APPENDIX H

Noise Assessment

REPORT

De Havilland Field Project

Noise Assessment

Submitted to:

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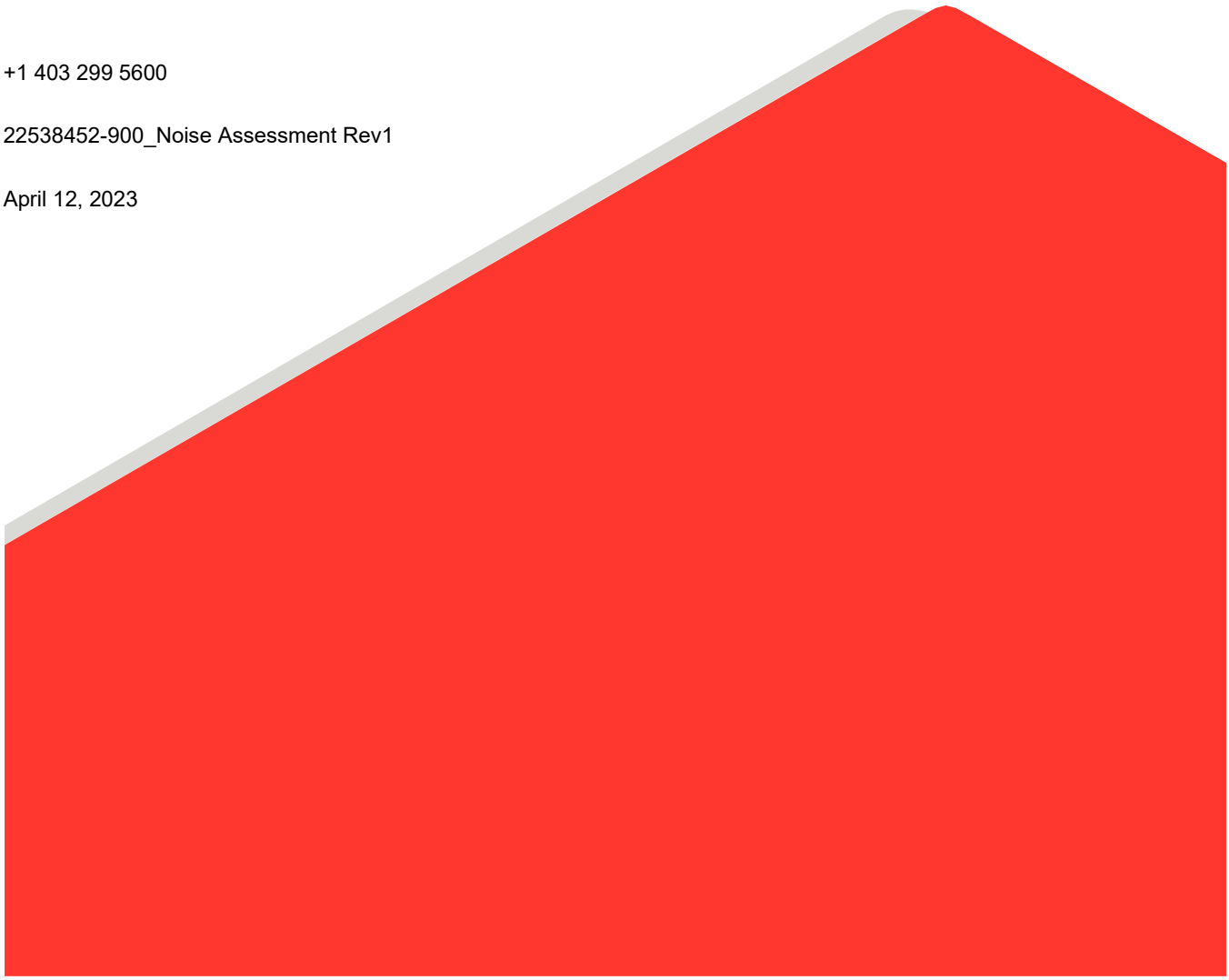

Distribution List

1 electronic copy - 2150038 Alberta Inc.

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1.0 INTRODUCTION

2150038 Alberta Inc. (”the Proponent”) is proposing development of the De Havilland Field (the Project) on existing farmland, which will soon be converted to industrial land, in Wheatland County, Alberta. The proposed Project site is located approximately 14 km west of the town of Strathmore and 20 km east of the City of Calgary. The Project site is bordered by TransCanada Highway 1, approximately 800 m north of the perimeter, by Range Road 264 along the eastern side, by Range Road 265 along the western side, and by Township Road 240 along the southern border. The proposed site occupies approximately 600 ha of existing farmland, which will soon be converted to industrial land, divided into three lots: an airstrip on the southern lot (Cell 1) and two commercial/industrial areas on the eastern and northern lots (Cell 2 and Cell 3, respectively).

The Proponent has retained WSP Canada Inc. (WSP) to prepare a noise assessment for the Project. The results of WSP’s noise assessment for the Project are presented in this report. The Project noise assessment report is structured as follows:

- Section 1 introduces the Project noise assessment.
- Section 2 presents a brief description of Project activities with the potential to effect noise levels in the surrounding environment.
- Section 3 identifies regulatory guidance that was considered in the Project noise assessment.
- Section 4 outlines the approach used in the Project noise assessment, including a description of the:
  - noise study area and relevant receptors
  - framework used to classify Project noise effects
  - methodology used to predict Project noise levels
- Section 5 provides a qualitative description of existing conditions in the noise study area.
- Section 6 presents results from the Project noise assessment, including a classification of potential effects.
- Section 7 summarizes and discusses the results of the Project noise assessment.

2.0 PROJECT ACTIVITIES

The Project noise assessment considered potential effects during both construction and operations. Major construction activities for the Project are anticipated to begin in 2024 and end sometime between 2034 and 2039 (i.e., a construction period of 10 to 15 years). Project operations are anticipated to begin in 2026 and continue for approximately 100 years.

Most Project construction activities are anticipated to occur 12 hours per day during daylight hours, with construction activities occasionally occurring 24 hours per day. During Project construction:

- the site will be cleared and levelled using engine-driven mobile equipment
- building foundations will be poured using concrete produced by a ready-mix concrete plant located on-site
- buildings will be erected using cranes and engine-driven mobile equipment (pile driving is not expected to be required during Project construction)

Details required to model or otherwise quantify noise from Project construction activities are not presently available. Therefore, as discussed in more detail in Section 4.2 of this report, potential noise effects from Project construction activities were assessed qualitatively.

Project operations are anticipated to occur only during the daytime, which is defined by Health Canada as the period between 7 am to 10 pm each day (Health Canada 2017). For the purposes of the noise assessment, Project operations were divided into three groups:

- manufacturing aircraft (i.e., stationary equipment confined to the Project site)
- road traffic travelling to and from the Project site
- arrival and departure of aircraft using the Project airstrip

Details required to model or otherwise quantify noise from the manufacturing of aircraft at the Project site are not presently available. Therefore, as discussed in more detail in Section 4.2 of this report, potential noise effects from the manufacturing of aircraft were assessed qualitatively. In contrast, details required to develop computer models to quantify noise from road traffic travelling to and from the Project site and aircraft using the Project airstrip are available. Therefore, as discussed in more detail in Section 4.2 and Section 4.3 of this report, potential noise effects from these Project activities were assessed quantitively.

3.0 REGULATORY GUIDANCE

The Project noise assessment took selected guidance from the following regulations and guidelines:

- Wheatland County *Bylaw 2022-13* (Wheatland 2022); hereafter referred to as the Noise Bylaw
- Health Canada *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise* (Health Canada 2017); hereafter referred to as Health Canada Guidance
- Alberta Transportation *Noise Attenuation Guidelines for Provincial Highways under Provincial Jurisdiction within Cities and Urban Areas* (Alberta Transportation n.d.); hereafter referred to Alberta Transportation Guidance
- Transport Canada *Managing Noise from Aircraft* (Transport Canada 2022) and Transport Canada *Aviation – Land Use in the Vicinity of Aerodromes* (Transport Canada 2013); hereafter referred to collectively as Transport Canada Guidance
- Alberta Energy Regulator (AER) *Directive 038: Noise Control* (AER 2007); hereafter referred to as AER Directive 038
- Alberta Utilities Commission (AUC) *Rule 012: Noise Control* (AUC 2021); hereafter referred to as AUC Rule 012

The Noise Bylaw applies to general noise sources throughout Wheatland County, including noise sources in the Project area. The Noise Bylaw prohibits *"…any noise that, in the opinion of a Peace Officer, having regard for the circumstances, is likely to annoy or disturb the peace of any reasonable Person"* (Wheatland 2022). However, the Noise Bylaw does not specify a threshold or limit above which noise levels are annoying or disturbing. In other words, the Noise Bylaw is entirely qualitative. The Noise Bylaw prohibits construction activities *"before 7:00 a.m. or after 9:00 p.m. Monday through Saturday; or before 9:00 a.m. or after 9:00 p.m. on a Sunday or holiday"* (Wheatland 2022). However, the Noise Bylaw indicates that *"The Chief Administrative Officer may issue a permit,*

on whatever conditions the Chief Administrative Officer considers appropriate, authorizing the production of noise in a manner, or of a type, that would otherwise contravene [this Bylaw]" (Wheatland 2022). Depending on the construction schedule, the Proponent may seek a permit from Wheatland County authorizing 24-hour per day construction activities for the Project.

Health Canada Guidance provides non-enforceable recommendations for assessing potential noise effects in federal environmental assessments. Health Canada Guidance characterizes potential noise effects in terms of sleep disturbance, interference with speech comprehension, noise complaints, and annoyance. To protect against sleep disturbance, Health Canada Guidance recommends that average nighttime noise levels ($L_{eq,night}$) not exceed 40 A-weighted decibels (dBA) outdoors, and that maximum noise levels (L_{max}) from individual events not exceed 60 dBA more than 10 to 15 times per nighttime, where nighttime corresponds to the period from 10 pm to 7 am (Health Canada 2017). To sustain adequate speech comprehension, Health Canada Guidance recommends that average daytime noise levels ($L_{eq,day}$) and average nighttime noise levels ($L_{eq,night}$) not exceed 55 dBA outdoors (Health Canada 2017). According to Health Canada Guidance, the likelihood of noise complaints is correlated to the combined day-night noise level (L_{dn}), which is calculated by time-averaging the $L_{eq,day}$ and $L_{eq,night}$ noise levels, after applying a 10 dBA penalty to the nighttime period (Health Canada 2017). Health Canada Guidance indicates that *"sporadic complaints"* are expected when L_{dn} exceeds 55 dBA, *"widespread complaints"* are expected when L_{dn} exceeds 62 dBA, and *"strong appeals to authorities to stop noise"* are expected when L_{dn} exceeds 75 dBA (Health Canada 2017). Finally, Health Canada Guidance provides formulae for calculating the percentage of an average community that would be highly annoyed (%HA) by a given L_{dn} noise level and recommends mitigation measures when the Project-related change in %HA exceeds 6.5% (Health Canada 2017).

Alberta Transportation Guidance applies to noise from provincial highways within cities and urban areas. Alberta Transportation Guidance characterizes potential noise effects using the average 24-hour noise level ($L_{eq,24}$), expressed in units of dBA. Alberta Transportation Guidance recommends that mitigation measures be considered in cases where the $L_{eq,24}$ noise level exceeds 65 dBA but indicates that the *"decision to implement noise mitigation must consider whether the mitigation is cost-effective, technically practical, broadly supported by the affects residents, and fits into overall provincial priorities"* (Alberta Transportation n.d.).

Transport Canada Guidance applies to noise from airports. Transport Canada Guidance recommends that noise from airports be characterized using the noise exposure forecast (NEF) metric and provides formulae for calculating NEF values based on type of aircraft and average number of flights per daytime and nighttime period (Transport Canada 2022). The NEF metric predicts community response to airport noise. According to Transport Canada Guidance: *"A NEF level greater than 25 is likely to produce some level of annoyance. If the NEF level is above 35, complaints will probably be numerous."* (Transport Canada 2022). Transport Canada Guidance also recommends that *"…serious consideration be given to an analysis of peak noise levels and the effects of these levels…"* (Transport Canada 2013) but does not set a threshold of limit for peak noise levels.

AER Directive 038 applies to noise from provincially regulated oil & gas facilities (AER 2007). AUC Rule 012 applies to noise from provincially regulated power plants and electrical substations (AUC 2021). Because Project activities are qualitatively different than the types of noise sources regulated by AER Directive 038 and AUC Rule 012, noise limits specified in these regulations are not appropriate for assessing potential noise effects from the Project. However, AER Directive 038 and AUC Rule 012 provide useful guidance on establishing appropriate study areas and identifying appropriate receptors for noise assessments. Both AER Directive 038 and AUC Rule 012 require that potential effects be assessed at receptors corresponding to occupied dwellings located within 1.5 km of the facility fence line or boundary (AER 2007; AUC 2021).

4.0 ASSESSMENT APPROACH

4.1 Noise Study Area and Receptors

In accordance with guidance from AER Directive 038 and AUC Rule 012, the Study Area for the Project noise assessment was established as a 1.5 km buffer on the Project boundary. Potential noise receptors were initially identified using publicly available satellite imagery. Noise receptors were subsequently verified by WSP during a site visit in late November 2022. A total of 36 noise receptors were identified within the Study Area and treated as receptors in Project noise assessment, including occupied dwellings and other areas of interest to local stakeholders.

Table 1 lists the 36 receptors considered in the Project noise assessment and provides Universal Transverse Mercator (UTM) coordinates for each receptor. Figure 1 presents a map showing the Project boundary, the Study Area for the noise assessment, and the 36 noise receptors.

Table 1: Noise Receptors

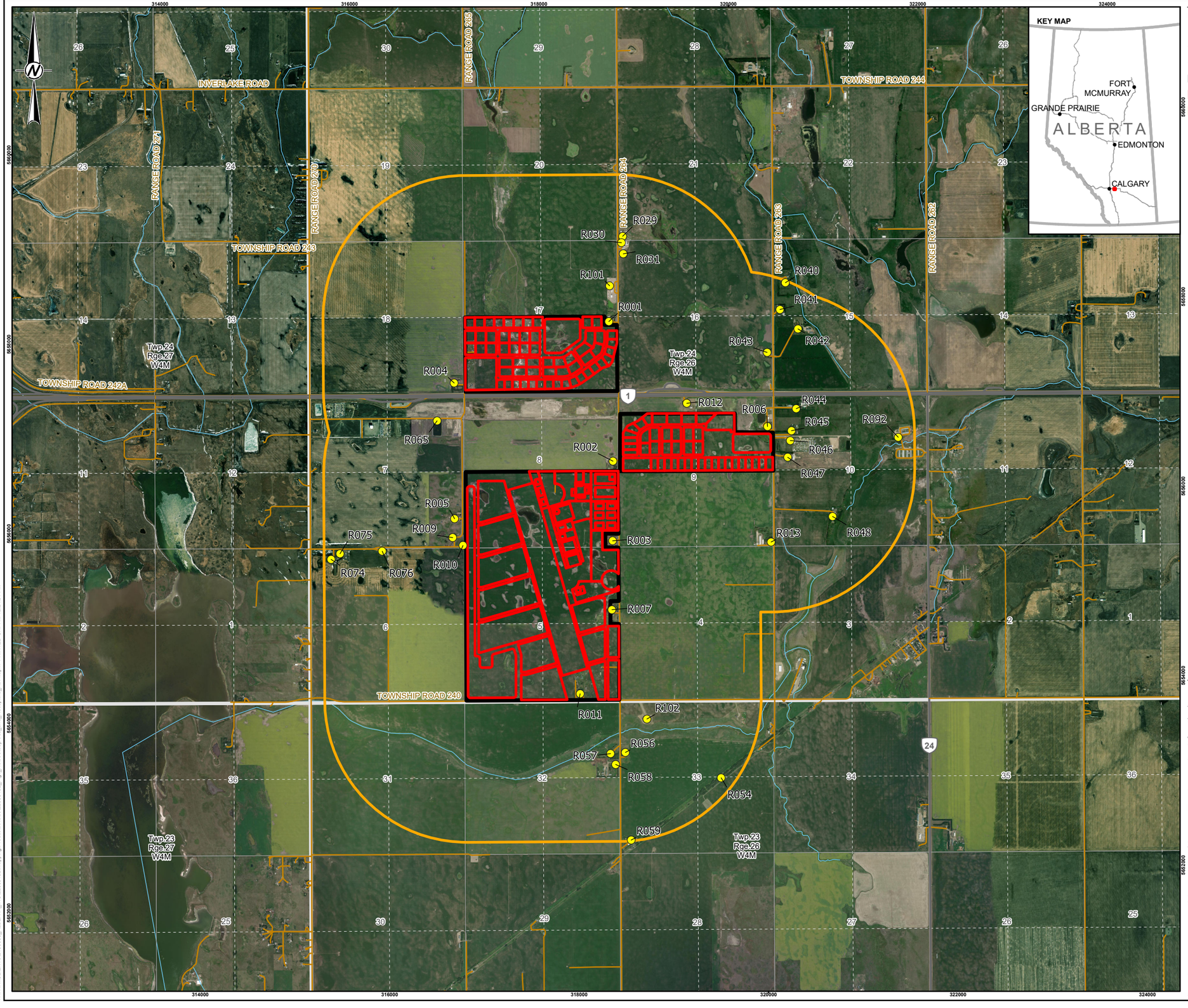
Receptor Identification Code[a]	Universal Transverse Mercator Coordinates [Zone 12]		Description
	Easting [m]	Northing [m]	
R001	318602	5657983	occupied dwelling
R002	318585	5656508	occupied dwelling
R003	318547	5655668	occupied dwelling
R004	316942	5657401	occupied dwelling
R005	316888	5655968	occupied dwelling
R006	320232	5656807	occupied dwelling
R007	318510	5654940	occupied dwelling
R009	316860	5655770	occupied dwelling
R010	316965	5655683	occupied dwelling
R011[b]	318139	5654067	occupied dwelling
R012	319389	5657087	occupied dwelling
R013	320220	5655586	occupied dwelling
R029	318784	5658876	occupied dwelling
R030	318769	5658810	business
R031	318783	5658692	occupied dwelling
R040	320482	5658317	occupied dwelling
R041	320413	5658036	occupied dwelling
R042	320595	5657824	occupied dwelling
R043	320260	5657589	occupied dwelling
R044	320542	5656983	occupied dwelling
R045	320483	5656752	occupied dwelling
R046	320466	5656648	occupied dwelling
R047	320432	5656474	occupied dwelling
R048	320880	5655829	occupied dwelling
R054	319591	5653119	occupied dwelling
R056	318591	5653428	occupied dwelling

Table 1: Noise Receptors

Receptor Identification Code[a]	Universal Transverse Mercator Coordinates [Zone 12]		Description
	Easting [m]	Northing [m]	
R057	318434	5653422	occupied dwelling
R058	318483	5653305	occupied dwelling
R059	318615	5652501	occupied dwelling
R065	316746	5657009	business
R074	315567	5655592	occupied dwelling
R075	315664	5655648	occupied dwelling
R076	316110	5655657	occupied dwelling
R092	321607	5656637	occupied dwelling
R101	318625	5658360	business
R102	318833	5653771	occupied dwelling

a) Receptor identification codes are non-continuous because some potential receptors initially identified using satellite imagery were subsequently eliminated based on the results of the November 2022 site visit.

b) This receptor is an occupied dwelling located within the Project boundary. The resident of this dwelling has a tenancy agreement with the Proponent.



KEY MAP

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
NOISE STUDY AREA AND RECEPTORS

CONSULTANT

wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
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4.2 Effects Classification

Noise effects from the Project were classified according to general criteria presented in Table 2.

Table 2: Noise Effects Criteria

Magnitude	Geographic Extent	Duration	Frequency
Negligible: No detectible change relative to existing or background conditions **Low:** Potentially detectible change to existing or background conditions but within guideline thresholds/limits **Moderate:** Readily noticeable change to existing or background conditions that exceeds guideline thresholds/limits **High:** Disturbing change to existing or background conditions	**Local:** Effects are confined to the Study Area (i.e., 1.5 km from the Project boundary) **Regional:** Effects extend beyond the Study Area but not more than 5 km from the Project boundary **Beyond Regional:** Effects extend more than 5 km from the Project boundary	**Short-Term:** Effects occur during construction **Medium-Term:** Effects occur during operations **Long-Term:** Effects extend beyond the end of operations	**Isolated:** Effect occurs once or a small number of times **Periodic:** Effect occurs intermittently **Continuous:** Effect occurs continuously

As noted in Section 2.0 of this report, details required to model or otherwise quantify noise from Project construction activities are not presently available. Therefore, the magnitude of potential noise effects from Project construction activities was classified qualitatively for each receptor in the Study Area. In particular, WSP used professional experience and information presented in Health Canada Guidance (Health Canada 2017) to estimate the likelihood of noise complaints as a result of Project construction activities. The magnitude classification criteria for Project construction noise are as follows:

- **Negligible** – no complaints ($L_{dn} \leq 55$ dBA)
- **Low** – sporadic complaints ($L_{dn} \leq 62$ dBA)
- **Moderate** – widespread complaints ($L_{dn} \leq 75$ dBA)
- **High** – strong appeals to stop noise ($L_{dn} > 75$ dBA)

Details required to model or otherwise quantify noise from the manufacturing of aircraft at the Project site are not presently available. Therefore, the magnitude of potential noise effects from the manufacturing of aircraft were also assessed qualitatively for each receptor in the Study Area based on professional experience and Health Canada Guidance on the likelihood of noise complaints (Health Canada 2017). The magnitude classification criteria for manufacturing activities during Project operations are as follows:

- **Negligible** – no complaints ($L_{dn} \leq 55$ dBA)
- **Low** – sporadic complaints ($L_{dn} \leq 62$ dBA)
- **Moderate** – widespread complaints ($L_{dn} \leq 75$ dBA)
- **High** – strong appeals to stop noise ($L_{dn} > 75$ dBA)

Details required to quantify noise from road traffic travelling to and from the Project site are available from the *De Havilland Field Transportation Impact Assessment* (Bunt 2022), which will hereafter be referred to as the Project TIA. As discussed in more detail in Section 4.3.1 of this report, information from the Project TIA was used to develop computer noise models of background road traffic (i.e., traffic unrelated to the Project) and road traffic associated with Project operations. These computer models were used to predict traffic noise levels at each receptor in the Study Area, and the magnitude of potential effects from traffic noise was then classified quantitively based on the threshold presented in Alberta Transportation Guidance (Alberta Transportation n.d.). The magnitude classification criteria for noise from Project-related traffic are as follows:

- **Negligible** – Project-related increase in $L_{eq,24} \leq 3$ dBA (hardly perceptible change)
- **Low** – combined background + Project $L_{eq,24} \leq 65$ dBA (Alberta Transportation mitigation threshold)
- **Moderate** – Project-related increase in $L_{eq,24} \leq 10$ dBA (readily noticeable change)
- **High** – Project-related increase in $L_{eq,24} > 10$ dBA (disturbing change)

Details required to quantify noise from aircraft arriving at and departing from the Project airstrip were provided by the Proponent. As discussed in more detail in Section 4.3.2 of this report, information from the Proponent was used to develop computer noise models of the Project airstrip, which were used to predict airstrip noise levels at each receptor in the Study Area.

As discussed in Section 3.0 of this report, Transport Canada Guidance recommends that noise from airports be assessed using the NEF metric (Transport Canada 2022), which is a time-averaged noise level based on the number of flights per daytime and nighttime period. While the NEF is an appropriate metric for assessing noise from typical airports with multiple flights per day, the NEF metric is not the best tool for assessing noise from the Project airstrip, which is anticipated to host just 50 arrivals and 50 departures per year. Because the number of flights arriving at and departing from the Project airstrip is very small (i.e., far fewer than one flight per day), the predicted NEF from Project operations is well-below the threshold value of 25 set out in Transport Canada guidance, which suggests that noise from aircraft will not have an effect on nearby receptors. However, noise from the Project airstrip will not be continuous or steady-state such that the time-average noise level appropriately represents potential effects. Instead, because the time between flights is expected to be more than 24 hours, noise from each arrival or departure should be treated as a separate event, and the most relevant parameter for such an assessment is the L_{max} (i.e., maximum noise level) experienced by each receptor during a single arrival or departure. Using the predicted L_{max} to assess potential noise effects from the Project airstrip is consistent with the Transport Canada recommendation to consider peak noise levels (Transport Canada 2013).

Transport Canada Guidance does not provide a threshold or limit for assessing peak noise levels. However, as discussed in Section 3.0 of this report, Health Canada Guidance provides a method for assessing sleep disturbance from individual noise events based on the L_{max} parameter. To protect against sleep disturbance, Health Canada Guidance recommends that L_{max} from individual noise events not exceed 60 dBA more than 10 to 15 times per nighttime period (Health Canada 2017). As noted above, there are anticipated to be just 50 arrivals and 50 departures per year at the Project airstrip, and all Project flights will occur during the daytime period (see Section 2.0 of this report). Therefore, it is not possible for L_{max} from the Project airstrip to exceed 60 dBA more than 10 or 15 times per nighttime period, and so it is not possible for the Project airstrip to result in sleep disturbance based on criteria from the Health Canada Guidance. Nevertheless, the 60 dBA threshold from Health Canada Guidance provides a useful lower limit for classifying the magnitude of noise effects from the Project

airstrip. Other thresholds for classifying the magnitude of airstrip noise effects were established by WSP based on professional experience. The magnitude classification criteria for noise from the Project airstrip are as follows:

- **Negligible** – L_{max} ≤ 60 dBA (Health Canada sleep disturbance threshold)
- **Low** – L_{max} ≤ 75 dBA (detectable)
- **Moderate** – L_{max} ≤ 85 dBA (readily noticeable)
- **High** – L_{max} > 85 dBA (disturbing)

4.3 Noise Prediction Methodology

4.3.1 Road Traffic

The Project TIA provides estimates of background traffic volumes (i.e., traffic volumes without the Project) and Project-related traffic volumes for a number of temporal snapshots corresponding to different years of Project operations (Bunt 2022). Three of these temporal snapshots were selected for modelling and assessment in the Project noise assessment:

- Opening Day – traffic volumes on the first day of Project operations
- Interim 2032 – traffic volumes in the year 2032
- Full Area Structure Plan (ASP) Buildout – traffic volumes following complete buildout of county ASP

Background and Project traffic volumes for each temporal snapshot were taken directly from Appendix D of the Project TIA (Bunt 2022). Traffic noise levels at each receptor were predicted using the United States Department of Transportation (US DOT) Traffic Noise Model (TNM), which is a software tool used in jurisdictions across North America to predict noise levels from road traffic (US DOT 2021). The TNM tool accounts for traffic volumes, traffic composition (e.g., cars vs. heavy trucks), speed limits, and traffic control devices (e.g., traffic lights and stop signs). In accordance with Alberta Transportation Guidance (Alberta Transportation n.d.) and the magnitude classification criteria presented in Section 4.2 of this report, the TNM tool was used to predict background and Project traffic noise levels in terms of $L_{eq,24}$ (i.e., average 24-hour noise level).

4.3.2 Airstrip

The Proponent identified the types of aircraft that will use the Project airstrip, as well as the number of arrivals and departures expected during each year of Project operations. WSP used information supplied by the Proponent to develop computer noise models of the airstrip based on an algorithm from European Civil Aviation Conference (ECAC) *Document 29* (ECAC 2016). Inputs to the ECAC computer models consisted of aircraft types, runway orientation and length, and arrival/departure frequencies within a representative six-month period. The ECAC computer models were used to predict airstrip noise levels at each receptor in the Study Area. Table 3 presents aircraft types and arrival/departure frequencies used to model the Project airstrip.

Table 3: Inputs to Noise Model of Project Airstrip

Type of Aircraft	Number of Arrivals Per Year	Number of Departures Per Year	Number of Arrivals Per Six-Month Period[a]	Number of Departures Per Six-Month Period[a]
Twin Otter	16	16	8	8
Dash 8	17	17	9	9
Water Bomber	17	17	9	9
Total – All Aircraft	**50**	**50**	**26**	**26**

a) The ECAC modelling algorithm predicts noise levels based on a representative six-month period.

The ECAC models were used to predict L_{max} noise levels for individual aircraft arrivals and departures. These L_{max} values were then used to classify the magnitude of airstrip noise effects at each receptor based on criteria specified in Section 4.2 of this report. The ECAC models were also used to predict $L_{eq,day}$ and $L_{eq,24}$ noise levels for a representative six-month period of Project operations and for individual days corresponding to specific airstrip activities (e.g., arrival or departure of a particular type of aircraft). As discussed in Section 4.2 of this report, time-averaged noise levels (e.g., $L_{eq,day}$ and $L_{eq,24}$) are not the best tools for assessing intermittent noise from the Project airstrip, so these values are presented for information purposes only and were not used in the classification of noise effects from the airstrip.

5.0 EXISTING CONDITIONS

Existing noise sources in the Study Area include:

- traffic on TransCanada Highway 1
- traffic on local grids roads (e.g., Range Road 264, Range Road 265, and Township Road 240)
- agricultural activities and machinery
- resident activities, including domestic dogs
- natural sources, such as birds, insects, and wind

At receptors located less than 500 m from TransCanada Highway 1, traffic noise is likely to dominate the contribution from other sources during both the daytime and nighttime period. Based on current Highway 1 traffic volumes, existing noise levels at these receptors could be as high as 69 dBA during the daytime period ($L_{eq,day}$) and 62 dBA during the nighttime period ($L_{eq,night}$).

At receptors located more than 500 m but less than 1 km from TransCanada Highway 1, existing noise levels are likely a combination of the contribution from highway traffic and other sources. Existing noise levels at these receptors likely range from 45 dBA to 59 dBA during the daytime period ($L_{eq,day}$) and from 35 dBA to 52 dBA during the nighttime period ($L_{eq,night}$), depending on distance from Highway 1.

At receptors located more than 1 km from TransCanada Highway 1, existing noise levels are likely consistent with a quiet rural environment. Based on Health Canada Guidance (Health Canada 2017), representative noise levels in a quiet rural environment are 45 dBA during the daytime period ($L_{eq,day}$) and 35 dBA during the nighttime period ($L_{eq,night}$).

6.0 ASSESSMENT RESULTS

6.1 Construction

The use of heavy machinery during Project construction will increase noise levels at receptors in the Study Area. Because noise levels attenuate with distance, noise level increases will be greatest at receptors located closest to the heavy machinery.

Mobile equipment required to support Project construction may include dozers, graders, excavators, and trucks. Stationary equipment required to support Project construction may include generators, and cranes. The operation of this engine-driven equipment will result in near-continuous emission of noise across a wide range of frequencies (i.e., broadband noise). The majority of this noise will be emitted from the engine exhaust, although the air intake, cooling fans, and engine casing also emit broadband noise.

Mobile equipment will likely make use of standard back-up alarms. Back-up alarms are an important safety feature on active construction sites. Back-up alarms use a tonal signal that emits noise in a very narrow frequency band (typically centred on 1 kilohertz). Tonal signals are effective at cutting through background noise and capturing attention but, as a result, tonal back-up alarms can be particularly disturbing to nearby receptors.

The Proponent will direct their construction contractor to implement the following measures to mitigate potential noise effects from Project construction:

- Conduct construction activities during daylight hours, where feasible.
- Fit internal combustion engines with appropriate muffler systems.
- Respond expeditiously to noise complaints and take appropriate action to manage any such complaints.

6.1.1 Effects Assessment

Noise effects from Project construction were classified using the criteria described in Section 4.2 of this report.

- Geographic Extent of noise effects from Project construction is expected to be **Local** since noise effects will likely be confined to the Study Area.
- Duration of noise effects from Project construction is **Short-Term** since effects will occur during construction activities.
- Frequency of noise effects from Project construction is **Isolated** since effects will occur once over the life of the Project (i.e., during the construction phase).

The magnitude of noise effects from Project construction at individual receptors will depend on the distance between the receptor and construction noise sources. Because noise attenuates with propagation distance, the magnitude of the effect is expected to be greatest at receptors located closest to the Project boundary and least at receptors located farthest from the Project boundary. As discussed in Section 4.2 of this report, WSP used professional experience and information presented in Health Canada Guidance (Health Canada 2017) to estimate the magnitude of construction noise effects at individual receptors. Table 4 presents the magnitude classification for each of the 36 receptors in the Study Area. Table 5 presents a summary showing the number of receptors in each magnitude category.

Table 4: Magnitude of Noise Effects from Project Construction

Receptor Identification Code	Effect Magnitude
R001	negligible
R002	negligible
R003	negligible
R004	negligible
R005	negligible
R006	negligible
R007	negligible
R009	negligible
R010	negligible
R011	low
R012	negligible
R013	negligible
R029	negligible
R030	negligible
R031	negligible
R040	negligible
R041	negligible
R042	negligible
R043	negligible
R044	negligible
R045	negligible
R046	negligible
R047	negligible
R048	negligible
R054	negligible
R056	negligible
R057	negligible
R058	negligible
R059	negligible
R065	negligible
R074	negligible
R075	negligible
R076	negligible
R092	negligible
R101	negligible
R102	negligible

Table 5: Summary of Noise Effect Magnitudes for Project Construction

Effect Magnitude	Number of Receptors
Negligible	35
Low	1
Moderate	0
High	0

The magnitude of noise effects from Project construction is predicted to be low or negligible at all receptors in the Study Area.

6.2 Manufacturing

The use of heavy machinery during aircraft manufacturing operations will increase noise levels at receptors in the Study Area. Because noise levels attenuate with distance, noise level increases will be greatest at receptors located closest to the heavy machinery.

The Proponent will implement the following measures to mitigate potential noise effects from aircraft manufacturing operations:

- Confine Project operations to the daytime period (i.e., 7 am to 10 pm) to reduce potential sleep disturbance.
- Enclose noisy equipment in buildings or shelters.
- Fit internal combustion engines with appropriate muffler systems.
- Respond expeditiously to noise complaints and take appropriate action to manage any such complaints.

6.2.1 Effects Assessment

Noise effects from aircraft manufacturing during Project operations were classified using the criteria described in Section 4.2 of this report.

- Geographic Extent of noise effects from aircraft manufacturing is expected to be **Local** since noise effects will likely be confined to the Study Area.
- Duration of noise effects from aircraft manufacturing is **Medium-Term** since effects will occur throughout the Project operations phase.
- Frequency of noise effects from aircraft manufacturing is **Continuous** since effects will occur continuously throughout the Project operations phase.

The magnitude of noise effects from aircraft manufacturing at individual receptors will depend on the distance between the receptor and manufacturing noise sources. Because noise attenuates with propagation distance, the magnitude of the effect is expected to be greatest at receptors located closest to the Project boundary and least at receptors located farthest from the Project boundary. As discussed in Section 4.2 of this report, WSP used professional experience and information presented in Health Canada Guidance (Health Canada 2017) to estimate the magnitude of aircraft manufacturing noise effects at individual receptors. Table 6 presents the magnitude classification for each of the 36 receptors in the Study Area. Table 7 presents a summary showing the number of receptors in each magnitude category.

Table 6: Magnitude of Noise Effects from Aircraft Manufacturing (Project Operations)

Receptor Identification Code	Effect Magnitude
R001	negligible
R002	negligible
R003	negligible
R004	negligible
R005	negligible
R006	negligible
R007	negligible
R009	negligible
R010	negligible
R011	negligible
R012	negligible
R013	negligible
R029	negligible
R030	negligible
R031	negligible
R040	negligible
R041	negligible
R042	negligible
R043	negligible
R044	negligible
R045	negligible
R046	negligible
R047	negligible
R048	negligible
R054	negligible
R056	negligible
R057	negligible
R058	negligible
R059	negligible
R065	negligible
R074	negligible
R075	negligible
R076	negligible
R092	negligible
R101	negligible
R102	negligible

Table 7: Summary of Noise Effect Magnitudes for Aircraft Manufacturing (Project Operations)

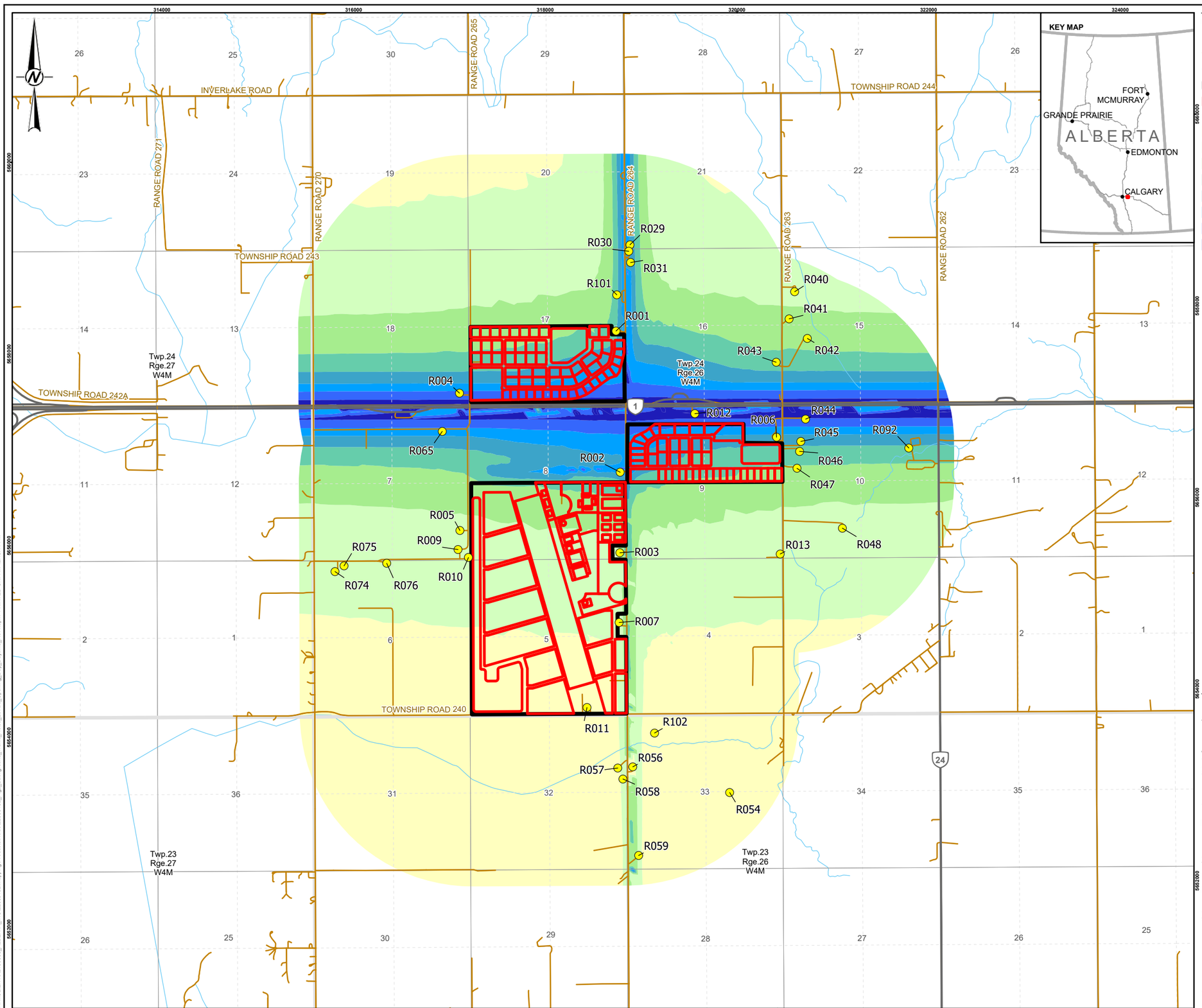
Effect Magnitude	Number of Receptors
Negligible	36
Low	0
Moderate	0
High	0

The magnitude of noise effects from manufacturing operations is predicted to be negligible at all receptors in the Study Area.

6.3 Road Traffic

The TNM tool was used to model background and Project traffic noise levels at each receptor in the Study Area. Traffic noise levels were predicted for three temporal snapshots: Opening Day, Interim 2032, and Full ASP Buildout. Background traffic noise levels were predicted in terms of $L_{eq,day}$ (average daytime noise level), $L_{eq,night}$ (average nighttime noise level), and $L_{eq,24}$ (average 24-hour noise level). Project traffic noise levels were predicted in terms of $L_{eq,day}$ and $L_{eq,24}$. Note that $L_{eq,night}$ noise levels were not predicted for Project traffic since all Project traffic will be confined to the daytime period (i.e., there will be no nighttime traffic associated with the Project).

Figure 2 presents a contour map showing predicated background traffic noise levels for the Opening Day temporal snapshot in terms of $L_{eq,day}$. Figure 3 presents a contour map showing predicated background traffic noise levels for the Opening Day temporal snapshot in terms of $L_{eq,night}$. Figure 4 presents a contour map showing predicted Project traffic noise levels for the Opening Day temporal snapshot in terms of $L_{eq,day}$.



LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT

PREDICTED DAYTIME NOISE LEVEL FROM BACKGROUND TRAFFIC (Leq, day; dBA)

- < 35
- 35 to 40
- 40 to 45
- 45 to 50
- 50 to 55
- 55 to 60
- 60 to 65
- > 65

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
BACKGROUND TRAFFIC NOISE LEVELS – OPENING DAY / DAYTIME

CONSULTANT

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	2

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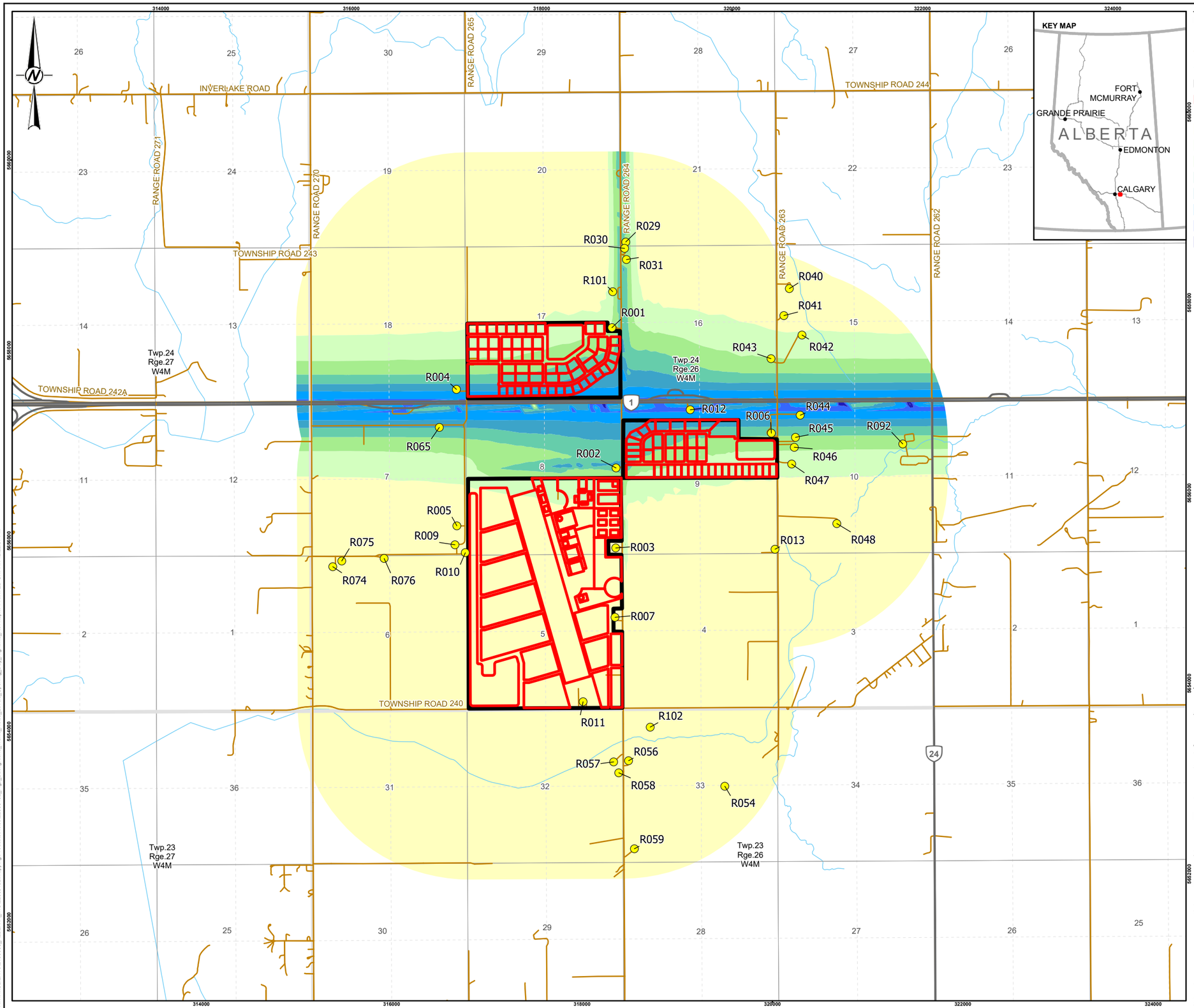

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT

PREDICTED NIGHTTIME NOISE LEVEL FROM BACKGROUND TRAFFIC (Leq, night; dBA)

- < 35
- 35 to 40
- 40 to 45
- 45 to 50
- 50 to 55
- 55 to 60
- 60 to 65
- > 65

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
BACKGROUND TRAFFIC NOISE LEVELS – OPENING DAY / NIGHTTIME

CONSULTANT

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
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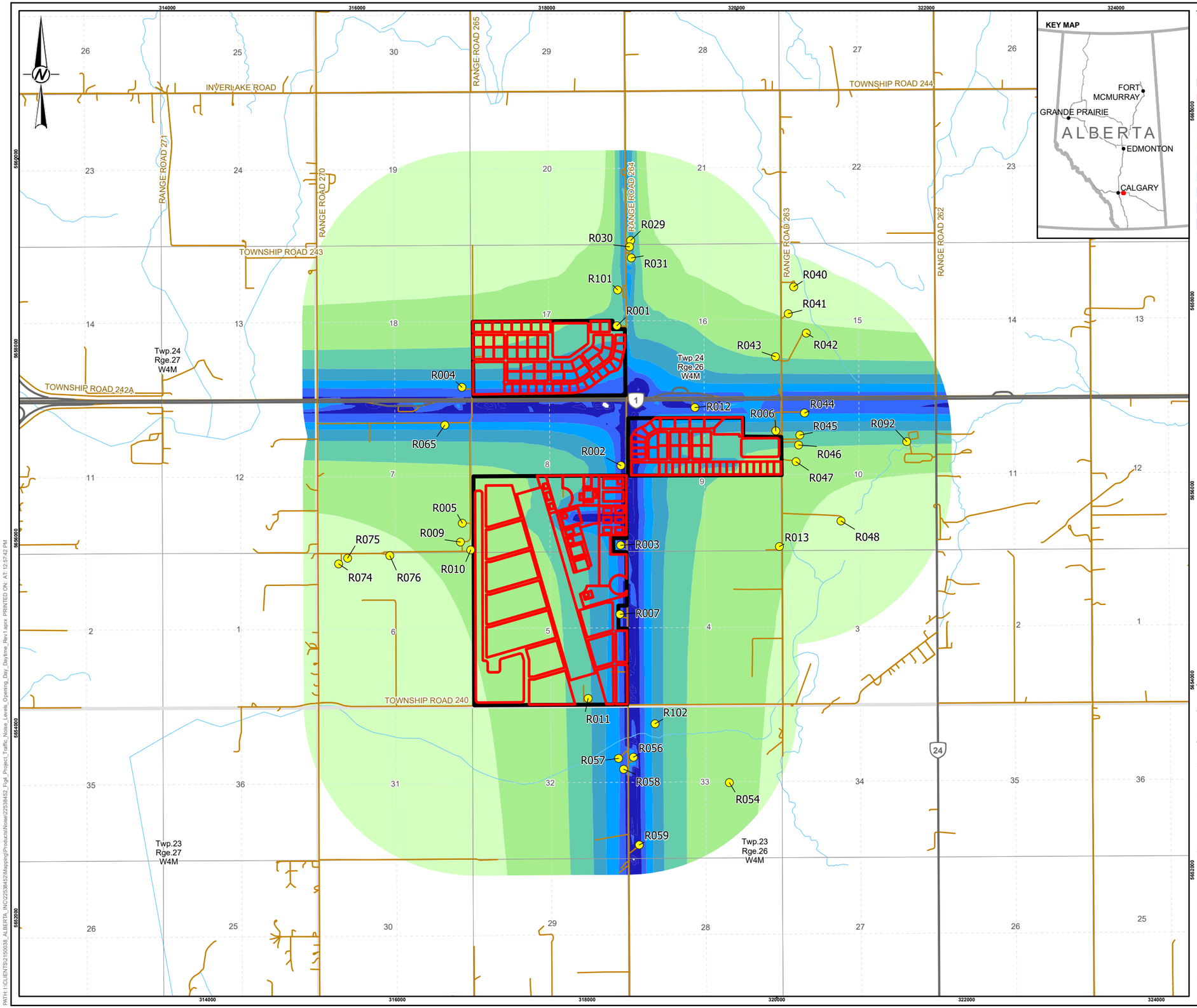

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT

PREDICTED DAYTIME NOISE LEVEL FROM PROJECT TRAFFIC (Leq, day; dBA)

- 35 to 40
- 40 to 45
- 45 to 50
- 50 to 55
- 55 to 60
- 60 to 65
- > 65

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
PROJECT TRAFFIC NOISE LEVELS – OPENING DAY / DAYTIME

CONSULTANT
wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VB
PREPARED	LB
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	4

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Table 8 presents predicted background traffic noise levels for each receptor in the Study Area and each of the three temporal snapshots considered in the Project noise assessment. Table 9 presents predicted Project traffic noise levels for each receptor in the Study Area and each of the three temporal snapshots considered in the Project noise assessment. Table 10 presents predicted combined background Project traffic noise levels, which were obtained by summing the values in Table 8 and the values in Table 9.

Table 8: Predicted Background Traffic Noise Levels

Receptor Identification Code	Background Noise Level [dBA] – Opening Day			Background Noise Level [dBA] – Interim 2032			Background Noise Level [dBA] – Full ASP Buildout		
	Daytime [Leq,day]	Nighttime [Leq,night]	24-Hour [Leq,24]	Daytime [Leq,day]	Nighttime [Leq,night]	24-Hour [Leq,24]	Daytime [Leq,day]	Nighttime [Leq,night]	24-Hour [Leq,24]
R001	49.2	40.5	47.5	51.0	42.6	49.3	52.7	44.9	51.1
R002	58.6	51.1	57.0	67.9	60.6	66.3	73.2	65.8	71.6
R003	40.2	30.9	38.5	59.1	51.7	57.5	65.8	58.5	64.2
R004	61.6	54.2	60.0	64.0	56.6	62.4	66.8	59.5	65.2
R005	38.8	31.3	37.2	42.3	34.9	40.7	54.2	46.9	52.6
R006	53.7	46.3	52.1	55.9	48.5	54.3	58.4	51.1	56.8
R007	37.1	27.7	35.3	57.4	49.9	55.8	64.0	56.7	62.4
R009	37.7	30.3	36.1	41.4	34.0	39.8	52.5	45.2	50.9
R010	37.4	29.9	35.8	41.2	33.8	39.6	65.3	58.0	63.7
R011	33.3	25.7	31.7	45.6	38.2	44.0	52.3	44.9	50.7
R012	69.0	61.7	67.4	71.3	63.9	69.7	73.8	66.5	72.2
R013	37.5	30.1	35.9	40.8	33.4	39.2	46.4	39.1	44.8
R029	55.7	45.9	53.9	56.6	46.8	54.8	58.9	50.7	57.2
R030	57.7	47.9	55.9	58.6	48.8	56.8	60.9	52.6	59.2
R031	55.1	45.3	53.3	56.0	46.2	54.2	58.3	50.0	56.6
R040	38.9	31.5	37.3	41.4	34.0	39.8	44.5	37.1	42.9
R041	41.1	33.7	39.5	43.6	36.2	42.0	46.4	39.1	44.8
R042	43.3	35.9	41.7	45.6	38.2	44.0	48.3	41.0	46.7
R043	47.4	40.0	45.8	49.7	42.3	48.1	52.3	44.9	50.7
R044	64.4	57.0	62.8	66.6	59.2	65.0	69.0	61.7	67.4
R045	51.8	44.3	50.2	54.0	46.6	52.4	56.5	49.1	54.9
R046	48.3	40.9	46.7	50.6	43.2	49.0	53.2	45.9	51.6
R047	44.5	37.0	42.9	46.9	39.5	45.3	49.9	42.6	48.3
R048	38.4	31.0	36.8	41.2	33.8	39.6	53.9	46.7	52.3
R054	31.4	23.9	29.8	38.2	30.8	36.6	44.0	36.7	42.4
R056	34.7	24.7	32.9	58.6	51.2	57.0	65.2	57.9	63.6
R057	33.6	24.6	31.9	55.1	47.6	53.5	61.7	54.4	60.1
R058	36.7	24.3	34.8	59.4	51.9	57.8	66.0	58.7	64.4
R059	38.8	23.0	36.8	64.4	57.0	62.8	71.0	63.7	69.4
R065	57.6	50.2	56.0	60.5	53.1	58.9	63.9	56.6	62.3
R074	36.5	29.0	34.9	39.7	32.3	38.1	44.1	36.7	42.5
R075	36.7	29.3	35.1	39.9	32.5	38.3	44.4	37.0	42.8

Table 8: Predicted Background Traffic Noise Levels

Receptor Identification Code	Background Noise Level [dBA] – Opening Day			Background Noise Level [dBA] – Interim 2032			Background Noise Level [dBA] – Full ASP Buildout		
	Daytime [Leq,day]	Nighttime [Leq,night]	24-Hour [Leq,24]	Daytime [Leq,day]	Nighttime [Leq,night]	24-Hour [Leq,24]	Daytime [Leq,day]	Nighttime [Leq,night]	24-Hour [Leq,24]
R076	37.0	29.6	35.4	40.3	32.9	38.7	45.2	37.9	43.6
R092	49.0	41.6	47.4	51.3	43.9	49.7	53.8	46.4	52.2
R101	48.5	38.7	46.7	49.6	39.9	47.8	51.8	43.6	50.1
R102	33.2	25.2	31.6	48.7	41.3	47.1	55.3	48.0	53.7

Table 9: Predicted Project Traffic Noise Levels

Receptor Identification Code	Project Noise Level [dBA] – Opening Day		Project Noise Level [dBA] – Interim 2032		Project Noise Level [dBA] – Full ASP Buildout	
	Daytime [Leq,day]	24-Hour [Leq,24]	Daytime [Leq,day]	24-Hour [Leq,24]	Daytime [Leq,day]	24-Hour [Leq,24]
R001	48.1	46.1	64.5	62.5	65.9	63.9
R002	65.1	63.1	70.5	68.5	76.1	74.1
R003	63.2	61.2	66.1	64.1	72.1	70.1
R004	59.2	57.2	64.7	62.7	66.9	64.9
R005	41.6	39.6	46.5	44.5	59.2	57.2
R006	50.0	48.0	56.2	54.2	58.2	56.2
R007	61.5	59.5	64.4	62.4	70.0	68.0
R009	41.1	39.1	45.9	43.9	57.5	55.5
R010	41.2	39.2	45.8	43.8	68.8	66.8
R011	49.2	47.2	52.2	50.2	58.3	56.3
R012	65.1	63.1	71.2	69.2	73.1	71.1
R013	40.5	38.5	45.3	43.3	48.7	46.7
R029	53.3	51.3	72.1	70.1	74.7	72.7
R030	55.1	53.1	74.0	72.0	76.6	74.6
R031	52.9	50.9	71.6	69.6	74.2	72.2
R040	38.1	36.1	44.8	42.8	47.5	45.5
R041	39.6	37.6	46.0	44.0	48.6	46.6
R042	40.9	38.9	47.0	45.0	49.5	47.5
R043	44.6	42.6	50.6	48.6	52.9	50.9
R044	60.2	58.2	65.9	63.9	68.0	66.0
R045	48.1	46.1	54.5	52.5	56.5	54.5
R046	45.3	43.3	51.7	49.7	53.7	51.7
R047	42.6	40.6	48.9	46.9	51.2	49.2
R048	39.2	37.2	44.5	42.5	47.6	45.6
R054	41.4	39.4	44.8	42.8	49.4	47.4
R056	62.5	60.5	65.4	63.4	69.0	67.0
R057	59.2	57.2	62.1	60.1	67.0	65.0

Table 9: Predicted Project Traffic Noise Levels

Receptor Identification Code	Project Noise Level [dBA] – Opening Day		Project Noise Level [dBA] – Interim 2032		Project Noise Level [dBA] – Full ASP Buildout	
	Daytime [Leq,day]	24-Hour [Leq,24]	Daytime [Leq,day]	24-Hour [Leq,24]	Daytime [Leq,day]	24-Hour [Leq,24]
R058	63.3	61.3	66.2	64.2	71.8	69.8
R059	67.8	65.8	70.7	68.7	74.7	72.7
R065	57.8	55.8	63.8	61.8	65.8	63.8
R074	38.7	36.7	43.9	41.9	47.6	45.6
R075	38.9	36.9	44.1	42.1	47.8	45.8
R076	39.5	37.5	44.6	42.6	48.8	46.8
R092	45.5	43.5	51.6	49.6	53.7	51.7
R101	47.2	45.2	65.2	63.2	67.4	65.4
R102	53.3	51.3	56.3	54.3	61.7	59.7

Table 10: Predicted Combined Traffic Noise Levels (Background + Project)

Receptor Identification Code	Opening Day Noise Level [Leq,24; dBA]			Interim 2032 Noise Level [Leq,24; dBA]			Full ASP Buildout Noise Level [Leq,24; dBA]		
	Background	Project	Combined	Background	Project	Combined	Background	Project	Combined
R001	47.5	46.1	49.9	49.3	62.5	62.7	51.1	63.9	64.1
R002	57.0	63.1	64.0	66.3	68.5	70.5	71.6	74.1	76.0
R003	38.5	61.2	61.2	57.5	64.1	64.9	64.2	70.1	71.1
R004	60.0	57.2	61.8	62.4	62.7	65.6	65.2	64.9	68.1
R005	37.2	39.6	41.5	40.7	44.5	46.0	52.6	57.2	58.5
R006	52.1	48.0	53.5	54.3	54.2	57.3	56.8	56.2	59.5
R007	35.3	59.5	59.5	55.8	62.4	63.2	62.4	68.0	69.1
R009	36.1	39.1	40.8	39.8	43.9	45.3	50.9	55.5	56.8
R010	35.8	39.2	40.8	39.6	43.8	45.2	63.7	66.8	68.5
R011	31.7	47.2	47.3	44.0	50.2	51.1	50.7	56.3	57.4
R012	67.4	63.1	68.8	69.7	69.2	72.5	72.2	71.1	74.7
R013	35.9	38.5	40.4	39.2	43.3	44.7	44.8	46.7	48.8
R029	53.9	51.3	55.8	54.8	70.1	70.2	57.2	72.7	72.8
R030	55.9	53.1	57.7	56.8	72.0	72.1	59.2	74.6	74.7
R031	53.3	50.9	55.2	54.2	69.6	69.7	56.6	72.2	72.3
R040	37.3	36.1	39.7	39.8	42.8	44.5	42.9	45.5	47.4
R041	39.5	37.6	41.6	42.0	44.0	46.1	44.8	46.6	48.7
R042	41.7	38.9	43.5	44.0	45.0	47.6	46.7	47.5	50.2
R043	45.8	42.6	47.5	48.1	48.6	51.4	50.7	50.9	53.8
R044	62.8	58.2	64.1	65.0	63.9	67.5	67.4	66.0	69.7
R045	50.2	46.1	51.6	52.4	52.5	55.5	54.9	54.5	57.7
R046	46.7	43.3	48.4	49.0	49.7	52.4	51.6	51.7	54.7
R047	42.9	40.6	44.9	45.3	46.9	49.1	48.3	49.2	51.8
R048	36.8	37.2	40.0	39.6	42.5	44.3	52.3	45.6	53.1
R054	29.8	39.4	39.8	36.6	42.8	43.7	42.4	47.4	48.6
R056	32.9	60.5	60.5	57.0	63.4	64.2	63.6	67.0	68.6

Table 10: Predicted Combined Traffic Noise Levels (Background + Project)

Receptor Identification Code	Opening Day Noise Level [Leq,24; dBA]			Interim 2032 Noise Level [Leq,24; dBA]			Full ASP Buildout Noise Level [Leq,24; dBA]		
	Background	Project	Combined	Background	Project	Combined	Background	Project	Combined
R057	31.9	57.2	57.2	53.5	60.1	60.9	60.1	65.0	66.2
R058	34.8	61.3	61.3	57.8	64.2	65.0	64.4	69.8	70.9
R059	36.8	65.8	65.8	62.8	68.7	69.6	69.4	72.7	74.3
R065	56.0	55.8	58.9	58.9	61.8	63.6	62.3	63.8	66.1
R074	34.9	36.7	38.8	38.1	41.9	43.4	42.5	45.6	47.3
R075	35.1	36.9	39.0	38.3	42.1	43.6	42.8	45.8	47.5
R076	35.4	37.5	39.5	38.7	42.6	44.1	43.6	46.8	48.5
R092	47.4	43.5	48.9	49.7	49.6	52.7	52.2	51.7	55.0
R101	46.7	45.2	49.0	47.8	63.2	63.3	50.1	65.4	65.5
R102	31.6	51.3	51.3	47.1	54.3	55.0	53.7	59.7	60.6

6.3.1 Effects Classification

Noise effects from road traffic during Project operations were classified using the criteria described in Section 4.2 of this report.

- Geographic Extent of noise effects from Project traffic is predicted to be **Regional** since noise effects will likely extend beyond the Study Area but not more than 5 km from the Project boundary.
- Duration of noise effects from Project traffic is **Medium-Term** since effects will occur throughout the Project operations phase.
- Frequency of noise effects from Project traffic is **Continuous** since effects will occur continuously throughout the Project operations phase.

The magnitude of noise effects from Project traffic at individual receptors was classified based on the criteria presented in Section 4.2 of this report. Table 11 presents the magnitude classification for each of the 36 receptors in the Study Area. Table 12 presents a summary showing the number of receptors in each magnitude category.

Table 11: Magnitude of Noise Effects from Project Traffic

Receptor Identification Code	Opening Day					Interim 2032					Full ASP Buildout				
	Background Noise Level [$L_{eq,24}$; dBA]	Combined Noise Level [$L_{eq,24}$; dBA]	Compliance with Alberta Transportation Threshold[a]	Project-Related Change[b] [dBA]	Effect Magnitude	Background Noise Level [$L_{eq,24}$; dBA]	Combined Noise Level [$L_{eq,24}$; dBA]	Compliance with Alberta Transportation Threshold[a]	Project-Related Change[b] [dBA]	Effect Magnitude	Background Noise Level [$L_{eq,24}$; dBA]	Combined Noise Level [$L_{eq,24}$; dBA]	Compliance with Alberta Transportation Threshold[a]	Project-Related Change[b] [dBA]	Effect Magnitude
R001	47.5	49.9	yes	2.4	negligible	49.3	62.7	yes	13.4	low	51.1	64.1	yes	13.0	low
R002	57.0	64.0	yes	7.0	low	66.3	70.5	no	4.2	moderate	71.6	76.0	no	4.4	moderate
R003	38.5	61.2	yes	22.7	low	57.5	64.9	yes	7.4	low	64.2	71.1	no	6.9	moderate
R004	60.0	61.8	yes	1.8	negligible	62.4	65.6	no	3.2	moderate	65.2	68.1	no	2.9	negligible
R005	37.2	41.5	yes	4.3	low	40.7	46.0	yes	5.3	low	52.6	58.5	yes	5.9	low
R006	52.1	53.5	yes	1.4	negligible	54.3	57.3	yes	3.0	negligible	56.8	59.5	yes	2.7	negligible
R007	35.3	59.5	yes	24.2	low	55.8	63.2	yes	7.4	low	62.4	69.1	no	6.7	moderate
R009	36.1	40.8	yes	4.7	low	39.8	45.3	yes	5.5	low	50.9	56.8	yes	5.9	low
R010	35.8	40.8	yes	5.0	low	39.6	45.2	yes	5.6	low	63.7	68.5	no	4.8	moderate
R011	31.7	47.3	yes	15.6	low	44.0	51.1	yes	7.1	low	50.7	57.4	yes	6.7	low
R012	67.4	68.8	no	1.4	negligible	69.7	72.5	no	2.8	negligible	72.2	74.7	no	2.5	negligible
R013	35.9	40.4	yes	4.5	low	39.2	44.7	yes	5.5	low	44.8	48.8	yes	4.0	low
R029	53.9	55.8	yes	1.9	negligible	54.8	70.2	no	15.4	high	57.2	72.8	no	15.6	high
R030	55.9	57.7	yes	1.8	negligible	56.8	72.1	no	15.3	high	59.2	74.7	no	15.5	high
R031	53.3	55.2	yes	1.9	negligible	54.2	69.7	no	15.5	high	56.6	72.3	no	15.7	high
R040	37.3	39.7	yes	2.4	negligible	39.8	44.5	yes	4.7	low	42.9	47.4	yes	4.5	low
R041	39.5	41.6	yes	2.1	negligible	42.0	46.1	yes	4.1	low	44.8	48.7	yes	3.9	low
R042	41.7	43.5	yes	1.8	negligible	44.0	47.6	yes	3.6	low	46.7	50.2	yes	3.5	low
R043	45.8	47.5	yes	1.7	negligible	48.1	51.4	yes	3.3	low	50.7	53.8	yes	3.1	low
R044	62.8	64.1	yes	1.3	negligible	65.0	67.5	no	2.5	negligible	67.4	69.7	no	2.3	negligible
R045	50.2	51.6	yes	1.4	negligible	52.4	55.5	yes	3.1	low	54.9	57.7	yes	2.8	negligible
R046	46.7	48.4	yes	1.7	negligible	49.0	52.4	yes	3.4	low	51.6	54.7	yes	3.1	low
R047	42.9	44.9	yes	2.0	negligible	45.3	49.1	yes	3.8	low	48.3	51.8	yes	3.5	low
R048	36.8	40.0	yes	3.2	low	39.6	44.3	yes	4.7	low	52.3	53.1	yes	0.8	negligible
R054	29.8	39.8	yes	10.0	low	36.6	43.7	yes	7.1	low	42.4	48.6	yes	6.2	low
R056	32.9	60.5	yes	27.6	low	57.0	64.2	yes	7.2	low	63.6	68.6	no	5.0	moderate
R057	31.9	57.2	yes	25.3	low	53.5	60.9	yes	7.4	low	60.1	66.2	no	6.1	moderate
R058	34.8	61.3	yes	26.5	low	57.8	65.0	yes	7.2	low	64.4	70.9	no	6.5	moderate
R059	36.8	65.8	no	29.0	high	62.8	69.6	no	6.8	moderate	69.4	74.3	no	4.9	moderate
R065	56.0	58.9	yes	2.9	negligible	58.9	63.6	yes	4.7	low	62.3	66.1	no	3.8	moderate
R074	34.9	38.8	yes	3.9	low	38.1	43.4	yes	5.3	low	42.5	47.3	yes	4.8	low
R075	35.1	39.0	yes	3.9	low	38.3	43.6	yes	5.3	low	42.8	47.5	yes	4.7	low
R076	35.4	39.5	yes	4.1	low	38.7	44.1	yes	5.4	low	43.6	48.5	yes	4.9	low
R092	47.4	48.9	yes	1.5	negligible	49.7	52.7	yes	3.0	negligible	52.2	55.0	yes	2.8	negligible
R101	46.7	49.0	yes	2.3	negligible	47.8	63.3	yes	15.5	low	50.1	65.5	no	15.4	high
R102	31.6	51.3	yes	19.7	low	47.1	55.0	yes	7.9	low	53.7	60.6	yes	6.9	low

a) Alberta Transportation Guidance recommends that mitigation be considered when $L_{eq,24}$ noise levels from highway traffic exceed 65 dBA (Alberta Transportation n.d.).

b) Project-related change in noise levels is the difference between the combined noise level and the background noise level.

Table 12: Summary of Noise Effect Magnitudes for Project Traffic

Temporal Snapshot	Magnitude of Effect – Number of Receptors Per Category			
	Negligible	Low	Moderate	High
Opening Day	18	17	0	1
Interim 2032	4	26	3	3
Full ASP Buildout	7	16	9	4

The magnitude of noise effects from Project traffic is predicted to be high at one receptor (R059) during the Opening Day temporal snapshot. At all other receptors, the magnitude of predicted noise effects is either low or negligible.

The magnitude of noise effects from Project traffic is predicted to be moderate at three receptors (R002, R004, and R059) and high at three receptors (R029, R030, and R031) during the Interim 2032 temporal snapshot. At all other receptors, the magnitude of predicted noise effects is either low or negligible.

The magnitude of noise effects from Project traffic is predicted to be moderate at nine receptors (R002, R003, R007, R010, R056, R057, R058, R059, and R065) and high at four receptors (R029, R030, R031, and R101) during the Full ASP Buildout temporal snapshot. At all other receptors, the magnitude of the predicted noise effects is either low or negligible.

6.4 Airstrip

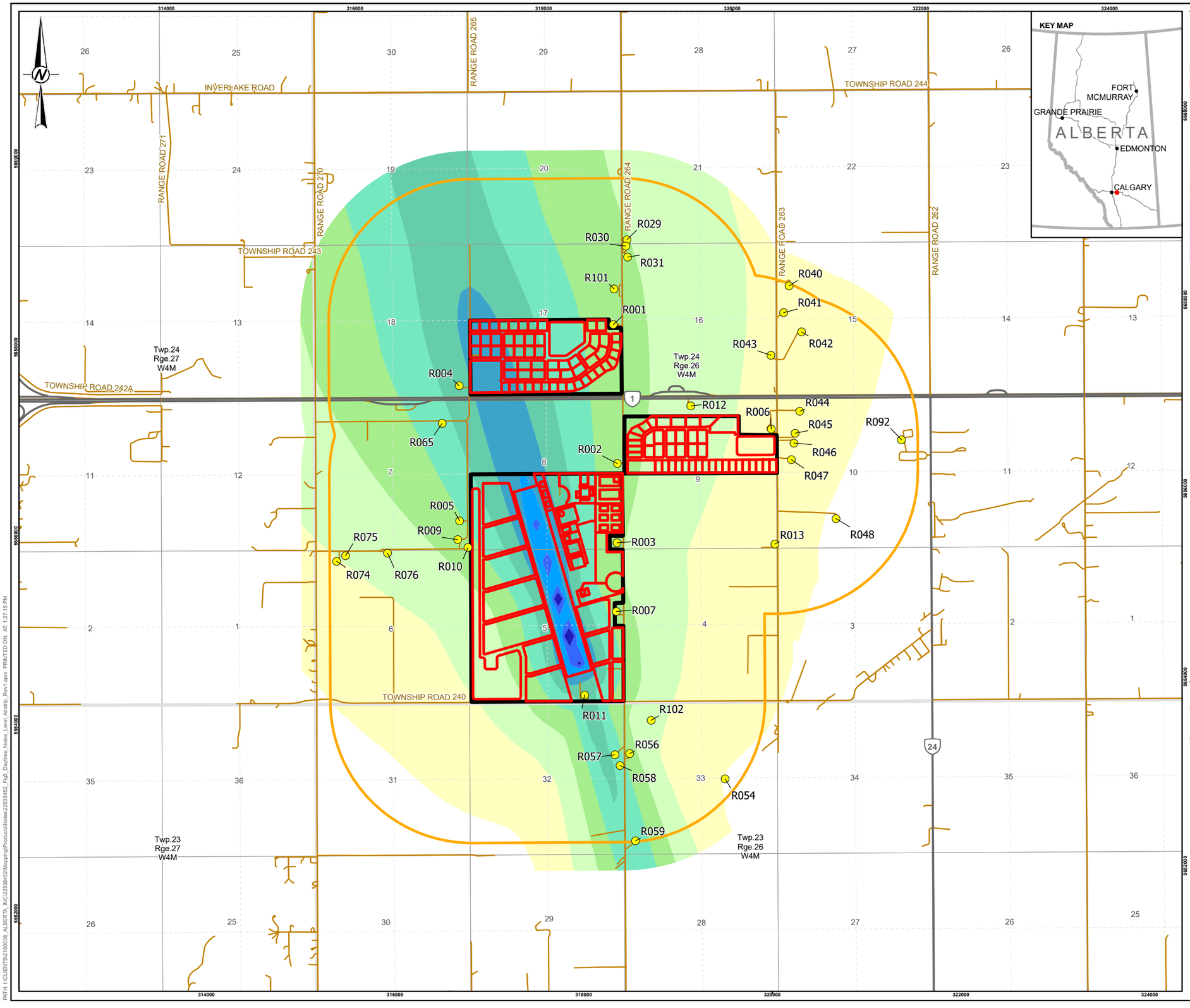
The ECAC models were used to predict noise from the Project airstrip at each receptor in the Study Area. The models were used to predict L_{max} noise levels for individual aircraft arrivals and departures. These L_{max} values were then used to classify the magnitude of airstrip noise effects at each receptor based on criteria specified in Section 4.2 of this report. The ECAC models were also used to predict $L_{eq,day}$ and $L_{eq,24}$ noise levels for a representative six-month period of Project operations and for individual days corresponding to specific airstrip activities (e.g., arrival or departure of a particular type of aircraft). Time-averaged noise levels (e.g., $L_{eq,day}$ and $L_{eq,24}$) are not the best tools for assessing intermittent noise from the Project airstrip, so these values are presented for information purposes only and were not used in the classification of noise effects from the airstrip.

Table 13 presents predicted $L_{eq,day}$ and $L_{eq,24}$ noise levels from the Project airstrip over a representative six-month period. Note that $L_{eq,night}$ noise levels were not predicted for the Project airstrip since all Project flights will be confined to the daytime period (i.e., there will be no nighttime flights associated with the Project). Figure 5 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip over a representative six-month period.

Figure 6 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip on a day with a Twin Otter arrival. Figure 7 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip on a day with a Twin Otter departure. Figure 8 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip on a day with a Dash 8 arrival. Figure 9 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip on a day with a Dash 8 departure. Figure 10 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip on a day with a Water Bomber arrival. Figure 11 presents a contour map showing predicted $L_{eq,day}$ noise levels from the Project airstrip on a day with a Water Bomber departure.

Table 13: Predicted Noise Level from Airstrip Operations – Six-Month Average

Receptor Identification Code	Airstrip Noise Level [dBA] – Six-Month Average	
	Daytime [$L_{eq,day}$]	24-Hour [$L_{eq,24}$]
R001	22.3	20.3
R002	22.2	20.2
R003	21.2	19.2
R004	32.9	30.9
R005	24.4	22.4
R006	13.3	11.3
R007	23.0	21.0
R009	22.6	20.6
R010	23.2	21.2
R011	35.0	33.0
R012	17.4	15.4
R013	11.5	9.5
R029	20.2	18.2
R030	20.3	18.3
R031	20.4	18.4
R040	13.3	11.3
R041	13.5	11.5
R042	12.8	10.8
R043	13.8	11.8
R044	12.2	10.2
R045	12.2	10.2
R046	12.1	10.1
R047	12.0	10.0
R048	9.7	7.7
R054	9.9	7.9
R056	22.4	20.4
R057	28.2	26.2
R058	27.4	25.4
R059	28.7	26.7
R065	28.4	26.4
R074	14.8	12.8
R075	15.3	13.3
R076	17.1	15.1
R092	8.8	6.8
R101	21.9	19.9
R102	16.5	14.5



LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

PREDICTED AVERAGE NOISE LEVEL FROM AIRSTRIP OPERATIONS (Leq, day; dBA)

- 10 to 15
- 15 to 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- 40 to 45
- 45 to 50
- > 50

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL FROM AIRSTRIP OPERATIONS – SIX-MONTH AVERAGE

CONSULTANT

wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
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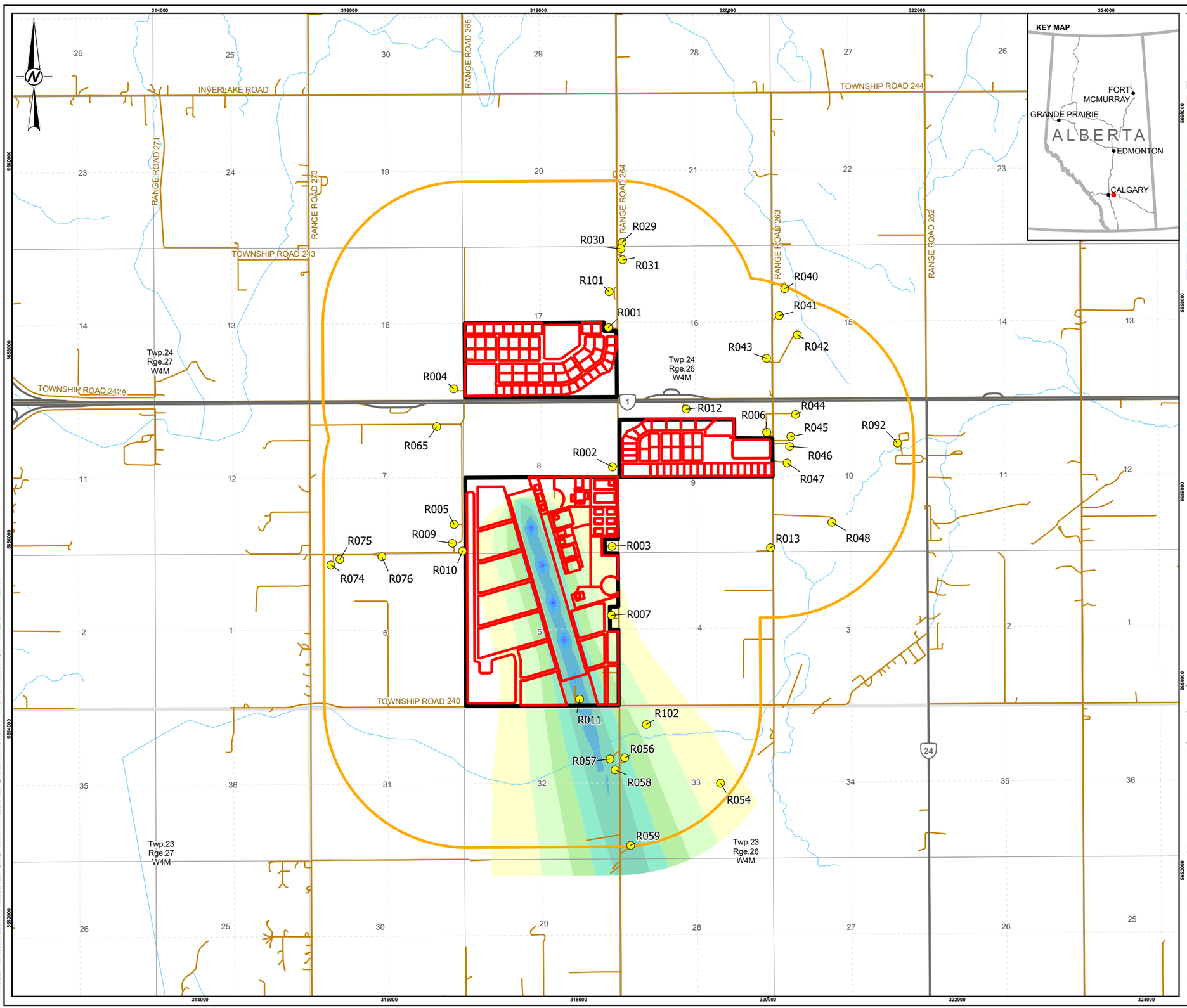

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL ON DAY WITH TWIN OTTER ARRIVAL

CONSULTANT
wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB/SP
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
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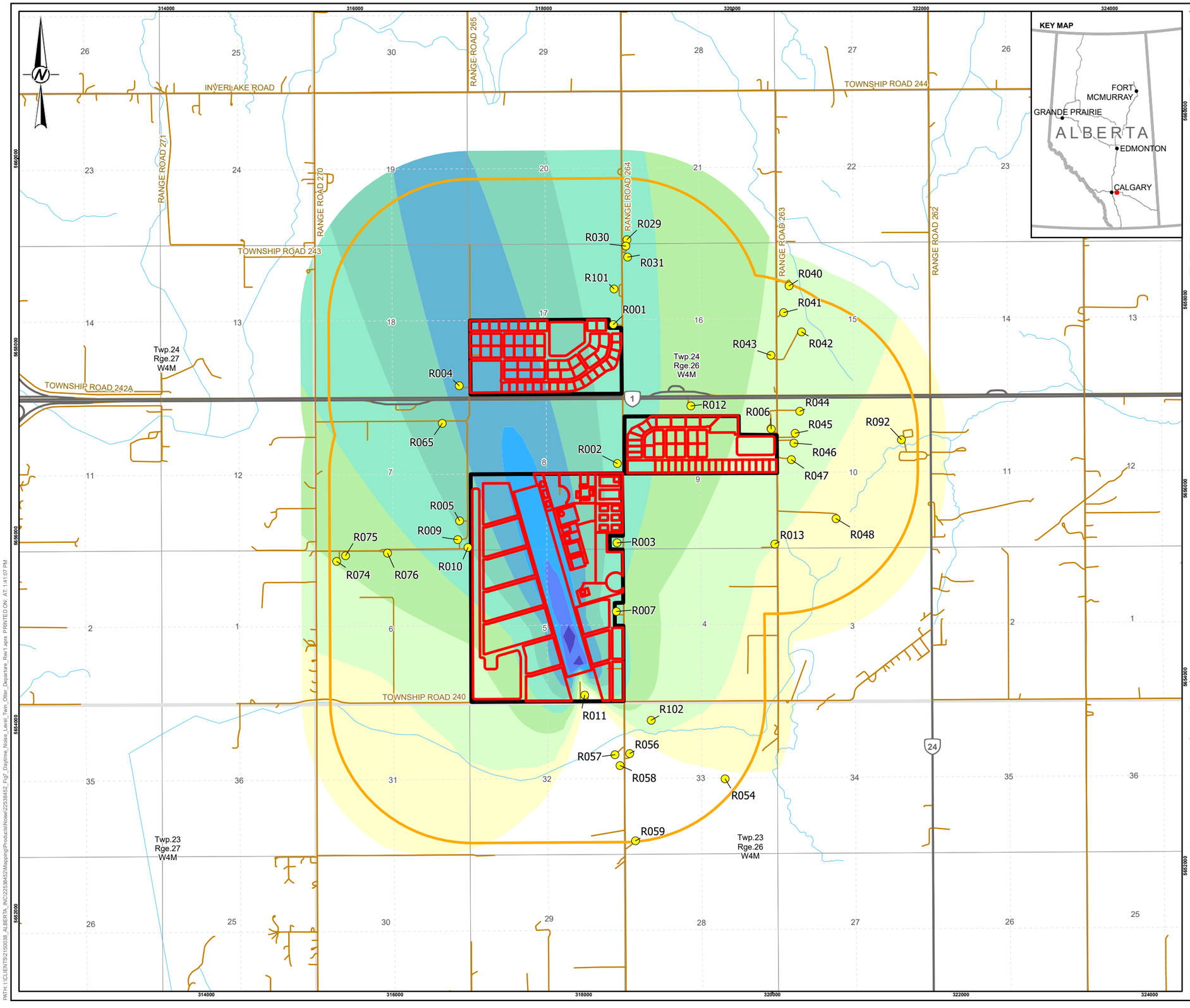

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

PREDICTED NOISE LEVEL ON DAY WITH TWIN OTTER DEPARTURE (Leq,day; dBA)

- 10 to 15
- 15 to 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- 40 to 45
- 45 to 50
- > 50

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL ON DAY WITH TWIN OTTER DEPARTURE

CONSULTANT

wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB/SP
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	7

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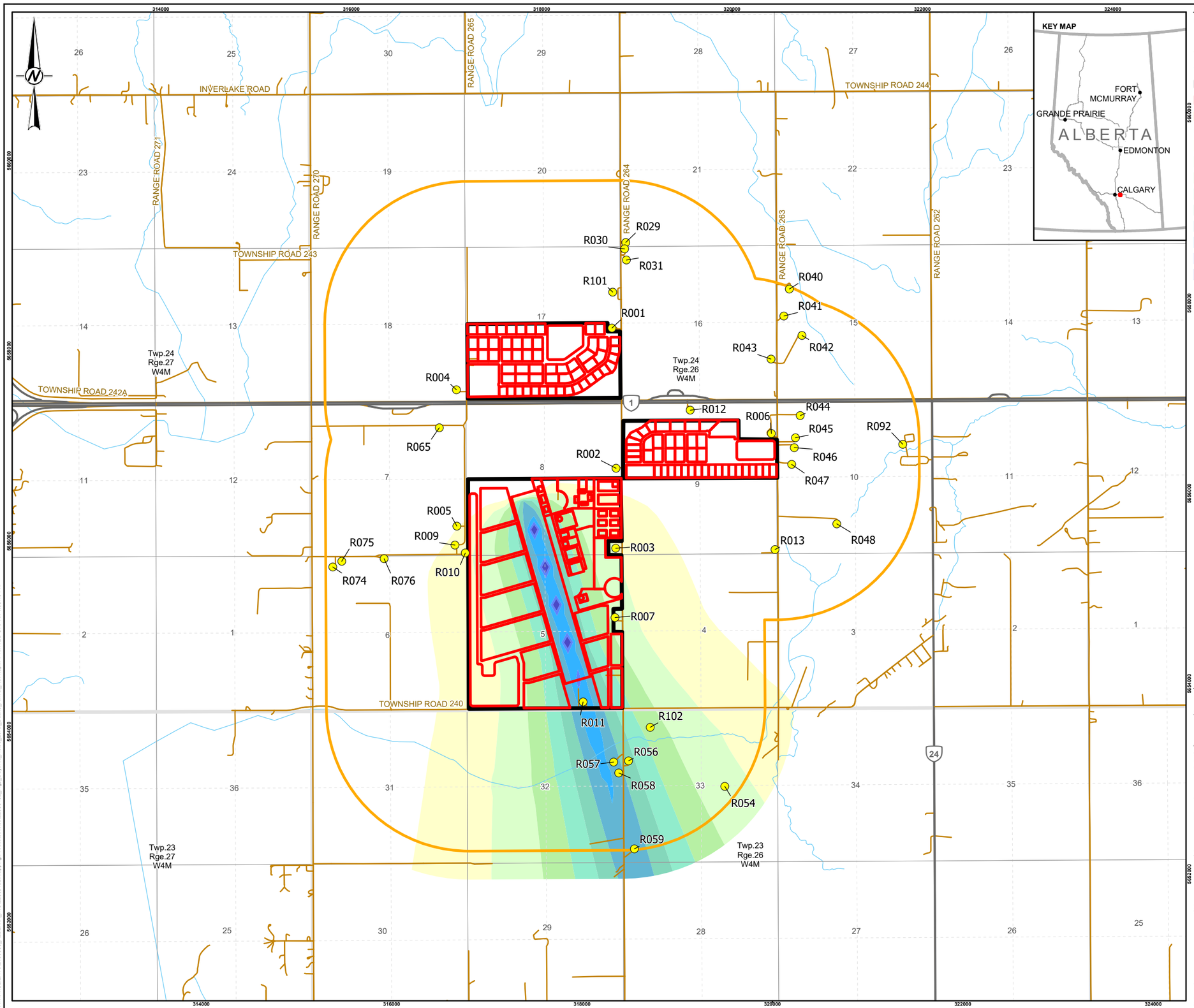

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

PREDICTED NOISE LEVEL ON DAY WITH DASH 8 ARRIVAL (Leq,day; dBA)

- 10 to 15
- 15 to 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- 40 to 45
- 45 to 50
- > 50

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL ON DAY WITH DASH 8 ARRIVAL

CONSULTANT

wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB/SP
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	8

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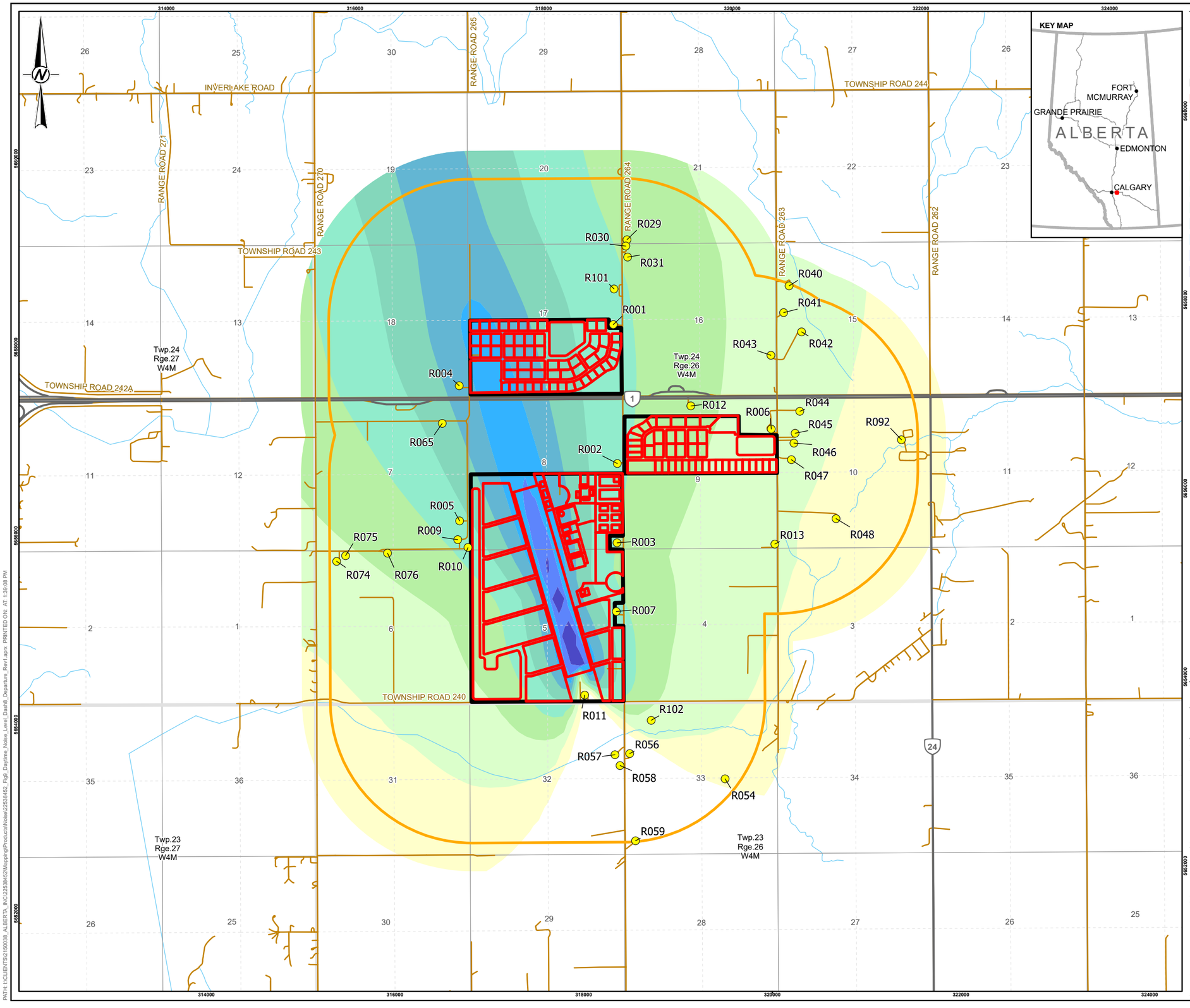

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

PREDICTED NOISE LEVEL ON DAY WITH DASH 8 DEPARTURE (Leq,day; dBA)

- 10 to 15
- 15 to 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- 40 to 45
- 45 to 50
- > 50

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL ON DAY WITH DASH 8 DEPARTURE

CONSULTANT

wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB/SP
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	9

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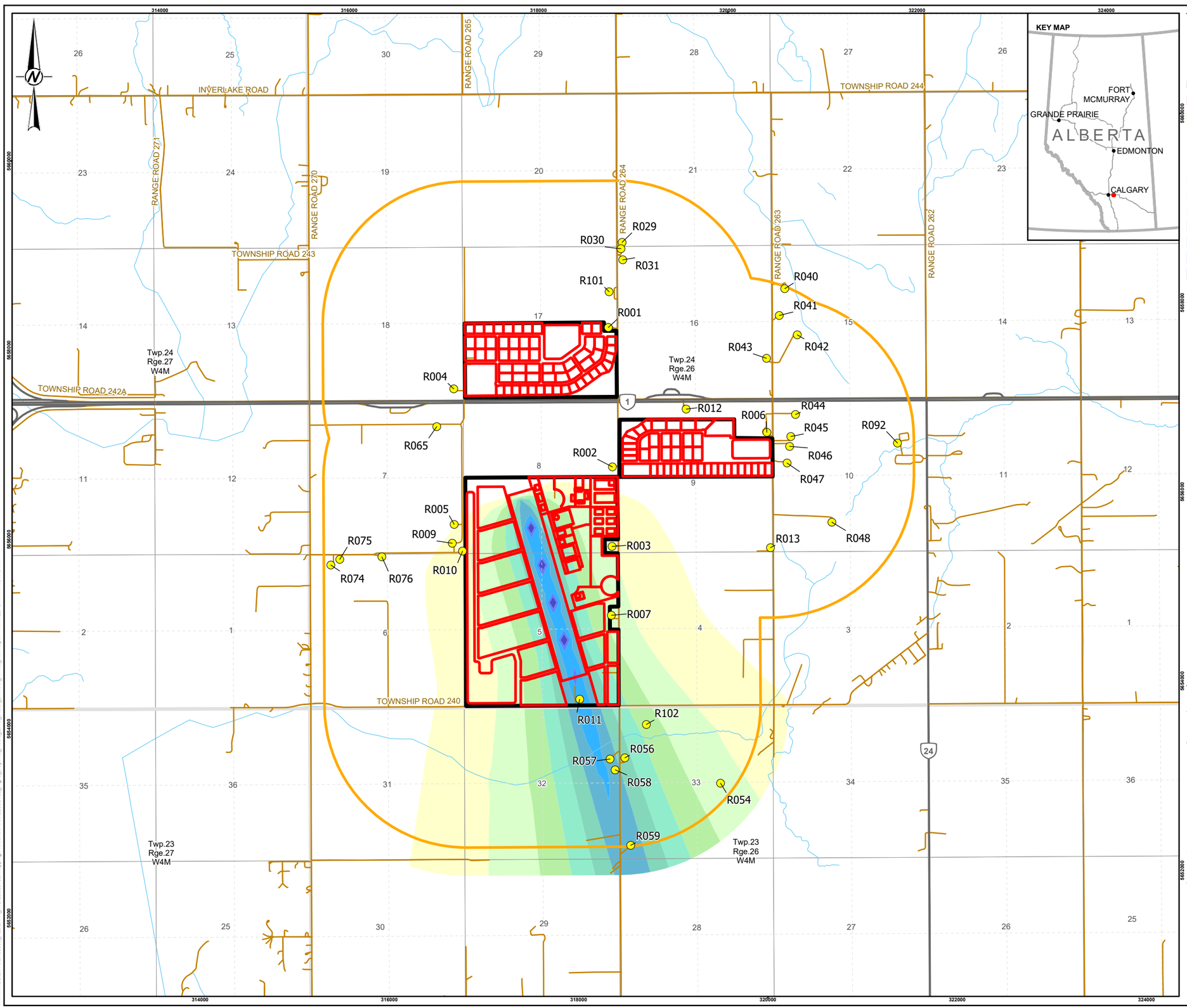

KEY MAP

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

PREDICTED NOISE LEVEL ON DAY WITH WATER BOMBER ARRIVAL (Leq,day; dBA)

- 10 to 15
- 15 to 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- 40 to 45
- 45 to 50
- > 50

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL ON DAY WITH WATER BOMBER ARRIVAL

CONSULTANT

wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB/SP
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	10

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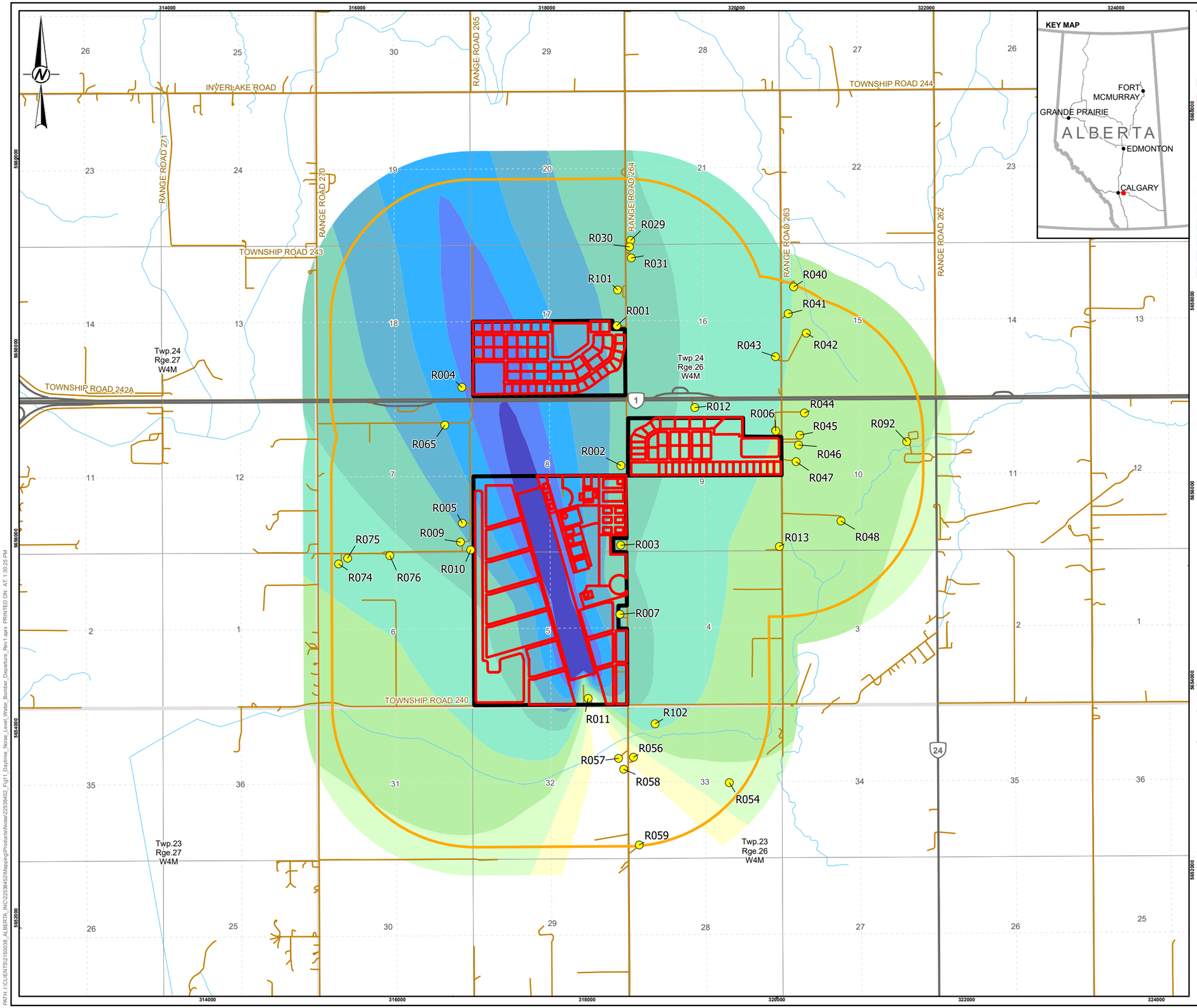

LEGEND

- NOISE RECEPTOR LOCATION
- LOCAL ROAD
- WATERCOURSE
- PROJECT BOUNDARY
- PROJECT FOOTPRINT
- NOISE STUDY AREA

PREDICTED NOISE LEVEL ON DAY WITH WATER BOMBER DEPARTURE (Leq,day; dBA)

- 10 to 15
- 15 to 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- 40 to 45
- 45 to 50
- > 50

0 500 1,000

1:40,000 METRES

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT
2150038 ALBERTA INC.

PROJECT
DE HAVILLAND FIELD

TITLE
DAYTIME NOISE LEVEL ON DAY WITH WATER BOMBER DEPARTURE

CONSULTANT
wsp

YYYY-MM-DD	2023-04-12
DESIGNED	VY
PREPARED	LB/SP
REVIEWED	VY
APPROVED	AF

PROJECT NO.	CONTROL	REV.	FIGURE
22538452	500	1	11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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For each receptor in the Study Area, Table 14 presents the L_{max} noise level corresponding to individual flight activities. Table 14 also presents the overall L_{max} noise level for any flight activity.

Table 14: Predicted Maximum Noise Levels for Individual Flight Activities

Receptor Identification Code	Noise Level During Flight Activity [Lmax; dBA]						Overall Maximum [Lmax; dBA]
	Twin Otter		Dash 8		Water Bomber		
	Arrival	Departure	Arrival	Departure	Arrival	Departure	
R001	31	67	36	70	36	78	78
R002	41	68	46	69	46	77	77
R003	49	67	54	68	54	75	75
R004	≤30	76	35	81	35	88	88
R005	50	70	55	72	55	79	79
R006	36	57	41	59	41	66	66
R007	52	74	58	74	58	82	82
R009	49	69	54	70	54	77	77
R010	50	69	55	70	55	78	78
R011	74	53	79	53	79	61	79
R012	36	62	41	64	41	71	71
R013	37	58	42	58	42	66	66
R029	≤30	66	33	68	33	75	75
R030	≤30	66	33	68	33	76	76
R031	≤30	66	33	68	33	76	76
R040	≤30	58	35	59	35	67	67
R041	≤30	58	36	59	36	67	67
R042	31	57	36	59	36	66	66
R043	32	58	37	60	37	67	67
R044	34	56	39	58	39	65	65
R045	35	56	40	57	40	65	65
R046	35	56	40	57	40	65	65
R047	35	56	40	57	40	65	65
R048	34	55	39	56	39	63	63
R054	47	55	52	55	52	63	63
R056	62	48	67	49	67	56	67
R057	68	44	73	44	73	52	73
R058	67	42	72	43	72	50	72
R059	68	32	74	34	74	42	74
R065	33	73	38	76	38	83	83
R074	38	59	43	61	43	68	68
R075	38	60	44	61	44	69	69
R076	41	62	47	63	47	71	71
R092	31	52	36	54	36	61	61
R101	≤30	67	34	70	34	78	78
R102	52	65	57	66	57	73	73

6.4.1 Effects Classification

Noise effects from the Project airstrip were classified using the criteria described in Section 4.2 of this report.

- Geographic Extent of noise effects from the Project airstrip is predicted to be **Beyond Regional** since noise effects will likely extend more than 5 km from the Project boundary.
- Duration of noise effects from the Project airstrip is **Medium-Term** since effects will occur throughout the Project operations phase.
- Frequency of noise effects from the Project airstrip is **Periodic** since effects will occur intermittently throughout the Project operations phase (i.e., 50 arrivals and 50 departures per year).

The magnitude of noise effects from the Project airstrip at individual receptors was classified based on the criteria presented in Section 4.2 of this report. Table 15 presents the magnitude classification for each of the 36 receptors in the Study Area. Table 16 presents a summary showing the number of receptors in each magnitude category.

Table 15: Magnitude of Noise Effects from Project Airstrip

Receptor Identification Code	Maximum Noise Level from Any Flight Activity [Lmax; dBA]	Effect Magnitude
R001	78	moderate
R002	77	moderate
R003	75	low
R004	88	high
R005	79	moderate
R006	66	low
R007	82	moderate
R009	77	moderate
R010	78	moderate
R011	79	moderate
R012	71	low
R013	66	low
R029	75	low
R030	76	moderate
R031	76	moderate
R040	67	low
R041	67	low
R042	66	low
R043	67	low
R044	65	low
R045	65	low
R046	65	low
R047	65	low
R048	63	low
R054	63	low
R056	67	low

Table 15: Magnitude of Noise Effects from Project Airstrip

Receptor Identification Code	Maximum Noise Level from Any Flight Activity [Lmax; dBA]	Effect Magnitude
R057	73	low
R058	72	low
R059	74	low
R065	83	moderate
R074	68	low
R075	69	low
R076	71	low
R092	61	low
R101	78	moderate
R102	73	low

Table 16: Summary of Noise Effect Magnitudes for Project Airstrip

Effect Magnitude	Number of Receptors
Negligible	0
Low	24
Moderate	11
High	1

The magnitude of noise effects from the Project airstrip is predicted to be moderate at eleven receptors (R001, R002, R005, R007, R009, R010, R011, R030, R031, R065, and R101) and high at one receptor (R004). At all other receptors, the magnitude of predicted noise effects is low. These effects only occur for the short duration when an aircraft is taking off or landing.

7.0 SUMMARY AND DISCUSSION

High magnitude Project noise effects are predicted for six of the 36 receptors in the Study Area: R004, R029, R030, R031, R059, and R101. At the other 30 receptors in the Study Area, the magnitude of Project noise effects is predicted to be moderate, low, or negligible.

High magnitude effects at R004 result from noise associated with the Project airstrip. Receptor R004 is located immediately northwest of the Project airstrip, directly in the flightpath of departing aircraft. Existing noise levels at R004 are already elevated because of proximity to TransCanada Highway 1 (Section 5.0). As such, time-averaged noise levels from airstrip operation (i.e., $L_{eq,day}$ and $L_{eq,24}$) are likely to be well-below existing noise levels. For example, the airstrip $L_{eq,day}$ for R004 is predicted to be 32.9 dBA (Table 13), which is well-below the existing $L_{eq,day}$ of 69 dBA estimated for receptors located closest to Highway 1 (Section 5.0), and more than 10 dBA less than the $L_{eq,day}$ of 45 dBA applicable in quiet rural environments (Health Canada 2017). However, during the departure of a Water Bomber, noise levels at R004 may temporarily reach 88 dBA (Table 14), which is very likely to be disturbing.

The Proponent anticipates that a total of 50 flights per year will depart the Project airstrip (Table 3). Given the small number of departures, high magnitude noise effects to R004 from operation of the Project airstrip could be partially mitigated through a communication plan that provides the residents of R004 with advance notice of

scheduled aircraft departures. Providing advance notice would allow residents to anticipate the temporary noise associated with aircraft flyovers and thereby reduce disturbance.

High magnitude noise effects at R029, R030, R031, R059, and R101 result from noise associated with Project traffic on public roads. Receptors R029, and R031 are occupied dwellings located north of Cell 3, and receptors R030 and R101 are businesses located north of Cell 3. Note that businesses are not usually considered noise receptors but R030 and R101 were included in the Project noise assessment in response to stakeholder interest. High magnitude noise effects to R029, R030, R031, and R101 are caused by Project traffic on Range Road 264 north of Cell 3. Receptor R059 is an occupied dwelling located south of Cell 1, and high magnitude noise effects to R059 are caused by Project traffic on Range Road 264 south of Cell 1. Note that high magnitude noise effects to R059 are only predicted for the early stages of Project operations (i.e., Opening Day temporal snapshot). The magnitude of Project noise effects to R059 will be reduced as non-Project development proceeds in the Study Area (i.e., Interim 2032 and Full ASP Buildout temporal snapshots), which will lead to an increase in noise levels from background traffic and a corresponding reduction in salience of noise from Project traffic.

High magnitude noise effects to R029, R030, R031, R059, and R101 could be partially mitigated through a traffic management plan that requires Project traffic to approach Cell 3 from the south and prohibits or restricts Project traffic from heading north on Range Road 264 when exiting Cell 3. Implementation of this management plan would effectively eliminate Project traffic on portions of Range Road 264 north of Cell 3. Similarly, high magnitude noise effects to R059 could be partially mitigated through a traffic management plan that requires Project traffic to approach Cell 1 from the north and prohibits or restricts Project traffic from heading south on Range Road 264 when exiting Cell 1. Implementation of this management plan would effectively eliminate Project traffic on portions of Range Road 264 south of Township Road 240.

Signature Page

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https://golderassociates.sharepoint.com/sites/166086/project files/5 technical work/900 noise assessment/reporting/rev1/de havilland field_noise assessment_rev1.docx

8.0 REFERENCES

AER (Alberta Energy Regulator). 2007. *Directive 038: Noise Control.*

Alberta Transportation. n.d. *Noise Attenuation Guidelines for Provincial Highways under Provincial Jurisdiction within Cities and Urban Areas.*

AUC (Alberta Utilities Commission). 2021. *Rule 012: Noise Control.*

Bunt (Bunt & Associates Engineering Ltd.). 2022. *De Havilland Field Transportation Impact Assessment – Final.*

ECAC (European Civil Aviation Conference). 2016. *Document 29 – Report on Standard Method of Computing Noise Contours Around Civil Airports.*

Health Canada. 2017. *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise.*

Transport Canada. 2022. *Managing Noise from Aircraft.* Website: https://tc.canada.ca/en/aviation/operating-airports-aerodromes/managing-noise-aircraft. Accessed December 8, 2022.

Transport Canada. 2013. *Aviation – Land Use in the Vicinity of Aerodromes. TP1247E.*

US DOT (United States Department of Transportation). 2021. *Traffic Noise Model.* Website: https://www.fhwa.dot.gov/environment/noise/traffic_noise_model/. Accessed September 7, 2021.

Wheatland (Wheatland County). 2022. *Bylaw 2022-13 Being a Bylaw of Wheatland County in the Province of Alberta for the Purpose of Regulating Noise.*

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