

Noise Monitoring Survey on Floatel #1- 7 (October 2 – 5, 2025)

Woodfibre LNG Project

November 21, 2025

123222939-RPT0070



Preamble

The Woodfibre Liquefied Natural Gas Project (the Project) is a liquefied natural gas export facility being constructed on the former Woodfibre Pulp and Paper Mill site in Átl'ka7tsem (Howe Sound), approximately seven kilometres south of Skwxwú7mesh (Squamish). The Project is on the historical location of a Skwxwú7mesh Úxwumixw (Squamish Nation) village known as Swiyát. Swiyát and Átl'ka7tsem (Howe Sound) are tied to the cultural well-being of Skwxwú7mesh Úxwumixw (Squamish Nation) members, their ancestors, and their descendants, and to other Indigenous groups as defined in the Project's Environmental Assessment Certificates. The Project is also operating within the traditional, ancestral, and unceded territory of the səliwətał (Tsleil-Waututh) Nation, and to other Indigenous groups as defined in the Project's Environmental Assessment Certificates. Woodfibre LNG General Partner Inc. (Woodfibre LNG) recognizes the importance of these areas to the Skwxwú7mesh stélməxw (Squamish People), and other Indigenous groups. Woodfibre LNG General Partner Inc., as general partner on behalf of Woodfibre LNG Limited Partnership seeks to construct and operate the Project in a manner that is respectful of Indigenous values. This Floatel Noise Monitoring and Mitigation Plan is primarily written in English with important place names, phrases, and passages provided in Skwxwú7mesh sníchim (the Squamish language).

Temíxwiýíkw chet wa naantem chet ti temíxw Swiyát
Chet wa sménhemswit kwis ns7éyxnitas chet ti temíxw
We7ú chet kwis t'íchimwit iy íwas chet ek' l tti.

Our ancient ancestors named this place Swiyát
We, as their descendants safeguard these lands
We will continue to swim and fish in these clear waters.

Limitations and Sign-off

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Squamish-English Translations

Squamish	English
Átl'ka7tsem	Howe Sound
ínexwantas	monitoring
Skwxwú7mesh	Squamish
Skwxwú7mesh sníchim	Squamish Language
Skwxwú7mesh stélmexw	Squamish people
Skwxwú7mesh Úxwumixw	Squamish Nation
Swiyát	Historic Squamish Nation village located at Woodfibre Site

Abbreviations

ANSI	American National Standards Institute
BC	British Columbia
BCER	British Columbia Energy Regulator
dB	Decibel level
dBA	A-weighted decibel level
EAC	Environmental Assessment Certificate
FNMMMP	Floatel Noise Monitoring and Mitigation Plan
HVAC	Heating, ventilation, and air-conditioning
Hz	Hertz
L _{Amax}	Maximum A-weighted equivalent sound level
L _d	Daytime equivalent sound level
L _{eq}	Energy equivalent sound level
L _n	Nighttime equivalent sound level
LNG	Liquified natural gas
MOE	Ministry of Environment and Climate Change Strategy, now Ministry of Environment and Parks
MOH	Ministry of Health
the Project	Woodfibre Liquefied Natural Gas Project
SPL	Sound pressure level
VCH	Vancouver Coastal Health
WHO	World Health Organization
Woodfibre LNG	Woodfibre LNG General Partner Inc.

Glossary

Adaptive Management	A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.
Bands (octave, 1/3 octave)	A series of electronic filters separate sound into discrete frequency bands, making it possible to know how sound energy is distributed as a function of frequency. Each octave band has a centre frequency that is double the centre frequency of the octave band preceding it.
daytime	The hours from 07:00 to 22:00.
dB - Decibel	A logarithmic unit associated with sound pressure levels and sound power levels.
dBA - decibel, A-weighted	A logarithmic unit where the recorded sound has been filtered using the A frequency weighting scale. A-weighting somewhat mimics the response of the human ear to sounds at different frequencies. A weighted sound pressure levels are denoted by the suffix 'A' (i.e., dBA), and the term pressure is normally omitted from the description (i.e., sound level or noise level).
energy equivalent sound level (L_{eq})	An energy-average sound level taken over a specified period of time. It represents the average sound pressure encountered for the period. The time period is often added as a suffix to the label (e.g., $L_{eq}(24)$ for the 24-hour equivalent sound level). L_{eq} is usually A-weighted. A L_{eq} value expressed in dBA is a good, single value descriptor of the annoyance of noise.
frequency	Number of cycles per unit of time. In acoustics frequency is expressed in hertz (Hz), i.e., cycles per second.
floatel	The marine-based work camp, associated facilities and mooring infrastructure dedicated to house approximately 650 Workers during the Construction of the Project.
hertz (Hz)	Unit of measurement of frequency, numerically equal to cycles per second.
L_d	Daytime sound level, an equivalent continuous sound level taken over 15 hours from 07:00 to 22:00.
L_{Amax}	The maximum value of the A-weighted sound pressure level during a measurement duration.

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L_n	Nighttime sound level, an equivalent continuous sound level taken over 9 hours from 22:00 to 07:00.
nighttime	The hours from 22:00 to 07:00.
noise	Unwanted sound.
noise level	Same as sound level, except applied to unwanted sounds.
sound	A dynamic (fluctuating) pressure.
sound pressure level (SPL)	<p>The logarithmic ratio of the root mean square (RMS) sound pressure to the sound pressure at the threshold of hearing. The sound pressure level is defined by the equation below where P is the RMS pressure due to a sound and P_0 is the reference pressure. P_0 is usually taken as 2.0×10^{-5} Pascals.</p> $\text{SPL (dB)} = 20 \log (P_{\text{RMS}}/P_0)$

1.0 INTRODUCTION

1.1 OVERVIEW

Woodfibre LNG General Partner Inc. (Woodfibre LNG) is constructing the Woodfibre Liquefied Natural Gas Project (the Project), which is located on the former Woodfibre Pulp Mill site approximately seven kilometres (km) southwest of Sk̓w̓x̓w̓7mesh (Squamish), British Columbia (BC).

Woodfibre LNG received an amendment to the Environmental Assessment Certificate (EAC) #E15-02 (Amendment #3) on November 1, 2023 for Floatel #1, approving the use of temporary accommodation for off-duty construction workers in a self-contained floating housing facility (floatel). The Amendment #3 includes conditions related to air quality and noise monitoring for Floatel #1 occupants.

Floatel #1 was mobilized and moored at the Project site on June 21, 2024, and will be continuously operating for approximately three years during the construction of the Project. Floatel #1 will provide accommodation for approximately 650 persons at peak construction. In addition to the accommodation spaces, the floatel also includes a variety of ancillary service facilities such as medical, food and beverage, laundry, recreational and leisure, and office spaces. Figure 1 in Appendix A shows the site plan and location of Floatel #1.

1.2 FLOATTEL NOISE MONITORING AND MITIGATION PLAN

Amendment #3 includes conditions regarding noise management for Floatel #1. Condition 30 of Amendment #3 states that:

30.1 The Holder must retain a Qualified Professional(s) to develop the following monitoring and mitigation plans, in consultation with MOE¹, MOH², BC Energy Regulator, VCH³ and Aboriginal Groups:

b) Noise Monitoring and Mitigation Plan.

In accordance with the requirements of Condition 30, the Floatel Noise Monitoring and Mitigation Plan (the FNMMP) for Floatel #1 has been developed on July 17, 2024 (Rev.4) by the Stantec Qualified Professional and reviewed by the regulatory agencies (Stantec FNMMP 2024). The FNMMP specifically includes the Noise Monitoring Plan, Noise Mitigation Plan and Adaptive Management Plan.

In addition, Woodfibre LNG requested an amendment (EAC Amendment #4) for the installation and operation of a second floating worker accommodation (Floatel #2), and Amendment #4 has been approved with Condition #36 regarding noise monitoring and mitigation plan for both Floatel #1 and Floatel #2. The FNMMP is being updated accordingly in consideration of the new amendment and is currently under review. Noise monitoring program for both floatels will be addressed in the next round of noise monitoring. Unless otherwise indicated, the FNMMP is applied for Floatel #1 herein.

¹ MOE: Formerly Ministry of Environment and Climate Change Strategy now the Ministry of Environment and Parks

² MOH: Ministry of Health

³ VCH: Vancouver Coastal Health

The FNMMP provides general guidance about how to assess workers' sleep disturbance due to Project related construction noise within the floatel cabins. The general guidance includes monitoring methods, sleep disturbance noise threshold, data analysis procedures, and reporting requirements.

1.3 OBJECTIVE

In accordance with the FNMMP, a series of quarterly noise monitoring programs will be conducted or initiated following changes in construction activities.

Seven noise monitoring surveys have been conducted on Floatel #1 since July 2024, and six summary reports have been submitted to date. All reports are listed below:

- The initial noise monitoring program was conducted from July 10 to July 14, 2024, to measure sound levels in the cabins. The results were presented in a report "Floatel Noise Monitoring Survey - 1 (July 10 - 14, 2024) – Woodfibre LNG Project" (Stantec 2024a).
- A 2nd subsequent noise monitoring survey was conducted from September 4 to September 7, 2024; and the results were presented in a report "Floatel Noise Monitoring Survey - 2 (September 4 – 7, 2024) – Woodfibre LNG Project" (Stantec 2024b).
- A 3rd subsequent noise monitoring survey was conducted from October 8 to October 11, 2024; and the results were presented in a report "Floatel Noise Monitoring Survey - 3 (October 8 – 11, 2024) – Woodfibre LNG Project" (Stantec 2024c).
- The 4th subsequent noise monitoring survey was conducted from January 31 to February 2, 2025; the results were presented in a report "Floatel Noise Monitoring Survey - 4 (January 31 – February 2, 2025) – Woodfibre LNG Project" (Stantec 2024d).
- The 5th subsequent noise monitoring survey was conducted from May 14 to May 17, 2025; the results were presented in a report "Floatel Noise Monitoring Survey - 5 (May 14 to May 17, 2025) – Woodfibre LNG Project" (Stantec 2024e).
- The 6th subsequent noise monitoring survey was conducted from July 23 to July 28, 2025; the results were presented in a report "Floatel Noise Monitoring Survey - 6 (July 23 to July 28, 2025) – Woodfibre LNG Project" (Stantec 2024f).

The 7th subsequent noise monitoring survey was conducted from October 2 to October 5, 2025. During this seventh noise monitoring period, shore grid power continued to supply electricity to the floatel. Continuous construction activities were observed during the dayshift and nightshift.

The objectives of the noise monitoring programs include the following:

- Measure sound levels at the selected cabins.
- Analyze data gathered and evaluate noise effects on the floater cabins from construction activities.
- Compare the measured sound levels with applicable sleep disturbance thresholds and assess compliance for sleep disturbance effect for sleeping quarter occupants.
- Conduct interviews about noise with occupants.
- Recommend mitigation or adaptive management plan if required.

1.4 ENVIRONMENTAL NOISE DESCRIPTORS

All noise descriptors in this assessment are based on the A-weighted decibel (dBA) scale. The dBA unit is based on relative loudness of sound at different frequencies and is meant to reflect the human ear's response to noise.

Environmental noise typically varies over time. To account for this variation, single number descriptors are used. It is defined as the steady, continuous sound level over a specified time that has the same acoustic energy as the actual varying sound levels over the specified time. The noise descriptors energy equivalent sound level (L_{eq}), daytime equivalent A-weighted sound level (L_d), nighttime equivalent A-weighted sound level (L_n), and maximum A-weighted sound level (L_{Amax}) are commonly used to quantify noise effects for activities of a project. The following provides a general description for these descriptors:

- L_{eq} represents the energy-average sound pressure encountered for the period.
- L_d is the 15-hour energy equivalent A-weighted sound level during the daytime period from 07:00 to 22:00.
- L_n is a 9-hour energy equivalent A-weighted sound level during the nighttime period from 22:00 to 07:00.
- L_{Amax} is the maximum A-weighted sound level recorded over the measurement duration.

The Glossary section provides additional details for these descriptors.

2.0 CABIN SOUND LEVEL TARGETS

Construction noise may cause sleep disturbance for the floatel occupants during the Project construction phase. This section focuses on the sleep disturbance threshold recommendations by Health Canada, as well as room sound level criteria from international standards (i.e., American National Standards Institute [ANSI]).

2.1 HEALTH CANADA SLEEP DISTURBANCE THRESHOLD

Noise may cause sleep disturbance for people and there is clear evidence that ongoing sleep disturbance is associated with a wide variety of health effects, such as cardiovascular effects, mental health and hearing impairment. Health Canada's Guidance for Evaluating Human Health Effects in Impact Assessment: NOISE, 2023 (Health Canada Noise Guidance) references the guidelines and recommendations of the World Health Organization (WHO) for community noise (WHO 1999) and Night Noise Guidelines for Europe regarding sleep disturbance (WHO 2009). The WHO 1999 guideline recommends a threshold for sleep disturbance as being an indoor sound level of no more than 30 dBA L_{eq} for continuous noise during the sleep period. Additionally, for individual noise events, Health Canada refers to WHO's recommendations that indoor sound levels should not exceed 45 dBA L_{Amax} more than 10 to 15 times per night to provide for a good sleep environment (WHO 1999). Health Canada recommends that an outdoor-to-indoor transmission loss with windows at least partially open is 15 dBA and fully closed windows are assumed to reduce outdoor sound levels by approximately 27 dBA (Health Canada 2023).

The Project construction activities may be scheduled 24 hours per day, meaning that the floatel occupants could be off-duty and sleeping during both daytime and nighttime while construction is ongoing. To assess potential sleep disturbances, the recommended indoor noise thresholds for the floatel are:

- 30 dBA (L_{eq}) for continuous noise level during sleep periods.
- Maximum 15 times of occurrence of $L_{Amax} > 45$ dBA during both daytime (07:00 to 22:00) and nighttime (22:00 to 07:00).

Although the Health Canada sleep disturbance threshold of 30 dBA is used in this assessment, it is better suited for private residential bedrooms with very low background noise. However, in spaces with higher occupant density, such as apartment buildings and hotel or motel rooms, background noise from central heating, ventilation and air-conditioning (HVAC) systems, as well as local people activities, a sound level of 30 dBA may not be feasible.

Therefore, in addition to Health Canada's thresholds, the ANSI S12.2 standard for hotel and motel room sound level criteria is used as an achievable target for evaluating interior noise on the floatel.

2.2 ANSI S12.2 SOUND LEVEL CRITERIA FOR ROOM

The ANSI S12.2-2019 (Reaffirmed in 2023) Criteria for Evaluating Room Noise is commonly used as a reference guide for assessment of sound level criteria for occupants in various interior environments. The ANSI standard specifies sound level criteria when evaluating the room noise by using the survey method that employs the A-weighted sound level. Table 2.1 lists the A-weighted sound level criteria for individual rooms or suite in hotels and motels, based on ANSI sound level criteria for room of various uses (ANSI S12.2).

Table 2.1 A-weighted Sound Level Criteria for Rooms – Hotels and Motels

Occupancy	A-weighted Sound Level dBA
Hotels/motels	
Individual rooms or suites	39-44
Meeting/banquet rooms	35-44
Service support areas	48-57
Source: Table C.1 of ANSI S12.2	

As the floatel worker accommodation is similar to the hotel/motel classification, the A-weighted sound level criteria of 39 to 44 dBA for individual rooms or suites are also included in the floatel noise evaluation, and 44 dBA will be set as the achievable target for the sleep disturbance thresholds.

3.0 NOISE MONITORING PROGRAM

In accordance with the FNMMP of Floatel #1, Stantec Qualified Professionals conducted this noise monitoring program on Floatel #1 from October 2 to October 5, 2025. The following sections outline the monitoring program details for Floatel #1, including cabin locations, measurement instrumentation, measurement setup, Project construction activities occurring during the measurement period, and data analysis methods.

3.1 CABIN LOCATIONS

The sound level meters were set up inside the representative cabins on different decks of the floatel. A representative cabin is an unoccupied cabin that is available for occupancy and is selected based on the highest potential noise impact. Key factors in cabin selection included proximity to construction activities, line of sight to noise sources, and availability during the survey period.

Six cabins were selected for the seventh noise monitoring survey: Cabin 2022, Cabin 5634, Cabin 6638, Cabin 7716, Cabin 9402 and Cabin 0105. Each cabin is located on a different deck, generally indicated by the first digit of the cabin number (e.g., Cabin 5634 on Deck 5 and Cabin 0105 on Deck 10).

Construction activities within the Project area were the major noise sources onsite and were the focus of the seventh noise monitoring surveys. The floatel is berthed starboard to shore, Cabin 5634, Cabin 6638, Cabin 9402 and Cabin 0105 are located at the starboard side of the floatel and facing the southwestern construction site. They were selected to evaluate noise effects from construction activities in the southwest. The rationale for the cabin selections is also presented in Table 3.1.

Table 3.1 summarizes the selected cabins, general descriptions, and field observations. Figure 2 through Figure 4, and Figure 6 through Figure 10 illustrate these cabin locations on each deck of the floatel.

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Table 3.1 Selected Cabins, Descriptions, and Observations

Cabin	Deck	Description and Observations during Monitoring Period	Reference Figures
2022	2	<ul style="list-style-type: none"> Deck 2 is under the ship water line. The 86 cabins on Deck 2 are mainly occupied by the crew members, there are a few construction workers also staying on Deck 2 due to full occupancy. Some cabins are adjacent to the floatel operating facilities, including Engine Stores (engine room) and workshop, and auxiliary equipment on Deck 3. Shore grid power provided power to the floatel during the survey period. Noise levels due to floatel operating equipment were reduced along the corridors. Cabin 2022 is located at the third row of cabins. Cabin ceiling ventilation was continuously operating. 	Figure 2 Figure 5
5634	5	<ul style="list-style-type: none"> Total of 219 cabins, the second highest numbers of cabins per deck after Deck 6. Cabins are occupied by the construction workers. There are Vent Stores (i.e., ventilation rooms) and Service Workshop located at the stern of Deck 5. Cabin 5634 was selected as it is located at the starboard side of the floatel and facing the southwestern construction site. Cabin ceiling ventilation was continuously operating. 	Figure 2 Figure 6
6638	6	<ul style="list-style-type: none"> Total of 248 cabins, highest number of cabins per deck among all decks. Cabins occupied by the construction workers. Cabin 6638 was selected as it is located at the starboard side of the floatel and facing the southwestern construction site, and also it is underneath the Gym on Deck 7. Cabin ceiling ventilation was continuously operating. 	Figure 3 Figure 7
7716	7	<ul style="list-style-type: none"> Total of 58 cabins on Deck 7. Ancillary service facilities on Deck 7 including Reception, Gym, Games Lounge, and other facility rooms. Cabins are occupied by the construction workers. Cabin 7716 it is located at the stern of the floatel and inside the cabin area on Deck 7. Cabin ceiling ventilation was continuously operating. 	Figure 3 Figure 8
9402	9	<ul style="list-style-type: none"> Total of 88 cabins on Deck 9. There is an outdoor area at the stern and a smoking area on the starboard side of Deck 9. Cabins are occupied by the construction workers. Some cabins are located underneath several Fan Rooms (rooms with ventilation fans) on Deck 10, e.g., Cabins 9420 to 9436. Higher noise from Fan Rooms ventilation openings was observed at the smoking area. Cabin 9402 is located at the starboard side of the floatel and facing the southwestern construction site. Cabin ceiling ventilation was continuously operating. 	Figure 4 Figure 9

Cabin	Deck	Description and Observations during Monitoring Period	Reference Figures
0105	10	<ul style="list-style-type: none"> Total of 17 cabins with office areas on Deck 10. Cabins are occupied by crew members and construction workers. There are several Fan Rooms on Deck 10. Cabin 0105 is located at the starboard side of the floatel and facing the southwestern construction site. Cabin ceiling ventilation was continuously operating. 	Figure 4 Figure 10

3.2 MEASUREMENT INSTRUMENTATION

Noise monitoring was conducted with two Brüel & Kjær Model 2250 sound level meters fitted with Brüel & Kjær 4189 and 4966 type microphones. The sound level meters meet the ANSI S1.4-2006 Type 1 and IEC 61672-1 Class 1 specifications. The sound level meters were field calibrated before and after each measurement period and have valid laboratory certificates. Laboratory certificates are considered valid within two-year period after last recalibration for the sound level meters and within one year period for the calibrator.

Table 3.2 summarizes details of the measurement instrumentation. Corresponding calibration certificates of sound level meters and calibrator are attached in Appendix C.

Table 3.2 Details of Measurement Instrumentation

Item	Description
Sound Level Meter	Brüel & Kjær Model 2250 s/n 2818093 Brüel & Kjær Model 2250 s/n 2809183
Microphone	Brüel & Kjær Model 4189 s/n 2799496 Brüel & Kjær Model 4966 s/n 2799510
Calibrator	Brüel & Kjær Model 4231 s/n 3009070
Bandwidth	1/3 Octave Band
Frequency Range	6.3 Hz – 20 kHz
Frequency Weightings	Z (Linear), A & C
Calibration Level	94 dB at 1 kHz

3.3 MEASUREMENT SETUP

Dayshift workers sleep during nighttime and nightshift workers sleep during daytime on the floatel. Therefore, continuous sound levels over 24 hours (i.e., over one daytime and one nighttime periods) were measured at the cabins.

Two sound level meters were deployed for continuous noise monitoring. The sound level meters were set to 1-minute logging intervals measuring L_{Amax} and L_{eq} sound levels in one-third octave band L_{eq} sound levels from 6.3 Hz to 20 kHz frequency range.

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Sound level meters also recorded the continuous digital audio signal simultaneously for further data analysis and post-processing to remove (isolate) extraneous noise events from the dataset.

The microphones were set up at bed height (i.e., 1 meter above the room floor) in each cabin. Figure 5 through Figure 10 in Appendix A illustrate the sound level meter setup at each cabin.

The monitoring procedures are described as below:

- Two sound level meters were set up at Cabin 5634 and Cabin 6638 collect continuous noise data over 24 hours from October 2 to October 3.
- Two sound level meters were switched to Cabin 2022 and Cabin 7716 to collect continuous noise data over 24 hours from October 3 to October 4.
- Two level meters were switched to Cabin 9402 and Cabin 0105 to collect continuous noise data over 24 hours from October 4 to October 5.

Table 3.3 summarizes the measurement duration at each cabin during the noise monitoring period.

Table 3.3 Noise Monitoring Duration at Cabins

Cabin	Measurement Start		Measurement End		Measurement Duration (hrs mm))
	Date (mm/dd/yyyy)	Time (hh:mm)	Date (mm/dd/yyyy)	Time (hh:mm)	
2022	10/03/2025	16:35	10/04/2025	18:29	25 hrs 54 mins
5634	10/02/2025	15:03	10/03/2025	16:17	25 hrs 14 mins
6638	10/02/2025	15:12	10/03/2025	16:28	25 hrs 16 mins
7716	10/03/2025	16:23	10/04/2025	18:22	25 hrs 59 mins
9402	10/04/2025	18:26	10/05/2025	18:31	24 hrs 5 mins
0105	10/04/2025	18:34	10/05/2025	18:36	24 hrs 2 mins

3.4 PROJECT CONSTRUCTION ACTIVITIES

There were Project dayshift and nightshift construction activities during the noise monitoring period from October 2 to October 5. The dayshift was from 07:00 to 17:00 and the nightshift was from 19:00 to 07:00. Figure 12 illustrates the construction areas onsite with Area ID #.

Major construction activities during the noise monitoring period included the following:

- Marine Work: Completed drilling the rock socket at temporary pile T2 with the LB45 drill rig; utilized the manitowoc crane to stage the prepared cruciform beam, empty totes and rigging, prepared work area and grout plant for the upcoming grout pour; completed grout pour on temporary pile T2.
- Civil Work: An excavator loaded rock trucks with blast rock material in the area, the material was hauled to the 4200 Area stockpile; continued loading, hauling, and placing Type A material to prepare the subgrade for the placement of the control building mud slab; and an excavator hammered bedrock in the utility #2 electrical trench footprint in the 4100 Area.

- Concrete Work: Crew finished pulling off tie sets due to design change at Flare Anchor B, and loaded rebar on a trailer from old design; bush hammering inside and the outside of the rebar ped on flare at Flare Anchor A.
- Water Treatment: Separated and organized HDPE pipe and fittings for install; performed housekeeping around 2700 GPM laydown; and worked with the site services to train on filling Pomerleau barge with water and receiving sewage.

3.5 DATA ISOLATION ANALYSIS

The FNMMP prescribes that measured noise data that are not representative of the existing acoustic environment, and non-representative weather conditions can be isolated from the data set prior to the calculation of any average values.

Weather during this monitoring period was generally representative most of the time; there were no high wind and heavy rain outside to influence the indoor measurements. Therefore, isolation was not applied to weather conditions.

Noise events isolated from the data set included:

- Qualified Professional activities (e.g., equipment setup and disassembly, daily regular checkups).
- Door knocking or opening at the monitored cabin.

These noise events were identified using audio recordings and also based on the Qualified Professional's field notes and then removed from the valid measurement data. Noise from local anthropogenic activities from neighbor occupants (e.g., toilet flushing, foot traffic and conversation in the corridor) and crew member activities nearby (e.g., regular operations, cleaning and maintenance activities) was considered to be part of the existing acoustic environment and was not isolated.

After the data isolation, L_{eq} , L_d , L_n , and L_{Amax} values were determined for the different measurement periods. Once the data isolation analysis was completed, the resulting valid noise data set (i.e., with invalid data removed) was logarithmically averaged over the corresponding time periods using the following formula:

$$L_{Aeq}(isolated, ave) = 10 \lg_{10} \left[\frac{1}{N_V} \sum_{i=1}^{N_V} 10^{(0.1 L_{Aeq})} \right] dBA$$

where N_V = number of valid 1-minute logging periods in the measurement data set.

4.0 MEASUREMENT RESULTS

This section summarizes the analysis results for the 7th noise monitoring on Floatel #1. The L_d , L_n , the occurrence of L_{Amax} higher than 45 dBA (i.e., Health Canada thresholds) are analyzed and presented in tables herein. In total, there are more than 9000 minutes logged measurement values at six cabins during the monitoring period.

4.1 MEASUREMENT RESULTS AT CABINS

Table 4.1 provides an overall summary of the noise monitoring results at each noise monitoring cabin.

Table 4.1 Summary of Measurement Results

Cabin	Deck	Overall Average Daytime L_d , dBA	Overall Average Nighttime L_n , dBA	Number of Highest Occurrence of $L_{Amax} > 45$ dBA	
				Daytime	Nighttime
2022	2	42.3	42.4	35	14
5634	5	44.6	44.6	551	540
6638	6	49.2	49.3	566	540
7716	7	39.3	39.4	16	8
9402	9	35.3	35.2	154	113
0105	10	39.8	39.8	38	2

The overall average daytime L_d sound levels are the logarithmic average of two daytime measurement results at each cabin. Details of daily measurement results at each cabin are described in the following sections. The daily results are compared to the Health Canada sleep disturbance thresholds and ANSI room sound level criteria of 39 to 44 dBA.

4.2 CABIN 2022

Table 4.2 summarizes the daily L_d and L_n sound levels, and quantities of occurrence with $L_{Amax} > 45$ dBA at Cabin 2022.

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Table 4.2 Summary of Daily L_d and L_n at Cabin 2022

Date (mm/dd/yyyy)	Average Daytime L_d , dBA	Average Nighttime L_n , dBA	Daytime Quantity of $L_{Amax} > 45$ dBA	Nighttime Quantity of $L_{Amax} > 45$ dBA	Health Canada		ANSI S12.2
					L_{eq} , dBA	Qty. of $L_{Amax} > 45$ dBA	L_{eq} , dBA
10/03/2025 ¹	42.4	42.4	35	14	30	15	39 to 44
10/04/2025	42.1	- ²	18	- ²	30	15	39 to 44

Notes:

¹ The measurements started at 16:35.

² “-” indicates no data was measured. The survey ended at 18:29.

Monitoring results for Cabin 2022 are summarized as follows:

- L_d and L_n are higher than the Health Canada noise threshold of 30 dBA.
- L_d and L_n are lower than recommended ANSI S12.2 room sound level criteria limit of 44 dBA.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are more than 15 times during daytime periods of October 3 and October 4.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are less than 15 times during nighttime period of October 3.

4.3 CABIN 5634

Table 4.3 summarizes the daily L_d and L_n sound levels, and quantities of occurrence with $L_{Amax} > 45$ dBA at Cabin 5634.

Table 4.3 Summary of Daily L_d and L_n at Cabin 5634

Date (mm/dd/yyyy)	Average Daytime L_d , dBA	Average Nighttime L_n , dBA	Daytime Quantity of $L_{Amax} > 45$ dBA	Nighttime Quantity of $L_{Amax} > 45$ dBA	Health Canada		ANSI S12.2
					L_{eq} , dBA	Qty. of $L_{Amax} > 45$ dBA	L_{eq} , dBA
10/02/2025 ¹	44.7	44.6	399	540	30	15	39 to 44
10/03/2025	44.6	- ²	551	- ²	30	15	39 to 44

Notes:

¹ The measurements started at 15:03.

² “-” indicates no data was measured. The survey ended at 16:17.

Monitoring results for Cabin 5634 are summarized as follows:

- L_d and L_n are higher than the Health Canada noise threshold of 30 dBA.
- L_d and L_n are higher than recommended ANSI S12.2 room sound level criteria limit of 44 dBA by less than 1 dBA, i.e., in the range of 0.6 or 0.7 dBA.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are more than 15 times during both daytime and nighttime periods. See Section 6.0 for further details of discussion.

4.4 CABIN 6638

Table 4.4 summarizes the daily L_d and L_n sound levels, and quantities of occurrence with $L_{Amax} > 45$ dBA at Cabin 6638.

Table 4.4 Summary of Daily L_d and L_n at Cabin 6638

Date (mm/dd/yyyy)	Average Daytime L_d , dBA	Average Nighttime L_n , dBA	Daytime Quantity of $L_{Amax} > 45$ dBA	Nighttime Quantity of $L_{Amax} > 45$ dBA	Health Canada		ANSI S12.2
					L_{eq} , dBA	Qty. of $L_{Amax} > 45$ dBA	L_{eq} , dBA
10/02/2025 ¹	49.2	49.3	405	540	30	15	39 to 44
10/03/2025	49.2	- ²	566	- ²	30	15	39 to 44

Notes:

¹ The measurements started at 15:12.

² “-” indicates no data was measured. The survey ended at 18:28.

Monitoring results for Cabin 6638 are summarized as follows:

- L_d and L_n sound levels are higher than the Health Canada noise threshold of 30 dBA.
- L_d and L_n sound levels are higher than the ANSI S12.2 room sound level criteria limit of 44 dBA.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are more than 15 times during both daytime and nighttime periods. See Section 6.0 for further details of discussion.

4.5 CABIN 7716

Table 4.5 summarizes the daily L_d and L_n sound levels, and quantities of occurrence with $L_{Amax} > 45$ dBA at Cabin 7716.

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Table 4.5 Summary of Daily L_d and L_n at Cabin 7716

Date (mm/dd/yyyy)	Average Daytime L_d , dBA	Average Nighttime L_n , dBA	Daytime Quantity of $L_{Amax} > 45$ dBA	Nighttime Quantity of $L_{Amax} > 45$ dBA	Health Canada		ANSI S12.2
					L_{eq} , dBA	Qty. of $L_{Amax} > 45$ dBA	L_{eq} , dBA
10/03/2025 ¹	39.5	39.4	16	8	30	15	39-44
10/04/2025	39.2	- ²	7	- ²	30	15	39-44

Notes:

¹ The measurements started at 16:23.

² "-" indicates no data was measured. The survey ended at 18:22.

Monitoring results for Cabin 7716 are summarized as follows:

- L_d and L_n sound levels are higher than the Health Canada noise threshold of 30 dBA.
- L_d and L_n sound levels are lower than the ANSI S12.2 room sound level criteria limit of 44 dBA.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are more than 15 times during daytime period of October 3.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are less than 15 times during nighttime period of October 3 and daytime period of October 4.

4.6 CABIN 9402

Table 4.6 summarizes the daily L_d and L_n sound levels, and quantities of occurrence with $L_{Amax} > 45$ dBA at Cabin 9402.

Table 4.6 Summary of Daily L_d and L_n at Cabin 9402

Date (mm/dd/yyyy)	Average Daytime L_d , dBA	Average Nighttime L_n , dBA	Daytime Quantity of $L_{Amax} > 45$ dBA	Nighttime Quantity of $L_{Amax} > 45$ dBA	Health Canada		ANSI S12.2
					L_{eq} , dBA	Qty. of $L_{Amax} > 45$ dBA	L_{eq} , dBA
10/04/2025 ¹	35.1	35.2	48	113	30	15	39 to 44
10/05/2025	35.5	- ²	154	- ²	30	15	39 to 44

Notes:

¹ The measurements started at 18:26.

² "-" indicates no data was measured. The survey ended at 18:31.

Monitoring results for Cabin 9402 are summarized as follows:

- L_d and L_n sound levels are higher than the Health Canada noise threshold of 30 dBA.
- L_d and L_n sound levels are lower than the ANSI S12.2 room sound level criteria limit of 44 dBA.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are more than 15 times during both daytime and nighttime periods.

4.7 CABIN 0105

Table 4.7 summarizes the daily L_d and L_n sound levels, and quantities of occurrence with $L_{Amax} > 45$ dBA at Cabin 0105.

Table 4.7 Summary of Daily L_d and L_n at Cabin 0105

Date (mm/dd/yyyy)	Average Daytime L_d , dBA	Average Nighttime L_n , dBA	Daytime Quantity of $L_{Amax} > 45$ dBA	Nighttime Quantity of $L_{Amax} > 45$ dBA	Health Canada		ANSI S12.2
					L_{eq} , dBA	Qty. of $L_{Amax} > 45$ dBA	L_{eq} , dBA
10/04/2025 ¹	39.9	39.8	18	2	30	15	39 to 44
10/05/2025	39.7	- ²	38	- ²	30	15	39 to 44

Note:

¹ The measurements started at 16:34.

² “-” indicates no data was measured. The survey ended at 16:36.

Monitoring results for Cabin 0105 are summarized as follows:

- L_d and L_n sound levels are higher than the Health Canada noise threshold of 30 dBA.
- The L_d and L_n sound levels are lower than the ANSI S12.2 room sound level criteria limit of 44 dBA.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are more than 15 times during daytime periods of October 4 and October 5.
- Quantities of occurrence with $L_{Amax} > 45$ dBA are less than 15 times during nighttime period of October 4.

5.0 NOISE INTERVIEWS

During the noise monitoring period on the floatel, the Qualified Professionals interviewed various cabin occupants. The purpose of the interview is to obtain an understanding of the noise effects of interest to the occupants; and perform an investigation if there are any potential noise issues identified on the floatel and inform the floatel management for further mitigation plans.

Thirty occupants were randomly selected for the interviews, which represents about 5% of the total occupants at the time. There were approximately 640 total construction worker occupants during the seventh noise monitoring survey. The quantity of the floatel occupants is close to full capacity.

Four questions were asked regarding noise issues:

1. General evaluation for your sleeping quality at the floatel.
2. How long have you stayed at the floatel?
3. Can you hear outside construction noise?
4. Any noise concern/complaints.

Details of the interviews, including interviewee ID #, interview date, cabin location, and work shift; and answers for the questions are included in Appendix B.

Feedback for the questions from the interviewees is summarized as below:

- No interviewees have noise concerns or complaints regarding construction noise.
- All interviewees don't have sleep disturbance issues during the stay on the floatel, including sleeping during the daytime period.
- Occasional perceptible noise events raised by one interviewee living on Deck 6, the events are due to activities in the Gym on Deck 7, such as weights dropping on the floor.

6.0 DISCUSSION

Table 6.1 summarizes the measurement results when compared to the Health Canada noise threshold and ANSI S12.2 room sound level criteria.

Table 6.1 Summary of Results

Cabin	Deck	Meet Health Canada Indoor L_{eq} Threshold of 30 dBA		Meet Health Canada $L_{Amax} > 45$ dBA Occurrence Less Than 15 Times		Meet ANSI S12.2 Room Sound Level Criteria of 44 dBA	
		Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
2022	2	No	No	No	Yes	Yes	Yes
5634	5	No	No	No	No	No	No
6638	6	No	No	No	No	No	No
7716	7	No	No	Yes/No ¹	Yes	Yes	Yes
9402	9	No	No	No	No	Yes	Yes
0105	10	No	No	No	Yes	Yes	Yes

Notes:

¹ Meet threshold on October 3 but exceed threshold on October 4.

Sound levels at all measured cabins are above the Health Canada sleep disturbance threshold of 30 dBA. During noise monitoring, Cabin 6638 and Cabin 5634 were two cabins with L_d and L_n sound levels exceeding the thresholds. It was observed that noise from strong airflow blowing through the ceiling ventilation outlet is the main contributor inside cabin.

In terms of the threshold of 45 dBA L_{Amax} or above occurrence less than 15 times, both Cabin 6638 and Cabin 5634 had the highest occurrence of L_{Amax} exceeding the threshold, continuous L_{Amax} more than 45 dBA noise levels were measured at these cabins. Cabin 2022, Cabin 7716 and Cabin 0105 met the threshold during nighttime periods. Cabin 2022, Cabin 9402 and Cabin 0105 exceed the threshold during daytime periods.

6.1 COMPARISON OF RECENT MEASUREMENT RESULTS

Table 6.2 compares the results from the three most recent surveys (i.e., 5th survey in May 2025, 6th survey in July 2025, and 7th survey in October 2025).

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Table 6.2 Comparisons of Fifth, Sixth and Seventh Survey Results

Cabin #			Daytime Highest L _d , dBA			Nighttime Highest L _n , dBA			Number of Highest Occurrence of L _{Amax} > 45 dBA					
									Daytime			Nighttime		
5 th	6 th	7 th	5 th	6 th	7 th	5 th	6 th	7 th	5 th	6 th	7 th	5 th	6 th	7 th
2010	2005	2022	46.1	48.3	42.3	46.2	48.2	42.4	670	649	35	540	539	14
5630	5616	5634	37.2	39.9	44.6	36.9	39.9	44.6	25	12	551	9	7	540
6004	6442	6638	41.3	38.9	49.2	41.2	38.8	49.3	46	22	566	21	5	540
7028	7028	7716	33.7	34.3	39.3	33.4	34.1	39.4	11	15	16	4	2	8
9436	9400	9402	35.4	50.1	35.3	35.7	49.3	35.2	23	647	154	5	540	113
0104	0108	0105	38.7	40.6	39.8	39.2	40.9	39.8	115	31	38	25	7	2

6.1.1 ANSI S12.2 Sound Level Criteria

The ceiling ventilation outlets are the dominant noise contributors in most cabins. All cabins do not have the option to open the window. Ceiling ventilation is essential to keep the cabins in comfortable warm or cool air flow for the occupants, similar to any hotel room. Turning off ventilation will affect the air circulation and temperature for cabin occupants. Therefore, the measurement results are compared to the ANSI S12.2 room sound level criteria for hotel/motel rooms.

During the 5th and 6th noise monitoring surveys, Cabin 2010 and Cabin 2005 exceeded the sound level criteria. Cabin 2010 and Cabin 2005 are located at the 1st row and 2nd row of cabins on Deck 2, respectively, and are underneath the operating facilities on Deck 3; intrusive noise emitted from the operating equipment was transmitted to these cabins through the partition deck and ceiling plenum and contributed to the high interior sound levels. Cabin 2022 is located at the 3rd row and further away from operating equipment, the interior L_d and L_n sound levels were 42.3 dBA and 42.4 dBA, respectively, i.e., starting from the third row on Deck 2, cabin interior sound levels will meet the sound level criteria.

During the 6th survey, Cabin 9400 had the highest daytime and nighttime sound levels (i.e., L_d 50.1 dBA and L_n 49.3 dBA) and exceeded the ANSI S12.2 room sound level criteria of 44 dBA. High airflow from the ceiling ventilation outlet was observed during monitoring, and contributed to the exceedance. During the 7th survey, Cabin 9402, which is adjacent to Cabin 9400, was selected to verify the interior noise levels. The results showed much lower sound levels (i.e., L_d 35.3 dBA and L_n 35.2 dBA) and met the ANSI criteria. As the distribution of ventilation airflow can be adjusted for cabin areas via control system, lower interior sound levels meeting the ANSI criteria may be achievable by controlling ventilation airflow for the cabin.

Similarly, during the 7th survey, Cabin 6638 had the highest daytime and nighttime sound levels (i.e., L_d 49.2 dBA and L_n 49.3 dBA) and exceeded the ANSI criteria due to high airflow from the ceiling ventilation outlet. It is recommended that noise monitoring for Cabin 6638 be conducted in the next noise monitoring survey (i.e., Q1 2026) and verify the interior sound levels under different airflow arrangements.

6.1.2 Health Canada Threshold of 45 dBA L_{Amax}

In terms of meeting the threshold of 45 dBA L_{Amax} or above occurrence less than 15 times, cabins on Deck 5 (i.e., Cabin 5630 and Cabin 5616), Deck 7 (i.e., Cabin 7716 and Cabin 7028), Deck 9 (i.e., Cabin 9436), and Deck 10 (i.e., Cabin 0108 and Cabin 0105) met the threshold during the nighttime periods, and cabins on Deck 7 also met the threshold during the daytime periods.

During three surveys (i.e., the 5th, 6th, and 7th surveys), Cabin 2010, Cabin 2005, Cabin 5634, Cabin 6638 and Cabin 9400 had the highest occurrence results. However, it was found that continuous L_{Amax} more than 45 dBA noise levels were measured at these cabins and noise would not be characterized as intermittent noise events, such that the threshold of 45 dBA L_{Amax} or above occurrence less than 15 times may not apply for the case.

Cabin 2022 and Cabin 2027 are located at the 3rd row and 4th row, respectively, which are further away from operating equipment on Deck 3, and had much less occurrences of 45 dBA L_{Amax} noise levels.

6.1.3 Noise Interviews

The interview results indicate no sleep disturbance issues and no noise concerns or complaints due to construction noise during this noise monitoring survey period; and present consistent results with all previous monitoring surveys

7.0 MITIGATION MEASURES

To prevent future noise concerns or complaints, potential noise mitigation measures and management controls that have been implemented or may be considered are summarized below:

- Shore grid power supply continues to provide power to the floatel. The power generation engines inside the Engine Stores will be used only in emergency situations. In accordance with the results of the third noise monitoring survey, the sound levels at corridors on Deck 2 have been reduced at different locations (Stance 2024c). In addition, Condition 37 of Amendment #4 requires Woodfibre LNG to catalogue when shore power will be shut down, and noise monitoring program will be conducted for any changes.
- As discussed in Section 6, cabins located in the 1st and 2nd rows on Deck 2 had high interior sound levels. However, sound levels in the cabins further away, starting from the 3rd row met the ANSI S12.2 room sound level criteria. Although the high interior sound levels are not from construction activities, instead caused by floatel operations, workers' cabin allocation to Deck 2 should be reduced where possible to keep a quieter sleeping environment, especially in the 1st and 2nd rows of the cabins. These cabin locations are illustrated in Figure 11. Where reducing occupancy of these cabins is not possible, hearing protection (e.g. earplugs) will be offered to occupants to facilitate undisturbed sleep. Noise monitoring for more cabins on Deck 2 is also recommended.
- It is recommended that noise measurements be conducted for Cabin 6638 in next noise monitoring survey again and verify the interior noise levels under different quantified airflow arrangements.
- For activities in the Gym, the floatel management has posted additional signage, and the receptionist also does regular patrolling to remind users that dropping the weights (e.g., deadlifts) should be minimized or avoided.
- Should the floatel management receive noise complaints, administration controls can be implemented to select or change specific cabins or decks for the workers who need alternative cabins.
- Maintain the Communication Protocol and Complaint Response Procedure to address and manage any future noise concerns or complaints by the floatel occupants.

8.0 CONCLUSIONS

The 7th noise monitoring survey was conducted on Floatel #1 from October 2 to October 5, 2025 to fulfill the requirements of Condition 30 of EAC#15-02. Continuous sound levels over 24 hours were collected at six selected cabins. Measured noise data were analyzed and compared with the Health Canada sleep disturbance thresholds, as well as ANSI S12.2 room sound level criteria and assess the compliance. Interviews with occupants for noise concerns were performed. Mitigation and an adaptive management plan were recommended.

The measurement results of the 7th noise monitoring survey were above the Health Canada thresholds. The measurement results met the ANSI S12.2 room sound level criteria at most cabins, except Cabin 5634 and Cabin 6638, however these exceedances were not attributable to construction activities. There were no sleep disturbance issues and noise concerns or complaints due to construction noise received from the floatel occupants. Noise from the Project construction activities did not affect the floatel interior acoustic environment. In addition, the Communication Protocol and Complaint Response Procedure will be maintained to address and manage any noise concerns or complaints from the floatel occupants.

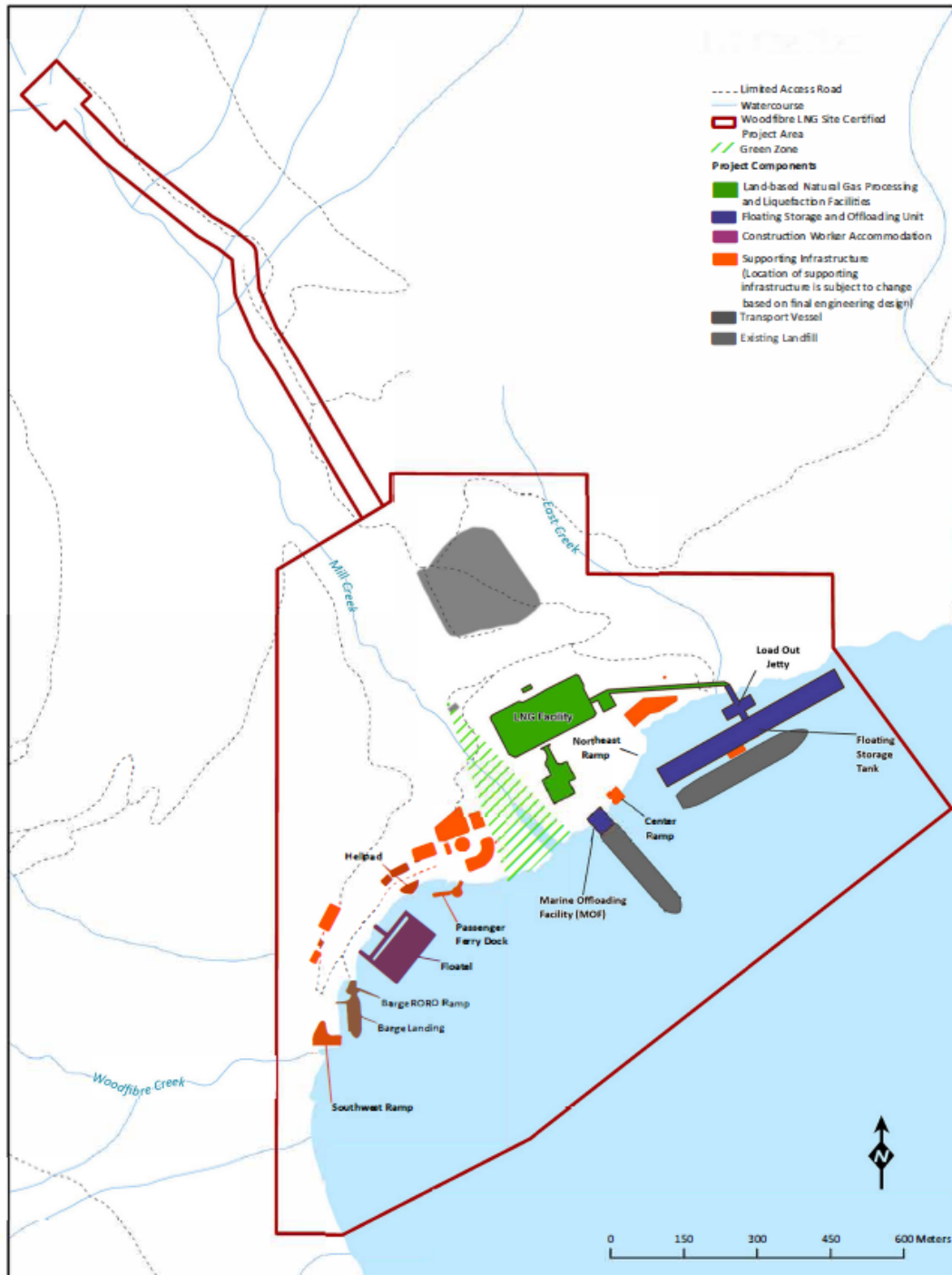
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- Woodfibre LNG 2023. Application for a Temporary Use Permit for the District of Squamish – Floatel. August 2023.

APPENDIX A FIGURES

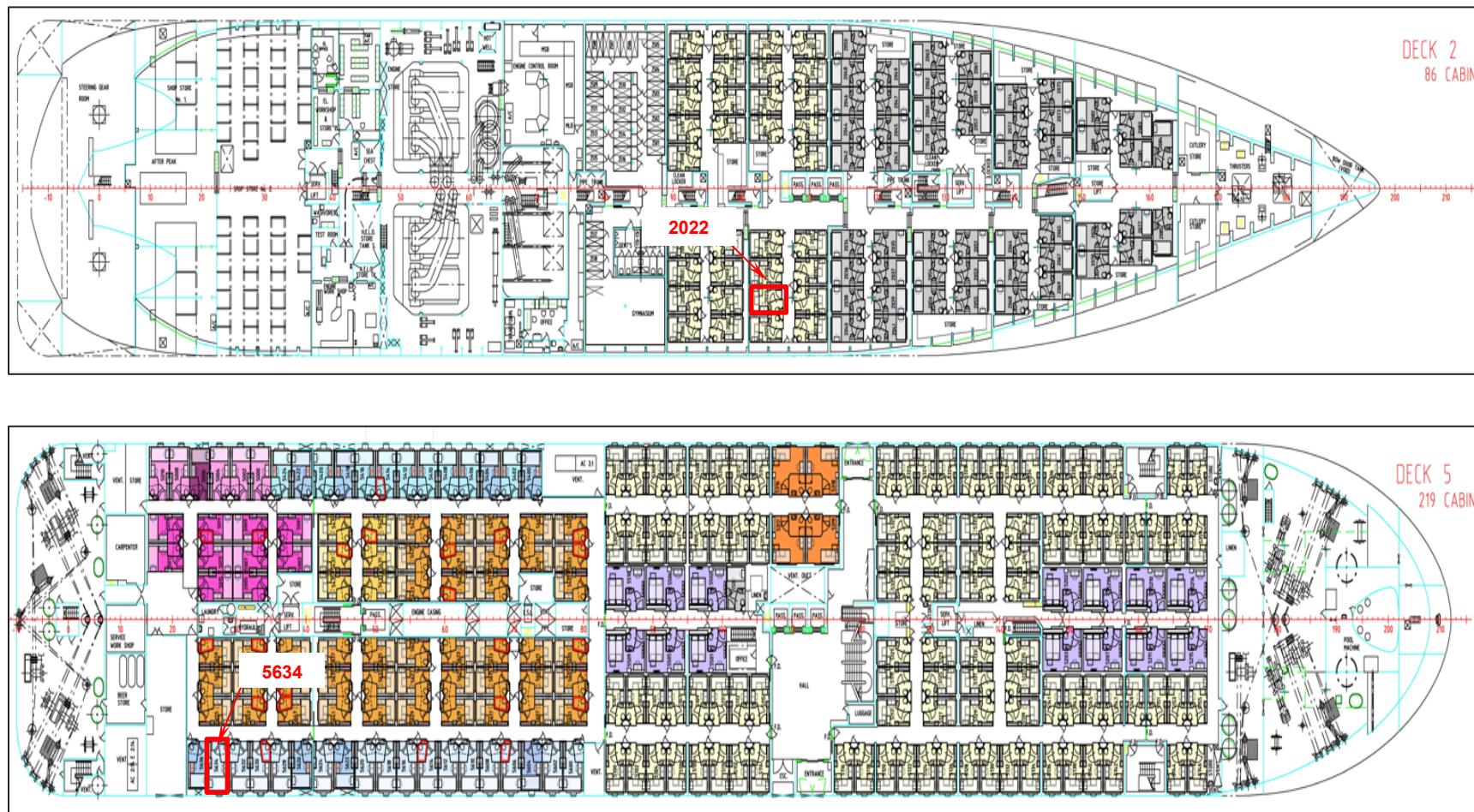
**WOODFIBRE LNG PROJECT:
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Figure 1 Site Plan with Floatel Location




**WOODFIBRE LNG PROJECT:
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Figure 2 Measurement Location at Cabin 2022 and Cabin 5634 (Deck 2 and Deck 5)



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Legend of Figure 2

 Noise monitoring cabin

Quantity of cabins per deck (unless otherwise indicated, applies to all figures with cabins)

	TYPE 1A-1	TYPE 1A-2	TYPE 1A-3	TYPE 1B-1	TYPE 1B-2	TYPE 1B-3	TYPE 1B-4	TYPE 1B-5	TYPE 1B-6	TYPE 1B-7	TYPE 1B-8	TYPE 1C-1	TYPE 1C-2	TYPE 1D	TYPE 1E-1	TYPE 1E-2	TYPE 1F-1	TYPE 1F-2	TYPE 2A	TYPE 2B	TYPE 2C	TYPE 3A	TYPE 3B	TYPE 4A	TYPE 4B	QUANTITY PER DECK
DECK 10				9																						17
DECK 9	18			8								30							7	1	17	4	2		1	88
DECK 7	24											30				2		2								58
DECK 6	208											8			2		2		24	1					3	248
DECK 5	102	6	44		15	5	9	10	7	1	1			4					14						1	219
DECK 2	34																							52		86
CABINS PER TYPE	386	6	44	17	15	5	9	10	7	1	1	60	8	4	2	2	2	2	45	2	17	4	2	8	57	716

**WOODFIBRE LNG PROJECT:
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Figure 3 Measurement Location at Cabin 6638 and Cabin 7716 (Deck 6 and Deck 7)

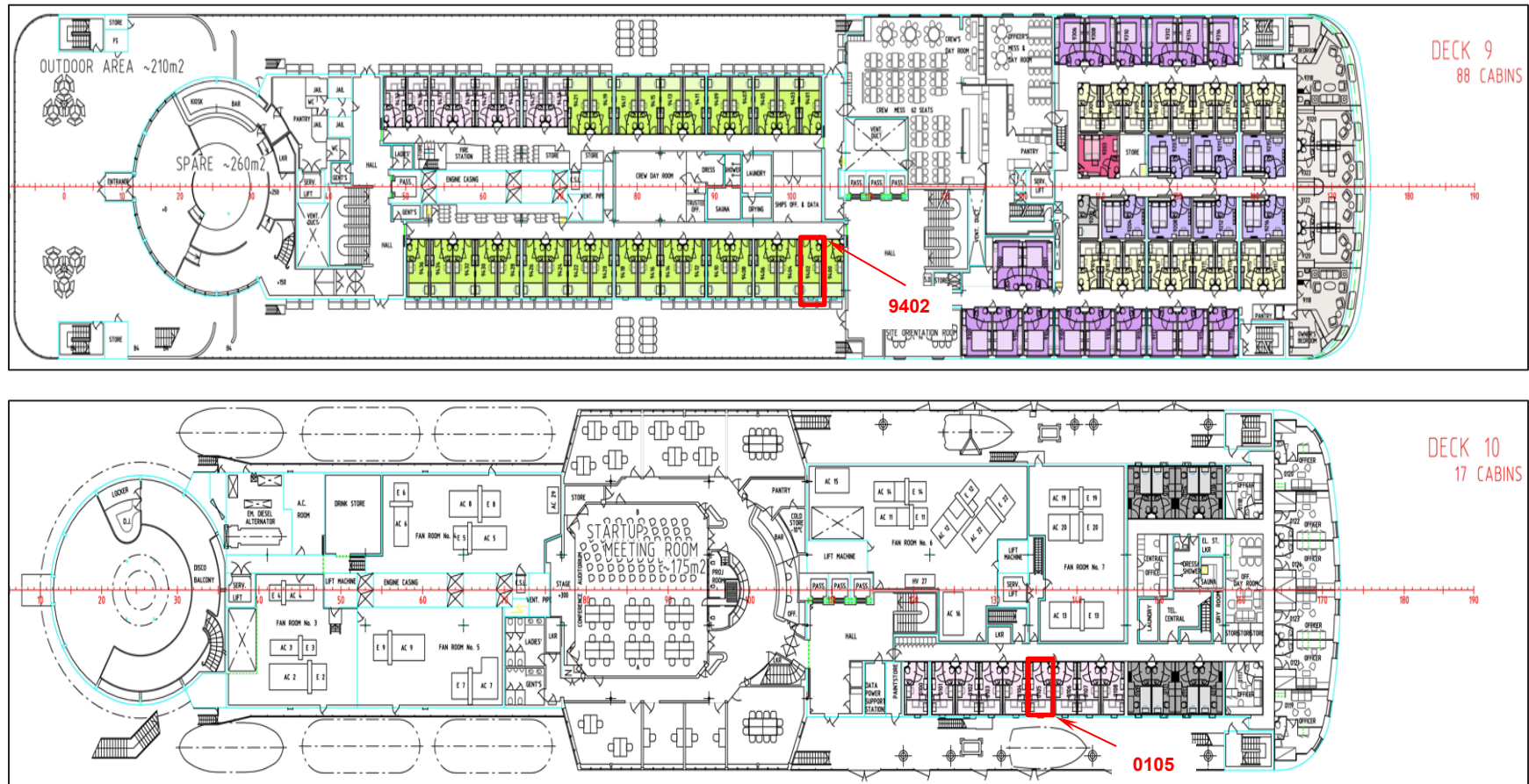


Legend

Noise monitoring cabin

**WOODFIBRE LNG PROJECT:
NOISE MONITORING SURVEY ON FLOATEL #1- 7
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Figure 4 Measurement Location at Cabin 9402 and Cabin 0105 (Deck 9 and Deck 10)



Legend



Noise monitoring cabin

Figure 5 **Sound Level Meter Setup at Cabin 2022**



Figure 6 **Sound Level Meter Setup at Cabin 5634**



Figure 7 Sound Level Meter Setup at Cabin 6638



Figure 8 Sound Level Meter Setup at Cabin 7716



Figure 9 Sound Level Meter Setup at Cabin 9402



Figure 10 Sound Level Meter Setup at Cabin 0105




**WOODFIBRE LNG PROJECT:
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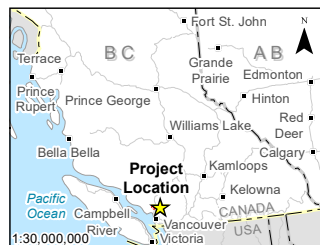
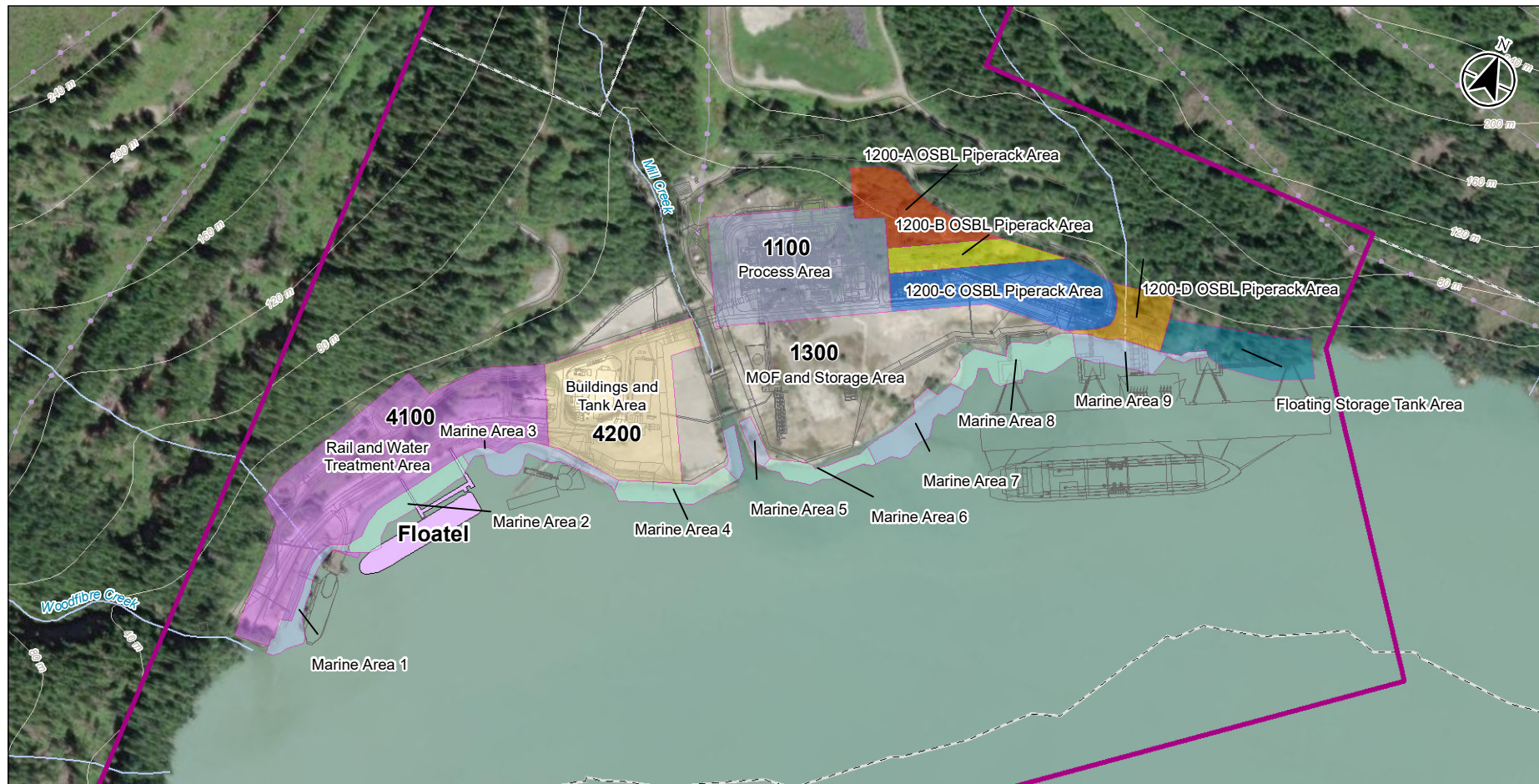
Figure 11 Cabins Not Preferable for Worker Accommodation on Deck 2



Legend

-  Cabins not preferable for worker accommodation

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Notes
1. Coordinate System: NAD 1983 UTM Zone 10N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada
3. Orthoimagery: ESRI World Imagery

- Transmission Line
- Topographic Contour
- Watercourse
- Municipal Boundary
- Project Design Linework
- Floatel
- Certified Project Area

0 50 100 150 200 250
m
1:7,500 (at original document size of 8.5x11)



Project Location: Woodfibre, British Columbia
Project Number: 123222160
Prepared by PKASIANCHUK on 2024 1004
Requested by ACALDERON on 20240822
Checked by YMA on 20240828

Client/Project/Report

Woodfibre LNG
Floatel Noise Monitoring Survey

Figure No.

12

Title

Construction Areas Onsite

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

APPENDIX B NOISE INTERVIEW RECORDS

WOODFIBRE LNG PROJECT:
NOISE MONITORING SURVEY ON FLOATTEL #1- 7
(OCTOBER 2 – 5, 2025)

Interviewer: Emma Xiong, EIT				Interview Questionnaire			
Interviewee Information							
ID # of Interviewee	Interview Date	Living Deck	Work Shift	1.General evaluation for your sleeping quality at Floatel	2.How long have you stayed?	3. Can you hear outside construction noise?	3. Any noise concerns/ complaints
#1	October 2	7	Day	Great	6 months	No	No
#2	October 2	7	Day	No issue	9 months	No	No
#3	October 2	5	Night	Sleep well	12 months	Haven't hear it	No concern
#4	October 2	9	Day	Good	12 months	No	No
#5	October 2	6	Day	It's ok	3 months	No	It's ok
#6	October 3	7	Day	Average Pretty good	8 months	No	No
#7	October 3	7	Day	Just ok	2 weeks	Not really	People outside
#8	October 3	7	Night	Average	3 weeks	No	Cleaner cleaning
#9	October 3	5	Night	No issue	7 months	Not at all	No noise concern
#10	October 3	2	Day	Always good	8 months	Never	Nothing complaint
#11	October 3	7	Day	Normal	9 months	Cannot hear	No
#12	October 3	5	Day	As usual	5 months	Never	Ventilation sound
#13	October 4	10	Day	All good	2 years	Didn't hear	Nothing
#14	October 4	7	Day	Good	6 months	No	No any issue
#15	October 4	7	Night	Need to adjust	4 months	No	People talking
#16	October 4	9	Day	Ok	10 months	Didn't noticed	No concern
#17	October 4	7	Day	Depends on	2 months	No noise from construction	No cleaning sound/ knock door
#18	October 4	6	Day	Ok	4 months	Haven't hear	no
#19	October 4	5	Night	Great	8 months	Barely not	Kitchen working sound
#20	October 4	5	Day	Sometimes hard to fall asleep	6 months	Cannot	No concern
#21	October 4	7	Day	Normal	10 months	Never	Neighbor toilet
#22	October 5	7	Day	Great	10 months	Not really	No complaint
#23	October 5	7	Day	Ok	13 months	No	People
#24	October 5	6	Night	All good	8 months	Didn't notice	All good
#25	October 5	9	Day	No problem with it	2 months	Nothing heard from construction	No, but heard people complain about gym noise
#26	October 5	9	Day	Get used to it	1 month	No	No
#27	October 5	5	Day	temperature	1 month	Not yet	People talking
#28	October 5	9	Day	So far so good	5 months	Never	No
#29	October 5	2	Day	Good	10 months	No	No noise concern
#30	October 5	7	Night	No any issue	8 months	Never	All good

APPENDIX C INSTRUMENTATION CALIBRATION CERTIFICATION

CERTIFICATE OF CALIBRATION

No.: 424477-707

Page 1 of 2

CALIBRATION OF:

Calibrator:	Brüel & Kjær	Type	4231	Serial No.:	3009070
Identification:	A	IEC Class:	1		

CUSTOMER:Stantec Consulting Ltd.
325 25 Street SE - Unit 200
Calgary, AB T2A 7H8**CALIBRATION CONDITIONS:**

Environment conditions:	Air temperature:	23.6	°C
	Air pressure:	98.63	kPa
	Relative Humidity:	49.5	%RH

SPECIFICATIONS:

This document certifies that the acoustic calibrator as listed under "Type" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. Hottinger Brüel & Kjær Inc. utilizes a simple acceptance decision rule as defined by ILAC G8 with measurement uncertainty value which will not exceed 50% of the tolerance. The calibration of the listed transducer was accomplished using a test system which conforms to the requirements of ISO/IEC 17025, ANSI/NCSL Z540-1, and guidelines of ISO 10012-1. For "as received" and "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation. This Certificate and attached data pages shall not be reproduced, except in full, without written approval of the Hottinger Brüel & Kjær Inc. Calibration Laboratory-Duluth, GA. Results relate only to the items tested. The transducer has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants. The acoustic calibrator has been calibrated in accordance with the requirements as specified in IEC60942.

PROCEDURE: The measurements have been performed with the assistance of Hottinger Brüel & Kjær Inc. acoustic calibrator calibration application Software version 2.3.4 Type 7794 using calibration procedure 4231 Complete

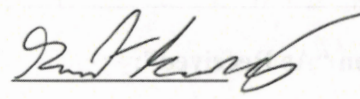
RESULTS:

<input checked="" type="checkbox"/> "As Received" Data: Within Acceptance Criteria	<input type="checkbox"/> "As Received" Data: Outside Acceptance Criteria
<input checked="" type="checkbox"/> "Final" Data : Within Acceptance Criteria	<input type="checkbox"/> "Final" Data : Outside Acceptance Criteria

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the calibrator under calibration.

Date of Calibration: 9 April, 2025

Certificate issued: 9 April, 2025

Can Phan
Calibration Technician
Grant Kennedy

Quality Representative

CERTIFICATE OF CALIBRATION

No.: 424477-707

Type: 4231

Serial No.: 3009070

Page 2 of 2

Sound Pressure Levels

All stated values are valid at environmental reference conditions

Nominal Level [dB]	Accept Limit Lower [dB]	Accept Limit Upper [dB]	Measured Level [dB]	Measurement Uncertainty [dB]
94	93.80	94.20	94.00	0.12
114	113.80	114.20	113.99	0.12

Frequency

Nominal Frequency [Hz]	Accept Limit Lower [Hz]	Accept Limit Upper [Hz]	Measured Frequency [Hz]	Measurement Uncertainty [Hz]
1000	999.00	1001.00	999.98	0.10

Total Distortion*

Distortion mode: ☒ TD* ☐ THD*

Calibration Level [dB]*	Accept Limit [%]*	Measured Distortion [%]*	Measurement Uncertainty [%]*
94	1.00	0.68	0.13
114	1.00	0.23	0.13

Environmental Reference Conditions:

Pressure: 101.3 kPa, Temperature: 23 °C, Relative Humidity: 50%

Instrument List

Type	Description	Serial no	Cal. date	Due date	Calibrated by	Trace number
3560	PULSE Analyzer	2723320	2024-10-16	2025-10-31	GK	401410-801
9545	Transfer Microphone	3	2024-10-18	2025-10-31	MH	401410-401
4228	Reference Sound Source	1618502	2023-04-19	2025-04-30	WS	CAS-632564-L2S0L9-708

During the calibration the calibrator has been loaded by the load volume of the Transfer Microphone. The load volumes for a number of different types of Transfer Microphones are listed in the table below.

For Brüel & Kjær Pistonphones types 4220 and 4228 the result of the SPL calibration has been corrected to be valid for a load volume of 1333 mm³. For all other types the result is valid with the actual load volume.

Transfer Microphone Type	Fulfil standard IEC 61094-1 LS	Fulfil standard IEC 61094-4 WS	Load Volume 1" (1/2" mic including DP-0776)	Load Volume 1/2"
4180	yes	yes	1126 mm ³	43 mm ³
4192	-	yes	1273 mm ³	190 mm ³
9545	-	-	1333 mm ³	-

Condition "As Received":

Good

The Hottinger Brüel & Kjær Calibration Laboratory
3079 Premiere Parkway Suite 120
Duluth, GA 30097
Telephone: 770/209-6907
Fax: 770/447-4033
Web site address: <http://www.hbkworld.com>

CERTIFICATE OF CALIBRATION

Certificate No: 409505- 802

Page 1 of 10

CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2250	Serial No: 2818093
Microphone:	Brüel & Kjær	4189	Serial No: 2799496
Preamplifier:	Brüel & Kjær	ZC-0032	Serial No: 16971
Software version:	BZ7222 Version 4.7.8		

CLIENT: Stantec Consulting Ltd.
200 - 325 25th Street SE
Calgary, AB T2A 7H8

CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 ± 3 °C
Environment conditions See actual values in Environmental Condition sections

SPECIFICATIONS:

This document certifies that the instrument as listed under "Model/Serial Number" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95%. Statements of compliance, where applicable, are based on calibration results falling within specified criteria with no reduction by the uncertainty of the measurement. The calibration of the listed instrumentation, was accomplished using a test system which conforms with the requirements of ISO/IEC 17025, ANSI/NCSL Z540-1, and ISO 10012-1. For "as received" and/or "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation. This Certificate and attached data pages shall not be reproduced, except in full, without the written approval of the Hottinger Brüel & Kjær Calibration Laboratory-Duluth, GA. Results relate only to the items tested. This instrument has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants.

PROCEDURE:

Hottinger Brüel & Kjær Model 3630 Sound Level Meter Calibration System Software 7763 Version 8.6 - DB: 8.60 Test Collection 2250-4189.

RESULTS:

As Received Condition	As Received Data	Final Data
<input checked="" type="checkbox"/> Received in good condition	<input checked="" type="checkbox"/> Within acceptance criteria	<input checked="" type="checkbox"/> Within acceptance criteria

Date of Calibration: 28 Feb. 2025

Certificate issued: 28 Feb. 2025

Grant Kennedy

Calibration Technician



John Avitabile
Quality Representative

Summary

Preliminary inspection	<u>Passed</u>
Environmental conditions, Prior to calibration	<u>Passed</u>
Reference information	<u>Passed</u>
Indication at the calibration check frequency	<u>Passed</u>
Acoustical signal tests of a frequency weighting, C weighting	<u>Passed</u>
Self-generated noise, Microphone installed	<u>Passed</u>
Self-generated noise, Electrical	<u>Passed</u>
Electrical signal tests of frequency weightings, A weighting	<u>Passed</u>
Electrical signal tests of frequency weightings, C weighting	<u>Passed</u>
Electrical signal tests of frequency weightings, Z weighting	<u>Passed</u>
Frequency and time weightings at 1 kHz	<u>Passed</u>
Long-term stability, Reference	<u>Passed</u>
Level linearity on the reference level range, Upper	<u>Passed</u>
Level linearity on the reference level range, Lower	<u>Passed</u>
Toneburst response, Time-weighting Fast	<u>Passed</u>
Toneburst response, Time-weighting Slow	<u>Passed</u>
Toneburst response, LAE	<u>Passed</u>
C-weighted peak sound level, 8 kHz	<u>Passed</u>
C-weighted peak sound level, 500 Hz	<u>Passed</u>
Overload indication	<u>Passed</u>
Long-term stability, 1. relative	<u>Passed</u>
High-level stability	<u>Passed</u>
Long-term stability, 2. relative	<u>Passed</u>
Environmental conditions, Following calibration	<u>Passed</u>

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Conformance to a performance specification is demonstrated when the following criteria are both satisfied: (a) a measured deviation from a design goal does not exceed the applicable acceptance limit and (b) the corresponding uncertainty of measurement does not exceed the corresponding maximum-permitted uncertainty of measurement given in IEC 61672-1:2013 for the same coverage probability of 95 %.

CERTIFICATE OF CALIBRATION

No.: 409505-701

Page 1 of 4

CALIBRATION OF:

Microphone:	Brüel & Kjær	Type	4189	Serial No.	2799496
Identification:	1				

CUSTOMER:Stantec Consulting
200-325 25 St SE
Calgary AB T2P 7H8**CALIBRATION CONDITIONS:**

Environment conditions:	Air temperature:	22 °C
	Air pressure:	99.3 kPa
	Relative Humidity:	23.5 %RH
Applied polarization voltage:	0 Vdc	

SPECIFICATIONS:

This document certifies that the instrument as listed under "Type" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. Hottinger Brüel & Kjær Inc. utilizes a simple acceptance decision rule as defined by ILAC G8 with measurement uncertainty value which will not exceed 50% of the tolerance. The calibration of the listed transducer was accomplished using a test system which conforms to the requirements of ISO/IEC 17025, ANSI/NC SL Z540-1, and guidelines of ISO 10012-1. For "as received" and "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation. This Certificate and attached data pages shall not be reproduced, except in full, without written approval of the Hottinger Brüel & Kjær Calibration Laboratory-Duluth, GA. Results relate only to the items tested. The transducer has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants.

PROCEDURE:

The measurements have been performed with the assistance of the Hottinger Brüel & Kjær Inc. Microphone Calibration System B&K 9721 with application software WT9649 and WT9650 version 5.3.0.11 using calibration procedure: 4189-S251-FF-01

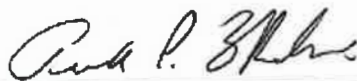
RESULTS:

<input checked="" type="checkbox"/> "As Received" Data: Within Acceptance Criteria	<input type="checkbox"/> "As Received" Data: Outside Acceptance Criteria
<input checked="" type="checkbox"/> "Final" Data : Within Acceptance Criteria	<input type="checkbox"/> "Final" Data : Outside Acceptance Criteria

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from standards, calibration method, effect of environmental conditions and any short-term contribution from the device under calibration.

Date of Calibration: February 28, 2025

Certificate issued: February 28, 2025

Can Phan
Calibration TechnicianAundra Welch
Quality Representative

CERTIFICATE OF CALIBRATION

No.: 409505-701

Type: 4189

Serial No.: 2799496

Page 2 of 4

Sensitivity

Nominal sensitivity:	-26 dB re. 1V/Pa	+/-	1.5 dB
Sensitivity at calibration conditions:	-25.16 dB re. 1V/Pa	or	55.24 mV/Pa
Sensitivity at reference conditions:	-25.18 dB re. 1V/Pa	or	55.11 mV/Pa
Uncertainty:	+/- 0.11 dB		
Correction factor K at reference conditions:	-0.82 dB		
Calibration Frequency:	251.19 Hz		

Reference Conditions:

Pressure: 101.3 kPa

Temperature: 23 °C

Relative Humidity: 50%

Traceable references

Type	Serial no	Cal. date	Due date	Calibrated by	Trace number
4180	2602440	2024-04-23	2026-04-30	DPLA	M2.10-1646-3.1

Condition "As Received":

Good

CERTIFICATE OF CALIBRATION

Certificate No: 424477-803

Page 1 of 10

CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2250	Serial No: 2809183
Microphone:	Brüel & Kjær	4189	Serial No: 2799510
Preamplifier:	Brüel & Kjær	ZC-0032	Serial No: 17456
Supplied Calibrator:	Brüel & Kjær	4231	Serial No: 3009303
Software version:	BZ7222 Version 4.7.7		

CLIENT: Stantec Consulting Ltd.
325 25 Street SE
Unit 200
Calgary, AB T2A 7H8

CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 ± 3 °C
Environment conditions See actual values in Environmental Condition sections

SPECIFICATIONS: This document certifies that the instrument as listed under "Model/Serial Number" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95%. Statements of compliance, where applicable, are based on calibration results falling within specified criteria with no reduction by the uncertainty of the measurement. The calibration of the listed instrumentation was accomplished using a test system which conforms with the requirements of ISO/IEC 17025, ANSI/NCSL Z540-1, and ISO 10012-1. For "as received" and/or "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation. This Certificate and attached data pages shall not be reproduced, except in full, without the written approval of the Hottinger Brüel & Kjær Calibration Laboratory-Duluth, GA. Results relate only to the items tested. This instrument has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants.

PROCEDURE: Hottinger Brüel & Kjær Model 3630 Sound Level Meter Calibration System Software 7763 Version 8.6 - DB:
8.60 Test Collection 2250-4189.

RESULTS:

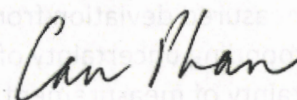
As Received Condition	As Received Data	Final Data
<u>_X_</u> Received in good condition	<u>_X_</u> Within acceptance criteria	<u>_X_</u> Within acceptance criteria

Date of Calibration: 10 Apr. 2025

Certificate issued: 10 Apr. 2025

Grant Kennedy

Calibration Technician



Can Phan

Quality Representative

Summary

Preliminary inspection	<u>Passed</u>
Environmental conditions, Prior to calibration	<u>Passed</u>
Reference information	<u>Passed</u>
Indication at the calibration check frequency	<u>Passed</u>
Acoustical signal tests of a frequency weighting, C weighting	<u>Passed</u>
Self-generated noise, Microphone installed	<u>Passed</u>
Self-generated noise, Electrical	<u>Passed</u>
Electrical signal tests of frequency weightings, A weighting	<u>Passed</u>
Electrical signal tests of frequency weightings, C weighting	<u>Passed</u>
Electrical signal tests of frequency weightings, Z weighting	<u>Passed</u>
Frequency and time weightings at 1 kHz	<u>Passed</u>
Long-term stability, Reference	<u>Passed</u>
Level linearity on the reference level range, Upper	<u>Passed</u>
Level linearity on the reference level range, Lower	<u>Passed</u>
Toneburst response, Time-weighting Fast	<u>Passed</u>
Toneburst response, Time-weighting Slow	<u>Passed</u>
Toneburst response, LAE	<u>Passed</u>
C-weighted peak sound level, 8 kHz	<u>Passed</u>
C-weighted peak sound level, 500 Hz	<u>Passed</u>
Overload indication	<u>Passed</u>
Long-term stability, 1. relative	<u>Passed</u>
High-level stability	<u>Passed</u>
Long-term stability, 2. relative	<u>Passed</u>
Environmental conditions, Following calibration	<u>Passed</u>

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Conformance to a performance specification is demonstrated when the following criteria are both satisfied: (a) a measured deviation from a design goal does not exceed the applicable acceptance limit and (b) the corresponding uncertainty of measurement does not exceed the corresponding maximum-permitted uncertainty of measurement given in IEC 61672-1:2013 for the same coverage probability of 95 %.

CERTIFICATE OF CALIBRATION

No.: 424477-701

Page 1 of 4

CALIBRATION OF:

Microphone:	Brüel & Kjær	Type	4189	Serial No.	2799510
Identification:	#2				

CUSTOMER:Stantec Consulting Ltd.
325 25 Street SE - Unit 200
Calgary, AB T2A 7H8**CALIBRATION CONDITIONS:**

Environment conditions:	Air temperature:	22.6	°C
	Air pressure:	98.622	kPa
	Relative Humidity:	50.6	%RH
Applied polarization voltage:	0 Vdc		

SPECIFICATIONS: This document certifies that the instrument as listed under "Type" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. Hottinger Brüel & Kjær Inc. utilizes a simple acceptance decision rule as defined by ILAC G8 with measurement uncertainty value which will not exceed 50% of the tolerance. The calibration of the listed transducer was accomplished using a test system which conforms to the requirements of ISO/IEC 17025, ANSI/NCSL Z540-1, and guidelines of ISO 10012-1. For "as received" and "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation. This Certificate and attached data pages shall not be reproduced, except in full, without written approval of the Hottinger Brüel & Kjær Calibration Laboratory-Duluth, GA. Results relate only to the items tested. The transducer has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants.

PROCEDURE:

The measurements have been performed with the assistance of the Hottinger Brüel & Kjær Inc. Microphone Calibration System B&K 9721 with application software WT9649 and WT9650 version 5.3.0.11 using calibration procedure: 4189-S251-FF-01

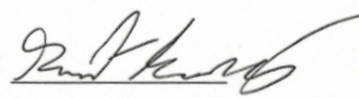
RESULTS:

<input checked="" type="checkbox"/> "As Received" Data: Within Acceptance Criteria	<input type="checkbox"/> "As Received" Data: Outside Acceptance Criteria
<input checked="" type="checkbox"/> "Final" Data : Within Acceptance Criteria	<input type="checkbox"/> "Final" Data : Outside Acceptance Criteria

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from standards, calibration method, effect of environmental conditions and any short-term contribution from the device under calibration.

Date of Calibration: 9 April, 2025

Certificate issued: 9 April, 2025

Can Phan
Calibration Technician
Grant Kennedy

Quality Representative

CERTIFICATE OF CALIBRATION

No.: 424477-701

Type: 4189

Serial No.: 2799510

Sensitivity

Nominal sensitivity:	-26 dB re. 1V/Pa	+/-	1.5 dB
Sensitivity at calibration conditions:	-26.45 dB re. 1V/Pa	or	47.59 mV/Pa
Sensitivity at reference conditions:	-26.48 dB re. 1V/Pa	or	47.45 mV/Pa
Uncertainty:	+/- 0.11 dB		
Correction factor K at reference conditions:	0.48 dB		
Calibration Frequency:	251.19 Hz		

Reference Conditions:

Pressure: 101.3 kPa
Temperature: 23 °C
Relative Humidity: 50%

Traceable references

Type	Serial no	Cal. date	Due date	Calibrated by	Trace number
4180	2602440	2024-04-23	2026-04-30	DPLA	M2. 10-1646-3.1

Condition "As Received":

Good