FREEFIELD LTD.
Ottawa, Ontario

ACOUSTIC ASSESSMENT FOR THE PROPOSED EAST OXFORD PIT MUNICIPALITY OF NORTH GRENVILLE, UNITED COUNTIES OF LEEDS AND GRENVILLE, ONTARIO

Prepared for

R. W. Tomlinson Limited

Prepared by

Freefield Ltd.

14th January 2026

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Executive Summary

R. W. Tomlinson Limited, Tomlinson, is applying to the Ministry of Natural Resources, MNR, for a Class "A" License, below water extraction, under the Aggregate Resources Act, ARA, for the proposed East Oxford Pit to be located at 1486 O'Neill Road, Geographic Township of Oxford on Rideau, Municipality of North Grenville, United Counties of Leeds and Grenville, Ontario, as shown in Figures 1 and 2.

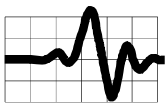
The MNR license application require the submission of an Acoustic Assessment Report of the proposed operation. Freefield Ltd. has been retained by Tomlinson to complete this Acoustic Assessment.

The acoustic assessment has been carried out according to the applicable Ministry of Environment, Conservation and Park, MECP, Noise Assessment Guidelines, including NPC-300, published August 2013.

The assessment considers the impacts on nearby noise sensitive lands, including existing residences and land zoned for potential noise sensitive use, of noise generated by all on-site equipment operations, including extraction by loaders, excavators or a dredge, aggregate processing by a wash plant, loading and stockpiling operations by loaders or excavators and on-site truck movements used for delivery and shipping of product.

Noise impacts have been predicted and compared to the MECP sound level limits as set out in NPC-300. Where applicable, noise mitigation measures such as barriers and limits to operations have been designed to ensure all operations comply with the applicable sound level limits.

Assessment methodology is provided in Section 1. A detailed description of the facility and its operations is provided in Section 2. Noise sources associated with operations at the pit are summarized in Section 3. Noise sensitive receptors are described in Section 1 and Section 4, with Section 5, 6 and 7 detailing applicable assessment criteria, an assessment of noise impacts and recommended mitigation measures.

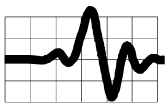


Version Control

Title	Comments	Prepared By	Issue Date
Acoustic Assessment for the Proposed East Oxford Pit, Municipality of North Grenville, Ontario	Issued for site plan application	Freefield Ltd.	14th January 2026 (This version)

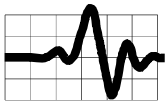
ACOUSTIC ASSESSMENT FOR THE PROPOSED EAST OXFORD PIT MUNICIPALITY OF NORTH GRENVILLE, UNITED COUNTIES OF LEEDS AND GRENVILLE, ONTARIO

Table of Contents



Tables 19

Figures 34



Appendix 1 Zoning Maps

Appendix 2 Acoustic Modeling Details

ACOUSTIC ASSESSMENT FOR THE PROPOSED EAST OXFORD PIT MUNICIPALITY OF NORTH GRENVILLE, UNITED COUNTIES OF LEEDS AND GRENVILLE, ONTARIO

1.0 Introduction

R. W. Tomlinson Limited, Tomlinson, is applying to the Ministry of Natural Resources, MNR, for a Class "A" License, below water extraction, under the Aggregate Resources Act, ARA, for the proposed East Oxford Pit to be located at 1486 O'Neill Road, Geographic Township of Oxford on Rideau, Municipality of North Grenville, United Counties of Leeds and Grenville, Ontario, as shown in Figures 1 and 2.

This report describes an assessment, carried out by Freefield Ltd., of the potential impact of noise from operations at the proposed pit on nearby noise sensitive receptors in accordance with Ministry of Environment, Conservation and Parks, MECP, guidelines for stationary noise sources. [1, 2] Where applicable, noise mitigation measures such as barriers and limits to operations have been designed to ensure all operations comply with the applicable sound level limits.

This report has been prepared in accordance with the MECP Document NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995[2]. Noise from the facility is assessed according to MECP Documents: NPC-300, *Stationary and Transportation Sources – Approval and Planning*, August 2013.[1] This report follows the recommended format contained in, *Sample Application Package, Basic Comprehensive Certificate of Approval (Air and Noise)*, July 2009.[3]

The noise assessment methodology is summarised below.

- Identification of noise sensitive receptors in the vicinity of the pit. Potential noise sensitive receptors include residences, motels, places of worship, schools, hospitals and vacant land zoned for potential noise sensitive use.

- Determination of the MECP sound level limits[1] which apply at each of the noise sensitive receptors.

- Identification of the sources of noise that will arise from pit operations. In the current study, the strengths of the various noise sources were obtained from noise measurements of similar equipment at other aggregate operations in Ontario by Freefield Ltd.

- Based on the strengths of the individual noise sources, noise levels due to pit operations are predicted at nearby noise sensitive receptors using a prediction procedure[3] which is favoured by the MECP. The MECP methodology requires that compliance be assessed under predictable "worst case" conditions for normal operations.

- Assessment of compliance of the noise due to pit operations with MECP sound level limits. Where appropriate mitigation measures are recommended such that compliance, with MECP sound level limits, is achieved at all receptors.

Note that this assessment considers all significant noise sources in operation on the site. The pit is not a significant source of vibration therefore an assessment of vibration impacts is not required.

Surrounding Lands, Acoustic Environment and Noise Sensitive Receptors

The proposed East Oxford Pit is located in a predominantly rural, agricultural and mineral extraction area, on the south side of O-Neill Road, immediately east of the intersection with Pattersons Corners Road, in the Geographic Township of Oxford on Rideau, Municipality of North Grenville, United Counties of Leeds and Grenville, Ontario.

The site consists of a mix of cleared agricultural and wooded land. The site is relatively flat with minor changes in elevation ranging from approximately 105 mASL at the sites western boundary and rising to approximately 109 mASL to a rise in the southern and mid region of the site then falling towards the northeast to an approximate elevation of 107 mASL to 108 mASL at the northern and eastern licensed boundary.

The lands surrounding the pit consist of relatively flat topography generally sloping down in a north easterly and south westerly direction.

Note that directions in this report are referenced to site north as shown in Figure 1.

The legal description of the land occupied by the proposed pit is as follows:

Part of Lots 13 and 14
Concession 8
(Geographic Township of Oxford on Rideau)
Municipality of North Grenville
County of Leeds and Grenville

A location plan showing the site with respect to the surrounding area is provided in Figure 1. A site layout plan, showing the sites detailed arrangement and elevation contours, is provided in Figure 2. A land use zoning map is provided in Appendix 1.

The proposed pit is located on land zoned Mineral Extractive Preserve (MXAP), Rural (RU) and Agriculture (A1), as shown on the Zoning Map, Appendix 1.

To the north of the site the land is zoned Rural (Rural). A number of existing residences and a vacant lot zoned for potential noise sensitive use on land zoned Rural (RU) lie in this direction fronting O'Neill Road. The closest existing and potential future residences in this direction have been selected as noise sensitive receptors in the following assessment.

To the east of the site the land is Rural (RU) and Mineral Extractive Preserve (MXAP). A number of existing residences and a vacant lot zoned for potential noise sensitive use on land zoned Rural (RU) lie in this direction fronting Pattersons Corners Road. The closest existing and potential future residences in this direction have been selected as noise sensitive receptors in the following assessment.

To the south of the site the land is zoned Rural (RU), Residential Density 1 (R1), Agriculture (A1) and Mineral Extractive Preserve (MXAP). A number of existing residences and vacant lots zoned for potential noise sensitive use on land zoned Residential Density 1 (R1) and Agriculture (A1) lie in this direction fronting Pattersons Corners Road and Oxford Station Road (County Road 20). The closest existing and potential future residences in this direction have been selected as noise sensitive receptors in the following assessment.

To the west of the site the land is zoned Agriculture (A1) and Mineral Extractive Preserve (MXAP). Tomlinson own the land immediately west of the proposed licensed boundary. This land falls within the same property parcel as the proposed licensed area. Further west fronting a number of existing residences existing fronting County Road 20. The closest existing residence in this direction has been selected as a noise sensitive receptor in the following assessment.

Where receptors have been located on vacant land zoned for potential noise sensitive use i.e. a possible future residence located on land zoned Rural, the location selected for assessment is consistent with the existing pattern of development in the area.

The noise sensitive receptors, which have been selected for detailed analysis, are shown in Figure 1. These were selected as being the receptors most likely impacted by noise from the proposed pit operations. Other noise sensitive receptors are at greater distances and will be less affected by noise from the pit.

Table 1 lists the noise sensitive receptors selected for analysis.

2.0 Facility Description

The proposed East Oxford Pit will have an annual tonnage limit of 1,000,000 tonnes.

Raw material (sand and aggregate) will be primarily extracted by loader or excavator and taken by truck to stockpiles located in the central processing area near the wash plant. Sand is then fed into the feed bins by loader, where it is transported by conveyor to a dry screen. Oversized material is diverted to a rotary (cone) or a VSI crushing unit. After crushing material is fed back into the dry screen for further processing. Material that passes through the dry screen is transferred to a wet screen before being delivered to a classifier that separates the material by size (larger, heavier material falls to the bottom, and smaller, lighter material continues to flow into a separate area). Sand then passes through the screws which dewater the material. Material is stockpiled using conveyors and stackers. A loader then loads the stockpiled aggregates onto trucks that are used to deliver the product off-site.

Extraction below water will be carried out by an excavator with a large boom or dragline or a cutter suction dredge.

Additional material may be brought on site as needed, stored and processed, before being shipped off site.

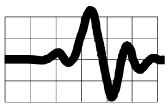
Extraction of East Oxford Pit will take place in five phases, as shown in Figure 2, with up to two lifts in each phase, corresponding to above water extraction and below water extraction. Site rehabilitation shall occur progressively after completion of extraction in each phase. The processing plant will be established in Phase 1 in location shown on Figure 2.

Phase 1 commences with extraction of the above water material with the cut proceeding from the southwest portion of the site in a north, south and easterly direction to the extraction limits of Phase 1. The base of Phase 1 above water will slope up in an easterly direction from an approximate elevation of 106 mASL at the eastern extraction limit to an approximate elevation of 107.5 mASL at the western extraction limit of Phase 1.

Phase 2 will continue the above water extraction from the current lift face of Phase 1 and proceed in an easterly direction to the setback limits abutting Pattersons Corners Road. The base will be sloped from an approximate elevation of 107.5 mASL at the western limit of Phase 2, abutting Phase 1, to an elevation range of approximately 107.5 mASL to 108 mASL at the site's eastern setback limit.

Phase 3 will continue the above water extraction from the current lift face of Phase 1 and proceed in a northerly direction to the setback limits abutting O'Neill Road. The lift floor will be sloped with approximate elevations ranging from 106 mASL at the western extraction limit to an elevation range of approximately 107 mASL to 107.5 mASL at the eastern limit of Phase 3.

Phase 4 will continue the above water extraction from the current lift face of Phase 1, Phase 2 and Phase 3 and proceed in a north and easterly direction to the extraction limits of Phase 4. The lift floor will be sloped from an elevation range of approximately 106 mASL to 108 mASL at the



southern limit of Phase 4, abutting Phase 1 and 2 to an elevation range of approximately 107.5 mASL to 108 mASL at the northern extraction limits abutting O-Neill Road.

Phase 5 will continue the above water extraction from the current lift face of Phase 4 and proceed in a north and easterly direction to the extraction limits of the site abutting O'Neill Road and Pattersons Corners Road. The lift floor will be sloped from an approximate elevation of 108 mASL to 108.5mASL.

Below water extraction shall occur concurrently after completion of above water extraction in each phase.

Equipment will generally be located on the floor of the pit.

Access for highway trucks used for the shipping will be via the proposed new southern site entry off County Road 20. The site entry is shown in Figure 2.

The following equipment will be operated on-site and is included in this assessment as significant sources of noise:

- One wash plant and associated diesel generator,
- Up to three loaders and excavators with buckets,
- One additional excavator with large boom or drag line OR one cutter suction dredge for below water extraction,
- Haulage Trucks,
- Portable equipment for site preparation and rehabilitation, including excavators, hydraulic shovels, dozers and scrapers.

A description of each operation follows:

Wash Plant

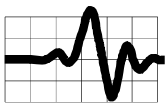
A wash plant is used to process extracted material and separate it into various grades of aggregate. The major components of the plant include a hopper (feed bin), dry screen deck, a rotary (cone) crushing unit or a VSI crushing unit, a wet screen deck, a classifier, one single and one double screw material washers and conveyors and stackers. Typically, associated operations include loaders used to supply raw material to the plant and to load trucks from stockpiles for delivery off-site. A diesel generator or hydro will be used to provide power to the plant.

The wash plant may operate on a 24-hour basis.

Loaders and Excavators

Typically, loaders and excavators are required on-site for the following:

- Extracting raw material from the extraction face,
- Loading extracted material onto trucks for delivery to the wash plant,
- Delivery of material from the extraction face to the wash plant,
- Loading aggregate from stockpiles into the hoppers to feed the wash plant,



- Loading processed aggregate on to trucks for shipping off-site,
- Generally pushing around rock and aggregate to maintain the site in a safe state,
- Removing overburden and site preparation,

Extraction operations by loader or excavator may take place occur only during the daytime hours (07:00 – 19:00). Loading and stockpiling operations by loader or excavator may occur on a twenty-four-hour basis (24-hour).

Cutter Suction Dredge

A cutter suction dredge may be used during certain periods for extraction below water. This equipment consists of a rotating cutter head, for breaking up hard soils. The sand and aggregate is sucked up by dredge pumps and deposited via pipelines to the shore deposit area prior to it being fed into the wash plant for processing.

Cutter suction dredge operations take place only during the daytime hours (07:00 – 19:00).

Aggregate Trucks

Aggregate trucks are used for delivery of material from the extraction face to the wash plant. It is assumed that up to 7 loads per hour will be delivered from the extraction face to the wash plant during periods of maximum capacity during the daytime period. During the evening and nighttime period Aggregate trucks delivering material from the extraction face to the wash plant are not in operation. The aggregate trucks travel relatively slowly, typically 30 kph or less.

Aggregate trucks delivering material from the extraction face to the wash plant operate only during the daytime hours (07:00 – 19:00).

Highway Trucks

To ship aggregate off-site, highway trucks enter via the site entry off Leeds and Grenville Road (County Road 20), travel to stockpiles located in the central processing plant near the wash plant, are loaded by loader, and then leave the site. It is assumed that up to 13 trucks per hour will enter the site and 13 trucks per hour will exit the site during periods of maximum capacity during the daytime period. During the evening and nighttime period, during periods of reduced demand, it is assumed a maximum of 5 trucks per enter the site and 5 trucks per hour exit the site.

The highway trucks travel relatively slowly on-site, typically 30 kph or less. Highway trucks may operate on-site on a 24-hour basis.

Hours of Operation

Daytime Operations (07:00 – 19:00) - During the daytime period, all significant noise sources are assumed to be in operation and include the following:

- One wash plant and associated diesel generator,
- Up to three loaders or excavators used for extraction, loading and stockpiling operations,
- One cutter suction dredge OR one additional excavator with large boom or dragline,
- On-site truck movements, to deliver material to the central processing area and haul the product off-site.

Evening and Nighttime Operations (19:00 – 07:00) – During the evening and nighttime period the following significant noise sources may be in operation:

- One wash plant and associated diesel generator,
- Up to one loader or excavator used for loading and stockpiling operations,
- On-site truck movements, to haul the product off-site.

3.0 Noise Source Summary

The following noise sources have been used to model noise generated by operations at the East Oxford Pit. In brackets are the shortened names of the noise sources as used in the acoustic model. The characteristics of these sources, as used in acoustic modelling, are summarized in Table 2.

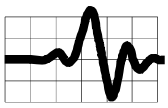
- One wash and an associated loader (Source: Wash_Plant);
- One diesel generator with exhaust muffler (Source: Generator_Exhaust);
- Up to two additional loaders or excavators in operation at the extraction face (Source: Excavators)
- One Cutter Suction Dredge (Source: Dredge)
- Aggregate trucks used for delivery of raw material to stockpiles (Source: IHR_Aggregate);
- Highway trucks used for delivery and shipping of product (Source: IHR_Shipping);

The strengths of all noise sources, i.e. the sound powers shown in Table 2, and used in this analysis, except the generator, are taken from noise measurements by Freefield Ltd. of similar operations made at other Tomlinson aggregate operations in Ontario. Noise from the generator supplying power to the wash plant is based on manufacturers data.

Noise from the wash plant has been modelled as a single point source located at the centre of the screener, 7.8 m above grade. The sound power of the wash plant is based on measurement data of a similar plant in operation at Tomlinson's Albion Pit, ARA License No.: 4058. Due to the cumulative impact of other nearby sources of noise, nearfield measurements were carried out of the wash plant's upper screen deck, 7.8 m above grade, with the results of the near field measurements used for the frequency spectrum of this source. In addition, measurements of noise from the overall plant were taken at five far field measurement locations, L1 to L5, in each direction from the wash plant and at four far field measurement locations for the diesel generator supplying power to the wash plant, while the wash plant was shut down, to determine the relative magnitudes of noise from the generator. The results of the far field measurements were used to calibrate the sound power of the wash plant used in this analysis and exclude the noise from the diesel generator in use at the Albion Pit. The sound power for the wash plant includes noise from one loader which was in operation during the measurements. The wash plant was processing aggregate at the time of noise measurements.

The generator used to provide power to the plant at the East Oxford Pit will be located inside an enclosure (trailer). Noise from the generator has been modelled as a single point source, 4 m above grade, corresponding to the typical height of the generator exhaust located on the roof of the trailer. The sound power for the generator is based on manufacturers data and includes the attenuation provided by the recommended exhaust silencer. Refer to Section 7.0.

Noise from loaders or excavators carrying out above water extraction at the extraction face have been modelled as area sources in the following assessment. In all scenarios the sound power for the excavators has been used for the purpose of assessing compliance, as this sound power is slightly higher than the sound power for the loaders, as shown in Table 2, hence, represents worst case operating conditions.



In all scenarios, the sound power for the dredge has been used for the purpose of assessing compliance of below water extraction operations, as this sound power is slightly higher than the sound power for the excavators, as shown in Table 2, hence, represents worst case operating conditions. Noise from the dredge has been modelled as a single point source, 2.5 m above water, corresponding to the typical height of the exhaust located on the roof of the engine enclosure. The sound power of the dredge is based on measurements of a dredge in operation at Tomlinson's Howe-Ross Pit and includes a reduction in the overall sound power of up to 7.6 dBA from the measured sound level. This is to be achieved via the installation of silencers, acoustic louvres and / or enclosures around noisy equipment. Refer to Section 7.0 for further details. An additional excavator can be used in place of the dredge for below water extraction with no reduction in overall sound power required.

Noise from the haul routes is estimated using the moving point source method and modelled as a continuous line source. Two internal haul route operations have been assessed. One haul route representing trucks delivering raw aggregate from the extraction face to the wash plant, and one haul route representing trucks used for delivery and shipping of product off site.

Refer Figure 3, 5, 7, 9 and 11 for location of sources for worst case scenarios analysed.

4.0 Point of Reception Summary

A total of twenty nearby noise sensitive receptors have been selected for detailed noise evaluation. These existing and potential future residences are those closest to the pit in all directions and represent the worst-case noise impacts in comparison to other nearby or more distant noise sensitive receptors.

The twenty points of reception selected for analysis, POR 1 to POR 20, are shown in Figure 1 and listed in Table 1.

As per MECP Guideline NPC-300, two points of reception (POR) have been selected at each noise sensitive receptor for which worst case sound levels have been calculated.

> POW – Plane of window (POW) points of reception are located on the dwelling or noise sensitive building, typically 2 m above ground for single storey dwellings and 4.5 m above ground for two storey dwellings.
>
> OPR – Outdoor Point of Reception, an area on the property of the residence. For large properties, the OPR point of reception can be up to 30 m from the dwelling at a height of 1.5 m above ground.

Where receptors have been located on vacant land zoned for potential noise sensitive use i.e. a possible future residence located on land zoned rural, the locations selected for assessment are consistent with the existing pattern of development in the area.

5.0 Assessment Criteria, Performance Limits

Sound level limits, as specified in the MECP guideline NPC-300 [1], depend on the acoustical classification of the area as Class 1, 2, 3 or 4.

> **Class 1 area** 'an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as urban hum.'
>
> **Class 2 area** 'an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas: sound levels characteristic of Class 1 during daytime (07:00 to 19:00 or to 23:00 hours); and, low evening and night background sound level defined by natural environment and infrequent human activity starting as early as 19:00 hours (19:00 or 23:00 to 07:00 hours).'
>
> **Class 3 area** 'a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as: a small community; agricultural area; a rural resort area such as a cottage or resort area; or, a wilderness area. '
>
> **Class 4 area** 'an area or specific site that would otherwise be defined as Class 1 or 2 and which: is an area intended for development with new noise sensitive land use(s) that are not yet built; is in proximity to existing, lawfully established stationary source(s); and, has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process. Additionally, areas with existing noise sensitive land use(s) cannot be classified as Class 4 areas.'

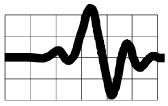
Due to the relatively low levels of road traffic along O'Neill Road, Pattersons Corners Road and County Road 20, and the dominant rural character of the area, the area in which all receptors are located is classified as Class 3 Area.

The applicable outdoor sound level limit at a point of reception is the higher of the applicable exclusion limit value, given in Tables 3 and Table 4, or the background sound level for that point of reception.

Background sound level means the sound level that is present in the environment, produced by noise sources other than the source under assessment. A background noise assessment was not carried out, hence, the levels given in Tables 3 and 4 are taken as the sound level limits at all points of reception for the purpose of this assessment according to their location in a Class 3 Area.

The applicable sound level limits for each point of reception are set out in Table 5.

Sound levels are assessed in terms of the 1-hour equivalent sound level, L_{eq}, effectively the average sound level over each hour. All sound levels are A-weighted, A-weighting being a frequency weighting with represents sensitivity of human hearing to sounds of differing frequencies.



6.0 Impact Assessment

Noise levels have been predicted at the noise sensitive receptors using "predictable worst case" assumptions under normal operations and using ISO 9613-2 sound propagation methodology[4] as implemented in the sound prediction software Cadna-A, Version 2025. The "predictable worst case" is interpreted as meaning the greatest noise impact anticipated under normal operating conditions. The ISO methodology provides a conservative (i.e. high) estimate of the noise level at a receptor taking into account adverse wind and meteorological conditions.

The estimation method includes the following:

- Distance attenuation is based on spherical spreading.
- Atmospheric attenuation.
- Ground attenuations, as appropriate.
- Barrier attenuation, as appropriate.

In order to consider cases of worst noise impacts, five operational scenarios have been modeled. In general, the worst impacts are those which occur when all equipment is operating concurrently.

The following five worst case scenarios are presented in this report and form the basis for the recommended mitigation measures and assessment of compliance to MECP criteria:

Scenario 1: *Worst Case, All equipment in operation in Phase 1 (Day, Evening and Night) – Figure 3, 4.1 and 4.2.*

Scenario 2: *Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 1 and Phase 2 (Day, Evening and Night) – Figure 5, 6.1 and 6.2.*

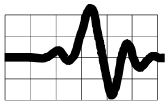
Scenario 3: *Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 2 and Phase 3 (Day, Evening and Night) – Figure 7, 8.1 and 8.2.*

Scenario 4: *Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 3 and Phase 4 (Day, Evening and Night) – Figure 9, 10.1 and 10.2.*

Scenario 5: *Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 4 and Phase 5 (Day, Evening and Night) – Figure 11, 12.1 and 12.2.*

In Table 6.1 to Table 6.5, estimated noise levels at the nearest receptors for the worst-case scenarios, during daytime and evening and nighttime periods of operation, are compared with the applicable sound level limits. More detailed estimates are contained in Appendix 2, Tables A2.8.1 to A2.8.10.

It can be seen that, with the recommended mitigation measures, the sound level limits are met at all noise sensitive points of reception, POR 1 to POR 20, for worst case operating conditions during



the proposed daytime 7 am to 7 pm (07:00 to 19:00), evening 7 pm to 11 pm (19:00 to 23:00), and nighttime, 11 pm to 7 am (23:00 – 07:00) period of operation.

Details of acoustic modeling are provided in Appendix 2. Figures 4.1, 4.2, 6.1, 6.2, 8.1, 8.2, 10.1, 10.2, 12.1 and 12.2 show predicted noise contours for each mode of operation analyzed.

Statement of Compliance

It is concluded that, with the recommended mitigation measures detailed in section 7.0, noise impacts from operations at the East Oxford Pit will be in compliance with MECP Environmental Noise Guidelines1 for the proposed daytime 7 am to 7 pm (07:00 to 19:00), evening 7 pm to 11 pm (19:00 to 23:00), and nighttime, 11 pm to 7 am (23:00 – 07:00) period of operation.

7.0 Mitigation Measures (Site Plan Recommendations)

Noise mitigation measures for the East Oxford Pit operations are detailed below. It is recommended that these measures be included on the official ARA Site Plan for the Pit.

The predicted noise impacts in Tables A2.8.1 to A2.8.10 are based on the implementation of the following mitigation measures:

7.1 Noise Barriers and Berms:

7.1.1 Noise barriers and berms are to be provided as per Table 7 and Figure 13 and 14.

7.1.2 Noise barriers shielding receptors on vacant lots zoned for potential noise sensitive use are only required following development of a noise sensitive use.

7.1.3 Noise shielding portable equipment may be progressively established to shield line of site from equipment operation to the identified receptors.

7.1.4 Noise barriers and berms are to be solid, have no gaps, and are to have a surface density of no less than 20 kg/m2. Examples of suitable barriers or berms are as follow:

- 7.1.4.1 Lift face or existing terrain;
- 7.1.4.2 Earth, gravel or aggregate berms or stockpiles;
- 7.1.4.3 Concrete or brick walls;
- 7.1.4.4 Commercial noise barriers;
- 7.1.4.5 Shipping containers or buildings,

7.2 Wash Plant

7.2.1 The operation of the wash plant and associated diesel generator may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

- 7.2.1.1 The wash plant is to be located on the pit floor at a maximum elevation of 107 mASL in the location shown in Figure 2.
- 7.2.1.2 Noise barriers are to be provided as per Table 7 and Figure 14.
- 7.2.1.3 The generator used to provide power to the wash plant is to be fitted with an exhaust silencer that meets the minimum insertion loss requirements listed in Table 8. The silencer is to be located inside the enclosures or as close as possible to the location where the exhaust exits the enclosures with the duct material between the silencer and the generator constructed of 16-gauge weather resistant metal. The silencer shall have a high transmission loss casing.
- 7.2.1.4 Item 7.2.1.3 above does not apply if hydro is used to provide power to the plant

7.3 Loaders and Excavators

7.3.1 The operation of the loaders may take place) may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

- 7.3.1.1 <u>During the daytime period (07:00 to 19:00):</u> A maximum of three loaders or excavators may be in operation concurrently with a maximum of two loaders or excavators in operation at the extraction face, except as noted in 7.4 below and as follows:
  - i. When operating less than 250 m from an identified receptor, a maximum of

two loaders or excavators may be in operation concurrently with a maximum of one loader or excavator in operation at the extraction face.

7.3.1.2 During the evening and nighttime period (19:00 to 07:00): A maximum of one loader or excavator may be in operation concurrently carrying out loading and stockpiling operations. Extraction by loader and excavator is not to occur during the evening and nighttime period.

7.4 Below Water Extraction

7.4.1 Below water extraction may take place only during the daytime period (07:00 to 19:00) and shall comply with the following:

7.4.1.1 One additional excavator fitted with a large boom or dragline OR a dredge may be in operation carrying out below water extraction concurrently with other pit operations except as provided below,

7.4.1.2 Below water extraction is not to occur concurrently with above water extraction within 250 m from an identified receptor,

7.4.1.3 If a dredge is utilized on-site, the dredge is to be fitted with an exhaust silencer on the engine exhausts, acoustic louvres on the radiator doors and a vented acoustic enclosure around the jet pump that meets the minimum insertion loss requirements listed in Table 8. The silencer is to be located inside the engine enclosure or as close as possible to the location where the exhaust exits the enclosures with the duct material between the silencer and the generator constructed of 16-gauge weather resistant metal. The silencer shall have a high transmission loss casing. The acoustic louvres and enclosure shall be constructed of weather resistant material. Mitigation measures to be confirmed by a qualified acoustical consultant prior to commissioning.

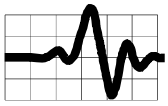
7.5 Trucks

7.5.1 The delivery of raw material from the extraction face to the wash plant using aggregate trucks and delivery and shipping of product using highway trucks may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.5.1.1 When operating on-site, highway trucks shall not exceed 30 km/h and shall not use compression braking (Jake Brakes).

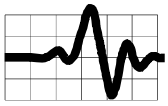
7.6 Portable construction equipment

7.6.1 Portable construction equipment used for site preparation (e.g. land clearing and construction of berms) and rehabilitation shall be fitted with exhaust mufflers and shall comply with MECP Publication NPC-115, Construction Equipment, August 1978 (This publication gives noise standards to be met by construction equipment in Ontario.) Site preparation and rehabilitation activities shall take place only during daytime hours (07:00 – 19:00) and are not to occur on Sundays or Statutory Holidays.



7.7 New Process

7.7.1 If a new process is introduced to the site, then this process shall be assessed by a qualified acoustical consultant prior to commissioning. Noise mitigation measures shall be reviewed, and altered, if necessary, to ensure that MECP sound level limits are met at all points of reception.



8.0 Conclusions

An acoustic assessment of operations at the proposed East Oxford Pit has been conducted according to MECP noise assessment procedures.[1, 2] Operations include extraction by loaders, excavators, dragline and or a dredge, aggregate processing by a wash plant, loading and stockpiling operations by loaders or excavators and on-site truck movements used for delivery and shipping of product.

It has been found that noise levels from the operations at nearby receptors are in compliance with MECP sound level limits as set out in publication NPC-300[1], provided that the noise mitigation measures described in Section 7.0 of this report are followed.

Professional Engineers Ontario **14th January 2026**

Limited Engineering Licensee

Name: M. A. WELLS
Number: 100542557
Limitations: Environmental acoustic assessments and recommendations to mitigate noise and vibration; acoustical engineering services for land-use planning, architectural and building acoustics, industrial acoustics, and occupational health and safety audits.

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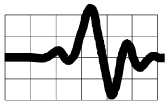
Limited Engineering Licensee, Professional Engineers Ontario, Registered Architect of NSW, Member, Canadian Acoustical Society, Member, Australian Acoustical Society (M.A.A.S.)



References

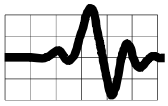
1. Ministry of Environment, Conservation and Parks Publication NPC-300, *Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning*, August 2013, adopted by the MECP on 22 October 2013.

2. Ministry of Environment, Conservation and Parks, Document NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995.

3. Ministry of Environment, Conservation and Parks, *Sample Application Package, Basic Comprehensive Certificate of Approval (Air and Noise)*, July 2009

4. International Standards Organization, *Acoustics - Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation*, ISO 9613-2: 1996(E).

5. The Corporation of the Municipality of North Grenville, By-Law No. 100-24.



TABLES

Table 1: Point of Reception Summary Table

Point of Reception	Location*
POR 1	Residence 1506 Pattersons Corners Road (1 storey)
POR 2	Residence 805 Pattersons Corners Road (2 storey)
POR 3	Vacant Lot via Pattersons Corners Road (2 storey)
POR 4	Vacant Lot via County Road 20 (2 storey)
POR 5	Vacant Lot via County Road 20 (2 storey)
POR 6	Residence 1469 County Road 20 (1 storey)
POR 7	Residence 1476 County Road 20 (2 storey)
POR 8	Vacant Lot via County Road 20 (2 storey)
POR 9	Residence 1380 County Road 20 (Assumed 2 storey)
POR 10	Vacant Lot via County Road 20 (2 storey)
POR 11	Residence 1265 County Road 20 (2 storey)
POR 12	Residence 1343 O'Neill Road (1.5 storey)
POR 13	Residence 1365 O'Neill Road (1 storey)
POR 14	Vacant Lot via O'Neill Road (2 storey)
POR 15	Residence 1411 O'Neill Road (2 storey)
POR 16	Residence 1445 O'Neill Road (2 storey)

Point of Reception	Location*
POR 17	Residence 1455 O'Neill Road (1.5 storey)
POR 18	Residence 1471 O'Neill Road (1.5 storey)
POR 19	Residence 1485 O'Neill Road (1 storey)
POR 20	Residence 1495 O'Neill Road (1.5 storey)

* For assessment purposes, points of reception, (POR), have been taken as upper floor windows (2 m above grade for single storey and 4.5 m above grade to represent two storey residences) and Outdoor Point of Receptions (30 m from Residence, 1.5 m above grade) in acoustic calculations. POR's located on vacant land have been assessed at 2 stories in height.

Table 2: Noise Source Summary Table

Name	Source ID	Sound Power (dBA)	Source Location Ht. above ground (m)[1]	Sound Character-istics	Noise Control Measures
Wash Plant (includes noise from one loader in operation at the plant)	Wash_Plant	109.5	7.8	Steady, non-tonal, non-directional	As noted in section 7.0
Generator	Generator	108.5[2]	4	Steady, non-tonal, directional	As noted in section 7.0
Cutter Suction Dredge	Dredge	103.2[3]	2.5	Steady, moving, non-tonal, non-directional	As noted in section 7.0
Loaders (Cat 982M or similar)	Loader	103.0	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Excavators (CAT345DLME or similar)	Excavator	103.2	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Aggregate Trucks (Delivery of raw material to the wash plant)	IHR_Aggregate (Aggregate_Truck_Passby)	105.3	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Highway Trucks (Shipping)	IHR_Shipping (Truck_Passby)	106.7	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0

Notes:
1. Height measured from finished grade at location of equipment operation.
2. Includes attenuation provided by the recommended silencer.
3. Includes 7.6 dBA attenuation to be provided by the recommended silencers, acoustic louvres and or enclosures. Refer to Section 7.0.

Table 3: MECP Exclusion Limit Values for One-Hour Equivalent Sound Level (Leq, dBA) at Outdoor Points of Reception

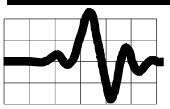
Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

Table 4: MECP Exclusion Limit Values for One-Hour Equivalent Sound Level (Leq, dBA) at Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

Table 5: Applicable One Hour Sound Level Limits for the Daytime Period (07:00 – 19:00)

Receptor & Point of Reception POW = Plane of Widow OPR = Outdoor Point of Reception	Sound Level Limit 1-hour LAEQ dBA (Daytime Period, 07:00 – 19:00)	Sound Level Limit 1-hour LAEQ dBA (Evening Period, 19:00 – 23:00)	Sound Level Limit 1-hour LAEQ dBA (Nighttime Period, 23:00 – 07:00)
POR_1_POW	45	40	40
POR_1_OPR	45	40	-
POR_2_POW	45	40	40
POR_2_OPR	45	40	-
POR_3_POW	45	40	40
POR_3_OPR	45	40	-
POR_4_POW	45	40	40
POR_4_OPR	45	40	-
POR_5_POW	45	40	40
POR_5_OPR	45	40	-
POR_6_POW	45	40	40
POR_6_OPR	45	40	-
POR_7_POW	45	40	40
POR_7_OPR	45	40	-
POR_8_POW	45	40	40
POR_8_OPR	45	40	-
POR_9_POW	45	40	40
POR_9_OPR	45	40	-
POR_10_POW	45	40	40
POR_10_OPR	45	40	-
POR_11_POW	45	40	40
POR_11_OPR	45	40	-
POR_12_POW	45	40	40
POR_12_OPR	45	40	-
POR_13_POW	45	40	40
POR_13_OPR	45	40	-
POR_14_POW	45	40	40
POR_14_OPR	45	40	-
POR_15_POW	45	40	40
POR_15_OPR	45	40	-



Receptor & Point of Reception POW = Plane of Widow OPR = Outdoor Point of Reception	Sound Level Limit 1-hour LAEQ dBA (Daytime Period, 07:00 – 19:00)	Sound Level Limit 1-hour LAEQ dBA (Evening Period, 19:00 – 23:00)	Sound Level Limit 1-hour LAEQ dBA (Nighttime Period, 23:00 – 07:00)
POR_16_POW	45	40	40
POR_16_OPR	45	40	-
POR_17_POW	45	40	40
POR_17_OPR	45	40	-
POR_18_POW	45	40	40
POR_18_OPR	45	40	-
POR_19_POW	45	40	40
POR_19_OPR	45	40	-
POR_20_POW	45	40	40
POR_20_OPR	45	40	-

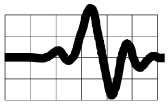
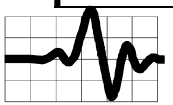


Table 6.1: Acoustic Assessment Summary Table, All Scenarios: Worst Case, Daytime Period of Operation, 7 am to 7 pm (07:00 - 19:00)

Point of Reception ID	Location	Scenario 1 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period Scenario 1 to 5 (dBA)	Compliance with Performance Limit (Yes/No)
POR 1	POW	39.9	40.1	40.9	38.9	39.7	45	Yes
	OPR	40.3	40.5	41.5	39.3	40.2	45	Yes
POR 2	POW	41	41.2	41.8	39.5	40.6	45	Yes
	OPR	41.2	41.5	42	39.1	40.5	45	Yes
POR 3	POW	44.7	44.5	43.3	41.1	41.5	45	Yes
	OPR	42.5	41.5	40.8	36.5	37	45	Yes
POR 4	POW	43.9	43.6	42.2	39.9	39.9	45	Yes
	OPR	43.6	43	40.9	38.2	38.5	45	Yes
POR 5	POW	43.3	42.8	42.8	39.1	39.3	45	Yes
	OPR	43.1	42.4	41.7	38.3	38.5	45	Yes
POR 6	POW	41.9	40.9	40	37.2	37.3	45	Yes
	OPR	42.5	41.7	40.7	37.7	37.9	45	Yes
POR 7	POW	43.5	41.9	41.5	39.5	39.7	45	Yes
	OPR	43	41.4	40.4	38.2	38.3	45	Yes
POR 8	POW	44.5	41.9	41.1	40.4	40.5	45	Yes
	OPR	44.8	41.9	41	40.2	40.4	45	Yes
POR 9	POW	39.3	39	39.2	39	39	45	Yes
	OPR	34.7	33.7	34.1	33.5	33.2	45	Yes
POR 10	POW	39	38.6	39.8	39.5	39.2	45	Yes
	OPR	41.7	40	40.1	39.7	39.5	45	Yes
POR 11	POW	39.7	38.6	39.1	38.6	38.2	45	Yes



Point of Reception ID	Location	Scenario 1 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period Scenario 1 to 5 (dBA)	Compliance with Performance Limit (Yes/No)
	OPR	38.8	37.6	38.1	37.7	37.3	45	Yes
POR 12	POW	41.3	40.7	42.6	41.6	38.8	45	Yes
	OPR	40.2	39.9	42.8	41.5	39.4	45	Yes
POR 13	POW	41.2	40.8	43.5	41.6	39	45	Yes
	OPR	40.2	39.9	44.1	41	38.2	45	Yes
POR 14	POW	42.8	42.2	43.9	43.5	40.3	45	Yes
	OPR	41.7	41.4	43.7	42.3	39.8	45	Yes
POR 15	POW	43.3	42.7	43.4	44	41.3	45	Yes
	OPR	42.3	42	42.8	42.8	40.6	45	Yes
POR 16	POW	43.1	42.4	43.7	43.5	42	45	Yes
	OPR	42	41.7	43.1	43	41.1	45	Yes
POR 17	POW	43.4	42.7	43.9	43.7	42.6	45	Yes
	OPR	42.5	41.9	43.6	42.7	40.7	45	Yes
POR 18	POW	42.6	41.8	42.7	41.7	41.7	45	Yes
	OPR	41.4	41	42.3	41.2	40.9	45	Yes
POR 19	POW	40.3	39.8	40.9	39.9	40	45	Yes
	OPR	41.1	40.4	41.4	40.3	40.4	45	Yes
POR 20	POW	41.8	41.2	42.2	40.1	40.8	45	Yes
	OPR	40.1	40.4	41.6	39.6	40	45	Yes

*Performance limits are based on 1-hour equivalent sound levels, Leq.
**Noise impacts insignificant.

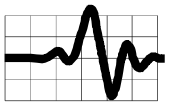
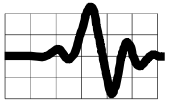


Table 6.2: Acoustic Assessment Summary Table, All Scenarios: Worst Case, Evening and Nighttime Period of Operation, 7 pm to 7 am (19:00 – 07:00)

Point of Reception ID	Location	Scenario 1 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Performance Limit* Evening / Nighttime Period Scenario 1 to 5 (dBA)	Compliance with Performance Limit (Yes/No)
POR 1	POW	34.9	34.9	38.8	35.5	35.8	40	Yes
	OPR	34.8	34.8	39.6	35.8	36.2	40	Yes
POR 2	POW	36.4	36.4	39.8	36.6	36.8	40	Yes
	OPR	36.4	36.4	40	36.5	36.8	40	Yes
POR 3	POW	39	38.7	43.3	38.7	38.7	40	Yes
	OPR	35.9	31.9	40.8	31.9	31.9	40	Yes
POR 4	POW	37.6	38.3	42.2	38.3	38.3	40	Yes
	OPR	35.9	36.4	40.9	36.4	36.4	40	Yes
POR 5	POW	37.2	37.7	42.8	37.7	37.7	40	Yes
	OPR	36.4	36.7	41.7	36.7	36.7	40	Yes
POR 6	POW	35.5	35.7	40	35.7	35.7	40	Yes
	OPR	36	36.2	40.7	36.2	36.2	40	Yes
POR 7	POW	37.2	37.2	41.5	37.2	37.2	40	Yes
	OPR	36.8	36.9	40.4	36.9	36.9	40	Yes
POR 8	POW	38.1	38.1	41.1	38.1	38.1	40	Yes
	OPR	38.1	38.1	41	38.1	38.1	40	Yes
POR 9	POW	38	38	39.2	38	38	40	Yes
	OPR	32.3	32.3	34.1	32.3	32.3	40	Yes
POR 10	POW	37.5	37.5	39.8	37.5	37.5	40	Yes
	OPR	38.1	38.1	40.1	38.1	38.1	40	Yes



Point of Reception ID	Location	Scenario 1 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Evening / Nighttime Period (Worst Case) (dBA)	Performance Limit* Evening / Nighttime Period Scenario 1 to 5 (dBA)	Compliance with Performance Limit (Yes/No)
POR 11	POW	37.2	37.2	39.1	37.2	37.2	40	Yes
	OPR	36.4	36.4	38.1	36.4	36.4	40	Yes
POR 12	POW	37.2	37.2	42.6	37.2	37.2	40	Yes
	OPR	36.9	36.9	42.8	38.2	38.2	40	Yes
POR 13	POW	36.1	36.1	43.5	37.2	37.2	40	Yes
	OPR	36.7	36.7	44.1	36.5	36.5	40	Yes
POR 14	POW	36.1	36.1	43.9	38	38	40	Yes
	OPR	36	36	43.7	37.7	37.7	40	Yes
POR 15	POW	36.5	36.5	43.4	38.5	38.5	40	Yes
	OPR	36.5	36.5	42.8	38.1	38.1	40	Yes
POR 16	POW	36.2	36.2	42.2	38.1	38.1	40	Yes
	OPR	36.1	36.1	41.5	37.7	37.7	40	Yes
POR 17	POW	36.4	36.4	41.6	38.4	38.4	40	Yes
	OPR	36.2	36.2	41.7	36.7	36.7	40	Yes
POR 18	POW	35.5	35.5	40.3	37	37.3	40	Yes
	OPR	35.4	35.4	40.2	36.6	36.9	40	Yes
POR 19	POW	34.5	34.5	38.7	35.6	35.9	40	Yes
	OPR	34.8	34.8	39.2	36	36.3	40	Yes
POR 20	POW	34.8	34.8	40	35.9	36.5	40	Yes
	OPR	34.7	34.7	39.7	35.5	36	40	Yes

*Performance limits are based on 1-hour equivalent sound levels, Leq.
**Noise impacts insignificant.

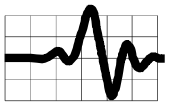
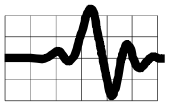
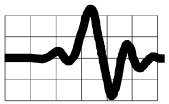


Table 7: Recommended Noise Barriers

Barrier	Minimum Height (m)	Minimum Length (m)*	Maximum Distance from Source (m)	Location	Required to shield Line of Sight from Identified Source ID	Required to shield Line of Sight to Identified Receptor/s	Description*
Barrier_1	5	50	Not applicable	Phase 1 Southern boundary setback, west of site entry, in location shown on Figure 13	Extraction Equipment	POR_8**	New barrier (site berm): • Only required when carrying out extraction operations south of Line AA following development of a noise sensitive use at POR 8.
Barrier_2	5	78.5	Not applicable	Phase 1 Southern boundary setback, east of site entry, in location shown on Figure 13	Extraction Equipment	POR_5** POR_6 POR_7 POR_8**	New barrier (site berm): • Only required when carrying out extraction operations south of Line AA. • Shielding to POR 5 and 8 only required following development of a noise sensitive use.
Barrier_2_ Extension	4	178.5	Not applicable	Phase 2 Southern boundary setback in location shown on Figure 13	Extraction Equipment	POR_4** POR_5** POR_6 POR_7 POR_8**	New barrier (site berm): • Only required when carrying out extraction operations south of Line AA in Phase 2. • Shielding to POR 4, 5 and 8 only required following development of a noise sensitive use.
Barrier_3	4 (6)	100 (260)	Not applicable	Phase 2 Eastern boundary setback in location shown on Figure 13	Extraction Equipment	POR_3** (POR_4**) (POR_5**)	New barrier (site berm): • Required prior to commencement of extraction operations in Phase 1. • Required to be increased to 6 m in height and extended to 260 m in length when carrying out extraction operations in Phase 2. • Only required following development of a noise sensitive use at POR 3, 4 or 5.



Barrier	Minimum Height (m)	Minimum Length (m)*	Maximum Distance from Source (m)	Location	Required to shield Line of Sight from Identified Source ID	Required to shield Line of Sight to Identified Receptor/s	Description*
Barrier_4	6	330	Not applicable	Phase 3 Northern boundary setback in location shown on Figure 13	Extraction Equipment	POR_12 POR_13 POR_14** POR_15	New barrier (site berm): • Required prior to commencement of extraction operations in Phase 3. • Shielding to POR 14 only required following development of a noise sensitive use.
Barrier_4_ Extension	6	350	Not applicable	Phase 4 and Phase 5 Northern boundary setback in location shown on Figure 13	Extraction Equipment	POR_16 POR_17 POR_18 POR_19 POR_20	New barrier (site berm): • Required prior to commencement of extraction operations in Phase 4 and Phase 5.
Barrier_5	6	215	Not applicable	Phase 5 Eastern boundary setback in location shown on Figure 13	Extraction Equipment	POR_1 POR_2	New barrier (site berm): • Required prior to commencement of extraction operations in Phase 4 and Phase 5
Barrier_WP1	8	30	30	Local barrier at wash plant as shown on Figure 14	Wash Plant	POR_3* POR_4* POR_5* POR_6 POR_7 POR_8*	New barrier (stockpile): • Required prior to commencement of wash plant operations. • Shielding to POR 3, 4, 5 and 8 only required following development of a noise sensitive use.
Barrier_WP2	8 (9)	12	30	Local barrier at wash plant as shown on Figure 14	Wash Plant	POR_10**	New barrier (stockpile): • Only required following development of a noise sensitive use at POR 10. • Required to be increased to 9 m high when operating the wash plant during the evening and nighttime period (19:00 – 07:00).



Barrier	Minimum Height (m)	Minimum Length (m)*	Maximum Distance from Source (m)	Location	Required to shield Line of Sight from Identified Source ID	Required to shield Line of Sight to Identified Receptor/s	Description*
Barrier_WP3	8	43.5 (20)	30	Local barrier at wash plant as shown on Figure 14	Wash Plant	POR_1 POR_2 POR_12 POR_13 POR_14** POR_15 POR_16 POR_17 POR_18 POR_19 POR_20	New barrier (stockpile): • Only required when operating the wash plant during the evening and nighttime period (19:00 – 07:00). • May be reduced to 20 m in length and only shield POR 1, 2, 16, 17, 18, 19 and 20 following establishment of Barrier_4. • Not required following establishment of Barrier_4_Extension, Barrier_5 and Barrier_6.

*Barriers (site berms) shielding extraction equipment may be progressively established to shield line of sight (LOS) from location of equipment operation to the identified receptors.

** Noise barriers shielding receptors on vacant lots zoned for potential noise sensitive use are only required following development of a noise sensitive use.

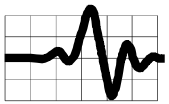
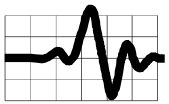


Table 8: Minimum Insertion Loss for Generator Exhaust Silencer

Name	Octave Band Centre Frequency, Hz Minimum Dynamic Insertion Loss (dB)								Rw
	63	125	250	500	1000	2000	4000	8000	
Silencer[2] to be installed at: • Generator exhaust (Source: Generator), • Dredge engine exhaust/s (Source: Dredge).	10	30	38	30	25	20	20	20	24
Acoustic louvre[3] to be installed at: Dredge Radiator Door/s (Source: Dredge)	11	13	15	22	28	26	25	23	25
Acoustic enlcosure4 to be installed at: • Dredge Jet Pump (Source: Dredge)	-	17	23	34	47	55	57	-	35

Notes:

1. Octave Band Centre Frequency, Hz, with minimum dynamic insertion loss in dB or dBA units re 10-12 Watts. Alternative levels at each frequency band permissible providing the overall insertion loss meets the overall insertion loss (Rw) as noted above and is not tonal in character.
2. Insertion loss based on Silex Silencer Model JB 6. Refer manufacturers data Appendix 3.
3. Insertion loss based on Vibro-Acoustics Acoustic Louvre Model ALV-MV-24). Refer manufacturers data Appendix 3.
4. Insertion loss based on Kinetics Noise Control Noise Block Acoustic Enclosure Model STL-2. Refer manufacturers data Appendix 3.



FIGURES

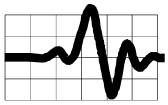


Figure 1: Scaled Area Location Plan showing Receptor Locations

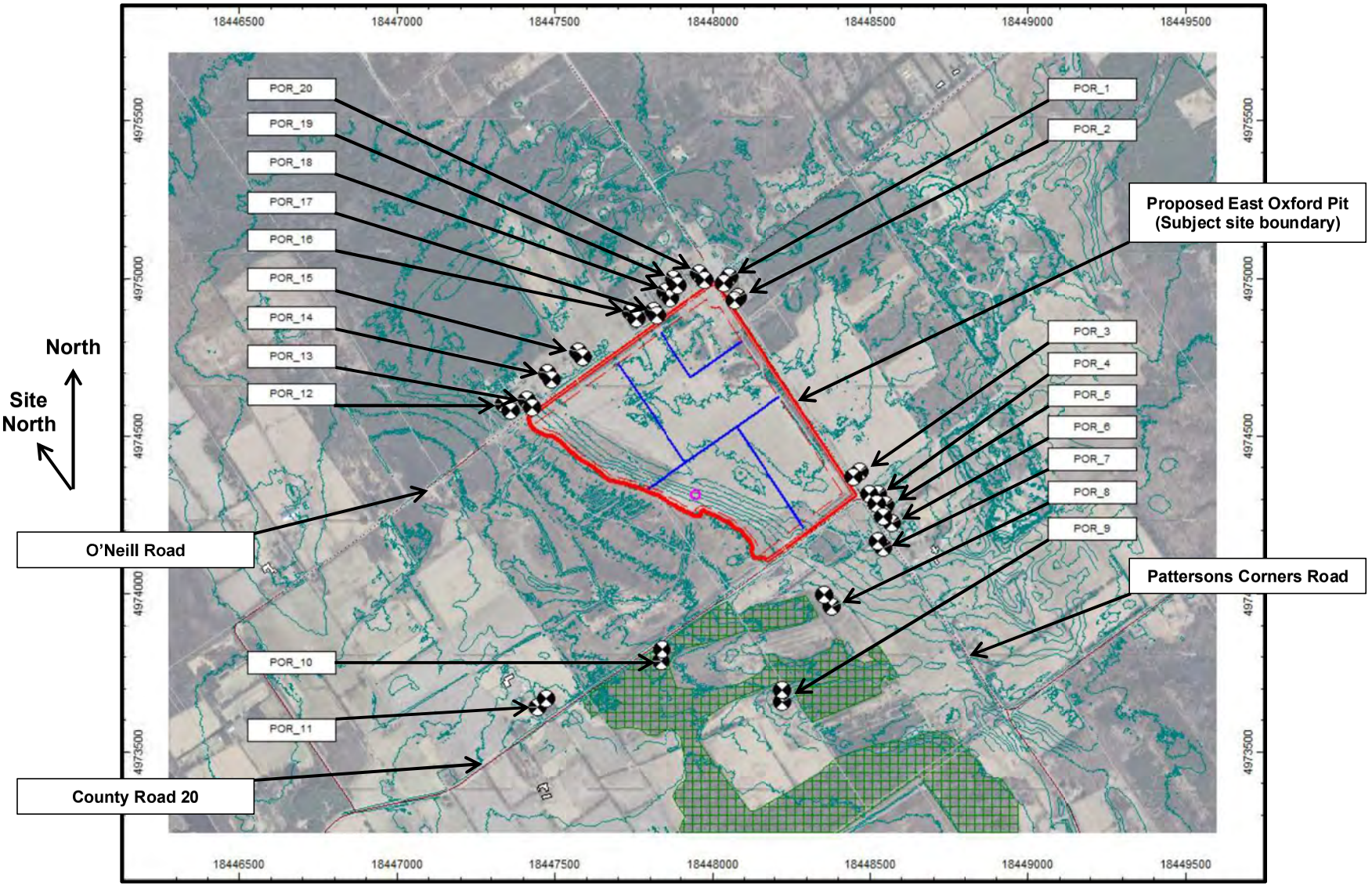


Figure 2: **Detail Site Layout & Surface Elevation Contours** (elevation contours for surrounding area based on LIO, Provincial Digital Elevation Model, shown at 1-meter intervals)

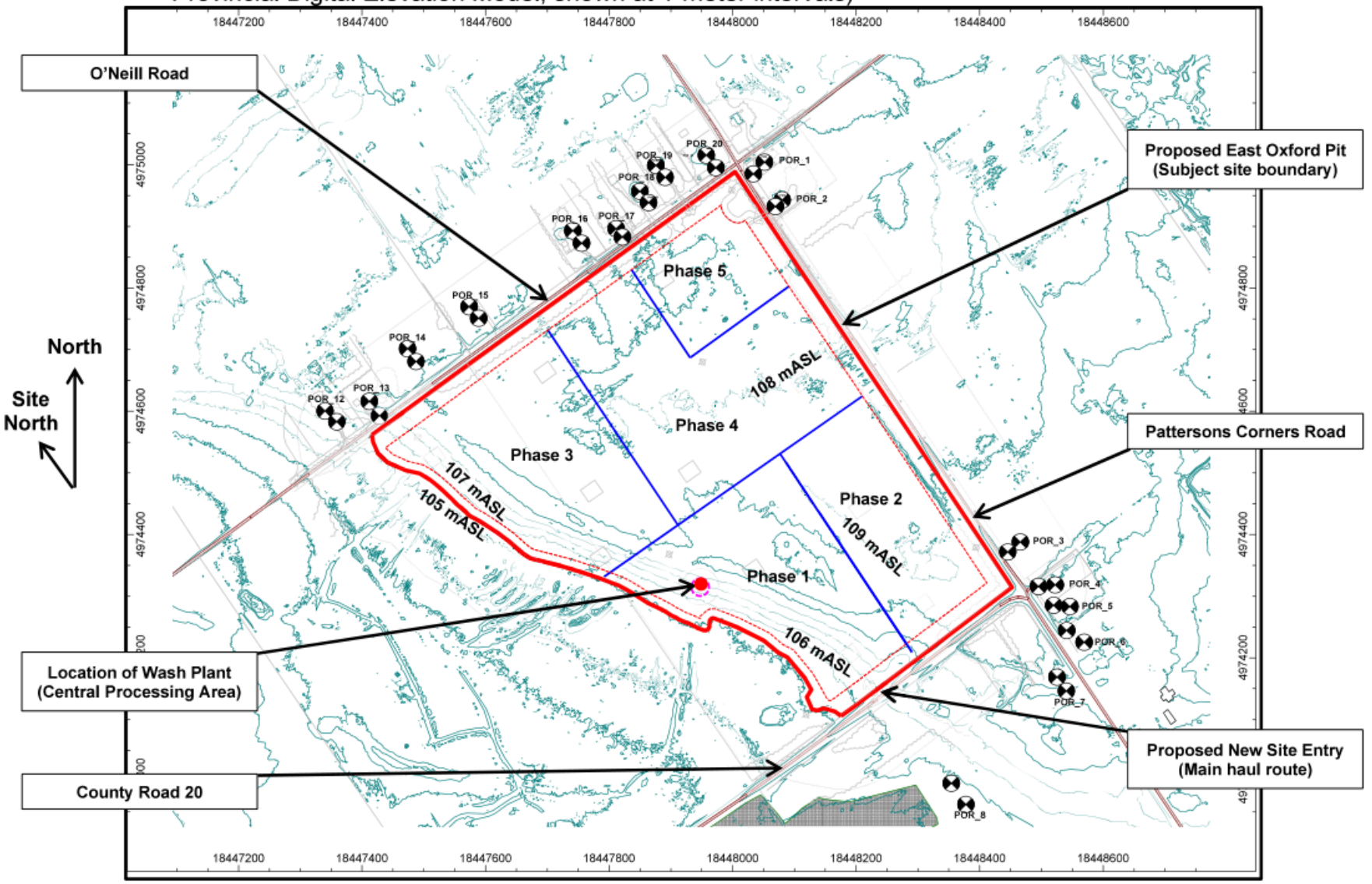


Figure 3: Scenario 1: Worst Case, All equipment in operation in Phase 1 (Day, Evening and Night)

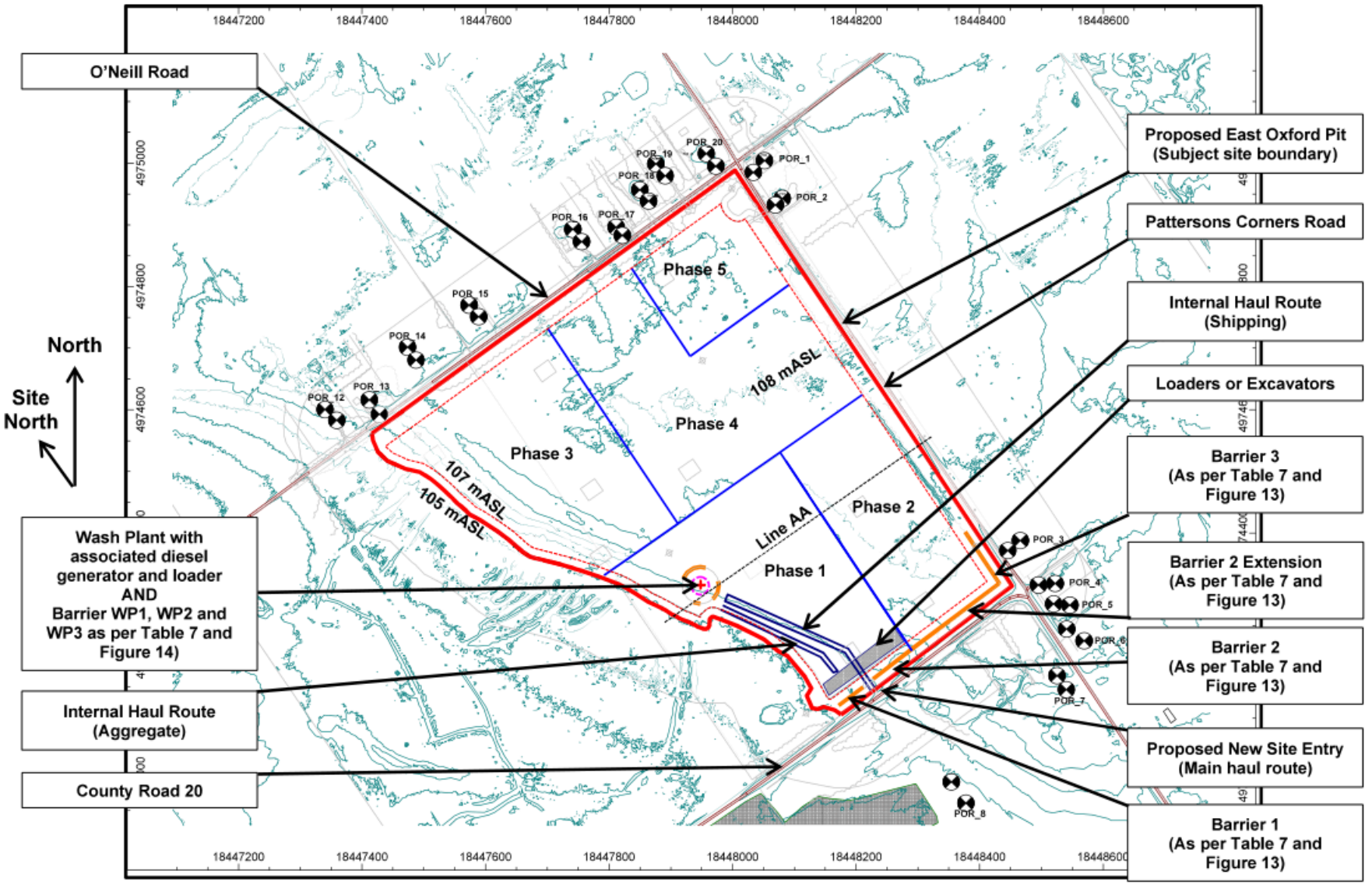


Figure 4.1: Prediction Results, Scenario 1: Worst Case, Daytime Period, Noise Contours, (Noise levels at 4.5 m)

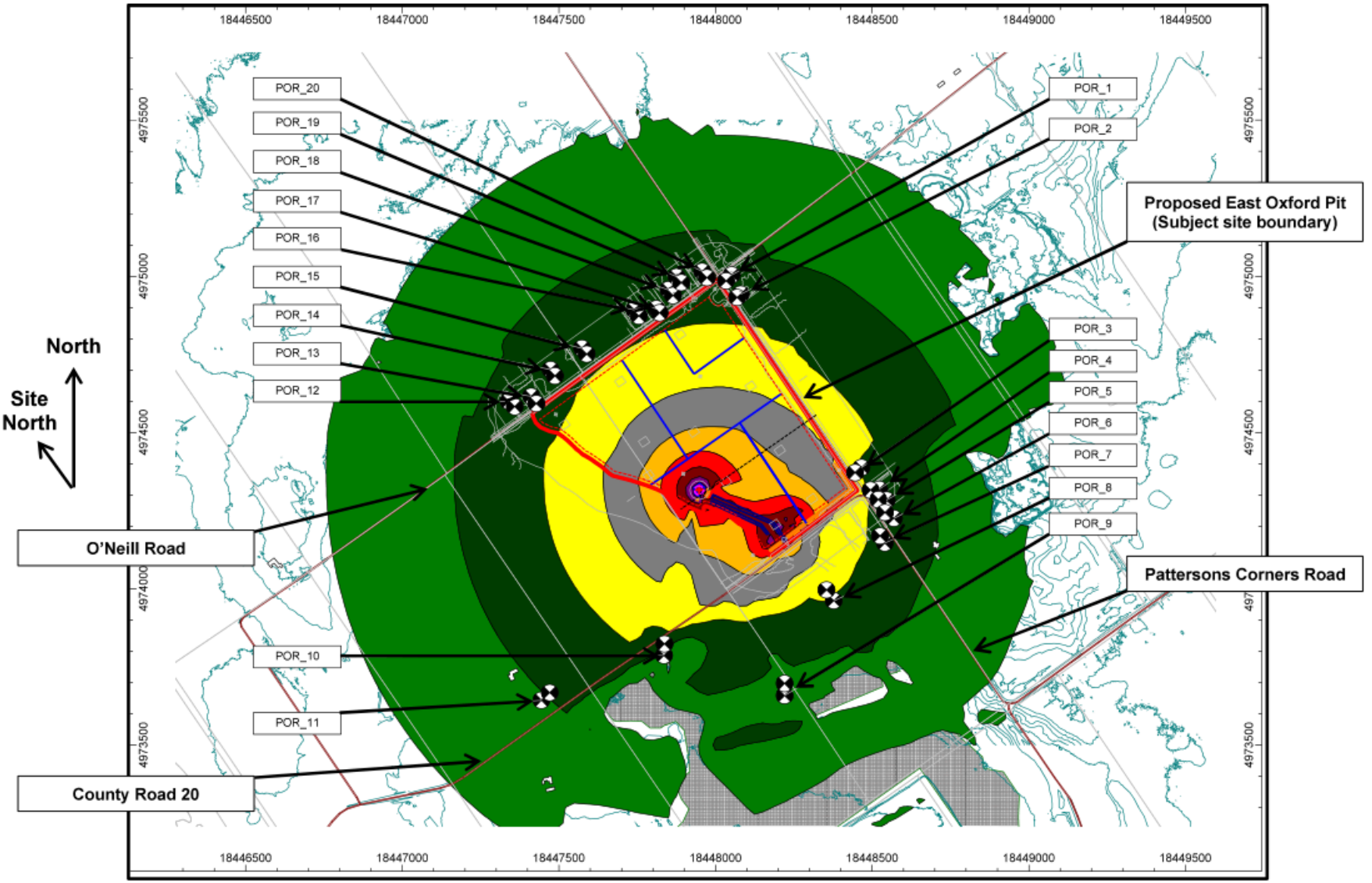


Figure 4.2: Prediction Results, Scenario 1: Worst Case, Evening and Nighttime Period, Noise Contours, (Noise levels at 4.5 m)

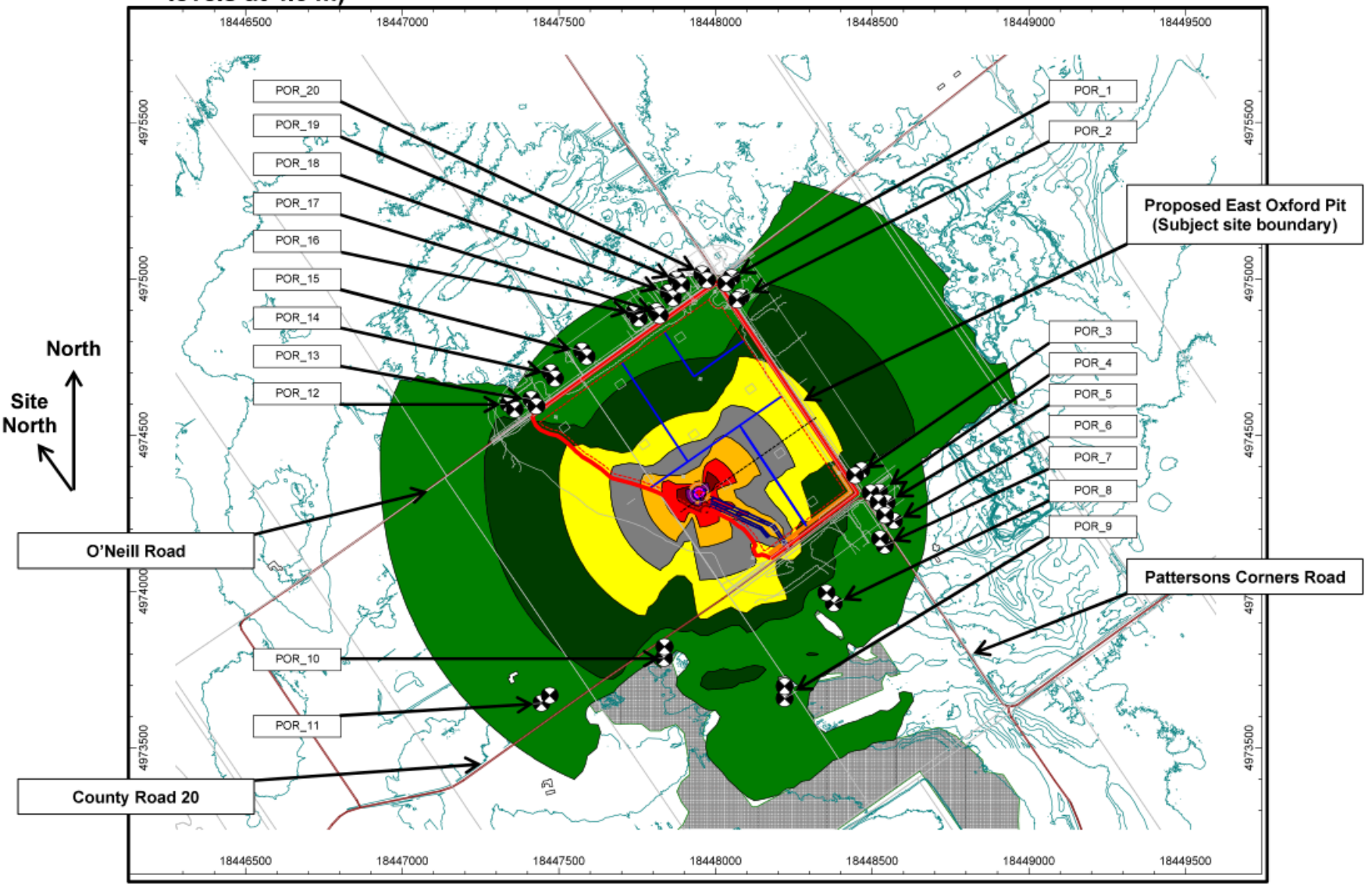


Figure 5: Scenario 2: Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 2 (Day, Evening and Night)

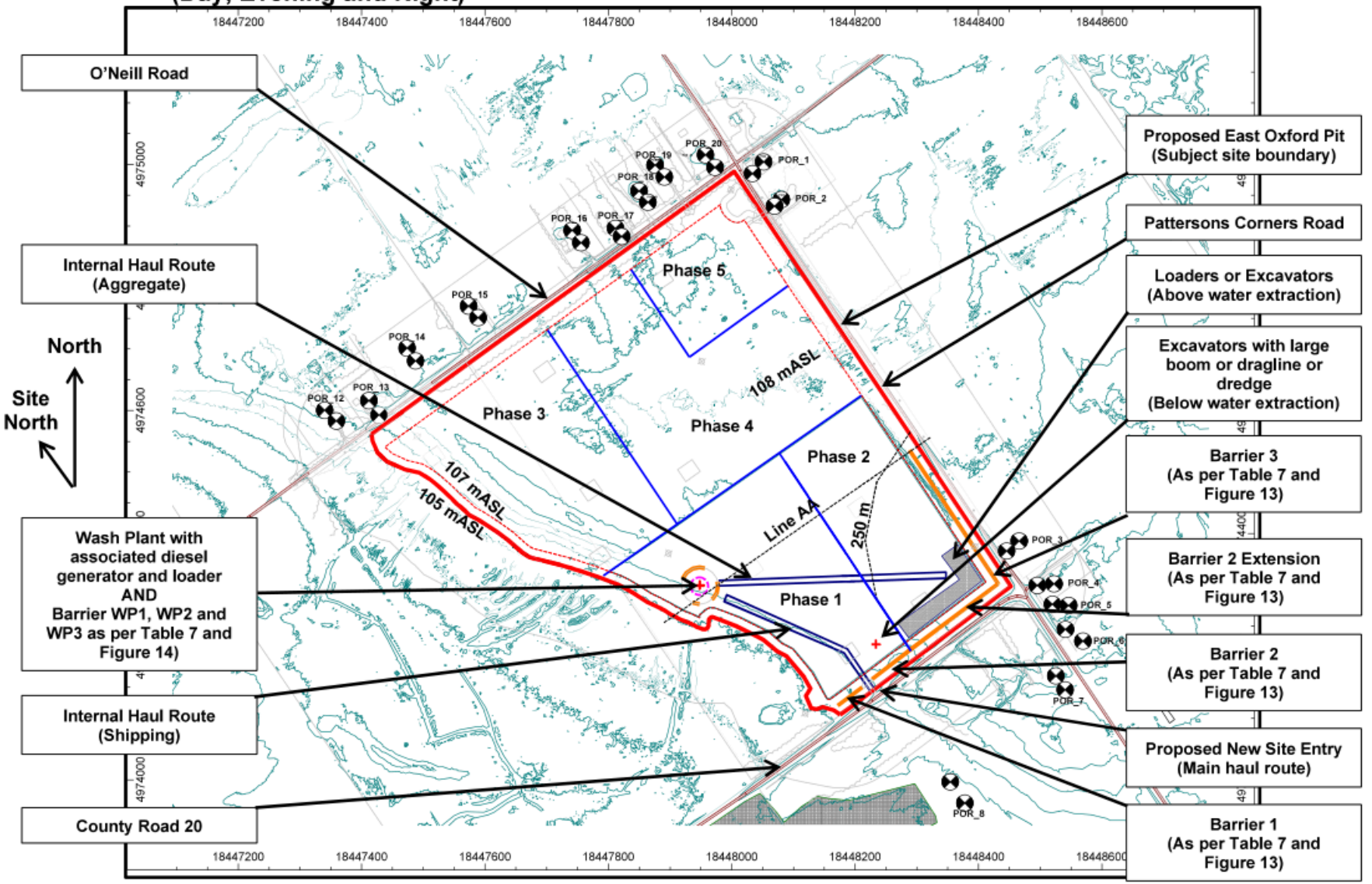


Figure 6.1: Prediction Results, Scenario 2: Worst Case, Daytime Period, Noise Contours, (Noise levels at 4.5 m)

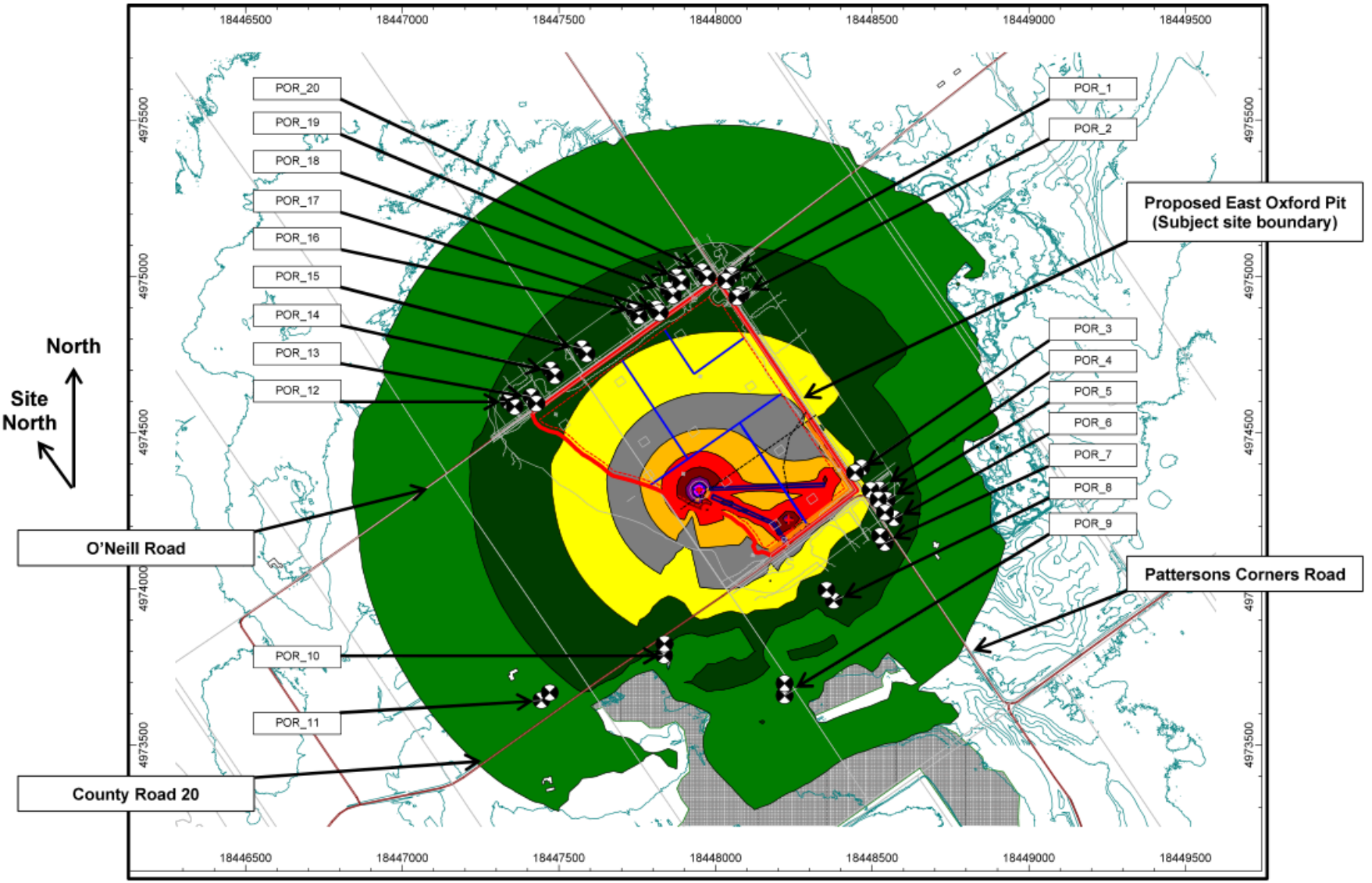


Figure 6.2: Prediction Results, Scenario 2: Worst Case, Evening and Nighttime Period, Noise Contours, (Noise levels at 4.5 m)

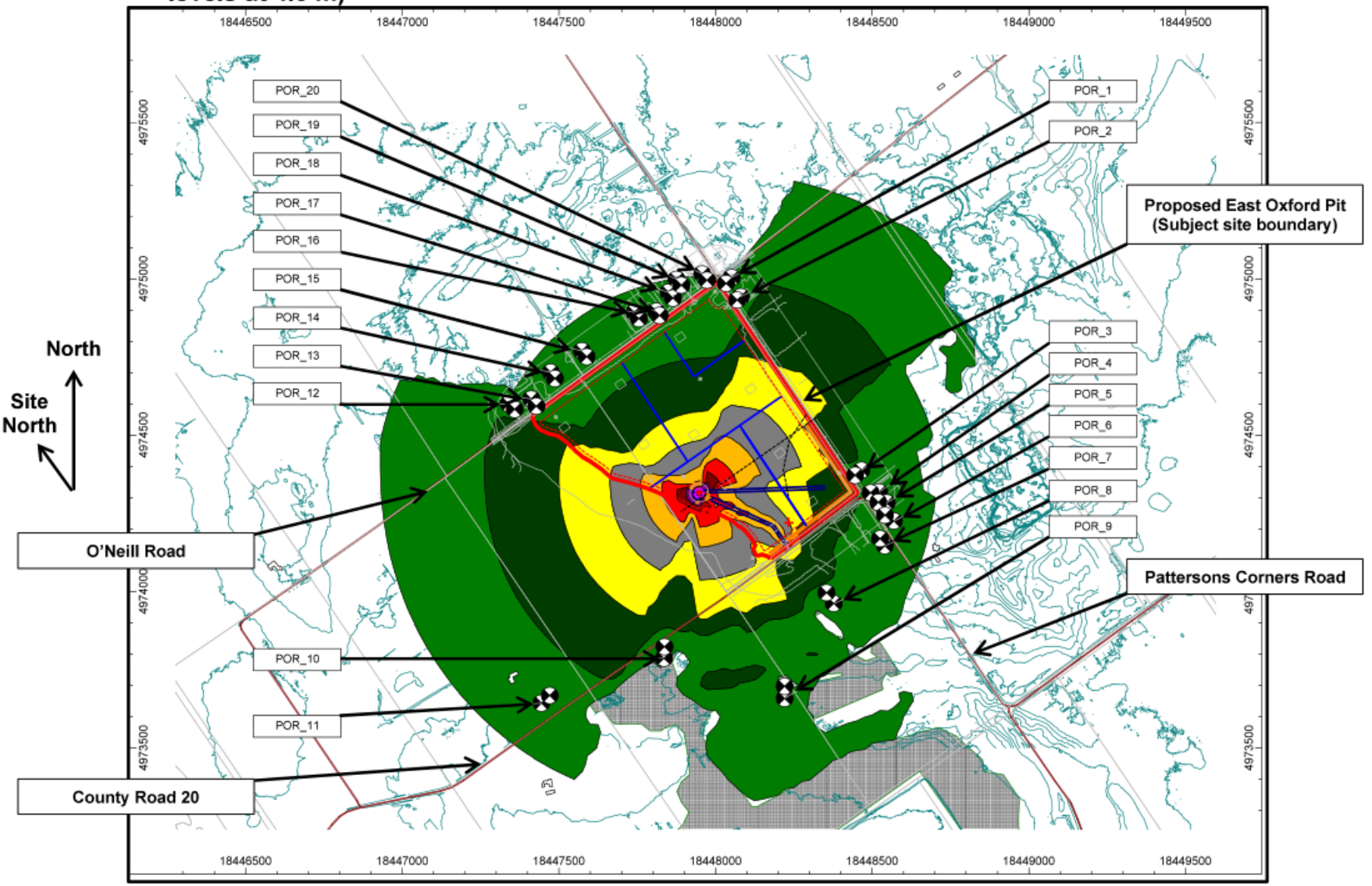


Figure 7: Scenario 3: Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 2 and Phase 3 (Day, Evening and Night)

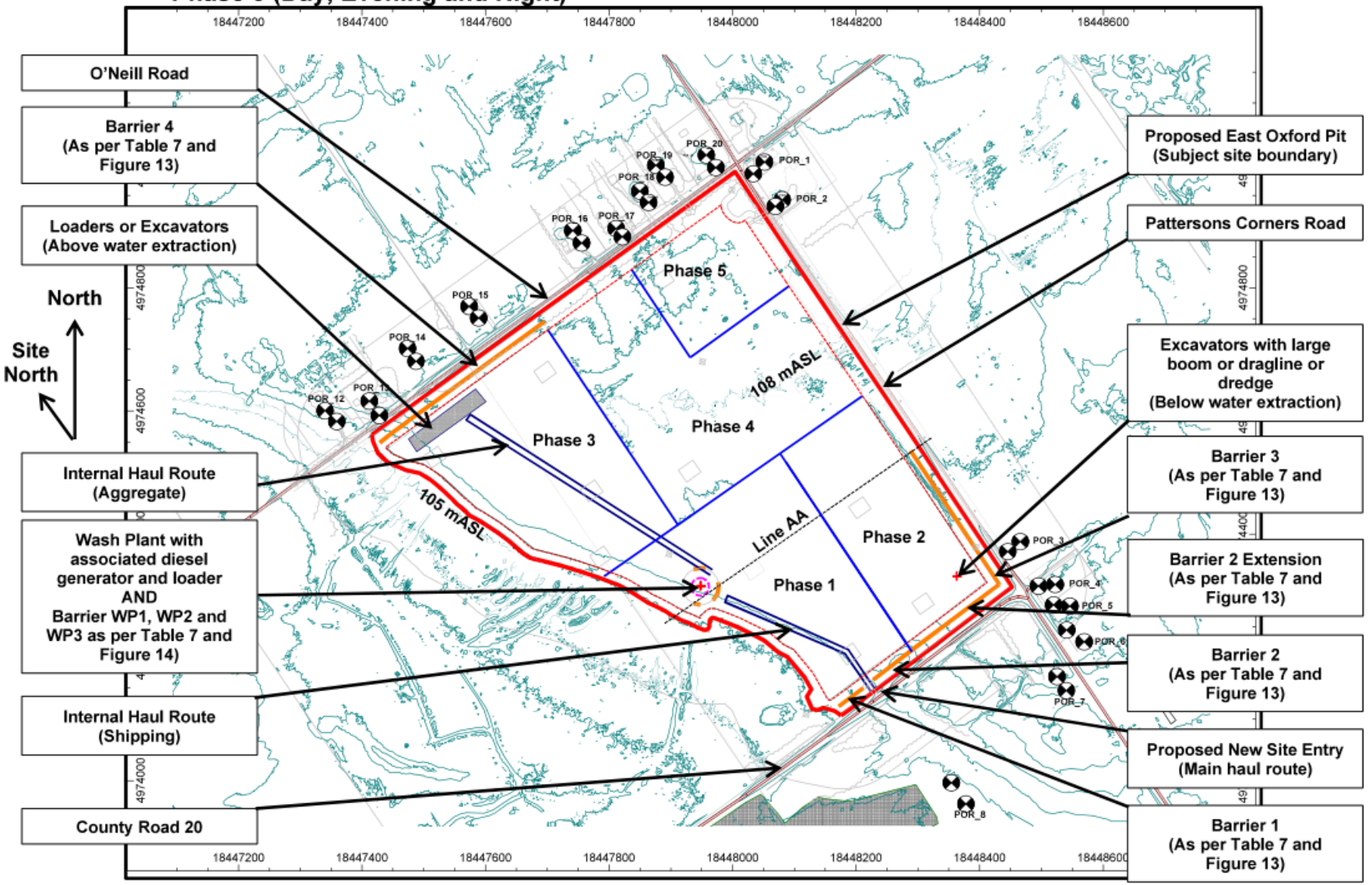


Figure 8.1: Prediction Results, Scenario 3: Worst Case, Daytime Period, Noise Contours, (Noise levels at 4.5 m)

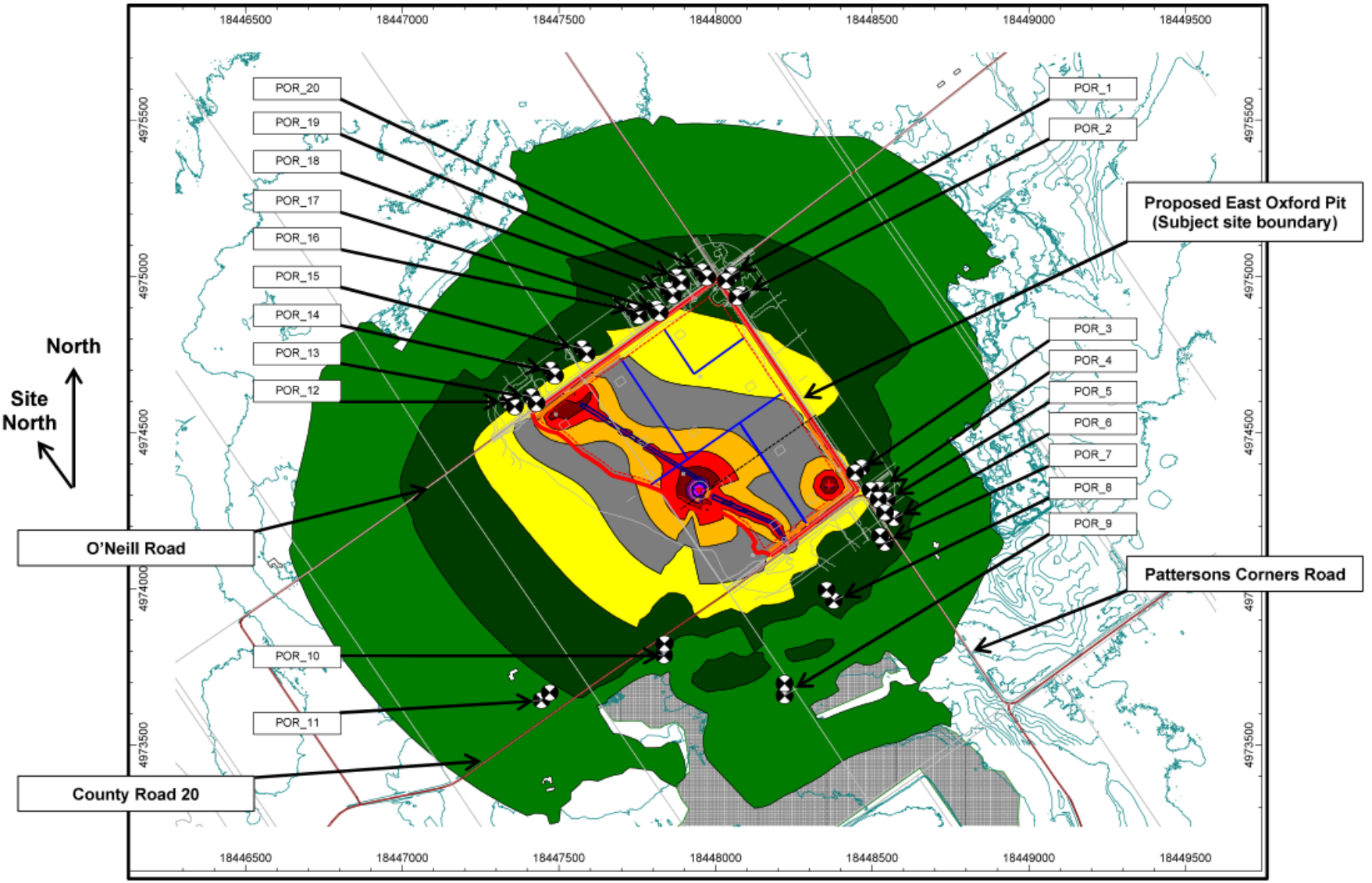


Figure 8.2: Prediction Results, Scenario 3: Worst Case, Evening and Nighttime Period, Noise Contours, (Noise levels at 4.5 m)

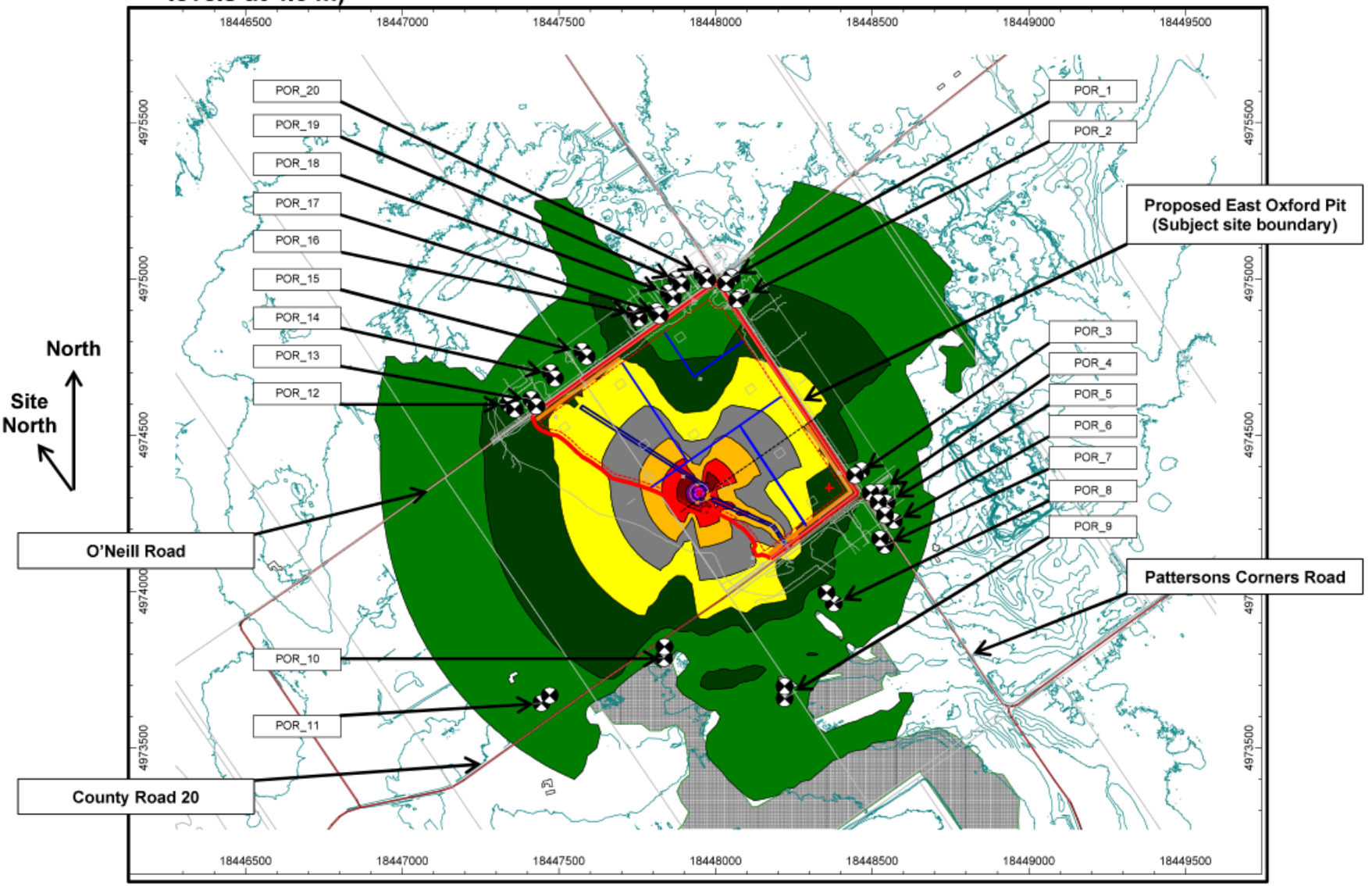


Figure 9: Scenario 4: Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 3 and Phase 4 (Day, Evening and Night)

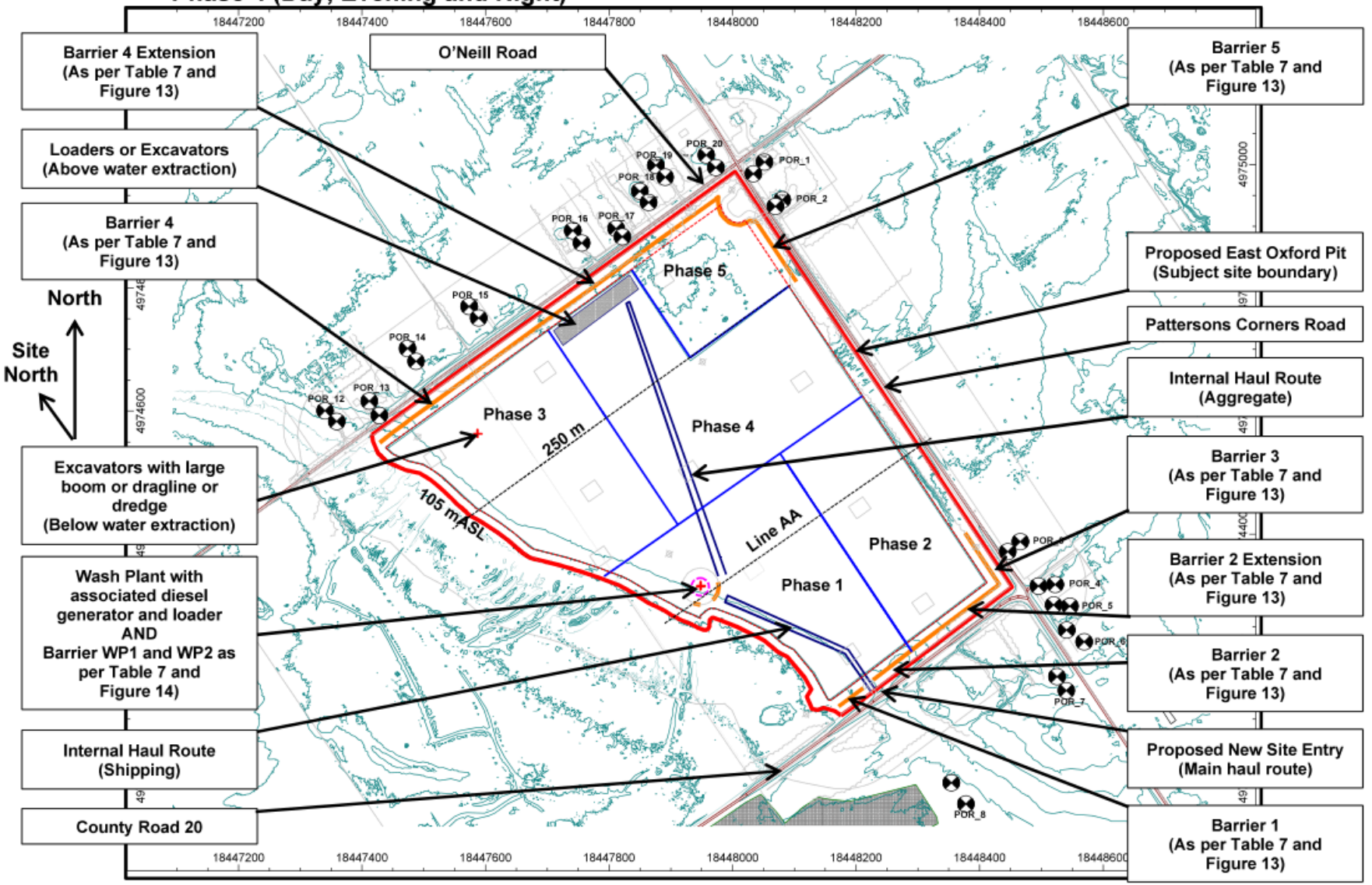


Figure 10.1: Prediction Results, Scenario 4: Worst Case, Daytime Period, Noise Contours, (Noise levels at 4.5 m)

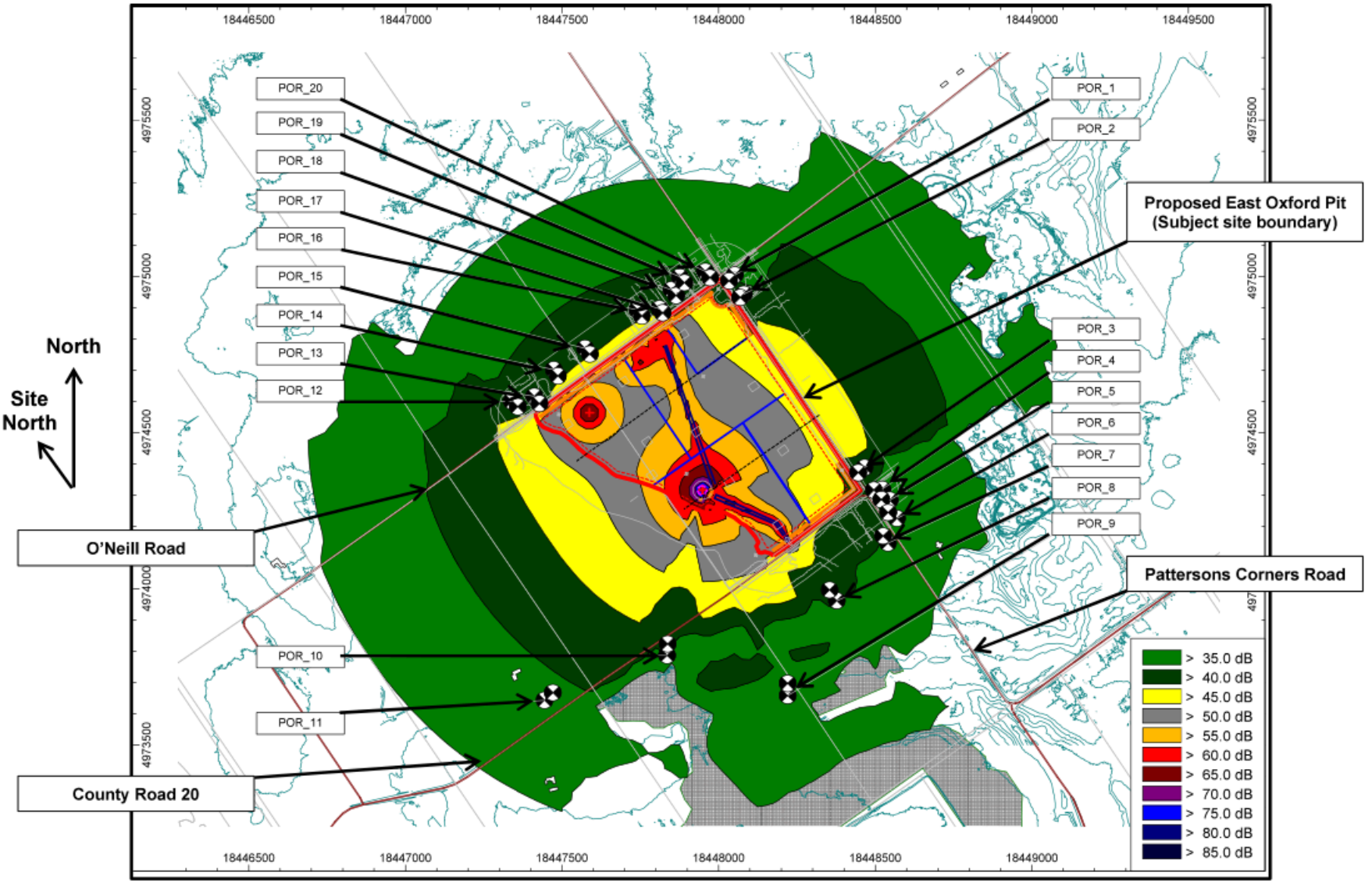


Figure 10.2: Prediction Results, Scenario 4: Worst Case, Evening and Nighttime Period, Noise Contours, (Noise levels at 4.5 m)

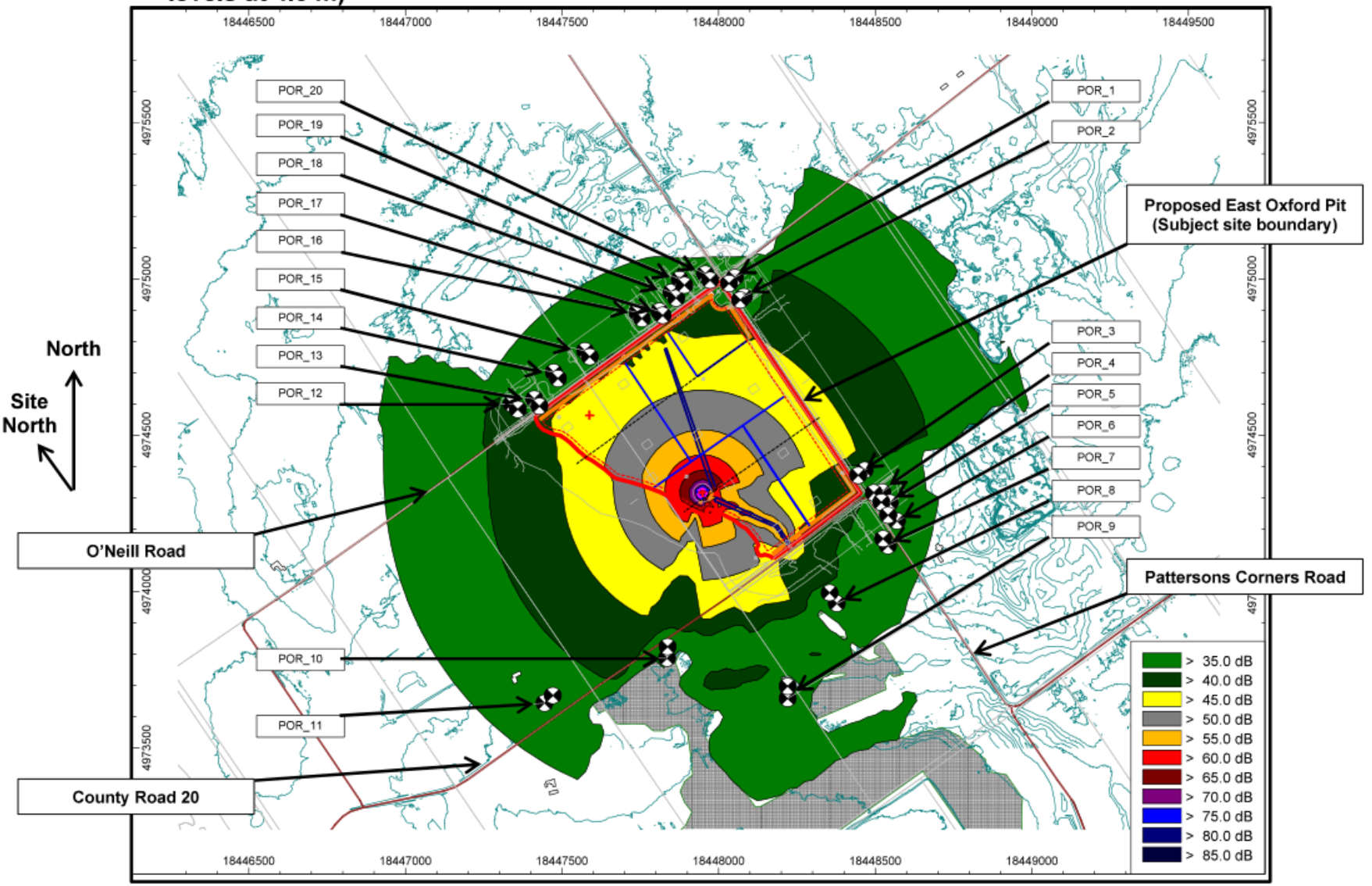


Figure 11: Scenario 5: Worst Case, Wash plant in operation in Phase 1 with extraction occurring in Phase 4 and Phase 5 (Day, Evening and Night)

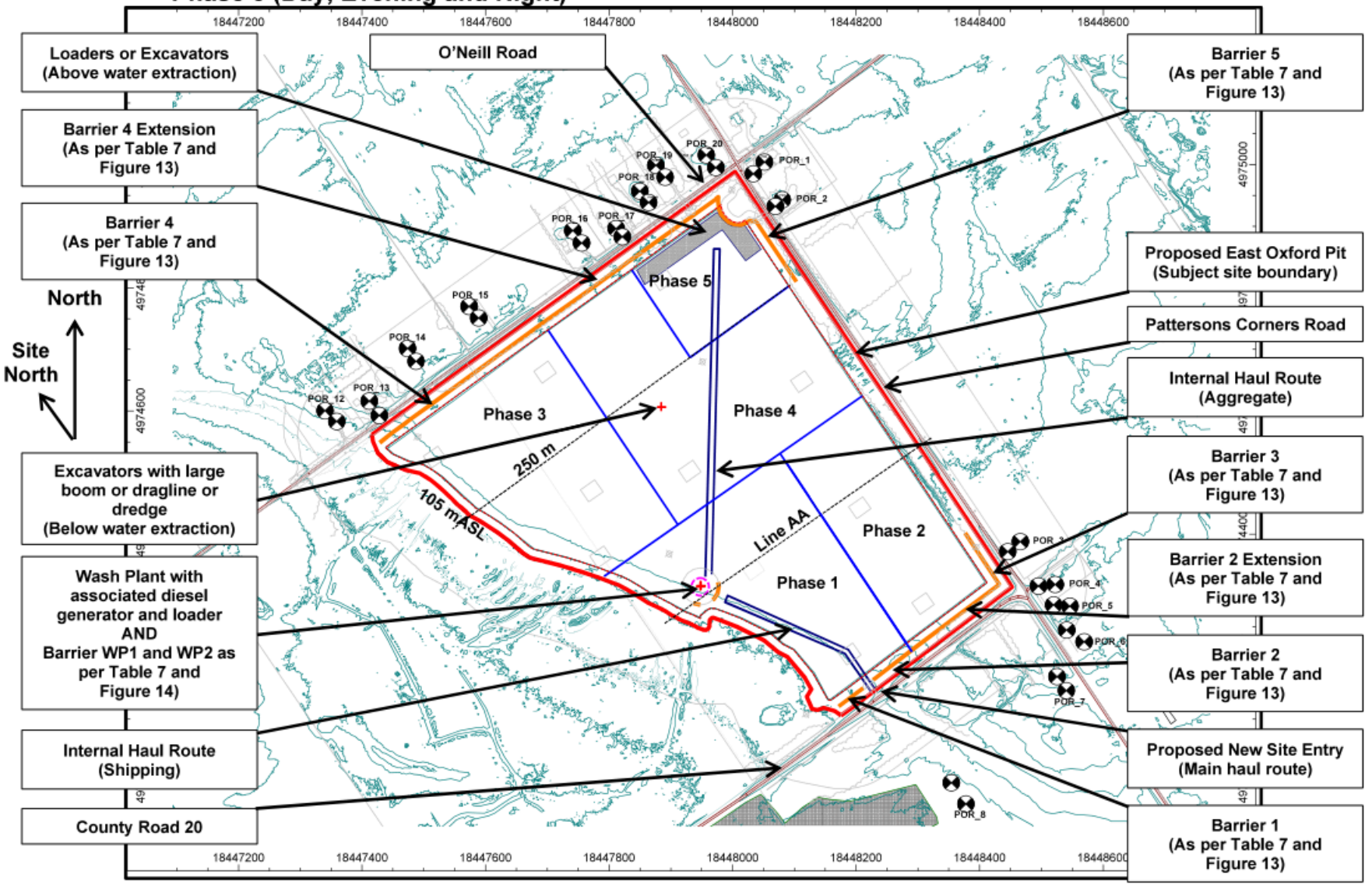


Figure 12.1: Prediction Results, Scenario 5: Worst Case, Daytime Period, Noise Contours, (Noise levels at 4.5 m)

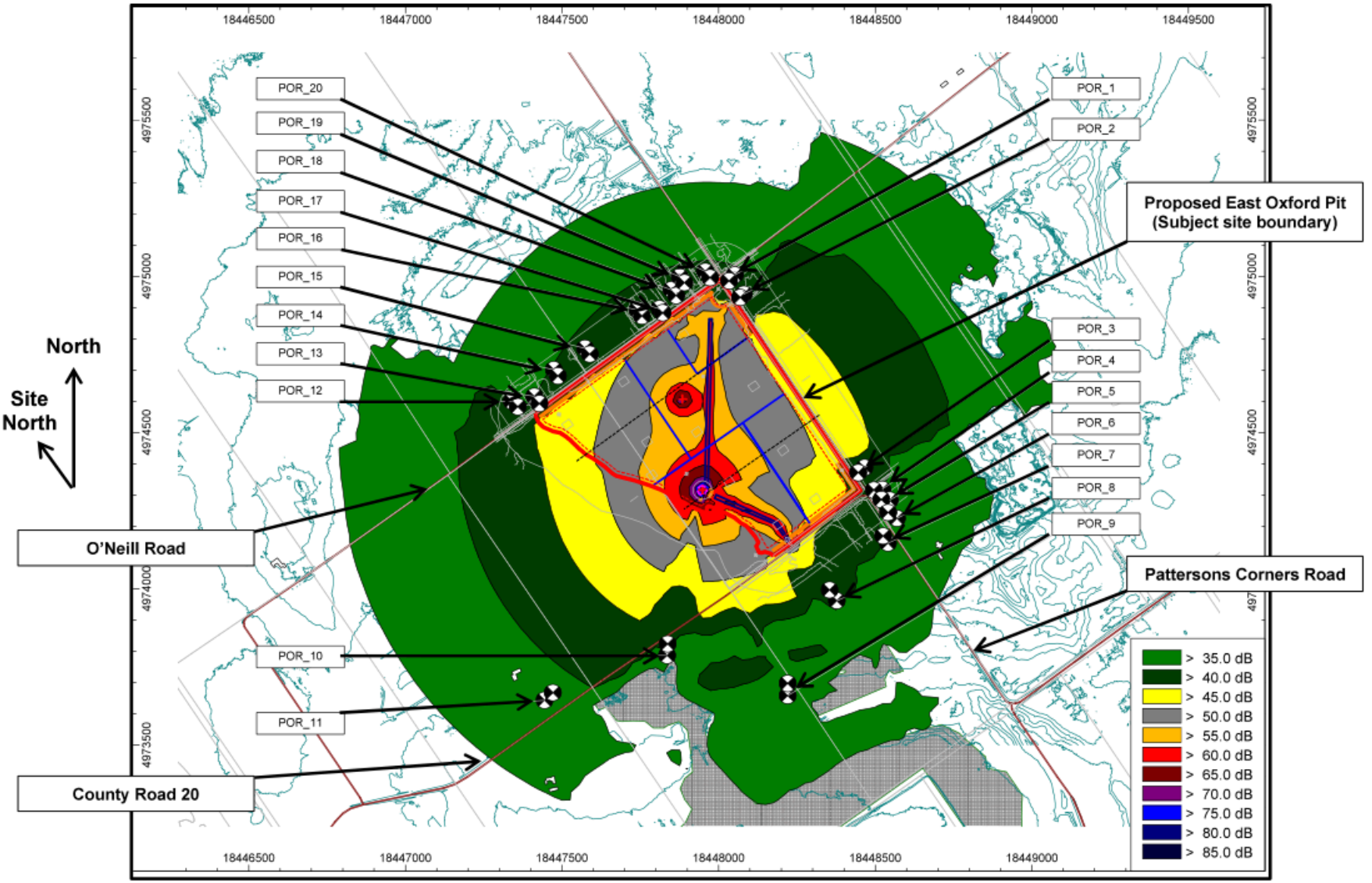


Figure 12.2: Prediction Results, Scenario 5: Worst Case, Evening and Nighttime Period, Noise Contours, (Noise levels at 4.5 m)

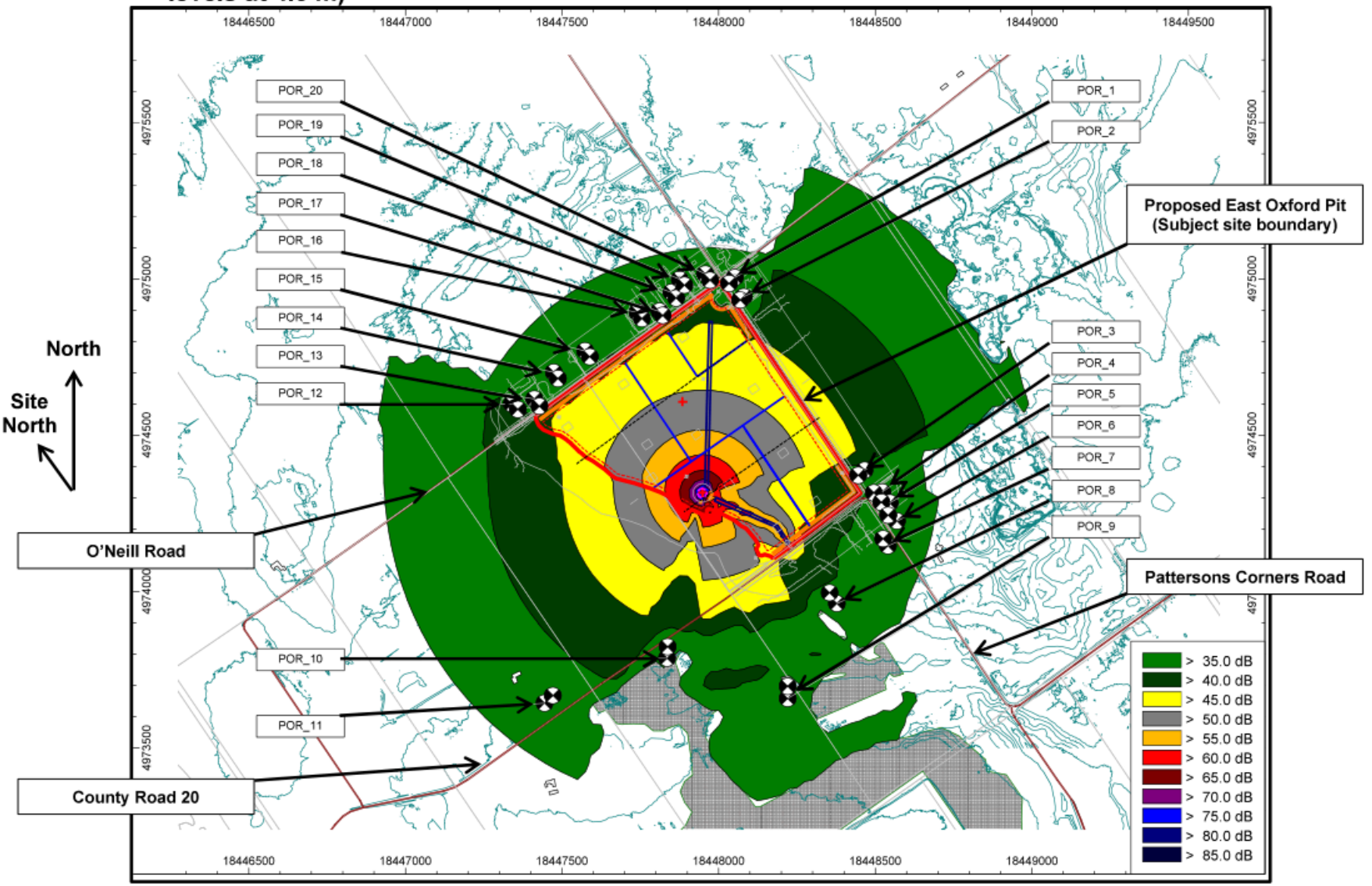


Figure 13: Detailed Plan showing Recommended Site Berms

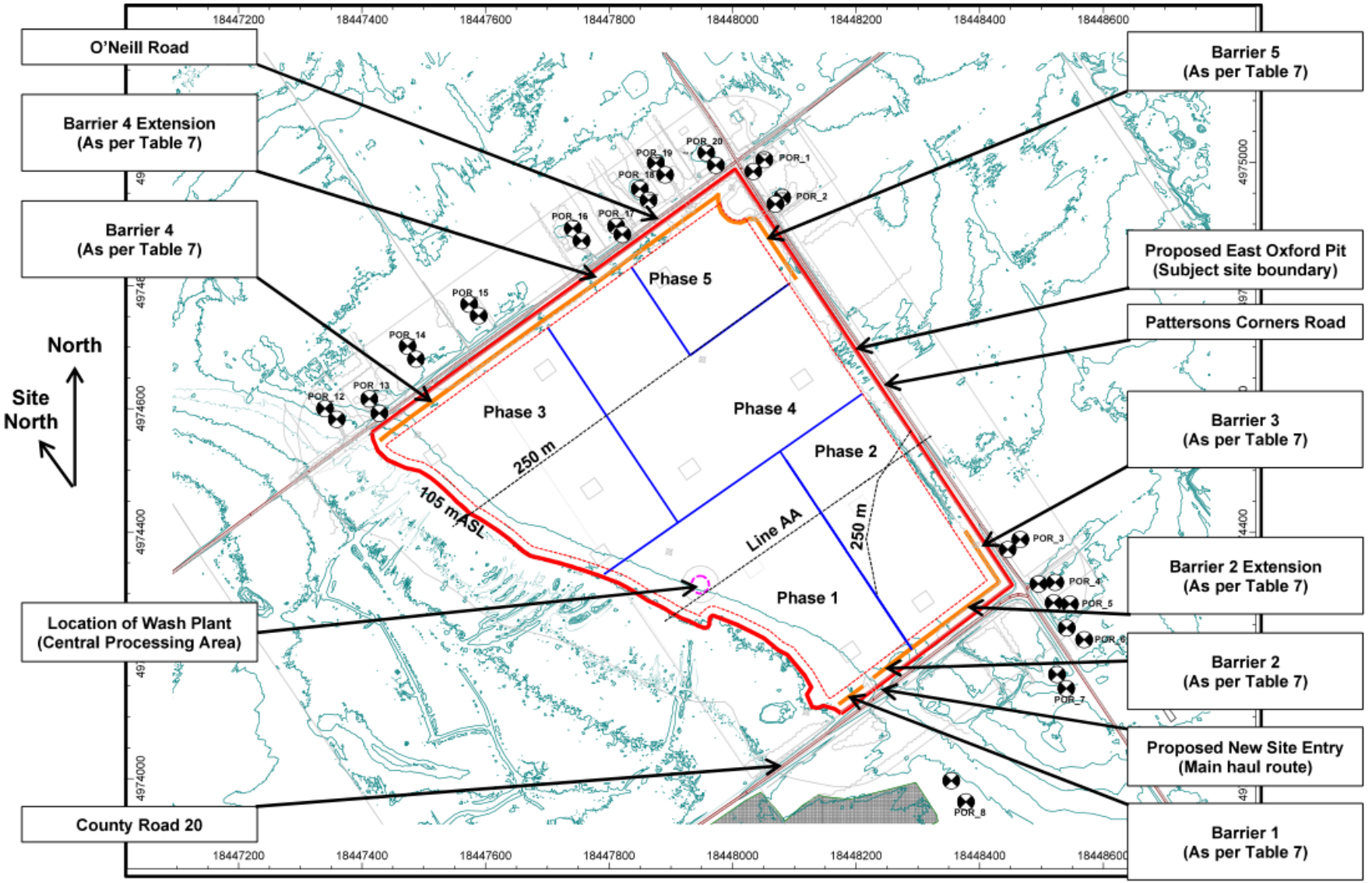
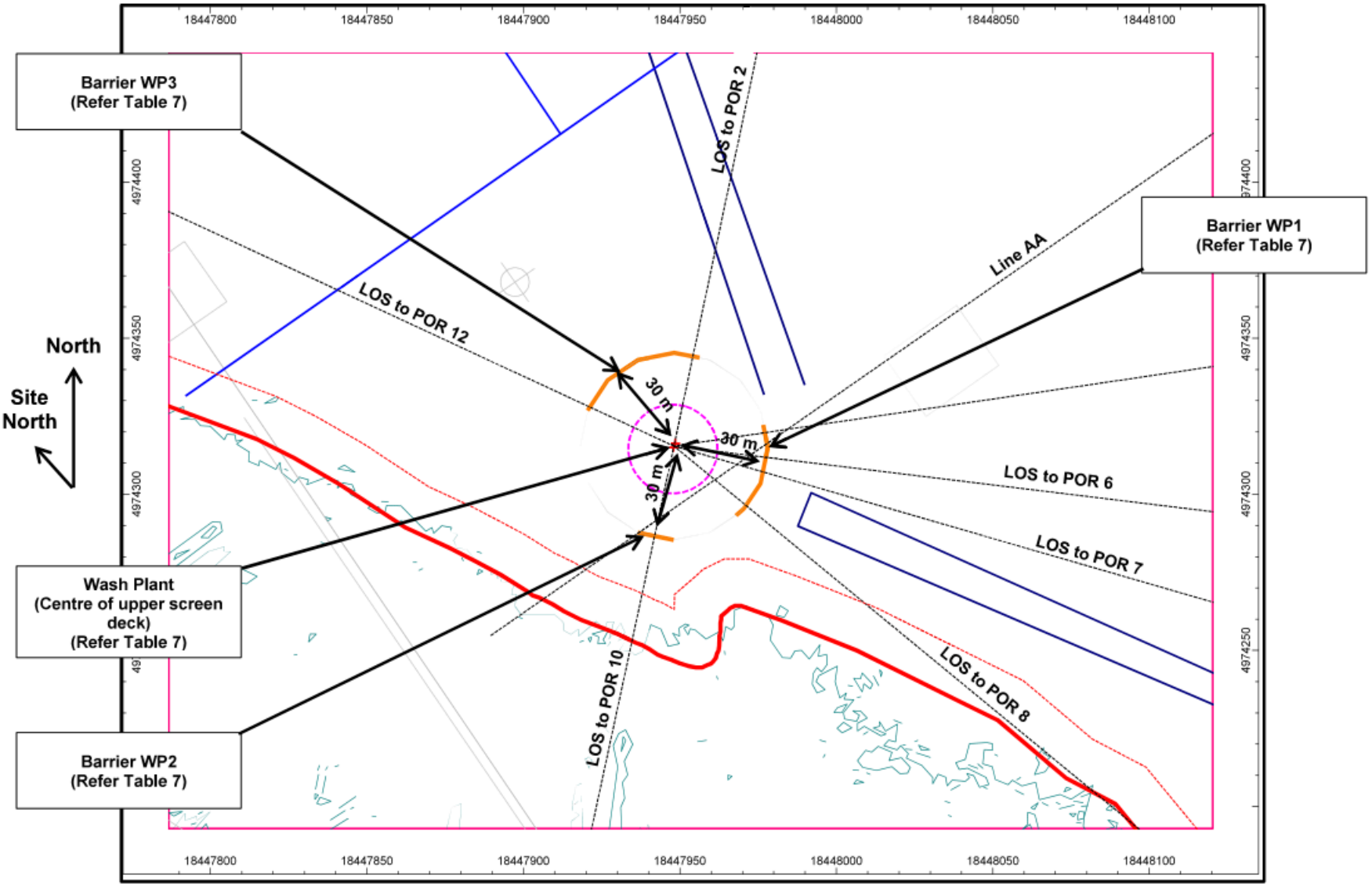


Figure 14: Detailed Plan at Wash Plant showing Recommended Noise Barriers (Stockpiles)



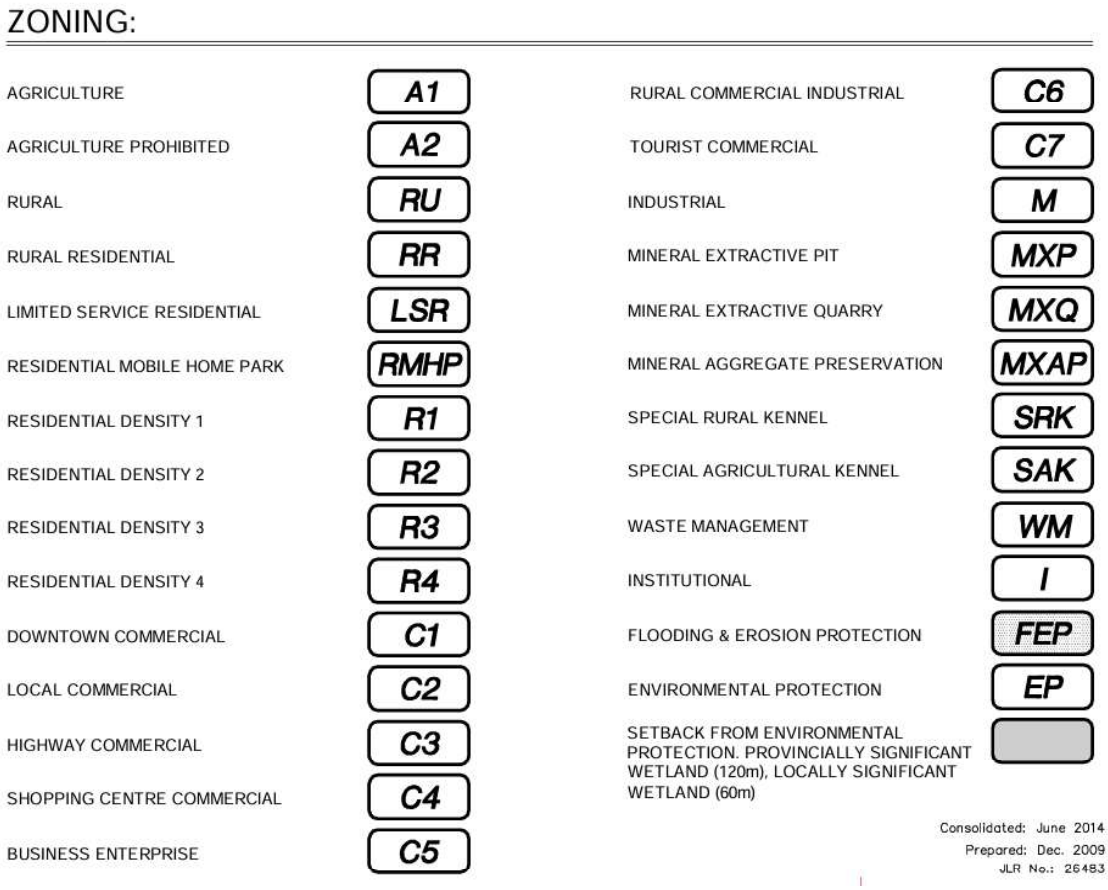
Appendix 1

Zoning Plan and Land Use Designations

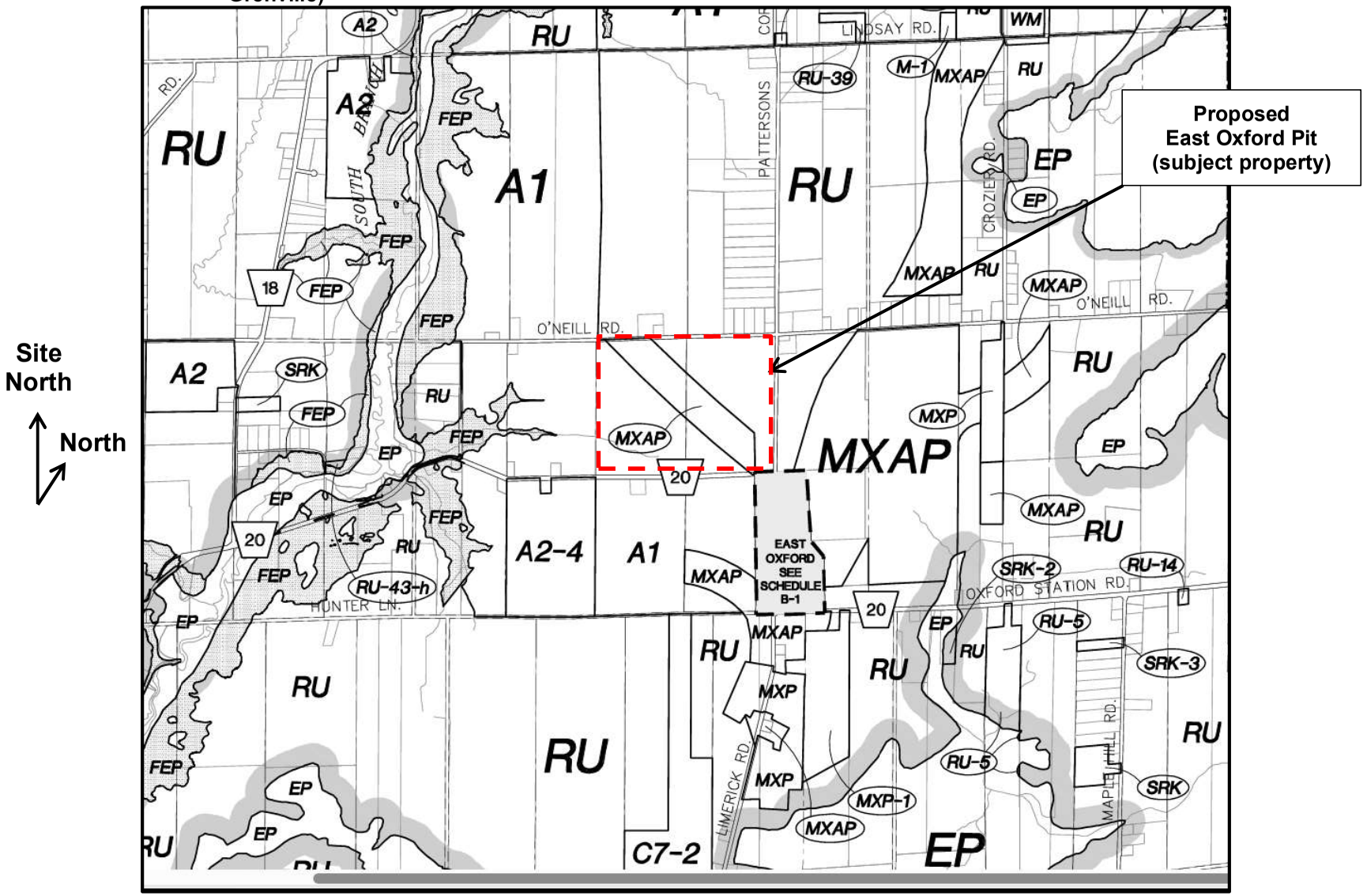
Contents:

- **Zoning Map: Municipality of North Grenville Zoning By-Law 50-12 Schedule 'A2'** (Source: Municipality of North Grenville)
- **Zoning Map: Municipality of North Grenville Zoning By-Law 50-12 Schedule 'B1'** (Source: Municipality of North Grenville)

Legend:



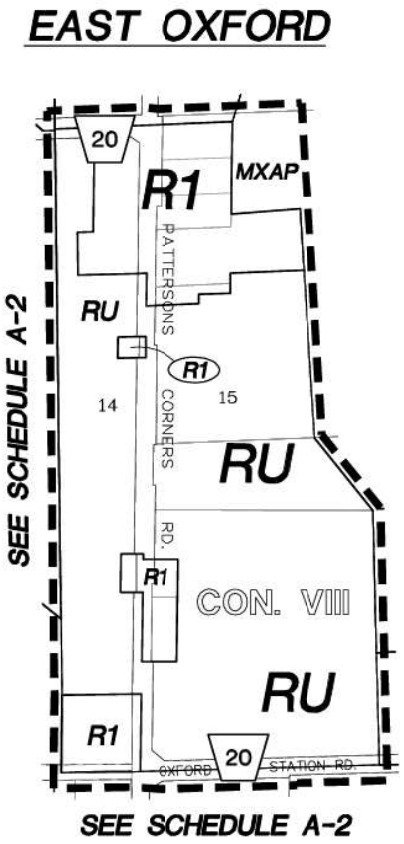
Zoning Map: **Municipality of North Grenville Zoning By-Law 50-12 Schedule 'A2' (Source: Municipality of North Grenville)**



Zoning Map: **Municipality of North Grenville Zoning By-Law 50-12 Schedule 'B1' (Source: Municipality of North Grenville)**

Site North

North



Appendix 2

Acoustic Modelling Details

Modeling Notes:

1. Acoustic model developed uses Cadna-A software, Version 2026.
2. Sound propagation is modeled according to ISO 9613-2: 1996(E)[4].
3. The whole of the above water extraction area is modelled with an absorption coefficient of 0.35 representative of exposed earth. Areas of below water extraction have been modelled with an absorption coefficient of 0.0 representative of a 100% reflective surface. The surrounding area is modeled with an absorption coefficient of 1.0 indicative of a Class 3 Area.
4. MECP favoured conservative modelling assumptions are used, that is, 'no subtraction of negative ground attenuation' and 'no negative path differences'.

Contents:

Table A2.1 Point of Reception Location Table

ID	Height	Coordinates		
		X	Y	Z
	(m)	(m)	(m)	(m)
POR_1_POW	1.5	18448051.8	4975004.25	109.07
POR_1_OPR	1.5	18448033.9	4974984.92	109.16
POR_2_POW	1.5	18448080.6	4974942.71	109.5
POR_2_OPR	1.5	18448069.4	4974932.09	109.5
POR_3_POW	4.5	18448466.1	4974387.88	114.5
POR_3_OPR	1.5	18448445.9	4974371.75	111.5
POR_4_POW	4.5	18448522.7	4974318.29	114.5
POR_4_OPR	1.5	18448495.6	4974315.68	111.5
POR_5_POW	4.5	18448546.4	4974283.29	114.5
POR_5_OPR	1.5	18448520.1	4974285.3	111.5
POR_6_POW	1.5	18448569.5	4974225.14	112.14
POR_6_OPR	1.5	18448541.1	4974244.22	111.52
POR_7_POW	4.5	18448540.7	4974146.1	115.5
POR_7_OPR	1.5	18448525.4	4974168.74	111.78
POR_8_POW	4.5	18448377.8	4973961.87	110.13
POR_8_OPR	1.5	18448354.5	4973996.4	107.33
POR_9_POW	4.5	18448220.6	4973658.14	110.5
POR_9_OPR	1.5	18448220.6	4973697.15	106.5
POR_10_POW	4.5	18447835.8	4973786.88	106.5
POR_10_OPR	1.5	18447837.6	4973823.2	103.5
POR_11_POW	4.5	18447444.3	4973643.13	106.5
POR_11_OPR	1.5	18447471.2	4973667.8	103.18
POR_12_POW	3	18447340.2	4974600.44	109.54
POR_12_OPR	1.5	18447359.1	4974582.89	107.45
POR_13_POW	1.5	18447412.1	4974616.09	109.5
POR_13_OPR	1.5	18447428.4	4974592.82	108.5
POR_14_POW	4.5	18447474	4974701.45	112.17
POR_14_OPR	1.5	18447487.5	4974680.77	109.42
POR_15_POW	4.5	18447573.5	4974769.74	112.46
POR_15_OPR	1.5	18447589	4974750.94	109.5
POR_16_POW	4.5	18447741.4	4974892.8	112.5
POR_16_OPR	1.5	18447755.8	4974872.68	109.5
POR_17_POW	3	18447811.7	4974896.18	111
POR_17_OPR	1.5	18447821.5	4974882.84	109.5
POR_18_POW	3	18447849.9	4974956.82	111
POR_18_OPR	1.5	18447864.2	4974938.47	109.2
POR_19_POW	1.5	18447875.9	4974998.94	109.5
POR_19_OPR	1.5	18447891.1	4974979.7	109.11

ID	Height	Coordinates		
		X	Y	Z
	(m)	(m)	(m)	(m)
POR_20_POW	3	18447957.4	4975015.52	111
POR_20_OPR	1.5	18447973.1	4974995.15	109

Table A2.2 Point Sources

ID	Result. PWL			Lw / Li	Noise Source Library File	Attenuation	Operating Time			Direct.	Height
	Day	Evening	Night	Type	Value		Day	Evening	Night		
	(dBA)	(dBA)	(dBA)				(min/hr)	(min/hr)	(min/hr)		(m)
Washplant_S1_5	109.5	109.5	109.5	Lw	Washplant		60.0	60.0	60.0	(none)	7.8
Generator_S1_5	108.5*	108.5	108.5	Lw	Generator_600kW	Silex_Silencer_Model_JB_6	60.0	60.0	60.0	(none)	4
Dredge_S2	103.2*	-	-	Lw	Dredge	Minus 7.6	60	0	0	(none)	2.5
Dredge_S3	103.2*	-	-	Lw	Dredge	Minus 7.6	60	0	0	(none)	2.5
Dredge_S4	103.2*	-	-	Lw	Dredge	Minus 7.6	60	0	0	(none)	2.5
Dredge_S5	103.2*	-	-	Lw	Dredge	Minus 7.6	60	0	0	(none)	2.5

*Includes the attenuation provided by the recommended mitigation as noted in Section 7.0 and Table 8.

Table A2.3 Line Sources

ID	Result. PWL			Lw / Li	Noise Source Library File	Direct.	Moving Pt. Src			
	Day	Evening	Night	Type	Value		Number/hr			Speed
	(dBA)	(dBA)	(dBA)				Day	Evening	Night	(km/h)
IHR_Shipping_S1_5	100.8	96.6	96.6	PWL-Pt	Truck_Passby	(none)	13	5	5	30
IHR_Aggregate_S2	97.7	-	-	PWL-Pt	Aggregate_Truck_Passby	(none)	7	0	0	30
IHR_Aggregate_S1	95.4	-	-	PWL-Pt	Aggregate_Truck_Passby	(none)	7	0	0	30
IHR_Aggregate_S3	98.8	-	-	PWL-Pt	Aggregate_Truck_Passby	(none)	7	0	0	30
IHR_Aggregate_S4	98.8	-	-	PWL-Pt	Aggregate_Truck_Passby	(none)	7	0	0	30
IHR_Aggregate_S5	99.3	-	-	PWL-Pt	Aggregate_Truck_Passby	(none)	7	0	0	30

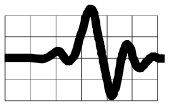


Table A2.4 Area Sources

ID	Result. PWL			Lw / Li	Noise Source Library File	Direct.	Moving Pt. Src		
	Day	Evening	Night	Type	Value		Number/hr		
	(dBA)	(dBA)	(dBA)				Day	Evening	Night
Excavators_S1	109.7	6.7	6.7	PWL-Pt	Truck_Passby	(none)	2	0	0
Excavators_S2	103.2	3.2	3.2	PWL-Pt	Excavator	(none)	1	0	0
Excavators_S3	106.2	3.2	3.2	PWL-Pt	Excavator	(none)	2	0	0
Excavators_S4	103.2	3.2	3.2	PWL-Pt	Excavator	(none)	1	0	0
Excavators_S5	103.2	3.2	3.2	PWL-Pt	Excavator	(none)	1	0	0

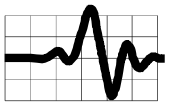


Table A2.5 Noise Barriers

ID	Height Above Grade (m)	Length
Barrier_1_S1_5	5	50.0
Barrier_2_S1_5	5	78.5
Barrier_2_Ext_S1_5	4	178.5
Barrier_3_S1	4	100.0
Barrier_3_S2_3	6	260.0
Barrier_3_S4_5	6	100.0
Barrier_4_S3_5	6	330.0
Barrier_4__Extension_S4_5	6	350.0
Barrier_5_S4_5	6	215
Barrier_WP1_S1_5	8	30.0
Barrier_WP2_S1_5	9	12.0
Barrier_WP3_Night_S1_2	8	43.5
Barrier_WP3_Night_S3	8	20.0

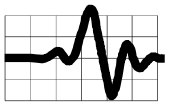


Table A2.6 Noise Source Library

ID	Type	Spectra (dB)											Source
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Washplant	Lw	109.8	96.6	104.1	102.6	105.2	104.8	103.1	99.8	92.8	109.5	113.8	Albion_Pit_30/4/18 at 2.2 m and 11/4/19 at L1-L5
Generator_600kW	Lw	65.3	97.8	112.9	120.6	122.2	123.3	125.3	121.5	109.7	129.7	130	Manufacturers Data - Cummins600DQPAA-Open Exhaust
Dredge	Lw	116.6	109	111.2	110.4	106.7	107	102.9	94.4	85.7	110.8	119.5	Meas. Howe-Ross Pit 20-05-13 83dBA at 9.7m
Loader	Lw	107.3	109.5	107.1	101.8	99.4	97.6	95.9	90.1	82.9	103	113.6	Meas. Howe-Ross Pit 20-05-13 72dBA at 14m
Excavator	Lw	100	110.2	109	100.8	98.5	98	95.2	92.6	87.7	103.2	113.5	Meas. OTR 23rd August 2017 at 13.0m
Aggregate_Truck_Passby	Lw	106.5	105.9	106.1	104.1	101.5	101.5	96.5	93.2	81.6	105.3	112.7	Meas. Howe-Ross Pit 20-05-13 Lmax75.7dBA at 12m
Truck_Passby	Lw	111.2	109.1	106.3	101.8	102.2	102.8	100	93.7	83.8	106.7	115	Meas. Alfred TRM 08/10/2021 - 75dBA at 15m Ref 1

***** Excludes noise from the diesel generator supplying power to the wash plant at the Albion Pit. Noise from one loader is included.

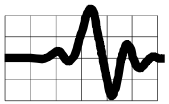


Table A2.7 Noise Measurement Data

ID	Type	Spectra (dB)											Source
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Meas_Washplant	Li	92.2	79	86.5	85	87.6	87.2	85.5	82.2	75.2	91.9	96.2	Albion_Pit_30/4/18 at 2.2m and 11/4/19 at L1-L5
Meas_Washplant_Genset_L1	Li	61.2	62	51.6	53.7	55.9	52.7	48.8	38.6	25.5	57.2	66	Albion_Pit_30/4/18 at L1 57.2 dBA at 201.5 m
Meas_Washplant_Genset_L2	Li	54.9	55.8	46.2	38.5	37.6	34.6	30.4	35.2	29.6	41.7	58.8	Albion_Pit_30/4/18 at L2 41.7 dBA at 440.25 m
Meas_Washplant_Genset_L3	Li	66.2	66.3	52.4	55	54.7	53.7	52.2	43.4	29.8	58.3	69.8	Albion_Pit_30/4/18 at L3 58.3 dBA at 168.3 m
Meas_Washplant_Genset_L4	Li	72.1	74.4	63.8	63.9	69.5	67.7	63	56.1	46.8	71.4	78.2	Albion_Pit_30/4/18 at L4 71.4 dBA at 55.2 m
Meas_Washplant_Genset_L5	Li	64.8	75.6	67.8	63.8	66.1	63.5	57.5	47.3	34	67.5	77.4	Albion_Pit_30/4/18 at L5 67.5 dBA at 149.3 m
Meas_Dredge	Li	89.2	81.6	83.8	83	79.3	79.6	75.5	67	58.3	83.4	92.1	Meas. Howe-Ross Pit 20-05-13 83dBA at 9.7m
Meas_Loader	Li	76.3	78.5	76.1	70.8	68.4	66.6	64.9	59.1	51.9	72	82.6	Meas. Howe-Ross Pit 20-05-13 72dBA at 14m
Meas_Excavator_CAT345DL	Li	69.6	79.8	78.6	70.4	68.1	67.6	64.8	62.2	57.3	72.8	83.1	Meas. OTR 23rd August 2017 at 13.0m
Meas_Aggregate_Truck_Passby	Li	74.9	74.3	74.5	72.5	69.9	69.9	64.9	61.6	50	73.7	81.1	Meas. Howe-Ross Pit 20-05-13 Lmax75.7dBA at 12m

***** Includes noise from the diesel generator supplying power to the wash plant at the Albion Pit and one loader that was feeding raw material into the plant during measurements.

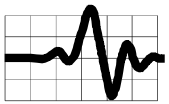


Table A2.8.1 Point of Reception Impacts by Source for Scenario 1* - Day

	Daytime Period (07:00 to 19:00)					
ID	Washplant_S1_5	Generator_S1_5	IHR_Shipping_S1_5	IHR_Aggregate_S1	Excavators_S1	Total
	dBA	dBA	dBA	dBA	dBA	dBA
POR_1_POW	36.6	34.3	28.1	22.3	32.2	39.9
POR_1_OPR	37	34.8	28.4	22.7	32.5	40.3
POR_2_POW	37.7	35.5	29.2	23.5	33.2	41
POR_2_OPR	37.9	35.8	29.4	23.7	33.4	41.2
POR_3_POW	37.2	32.7	33.4	26.5	42.9	44.7
POR_3_OPR	34.9	21.6	31.9	26	41.1	42.5
POR_4_POW	36.2	29.9	32	25.8	42.4	43.9
POR_4_OPR	35	21.3	32.1	25.6	42.5	43.6
POR_5_POW	35.8	29.6	31.6	25.4	41.7	43.3
POR_5_OPR	35.6	22.2	31.6	25.1	41.8	43.1
POR_6_POW	34.6	22.8	30.6	24.1	40.4	41.9
POR_6_OPR	35.2	22.7	31.2	24.7	41	42.5
POR_7_POW	35.7	29.7	32.1	25.4	41.9	43.5
POR_7_OPR	35.3	29.2	31.7	25	41.4	43
POR_8_POW	36	30.1	35.9	26.5	42.8	44.5
POR_8_OPR	36.4	24.5	36.5	26.9	43.2	44.8
POR_9_POW	36.6	31.8	26.3	20.6	32.4	39.3
POR_9_OPR	30.7	26.9	21.1	15.2	30.4	34.7
POR_10_POW	36.5	29.5	28.6	24.3	32.2	39
POR_10_OPR	37	29.5	31.5	26.4	38.6	41.7
POR_11_POW	35.7	31.2	26.7	21.5	35.6	39.7
POR_11_OPR	34.5	31.5	25.8	20.3	34.5	38.8
POR_12_POW	38.5	35	25	23	34.2	41.3
POR_12_OPR	37.4	35.3	23.4	18.3	31.1	40.2
POR_13_POW	38	36	24.4	19.1	33.9	41.2
POR_13_OPR	38.5	31.9	24.3	19.4	31.8	40.2
POR_14_POW	39.6	36.3	28.5	22.2	37	42.8
POR_14_OPR	38.5	36.5	27.3	20.3	34.3	41.7
POR_15_POW	40	36.7	29.4	23.8	37.4	43.3
POR_15_OPR	39	37.1	28.4	21.6	34.9	42.3
POR_16_POW	39.6	36.2	29.9	24.6	37.7	43.1
POR_16_OPR	38.5	36.5	28.8	22.1	35.1	42
POR_17_POW	39.8	36.6	30.2	25	38	43.4
POR_17_OPR	38.6	36.7	29.2	22.6	36.9	42.5
POR_18_POW	38.8	35.5	29.6	24.4	37.5	42.6
POR_18_OPR	37.7	35.7	28.6	20.3	35.1	41.4
POR_19_POW	36.7	34.4	27.7	21.2	34	40.3
POR_19_OPR	37.1	34.9	28.1	19.9	36	41.1
POR_20_POW	38	34.5	29.1	23.9	37	41.8
POR_20_OPR	36.9	34.6	28.1	21.3	32.2	40.1

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.2 Point of Reception Impacts by Source for Scenario 1* - Night

	Evening and Nighttime Period (19:00 to 07:00)			
ID	Washplant_S1_5	Generator_S1_5	IHR_Shipping_S1_5	Total
	dBA	dBA	dBA	dBA
POR_1_POW	33.5	27.6	24	34.9
POR_1_OPR	33.4	27.6	24.3	34.8
POR_2_POW	35	29.6	25	36.4
POR_2_OPR	35	29.4	25.2	36.4
POR_3_POW	37.2	32.7	29.3	39
POR_3_OPR	34.9	21.6	27.7	35.9
POR_4_POW	36.2	29.9	27.9	37.6
POR_4_OPR	35	21.3	27.9	35.9
POR_5_POW	35.8	29.6	27.5	37.2
POR_5_OPR	35.6	22.2	27.4	36.4
POR_6_POW	34.6	22.8	26.4	35.5
POR_6_OPR	35.2	22.7	27.1	36
POR_7_POW	35.7	29.7	28	37.2
POR_7_OPR	35.3	29.2	27.6	36.8
POR_8_POW	36	30.1	31.8	38.1
POR_8_OPR	36.4	24.5	32.4	38.1
POR_9_POW	36.6	31.8	22.1	38
POR_9_OPR	30.7	26.9	16.9	32.3
POR_10_POW	36.5	29.5	24.4	37.5
POR_10_OPR	37	29.5	27.4	38.1
POR_11_POW	35.7	31.2	22.6	37.2
POR_11_OPR	34.5	31.5	21.6	36.4
POR_12_POW	36.3	29.3	20.8	37.2
POR_12_OPR	35.8	29.7	19.3	36.9
POR_13_POW	35.1	28.7	19.9	36.1
POR_13_OPR	35.7	29.2	20.1	36.7
POR_14_POW	34.9	28.6	23.9	36.1
POR_14_OPR	35	28.4	22.7	36
POR_15_POW	35.3	28.7	25.3	36.5
POR_15_OPR	35.4	28.5	24.2	36.5
POR_16_POW	34.9	28.3	25.7	36.2
POR_16_OPR	34.9	28.1	24.7	36.1
POR_17_POW	35.1	28.4	26.1	36.4
POR_17_OPR	35.1	28.2	25	36.2
POR_18_POW	34.2	27.7	25.4	35.5
POR_18_OPR	34.2	27.6	24.4	35.4
POR_19_POW	33.2	26.9	23.6	34.5
POR_19_OPR	33.5	27.2	23.9	34.8
POR_20_POW	33.4	27.3	25	34.8
POR_20_OPR	33.3	27.2	24	34.7

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

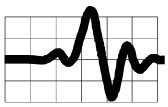


Table A2.8.3 Point of Reception Impacts by Source for Scenario 2* - Day

	Daytime Period (07:00 to 19:00)					
ID	Washplant_S1_5	Generator_S1_5	Dredge_S2	IHR_Shipping_S1_5	IHR_Aggregate_S2	Total
	dBA	dBA	dBA	dBA	dBA	dBA
POR_1_POW	36.6	34.3	30.3	28.2	26.2	29.3
POR_1_OPR	37	34.8	30.5	28.5	26.5	29.7
POR_2_POW	37.7	35.5	31.3	29.3	27.3	30.4
POR_2_OPR	37.9	35.8	31.5	29.5	27.5	30.8
POR_3_POW	38	23.8	38.3	33.2	32.8	40.2
POR_3_OPR	30.3	20.5	34.6	29.9	29.7	39.1
POR_4_POW	36.9	30.6	37.2	32.4	31.3	39.4
POR_4_OPR	35.5	21.9	37.2	32.4	29.9	39
POR_5_POW	36.3	30.1	36.6	31.9	30.9	38.3
POR_5_OPR	36	22.7	36.5	31.8	30.6	38
POR_6_POW	34.8	23	34.9	30.6	28.8	36.1
POR_6_OPR	35.4	23	35.7	31.3	29.6	37
POR_7_POW	35.7	29.7	35.6	32.1	29.7	36.6
POR_7_OPR	35.4	29.2	34.7	31.7	29.2	36.2
POR_8_POW	36	30.1	35.3	35.9	29	33.8
POR_8_OPR	36.4	24.5	35	36.5	29.3	33.9
POR_9_POW	36.6	31.8	28	26.3	25.2	26.5
POR_9_OPR	30.7	26.9	23.2	21.1	20.7	23.6
POR_10_POW	36.5	29.5	25.9	28.6	26	25.9
POR_10_OPR	37	29.5	31.7	31.5	27.6	28
POR_11_POW	35.7	31.2	29.3	26.7	23.5	27.5
POR_11_OPR	34.5	31.5	27.7	25.8	21.9	26.1
POR_12_POW	38.5	35	25.4	25	25.1	28.3
POR_12_OPR	37.4	35.3	24.8	23.4	20.3	23.8
POR_13_POW	38	36	28.7	24.4	24.4	27.5
POR_13_OPR	38.5	31.9	25.5	24.3	21.2	24.6
POR_14_POW	39.6	36.3	30.8	28.5	26.5	29.6
POR_14_OPR	38.5	36.5	29.2	27.3	25	28.1
POR_15_POW	40	36.7	31.3	29.4	27.3	30.2
POR_15_OPR	39	37.1	29.8	28.4	25.9	28.8
POR_16_POW	39.6	36.2	31.6	29.9	27.7	31
POR_16_OPR	38.5	36.5	30.1	28.8	26.3	29.7
POR_17_POW	39.8	36.6	31.9	30.2	28.1	31.4
POR_17_OPR	38.6	36.7	30.6	29.2	26.8	30.2
POR_18_POW	38.8	35.5	31.4	29.6	27.5	31.1
POR_18_OPR	37.7	35.7	30.2	28.6	25.1	29.2
POR_19_POW	36.7	34.4	25.9	27.7	25.5	29.3
POR_19_OPR	37.1	34.9	29.8	28.1	25.8	29.7
POR_20_POW	38	34.5	31.3	29.2	27.2	31.2
POR_20_OPR	36.9	34.6	30	28.2	26	30.2

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.4 Point of Reception Impacts by Source for Scenario 2* - Night

	Evening and Nighttime Period (19:00 to 07:00)			
ID	Washplant_S1_5	Generator_S1_5	IHR_Shipping_S1_5	Total
	dBA	dBA	dBA	dBA
POR_1_POW	33.5	27.6	24.1	34.9
POR_1_OPR	33.4	27.6	24.3	34.8
POR_2_POW	35	29.6	25.1	36.4
POR_2_OPR	35	29.4	25.3	36.4
POR_3_POW	38	23.8	29.1	38.7
POR_3_OPR	30.3	20.5	25.7	31.9
POR_4_POW	36.9	30.6	28.2	38.3
POR_4_OPR	35.5	21.9	28.2	36.4
POR_5_POW	36.3	30.1	27.7	37.7
POR_5_OPR	36	22.7	27.6	36.7
POR_6_POW	34.8	23	26.5	35.7
POR_6_OPR	35.4	23	27.2	36.2
POR_7_POW	35.7	29.7	28	37.2
POR_7_OPR	35.4	29.2	27.6	36.9
POR_8_POW	36	30.1	31.8	38.1
POR_8_OPR	36.4	24.5	32.4	38.1
POR_9_POW	36.6	31.8	22.1	38
POR_9_OPR	30.7	26.9	16.9	32.3
POR_10_POW	36.5	29.5	24.4	37.5
POR_10_OPR	37	29.5	27.4	38.1
POR_11_POW	35.7	31.2	22.6	37.2
POR_11_OPR	34.5	31.5	21.6	36.4
POR_12_POW	36.3	29.3	20.8	37.2
POR_12_OPR	35.8	29.7	19.3	36.9
POR_13_POW	35.1	28.7	19.9	36.1
POR_13_OPR	35.7	29.2	20.1	36.7
POR_14_POW	34.9	28.6	23.9	36.1
POR_14_OPR	35	28.4	22.7	36
POR_15_POW	35.3	28.7	25.3	36.5
POR_15_OPR	35.4	28.5	24.2	36.5
POR_16_POW	34.9	28.3	25.7	36.2
POR_16_OPR	34.9	28.1	24.7	36.1
POR_17_POW	35.1	28.4	26.1	36.4
POR_17_OPR	35.1	28.2	25	36.2
POR_18_POW	34.2	27.7	25.4	35.5
POR_18_OPR	34.2	27.6	24.4	35.4
POR_19_POW	33.2	26.9	23.6	34.5
POR_19_OPR	33.5	27.2	23.9	34.8
POR_20_POW	33.4	27.3	25	34.8
POR_20_OPR	33.3	27.2	24	34.7

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

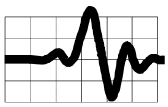


Table A2.8.5 Point of Reception Impacts by Source for Scenario 3* - Day

	Daytime Period (07:00 to 19:00)					
ID	Washplant_S1_5	Generator_S1_5	Dredge_S3	IHR_Shipping_S1_5	IHR_Aggregate_S3	Total
	dBA	dBA	dBA	dBA	dBA	dBA
POR_1_POW	36.6	34.3	27.4	28.2	28	34.9
POR_1_OPR	37	34.8	31.3	28.5	28.5	35.4
POR_2_POW	37.7	35.5	28.5	29.3	28.7	35.2
POR_2_OPR	37.9	35.8	28.6	29.5	29	35.5
POR_3_POW	38	23.7	40.6	33.2	25.6	28.9
POR_3_OPR	30.3	20.5	39.6	29.9	24.5	28.2
POR_4_POW	36.9	30.5	38.9	32.4	24.5	28.1
POR_4_OPR	35.5	21.9	37.7	32.4	23.8	27.5
POR_5_POW	36.3	30	40.5	31.9	24	27.7
POR_5_OPR	36	22.6	39.2	31.8	23.4	27.2
POR_6_POW	34.8	23	36.9	30.6	22.4	26.4
POR_6_OPR	35.4	22.9	37.8	31.3	22.9	26.8
POR_7_POW	35.7	29.6	37.6	32.1	27.9	31.6
POR_7_OPR	35.4	29.2	36.7	31.7	22.7	26.7
POR_8_POW	36	30.1	34.4	35.9	24.2	29.9
POR_8_OPR	36.4	24.4	34.1	36.5	23.5	27.5
POR_9_POW	36.6	31.8	27	26.3	25.2	30.1
POR_9_OPR	30.7	26.9	25	21.1	19.6	25.6
POR_10_POW	36.5	29.4	26.8	28.5	28.9	33.4
POR_10_OPR	37	29.5	28.7	31.5	27.7	32.3
POR_11_POW	35.7	31.2	27.6	26.7	25.9	32.1
POR_11_OPR	34.5	31.5	26	25.8	24.4	30.7
POR_12_POW	35.7	31.8	25	23.8	30.4	40.5
POR_12_OPR	36.4	33.3	24.3	22.3	29.8	40.5
POR_13_POW	35.4	32.5	24.7	21.2	30.2	42
POR_13_OPR	34.9	31.2	24.8	18.3	29.1	43
POR_14_POW	36.3	32.9	26	24.6	32.4	42
POR_14_OPR	35.8	32.9	25.2	23.7	30.7	42
POR_15_POW	36.8	33.4	26.5	25.6	32.6	41
POR_15_OPR	36.2	33.3	25.7	24.9	30.7	40.3
POR_16_POW	39.6	36.2	31.6	29.9	33.4	37.6
POR_16_OPR	38.5	36.5	30.1	28.8	32.7	37.3
POR_17_POW	39.8	36.6	32	30.2	33.5	37.4
POR_17_OPR	38.6	36.7	30.7	29.2	32.4	38.5
POR_18_POW	38.8	35.5	31.7	29.6	32	35.5
POR_18_OPR	37.7	35.7	30.5	28.6	30.9	36.2
POR_19_POW	36.7	34.4	29.8	27.7	29.5	33.8
POR_19_OPR	37.1	34.9	30.2	28.1	29.9	34.7
POR_20_POW	38	34.5	31.9	29.2	30.2	35.9
POR_20_OPR	36.9	34.6	30.7	28.2	28.9	36

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.6 Point of Reception Impacts by Source for Scenario 3* - Night

	Evening and Nighttime Period (19:00 to 07:00)			
ID	Washplant_S1_5	Generator_S1_5	IHR_Shipping_S1_5	Total
	dBA	dBA	dBA	dBA
POR_1_POW	33.1	27.7	24.1	38.8
POR_1_OPR	33.4	27.8	24.3	39.6
POR_2_POW	35	29.7	25.1	39.8
POR_2_OPR	35	29.5	25.3	40
POR_3_POW	38	23.7	29.1	43.3
POR_3_OPR	30.3	20.5	25.7	40.8
POR_4_POW	36.9	30.5	28.2	42.2
POR_4_OPR	35.5	21.9	28.2	40.9
POR_5_POW	36.3	30	27.7	42.8
POR_5_OPR	36	22.6	27.6	41.7
POR_6_POW	34.8	23	26.5	40
POR_6_OPR	35.4	22.9	27.2	40.7
POR_7_POW	35.7	29.6	28	41.5
POR_7_OPR	35.4	29.2	27.6	40.4
POR_8_POW	36	30.1	31.8	41.1
POR_8_OPR	36.4	24.4	32.4	41
POR_9_POW	36.6	31.8	22.1	39.2
POR_9_OPR	30.7	26.9	16.9	34.1
POR_10_POW	36.5	29.4	24.4	39.8
POR_10_OPR	37	29.5	27.4	40.1
POR_11_POW	35.7	31.2	22.6	39.1
POR_11_OPR	34.5	31.5	21.6	38.1
POR_12_POW	35.7	31.8	19.6	42.6
POR_12_OPR	36.4	33.3	18.2	42.8
POR_13_POW	35.4	32.5	17	43.5
POR_13_OPR	34.9	31.2	14.2	44.1
POR_14_POW	36.3	32.9	20.3	43.9
POR_14_OPR	35.8	32.9	19.1	43.7
POR_15_POW	36.8	33.4	21.4	43.4
POR_15_OPR	36.2	33.3	20.8	42.8
POR_16_POW	37.2	30.5	25.7	42.2
POR_16_OPR	36.2	30	24.7	41.5
POR_17_POW	35.1	29.1	26.1	41.6
POR_17_OPR	35.1	28.8	25	41.7
POR_18_POW	34.2	28.1	25.4	40.3
POR_18_OPR	34.2	28	24.4	40.2
POR_19_POW	33.2	27.2	23.6	38.7
POR_19_OPR	33.5	27.5	23.9	39.2
POR_20_POW	33.4	27.6	25	40
POR_20_OPR	33.3	27.4	24	39.7

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

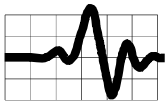


Table A2.8.7 Point of Reception Impacts by Source for Scenario 4* - Day

	Daytime Period (07:00 to 19:00)					
ID	Washplant_S1_5	Generator_S1_5	Dredge_S4	IHR_Shipping_S1_5	IHR_Aggregate_S4	Total
	dBA	dBA	dBA	dBA	dBA	dBA
POR_1_POW	33.7	30.4	29.3	24.9	27.9	34.2
POR_1_OPR	34	30.8	29.8	25	28.2	34.6
POR_2_POW	34.7	31.6	29.3	26.6	27.9	34
POR_2_OPR	34.7	31.4	28.7	26.1	27.3	33.3
POR_3_POW	38	23.9	31.8	33.2	30.4	32.4
POR_3_OPR	30.3	20.5	26.4	29.9	27.6	31
POR_4_POW	36.9	30.6	26.2	32.4	26.8	30.4
POR_4_OPR	35.5	21.9	25.5	32.4	25.3	27.3
POR_5_POW	36.3	30.1	25.8	31.9	25.5	27.5
POR_5_OPR	36	22.7	25.1	31.8	24.8	26.2
POR_6_POW	34.8	23	24.2	30.6	23.6	25.1
POR_6_OPR	35.4	23	24.6	31.3	24.1	25.5
POR_7_POW	35.7	29.7	29.8	32.1	28.9	29.9
POR_7_OPR	35.4	29.2	24.4	31.7	23.8	25
POR_8_POW	36	30.2	29.8	35.9	26.9	28.4
POR_8_OPR	36.4	24.4	25.4	36.5	25.8	27.3
POR_9_POW	36.6	31.8	28	26.3	25.5	25.5
POR_9_OPR	30.7	26.9	22.7	21.1	19.1	22.4
POR_10_POW	36.5	29.5	31.5	28.5	27.9	29.3
POR_10_OPR	37	29.5	30.1	31.5	26.7	28.1
POR_11_POW	35.7	31.2	29.8	26.7	24.4	27.1
POR_11_OPR	34.5	31.5	28.3	25.8	22.9	25.6
POR_12_POW	35.7	31.8	38.2	23.8	27	32.4
POR_12_OPR	36.4	33.3	37.4	22.3	26.5	32.1
POR_13_POW	35.4	32.5	37.9	21.2	27.4	33.6
POR_13_OPR	34.9	31.2	37.2	18.3	26.9	33.8
POR_14_POW	36.3	32.9	40.5	24.6	29.5	35.9
POR_14_OPR	35.8	32.9	38.4	23.7	28.8	35.4
POR_15_POW	36.8	33.4	39.9	25.8	31.3	38.1
POR_15_OPR	36.2	33.3	37.8	25	30.1	37.4
POR_16_POW	36.3	32.9	35.7	26.3	32.8	39.9
POR_16_OPR	35.8	32.9	35.1	25.6	31	39.7
POR_17_POW	36.6	33.3	34.9	26.6	32.7	40.5
POR_17_OPR	35	31.3	34.1	25	30.2	40
POR_18_POW	35.3	31.8	33.1	25.6	31.3	38
POR_18_OPR	34.8	31.6	32.5	25	29.7	37.6
POR_19_POW	33.8	30.6	31.2	24.3	29.2	35.9
POR_19_OPR	34.1	30.9	31.4	24.6	29.3	36.3
POR_20_POW	34.2	30.5	31	25.2	29.4	36.1
POR_20_OPR	33.7	30.2	30.4	24.6	28.2	35.6

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.8 Point of Reception Impacts by Source for Scenario 4* - Night

	Evening and Nighttime Period (19:00 to 07:00)			
ID	Washplant_S1_5	Generator_S1_5	IHR_Shipping_S1_5	Total
	dBA	dBA	dBA	dBA
POR_1_POW	33.7	30.4	20.7	35.5
POR_1_OPR	34	30.8	20.9	35.8
POR_2_POW	34.7	31.6	22.5	36.6
POR_2_OPR	34.7	31.4	21.9	36.5
POR_3_POW	38	23.9	29.1	38.7
POR_3_OPR	30.3	20.5	25.7	31.9
POR_4_POW	36.9	30.6	28.2	38.3
POR_4_OPR	35.5	21.9	28.2	36.4
POR_5_POW	36.3	30.1	27.7	37.7
POR_5_OPR	36	22.7	27.6	36.7
POR_6_POW	34.8	23	26.5	35.7
POR_6_OPR	35.4	23	27.2	36.2
POR_7_POW	35.7	29.7	28	37.2
POR_7_OPR	35.4	29.2	27.6	36.9
POR_8_POW	36	30.2	31.8	38.1
POR_8_OPR	36.4	24.4	32.4	38.1
POR_9_POW	36.6	31.8	22.1	38
POR_9_OPR	30.7	26.9	16.9	32.3
POR_10_POW	36.5	29.5	24.4	37.5
POR_10_OPR	37	29.5	27.4	38.1
POR_11_POW	35.7	31.2	22.6	37.2
POR_11_OPR	34.5	31.5	21.6	36.4
POR_12_POW	35.7	31.8	19.6	37.2
POR_12_OPR	36.4	33.3	18.2	38.2
POR_13_POW	35.4	32.5	17	37.2
POR_13_OPR	34.9	31.2	14.2	36.5
POR_14_POW	36.3	32.9	20.5	38
POR_14_OPR	35.8	32.9	19.6	37.7
POR_15_POW	36.8	33.4	21.6	38.5
POR_15_OPR	36.2	33.3	20.9	38.1
POR_16_POW	36.3	32.9	22.1	38.1
POR_16_OPR	35.8	32.9	21.4	37.7
POR_17_POW	36.6	33.3	22.5	38.4
POR_17_OPR	35	31.3	20.8	36.7
POR_18_POW	35.3	31.8	21.5	37
POR_18_OPR	34.8	31.6	20.8	36.6
POR_19_POW	33.8	30.6	20.1	35.6
POR_19_OPR	34.1	30.9	20.5	36
POR_20_POW	34.2	30.5	21	35.9
POR_20_OPR	33.7	30.2	20.5	35.5

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

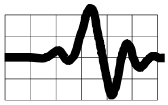


Table A2.8.9 Point of Reception Impacts by Source for Scenario 5* - Day

	Daytime Period (07:00 to 19:00)					
ID	Washplant_S1_5	Generator_S1_5	Dredge_S5	IHR_Shipping_S1_5	IHR_Aggregate_S5	Total
	dBA	dBA	dBA	dBA	dBA	dBA
POR_1_POW	34	30.8	33.5	25	30.8	32.6
POR_1_OPR	34.4	31.2	33.9	25.2	31.3	33.6
POR_2_POW	34.9	31.9	33.6	26.7	31.4	34.3
POR_2_OPR	34.9	31.7	32.9	26.2	31	35
POR_3_POW	38	23.9	35.6	33.2	31.8	26.5
POR_3_OPR	30.3	20.5	32.3	29.9	29.4	25.2
POR_4_POW	36.9	30.6	29.6	32.4	28.8	25.2
POR_4_OPR	35.5	21.9	29.1	32.4	27.3	24
POR_5_POW	36.3	30.1	29.1	31.9	28.5	24.6
POR_5_OPR	36	22.7	28.5	31.8	26.5	23.3
POR_6_POW	34.8	23	27.4	30.6	24.6	21.8
POR_6_OPR	35.4	23	27.9	31.3	25.2	22.1
POR_7_POW	35.7	29.7	32.7	32.1	29.7	24
POR_7_OPR	35.4	29.2	27.5	31.7	24.6	19.2
POR_8_POW	36	30.2	32.4	35.9	27.2	18.8
POR_8_OPR	36.4	24.4	31.3	36.5	26.5	18.4
POR_9_POW	36.6	31.8	29.4	26.3	25.7	20.4
POR_9_OPR	30.7	26.9	22.7	21.1	19.5	15.7
POR_10_POW	36.5	29.5	31.7	28.5	27.7	21.8
POR_10_OPR	37	29.5	30.4	31.5	26.5	19.7
POR_11_POW	35.7	31.2	28.6	26.7	24.4	19.4
POR_11_OPR	34.5	31.5	27	25.8	22.9	17.7
POR_12_POW	35.7	31.8	32.1	23.8	26.4	22.8
POR_12_OPR	36.4	33.3	31.5	22.3	25.9	22.2
POR_13_POW	35.4	32.5	32.7	21.2	26.7	23.3
POR_13_OPR	34.9	31.2	31.7	18.3	26.4	23.6
POR_14_POW	36.3	32.9	34.7	24.6	28.6	25.6
POR_14_OPR	35.8	32.9	34	23.7	27.9	25.2
POR_15_POW	36.8	33.4	36.6	25.8	30.3	28.1
POR_15_OPR	36.2	33.3	35.2	25	29.5	27.8
POR_16_POW	36.3	32.9	37.4	26.3	32.7	32.7
POR_16_OPR	35.8	32.9	35.7	25.6	31.2	32.1
POR_17_POW	36.6	33.3	37.5	26.8	33.4	35.2
POR_17_OPR	35	31.3	34.4	25.1	30.7	34.8
POR_18_POW	35.6	32.1	36.4	26	33.1	34.6
POR_18_OPR	35	31.9	34.7	25.3	31.3	34.5
POR_19_POW	34.1	31	34.4	24.6	31.2	32.6
POR_19_OPR	34.5	31.4	34.6	24.9	31.4	33.5
POR_20_POW	34.8	31.1	34.9	25.6	32.8	33.6
POR_20_OPR	34.2	30.9	33.7	25	30.7	33.5

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.10 Point of Reception Impacts by Source for Scenario 5* - Night

	Evening and Nighttime Period (19:00 to 07:00)			
ID	Washplant_S1_5	Generator_S1_5	IHR_Shipping_S1_5	Total
	dBA	dBA	dBA	dBA
POR_1_POW	34	30.8	20.8	35.8
POR_1_OPR	34.4	31.2	21.1	36.2
POR_2_POW	34.9	31.9	22.5	36.8
POR_2_OPR	34.9	31.7	22	36.8
POR_3_POW	38	23.9	29.1	38.7
POR_3_OPR	30.3	20.5	25.7	31.9
POR_4_POW	36.9	30.6	28.2	38.3
POR_4_OPR	35.5	21.9	28.2	36.4
POR_5_POW	36.3	30.1	27.7	37.7
POR_5_OPR	36	22.7	27.6	36.7
POR_6_POW	34.8	23	26.5	35.7
POR_6_OPR	35.4	23	27.2	36.2
POR_7_POW	35.7	29.7	28	37.2
POR_7_OPR	35.4	29.2	27.6	36.9
POR_8_POW	36	30.2	31.8	38.1
POR_8_OPR	36.4	24.4	32.4	38.1
POR_9_POW	36.6	31.8	22.1	38
POR_9_OPR	30.7	26.9	16.9	32.3
POR_10_POW	36.5	29.5	24.4	37.5
POR_10_OPR	37	29.5	27.4	38.1
POR_11_POW	35.7	31.2	22.6	37.2
POR_11_OPR	34.5	31.5	21.6	36.4
POR_12_POW	35.7	31.8	19.6	37.2
POR_12_OPR	36.4	33.3	18.2	38.2
POR_13_POW	35.4	32.5	17	37.2
POR_13_OPR	34.9	31.2	14.2	36.5
POR_14_POW	36.3	32.9	20.5	38
POR_14_OPR	35.8	32.9	19.6	37.7
POR_15_POW	36.8	33.4	21.6	38.5
POR_15_OPR	36.2	33.3	20.9	38.1
POR_16_POW	36.3	32.9	22.1	38.1
POR_16_OPR	35.8	32.9	21.4	37.7
POR_17_POW	36.6	33.3	22.7	38.4
POR_17_OPR	35	31.3	20.9	36.7
POR_18_POW	35.6	32.1	21.8	37.3
POR_18_OPR	35	31.9	21.1	36.9
POR_19_POW	34.1	31	20.4	35.9
POR_19_OPR	34.5	31.4	20.8	36.3
POR_20_POW	34.8	31.1	21.4	36.5
POR_20_OPR	34.2	30.9	20.8	36

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8 Distance Source to Point of Reception

ID	Coordinates		Washplant_S1_5	Generator_S1_5	Dredge_S2	Dredge_S3	Dredge_S4	Dredge_S5
	X (m)		18447948	18447949	18448234	18448363	18447587	18447884
		Y (m)	4974315	4974316	4974220	4974332	4974563	4974606
POR_1_POW	18448051.81	4975004.25	697	696	805	741	641	432
POR_1_OPR	18448033.85	4974984.92	675	674	791	732	615	407
POR_2_POW	18448080.6	4974942.71	642	640	739	673	623	389
POR_2_OPR	18448069.4	4974932.09	629	628	731	669	607	375
POR_3_POW	18448466.14	4974387.88	523	523	287	118	896	621
POR_3_OPR	18448445.87	4974371.75	501	500	261	92	880	609
POR_4_POW	18448522.66	4974318.29	575	574	305	160	967	700
POR_4_OPR	18448495.63	4974315.68	548	547	279	134	942	677
POR_5_POW	18448546.37	4974283.29	599	599	319	190	999	737
POR_5_OPR	18448520.05	4974285.3	573	572	294	164	973	712
POR_6_POW	18448569.52	4974225.14	628	628	336	232	1039	784
POR_6_OPR	18448541.07	4974244.22	597	597	308	198	1006	750
POR_7_POW	18448540.73	4974146.1	616	616	316	257	1041	802
POR_7_OPR	18448525.44	4974168.74	596	595	296	230	1018	776
POR_8_POW	18448377.84	4973961.87	556	557	296	370	993	812
POR_8_OPR	18448354.54	4973996.4	517	517	254	335	954	770
POR_9_POW	18448220.64	4973658.14	711	712	562	688	1105	1006
POR_9_OPR	18448220.64	4973697.15	675	676	523	650	1073	969
POR_10_POW	18447835.81	4973786.88	540	541	588	758	815	821
POR_10_OPR	18447837.6	4973823.2	504	505	561	731	781	785
POR_11_POW	18447444.3	4973643.13	840	841	978	1148	931	1059
POR_11_OPR	18447471.18	4973667.8	804	805	941	1112	903	1026
POR_12_POW	18447340.23	4974600.44	671	671	971	1058	250	544
POR_12_OPR	18447359.08	4974582.89	647	647	947	1035	229	526
POR_13_POW	18447412.07	4974616.09	615	615	912	993	183	472
POR_13_OPR	18447428.37	4974592.82	589	589	888	970	161	456
POR_14_POW	18447473.95	4974701.45	612	611	900	963	179	421
POR_14_OPR	18447487.5	4974680.77	588	588	877	943	154	404
POR_15_POW	18447573.54	4974769.74	589	588	859	903	207	351
POR_15_OPR	18447589	4974750.94	565	564	835	880	188	329
POR_16_POW	18447741.41	4974892.8	614	613	834	838	364	320
POR_16_OPR	18447755.81	4974872.68	590	589	809	813	353	296
POR_17_POW	18447811.66	4974896.18	597	596	797	789	402	299
POR_17_OPR	18447821.54	4974882.84	582	581	781	773	397	283
POR_18_POW	18447849.89	4974956.82	649	648	831	809	473	352
POR_18_OPR	18447864.23	4974938.47	629	628	808	786	467	333
POR_19_POW	18447875.88	4974998.94	688	687	857	826	523	393
POR_19_OPR	18447891.12	4974979.7	667	666	834	802	516	373
POR_20_POW	18447957.44	4975015.52	701	699	842	795	585	416
POR_20_OPR	18447973.12	4974995.15	681	679	818	770	579	399

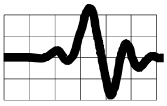


Table A2.9 Sample Calculations – Scenario 1

Receiver
Name: POR_1
ID: POR_1_POW
X: 18448051.81 m
Y: 4975004.25 m
Z: 109.07 m

Point Source, ISO 9613, Name: "Washplant", ID: "Washplant_S1_5"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
31	18447947.93	4974314.97	114.82	0	DEN	32	70.4	0.0	0.0	0.0	0.0	67.9	0.0	-4.8	0.0	0.0	0.0	0.0	0.0	7.3
31	18447947.93	4974314.97	114.82	0	DEN	63	70.4	0.0	0.0	0.0	0.0	67.9	0.1	-4.8	0.0	0.0	0.0	0.0	0.0	7.2
31	18447947.93	4974314.97	114.82	0	DEN	125	88.0	0.0	0.0	0.0	0.0	67.9	0.3	4.3	0.0	0.0	0.0	0.0	0.0	15.6
31	18447947.93	4974314.97	114.82	0	DEN	250	94.0	0.0	0.0	0.0	0.0	67.9	0.7	6.5	0.0	0.0	0.0	0.0	0.0	19.0
31	18447947.93	4974314.97	114.82	0	DEN	500	102.0	0.0	0.0	0.0	0.0	67.9	1.3	4.4	0.0	0.0	0.0	0.0	0.0	28.4
31	18447947.93	4974314.97	114.82	0	DEN	1000	104.8	0.0	0.0	0.0	0.0	67.9	2.5	0.1	0.0	0.0	0.0	0.0	0.0	34.3
31	18447947.93	4974314.97	114.82	0	DEN	2000	104.3	0.0	0.0	0.0	0.0	67.9	6.7	-0.6	0.0	0.0	0.0	0.0	0.0	30.3
31	18447947.93	4974314.97	114.82	0	DEN	4000	100.8	0.0	0.0	0.0	0.0	67.9	22.8	-0.6	0.0	0.0	0.0	0.0	0.0	10.7
31	18447947.93	4974314.97	114.82	0	DEN	8000	91.7	0.0	0.0	0.0	0.0	67.9	81.5	-0.6	0.0	0.0	0.0	0.0	0.0	-57.1

Point Source, ISO 9613, Name: "Generator", ID: "Generator_S1_5"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
35	18447948.51	4974316.21	111.02	0	DEN	32	25.9	0.0	0.0	0.0	0.0	67.8	0.0	-5.3	0.0	0.0	0.0	0.0	0.0	-36.7
35	18447948.51	4974316.21	111.02	0	DEN	63	61.6	0.0	0.0	0.0	0.0	67.8	0.1	-5.3	0.0	0.0	0.0	0.0	0.0	-1.0
35	18447948.51	4974316.21	111.02	0	DEN	125	66.8	0.0	0.0	0.0	0.0	67.8	0.3	4.4	0.0	0.0	0.0	0.0	0.0	-5.7
35	18447948.51	4974316.21	111.02	0	DEN	250	74.0	0.0	0.0	0.0	0.0	67.8	0.7	6.7	0.0	0.0	0.0	0.0	0.0	-1.3
35	18447948.51	4974316.21	111.02	0	DEN	500	89.0	0.0	0.0	0.0	0.0	67.8	1.3	3.9	0.0	0.0	0.0	0.0	0.0	15.9
35	18447948.51	4974316.21	111.02	0	DEN	1000	98.3	0.0	0.0	0.0	0.0	67.8	2.5	-0.4	0.0	0.0	0.0	0.0	0.0	28.3
35	18447948.51	4974316.21	111.02	0	DEN	2000	106.5	0.0	0.0	0.0	0.0	67.8	6.7	-1.0	0.0	0.0	0.0	0.0	0.0	33.0
35	18447948.51	4974316.21	111.02	0	DEN	4000	102.5	0.0	0.0	0.0	0.0	67.8	22.8	-1.0	0.0	0.0	0.0	0.0	0.0	12.9
35	18447948.51	4974316.21	111.02	0	DEN	8000	88.6	0.0	0.0	0.0	0.0	67.8	81.3	-1.0	0.0	0.0	0.0	0.0	0.0	-59.5

Area Source, ISO 9613, Name: "Loaders or Excavators", ID: "Excavators_S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
44	18448232.08	4974202.22	108.95	0	D	32	39.6	32.6	0.0	0.0	0.0	69.3	0.0	-5.6	0.0	0.0	4.8	0.0	0.0	3.7
44	18448232.08	4974202.22	108.95	0	D	63	50.7	32.6	0.0	0.0	0.0	69.3	0.1	-5.6	0.0	0.0	4.8	0.0	0.0	14.7
44	18448232.08	4974202.22	108.95	0	D	125	58.0	32.6	0.0	0.0	0.0	69.3	0.3	5.0	0.0	0.0	0.0	0.0	0.0	16.0
44	18448232.08	4974202.22	108.95	0	D	250	61.0	32.6	0.0	0.0	0.0	69.3	0.9	7.6	0.0	0.0	0.0	0.0	0.0	15.9
44	18448232.08	4974202.22	108.95	0	D	500	66.8	32.6	0.0	0.0	0.0	69.3	1.6	4.1	0.0	0.0	0.7	0.0	0.0	23.8
44	18448232.08	4974202.22	108.95	0	D	1000	70.6	32.6	0.0	0.0	0.0	69.3	3.0	-0.5	0.0	0.0	4.8	0.0	0.0	26.6
44	18448232.08	4974202.22	108.95	0	D	2000	69.0	32.6	0.0	0.0	0.0	69.3	7.9	-1.1	0.0	0.0	4.8	0.0	0.0	20.8
44	18448232.08	4974202.22	108.95	0	D	4000	62.5	32.6	0.0	0.0	0.0	69.3	26.9	-1.1	0.0	0.0	4.8	0.0	0.0	-4.7
44	18448232.08	4974202.22	108.95	0	D	8000	50.5	32.6	0.0	0.0	0.0	69.3	96.1	-1.1	0.0	0.0	4.8	0.0	0.0	-85.9
44	18448232.08	4974202.22	108.95	0	N	32	-63.4	32.6	0.0	0.0	0.0	69.3	0.0	-5.6	0.0	0.0	4.8	0.0	0.0	-99.3
44	18448232.08	4974202.22	108.95	0	N	63	-52.3	32.6	0.0	0.0	0.0	69.3	0.1	-5.6	0.0	0.0	4.8	0.0	0.0	-88.3
44	18448232.08	4974202.22	108.95	0	N	125	-45.0	32.6	0.0	0.0	0.0	69.3	0.3	5.0	0.0	0.0	0.0	0.0	0.0	-87.0
44	18448232.08	4974202.22	108.95	0	N	250	-42.0	32.6	0.0	0.0	0.0	69.3	0.9	7.6	0.0	0.0	0.0	0.0	0.0	-87.1
44	18448232.08	4974202.22	108.95	0	N	500	-36.2	32.6	0.0	0.0	0.0	69.3	1.6	4.1	0.0	0.0	0.7	0.0	0.0	-79.2
44	18448232.08	4974202.22	108.95	0	N	1000	-32.4	32.6	0.0	0.0	0.0	69.3	3.0	-0.5	0.0	0.0	4.8	0.0	0.0	-76.4
44	18448232.08	4974202.22	108.95	0	N	2000	-34.0	32.6	0.0	0.0	0.0	69.3	7.9	-1.1	0.0	0.0	4.8	0.0	0.0	-82.3
44	18448232.08	4974202.22	108.95	0	N	4000	-40.5	32.6	0.0	0.0	0.0	69.3	26.9	-1.1	0.0	0.0	4.8	0.0	0.0	-107.8
44	18448232.08	4974202.22	108.95	0	N	8000	-52.5	32.6	0.0	0.0	0.0	69.3	96.1	-1.1	0.0	0.0	4.8	0.0	0.0	-188.9
44	18448232.08	4974202.22	108.95	0	E	32	-63.4	32.6	0.0	0.0	0.0	69.3	0.0	-5.6	0.0	0.0	4.8	0.0	0.0	-99.3
44	18448232.08	4974202.22	108.95	0	E	63	-52.3	32.6	0.0	0.0	0.0	69.3	0.1	-5.6	0.0	0.0	4.8	0.0	0.0	-88.3
44	18448232.08	4974202.22	108.95	0	E	125	-45.0	32.6	0.0	0.0	0.0	69.3	0.3	5.0	0.0	0.0	0.0	0.0	0.0	-87.0
44	18448232.08	4974202.22	108.95	0	E	250	-42.0	32.6	0.0	0.0	0.0	69.3	0.9	7.6	0.0	0.0	0.0	0.0	0.0	-87.1
44	18448232.08	4974202.22	108.95	0	E	500	-36.2	32.6	0.0	0.0	0.0	69.3	1.6	4.1	0.0	0.0	0.7	0.0	0.0	-79.2
44	18448232.08	4974202.22	108.95	0	E	1000	-32.4	32.6	0.0	0.0	0.0	69.3	3.0	-0.5	0.0	0.0	4.8	0.0	0.0	-76.4
44	18448232.08	4974202.22	108.95	0	E	2000	-34.0	32.6	0.0	0.0	0.0	69.3	7.9	-1.1	0.0	0.0	4.8	0.0	0.0	-82.3
44	18448232.08	4974202.22	108.95	0	E	4000	-40.5	32.6	0.0	0.0	0.0	69.3	26.9	-1.1	0.0	0.0	4.8	0.0	0.0	-107.8
44	18448232.08	4974202.22	108.95	0	E	8000	-52.5	32.6	0.0	0.0	0.0	69.3	96.1	-1.1	0.0	0.0	4.8	0.0	0.0	-188.9
48	18448188.62	4974179.02	108.43	0	D	32	39.6	31.7	0.0	0.0	0.0	69.4	0.0	-5.6	0.0	0.0	4.8	0.0	0.0	2.7
48	18448188.62	4974179.02	108.43	0	D	63	50.7	31.7	0.0	0.0	0.0	69.4	0.1	-5.6	0.0	0.0	4.8	0.0	0.0	13.7
48	18448188.62	4974179.02	108.43	0	D	125	58.0	31.7	0.0	0.0	0.0	69.4	0.3	4.8	0.0	0.0	0.0	0.0	0.0	15.2

Appendix 3

Manufacturers Data

Contents:

- Manufacturers Data for Silex Silencer Model JB 6.
- Manufacturers Data for Vibro Acoustics ALV
- Manufacturers Data for Kinetics Noiseblock Enclosure Performance

Manufacturers Data for Silex Silencer Model JB 6.

www.silex.com JB

CRITICAL CYLINDRICAL SILENCERS

25 to 32 dBA Noise Reduction

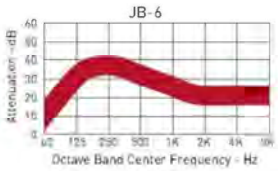
SILENCER SELECTION

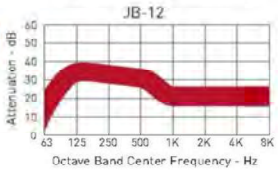
For immediate assistance to select the appropriate silencer that best suits your application's acoustical and backpressure requirements contact Silex Innovations. Or, use our exclusive silencer sizing and selection program, found at www.silex.com.

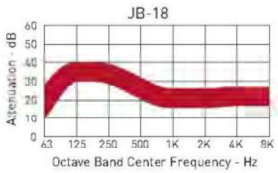
PERFORMANCE & MATERIALS

The critical grade series are reactive silencers with good acoustical performance. All of the silencers are manufactured from light to heavy gauge steel and finished with high temperature black paint. A drain is included as a standard component on the silencer.

TYPICAL ATTENUATION CURVE





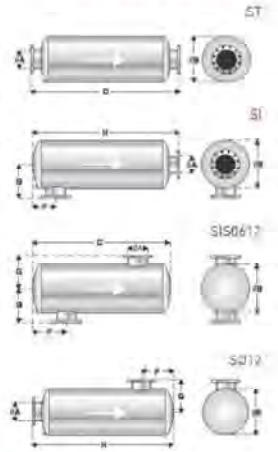


DIMENSIONS

Model	ØA in(mm)	ØB in(mm)	C in(mm)	D in(mm)	F** in(mm)	G in(mm)	H in(mm)	Wgt lb(kg)
JB-1.5	1.5	9(229)	24(610)	30(762)	4(102)	7.5(191)	27(686)	23(10)
JB-2	2	9(229)	24(610)	30(762)	4.5(114)	7.5(191)	27(686)	24(11)
JB-2.5	2.5	10(254)	28(711)	34(864)	5(127)	8(203)	31(787)	34(15)
JB-3	3	12(305)	32(813)	38(660)	5.5(140)	9(229)	35(889)	46(21)
JB-3.5	3.5	14(356)	36(914)	42(1067)	6(152)	10(254)	39(991)	65(29)
JB-4	4	14(356)	40(1016)	48(1219)	6(152)	11(279)	44(1118)	77(35)
JB-5	5	16(406)	49(1245)	57(1448)	7(178)	12(305)	53(1346)	107(49)
JB-6	6	18(457)	55(1397)	63(1600)	8(203)	13(330)	59(1499)	135(61)
JB-8	8	22(559)	66(1676)	74(1880)	9.5(241)	15(381)	70(1778)	208(94)
JB-10	10	26(660)	81(2057)	89(2261)	11.5(292)	17(432)	85(2159)	370(168)
JB-12	12	30(762)	94(2388)	102(2591)	13(330)	19(483)	98(2489)	505(229)
JB-14	14	36(914)	99(2515)	109(2769)	15.5(394)	23(584)	104(2642)	642(291)
JB-16	16	40(1016)	109(2769)	119(3023)	16.5(419)	25(635)	114(2896)	971(440)
JB-18	18	45(1142)	117(2972)	127(3226)	18(457)	27.5(699)	122(3099)	1167(529)
JB-20	20	50(1270)	127(3226)	137(3480)	20.5(521)	30(762)	132(3353)	1669(757)
JB-22	22	54(1372)	139(3531)	149(3785)	22.5(572)	32(813)	144(3658)	1972(894)
JB-24	24	60(1524)	152(3861)	162(4115)	24(610)	35(889)	157(3988)	2384(1081)
JB-26	26	64(1626)	173(4394)	183(4648)	25.5(648)	37(940)	178(4521)	2854(1295)
JB-28	28	68(1727)	190(4826)	200(5080)	26.5(673)	39(991)	195(4953)	3278(1487)
JB-30	30	72(1829)	206(5232)	216(5486)	28(711)	41(1041)	211(5359)	3777(1713)

**For F dimension other than that specified, please contact Silex Innovations.
Available in sizes up to 60" inlet.

TYPICAL ORIENTATIONS



OPTIONS

- Aluminized steel, 304L or 316L stainless steel
- Dual inlet or custom inlet / outlet configurations
- Thermal insulation blankets to suit all configurations
- Mounting brackets, gussets and lifting lugs

Metric dimensions rounded to nearest mm. Dimensions and weights are nominal and may vary slightly in production models. On silencers 4" and larger the inlet and outlet are flanged, manufactured from minimum ¼" thick plate and drilled to ANSI class 150.
The default material used is aluminized steel, however NGP reserves the right to substitute to carbon steel due to material availability, gauge and size limitations.

Corporate Headquarters
1560 Williams Drive
Stoughton, WI 53589
Tel: 608-719-1800

Silex INNOVATIONS

silex.com
Silex: 1-800-367-7818
Sales/Quote Email: Silex.Sales@nelsonjgp.com
Order Email: Silex.Orders@nelsonjgp.com

35

Manufacturers Data for Vibro Acoustics ALV

CERTIFIED PERFORMANCE DATA

VIBRO-ACOUSTICS®
A Swegon Group company

ALV

Acoustic Louver
V Blade

How to Specify Example:

48 X 60 ALV-MV X 12

Duct Width | Duct Height | Louver Model | Louver Depth

Depth (in.)	Model	Octave Band Transmission Loss (dB)								Free Area (%)	Face Velocity (fpm) Pressure Drop (in.wg)			
		63	125	250	500	1000	2000	4000	8000		150	250	350	500
6	ALV-LV-6	6	8	9	12	17	20	21	20	18	0.10	0.27	0.53	1.08
	ALV-MV-6	6	6	8	10	15	19	19	19	26	0.07	0.18	0.36	0.73
8	ALV-LV-8	7	9	10	13	17	21	20	20	19	0.10	0.28	0.54	1.10
	ALV-MV-8	6	6	7	10	15	20	19	20	28	0.06	0.18	0.35	0.71
12	ALV-LV-12	6	10	12	16	23	26	20	22	21	0.09	0.24	0.47	0.97
	ALV-MV-12	7	7	10	13	20	21	20	20	30	0.06	0.17	0.33	0.67
18	ALV-LV-18	10	12	16	21	28	27	25	24	19	0.10	0.27	0.52	1.06
	ALV-MV-18	9	10	14	18	25	24	23	22	28	0.07	0.19	0.37	0.76
24	ALV-LV-24	11	16	17	25	31	29	26	24	19	0.11	0.30	0.59	1.21
	ALV-MV-24	11	13	15	22	28	26	25	23	26	0.08	0.22	0.43	0.88

Pressure drop may be too high for most practical applications

Acoustical Performance

Transmission Loss (TL) determined by ASTM E90. Noise Reduction (NR) may be determined as: NR=TL+6. Insertion Loss (IL) may be estimated using: IL=TL+2 for all bands of interest.

Aerodynamic Performance

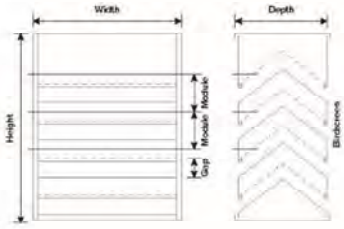
Free Area and Pressure Drop determined by AMCA Standard 500-L for free inlet and outlet under ideal conditions. System effects due to ducted conditions, low height, or obstructions may increase pressure drop by a factor of 1.5 or higher.

Dimensions

Maximum single piece size: 60" x 120"; larger louver sizes will be multiple pieces. Minimum height: 12". Louver with less than 30° high, will require assistance with product selection to minimize risk of higher pressure drop values.

Available Options

- Bird screen: 1" x 1" heavy wire mesh
- Surface preparation and finishing:
  - Mill finish
  - Prime coat
  - Satin coat/galvaneal
  - Baked enamel
  - Anodized (aluminum only)
  - Other finishes available
- Aluminum or Stainless steel
- Media protection:
  - Tedlar
  - Fiberglass cloth
- Custom louver shapes and design for special applications



1-800-565-8401 | info@vibro-acoustics.com | www.vibro-acoustics.com

Manufacturers Data for Kinetics Noiseblock Enclosure Performance

NOISEBLOCK™ Acoustical Performance Data

NOISEBLOCK panel acoustic performance is backed by independent testing in a NVLAP accredited laboratory. When tested in accordance with *ASTM C423, Standard Method of Test for Sound Absorption of Acoustic Materials in Reverberant Rooms,* the panel assembly shall have the following minimum airborne sound absorption:

Model	Construction[3]	Sound Absorption						NRC[4]
		125	250	500	1000	2000	4000	
STL-2[1]	18 ga. solid / 22 ga. perforated	0.15	0.66	1.07	1.06	0.97	0.86	0.95
STL-2[1]	16 ga. solid / 22 ga. perforated	0.15	0.66	1.07	1.06	0.97	0.86	0.95
STL-4[2]	18 ga. solid / 22 ga. perforated	0.60	1.13	1.12	1.09	1.03	0.91	1.00
STL-4[2]	16 ga. solid / 22 ga. perforated	0.60	1.13	1.12	1.09	1.03	0.91	1.00
HTL-4[2]	16 ga. solid / 22 ga. perforated + septum	0.60	1.13	1.12	1.09	1.03	0.91	1.00

When tested in accordance with *ASTM E90, Standard Recommended Practice for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*, the panel assembly shall have the following minimum airborne sound transmission loss:

Model	Construction[3]	Transmission Loss, dB						STC[5]
		125	250	500	1000	2000	4000	
STL-2[1]	18 ga. solid / 22 ga. perforated	17	23	34	47	55	57	37
STL-2[1]	16 ga. solid / 22 ga. perforated	19	25	35	48	56	60	39
STL-4[2]	18 ga. solid / 22 ga. perforated	21	28	39	48	56	58	40
STL-4[2]	16 ga. solid / 22 ga. perforated	24	32	41	51	60	66	43
HTL-4[2]	16 ga. solid / 22 ga. perforated + septum	27	34	48	61	66	70	48
HTL-4[2]	16 ga. solid / 22 ga. solid	27	39	59	68	67	72	52

The acoustic performance of **NOISEBLOCK** panel systems is not degraded through prolonged exposure to noise, vibration, pressure differential, dampness, wind, rain or snow.

[1] (2) = 2-inch thickness
[2] (4) = 4-inch thickness
[3] solid inner skin available
[4] Noise Reduction Coefficient (NRC) is the average of coefficients at 250, 500, 1K and 2K Hz, expressed in the nearest integral multiple of 0.05.
[4] Sound Transmission Class (STC) is determined by comparing test data with a set of standard STC contours as described in *ASTM E413, Standard Classification for Determination of Sound Transmission Class.*

KINETICS Noise Control.

kineticsnoise.com/noiseblock
sales@kineticsnoise.com
1-800-959-1229

MADE IN USA

Kinetics Noise Control, Inc. is continually upgrading the quality of our products. We reserve the right to make changes to this and all products without notice.

NPE | 11/19

RESUME: Dr. HUGH WILLIAMSON, P.Eng.

QUALIFICATIONS:

Ph.D. Mechanical Engineering, University of New South Wales, 1972

B.Sc. Mechanical Engineering, (with Distinction), University of Alberta, 1967

Member, Professional Engineers, Ontario

Member, Canadian Acoustical Association

KEY COMPETENCIES:

- Environmental noise and vibration assessments, Environmental Compliance Approval (ECA). Noise assessment for land use planning
- Noise impact assessments for the Aggregates Industry.
- Architectural and building acoustics, acoustics of office spaces, meeting rooms, auditoriums and studios, noise and vibration control of building mechanical services.
- Industrial noise and vibration assessment and control.
- Transportation noise and vibration.
- Noise and vibration aspects of Occupational Health and Safety (OH&S).

PROFESSIONAL EXPERIENCE:

Hugh Williamson is a professional engineer with many years of experience in the measurement, analysis and control of noise and vibration. Freefield Ltd. was incorporated in 2017 and provides consulting services in architectural, building, industrial, transportation and environmental acoustics and vibration. Clients include architects, engineering firms, industrial firms and government departments. Prior to joining Freefield Ltd. Hugh Williamson founded and directed Hugh Williamson Associates Inc. which specialized in consulting services in architectural, building, industrial, transportation and environmental acoustics and vibration. His career included extensive periods in industry as well as university level research and teaching. He is a former Director of the Acoustics and Vibration Unit at the Australian Defence Force Academy. He has published over 50 engineering and scientific papers and has been an invited speaker on noise and vibration at national and international conferences. He has more than 27 years of experience as a consultant.

CLIENT LIST:

Hugh Williamson has provided consulting services to large and small clients including National Research Council, J. L. Richards & Associates, Barry Padolsky Associates, Atkinson Schroeter Design Group, R. W. Tomlinson Limited, Geo. Tackaberry Construction, Miller Paving, City of Ottawa and Government of Canada.

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RESUMÉ: MICHAEL WELLS

QUALIFICATIONS:	Limited Engineering Licensee*, Professional Engineers Ontario *Limitation: Environmental acoustic assessments and recommendations to mitigate noise and vibration; acoustical engineering services for land-use planning, architectural and building acoustics, industrial acoustics, and occupational health and safety audits. Registered Architect of NSW, Registration Number: 8111 B. Architecture (Hons), University of Sydney, 2002 B.Sc. Architecture, University of Sydney, 1999 Member, Canadian Acoustical Association Associate Member, INCE-USA
KEY COMPETENCIES:	• Environmental noise and vibration assessments, Environmental Compliance Approval (ECA). Noise assessment for land use planning. • Architectural and building acoustics, acoustics of office spaces, meeting rooms, auditoriums and studios, noise and vibration control of building mechanical services. • Industrial noise and vibration assessment and control. • Noise assessments for Occupational Health and Safety.

PROFESSIONAL EXPERIENCE:

Michael Wells is a Limited Engineering Licensee, Professional Engineers Ontario, in the field of acoustic engineering as described above. He is also a professional Architect registered in NSW, Australia. Michael. He has more than 10 years of experience in Canada in the measurement, analysis and control of noise and vibration. Michael is a founding Director of Freefield Ltd., incorporated in 2017, which provides consulting services in architectural, building, industrial, transportation and environmental acoustics and vibration. Prior to establishing Freefield Ltd., he worked for the Ontario acoustic consulting firm Hugh Williamson Associates Inc. Previously, Michael worked in Sydney, Australia, specializing in the design of institutional, commercial and residential projects. He is the former Director of Architectural Workshops Australia and Vision Blue Pty Ltd.

CLIENT LIST:

Michael Wells has provided consulting services to large and small clients including: National Research Council, R. W. Tomlinson, G. Tackaberry & Sons Construction, Heidelberg Materials, Miller Paving, J. L. Richards & Associates, Barry Padolsky Associates, Atkinson Schroeter Design Group and Industry Canada.