



SOUTH YARRA (EASTERN PORTAL) PRECINCT

COMMUNITY REFERENCE GROUP

8 SEPTEMBER 2020



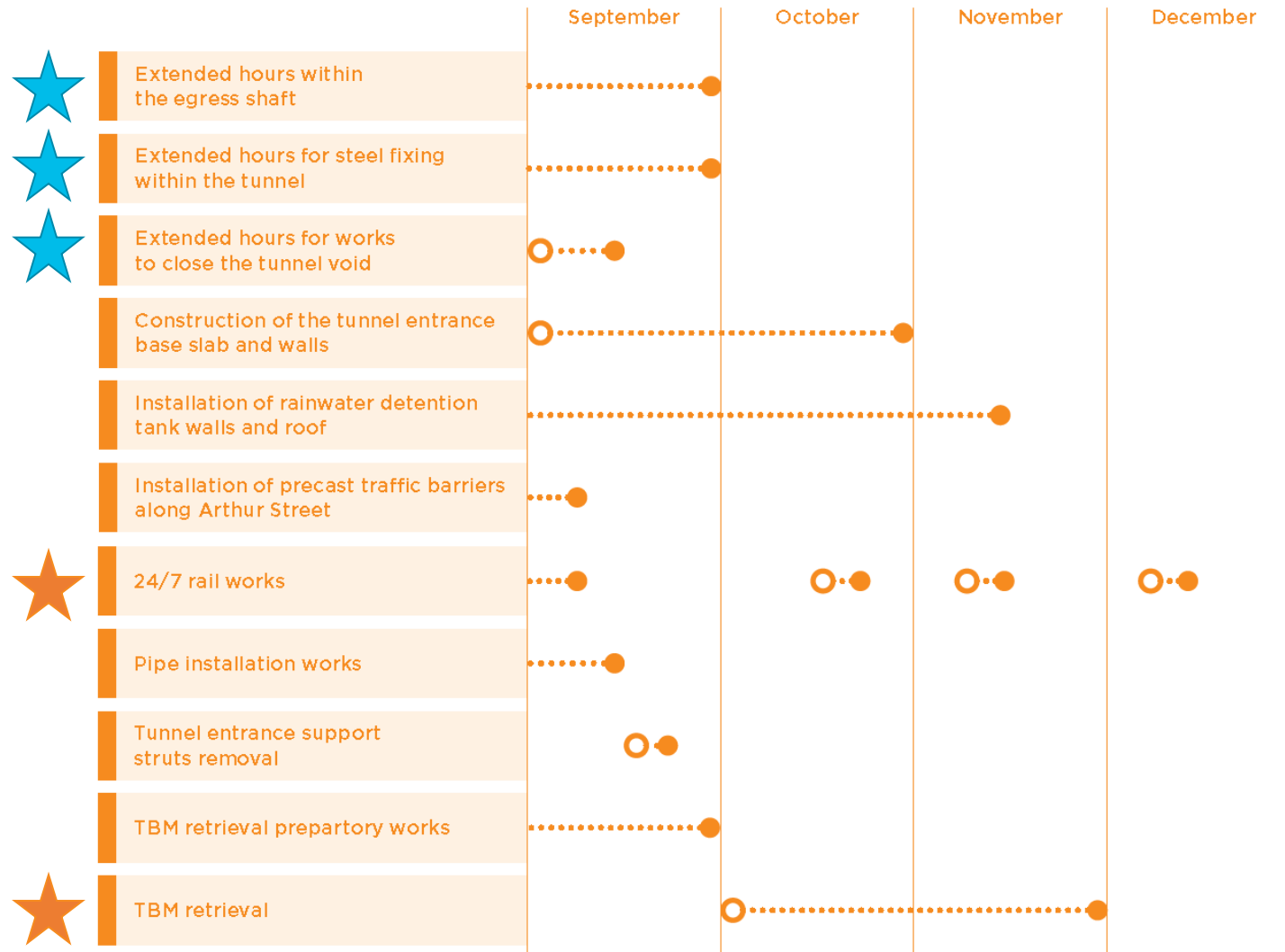
- Construction is continuing on the Metro Tunnel Project
- The health and safety of the community and our workers is our key priority
- **Due to stage 4 restrictions, we are temporarily moving all community engagement and resident notifications online**
- We have strict protocols in place to protect the safety of our construction workforce and the community, including:
 - enhanced industrial cleaning arrangements
 - provision of personal protective equipment
 - measures to reduce staff contact to reduce contact between the workforce
 - RIA is running two pre-starts between 6am and 7am to ensure social distancing.






PROGRAM

CONSTRUCTION LOOKAHEAD FOR 2020



 Around the clock Monday to Friday and from 7am to 3pm on Saturday

 24/7

CONSTRUCTION PROGRESS

RIA



PROGRESS UPDATE

CYP



TBM RETRIEVAL SHAFT PROGRESS UPDATE



TBM RETRIEVAL SHAFT UPCOMING WORKS



- Construction of two stub tunnels in the western wall of the retrieval shaft is nearing completion
- The eastbound stub tunnel is complete, ready for TBM Millie's breakthrough
- The westbound stub tunnel is approximately two weeks from completion
- The tunnelling team are in the final stages of excavation and shotcrete



The eastbound stub tunnel in August



TUNNELLING UPDATE

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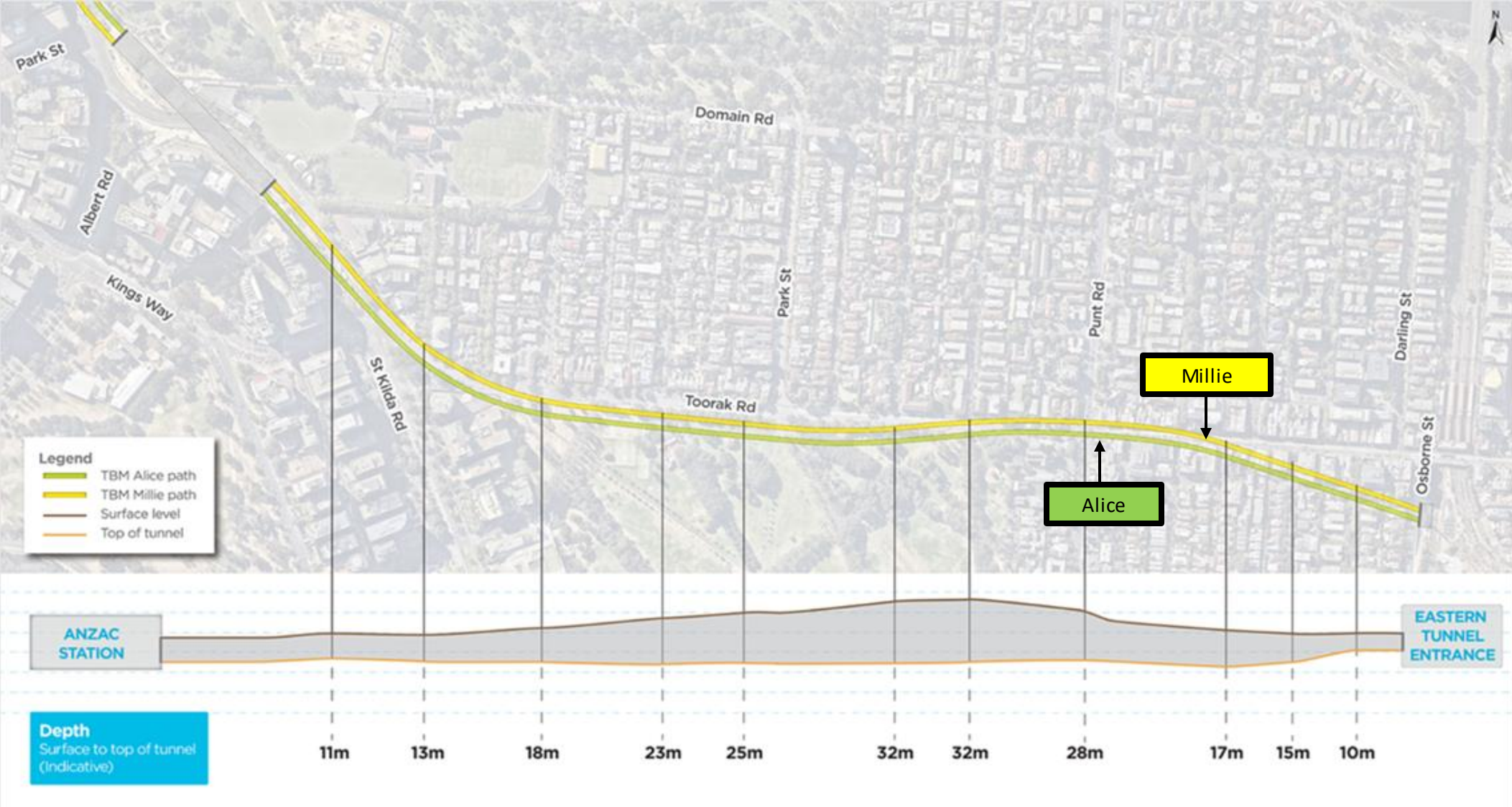


- Both TBMs are expected to complete their journey from Domain to South Yarra in late September/early October
- Millie will break through the western wall of the retrieval shaft first, completing the eastbound tunnel
- Alice will arrive approximately two weeks later



Alice & the westbound tunnel

CURRENT TBM LOCATIONS





TBM RETRIEVAL

TBM DISASSEMBLY

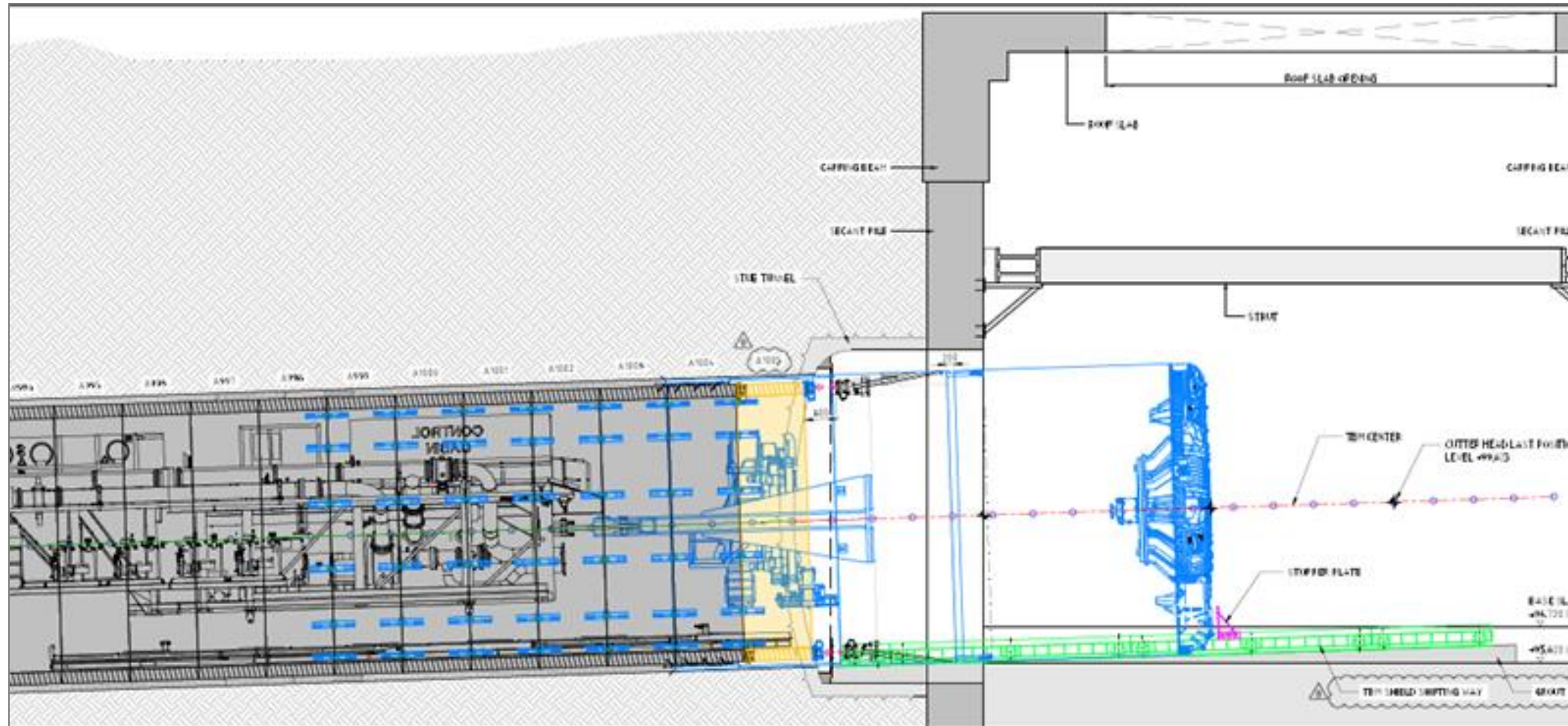


- Once the TBMs have broken through into the retrieval shaft in Osborne Street, we will begin 24/7 works in the underground shaft to disassemble the TBMs
- The TBM is disassembled in the retrieval shaft before the gantry crane is used to bring the individual parts to the surface
- TBM parts will be loaded onto trucks at surface level primarily during the day to minimise above-ground works overnight
- The loaded trucks will then be driven off site overnight after 1am.



TBM Millie inside the Anzac Station box

TBM EXTRACTION



Each TBM will break through the stub tunnel before being disassembled and extracted using the gantry crane

TBM TRANSPORT



An over height TBM part at the Anzac Station site in early 2020

TBM TRANSPORT

- A total of 20 oversized transports will take place over 15 nights between Osborne Street and the Anzac Station site
 - 14 TBM parts will be transported back to the Anzac Station site via Toorak Road and St Kilda Road
 - 6 TBM parts are classified as over height deliveries and cannot travel underneath tram lines on Toorak Road. Over height deliveries will travel via Darling Street, Alexandra Avenue, Linlithgow Avenue and St Kilda Road
- All deliveries require the temporary closure of Osborne Street. Over height deliveries require the temporary closure of Toorak Road for up to one hour, between 12am – 6am, to raise tram lines
- 16 TBM parts will be pulled back through the completed tunnel, due to their smaller size

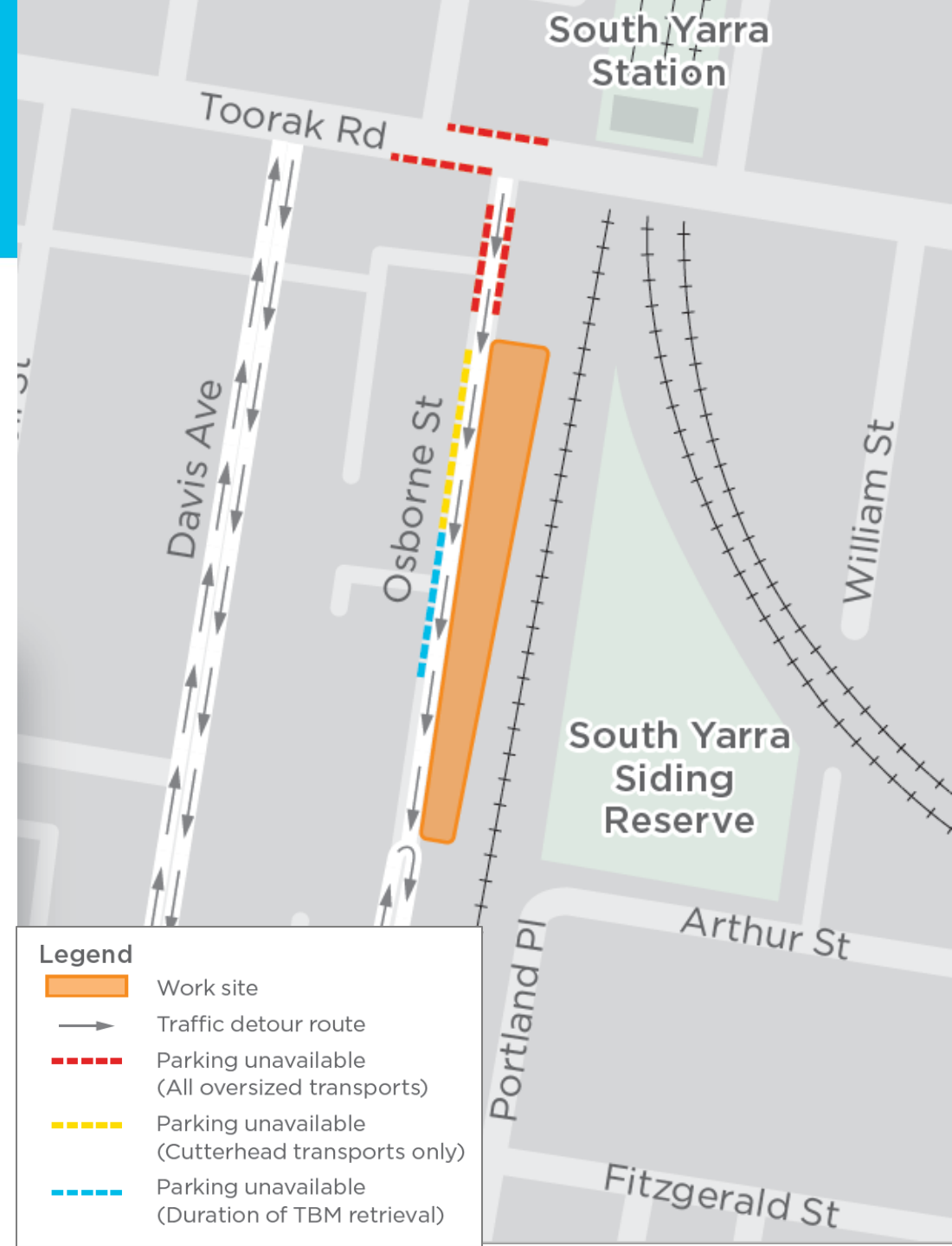


Indicative only

PARKING IMPACTS

- Parking restrictions will be in place on Osborne Street and Toorak Road during TBM retrieval
- **BLUE** = Unavailable for the duration of TBM retrieval process, to allow truck movements in/out of site
- **RED** = Unavailable the day prior to all oversized transports, to allow trucks carrying parts to manoeuvre out of Osborne St/Toorak Rd (Reinstated the following morning – assuming no transport the following night)
- **YELLOW** = Unavailable the day prior to the transport of two TBM cutterheads, due to their width. (Reinstated the following morning)
- Notification will be provided regarding temporary removal of parking
- For updates on the anticipated removal dates, visit:

www.metrotunnel.vic.gov.au/construction/south-yarra/transport-changes-in-south-yarra



TUNNELLING NOISE AND VIBRATION

TBM Ground-borne Noise and Vibration Model Process

1. Model for potential noise and vibration exceedances;
2. Validate in stages (Domain to South Yarra; Domain to City) - attended monitoring
3. Update model with attended monitoring data

Consultation will be progressively undertaken with potentially affected residents prior to TBM arrival.

NV8 – Vibration Guideline Targets for Structures (PPV)

- External vibration targets for infrastructure to ensure the integrity is not affected by construction generated vibration

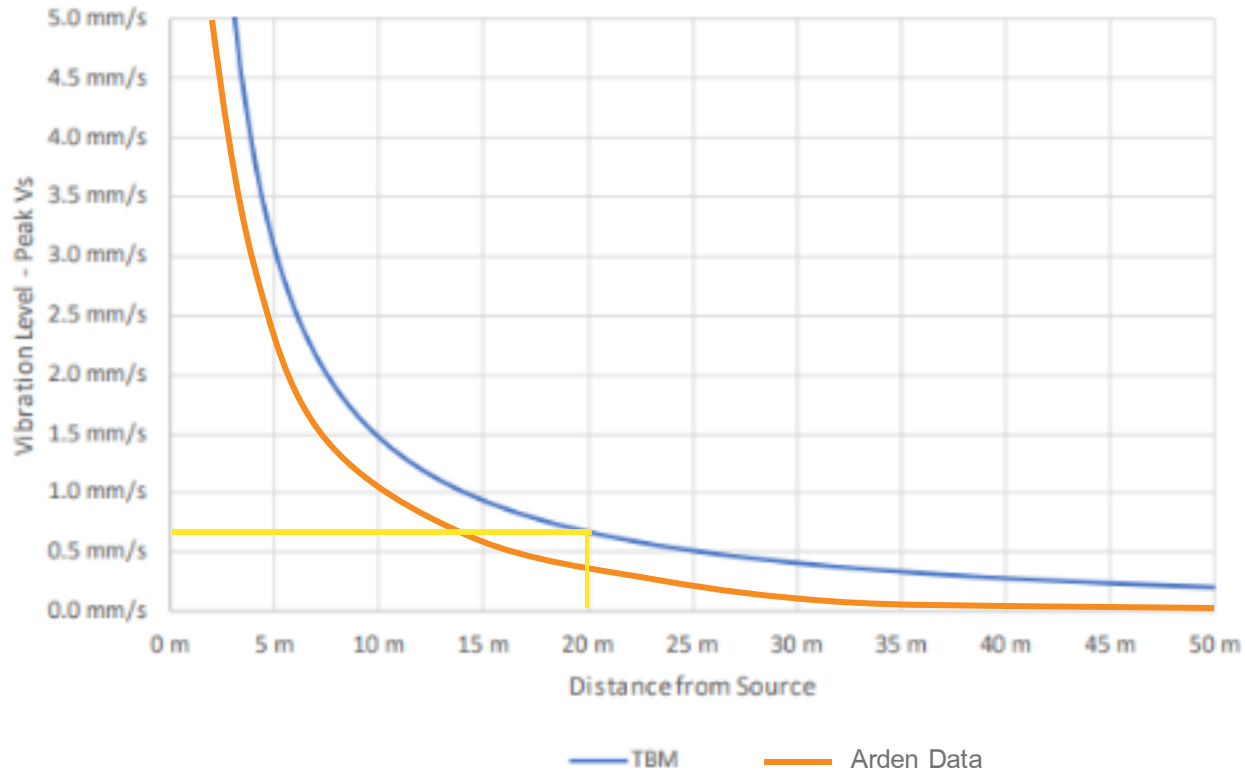
NV11 – Vibration Dose Values (VDVs) Human Comfort

- Vibration dose values that are appropriate for the protection of personal amenity

NV13 - Ground-borne (Internal) Noise Guidelines for Amenity

- Regenerated noise, or ground-borne noise, is an associated effect of the small vibration related displacement that occurs on hard surfaces within buildings.

TBM MODELLING – NV8 VIBRATION (STRUCTURES)



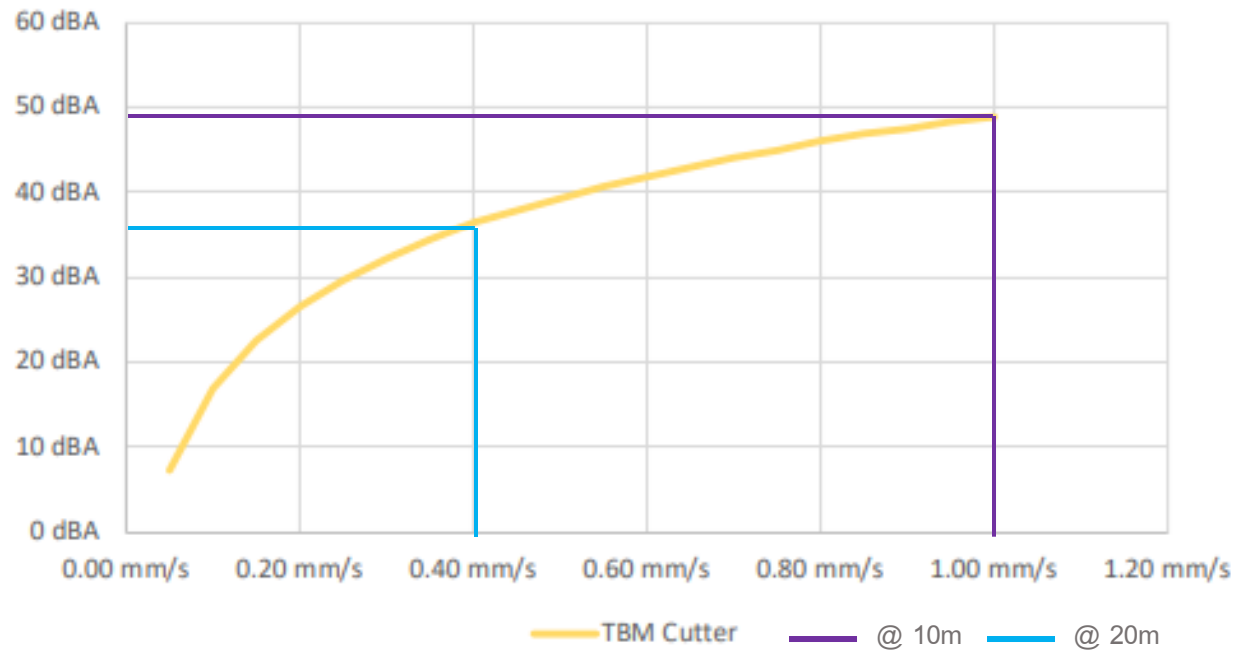
Graph: Estimated level of vibration as a function of distance from the TBM cutter head

EPR NV8 Criteria

Table NV8-1: Short-term vibration on structures

Type of structure	Vibration at the foundation, mm/s (Peak Component Particle Velocity)			Vibration at horizontal plane of highest floor at all frequencies
	1 - 10 Hz	10 - 50 Hz	50 - 100 Hz ¹	mm/s (Peak Component Particle Velocity)
Type 1: Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 - 40	40 - 50	40
Type 2: Dwellings and buildings of similar design and/or occupancy	5	5 - 15	15 - 20	15
Type 3: Structures that have a particular sensitivity to vibration e.g. heritage buildings	3	3 - 8	8 - 10	8

TBM MODELLING – NV13 GROUNDBORNE NOISE

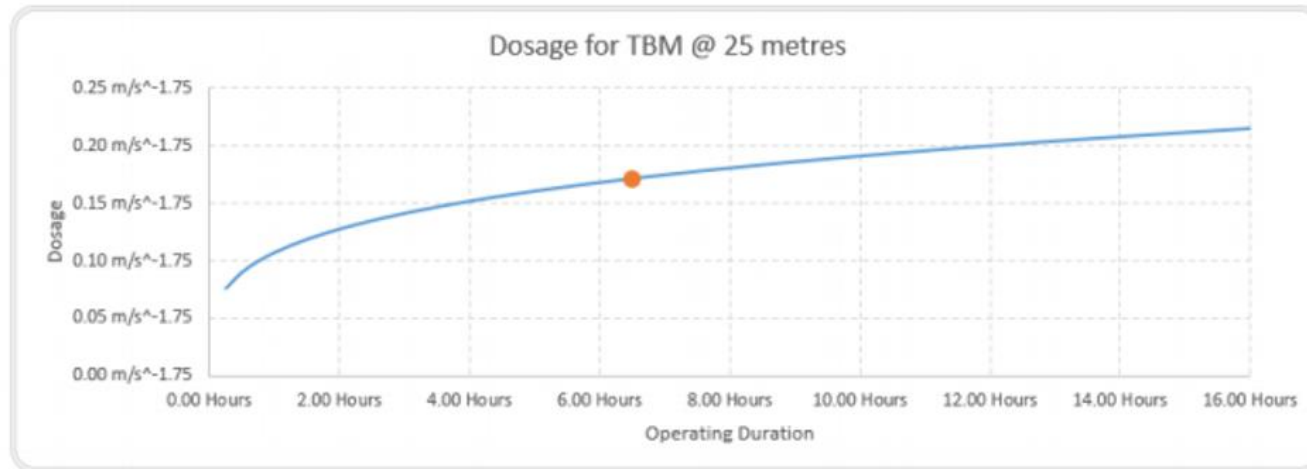


EPR NV13 Criteria

Time Period	Internal $L_{Aeq,15min}$, dB
Evening, 6pm to 10pm	40
Night, 10pm to 7am	35

Graph: Estimated range of ground-borne noise levels depending upon source vibration characteristics

TBM MODELLING – NV11 HUMAN COMFORT (VDV)



Graph: Example of the dosage calculations for estimating dosage based upon the peak vibration level in mm/s and the TBM operating schedule

Location	VDV (m/s ^{1.75})			
	Day 7:00am to 10:00pm		Night 10:00pm to 7:00am	
	Preferred Value	Maximum Value	Preferred Value	Maximum Value
Residences	0.20	0.40	0.10	0.20
Offices, schools, educational institutions, places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

EPR NV11 criteria

EASTERN PORTAL – TBM MODELLING



Building	Max. Vibration (NV8)	Vibration Dose Value (NV11)	Groundborne Noise (NV13)
67 Davis Avenue	0.3mm/s	$<0.1\text{m/s}^{-1.75}$	26.3dBA
135 Osborne Street	0.3mm/s	$<0.1\text{m/s}^{-1.75}$	24.5dBA

Key:
No exceedance predicted
Possible evening criteria exceedance
Possible night-time/evening exceedance

Noise Environmental Performance Requirements (EPRs)

- Construction Noise Vibration Impact Assessment (CNVIA) completed for upcoming TBM retrieval works

NV21 - Residential Impact Mitigation Guidelines (RIMG)

Works are considered 'unavoidable' and subject to RIMG, 10pm – 7am

- Provides airborne noise guidelines based on background noise monitoring
- **Acoustic Treatment:** Exceeds 40 days in any six consecutive months; and
- **Alternative Accommodation:** Exceeds 10 days in any 15 consecutive days; and 40 days in any six consecutive months.

NOISE MODELLING



Building	TBM Retrieval - Night	TBM Disassembly - Night	TBM Retrieval & Disassembly - Night
	Unmitigated predicted noise level dB LAeq(1 hour)		
137 Osborne Street	66 dB	60 dB	67 dB
101 Osborne Street	45 dB	45 dB	55 dB
23 William Street	57 dB	54 dB	59 dB

External noise target dB LAeq(1hr)
Acoustic Treatment: 59dB>
Alternative Accommodation: 65dB>

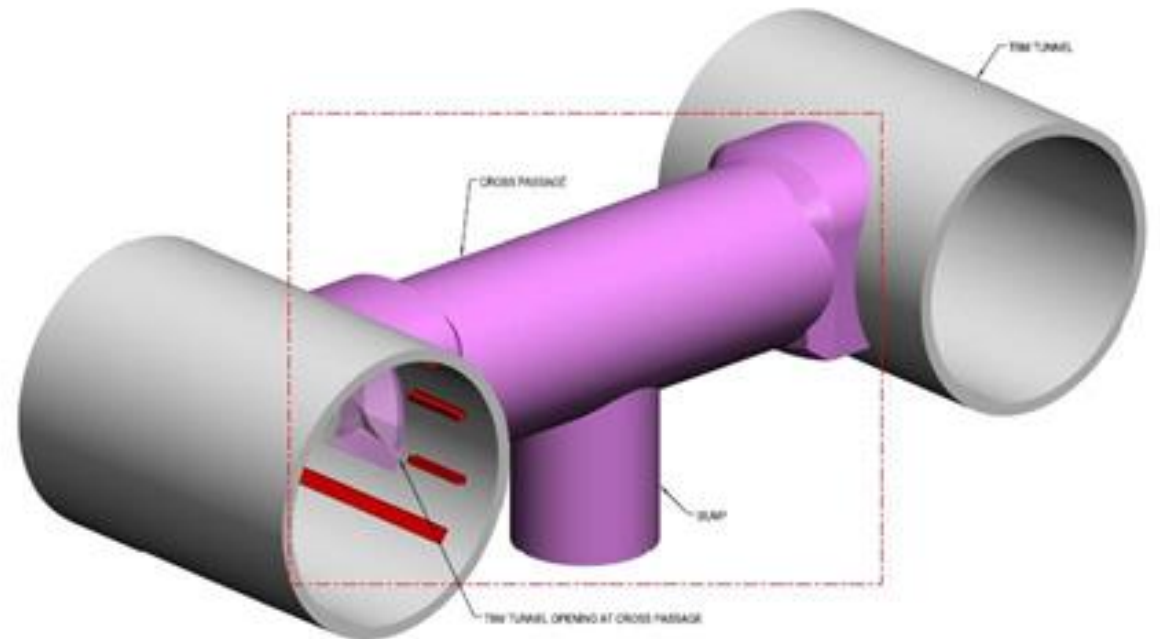
- Noise levels shown are unmitigated
- CYP will be onsite conducting attended and unattended monitoring
- CYP have a system in place to track noise levels and any exceedances

LOOKAHEAD – CROSS PASSAGE CONSTRUCTION

CROSS PASSAGE CONSTRUCTION



- Once TBM retrieval is complete, cross passage excavation will commence
- A cross passage is a short tunnel that connects the two parallel tunnels. These passages are an important safety feature that allow people (including emergency services) to move from one tunnel to the other
- There are 26 cross passages across the Project's tunnel alignment, including six between Anzac Station and the Eastern Portal



CROSS PASSAGE CONSTRUCTION



- Each cross passage opening is 3.1m high and 2.4m wide
- These are excavated traditionally, using a 5-tonne excavator
- Soil will be transported from each cross passage to the Eastern Portal, where it will be loaded onto trucks and removed from the site
- Truck movements (approx. 2 per day) are expected within normal construction hours
- Cross passage construction between Domain and the Eastern Portal is expected to be completed mid-2021



Cross Passage 2, between the Western Portal (Kensington) and the North Melbourne Station (Arden)



COMMUNITY & COMMUNICATIONS UPDATE

COMMUNICATIONS

Recent and upcoming communications



- The September construction update has been sent out to residents and businesses by email – also available online
- **Please encourage your neighbours and networks to sign up for online notifications**
- Up to date information on the oversized transport schedule can be found at metrotunnel.vic.gov.au/construction/south-yarra/transport-changes-in-south-yarra

Communications Equipment Rooms (CER) and Signalling Equipment Rooms (SER) development plan amendment

Ongoing engagement with

- City of Stonnington
- Residents in William and Chambers Streets
- UDAAP
- MTM

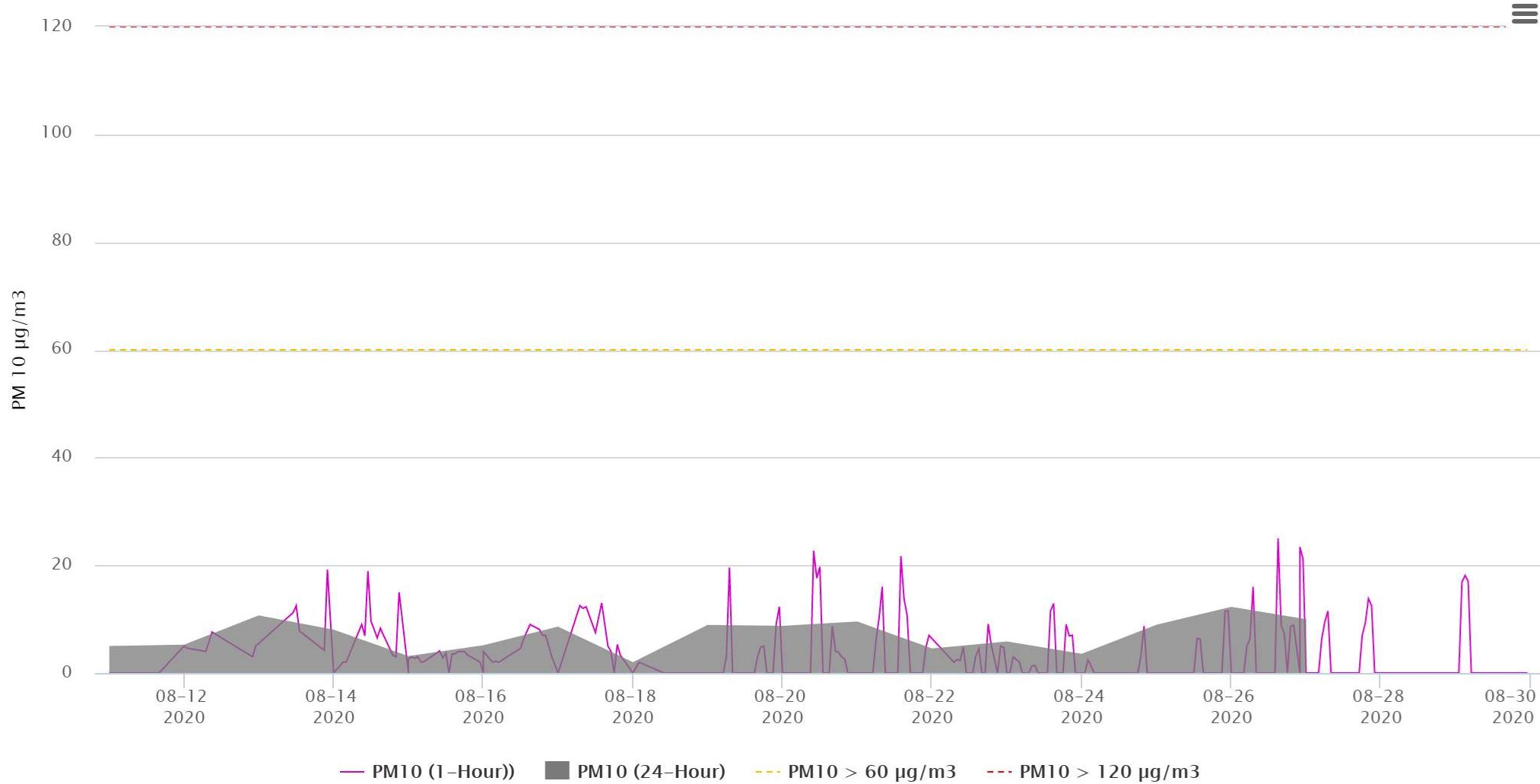
Further updates on process to be provided in October





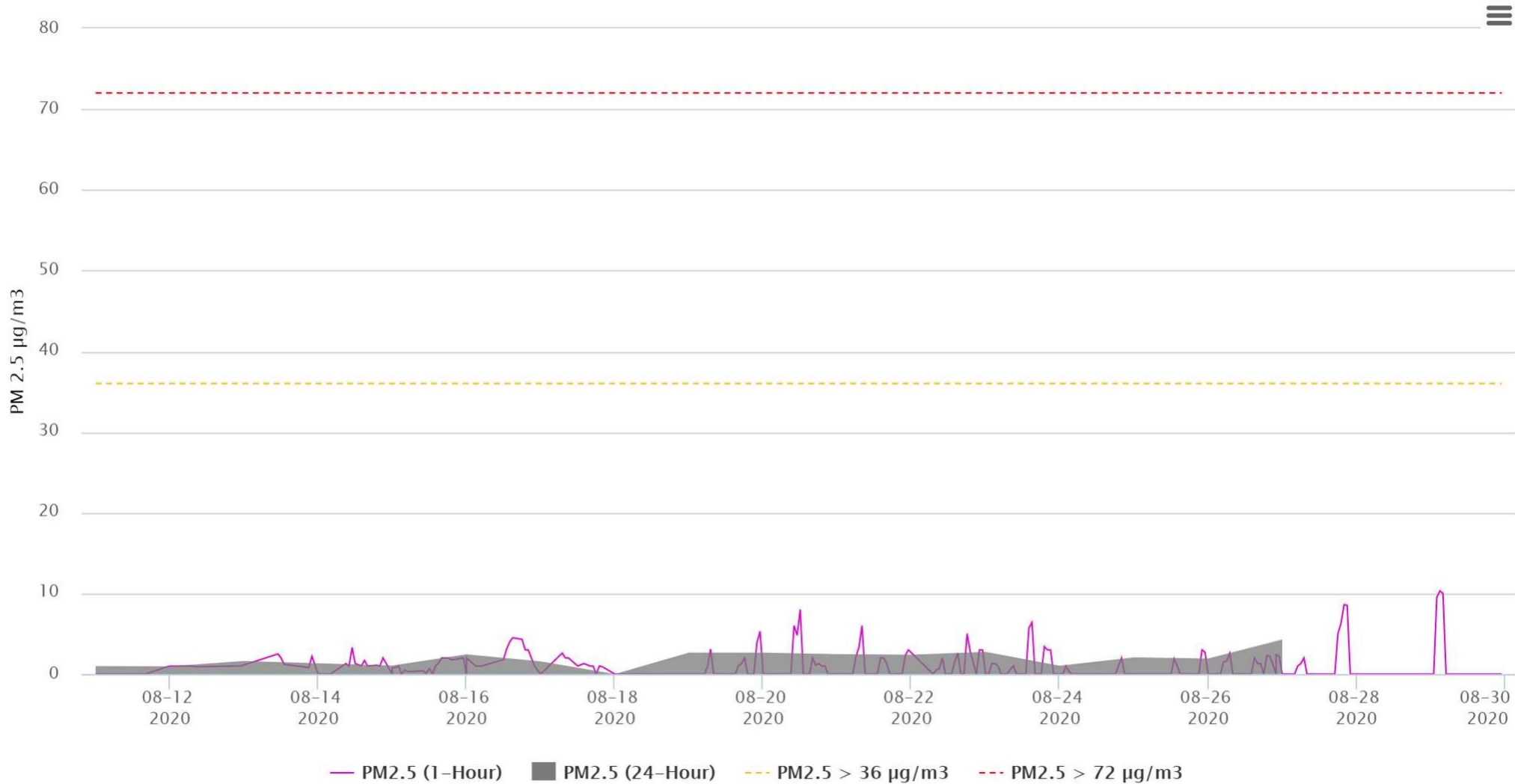
ENVIRONMENTAL MANAGEMENT

AIR QUALITY MONITORING



**William Street
August 2020
PM10**

AIR QUALITY MONITORING

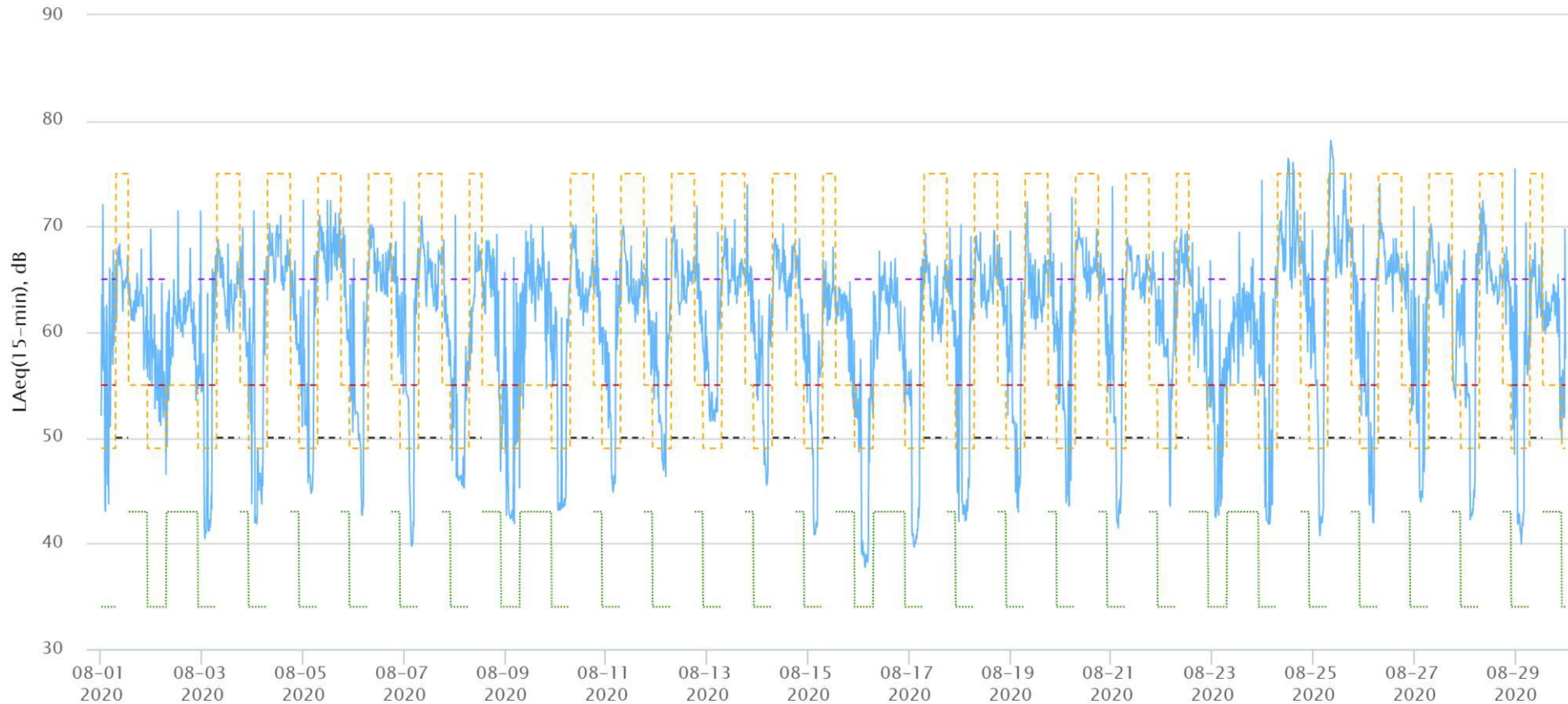


**William Street
August 2020
PM2.5**

NOISE MONITORING



19 William Street, South Yarra: Measured Noise Levels



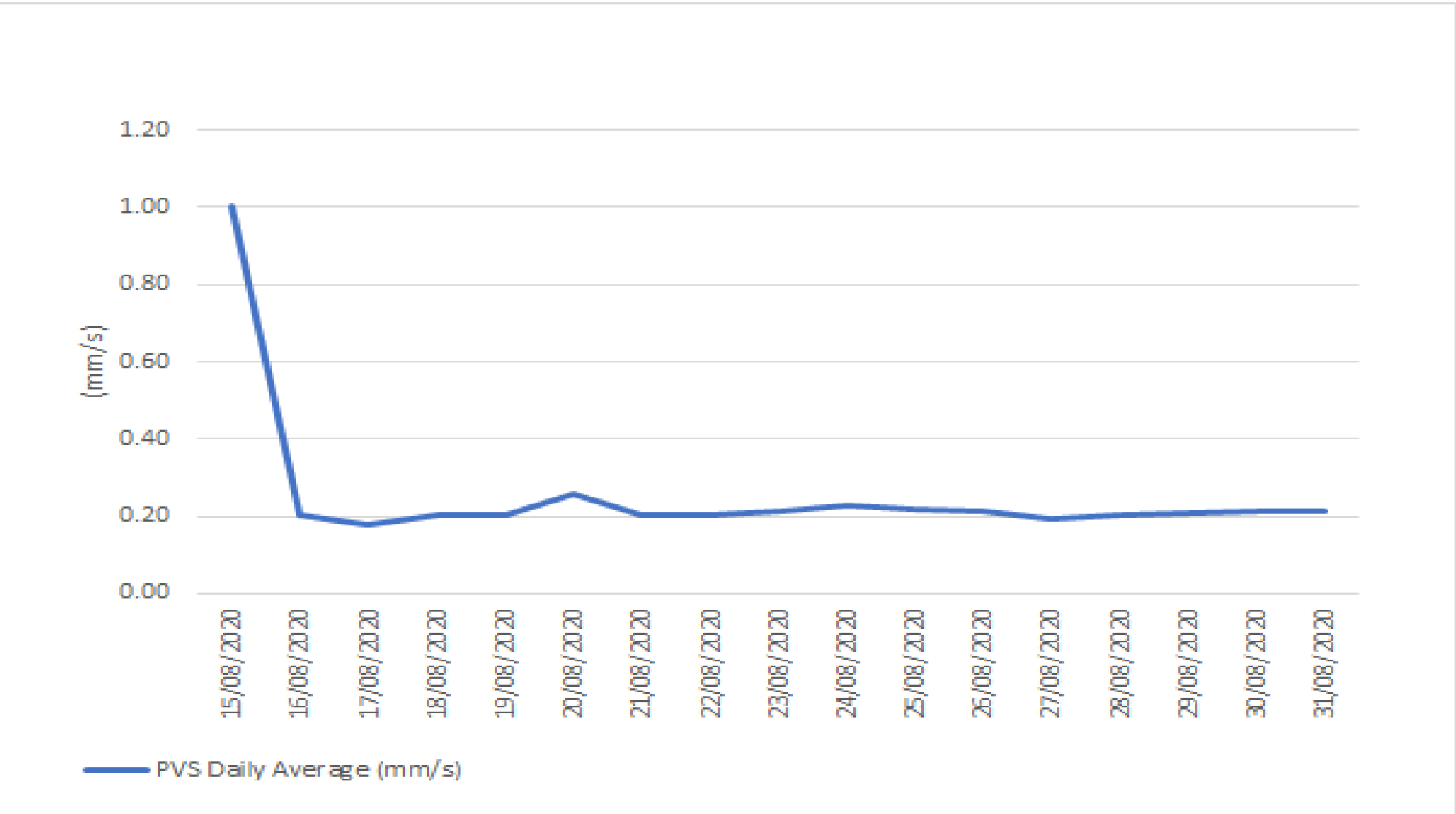
**William Street
August 2020**

- Measured Noise Level [LAeq(15-min)]
- - - NV21 Management Measures Zone 4 (EP)
- - - NV21 Noise Affected Zone 4 (EP)
- - - NV21 RMIG Unavoidable night > 65 dBA
- - - NV21 RMIG Unavoidable night > 55 dBA
- NV6 Evening and Night Zone 4

VIBRATION MONITORING



**Eastern Portal
August 2020**





Questions?