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SUEZ/VENTIA JOINT VENTURE

890 TAYLORS ROAD DANDENONG SOUTH, VICTORIA

PROPOSED CONTAMINATED SOIL WASHING FACILITY

Assessment of Noise Emission

Prepared for:

Suez/Ventia Joint Venture

C/-

Ricardo Energy, Environment & Planning

Level 4, 3 Bowen Crescent,

Melbourne, Victoria 3004

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EXECUTIVE SUMMARY

Watson Moss Growcott Acoustics (WMG) has undertaken a noise emission assessment for the proposed development of part of the 890 Taylors Rd site to receive and stockpile Category C and Category D soils, and to develop soil washing operations. This new facility will be operated by the Suez/Ventia Joint Venture (SVJV) and will be complementary to the existing thermal treatment facility.

The site will receive and stockpile up to 200,000 tonnes (at any one time) of Cat C and Cat D soils that will be banded and covered. These soils will be progressively processed using a soil washing plant with an adjacent wastewater treatment unit.

Soil washing will include washing, grading and refining waste soils to produce a range of sand, soil and aggregate products. The project will include additional traffic both to deliver soils to site and remove products.

The soil washing process will proceed 24 hours per day. The night period is therefore the most critical for the noise assessment.

The purpose of the assessment has been to assess off-site noise emission from the proposed use in terms of the Environment Protection Act 2017 as amended by the Environment Protection Amendment Act 2018 (The Act) and subordinate legislation, and to determine appropriate noise control measures, if necessary, to achieve compliance with relevant noise limits applicable under the legislation at noise sensitive locations.

This report covers the following aspects:

- Monitoring of existing ambient noise levels at relevant residential locations to establish and confirm background noise levels as part of determining noise targets.
- Determination of noise limits in accordance with EPA Publication 1826.4
- Calculation of resultant noise levels at potentially affected residential locations resulting from the proposed use, using a three-dimensional noise modelling software package
- Consideration of modelled noise levels in terms of noise limits and other guidance under the Act
- Recommendation of appropriate noise control measures where the predicted resultant off-site noise levels exceed the applicable noise limits.

Inspections and ambient noise measurements have indicated that the existing residential area east of the subject site is exposed to a relatively high background level for the residential zoning due to the presence of the Dandenong-Hastings Rd between the subject site and the residential area.

The small number of houses located in the industrial area west of the subject site are currently exposed to a background level that is low relative to the expectations for industrially zoned land.

These factors have been taken into account in determining noise limits in accordance with the Noise Protocol.

Noise modelling based on the proposed operational parameters has established that the resultant noise level at the noise sensitive areas will be well below the noise limits for the day, evening and night periods, by a sufficient margin to provide for compliance with the noise limits with the addition of noise contributions from other industrial, commercial and trade sources.



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1. INTRODUCTION

Watson Moss Growcott Acoustics (WMG) has undertaken a noise emission assessment for the proposed development of part of the 890 Taylors Rd site to receive and stockpile Category C and Category D soils, and to develop soil washing operations. This new facility will be operated by the Suez/Ventia Joint Venture (SVJV) and will be complementary to the existing thermal treatment facility.

The site will receive and stockpile up to 200,000 tonnes (at any one time) of Cat C and Cat D soils that will be banded and covered. These soils will be progressively processed using a soil washing plant with an adjacent wastewater treatment unit.

Soil washing will include washing, grading and refining waste soils to produce a range of sand, soil and aggregate products. The project will include additional traffic both to deliver soils to site and remove products.

The soil washing process will proceed 24 hours per day. The night period is therefore the most critical for the noise assessment.

The purpose of the assessment has been to assess off-site noise emission from the proposed re-development in terms of the Environment Protection Act 2017 as amended by the Environment Protection Amendment Act 2018 (The Act) and subordinate legislation, and to determine appropriate noise control measures, if necessary, to achieve compliance with relevant noise limits applicable under the legislation at noise sensitive locations.

This report covers the following aspects:

- Monitoring and hand-held noise measurements of existing ambient noise levels at locations representative of residential areas potentially affected by noise emission from the proposed use at the subject site.
- Determination of noise limits in accordance with EPA Publication EPA Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol)
- Prediction of noise levels at potentially affected residential locations resulting from the proposed re-developed facility, using a three-dimensional noise modelling software package
- Consideration of predicted noise levels in terms of noise limits and other guidance under the Act
- Recommendation of appropriate noise control measures where the predicted resultant off-site noise levels exceed the applicable noise limits.

This report presents a summary of the assessment, and findings.



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2. NOISE ASSESSMENT TERMINOLOGY

Noise assessment terminology used within this report is defined within Table 1 below.

Table 1: Noise Assessment Terminology

| Terminology | Definition |
|--------------------------------|---|
| dB(A) | Decibels recorded on a sound level meter, which has had its frequency response modified electronically to an international standard, to quantify the average human loudness response to sounds of different character |
| L_{eq} | The equivalent continuous level that would have the same total acoustic energy over the measurement period as the actual varying noise level under consideration. It is the noise measure defined by the EPA as the measure of the noise to use in assessing compliance with noise limits. |
| Sound Power Level (L_w) | The sound power level of a noise source is amount of energy in the form of sound emitted from the source. Therefore, sound power level does not vary with distance from the source or with a different acoustic environment. $L_w = L_p + 10 \log_{10} A$ dB, re: 1pW, (10^{-12} Watts) where A is the measurement surface area (m^2) in a free field. |
| Sound Pressure Level (L_p) | The level of sound measured on a sound level meter and expressed in decibels (dB). Where $L_p = 10 \log_{10} (P_a/P_o)^2$ dB (or $20 \log_{10} (P_a/ P_o)$ dB) where P_a is the rms sound pressure in Pascal and P_o is a reference sound pressure conventionally chosen is $20 \mu Pa$ (20×10^{-6} Pa) for airborne sound. L_p varies with distance from a noise source. |

3. SUBJECT SITE, PROPOSED EXTENSION AND SURROUNDING ENVIRONMENT

The aerial photo shown below in Figure 1 identifies the subject site under consideration and the noise sensitive areas considered relevant for this assessment.



Figure 1: Aerial photo indicating subject site and noise sensitive areas

As indicated in Figure 1, there are noise sensitive areas (houses) in two directions.

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Figure 2 below shows the preliminary layout within the south west corner of the overall site.

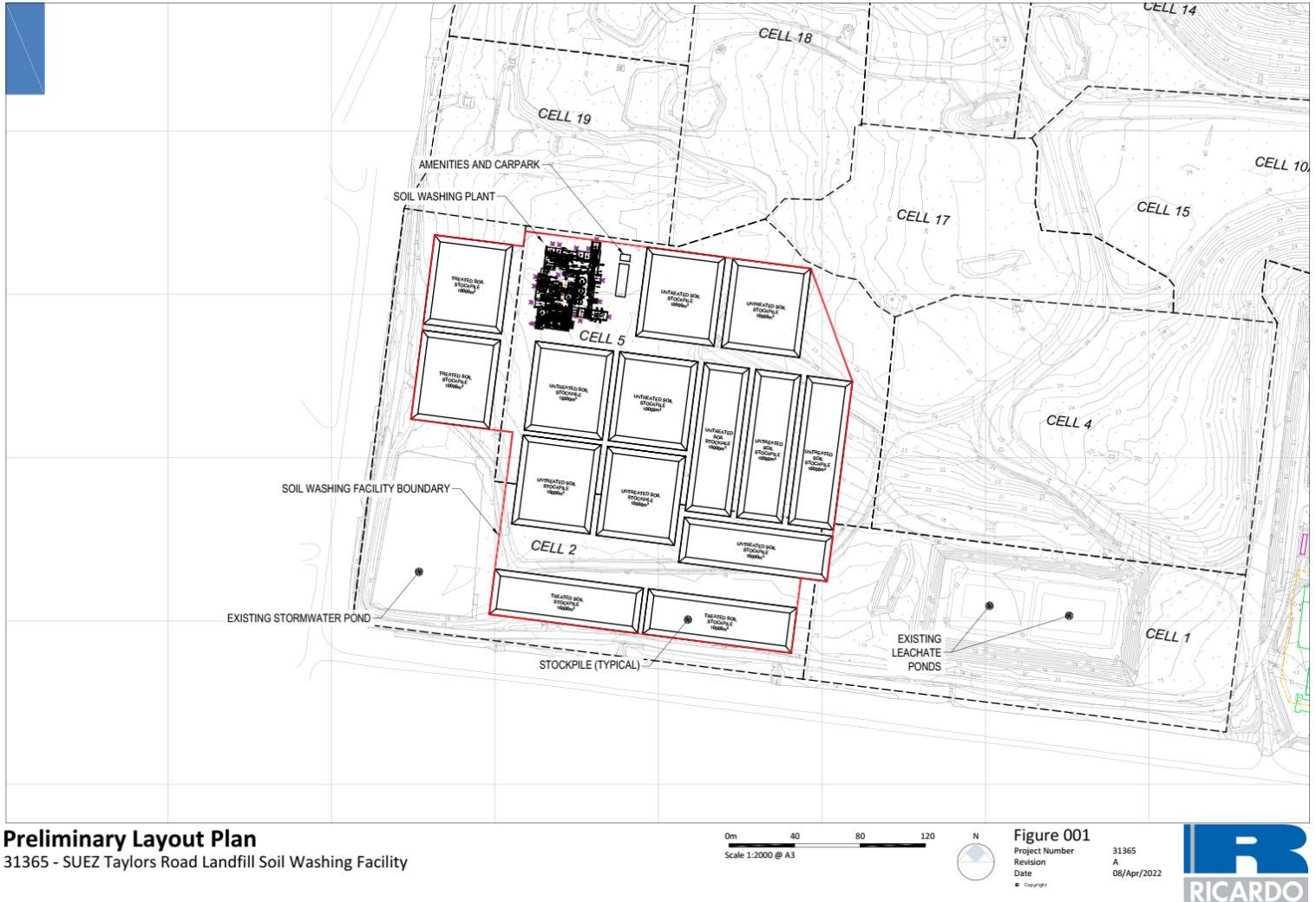


Figure 2: Preliminary layout plan of the proposal in the south west corner of the overall site

4. AMBIENT NOISE MONITORING

The ambient background noise level plays a part in determination of the project noise targets.

Initially, with the focus on the night period, a visit was made to the residential area east of the subject site, east of the Dandenong-Hastings Rd, and Colemans Rd west of the subject site during the night period.

This initial appraisal indicated ambient background noise levels relatively high for the mix of planning scheme zonings east of the site and low for Colemans Rd.

The short-term ambient background noise levels obtained in the residential area east of Dandenong-Hastings Rd were found to be consistent with the ambient background noise levels reported in a Noise Impact Assessment report prepared for Ricardo Energy Environment and Planning by Trinity Consultants Australia, for a Proposed Materials Recycling Facility at 890 Taylors Road, Dandenong South, dated 21 December 2021, Report No. 217402.0027.R01V01.



The background levels in that report measured at or near 33 Astley Wynd, which is considered to be an appropriate location for the monitoring, have therefore been accepted for use in determining the noise targets in that area, with one minor exception. The report adopted the average of the daily averaged L₉₀ dB(A) results obtained under suitable weather conditions as the basis for determining the noise limits, but in accordance with Victorian EPA established practice, the lowest of the daily averaged results has been used in the current assessment.

The monitoring results are tabulated below

Table 2: Noise monitoring results for eastern residential area obtained from Trinity Consultants Australia Report No. 217402.0027.R01V01, 21 Dec 2021

| Day and Date | Average Day, Evening, Night Period Background Level, L ₉₀ dB(A) | | |
|----------------------|--|--|------------------------------------|
| | Day (Mon-Sat, 7:00am to 6:00pm) | Evening (Mon-Sat, 6:00pm to 10:00pm; Sun, Public Holidays 7:00am to 10:00pm) | Night (Mon-Sun, 10:00pm to 7:00am) |
| Monday 22/11/2021 | 53 | 49 | N/A |
| Tuesday 23/11/2021 | 58 | 52 | 45 |
| Wednesday 24/11/2021 | 55 | 50 | 44 |
| Thursday 25/11/2021 | 56 | 52 | 46 |
| Friday 26/11/2021 | Wind | Wind | 47 |
| Saturday 27/11/2021 | Wind | Wind | 44 |
| Sunday 28/11/2021 | 51 | 49 | 47 |
| Average | 55 | 50 | 46 |
| Minimum | 53 (51 on Sun is part of 'evening') | 49 | 44 |

The short-term night noise measurements conducted in Colemans Rd indicated a low background relative to the planning scheme zonings and longer-term monitoring at this location had not previously been conducted, so a noise logger was installed at 100 Colemans Rd, representative of the ambient noise environment at 90 and 110 Colemans where residential dwellings are located within the industrial zone. This is also considered to be reasonably representative of the environment in the vicinity of 845 Taylors Rd.

The following results were obtained.

Table 3: Noise monitoring results obtained at 100 Colemans Rd

| Day and Date | Average Day, Evening, Night Period Background Level, L ₉₀ dB(A) | | |
|--------------|--|---------|-------|
| | Day | Evening | Night |
| Tue 10 May | | 43 | 43 |
| Wed 11 May | 49 | 43 | 42 |
| Thu 12 May | 47 | | |
| Minimum | 47 | 43 | 42 |

These results are low for the 100% industrial nature of the Colemans and Taylors Rd precinct. The surrounding area is predominantly used for warehousing and shipping container storage with intermittent not continuous activity and noise generation. This gives rise to the relatively low background L₉₀ level between noise events.

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The implications of the ambient background levels are discussed in the next section.

5. NOISE EMISSION ASSESSMENT CRITERIA

Noise emissions within the State of Victoria are governed by the legislative framework contained within the Environment Protection Act 2017 as amended by the Environment Protection Amendment Act 2018 (the Act) and subordinate legislation.

The approach within the Act focuses on prevention of pollution impacts rather than managing the impacts after they have occurred and is based on a person or entity's General Environmental Duty (GED) for the protection of human health and the environment from pollution, waste and emissions, including noise.

The GED is explained within Part 3.2 of the Environment Protection Amendment Act 2018 and stipulates that 'a person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable'.

Determining what is deemed 'reasonably practicable' is explained within EPA Publication 1856 and relates to the implementation of controls that are proportionate to the potential risk. It relates to the potential for harm to occur, the potential impacts on the environment, and considers what controls are available to reduce the risk, and their associated costs.

Under the Act it is the responsibility of the operator to understand and assess the risks which their operations may pose on human health or the environment and once understood, to implement proportionate controls to mitigate or minimise the risk of harm.

The definition of harm within the Act introduces the concept of what is deemed 'unreasonable' generally, and in particular 'unreasonable noise'. For noise emitted from commercial, industrial or trade premises to noise sensitive areas, the Regulations under the Act essentially define unreasonable noise as noise that exceeds the noise limit that applies under the Noise Protocol (EPA Publication 1826.4) at the time the noise is emitted.

Methodologies, specific criteria, and guidance regarding unreasonable noise emissions are included within the following Regulations and guideline documentation referred to within the Act and provided by the Environment Protection Authority (EPA):

- Environment Protection Regulations 2021 (the Regulations).
- EPA Publication 1826.4 '*Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*' (the Noise Protocol).
- Environmental Reference Standard (ERS).
- EPA Publication 1996 *Noise Guideline – assessing low frequency noise*.
- EPA Publication 1856 *Reasonably practicable*.

With the above considered, whilst evaluating risks and implementing reasonably practicable measures are considered as a necessity to comply with the GED, the basis for any noise emission assessment will be ensuring that noise emissions are not deemed unreasonable, discussed further below.

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5.1 ENVIRONMENT PROTECTION REGULATIONS AND NOISE PROTOCOL

Implementation of the general concepts within the Act rely on the Regulations. The objectives of the Regulations are to further the purposes of and give effect to the Act by imposing obligations in relation to environmental protection through providing a basis for addressing potential emissions.

The Regulations further define the concepts of 'unreasonable' and 'aggravated' noise and introduce the Noise Protocol as a tool for quantitatively addressing noise emissions from commercial premises within 'noise sensitive areas' including residential and accommodation type premises as well as childcare, kindergarten, primary school and secondary school facilities.

Within the Regulations, a person who conducts a prediction, measurement, assessment, or analysis of noise within a noise sensitive area for the purpose of the Act or the Regulations must conduct the relevant works in accordance with the Noise Protocol.

The main focus of the noise assessment has therefore been consideration of noise emission in terms of noise limits determined in accordance with the Noise Protocol.

5.1.1 General methodologies

The subject site land and the sensitive receptors surrounding the subject site are located within a 'major urban area' and therefore assessed in accordance with the urban area method.

The relevant day, evening, and night Noise Protocol assessment periods are shown in Table 2 below.

Table 4: Details of EPA Assessment Periods

| EPA Assessment Period | Relevant Days | Relevant Time Periods |
|-----------------------|-------------------------|-----------------------|
| Day | Monday to Saturday | 7:00am to 6:00pm |
| Evening | Monday to Saturday | 6:00pm to 10:00pm |
| | Sunday, Public Holidays | 7:00am to 10:00pm |
| Night | All Days | 10:00pm to 7:00am |

The first stage in the determination of noise limits in accordance with the Noise Protocol procedures is to consider the zoning types within a 200m radius of a noise sensitive area such as residential premises. The mix of zonings determines the influencing factor, from which the zoning levels are calculated.

Planning Scheme zonings are allocated a Type Number 1, 2 or 3, 1 being for residential and similar zones, 2 being commercial, light industrial and similar, and 3 being heavy and extractive industries and the like.

The zoning levels apply as the noise limits unless the ambient background level is relatively high or relatively low for the mix of zonings around the noise sensitive area, so the existing



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ambient background levels are used as the second stage in determining the Noise Protocol noise limits.

The zoning circles and zoning types relevant to determination of the Noise Protocol zoning levels are attached in Appendix One, for two locations in the residential area east of the subject site and in Colemans Rd.

The second stage is to adjust the noise limits determined on the basis of planning scheme zonings up or down if the existing background levels at relevant noise sensitive areas are higher or lower respectively than would typically be expected in the mix of zonings around the noise sensitive area.

Assessment of noise emission under the Noise Protocol is made using the L_{eq} noise measure, assessed over a 30-minute period. The noise limit is to be complied with at all locations within the boundaries of residential property, which are also within 10 m of the external walls of a residential dwelling.

The measured L_{eq} level is subject to adjustments to account for characteristics such as tonality (concentration of acoustic energy in a narrow frequency range), intermittency (noises repetitively changing significantly in level) and impulsiveness (noise levels increasing very rapidly). These adjustments are added to the measured level). A negative 'duration adjustment' can also be applicable if industrial noise does not operate for 100% of the assessment period.

The Noise Protocol noise limit applies to the total of all noise emissions from commercial, trade and industrial premises, not just the subject site.

Therefore, the target noise limits for the proposed use at the subject site are less than the overall Noise Protocol limits to allow other industrial noise contributions while remaining below the noise limits. There are a number of other industries in the vicinity with the potential to contribute to the resultant overall level at the noise sensitive area.

5.1.2 Determination of Relevant Noise Limits and Project Noise Target

Based on the mix of Planning Scheme zonings at the residential area east of the subject site, the Noise Protocol Zoning Levels are 53, 46 and 41 dB(A) for the day, evening and night periods respectively for the houses nearest to the subject site.

Consideration has also been given to houses 200 m and more east of the residential zone boundary, where the zonings within 200 m would be 100% residential and the zoning levels would be 50, 44 and 39 dB(A) for the day, evening and night periods respectively.

The lowest monitored L_{90} levels averaged over each of the day, evening and night periods obtained during the monitoring by others in Dec 2021 were 53, 49 and 44 dB(A) for the day, evening and night periods respectively as set out in section 4 above. The night noise survey showed these ambient background noise levels to extend back to the area 200 m from the residential zone boundary.

These background levels are 'high' for the day, evening and night periods relative to the zoning levels. When background levels are above the neutral range, the noise limit becomes a margin above the background level, giving noise protocol noise limits of 59, 52 and 47 dB(A) for the day, evening and night periods respectively.

In Colemans Rd and Taylors Rd, which are 100% industrially zoned within 200 m of the houses, the zoning levels are 68, 61 and 56 dB(A) for the day, evening and night periods respectively.



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The lowest monitored L_{90} levels averaged over each of the day, evening and night periods obtained during the monitoring in May 2022 were 47, 43 and 42 dB(A) for the day, evening and night periods respectively.

These levels are 'low' for the day, evening and night periods relative to the zoning levels. When background levels are below the neutral range, a calculation procedure is used to calculate the final noise limit based on both the zoning and background levels, giving noise protocol noise limits of 62, 55 and 52 dB(A) for the day, evening and night periods respectively.

These noise limits apply to the sum total of noise contributions from all commercial, industrial and trade premises, so the contribution from the facility under consideration needs to be below the noise limits by a sufficient margin to allow for other contributions while remaining below the noise limits overall.

5.1.3 Noise Protocol Assessment Adjustments

When considering noise impacts on residential receptors, the Noise Protocol methodology includes relevant adjustment factors which account for the potential for the noise source to impact on the acoustic amenity of the noise sensitive receptor. The relevant adjustments include:

- Tonal Adjustment
- Impulsive adjustment.
- Intermittency adjustment.
- Reflection Adjustment.
- Duration Adjustment.

Clarification regarding each of the adjustments is shown below in Table 4.

Table 5: Noise Protocol Assessment Adjustments

| Relevant Adjustment | Description |
|----------------------|--|
| Tonal Adjustment | When the noise is tonal in character than an adjustment shall be made as follows: <ul style="list-style-type: none"> ▪ When the tonal character of the noise is just detectable then + 2 dB(A). ▪ When the tonal character of the noise is prominent then + 5 dB(A). |
| Impulsive Adjustment | When the noise is impulsive in character then an adjustment shall be made as follows: <ul style="list-style-type: none"> ▪ When the impulsive character of the noise is just detectable then + 2 dB(A). ▪ When the impulsive character of the noise is prominent then + 5 dB(A). |



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| Relevant Adjustment | Description |
|--------------------------|---|
| Intermittency Adjustment | An intermittency adjustment applies when the noise increases in level rapidly by at least 5 dB, on at least two occasions during a 30-minute period and maintains the higher level for at least one minute duration. The relevant intermittency adjustments applicable include: <ul style="list-style-type: none"> ▪ When the level increase is >10 dB during the day period, then apply an adjustment of +3 dB(A). ▪ When the level increase is 5-10 dB during the night period, then apply an adjustment of +3 dB(A). ▪ When the level increase is >10 dB during the night period, then apply an adjustment of +5 dB(A). |
| Reflection Adjustment | When the measurement point is located outdoors and the microphone is located from 1 to 2 metres from an acoustically reflecting surface, an adjustment of -2.5 dB shall be made. |
| Duration Adjustment | If noise emissions from the commercial, industrial or trade premises investigated do not occur over the whole continuous 30-minute period, the duration adjustment applies. This is the only one of the adjustments that is negative, reducing the effective level compared with the 'raw' measured level. The duration adjustment equals $10 \times \log_{10}(\text{total time source operating}/\text{measurement period})$. |

The above adjustments are applied to the measured/predicted values at residential receptors to determine the 'effective' noise level impacting on the residential receptor, which is what is compared with the noise limits.

The only adjustment likely to be applicable for this project would be a tonal adjustment if conventional tonal reversing beepers were to be used on the site.

5.2 ENVIRONMENT REFERENCE STANDARD

The ERS provides environmental values which have been developed to reflect the ambient soundscape associated with different land use settings, from highly urbanised areas to natural environments.

Through consideration of land zoning types, and varying assessment periods for the day and night, it is understood that the ERS intends to provide consideration of noise levels which may impact on:

- Sleep during the night.
- Domestic and recreational activities.
- Normal conversation.
- Child learning and development.
- Human tranquillity and enjoyment outdoors in natural areas.
- Musical entertainment.

Whilst being included within The Act, the ERS is not a compliance standard and clearly states that 'the objectives for each land use category are typical ambient sound level values and are neither noise limits nor noise design criteria'.



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It's understood that the primary function of the ERS is to provide an environmental assessment benchmark to assist 'decision makers' with evaluating noise emissions within areas not captured within The Regulations and Noise Protocol.

The assessment has considered noise emissions from the site at existing residential receptors as well as within currently vacant farm zone land which may be developed for residential use at a later stage.

Given the proximity of the noise sensitive residential receptors to the site, and the fact that the focus of the noise emission assessment is based on the Noise Protocol, it is understood that consideration of the ERS will not impact on the findings of the assessment and has therefore not been considered further.

5.3 EPA NOISE GUIDELINE – ASSESSING LOW FREQUENCY NOISE

As defined within The Act, a person must not, from a place or premises that are not residential premises emit an unreasonable noise or permit an unreasonable noise to be emitted.

Within the Regulations, unreasonable noise is based on exceedances determined in accordance with the Noise Protocol, however, the Regulations also include consideration of the sound frequency spectrum associated with a noise emission.

To provide some basis for addressing low frequency noise emissions and determining whether the noise emission is deemed 'unreasonable', the EPA released Publication 1996 *Noise Guideline – assessing low frequency noise*.

The guideline document provides 'threshold levels for assessing low frequency noise' which are not set limits, but levels that indicate a potential risk of problematic low frequency noise. The guideline notes that disturbance from low frequency noise depends on the:

- noise level
- characteristics that can increase annoyance with the noise, for example, tonality, frequency modulation
- baseline noise levels in the absence of the noise of concern.

The threshold levels for indoor and outdoor measurements are included in the Table below.

Table 6: Indoor and outdoor measurement one-third octave band noise level thresholds

| Measurement Location | One-third octave band noise levels Hz | | | | | | | | | | | | |
|----------------------------------|---------------------------------------|------|----|----|----|------|----|----|----|----|-----|-----|-----|
| | 10 | 12.5 | 16 | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| Indoor noise dB L _{eq} | 92 | 87 | 83 | 74 | 64 | 56 | 49 | 43 | 42 | 40 | 38 | 36 | 34 |
| Outdoor noise dB L _{eq} | 92 | 89 | 86 | 77 | 69 | 61 | 54 | 50 | 50 | 48 | 48 | 46 | 44 |

The low frequency noise guideline notes that:

Predicting expected noise levels at noise sensitive receivers may be compared against the relevant low frequency threshold levels.

However, noise level calculations in the low frequency range can be problematic and of limited accuracy. The use of noise calculations should be restricted to indicative estimations only.



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Due to this, calculations should only be used as a screening tool to assess the risk of low frequency noise from the proposed development and/or extension of existing commercial, industrial and trade premises.

Therefore, the predicted low frequency noise levels can only be considered indicative at this stage of the project.

6. CALCULATED RESULTANT NOISE LEVELS

6.1 NOISE CALCULATION METHODOLOGY

Modelling of operational noise emissions associated with the proposal has been conducted using DataKustik CadnaA 2021 environmental noise modelling software.

Relevant information regarding site elevations has been provided by the client and the surrounding environment topography has been sourced from online databases including 'ELVIS' - Elevation and Depth - Foundation Spatial Data and VicMaps.

The model has been developed and configured with sufficient detail for appropriate noise emission calculations to be undertaken.

The modelling software implements the calculation procedures defined within International Standard *ISO 9613-2: 1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation* (ISO 9613).

The ISO 9613-2 method aims to determine the average sound level under meteorological conditions favourable to propagation, that is, moderately downwind propagation or propagation under a well-developed, but moderate, ground-based temperature inversion, such as can occur at night.

Environment Protection Authority assessment methodology indicates that residual noise levels at noise sensitive receivers should be considered when weather conditions assist propagation of noise emissions in the direction of the receivers. This condition is implemented by the noise modelling software.

The noise modelling has allowed for the effects of light breezes from the noise sources to the residential locations enhancing sound propagation. For much of the time, the resultant noise levels would be lower than predicted on this basis.

Through implementation of ISO 9613-2 within CadnaA 2020, the noise emission modelling considers the following attenuation measures:

- Geometrical spreading.
- Atmospheric absorption.
- Ground attenuation.
- Meteorological effects.
- Source/Receiver height effects.
- Attenuation due to the surrounding environment including existing buildings/structures.

Apart from the reduction of sound due to distance, ground attenuation and atmospheric effects, noise attenuation results from acoustic shielding due to intervening natural topography and substantial buildings that are in place.



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6.2 NOISE MODELLING INPUT PARAMETERS

The noise level that is to be assessed in terms of the noise limits at off-site residential premises is the L_{eq} over a 30-minute period, adjusted as discussed in section 4.1 above.

Therefore, the objective of noise modelling to calculate resultant off-site noise levels is to capture the mix of mobile equipment operating during a 30-minute period, in combination with the continuous operation of the soil washing plant.

The noise modelling has allowed for operation of the following:

- Five deliveries of soil to the site per hour during the day and three per hour during the evening and night periods. This is a conservative basis for the calculation, with more typical rates likely to be half this amount.
- Dispatch of five loads of cleaned soil/products from the site per hour during the day period only.
- Continuous operation of the soil washing plant (SWP) during the day, evening and night periods.
- Continuous operation of a nominally 30 tonne excavator for excavation and stockpile management of priority areas during the day period only.
- Operation of a wheel loader to move soil from stockpile area to SWP during the day, evening and night periods, and to assist moving cleaned material offloaded by tipper truck to the correct open stockpile and load finished products for dispatch during the day period only.
- Continuous operation of a tipper truck for moving washed soil from soil washing plant to stockpiling areas during the day period only.
- A bobcat, water cart and ute may operate intermittently as required, but would be negligible noise contributors in terms of both level and duration, which are the two factors that contribute to the overall L_{eq} .

Sound power levels to use in the noise emission modelling were derived from data provided by the client for the soil washing plant that is to be moved from a site in South Australia and file data for the other equipment, as set out in the table below.

Table 7: Source Sound Power Levels used in the noise modelling

| Noise Source | Sound Power Level (dB A-weighted Re. 1pW) In Octave Frequency Bands (Hz) and overall dB(A) | | | | | | | |
|--|--|-----|-----|-----|------|------|------|-------|
| | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | dB(A) |
| Soil washing plant, derived from sound pressure levels conducted by others on the plant to be moved from South Australia | 80 | 86 | 84 | 83 | 85 | 89 | 95 | 103 |
| Typical road truck hauling soil and products at steady speed within the site | 87 | 91 | 93 | 97 | 99 | 99 | 92 | 104 |
| Loader CAT 938M or equivalent | 92 | 92 | 88 | 94 | 96 | 94 | 89 | 101 |
| Volvo A40G or equivalent haul truck | 84 | 92 | 99 | 107 | 107 | 106 | 100 | 112 |



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6.3 NOISE MODELLING RESULTS AND DISCUSSION

The modelled noise level at relevant noise sensitive areas based on the modelling parameters set out above area set out in the table, together with the noise limits that apply at those locations.

Table 8: Noise modelling results and noise limits

| Noise sensitive area | Modelled noise level, dB(A) | | Noise limit, dB(A) | | |
|--|-----------------------------|-------------------|--------------------|---------|-------|
| | Day | Evening and night | Day | Evening | Night |
| 90 Colemans Rd | 41 | 29 | 62 | 55 | 52 |
| 110 Colemans Rd | 43 | 32 | 62 | 55 | 52 |
| 845 Taylors Rd | 54 | 41 | 62 | 55 | 52 |
| Cnr Astley Wynd and Carboni Crs, typical of residential area nearest to subject site | 33 | 22 | 59 | 52 | 47 |
| 19 Carboni Crs, typical of more elevated residential area | 33 | 23 | 59 | 52 | 47 |

The modelled noise levels are lower than the relevant noise limits by a sufficient margin, at least 8 dB(A), to allow for contributions from other commercial, industrial and trade sources while maintaining the overall level below the noise limits during all of the day, evening and night periods.

Provided that tonal reversing beepers are not used at the site, no noise character adjustments will be applicable.

Use of mobile equipment fitted with tonal reversing beepers, especially during the night period, would have the potential to introduce a tonal adjustment. Use of broadband reverse alarms at the site has been recommended to avoid this possibility.

The modelled low frequency noise levels have been compared with the low frequency threshold levels and found to exceed the low frequency threshold levels by up to approximately 10 dB in some one third octave frequency bands during the day period and up to 2 dB during the evening and night periods at the nearest house to the site, 845 Taylors Rd.

The results during the most noise-sensitive night period are considered to be of little significance in terms of the dot points in section 5.3. The margin above the guideline threshold is higher during the day period, but in the context of the area, noise due to diesel engine driven vehicles is an existing part of the environment on a regular basis.

If assessment and resident-response during actual operation as distinct from prediction indicates that further noise reduction would be desirable, then construction of a noise control bund west of the site would remain as an option.



7. RECOMMENDED NOISE CONTROL STRATEGIES

ADVERTISED PLAN

7.1 LOADER SELECTION

The loader is required to operate throughout the night period and noise modelling has established that a 'low noise' loader will be required, such as a CAT 938M or equivalent, with a sound power level of 101 dB(A).

7.2 REVERSE ALARMS

Conventional tonal reversing beepers have the potential to cause annoyance to residents and contribute to exceedance of noise limits at the residential locations around the site, particularly during the night period when the ambient background levels and noise limits are the lowest, due to the highly distinctive character and on-off nature of the noise.

All mobile equipment operating at the site should be fitted with broadband reverse alarms, which vary their noise output according to the ambient noise level. These reversing alarms should be selected for the lowest noise level consistent with safe operation.

Trucking contractors delivering soil to the site should be contractually required to only use trucks fitted with broadband reverse alarms, with trucking routes configured to minimise requirements to reverse.

8. CONCLUSIONS

Watson Moss Growcott Acoustics (WMG) has undertaken a noise emission assessment for the proposed development of part of the 890 Taylors Rd site to receive and stockpile Category C and Category D soils, and to develop soil washing operations. This new facility will be operated by the Suez/Ventia Joint Venture (SVJV) and will be complementary to the existing thermal treatment facility.

Inspections and noise measurements have indicated that the existing residential area east of the subject site is exposed to a relatively high background level for the residential zoning due to the presence of the Dandenong-Hastings Rd between the subject site and the residential area.

The small number of houses located in the industrial area west of the subject site are currently exposed to a background level that is low relative to the expectations for industrially zoned land.

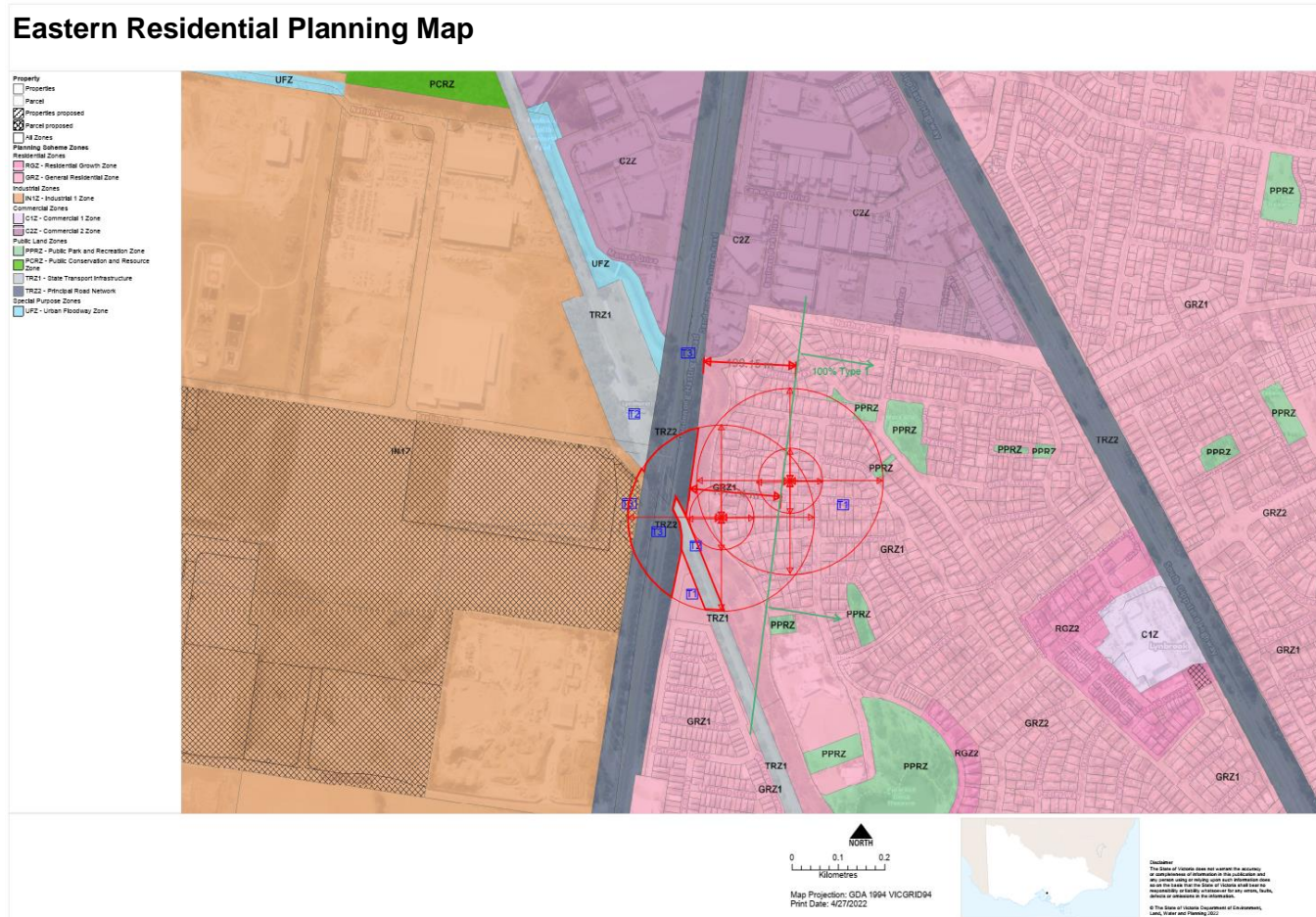
These factors have been taken into account in determining noise limits in accordance with the Noise Protocol.

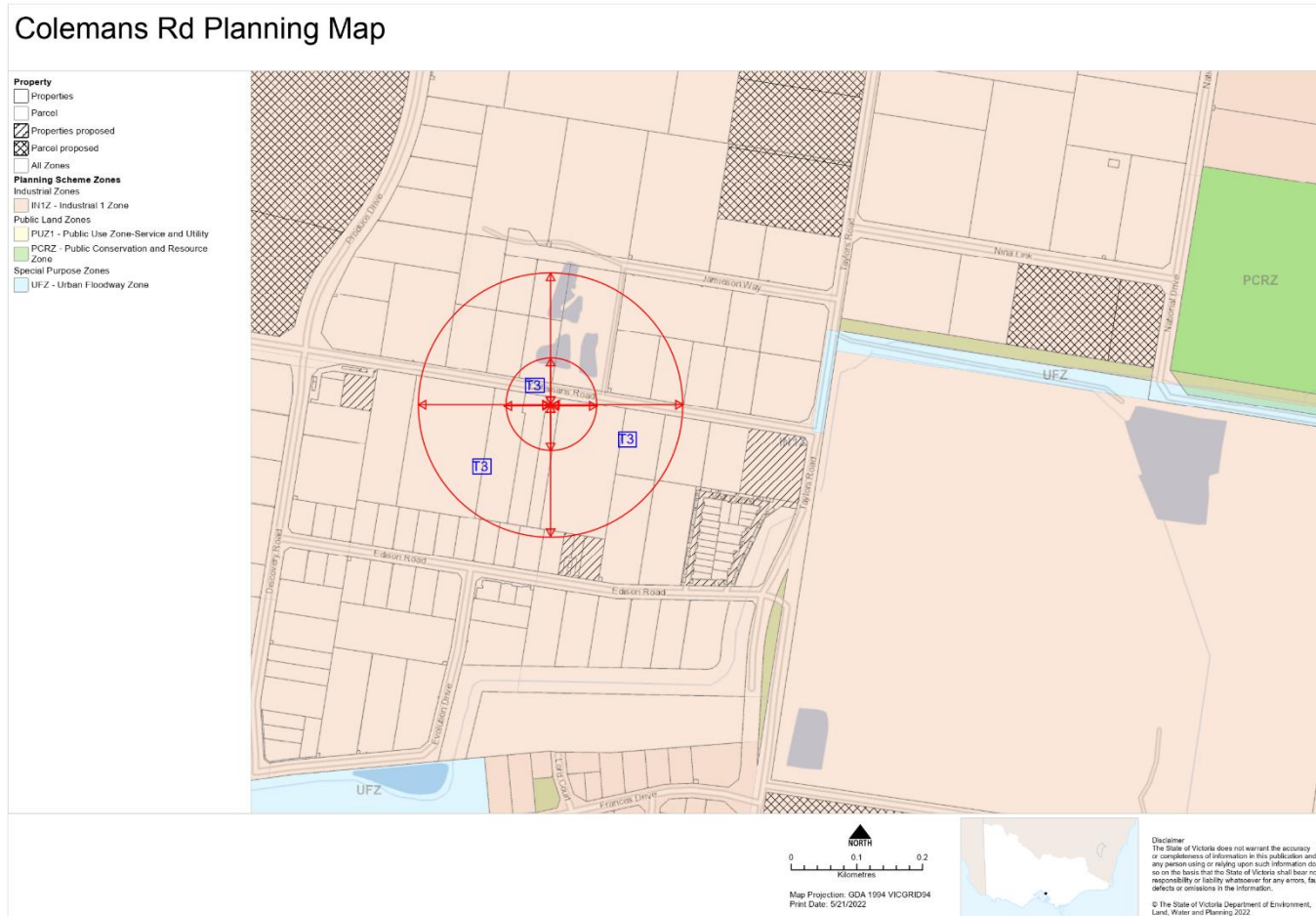
Noise modelling has established that the resultant noise level at the noise sensitive areas will be well below the noise limits for the day, evening and night periods, by a sufficient margin to provide for compliance with the noise limits with the addition of noise contributions from other industrial, commercial and trade sources.

NEVILLE GODDARD
WATSON MOSS GROWCOTT
acoustics pty ltd

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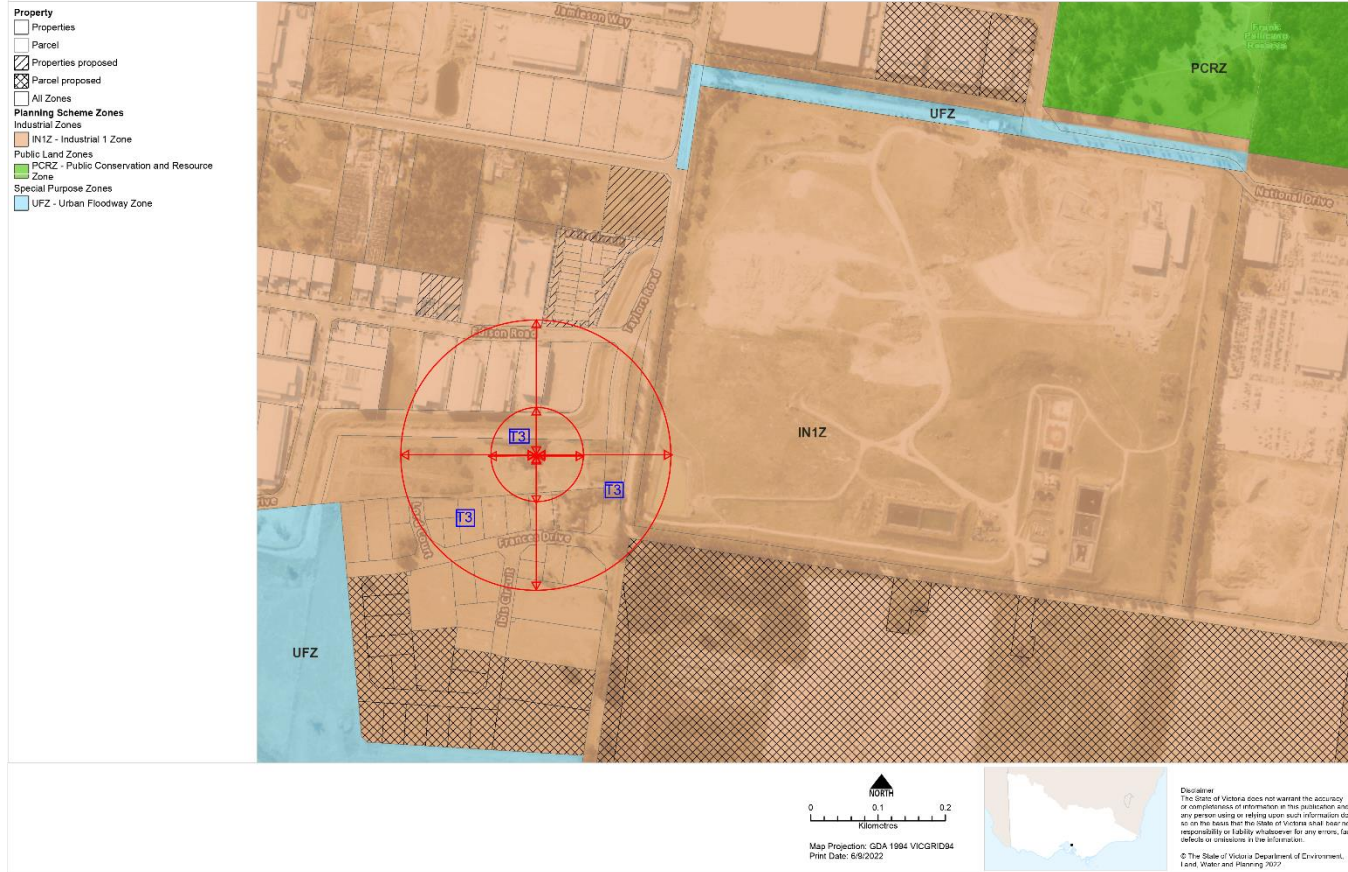
APPENDIX ONE: PLANNING SCHEME MAPS ANNOTATED WITH RELEVANT NOISE PROTOCOL ZONING TYPES





ADVERTISED
 PLAN

845 Taylors Rd Planning Map



**ADVERTISED
PLAN**