GRIFFIN COAL LANCO

8/07/14

Mr Richard Sutherland
A/ Manager
Mining and Industrial Assessments
Office of the Environmental Protection Authority
The Atrium, Level 8,
168 St Georges Terrace,
PERTH WA 6000

Dear Richard

SECTION 38 REFERRAL – GRIFFIN COAL CONTAINERISED COAL EXPORT PROJECT

Im pleased to enclose two hard and soft copies of the Section 38 Referral document for Griffin Coal Mining Company Pty Ltd proposal to transport coal in sealed containers for export via Berth 5 at the Bunbury Port.

Should you require additional information, please do not hesitate to contact me on 9780 2441.

Yours sincerely
Griffin Coal / Lanco

BRANT EDWARDS
Technical Services and Environmental Manager

GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

EPA REFERRAL FORM PROPONENT

Referral of a Proposal by the Proponent to the Environmental Protection Authority under Section 38(1) of the *Environmental Protection Act 1986*.

PURPOSE OF THIS FORM

Section 38(1) of the *Environmental Protection Act 1986* (EP Act) provides that where a development proposal is likely to have a significant effect on the environment, a proponent may refer the proposal to the Environmental Protection Authority (EPA) for a decision on whether or not it requires assessment under the EP Act. This form sets out the information requirements for the referral of a proposal by a proponent.

Proponents are encouraged to familiarise themselves with the EPA's *General Guide on Referral of Proposals* [see Environmental Impact Assessment/Referral of Proposals and Schemes] before completing this form.

A referral under section 38(1) of the EP Act by a proponent to the EPA must be made on this form. A request to the EPA for a declaration under section 39B (derived proposal) must be made on this form. This form will be treated as a referral provided all information required by Part A has been included and all information requested by Part B has been provided to the extent that it is pertinent to the proposal being referred. Referral documents are to be submitted in two formats – hard copy and electronic copy. The electronic copy of the referral will be provided for public comment for a period of 7 days, prior to the EPA making its decision on whether or not to assess the proposal.

CHECKLIST

Before you submit this form, please check that you have:

	Yes	No
Completed all the questions in Part A (essential).	✓	
Completed all applicable questions in Part B.	✓	
Included Attachment 1 – location maps.	✓	
Included Attachment 2 – additional document(s) the proponent wishes to provide (if applicable).	✓	
Included Attachment 3 – confidential information (if applicable).		✓
Enclosed an electronic copy of all referral information, including spatial data and contextual mapping but excluding confidential information.	✓	

Following a review of the information presented in this form, please consider the following question (a response is optional).

Do you consider the proposal requires formal environmental impact assessment? ☐ Yes ✓ No ☐ Not sure
If yes, what level of assessment? ☐ Assessment on Proponent Information ☐ Public Environmental Review

PROPONENT DECLARATION (to be completed by the proponent)

I, David Trench, Declare to be the person responsible for the proposal to submit this form and further declare that the information contained in this form is true and not misleading.

Signature:	Name (print): David Trench
Email: david.trench@griffincoal.com.au	Company: Lanco Resources Australia
Date:	

PART A - PROPONENT AND PROPOSAL INFORMATION
(All fields of Part A must be completed for this document to be treated as a referral)

1 PROPONENT AND PROPOSAL INFORMATION

1.1 Proponent

Name	The Griffin Coal Mining Company Pty Ltd
Joint Venture parties (if applicable)	No
Australian Company Number (if applicable)	16 008 667 285
Postal Address (where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State)	Locked Bag 218, Collie, WA 6225
Key proponent contact for the proposal: • name • address • phone • email	• Brant Edwards • Centaur Road, Collie • 08 9780 2441 • b.edwards@griffincoal.com.au
Consultant for the proposal (if applicable): • name • address • phone • email	• Fionnuala Hannon (GHD), • 1/10 Victoria street, Bunbury, WA 6230 • (08) 9721 0711 • fionnuala.hannon@ghd.com

1.2 Proposal

Title	Containerised Coal Export Project, Berth 5, Bunbury Port (the Project)
Description	The Project proposes to export up to 1.25 million tonnes per annum (Mtpa) of coal from Berth 5 of the Bunbury Port inner harbour. The Project includes: • Containerised coal transport by rail to the Picton Container Terminal. • Griffin Coal will load the containers at the Ewington Minesite at Collie • Aurizon will manage the unloading of the containers at the Picton Terminal. • Containers will be transported by truck from the Picton Terminal to the Bunbury Port on a 24 hour basis, via the Port Access Rd. • Storage and handling of the coal containers will be managed by Qube

	Ports and Bulk at a dedicated laydown area close to Berth 5. • The coal containers will be stacked on a designated hardstand area (approx. 15 000m^2). • Shore cranes will be used load the coal containers onto vessels. • Qube will be responsible for the loading of containers on Panamax or equivalent vessel (capacity 45 000t) for export every 10-11 days, ie 45 shipments per annum.
Extent (area) of proposed ground disturbance.	All activities within the port will be conducted on reclaimed port land within the Inner Harbour and no native vegetation will be disturbed. The activities at Preston and Ewington are within existing operations and involve no new ground disturbance.
Timeframe in which the activity or development is proposed to occur (including start and finish dates where applicable).	The laydown area for the containers will be constructed in the third quarter of 2014. Exports are expected to commence in the fourth quarter of 2014.
Details of any staging of the proposal.	N/A
Is the proposal a strategic proposal?	No
Is the proponent requesting a Declaration that the proposal is a derived proposal? If so, provide the following information on the strategic assessment within which the referred proposal was identified: • title of the strategic assessment; and • Ministerial Statement number.	No
Please indicate whether, and in what way, the proposal is related to other proposals in the region.	This Project uses existing rail and port facilities within the Bunbury Port inner harbour. The coal is sourced from existing operations at the Lanco Ewington coal mine. It is not related to, or dependent on, the Lanco Resources Australia Pty Ltd proposal to construct a bulk export terminal at Berth 14A of the Port proceeding . None of the facilities for the Project will be used by bulk coal export proposal, nor will any of the bulk coal export facilities be used by the Project.
Does the proponent own the land on which the proposal is to be established? If not, what other	No: Qube will lease the proposed laydown area from the Bunbury Port

arrangements have been established to access the land?	Authority.
What is the current land use on the property, and the extent (area in hectares) of the property?	Berth 5 is within the Bunbury Port Inner Harbour. The Inner Harbour has five developed berths and is planned to expand to accommodate a total of 13 berths. Berth 5 is an existing land backed multi-use facility through which mineral sands, other bulk products and break-bulk cargoes are exported and imported.

1.3 Location

Name of the Shire in which the proposal is located.	City of Bunbury
For urban areas: • street address; • lot number; suburb; and • nearest road intersection.	• 963 Estuary Drive; • Part of Lot 963 On Plan 220558 and Part of Lot 962 on Plan 219848 • Vittoria, WA 6320 • Leschenault Drive and Estuary Drive.
For remote localities: • nearest town; and • distance and direction from that town to the proposal site.	N/A
Electronic copy of spatial data - GIS or CAD, geo-referenced and conforming to the following parameters: • GIS: polygons representing all activities and named; • CAD: simple closed polygons representing all activities and named; • datum: GDA94; • projection: Geographic (latitude/longitude) or Map Grid of Australia (MGA); • format: Arcview shapefile, Arcinfo coverages, Microstation or AutoCAD.	Yes

1.4 Confidential Information

Does the proponent wish to request the EPA to allow any part of the referral information to be treated as confidential?	No
If yes, is confidential information attached as a separate document in hard copy?	NA

1.5 Government Approvals

Is rezoning of any land required before the proposal can be implemented? If yes, please provide details.		No	
Is approval required from any Commonwealth or State Government agency or Local Authority for any part of the proposal? If yes, please complete the table below.		Yes –	

Agency/Authority	Approval required	Application lodged Yes / No *	Agency/Local Authority contact(s) for proposal
Department of Environmental Regulation (DER)	Works Approval	No, but DER has been briefed on the project.	Neville Welsh (DER officer, Southern Region)

- The Bunbury Port Authority was granted a Works Approval for this project in. This Works Approval will be withdrawn and Lanco Resources Australia will apply for a new Works Approval.

PART B - ENVIRONMENTAL IMPACTS AND PROPOSED MANAGEMENT

2. ENVIRONMENTAL IMPACTS

Describe the impacts of the proposal on the following elements of the environment, by answering the questions contained in Sections 2.1-2.11:

2.1 flora and vegetation;

2.2 fauna;

2.3 rivers, creeks, wetlands and estuaries;

2.4 significant areas and/ or land features;

2.5 coastal zone areas;

2.6 marine areas and biota;

2.7 water supply and drainage catchments;

2.8 pollution;

2.9 greenhouse gas emissions;

2.10 contamination; and

2.11 social surroundings.

These features should be shown on the site plan, where appropriate.

For all information, please indicate:

(a) the source of the information; and

(b) the currency of the information.

2.1 Flora and Vegetation

2.1.1 Do you propose to clear any native flora and vegetation as a part of this proposal?

[A proposal to clear native vegetation may require a clearing permit under Part V of the EP Act (Environmental Protection (Clearing of Native Vegetation) Regulations 2004)]. Please contact the Department of Environmental Regulation (DER) for more information.

(please tick) ☐ Yes **If yes**, complete the rest of this section.

✓ No **If no**, go to the next section

2.1.2 How much vegetation are you proposing to clear (in hectares)?

2.1.3 Have you submitted an application to clear native vegetation to the DER (unless you are exempt from such a requirement)?

☐ Yes ☐ No **If yes**, on what date and to which office was the application submitted of the DER?

2.1.4 Are you aware of any recent flora surveys carried out over the area to be disturbed by this proposal?

☐ Yes ☐ No **If yes**, please attach a copy of any related survey reports and provide the date and name of persons / companies involved in the survey(s).

If no, please do not arrange to have any biological surveys conducted prior to consulting with the DER.

2.1.5 Has a search of DER records for known occurrences of rare or priority flora or threatened ecological communities been conducted for the site?

☐ Yes ☐ No If you are proposing to clear native vegetation for any part of your proposal, a search of DER records of known occurrences of rare or priority flora and threatened ecological communities will be required. Please contact DER for more information.

2.1.6 Are there any known occurrences of rare or priority flora or threatened ecological communities on the site?

☐ Yes ☐ No **If yes**, please indicate which species or communities are involved and provide copies of any correspondence with DER regarding these matters.

2.1.7 If located within the Perth Metropolitan Region, is the proposed development within or adjacent to a listed Bush Forever Site? (You will need to contact the Bush Forever Office, at the Department for Planning and Infrastructure)

☐ Yes ☐ No **If yes**, please indicate which Bush Forever Site is affected (site number and name of site where appropriate).

2.1.8 What is the condition of the vegetation at the site?

2.2 Fauna

2.2.1 Do you expect that any fauna or fauna habitat will be impacted by the proposal?

(please tick) ☐ Yes **If yes**, complete the rest of this section.

✓ No **If no**, go to the next section.

2.2.2 Describe the nature and extent of the expected impact.

2.2.3 Are you aware of any recent fauna surveys carried out over the area to be disturbed by this proposal?

☐ Yes ☐ No **If yes**, please attach a copy of any related survey reports and provide the date and name of persons / companies involved in the survey(s).

If no, please do not arrange to have any biological surveys conducted prior to consulting with the DER.

2.2.4 Has a search of DER records for known occurrences of Specially Protected (threatened) fauna been conducted for the site?

☐ Yes ☐ No (please tick)

2.2.5 Are there any known occurrences of Specially Protected (threatened) fauna on the site?

☐ Yes ☐ No **If yes**, please indicate which species or communities are involved and provide copies of any correspondence with DER regarding these matters.

2.3 Rivers, Creeks, Wetlands and Estuaries

2.3.1 Will the development occur within 200 metres of a river, creek, wetland or estuary?

(please tick) ☐ Yes **If yes**, complete the rest of this section.

✓ No **If no**, go to the next section.

2.3.2 Will the development result in the clearing of vegetation within the 200 metre zone?

☐ Yes ☐ No **If yes**, please describe the extent of the expected impact.

The Project Area has previously been cleared.

2.3.3 Will the development result in the filling or excavation of a river, creek, wetland or estuary?

☐ Yes ☐ No **If yes**, please describe the extent of the expected impact.

2.3.4 Will the development result in the impoundment of a river, creek, wetland or estuary?

☐ Yes ☐ No **If yes**, please describe the extent of the expected impact.

2.3.5 Will the development result in draining to a river, creek, wetland or estuary?

☐ Yes ☐ No **If yes**, please describe the extent of the expected impact.

2.3.6 Are you aware if the proposal will impact on a river, creek, wetland or estuary (or its buffer) within one of the following categories? (please tick)

Conservation Category Wetland	☐ Yes	☐ No	☐ Unsure
Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998	☐ Yes	☐ No	☐ Unsure
Perth's Bush Forever site	☐ Yes	☐ No	☐ Unsure
Environmental Protection (Swan & Canning Rivers) Policy 1998	☐ Yes	☐ No	☐ Unsure
The management area as defined in s4(1) of the *Swan River Trust Act 1988*	☐ Yes	☐ No	☐ Unsure
Which is subject to an international agreement, because of the importance of the wetland for waterbirds and waterbird habitats (e.g. Ramsar, JAMBA, CAMBA)	☐ Yes	☐ No	☐ Unsure

2.4 Significant Areas and/ or Land Features

2.4.1 Is the proposed development located within or adjacent to an existing or proposed National Park or Nature Reserve?

☐ Yes ✓ No **If yes**, please provide details.

2.4.2 Are you aware of any Environmentally Sensitive Areas (as Declared by the Minister under section 51B of the EP Act) that will be impacted by the proposed development?

✓ Yes ☐ No **If yes**, please provide details.

One Environmentally Sensitive area (ESA) (1811) is mapped on the DEC Native Vegetation Viewer as occurring within the Project Area (DEC, 2012). However, the values associated with this ESA are no longer represented within the Project area due to previous Port development and expansion and current operations within the Inner Harbour.

2.4.3 Are you aware of any significant natural land features (e.g. caves, ranges etc) that will be impacted by the proposed development?

☐ Yes ✓ No **If yes**, please provide details.

2.5 Coastal Zone Areas (Coastal Dunes and Beaches)

2.5.1 Will the development occur within 300 metres of a coastal area?

(please tick) ☐ Yes **If yes**, complete the rest of this section.

✓ No **If no**, go to the next section.

2.5.2 What is the expected setback of the development from the high tide level and from the primary dune?

N/A

2.5.3 Will the development impact on coastal areas with significant landforms including beach ridge plain, cuspate headland, coastal dunes or karst?

☐ Yes ✓ No **If yes**, please describe the extent of the expected impact.

2.5.4 Is the development likely to impact on mangroves?

☐ Yes ✓ No **If yes**, please describe the extent of the expected impact.

2.6 Marine Areas and Biota

2.6.1 Is the development likely to impact on an area of sensitive benthic communities, such as seagrasses, coral reefs or mangroves?

☐ Yes ✓ No **If yes**, please describe the extent of the expected impact.

2.6.2 Is the development likely to impact on marine conservation reserves or areas recommended for reservation (as described in *A Representative Marine Reserve System for Western Australia*, CALM, 1994)?

☐ Yes ✓ No **If yes**, please describe the extent of the expected impact.

2.6.3 Is the development likely to impact on marine areas used extensively for recreation or for commercial fishing activities?

☐ Yes ✓ No **If yes**, please describe the extent of the expected impact, and provide any written advice from relevant agencies (e.g. Fisheries WA).

2.7 Water Supply and Drainage Catchments

2.7.1 Are you in a proclaimed or proposed groundwater or surface water protection area?

(You may need to contact the Department of Water (DoW) for more information on the requirements for your location, including the requirement for licences for water abstraction. Also, refer to the DoW website)

☐ Yes ✓ No **If yes**, please describe what category of area.

2.7.2 Are you in an existing or proposed Underground Water Supply and Pollution Control area?

(You may need to contact the DoW for more information on the requirements for your location, including the requirement for licences for water abstraction. Also, refer to the DoW website)

☐ Yes ✓ No **If yes**, please describe what category of area.

2.7.3 Are you in a Public Drinking Water Supply Area (PDWSA)?

(You may need to contact the DoW for more information or refer to the DoW website. A proposal to clear vegetation within a PDWSA requires approval from DoW.)

☐ Yes ✓ No **If yes**, please describe what category of area.

2.7.4 Is there sufficient water available for the proposal?

(Please consult with the DoW as to whether approvals are required to source water as you propose. Where necessary, please provide a letter of intent from the DoW)

✓ Yes ☐ No (please tick)

Sufficient water is available from existing supply within the Bunbury Port Inner Harbour. No new sources of water will be required by the Project.

2.7.5 Will the proposal require drainage of the land?

✓ Yes ☐ No

If yes, how is the site to be drained and will the drainage be connected to an existing Local Authority or Water Corporation drainage system? Please provide details.

Stormwater will drain to a collection sump within the inner harbour where it will be treated in a hydrocarbon recovery system and tested prior to being discharged into the inner harbour basin.

Spoon drains will be constructed on the downslope of the container loading/unloading areas to collect potentially contaminated stormwater. The collected water will be directed to a sediment trap for retention and finally discharged to the Inner Harbour after treatment (if required).

Site drainage will be managed by Qube who will be responsible for the drainage system for the laydown area. The laydown area will be constructed and designed to ensure compliance to the *Urban Stormwater Management Guidelines* (Agriculture and resource Management Council of Australia and New Zealand and the Australian and New Zealand Environment and Conservation Council, 2000. The system will comprise a dedicated catchment and containment drains complete with an engineered sediment trap and hydrocarbon treatment system.

2.7.6 Is there a water requirement for the construction and/ or operation of this proposal?

(please tick) ✓ Yes **If yes**, complete the rest of this section.

☐ No **If no**, go to the next section.

2.7.7 What is the water requirement for the construction and operation of this proposal, in kilolitres per year?

There will be a minimal water requirement in the construction of the lay down area. Water distributed to ground by water carts may be required for the purposes of dust suppression during construction. Operations water demand will be very small and mostly for domestic type uses.

2.7.8 What is the proposed source of water for the proposal? (e.g. dam, bore, surface water etc.)

There is an existing water supply to Berth 5 and this is expected to meet most of the water supply demand. Any additional water that may be required (possibly during construction mainly for dust suppression) will be brought on site in tankers on an as-needs basis and sourced from offsite existing commercial suppliers.

2.8 Pollution

2.8.1 Is there likely to be any discharge of pollutants from this development, such as noise, vibration, gaseous emissions, dust, liquid effluent, solid waste or other pollutants?

(please tick) ✓ Yes — **If yes**, complete the rest of this section.

☐ No — **If no**, go to the next section.

Dust and noise impacts will need to be managed as part of the Project.

2.8.2 Is the proposal a prescribed premise, under the Environmental Protection Regulations 1987?

(Refer to the EPA's *General Guide for Referral of Proposals to the EPA under section 38(1) of the EP Act 1986* for more information)

✓ Yes ☐ No — **If yes**, please describe what category of prescribed premise.

Berth 5 is currently included within the Berth 8 prescribed premises boundary. Berth 8 is a Category 58 prescribed premise – Bulk Material Loading or Unloading – Up to 100tpd.

2.8.3 Will the proposal result in gaseous emissions to air?

☐ Yes ✓ No — **If yes**, please briefly describe.

2.8.4 Have you done any modelling or analysis to demonstrate that air quality standards will be met, including consideration of cumulative impacts from other emission sources?

✓ Yes ☐ No

If yes, please briefly describe.

Dust modelling for the proposed works has shown that there will be no increase cumulative dust concentrations outside the port boundary during the operational phases of the Project.

Dust emissions from the construction phase of the Project are anticipated to be minimal with proper management controls in place such as water carts to supress dust.

The Project has been designed to prevent the generation of dust by transporting and storing coal in sealed containers. Coal will be delivered with a moisture level of between 20-28% to reduce the potential for dust emissions should there be a breach of any container.
Qube will be responsible for all dust monitoring and the effectiveness of individual dust control measures.

2.8.5 Will the proposal result in liquid effluent discharge?

☐ Yes ✓ No

If yes, please briefly describe the nature, concentrations and receiving environment.

2.8.6 If there is likely to be discharges to a watercourse or marine environment, has any analysis been done to demonstrate that the State Water Quality Management Strategy or other appropriate standards will be able to be met?

✓ Yes ☐ No

If yes, please describe.

Stormwater will drain to a collection sump within the inner harbour where it will be treated in a hydrocarbon recovery system and tested prior to being discharged into the inner harbour basin.

Stormwater from areas that have a risk of contamination will pass through engineered sediment retention traps prior to being discharged into the Inner Harbour (after treatment, if required).

2.8.7 Will the proposal produce or result in solid wastes?

☐ Yes ✓ No **If yes**, please briefly describe the nature, concentrations and disposal location/ method.

2.8.8 Will the proposal result in significant off-site noise emissions?

☐ Yes ✓ No **If yes**, please briefly describe.

2.8.9 Will the development be subject to the Environmental Protection (Noise) Regulations 1997?

✓ Yes ☐ No **If yes**, has any analysis been carried out to demonstrate that the proposal will comply with the Regulations?

The nearest sensitive receptor is approximately 430m from the export Berth,

Noise modelling has indicated that noise emissions from the containerised coal export project will comply with assigned noise levels.

Management measures will be implemented to minimise noise emissions. Verification monitoring will be undertaken at a minimum of three locations that are representative of noise levels at noise sensitive receivers during commissioning to confirm whether tonality is present in noise emissions and to confirm the sound power levels of operating equipment.

Noise modelling results for Bunbury Port are presented in Attachment 2. SVT 2013: Environmental Noise Assessment for Bunbury Port Containerised Coal Export Project. The noise assessment (SVT, 2013) includes a train unloading noise component which is no longer relevant; therefore this report represents a worst case scenario.

2.8.10 Does the proposal have the potential to generate off-site, air quality impacts, dust, odour or another pollutant that may affect the amenity of residents and other "sensitive premises" such as schools and hospitals (proposals in this category may include intensive agriculture, aquaculture, marinas, mines and quarries etc.)?

✓ Yes ☐ No

If yes, please describe and provide the distance to residences and other "sensitive premises".

While there is a very low risk of dust emissions impacting sensitive receivers during the operational phase of the project due to the contained nature of the coal, verification dust monitoring will be in place during commissioning and operations for the life of the works approval. There will be an additional dust monitoring station located adjacent to Berth 5 to monitor for any potential changes in air quality.

2.8.11 If the proposal has a residential component or involves "sensitive premises", is it located near a land use that may discharge a pollutant?

☐ Yes ☐ No ✓ Not Applicable

If yes, please describe and provide the distance to the potential pollution source

2.9 Greenhouse Gas Emissions

2.9.1 Is this proposal likely to result in substantial greenhouse gas emissions (greater than 100 000 tonnes per annum of carbon dioxide equivalent emissions)?

☐ Yes ✓ No

If yes, please provide an estimate of the annual gross emissions in absolute and in carbon dioxide equivalent figures.

2.9.2 Further, if yes, please describe proposed measures to minimise emissions, and any sink enhancement actions proposed to offset emissions.

2.10 Contamination

2.10.1 Has the property on which the proposal is to be located been used in the past for activities which may have caused soil or groundwater contamination?

✓ Yes ☐ No ☐ Unsure **If yes**, please describe.

Lot 963 is classified as “Contaminated-remediation required” according to the DEC Contaminated Sites Database.

The Project is located within Lot 963. This Lot is a ‘super lot’ which includes the majority of the land at the inner harbour.

Part of Lot 963 is used for the bulk storage of caustic soda and alumina as well as acting as a loading facility for alumina and unloading facility for caustic soda. This is considered a land use that has the potential to cause contamination, as specified in the guideline 'Potentially Contaminating Activities, Industries and Landuses' (Department of Environment, 2004). The contamination potential is confined to a small area adjacent to Berths 4 and 6.

While Berth 5 has not been used for caustic soda or alumina export/import purposes, it is within ‘super lot’ 963 and is therefore part of a registered contaminated site (see 2.10.3).

2.10.2 Has any assessment been done for soil or groundwater contamination on the site?

☐ Yes ✓ No **If yes**, please describe.

2.10.3 Has the site been registered as a contaminated site under the *Contaminated Sites Act 2003*? (on finalisation of the CS Regulations and proclamation of the CS Act)

✓ Yes ☐ No **If yes**, please describe.

The Project is located within Lot 963, a super lot, part of which was classified as “Contaminated-remediation required” under the *Contaminated Sites Act 2003* on the 22/05/2009.

2.11 Social Surroundings

2.11.1 Is the proposal on a property which contains or is near a site of Aboriginal ethnographic or archaeological significance that may be disturbed?

☐ Yes ✓ No ☐ Unsure **If yes**, please describe.

2.11.2 Is the proposal on a property which contains or is near a site of high public interest (e.g. a major recreation area or natural scenic feature)?

☐ Yes ✓ No **If yes**, please describe.

The Project is located within the Port Operational Boundaries and public access to berths is not permitted other than for people on port business. Access controls are in place to ensure this. The operational areas of the Inner Harbour are all on reclaimed land and the Inner Harbour itself is an artificial water body created by dredging.

2.11.3 Will the proposal result in or require substantial transport of goods, which may affect the amenity of the local area?

✓ Yes ☐ No **If yes**, please describe.

Coal will be railed from the Ewington Mine at Collie to Picton Rail terminal. There will be 22 train services over an 11 day period (time required to build a container stockpile) when shipments are to take place. The containers will be trucked (a total of 528 truck movements for each 11 day time period, which is approximately 48 trucks per 24 hour period) from the Picton Rail terminal via the Port Access Road (Willinge Drive) to the Inner Harbour over a 24 hour period. The Port Access Road is a dedicated transport route for the movement of freight into and out of the Port.

3. PROPOSED MANAGEMENT

3.1 Principles of Environmental Protection

3.1.1 Have you considered how your project gives attention to the following Principles, as set out in section 4A of the EP Act? (For information on the Principles of Environmental Protection, please see EPA Position Statement No. 7, available on the EPA website)

1. The precautionary principle.	✓ Yes	☐ No
2. The principle of intergenerational equity.	✓ Yes	☐ No
3. The principle of the conservation of biological diversity and ecological integrity.	✓ Yes	☐ No
4. Principles relating to improved valuation, pricing and incentive mechanisms.	✓ Yes	☐ No
5. The principle of waste minimisation.	✓ Yes	☐ No

3.1.2 Is the proposal consistent with the EPA's Environmental Protection Bulletins/Position Statements and Environmental Assessment Guidelines/Guidance Statements (available on the EPA website)?

✓ Yes ☐ No

3.2 Consultation

3.2.1 Has public consultation taken place (such as with other government agencies, community groups or neighbours), or is it intended that consultation shall take place?

✓ Yes ☐ No

If yes, please list those consulted and attach comments or summarise response on a separate sheet.

Consultation regarding the Project has taken place with the following community groups, state government and regulatory agencies;

- DER (Licensing Branch)
- Bunbury Port Authority
- Port Community Liaison Committee
- Griffin Coal Reference Group
- Office of the Environmental Protection Authority
- Department of State Development
- Department of Mines and Petroleum
- Main Roads WA
- City of Bunbury
- South West Development Commission
- Bunbury Chamber of Commerce and Industry
- Dolphin Discovery Centre
- Rotary Club of South Bunbury

Invitations and opportunities to comment and raise issues were provided at each consultation meeting. Any issues raised were addressed at the time.

Attachment 1

Figure 1 - Location Plan
Figure 2 - Transport Route

N

0

GDA94 MGA-50
Scale 1:5000(A3)

375,000mE

375,500mE

376,000mE

376,500mE

6312000mN

6311500mN

CRANE

BERTH-5

ROAD
ONE WAY

ROAD
ONE WAY

ENTRY

EXIT

CONTAINER
STORAGE AREA
1.797HA

CONTAINER
SCREEN

SEDIMENT BASIN
300 SQM

ROAD
TWO WAY

TRUCKS ENTERING PORT

LEGEND:

- Spoon Drain
- Container Screen
- Truck Entry
- Truck Exit
- Sediment Trap
- Storage Area
- Dedicated Refuelling Area
- Cranes
- Sediment Basin

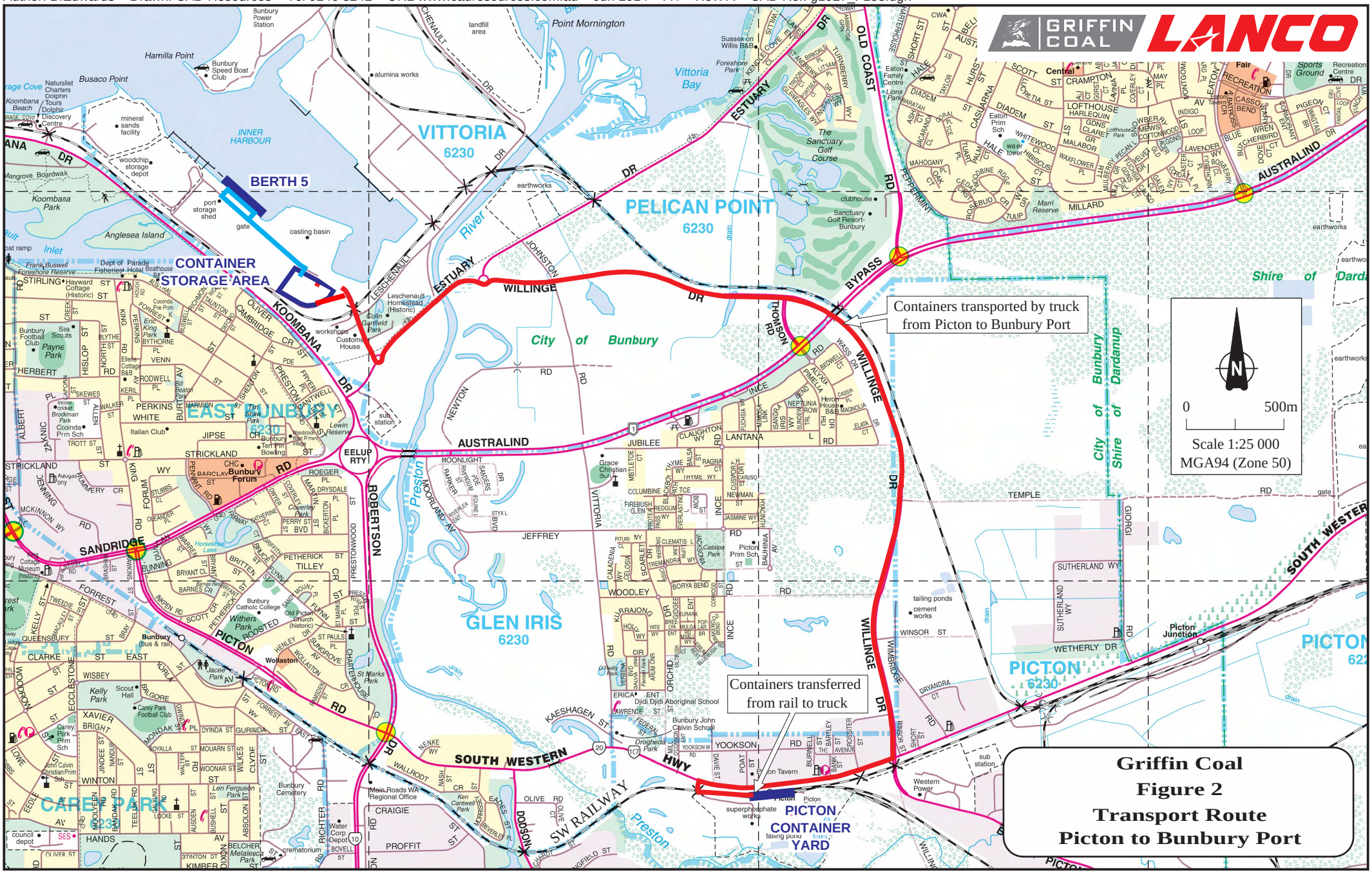
The Griffin Coal Mining Company Pty. Limited

BUNBURY PORT

PROPOSED BERTH 5 COAL TERMINAL LOCATION PLAN

FIGURE-1

Author: B.Edwards ~ Drawn: CAD Resources ~ Tel 9246 3242 ~ URL www.cadresources.com.au ~ Jun 2014 ~ A4 ~ Rev: A ~ CAD Ref: g1027_F138.dgn

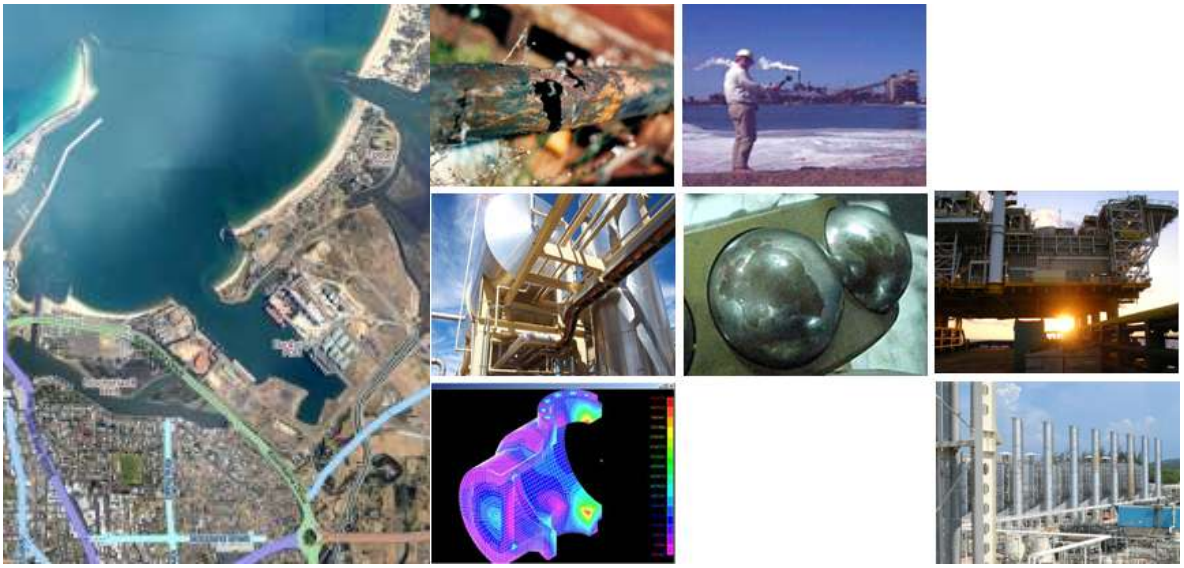


Attachment 2 – Additional Documentation

Noise Study Report: SVT Engineering Consultants, 2013

SVT ENGINEERING CONSULTANTS

ENVIRONMENTAL NOISE ASSESSMENT FOR BUNBURY PORT CONTAINERISED COAL EXPORT PROJECT



GRIFFIN COAL

Rpt05-1254008-Rev3-13 June 2013

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EXECUTIVE SUMMARY

SVT has undertaken an environmental noise impact assessment of Griffin Coal's proposed containerised coal export facilities at Bunbury Port.

Because noise from the existing port operations has the potential to approach or exceed environmental noise limits, Griffin Coal's facilities have to comply with noise levels 5 dB below the assigned noise levels of the Environmental Protection (Noise) Regulations 1997 in order to achieve compliance with these Regulations.

Preliminary noise modelling showed that noise controls are required to minimise noise impacts at noise sensitive receivers surrounding the port. These controls include:

- Location of strategically placed container stockpiles to improve noise attenuation;
- Sound attenuation applied to harbour cranes, forklifts, trucks and reach stackers; and
- Implementation of speed limits for trucks.

These controls were incorporated into the noise model and based on the modelling results SVT concludes the following:

- Noise emissions from the coal export project, when considered in isolation, can comply with Environmental Protection (Noise) Regulations 1997 assigned noise levels at all selected sensitive receptors, at all times;
- Noise emissions from the project can comply with cumulative noise limits at all selected sensitive receptors during day and evening periods; and
- The risk of non-compliance when considering cumulative noise limits during night time operations is approximately 10% when accounting for frequency of operations at the facility and prevailing wind conditions. This is considered to be an upper estimate of the risk since it does not account for the frequency of simultaneous night time operations of the Port.

TABLE OF CONTENTS

1. INTRODUCTION

SVT has been commissioned by Griffin Coal to undertake an environmental noise impact assessment of their proposed containerised coal export facility in Bunbury Port. Griffin Coal proposes to export containerised coal from Berth 5 of Bunbury Port commencing in the last quarter of 2013 and will continue for over a period of four years.

The objective of this assessment is to determine whether or not the noise emissions from the proposed export operations would comply with the *Environmental Protection (Noise) Regulations 1997* (*Regulations*). To achieve the objective the following activities have been undertaken:

- Review of documentation provided by Griffin Coal, including proposed site plans, equipment lists and noise data;
- Measurement of sound power levels of mobile equipment;
- Development of an acoustic model for the proposed export operations;
- Identification of noise mitigation measures required to minimise noise impacts at selected noise sensitive locations;
- Calculation of the noise levels at selected noise sensitive locations for calm conditions and for worst-case wind conditions in each of 8 cardinal wind directions;
- Provision of day and night-time noise contours for worst case meteorological conditions; and
- Assessment of noise emissions from the proposed operations for compliance with noise limits imposed under the *Regulations* at the selected noise sensitive receiver locations.

The closest noise sensitive premises are selected as the same locations identified by the Bunbury Port Authority for previous noise impact assessments.

Figure A1 in Appendix A provides an aerial view of the Bunbury Port and surrounding area including the selected noise sensitive premises.

2. SUMMARY OF LEGISLATION

Noise management in Western Australia is implemented through the *Environmental Protection (Noise) Regulations 1997* (the regulations) which operate under the *Environmental Protection Act*. The Regulations specify maximum noise levels (assigned levels) which are the highest noise levels that can be received at noise-sensitive premises, commercial and industrial premises. Table 2-1 presents the assigned noise levels.

Assigned noise levels have been set differently for noise sensitive premises, commercial premises, and industrial premises. For noise sensitive premises, eg residences, an "influencing factor" is incorporated into the assigned noise levels. The influencing factor depends on land use zonings within circles of 100m and 450m radius from the noise receiver, including:

- the proportion of industrial land use zonings;
- the proportion of commercial zonings; and
- the presence of major roads.

For noise sensitive residences, the time of day also affects the assigned levels.

The regulations define three types of assigned noise level:

- L_{Amax} assigned noise level means a noise level which is not to be exceeded at any time;
- L_{A1} assigned noise level which is not to be exceeded for more than 1% of the time;
- L_{A10} assigned noise level which is not to be exceeded for more than 10% of the time.

The L_{A10} noise limit is the most significant for this study since this is representative of continuous noise emissions from the proposed coal export facilities.

Table 2-1 : Assigned Noise Levels

Type of premises receiving noise	Time of Day	Assigned Noise Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday	45 + Influencing factor	55 + Influencing factor	65 + Influencing factor
	0900 to 1900 hours Sunday and public holidays	40 + Influencing factor	50 + Influencing factor	65 + Influencing factor
	1900 to 2200 hours all days	40 + Influencing factor	50 + Influencing factor	55 + Influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + Influencing factor	45 + Influencing factor	55 + Influencing factor
Noise sensitive premises at locations further than 15 metres from a building directly associated with a noise sensitive use	All hours	60	75	80
Commercial premises	All hours	60	75	80

Type of premises receiving noise	Time of Day	Assigned Noise Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Industrial premises	All hours	65	80	90

The influencing factor at 4 of the 6 selected noise sensitive receptors (R1, R2, R4 and R5) is zero. At receptor R3, which is closest to the boundary of the port industrial area, the influencing factor is 7 because of the proportion of industrially zoned land (i.e. the port) within 450 m of this receptor. At receptor R6 the influencing transport factor is 2 because of the proportion of main road within 450 m of this receptor.

The assigned noise levels (including influencing factor where appropriate) are presented in Table 2-2 for receptors in the study area.

Table 2-2 : Assigned Noise Levels for Selected Receptors

Time of Day	Assigned Noise Level – L_{A10} dB(A)				
	Locations R1, R2, R4 & R5	Location R3	Location R6	Commercial Premises	Industrial Premises
0700 to 1900 hours Monday to Saturday	45	52	47	60	65
0900 to 1900 hours Sunday and public holidays	40	47	42	60	65
1900 to 2200 hours all days	40	47	42	60	65
2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35	42	37	60	65

2.1.1 Project Noise Limits Accounting for Cumulative Noise Impacts

The Regulations require that noise emissions must not significantly contribute to any exceedance of the assigned noise levels. Noise levels are considered to contribute to an exceedance if they are within 5 dB of the assigned noise levels. Noise from the coal export facility has the potential to contribute to cumulative exceedances of the assigned noise levels under certain conditions. Therefore, when these conditions occur, noise emissions from the proposed coal export facilities must be at least 5 dB below the assigned noise levels in order to comply with the Regulations. The effective noise limits for the project, accounting for cumulative noise impacts, are presented in Table 2-3.

Table 2-3 : Project Noise Limits for Selected Noise Sensitive Receptors

Time of Day	Project Noise Limit – L_{A10} dB(A)		
	Locations R1, R2, R4 & R5	Location R3	Location R6
0700 to 1900 hours Monday to Saturday	40	47	42
0900 to 1900 hours Sunday and public holidays	35	42	37
1900 to 2200 hours all days	35	42	37
2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	30	37	32

Since the proposed facilities may operate 24 hours per day, the night-time noise limits will have the greatest effect on the noise control requirements for the proposal.

2.1.2 Adjustments for Intrusive Characteristics

Received noise levels associated with operations at the facility must be adjusted if the noise exhibits intrusive or dominant characteristics, ie if the noise is impulsive (eg banging), tonal (eg whining noise having a defined pitch), or modulating (eg noise which varies cyclically in either pitch or amplitude). Table 2-4 presents the penalties incurred when intrusive or dominant characteristics cannot be reasonably and practicably removed. The adjusted noise levels must now comply with the assigned noise levels. Regulation 9 sets out objective tests to assess whether the noise is taken to be free of these characteristics.

Table 2-4 : Adjustments for Intrusive or Dominant Noise Characteristics.

Adjustment where noise emission is not music these adjustments are cumulative to a maximum of 15 dB		
Where tonality is present	Where modulation is present	Where impulsiveness is present
+5 dB	+5 dB	+10 dB

3. NOISE MODELLING

3.1 Methodology

An acoustic model has been developed using SoundPlan program developed by SoundPLAN LLC. This program calculates sound pressure levels at nominated receiver locations or produces noise contours over a defined area of interest around the noise sources. SoundPlan can be used to model different types of noises, such as industrial noise, traffic noise and aircraft noise, and it has been recognised internationally including in Australia. The inputs required in SoundPlan are noise source data, ground topographical data, meteorological data and receiver locations.

SoundPlan provides a range of prediction algorithms that can be selected by the user. One of most widely recognized algorithms is the CONCAWE[1,2] prediction algorithm, and it has been selected for this study. The acoustic model has been used to generate noise contours for the area surrounding the Bunbury Port and also to predict noise levels at the selected noise sensitive receiver locations.

The model does not include noise emissions from any sources other than the proposed coal export operations. Therefore, noise emissions from the neighbouring industries, road traffic, domestic sources, animals, sea wave induced noise, etc. are not considered.

3.2 Operating Scenarios

The proposed coal export operations involve the following activities:

- Low noise N-ViroMotive trains will be used to transport coal containers to the south-eastern end of the Bunbury Port. Two trains will arrive at the port at 5:10 am and 5:55 pm respectively. Train and Shunting noise are not included in the assessment.
- One (1) truck will transport full coal containers from the rail siding area to the stockpile and return empty containers to the rail siding area;
- One (1) forklift will load and unload empty containers at the stockpile;
- One (1) forklift will unload empty containers from the truck at the rail siding area;
- One (1) Reach Stacker will be used to load full coal containers onto trucks from the container stockpile;
- Two (2) Reach Stackers will unload full coal containers from the trains and reload empty containers back onto the trains.
- Three (3) trucks will transport the full coal containers from the stockpile to Berth 5 and return the empty containers back to the stockpile;

[1] CONCAWE (Conservation of Clean Air and Water in Europe) was established in 1963 by a group of oil companies to carry out research on environmental issues relevant to the oil industry.

[2] *The propagation of noise from petroleum and petrochemical complexes to neighbouring communities,* CONCAWE Report 4/81, 1981

- Two (2) Harbour Cranes will lift the coal containers and discharge coal into the ship's hold; and
- Two (2) forklifts will be used to load empty coal containers onto the trucks from the wharf.

Griffin Coal has advised that:

- Trains, Reach Stackers, forklifts and trucks operate every day (7 days a week) at the rail siding area and stockpile.
- Ship loading happens in 11 day cycles. Each ship will take approximate 72 hours continuously (day and night) to load.
- Cranes operate during the ship loading periods only.

Table 3-1 lists the proposed equipment for the operations.

Table 3-1: Proposed equipment.

Equipment	Number of Equipment
N-ViroMotive Trains	2
Reach Stackers	3
Trucks	4
Harbour Cranes	2
Forklifts	4

Table 3-2 details the scenarios and equipment used.

Table 3-2: Scenarios and Equipment used.

Scenario	Description	Equipment
1	A - Relocating empty container containers from stockpile to train	• 1 - Forklift at Stockpile • 1 - Forklift at Train • 1 - Truck
	B – Unloading full containers from train and loading empty containers onto train	• 2 - Reach Stackers at Train
	C – Relocating full containers from train to stockpile	• 1 - Reach Stacker at Stockpile • 1 - Reach Stacker at Train • 1 - Truck
2	Shiploading	• 1 - Reach Stacker at Stockpile • 1 - Forklift at Stockpile • 2 - Forklift at Berth • 3 - Trucks (idle at Berth, idle at Stockpile and in transit between Berth and Stockpile) • 2 - Harbour Cranes
3	A – Shiploading Scenario (2) simitanously with Scenario 1A	• 1 - Forklift at Train • 1 - Truck • 1 - Reach Stacker at Stockpile • 1 - Forklift at Stockpile • 2 - Forklift at Berth • 3 - Trucks (idle at Berth, idle at Stockpile and in transit between Berth and Stockpile) • 2 - Harbour Cranes
	B - Shiploading Scenario (2) simitanously with Scenario 1B	• 2 - Reach Stackers at Train • 1 - Reach Stacker at Stockpile • 1 - Forklift at Stockpile • 2 - Forklift at Berth • 3 - Trucks (idle at Berth, idle at Stockpile and in transit between Berth and Stockpile) • 2 - Harbour Cranes
	C – Shiploading Scenario (2) simitanously with Scenario 1C	• 1 - Reach Stacker at Train • 1 - Truck • 1 - Reach Stacker at Stockpile • 1 - Forklift at Stockpile • 2 - Forklift at Berth • 3 - Trucks (idle at Berth, idle at Stockpile and in transit between Berth and Stockpile) • 2 - Harbour Cranes

The assumed locations of operating equipment are shown in Figures A3 to A9 in Appendix A.

3.3 Base Line Modelling Data

3.3.1 Topography, Ground Types and Barriers

Topographical information for the noise model was obtained from the Bunbury Port Authority. An absorbent ground type (equivalent to a porous, unsealed surface such as grass) has been used for sound propagation over land while a hard and reflective surface type has been used for propagation over water.

The noise model also includes the shielding effects of large structures such as sheds and tanks within the port. The shielding effects of residential houses and office buildings are not considered.

The 3.5 m high screen wall built recently, as shown in Figure A10 in Appendix A, has been incorporated into the noise model.

3.3.2 Receiving Locations

The six representative receiving locations, identified by the Bunbury Port Authority, have been selected for this assessment.

R1 Caravan Park on Koombana Drive.

R2 Stirling St, midway along waterfront section.

R3 Oliver St, midway along street.

R4 Venn / Burt St, near intersection.

R5 Pickworth Retreat, north west corner (near Pelican Pt).

R6 Corner Jubilee Road and Ince Road near the roundabout (added on request of DEC).

The above receiver locations are shown in Figure A1 in Appendix A.

3.3.3 Baseline Noise Emission Data

Sound power levels of Reach Stackers and Trucks were measured at the following two sites:

- Geraldton Port on 12th November 2012; and
- Bunbury Port on 6th December 2012.

Table 3-3 presents the sound power levels of the proposed equipment. The sound power levels of reach stackers and trucks were calculated from the sound pressure levels measured at locations 15 m away from a driving stacker/truck. The overall sound power levels of the harbour cranes and forklifts were provided by Griffin Coal while the spectrum shapes were taken from SVT's database. The sound power level of the train locomotive was taken from SVT's database and is based on measured data.

Table 3-3 : Baseline sound power levels for proposed equipment.

Equipment	Octave Frequency band Sound Power Levels in dB(lin)									Overall	
	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(lin)	dB(A)
Reach Stackers	104.6	114.9	112.4	109.1	105.4	100.7	96.3	93.1	86.6	***118.1***	**107.3**
Trucks (30 kph)	106.5	114.1	105.9	101.5	100.6	98.1	95.6	89.2	82.3	**116.0**	**103.5**
Trucks (Idling)	95.7	103.3	95.1	90.7	89.8	87.3	84.8	78.4	71.5	**105.0**	**92.5**
Harbour Cranes	90.6	95.3	97.2	103.0	103.8	104.3	102.5	97.6	87.3	***110.2***	**108.6**
Forklifts	101.1	99.8	100.6	99.3	100.1	94.5	92.5	88.1	81.3	**107.6**	**101.0**
Locomotive Noise	119.3	122.4	117.3	107.7	102.0	100.8	98.8	93.7	91.6	***125.1***	**107.7**

Preliminary results indicated that noise controls would be required for some equipment. These controls are described in section 3.4 and the modelled sound power levels are provided in Table 3-5.

3.3.4 Meteorology

SoundPlan calculates noise levels for defined meteorological conditions. In particular, temperature, relative humidity, wind speed and direction data are required as input to the model.

For the noise modelling SVT has used the worst case meteorological conditions suggested by the EPA (*Environmental Protection Act 1986*) Guidance note No 8 for assessing noise impact from new developments as the upper limit of the meteorological conditions investigated.

Table 3-4 presents the worst-case meteorological conditions for noise emission from the proposed coal export operations.

Table 3-4: Worst-case meteorological conditions for noise emission from the proposed operations.

Time of day	Temperature Celsius	Relative Humidity	Wind speed	Pasquill Stability Category
Day (0700 --- 1900)	20° Celsius	50%	4 m/s	D
Evening (1900 --- 2200)	20° Celsius	50%	4 m/s	D
Night (2200 --- 0700)	15° Celsius	50%	3 m/s	F

Since day and evening meteorological conditions are the same, only the day-time and night-time conditions have been considered in the model.

3.4 Noise Controls Incorporated in the Model

Preliminary results from noise modelling indicated that noise controls would be required to reduce noise emissions from the proposed operations. The noise model was used to optimise the noise controls that could be practicably implemented to minimise noise emissions. Consequently, the following noise controls have been incorporated into the noise model:

- A container barrier will be permanently setup at the Stockpile. The placement of these containers offer noise attenuation benefits. The locations of the stockpiled containers is shown in Figure A2 of Appendix A;
- During shiploading, containers will be temporarely stockpiled between the storage shed and administration building opposite berth 5. These containers offer noise attenuation benefits. The locations of the stockpiled containers is shown in Figure A2 of Appendix A;
- Speed limits (25 kph) will be imposed on trucks operating within the facility;
- Low noise forklift trucks will be used in place of reach stackers during ship loading at Berth 5;
- Noise attenuation measures will be installed on harbour cranes. A noise level reduction of 5 dB has been assumed for the noise model; and
- Noise attenuation measures will be installed on trucks, forklifts and reach stackers. A noise level reduction of 3.5 dB has been assumed.

Table 3-5 provides the sound power level data, including noise attenuation, used in the noise model.

Table 3-5 : Modelled sound power levels for proposed equipment.

Equipment	Octave Frequency band Sound Power Levels in dB(lin)									Overall	
	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(lin)	dB(A)
Reach Stackers	101.1	111.4	108.9	105.6	101.9	97.2	92.8	89.6	83.1	***114.6***	**103.7**
Trucks (25 kph)	103.0	110.6	102.4	98.0	97.1	94.6	92.1	85.7	78.8	**112.3**	**99.8**
Trucks (Idling)	95.7	103.3	95.1	90.7	89.8	87.3	84.8	78.4	71.5	**105.0**	**92.5**
Harbour Cranes	85.6	90.3	92.2	98.0	98.8	99.3	97.5	92.6	82.3	**105.2**	**103.6**
Forklifts	82.6	84	90.1	90	88.8	90.8	89.8	83.8	76.8	**104.1**	**97.5**
Locomotive Noise	119.3	122.4	117.3	107.7	102.0	100.8	98.8	93.7	91.6	***125.1***	**107.7**

4. MODELLING RESULTS

4.1 Point Calculations

Point calculations have been performed for each scenario at each of the 6 selected noise sensitive locations for worst-case meteorological conditions, calm meteorological conditions and worst-case winds in 8 cardinal directions.

Table 4-1, Table 4-2 and Table 4-3 present a summary of the predicted worst-case night and day-time noise levels in dB(A) for scenarios 1, 2 and 3.

The modelling shows that ship loading operations (scenario 2) dominate noise emissions at location R3 whilst similtanous shiploading and rail siding operations (scenario 3A, 3B and 3C) dominate noise emissions at location R2, R3 and R4.

Table 4-1 : Worst-case noise levels scenario 1 in dB(A).

Noise Sensitive Receivers	Scenario 1A		Scenario 1B		Scenario 1C	
	Day/Evening	Night	Day/Evening	Night	Day/Evening	Night
R1	20.3	20.6	21.7	22.1	24.1	24.5
R2	23.0	23.3	28.5	28.8	21.8	22.1
R3	29.1	29.1	25.3	25.4	31.2	31.2
R4	26.2	26.3	30.4	**30.7**	26.0	26.2
R5	20.8	21.2	25.3	25.7	24.2	24.7
R6	15.8	16.1	22.7	23.1	16.5	16.9

Table 4-2 : Worst-case noise levels scenario 2 in dB(A).

Noise Sensitive Receivers	Scenario 2	
	Day/Evening	Night
R1	20.6	26.4
R2	29.6	29.8
R3	40.3	**40.3**
R4	29.6	29.7
R5	25.9	26.4
R6	19.3	19.9

Table 4-3 : Worst-case noise levels scenario 3 in dB(A)

Noise Sensitive Receivers	Scenario 3A		Scenario 3B		Scenario 3C	
	Day/Evening	Night	Day/Evening	Night	Day/Evening	Night
R1	26.5	26.9	27.4	27.7	26.2	26.5
R2	30.4	**30.6**	32.1	**32.3**	29.9	30.1
R3	40.3	**40.4**	40.4	**40.4**	40.3	40.3
R4	31.1	**31.2**	33.0	**33.2**	30.0	30.1
R5	26.7	27.2	28.6	29.1	26.1	26.6
R6	20.8	21.3	24.3	24.8	19.9	20.5

The tables in Appendix B present the noise levels in dB(A) at the selected noise-sensitive receiver locations for scenarios 1 and 2 and 3 respectively. The tables indicate:

- Wind direction has a big impact on the noise levels at the receiver locations.
- A higher noise level will be predicted when wind blows from the coal export facility towards the receiver location.
- For the same operation conditions and at the same receiver location, the night-time noise level is slightly higher than the day/evening-time noise level due to meteorological conditions which are more favourable for noise propogation.

4.2 Noise Contours

Noise contours have been prepared for the worst-case meteorological conditions given in Table 3-4 for day and night time sound propagation. The noise contours are presented in Figures C1 to C13 in Appendix C, showing levels from 30 dB(A) to 60 dB(A) with 5 dB intervals. These noise contours represent the worst-case noise propagation envelopes, ie, worst-case propagation in all directions simultaneously.

5. COMPLIANCE ASSESSMENT

The predicted noise levels presented in Table 4-1 to Table 4-3 are below the project noise limits at selected receiving locations during the day and evening hours.

During the night-time, predicted noise levels are below the assigned noise levels at all selected receiving locations, but can exceed the project limits (which include a 5 dB adjustment for significance) at some locations under certain weather conditions. Table 5-1 and Table 5-2 summarise these exceedances.

Table 5-1 : Compliance assessment for night-time operations scenario 1B.

Closest Residences	Noise Limits in dB(A)	Scenario 1B	
		Exceedance in dB	Non-Compliance Wind Direction
R1	30	n/a	n/a
R2	30	n/a	n/a
R3	37	n/a	n/a
R4	30	0.4 – 0.7	N - SE
R5	30	n/a	n/a
R6	32	n/a	n/a

Table 5-2 : Compliance assessment for night-time operations scenario 3.

Closest Residences	Noise Limits in dB(A)	Scenario 3A		Scenario 3B		Scenario 3C	
		Exceedance in dB	Non-Compliance Wind Direction	Exceedance in dB	Non-Compliance Wind Direction	Exceedance in dB	Non-Compliance Wind Direction
R1	30	n/a	n/a	n/a	n/a	n/a	n/a
R2	30	0.4 – 0.6	N - SE	1.7 – 2.3	Calm & N - SE	0.1	NE - E
R3	37	1.9 – 3.4	Calm & W - E	2.0 – 3.4	Calm & W - E	1.8 – 3.3	Calm & W - E
R4	30	0.5 – 1.2	Calm & NW - E	1.3 – 3.2	Calm & NW - SE	0.1	N - E
R5	30	n/a	n/a	n/a	n/a	n/a	n/a
R6	32	n/a	n/a	n/a	n/a	n/a	n/a

Non-compliance occurs during ship loading and is dependent on prevailing weather conditions. Therefore, in order to investigate the risk of non-compliance, three years' worth of wind data for Bunbury has been analysed to determine the frequency of occurrence of wind conditions which could potentially result in non-compliance. The frequency and duration of ship loading operations has also been taken into account. Figure 5-1 shows the frequency of occurrence of worst-case winds (up to 3 m/s) during the night-time hours (10 pm to 7 am) in Bunbury.

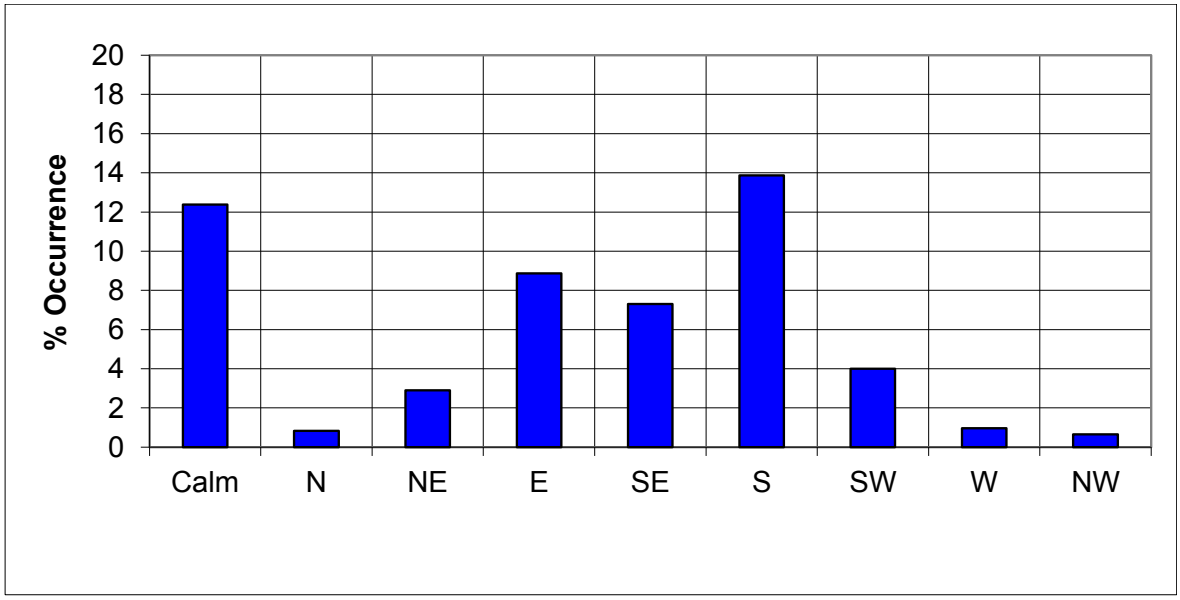

Figure 5-1 : Frequency of Occurrence of Worst-Case Winds During the Night in Bunbury

As described in Section 3.2, ship loading is proposed to occur every eleven days and to last for three days, whereas train loading/unloading, in particular Scenario 1B, happens everyday.

Ship loading occurs for 27% of the time. Since ship loading is a 24 hour operation it is equally likely to occur during the day and night time hours. Train loading/unloading (Scenario 1B) happens a couple of hours during the night time period after arrival of the train, the estimated occurrence is therefor 50%.

Table 5-3 and Table 5-4 present the risk of exceeding environmental noise limits at each location by summing the percentage occurrence for wind directions which may cause the coal export facility to contribute to exceedances of the assigned noise levels and accounting for frequency of occurance of the operating scenarios.

Table 5-3 : Percentage Occurrence of Weather Conditions and Operating Condition Which May Cause Noise From the Container Handling Facility to Contribute to Exceedances of the Assigned Noise Levels Scenario 1B

Receiving Location	% Occurrence of Scenario 1B	% Occurrence of Unfavourable weather conditions	% Risk of exceedance
R1	50	0	0
R2	50	0	0

Receiving Location	% Occurrence of Scenario 1B	% Occurrence of Unfavourable weather conditions	% Risk of exceedance
R3	50	0	0
R4	50	20	10
R5	50	0	0
R6	50	0	0

Table 5-4 : Percentage Occurrence of Weather Conditions and Operating Condition Which May Cause Noise From the Container Handling Facility to Contribute to Exceedances of the Assigned Noise Levels Scenario 3

Receiving Location	% Occurrence of Scenario 3	% Occurrence of Unfavourable weather conditions	% Risk of exceedance
R1	27	0	0
R2	27	32	9
R3	27	27	7
R4	27	33	9
R5	27	0	0
R6	27	0	0

The figures in Table 5-3 and Table 5-4 and represent an upper estimate of the risk of non-compliance since they do not account for the frequency of simultaneous night-time operation of other port users that would be deemed as significant contributors.

6. CONCLUSIONS

Preliminary noise modelling indicated that noise controls would be necessary to minimize noise impacts associated with operations of the coal export facilities. These controls include:

- Strategically placed container stockpiles to improve noise attenuation;
- During shiploading, containers will be temporarely stockpiled between the storage shed and aministration building opposite berth 5. These containers offer noise attenuation benefits. The locations of the stockpiled containers is shown in Figure A2 of Appendix A;
- Use of quieter forklifts in place of reach stackers when loading ships;
- Sound attenuation applied to harbour cranes, forklifts, trucks and reach stackers; and
- Implementation of speed limits for trucks.

These controls were incorporated into the noise model and based on the modelling results SVT concludes the following:

- Noise emissions from the coal export facility can comply with project noise limits at the selected receivers during daytime and evening hours.
- Noise emissions from the coal export facility, when considered in isolation, can comply with the assigned noise levels during night time hours. However, under some wind conditions, the project noise limits (which include a 5 dB adjustment to account for cumulative noise from other port users) may be exceeded at locations R2, R3 & R4.
- Ship loading activities dominate received noise levels at receiving locations R2 to R4. Train loading and unloading dominates received noise levels at location R4.

APPENDIX A : FIGURES

Figure A1. Aerial view of the Bunbury Port and Noise Sensitive Recievers

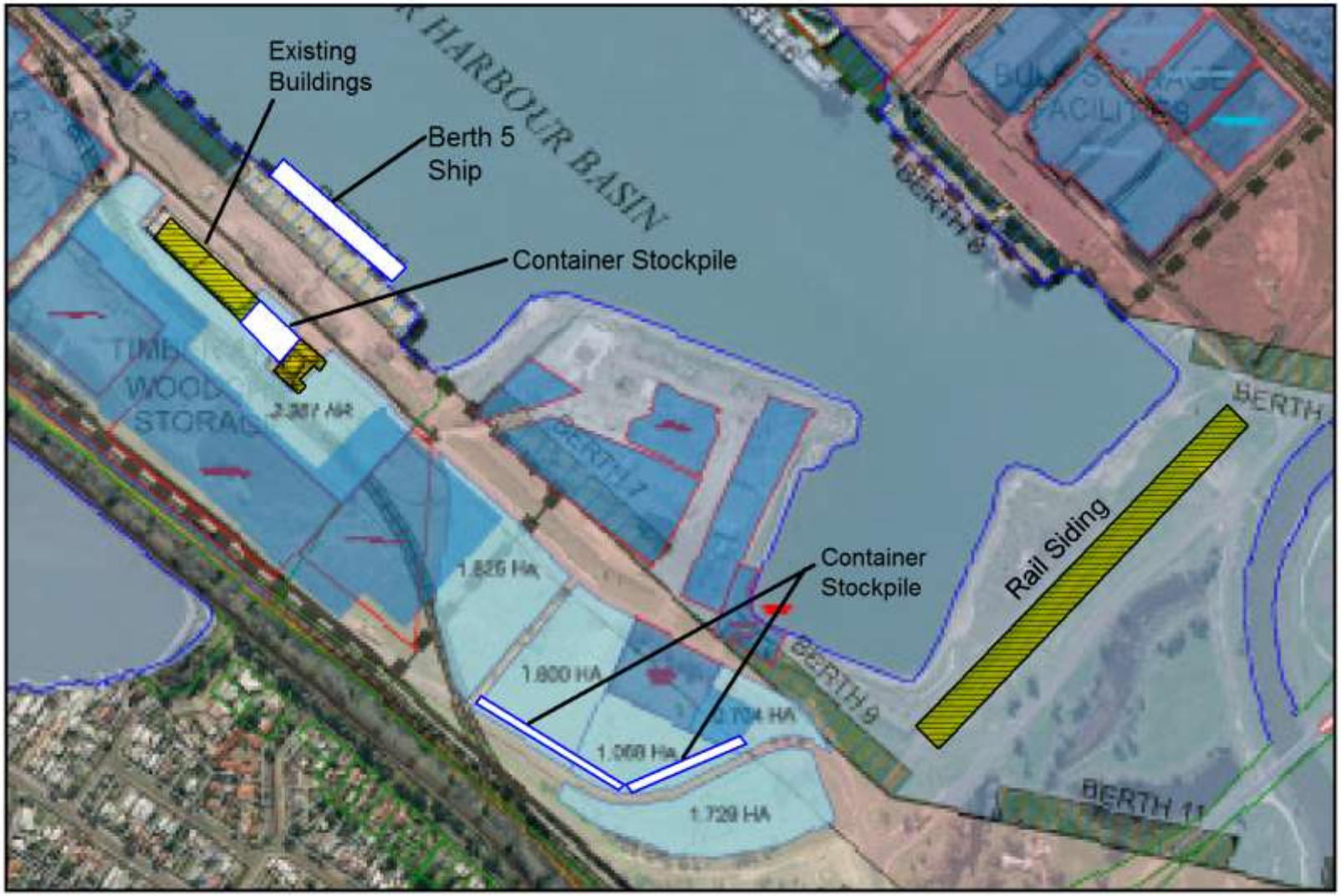

Figure A2. Locations of container stockpiles, buildings and rail siding

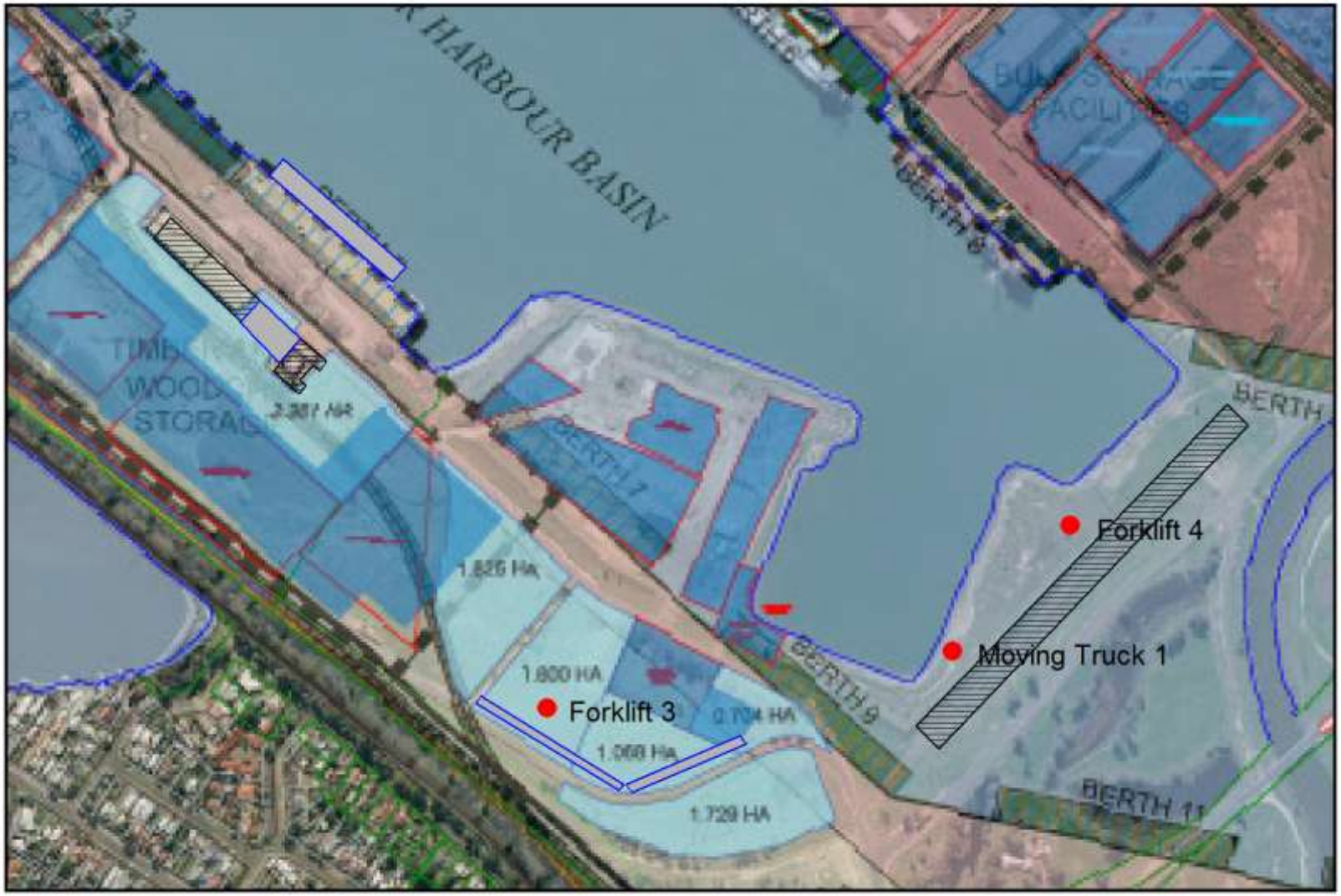

Figure A3. Locations of Operating Equipment for Scenario 1a.

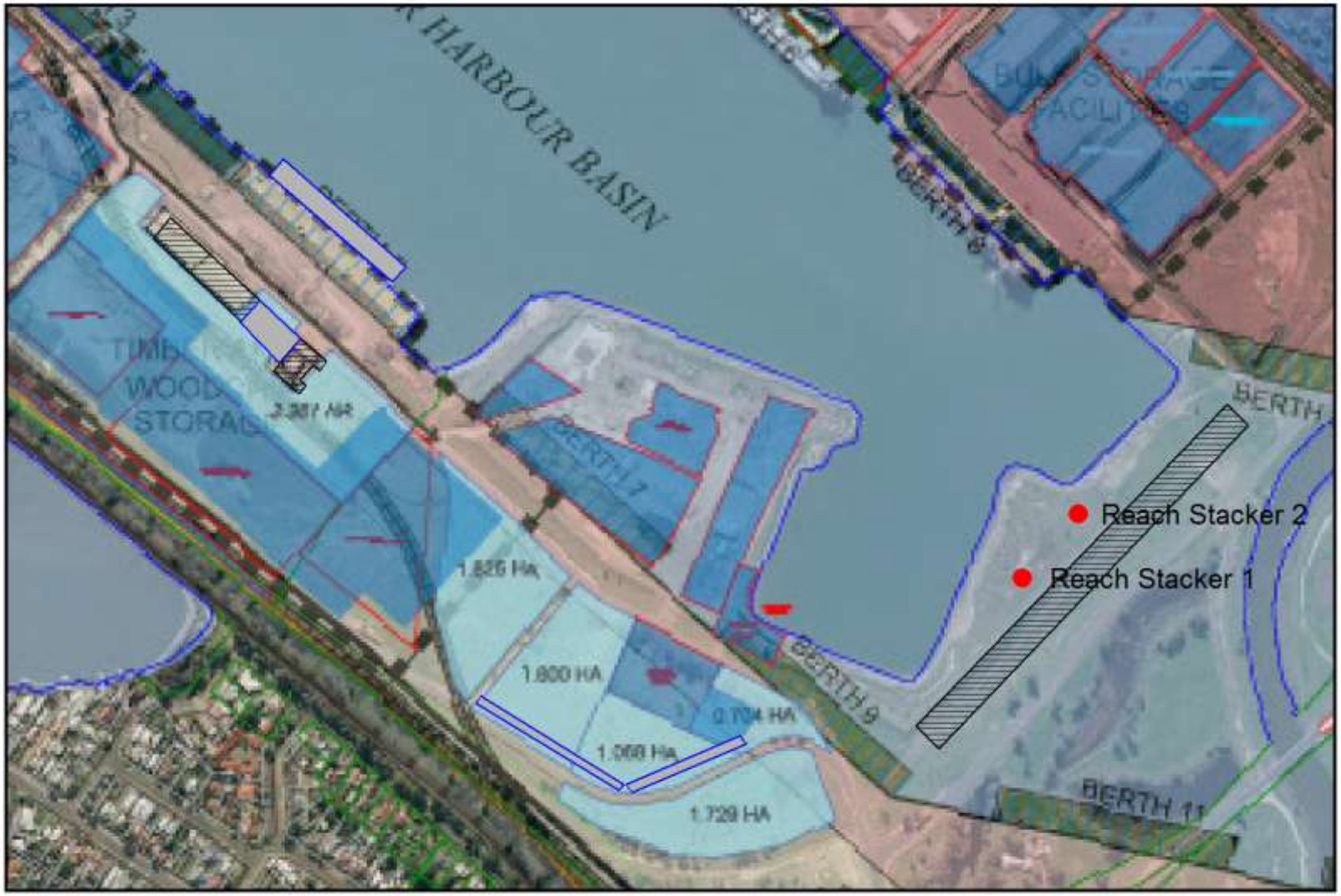

Figure A4. Locations of Operating Equipment for Scenario 1b.

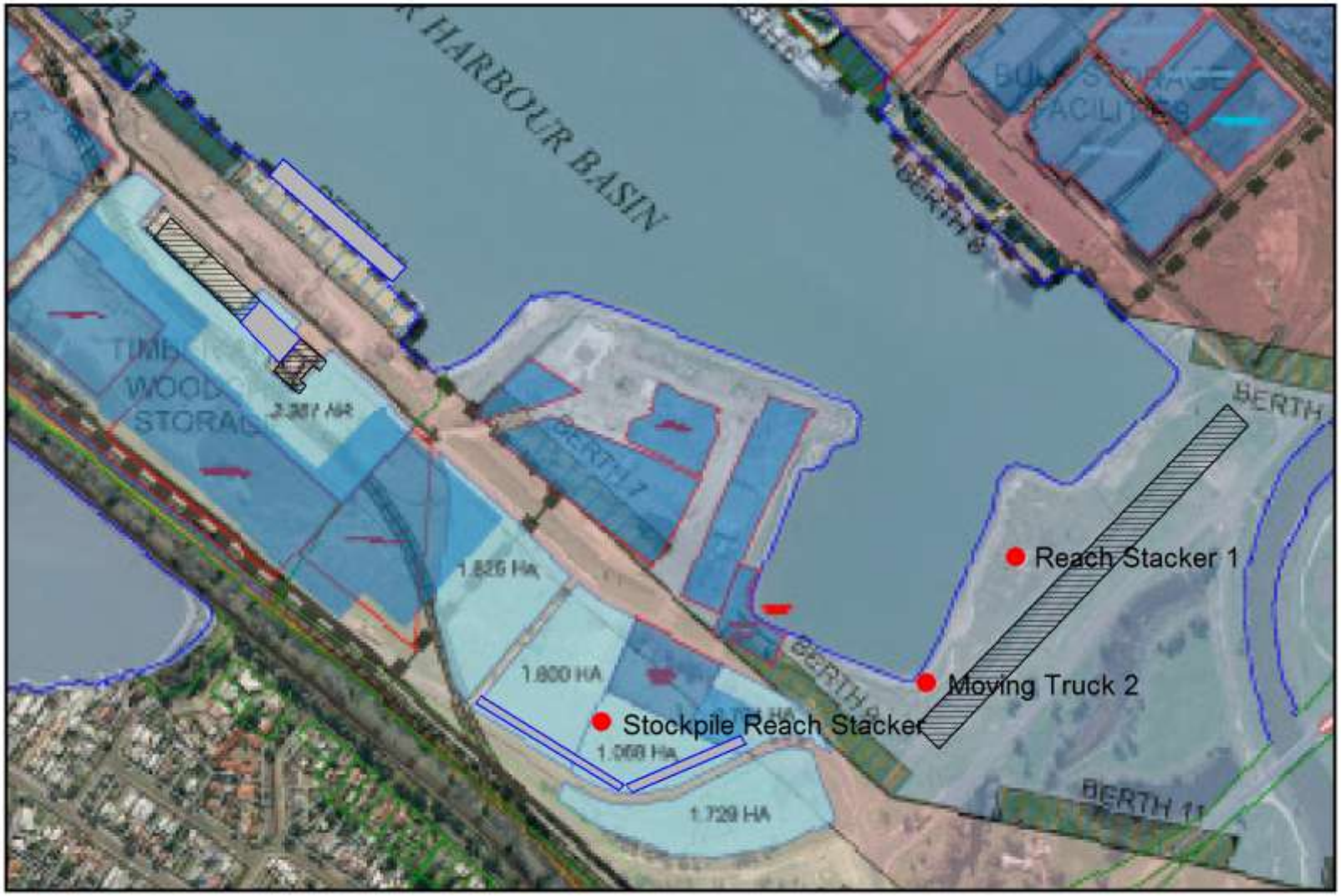

Figure A5. Locations of Operating Equipment for Scenario 1c.

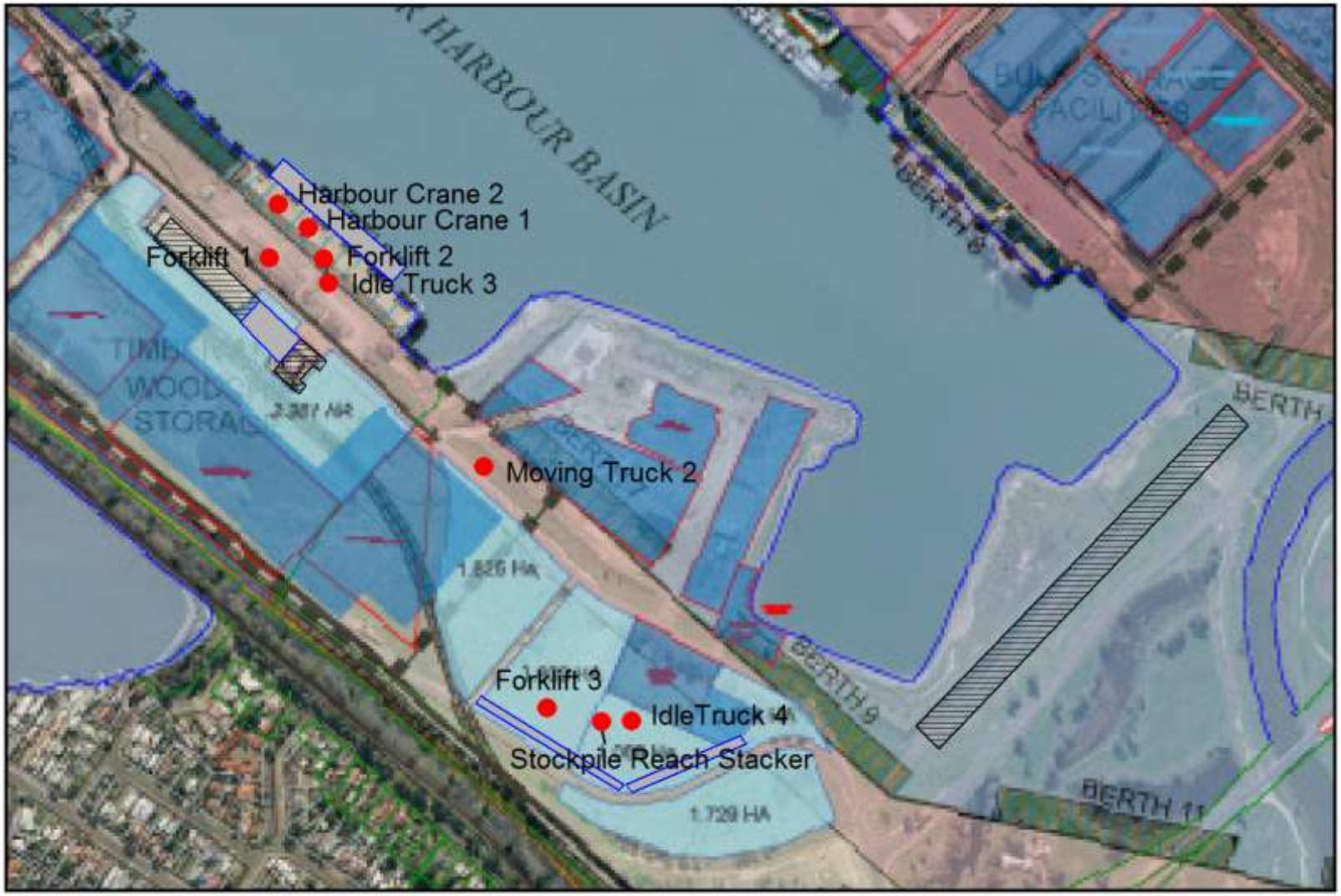

Figure A6. Locations of Operating Equipment for Scenario 2.

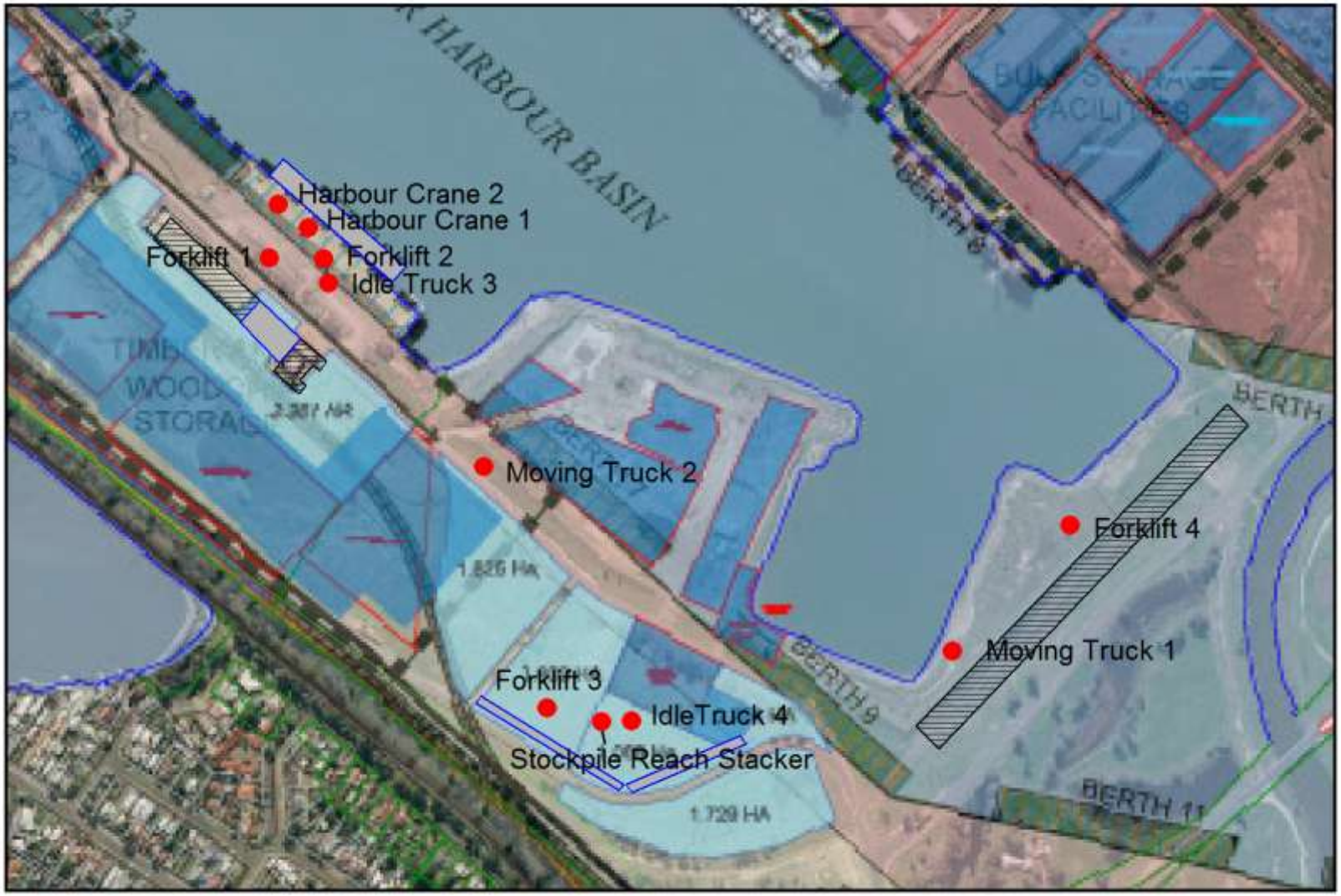

Figure A7. Locations of Operating Equipment for Scenario 3a.

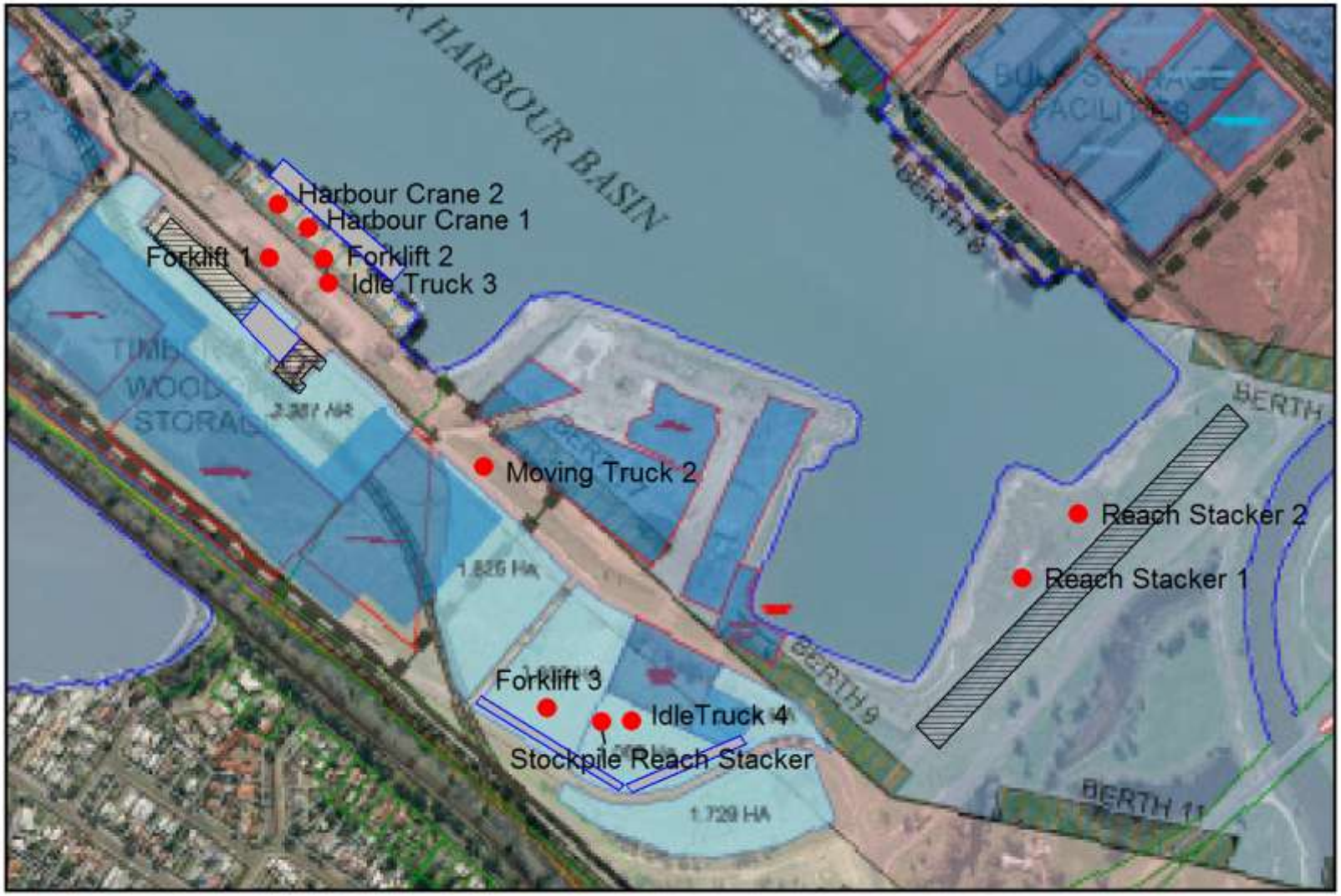

Figure A8. Locations of Operating Equipment for Scenario 3b.

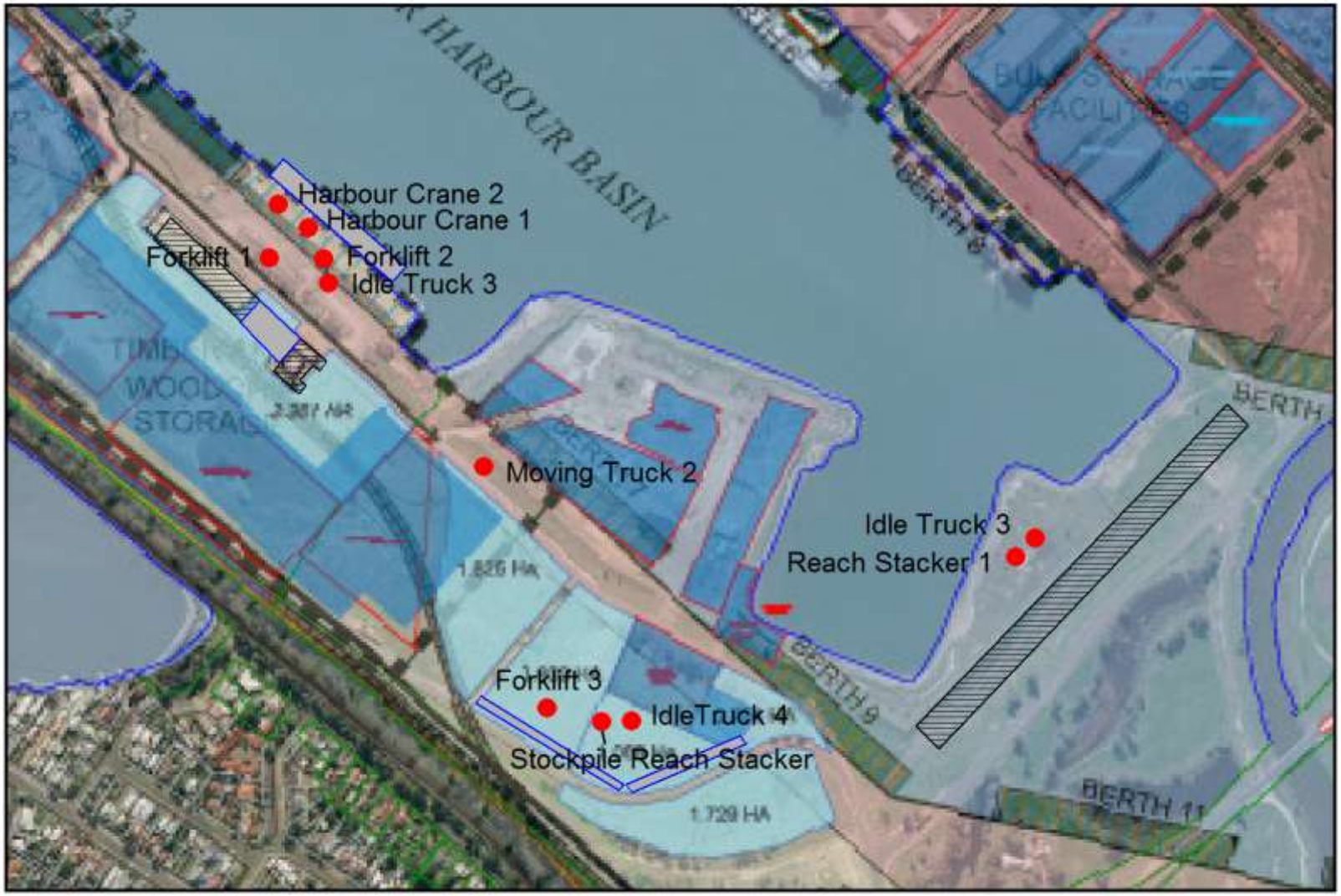

Figure A9. Locations of Operating Equipment for Scenario 3c.

Figure A10. Location of recently built 3.5m high screen wall (yellow line).

APPENDIX B : SCENARIO RESULTS

Predicted noise levels in dB(A) for operating scenario 1A.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 1A (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	12.2	20.1	20.3	20.3	19.9	11.7	10.6	10.6	15.5
R2	18.7	23.0	23.0	23.0	17.9	13.1	13.0	13.2	18.2
R3	29.0	29.1	28.9	27.6	26.3	26.2	26.3	27.4	27.4
R4	25.8	26.2	26.2	25.3	17.4	16.3	16.3	18.7	21.7
R5	13.9	13.7	12.5	13.6	20.4	20.4	20.4	19.0	15.7
R6	15.6	8.2	6.5	6.5	7.3	15.2	15.8	15.8	11.3
Night-time Operations									
R1	16.3	20.6	20.6	20.6	20.6	15.4	12.8	13.0	20.3
R2	22.8	23.3	23.3	23.3	22.5	16.5	15.2	16.8	22.8
R3	29.1	29.1	29.1	28.2	27.1	26.7	27.0	28.2	28.2
R4	26.3	26.3	26.3	26.1	21.2	18.7	19.2	22.9	25.7
R5	16.1	14.8	15.5	18.7	20.8	20.8	21.0	21.2	21.3
R6	16.1	12.5	8.9	8.5	11.0	16.1	16.1	16.1	15.8

Predicted noise levels in dB(A) for operating scenario 1B.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 1B (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	13.0	21.6	21.7	21.7	20.6	11.3	10.3	10.3	16.0
R2	24.2	28.5	28.5	28.4	22.0	17.3	17.2	17.6	22.9
R3	24.6	25.3	25.3	24.4	18.1	17.1	17.1	18.5	21.2
R4	30.1	30.4	30.4	29.4	20.5	19.3	19.3	21.9	25.3
R5	14.7	14.1	14.1	17.5	25.3	25.3	25.3	22.5	19.4
R6	22.5	13.8	11.2	11.2	12.4	21.9	22.7	22.7	17.1
Night-time Operations									
R1	18.4	22.1	22.1	22.1	22.0	15.5	12.9	13.6	21.9
R2	28.4	28.8	28.8	28.8	27.4	21.0	19.7	21.6	28.3
R3	25.4	25.4	25.4	25.3	21.0	19.0	19.1	21.5	24.4
R4	30.7	30.7	30.7	30.4	24.7	22.0	22.6	26.8	30.0
R5	18.5	16.3	17.4	23.3	25.7	25.7	25.7	25.7	25.7
R6	23.1	19.1	14.6	14.0	16.7	22.9	23.1	23.1	22.7

Predicted noise levels in dB(A) for operating scenario 1C.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 1C (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	14.5	23.8	24.1	24.1	23.8	14.4	12.8	12.8	18.5
R2	16.6	21.8	21.8	21.8	16.8	10.9	10.7	10.8	16.6
R3	30.9	31.2	31.2	30.1	27.7	27.3	27.3	28.7	29.4
R4	25.6	26.0	26.0	25.1	16.7	15.3	15.3	18.0	21.4
R5	19.7	19.6	17.3	15.3	23.0	22.8	23.0	23.0	18.3
R6	16.3	7.3	5.4	5.4	6.9	16.2	16.5	16.5	11.3
Night-time Operations									
R1	19.0	24.5	24.5	24.5	24.5	18.7	15.7	15.7	24.1
R2	21.3	22.1	22.1	22.1	21.4	14.9	13.3	14.9	21.6
R3	31.2	31.2	31.2	30.8	29.0	28.3	28.5	29.9	30.5
R4	26.2	26.2	26.2	26.0	20.9	18.1	18.6	22.4	25.5
R5	21.1	20.5	20.9	21.0	23.4	23.4	24.2	24.8	25.0
R6	16.9	12.0	8.5	8.3	11.3	16.9	16.9	16.9	16.6

Predicted noise levels in dB(A) for operating scenario 2.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 2 (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	17.3	25.7	26.0	26.0	25.5	16.7	15.3	15.3	20.8
R2	28.2	29.6	29.6	29.0	21.8	18.9	19.0	21.7	24.8
R3	40.2	40.0	36.7	33.6	32.7	33.3	37.9	39.9	36.9
R4	29.5	29.5	29.0	22.7	20.1	20.0	21.4	28.4	25.4
R5	20.7	20.5	18.3	16.5	24.9	24.8	24.9	25.3	20.0
R6	19.3	9.8	7.8	7.8	9.1	19.3	19.3	19.3	13.9
Night-time Operations									
R1	21.6	26.4	26.4	26.4	26.3	20.8	18.0	18.2	25.9
R2	29.6	29.8	29.8	29.6	26.2	22.1	22.1	25.1	29.1
R3	40.3	40.2	38.8	35.7	34.6	35.8	39.4	40.1	39.6
R4	29.7	29.7	29.6	26.5	22.9	22.5	25.2	29.4	28.9
R5	22.5	21.5	21.8	21.9	25.3	25.4	25.9	26.4	26.7
R6	19.9	15.3	11.1	10.8	14.0	19.9	19.9	19.9	19.9

Predicted noise levels in dB(A) for operating scenario 3A.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 3A (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	17.9	26.3	26.5	26.5	26.0	17.2	15.9	15.9	21.4
R2	28.6	30.4	30.4	29.9	23.2	19.8	19.9	22.2	25.6
R3	40.2	40.1	36.8	33.9	32.8	33.3	37.9	39.9	36.9
R4	30.9	31.1	30.7	27.1	21.7	21.3	22.3	28.8	26.8
R5	21.0	20.8	18.9	17.9	25.9	25.8	25.9	25.9	21.0
R6	20.7	11.9	10.0	10.0	11.1	20.6	20.8	20.8	15.6
Night-time Operations									
R1	22.3	26.9	26.9	26.9	26.8	21.3	18.5	18.7	26.5
R2	30.4	30.6	30.6	30.5	27.6	23.1	22.9	25.6	30.0
R3	40.3	40.3	38.9	35.9	34.7	35.8	39.4	40.2	39.7
R4	31.2	31.2	31.2	29.2	25.0	23.8	26.0	30.1	30.5
R5	23.0	21.9	22.2	23.2	26.3	26.4	26.8	27.2	27.5
R6	21.3	17.0	13.0	12.6	15.6	21.3	21.3	21.3	21.2

Predicted noise levels in dB(A) for operating scenario 3B.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 3B (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	18.7	27.2	27.4	27.4	26.7	17.8	16.5	16.5	22.1
R2	29.6	32.1	32.1	31.7	24.9	21.2	21.2	23.1	27.0
R3	40.3	40.2	37.0	34.1	32.9	33.4	37.9	39.9	37.0
R4	32.8	33.0	32.8	30.2	23.3	22.7	23.5	29.3	28.3
R5	21.7	21.4	19.7	20.1	28.1	28.1	28.1	27.1	22.8
R6	24.2	15.2	12.9	12.9	14.0	23.8	24.3	24.3	18.8
Night-time Operations									
R1	23.3	27.7	27.7	27.7	27.7	21.9	19.2	19.5	27.4
R2	32.0	32.3	32.3	32.2	29.8	24.6	24.1	26.7	31.7
R3	40.4	40.4	39.0	36.1	34.8	35.9	39.4	40.2	39.8
R4	33.2	33.2	33.2	31.9	26.9	25.3	27.1	31.3	32.5
R5	24.0	22.6	23.1	25.7	28.5	28.6	28.8	29.1	29.2
R6	24.8	20.6	16.2	15.7	18.5	24.7	24.8	24.8	24.5

Predicted noise levels in dB(A) for operating scenario 3C.

Noise Sensitive Premises	Predicted noise levels in dB(A) for scenario 3C (Calm & worst-case conditions)								
	N	NE	E	SE	S	SW	W	NW	Calm
Day/Evening-time Operations									
R1	17.5	25.9	26.2	26.2	25.6	16.8	15.4	15.4	20.9
R2	28.3	29.8	29.8	29.3	22.2	19.1	19.2	21.8	25.1
R3	40.2	40.0	36.7	33.7	32.8	33.3	37.9	39.9	36.9
R4	29.9	30.0	29.5	24.1	20.5	20.3	21.6	28.5	25.7
R5	20.8	20.6	18.5	16.8	25.3	25.1	25.2	25.5	20.3
R6	19.9	10.5	8.5	8.5	9.8	19.9	19.9	19.9	14.6
Night-time Operations									
R1	21.8	26.5	26.5	26.5	26.4	20.9	18.1	18.3	26.1
R2	29.8	30.1	30.1	29.9	26.6	22.4	22.3	25.2	29.4
R3	40.3	40.2	38.8	35.8	34.7	35.8	39.4	40.2	39.6
R4	30.1	30.1	30.1	27.3	23.4	22.8	25.4	29.6	29.4
R5	22.6	21.6	21.9	22.3	25.7	25.7	26.2	26.7	26.9
R6	20.5	16.0	11.8	11.4	14.6	20.5	20.5	20.5	20.5

APPENDIX C : NOISE CONTOURS

Figure C1. Worst-case day-time noise level contours for operating scenario 1a.

Figure C2. Worst-case night-time noise level contours for operating scenario 1a.

Figure C3. Worst-case day-time noise level contours for operating scenario 1b.

Figure C4. Worst-case night-time noise level contours for operating scenario 1b.

Figure C5. Worst-case day-time noise level contours for operating scenario 1c.

Figure C6. Worst-case night-time noise level contours for operating scenario 1c.

Figure C7. Worst-case day-time noise level contours for operating scenario 2.

Figure C8. Worst-case night-time noise level contours for operating scenario 2.

Figure C9. Worst-case day-time noise level contours for operating scenario 3a.

Figure C10. Worst-case night-time noise level contours for operating scenario 3a.

Figure C11. Worst-case day-time noise level contours for operating scenario 3b.

Figure C12. Worst-case night-time noise level contours for operating scenario 3b.

Figure C13. Worst-case day-time noise level contours for operating scenario 3c.

Figure C14. Worst-case night-time noise level contours for operating scenario 3c.