

E-mail Memorandum		
To:	Ian MacDonald Ian.MacDonald@HydroOne.com	From: Andrew Dobson
		Date: Revised May 29, 2018
Company	Hydro One Networks Inc.	Total Pages: 11
Re:	Hanover Transmission Station, Hanover, Ontario Noise Control Options	

Dear Mr. MacDonald,

As you are aware, the results of the most recent acoustic measurements, conducted on March 20, 2018, and the subsequent updated acoustical modelling indicate that the sound levels of the Hanover TS are currently within the applicable limits of the Ministry of the Environment and Climate Change (“MOECC”) at the existing sound sensitive points of reception, however the TS would exceed the limits by up to 6 dBA at the location of a proposed residential development to the south, as outlined in our memo dated April 16th, 2018.

It has been established that the sound level excesses are attributable to the existing T1 and T2 transformers. More specifically, it is the sound emitted by the transformer cores, rather than the sound of the cooling fans, which is primarily responsible for the excesses. Accordingly, using the acoustical model of the Hanover TS (discussed in the April-2018 memo), with input from Hydro One and an updated site plan showing the positioning of the proposed dwellings (attached as Figure 1), four mitigation options have been developed to reduce the sound levels of the T1 and T2 transformers, to bring the TS into compliance with the MOECC limit of 45 dBA at the location of the proposed development. Details are provided below.

Option 1: Localized Acoustic Barrier South and East of T2

An “L” shaped acoustic barrier situated to the south and east of the T2 transformer has been proposed. Both the east and south extents of the barrier each have a minimum length of 6 metres and are offset 1.5 metres from the radiator/fan banks, as depicted in Figure 2A. The barrier height is 1.0 metre higher than the top of the T2 transformer tank (barrier height of approximately 6.0 metres above grade). The barrier must have a solid construction with a surface density of no less than 20 kg/m², be free of gaps and cracks, and be constructed with an acoustically absorptive material on the north and west facing sides (i.e. facing the transformer) with a minimum NRC rating of 0.75, to prevent an increase in sound levels at the existing residences to the northwest. Note that, although this barrier is positioned near to the T2 transformer, it will also sufficiently mitigate the sound emitted from the T1 transformer. Figure 2B graphically shows the predicted sound levels associated with this noise control option.

Option 2: Property Line Barrier North of the Development

An acoustic barrier situated to the north of the residential development has been proposed. The barrier extends from the northwest corner of Lot 67, a minimum of 75 metres to the southeast, along

the north property line (i.e. roughly 7.5 metres north of the proposed dwellings), as depicted in Figure 3A. The barrier height is 1.0 metres higher than the proposed dwelling window centre points (barrier height of approximately 5.5 metres above grade). The barrier must have a solid construction with surface density of no less than 20 kg/m², and be free of gaps and cracks. The barrier does not need to be acoustically absorptive, but rather can be constructed of any material which meets the surface density requirement, such as masonry, wood, steel, etc. The predicted sound levels associated with this option are shown graphically in Figure 3B, attached.

Option 3: Property Line Barrier North of Lot 67, One Block of Single-Storey Townhomes

An acoustic barrier situated to the north of residential Lot 67, in combination with restricting the block of six townhouses situated immediately east of Lot 67 to single-storey dwellings (rather than two-story dwellings) has been proposed. The barrier extends from the northwest corner of Lot 67, a minimum of 32 metres to the southeast, along the north property line (i.e. roughly 7.5 metres north of the proposed dwelling), as depicted in Figure 4A. The barrier height is 1.0 metre higher than the proposed dwelling window centre points (barrier height of approximately 5.5 metres above grade). The barrier must have a solid construction with surface density of no less than 20 kg/m², and be free of gaps and cracks. The barrier does not need to be acoustically absorptive, but rather can be constructed of any material which meets the surface density requirement, such as masonry, wood, steel, etc. The predicted sound levels associated with this option are shown graphically in Figure 4B, attached.

Option 4: Property Line Barrier North of Lot 67, Single-Storey Dwelling in Lot 67 and One Block of Single-Storey Townhomes

An acoustic barrier situated to the north of residential Lot 67, in combination with restricting the dwelling within Lot 67 and the block of six townhouses situated immediately east of Lot 67 to single-storey dwellings (rather than two-story dwellings) has been proposed. The barrier extends from the northwest corner of Lot 67, a minimum of 32 metres to the southeast, along the north property line (i.e. roughly 7.5 metres north of the proposed dwelling), as depicted in Figure 5A. The barrier height is 1.5 metres higher than the proposed dwelling window centre points (barrier height of approximately 3.0 metres above grade). The barrier must have a solid construction with surface density of no less than 20 kg/m², and be free of gaps and cracks. The barrier does not need to be acoustically absorptive, but rather can be constructed of any material which meets the surface density requirement, such as masonry, wood, steel, etc. The predicted sound levels associated with this option are shown graphically in Figure 5B, attached.

We trust that this information satisfies your immediate needs. If you have any questions or require further assistance, please do not hesitate to call.

Yours truly,

Howe Gastmeier Chapnik Limited



Andrew Dobson, BSc, INCE

Reviewed by



Ian Bonsma, PEng

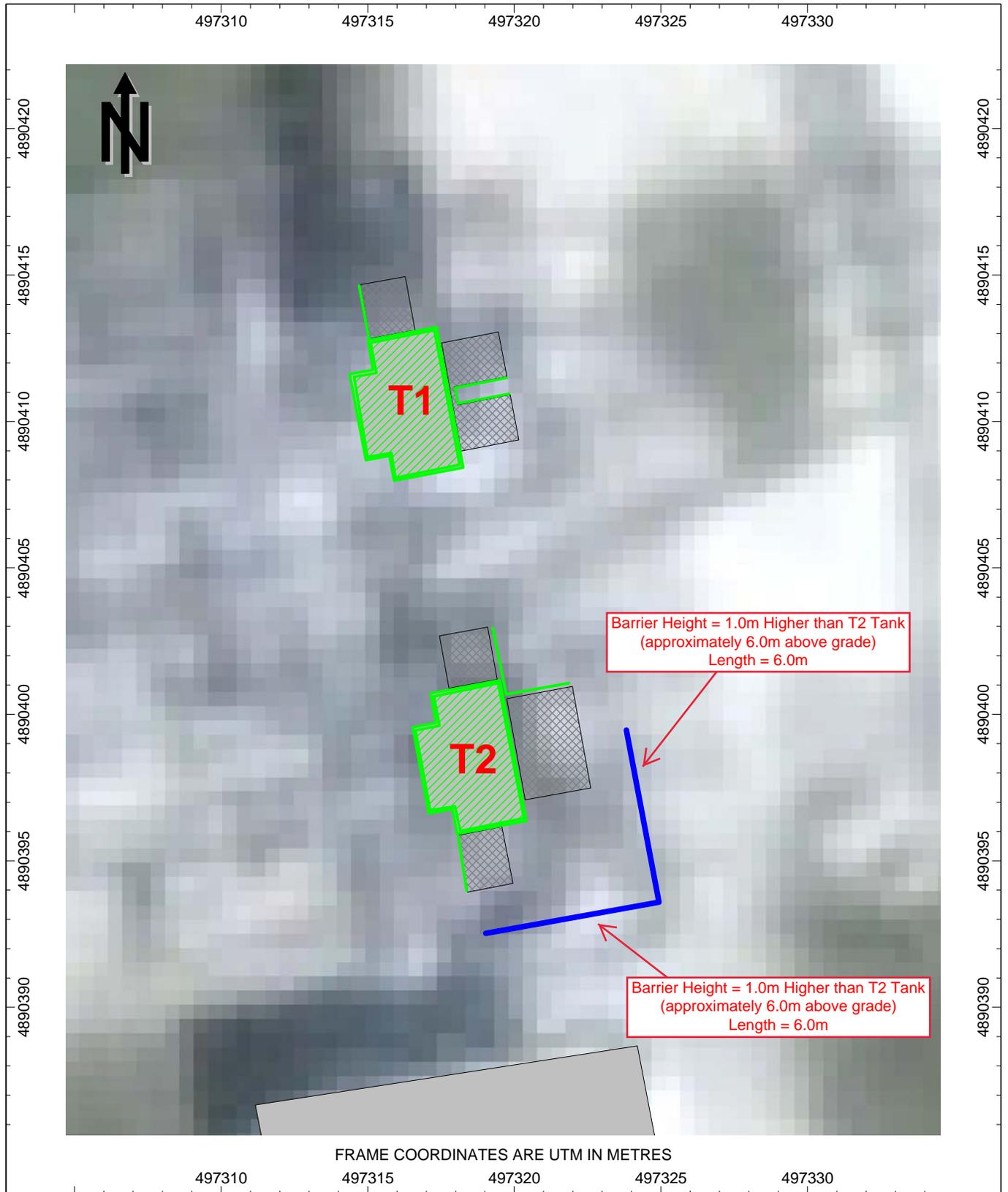


Figure 2A: Noise Barrier Dimensions - Local Barrier South and East of T2 Transformer
Hydro One Hanover TS



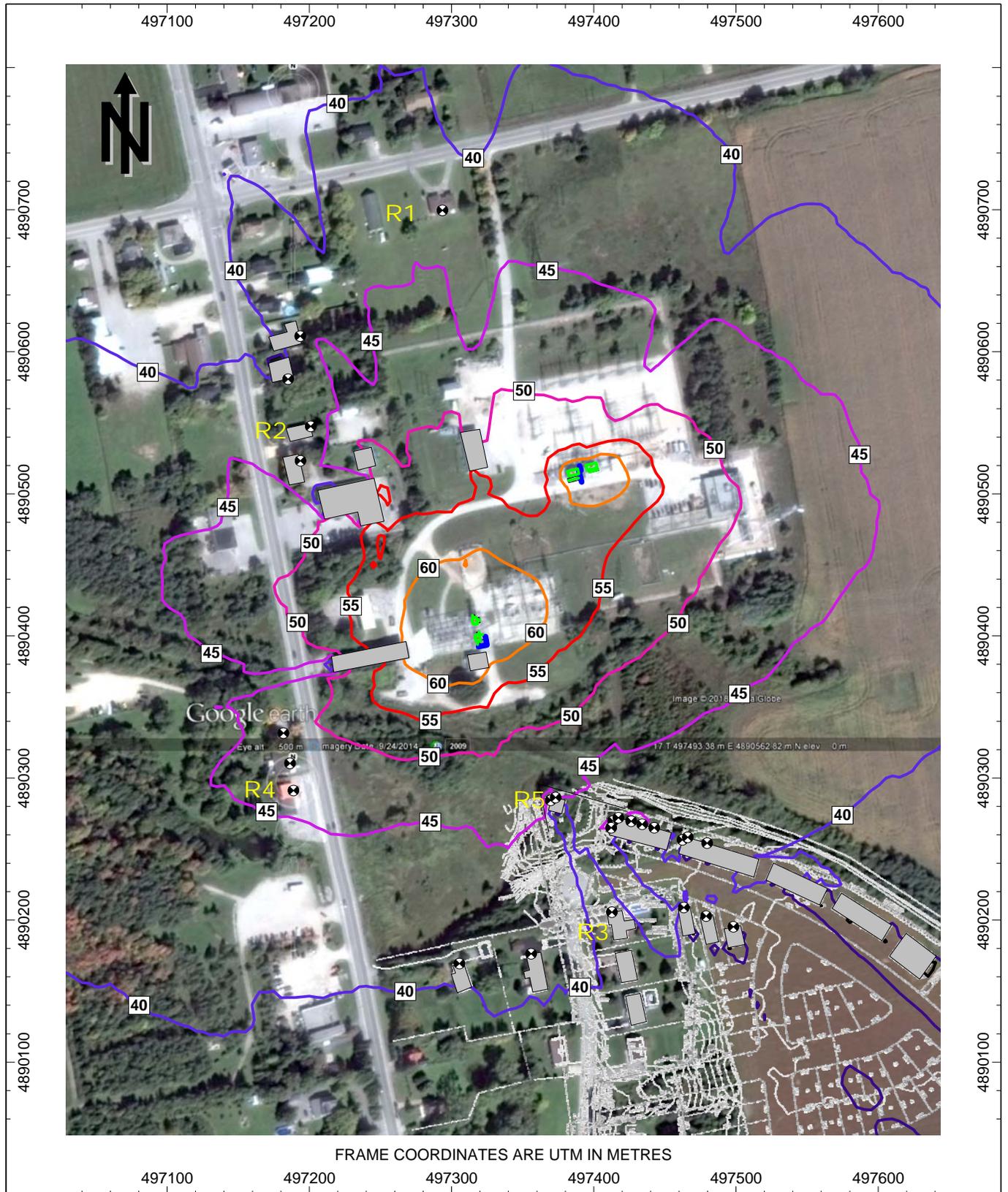


Figure 2B: Predicted Mitigated Sound Level Contours, L_{eq} [dBA], with Barrier South & East of T2
 Hydro One Hanover TS
 Prediction Height = 4.5m Above Grade



ACOUSTICS



NOISE



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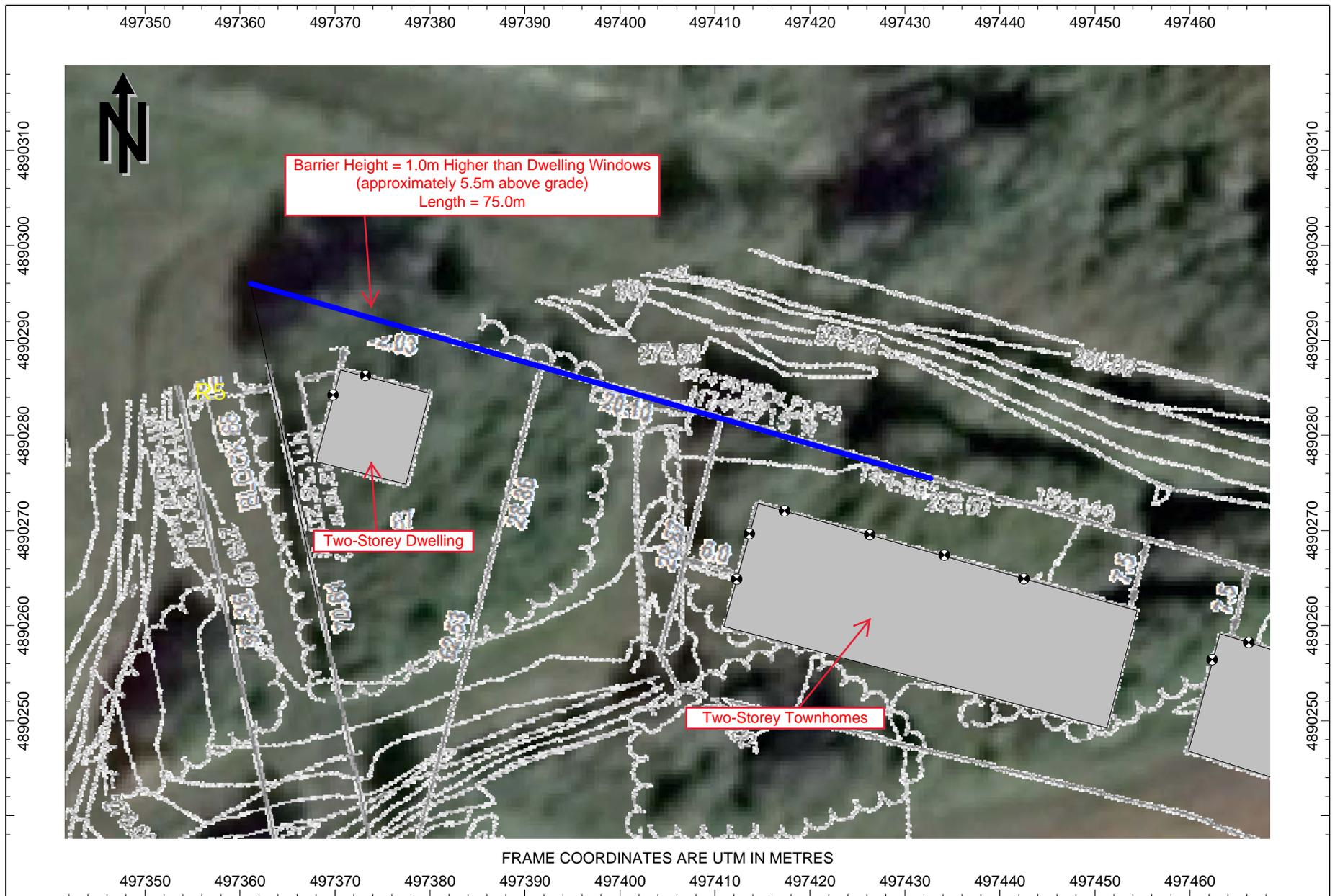


Figure 3A: Noise Barrier Dimensions - Barrier North of Proposed Development
Hydro One Hanover TS



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NOISE



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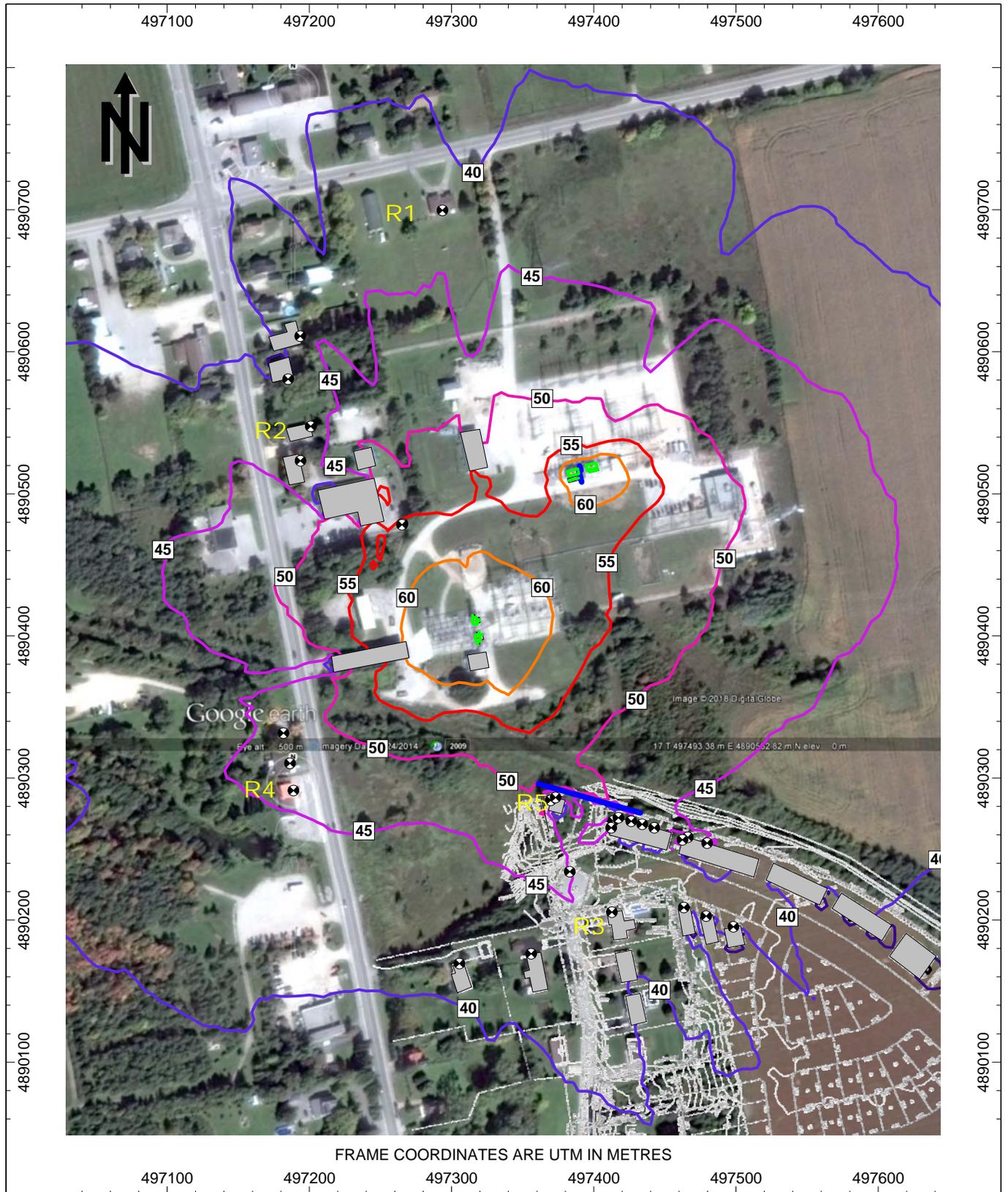


Figure 3B: Predicted Mitigated Sound Level Contours, Leq [dBA], with Barrier North of Development
 Hydro One Hanover TS
 Prediction Height = 4.5m Above Grade

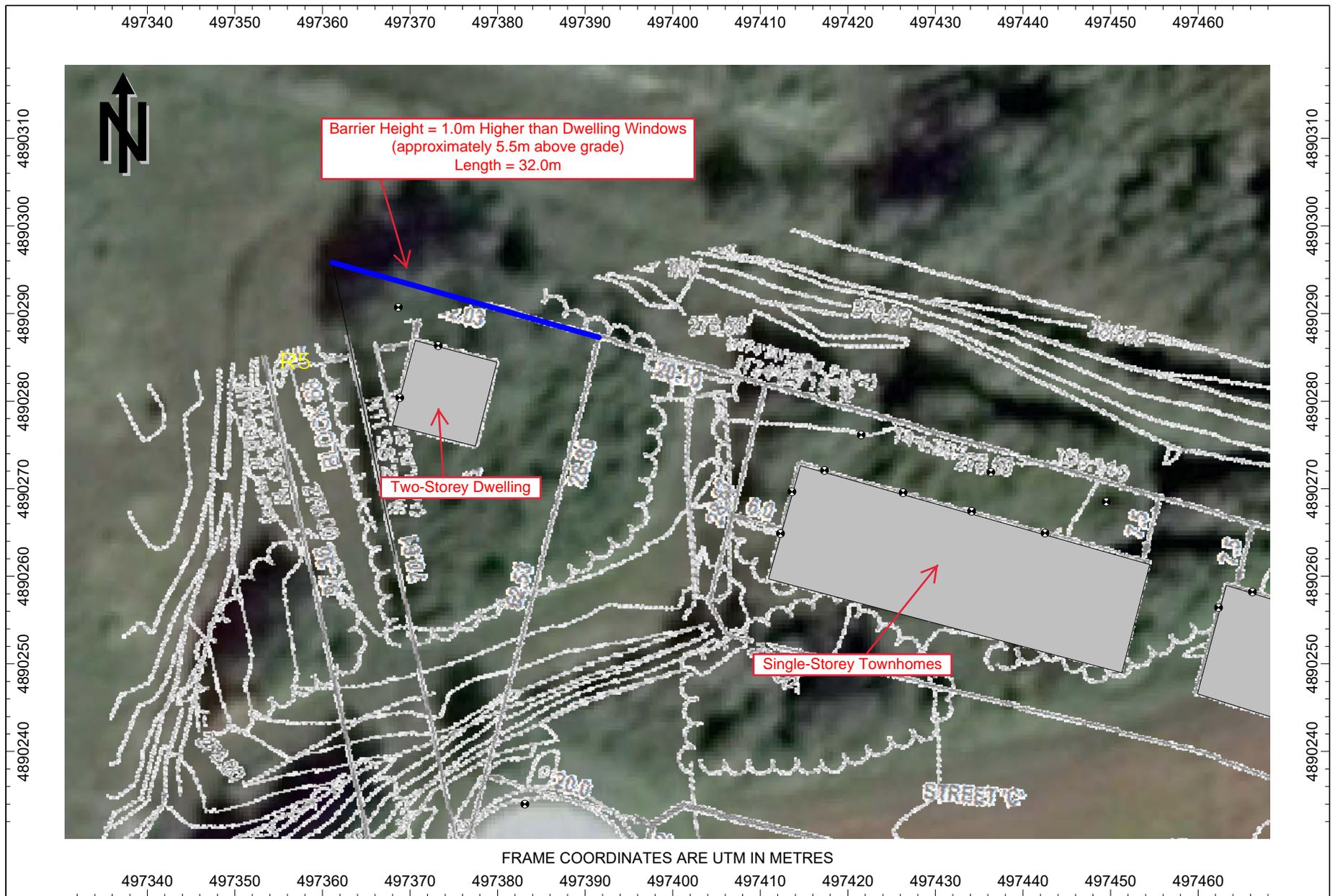


Figure 4A: Noise Barrier Dimensions - Barrier North of Lot 67 With Single-Storey Dwellings in the Townhouse Block East of Lot 67



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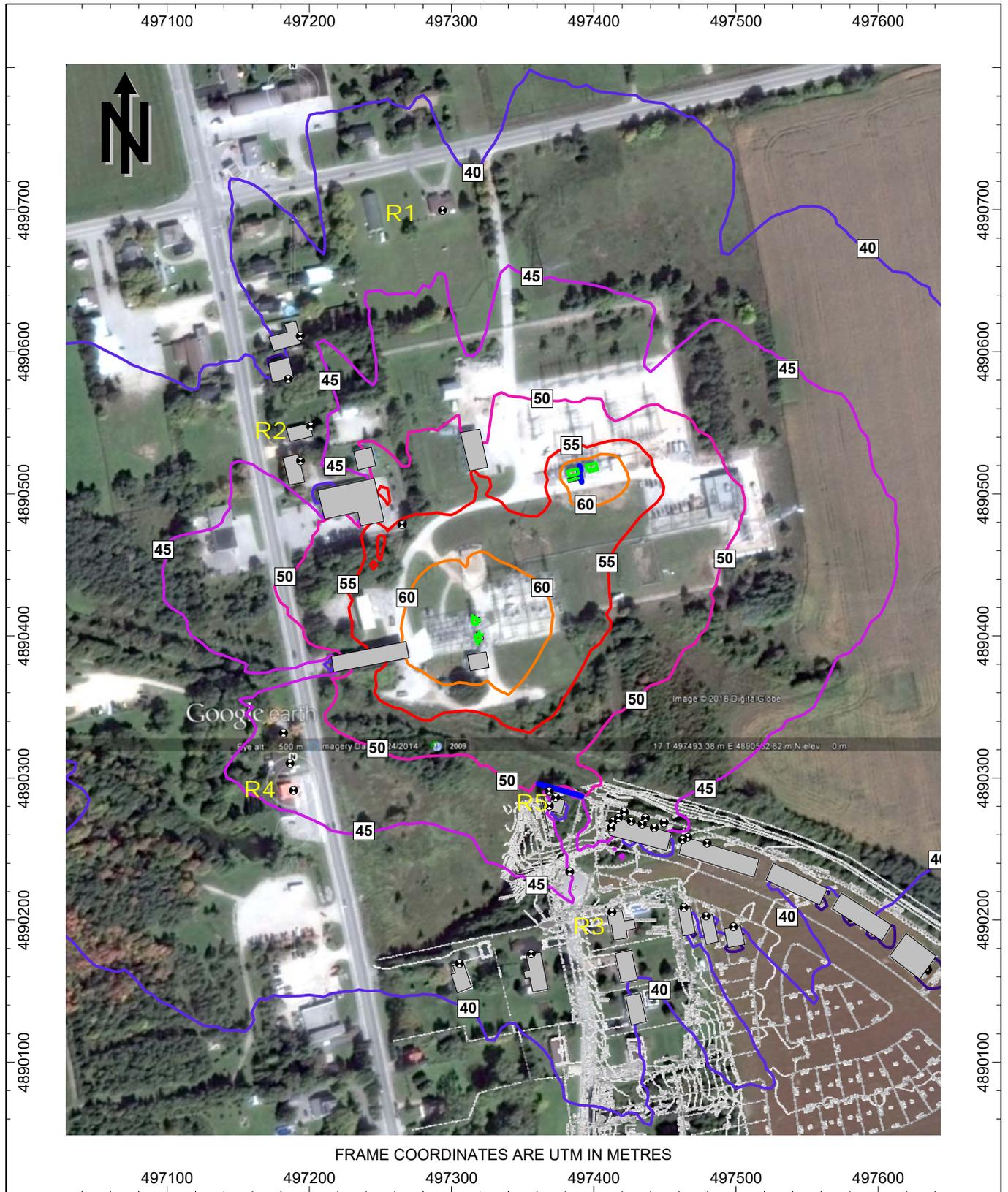


Figure 4B: Predicted Mitigated Sound Level Contours, Leq [dBA], with Barrier North of Lot 67, Single Storey Townhomes East of Lot 67
 Hydro One Hanover TS, Prediction Height = 4.5m Above Grade



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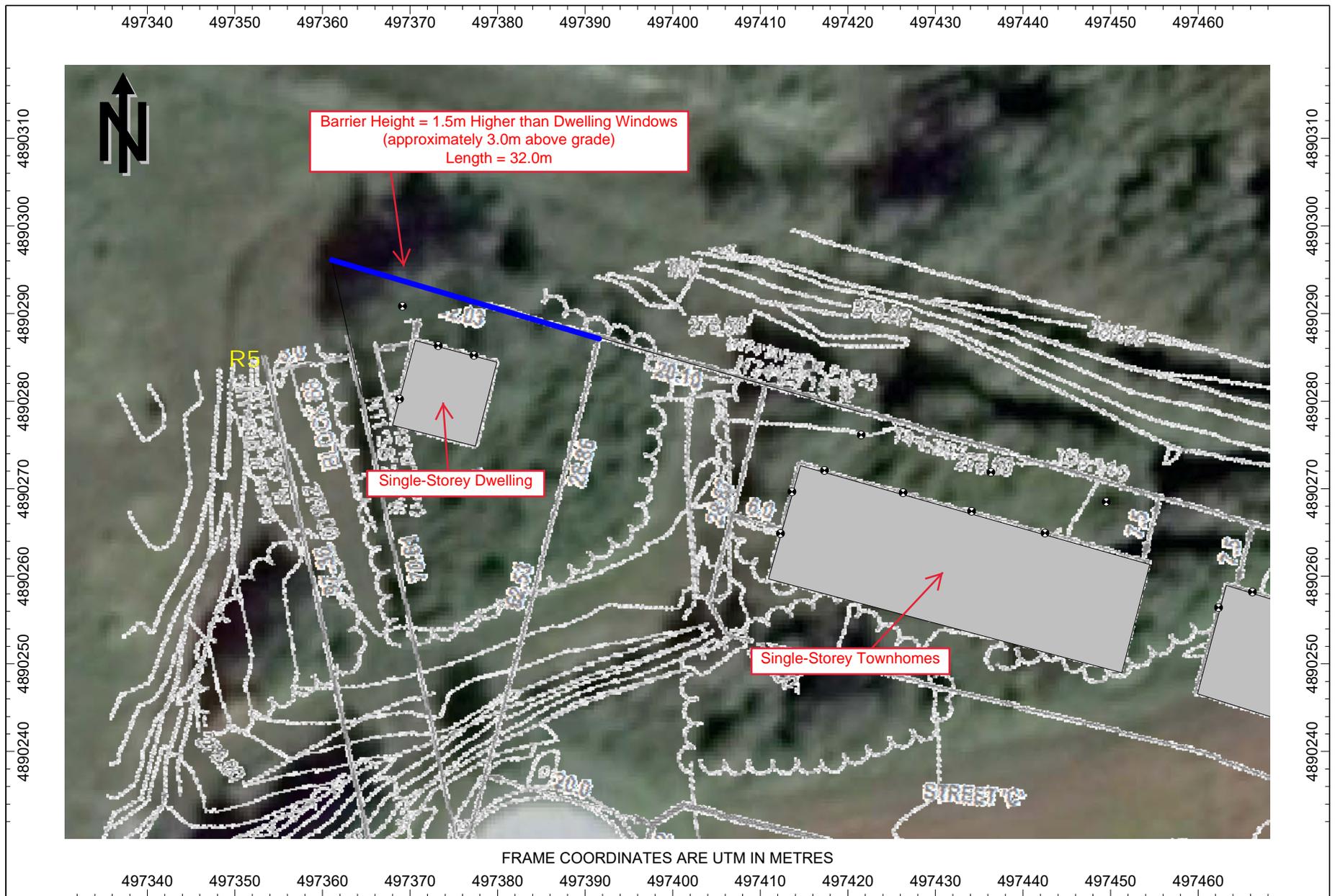


Figure 5A: Noise Barrier Dimensions - Barrier North of Lot 67
With Single-Storey Dwellings in Lot 67 and the Townhouse Block East of Lot 67



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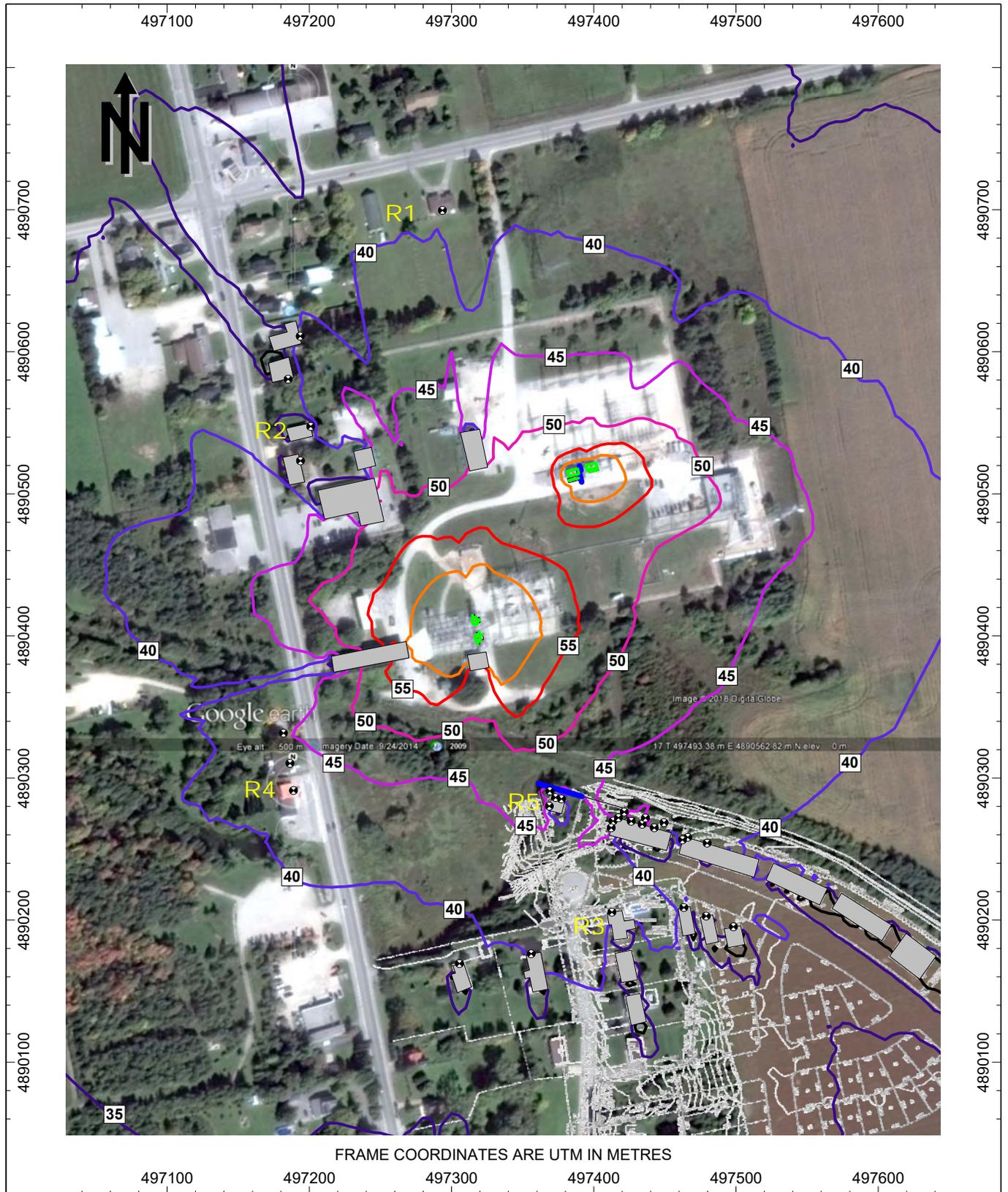


Figure 5B: Predicted Mitigated Sound Level Contours, L_{eq} [dBA], with Barrier North of Lot 67, Single Storey Dwelling in Lot 67 and Single Storey Townhomes East of Lot 67
Hydro One Hanover TS, Prediction Height = 1.5m Above Grade