

MEMORANDUM

DATE:	April 1 2019	
TO:	Tim Blair, Supervisor, Planning Vancouver Fraser Port Authority	Email: tim.blair@portvancouver.com
PREPARED BY:	Katie McKinnon Matt Johnston	Regulatory Advisor, Trans Mountain Noise Specialist, RWDI
RE:	Request to amend PER VFPA 15-322 Condition 37 Noise Limits for Westridge Marine Terminal Construction	

1.0 Background

On August 28, 2017, the Vancouver Fraser Port Authority issued a Project and Environmental Review (PER) Permit to Trans Mountain for the Westridge Marine Terminal Upgrade and Expansion Project, at component of the Trans Mountain Expansion Project. On September 29, 2017, Trans Mountain commenced construction at the Westridge Marine Terminal.

As part of the application for the PER Permit, Trans Mountain submitted to VFPA a Noise Management Plan for Construction at Pump Stations and Terminals (Noise Management Plan). The Noise Management Plan covers construction activity at Westridge Marine Terminal as well as other terminals and pumps stations across the Expansion Project. The Noise Management Plan was also submitted to the National Energy Board (NEB) pursuant to NEB Condition 80.

The Noise Management Plan set out daytime and nighttime noise limits for construction activity at Westridge Marine Terminal. These noise limits were adopted as Condition 37 of the VFPA PER Permit, which states:

The Applicant shall ensure that noise levels within the surrounding community as identified in Noise Management Plan for Construction at Pump Stations and Terminals PER Submission TR.07 Table C-3 remain below the following thresholds, where nighttime hours are from 10 PM to 7 AM: WMT_1: Daytime Limit – 61 dBA; Nighttime limit – 51 dBA (Location: Northcliffe Crescent and North Clide Ave, Burnaby) – WMT_2: Daytime limit – 61 dBA; Nighttime limit – 51 dBA (Location: Bayview Drive and Malibou Drive, Burnaby) – WMT_3: Daytime limit – 66 dBA; Nighttime limit – 56 dBA (Location: Bayview Drive and Barnet Road, Burnaby)

As outlined in the Noise Management Plan, noise limits were identified based on noise modelling completed in June and October 2016. Changes in background conditions since original noise modelling was completed have necessitated re-monitoring at the site to confirm the ambient baseline noise level.

On August 30, 2018, the Federal Court of Appeal issued a decision nullifying the Certificate of Public Convenience and Necessity (CPCN) for the Trans Mountain Expansion Project. As a result of this decision, construction activity at Westridge Marine Terminal was shut-down. The shut-down of Project activity provided an opportunity to conduct baseline noise monitoring without interference of construction noise.

Results from this updated baseline noise monitoring indicate that the measured sound levels of the community receptor located southeast of the WMT within the Barnet Road community (R3) are higher than the expected BC Oil and Gas Commission (BC OGC) ambient sound level (ASL). As such, this amendment document requests VFPA noise limit adjustments for R3. Please note that receptor R3 is also known as WMT_3 in the NEB Conditions 80 & 86 noise management plans (NMPs).

Trans Mountain is, therefore, seeking an amendment to VFPA PER 15-322 Condition 37.

2.0 Monitoring Results and Implications for Construction Noise Limits at Westridge

2.1 BC OGC Noise Guideline

According to BC OGC, the permissible sound level (PSL), which is the noise level not to be exceeded, is derived from environmental factors (i.e., dwelling density and distance to transportation infrastructure). Based on the PSL chosen, the receptor has an expected ambient sound level (ASL), which is the sound level at the receptor in the absence of the project/industry related noise (in this case, TMEP construction activity). If it is found that the measured ASL is not as expected through this method, the PSL should be adjusted.

The previous 2016 monitoring results were found to be in agreement with the BC OGC ASL and is representative of the area. This location has similar setback distances from Barnet Highway as R3. The current monitoring location, however, indicates that the noise levels on the north side of Barnet Road (at R3) are higher than the 2016 monitoring results. The difference in sound levels is likely the result of varying densities of traffic volumes on the immediately adjacent Barnet Highway and spatial differences (e.g., differences in local shielding).

2.2 Monitoring Details

Sound monitoring at R3 began on July 13, 2018 and monitoring is ongoing as of the date of this amendment request. Monitoring is conducted in accordance with BC OGC Noise Guideline best practices as detailed in Chapter 4 of the guideline which includes the use of a Class 1 sound level meter. It has been found that at this location, the ASL is higher than previously assumed through the BC OGC Guidelines and measured at alternate locations. Measurements include sound recording and based on recordings, it is found that the sound is dominated by road traffic noise from Barnet Highway. Additionally, the daily noise "profile" follows that of typical road noise dominated area. The R3 location is shown in Figure 1.



Figure 1: R3 Monitoring Location

2.3 Monitoring Results

Throughout the monitoring conducted to date, it is generally found that the measured levels are higher than the expected BC OGC ASL. To determine the true ASL, the sound levels during a period when there were no construction activities at WMT was reviewed (August 30, 2018 to September 17, 2018). Figure 2 shows the average weekday measured sound level per hour at R3 compared to BC OGC's assumed ASL using dwelling density and roadway proximity adjustments and the hourly recorded levels are provided in Attachment A.

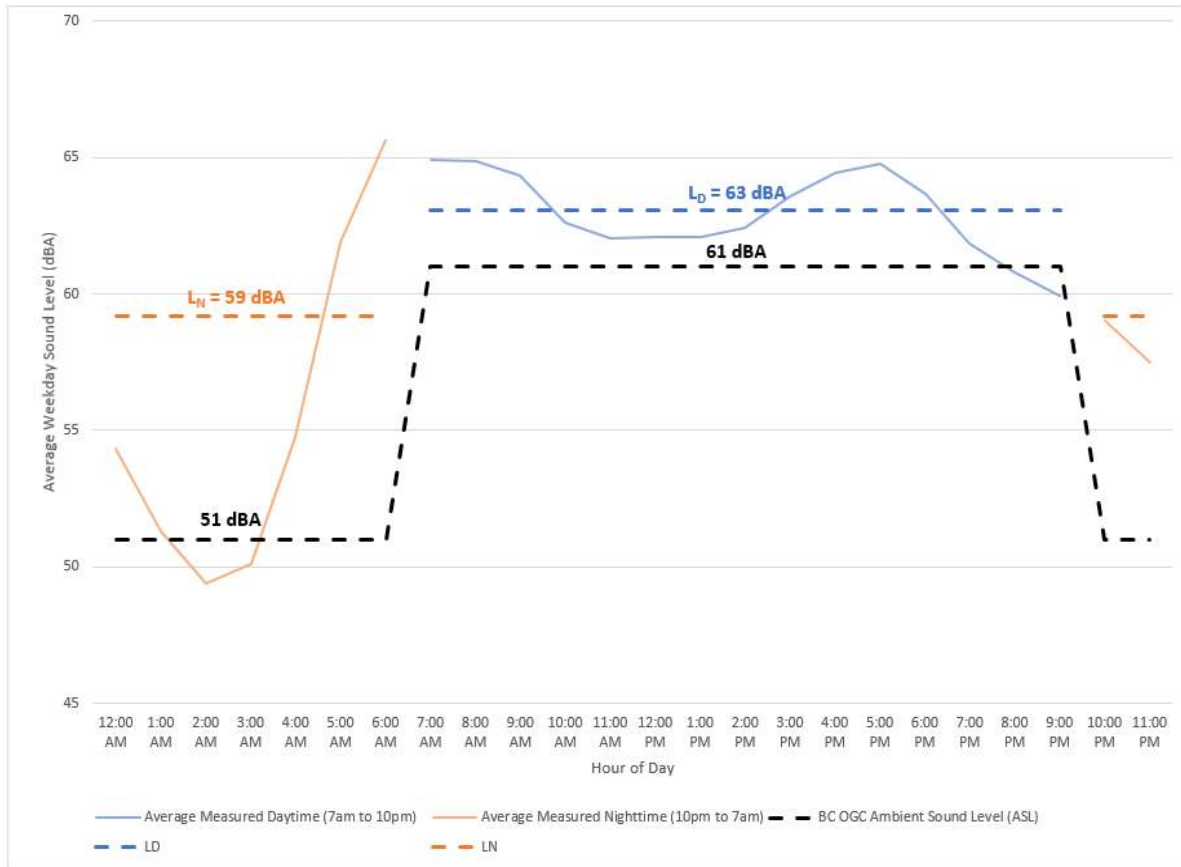


Figure 2: BC OGC Ambient Sound Level vs. Measured Sound Level at R3

As shown in Figure 2 and Attachment A, the measured sound level typically always exceeds the BC OGC ASL. This demonstrates that the ASL as dictated by the BC OGC general method is not appropriate for this monitoring location.

The morning rush hour begins at 5 am which is not anticipated in the BC OGC approach and is the source of the high night-time average equivalent sound level (LN) result. The average ASL between 5 am and 7 am is 64 dBA which is similar to the daytime average equivalent sound level (LD). Therefore, the following is requested as a part of the noise limit amendment:

- Daytime hours be modified to include the hours 5 am to 10 pm and nighttime hours include 10 pm to 5 am for the purpose of compliance monitoring.

This will align levels with the actual diurnal patterns that are occurring. The modified day/night split proposed for the average weekday measured sound level per hour at R3 compared to BC OGC's assumed ASL are shown in Figure 3.

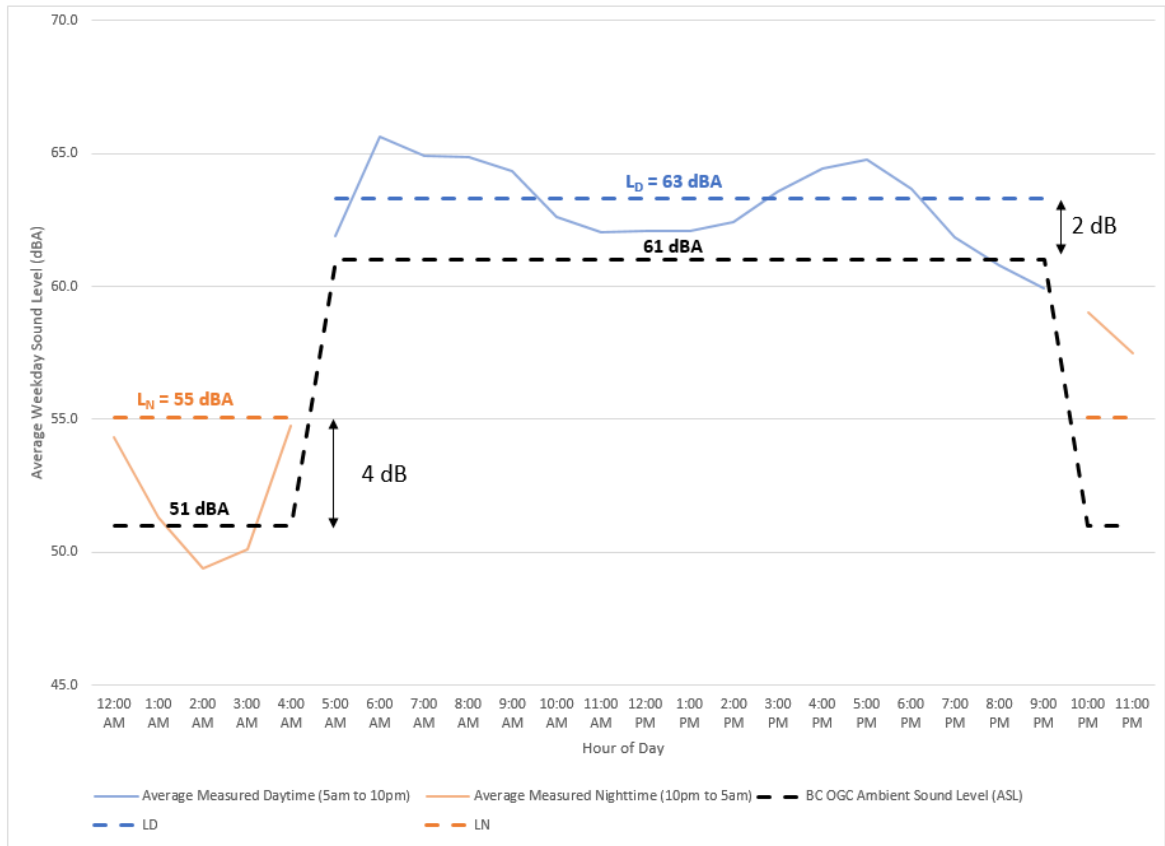


Figure 3: R3 Hourly Measured Data with Shifted Day/Night Split

As shown in Figure 3, the modified day/night split better represents the differences between day and night, but does not address the BC OGC ASL for this location. The remaining issue is that the measured levels are still greater than the BC OGC ASLs. According to the BC OGC Noise Guidelines, receptors where the measured ASL is greater than the expected ASL, a “Class A2” adjustment is applied. Table 1 summarizes the application of the Class A2 adjustment.

Table 3: Resulting A2 Adjustment

Day/Night (hours)	BC OGC BSL at R3 (dBA) ^[1]	Measured ASL at R3 (dBA) ^[3]	BC OGC BSL minus Measured ASL	Class A2 Adjustment (dB) ^[4]	Resulting Proposed PSL (dBA) ^[5]
Day (5 am – 10 pm)	66	63	3	+2	68
Night (10 pm – 5 am)	56	55	1	+4	60

Notes: [1] As defined in NMPs for NEB and VFPA. Derived from Basic Sound Levels (BSLs) for residences with dwelling density greater than 160 dwellings per quarter section and located within 30 m of a heavily travelled road (Table 1 of BC OGC Noise Guidance).
PSL (nighttime) = Basic Sound Level (BSL).

- PSL (daytime) = BSL + 10 dB (daytime adjustment).
- [2] The assumed ASL is 5 dB less than the PSL per BC OGC Noise Guidance.
- [3] As provided in Figure 3 above.
- [4] As per Figure 1 of Section 2.3.4 in BC OGC Noise Guidance.
- [5] PSL (nighttime) = Basic Sound Level (BSL) + Class A2 Adjustment.
- PSL (daytime) = BSL + 10 dB (daytime adjustment) + Class A2 Adjustment.

For reference, Figure 1 of Section 2.3.4 in the BC OGC Noise Guidance is provided as Figure 4 below.

Figure 1 - Ambient Monitoring Adjustment, A2

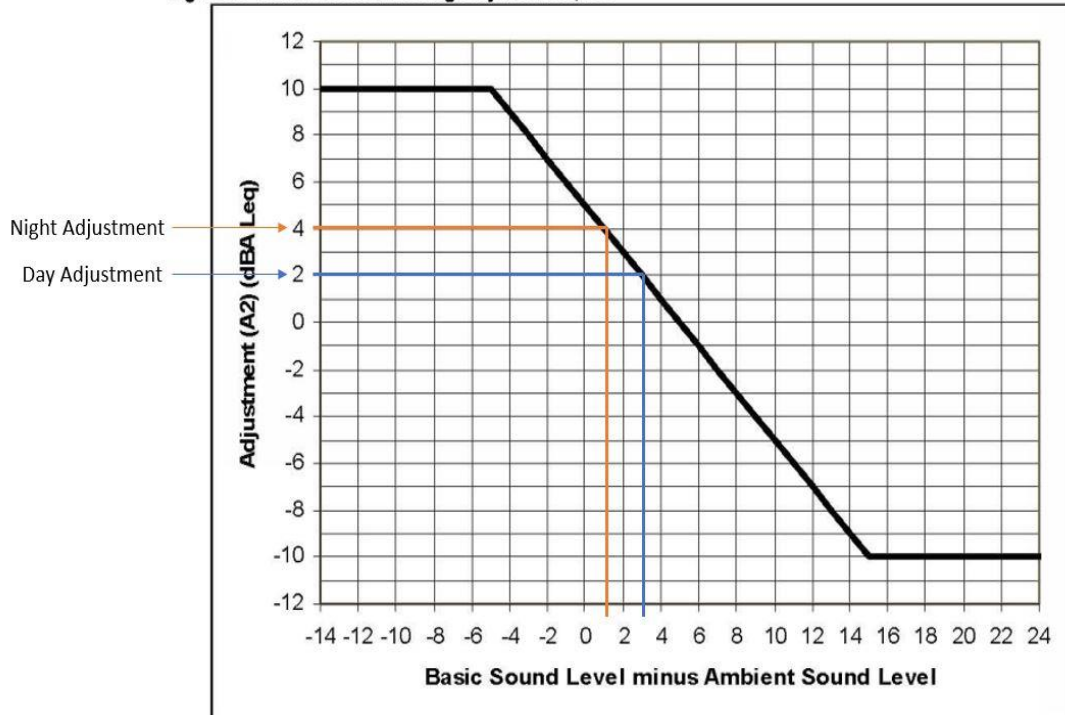


Figure 4: BC OGC Noise Guideline Figure 1 – Ambient Monitoring Adjustment, A2

Based on the above analysis of the ambient sound level at the compliance monitoring location for R3, the following is requested as a part of the noise limit amendment:

- The PSLs at R3 be updated to 68 dBA and 60 dBA for daytime and nighttime, respectively.

3.0 Noise Limit Adjustment Request Summary

The monitored ambient sound levels have proven that the targets are currently not aligned with the intention of BC OGC Noise Guidance. As such, it would not be practical to continue with the same PSLs at R3. Therefore, it is requested the the following be adjusted to reflect the existing ambient noise levels for R3:

1. Daytime hours be modified to include the hours 5 am to 10 pm and nighttime hours include 10 pm to 5 am for the purpose of compliance monitoring.
2. The PSLs at R3 be updated to 68 dBA and 60 dBA for daytime and nighttime, respectively.

4.0 Future Monitoring

VFPA will continue to receive a weekly summary report where there will be no change to monitoring results at R1 and R2. However, for R3, the night-time average sound level provided will be for the 5am to 10 pm period, as well, the PSL will be adjusted to reflect the precise monitoring location as detailed above.

Attachment A – Hourly Summary of Monitoring at R3

Date	Hourly L_{EQ} of Acceptable Data at R3 Monitor (dBA)																							
	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
8/30/2018	55.3	53.3	50.2	49.8	55.6	61.9	66.0	65.6	65.2	63.7	62.7	62.0	62.1	62.0	62.5	63.7	64.4	64.4	63.3	61.8	61.2	60.6	59.3	57.1
8/31/2018	55.2	51.3	51.7	50.4	54.9	61.4	65.6	65.5	64.6	63.7	63.0	62.7	62.4	62.5	62.8	63.5	64.3	64.2	63.2	61.6	60.4	60.1	59.2	58.9
9/3/2018	55.2	54.2	51.1	51.5	51.7	55.5	57.4	57.2	58.5	60.5	62.0	62.0	62.3	61.7	61.9	61.7	62.3	62.2	61.9	61.4	60.9	59.6	58.2	56.0
9/4/2018	53.4	50.1	48.4	48.6	55.3	62.8	66.8	66.4	65.3	64.0	62.2	61.6	61.7	62.5	61.6	63.3	64.3	67.8	64.7	61.9	60.3	59.6	58.5	56.5
9/5/2018	53.3	50.0	49.3	50.5	54.7	62.9	66.9	65.5	65.8	65.3	62.2	61.4	62.1	61.9	62.7	63.2	64.5	64.4	63.9	62.3	61.2	61.4	59.0	56.3
9/6/2018	53.6	51.3	47.5	50.8	54.4	62.4	66.3	66.0	66.1	65.1	62.4	61.9	61.6	61.4	61.8	63.3	64.6	64.3	63.1	61.6	60.9	60.5	59.0	56.2
9/7/2018	54.5	51.4	48.6	49.8	53.8	61.8	65.8	65.7	65.6	64.0	62.2	61.7	61.5	61.7	62.3	64.0	64.9	64.9	63.8	62.5	60.2	59.6	59.6	57.6
9/10/2018	53.3	51.0	47.4	47.8	54.7	62.3	66.2	65.0	64.7	65.1	63.9	62.1	62.4	62.1	62.5	64.0	64.6	65.1	63.9	61.3	60.4	59.3	58.2	56.2
9/11/2018	54.2	50.2	51.9	50.5	55.5	61.8	66.4	65.6	66.1	65.4	62.6	62.3	62.5	62.7	61.9	63.7	64.7	64.8	63.7	61.6	60.8	59.6	58.6	62.6
9/12/2018	52.8	52.0	48.3	49.7	55.1	63.4	66.7	65.5	65.5	65.0	63.0	62.3	62.2	62.5	63.0	64.2	65.0	64.9	64.5	61.4	60.8	59.9	58.7	55.9
9/13/2018	53.5	49.4	49.0	50.1	55.8	63.6	66.1	64.5	63.9	65.1	62.9	62.3	62.2	62.3	62.9	64.2	64.9	65.2	64.1	62.8	61.4	59.7	60.7	57.9
9/14/2018	54.4	50.9	49.4	49.5	55.4	62.2	66.3	65.7	66.0	64.6	62.5	62.2	62.1	62.0	62.9	64.3	64.9	64.5	63.4	61.7	60.3	59.9	59.7	59.6
9/17/2018	57.1	51.7	49.2	52.3	54.6	62.8	66.7	65.6	66.2	64.7	62.5	61.8	61.9	61.7	62.5	63.5	64.5	65.0	64.4	62.2	61.4	59.6	58.5	56.1

Average	54.3	51.3	49.4	50.1	54.7	61.9	65.6	64.9	64.9	64.3	62.6	62.0	62.1	62.1	62.4	63.6	64.4	64.8	63.7	61.8	60.8	59.9	59.0	57.5
---------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

5.0 Amendment Request

Trans Mountain is requesting the following amendments be made to VFPA Permit 15-322 Condition 37:

- Amend the definition of nighttime hours, for the purpose of noise monitoring, to 10:00 PM to 5:00 AM
- Amend the Permissible Sound Level (PSL) at WMT R3 (Bayview Drive and Barnet Road, Burnaby) to 68 dBA for daytime and 60 dBA for nighttime

Trans Mountain will file an updated Noise Management Plan for Pump Stations and Terminals with the VFPA at the time that it is filed with the National Energy Board.