Narromine Facility Upgrade

323 The McGrane Way, Narromine, NSW 2821

Noise Impact Assessment for Development Application

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Project Name: Narromine Facility Upgrade
Project Location: 323 The McGrane Way, Narromine, NSW 2821
Noise Impact Assessment for Development Application

floth

CLIENT

Pioneer Hi-Bred Australia Pty Ltd

ARCHITECT

TaylorEllis

floth

Amendment Register

Rev. No	Section & Page No.	Issue/Amendment	Author	Project Engineer	Checked	Date
P1	-	Preliminary Issue				27/03/2023

EXECUTIVE SUMMARY

Floth Pty Ltd (Floth) has Floth has been commissioned by Pioneer Hi-Bred Australia Pty Ltd (Gentech Seeds Narromine) to conduct a noise emissions assessment for the proposed upgrade to the existing seed processing facility located at 323 The McGrane Way, Narromine 2821.

This report presents the noise impact assessment for the proposed facility upgrade as part of Development Application submission to the local authority, Narromine Shire Council.

The noise impacts considered to be as part of this assessment are as follows:

- Noise emissions from the proposed upgrade to the seed production and processing facility:
  - Seed production/processing plant, equipment and operations.
  - Mechanical plant and equipment.

Other noise sources associated with the proposed development are expected to be less significant compared with those listed above.

Preliminary noise emission predictions of preliminary mechanical plant design and selections has been conducted from new air-conditioning and ventilation plant/equipment. This preliminary assessment indicated that the air-conditioning and ventilation plant satisfied noise the environmental noise limits nominated in this report. Also, preliminary assessment of the fire pump equipment indicated that a fire pump with a sound power level ≤ 112 dB(A) shall achieve compliance with day time project noise trigger limits.

An assessment of the new significant plant, equipment and processes associated with the seed production and processing in Shed 3 indicated compliance with the applicable parameter assigned levels for all periods under the following condition:

- Cyclone Separator/s located within Shed 3 “Towers” are limited to a source noise level of 94 dB(A).

Noise modelling of a worst-case scenario for Shed 3 internal noise emissions (with Cyclone Separator/s limited to 94 dB(A)) indicated exceedance of the night-period project trigger noise level criteria but satisfied the maximum noise level criteria for night time noise emissions. Considering that the worst-case scenario is anticipated to be a rare occurrence and that the NSW Noise Policy for Industry 2017 Maximum Noise Level criteria is met, Floth do not anticipate adverse noise impacts from the Shed 3 upgrades.

Similarly, the blower room and external dust collector noise emissions predictions suggested compliance with the applicable parameter assigned levels for all periods without additional acoustic mitigation measures.

Nevertheless, Floth recommend that new industrial plant, equipment and operations are acoustically controlled as reasonably and feasibly practicable.

In summary, the assessment has shown that the noise impacts from the proposed development can be managed and that adverse noise impacts on surrounding NSRs are not expected to arise.

Contents

1. INTRODUCTION

Floth Pty Ltd (Floth) has been commissioned by Pioneer Hi-Bred Australia Pty Ltd (Gentech Seeds Narromine) to conduct a noise emission assessment for the proposed upgrade to the existing seed processing facility located at 323 The McGrane Way, Narromine 2821.

This report presents the noise impact assessment for the proposed industrial facility upgrade as part of Development Application submission to the local authority, Narromine Shire Council.

The noise impacts considered to be as part of this assessment are as follows:

- Noise emissions from the proposed upgrade to the seed production and processing facility:
  - Production/processing plant, equipment and operations.
  - Mechanical plant and equipment.

2. PROJECT, SITE AND SURROUNDING AREA

2.1 Project Description

The existing Gentech Seeds Narromine facility is currently described as follows:

- Shed 1and Shed 2 house plant and equipment and is used for seed production and processing operations. Operation areas include:
  - Corn Processing
  - Grading
  - Bagging
  - Storage
  - Chemical mixing
  - Seed conditioning
- Shed 3: Storage Shed
- Shed 4: Storage Shed
- Existing Administration Building
- Storage Silos
- Existing sheds east of site
- External Dust Collectors and Cyclone Separators

Gentech Seeds Narromine propose to transform the existing Shed 3 from a storage shed to a processing facility with grading plant and bagging plant. Refer to Figure 1 for an overview of the proposed upgrades to the existing subject industrial facility.

Figure 1: Site Plan with Facility Upgrades (ref. DWG DA-01-00 by Taylor Ellis)

2.1.1 New Plant and Equipment Associated with the Upgrade Works

Floth understand the following upgrades are proposed for the GenTech Seeds Narromine site:

- **Shed 3:** New seed grading and packing plant and equipment and operations
- **New Blower Room:** Two (2) off blower fans and one (1) compressor.
- **External Dust Collectors**: Three (3) off dust collector plant with associated fans which are located west of existing shed 4 and south of blower room
- **External Blower Fan** located south of shed 1 and adjacent to the three (3) new silos.

2.1.2 Facility Operating Hours

Floth has been advised by the facility manager that the processing and production facility mainly operates during the harvesting season which is understood to be between December to April (duration of 4 months). During this period, the facility will operate from 5am to 8pm on each day.

2.2 Site Details

The existing facility is located on 323 The McGrane Way, Narromine 2821. The site is bounded by the following:

- North:
  - External Industrial / Agricultural operated by Qube Agri,
  - The McGrane Way (road) located north west of site, and
  - Single-storey home located off Wingfield Rd.
- East : Industrial / Agricultural facility
- South:
  - Open field
  - Single-storey home
- West: The McGrane Way

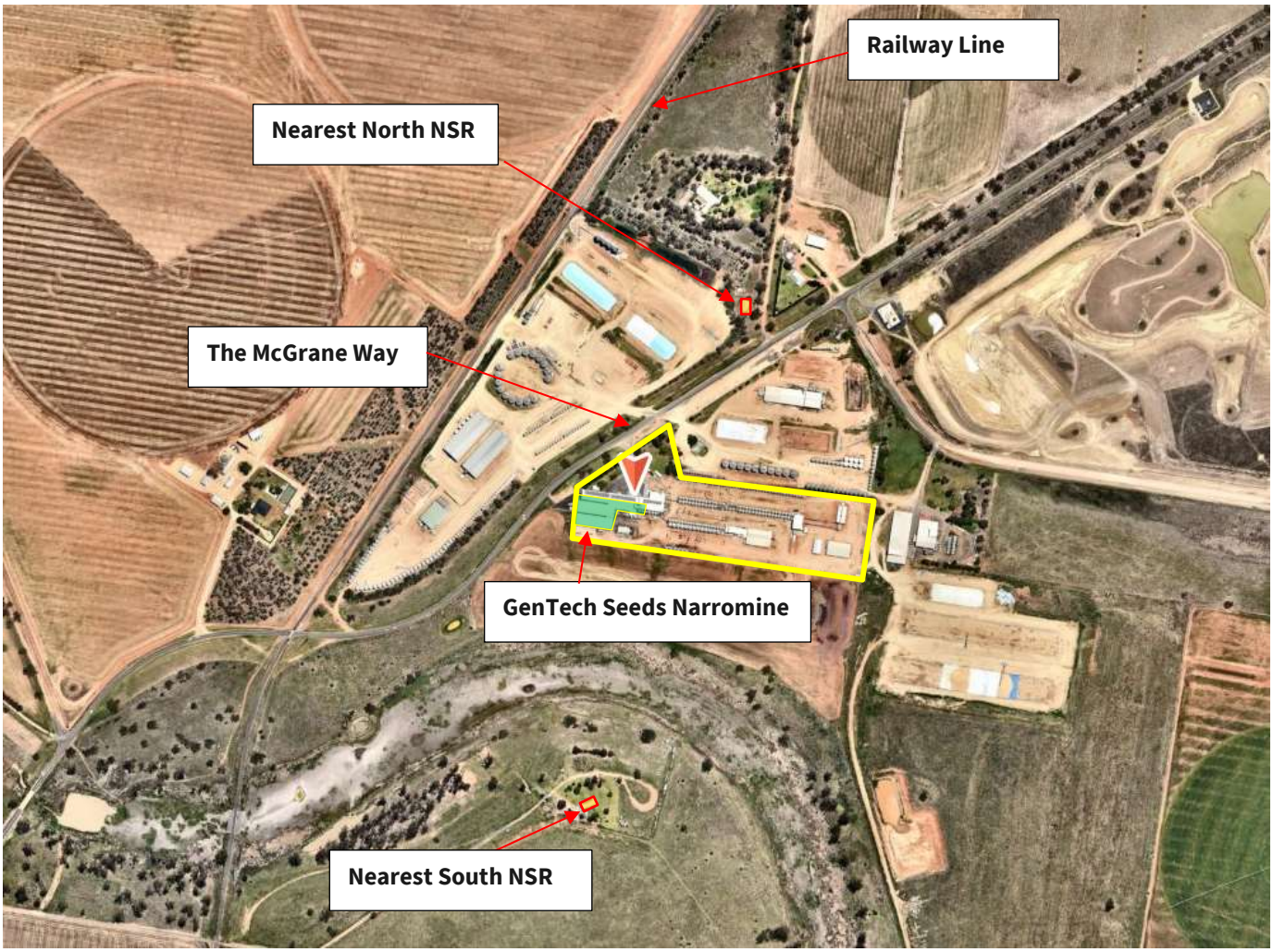

Figure 2: Aerial View of Site (ref. NearMap)

It can be seen from Figure 1 that there is significant distance between the facility and the nearest homes/noise sensitive receivers. The adjacent lots are a combination of production/industrial/agricultural facilities or uses with nearest road being The McGrane Way located west of the subject facility. There is a railway that is approximately 250 metres west of the Gentech facility.

The site is located within the Narromine Shire Council. The property details reproduced in Table 1 are taken from the NSW Planning Portal Spatial Viewer tool available online.

Table 1: Property Details of the Subject Site

PROPERTY DETAILS	DESCRIPTION
Property Address	323 The McGrane Way, Narromine NSW 2821
Lot Number	1/-/DP868195
Land Size	≈ 6 ha
Local Planning Scheme	Narromine Local Environment Plan 2011
Land Zoning	RU 1: Primary Production

2.3 Noise Sensitive Receivers

The main sources of noise emission from the proposed facility upgrades that will be controlled to satisfy the noise limits at the surrounding Nearest Noise Sensitive receivers (NSRs) are from new seed production and processing plant and operations. The indicative separation between the nearest NSRs and the proposed development are presented in Table 2.

Table 2: Nearest Noise Sensitive Receivers Surrounding Proposed Development Site

RECEIVER	DESCRIPTION	LAND ZONING	ADDRESS	APPROXIMATE DISTANCE SEPARATION*
Residential Receiver to the North	Single-storey home	RU1: Primary Production	284 The McGrane Way	330 metres
Residential Receiver to the South	Single-storey home	RU1: Primary Production	459 The McGrane Way	415 metres
Nearest Residential type zoning	Single-storey and double-storey homes	R1 Residential	223 Tomingley Road	>1500 metres

*Distance separation from nearest boundaries between subject site and receiver.

It is noted that the nearest noise sensitive receivers are directly adjacent to other existing industrial premises/facilities. Based on this, Floth anticipate that these NSRs have been historically exposed to industrial noise sources.

3. REFERENCES

[1] NSW DECCW Road Noise Policy

[2] NSW EPA Noise Policy for Industry (2017) (NPfI)

[3] Narromine Shire Council Development Control Plan

[4] NSW EPA Interim Construction Noise Guideline (ICNG)

[5] Australian Standard 2436-2010 “Guide to noise and vibration control on construction, demolition and maintenance sites”

[6] NSW EPA Assessing Vibration: A Technical Guideline

[7] British Standard BS 7385-2:1993 *‘Evaluation and measurement for vibration in buildings’*

[8] NSW Roads & Maritime Services ‘Construction Noise and Vibration Guideline’

4. NOISE CRITERIA

The noise and vibration criteria for the proposed upgrade to the existing Gentech Seeds Narromine facility is defined by NSW state policies / legislation and guidelines and applicable Australian Standards. The relevant noise criteria for the proposed development are presented in Table 3.

Table 3: Summary of Applicable Noise Policies and Guidelines

ASSESSMENT	APPLICABLE CRITERIA	NOISE SOURCES
Noise Emissions from the Proposed Development	NSW DECCW Road Noise Policy [1] NSW EPA NPfI (2017) [2] Narromine Shire Council Development Control Plan [3]	• Seed processing operations • Seed processing plant and equipment • Air-conditioning and ventilation plant and equipment. • Forklift operation • Emergency Equipment (e.g. Fire Pump)
Construction Noise	NSW EPA Interim Construction Noise Guideline [4] AS2436 [5] NSW EPA Assessing Vibration: A Technical Guideline [6] BS 7385-2:1993 [7] NSW Roads & Maritime Services' Construction Noise and Vibration Guideline [8]	• Noise and vibration associated with construction activities

4.1 Noise Emission Criteria

4.1.1 Traffic Noise Generated by the Development

The NSW DECCW *Road Noise Policy [1]* provides guidance on the assessment of noise due to additional road traffic on public roads directly attributed to the proposed development. For traffic generating developments, the policy states:

*For existing residences and other sensitive land uses affected by **additional traffic on existing roads generated by land use developments**, any increase in total traffic noise level should be limited to 2 dB above that of the corresponding 'no building option'.*

The potential noise impact on surrounding residential NSRs will be conservatively assessed against a '+2 dB increase' criteria as outlined in Section 3.4.1. of the *Road Noise Policy* [1].

4.1.2 Operational Noise (Seed Processing and Plant)

The proposed development has the potential to impact on the nearby residential NSRs and industrial premises through the introduction of mechanical plant and equipment. In order to define the assessment criteria for seed processing plant, equipment, operations and air-conditioning and ventilation plant, reference is made to the NSW *NPfI 2017* [2]. The noise policy is used to derive the following three noise parameters:

1. Project Intrusiveness Noise Levels
2. Project Amenity Noise Levels
3. Project Noise Trigger Levels

4.1.3 Applying the Noise Policy to Existing sites

The NSW NPfI provides governing principles for when determining the project noise trigger levels and/or assessment requirements for existing industry with extension/upgrade proposals.

- *The project noise trigger levels should not be applied as mandatory noise limits. The project noise trigger level is the level used to assess noise impact and drive the process of assessing all feasible and reasonable control measures.*
- *Where an existing industry has been in operation for more than 10 years and existing site operations exceed the project amenity noise level, the project amenity noise level may be adopted as the project noise trigger level to assess existing, and existing plus proposed site operations, as relevant.*
- *Where a development proposal involves a discrete process, and premises-wide mitigation has or is to be considered outside of the development, a project noise trigger level for noise from new/modified components (not the whole site) of the operation may be set a 10 dB(A) or more below existing site noise levels or requirements. This approach means that the increase in noise from the whole site is minimised and provides scope for existing components to achieve noise reductions over time.*

Noting the rural setting of the site location, Floth have adopted the applicable minimum Rating Background Levels (RBL) given in the NSW NPfI to the facility upgrades proposed to the Gentech Seeds Narromine facility. Floth anticipate that new/modified components to the site will not increase noise from the site significantly given that the major new sources comply with the project noise trigger levels derived in Table 4 (based on the minimum RBLs).

4.1.4 Project Intrusiveness Noise Levels

The Project Intrusiveness Noise Level aims to protect against significant changes in noise levels as industry is introduced into areas containing noise sensitive uses such as residences, hotels, schools etc.

As aforementioned, background noise monitoring has not been conducted for this project and the applicable minimum RBL's have been adopted for each of the periods in accordance with the NSW NPfI 2017. As such, the Project Intrusiveness Noise Levels applicable to the residences surrounding the proposed development are presented in Table 4.

Table 4:NPfI 2017 Project Intrusiveness Noise Levels

RECEIVER	TIME OF DAY	ADOPTED RBL[1]	$L_{Aeq,15min}$ dB(A)
Residential	Day	35	RBL + 5 dB = 40
	Evening	30	RBL + 5 dB = 35
	Night	30	RBL + 5 dB = 35

4.1.5 Project Amenity Noise Levels

The Project Amenity Noise Levels seeks to protect against the cumulative noise impacts from industry and maintain amenity of sensitive land uses (e.g. residences, hotels). The Project Amenity Noise Levels applicable to the residences (NSR's) surrounding the proposed development, as well as nearby industrial premises are presented in Table 5.

Table 5: NPfI 2017 Project Amenity Noise Levels

RECEIVER	NOISE AMENITY AREA	TIME OF DAY	RECOMMENDED AMENITY LEVELS	PROJECT AMENITY LEVELS
			L_{Aeq} dB(A)	$L_{Aeq,15min}$ dB(A)
Residential	Rural	Day	50	48
		Evening	45	43
		Night	40	38

[1] These adopted rated background levels (RBLs) are the minimum assumed RBLs that apply in the NPfI policy.

RECEIVER	NOISE AMENITY AREA	TIME OF DAY	RECOMMENDED AMENITY LEVELS	PROJECT AMENITY LEVELS
			L_{Aeq} dB(A)	$L_{Aeq,15min}$ dB(A)
Industrial Premises	N/A	When in use	70	68

* Project amenity noise level (ANL) is Urban ANL (Table 2.2 of NSW NPfI 2017) minus 5 dB(A) plus 3 dB(A) to convert from a period level to a 15-minute level.

4.1.6 Project Noise Trigger Level

The Project Noise Trigger Levels are the more stringent of the Project Intrusiveness Noise Level and the Amenity Noise Level for each assessment period. These are presented in Table 6 with the Project Intrusiveness Noise Level criteria being the more stringent for this project.

Table 6: Project Noise Trigger Levels

RECEIVER	TIME OF DAY	PROJECT INTRUSIVENESS NOISE LEVELS	PROJECT AMENITY NOISE LEVELS*	PROJECT NOISE TRIGGER LEVEL
		$L_{Aeq,15min}$ dB(A)	$L_{Aeq,15min}$ dB(A)	$L_{Aeq,15min}$ dB(A)
Residential (Rural)	Day	40	48	**40**
	Evening	35	43	**35**
	Night	35	38	**35**
Industrial premises	When in use	N/A	68	**68**

As mentioned in Section 2.1.2, the advised operating hours of the facility are from 5am to 8pm for only periods of the year during harvesting season. During the early morning operation (from 5am) existing background noise levels may be rising potentially due to traffic increases and commencement of off-site industrial operations. During this 'shoulder period' between the night and day period (5am to 7am), the project noise trigger levels may be higher where the 'shoulder period' RBL is higher than that for the night period.

Nevertheless, for conservativeness, the noise emissions will be assessed against the applicable project noise trigger levels are during all day, evening and night periods.

4.1.7 Maximum Noise Level Assessment

Where a subject development / premises has night time noise emissions at a residential or noise sensitive location that exceed the following limits, an additional assessment is required to assess the potential for sleep disturbance:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB (35 dB(A**)**), whichever is greater, and/or
- L_{Afmax} 52 dB(A) or the prevailing RBL plus 15 dB (45 dB(A)), whichever is greater.

4.1.8 Construction Noise

The potential for construction noise to impact the amenity of surrounding noise sensitive receivers will be assessed in accordance with the NSW EPA Interim Construction Noise Guideline (ICNG) [4].

Construction hours are not anticipated to be within the night period. Where construction works are intended to occur in the night period, an additional acoustic assessment will be required to be completed by the contractor. All feasible and reasonable acoustic measures should be included in the Construction Management Plan (CMP) to meet the following construction noise codes and guidelines.

4.1.9 NSW EPA Interim Construction Noise Guideline

The key steps to managing construction noise outlined in the ICNG are as follows:

1. Identify sensitive land uses that may be affected,
2. Identify hours for the proposed construction works,
3. Identify noise impacts at sensitive land uses,
4. Select and apply the best work practices to minimise noise impacts.

The sensitive land uses that may potentially be affected by construction noise associated with the proposed development are nominated in Section 2.3.

4.1.9.1 Quantitative Assessment Method

The project can be classified as a "*major commercial development"* which most likely will have a construction duration that is approximately 12 months. Given that, the quantitative assessment method as described in the ICNG is more appropriate than the quantitative method. The following sections provide the criteria apart of the quantitative assessment method.

4.1.9.2 Airborne Noise

The ICNG provides an approach for determining Noise Management Levels (NMLs) at potentially affected sensitive/residential receivers based on the Background Noise Level (minimum assumed RBLs). The NMLs at surrounding sensitive/residential receivers are presented in Table 7.

Table 7: NMLs for Sensitive/Residential Receivers

TIME OF DAY	NOISE MANAGEMENT LEVEL, $L_{AEQ(15MIN)}$ DB(A)	HOW TO APPLY
Recommended standard hours: Monday to Friday - 7am to 6pm Saturday - 8am to 1pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of the works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences). 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for work outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

The ICNG nominates the following air-borne construction noise levels at commercial receivers:

- Industrial premises: external $L_{Aeq(15min)}$ 75 dB(A)

The derived screening levels used to assess the potential for airborne construction noise impacts at NSRs appropriate to the subject site are presented in Table 8.

Table 8: Airborne Construction Noise Screening Levels

TIME OF DAY	BACKGROUND NOISE LEVEL, DB(A)	TYPE OF RECEIVER, $L_{AEQ(15MIN)}$ dB(A)	
		RESIDENTIAL	INDUSTRIAL
Day Period	40	50 (external)	75 (external)

4.1.9.3 Ground borne Noise at Sensitive Receivers/Residences

The ICNG [3] provides guidance on acceptable levels of ground borne noise at residential premises due to construction activities. The noise limits apply during the evening and night periods, which are outside of the proposed construction hours. Construction activities are not expected to occur outside of the recommended hours for the proposed development, and as such, the potential for ground borne noise has not been assessed further. Where construction works are required outside of proposed standard hours, additional acoustic assessment will need to be completed by the contractor. Any acoustic measures are to be documented in the Construction Management Plan (CMP).

4.1.9.4 Sleep Disturbances at Sensitive Receivers/Residences

The ICNG [4] provides an assessment methodology for sleep disturbance during the night period at residential premises due to construction activities. As construction activities are not expected to occur during the night period, a sleep disturbance assessment is not required. Where construction works are required outside of recommended standard hours, additional acoustic assessment will need to be completed by the contractor. Any acoustic measures are to be documented in the CMP.

4.2 Construction Vibration

Vibration generated from construction activities has the potential to affect surrounding sensitive receivers and buildings in the following ways:

- Perceptible vibration exceeding human comfort criteria affecting occupants of the building; and
- Structural vibration that may lead to the deterioration or cosmetic damage to the building structure.

It is noted that the level of vibration that may cause cosmetic damage to a building structure is typically orders of magnitude higher than that which would cause an adverse comment by building occupants. As such, perceptible vibration is not necessarily damaging to the building structure.

4.2.1 Human Comfort Vibration Criteria

The NSW EPA's *Assessing Vibration: A Technical Guideline* [6] nominates vibration limits aimed at minimising the potential for adverse reaction by building occupants based on the type of vibration (e.g. continuous, transient and intermittent event) in terms of the Vibration Dose Value (VDV). The VDV is a weighted vibration velocity dose referenced to an eight-hour day that penalises vibration impulses (i.e. rapid changes in vibration level), due to their perceived annoyance to occupants. The vibration associated with the types of construction activities that will be undertaken is best described as 'intermittent'. The VDV limits for intermittent vibration nominated in the guideline are presented in Table 9.

Table 9: Acceptable Vibration Dose Values for Intermittent Vibration ($ms^{-1.75}$)

LOCATION	DAYTIME[2]	
	PREFERRED VALUE	MAXIMUM VALUE
Residences (noise sensitive)	0.20	0.40
Offices, schools, educational institutions and places of worship	0.40	0.80

4.2.2 Structural Vibration Criteria

Currently, there are no available Australian Standards for the assessment of potential building damage due to vibration. Instead, reference is made to British Standard BS 7385-2:1993 *'Evaluation and measurement for vibration in buildings'* [7]. It is noted that this Standard is also referenced in NSW Roads & Maritime Services' *Construction Noise and Vibration Guideline* [8].

The recommended maximum limits from BS 7385-2 to prevent cosmetic damage to building structures are presented in Table 10.

Table 10: Maximum Vibration Limits to Minimise the Potential for Cosmetic Damage to Structures

LINE	TYPE OF BUILDING	PEAK COMPONENT OF PARTICLE VELOCITY IN FREQUENCY RANGE OF PREDOMINANY PULSE	
		4 HZ TO 15 HZ	15 HZ AND ABOVE
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4Hz and above	-
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 5 mm/s at 40 Hz and above

[2] Daytime is defined as 7:00am to 10:00pm

5. NOISE MODEL

A 3-D computer noise model of the site and its surrounds was created in SoundPLAN v8.2 as presented in Figure 3 and Figure 4, using architectural plans provided by Taylor Ellis. The topography in the locality appears to be mostly flat with limited undulation. For the purposes of the modelling scenario the proposed development and surrounding receivers have been modelled at the same relative level, with no shielding due to local topography. Aerial photography and site observations were used to determine the existing building heights and shielding effects from boundary fences.

Figure 3: 3-D View of the SoundPLAN model including Topography, Point Source Location and Nearby Surroundings

The SoundPLAN noise modelling predicts the noise emission from using algorithms defined in ISO 9613 *"Acoustics – Attenuation of sound during propagation outdoors".* Point receivers were assigned to the building facades of nearest NSRs at a distance of 1 metre (i.e. the predictions include façade reflection). The receivers were placed from 1.5 metres above the FFLs, which were assumed using conservative floor to floor heights.

A ground absorption value of G=0.5 was set as a cumulative value in the model. The environment in proximity of the site was observed to have about an equal distribution of reflective ground (roads, hardstands, sand) and absorptive ground (vegetation, lawn).

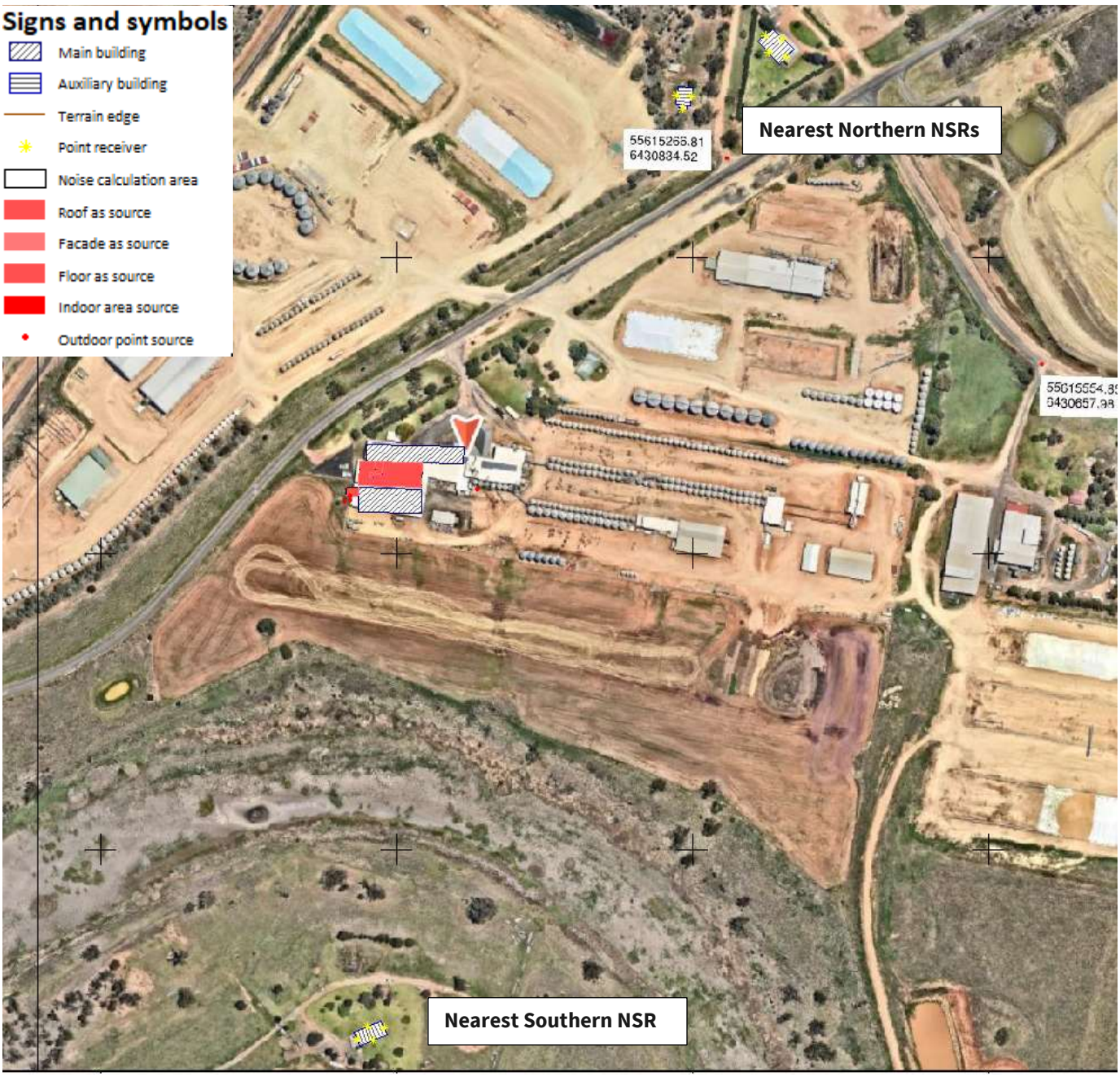

Figure 4: Site Plan View of SoundPLAN Model with Noise Sources and Noise Receivers

6. OPERATIONAL NOISE EMISSIONS FROM NEW PLANT

6.1 Air-Conditioning and Ventilation Plant and Equipment

A preliminary assessment of the proposed air-conditioning plant and equipment located on the shed 3 roof indicated compliance with NSW NPfI project noise trigger levels during all periods. Floth has acoustically assessed the noise emissions of four (4) indirect evaporative coolers will located on roof of Shed 3, with each unit having a sound power level of 69 dB(A).

6.2 Traffic Generated by Development

The site is not likely to have an increase in traffic that would result in a 2 dB increase in noise level to the existing as a result of the proposed facility upgrade works.

6.3 Shed 3 Noise Emissions – Grading and Bagging Plant and Operations

6.3.1 Noise Source Definition

The facility has conducted an audit of internal noise levels within existing Shed 1 which facilitates production and processing operations similar to what is proposed for Shed 3. Floth have been advised that the upgrades to existing Shed 3 will involve grading and bagging operations outlined in Table 11. Refer to Appendix B for a summary of the Gentech Seeds Narromine noise measurements conducted in 2017 (noise measurement sheet).

Table 11: Noise Level Monitoring – Shed 1 of GenTech Seeds Narromine Facility

AREA	MEASURED INTERNAL NOISE LEVELS[3]
Grading Plant	
Grading Plant No.1 – 3 Gravity Tables Operating, All Main Doors Open	77 – 98 dB(A)
Bagging Plant	
Bagging Plant No.1 – Northern & Southern Doors Open	74 dB(A)
Treating Tower	70 – 88 dB(A)
Storage Area	85 dB (A)
Chemical Mixing Room	78 dB(A)

[3] Noise levels were measured using a Digital Sound Level Meter N19 Q1362 on the 12.04.2017.

As such, Floth have used the above measured internal sound pressure levels as basis in defining source noise levels for Shed 3. The following source definitions were used for the purposes of acoustic modelling :

Table 12: Shed 3 Internal Noise Source Levels

EQUIPMENT		NOISE LEVELS	SOURCE TYPE
ID	MODEL		
Shed 3 Industrial Shed	n/a	Worst-Case Internal Noise: SWL - 115 dB(A)	Area (per unit)
	n/a	Average Internal Noise: SWL - 109 dB(A)	Area (per unit)
Cyclone Separators	Schenk	SWL – 97 dB(A)	Point (per unit)

Note 1: SWL – Sound Power Level

Note 2: Note that the worst-case and average scenarios for Shed 3 Internal noise were assigned area sound power levels (per unit) to reflect the worst-case and average measured noise levels provided in Table 11.

Note 3: A sound power level of 97 dB(A) was set as a limit for the cyclone separators such that compliance with relevant environmental noise emission criteria is achieved. Floth understand that cyclone separators are known to exhibit tonal noise properties. To account for a +5dB penalty for tonal noise (as per NSW NPfI 2017), an adjusted noise limit for the Cyclone Separators sound power level shall be 94 dB(A).

6.3.2 Modelling Assumptions

The following assumptions were used in the modelling of the Shed 3 noise emissions:

- Area source modelled at a 2 metre height from ground.
- Point source located at heights which reflect cyclone separator positions in Shed 3 Towers.
- Ground absorption G=0.5.
- Roller shutters in open position and single doors used for personnel entry/exit in closed position.

6.3.3 Noise Predictions

In summary of the noise modelling that was conducted using SoundPLAN software (refer to Section 5), Floth present noise predictions in Table 13 for the Shed 3 noise assessment.

Table 13: Shed 3 Upgrade Noise Emission Predictions

NOISE SENSITIVE RECEIVER	WORST CASE NOISE IMPACT $L_{Aeq,t}$	AVERAGE NOISE IMPACT, $L_{Aeq,t}$	COMPLIANCE ($L_{Aeq,15\ min}$ CRITERIA)	
			DAY (≤ 40 dBA)	EVENING AND NIGHT (≤ 35 dBA)
Nearest North NSR	39 dB(A)	33dB(A)	Worst-Case Operation ✔	Worst-Case Operation ✘, exceeds by 4 dB.
			Average Case Operation ✔	Average Case Operation ✔
Nearest South NSR	39 dB(A)	33dB(A)	Worst-Case Operation ✔	Worst-Case Operation ✘, exceeds by 4 dB.
			Average Case Operation ✔	Average Case Operation ✔

6.4 Blower Room

6.4.1 Noise Source Definition

The noise data presented in Table 14 is for the noise sources located in the proposed blower room. This information was provided to Floth by the Project Engineers (Keen Project Solutions).

Table 14: Blower Room Noise Source Levels

EQUIPMENT		NOISE LEVELS	SOURCE TYPE
ID	MODEL		
Blwr-86100	160CDL48RC2	SWL - 82 dB(A)	Point Source within Industrial Building the equipment's reflecting fan noise.
Blwr-86460	Heliflow 514	SWL - 69 dB(A)	Point Source within Industrial Building the equipment's reflecting fan noise.
Compressor	Atlas Copco Compressor GA37L-75VSD+	SPL – 70 dB(A) at 1 metre from source SWL – 78 dB(A)	Point Source within Industrial Building

Note 1: SWL- Sound Power Level

Note 2: SPL – Sound Pressure Level

6.4.2 Modelling Assumptions

The following assumptions were used in the modelling of the blower room noise emissions:

- Point noise sources modelled for the blower units were set a 0.5 metre heights from ground
- Point noise source for the Compressor unit was set a 4 metres from ground floor or approximately 1 metre from the second-storey floor.
- The roller shutters on the western façade of the blower room are in a closed position.
- The aluminium louvre sections on the northern (approx. 60m^2) and western façade (approx.. 12m^2) were modelled as open façade (no transmission loss).

6.4.3 Noise Predictions

In summary of the noise modelling that was conducted using SoundPLAN software, Floth present noise predictions in Table 15 for operation of equipment in blower room. It is predicted that the noise emissions from the blower room will satisfy the project noise emission limits.

Table 15: Blower Room Noise Emission Predictions

NOISE SENSITIVE RECEIVER	NOISE IMPACT, $L_{Aeq,t}$	COMPLIANCE ($L_{Aeq,15\ min}$ CRITERIA)	
		DAY (≤ 40 dBA)	EVENING AND NIGHT (≤ 35 dBA)
Nearest North NSR	12 dB(A)	✔	✔
Nearest South NSR	12 dB(A)	✔	✔

6.5 External Dust Collector / Blower Fans

6.5.1 Noise Source Definition

The noise data presented in Table 14 is for the noise sources located externally. This information was provided to Floth by the Project Engineers (Keen Project Solutions).

Table 16: External Equipment Noise Source Levels

EQUIPMENT		NOISE LEVELS	
ID	MODEL	SOUND POWER LEVEL	SOURCE
Blwr-86701	GTE – DC 15	85 to 95 dB(A)	Fan noise modelled as a point source
Blwr-86801	GTE – DC 30	85 to 92 dB(A)	Fan noise as a point source
Blwr-86901	GTE – DC 15	85 to 90 dB(A)	Fan noise as a point source
Blwr-86100	160CDL48RC2	82 dB(A)	Fan noise as a point source

Note 1: SWL- Sound Power Level

6.5.2 Modelling Assumptions

The following assumptions were used in the modelling of the external equipment noise emissions:

- Point noise sources were modelled at a 1 metre height from ground to represent the noise emissions from the externally located dust collectors and blower fans.
- Where a noise level range was given for the sound power source data (Table 16), the upper end of the range was used in the noise modelling, conservatively.

6.5.3 Noise Predictions

In summary of the noise modelling that was conducted using SoundPLAN software, Floth present noise predictions in Table 17 for external dust collector and blower equipment operation. It is predicted that dust collectors and/or blowers will satisfy the project noise emission limits.

Table 17: External Dust Collectors and Blower Plant Noise Emission Predictions

NOISE SENSITIVE RECEIVER	NOISE IMPACT, $L_{Aeq,t}$	COMPLIANCE ($L_{Aeq,15\ min}$ CRITERIA)	
		DAY (≤ 40 dBA)	EVENING AND NIGHT (≤ 35 dBA)
Nearest North NSR	20	✔	✔
Nearest South NSR	33	✔	✔

6.6 Forklift Operation to Service New External Dust Collectors (Sweep Path along New Hardstand)

Floth understand that only electric forklifts are being used at the facility and as such noise emissions are anticipated to be insignificant compared to the noise from the new plant.

6.7 Fire Pump (Emergency Equipment)

The fire pump operation is anticipated to be infrequent and only operating during monthly testing which is anticipated to be only conducted during the day period. Floth also understand that the fire pump set will be containerised.

Based on a preliminary assessment, the maximum allowable noise level to achieve compliance with day time environmental noise limits is a sound power level of 112 dB(A).

6.8 Construction Noise

Construction noise is acceptable provided that it is carried out in accordance with the EPNR as presented in Section 4.1.8.

Feasible and reasonable measures should be adopted by the Contractor. The noise mitigation measures should be identified in a Construction Management Plan (CMP) prepared by the Contractor and may include:

- Community notification;
- Operate plant in quiet and efficient manner;
- Use of localised noise barriers, appliance attenuators and silencers etc.
- Scheduling of noisy activities to occur in less sensitive periods;
- Train workers in minimising noise and quiet work practices;
- Implement a complaint handling procedure.

Using the construction noise mitigation strategies noted above, the noise impacts from the construction period can be suitably managed to prevent excessive noise impacts at surrounding sensitive receivers.

7. SUMMARY

Floth has been commissioned by Pioneer Hi-Bred Australia Pty Ltd (Gentech Seeds Narromine) to conduct a noise emission assessment for the proposed upgrade to the existing seed processing facility located at 323 The McGrane Way, Narromine 2821.

This report presents the noise impact assessment for the proposed facility upgrade as part of Development Application submission to the local authority, Narromine Shire Council.

The noise impacts considered to be as part of this assessment are as follows:

- Noise emissions from the proposed upgrade to the production and processing facility:
  - Seed production/processing plant, equipment and operations.
  - Mechanical plant and equipment.

Other noise sources associated with the proposed development are expected to be less significant compared with those listed above.

Preliminary noise emission predictions of preliminary mechanical plant design and selections has been conducted from new air-conditioning and ventilation plant/equipment. This preliminary assessment indicated that the air-conditioning and ventilation plant satisfied noise the environmental noise limits nominated in this report. Also, preliminary assessment of the fire pump equipment indicated that a fire pump with a sound power level ≤ 112 dB(A) shall achieve compliance with day time project noise trigger limits.

An assessment of the new significant plant, equipment and processes associated with the seed production and processing in Shed 3 indicated compliance with the applicable parameter assigned levels for all periods under the following condition:

- Cyclone Separator/s located within Shed 3 “Towers” are limited to a source noise level of 94 dB(A).

Noise modelling of a worst-case scenario for Shed 3 internal noise emissions (with Cyclone Separator/s limited to 94 dB(A)) indicated exceedance of the night-period project trigger noise level criteria but satisfied the maximum noise level criteria for night time noise emissions. Considering that the worst-case scenario is anticipated to be a rare occurrence and that the NSW Noise Policy for Industry 2017 Maximum Noise Level criteria is met, Floth do not anticipate adverse noise impacts from the Shed 3 upgrades.

Similarly, the blower room and external dust collector noise emissions that were modelled suggested compliance with applicable parameter assigned levels for all periods without additional acoustic mitigation measures.

Nevertheless, Floth recommend that new industrial plant, equipment and operations are acoustically controlled as reasonably and feasibly practicable.

In summary, the assessment has shown that the noise impacts from the proposed development can be managed and that adverse noise impacts on surrounding NSRs are not expected to arise.

Appendix A– Referenced Architectural Documentation

REFERENCED ARCHITECTURAL DRAWING PACKAGE			
DRAWING NUMBER	**DRAWING NAME**	**REVISION**	**DATE**
DA-00-00	Cover Sheet	Draft DA Issue	06.03.2024
DA-01-00	Overall Site Plan	Draft DA Issue	06.03.2024
DA-02-00	Overall Floor Plan – Shed 3	Draft DA Issue	06.03.2024
DA-05-00	Shed 3 Elevations	Draft DA Issue	06.03.2024
DA-05-10	Site Elevations	Draft DA Issue	06.03.2024
DA-06-00	Building Sections – Sheet 1	Draft DA Issue	06.03.2024
DA-06-01	Building Sections – Sheet 2	Draft DA Issue	06.03.2024
DA-09-00	Building Perspectives	Draft DA Issue	06.03.2024

Appendix B – Noise Levels - GenTech Seeds Narromine Site

GenTech Seeds
Exclusive producer distributor of Pioneer® brand products

Noise Level Monitoring - GenTech Seeds Narromine Site.

Tested using the Digital Sound Level Meter N19 Q1362

DATE:- 12-4-17

Area	Machinery	Readings
Corn Processing Plant - with all doors except southern & western external doors open.		
3 Husking Beds	Southern Operating Area	99.5
	Northern Operating Area	100.2
	Sorting Table No. 1	90.8
	Between Tables 1 & 2	91.0
	Sorting Table No. 3	93.1
	Eastern End of Sorting Table 3	92.6
Morning Tea Room	Centre of Room, All Doors Open	90.8
	1m East of Tea Room Door	85.2
	2m East of Tearoom Door	84.7
Green Corn Unloading Area	Inload Hopper Working Area, Walking Floor Not Operating	83.2
Batch Dryer Area	Working Area of Lower Drying Tunnel	86.3
	Top of Dryer Tripper Conveyor Operating	88.4
	Working Area on Top of Corn Drying	82.6
	Southern End Inload Cross Conveyor Junction Hopper, Falling Cobs	91.7
Husk Bailing Shed With New Automatic Husk Compactor	Work Area Inside Husking Shed	82.5
	Bale Pick Up Area Outside Shed	80.5
	Husk Conveyor Area, Southern Side	88.3
	1m Around Cyclone Area, Southern Side	86
	1m Around Aspirator, Western Side	92.4
Corn Processing Whilst Shelling - Air Wand Operating	Seed Disharger into Silo, Southern Side Husking Shed 1m from Silo50	92.4
	Centre Sheller/Husking Shed Area	102.1
	Sheller Work Platform	107.5
	Centre Tearoom, Doors Open	89.6
Cob Unloading Area	1m North Outside Sheller Shed	95.6
	Within 1m Bees Wings Cyclone	89.2
Grading Plant		
Grading Plant No. 1 - 3 Gravity Tables Operating, All Main Doors Open	Southern Door Closed	96.1
	2m Outside Eastern Door, Open	80.8
	1m Inside Eastern Door, Open	85.8
	4m North of Cimbria 06 in Isle Way	88.1
	Working Area Around Sizing Section	92.4
	Centre Isle Way Adjacent to Sizers	91.7
	1m Away Gravity Table Area, 3 Gravities	98.4
	Centre Isle Way Against Plastic Door Strip in Bagging No. 1	96.3
	Centre Isle Way Between Gravity Tables & Scarifier No. 2 (Not Working)	95.9
	Grading Inload Conveyor Area (Not	77.4
	Work Area Around Eastern Dust	81.3

Bagging Plant		
Bagging Plant No. 1 - Northern & Southern Doors Open	1m Inside Plastic Doorway Strip From Grading Plant No. 1	73.9
Treating Tower	First Landing On Way Upstairs	70.3
	1m Around Jog Dryer, First Deck	71.4
	Top Landing Around Treater	73.3
	Top Landing South Side Treater Near	72.5
	Top Landing in Jog Drying Area	73.3
	1m Around Bag Filling Area	78.2
	1m Around Bag Filling Area For 1sec As	88.2
	Sewing Machine Area	81.9
	Automatic Bad Stacking Machine Work	83.1
	Stretch Wrapper No.2 Area	81.6
Storage Area	Centre of Warehouse No.1	74.2
Chemical Mixing Room	1m Around AS31 Kaeser Air Compressor	84.9
Parent Seed Condition Shed	Southern Side	77.6
Conditioning Shed - All Doors Open Except Door into Office, Gravity Table Running (Not Operating)	1m Outside the North-East Door	70.8
	Inloading Area, Unclean Seed	78.3
	160 Oliver Gravity Table Work Area	71.0
	Under Mesh Platform, in Storage Bin	65.5
	Upstairs Sizing Section Work Area	71.3
	M2BC Clipper Screen Cleaner Area	70.2
	Aspirator Landing Area	70.7
	Seed Treating & Chemical Mixing	68.4
	Bagging Area, Ground Floor, Not	73.1
	Pallet Wrapping Area	67.1
	Centre of Parent Seed Conditioning Shed	71.2
	Inside Office, Door Closed	48.1
	Centre Storage Room Directly East of	68
Dryer No.1- Operating, Air Compressor Not in Operation	Centre of Thoroughfare Directly North of Conditioning Plant Door	70.9
Administration Area	Person Operating Air Wand	82.4
Administration Area - 3 Gravity Tables Operating Next Door	Kitchen Area	70.3
	Tea Room	58.6
	Northern Hallway to Conference Room	55.6
	Reception Area	61
Laboratory Area	Front Desk	63.8
Laboratory Area	Administration Office	51.8
	Work Area Inside Germ Cabinet Room	65.4
	0.5m From Germ Cabinets	65
	Seed Vacuum Distributor, Whilst Operating	82.5

DATE _____ AUDITOR _____ AUDITOR _____

Appendix C – SoundPLAN Noise Maps

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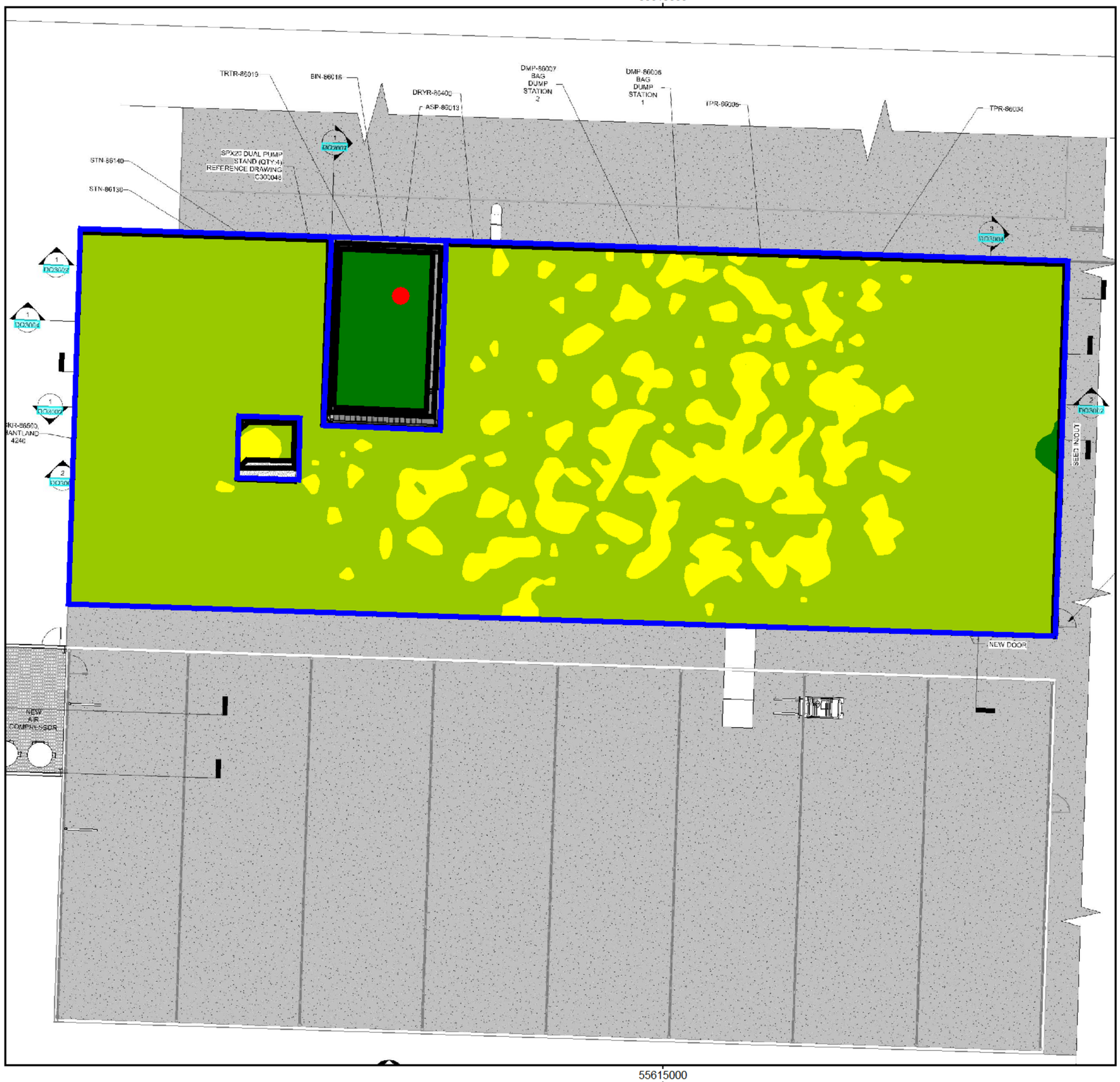


55615000

Customer: PIONEER BRAND SEEDS
Project: NARROMINE FACILITY UPGRADE
Project No.: 24017

NARROMINE FACILITY UPGRADE
SHED 3 - INTERNAL NOISE LEVEL
NOISE PREDICTION - AVERAGE SCENARIO
GRID NOISE MAP AT 2 METRE HEIGHT

PIONEER® BRAND · SEEDS

Signs and symbols

- Main building
- Noise calculation area
- Indoor point source
- Indoor area source
- Industrial building; Room
- Roof as source
- Facade as source
- Floor as source
- Transmissive area
- Calculation area
- Bitmap

Levels LrD
in dB(A)

<	89
89 -	91
91 -	93
>=	93

N

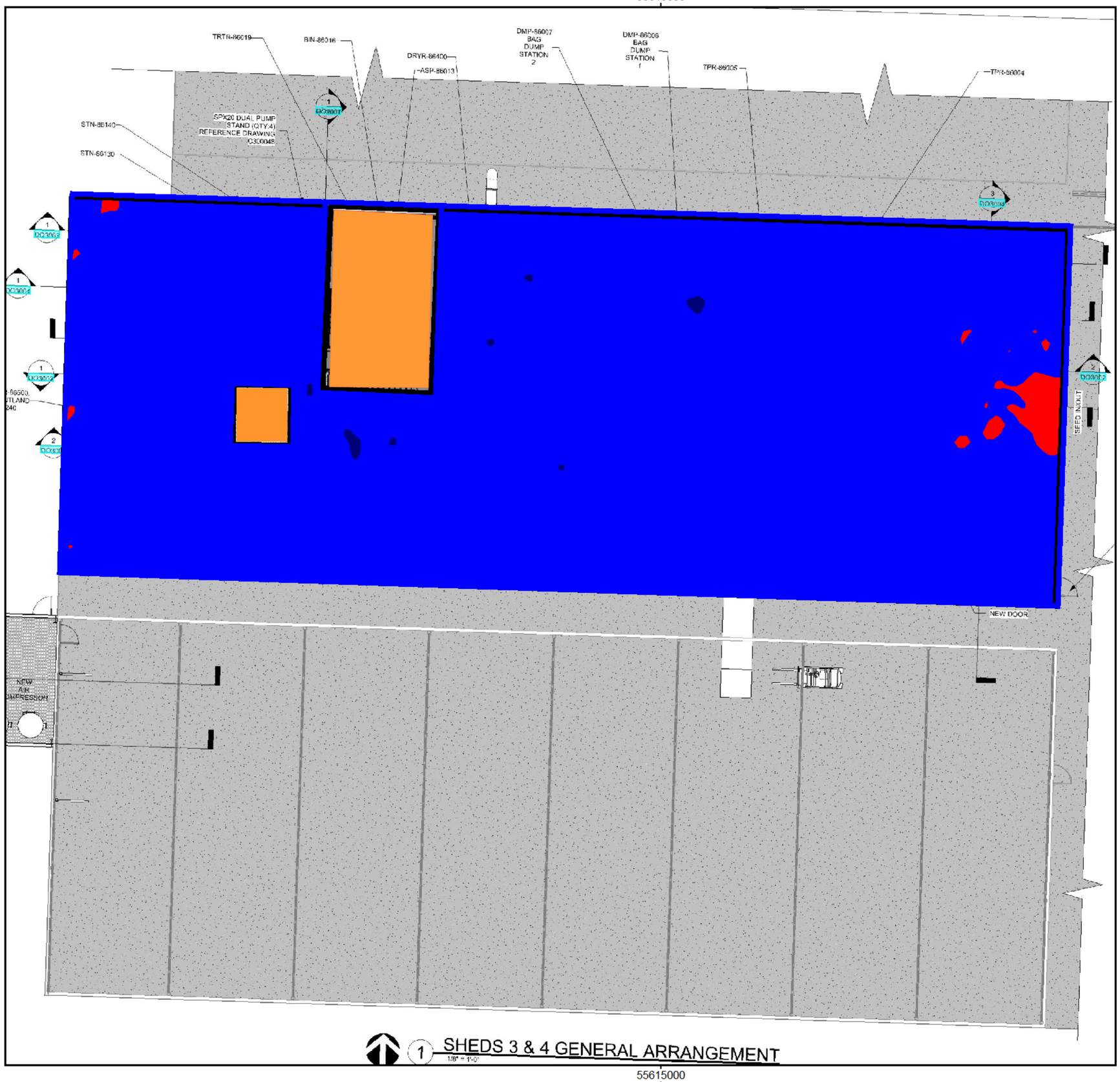
Length scale 1:213

0 2 4 8 12 1

Floth

N:\Acoustics Modelling\24017\Shed 3 Indoor Noise - Average Measured Noise Levels .sgs

55615000



1 SHEDS 3 & 4 GENERAL ARRANGEMENT
1/8" = 1'-0"

55615000

Customer: PIONEER BRAND SEEDS
Project: NARROMINE FACILITY UPGRADE
Project No.: 24017

NARROMINE FACILITY UPGRADE
SHED 3 - INTERNAL NOISE LEVEL
NOISE PREDICTION - WORST CASE SCENARIO
GRID NOISE MAP AT 2 METRE HEIGHT

PIONEER® BRAND • SEEDS

Signs and symbols

- Main building
- Noise calculation area
- Indoor point source
- Indoor area source
- Industrial building; Room
- Roof as source
- Facade as source
- Floor as source
- Transmissive area
- Calculation area
- Bitmap

Levels LrD
in dB(A)

<	95
95 -	97
97 -	99
>=	99

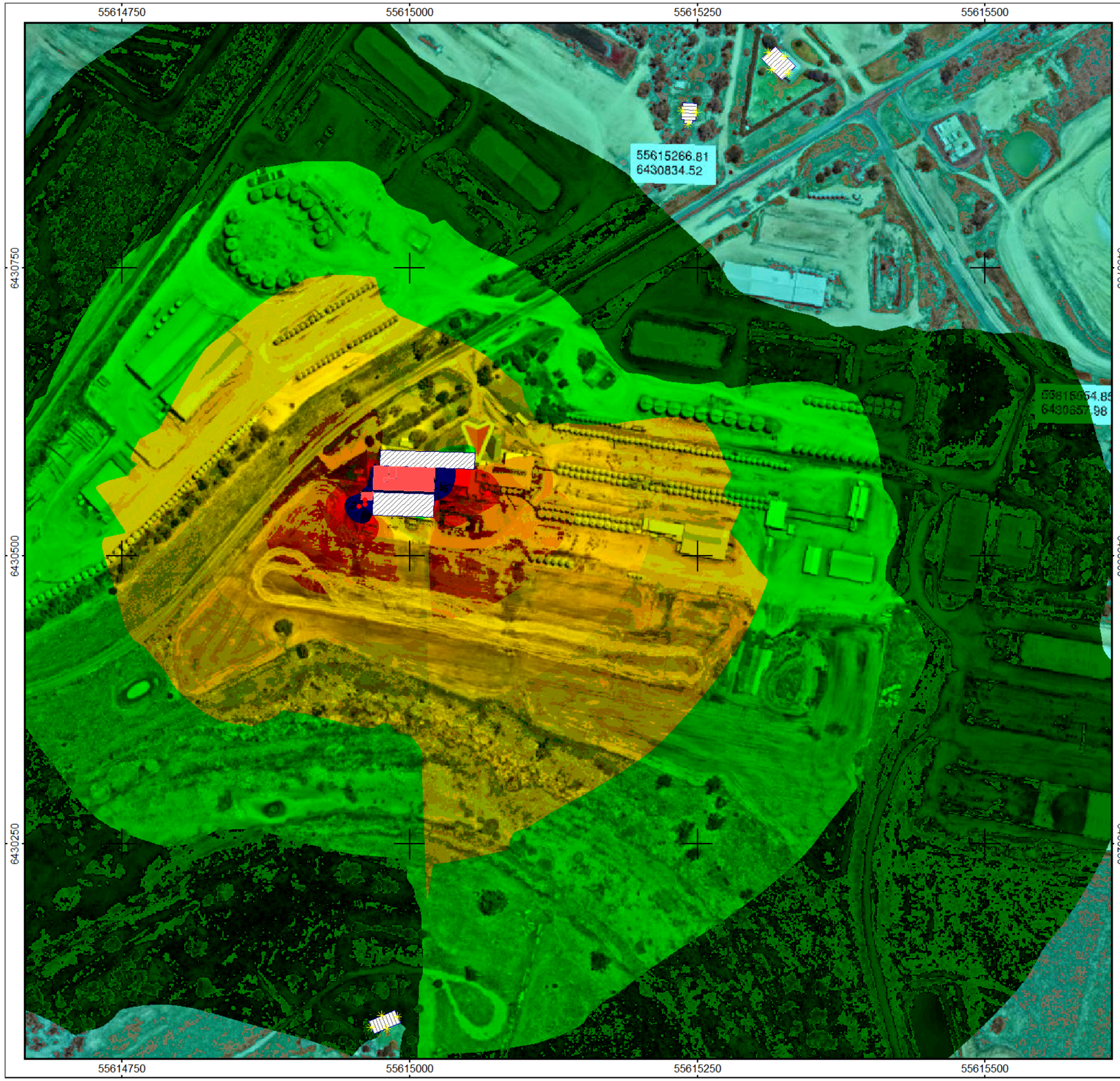
N

Length scale 1:211

0 2 4 8 12

floth

N:\Acoustics Modelling\24017\Shed 3 Indoor Noise - Worst Case Measured Noise Levels .sgs



Customer: PIONEER BRAND SEEDS
Project: NARROMINE FACILITY UPGRADE
Project No.: 24017

NARROMINE FACILITY UPGRADE
ALL NEW NOISE SOURCES
NOISE PREDICTION - ALL PERIODS
GRID NOISE MAP AT 2 METRE HEIGHT

PIONEER® BRAND · SEEDS

Signs and symbols

- Main building
- Auxiliary building
- Terrain edge
- Point receiver
- Noise calculation area
- Roof as source
- Facade as source
- Floor as source
- Indoor area source
- Outdoor point source

Levels LrD
in dB(A)

<	35
35 -	39
39 -	43
43 -	47
47 -	51
51 -	55
55 -	59
59 -	63
63 -	67
>=	67

N

Length scale 1:3371
0 25 50 100 150 200 m

Floth

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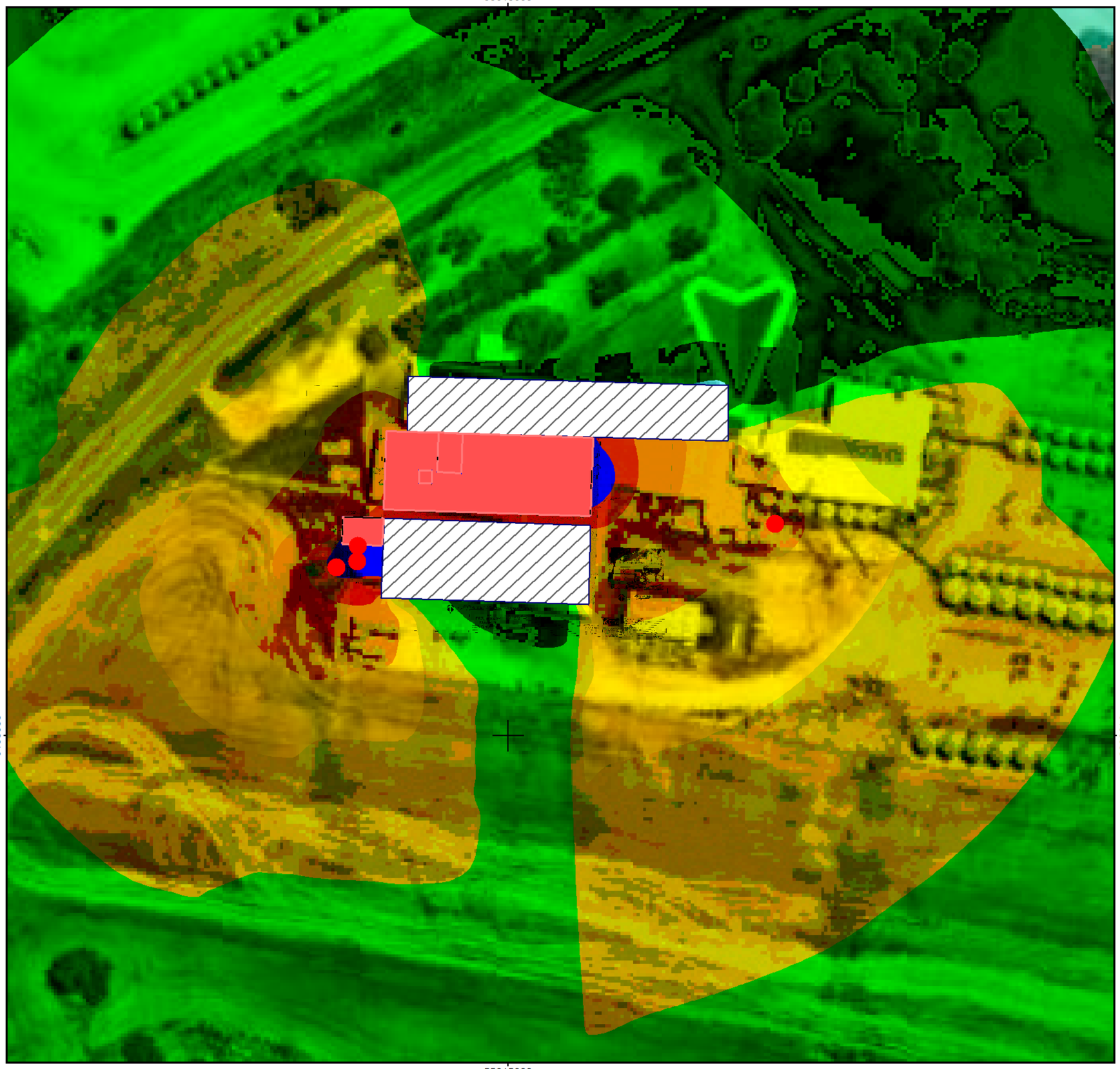

6430500

55615000

Customer: PIONEER BRAND SEEDS
Project: NARROMINE FACILITY UPGRADE
Project No.: 24017

NARROMINE FACILITY UPGRADE
ALL NEW NOISE SOURCES
NOISE PREDICTION - ALL PERIODS
FOCUSED GRID NOISE MAP AT 2 METRE HEIGHT

PIONEER® BRAND · SEEDS

Signs and symbols

- Main building
- Auxiliary building
- Terrain edge
- Point receiver
- Noise calculation area
- Roof as source
- Facade as source
- Floor as source
- Indoor area source
- Outdoor point source

Levels LrD
in dB(A)

<	40
40 -	45
45 -	50
50 -	55
55 -	60
60 -	65
65 -	70
70 -	75
>=	75

N

Length scale 1:1014

0 5 10 20 30 40 m

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N:\Acoustics Modelling\24017\CLOSE UP All Noise Sources GNM - Rev 02 22.03.2024.sgs

floth

floth.com.au

BRISBANE
Level 2
69 Robertson St
Fortitude Valley QLD 4006
+61 7 3513 8000
bne@floth.com.au

SYDNEY
Level 8, Tower A
799 Pacific Hwy
Chatswood NSW 2067
+61 2 9406 4555
syd@floth.com.au

PERTH
Level 6
66 St Georges Tce
Perth WA 6000
+61 8 6162 2396
perth@floth.com.au

MELBOURNE
Suite 13.04, Level 13
470 Collins St
Melbourne VIC 3000
+61 3 9448 8755
mel@floth.com.au

JAKARTA
Wisma Kemang Level 2
JL Kemang Selatan Raya No. 1
Jakarta Selatan 12560, Indonesia
+62 21 781 6326
floth@flothindonesia.com