Noise Impact Analysis

VicDom Uxbridge Pit

Proposed Gravel Pit Expansion

3444 Brock Road North
Town of Uxbridge
Regional Municipality of Durham

May 2011
Project: 107-414

Prepared for

VicDom Sand and Gravel Limited

Prepared by

John Emeljanow, B.Eng., P.Eng.

VALCOUSTICS
Canada Ltd.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Noise Impact Analysis

VicDom Uxbridge Pit

Proposed Gravel Pit Expansion

3444 Brock Road North
Town of Uxbridge
Regional Municipality of Durham

1.0 INTRODUCTION

Valcoustics Canada Ltd. has been retained to complete a sound impact analysis of the proposed expansion to the VicDom Uxbridge Pit.

1.1 PURPOSE

The purpose of this report is to:

- identify the potential noise sources;
- outline the sound exposure levels expected at surrounding neighbours during the operation of the gravel pit; and
- provide recommendations for mitigation measures required to meet the Ministry of the Environment (MOE) noise guidelines.

1.2 SITE

The proposed gravel pit site is immediately south of the existing VicDom Uxbridge Pit. The site is to the west of Brock Road North, between Webb Road and Goodwood Road. The 4th Concession Road forms the western boundary of the site.

The site is identified as:

Part of Lots 10, 11 and
Part of Road Allowance between Lots 10 and 11
Concession IV
Township of Uxbridge
Regional Municipality of Durham

See Figure 1 for a Key Plan.

The land uses in the general area include agriculture, rural residential, recreational uses and aggregate extraction.

1.3 NOISE SENSITIVE RECEPTORS

See Figure 2 for the noise sensitive receptor locations. Receptors 1 and 2 are located to the west of the site. Receptors 3 and 4 are to the south of the site. Receptor 5 is to the east of the site. Receptor 6 is located on the site across 4th Concession Road from Receptor 2. It is being rented and will continue to be used as a residential dwelling in the future. Thus, Receptor 6 has been considered a sensitive receptor in this assessment. All of the noise sensitive receptors locations are single family detached residential dwellings.

All other receptors are further removed from the site and will benefit from increased distance attenuation and will receive lower sound exposures. Thus, the MOE guideline limits will inherently be met.

2.0 PROGRAMME OF OPERATION

2.1 HOURS OF OPERATIONS

The proposed hours of operation extend from 0600 to 1700 hours. The drag line can operate from 0600 to 2100 hours.

2.2 OVERALL OPERATION

Initially, overburden will be removed to expose the gravel. These activities should be relatively short lived. Overburden material will be used for both the construction of perimeter berms and the rehabilitation process.

Aggregate extraction will generally progress to the south from the existing main pit, from west to east across the site toward Receptor 5. Extraction will generally occur in one lift. Beyond the first lift, there will be below water extraction.

For above water extraction, activity would involve a wheeled loader at the working face loading a haul truck which will haul material to the processing plant in the existing pit to the north. There may also be a screening plant at the working face for above water table extraction. For below water table extraction, a floating dredger will be used to extract the aggregate. A conveyor will move the material from the dredger to shore where it will be stockpiled. A wheeled loader will then load a haul truck with material from the stockpile which will haul it to the processing plant in the existing pit.

There will not be crushing or washing of material in the expansion area. Processing and washing will continue as it currently exists in the existing pit. Crushing in the existing pit is done below grade and is exempt from requiring a C of A.

3.0 ENVIRONMENTAL NOISE GUIDELINES

The MOE noise guidelines require that the noise assessment determine the “predictable worst case” impacts. Thus, the assessment needs to evaluate the largest possible excess over the noise guideline limits based on the proposed operations in any hour of operation.

3.1 ON-SITE OPERATIONS

Noise sensitive receptors are residential uses. The area surrounding the site is considered a “Class 2 Area”, according to MOE definition. A Class 2 Area is an area that has qualities representative of both Class 1 and Class 3 areas, and in which a low ambient sound environment defined by natural environment and infrequent human activity will typically be realized as early as 1900 hours. See Glossary of Terms for definitions of Class 1, Class 2 and Class 3 areas.

The appropriate environmental sound level guidelines are found in the MOE Publication NPC-205, *"Sound Level Limits For Stationary Sources In Class 1 and 2 Areas (Urban)"*. For Class 2 Areas, the sound from the source (L_{eq} in any hour) should not exceed the ambient one hour L_{eq} at the receptors of concern, in the corresponding hours.

Notwithstanding the above, for a Class 2 Area, no mitigation is required for any source that does not exceed 50 dBA (one hour L_{eq}), at any off-site receptor of concern between the hours of 0700 and 1900 hours. Between 1900 and 0700 hours, a 45 dBA limit is applicable. These guideline sound limits are referred to as "exclusion limits".

Please note that the MOE terminology "stationary source" refers to the site as a whole including the composite effect of all of the individual sound sources, even if the latter can actually move around the site. Thus, source, as referred to above, means the site (operation) as a whole.

3.2 OFF-SITE HAUL ROUTE

There are no specific statutes, regulations, formal policies under the Planning Act or guidelines applicable to adding licensed motor vehicles to public roadways and dealing with noise.

4.0 EXISTING SOUND ENVIRONMENT

At all receptors, the ambient sound environment is dominated by sounds from existing road traffic on Brock Road North or 4th Concession Road and sounds from the existing extraction operations.

5.0 APPLICABLE ENVIRONMENTAL NOISE GUIDELINES

Shipping activities will not change as a result of the expansion. The only change is that extraction will be closer to some receptor locations. Thus, for this assessment, only the extraction activity has been addressed as shipping and processing activities and their noise generation remain unchanged. To be conservative, the MOE exclusion limits have been applied for activities in the expansion areas. These are the most stringent of the noise guideline limits.

6.0 ANALYSIS

A gravel pit operation is a dynamic, continually changing process, that moves across the site. The site operations consist of various components:

- the stripping of overburden;
- the excavating, transporting and processing of aggregate;
- the rehabilitation of the gravel pit; and
- miscellaneous construction activities.

As indicated earlier, the excavation, screening and transport of material from the working face has been assessed. All other activities will continue as they are now or are considered construction. Construction activities are not chronic and are excluded from the assessment as per the MOE stationary source guidelines. Any equipment used for construction must comply with the emission limits outlined in NPC-115.

A Komatsu WA600 Wheel Loader will load material from the working face either into a screening plant or into a Dresser DT56 haul truck. A dredger powered by a remote diesel generator set will be used for below water extraction.

Sound level measurements of the equipment to be used in the expansion area were done by Valcoustics Canada Ltd. staff. The measurements were done at the existing VicDom facility to the north. The reference sound data used in our analysis is:

Type	Model	Maximum Sound Emission Level
Front End Loader	Komatsu WA600	76.5 dBA @ 15 m
Haul Truck	Dresser DT56	83 dBA @15 m
Dredger/Diesel Genset		80 dBA @ 15 m
Screen Plant		85 dBA @ 15 m

Note that other equipment with similar sound emission levels can be used on the site without impacting the off-site sound exposures. For example, an excavator can be used instead of a front end loader. This is because the equipment used for the noise assessment is considered to reflect a worst case operating scenario.

The factors accounted for in extrapolating the sound to off-site receptors are:

- Geometric spreading (distance) effect: reduction of 6 dBA per doubling of distance. As the distance increases, the sound energy is distributed over an ever-increasing volume.

- The attenuation created by sound barriers and/or natural topography that intervene between the noise sources and receptors.

Other factors such as ground effect, atmospheric absorption, etc., that would reduce the sound exposures have not been taken into account, adding to the conservativeness of the assessment.

7.0 RESULTS

The worst case unmitigated sound exposure of 66 dBA is predicted to occur at Receptor 6, the closest receptor location to the extraction area. The worst case sound exposure at Receptors 1, 2, 3, 4 and 5 are 65 dBA, 62 dBA, 47 dBA, 42 dBA and 37 dBA, respectively. See Tables 1A and 1B. Sample sound exposure calculations are included as Appendix A.

Without mitigation, excesses above the MOE guideline limits are predicted at receptors to the west of the site. Receptors to the east and south will be acoustically screened from the operations by the existing topography and are predicted to receive sound exposures in compliance with the MOE guideline limits.

To meet the MOE guideline limits, we recommend:

- The mobile screening plant only be permitted to operate during daytime hours (i.e., 0700 to 1900 hours).

- Perimeter berms be constructed as shown on Figure 3.

- Any equipment used for construction activities comply with the noise emission limits outlined in MOE Publication NPC-115.

The resultant mitigated sound exposures accounting for the recommended noise mitigation measures are shown in Tables 2A and 2B.

8.0 CONCLUSIONS

With the appropriate implementation of the mitigation measures outlined herein, the sound exposures from the worst case operations will be in compliance with MOE noise guideline limits.

As the operation moves over the site, elevation, distance and sound exposure vary relative to off-site receptors. Thus, the noise analysis has been approached on the basis of determining worst case conditions to ensure that the data presented does not under-predict the potential off-site sound exposures. The interpretation of the sound exposure predictions must take this into account.

JE\hd
J:\2007\107414\000\Reports\VicDom Uxbridge Pit-Noise Fnl.wpd

REFERENCES

1. "Model Municipal Noise Control By-Law", Final Report, Ontario Ministry of Environment, August 1978.

2. "Noise Emission Levels for Vehicles in Ontario", Ontario Ministry of Transportation and Communications, November 1985, H05-85-02.

3. "Sound Level Limits for Stationary Sources in Class 1 and 2 Areas (URBAN)" Ontario Ministry of Environment, Publication NPC-205, October 1995.

4. "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)", Ontario Ministry of Environment, Publication NPC-232, October 1995.

5. "Information to be Submitted for Approval of Stationary Sources of Sound", Ontario Ministry of Environment, Publication NPC-233, October 1995.

GLOSSARY OF TERMS

Class 1 Area (MOE definition):

means an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the urban hum.

Class 2 Area (MOE definition):

means an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 Areas, and in which a low ambient sound level, normally occurring only between 23:00 and 07:00 hours in Class 1 Areas, will typically be realized as early as 19:00 hours.

Other characteristics which may indicate the presence of a Class 2 Area include:

- absence of urban hum between 19:00 and 23:00 hours;
- evening background sound level defined by natural environment and infrequency human activity; and
- no clearly audible sound from stationary sources other than from those under impact assessment.

Class 3 Area (MOE definition):

means a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as the following:

- a small community with less than 1000 population;
- agricultural area;
- a rural recreational area such as a cottage or a resort area; or
- a wilderness area.

Construction (MOE definition):

"Construction" includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earthmoving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith.

Construction Equipment (MOE definition):

"Construction equipment" means any equipment or device designed and intended for use in construction, or material handling, including but not limited to, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway haulers or trucks, ditchers, compactors and rollers, pumps, concrete mixers, graders, or other material handling equipment.

Conveyance (MOE definition):

"Conveyance" includes a vehicle and any other device employed to transport a person or persons or goods from place to place but does not include any such device or vehicle if operated only within the premises of a person.

dB - Decibel:

See Sound (Pressure) Level.

dBA - A weighted decibel:

A nationally and internationally standardized frequency weighting applied to the sound level spectrum to approximate the sensitivity of the human hearing mechanism as a function of frequency (pitch).

L_{eq} - The energy equivalent continuous sound level:

The constant sound level over the time period in question, that results in the same total sound energy as the actually varying sound. Must be associated with a time period.

L_x - Statistical Sound Level Descriptor:

The sound level exceeded for x% of the time. For all practical purposes, L_{90} is the residual (lowest) ambient sound level.

Sound (Pressure) Level:

Measured in decibels (dB) it is the logarithmic ratio of the instantaneous energy of a sound to the energy at the threshold of hearing. Mathematically:

$$SPL\ (dB) = 20\ \log\ (\frac{p}{p_0})$$

where p is the pressure due to the sound and p_o is the pressure at the threshold of hearing, taken as 20 micro Pascals.

Stationary Source (MOE definition):

"Stationary source" means a source of sound which does not normally move from place to place and includes the premises of a person as one stationary source, unless the dominant source of sound on those premises is construction or a conveyance.

TABLE 1A

WORST CASE UNMITIGATED SOUND EXPOSURE

ABOVE WATER TABLE

Receptor	Minimum Source To Receiver Distance (m)	Equipment Sound Exposures (dBA)			Combined Daytime Sound Exposure (dBA)	Combined Nighttime Sound Exposure (dBA)(1)
		Front End Loader	Haul Truck	Screening Plant		
1	160	55	54	64	65	58
2	240	52	51	61	62	54
3	200	38	37	47	47	40
4	370	32	31	41	42	35
5	850	27	26	36	37	31
6	100	56	55	65	66	62

Note:

(1) Screening plant does not operate at night.

TABLE 1B

WORST CASE UNMITIGATED SOUND EXPOSURE

BELOW WATER TABLE

Receptor	Minimum Source To Receiver Distance (m)	Equipment Sound Exposures (dBA)			Combined Daytime and Nighttime Sound Exposure (dBA)
		Front End Loader	Haul Truck	Dredger/Diesel Genset	
1	160	55	54	59	62
2	240	52	51	56	58
3	200	38	37	42	44
4	370	33	32	37	39
5	850	27	26	31	33
6	260	51	50	55	58

TABLE 2A

WORST CASE MITIGATED SOUND EXPOSURE

ABOVE WATER TABLE

Receptor	Minimum Source To Receiver Distance (m)	Equipment Sound Exposures (dBA)			Combined Daytime Sound Exposure (dBA)	Combined Nighttime Sound Exposure (dBA)(1)
		Front End Loader	Haul Truck	Screening Plant		
1	160	40	39	49	50	44
2	240	40	39	49	50	43
3	200	38	36	47	47	40
4	370	32	31	41	42	35
5	850	27	26	36	37	31
6	100	40	39	49	50	44

Note:

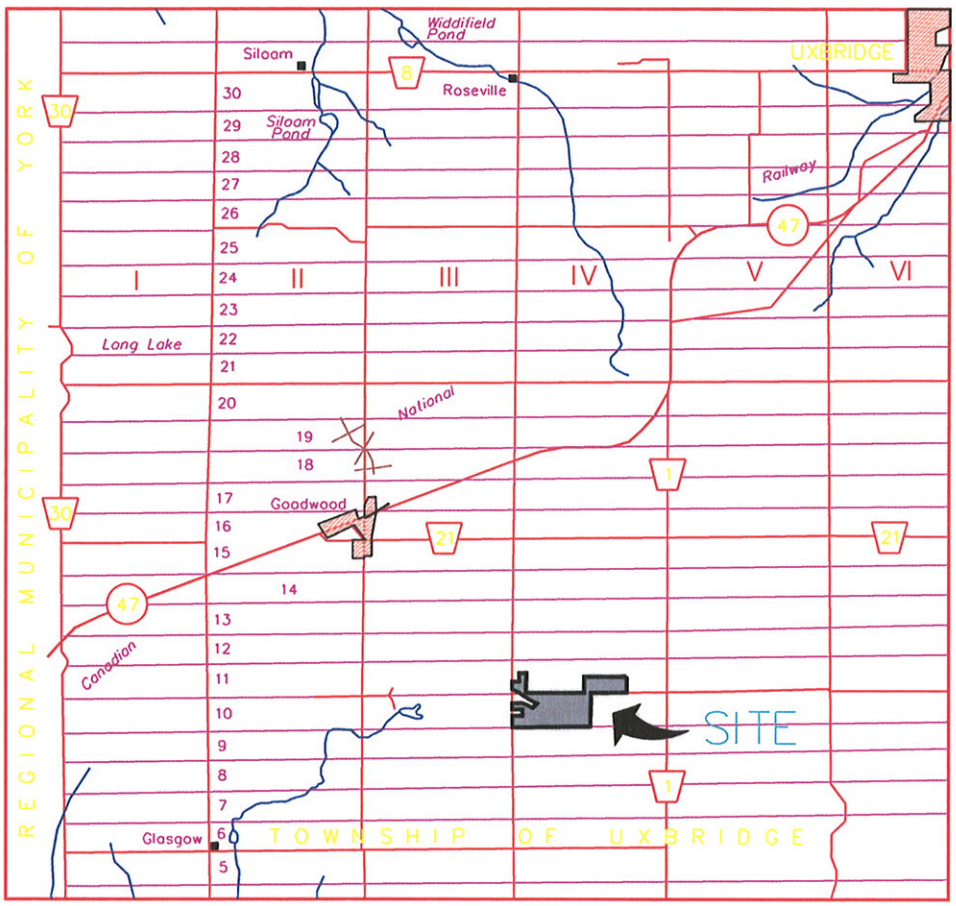
(1) Screening plant does not operate at night.

TABLE 2B

WORST CASE MITIGATED SOUND EXPOSURE

BELOW WATER TABLE

Receptor	Minimum Source To Receiver Distance (m)	Equipment Sound Exposures (dBA)			Combined Daytime and Nighttime Sound Exposure (dBA)
		Front End Loader	Haul Truck	Dredger/Diesel Genset	
1	160	39	38	43	45
2	240	38	37	42	45
3	200	38	37	42	44
4	370	33	32	37	39
5	850	27	26	31	33
6	260	38	37	42	44



KEY PLAN	FIGURE 1

1993-1

PART OF LOTS 10 & 11 AND PART OF ROAD ALLOWANCE BETWEEN LOTS 10 & 11 CONCESSION IV, TOWNSHIP OF UXBRIDGE REGIONAL MUNICIPALITY OF DURHAM

60 0 60 120 180 metres

SCALE 1:3000

DECLARATION OF PURPOSE

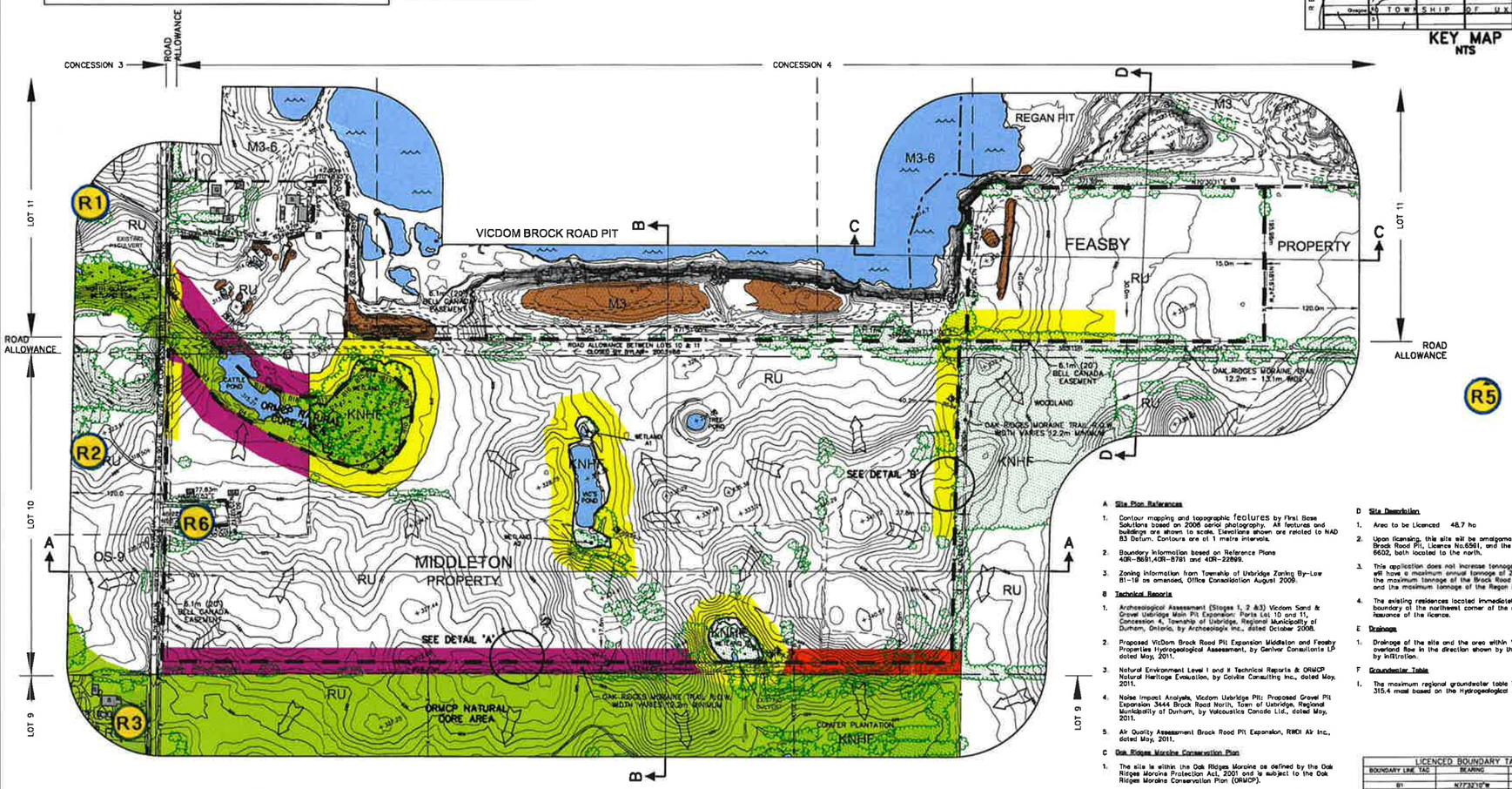
THIS SITE PLAN IS PREPARED UNDER THE AGGREGATE RESOURCES ACT FOR A CLASS 'A' LICENCE, CATEGORY 1.

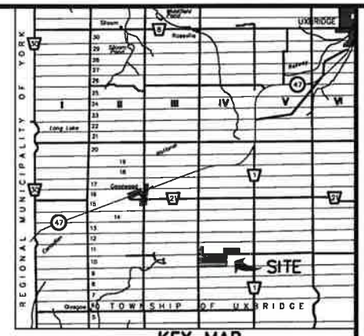
ZONING LEGEND:

RU	ZONE:	RURAL
	USE:	AGRICULTURE, RURAL RESIDENTIAL, WOODLAND, WETLAND
M3	ZONE:	RURAL RESOURCE EXTRACTION AREA
USE:		GRAVEL PIT
M3-6	ZONE:	RURAL RESOURCE EXTRACTION AREA – EXCEPTION (NO ACCESS FROM PIT TO 4TH LINE OR ROAD ALLOWANCE BETWEEN LOTS 10 AND 11.)
USE:		GRAVEL PIT
OS-9	ZONE:	RECREATIONAL OPEN SPACE – EXCEPTION (HOME OCCUPATION, HOME INDUSTRY AND PRIVATE RECREATION PARK NOT PERMITTED
USE:		WOODLAND, PASTURE

BUILDING LEGEND:

R	RESIDENCE
S	SHED
SA	SHED – ABANDONED
G	GARAGE
CH	CHALET
B	BARN
BA	BARN – ABANDONED
CS	CATTLE SHELTER
T	TRAILER



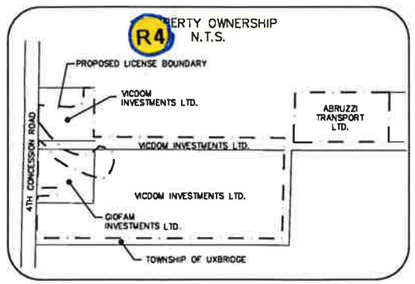


KEY MAP
NTS

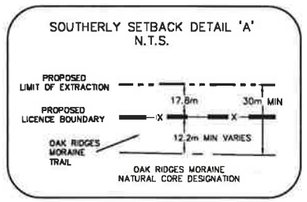
LEGEND

- PROPOSED LICENSED BOUNDARY
- EXISTING LICENSED BOUNDARY OF ADJACENT PIT
- LINE INDICATING ALL POINTS WITHIN 120m (MIN.) OF LICENCED BOUNDARY.
- TOWNSHIP LOT LINE
- ZONE LINE
- POST & WIRE FENCE – UNLESS OTHERWISE NOTED
- PUBLIC ROAD
- INTERNAL ROAD
- TRAIL
- PROPOSED LIMIT OF EXTRACTION
- STRUCTURES AND BUILDINGS
- BUILDING FOUNDATION
- CONTOURS & SPOT ELEVATIONS
- GENERAL DIRECTION OF DRAINAGE
- TREES/BUSH
- POND/SURFACE WATER
- WETLAND (STAKED AND SURVEYED WITH MNR APPROVAL)
- INTERMITTENT WATER COURSE
- SECTION ARROWS
- OVERBURDEN STOCKPILE
- NATURAL CORE AREAS NO DEVELOPMENT/SITE ALTERATION, CANNOT LICENCE
- KEY NATURAL HERITAGE FEATURE VEGETATED PROTECTION ZONE(30m MIN) NO DEVELOPMENT/SITE ALTERATION
- SETBACK FROM NATURAL CORE AREA ADJACENT TO KNHF (30m MIN) NO DISTURBANCE/NO STORAGE OF TOPSOIL/BERMS PERMITTED
- SETBACK FROM NATURAL CORE AREA NOT ADJACENT TO KNHF (30m MIN) STORAGE OF TOPSOIL/BERMS PERMITTED
- GIORDANO LAKE
- MONITORING WELL
- LOCATION 2 (BaGs-31) ARCHAEOLOGICAL ASSESSMENT

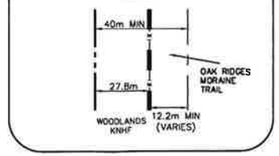
PROPERTY OWNERSHIP
N.T.S.



SOUTHERLY SETBACK DETAIL 'A'
N.T.S.



WESTERLY SETBACK DETAIL 'B'
N.T.S.



A Site Plan References

1. Contour mapping and topographic features by First Base Solutions based on 2006 aerial photography. All features and buildings are shown to scale. Elevations shown are related to NAD 83 Datum. Contours are at 1 metre intervals.
2. Boundary information based on Reference Plans 40R-8691,40R-8781 and 40R-22869.
3. Zoning information from Township of Uxbridge Zoning By-Law 81-18 as amended, Office Consolidation August 2009.

B Technical Reports

1. Archaeological Assessment (Stages 1, 2 &3) Vicdom Sand & Gravel Uxbridge Main Pit Expansion: Parts Lot 10 and 11, Concession 4, Township of Uxbridge, Regional Municipality of Durham, Ontario, by Archaeologix Inc., dated October 2008.
2. Proposed VicDom Brock Road Pit Expansion Middleton and Feasby Properties Hydrogeological Assessment, by Genivar Consultants LP dated May, 2011.
3. Natural Environment Level 1 and 2 Technical Reports & ORMCP Natural Heritage Evaluation, by Colville Consulting Inc., dated May, 2011.
4. Noise Impact Analysis, Vicdom Uxbridge Pit; Proposed Gravel Pit Expansion 3444 Brock Road North, Town of Uxbridge, Regional Municipality of Durham, by Valcoustics Canada Ltd., dated May, 2011.
5. Air Quality Assessment Brock Road Pit Expansion, RWDI Air Inc., dated May, 2011.

C Oak Ridges Moraine Conservation Plan

1. The site is within the Oak Ridges Moraine as defined by the Oak Ridges Moraine Protection Act, 2001 and is subject to the Oak Ridges Moraine Conservation Plan (ORMCP).
2. The lands to be licenced are designated Countryside Area by the ORMCP. Adjacent lands designated Natural Core Area are shown in green.
3. Key Natural Heritage Features (KNHF) have been identified on and adjacent to the site.
4. The Natural Environment Level 1 and 2 Technical Reports & ORMCP Natural Heritage Evaluation specify the following in conformity with the ORMCP:
   a) Natural Core Area
   No development or site alteration, cannot licence.
   b) Key Natural Heritage Feature and Vegetated Protection Zone
   No development/site alteration, minimum 30 metre setback from feature.
   c) Setback from Natural Core area(adjacent to KNHF)
   Minimum 30 metre setback, no disturbance permitted, no storage of topsoil.
   d) Setback fr
   Limited on
   including s
   e) The limits
   approved t
   f) The setbac
   established
5. The limit of ext
   requirements or
   berms as show

D Site Description

1. Area to be Licenced 48.7 ha
2. Upon licensing, this site will be amalgamated with the VicDom Brock Road Pit, Licence No.6961, and the Regan Pit, Licence No. 6602, both located to the north.
3. This application does not increase tonnage. The amalgamated pit will have a maximum annual tonnage of 2,165,000, comprised of the maximum tonnage of the Brock Road Pit of 1,815,000 tonnes and the maximum tonnage of the Regan Pit of 350,000 tonnes.
4. The existing residences located immediately north of the licence boundary at the northwest corner of the site will be vacated upon issuance of the licence.

E Drainage

1. Drainage of the site and the area within 120 m of the site is by overland flow in the direction shown by the arrows on the plan, or by infiltration.

F Groundwater Table

1. The maximum regional groundwater table is at an elevation of 315.4 masl based on the Hydrogeological Assessment.

LICENCED BOUNDARY TABLE

BOUNDARY LINE TAG	BEARING	DISTANCE
B1	N77°32'10"W	6.83m
B2	N66°49'37"W	29.21m
B3	N50°06'36"W	58.84m
B4	N78°00'13"W	76.41m
B5	N84°16'38"W	73.81m
B6	N86°45'30"W	37.65m
B7	N85°04'36"W	29.85m
B8	N32°14'33"W	27.90m
B9	N11°44'45"E	27.35m
B10	N00°13'15"E	31.00m
B11	N20°21'45"W	33.84m
B12	N84°10'30"W	23.88m
B13	N80°43'28"W	28.98m
B14	N82°30'36"E	17.65m
B15	N31°28'36"E	21.46m
B16	N28°29'25"E	29.85m
B17	N68°12'48"E	37.36m
B18	N84°41'37"E	29.45m
B19	N84°59'27"W	43.48m
B20	N64°01'11"W	80.80m
B21	N56°27'45"W	64.24m
B22	N68°14'29"W	8.02m

VALCOUSTICS Canada Ltd.

FIGURE 2 RECEPTORS

SCHEDULE OF REVISIONS (PRE LICENCING)

SCHEDULE OF AMENDMENTS

NO.	DATE	DESCRIPTION	APPROVED

PRELIMINARY ONLY

TRUDY P. PATERSON
IS APPROVED BY THE MINISTRY OF NATURAL RESOURCES PURSUANT TO SECTION 8 (4) OF THE AGGREGATE RESOURCES ACT TO PREPARE AND CERTIFY SITE PLANS.

TRUDY P. PATERSON DATE

VICDOM BROCK ROAD PIT EXPANSION

TOWNSHIP OF UXBRIDGE

APPLICANT: VICDOM SAND AND GRAVEL (ONTARIO) LIMITED
P.O. BOX 1359
UXBRIDGE, ONTARIO
L9P 1N8

EXISTING FEATURES

PROJECT NO. 05-1993 DRWG. NO. 1993-1 OF 4
DATE: MAY 2011 SCALE: 1:3000
DRAWN: CAP CHECKED: APPROVED:

Skelton Brumwell

ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS
93 BELL FARM ROAD, SUITE 107 BARRIE, ONTARIO L4M 5G1
TELEPHONE (705) 726-1141 FAX. (705) 726-0331

SEE NOTE H2

LOCATION 2 (BdGa-31)
ARCHAEOLOGICAL ASSESSMENT

B

C

D

A

1B

1A

1A

3

2

2

2

2

2

3A

3A

BERMS

POND SURFACE 315.5masl

FINAL DEPTH OF EXTRACTION
BELOW THE W/T MAXIMUM 30m

CATTLE POND

VIC'S POND

ORMCP NATURAL CORE AREA

ORMCP NATURAL CORE AREA

WETLAND A1

WETLAND A2

WETLAND B

WETLAND C

SEE NOTE H5

OAK RIDGES MORAINE TRAIL

OAK RIDGES MORAINE TRAIL
WIDTH VARIES 12.2m MINIMUM

EXISTING CULVERT

322.50

325.25

325.25

327.75

327.75

315.27

315.42

40m

27.8m

17.8m

17.8m

17.8m

15m

LOT 9

N

VALCOUSTICS
Canada Ltd.

FIGURE 3 BERMS

APPENDIX A

SAMPLE CALCULATIONS

Vicdom Uxbridge Pit Expansion

File: 107-414
Date: 30-May-11
Receptor Location: 1 See Figure

Above Water Table - Daytime

Equipment	Model	Ref. @ 15 m	Number	Operates Min./Hr.	Result @ 15 m
Screen Plant		85	1	60	85
Haul Truck	Dresser DT 56	83	1	10	75
Front End Loader	Komatsu WA 600	76.5	1	50	76
				Sum	86

S-Rx	160	Source to Receiver Distance (m)
B-Rx	120	Barrier to Receiver Distance (m)
EAR	320	Elevation at Receiver (m)
RH	1.5	Receiver Height (m)
EABQ	319	Elevation at Source - Bottom of Quarry (m)
EATWF	316	Elevation at Source - Top of Working Face (m)
SH - Processing	2.5	Source Height for the processing equipment (m)
EBPB	315	Elevation at Base of Perimeter Barrier (m)
BH	0	Barrier Height (m)

S-Rx (m)	Excavating Dist Atten. (dB)	Excavating Barrier Atten (dB)	Excavating Sound Exp (dBA)
160	21	0	65
185	22	0	64
210	23	0	63
235	24	0	62
260	25	0	61
285	26	0	60
310	26	0	60
335	27	0	59
360	28	0	58
385	28	0	58
410	29	0	57
435	29	0	57
460	30	0	56
485	30	0	56
510	31	0	55
535	31	0	55
560	31	0	54
585	32	0	54
610	32	0	54
635	33	0	53
660	33	0	53
685	33	0	53

Vicdom Uxbridge Pit Expansion

File: 107-414
Date: 30-May-11
Receptor Location: 1 See Figure

Above Water Table - Nighttime

Equipment	Model	Ref. @ 15 m	Number	Operates Min./Hr.	Result @ 15 m
Screen Plant		0	1	60	0
Haul Truck	Dresser DT 56	83	1	10	75
Front End Loader	Komatsu WA 600	76.5	1	50	76
				Sum	78

S-Rx	160	Source to Receiver Distance (m)
B-Rx	120	Barrier to Receiver Distance (m)
EAR	320	Elevation at Receiver (m)
RH	4.5	Receiver Height (m)
EABQ	319	Elevation at Source - Bottom of Quarry (m)
EATWF	316	Elevation at Source - Top of Working Face (m)
SH - Processing	2.5	Source Height for the processing equipment (m)
EBPB	315	Elevation at Base of Perimeter Barrier (m)
BH	0	Barrier Height (m)

S-Rx (m)	Excavating Dist Atten. (dB)	Excavating Barrier Atten (dB)	Excavating Sound Exp (dBA)
160	21	0	58
185	22	0	57
210	23	0	56
235	24	0	55
260	25	0	54
285	26	0	53
310	26	0	52
335	27	0	52
360	28	0	51
385	28	0	50
410	29	0	50
435	29	0	49
460	30	0	49
485	30	0	48
510	31	0	48
535	31	0	47
560	31	0	47
585	32	0	47
610	32	0	46
635	33	0	46
660	33	0	46
685	33	0	45

Vicdom Uxbridge Pit Expansion

File: 107-414
Date: 30-May-11
Receptor Location: 1 See Figure

Below Water Table - Daytime & Nighttime

Equipment	Model	Ref. @ 15 m	Number	Operates Min./Hr.	Result @ 15 m
Generator		80	1	60	80
Haul Truck	Dresser DT 56	83	1	10	75
Front End Loader	Komatsu WA 600	76.5	1	50	76
				Sum	82

S-Rx	160	Source to Receiver Distance (m)
B-Rx	120	Barrier to Receiver Distance (m)
EAR	320	Elevation at Receiver (m)
RH	4.5	Receiver Height (m)
EABQ	316	Elevation at Source - Bottom of Quarry (m)
EATWF	316	Elevation at Source - Top of Working Face (m)
SH - Processing	2.5	Source Height for the processing equipment (m)
EBPB	315	Elevation at Base of Perimeter Barrier (m)
BH	0	Barrier Height (m)

S-Rx (m)	Excavating Dist Atten. (dB)	Excavating Barrier Atten (dB)	Excavating Sound Exp (dBA)
160	21	0	62
185	22	0	60
210	23	0	59
235	24	0	58
260	25	0	58
285	26	0	57
310	26	0	56
335	27	0	55
360	28	0	55
385	28	0	54
410	29	0	54
435	29	0	53
460	30	0	53
485	30	0	52
510	31	0	52
535	31	0	51
560	31	0	51
585	32	0	50
610	32	0	50
635	33	0	50
660	33	0	49
685	33	0	49

Vicdom Uxbridge Pit Expansion

File: 107-414
Date: 30-May-11
Receptor Location: 1 See Figure

Above Water Table - Daytime

Equipment	Model	Ref. @ 15 m	Number	Operates Min./Hr.	Result @ 15 m
Screen Plant		85	1	60	85
Haul Truck	Dresser DT 56	83	1	10	75
Front End Loader	Komatsu WA 600	76.5	1	50	76
				Sum	86

S-Rx	160	Source to Receiver Distance (m)
B-Rx	120	Barrier to Receiver Distance (m)
EAR	320	Elevation at Receiver (m)
RH	1.5	Receiver Height (m)
EABQ	319	Elevation at Source - Bottom of Quarry (m)
EATWF	316	Elevation at Source - Top of Working Face (m)
SH - Processing	2.5	Source Height for the processing equipment (m)
EBPB	315	Elevation at Base of Perimeter Barrier (m)
BH	12.75	Barrier Height (m)

S-Rx (m)	Excavating Dist Atten. (dB)	Excavating Barrier Atten (dB)	Excavating Sound Exp (dBA)
160	21	16	50
185	22	14	50
210	23	14	49
235	24	13	49
260	25	13	49
285	26	12	48
310	26	12	47
335	27	12	47
360	28	12	47
385	28	12	46
410	29	12	46
435	29	11	45
460	30	11	45
485	30	11	44
510	31	11	44
535	31	11	44
560	31	11	43
585	32	11	43
610	32	11	43
635	33	11	42
660	33	11	42
685	33	11	42

Vicdom Uxbridge Pit Expansion

File: 107-414
Date: 30-May-11
Receptor Location: 1 See Figure

Above Water Table - Nighttime

Equipment	Model	Ref. @ 15 m	Number	Operates Min./Hr.	Result @ 15 m
Screen Plant		0	1	60	0
Haul Truck	Dresser DT 56	83	1	10	75
Front End Loader	Komatsu WA 600	76.5	1	50	76
				Sum	78

S-Rx	160	Source to Receiver Distance (m)
B-Rx	120	Barrier to Receiver Distance (m)
EAR	320	Elevation at Receiver (m)
RH	4.5	Receiver Height (m)
EABQ	319	Elevation at Source - Bottom of Quarry (m)
EATWF	316	Elevation at Source - Top of Working Face (m)
SH - Processing	2.5	Source Height for the processing equipment (m)
EBPB	315	Elevation at Base of Perimeter Barrier (m)
BH	12.75	Barrier Height (m)

S-Rx (m)	Excavating Dist Atten. (dB)	Excavating Barrier Atten (dB)	Excavating Sound Exp (dBA)
160	21	15	43
185	22	13	44
210	23	12	44
235	24	11	44
260	25	10	43
285	26	10	43
310	26	10	43
335	27	9	42
360	28	9	42
385	28	9	41
410	29	9	41
435	29	9	41
460	30	9	40
485	30	8	40
510	31	8	39
535	31	8	39
560	31	8	39
585	32	8	39
610	32	8	38
635	33	8	38
660	33	8	38
685	33	8	37

Vicdom Uxbridge Pit Expansion

File: 107-414
Date: 30-May-11
Receptor Location: 1 See Figure

Below Water Table - Daytime & Nighttime

Equipment	Model	Ref. @ 15 m	Number	Operates Min./Hr.	Result @ 15 m
Generator		80	1	60	80
Haul Truck	Dresser DT 56	83	1	10	75
Front End Loader	Komatsu WA 600	76.5	1	50	76
				Sum	82

S-Rx	160	Source to Receiver Distance (m)
B-Rx	120	Barrier to Receiver Distance (m)
EAR	320	Elevation at Receiver (m)
RH	4.5	Receiver Height (m)
EABQ	316	Elevation at Source - Bottom of Quarry (m)
EATWF	316	Elevation at Source - Top of Working Face (m)
SH - Processing	2.5	Source Height for the processing equipment (m)
EBPB	315	Elevation at Base of Perimeter Barrier (m)
BH	12.75	Barrier Height (m)

S-Rx (m)	Excavating Dist Atten. (dB)	Excavating Barrier Atten (dB)	Excavating Sound Exp (dBA)
160	21	18	44
185	22	15	45
210	23	14	45
235	24	13	45
260	25	12	45
285	26	12	45
310	26	11	45
335	27	11	45
360	28	10	44
385	28	10	44
410	29	10	44
435	29	10	43
460	30	10	43
485	30	9	43
510	31	9	42
535	31	9	42
560	31	9	42
585	32	9	42
610	32	9	41
635	33	9	41
660	33	9	41
685	33	9	41

APPENDIX B

CURRICULUM VITAE FOR JOHN EMELJANOW

JOHN EMELJANOW

EDUCATION:

B.Eng., McMaster University, June 1989, Mechanical Engineering

Course on Noise Control in Land Use Planning; Ministry of the Environment and Energy, Toronto, June 1989

PROFESSIONAL AFFILIATION:

Registered Professional Engineer, Professional Engineers of Ontario

EMPLOYMENT:

Valcoustics Canada Ltd, May 1989 to date.

EXPERIENCE:

Valcoustics Canada Ltd., Senior Engineer, has acted as project manager on a number of major projects. Responsibilities include architectural acoustics, noise/vibration measurement, analysis, design computations, and report preparation.

Architectural acoustics involving the interaction of sound and architectural elements within a space to obtain the desired acoustical environment. This involves control of reverberation, ambient sound level, location of sound absorbing and sound reflecting surfaces as well as isolation of sound to and from adjacent spaces. Representative projects are: Brampton Consolidated Courthouses; Upper Canada College Expansion, Toronto; Toronto Stock Exchange Renovations (The Design Exchange); Sunnybrook Health Science Centre Expansion and Renovation, Toronto; Metro Convention Centre Expansion, Toronto; Canary Wharf (DS5), London; Sudbury Regional Hospital; and GTAA Infield Development, Mississauga.

Environmental noise and vibration studies to determine impact of ground and air transportation and stationary sources of sound on adjacent land use, both existing and proposed, as well as selection and analysis of noise mitigation measures, including sound barriers, architectural elements, and operational techniques. Projects are prepared for private and government sectors, involving residential, industrial and commercial development. Representative projects include: Walker Brothers Quarry, Thorold; Keele Valley Landfill Vertical Expansion, Maple; Canadian National Railway Lands Redevelopment, Toronto; The Woodbridge Expansion Area, Vaughan; Rimply Manufacturing Plant, Newmarket; Honda Canada Manufacturing Minivan Plant, Alliston; Sheppard Subway, Toronto; and Highway 11, Burk's Falls to Powassin.

Mechanical system noise and vibration analyses to control the impact of air-borne and structure-borne sound from mechanical equipment on adjacent spaces through the design of demising surfaces, as well as the control of noise generated and transmitted through HVAC systems. Representative projects include: the New Princess Margaret Hospital, Toronto; National Trade Centre, Toronto; IBM Facility for Software Development, Markham; Niagara College-Glendale Campus, Niagara Falls; The American School, Shanghai; Guelph General Hospital; and Xiamen Conference Centre, China.

Mr. Emeljanow was also a major contributor to the Province of Ontario Architectural Design Standards for Court Houses, Acoustics Section.

PUBLICATIONS & PRESENTATIONS:

"A Technique for Comparing Alternative Transportation Corridor Alignments Based on Noise Impact", presented at Inter-Noise 92, Toronto, Ontario, July 1992.

"Environmental Noise Aspects of Landfill Site Selection", Canadian Acoustics, Vol. 21, No. 3, September 1993.

"Acoustical Challenge of Quarry Design", Canadian Acoustics, Vol. 22, No. 3, September 1994.