

February 5, 2020

Aercoustics Project #: 16424.00

James Dick Construction14442 Regional Road 50
Bolton, Ontario
L7E 3E2

ATTN: Greg Sweetnam. gsweetnam@jamesdick.com

Subject: Reid Road Quarry
Noise Impact Study Report Addendum #1**1 Introduction**

This letter serves as addendum #1 to the noise impact study (Noise Study)¹ to address some changes to our noise impact study. Note that the noise monitoring and receptor sound level limit revisions were previously provided in a memorandum issued by Aercoustics on December 4, 2019.

1. Receptor sound level limits

As requested during the Joint Agency Review Team (JART) review, Aercoustics conducted noise monitoring to quantify the ambient noise levels at various distances from Highway 401 with the objective to verify the ambient noise levels predicted by Aercoustics in the Noise Study.

The results of the noise monitoring determined that adjustments to the receptor sound level limits were appropriate. This also required some minor revisions to the recommended noise controls to satisfy the Ontario Ministry of the Environment, Conservation and Parks (MECP) sound level limits.

2. New topography information

A topography survey was conducted by Harden Environmental Services Limited (Harden) of lands adjacent to the north of the proposed Reid Road Quarry Phase 2 area. This survey revealed that the existing land topography on the north side, likely a previously constructed noise berm.

¹ Aercoustics report entitled "Noise Impact Study, Project: 16424, Reid Road Reservoir Quarry, Town of Milton, Regional Municipality of Halton, Ontario", dated December 12, 2017.

3. Culvert at base of acoustic barrier

It is understood that Conservation Halton has requested the addition of a gap, culvert or permeable base of some of the acoustical barriers to allow water to flow across the barrier.

A culvert installed at the base of the barrier should not compromise the noise control mitigation of the acoustic barrier, if it is positioned such that there is no line of sight between quarry equipment and noise receptors through the culvert

This document presents the noise monitoring results, the updated noise control recommendations, and the noise impact prediction results. With the updated noise predictions, the proposed Reid Road Quarry operation is predicted to satisfy the MECP sound level limits.

Although not technically part of a noise impact study, James Dick Construction has also agreed to adopt a complaint response protocol that includes comments to document and respond to complaints and attempt to resolve concerns based on good communication and changes to the operation where required.

2 Noise Monitoring

The purpose of the noise monitoring was to quantify the ambient noise levels at various distances from Highway 401 with the objective to verify the ambient noise levels predicted by Aercoustics in the noise impact study (Noise Study)².

The following sections describes the noise monitoring conducted on the Reid Road Quarry site during the dates of October 17, 2019 through to October 25, 2019 and the results.

2.1 Equipment

The equipment used for the noise monitoring consisted of three (3) Larson Davis Model 820 sound level meters. Calibration checks were performed on these noise monitors using a Bruel & Kjaer model 4231 Acoustic Calibrator.

2.2 Locations

The monitors were positioned at the locations M1, M2 and M3 as illustrated in Figure 1. Table 1 presents the approximate distances from the centreline of Highway 401.

² Aercoustics report entitled “Noise Impact Study, Project: 16424, Reid Road Reservoir Quarry, Town of Milton, Regional Municipality of Halton, Ontario”, dated December 12, 2017.

Table 1: Noise Monitor distances from Highway 401

Monitor	Approximate Distance from Highway 401
M1	950m
M2	560m
M3	130m

2.3 Monitoring procedure and results

During the monitoring period, the monitors recorded hourly energy averaged sound levels (Leqs) as well as other statistical information.

Figures 2 through 4 present graphs of the monitor measured sound levels. Weather data, wind speed and times of precipitation, is also presented on these graphs. The weather data was obtained from a publicly available weather station, identified as weather station IMILTO22, located near Campbellville. In general, the weather conditions were acceptable for the noise monitoring for most of the monitoring period, with wind speeds generally below 10 km/hr and only a few periods of precipitation.

The minimum and average hourly Leqs recorded at each of the noise monitors, for the proposed operating time periods of the quarry, are summarized in Table 2.

Table 2: Minimum Noise Monitor Recorded Leq(1hr) – Monday - Saturday

Monitor	Early Morning (06:00 – 07:00) Minimum (Average)	Daytime (07:00 – 19:00) Minimum (Average)
M1	51 dBA (53 dBA)	41 dBA (51 dBA)
M2	52 dBA (58 dBA)	48 dBA (57 dBA)
M3	63 dBA (67 dBA)	61 dBA (67 dBA)

The noise monitoring results generally reflect that Highway 401 dominates the ambient sound levels most of the time. However, the monitors at locations M1 and M2 recorded minimum hourly Leq levels below the levels predicted by Aercoustics in the Noise Study.

As existing ambient noise levels are the basis of the Ontario Ministry of the Environment, Conservation and Parks (MECP) sound level limits, the receptor sound level limits in the Noise Report should be updated to reflect the noise monitored data and noise control recommendations updated as required to satisfy these sound level limits.

3 New Topography Information

A topography survey was conducted by Harden Environmental Services Limited (Harden) of lands adjacent to the north of the proposed Reid Road Quarry Phase 2 area. This survey revealed that the existing land topography on the north side, likely a previously constructed noise berm, is at an elevation of EL296m.

This existing berm has a top elevation of EL296m along most of its length and tapers down on the Phase 2 lands west end. As this elevation is the same as that recommended as the acoustical barrier in the Noise Study, this existing topography can be used as part of the acoustical barrier noise control. The addition of a noise barrier, likely in the form of an acoustical fence, will be required to increase the existing berm top elevation particularly on its west end to satisfy the EL296m top of barrier elevation requirement.

The Figure below illustrates the concept.

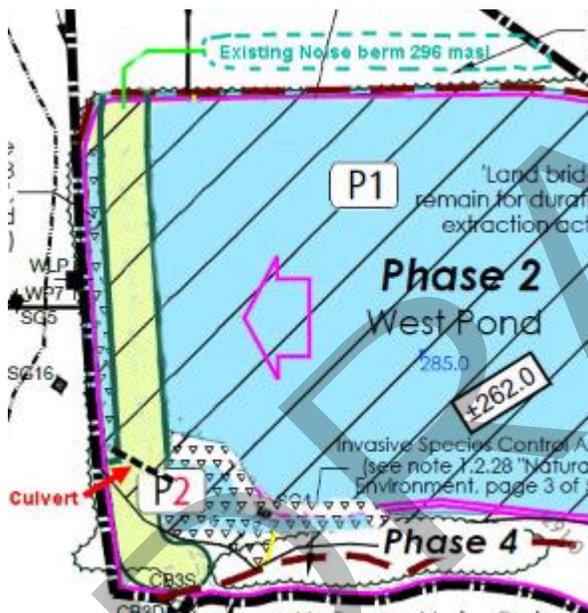


Figure 1: Concept of incorporating existing berm as noise control feature
(also illustrates the position of a potential culvert at the base of the acoustical barrier)

4 Updated Noise Control Recommendations

4.1 Receptor Sound Level Limits

As per MECP NPC-300 for a Class 1 area, the applicable sound level limit for the proposed quarry is the greater of the existing background sound or the exclusion limits of 50 dBA for the daytime and evening periods (07:00-23:00) and 45 dBA for the night-time period (23:00-07:00).

In reviewing the noise monitor data, Table 3 presents the sound level limits based on distance ranges from Highway 401.

Table 3: Receptor Sound Level Limits based on distance from Highway 401

Distance from Highway 401 Centre	Early Morning (06:00 – 07:00)	Daytime (07:00 – 19:00)
<150m	60 dBA	60 dBA
Between 150m and 360m	52 dBA	52 dBA
>360m	45 dBA	50 dBA

Although receptor R04 is within 150m from Highway 401, as it is shielded from the highway with an earth berm the sound level limit for this receptor is taken as 53 dBA, consistent with the road traffic noise prediction for this receptor in the Noise Study.

4.2 Recommended Changes to Noise Controls

To address the change in receptor sound level limits, the following revisions to the noise controls are recommended:

1. Increase the Phase 1 perimeter berm height
2. Add extensions to the main processing plant barriers
3. Minor realignment of the Phase 2 barrier to incorporate existing berm
4. Add an extension to the primary crusher barrier in the Phase 4, central pond parcel.
5. Add an acoustic barrier on the southeast side of Phase 3

The recommended changes in the noise controls are illustrated in Figure 5. The following sections present the complete list of noise control recommendations with the inclusion of the above listed recommended changes. In addition, minor revisions were made to improve clarity as well as the recommendations of the perimeter barriers have been updated; specifying top of barrier elevations rather than barrier heights.

4.3 Recommended Noise Controls

The recommended noise controls presented in this section have been determined through noise impact predictions. They have been determined to be effective in controlling the noise generated by the aggregate quarry activity, satisfying the MECP sound level limits. It should be noted that there may be other effective noise controls that could replace or revise some of the recommended controls of this report. Prior to implementing any changes to the noise controls, appropriate studies should be undertaken to demonstrate that the MECP sound level limits will be satisfied.

The following noise controls are recommended:

4.3.1 General Controls

1. Equipment used for site preparation shall satisfy noise emission requirements defined in MECP publication NPC-115
2. The aggregate quarry equipment shall satisfy the noise emission levels listed in the following Table:

Equipment	Reference Sound Pressure Level At 30m (dBA)
Rock Drill	74
Main Processing Plant	85
Primary Crusher	80
Dragline	69
Excavator	69
Extraction/Shipment Loader ²	69 (66) ¹
Off-Highway Truck	74

Notes:

1. For shipment loading only operation a 50% duty cycle was used.

3. There shall be a fixed location of the main processing plant, positioned in Phase 5 lands.

4.3.2 Acoustic Barrier

Acoustic barriers are recommended for noise control. An acoustic barrier shall be solid with no gaps or openings and satisfy a minimum surface density of 20 kg/m² (4 lb/ft²). It can take the form of an earth berm, acoustic fence, aggregate stockpile, a combination of these or any other construction satisfying the requirements of an acoustic barrier.

4.3.3 Main Processing Plant Operation

4. Prior to aggregate operation of the main processing plant, acoustic barriers shall be constructed as follows:
 - a. An acoustic barrier shall be constructed to provide shielding of the main processing plant to the south and north with extent and position as illustrated in Figure 5. The acoustic barrier shall be 5m in height and be positioned a maximum distance of 50m from the main processing plant.
 - b. An acoustic barrier shall be constructed on the southeast side of the Phase 3 lands with extent and position as illustrated in Figure 5. The acoustic barrier shall have a top of barrier elevation of EL300m.

These acoustic barriers shall remain for the duration of the quarry operation.

4.3.4 Phase 1

5. An acoustic barrier shall be constructed on the west and northwest end of the Phase 1 lands, with position and extent as illustrated in Figure 5. The acoustic barrier shall have a top of barrier elevation of EL297m, with the exception of its south leg. This south leg shall have a top of barrier elevation of EL296m. The acoustic barrier can be removed when extraction in the Phase 1 lands are complete.
6. An acoustic barrier is required to shield the primary crusher from receptors to the project northwest and southwest, towards receptors R01 & R11, as well as towards VL-07 & VL-08 if dwellings are present. The acoustic barrier shall be 5m in height and be positioned a maximum distance of 5m from the primary crusher.

4.3.5 Phase 2

7. Prior to extraction in Phase 2, an acoustic barrier shall be constructed on the west end of the Phase 4 lands and the northwest side of the Phase 2 lands, with position and extent as illustrated in Figure 5. The acoustic barrier shall have a top of barrier elevation of EL296m. This barrier will be a combination of existing topography, existing earth berm to the north, and a new barrier construction at the corner and at the west end of the pond. The acoustic barrier can be removed when extraction in the Phase 2 and Phase 4 lands are complete.
8. An acoustic barrier is required to shield the primary crusher from receptors to the project west, towards receptors R01-R03. The acoustic barrier shall be 5m in height and be positioned a maximum distance of 5m from the primary crusher.

4.3.6 Phase 3

9. No additional noise controls are required.

4.3.7 Phase 4

10. Central Pond Parcel

- a. An acoustic barrier is required to shield the primary crusher from receptors to the project south, southwest and west, towards receptors R01, R02, R10 & R11. The acoustic barrier shall be 5m in height and be positioned a maximum distance of 5m from the primary crusher.

11. West Pond Parcel

- a. An acoustic barrier is required to shield the primary crusher from receptors to the project west, towards receptors R01-R03. The acoustic barrier shall be 5m in height and be positioned a maximum distance of 5m from the primary crusher.

4.3.8 Phase 5

- 12. No additional noise controls are required.

4.4 Predicted levels with controls

The predicted worst case noise levels produced by the operations within the Reid Road Reservoir Quarry area are summarized in the Tables 4 and 5.

Sincerely,

AERCOUSTICS ENGINEERING LIMITED



Bob Rimrott, M.A.Sc., P.Eng.

Tables

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Table 4: Summary of Predicted Noise Impact, Reid Road Reservoir Quarry in dBA – Daytime

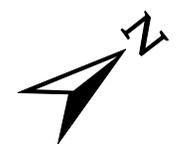
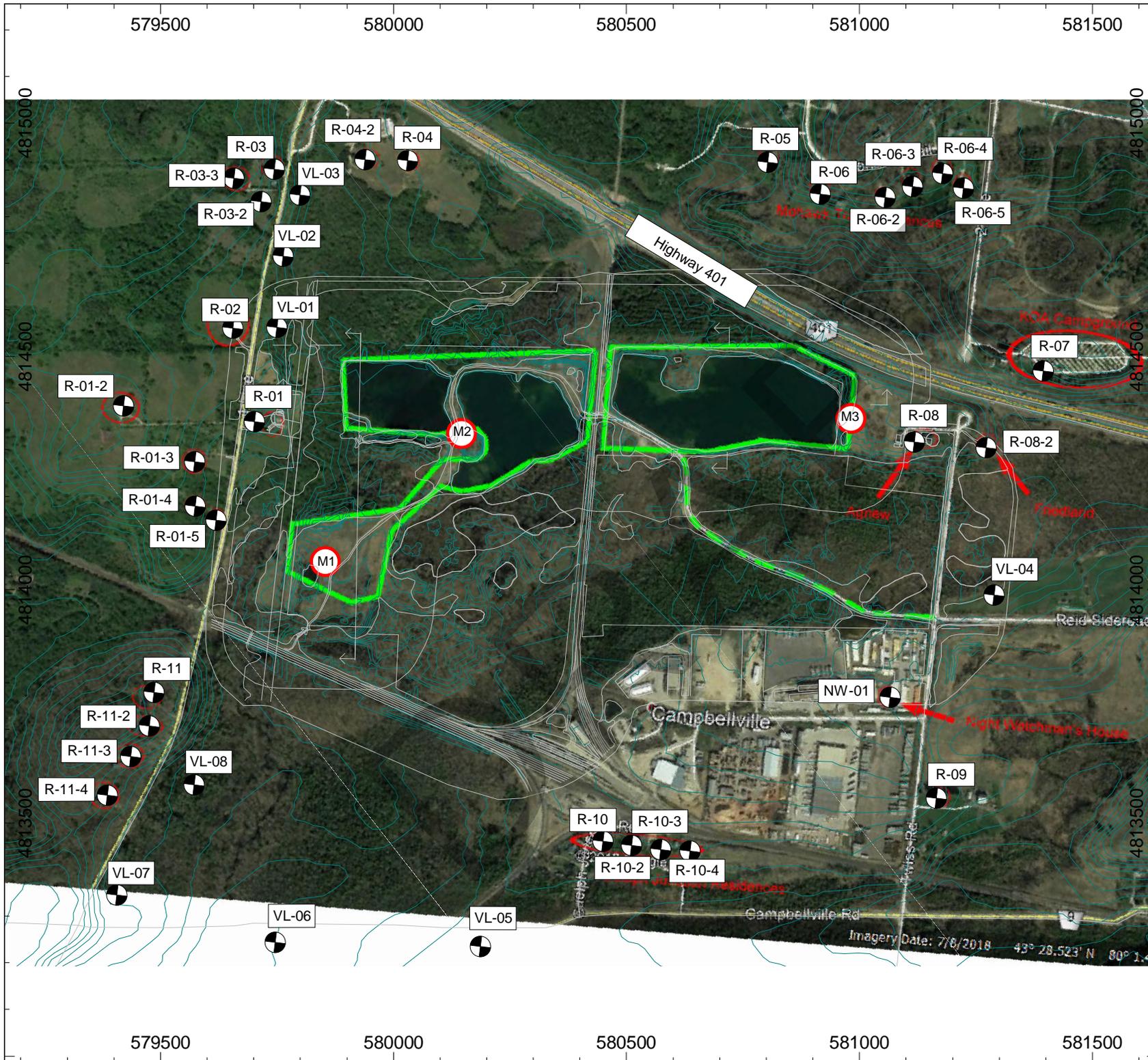
Receptor	Quarry Operations – Drilling, Extraction, Processing & Shipment					MECP Sound Level Limit
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	
R-01	49	50	46	49	46	50
R-01-2	48	48	43	48	42	50
R-01-3	49	49	44	48	44	50
R-01-4	49	48	46	47	44	50
R-01-5	50	48	46	48	44	50
R-02	49	50	45	49	45	50
R-03	47	49	46	51	44	52
R-03-2	48	52	46	52	45	52
R-03-3	47	51	46	51	44	52
R-04	51	52	48	53	47	53
R-04-2	47	51	47	51	46	53
R-05	46	48	46	48	46	52
R-06	49	49	51	51	48	52
R-06-2	48	48	50	49	46	52
R-06-3	47	47	49	48	45	50
R-06-4	46	47	49	47	44	50
R-06-5	46	47	49	47	44	50
R-07	54	54	55	54	53	60
R-08	52	53	58	54	50	60
R-08-2	49	48	51	48	47	60
R-09	46	47	47	47	44	50
R-10	50	49	47	47	46	50
R-10-2	49	49	46	47	46	50
R-10-3	49	48	45	47	44	50
R-10-4	48	45	45	45	44	50
R-11	50	49	48	49	48	50
R-11-2	50	48	48	48	48	50
R-11-3	48	47	47	47	47	50
R-11-4	47	46	46	46	46	50
VL-01	47	49	44	48	44	50
VL-02	46	47	45	48	43	50
VL-03	45	47	44	49	43	50
VL-04	46	47	48	47	44	50
VL-05	49	47	44	44	43	50
VL-06	47	44	42	42	40	50
VL-07	48	45	45	45	45	50
VL-08	48	44	42	44	41	50
NW-01	47	47	47	47	47	

Table 5: Summary of Predicted Noise Impact, Reid Road Reservoir Quarry in dBA – Before 7am

Receptor	Quarry Operations –Shipment	MECP Sound Level Limit
R-01	33	45
R-01-2	29	45
R-01-3	32	45
R-01-4	30	45
R-01-5	31	45
R-02	31	45
R-03	30	52
R-03-2	31	52
R-03-3	30	52
R-04	31	53
R-04-2	31	53
R-05	32	52
R-06	33	52
R-06-2	32	52
R-06-3	31	45
R-06-4	31	45
R-06-5	34	45
R-07	38	60
R-08	36	60
R-08-2	33	60
R-09	34	45
R-10	31	45
R-10-2	31	45
R-10-3	30	45
R-10-4	31	45
R-11	33	45
R-11-2	32	45
R-11-3	31	45
R-11-4	30	45
VL-01	31	45
VL-02	29	45
VL-03	28	45
VL-04	34	45
VL-05	29	45
VL-06	26	45
VL-07	30	45
VL-08	27	45
NW-01	37	

Figures

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Scale: NTS
 Drawn by: BR
 Reviewed by: BR
 Date: Aug 2019
 Revision: 1



Project ID: 16424.00

Project Name
 James Dick
 Reid Reservoir Quarry

Figure Title
 Site Plan
 with additional receptors
 and proposed monitor
 locations

Figure 2

Reid Road Quarry – Noise Report Addendum #1

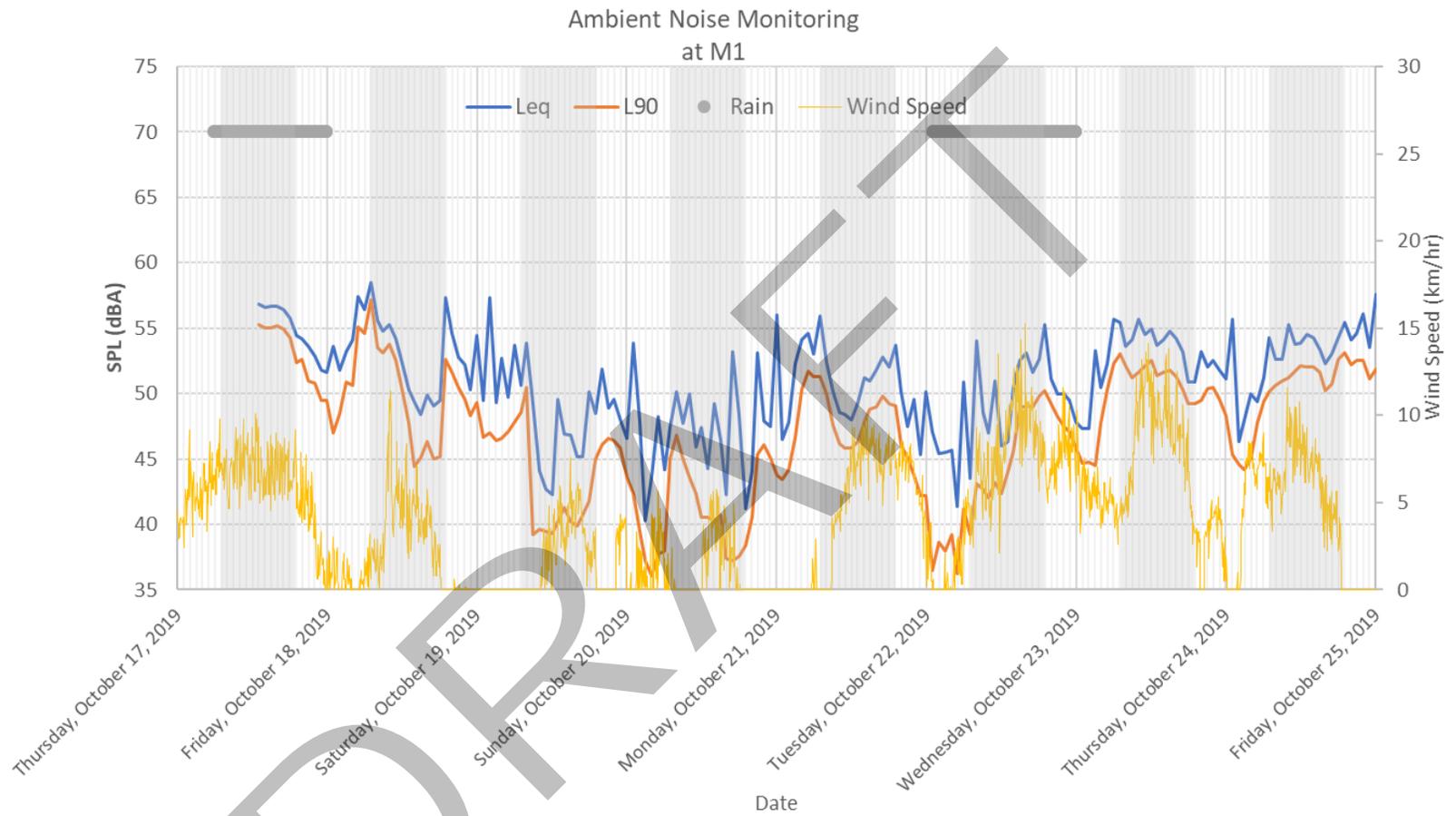


Figure 3

Reid Road Quarry – Noise Report Addendum #1

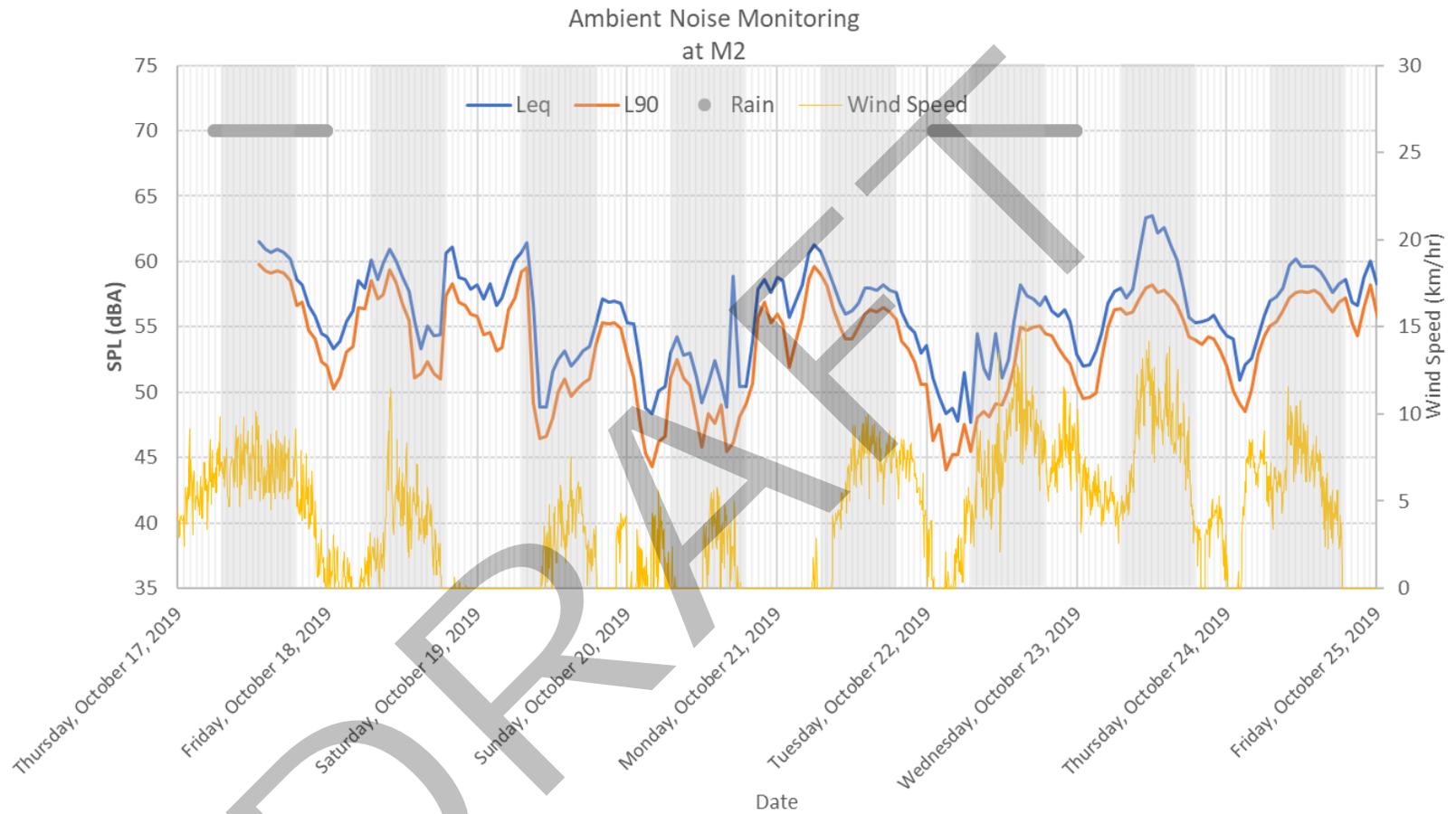


Figure 4

Reid Road Quarry – Noise Report Addendum #1

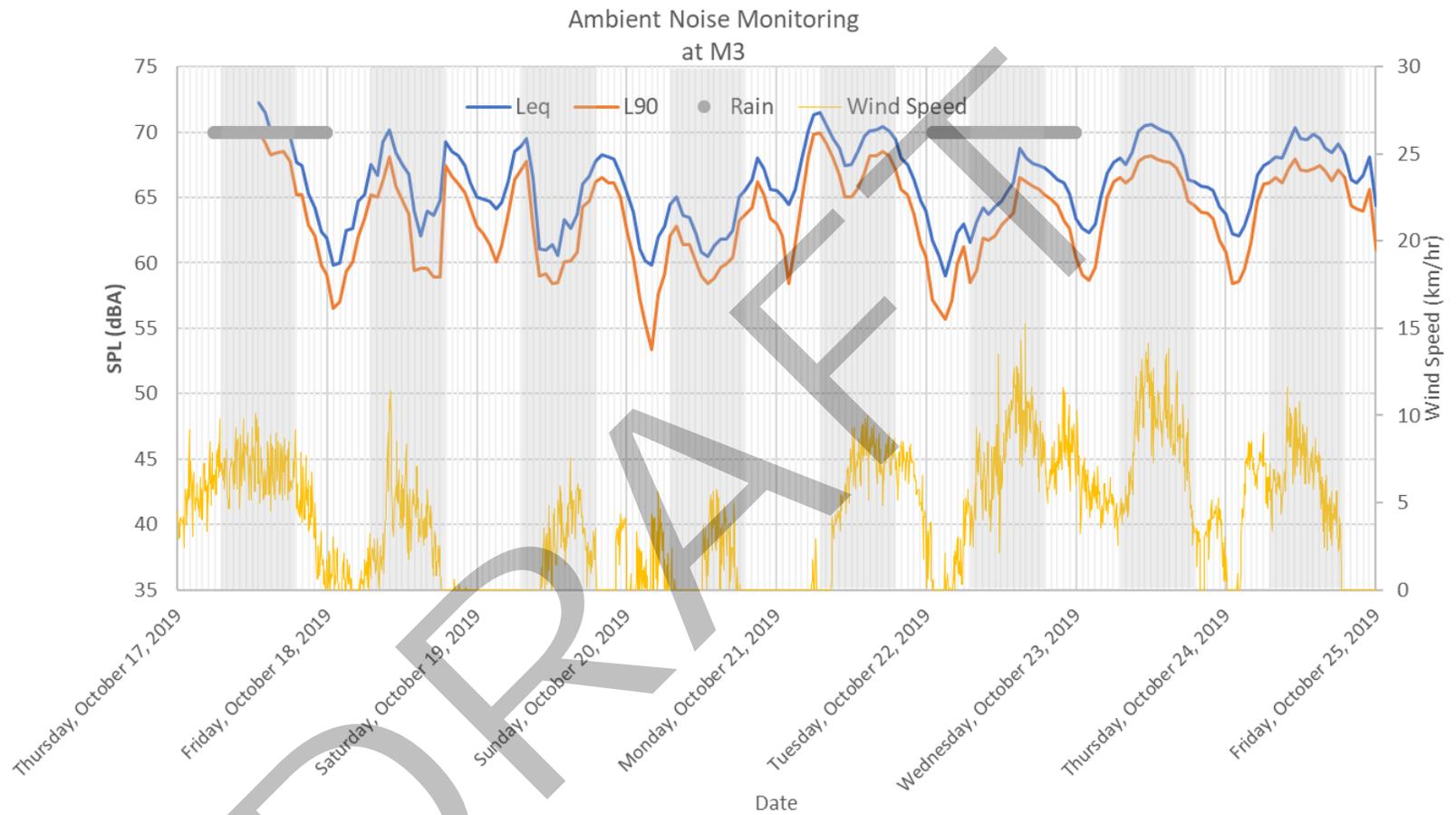
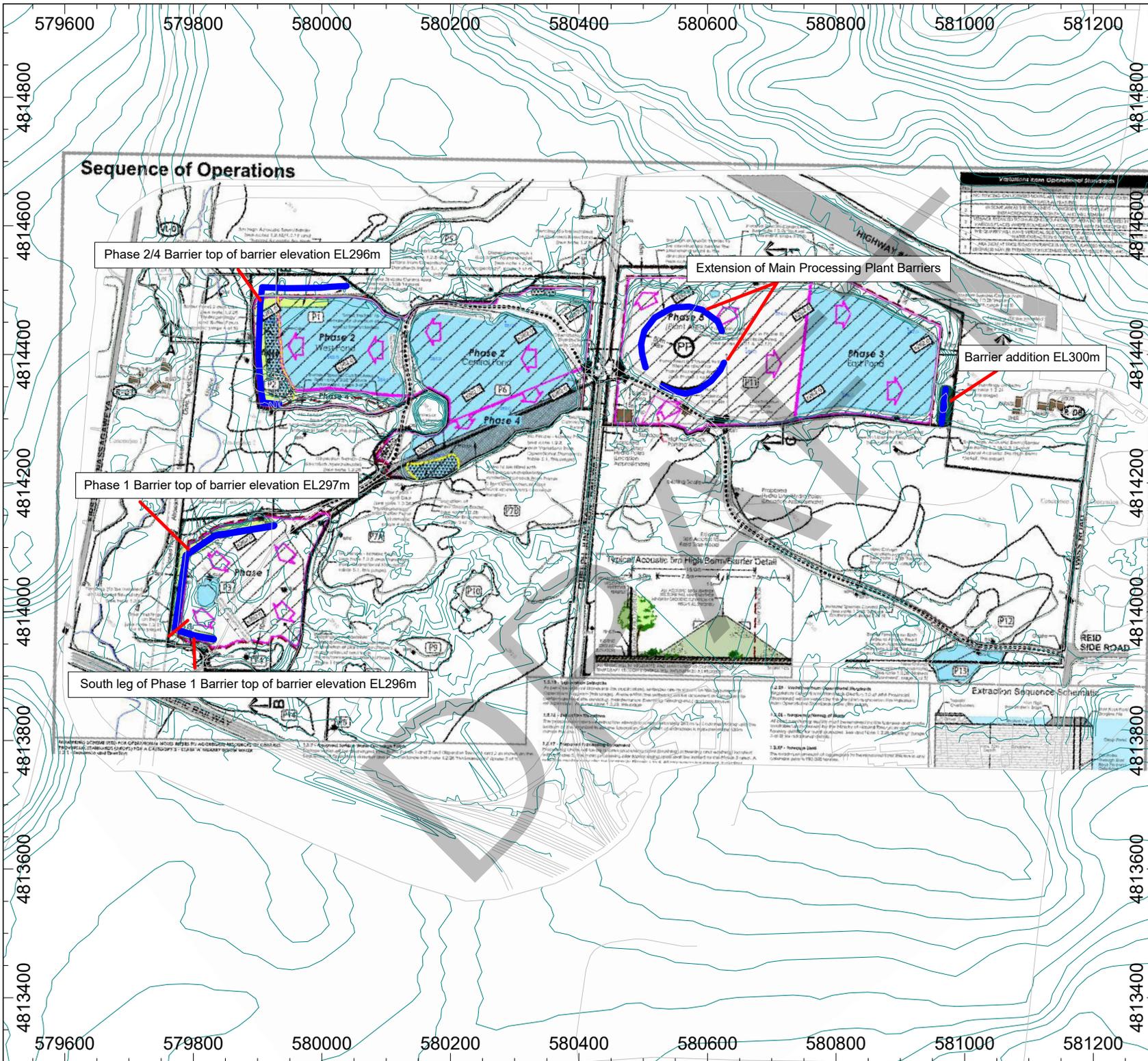


Figure 5



Scale: NTS
 Drawn by: BR
 Reviewed by: BR
 Date: Dec 2019
 Revision: 1



Project ID: 16424.00

Project Name
 James Dick
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Figure Title
 Plan highlighting
 noise controls changes

Figure 6