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NOISE IMPACT STUDY - Project: 15337.00

Macleod 3 and 5 Quarry Extensions Noise Impact Study

Geographic Township of Cornwall County of South Stormont

Prepared for:

Cornwall Gravel Co. Ltd.

390 Eleventh Street West Cornwall, Ontario K6H 5R9

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Table of Contents

| 1 | Introduction | 3 |
|-----|---|----|
| 2 | Site Description | 3 |
| 3 | Noise Criteria | 4 |
| 3.1 | Acoustical Classification | 4 |
| 3.2 | MOECC Sound Level Limits | 4 |
| 3.3 | Zoning & Vacant Lots | 5 |
| 4 | Aggregate Quarry Operation | 5 |
| 4.1 | Hours of Operation | 5 |
| 4.2 | Site Preparation and Rehabilitation | 5 |
| 4.3 | Extraction and Processing & Transport | 6 |
| 4.4 | Equipment | 6 |
| 5 | Noise Predictions & Controls | 7 |
| 5.1 | Noise Prediction Methodology | 7 |
| 5.2 | Aggregate Quarry Noise Sources | 8 |
| 5.3 | Recommended Noise Controls | 8 |
| 5.4 | Predicted Sound Levels with Controls | 11 |
| 6 | Truck Traffic Noise on Haul Route | 14 |
| 7 | Conclusions | 15 |

1 Introduction

Cornwall Gravel Co. Ltd. (Cornwall Gravel) is applying for two Category 2 Class "A" aggregate licences to extend the existing Macleod Quarry operations. These two proposed aggregate operations are identified as Macleod 3 and Macleod 5.

Macleod 3 is located at Part of Lot 6, Concession 4 in the Geographic Township of Cornwall, County of South Stormont. The applicant is proposing a licenced area of 36.4 ha and an extraction area of 29.8 ha for Macleod 3. Macleod 5 is located at Part of Lot 2, Concession 4 in the Geographic Township of Cornwall, County of South Stormont. The applicant is proposing a licenced area of 40.5 ha and an extraction area of 32.4 ha for Macleod 5.

Aercoustics Engineering Limited (Aercoustics) has been retained to prepare a Noise Impact Study. The purpose of this study is to provide noise control recommendations in order that the operation within the aggregate quarry will satisfy the Ontario Ministry of the Environment and Climate Change (MOECC) noise guidelines.

Sound level limits for the aggregate quarry noise on the residential receptors were first established. These were based on the noise guidelines of the MOECC. Next, the noise predictions of the aggregate quarry operations were performed at these residential receptors. Where the predicted levels were found to exceed the MOECC sound level limits, noise control measures were recommended to satisfy these limits.

The cumulative noise from the two proposed licences was considered in this study such that the overall noise from both sites was designed to remain in compliance with the MOECC sound levels limits.

Figure 1 provides a key plan showing the location of the proposed aggregate quarries. Figure 2 illustrates the two proposed licenced areas, associated extraction limits and phasing, as well as all surrounding noise sensitive receptors (residences). A site plan is provided in Figure 3 and Figure 6, illustrating the aggregate quarry area and the locations of local receptors.

2 Site Description

Figure 1 provides a key plan showing the location of the proposed quarries and the surrounding area. The sites are located between Headline Road and South Branch Road, east of McConnell Avenue, in the Geographic Township of Cornwall. The site is in a rural area where aggregate extraction, employment/commercial uses, and agriculture are the dominant land uses. The Highway 401 is located about 3 km to the south. The existing Macleod 1 Quarry, and the planned Macleod 2 Quarry and Macleod 4 Quarry are located on the land between the two proposed quarries.

The aggregate quarries addressed by this noise impact study consist of operations within the lands outlined in Figure 2. These operations include excavation, rock drilling, blasting, aggregate haulage/shipping, operation of a portable asphalt plant, and processing with a portable processing plant (crushing, screening and washing). There are several existing single family residential dwellings in the vicinity of the quarry areas. These are identified as Receptors R01 to R38. No potential noise receptors were identified on noise sensitive zoned lots (vacant lots) which would introduce new worst-case noise receptors.

3 Noise Criteria

3.1 Acoustical Classification

The appropriate noise criteria for the receptors in the vicinity of the Macleod 3 and 5 Quarry Extensions were based on the MOECC Noise Pollution Control publication NPC-300 *"Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning*" (MOE, August 2013).

Points of reception R15, R19 and R20 are located in an ambient acoustical environment consistent with the Class 3 (Rural) designation as defined by the MOECC Publication NPC-300. This is reserved for a rural area with a prevailing acoustical environment that is dominated by natural sounds with little or no road traffic. There is some existing aggregate activity and distant steady road traffic audible at some of these residences, but for conservatism and simplicity these were assumed to be Class 3.

Points of reception R01 to R14, R16 to R18 and R21 to R38 are considered to be in an acoustical environment consistent with the Class 2 (Urban) designation as defined by the MOECC Publication NPC-300. In a Class 2 area, the background sound levels during the daytime (07:00 to 19:00) are defined by man-made sources while in the evening and nighttime periods, natural sounds are typically dominant. These dwellings front onto one of the three nearby arterial roads.

3.2 MOECC Sound Level Limits

The applicable limits for noise from a stationary source at a noise sensitive point of reception (receptor) in a Class 2 (Urban) area and a Class 3 (Rural) area are outlined in Table 1.

| Class 2 Area (Urban) | Class 3 Area (Rural) |
|----------------------|------------------------------------|
| 50* | 45* |
| 45* | 40* |
| | Class 2 Area (Urban) 50* 45* |

Table 1 : Sound Level Limits for Stationary Sources – Hourly LEQ (dBA)

*or background sound level if higher

The noise from a stationary source should not exceed these limits in any hour. At some points of reception in the vicinity of the proposed quarries, the lowest background sound

level may be higher than the exclusion limits listed above due to existing activities and road traffic. Regardless, the minimum exclusion limits were used to define the target sound level criteria.

3.3 **Zoning & Vacant Lots**

The MOECC's NPC-300 document requires consideration for potential receptors on noise sensitive zoned lots. These are defined as a lot that has been zoned to permit a noise sensitive land use and that is either currently vacant or has an existing land use that is not a noise sensitive land use.

For the area surrounding the facility, no vacant lands were identified which would generate additional worst-case receptors on noise sensitive zoned lots.

4 Aggregate Quarry Operation

The site plans outline the sequence and direction of operations in each phase. In general terms, the types of work consist of site preparation and rehabilitation, extraction and processing, and shipment off-site.

4.1 Hours of Operation

The proposed hours of normal operation are from 7:00 a.m. to 7:00 p.m. seven days per week, excluding statutory holidays. At no time shall crushing, rock breaking or blasting take place on a statutory holiday. Shipping and loading is permitted outside the normal hours of operation. Equipment maintenance may take place outside of the normal operating hours. The proposed hours of operation are summarized below in Table 2.

Table 2 : Operating Hours

| Time of Day | Day of Week | Operations |
|------------------------------|------------------|---|
| 07:00 to 07:00 (24 hours) | Monday to Sunday | Loading & Transport Only (to Macleod 1) |
| 07:00 to 19:00 | Monday to Sunday | Full Operation – Extraction, Processing, Rock Drilling, Loading & Shipping |

4.2 Site Preparation and Rehabilitation

Site preparation includes the construction of acoustic barriers and any required visual screens specified on the site plan. Topsoil and overburden will be removed. This work will be done primarily with bulldozers, scrapers, trucks, loaders and excavators. Rehabilitation phases will involve similar equipment in establishing the final grading for the site.

The site preparation and rehabilitation work described above is not part of the daily operation of the quarry and is of short duration. These construction activities are not considered in the noise control analysis. The equipment used for these activities must satisfy the noise emission requirements of the MOECC document NPC-115 "Construction

By defining a maximum permissible noise emission for construction

Equipment". By defining a maximum permissible noise emission for construction equipment rather than directly limiting the noise impact at a sensitive point of reception, the MOECC is recognizing that construction is a temporary and largely unavoidable source of noise.

In order to minimize the noise impact associated with the construction activities, it is suggested that:

- Construction operations should be restricted to the daytime hours. When possible, site preparation should be conducted during the fall, winter, or spring months when there is a reduced level of extraction and when residential windows are more likely to remain closed.
- Perimeter berms or fences should be constructed as soon as practical during site preparation so as to provide the surrounding residences with some acoustical shielding for the remaining overburden stripping and extraction operations.

4.3 **Extraction and Processing & Transport**

The maximum annual tonnage to be removed from each of the two proposed quarries is 3,400,000 tonnes. The quarries will operate with a portable processing plant which follows the working face. Off-road trucks will transport material from stockpiles to the Macleod 1 Quarry, where highway trucks will be loaded for shipment to market. Aggregate will be extracted using up to two (2) front end loaders at the working face.

The worst-case operation from a noise context involves material transported by loaders directly into a portable processing plant. Processed material will be stored in stockpiles in the vicinity of the processing area. Two shipping loaders will be used in the processing area to load highway trucks with finished aggregate product for transport to market.

Material may also at times be transported directly from the proposed Macleod 3 and 5 sites to the Macleod 1 Quarry for processing, without the use of a portable processing plant at the proposed sites.

The proposed Macleod 3 and 5 Quarry Extensions are planned to have up to 5 lifts.

4.4 Equipment

The equipment will be shared between the Macleod 3 and Macleod 5 operations. This is intended to allow for concurrent operation of the two licensed properties while still satisfying the MOECC sound level limits for combined operation. The extraction, rock drilling, processing and shipment equipment operating simultaneously in the Macleod 3 and the Macleod 5 quarries is limited to:

- One (1) Portable Processing Plant
- One (1) Portable Asphalt Plant
- One (1) Rock Drill
- Two (2) Extraction Loaders
- Two (2) Shipment Loaders
- 20 Off-road truck trips/hr (40 passes/hr)

It's understood that the intention is for the two properties to be operated separately, in which case all of the above equipment can be located in one of the two properties. This would represent the predictable worst case scenario.

If desired, one Extraction Loader (maximum 74 dBA) may be replaced with two Quiet Extraction Loaders (maximum 70 dBA) wherever an Extraction Loader is permitted.

5 Noise Predictions & Controls

5.1 **Noise Prediction Methodology**

The aggregate quarry operations described in the previous section were modelled. Noise predictions were conducted based on the predictable worst case noise impact for each of the aggregate quarry operation areas at each of the receptors. This represents a design case where the quarry is running at full capacity with all of the equipment operating simultaneously and at locations where noise impact is highest for each receptor. The majority of the time, work would be occurring in other areas of the site with lower associated noise impacts.

The noise prediction model was generated using Datakustik's Noise Prediction Software, CadnaA. This model is based on established noise prediction methods outlined in the ISO 9613-2 standard entitled "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method and calculation".

Noise levels were predicted using existing topography under conditions of downwind propagation, generally with hard ground modelled in the quarry area and soft ground conditions near the points of reception. There is some foliage surrounding the site, but this was not modelled for conservatism. Appendix A contains sample stationary source calculations.

The drill elevation was modelled with a base elevation located on the top of the bench during any given lift, or 1.5 m above existing grade during the first lift.

The noise impact of the operation was predicted. Where the MOECC sound level limits were calculated to be exceeded, noise control measures were modelled and the noise impact recalculated. This process was repeated until the sound level limits were satisfied.

5.2 Aggregate Quarry Noise Sources

The reference sound pressure levels used for the aggregate quarry equipment are outlined in Table 3. These were based on similar equipment from the Aercoustics database.

 Table 3: Reference Sound Pressure Levels of Aggregate Quarry Equipment

| Equipment | Reference Sound Pressure Level at 30m (dBA) |
|----------------------------------|--|
| Portable Processing Plant | 85 |
| (crushing, screening & washing) | 85 |
| Portable Asphalt Plant | 73 |
| Rock Drill | 79 |
| Extraction Loader | 74 |
| Shipment or Asphalt Plant Loader | 70 ¹ |
| Off-Road Truck – 30 km/hr | 75 |

1 - The shipment loaders were assumed to operate at a 50 % duty cycle.

5.3 **Recommended Noise Controls**

The recommended noise controls presented in this section have been determined through noise impact predictions to be effective in controlling the noise generated by the aggregate quarry activity, satisfying the MOECC sound level limits. It should be noted that there may be other effective noise controls that could replace or revise some of the recommended controls of this report. Prior to implementing any changes to the noise controls, appropriate studies should be undertaken to demonstrate that the MOECC sound level limits will be satisfied.

An acoustic barrier is required to be solid, with no gaps or openings, and shall satisfy a minimum area density of 20 kg/m2.

Refer to Figures 3 to 5 for an illustration of the Macleod 3 noise prediction model showing timing and implementation of noise controls during Phases 1, 2a and 2b. Refer to Figures 6 and 7 for an illustration of the Macleod 5 noise prediction model showing timing and implementation of noise controls during Phases 1 and 2. The perimeter acoustic barriers are shown in blue and the top of berm elevation in metres above sea level is shown at specific points.

It should be noted that Berm H, which is required in the final phase of the Macleod 3 Quarry, is proposed on the east perimeter of the Macleod 2 lands. It is understood that proposed amendments to the Macleod 2 licence are being submitted concurrently with the subject application, and that the Berm H requirements will be included.

5.3.1 General

The following numbered list presents a comprehensive summary of the recommended noise controls for both Macleod 3 and 5 Quarry Extensions, as they might appear on the licence:

General:

1. The hours of operation shall be as described in Table A.

Table A: Operating Hours

| Time of Day | Day of Week | Operations |
|------------------------------|------------------|--|
| 07:00 to 07:00 (24 hours) | Monday to Sunday | Loading & Transport Only (to Macleod 1) |
| 07:00 to 19:00 | Monday to Sunday | Full Operation – Extraction, Processing, Rock Drilling, Loading & Transport |

- 2. The extraction, processing and transport equipment operating simultaneously in both the Macleod 3 and the Macleod 5 quarries shall be limited to:
 - a. One (1) Portable Processing Plant
 - b. One (1) Portable Asphalt Plant
 - c. One (1) Rock Drill
 - d. Two (2) Extraction Loaders
 - e. Two (2) Shipment / Asphalt Plant Loaders
 - f. 20 Off-road truck trips/hr (40 passes/hr)
- 3. The aggregate quarry equipment shall satisfy the noise emission levels listed in Table B.

 Table B: Reference Sound Pressure Levels of Aggregate Quarry Equipment

| Equipment | Reference Sound Pressure Level at 30m (dBA) |
|--|--|
| Portable Processing Plant | 85 |
| Portable Asphalt Plant | 73 |
| Rock Drill | 79 |
| Extraction Loader | 74 |
| Shipment or Asphalt Plant Loader | 70 ¹ |
| Off-Road Truck | 75 |
| 1. The chipment leaders were conversed to open | |

1 - The shipment loaders were assumed to operate at a 50 % duty cycle.

- 4. The sound emissions of all construction equipment involved in site preparation and rehabilitation activities shall comply with the sound level limits specified in the MOECC publication NPC-115 "Construction Equipment".
- 5. New equipment technology or different configurations may allow proposed changes to any portion of the extraction and processing operations including additional equipment to operate on the site, equipment to be substituted, and/or different berm heights, while still meeting the applicable sound level limits. Changes may be permitted to the site operations and noise controls provided that the changes still meet the sound level limits, as confirmed through documentation prepared by a Professional Engineer specializing in noise control. Prior to any modification, notification shall be given to the MNRF.
- 6. The quarry floor shall have an elevation of 52 m a.s.l. or lower.
- 7. The phasing order and direction of extraction shall be as indicated on the drawings.

5.3.2 Macleod 3 Quarry

The following numbered list presents a comprehensive summary of the recommended noise controls specific to the Macleod 3 Quarry Extension, as they might appear on the licence:

Macleod 3 Quarry:

- Perimeter berms shall be constructed as indicated on the drawings. The minimum required top-of-berm elevations are specified. Berm D shall be constructed prior to extraction in Phase 1. Berm E shall be constructed prior to Phase 2a. Berm F, Berm G and Berm H shall be constructed prior to Phase 2b. Once constructed, the berms shall remain in place for the project lifetime.
- 9. Operation of the portable asphalt plant in the Macleod 3 lands above an elevation of 30 m a.s.l. is prohibited.
- 10. The first bench working face shall have a minimum height of 15 m from the quarry floor. During the first lift, all equipment (with the exception of the rock drill) shall remain on the quarry floor within 60 m of the working face.

- Page 11
- 11. During the first lift of operations within Phase 2a, the portable processing plant shall not operate when the rock drill is operating within 200 m of the north extraction limit.
- 12. During the first lift of operations within Phase 2b, the portable processing plant shall not operate when the rock drill is operating within 450 m of the south extraction limit.
- 13. During the first lift of operations within Phase 2b, the portable processing plant shall not operate within 450 m of the south extraction limit. Once the working face has progressed 60 m past where the plant may operate, a local acoustic barrier with a minimum height of 8 m shall be located between the processing equipment and receptors R33 to R36, and be within 60 m of the plant equipment. This local acoustic barrier requirement may be satisfied with stockpiles maintaining the minimum height requirement.

5.3.3 Macleod 5 Quarry

The following numbered list presents a comprehensive summary of the recommended noise controls specific to the Macleod 5 Quarry Extension, as they might appear on the licence:

Macleod 5 Quarry:

- 8. Perimeter berms shall be constructed as indicated on the drawings. The minimum required top-of-berm elevations are specified. Berm C shall be constructed prior to extraction in Phase 1. Berms A and B shall be constructed prior to Phase 2. Once constructed, the berms shall remain in place for the project lifetime.
- 9. During the first lift, the portable asphalt plant shall not operate within 300 m of the north extraction limit.
- 10. The first bench working face shall have a minimum height of 12 m from the quarry floor. During the first lift, all equipment (with the exception of the rock drill) shall remain on the quarry floor within 80 m of the working face.
- 11. During the first lift, the portable processing plant shall not operate when the rock drill is operating within 200 m of the north extraction limit.

5.4 **Predicted Sound Levels with Controls**

The predicted worst case noise levels produced by operations within the proposed Macleod 3 Quarry area are summarized in Table 4.

| | Shippir (19:00 ti | ng Only o 07:00) | Extraction, Processing & Shipping | | | | | | | |
|-----------|----------------------|---------------------|-----------------------------------|---------------|--|--|--|--|--|--|
| Point of | (10.001 | Predicted | (0001 | Predicted | | | | | | |
| Reception | Sound Level Limit | Maximum Sound | Sound Level Limit | Maximum Sound | | | | | | |
| | | Level | | Level | | | | | | |
| R01 | 45 | 30 | 50 | 42 | | | | | | |
| R02 | 45 | 26 | 50 | 36 | | | | | | |
| R03 | 45 | 28 | 50 | 38 | | | | | | |
| R04 | 45 | 28 | 50 | 37 | | | | | | |
| R05 | 45 | 28 | 50 | 39 | | | | | | |
| R06 | 45 | 28 | 50 | 36 | | | | | | |
| R07 | 45 | 26 | 50 | 35 | | | | | | |
| R08 | 45 | 27 | 50 | 37 | | | | | | |
| R09 | 45 | 27 | 50 | 35 | | | | | | |
| R10 | 45 | 33 | 50 | 45 | | | | | | |
| R11 | 45 | 37 | 50 | 50 | | | | | | |
| R12 | 45 | 33 | 50 | 44 | | | | | | |
| R13 | 45 | 35 | 50 | 49 | | | | | | |
| R14 | 45 | 32 | 50 | 42 | | | | | | |
| R15 | 40 | 31 | 45 | 40 | | | | | | |
| R16 | 45 | 29 | 50 | 37 | | | | | | |
| R17 | 45 | 28 | 50 | 36 | | | | | | |
| R18 | 45 | 29 | 50 | 36 | | | | | | |
| R19 | 40 | 27 | 45 | 35 | | | | | | |
| R20 | 40 | 26 | 45 | 32 | | | | | | |
| R21 | 45 | 33 | 50 | 46 | | | | | | |
| R22 | 45 | 38 | 50 | 48 | | | | | | |
| R23 | 45 | 39 | 50 | 48 | | | | | | |
| R24 | 45 | 40 | 50 | 49 | | | | | | |
| R25 | 45 | 39 | 50 | 49 | | | | | | |
| R26 | 45 | 38 | 50 | 48 | | | | | | |
| R27 | 45 | 39 | 50 | 49 | | | | | | |
| R28 | 45 | 39 | 50 | 49 | | | | | | |
| R29 | 45 | 40 | 50 | 50 | | | | | | |
| R30 | 45 | 40 | 50 | 50 | | | | | | |
| R31 | 45 | 41 | 50 | 50 | | | | | | |
| R32 | 45 | 40 | 50 | 50 | | | | | | |
| R33 | 45 | 40 | 50 | 50 | | | | | | |
| R34 | 45 | 41 | 50 | 49 | | | | | | |
| R35 | 45 | 40 | 50 | 49 | | | | | | |
| R36 | 45 | 39 | 50 | 49 | | | | | | |
| R37 | 45 | 38 | 50 | 48 | | | | | | |
| R38 | 45 37 | | 50 | 47 | | | | | | |

| Table 4 : Macleod 3 Worst Case Predicted Sound Levels and Criteria – Hourly L_{EQ} (dBA) | ļ |
|--|---|
| | |

The predicted worst case noise levels produced by operations within the proposed Macleod 5 Quarry area are summarized in Table 5.

| | Shippir (10:00 t | ng Only | Extraction, Processing & Shipping | | | | | | |
|-----------|---------------------|----------------------|-----------------------------------|---------------|--|--|--|--|--|
| Point of | (19.00 (| UUT.UU) Dradiatad | Predicted | | | | | | |
| Reception | Sound Lovel Limit | Maximum Sound | Sound Loval Limit | Maximum Sound | | | | | |
| | | | | | | | | | |
| R01 | 45 | 36 | 50 | 45 | | | | | |
| R02 | 45 | 37 | 50 | 46 | | | | | |
| R03 | 45 | 37 | 50 | <u>47</u> | | | | | |
| R04 | 45 | 37 | 50 | 47 | | | | | |
| R05 | 45 | 38 | 50 | 49 | | | | | |
| R06 | 45 | 37 | 50 | 48 | | | | | |
| R07 | 45 | 37 | 50 | 47 | | | | | |
| R08 | 45 | 39 | 50 | 49 | | | | | |
| R09 | 45 | 39 | 50 | 48 | | | | | |
| R10 | 45 | 31 | 50 | 41 | | | | | |
| R10 | 45 | 34 | 50 | 44 | | | | | |
| R12 | 45 | 31 | 50 | 42 | | | | | |
| R12 | 45 | 34 | 50 | 45 | | | | | |
| R14 | 45 | 32 | 50 | 42 | | | | | |
| R15 | 40 | 31 | 45 | 40 | | | | | |
| R16 | 45 | 33 | 50 | 42 | | | | | |
| R17 | 45 | 33 | 50 | 43 | | | | | |
| R18 | 45 | 33 | 50 | 43 | | | | | |
| R19 | 40 | 35 | 45 | 45 | | | | | |
| R20 | 40 | 32 | 45 | 42 | | | | | |
| R21 | 45 | 33 | 50 | 43 | | | | | |
| R22 | 45 | 31 | 50 | 40 | | | | | |
| R23 | 45 | 30 | 50 | 39 | | | | | |
| R24 | 45 | 29 | 50 | 38 | | | | | |
| R25 | 45 | 29 | 50 | 38 | | | | | |
| R26 | 45 | 27 | 50 | 37 | | | | | |
| R27 | 45 | 27 | 50 | 38 | | | | | |
| R28 | 45 | 26 | 50 | 35 | | | | | |
| R29 | 45 | 27 | 50 | 38 | | | | | |
| R30 | 45 | 27 | 50 | 38 | | | | | |
| R31 | 45 | 27 | 50 | 37 | | | | | |
| R32 | 45 | 27 | 50 | 37 | | | | | |
| R33 | 45 | 27 | 50 | 36 | | | | | |
| R34 | 45 | 26 | 50 | 37 | | | | | |
| R35 | 45 | 30 | 50 | 39 | | | | | |
| R36 | 45 | 29 | 50 | 37 | | | | | |
| R37 | 45 | 28 | 50 | 37 | | | | | |
| R38 | 45 | 26 | 50 | 35 | | | | | |

Table 5 : Macleod 5 Worst Case Predicted Sound Levels and Criteria – Hourly LEQ (dBA)

With the incorporation of the recommended noise controls, the predicted noise impact will satisfy the MOECC sound level limits.

6 Truck Traffic Noise on Haul Route

The noise impact of truck traffic on public roadways is not addressed by the MOECC in their noise guidelines. However, the MOECC requires consideration of noise impact in choosing the off-property haul route.

The aggregate from the proposed Macleod 3 and 5 Quarry Extensions will be shipped to market from the existing Macleod 1 Quarry site access. The two primary access points exit and enter onto Headline Road and South Branch Road, which are both established haul routes.

This study includes a preliminary analysis of the potential off property haul routes.

Based on existing Peak AM and Peak PM Hour traffic counts provided by MacIntosh Perry, the existing annual average daily traffic (AADT) for Headline Road is approximately 1500 vehicles, and the existing AADT for South Branch Road is approximately 3000 vehicles. Both of these roads have a high percentage of heavy truck traffic (about 10-15 %).

It was assumed based on input from MacIntosh Perry that the proposed peak hour truck traffic generated by Macleod 3 and 5 Quarry Extensions in the summer months is 126 additional one-way trips per hour.

Using the existing traffic counts as a baseline, it is estimated that the sound levels from road traffic along Headline Road will increase by between 6 dB to 8 dB with the proposed peak truck traffic of 126 one-way trips per hour. The Ministry of Transportation (MTO) considers an increase in road traffic sound levels of between 5 dB and 10 dB "significant".

This analysis is conservative, and the actual future conditions may not exhibit the full change in sound level described above. Firstly, the predicted peak hour truck traffic was based on the maximum allowable annual extraction limit from the two proposed quarries combined. Since the quarries are not planned to operate simultaneously, there is a good chance this number would be reduced by at least half. Further, as the Macleod 3 and Macleod 5 quarries become operational, it is possible that the truck traffic from the existing quarries would be reduced as the material from these older quarries is depleted. Finally, the noise analysis was based on all 126 trucks leaving the site onto either Headline Road or South Branch Road, while the actual traffic distribution is likely to be spread between these two haul roads.

With this, the proposed haul route is not expected to cause an objectionable increase in road traffic noise, and is considered the preferred haul route in the context of noise impact.

7 Conclusions

Aercoustics has conducted a noise impact study for the Macleod 3 and 5 Quarry Extensions. The purpose of this noise impact study was to provide noise control recommendations in order that the operation within the proposed quarries will satisfy the Ontario Ministry of the Environment and Climate Change (MOECC) noise guidelines. Figure 2 provides a site plan outlining the aggregate quarry areas and the locations of local residences (receptors).

To this end, sound level limits, based on the MOECC noise guidelines, were developed. Calculations were then carried out to determine the worst case noise for each of the aggregate quarry operation areas at each of the receptors. Where noise was predicted to exceed the MOECC sound level limits, noise control recommendations and required equivalent source reference sound levels were provided.

The worst case has been assessed for all planned operations within the two pits, including having all the permitted equipment on the Macleod 3 property, having all the permitted equipment on the Macleod 5 property, and any shared distribution of the permitted equipment between the two properties.

Refer to Appendix B for a summary of the qualifications of the authors.

With the implementation of the recommended noise controls, the proposed aggregate quarry operation is predicted to satisfy the MOECC noise guidelines.





| C) aercoustics | Scale: N.T.S. Drawn: DF Eng: DF Date: 2017.01.17 | Project Name: Proposed Macleod 3 & 5 Quarries |
|--|--|--|
| The scope of the work outlined in this document is | 1004 Middlegate | AEL File: 15337.00 |
| limited to the acoustic, noise and/or vibration control aspects of the design. Contractor to verify all dimensions | Road, Suite 1100, Mississauga, ON P: 416.249.3361 F: 416.249.3613 | Drawing Title: Key Plan Showing Site Location Figure 1 |













Appendix A

Sample Stationary Source Noise Calculations



Receiver: R01 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 45 | | | |
| 2 | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R01 | 519482.6 | 4992921.3 | 73.9 |
| | | | | |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 67.1 | 0.0 | 1.3 | 12.6 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 69.1 | 0.0 | -0.4 | 8.7 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_ | Off-Road Trucks | 520266.4 | 4992771.2 | 57.5 | 0 | 83 | 13.8 | А | 69.0 | 0.0 | 0.8 | 5.8 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_ | Off-Road Trucks | 520270.0 | 4992694.6 | 57.5 | 0 | 83 | 21.1 | А | 69.3 | 0.0 | 0.9 | 4.4 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 69.6 | 0.0 | 1.4 | 6.7 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 69.0 | 0.0 | -0.2 | 7.3 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 43 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 69.0 | 0.0 | 0.7 | 4.1 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 39 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 68.9 | 0.0 | -0.2 | 7.9 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |

ISO 9613-2 Sample Calculation Page 1 of 38

Receiver: R02 Project: Macleod 5 Phase 2 Project Number: 15337

| X | Y |
|---|---------------|
| | X 519779.3 |

| Source ID | Source Name | Х | Y | Ζ | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 63.9 | 0.0 | -1.7 | 11.8 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 66.0 | 0.0 | -2.4 | 17.0 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 32 |
| D05_ | Off-Road Trucks | 520268.7 | 4992722.6 | 57.5 | 0 | 83 | 20.8 | А | 66.6 | 0.0 | -2.3 | 12.7 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_ | Off-Road Trucks | 520272.3 | 4992646.0 | 57.5 | 0 | 83 | 15.1 | А | 67.3 | 0.0 | -2.5 | 8.9 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 67.9 | 0.0 | -2.4 | 7.8 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 66.0 | 0.0 | -2.2 | 15.8 | 3.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 40 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 65.4 | 0.0 | -0.4 | 5.2 | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 43 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 65.8 | 0.0 | -2.2 | 15.5 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |

Z 74.1

ISO 9613-2 Sample Calculation Page 2 of 38

Receiver: R03 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | | | | | | | | | |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|
| Day | 47 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Receiver Name | Receiver ID | Х | Y | Z | | | | | | | | |
| (untitled) | R03 | 519863.7 | 4993113.9 | 73.3 | | | | | | | | |
| | | | | | | | | | | | | |
| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar |
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 63.5 | 0.0 | -0.1 | 10.4 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 65.3 | 0.0 | -0.9 | 15.5 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 66.2 | 0.0 | -0.1 | 9.7 |
| D05_ | Off-Road Trucks | 520268.9 | 4992615.0 | 57.5 | 0 | 83 | 14.9 | А | 67.2 | 0.0 | -0.2 | 5.8 |
| D05_ | Off-Road Trucks | 520246.7 | 4992535.2 | 57.5 | 0 | 83 | 21.3 | А | 67.8 | 0.0 | -0.2 | 5.4 |
| D05_ | Off-Road Trucks | 520218.5 | 4992469.3 | 57.5 | 0 | 83 | 13.1 | А | 68.3 | 0.0 | -0.2 | 5.2 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 65.2 | 0.0 | -0.8 | 14.4 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | Α | 64.3 | 0.0 | 0.5 | 4.4 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | Α | 65.1 | 0.0 | -0.8 | 14.1 |

ISO 9613-2 Sample Calculation Page 3 of 38

| Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------|------|-------|------|-----|-----|----|
| 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |
| 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41 |
| 3.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 44 |
| 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |

Receiver: R04 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | | | | | | | | | |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|
| Day | 47 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Receiver Name | Receiver ID | Х | Y | Z | | | | | | | | |
| raised bungalow | R04 | 519899.2 | 4993133.3 | 74.9 | | | | | | | | |
| | | | | | | | | | | | | |
| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar |
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 63.5 | 0.0 | -1.6 | 12.5 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 65.0 | 0.0 | -2.2 | 16.5 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 66.0 | 0.0 | -2.1 | 11.0 |
| D05_ | Off-Road Trucks | 520264.6 | 4992599.6 | 57.5 | 0 | 83 | 18.0 | А | 67.2 | 0.0 | -2.3 | 7.4 |
| D05_ | Off-Road Trucks | 520242.4 | 4992519.8 | 57.5 | 0 | 83 | 20.1 | Α | 67.9 | 0.0 | -2.4 | 7.3 |
| D05_ | Off-Road Trucks | 520218.5 | 4992469.3 | 57.5 | 0 | 83 | 13.1 | Α | 68.3 | 0.0 | -2.4 | 7.3 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 65.0 | 0.0 | -2.0 | 15.1 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 63.9 | 0.0 | -0.4 | 5.2 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 64.9 | 0.0 | -2.1 | 15.0 |

ISO 9613-2 Sample Calculation Page 4 of 38

| Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------|------|-------|------|-----|-----|----|
| 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |
| 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 42 |
| 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 45 |
| 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |

Receiver: R05 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | | | | | | | | | |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|
| Day | 49 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Receiver Name | Receiver ID | Х | Y | Z | | | | | | | | |
| (untitled) | R05 | 520012.9 | 4993071.9 | 75.5 | | | | | | | | |
| | | | | | | | | | | | | |
| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar |
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | Α | 61.2 | 0.0 | -2.1 | 14.8 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | Α | 62.5 | 0.0 | -2.8 | 18.8 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | Α | 64.0 | 0.0 | -3.0 | 14.2 |
| D05_ | Off-Road Trucks | 520251.9 | 4992554.1 | 57.5 | 0 | 83 | 22.0 | Α | 66.1 | 0.0 | -3.2 | 9.0 |
| D05_ | Off-Road Trucks | 520229.7 | 4992474.3 | 57.5 | 0 | 83 | 9.1 | Α | 67.1 | 0.0 | -3.3 | 8.7 |
| D05_ | Off-Road Trucks | 520218.5 | 4992469.3 | 57.5 | 0 | 83 | 13.1 | Α | 67.1 | 0.0 | -3.3 | 8.6 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | Α | 62.5 | 0.0 | -2.5 | 17.6 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | Α | 60.9 | 0.0 | -0.9 | 7.0 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 62.4 | 0.0 | -2.6 | 17.1 |

ISO 9613-2 Sample Calculation Page 5 of 38

| Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------|------|-------|------|-----|-----|----|
| 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 43 |
| 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47 |
| 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |

Receiver: R06 Project: Macleod 5 Phase 2

Project Number: 15337

| Time Period | Total (dBA) | | | | | | | | | | | | | | | | | | |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| Day | 48 | | | | | | | | | | | | | | | | | | |
| | | - | | | | | | | | | | | | | | | | | |
| Receiver Name | Receiver ID | Х | Y | Z | | | | | | | | | | | | | | | |
| (untitled) | R06 | 519995.7 | 4993168.2 | 74.2 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 63.5 | 0.0 | -1.8 | 13.1 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 64.3 | 0.0 | -2.4 | 17.7 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 65.6 | 0.0 | -2.5 | 12.3 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 67.5 | 0.0 | -2.7 | 7.8 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520223.6 | 4992469.8 | 57.5 | 0 | 83 | 10.0 | А | 68.3 | 0.0 | -2.8 | 7.7 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_ | Off-Road Trucks | 520213.6 | 4992468.7 | 57.5 | 0 | 83 | 10.1 | А | 68.3 | 0.0 | -2.8 | 7.7 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 64.3 | 0.0 | -2.1 | 16.4 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 42 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 62.8 | 0.0 | -0.5 | 5.6 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 46 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 64.2 | 0.0 | -2.2 | 16.1 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |

ISO 9613-2 Sample Calculation Page 6 of 38

Receiver: R07 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | | | | | | | | | |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|
| Day | 47 | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| Receiver Name | Receiver ID | Х | Y | Z | | | | | | | | |
| (untitled) | R07 | 520244.7 | 4993187.4 | 72.4 | | | | | | | | |
| | | | | | | | | | | | | |
| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar |
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 64.1 | 0.0 | -0.6 | 9.4 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 62.7 | 0.0 | -1.5 | 19.3 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 64.7 | 0.0 | -0.7 | 14.5 |
| D05_ | Off-Road Trucks | 520265.5 | 4992602.8 | 57.5 | 0 | 83 | 17.5 | А | 66.3 | 0.0 | -0.7 | 8.4 |
| D05_ | Off-Road Trucks | 520243.3 | 4992523.0 | 57.5 | 0 | 83 | 20.4 | А | 67.5 | 0.0 | -0.6 | 7.6 |
| D05_ | Off-Road Trucks | 520218.5 | 4992469.3 | 57.5 | 0 | 83 | 13.1 | А | 68.1 | 0.0 | -0.6 | 7.1 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 62.9 | 0.0 | -1.3 | 18.6 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | Α | 60.2 | 0.0 | 0.0 | 9.8 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 63.0 | 0.0 | -1.3 | 17.4 |

ISO 9613-2 Sample Calculation Page 7 of 38

| Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------|------|-------|------|-----|-----|----|
| 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 32 |
| 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41 |
| 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 45 |
| 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |

Receiver: R08 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 49 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R08 | 520273.8 | 4993231.5 | 74.5 |
| | | | | |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 65.0 | 0.0 | -2.2 | 10.7 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 63.6 | 0.0 | -2.6 | 17.6 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 65.4 | 0.0 | -2.7 | 8.8 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 67.7 | 0.0 | -3.0 | 8.0 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520218.5 | 4992469.3 | 57.5 | 0 | 83 | 13.1 | А | 68.7 | 0.0 | -3.0 | 7.9 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 63.8 | 0.0 | -2.4 | 16.4 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 43 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 61.4 | 0.0 | -0.6 | 6.1 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 63.9 | 0.0 | -2.5 | 15.8 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |

ISO 9613-2 Sample Calculation Page 8 of 38

Receiver: R09 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | i otal (dBA) | | | |
|---------------|--------------|----------|-----------|------|
| Day | 48 | | | |
| | | - | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R09 | 520339.6 | 4993252.2 | 71.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 65.8 | 0.0 | -0.6 | 7.3 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 64.1 | 0.0 | -0.8 | 16.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 65.8 | 0.0 | -0.1 | 6.6 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 68.0 | 0.0 | -0.2 | 5.2 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520218.5 | 4992469.3 | 57.5 | 0 | 83 | 13.1 | А | 69.0 | 0.0 | -0.2 | 5.1 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 64.3 | 0.0 | -0.7 | 15.1 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 42 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 62.1 | 0.0 | 0.4 | 5.2 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 64.4 | 0.0 | -0.8 | 14.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |

ISO 9613-2 Sample Calculation Page 9 of 38

Receiver: R10 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | |
|---------------|-------------|----------|-----------|
| Day | 38 | | |
| 2 | | | |
| Receiver Name | Receiver ID | Х | Y |
| (untitled) | R10 | 520388.4 | 4991014.0 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 76.0 | 0.0 | 1.4 | 3.5 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | Α | 76.1 | 0.0 | 0.3 | 4.5 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 74.8 | 0.0 | 1.8 | 3.2 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.6 | 0.0 | 1.6 | 3.3 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.0 | 0.0 | 0.6 | 4.2 | 6.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 76.5 | 0.0 | 0.9 | 0.0 | 7.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 76.0 | 0.0 | 0.2 | 4.5 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |

Z 62.5

ISO 9613-2 Sample Calculation Page 10 of 38

Receiver: R11 Project: Macleod 5 Phase 2 Project Number: 15337

| l ime Period | I otal (dBA) | | | |
|---------------|--------------|----------|-----------|------|
| Day | 41 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R11 | 520362.2 | 4991363.5 | 66.7 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.1 | 0.0 | -1.1 | 5.9 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.2 | 0.0 | -1.9 | 6.7 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 72.5 | 0.0 | -1.2 | 6.0 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 73.6 | 0.0 | -1.6 | 6.3 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.1 | 0.0 | -1.8 | 6.5 | 5.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 74.7 | 0.0 | -1.0 | 0.0 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 74.1 | 0.0 | -1.8 | 6.6 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |

ISO 9613-2 Sample Calculation Page 11 of 38

Receiver: R12 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 39 | | | |
| | | - | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R12 | 520486.3 | 4991193.4 | 63.2 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 75.2 | 0.0 | 1.3 | 3.6 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.2 | 0.0 | 0.0 | 4.8 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 73.8 | 0.0 | 1.6 | 3.3 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 74.7 | 0.0 | 1.3 | 3.4 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.2 | 0.0 | 0.3 | 4.5 | 6.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.7 | 0.0 | 0.7 | 0.0 | 7.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.2 | 0.0 | 0.1 | 4.7 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

ISO 9613-2 Sample Calculation Page 12 of 38

Receiver: R13 Project: Macleod 5 Phase 2 Project Number: 15337

| I ime Period | I otal (dBA) | | | |
|---------------|--------------|----------|-----------|------|
| Day | 42 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R13 | 520474.3 | 4991402.2 | 68.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.0 | 0.0 | -1.2 | 6.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.0 | 0.0 | -2.2 | 6.9 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 72.4 | 0.0 | -1.4 | 6.1 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 73.4 | 0.0 | -1.8 | 6.6 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.0 | 0.0 | -2.0 | 6.8 | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 39 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 74.6 | 0.0 | -1.2 | 0.0 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 74.0 | 0.0 | -2.0 | 6.8 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |

ISO 9613-2 Sample Calculation Page 13 of 38

Receiver: R14 Project: Macleod 5 Phase 2 Project Number: 15337

| i otal (dBA) | | | |
|--------------|--------------------|-------------------------------|--|
| 39 | | | |
| | | | |
| Receiver ID | Х | Y | Z |
| R14 | 520647.7 | 4991326.1 | 62.8 |
| | Receiver ID R14 | Receiver ID X R14 520647.7 | Receiver ID X Y R14 520647.7 4991326.1 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.7 | 0.0 | 1.0 | 3.8 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.7 | 0.0 | -0.2 | 5.0 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520267.8 | 4992611.0 | 57.5 | 0 | 83 | 15.9 | А | 73.5 | 0.0 | 1.1 | 3.7 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_ | Off-Road Trucks | 520245.6 | 4992531.2 | 57.5 | 0 | 83 | 21.0 | А | 73.1 | 0.0 | 1.4 | 3.5 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 74.1 | 0.0 | 1.1 | 3.7 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.6 | 0.0 | 0.1 | 4.7 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.2 | 0.0 | 0.5 | 4.3 | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 74.6 | 0.0 | -0.1 | 4.9 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

ISO 9613-2 Sample Calculation Page 14 of 38

Receiver: R15 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 39 | | | |
| 2 | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R15 | 520889.2 | 4991519.6 | 65.1 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.4 | 0.0 | -2.0 | 6.9 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.1 | 0.0 | -2.1 | 8.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 72.7 | 0.0 | -1.7 | 7.7 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 73.5 | 0.0 | -1.9 | 8.6 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.0 | 0.0 | -2.0 | 7.8 | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 74.6 | 0.0 | -1.2 | 5.9 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 74.1 | 0.0 | -2.1 | 7.8 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

ISO 9613-2 Sample Calculation Page 15 of 38

Receiver: R16 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 39 | | | |
| | | - | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R16 | 521230.2 | 4991590.5 | 63.3 |

| Source ID | Source Name | Х | Y | Ζ | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 75.2 | 0.0 | -1.9 | 6.7 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.8 | 0.0 | -2.1 | 6.9 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 73.7 | 0.0 | -1.7 | 7.6 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 74.4 | 0.0 | -1.8 | 6.6 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.8 | 0.0 | -2.0 | 6.8 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.2 | 0.0 | -1.1 | 5.9 | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 74.8 | 0.0 | -2.0 | 6.8 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

ISO 9613-2 Sample Calculation Page 16 of 38

Receiver: R17 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 39 | | | |
| 2 | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R17 | 521321.8 | 4991675.4 | 63.6 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 75.3 | 0.0 | -2.0 | 6.7 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.7 | 0.0 | -2.1 | 7.0 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 73.8 | 0.0 | -1.7 | 7.2 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_ | Off-Road Trucks | 520269.1 | 4992714.6 | 57.5 | 0 | 83 | 21.4 | А | 74.4 | 0.0 | -1.8 | 6.6 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.7 | 0.0 | -2.0 | 6.8 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.1 | 0.0 | -0.9 | 5.6 | 7.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 74.8 | 0.0 | -2.0 | 6.8 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

ISO 9613-2 Sample Calculation Page 17 of 38

Receiver: R18 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 40 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R18 | 521350.8 | 4991759.5 | 64.1 |
| | | | | |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 75.1 | 0.0 | -2.0 | 6.8 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.5 | 0.0 | -2.0 | 6.9 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 73.6 | 0.0 | -1.7 | 7.2 | 3.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_ | Off-Road Trucks | 520268.7 | 4992721.9 | 57.5 | 0 | 83 | 20.9 | А | 74.2 | 0.0 | -1.9 | 6.8 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_ | Off-Road Trucks | 520272.4 | 4992645.3 | 57.5 | 0 | 83 | 14.9 | А | 73.9 | 0.0 | -1.8 | 6.7 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.5 | 0.0 | -1.9 | 6.7 | 5.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 74.9 | 0.0 | -0.6 | 5.3 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 74.6 | 0.0 | -2.0 | 6.8 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

ISO 9613-2 Sample Calculation Page 18 of 38

Receiver: R19 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 41 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R19 | 521384.6 | 4992108.9 | 64.6 |
| | | | | |
| 0 | | | | |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.2 | 0.0 | -1.9 | 6.7 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 73.3 | 0.0 | -1.7 | 6.4 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 32 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 72.7 | 0.0 | -1.9 | 7.0 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_ | Off-Road Trucks | 520267.6 | 4992745.6 | 57.5 | 0 | 83 | 18.8 | А | 73.2 | 0.0 | -1.5 | 6.3 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_ | Off-Road Trucks | 520271.7 | 4992659.4 | 57.5 | 0 | 83 | 17.7 | А | 72.9 | 0.0 | -1.7 | 6.6 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 73.3 | 0.0 | -1.5 | 6.3 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 40 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 73.7 | 0.0 | -0.1 | 4.9 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 32 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 73.4 | 0.0 | -1.7 | 6.5 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |

ISO 9613-2 Sample Calculation Page 19 of 38

Receiver: R20 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 40 | | | |
| 2 | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R20 | 521729.9 | 4992426.8 | 63.2 |
| | | | | |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 75.4 | 0.0 | -1.5 | 6.3 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.5 | 0.0 | -1.3 | 6.1 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ | Off-Road Trucks | 520258.3 | 4992577.0 | 57.5 | 0 | 83 | 20.4 | А | 74.4 | 0.0 | -1.4 | 6.2 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_ | Off-Road Trucks | 520236.1 | 4992497.2 | 57.5 | 0 | 83 | 17.5 | А | 74.5 | 0.0 | -1.5 | 6.3 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_ | Off-Road Trucks | 520270.1 | 4992693.2 | 57.5 | 0 | 83 | 21.0 | А | 74.4 | 0.0 | -1.3 | 6.1 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.6 | 0.0 | -1.2 | 6.0 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 74.7 | 0.0 | 0.1 | 0.0 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 74.6 | 0.0 | -1.4 | 6.2 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

ISO 9613-2 Sample Calculation Page 20 of 38

Receiver: R21 Project: Macleod 5 Phase 2 Project Number: 15337

| појести | umber. | 10007 | |
|---------|--------|-------|--|
| | | | |
| | | | |

Time Period

| Day | 43 | | | |
|-----------------|-------------|----------|-----------|------|
| | | | | |
| Receiver Name | Receiver ID | X | Y | Z |
| raised bungalow | R21 | 519180.7 | 4992740.1 | 73.5 |

Total (dBA)

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 70.2 | 0.0 | -0.1 | 14.9 | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 71.8 | 0.0 | -1.4 | 7.4 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 71.7 | 0.0 | -0.7 | 8.3 | 3.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 71.7 | 0.0 | -1.0 | 6.3 | 3.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 71.7 | 0.0 | -1.3 | 6.3 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 71.9 | 0.0 | -0.3 | 5.1 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 71.6 | 0.0 | -1.3 | 6.6 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |

ISO 9613-2 Sample Calculation Page 21 of 38

Receiver: R22 Project: Macleod 5 Phase 2

Project Number: 15337

| l ime Period | i otal (dBA) | | |
|---------------|--------------|----------|-----------|
| Day | 39 | | |
| | | ' | |
| Receiver Name | Receiver ID | Х | Y |
| (untitled) | R22 | 518796.5 | 4992567.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 73.4 | 0.0 | 2.1 | 7.5 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 74.5 | 0.0 | 0.4 | 4.4 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 74.3 | 0.0 | 1.9 | 4.8 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 74.4 | 0.0 | 1.7 | 3.2 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 74.5 | 0.0 | 0.8 | 4.1 | 5.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 74.6 | 0.0 | 1.4 | 3.4 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 74.4 | 0.0 | 0.5 | 4.4 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23 |

75.5

ISO 9613-2 Sample Calculation Page 22 of 38

Receiver: R23 Project: Macleod 5 Phase 2 Project Number: 15337

| Day 39 |
|--------|

| Receiver Name | Receiver ID | Х | Y | Z |
|---------------|-------------|----------|-----------|------|
| (untitled) | R23 | 518647.6 | 4992398.6 | 79.8 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.5 | 0.0 | -0.1 | 8.8 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.5 | 0.0 | -1.3 | 6.1 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 75.1 | 0.0 | -0.9 | 10.4 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.4 | 0.0 | -1.1 | 5.9 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.4 | 0.0 | -1.2 | 6.0 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.6 | 0.0 | -0.2 | 0.0 | 7.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 75.4 | 0.0 | -1.3 | 6.1 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

ISO 9613-2 Sample Calculation Page 23 of 38

Receiver: R24 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 38 | | | |
| 2 | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R24 | 518730.0 | 4992347.3 | 76.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.1 | 0.0 | 2.2 | 11.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.1 | 0.0 | 0.5 | 4.6 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 74.7 | 0.0 | 2.0 | 4.3 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.0 | 0.0 | 1.8 | 3.2 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.1 | 0.0 | 0.9 | 4.1 | 6.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.3 | 0.0 | 1.5 | 3.3 | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.0 | 0.0 | 0.5 | 4.7 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

ISO 9613-2 Sample Calculation Page 24 of 38

Receiver: R25 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | |
|---------------|-------------|----------|-----------|
| Day | 38 | | |
| | | | |
| Receiver Name | Receiver ID | Х | Y |
| (untitled) | R25 | 518610.3 | 4992307.8 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.8 | 0.0 | 0.0 | 12.3 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.8 | 0.0 | -1.3 | 6.2 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 75.4 | 0.0 | -0.9 | 6.8 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.6 | 0.0 | -1.1 | 5.9 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.8 | 0.0 | -1.1 | 5.9 | 6.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.9 | 0.0 | -0.2 | 4.9 | 7.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 75.7 | 0.0 | -1.4 | 6.2 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

76.9

ISO 9613-2 Sample Calculation Page 25 of 38

Receiver: R26 Project: Macleod 5 Phase 2

Project Number: 15337

| Time Period | Total (dBA) |
|---------------|-------------|
| Day | 36 |
| | |
| Receiver Name | Receiver ID |

| (untitled) R26 518627.1 4992270.8 73 | 73.2 |
|--------------------------------------|------|

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|-----------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.8 | 0.0 | 0.6 | 6.8 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.6 | 0.0 | 1.9 | 6.6 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.7 | 0.0 | 1.0 | 5.8 | 6.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.9 | 0.0 | 1.6 | 3.3 | 7.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.7 | 0.0 | 0.5 | 6.7 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |

ISO 9613-2 Sample Calculation Page 26 of 38

Receiver: R27 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) |
|---------------|-------------|
| Day | 38 |
| | |
| Receiver Name | Receiver ID |

| Receiver Name | Receiver ID | Х | Y | Z |
|---------------|-------------|----------|-----------|------|
| (untitled) | R27 | 518660.3 | 4992222.0 | 75.2 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.7 | 0.0 | 0.0 | 9.0 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.7 | 0.0 | -1.3 | 6.1 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 75.2 | 0.0 | -0.9 | 9.0 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.5 | 0.0 | -1.1 | 5.9 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.6 | 0.0 | -1.2 | 5.9 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.9 | 0.0 | -0.1 | 4.9 | 7.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.6 | 0.0 | -1.3 | 6.1 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

ISO 9613-2 Sample Calculation Page 27 of 38

Receiver: R28 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | |
|---------------|-------------|---|
| Day | 35 | |
| | | |
| Receiver Name | Receiver ID | Х |

| Receiver Name | Receiver ID | Λ | Ϋ́ | Ζ. |
|---------------|-------------|----------|-----------|------|
| (untitled) | R28 | 518698.9 | 4992148.5 | 72.4 |
| | | | | |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|-----------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.6 | 0.0 | 0.6 | 7.8 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.4 | 0.0 | 1.9 | 6.5 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.6 | 0.0 | 1.0 | 6.9 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.8 | 0.0 | 1.6 | 3.3 | 7.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.5 | 0.0 | 0.5 | 7.6 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |

ISO 9613-2 Sample Calculation Page 28 of 38

Receiver: R29 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|-----------------|-------------|----------|-----------|------|
| Day | 38 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Ζ |
| raised bungalow | R29 | 518839.3 | 4991901.2 | 72.3 |

| Source ID | Source Name | Х | Y | Ζ | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.7 | 0.0 | 0.2 | 11.2 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.6 | 0.0 | -1.1 | 5.9 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 74.8 | 0.0 | -0.5 | 10.4 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.3 | 0.0 | -0.7 | 5.5 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.5 | 0.0 | -0.9 | 5.7 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.9 | 0.0 | -0.1 | 4.8 | 7.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.5 | 0.0 | -1.1 | 5.9 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

ISO 9613-2 Sample Calculation Page 29 of 38

Receiver: R30 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 38 | | | |
| | | - | | |
| Receiver Name | Receiver ID | X | Y | Z |
| (untitled) | R30 | 518884.3 | 4991822.8 | 70.0 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 74.7 | 0.0 | 2.3 | 7.8 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 75.6 | 0.0 | 0.6 | 4.3 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 29 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.3 | 0.0 | 1.9 | 3.2 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 75.6 | 0.0 | 1.0 | 3.9 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 75.9 | 0.0 | 1.6 | 3.3 | 7.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 75.5 | 0.0 | 0.5 | 4.4 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |

ISO 9613-2 Sample Calculation Page 30 of 38

Receiver: R31 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | |
|---------------|-------------|----------|-----------|
| Day | 37 | | |
| | | | |
| Receiver Name | Receiver ID | Х | Y |
| (untitled) | R31 | 519079.0 | 4991447.0 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 75.4 | 0.0 | 2.2 | 10.8 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 76.1 | 0.0 | 0.7 | 4.5 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 75.1 | 0.0 | 2.0 | 5.7 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.8 | 0.0 | 1.9 | 3.6 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.1 | 0.0 | 1.0 | 4.0 | 6.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | Α | 76.5 | 0.0 | 1.6 | 3.2 | 7.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 76.0 | 0.0 | 0.5 | 4.7 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |

Z 62.7

ISO 9613-2 Sample Calculation Page 31 of 38

Receiver: R32 Project: Macleod 5 Phase 2 Project Number: 15337

| Day 36 |
|--------|

| Receiver Name | Receiver ID | Х | Y | Z |
|---------------|-------------|----------|-----------|------|
| (untitled) | R32 | 519050.3 | 4991332.9 | 61.4 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 76.0 | 0.0 | 2.2 | 6.4 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | Α | 76.6 | 0.0 | 0.8 | 4.9 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 76.3 | 0.0 | 1.9 | 3.1 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.6 | 0.0 | 1.1 | 4.3 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 77.0 | 0.0 | 1.7 | 3.2 | 8.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 76.5 | 0.0 | 0.5 | 5.1 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20 |

ISO 9613-2 Sample Calculation Page 32 of 38

Receiver: R33 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | |
|---------------|-------------|----------|-----------|
| Day | 34 | | |
| | | · | |
| Receiver Name | Receiver ID | Х | Y |
| (untitled) | R33 | 519505.2 | 4990590.1 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 78.0 | 0.0 | -0.3 | 5.1 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 78.4 | 0.0 | -1.2 | 6.0 | 6.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 77.4 | 0.0 | -0.9 | 5.7 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 78.0 | 0.0 | -1.0 | 5.8 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 78.4 | 0.0 | -1.1 | 5.9 | 7.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 32 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 78.7 | 0.0 | -0.2 | 4.9 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 78.3 | 0.0 | -1.4 | 6.2 | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |

63.5

ISO 9613-2 Sample Calculation Page 33 of 38

Receiver: R34 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | |
|---------------|-------------|----------|-----------|
| Day | 35 | | |
| | | | |
| Receiver Name | Receiver ID | Х | Y |
| (untitled) | R34 | 519682.4 | 4990698.9 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 77.5 | 0.0 | 2.0 | 3.3 | 5.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 77.8 | 0.0 | 0.8 | 4.1 | 6.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 76.7 | 0.0 | 2.1 | 3.0 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 77.4 | 0.0 | 1.9 | 3.0 | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 77.8 | 0.0 | 1.2 | 3.7 | 7.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 78.2 | 0.0 | 1.7 | 3.2 | 8.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | A | 77.7 | 0.0 | 0.5 | 4.4 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |

Z 59.0

ISO 9613-2 Sample Calculation Page 34 of 38

Receiver: R35 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) |
|-------------|-------------|
| Day | 37 |
| | |
| | |

| | | ~ | | <u> </u> |
|------------|-----|----------|-----------|----------|
| (untitled) | R35 | 520073.4 | 4990930.3 | 62.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 76.3 | 0.0 | -0.8 | 5.6 | 5.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 76.5 | 0.0 | -1.5 | 6.3 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 75.2 | 0.0 | -1.0 | 9.4 | 4.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 76.0 | 0.0 | -1.2 | 6.2 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.5 | 0.0 | -1.3 | 6.2 | 6.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 76.9 | 0.0 | -0.5 | 5.3 | 8.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 76.4 | 0.0 | -1.5 | 6.4 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |

ISO 9613-2 Sample Calculation Page 35 of 38

Receiver: R36 Project: Macleod 5 Phase 2 Project Number: 15337

| I ime Period | l otal (dBA) | | | |
|---------------|--------------|----------|-----------|------|
| Day | 37 | | | |
| | | - | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R36 | 520107.8 | 4990973.0 | 59.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 76.1 | 0.0 | 1.5 | 3.4 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 76.3 | 0.0 | 0.5 | 4.4 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 75.0 | 0.0 | 1.9 | 6.0 | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.8 | 0.0 | 1.8 | 3.3 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.2 | 0.0 | 0.8 | 4.0 | 6.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 76.7 | 0.0 | 1.3 | 3.6 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 76.2 | 0.0 | 0.4 | 4.5 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |

ISO 9613-2 Sample Calculation Page 36 of 38

Receiver: R37 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 37 | | | |
| | | | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R37 | 520173.4 | 4990981.1 | 62.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|------|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 76.0 | 0.0 | -1.0 | 5.8 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 76.2 | 0.0 | -1.5 | 7.2 | 5.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ | Off-Road Trucks | 520250.8 | 4992550.2 | 57.5 | 0 | 83 | 22.2 | А | 74.9 | 0.0 | -1.0 | 11.1 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 75.8 | 0.0 | -1.3 | 7.4 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.2 | 0.0 | -1.4 | 6.9 | 6.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 76.7 | 0.0 | -0.6 | 5.4 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 76.2 | 0.0 | -1.6 | 6.7 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 21 |

ISO 9613-2 Sample Calculation Page 37 of 38

Receiver: R38 Project: Macleod 5 Phase 2 Project Number: 15337

| Time Period | Total (dBA) | | | |
|---------------|-------------|----------|-----------|------|
| Day | 35 | | | |
| | | - | | |
| Receiver Name | Receiver ID | Х | Y | Z |
| (untitled) | R38 | 520222.9 | 4990924.7 | 59.5 |

| Source ID | Source Name | Х | Y | Z | Refl. | Lw | L/A | Freq | Adiv | K0 | Agr | Abar | Aatm | Afol | Ahous | Cmet | Dc | RL | Lr |
|------------------|------------------|----------|-----------|------|-------|-----|------|------|------|-----|-----|------|------|------|-------|------|-----|-----|----|
| D05_AsphaltPlant | Asphalt Plant | 520097.5 | 4992761.6 | 59.0 | 0 | 110 | 0.0 | А | 76.3 | 0.0 | 1.5 | 5.7 | 5.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22 |
| D05_Loaders | Loaders | 520275.8 | 4992802.9 | 57.5 | 0 | 115 | 0.0 | А | 76.5 | 0.0 | 0.5 | 6.2 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26 |
| D05_ | Off-Road Trucks | 520269.5 | 4992706.6 | 57.5 | 0 | 83 | 21.9 | А | 76.0 | 0.0 | 1.7 | 5.5 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17 |
| D05_Plant | Plant | 520268.8 | 4992795.2 | 59.0 | 0 | 123 | 0.0 | А | 76.4 | 0.0 | 0.8 | 5.7 | 6.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 33 |
| D05_Drill | Rock Drill | 520275.7 | 4992899.7 | 76.0 | 0 | 117 | 0.0 | А | 76.9 | 0.0 | 1.2 | 3.6 | 8.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| D05_ShipLoaders | Shipment Loaders | 520254.0 | 4992791.4 | 57.5 | 0 | 110 | 0.0 | А | 76.4 | 0.0 | 0.3 | 5.9 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19 |

ISO 9613-2 Sample Calculation Page 38 of 38

Appendix B

Qualifications of the Authors





Aercoustics Engineering Ltd. 50 Ronson Drive, Suite 165 Toronto, ON M9W 1B3 Tel: 416-249-3361 Fax 416-249-3613 aercoustics.com

derek flake M.Sc., P.Eng.

Profile

Derek is an employee of Aercoustics Engineering Limited, an engineering consulting company specializing in acoustics, noise and vibration. Prior to that, he worked for several years at another acoustics, noise and vibration firm and he completed a Master of Science in the field of ultrasound transducer design. Derek is a Professional Engineer with the Professional Engineers Ontario.

Derek has been recognized by the Ontario Municipal Board (OMB) as an expert in environmental noise and has provided expert opinion testimony to the Board.

Employment History

- 2012 Present Project Engineer, Aercoustics Engineering Ltd.
- 2009 2012 Engineering Intern, Jade Acoustics Incorporated

Additional Activities / Committees

2014 – Present Member of Training and Development Committee at the Ontario Sand, Stone and Gravel Association (OSSGA)

Professional Registration / Affiliations

Licensed Professional Engineer with the Professional Engineers of Ontario (PEO)

Education

| Master of Science (M.Sc.) | Medical Biophysics (Ultrasound Physics) University of Toronto |
|---------------------------------------|--|
| Bachelor of Applied Science (B.A.Sc.) | Engineering Physics (Mechanical) Queen's University |

Courses and Speaking Events

Instructor, Municipal Law Enforcement Officers' Association (MLEOA) Environmental Noise training courses. This is an annual four-day training program which provides the officers with an understanding of sound measurement and its relationship with environmental noise impact. The officer is trained in the utilization of technical equipment required in the application of sound measurement theories. This course also covers the unique elements of qualitative noise regulations and is authorized by the Ministry of the Environment and Climate Change.

Attended PSMJ Resources Project Management Bootcamp, Toronto, 2016.

Attended course on *"Aggregates 101 Training,"* OSSGA Health and Safety Seminar, Toronto, 2015. Mr. Flake both attended and aided in the development for parts of the course.

Speaker, "*The New NPC-300 Noise Guideline: What does it mean for your noise by-law?*" MLEOA Annual General Meeting, Kingston, 2014.

Professional Activities

Environmental Compliance Approvals

Mr. Flake was involved in several noise and vibration impact studies for industrial uses. He has prepared Acoustic Assessment Reports for use in applications for Environmental Compliance Approvals. These studies provided conceptual as well as detailed designs of noise mitigation to reduce in-plant noise or noise emission into the environment. In-plant projects generally involved noise surveys, detailed noise/vibration measurements of equipment, data analysis and computer modelling of noise controls to evaluate effectiveness. In some cases, detailed designs and specifications have been provided.

Land Use Planning

In the field of environmental acoustics, Mr. Flake has completed numerous projects involving noise impact from planned stationary sources as well as noise impact studies for proposed residential developments. These projects included conducting studies for proposed operations and developments and addressing noise concerns for existing operations. Peer reviews of noise studies prepared by other acoustic consultants were also completed by Mr. Flake. In the land use planning process, Mr. Flake has completed studies which provide assessments of the noise impact on proposed residential, commercial and industrial developments from the local environment which includes noise from road, rail, and aircraft traffic and stationary noise sources such as industrial and commercial uses. Also, vibration measurements and studies were conducted to assess vibration from rail traffic such as trains, streetcars and subways. The studies include recommendations for noise control of the sources, dwelling building components, wall,

window, and door constructions to satisfy the Ministry of Environment and Climate Change noise guidelines.

In addition, Mr. Flake has conducted architectural drawing reviews for residential and commercial developments to ensure the construction plans will meet the requirements set out in environmental noise studies and specifications documents.

Aggregates

Mr. Flake has done work in the aggregates industry which involved the preparation and support of over a dozen noise impact studies to determine technical feasibility of aggregate license applications to the Ministry of Natural Resources. This work included preparing the noise impact studies, supporting the findings at public meetings, and performing acoustic audits to confirm compliance with the noise requirements.

Renewable Energy

Mr. Flake has performed IEC 61400 testing of Wind Turbines and Transformer Station noise audits.

Noise Source Investigations and Room Acoustics

Mr. Flake has completed several projects involving design of spaces where sound privacy and room acoustics were critical. These projects have included noise complaint investigation, room acoustics, mechanical noise, noise measurements to quantify sound isolation, and environmental noise impact. Examples of spaces include cinemas, hospitals and residential condominiums.



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PROFESSIONAL PROFILE

H. ROBERT RIMROTT, M.A.Sc., P.Eng.

EDUCATION

B.A.Sc., University of Toronto M.A.Sc., University of Toronto

PROFESSIONAL MEMBERSHIPS

Professional Engineer, Ontario (PEO) Consulting Engineer, Ontario (PEO) Acoustical Society of America (ASA) American Society of Mechanical Engineers (ASME)

PROFESSIONAL BACKGROUND

In 1987, Mr. Rimrott began his work as an acoustics and vibration consultant. In his many years in this field, he has completed many successful projects. In 1992, he joined Aercoustics Engineering Limited. He is a partner and principal engineer with the firm. Mr. Rimrott is recognized as an expert by the Ministry of Environment and Energy and has provided expert testimony in the forum of the Ontario Municipal Board Hearings.

In the field of environmental acoustics, Mr. Rimrott has completed numerous projects involving noise from planned stationary sources as well as noise studies for residential developments. These projects included conducting studies for both proposed operations and developments, studies addressing noise concerns for existing operations, and peer review of noise studies conducted by other acoustic consultants. Projects have included Industrial plants, Aggregate Pits and Quarries, and many other operations.

In the land use planning process Mr. Rimrott has completed studies provide assessments of the noise on the proposed residential development from the local environment which includes noise from road, rail, and aircraft traffic and stationary noise sources such as industries, and gun clubs. The studies include recommendations on noise control of the sources, dwelling building components, wall, window, and door constructions to satisfy the Ministry of Environment and Energy noise guidelines.

Partial Listing of Representative Projects

PITS AND QUARRIES

INDUSTRIAL

Dufferin Aggregates, many Pits Wimpey, Nolan Quarry Truax Pit United Aggregates, Acton quarry Cox Construction, Puslinch Pit Beamish Construction, Coboconk Quarry Coutrice Steel Co Steel Lasco Georga Pacific Flakeboard Boise Cascade Oriented Strand Board Plant Boise Cascade Co-Generation Station Moore Business Forms Metal Coating Alcan Foil Products INCO Alcan Rolled Products Townsend Lumber

BLAST / IMPULSE NOISES

Quarry Blasting Noise Meaford Artillery Range Walker Dog Kennel Pioneer Sportsmen Club

