

**Federal Court of Appeal**



**Cour d'appel fédérale**

**Date: 20230613**

**Docket: A-248-21**

**Citation: 2023 FCA 137**

**CORAM: PELLETIER J.A.  
RIVOALEN J.A.  
ROUSSEL J.A.**

**BETWEEN:**

**SHAWN SOMERVILLE MILNE**

**Appellant**

**and**

**HIS MAJESTY THE KING**

**Respondent**

Heard by online video conference hosted by the Registry on November 22, 2022.

Judgment delivered at Ottawa, Ontario, on June 13, 2023.

**REASONS FOR JUDGMENT BY:**

**PELLETIER J.A.**

**CONCURRED IN BY:**

**RIVOALEN J.A.  
ROUSSEL J.A.**

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**REASONS FOR JUDGMENT**

**PELLETIER J.A.**

**I. Introduction**

[1] Mr. Milne, the appellant, had a sliver of his land expropriated by the Government of Canada (Canada) for the expansion of an existing double track railway corridor to accommodate a third line of track for use by the Canadian National Railway Company (CNR) and Via Rail. He originally received \$1,000 as compensation for the value of the expropriated land. In the decision

under appeal, the Federal Court increased this amount by \$1,100, for a total compensation of \$2,100. This amount is not in issue in this appeal.

[2] Mr. Milne claimed additional compensation from Canada because his home, in his view, was no longer habitable due to the increased noise from railway operations. In the alternative, he alleged that his land has diminished in value, also as a result of the increased noise from railway operations.

[3] In a decision reported as *Milne v. Canada*, 2021 FC 765 (the Decision), the Federal Court dismissed his claims, finding that he had not proved that there was a perceptible increase in sound. The Court awarded Mr. Milne his costs of the proceedings, pursuant to the special costs regime found in the *Expropriation Act*, R.S.C. 1985, c. E-21. These reasons deal with Mr. Milne's appeal from the dismissal of his claim for compensation. Mr. Milne also appealed from the costs order made by the Federal Court. That appeal will be dealt with in separate reasons.

[4] Mr. Milne appeals the Federal Court's judgment saying that it made a palpable and overriding error on a critical fact, namely the sound level at Mr. Milne's home before the construction of the additional line of track. The sound levels from railway operations subsequent to the construction were based on measured sound levels and are not in dispute.

[5] For the reasons which follow, I would allow the appeal.

II. Background Facts

[6] The analysis which follows is based on certain technical concepts which were explained in the Federal Court's decision, the material portions of which are reproduced below:

[53] The experts discussed two variables in particular in their noise and vibration evidence: the day-night sound level ("Ldn") and the percentage highly annoyed ("%HA").

[54] The Ldn is a unit of measurement that represents the average level of sound during a 24-hour period. It is expressed in "A-weighted" decibels ("dBA"), a unit that measures the volume of sound adjusted for the perception of human hearing.

...

[56] The Ldn is calculated by combining the daytime sound level ("Ld"), which measures the levels of sound from 7:00am until 10:00pm, and the night-time sound level ("Ln"), which measures the level of sound from 10:00pm until 7:00am. Since noise is more disturbing to residents at night, a +10 decibel penalty is applied to the Ln.

[57] The %HA is the percentage of people based on survey data who are predicted to be highly annoyed by sound levels at a particular Ldn.

[7] Prior to undertaking construction of the third line of track, the CNR commissioned Stantec Consulting Ltd. (Stantec) to conduct an acoustic assessment "to assess the sound and vibration effects associated with proposed improvements to the rail corridor between Toronto, Ontario and Montreal, Quebec in support of increased VIA passenger train service": Appeal Book (AB) at p. 874. The resulting report was entitled *Screening-Level Sound and Vibration Assessment* but was generally referred to by the parties as the Stantec Report, which I will do as well. While the Stantec Report included vibration studies, they are not material to this appeal and will not be considered in these reasons.

[8] The Stantec Report set out the guidelines by which sound levels would be assessed, namely Health Canada's draft noise guidelines for environmental assessment projects, titled *National Assessment for Environmental Assessment: Health Impacts of Noise* dated May 2005. (the Health Canada Guidelines). According to these Guidelines, if the Ldn at a material location exceeds 75 dBA or if the change in percentage of highly annoyed affected receptors exceeds 6.5%, appropriate mitigation measures should be considered: Decision at para. 96.

[9] The major issue in this appeal is the difference in sound levels at the Milne residence as a result of the expansion of the railway corridor. This issue affects the assessment of the relief to which Mr. Milne is entitled. The post-expansion sound level has been measured and is not in dispute. However, the pre-expansion sound level was not measured and had to be determined using other tools. That determination is the subject of this appeal.

[10] The purpose of the Stantec Report was to establish baseline (or pre-expansion) sound levels for traffic in the existing corridor and to predict the likely sound levels once the corridor expansion was completed and in operation (post-expansion sound levels). The methodology used to do this was set out in the Executive Summary portion of the report:

The existing (i.e. baseline) conditions within the identified study area were established using a rail noise prediction model was [sic] created to calculate the baseline sound levels. Ambient sound monitoring was also conducted at selected locations in order to validate the results of the modelling. Modelling is preferred for establishing baseline conditions as it more readily allows comparison to future scenarios on a consistent basis (e.g., maximum train volumes).

The sound assessment was performed by modifying the baseline rail noise prediction model to account for expected future traffic volumes (i.e. operational scenario), setback distance changes, and track modifications (e.g., additional cross-overs). The sound level prediction results for the operational scenario were compared against the 75 dBA criterion. The prediction results for the baseline and

operational scenarios were used to calculate the change in percentage of highly annoyed receptors for comparison against the 6.5% change criterion.

Stantec Report, AB at p. 874

[11] Using this methodology, the Stantec Report set out predicted sound levels at various distances from the line of track, both pre- and post-expansion.

[12] In order to prove his case, Mr. Milne retained his own experts to measure post-expansion sound levels at his home and to calculate/model pre-expansion sound levels. These experts produced a report entitled *Noise and Vibration Measurement and Modelling Program: 464 Mitchell Road, Belleville* which, like the parties, I will refer to as the Arcadis Report.

[13] The relevant dates are as follows:

- The Stantec Report is dated February 12, 2010;
- The construction of the third line of track started on or about April 24 and it went into service on November 24, 2012; and
- The Arcadis Report is dated April 2015.

[14] The parties prepared an Agreed Statement of Facts which was attached as an Annex to the Federal Court's reasons. The relevant portions for the purposes of this appeal are reproduced below:

[1] Since the mid 1800s, the Canadian National Railway Company ("CN") has operated a double main line track running between Montréal and Toronto along and adjacent to the south side of Airport Parkway between Belleville and Napanee (known as the Marysville Corridor).

[2] The 'Subject Property' is a 95-acre parcel of land, municipally known as 464 Mitchell Road, Belleville, Ontario, that is adjacent to the south side of the Marysville Corridor in the Belleville area. The Subject Property is located between miles 216.01- 216.23 in the Kingston subdivision [of the CNR line of track].

[3] Prior to the expropriation and the construction of the 'Project':

(a) [Mr. Milne's] residence was located approximately 112 feet (34.14 metres) from the southern most rail line;

(b) The residence was located approximately 83 feet (25.3 metres) from the railway corridor / right-of-way; and

(c) The northern boundary of the Subject Property included an earth berm and vegetation that provided visual screening from the rail corridor / right-of-way to the residence.

...

[24] The third rail track was constructed on the south side of the existing rail corridor and within the existing right-of-way to the North of the Subject Property.

[25] As a result of the expropriation and the construction of the Project:

(a) The residence is now approximately 98 feet (29.87 metres) south of the new third main line track after its construction;

(b) The residence house is now approximately 48 feet (14.6 metres) south of the railway corridor; and

(c) The earth berm and vegetation located on the Required Lands was removed.

[26] Project construction commenced on or about April 24, 2012.

(Emphasis in the original)

[15] While the Agreed Statement of Facts posited the existence of a berm, it did not describe it other than by indicating that it was made of earth and vegetation. As a result, disagreements arose as to the effect of the berm on sound levels at the Milne residence.

[16] With that background information in mind, I turn now to the decision under appeal.

### III. The Decision under Appeal

[17] Since the critical findings are those in relation to the pre-expansion sound levels at Mr. Milne's house and the existence of the berm, I will limit my review to those parts of the Federal Court's decision which touch upon those findings.

[18] After dealing with some procedural history and pre-trial motions, the Federal Court assessed the credibility of the witnesses before it. The Court found that Mr. Milne, Mr. Kirby (Mr. Milne's expert, who spoke to the Arcadis Report) and Mr. Babic (Canada's expert, who spoke to the Stantec Report) were all credible: Decision at paras. 50, 52. As a result, none of the relevant findings turned on credibility issues.

[19] The Federal Court then reviewed the expert reports. The Federal Court noted that the Stantec Report contained the only measurement of the pre-expansion sound levels near Mr. Milne's property. The Report originally found that the pre-expansion Ldn at 20 metres from the railway track was 66 dBA: Stantec Report, AB at p. 0922. This was later corrected to 73.8 dBA: Decision at para. 61, AB at p. 1217.

[20] The Court then noted that the Stantec Report used a modelling program called STEAM to predict the pre- and post-expansion sound levels along the Marysville Corridor in which the Milne residence is located: Decision at para. 62. The measurements referred to above were taken as a means of verifying the predicted sound levels: Stantec Report, AB at p. 0901.



[21] At paragraph 63 of its Decision, the Federal Court summarized the results of the Stantec Report's modelling of noise levels in the Marysville Corridor:

Stantec used STEAM to predict that the **pre-expansion** Ldn at 29 meters from the track along the Marysville Corridor would be 80 dBA, which results in a %HA of 55%. Stantec then predicted that the **post-expansion** Ldn at that distance would increase by only 0.13 dBA, which entails an increase of %HA of 0.42%.

(Emphasis in the original)

[22] Post-expansion, the Milne residence was 29 metres from the track. On the basis of the Stantec Report, Canada concluded that no mitigation was required since the increase in sound level did not exceed the Health Canada Guidelines: AB at p. 0088.

[23] The Federal Court then reviewed the Arcadis Report. It noted that Arcadis undertook the only post-expansion measurement of sound levels at Mr. Milne's property: Decision at para. 64.

[24] The Court reported that Arcadis, using Stantec's measurement data, calculated that the pre-expansion Ldn at Stantec's monitoring station located 20 metres from the track was 73.6 dBA, 0.2 dBA less than Stantec's calculated sound level at that location: Decision at para. 65.

[25] The Court then noted that, using its own measurement data, Arcadis calculated that the post-expansion sound level at its own monitoring station, also located 20 metres from the track, was 78.7 dBA. Arcadis set up its measurement station at this distance from the track to replicate Stantec's measurement location: Decision at para. 66.

[26] The Federal Court recited that Arcadis, using Cadna-A modelling, found that the Ldn at Mr. Milne's residence was 71.4 dBA pre-expansion and 76.5 dBA post-expansion. The Federal Court noted that, as a result, "the 2015 ARCADIS Report found the expansion of the railway corridor resulted in an increase in Ldn at the Plaintiff's residence of 5.1 dBA, entailing an increase in %HA of 16.2%": Decision at para. 68.

[27] The Federal Court then addressed the impact of the berm on the sound values at Mr. Milne's home, referring to the Cadna-A modelling which Arcadis had undertaken. Given the importance of these observations for what follows, the Court's comments are reproduced below:

The 2015 ARCADIS Report attributed the increase in sound at the Plaintiff's residence primarily to the removal of the berm\* between the Plaintiff's residence and the railway corridor. It found the berm reduced the Ldn at the Plaintiff's residence by approximately 4 dBA. If the berm was not accounted for in the pre-expansion Ldn, the post-expansion Ldn was predicted to be only approximately 1 dBA greater than the pre-expansion Ldn. In other words, without the presence of the berm pre-expansion and its removal post-expansion, the increase in sound caused by the railway corridor expansion would be imperceptible at the Plaintiff's residence.

Decision at para. 69

\*The berm referred to in this passage is the 3 metre berm identified in the Arcadis report and not the berm referred to in the Agreed Statement of Facts.

[28] Having thus summarized the experts' reports, the Court analyzed this evidence. The Court noted that the parties essentially agreed that the pre-expansion Ldn at Stantec's measuring station, 20 metres from the track, was 73.8 dBA: Decision at para. 75. The Court then found that Arcadis "modelled the pre-expansion Ldn at [Mr. Milne's] residence (33 meters from the railway track) to be 71.4 dBA": Decision at para. 76 (emphasis in the original). The Court noted that Canada challenged this conclusion on three grounds, two of which the Court rejected. The

challenge which the Court accepted was that the existence of a three metre berm had not been proved: Decision at paras. 76-77.

[29] The Court observed that Arcadis had modelled the pre-expansion sound level at Mr. Milne's residence both with and without a three metre berm. When the berm was included, the pre-expansion sound level was found to be 71.4 dBA but when the berm was not taken into account, the pre-expansion sound level at the residence was 75.8 dBA: Decision at para. 82.

[30] The Court explained why it found that the existence of the three metre berm had not been proved. It explained that Mr. Kirby provided no evidence of the berm, admitting that he had not visited Mr. Milne's property before doing his measurements for the Arcadis Report in 2014. In any event, the berm had been removed by then and so Mr. Kirby neither saw nor measured the berm, "ostensibly relying upon [Mr. Milne] for the measurement": Decision at para. 85.

[31] The Court also found that there was no documentary evidence of the berm. The photographs which were put into evidence did not show a three metre earth berm. They did show a certain amount of vegetation that was ultimately removed when the rail line was expanded: Decision at para. 86.

[32] The Court summarized its position as follows:

In light of the above, I afford little weight to the 2015 ARCADIS Report's finding that the pre-expansion Ldn at the Plaintiff's residence was 71.4 dBA, as this calculation relied upon the existence of a 3-metre berm. Instead, I afford greater weight to the 2015 ARCADIS Report's finding that the pre-expansion Ldn at the Plaintiff's residence was 75.8 dBA, as this calculation reflects the pre-expansion sound levels without a berm.

Decision at para. 89

[33] The Court then accepted Arcadis' conclusion that the post-expansion Ldn at Mr. Milne's house was approximately 76.5 dBA, a finding which was not contradicted by any other evidence. It noted that Arcadis provided the only post-expansion measurement of the sound levels at Mr. Milne's residence. Canada's expert, Mr. Babic testified that he was not asked to examine this finding: Decision at paras. 90-91.

[34] Significantly, Mr. Babic agreed that measurements are the "gold standard" and that they "generally provide more accurate representations of sound levels than modelling": Decision at para. 91.

[35] In the result, the Court found that the increase in sound level at Mr. Milne's residence was in the order of 1 dBA, which it characterized as an imperceptible change: Decision at para. 93. At paragraph 94 of its reasons, the Court repeated that the berm was integral to Arcadis' finding that there was a perceptible increase in sound at the Milne residence post-expansion, and, as Mr. Milne had not established that a three metre berm existed pre-expansion, it concluded that there was no perceptible increase in sound.

[36] The Court then addressed the Health Canada Guidelines, which consider the point at which noise mitigation measures should be contemplated. These Guidelines recommend that mitigation should be considered if sound levels exceed an Ldn of 75 dBA or if there is an increase of 6.5% highly annoyed at a given location: Decision at para. 96. Given the Court's findings that the Ldn at Mr. Milne's residence was 75.8 dBA pre-expansion and 76.5 dBA post-expansion, it concluded that the 75 dBA threshold was exceeded in both cases but since the increase in sound was imperceptible, no mitigation was indicated: Decision at paras. 102, 104.

#### IV. Issues

[37] Since the post-expansion sound level at the Milne residence is not in dispute, the major issue in this appeal is the Federal Court's conclusion as to the pre-expansion sound level at that location.

[38] Mr. Milne argues that the Federal Court's conclusion is wrong for a number of reasons, all having to do with the Federal Court's preference for the results of the Cadna-A modelling without the berm. Mr. Milne argues that the Court should have preferred Arcadis' "measured" result rather than its "modelled" result, primarily on the basis that measurement is the gold standard of accuracy. Mr. Milne also argues that the Court's conclusion that the pre-expansion sound level at his home was 75.8 dBA could only be true if the sound level increased from the measured sound level at 20 metres from the track (73.6 dBA) to the Milne residence, 33 metres from the track. This flies in the face of the common experience that sound decreases over distance.

[39] That said, I turn now to the analysis of the evidence and the Court's conclusions.

V. Analysis

[40] Since this is an appeal of a trial court decision after a trial, the applicable standard of review is that articulated in *Housen v. Nikolaisen*, 2002 SCC 33, [2002] 2 S.C.R. 235, namely correctness for questions of law and palpable and overriding error and questions of fact or mixed fact and law, except in the case of an extricable error of law, in which case the standard of correctness applies.

[41] In order to understand whether or not the Federal Court fell into error as alleged by Mr. Milne, it is necessary to understand the expert reports which it had before it.

[42] Since the Stantec Report was prepared pre-expansion, it is only relevant to the extent that it assists in determining the pre-expansion sound level at Mr. Milne's home.

[43] As noted earlier, Stantec proceeded by modelling pre- and post-expansion sound levels along the length of the corridor. It also established monitoring stations at locations along the way as a check on the accuracy of the modelling. Of particular importance to this appeal is the monitoring station established at 20 metres north of the track in proximity to the Milne residence. This was the only pre-expansion measurement of sound levels near Mr. Milne's residence.

[44] As previously noted, Stantec calculated the average sound level at 20 metres from the track as 73.8 dBA. In its report, Arcadis recalculated the pre-expansion sound level at that

location using Stantec's data and concluded that the average sound level at that time and location was 73.6 dBA: Arcadis Report, section 4.1.1, AB at p. 1091. Both expert witnesses agreed that the 0.2 dBA difference between their results was not significant and so, I will refer to this data point as 73.6 dBA.

[45] Arcadis did the only measurement of post-expansion sound levels at the Milne residence. It set up sound measuring equipment at two locations on the Milne property, one at 20 metres south of the track and the other in a bedroom in the residence. The 20 metre location was chosen to replicate Stantec's 20 metre location. While Canada argued that these last two locations were not comparable because Stantec's measurements were taken at a different location with different topography, the Federal Court treated them as equivalent: Decision at para. 80. Using measurements obtained from its own 20 metre measuring station, Arcadis calculated that the average post-expansion sound level at that location was 78.7 dBA: Arcadis Report, section 4.1.2, AB at p. 1091.

[46] Arcadis then considered the data from the point of view of the U.S. FTA (Federal Transit Administration) noise impact procedure. Arcadis' rationale for doing this, and the results which it produced, are found in the following paragraph which is important for what follows:

The U.S. FTA rail noise impact procedure was introduced in the [Stantec report] to assess the rail yard noise. This method was not applied to the rail line as the Health Canada approach was adopted for this purpose. It is an instructive exercise to apply this approach as a point of comparison to the results of the Health Canada assessment, as the FTA reference document outlines that this procedure is also applicable to rail traffic. Under this approach, the baseline [pre-expansion]  $L_{dn}$  is compared to the operations [post-expansion]  $L_{dn}$ , using the plot depicted in Figure 4.3. The baseline [pre-expansion]  $L_{dn}$  was calculated to be 73.6 dBA on average at 20 m from the mainline (from the [Stantec] data). When projected to the house (33 m from the main line) the resulting baseline level is 71.4 dBA.

Similarly, adjusting the calculated operations [post-expansion] data of 78.7 dBA from 20 m to 33 m results in a sound level of 76.5 dBA.

Arcadis Report, section 4.3, AB at p. 1096 (my emphasis)

[47] For convenience, the values obtained using the U.S. FTA rail noise impact procedure were the following (values in dBA):

	Mon. Sta*	Milne Res.	Difference
Baseline (pre-expansion)	73.6	71.4	2.2
Operating (post-expansion)	78.7	76.5	2.2
Difference	5.1	5.1	

\*Monitoring Station –measured results

[48] In the end, Mr. Milne put his case forward on the basis of this analysis. The sound levels upon which he based his claim are those shown in this table. Specifically, he argued that the pre-expansion sound level at his home was 71.4 dBA and that the post-expansion sound level was 76.5 dBA: Closing Written Submissions of the Plaintiff at pp. 18-19, AB at pp. 2929-2930.

[49] The significance of this data is that the distinction between measured sound levels and sound levels derived by other means is an important aspect of Mr. Kirby's evidence. The results in the monitoring station column are based on the measurement data collected at each expert's monitoring station. The results at the Milne residence are the results obtained when the 20 metre (monitoring station) data is projected, using the U.S. FTA noise impact procedures, to the residence. It is evident that, when Mr. Kirby describes Milne residence results as measured, he means that those results were obtained on the basis of measured data at the 20 metre mark. As we shall see, this distinguishes these results from those obtained by modelling.



[50] As noted earlier, the Arcadis Report also modelled the pre-expansion sound levels. Its clearly expressed objective in doing so was “as a point of comparison to the results from the measurement program, and to determine whether the application of accurate assumptions based on site observations would have resulted in a different conclusion in the [Stantec Report]”: Arcadis Report, AB at p. 1106. In other words, the modelling was not intended as a check on Arcadis’ own results but was instead directed to undermine Stantec’s results. This was but another in a series of volleys between the two experts, each attempting to demonstrate the error of the other’s position: AB at Tabs 33-34 and 36-40.

[51] The “accurate assumptions” referred to above included the topography, the presence of the berm, the location of the passing track, and the traffic level on the track closest to the Milne residence: AB at pp. 1106-1107.

[52] As was noted earlier, Stantec used a model to estimate pre-expansion sound levels so as to facilitate the comparison with post-expansion sound levels. Stantec used the STEAM modelling program. Arcadis applied revised assumptions in STEAM and another modelling program called Cadna-A. Arcadis favoured the use of the Cadna-A program because it allowed for inclusion of topographical data, including the berm, which was not possible in STEAM. Unlike STEAM, “Cadna-A is a CAD-based [Computer-Aided Design] outdoor noise propagation model”: Arcadis Report, section 5.2.2, AB at p. 1107. Mr. Kirby testified that the Cadna-A modelling program integrated different standards applicable to different cases. In this case, Arcadis used the Cadna-A system incorporating FTA algorithms: Arcadis Report, section 5.2.2, AB at pp. 1107-1108.

[53] Both modelling programs were run with the same maximum pre-expansion and post-expansion rail traffic volumes that were applied in the Stantec Report “to show how the results would differ with site specific information taken into account”: Arcadis Report at 5.4.2, AB at p. 1112. Unlike the U.S. FTA noise impact procedures which used measured train noise levels as inputs, the Cadna-A modelling used typical train noise data published by the U.S. Federal Rail Association (FRA): Arcadis Report at 5.2.2, AB at p. 1108.

[54] The Cadna-A modelling showed results for pre-and post-expansion scenarios with the berm included in the topographical profile used in the pre-expansion scenario. Since the Stantec STEAM modelling had not considered the berm, Arcadis also modelled, for comparison purposes, the pre-expansion scenario with the berm removed. The results of these modelling exercises are shown in the following table (all values dBA):

Cadna-A	Mon. Sta.*	Milne Res.	Difference
A-Pre-expansion <sup>1</sup>	78.3	71.9	6.4
B-Pre-expansion <sup>2</sup>	78.3 <sup>3</sup>	75.8	2.5
C- Post-expansion	81.3	76.8	4.5
Difference			
Line C – Line A	3.0	4.9	
Line C – Line B	3.0	1.0	

\*Monitoring Station

<sup>1</sup>including the 3 metre berm

<sup>2</sup>excluding the 3 metre berm

<sup>3</sup>Arcadis assumed that the berm was located between the track and the 20 metre measuring station: see Milne Memorandum of fact and law at para. 51 station: see Milne Memorandum of fact and law at para. 51

[55] I shall return to these results shortly but I point out that the modelled pre-expansion sound level at the Milne residence was 71.9 dBA and not 71.4 dBA as reported by the Court: Decision at paras. 68, 76, and 82.

[56] With this background in mind, I return to the Federal Court's treatment of this evidence. At paragraph 65 of the Decision, the Federal Court noted that, using Stantec's measured data, the Arcadis Report calculated that the pre-expansion Ldn at 20 metres from the railway track was 73.6 dBA. Then, at paragraph 66 of the Decision, the Federal Court correctly notes that the Arcadis Report found that "the post-expansion Ldn at 20 metres from the railway track is 78.7 dBA" (my emphasis).

[57] The Court then purported to restate the Arcadis Report's conclusion as to the increase in %HA at the Milne residence as follows:

Accordingly, the 2015 ARCADIS Report found the expansion of the railway corridor resulted in an increase in Ldn at [Mr. Milne's] residence of 5.1 dBA, entailing an increase in %HA of 16.2%.

Decision at para. 68 (my emphasis)

[58] This is an error in that the only references in the Arcadis Report to a 16.2% increase in the %HA occurs in section 4.1.2 of the Arcadis Report (AB at p. 1092), and in section 6.1 (AB at p. 1114) both of which refer to the sound levels at the 20 metre mark. There is no indication in the Arcadis Report of the post-expansion %HA at the Milne residence.

[59] The Court then reviewed the modelling reported in the Arcadis Report, in particular the differences between the Cadna-A modelling with and without the berm. The Court discussed the

effect of the berm on sound levels at the Milne residence, noting that the berm resulted in approximately 4 dBA of sound mitigation. The Court observed that, without the berm pre-expansion, the increase in sound level at the Milne residence post-expansion would be a negligible 1 dBA: Decision at para. 69. The source of this information is section 5.4.2 of the Arcadis Report: AB at p. 1112-1113.

[60] Having found that the existence of a 3 metre berm had not been proven, the Court concluded:

...I afford little weight to the 2015 ARCADIS Report's finding that the pre-expansion Ldn at the Plaintiff's residence was 71.4 dBA, as this calculation relied upon the existence of a 3-metre berm. Instead, I afford greater weight to the 2015 ARCADIS Report's finding that the pre-expansion Ldn at the Plaintiff's residence was 75.8 dBA, as this calculation reflects the pre-expansion sound levels without a berm.

Decision at para. 89 (my emphasis)

[61] If one consults the Arcadis Report, one finds two relevant values for the pre-expansion sound level at the Milne residence. The first is 71.4 dBA, which was obtained using U.S. FTA noise impact procedures: Arcadis Report, section 4.2, AB at p. 1096. The second is 71.9 dBA obtained using the Cadna-A modelling which incorporated the FTA algorithms: Arcadis Report, section 5.4.2, AB at p. 1112. If the Court meant to set aside the results of the Cadna-A modelling, it ought to have set aside the 71.9 value and not the 71.4 value, which was obtained using a different methodology. Since both methodologies refer to FTA, one suspects that the Court conflated them. In fact, the text of the Decision demonstrates that the Court considered the 71.4 value to have been obtained by modelling:

[68] Based on Cadna-A modelling, the 2015 ARCADIS Report found the **pre-expansion Ldn at the Plaintiff's residence was 71.4 dBA, and the post-expansion Ldn at that location is 76.5 dBA.**

(Bold type in the original, the underlining is mine)

[76] Using the measured data in the 2010 Stantec Report, the 2015 ARCADIS Report modelled the pre-expansion Ldn at the Plaintiff's residence (33 meters from the railway track) to be 71.4 dBA.

(Emphasis in the original)

[82] When the berm was included in the modelling, the 2015 ARCADIS Report found the pre-expansion Ldn at the Plaintiff's residence was 71.4 dBA.

(my emphasis)

[62] As a result, the Court rejected the 71.4 dBA value because it mistakenly believed it was obtained using Cadna-A modelling incorporating a 3 metre berm. This was an error. The 71.4 dBA value was obtained by projecting the sound level measured at 20 metres to 33 metres. That said, is there any reason to believe that, despite the difference in methodology, the methodology that led to the 71.4 dBA value accounted for the impact of a berm? One could point to the minor difference between the two values, 71.4 vs. 71.9, to argue that, while the methodology was different, the results were effectively the same.

[63] The best way to answer this question would have been to ask Mr. Kirby, but unfortunately that was not done. The best that can be done is to point to the difference in Ldn between the 20 and the 33 metre marks, pre- and post-expansion, using the FTA noise impact procedures. If the berm was considered in the pre-expansion analysis and not in the post-expansion analysis, one would expect a difference in the decrease in the Ldn (as the sound travelled from the 20 metre mark to the Milne residence) between the pre- and post-expansion

analyses. However, if one refers to the table at paragraph 47 above, one sees that in both cases the difference in Ldn is the same, that is, 2.2 dBA. The fact that the degree of attenuation is the same in both cases suggests that the 3 metre berm was not included in the projection of the pre-expansion sound level.

[64] This can be compared to the difference in Ldn which was shown in the Cadna-A analysis, as recorded in the table shown at paragraph 54 above. When the sound levels were modelled, including the berm in the pre-expansion analysis, the degree of attenuation pre- and post-expansion was 6.4 and 4.5 dBA respectively, thus showing the effect of the berm on that analysis. The absence of a like difference when the U.S. FTA noise impact procedures were applied to the data confirms that the berm was not included in that analysis. As a result, the Federal Court erred in rejecting the 71.4 dBA result.

[65] There is another reason for rejecting the Court's conclusion that the pre-expansion sound level at the Milne residence was 75.8 dBA. To accept that value would mean the sound level increased from 73.6 dBA (the measured value at 20 metres) to 75.8 dBA at the Milne residence at 33 metres. This increase in the loudness of train noise as it moved away from the track is inconsistent with common experience. Sound decreases with distance: if a person speaks too softly, we come closer to hear them, we do not back up. The Court would be entitled to take judicial notice of this physical phenomenon as a matter so "generally accepted as not to be the subject of debate among reasonable persons": *R. v. Find*, 2001 SCC 32, [2001] 1 S.C.R. 863 at para. 48, *R. v. Spence*, 2005 SCC 71, [2005] 3 S.C.R. 458 at para. 53.

[66] In any event, the fact that sound decreases with distance was in evidence before the Court. In the cross-examination of Mr. Kirby, counsel for Canada read from a text which Mr. Kirby had agreed was authoritative in the field, James P. Cowan, *Handbook of Environmental Acoustics* (New York: John Wiley & Sons, 1994), as follows:

Sound radiating from a line source would spread in a cylindrical pattern. In this case the SPL [sound pressure level] would drop off at a rate of 3 decibels with each doubling of the distance from a source. Typical line sources include traffic on highways and long, long trains.

Transcript Brief at p. 0576, lines 14-18.

[67] Mr. Kirby agreed with this proposition: Transcript Brief, at p. 0533, lines 7-24, and at p. 0576, lines 4-22. The point here is not the rate of decrease, but the fact that sound decreases with distance. It does not increase.

[68] The Federal Court acknowledged this anomaly at paragraph 82 of the Decision when it wrote:

(I note that under the Cadna-A modelling, the pre-expansion Ldn at 20 metres from the railway track was 78.3 dBA, thus explaining why the pre-expansion Ldn of 75.8 dBA at the Plaintiff's residence without the berm as modelled is greater than the pre-expansion Ldn of 73.6 dBA at 20 metres from the railway track as measured).

[69] With respect, this explains nothing. The pre-expansion sound level at 20 metres was known; it had been measured by Stantec and the experts both agreed that it was correct. The fact that the modelling produced a different value (78.3 dBA vs. 73.6 dBA) is simply evidence that the modelling did not produce a reliable result. If it was not reliable at 20 metres, with or without the berm, it was unreliable at 33 metres.

[70] While the Federal Court was justified in rejecting the results of the modelling which incorporated a 3 metre berm, it was not justified in rejecting the evidence of the pre-expansion sound level at the Milne residence determined using the U.S. FTA noise impact procedures. This is because the 71.4 dBA result did not suffer from the same defect as the modelled 75.8 dBA result and it was the only other evidence of the pre-expansion sound level.

[71] In rejecting this evidence because of its mistaken understanding as to how it was arrived at, the Federal Court fell into palpable and overriding error. It was palpable in that it was immediately obvious when one examined the evidence. It was overriding in that it was critical to the Court's assessment of the relief to which Mr. Milne was entitled.

[72] The question of relief turned on the application of the guidelines issued by Health Canada and the FTA. The Health Canada Guidelines recommend that mitigation be considered when the sound level equals or exceeds 75 dBA or the %HA exceeds 6.5%: Decision at para. 96. However, the Federal Court concluded that mitigation "was only recommended under the absolute criterion of the Health Canada Guidelines": Decision at para. 101.

[73] The draft Health Canada Guidelines (2005) provide that:

If the percentage highly annoyed increases by 6.5% or more OR if the value of  $10 \log(10^{0.1 * L_{eq24}} + 3.375 * 10^{0.1 * L_n})$  exceeds 75 dBA, then the impact is considered severe (HUD 1984, HMMH 1995, FTA 1995, FRA 1998). It is recommended that mitigation should be proposed in this situation.

AB at pp.1752-1753

[74] The current Health Canada Guidelines, released in 2017, are clear that:



Noise mitigation measures should be considered when a change in the calculated %HA at any given receptor location exceeds 6.5%. The ISO method does not characterize the nature of the increase in terms of severity of impact. However, the U.S. Federal Transit Administration describes a long-term increase of more than 6.5%HA as representing a severe project-related noise impact (Hanson *et al.* 2006).

...

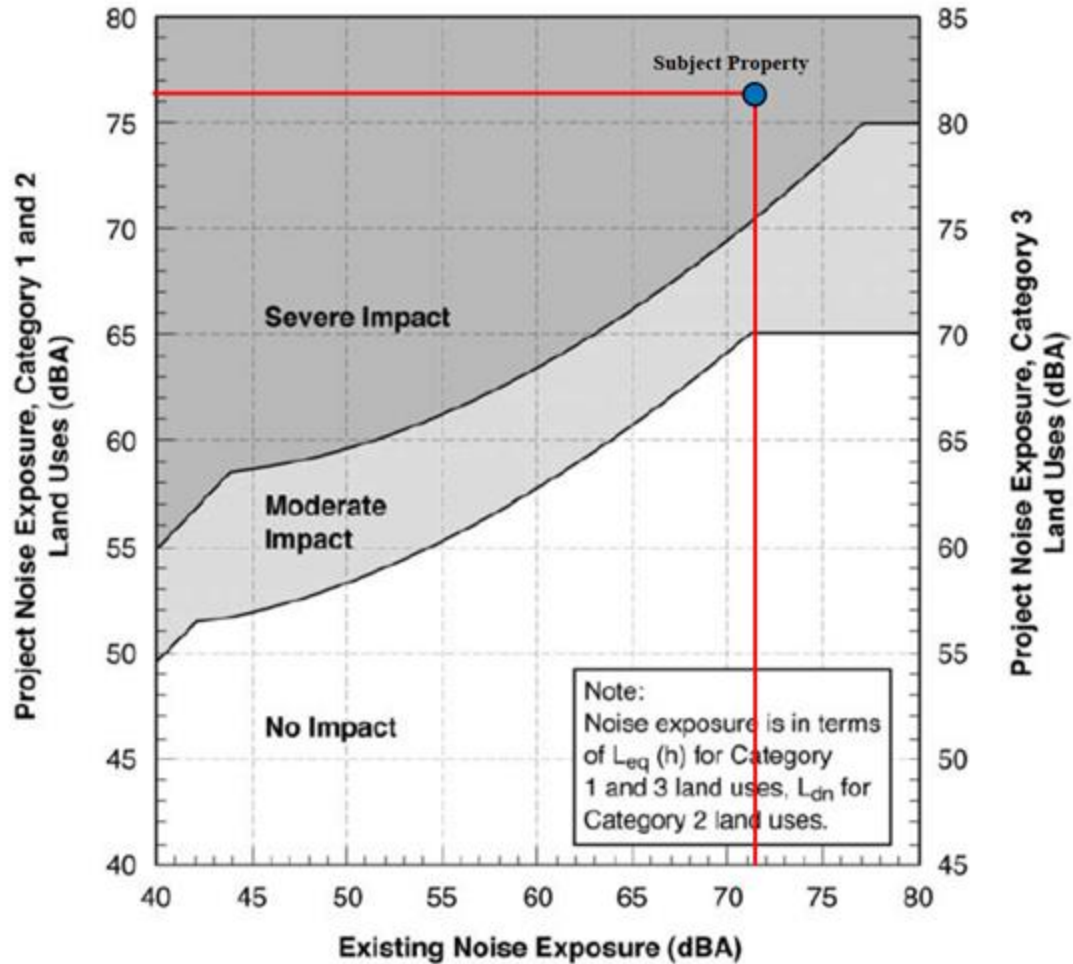
Therefore, Health Canada holds the view that mitigation of project noise be applied if it exceeds an Ldn of 75 dBA, even if the change in %HA does not exceed 6.5%.

Health Canada's Healthy Environments and Consumer Safety Branch, *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise* (Ottawa, Ontario, 2017), AB at p. 1769

[75] As a result, the Federal Court's decision to limit mitigation to the absolute criterion of 75 dBA is not necessarily non-compliant with the Health Canada Guidelines. The requirement that mitigation be considered was met.

[76] The Court went on to find that, because the sound level at the Milne residence increased by approximately 1 dBA, it had not been established that the change in %HA threshold of 6.5% was met. Given that the pre-expansion %HA at the Milne residence was never calculated (Arcadis Report, section 4.2, AB at p. 1096), it is not possible to determine if mitigation was required under the relative criterion.

[77] The Arcadis Report dealt with the impact of noise increases using the FTA noise impact procedures and found that the increase in sound level at the Milne residence constituted a severe impact, a finding which called for consideration of mitigation. This conclusion was based upon the following graph which is found in the Arcadis Report:



Arcadis Report, section 4.2, AB at p. 1097

[78] The Milne residence is a category 2 land use (residential): AB at p. 1096. The X-axis of the graph shows the pre-expansion noise level at the Milne residence while the left Y-axis shows the post-expansion noise level. It can be seen that if the pre-expansion noise level increases (i.e. the blue dot moves to the right) there is no point at which the post-expansion impact will be less than severe. Specifically, even if one accepted the Federal Court's conclusion as to the pre-expansion sound level at the Milne residence, 75.8 dBA, the impact would still be rated as severe, even if the post-expansion sound level did not decrease.

[79] Mr. Kirby explained this graph in his evidence:

And you can see -- one of the things that I think is important to point out here is that, if existing noise exposures were lower in the order of, say, 40 or 45, then that 5 decibel increment wouldn't be significant. It would result in no impact. And I think this is a good feature of this analysis or the use of this particular tool, because it shows you that sort of sliding scale. So when things are getting louder from an existing conditions perspective, then there's less room before you start causing a severe impact.

Q.[Appellant's Lawyer] Can you explain that to us a little bit, you know, what -- why that is?

A. Well, it's a question of people's tolerances. Once you're exposed to a very high level of noise to start with, your tolerance to receive more of it just becomes less. It's a fairly simply [*sic*] equation in that regard.

Transcript Brief at p. 0457, lines 5-21

[80] The Federal Court then concluded its analysis of the effects of the railway expansion on the Milne residence as follows:

In light of the above, I find the applicable guidelines offer little support to the Plaintiff's argument that the increase in sound caused by the expansion of the railway corridor has negatively affected his residence. The only criterion breached was the absolute criterion under the Health Canada Guidelines. However, this criterion was breached both pre- and post-expansion, as the Ldn at the Plaintiff's residence exceeded 75 dBA at all relevant times. I therefore find that the breach of the Health Canada Guidelines does not indicate a change in sound levels.

Decision at para. 104

[81] In essence the Court concluded that, since the increase in sound level was only 1 dBA, which was previously described as imperceptible, Mr. Milne was essentially in the same position as he was pre-expansion. In doing so, the Court failed to consider the Health Canada Guidelines which recommend mitigation at sound levels in excess of 75 dBA. More importantly, it did not take into account the evidence relating to the FTA's *Transit Noise and Vibration Impact*

*Assessment*, (Washington, D.C., 2006), AB at pp. 2356-2616, (Guidelines) which establish that at higher sound levels, such as 71.4 dBA, small increments in sound are perceived negatively. In this instance, the actual increment was larger than that 1 dBA erroneously accepted by the Federal Court and was received very negatively by the Milne family, as predicted by the FTA's Guidelines.

[82] All of which leads to the conclusion that mitigation was recommended under both the Health Canada Guidelines and FTA Guidelines. In coming to the conclusion that Mr. Milne had not established his entitlement to relief, the Federal Court returned repeatedly to the absence of evidence of any impact on his property:

[179] In my view, the [appellant] has not established that he has been "ousted" from his residence due to an increase in sound levels caused by the railway corridor expansion. The [appellant] has not established that the berm north of his residence, which purportedly acted as a noise attenuating feature, existed at the time of taking, at least in the manner relied upon in the 2015 ARCADIS Report (see discussion beginning at paragraph 81 of this judgment). The notion that the taking of the Required Lands resulted in the removal of the berm, and hence a perceptible increase in sound, is therefore not established.

(my emphasis)

[185] I am not persuaded by the [appellant]'s argument. Pre-expansion, the [appellant]'s residence was a rural dwelling on farm land that was located next to a busy railway corridor; post-expansion, the [appellant]'s residence is essentially the same, only the corridor is somewhat busier and the traffic somewhat closer. The [appellant] has failed to establish that these changes necessitate the relocation of his residence, as the [appellant] has not established that the noise from the railway corridor is perceptibly greater post-expansion.

(my emphasis)

[196] The [appellant]'s claim for injurious affection relied upon the conclusion in "Scenario C" of Mr. Lansink's [Mr. Milne's expert] 2019 GSI Report, discussed at paragraph 125 of this judgment. Mr. Lansink's injurious affection analysis relied upon the stated assumption that the [appellant]'s residence is only suitable as a rental property due primarily to the increase in sound caused by the railway corridor expansion. The [appellant], however, failed to establish that the sound

levels at his residence increased perceptibly post-expansion, thus undermining the stated assumption relied upon in Mr. Lansink's injurious affection analysis.

(my emphasis)

[83] Admittedly, factors other than noise played a role in the Court's assessment of the appraisal evidence. But the conclusion that the claim of unacceptable additional noise had not been made out was a significant consideration. In the circumstances, the matter should be returned to the Federal Court for re-examination on the basis that Mr. Milne is entitled to relief, the issue being the quantum of that relief.

[84] On the issue of costs, Mr. Milne asks this Court to make the order which the Federal Court ought to have made and to award him costs on the basis provided for in the *Expropriation Act*. Since I would return the matter to the Federal Court to redetermine the amount of the compensation to which he is entitled, I am not inclined to award costs as requested by Mr. Milne since the issues relevant to an award of costs under the *Expropriation Act* have not been finally resolved. On the other hand, Mr. Milne has been successful in this appeal and should recover more than the basic amount of party and party costs, given the spirit of the costs provisions of the *Expropriation Act*. I would therefore award Mr. Milne his costs of the appeal to be assessed at the high end of Column IV.

## VI. Conclusion

[85] As a result, I would allow the appeal with costs to be assessed at the high end of Column IV and return the matter to the Federal Court so that the trial judge can determine the quantum of the relief to which Mr. Milne is entitled on the basis of this Court's conclusion that the noise

impact on his residence following the expansion was severe and mitigation is recommended under the Health Canada Guidelines.

"J.D. Denis Pelletier"

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J.A.

"I agree.  
Marianne Rivoalen J.A."

"I agree.  
Sylvie E. Roussel J.A."

**FEDERAL COURT OF APPEAL**

**NAMES OF COUNSEL AND SOLICITORS OF RECORD**

**DOCKET:** A-248-21

**STYLE OF CAUSE:** SHAWN SOMERVILLE MILNE  
v. HIS MAJESTY THE KING

**PLACE OF HEARING:** BY ONLINE VIDEO  
CONFERENCE

**DATE OF HEARING:** NOVEMBER 22, 2022

**REASONS FOR JUDGMENT BY:** PELLETIER J.A.

**CONCURRED IN BY:** RIVOALEN J.A.  
ROUSSEL J.A.

**DATED:** JUNE 13, 2023

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