REGULATOR VERSION	HVO SHAREPOINT VERSION	DATE	CHANGE DETAILS	REVIEW TEAM	REGULATOR APPROVAL
	-	24/06/2024	Review following submission of 2023 Annual Review	Brenton Hubert (E&C Superintendent), Andrew Speechly (E&C Manager)	-
	-	25/06/2025	Review following submission of 2024 AEMR and DA 450-10-2003 Mod 8 approval.	Brenton Hubert (E&C Superintendent), Ben de Somer (E&C Manager)	26/08/2025

APPENDIX A: TYPICAL BLASTING PERMISSION PAGE

APPENDIX B: POST BLAST FUME GENERATION MITIGATION AND MANAGEMENT PLAN

Hunter Valley Operations:

Post Blast Fume Generation

Mitigation and Management Plan

HUNTER VALLEY OPERATIONS

Edition: Fifth Edition Date: 11 August 2025

TABLE OF CONTENTS

1 | INTRODUCTION

This document has been prepared to provide a protocol for the mitigation and management of post blast NOx fumes from blasting operations at Hunter Valley Operations (HVO) and is based on the AEISG Code of Practice (2011). This provides the basis on which to make blasting decisions to minimise the incident and severity of post blast fume events at HVO.

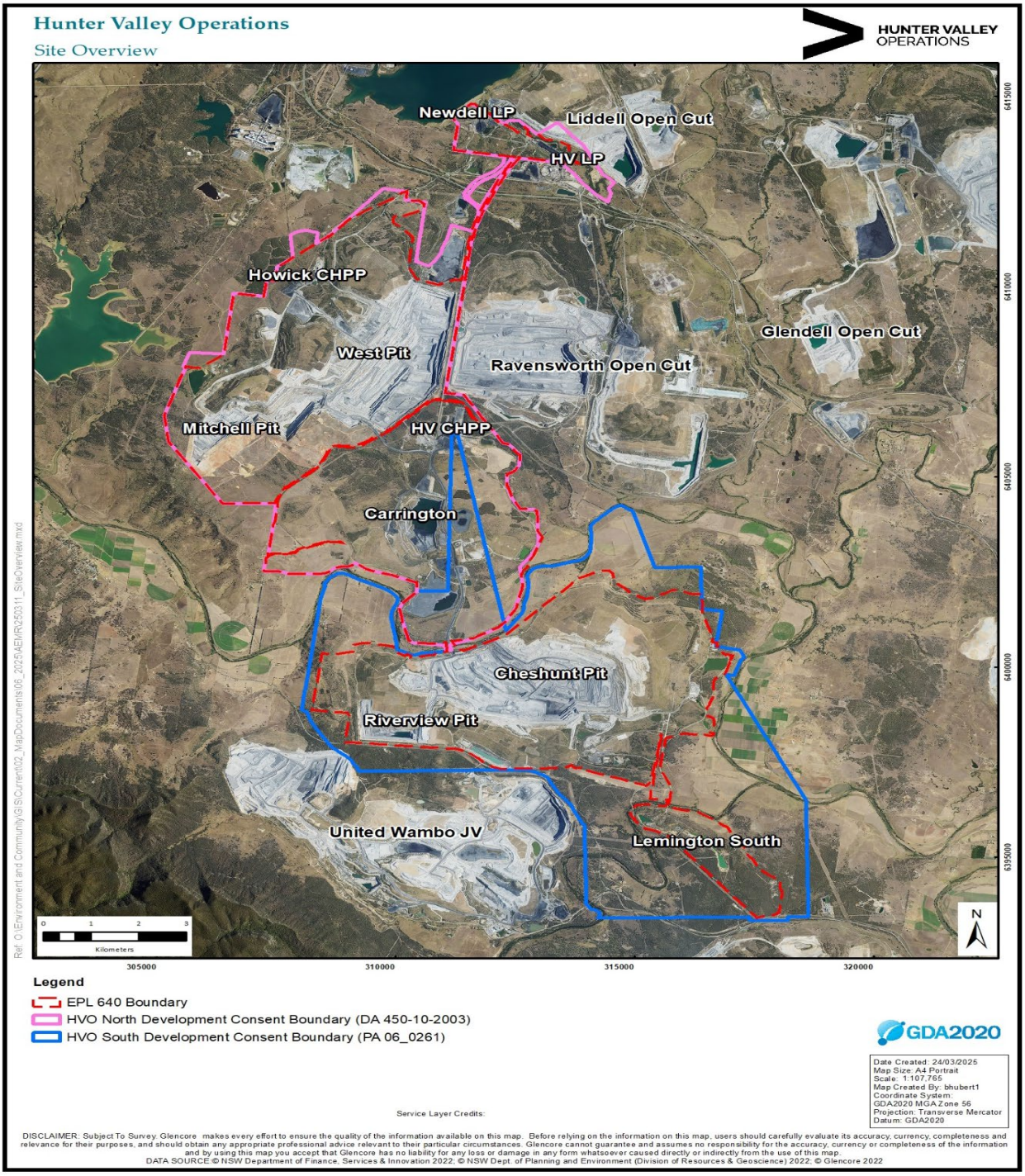


Figure 1: HVO Overview

1. NOx Fume

All blasting explosives produce large volumes of gas in very short time spans (milliseconds).

The application of ammonium nitrate based blasting explosives in the field, under variable conditions, can lead to non-ideal explosive reactions and the production of Nitric oxide (NO) and Nitrogen dioxide (NO_2). Nitric oxide is unstable in air and readily oxidises to nitrogen dioxide. Nitrogen dioxide is identifiable by the generation of orange/brown clouds.

2. The causes of fume in blasting

Fumes are generated as a result of an explosive not reacting with a full, high order, steady state detonation. The causes of this are many and variable. This protocol groups causes into categories and further identifies controls that are best able to control the variable. The seven main categories that contribute to post blast fume, these causes along with relevant controls are detailed in Section 4.

3. Identification of persons to prevent fumes

This section identifies the persons in the organisation and their role in relation to ensuring post blast fume from blasts as shown in Table 1.

Table 2: Roles and Responsibilities

Person	Role	Responsibilities/Remarks
Mine/Pit Planner	Plan the mine/pit operations to extract coal	Design extraction plan to minimise those blasting activities such as box cuts or blast areas that do not have a free face.
Geologist	Provide data on ground conditions to assist blast designer with shot design	Accurate provision of ground data across the proposed shot. Provide soil moisture index data for site.
Blast Designer	Design a blast to provide good extraction of material while manage blasting hazards	Blast design to consider: Geology & rock mass conditions. Explosive product selection appropriate to ground and water conditions. Historical blast performance for the current area. Weather conditions during loading and firing. Checking blasting permissions page prior to firing to ensure favourable conditions.
Drill and Blast Superintendent	Manage all drill and blast operations for the site.	On bench water management. Competence of blast team. Adequate resourcing of blasting activities.
Drill Supervisor	Supervise drill activities on the bench.	Conduit between drill activity and blast designer. Bench preparation prior to drilling.

Driller	To provide drilled holes for the loading of explosives for a shot.	Accurately drill the shot plan and report variations. Report anomalous ground conditions to drill supervisor. Collar protection of holes.

Blast Supervisor	Manage day to day blasting operations.	Review the use of products appropriate to conditions. Review actual loaded condition of blast prior to shot being fired. Compliance check of on bench activity.
Shotfirer	Manage all explosives activities on bench.	Compliance with design. Notify any variations from design. Recording explosive use data. Supervision of loading technique; • Preventing contamination of the explosive column. • Stemming. • Accurate placement of gas bags. Manage MMU's on bench operations; • Ensuring QC density checks completed. • Hose handling for pumped products. Conduit between on-bench and blast supervisor. Identifying and reporting hole slumping.
Trainee Shotfirer	Support shotfiring activities On bench activities as directed by the Shotfirer	Measuring the depth of holes. Identifying water conditions down hole. Positioning of primers in blast holes. Accurate placement of gas bags. Identifying hole slumping.

MMU Operator	Manufacture blasting explosives On bench activities as directed by the Shotfirer	Compliance with shotfirers loading instructions. MMU Calibration. Adequate and correct process chemicals. Manufacture QC checks. Generate delivery/production records.

Explosives manufacturer/ Supplier	Provide explosives fit for purpose	Manufacturing equipment compliance. Provision of precursors and formulation to ensure minimum amount of fume. Change management of formulation to ensure fumes are minimised in product. Design, calibration and operation of explosives manufacturing equipment to deliver consistent explosives within specification. Provide recommendations for product use and training as required.

2 | CAUSES & CONTROL MATRIX

The following matrix covers each potential causes and situations that may contribute to fume generation, identified in section 2 of this protocol. For each potential cause, a likely indicator and control measure is outlined.

Primary Cause 1: Geological conditions		
Potential Cause	**Likely indicators**	**Control measures**
Blasting in weak/soft strata (Incorrect Timing and Pattern Design)	• Specific areas known to contain weak/soft strata only • Excessive Powder Factor	Understand geology of each shot and design blast (timing and explosive product) to ensure adequate relief in weak/soft strata, for example incorporation of a free face, reduction of powder factor, modified timing.
Explosive product seeping into cracks	• Slumping • Specific areas known to contain a high incidence of faulted/fractured ground only • Not achieving designed collar height when loading as per load sheet	Follow manufacturer's recommendations on explosive product selection
		Consider the use of blast hole liners, or, bag off above cracking
		Record and monitor blast holes which have slumped or require excessive explosive product to reach stemming height, but where water is not present

Primary Cause 1: Geological conditions		
Potential Cause	**Likely indicators**	**Control measures**
Dynamic water in holes	• Slumped blast holes • Usually when using non water-resistant explosive products	Minimise sleep time of shot
		Consider manufacturer's recommendations on explosive product selection
		Understand hydrology of pit and plan blasting to avoid interaction between explosives and dynamic water (either natural or from other pit operations) Check after pumping to understand recharge rate of the drill hole.
Moisture in clay	• When clay or clay rich strata present	If the drill holes are defined as wet, then water resistant explosive products with appropriate energy will be used in the loading of these holes.
Blast hole deterioration between drilling and loading	• Traceable to specific geological areas • Dipped depth inconsistent with drilled depth indicating hole collapse	Minimise time between drilling and loading
		Use hole savers
		Drill & Blast Engineer to ensure benches are unaffected by backbreak from earlier blasts, for example presplits, buffers etc.
		Optimise drilling practices to minimise hole damage.
Ground movement	• Horizon offset (bench, etc.) • Area previously known for misfires	Design sequence timing to prevent hole movement and dislocation of explosives columns.

Primary Cause 2: Climate / seasonality		
Potential Cause	**Likely indicators**	**Control measures**
Rainfall on a sleeping shot.	• Excessive rainfall • Slumping of holes • Ponding of water on pattern	Review rainfall forecasts for planned sleep time of shot and select explosive products according to manufacturer's recommendations.
		Minimise sleep time for dry blast hole explosive products if rain is predicted. Consider early firing of blast.
		Bench design for water runoff with appropriate bunding &drainage.
		If a large rain event is predicted to impact on a live shot, then the top of blast holes will be protected to prevent water ingress by constructing contour drains to divert water away from hole collars with an excavator.
		Consider removing water affected product
		Loaded drill holes are to be inspected for slumping prior to initiation after a rainfall event.

Primary Cause 3: Blast Design		
Potential Cause	**Likely indicators**	**Control measures**
Explosive desensitisation due to the blast hole depth	• In deep holes only	Reduce bench height
		Ensure adequate relief in deep holes
		Consider manufacturer's recommendations on explosive product selection and blast design for deep holes.
Inappropriate priming and/or placement	• Residue product	Consider manufacturer's recommendations on explosive product initiation, in general, top and bottom priming in holes greater than 18m deep.
Inter-hole explosive desensitisation	• Blast holes drilled close r together than planned • Blast hole deviation differs greatly from planned	Review the design and adjust for actual drilling.
		Review product selection and adjust for new design
Intra-hole explosive desensitisation in decked blast	• When using decks only	Appropriate separation of explosive decks. Initiator timing.
Excessive confinement (Incorrect Timing and Pattern Design)	• Specific to blasts known to be confined • No free face present • Excessive Powder Factor	Understand geology of each shot and design blast (timing and explosive product) to ensure adequate relief in all strata. Consider incorporation of a free face, reduction of powder factor, modified timing, depth of blast, etc.

Primary Cause 4: Explosive product selection		
Potential Cause	**Likely indicators**	**Control measures**
Non water-resistant explosive products loaded into wet or dewatered holes	• Blasts containing wet/dewatered blast holes only	Consider manufacturer's recommendations on explosive product selection.
		Education of bench crew on explosive product recommendations from current supplier.
		Discipline in on-bench practices Follow load sheet.
Excessive energy in strata desensitising adjacent explosive product columns	• Specific to areas known to contain weak/soft strata only	Understand geology of each shot and design blast (timing and explosive product) to match, for example reduction of powder factor.
		Consider manufacturer's recommendations on explosive product selection
		Obtain appropriate technical assistance if required to ensure optimal result.
Primer of insufficient strength to initiate explosive column	• For blasts using a particular primer type / size	Consider manufacturer's recommendations on compatibility of initiating systems with explosives
Desensitisation of explosive column from in-hole detonating cord initiation	• In areas where in-hole cord initiation is used	Consider manufacturer's recommendations on compatibility of initiating systems with explosives

Primary Cause 5: Explosive quality		
Potential Cause	**Likely indicators**	**Control measures**
Explosive product incorrectly formulated	• All areas associated with loading from a specific delivery system • Product appearance abnormal	Explosives formulated by supplier to an appropriate oxygen balance to minimise the likelihood of post-blast fume Development and maintenance of an explosive QA/QC programme.
Inadequate mixing of raw materials	• In all areas associated with loading from a specific delivery system • Product	Visual check Density check MMU Calibration check
Delivery system metering incorrectly (on bench incorrect manufacture of product)	• All blasts and all locations utilising explosive product(s) that incorporate a specific precursor	Regular calibration of MMU Quality control of explosive products conducted in accordance with manufacturer's recommendations
Explosive precursors not manufactured or supplied to specification or degradation during transport and storage	• Traceable to a precursor which has degraded between manufacture and use	Contractor Management System – regular Audits of supplier to ensure compliance with QA/QC systems.
Initiation explosives not manufactured to specification or degradation during transport and storage	• Damaged packing or out- of-date stock • Misfire	Rotating Stock in Explosives Magazine HVO-10-WI-Mine-090 Explosive Storage and Stock Control
Raw material changes	• All areas associated with loading from a specific delivery	Change management procedures in place by suppliers

	system • Product appearance changed	Prior notification to suppliers from site change management systems where other raw materials are supplied by the customer, for example diesel fuels

Primary Cause 5: Explosive quality		
Potential Cause	**Likely indicators**	**Control measures**
Product Degradation	• Slumping of holes	As per Explosives Supplier TDS for Sleep time Sleeping a shot more than the Explosives Suppliers Maximum sleep time requires the approval by the Manager of Mining Engineering. Any sleeping shot is inspected daily by the Shotfirer when in attendance.

Primary Cause 6: Contamination of explosives in the blast hole		
Potential Cause	**Likely indicators**	**Control measures**
Explosive product mixes with mud/sediment at bottom of hole.	• Blasts containing wet/dewatered blast holes only • Dipped depth inconsistent with drilled depth indicating hole collapse	Optimise drilling practices to minimise blast hole damage
		~~Ensure~~ Appropriate loading practices are followed during charging
		Position primer in undamaged explosive product
		Where mud or sediment is identified in a hole from dipping, a gas bag will be used to separate mud/sediment from explosive product.
		Use blast hole savers where appropriate
Penetration of	• Blasts charged with	Use appropriate stemming material

stemming material into top of explosive column (fluid/pumpable explosive products only)	fluid/pumpable explosive products only	Check explosive product is gassed to manufacturers specifications before stemming

Water entrainment in explosive product	• Blasts containing wet/dewatered blast holes only • Dynamic water present • Historical groundwater information	Adjust explosive product selection according to manufacturer's recommendations depending on changing conditions.
		Check appropriate loading practices are followed during charging
		Follow best practice when loading into wet or dewatered blast holes from the bottom up
		Best endeavors to ensure all primers are positioned in undamaged explosive product
		Use of gas bags in dewatered blast holes where appropriate
		Best endeavors to protect top of explosives column to prevent water ingress
		Reduce excessive hose lubrication during charging
		Consider adjusting explosive product selection according to manufacturer's recommendations for wet environment.
		Verify correct hose handling practices are in place
		Consider loading in low lying areas last where practical
		Minimize sleep time where practical

Primary Cause 7: On bench practices		
Potential Cause	**Likely indicators**	**Control measures**
Hole condition incorrectly identified	• Slumping of holes • Unexpected material in drill cuttings	Assess all holes prior to loading
		Use number and location of wet holes as a basis for explosive product selection and determining loading sequence
		Minimise time between drilling and loading, especially in soft and clay strata. Note: Enough time should be allowed for any dynamic water in the hole to be identified
		Assess holes for slumping on any sleeping shots
		Minimise sleep time
Blast not drilled as per plan	• Can be correlated with incorrectly drilled patterns	Drillers to report holes not complying with plan. Verify drill hole accuracy in areas considered critical using drill hole positioning and recording system. Adjust design as necessary.
Dewatering of holes diverts water into holes previously loaded with dry hole explosive products	• Visual inspections of water on bench. • Bench setup, understanding gradient of bench for water runoff	Load wet holes in a sequence that ensures other holes are not impacted. Adjust explosive product selection according to manufacturer's recommendations.

3 | MANAGEMENT OF FUME

Due to the close proximity of the Golden Highway, Lemington Road, Comleroi Road and Hobden Reserve to Hunter Valley Operations lease boundaries, blasting restrictions detailed in HVO Blast Monitoring Programme such as wind speeds and directions, are strictly observed. Any shot expected to produce fume that is in close proximity to the aforementioned public areas require a road closure as per HVO-10-ENVMP-E6-004 Blast Management Plan

Within site boundaries, the blasting exclusion zone and sentry procedure takes into account the location of mine personnel on the lease at the time of detonation. A minimum 500 m exclusion zone is the standard for HVO, however may be extended to any distance at the Shotfirers discretion. This includes reducing the risk of exposure to personnel downwind of a blast with the potential for fume.

The health and safety risks of Post Blast Fume and information for treatment by medical staff, is outlined in

Appendix 3 & 4. In the event that a post-load risk rating indicates the likelihood of fume the following protocol is to apply.

Report / Record	Responsibility	Content
Identify factors contributing to potential fume	Drill and Blast Engineer	• Horizon history • Clay / weak material • Rain during loading • Holes slumping • Product selection issues • Product delivery issues • Excessive sleep time • Dynamic water
Defining Fume Management Zone	Competent group consisting of Superintendent, Supervisor, Engineer and Shotfirer – all persons inside the FMZ to be evacuated and area sentried prior to blast	Extent of zone based on Likely fume level at blast to be assessed by group based on above factors Wind speed and direction Inversions Cloud cover Time of day Atmospheric stability Temperature Humidity Dispersion model

Fume management zone notifications	D&B Engineer D & B Supervisor D&B Engineer / ~~D~~,D & B Supervisor Environment Officer	A hardcopy plan with FMZ clearly marked on current aerial photo along with any sensitive sites (Roads, United Colliery, Ravensworth Surface Operations) Daily blast schedule email Internal notifications ▪ Time permitting – TBT fume ▪ protocols - windows up, a/c on recirculation ▪ ESO to be on standby for high potential events Road closure notifications - As per Road Closure Management Plan External Stakeholders such as DP&E, EPA, Community, etc.
Firing Blast – as per HVO-10-WI-Mine-049 Closing Public Roads	Traffic Control Supervisor All Shotfirer D&B Engineer	Fume level measurements as part of road inspection Fume protocol for vehicle occupants – verbal or document - Windows up and a/c on recirculation Fume observation - Warning message to potentially impacted parties if required – • Windows up and a/c on recirculation To utilize fume monitor when conducting post blast inspection Video blast Fume level measurements (monitoring)

Fume Emergency	All	Shotfirer, supervisor or sentry or any witness to raise emergency based on observations. ESO and OCE to coordinate response. Advice for anyone potentially affected by fume • Get out of the cloud. • Seek fresh air. • Use water to reduce the amount of exposure to wash out eyes and clear nose and throat See Appendix 3 & 4 for health and safety risks of fume and advice for treating medical staff
Reporting	Shotfirer D&B Engineer Supervisor	HVO-10-FRM-MINE-001 Shotfiring Report. Assess Fume Management Zone against forecast Notify Explosives Supplier of fume event to aid in investigation and communication The following fume events shall be raised as incidents: Any blast fume required to be reported to external stakeholders (see below); the visible fume cloud travels beyond the blast exclusion zone; when any person has been directly exposed to fumes Note that a road closed for the purpose of blasting is considered part of the site The following factors should be considered for inclusion in any post-blast incident report: • date and time of blast; • explosives type, quantity, initiation type; • ground geology (soft, faults, wet);

		• post-blast NOx gas rating, eg 0 – 5 & A-C; • duration of any post-blast NOx gas event (measure of time to disperse); • direction of movement of any post-blast NOx plume; • movement of any post-blast NOx gas plume relative to the established exclusion zone and any established management zone (i.e. maintained within, exceeded); • climate conditions, including temperature, humidity, wind speed and direction, cloud cover, rain; • results/readings of any NOx monitoring equipment employed for the blast • video results of blast where relevant.
	Environment Manager (or Delegate)	Notify the Department of Planning and Environment of any blast producing post blast fume that rates 3 (at its greatest extent) which leaves the site to a public area or non-mine area, and any blast that rates 4 or 5. Where the fume leaves the site and has the potential to cause material harm (to the public/environment), immediately notify the following as per the Pollution Incident Response Management Plan::
	Superintendent	• **EPA Environmental Line (131 555)** • **DPHI (02 6575 3402)** • **Ministry of Health (Newcastle Public Health Unit (02 4924 6477)** • **SafeWork NSW (13 10 50)** • **Singleton Council (02 6578 7290, a/h 02 6572 1400)**

	Mining Manager	• **Fire and Rescue NSW (000)** Escalate fume events to Mining Manager & Environment Manager Reporting of fume events to Mines Inspectorate as appropriate.

4 | DOCUMENTATION AND RECORDS

The documentation and records used for the preparation and firing of a blast are retained for a period of 4 years in accordance with Environment Protection Licence 640 by the Drill and Blast Engineer. The records contain:

Report / Record	Responsibility	Content

Blast design and performance record	Blast Designer	• Blast Design
		• Design Checklist
		• Drill Pattern Plans
		• Load Sheet
		• Blasting Schedule
		  o Location of Blast
		  o Type of Blast
		  o Weather Forecast
		• Video of blast
		  o Operator is to ensure that filming continues post detonation, to ensure any potential fume or dust clouds are captured.
		• Environmental records
		  o Air Blast
		  o Vibration
		• Monthly reconciliation of blasted volumes

Explosives stock control	Shot Firer	• Quantity (weight/numbers of units) of explosives delivered • Quantity (weight/numbers of units) of explosives used on a shot basis □

Shotfiring Report	Shotfirer in charge	• Date/time of firing • Name, type and location of shot • Explosives type, tonnages delivered of explosives used • Number of holes charged (for day/total) • Pattern Size • Hole Diameter • Average Hole Depth • Numbers of holes fired • General comment on blast loading progress or results. • Environmental comments

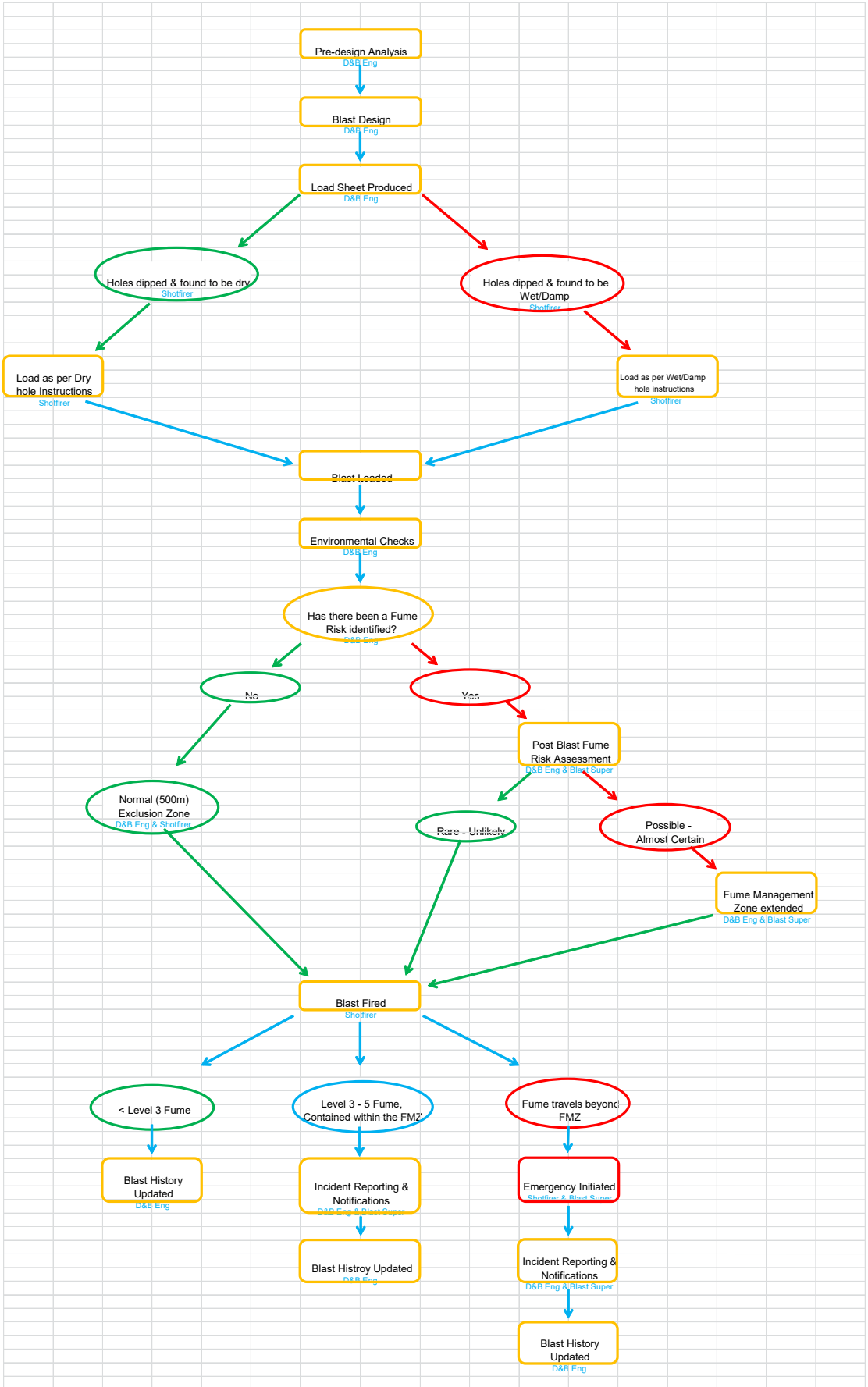
		○ Fume Category (if required) ○ Noise Results ○ Vibration Results
Drill Shift Report	Drill Operator	• Drill Number • Location/Pattern No. • Burden & Spacing • Operator Name • Bit Size • Date/Time/Shift • Drilling task by the Hour • Hole Number • Hole Depth • Comments and/or defects • Total Summary for shift

5 | GLOSSARY

Wet Hole – A wet hole is defined as any drill hole containing more than 1 metre of water at the bottom of the hole and/or having wet sides anywhere down the hole. Any hole that has been dewatered is classified as a wet hole.

Dry Hole – A dry hole is defined as any drill hole having less than 1 metre of static water at the bottom of the hole. Should water be detected through the dipping process, a gas bag is used to close off the bottom of the hole, with drill hole cuttings shoveled back on top of the gas bag, prior to the loading of any explosive product.

APPENDIX 1 – GENERALISED FLOWCHART FOR FUME EVENT


Pre-design Analysis
D&B Eng
Blast Design
D&B Eng
Load Sheet Produced
D&B Eng
Holes dipped & found to be dry
Shotfirer
Holes dipped & found to be Wet/Damp
Shotfirer
Load as per Dry hole Instructions
Shotfirer
Load as per Wet/Damp hole instructions
Shotfirer
Blast Loaded
Environmental Checks
D&B Eng
Has there been a Fume Risk identified?
No
Yes
Post Blast Fume Risk Assessment
D&B Eng & Blast Super
Normal (500m) Exclusion Zone
D&B Eng & Shotfirer
Rare - Unlikely
Possible - Almost Certain
Fume Management Zone extended
D&B Eng & Blast Super
Blast Fired
Shotfirer
< Level 3 Fume
Level 3 - 5 Fume, Contained within the FMZ
Fume travels beyond FMZ
Blast History Updated
D&B Eng
Incident Reporting & Notifications
Emergency Initiated
Shotfirer & Blast Super
Blast Histroy Updated
Incident Reporting & Notifications
D&B Eng & Blast Super
Blast History Updated
D&B Eng

APPENDIX 2 – VISUAL NOx GASES RATING SCALE

The following table, together with the Field Colour Chart on the next page, details how NOx gases from a surface blast can be assessed

Level	Typical Appearance
Level 0 No NOx gas	
Level 1 Slight NOx gas	
1A Localised	
1B Medium	
1C Extensive	
Level 2 Minor yellow/orange gas	
2A Localised	
2B Medium	
2C Extensive	
Level 3 Orange gas	
3A Localised	
3B Medium	
3C Extensive	
Level 4 Orange/red gas	
4A Localised	
4B Medium	
4C Extensive	
Level 5 Red/purple gas	
5A Localised	
5B Medium	
5C Extensive	

Field Colour Chart.

Assessing the amount of NOx produced from a blast will depend on the distance the observer is from the blast and the prevailing weather conditions. The Field Colour Chart can be used to assess the level of NOx that is produced in a surface blast.

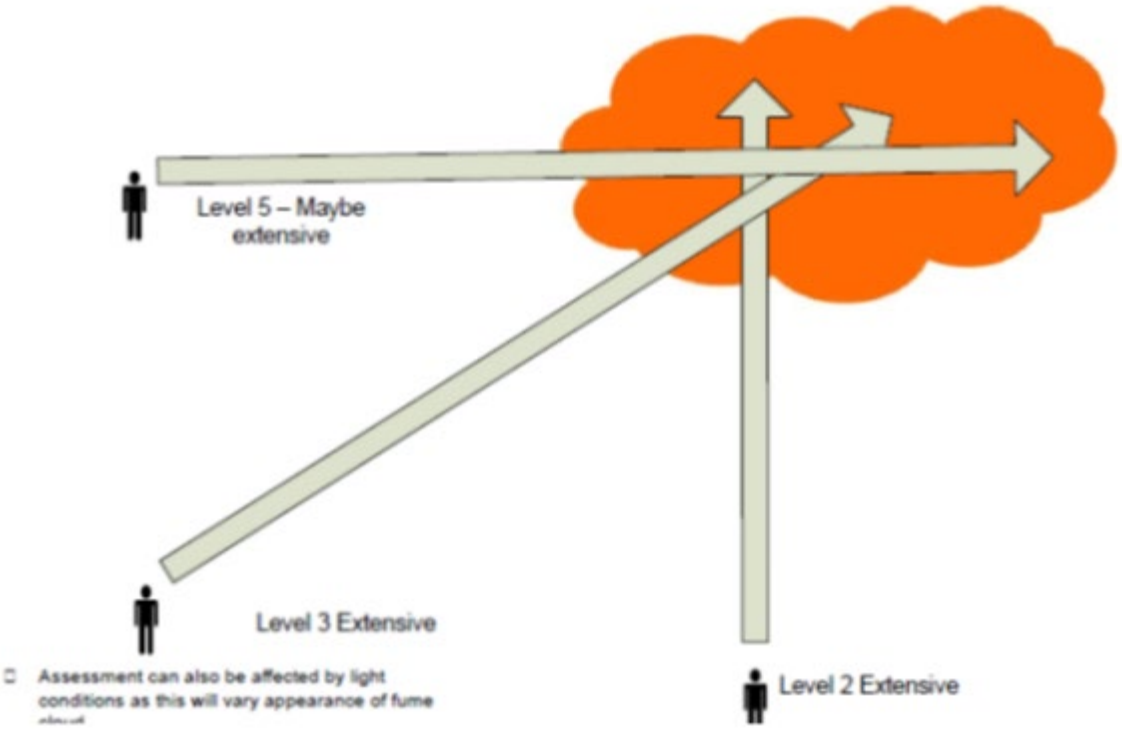
Pantone colour numbers have been included in the Field Colour Chart to ensure colours will always be produced correctly thereby ensuring a reasonable level of standardization in reporting fume events across the mining industry.

Level	Colour	Pantone Number
Level 0 No NOx gas		Warm Grey 1C (RGB 244, 222, 217)
Level 1 Slight NOx gas		Pantone 155C (RGB 244, 219, 170)
Level 2 Minor yellow/orange gas		Pantone 157C (RGB 237, 160, 79)
Level 3 Orange gas		Pantone 158C (RGB 232, 117, 17)
Level 4 Orange/red gas		Pantone 1525C (RGB 181, 84, 0)
Level 5 Red/purple gases		Pantone 161C (RGB 99, 58, 17)

Observation Issues

The angle of the person to the fume event will influence the assessment. Where possible and without placing persons in the path of the fume cloud there, should be a number of observers to record the level. This can be moderated to give a more accurate indication of the cloud.

The issue is that the observer position and fume cloud orientation may influence the rating given.



APPENDIX 3 – HEALTH AND SAFETY RISKS OF BLAST FUMES

NIOSH Pocket Guides

The US National Institute for Occupational Safety and Health (NIOSH) produces the *NIOSH Pocket Guide to Chemical Hazards* (NPG)... "intended as a source of general industrial hygiene information on several hundred chemicals/classes for workers, employers, and occupational health professionals. The NPG does not contain an analysis of all pertinent data, rather it presents key information and data in abbreviated or tabular form for chemicals or substance groupings (e.g. cyanides, fluorides, manganese compounds) that are found in the work environment. The information found in the NPG should help users recognize and control occupational chemical hazards."

The NIOSH Pocket Guides for NO, NO_2 and CO are reproduced with authority of the US Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA.

The guides can be accessed through the NIOSH Pocket Guide to Chemical Hazards homepage: http://www.cdc.gov/niosh/npg/default.html

Note that the exposure limits do not necessarily match the Australian STEL and TWA.

Health and Safety Risks of Blast Fumes

Nitrogen Dioxide (NO_2)

NO_2 is a toxic gas that irritates the eyes and mucous membranes, primarily by dissolving on contact with moisture and forming a mixture of nitric and nitrous acids.

Inhalation can result in respiratory tract irritation and pulmonary oedema. Onset of pulmonary oedema can be delayed and can cause death, so personnel who have been exposed to NO_2 must be observed in hospital for at least 12 hours. Changes in pulmonary function are evident at exposures levels of 2 to 3 ppm NO_2 [Ref 9]; asthmatics are particularly sensitive, potentially suffering significant bronco-spasm at very low concentrations.

NO_2 varies in colour from light orange through to reddish-brown, depending on the concentration and the light conditions. NO_2 is visible in concentrations above 2.5 ppm [Ref 5], although from a distance (such as viewing a blast) the concentrations may need to be above 30 ppm to be observed [Ref 2].

NO_2 has a sharp, biting odour and can be detected by smell at low concentrations (< 0.5 ppm), but the sense of smell can be subdued above 4 ppm. It has a higher molar mass (46) than air (28.8) and consequently tends to travel across the ground, dispersing over distance.

The STEL for NO_2 is 5 ppm (9.4 mg/m³), TWA is 3 ppm (5.6 mg/m³), and 20 ppm is considered IDLH (immediately dangerous to life or health).

The US National Institute for Occupational Safety and Health (NIOSH) recommended short term exposure limit is 1 ppm

Concentration	Symptoms
~ 800 ppm	15 seconds exposure lethal by reflex choking if not rescued. Extremely irritating to the eyes, nose and throat.
~ 350 ppm	5 minutes exposure lethal by reflex choking if not rescued. Extremely irritating to the eyes, nose and throat
~ 250 ppm	Lethal to man 15 minutes by reflex choking. Airway reactivity and resistance makes breathing more difficult with time. Less than 5 minutes exposure causes potentially fatal pulmonary oedema
~ 200 ppm	Lethal to man in 30 minutes by reflex choking. Airway reactivity and resistance makes breathing difficult.
150 ppm	For 10 minutes or less causes coughing; eye, nose and throat irritation; headache; nausea and vomiting. Longer exposure can cause permanent eye damage and potentially fatal delayed pulmonary oedema
90 ppm	For 40 minutes has caused moderate irritation to the eyes and mucous membranes and potentially fatal delayed pulmonary oedema. The delay may be up to 70 hours when symptoms of cyanosis (turning blue), shortness of breath, restlessness, headache and frothy yellow or brown sputum appear. If untreated, fluids or froth can flood the lungs (i.e. drowning) or can be infected by viruses or bacteria resulting in bronchitis or pneumonia which may be fatal to a weakened patient.
50 ppm	Moderately irritating to the eyes and mucous membranes within 10 minutes and long exposure can cause permanent eye damage.
4-5 ppm:	For 15 minutes will cause increased airway reactivity (constriction of airways), airway resistance (more effort needed to breathe), and decreased diffusion of gases in the lungs
4 ppm	For 10 minutes anaesthetises the nose so it can no longer smell
0.1 ppm	For 2 hours can result in increased airway reactivity for asthmatics or people with chronic bronchitis.

Symptoms of nitrogen dioxide exposure [Ref 1]

Nitric Oxide (NO)

NO is a colourless gas, with a slightly irritating odour. It is slightly soluble in water and forms nitrous and nitric acid. Mild exposure can cause shortness of breath, coughing and chest pains, but more severe exposure (above 100 ppm) can lead to pulmonary oedema, cyanosis, or respiratory failure [Ref 8].

The TWA is 25 ppm (31 mg/m³), and 100 ppm is IDLH (immediately dangerous to life or health).

Concentration	Symptoms
~ 8,000 ppm (0.8%)	Sudden unconsciousness followed by death in 1 minute by chemical asphyxiation. Higher concentrations may be fatal in less time
~ 3,000 ppm (0.3%)	Dizziness or drowsiness in minutes quickly followed by unconsciousness and death in 5 Minutes
~ 1,600 ppm	Muscular tremors, loss of coordination, faster breathing, faster heart rate, drowsiness, dizziness, excess salivation and vomiting may occur in 5 minutes with unconsciousness in 10 minutes and death in 15 minutes
~ 400 ppm	First symptoms, similar to 1,600 ppm above, appear within 2 hours when Methemoglobin concentration reaches 30-40%. Vomiting may cease and unconsciousness may occur within 3 hours. Still has the potential to be fatal if Methemoglobin concentration of blood reaches 70- 90%
0.3 – 0.9 ppm	Pungent odour

Symptoms of nitric oxide exposure [Ref 1]

Carbon Monoxide (CO)

CO is a colourless, odourless and tasteless gas. It is readily absorbed through the lungs, where it displaces oxygen in blood through the formation of CO-haemoglobin, leading to headache, fatigue, dizziness, drowsiness and nausea. Large amounts of CO can lead to rapid loss of consciousness and death.

Atmospheric CO (ppm)	CO-Hb in Blood (%)	Symptoms
1950	80	Rapidly fatal.
800-1220	60-70	Unconsciousness; intermittent convulsions; respiratory failure; death if exposure is prolonged.
350-520	40-50	Headache; confusion; collapse; fainting upon exertion.
220	30	Decided headache; irritability; easy fatigability; disturbed judgment; possible dizziness; dimness of vision.
120	20	Shortness of breath with moderate exertion; occasional headache with throbbing in the temples.
70	10	Shortness of breath upon vigorous exertion; possible tightness across the forehead.

Symptoms of carbon monoxide exposure. The table gives the levels of COHb in the blood which tend to form at equilibrium with various concentrations of CO in the air and the clinical effects observed [Ref 10].

The TWA is 30 ppm (34 mg/m³). Short-term excursions should never exceed 400 ppm [Ref 12].

Sulphur Dioxide (SO_2)

SO_2 is a colourless gas with a characteristic pungent and irritating odour. It is a severe irritant of the eyes, mucous membranes and skin, due to the rapid formation of sulphurous acid on contact with moist membranes. High concentrations can cause respiratory paralysis or pulmonary oedema.

Concentration	Symptoms
80 – 100 ppm	May cause an increased incidence of nasopharyngitis, shortness of breath on exertion (dyspnea), and chronic fatigue
10 – 50 ppm	For 5 to 15 minutes: irritation of the eyes, nose and throat; rhinorrhea (discharge of thin nasal mucus), choking, cough, and in some instances reflex broncoconstriction with increase pulmonary resistance.
10 ppm	Upper respiratory irritation; nose bleeds
5 ppm	Coughing after 5 minutes
3 ppm	Odour threshold
0.3 – 1 ppm	Detectable by taste

Symptoms of sulphur dioxide exposure [Ref 15]

The STEL for SO_2 is 5 ppm (13 mg/m³), TWA is 2 ppm (5.2 mg/m³), and 100 ppm is considered IDLH (immediately dangerous to life or health) [Ref 15].

Hydrogen Sulphide (H_2S)

H_2S is a colourless gas with a strong 'rotten egg' odour. It is irritating to the eyes and the respiratory tract, and may cause effects on the central nervous system. Inhalation may lead to pulmonary oedema, and as with NO_2, the effects may be delayed by several hours.

Concentration	Symptoms
400 – 700 ppm	Loss of consciousness and possible death after 30 – 60 minutes
50 – 200 ppm	Severe respiratory tract irritation; eye irritation
100 ppm	Loss of sense of smell due to olfactory fatigue
20 ppm	Neurological effects including memory loss and dizziness
5 – 10 ppm	Minor metabolic effects
2 ppm	Bronchial restriction in some asthmatics
0.008 ppm	Odour threshold

Symptoms of hydrogen sulphide exposure [Ref 16, 17]

The STEL for H_2S is 15 ppm (21 mg/m³), TWA is 10 ppm (14 mg/m³), and 100 ppm is considered IDLH (immediately dangerous to life or health).

APPENDIX 4 - INFORMATION FOR TREATING MEDICAL STAFF

Those exposed to NOx gases should seek immediate medical treatment and consideration should be given to placing those exposed under observation for at least 24 hours after exposure.

To assist medical staff the following guide should be provided.

Advice to Medical Staff in the Treatment of Those Who Have Been Exposed to NOx Gases.

The patient may have been exposed to NOx. This is a gas usually produced on mines after the use of explosives. NOx consists of multiple combinations of nitrogen and oxygen (N2O, NO, NO2, N2O4, N2O3, N2O5). Nitrogen dioxide (NO2) is the principle hazardous nitrous gas. NOx irritates the eyes and mucous membranes primarily by dissolving on contact with moisture and forming a mixture of nitric and nitrous acids. But this is not the only mechanism by which injury may occur. Inhalation results in both respiratory tract irritation and pulmonary oedema. High level exposure can cause methhaemoglobinaemia. Some people, particularly asthmatics, can experience significant broncospasm at very low concentrations.

The following effects are commonly encountered after NOx exposure:

ACUTE

• Cough

• Shortness of breath

• Irritations of the mucous membranes of the eyes, nose and throat

SHORT TERM

• Pulmonary oedema which may be delayed for up to 4-12 hours

MEDIUM TERM

• R.A.D.S. (Reactive Airways Dysfunction Syndrome

• In rare cases bronchiolitis obliterans which may take from 2-6 weeks to appear

LONG TERM

• Chronic respiratory insufficiency

High level exposure particularly associated with methhaemoglobinaemia can cause chest pain, cyanosis, and shortness of breath, tachapnea, and tachycardia. Deaths have been reported after exposure and are usually delayed. Even non-irritant concentrations of NOx may cause pulmonary oedema. Symptoms of pulmonary oedema often don’t become manifest until a few hours after exposure and are aggravated by physical effort. Prior to transfer to you the patient should have been advised to rest and if any respiratory symptoms were present should have been administered oxygen. The patient will need to be treated symptomatically but as a base line it is suggested that the following investigations are required:

• Spirometry

• Chest x-ray

• Methheamoglobin estimation

Because of the risk of delayed onset pulmonary edema it is recommended that as a precaution the patient be observed for up to 12 hours. As no specific antidote for NOx exists, symptoms will have to be treated on their merits.

References

AEISG, 2011, *Code of Practice – Prevention and Management of Blast Generated NO_x Gases in Surface Blasting*, Edition 2, August 2011.

Environmental Procedure ATT09-02-11

Environmental Procedure EP9.2

HVO-10-ENVMP-SITE-E6-004 Hunter Valley Operations Blast Management Plan

HVO-10-PMHMP-SITE-002 Explosives Principal Mining Hazard Management Plan

HVO-10-WI-MINE-049 Closing Public Roads

HVO-10-WI-MINE-013 Preparing Bench and Access Roads for Drilling & Blasting Activities

HVO-10-WI-MINE-052 Dealing with Misfires

HVO-10-WI-MINE-088 Blasting activity in elevated temperatures (Hot excessive holes) or reactive ground

HVO-10-WI-MINE-090 Explosives Storage Stock Control

HVO-10-WI-MINE-043 Securing, Demarcating and Accessing Blast Areas

HVO-10-WI-MINE-052 Dealing with Misfires

HVO-10-WI-MINE-051 Tying and Firing a Shot

HVO-10-WI-MINE-045 Priming, Loading and Stemming Blast Holes

HVO-10-WI-MINE-110 Removing Stemming Material and or Explosives from a Blast Hole

HVO-10-WI-MINE-089 Drilling and Blasting Activity in Gaseous Areas

HVO-10-WI-MINE-092 Filming a Blast

HVO-10-WI-MINE-036 Measuring (Dipping) and Dewatering Blast Holes

HVO-14-ENVMP-SITE-057 Hunter Valley Operations Pollution Incident Response Management Plan

Coal Australia, Mine Operations Improvement - Blast Fume Management Guidelines

Orica Mining Services, 2010, *Orica Product Selection Guide October 2010*, Orica Australia Pty Ltd.

Queensland Government, 2011, *Queensland Guidance Note QGN 20 v2 Management of oxides of nitrogen in open cut blasting*. Department of Employment, Economic Development and Innovation, Queensland.

Safe Work Australia, Exposure Standard for Carbon Monoxide, http://hsis.ascc.gov.au/DocumentationES.aspx?ID=111

US National Institute for Occupational Safety and Health (NIOSH), *Pocket Guide to Chemical Hazards – Nitrogen Dioxide*, http://www.cdc.gov/niosh/npg/npgd0454.html

US National Institute for Occupational Safety and Health (NIOSH), *Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs)*, http://www.cdc.gov/niosh/idlh/idlhintr.html

US National Institute for Occupational Safety and Health (NIOSH) and US Occupational Safety and Health Administration, *Occupational Safety and Health Guideline for Sulfur Dioxide*, 1978, http://www.cdc.gov/niosh/docs/81-123/pdfs/0575.pdf

US Occupational Safety & Health Administration, *Nitric Oxide in Workplace Atmospheres* (ID190), http://www.osha.gov/dts/sltc/methods/inorganic/id190/id190.html US Occupational Safety & Health

Administration, *Nitric Dioxide in Workplace Atmospheres* (ID182), http://www.osha.gov/dts/sltc/methods/inorganic/id182/id182.html

US Occupational Safety & Health Administration, *Carbon Monoxide in Workplace Atmospheres*, http://www.osha.gov/dts/sltc/methods/inorganic/id209/id209.html

National Occupational Health and Safety Commission, *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment*, (NOHSC:1003), Australian Government Publishing Service, Canberra, 1995.

APPENDIX C: ROAD CLOSURE MANAGEMENT PLANS

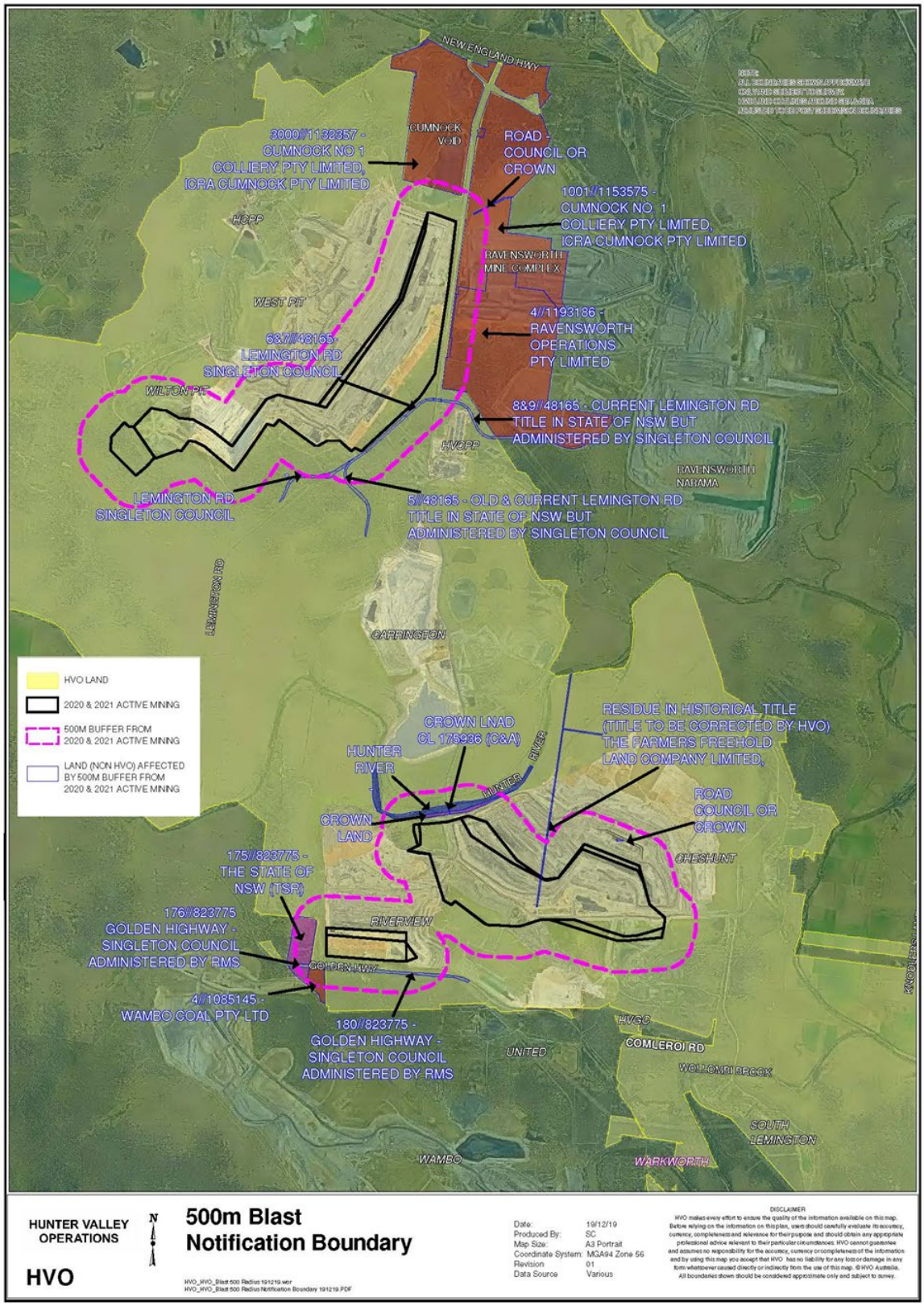
Road Closure Mgt Plan Lemington Road

https://author.hvo.net/_layouts/15/WopiFrame.aspx?sourcedoc=%7BCFA6138C-3970-4B1D-8037-348625E948A2%7D&file=HVO%20Road%20Closure%20Management%20Plan%20Lemington%20Road.docx&action=default&DefaultItemOpen=1

Golden Highway

https://author.hvo.net/_layouts/15/WopiFrame.aspx?sourcedoc=%7BFB37B623-1581-4288-8F16-1181C42D36CE%7D&file=HVO%20Road%20Closure%20Management%20Plan%20Golden%20Hwy.docx&action=default&DefaultItemOpen=1

APPENDIX D: 500M BLAST ZONE – LAND OWNERSHIP



APPENDIX E: CONSULTATION WITH THE EPA

YANCOAL AUSTRALIA LTD
OFFICE: Level 26, 363 George Street Sydney NSW 2000
PHONE: +61 2 8583 5300
FAX: +61 2 8583 5399
EMAIL: info@yancoal.com.au
WEBSITE: www.yancoalaustralia.com.au
ABN 82 111 859 119

26 March 2018

Environmental Protection Authority NSW
PO Box 448G
NEWCASTLE NSW 2300

ATTN: Mark Hartwell

Dear Mark

RE: Hunter Valley Operations – EPA Consultation on Noise, Air Quality, Blasting and Water Management Plans

We refer to relevant conditions in contemporary Approvals granted under the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), requiring Hunter Valley Operations to consult with the EPA during development of Environmental Management Plans for Noise, Air Quality and Greenhouse Gas, Blasting, and Water.

We note that the EPA has previously advised (including letter from the EPA to Hunter Valley Operations, reference DOC14/115042, EF13/2793), that "*the…EPA encourages the development of such plans…* [the] *EPA does not review these documents as our role is…not to be directly involved in the development of strategies to achieve those objectives*".

We therefore write seeking confirmation on whether EPA still maintains this position and no longer requires to be consulted on the drafting of such plans for Hunter Valley Operations.

We would be grateful if you could please advise of the EPA's position in this regard by 5 April 2018.

We look forward to hearing from you.

Yours sincerely

Andrew Speechly
Manager Environment & Community
Yancoal – Hunter Valley Operations

NSW EPA

DOC18/180487-02, EF16/2461

Hunter Valley Operations
PO Box 267
SINGLETON NSW 2330

18 June 2018

Attention: Dominic Brown

Dear Mr Brown

HUNTER VALLEY (HVO) MANAGEMENT PLAN CONSULATION

Reference is made to your email dated 26 March 2018 to the Environment Protection Authority ("EPA") in relation to *Hunter Valley Operations Management Plan Consultation*.

The EPA encourages the development of such plans to ensure that proponents have met their statutory obligations and designated environmental objectives. However, the EPA does not review these documents, nor provide input to these documents as our role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives.

The EPA does not require HVO to consult with it regarding the development of plans required under planning consents. The EPA provides its recommended conditions of approval to the Department of Planning and Environment during the development assessment and approvals process.

If you wish to discuss the matter further please contact Natasha Ryan on 02 4908 6833.

Yours sincerely

MARK HARTWELL
Head Regional Operations Unit - Hunter
Environment Protection Authority

APPENDIX F: APPROVAL OF THE MANAGEMENT PLAN

NSW GOVERNMENT | Planning & Environment

Resource Assessments
Planning Services
Contact: Melissa Anderson
Phone: 8275 1392
Email: Melissa.anderson@planning.nsw.gov.au

Mr Dominic Brown
Environment and Community Coordinator
Hunter Valley Operations
PO Box 315
SINGLETON NSW 2330
Dominic.Brown@hvo.com.au

Dear Mr Brown

Hunter Valley Operations (DA 450-10-2003 and MP 06_0261)
Approval of Blast Management Plan

I refer to your email of 28 March 2019 submitting version 3.3 of the Hunter Valley Operations (HVO) Blast Management Plan (Plan) for approval, as required under condition 19 of Schedule 3 of HVO North (DA 450-10-2003) and condition 18 of Schedule 3 of HVO South (MP 06_0261).

The Department has reviewed the Plan and finds that it meets the requirements of both development approvals.

Consequently, the Secretary approves the Plan. Please place the final (untracked) version of the Plan on the HVO project's website at your earliest convenience.

Should you have any enquiries in relation to this matter, please contact Melissa Anderson at the details above.

Yours sincerely

JEvans 3/4/2019

Jessie Evans
A/Director
Resource Assessments
as nominee of the Secretary

Department of Planning, Housing and Infrastructure

NSW GOVERNMENT

Our ref: MP06_0261-PA-175

Environment and Community Team
HV Operations Pty Ltd
1011 Lemington Road
Lemington, NSW, 2330

26/08/2025

Subject: Revised Blast Management Plan – HVO South (MP06_0261)

I refer to your submission dated 11 August 2025 requesting approval of the revised Blast Management Plan (Version 4.0, dated 18 August 2025) submitted to meet the requirements of Schedule 3, condition 18 of MP06_0261 and Schedule 3, condition 19 of DA450-10-2003.

The Department has carefully reviewed the document and is satisfied that it has been updated to reflect the 2024 Annual Review dated 31 March 2025 and the approval of HVO North Mod 8 granted 24 April 2025.

The Department also notes that given the nature of the updates that consultation with public authorities listed in Schedule 3, condition 18 of MP06_0261 is not required, per Schedule 5, condition 1C of MP06_0261.

Accordingly, as nominee of the Planning Secretary, I approve the revised Blast Management Plan (Version 4.0, dated 18 August 2025) under Schedule 3, condition 18 of MP06_0261.

You are reminded that if there are any inconsistencies between the Plan and the conditions of approval, the conditions prevail. Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Kiera Plumridge at kiera.plumridge@dpie.nsw.gov.au.

Yours sincerely,

Jack Turner
Team Leader
Resource Assessments

As nominee of the Planning Secretary