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TG616-05F03 Fire Tanks (r2).docx

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Kings Park Waste Metal Recovery, Processing and Recycling Facility - Fire Hydrant Water Storage Tanks and Pumps Acoustic Assessment

1 Introduction

Renzo Tonin & Associates was engaged to assess the noise impacts from the proposed fire hydrant water storage tanks and pumps to be installed at the Kings Park Waste Metal Recovery, Processing and Recycling Facility. The purpose of this review is to determine the additional impacts to the predicted noise levels presented in the "EIS Supplementary Noise and Vibration Impact Assessment", prepared by Renzo Tonin & Associates with reference TG616-03F01 dated 3 September 2015 and the subsequent "Section 96 Difference to Acoustic Impacts", prepared by Renzo Tonin & Associates with reference TG616-05F02 dated 10 August 2016.

2 Proposed Fire Tanks and Pump House Motors

This assessment is based on the architectural drawing provided by the client with drawing reference: DA-1049-14-A101-L. The proposal is for the installation of 2 fire hydrant water storage tanks each holding 451,000 litres, dimensions of 7.5m and 10.61m height, and the fire pump house installed on the western side of the 23 Tattersall Road lowered car park.

The pump house located adjacent to the tanks will be constructed from reinforced concrete and contain the noise generating equipment listed in the table below:

Table 2.1 – Noise Generating Equipment

Noise Source	Noise rating
1 x Diesel motor - John Deere 6cylinder heat exchanger cooled rated at 249kW @1,600RPM	94dB(A) @ 1m
1 x Electric motor - TEFC ,415 Volt, 110kw, 182 Amp, FLC running 2 pole speed	78dB(A) @ 1m

It is noted that only one motor will operate at any one time. The electric motor and the diesel motor will be turned on for monthly testing during operating hours which will last approximately one hour.

In the event of a fire the electric motor will be utilised first and if FRNSW elect to turn the power off to the site then the electric motor will be turned off and the diesel motor engaged.

Construction of the fire hydrant water storage tanks and the fire hydrant system pump house will occur within the approved construction hours from Development Consent Condition B31 (Application SSD5041):

- Monday to Friday 7am to 6am
- Saturday 8am to 1pm
- Sunday & Public Holidays Nil

3 Noise Impacts

For the fire hydrant system pump room, it is noted that this is utilised in the case of a fire emergency at the site. Scheduled testing of the equipment may occur monthly and the noise emissions from the testing will be assessed. Testing of the equipment will use the electric motor within the pump room and is assumed to be completed within one hour per test during operating hours, The same one hour test per month will be conducted for the diesel engine. The difference to the predicted noise level emission from site operations with the testing of the fire hydrant system is shown below.

Table 3.1 – Difference to Predicted Noise Level Emission from Site Operations with Testing of Fire Hydrant System

Receiver	Change in Acoustic Impact
R1 - Residential Premises to the east - Sunnyholt Road	No change
R2 - Residential Premises to the north - Camorta Close	No change
R3 - Residential Premises to the west - Railway Road	No change
R4 - Neighbouring Industrial Premises to the north - 38 Tattersalls Road	No change
R5 - Neighbouring Industrial Premises to the west - 57-69 Tattersalls Road	No change
R6 - Neighbouring Industrial Premises to the east - 21 Tattersalls Road	No change
R7 - Neighbouring Industrial Premises to the south - 38 Forge Street	No change

It can be seen from the table above that with the proposed fire hydrant water storage pumps, the predicted noise levels to identified receivers will be the same as the noise levels presented in the previous assessments. All receivers were predicted to comply with the nominated criteria in the previous assessments and therefore all receivers are predicted to comply with the addition of the fire hydrant water storage tanks and pumps.

4 Conclusion

A review of the proposed fire hydrant water storage tanks and pumps for Kings Park Waste Metal Recovery, Processing and Recycling Facility showed that predicted noise levels at the identified receiver locations will be the same as presented in the previous reports. All identified receiver locations were found to comply with the nominated noise criteria in the previous reports, and compliance will be maintained with the installation of the proposed fire hydrant water storage tanks and pumps.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
14.09.2017	Generate letter		0	WC		WC
18.09.2017	Added plan 2		1	WC		WC
25.09.2017	Only revised plan		2	WC		WC

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).

L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.