

# Statements of Agreed Opinions and Facts

## Whittlesea Planning Scheme Amendment C241wsea: Shenstone Park PSP - Vibration/Airblast Conclave

Date: 9<sup>th</sup> November 2020

Time: 3.30pm – 5.00pm

### Introduction

Planning Panels Victoria (PPV) directed to organise a conclave relevant to vibration/airblast impacts relevant to the Whittlesea Planning Scheme Amendment C241wsea: Shenstone Park PSP. PPV has required the following nominated experts to participate in the conclave to discuss vibration and airblast issues relating to the proposed quarries:

- Jim Antonopoulos (SLR)
- Valeri Lenchine (GHD)
- Tim Marks (Marshall Day Acoustics (MDA))
- Adrian Moore (Terrock Consulting Engineers)
- Peter Ramsay (Peter J Ramsay & Associates)

The conclave was conducted across MS Teams. This statement highlights points of agreement and disagreement between the experts.

It is noted that the agreement of the conclave is not a requirement, disagreement may remain between experts after the conclave.

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**1. Applicable limits for:**

1.1. Overpressure

It was agreed that 115 dBL due to overpressure from blast operations is an appropriate criterion. It is noted that this criterion should apply to 95% of blasts within a 12 month period as enforced by Environmental Resource Regulation (ERR), which is the relevant regulation applicable in Victoria. Higher limits would apply to commercial and industrial uses.

1.2. Vibration

It was agreed that 5 mm/s PPV (peak particle velocity for 95% of blasts) is an appropriate criterion for ground vibration from blasting to sensitive receivers. Valeri Lenchine noted that previous GHD reports have nominated a 2 mm/s PPV criterion as a long-term goal as per ANZEC guidelines, however 5 mm/s ( for 95 % of blasts) is considered more appropriate at Shenstone Park. Higher limits would apply to commercial and industrial uses.

1.3. Fly rock

It is recognised that:

- There is no quantitative assessment or specific criteria for management of fly rock from blasting activities within the state regulations and guidelines.
- It is understood that ERR policy has been introduced to ensure that rocks are not permitted beyond the Work Authority boundary. If fly rock is thrown beyond the boundary then an enquiry can be initiated, and the shot firer’s permit can be withdrawn or the shot firer can be disqualified for a period..
- Responsible Authority (ERR) places onus on a shot firer to determine exclusion zones.
- Exclusion zones can extend beyond the extraction boundary.
- Superseded regulations were more specific as for fly rock control.

1.4. Note on operational vibration

It was agreed that the vibration impact from typical (non-blasting) quarrying operations will not extend beyond the Work Authority boundaries at each quarry and it is therefore not required to define buffers around quarries from quarrying equipment. It is agreed that adopting ground vibration and air blast overpressure guidance from AS 2187.2 2006 is a reasonable target, and there is a need to consider the particular requirements of individual operators or asset holders.

It is recognised that:

- DIN, British and NSW standards or guidelines have no statutory power in Victoria but are often referenced for use as Guidelines. Local authorities can enforce their own rules however it is agreed that this will not be important for defining buffer distances.
- AS 2187.2 2006 defines a 25 mm/s PPV ground vibration criterion and 125 dBL air blast overpressure limit for occupied industrial or commercial uses, unless agreed with an operator for a higher/lower criterion. These limits are also quoted in the ERR guidelines.

## 2. Buffer zones:

### 2.1. Reference for buffer zones

Jim Antonopoulos, Adrian Moore and Peter Ramsay agree that relevant buffer zones should be measured from the nearest blasting works or extraction areas. The reasoning is that the separation distance for a sensitive use should be measured from the activity area of the quarry, not the Works Authority boundary. This is in accordance with EPA guidelines for separation distances in EPA Publication 1518. The proposed extraction area is sometimes approximately 20 m inside the Work Authority boundary but maybe hundreds of meters.

It was agreed by Tim Marks and Valeri Lenchine that the relevant buffers should be measured from the Works Authority boundary at each quarry for simplicity. The 20 m offset does not represent a significant variation to the proposed buffer zones.

It is recognised that:

- Tim Marks and Valeri Lenchine consider that defining buffers based on a Works Authority boundary eliminates complications related to actual boundaries of the extraction zones that may vary during lifetime of the quarries. Adrian Moore, Peter Ramsay and Jim Antonopoulos do not agree and buffer should be measured from the extraction boundary.
- In this situation, the proposed extraction area has been provided by the quarry operator, Barro. It is straightforward to measure buffers recommended due to impacts from the extraction activity from the proposed extraction.
- Instrument of control is observance with blast overpressure and vibration limits. It is up to quarry management and the authorized shot firer to design blasts and the extraction sequence so that they comply with those limits defined by the Works Authority.

### 2.2. Overpressure

Jim Antonopoulos, Tim Marks, Adrian Moore and Peter Ramsay agree that a 500 m amenity buffer would be sufficient to comply with the 115 dBL criterion. Val Lenchine disagrees, stating that there may be other more appropriate buffer estimates.

It is noted that:

- EPA guideline 1518 are not based on overpressure or ground vibration so does not take precedence. The EPA guidelines is for amenity impacts due to dust and odour only, where the recommended buffer is 500 m to address all those issues.
- The only person to calculate actual levels of overpressure with charge size information that was provided by Barro Group was Adrian Moore.
- Compliance with blast related ground vibration limits would not present any challenges to the quarry.
- It is generally accepted by the quarry/mining industry that a 500 m buffer is sufficient for compliance with air blast overpressure and ground vibration limits defined by ERR guidelines. Onsite analysis of air blast overpressure would not be particularly useful due to the distance to sensitive receivers.
- Correct design of the blast can lead to compliance with 115 dBL at 500 m. The onus is on the quarry to implement blast practices within quarry that will determine and control vibration levels
- Would be preferable for Phillips quarry for blasts to be directed towards the west Quarry managerial practices will define compliance with criteria.

### 2.3. Vibration

It was agreed that a 500 m buffer is appropriate for compliance with 5 mm/s PPV vibration criteria, when using the site constants defined in Adrian Moore's report.

It was noted that:

- Ground vibration buffer will likely be less than 500 m given that charge sizes are less than 100 kg.
- The density and character of the rock, and wave speeds will play a large part in defining the site constants and therefore the buffer size.

### 2.4. Fly rock

It was agreed that a 200 m fly rock buffer is appropriate provided it can move along with the blast position. Adrian Moore disagrees with this point.

It was noted that:

- ERR does not enforce a fly rock buffer.
- Onus is on shot firer to modify blasting practice so as to prevent rocks being thrown beyond the boundary of the Work Authority.

### 2.5. Blast restricted zone at the southern boundary (WWTP)

It was agreed that the appropriate vibration criteria for the blast restricted zone in Woody Hill should be controlled by the WWTP operator as it is their infrastructure.

It is noted that:

- The separation distance is approximately 50 m.
- Adrian Moore's report indicated that the blast restricted zone is necessary for personal exclusion and this recommendation is based on 100 mm/s criterion as a non-damaging level for concrete and structures.
- Valeri Lenchine and Tim Marks disagree with the assessment that a blast restricted zone is not necessary as there is no indication whether the Wastewater Treatment Plant (WWTP) will be constructed from concrete or other materials.
- Tim Marks notes that the buffer or restricted zone requirements should be "reverse engineered" based on WWTP owner requirements.

### 2.6. Pipes and buried structures

It is agreed that buffers for sensitive underground assets should be defined on the basis of meeting certain criteria introduced by asset owners. APA is the pipeline operator in this case.

It is noted that:

- GHD used certain criterion in their assessment, however not clear whether these criteria were specified by the operator of the pipeline.
- Tim Marks noted that 20 mm/s was proposed by GHD but it is not clear if this criterion was proposed or agreed to by APA, but this should be confirmed by reference to APA.

Recommendations on buffers for PSP. It was agreed that separate buffers for blast vibration

and air blast overpressure are not required - in this case the most conservative (or largest) buffer should apply.

A buffer distance of 500 m to sensitive land use is recommended by Jim Antonopoulos, Tim Marks, Adrian Moore and Peter Ramsay.

Jim Antonopoulos, Adrian Moore, and Peter Ramsay consider that the buffer should be measured from the proposed extraction boundary, Valeri Lenchine and Tim Marks consider that it should be measured from the Works Authority boundary.

It is noted that:

- Operational vibration from typical equipment and truck movement is extremely unlikely to impact the amenity of nearby sensitive receivers.

### 3. Buffer restrictions/recommendations for developments:

#### 3.1. Within the fly rock buffer

There may be potential for non-sensitive infrastructure, such as for selective commercial or industrial uses, to be developed within the 200 m fly rock buffer with the proviso that all personnel have evacuated the area prior to blasting. Valeri Lenchine, and Tim Marks disagree with the allowance of any commercial or industrial developments within the fly rock buffer based on safety rationales.

#### 3.2. Between fly rock buffer and vibration/ overpressure buffer

It is agreed that there may be potential for non-sensitive land uses between the fly rock buffer and vibration/over pressure buffer, such as commercial and industrial infrastructure development. Consideration should be given to other assets such as pipelines that will be part of future projects or infrastructure. Additional vibration restrictions may be introduced to the quarry operations based on vibration specification applicable to these assets.

It is noted that:

- There is land within the PSP that will be used for public open spaces.
- Both the WWTP and underground assets (pipelines) could force edge of extraction boundary and lead to a change of buffer requirements. For example, if the WWTP sets a vibration limit of 25 mm/s PPV that may require a different buffer between extraction zone of Woody Hill quarry.

#### 3.3. Beyond vibration/overpressure buffer

The conclave doesn't recommend specific conditions for sensitive use developments beyond sensitive uses buffer.

**Signed by**



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Jim Antonopoulos (SLR)



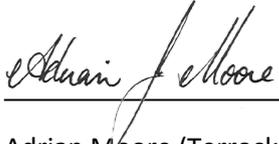
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Valeri Lenchine (GHD)



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Tim Marks (Marshall Day Acoustics)



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Adrian Moore (Terrock Consulting Engineers)



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Peter Ramsay (Peter J Ramsay & Associates)