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BEVERIDGE INTERMODAL FREIGHT TERMINAL – OPERATIONAL NOISE CONSIDERATIONS

This document summarises the findings of a preliminary assessment of operational noise considerations associated with the proposed Beveridge Intermodal Freight Terminal (BIFT).

The assessment provides high-level information regarding the following:

- An overview of the site and the potential sources of noise associated with the BIFT
- Existing and proposed noise-sensitive receiver locations
- Characteristics of the existing ambient noise environment
- Applicable noise policies and guidelines
- An overview of the planning and design opportunities available to manage environmental noise levels.

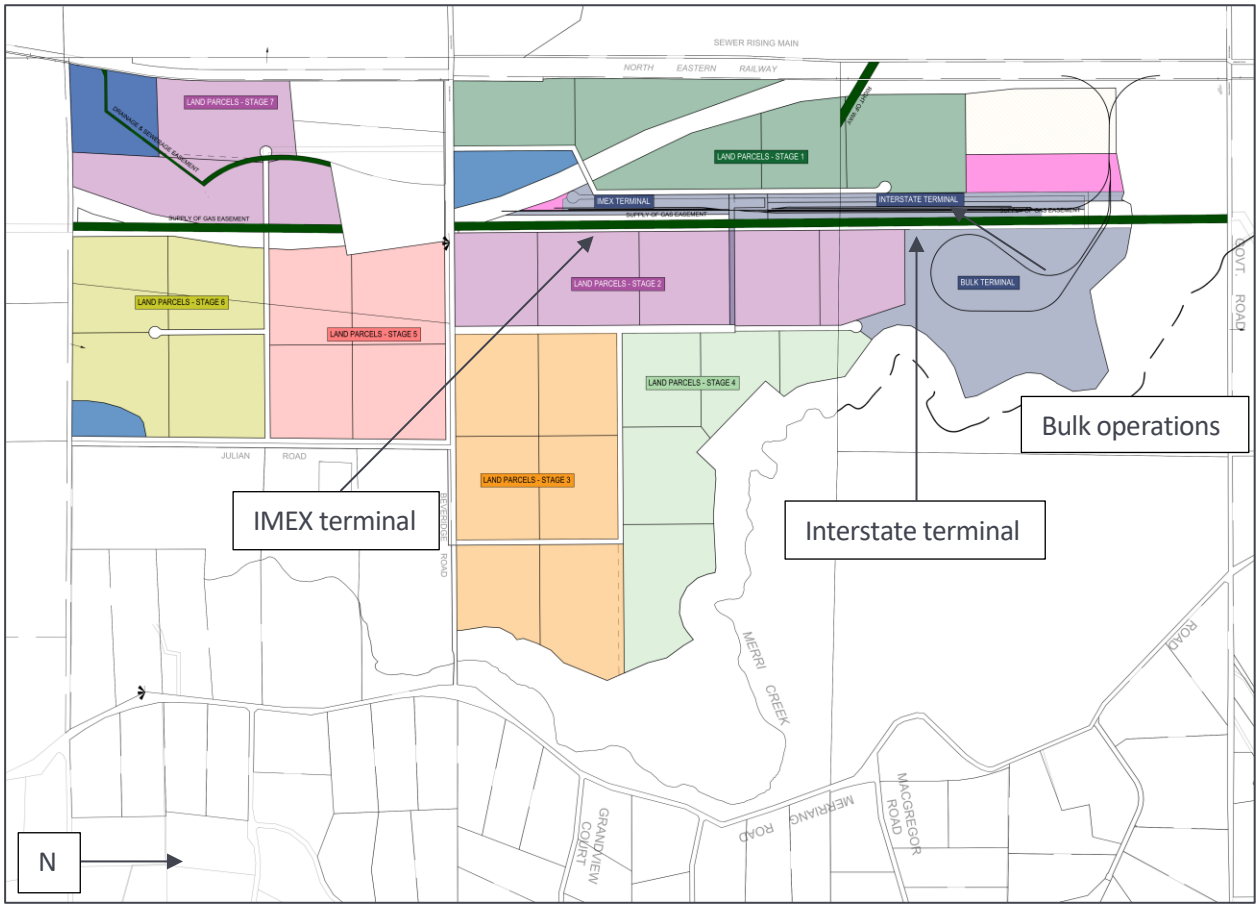
SITE OVERVIEW

The project site comprises approximately 1,100 hectares of land, located east of the Beveridge Township approximately 40 km north of Melbourne CBD.

The master planning for the site continues to evolve and alternative site and operational arrangements are being evaluated, accounting for the findings of a range of specialist studies, including noise. The current version of the preliminary site Master Plan is included as Figure 1 and reflects recent changes to the layout to locate the rail terminals within the site and away from the western boundary; this provides the benefit of increased separation of the rail terminals (a key source of noise at the site) from potential future development sites to the west (discussed subsequently).

The preliminary Master Plan represents an example ultimate design development. However, it is intended that the project would be completed in multiple stages over a period 15 or more years. This is an important point of context to the noise assessment as the ambient noise environment and surrounding land uses are likely to change considerably over this time period.

Figure 1: Preliminary site Master Plan – ultimate design



Presently, background noise levels in the area around the site are generally low, consistent with the low level of existing development in the area. This was confirmed by unattended noise monitoring at the site which has been used to provide a preliminary indication of the range of noise criteria which may apply to the site (discussed in subsequent sections).

Existing noise-sensitive receivers

Aerial photography of the subject site and surrounds indicates a number of existing noise-sensitive dwellings in proximity to the subject site boundary. The nearest receivers to proposed site infrastructure consist of a limited number of dwellings located between 100 and 150 m from the site boundary, to the north of the site and between the northern and southern sections of the site.

In the broader area around the site, the Beveridge township is located approximately 815 m to the west of the subject site and features a number of dwellings. There are also a number of dwellings located along Hadfield and Merriang Roads to the east of the site (near to the site boundary but in excess of 500 m from proposed site infrastructure).

The locations of identified existing dwellings are indicated in Figure 2.

Potential future noise-sensitive receivers

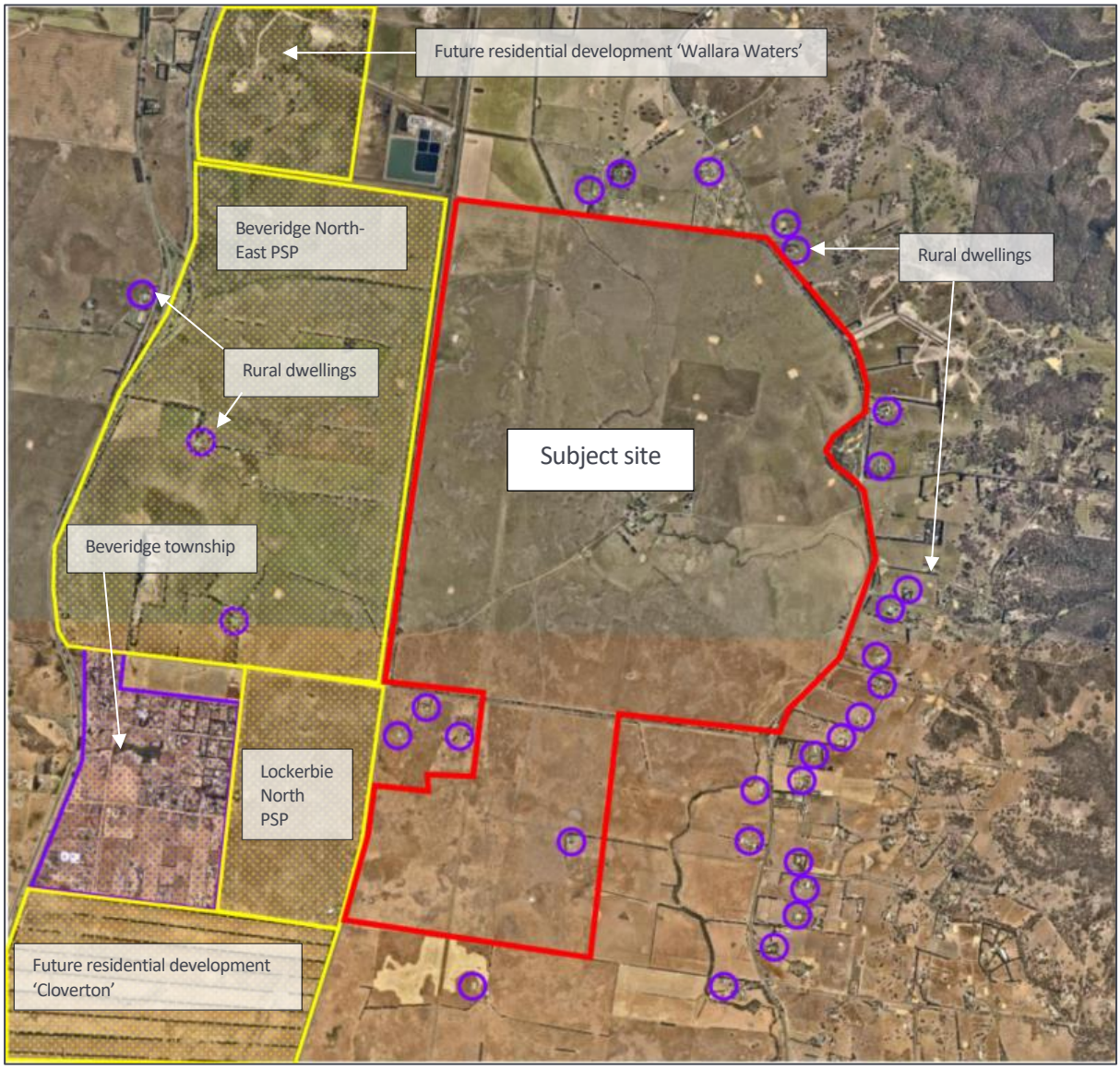
Planned and potential future residential subdivisions in the surrounding area include:

- Wallara Waters, located approximately 700 m to the north west of the subject site
- Cloverton, located immediately adjacent to the south west corner of the subject site
- Lockerbie North Precinct Structure Plan (PSP), located to the immediate west of the subject site
- Beveridge North East PSP, located to the immediate west of the subject site (no details available at this stage regarding the nature of the proposed land uses).

Dwellings do not currently exist on these subdivisions (with the exception of Wallara Waters, which has commenced construction in the northern portion initial stage of the development). It not presently known whether any planning approvals are in place for residential development at these sites. For the purposes of this assessment, consideration has been given to the potential for dwellings to be located within these subdivisions when the BIFT is operational and all planned stages of the project have been developed.

The location of potential future residential subdivisions are also shown on the map included in Figure 2, highlighted in yellow.

Figure 2: Nearest existing and potential noise-sensitive receivers to the subject site



NOISE POLICY & GUIDELINES

On-site operational noise

The current key policy for the assessment of noise from the proposed development is *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* (SEPP N-1)[1]. The policy provides a procedure for determining noise limits which apply to activities on commercial and industrial premises.

The Victorian EPA is scheduled to release updated noise policy documents in the second half of 2021 which will replace SEPP N-1 and other related noise guidelines and policies. The draft documents do not indicate significant changes to the general assessment methodology compared to the existing SEPP N-1 policy. While there are some detailed aspects of the draft proposed changes which may influence the design of potential future sensitive land uses which encroach on the BIFT site, the external noise criteria are expected to be equivalent.

The noise criteria which apply to the project would be dependent on future changes to land use zoning, increases in background noise levels as a result of development in the area and the updated industry noise policies. However, an indication of the potential range of noise limits based on SEPP N-1 is provided Table 1. The lower range of criteria values presented in Table 1 are based on the minimum measured background values, and the existing land zoning for the site (i.e. 100% Type 1 - rural). The higher range of criteria values are based on 'neutral' or typical background levels and land zoning changes representing an increase of industrial-type uses (e.g. 50% Type 3 - industrial).

Table 1: Potential range of SEPP N-1 noise limits, dB L_{eff}

Description	Day	Evening	Night
Preliminary noise criteria range	45 - 59	41 - 52	36 - 47

The levels indicated in Table 1 represent a broad range of criteria and demonstrate that future development at the site and surrounding areas will significantly alter the criteria which applies to the site.

Other noise considerations

In addition to criteria for operational noise associated with activities on the proposed development site, the following additional sources of noise and related guidance documents are noted:

Road traffic noise

Criteria for assessing changes in traffic noise as a result of additional vehicles on the surrounding road network associated with the project are not provided by SEPP N-1 or by any other regulations, legislation, or guidelines in Victoria.

In lieu of Victorian policy, reference is often made to relevant NSW publications for guidance. For the assessment of noise from off-site truck movements, the relevant publication is the NSW Road Noise Policy. While the NSW Road Noise Policy is not strictly applicable in Victoria, the criteria would be used in conjunction with other general assessment references (e.g. sleep disturbance criteria) to inform future assessments of road traffic generated by the development.

[1] The proposed development site is located within, and is bordered by, the SEPP N-1 boundary. Some surrounding locations are located outside of the SEPP N-1 boundary, but are within the Urban Grown Boundary. Under current Victorian policy, the method of determining noise limits at sensitive receivers would also be based on SEPP N-1, irrespective of whether the receivers are located outside the SEPP N-1 boundary area of application.

Rail traffic noise

Criteria for assessing changes in rail traffic noise as a result of additional freight movements on the existing rail network are not defined by Victorian noise policies or guidelines. However, related guidance is contained in the Victorian Department of Transport's document *Passenger Rail Infrastructure Noise Policy* (PRINP). This publication is primarily concerned with assessing noise levels from passenger rail infrastructure, but requires the noise contribution of freight movements on passenger rail lines to be accounted for. This publication, in conjunction with other general assessment methods (e.g. sleep disturbance criteria), would be used to inform future assessments of additional freight movements on the rail line adjoining the development site.

Construction noise

Guidelines and criteria for the noise associated with construction of the development are provided by EPA Publication 1254 *Noise Control Guidelines* (EPA 1254). This document would be referenced to inform future noise assessments of construction noise where warranted (e.g. in relation to a possible future road connection between the site and the Outer Metropolitan Ring Road).

PRELIMINARY NOISE ASSESSMENT

Noise sources

On-site noise sources

The key function of the rail terminals will be the unloading and transfer of containers between trucks and trains. This is likely to be the noisiest aspect of the site's operation and may involve the following types of equipment:

- Diesel locomotives
- Container wagons and bulk wagons
- Reach stackers
- Mobile gantries.

The rail terminals are proposed to ultimately operate 24 hours a day, 365 days a year.

Other noise-generating activities will relate to warehousing facilities, associated material handling and site vehicles. Key sources for these components are likely to include:

- Trucks
- Forklifts
- Conveyers
- Bulldozers.

The sound power levels for the noise sources described above typically range between 105 – 115 dB L_{WA} depending on type of plant and intensity of use, with some noisier activities extending to 120 dB L_{WA}. Note that the sound power levels characterise the emissions of the sources and are distinct from the potential level of noise reaching surrounding locations; the latter would be much lower in value and would depend on factors such as separating distances, built structures (including screening) and atmospheric conditions.

Off-site noise sources

A key aspect of operation of an intermodal terminal is truck and rail freight movements to and from the site. Data from the traffic and transport statement, prepared by GTA Consultants to accompany the EES referral, describes progressive increases in truck and train traffic as the development progresses.

The timing of different project stages is not yet confirmed. However, the first stage of the development approximately corresponds to the first 5 years after opening and is conservatively predicted to generate up to approximately 950 truck movements per day. This estimate increases to approximately 3,100 heavy vehicles per day during the second stage of development (as an indication of timing, approximately 5 to 15 years after opening). Longer term stages may result in up to approximately 9,000 heavy vehicles per day. These truck movement numbers are understood to represent initial upper estimates primarily for master planning. The values are noted to be conservatively high and the actual number of movements are expected to be lower, but will be the subject of further investigation as the design progresses. The development would also involve progressive increases in passenger vehicle movements over time. The staged development of the project would be accompanied by staged upgrades to road infrastructure around the site.

In relation to rail freight movements, current conservative estimates for master planning are based on the development handling an approximate throughput of 400,000 Twenty-foot Equivalent Units (TEU) per annum during the first stage, rising to up to 2 million TEUs per annum in the long term. Actual throughputs are to be assessed in further detail subsequently.

To support the operation of the terminal, truck and rail movements are also proposed to occur 24 hours a day, 365 days a year.

Noise management

A number of important variables will affect noise levels emanating from the site.

As the layout, design and operational profile of the site is evolving, definitive noise modelling and compliance assessments cannot be undertaken at this early stage in the project. However, the potential noise emissions of key elements of the development indicate that layout measures, engineering controls and planning measures will be necessary to manage noise at key interfaces such as that of the rail terminals. Importantly, recognising the strategic significance of the infrastructure proposed at the site, suitable planning measures are likely to include planning controls applied to neighbouring development sites, consistent with the types of measures used in Melbourne for the protection of state and nationally significant freight transport infrastructure.

Noise from off-site sources such as rail freight and truck haulage to and from site will also need to be managed appropriately, particularly during initial development stages when trucks would utilise the existing local road network to the site. Further assessments as the design progresses will involve the evaluation of options for site access routes, as well as the availability of practical noise reduction strategies, where required.

The following sections provide a general discussion of the types of noise mitigation strategies to be assessed as the design and planning of the project evolves.

On-site sources

Table 2: Potential on-site noise mitigation strategies

Site location	Nearest potential noise-sensitive receivers	Potential noise management strategies
Rail terminals	Approximately 1000 m to the nearest existing residence to the north, and approximately 650 m to the nearest existing residences on Beveridge Road. Approximately 600 m to undeveloped land (Beveridge Northeast PSP) to the west on the other side of the rail (significantly increased separation relative to earlier iterations of the site layout) corridor and 950 m to the future Wallara Waters housing estate to the northwest.	*Off-site measures* • Planning controls for any encroaching noise-sensitive land use development *On-site measures* • Strategic layout design to maximise buffers where practical • Acoustic screening by dedicated structures, containers, or warehouse buildings • Selection of low noise emission plant
Bulk Materials	Distances range from 800 – 1,400 m from the nearest existing residences to the north of the site.	Mitigation options will be highly dependent on final layout and format of depot (including type of bulk materials handled), but may include: • Local screening measures (e.g. noise barriers or fences) • Strategic layout design to maximise buffers where practical • Selection of low-noise plant • Equipment-based mitigation packages

Site location	Nearest potential noise-sensitive receivers	Potential noise management strategies
Truck parking	Location is not yet determined.	• Strategic layout design to maximise buffers where practical • Local screening measures (e.g. noise barriers or fences) • Acoustic screening provided by intervening warehouses, containers etc
Tenanted lot (typical logistics warehouse)	Potentially located 100 m from either undeveloped land or existing dwellings	It would be the responsibility of individual warehouse tenants to achieve compliance with the criteria. Consideration will need to be given to cumulative effects due to the combined noise from the terminals and other warehouse uses. An overarching site Noise Management Plan is likely to provide the most effective means of defining individual tenancy obligations that are consistent with the overall cumulative noise limits. Mitigation options may include: • Acoustic screening measures • Nomination of appropriate building envelope for warehouse and/or consideration of the location of any openings in the warehouse building • Managerial controls such as limiting noisier activities to less-sensitive times

Off-site sources

The main consideration with respect to off-site noise sources is truck movements on the existing local network during the initial stages of development and in particular, truck movements to and from the site during the night period.

Freight movements on the rail network during the night will also require consideration, albeit in the context of comparable noise levels which would already occur from existing freight movements on the rail line.

In relation to truck movements, the potential future noise impact is most relevant to a small number of existing receivers along Beveridge Road. In particular, three houses located on the south side of Beveridge Road. Options for controlling noise levels at the source, or the introduction of roadside barriers, are generally limited and impractical to control development-related traffic generation on existing roads. Off-site mitigation measures consisting of treatments applied at receiver locations, whether in the form of localised screening or dwelling treatments, or a combination of the two, are likely to represent the most effective potential treatment options. In general, off-site treatment measures are not usually considered a suitable or practical option, particularly along transport routes with large numbers of residential dwellings located close to the road site. However, considering the low number of dwellings along the existing local road network to the site, in conjunction with the significance of the infrastructure proposed at the site, the viability and effectiveness of offsite measures warrant consideration.

The longer-term strategy for access to the site may involve the construction of a new access route between the site and the Outer Melbourne Ring Road. This would provide the opportunity to divert development traffic from the local road network and away from existing receiver locations. A new access route also provides the opportunity to include dedicated noise screening measures where appropriate.

DISCUSSION

The proposed BIFT represents a significant infrastructure project which inherently involves on-site and offsite noise generating activities.

The key considerations with respect to environmental noise are:

- On-site activities associated with the rail terminals
- Off-site truck movements on the local road network.

Progressive increases in freight movements on the existing rail line will also require consideration.

The preliminary noise assessment indicates that environmental noise will be an important consideration to feed into the master planning and design development of the site. Detailed modelling and compliance assessments will be required as the design and planning of the project progresses. A key objective of this process will be to make the best practical use of layout and building form to address operational and environmental considerations including noise. This will involve detailed modelling and assessments accounting for a range of variables including the site design, projected operational profile, land zoning and evolution of potential surrounding land uses.

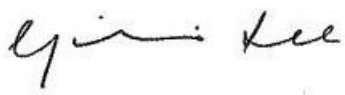
Noise management measures are likely to consist of a combination of design and control measures implemented at the site, as well as offsite planning and targeted mitigation measures. Importantly, recognising the strategic significance of the infrastructure proposed at the site, suitable planning measures are likely to include planning controls applied to neighbouring development sites, consistent with the types of measures used in Melbourne for the protection of state and nationally significant freight transport infrastructure. This is particularly relevant to land associated with the Beveridge North East PSP, to the west of the subject site, which is in the early stages of planning.

The preliminary assessment, and the detailed studies that will be required subsequently, are framed by legislated policy requirements and common assessment standards referenced in Victoria. This assessment framework, and the level of investigation required to address environmental noise, applies irrespective of the selected approval pathway for the project.

We trust the above information is suitable for your immediate purposes. Please do not hesitate to contact us if you have any questions or would like to discuss.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD



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