# Denison/Ashfield Quarry Noise

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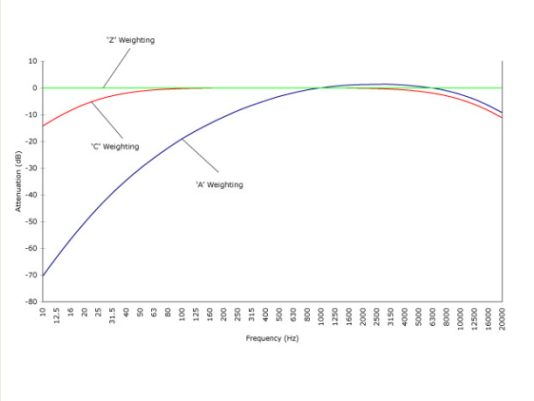
# Denison/Ashfield Quarry Noise

- 6 specific concerns
- 1 general concern

# Specific Concern #1—Time Weighting

- Want sound level meter to respond to changes in the acoustic environment as the ear does
- Use weightings to match human response
  - Frequency weighting
    - A weighting
    - C weighting
  - Time weighting
    - Fast—125 ms
      - Corresponds approximately to the ear's integration time
    - Slow—1000 ms  (Leq 1 sec is similar)
      - Doesn't correspond to the ear's Integration time



# Specific Concern #2—Range of Results

- CADNA modeling implements equations in ISO 9613 Part 2
- ISO 9613 Part has accuracy range of ±3 dB

**Table 5 — Estimated accuracy for broadband noise of $L_{AT}$(DW) calculated using equations (1) to (10)**

| Height, $h$ *) | Distance, $d$ *) | |
|---|---|---|
| | $0 < d < 100$ m | $100 \text{ m} < d < 1\,000$ m |
| $0 < h < 5$ m | ± 3 dB | ± 3 dB |
| $5 \text{ m} < h < 30$ m | ± 1 dB | ± 3 dB |

*) $h$ is the mean height of the source and receiver.
$d$ is the distance between the source and receiver.

NOTE — These estimates have been made from situations where there are no effects due to reflection or attenuation due to screening.

ISO 9613 Part 2, page 14

# Specific Concern #2—Range of Results Continued

calculation shown in table 5. These estimates of accuracy are restricted to the range of conditions specified for the validity of the equations in clauses 3 to 8 and are independent of uncertainties in sound power determination.

NOTE 24 The estimates of accuracy in table 5 are for downwind conditions averaged over independent situations (as specified in clause 5). They should not necessarily be expected to agree with the variation in measurements made at a given site on a given day. The latter can be expected to be considerably larger than the values in table 5.

ISO 9613 Part 2, page 13

# Specific Concern #2—Range of Results Continued

- CADNA Technical Note about uncertainty

It is relevant what to do with the uncertainty calculated for immission levels. If the calculated level is used to prove that the reference values are not exceeded with a planned site, then the comparison between reference value and calculated value is extremely relevant, because it decides about approval or refusal. In this case, uncertain emission assumptions and an uncertain result could well lead to the opinion that the burden of proof is on the side of the proposer and that he has to add a penalty depending on the uncertainty before any comparisons between calculated and reference values are performed. Based on a confidence level of 95%, the desired penalty would be the standard deviation times 1.65.

DataKustik Technical Note, 4

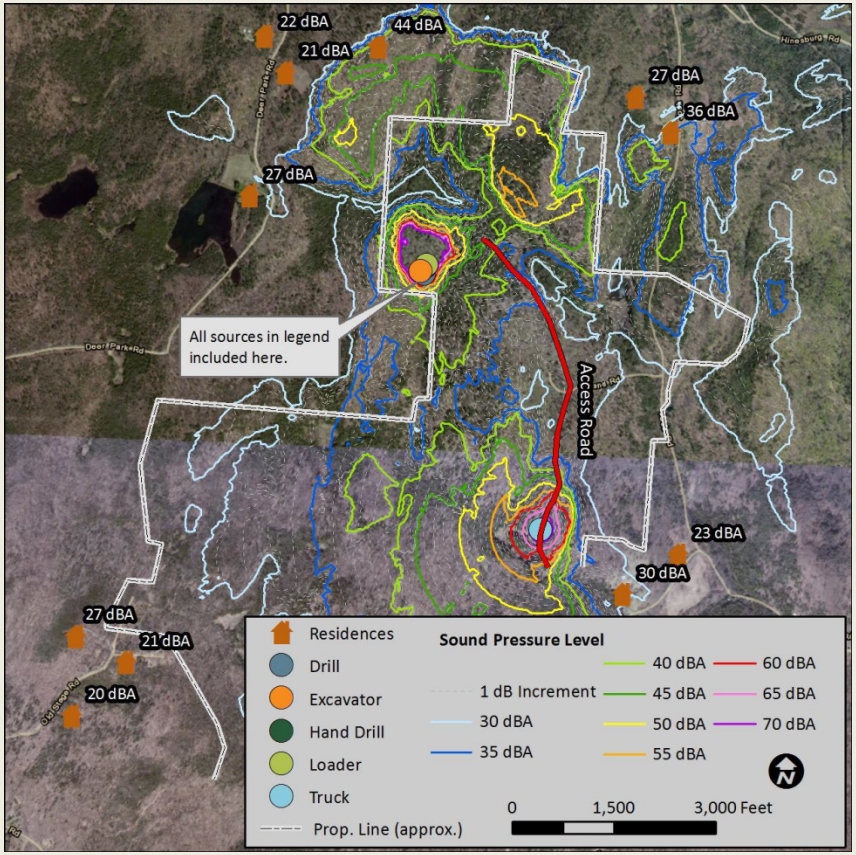
# Specific Concern #3—Reflections

- Reflections matter
  - Buildings
  - Quarry walls

# Specific Concern #4—Worst Case

- All sources running is not necessarily worst case
- Worst case
  - Loudness (sound power level of equipment)
  - Location
    - Different neighboring properties have different worst case configurations
  - Environmental conditions
  - Correction factor for 9613 Part 2 range of results issue

# Specific Concern #4
# Location of Truck on the Access Road




RSG Noise Impact Assessment

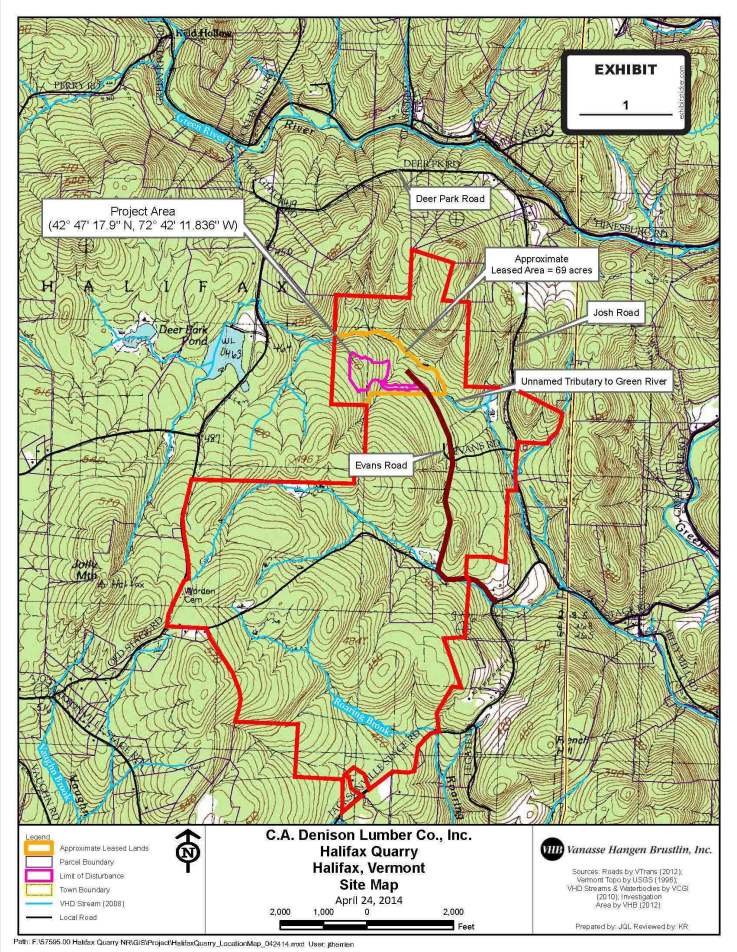
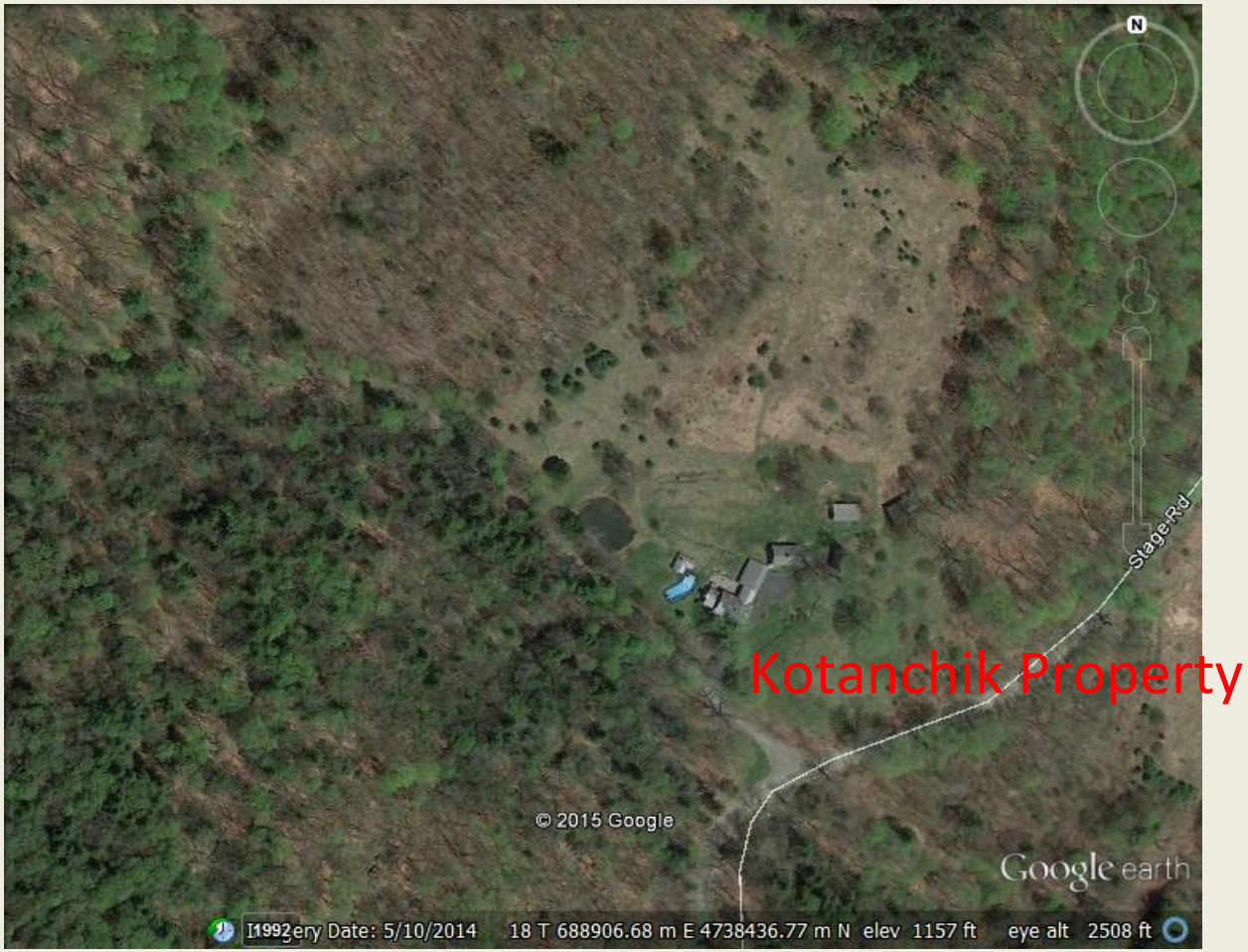



Exhibit 1 (revised)

# Specific Concern #4
# Location of Truck on the Access Road



# Specific Concern #5—Foliage

- Use of foliage in the modeling not justified
  - Operations beyond leaf season
    - April 1- November 30 (Schedule B)
    - April 16-December 14 (ANR 2/27/2015 response to HRO #2)

The foliage of trees and shrubs provides a small amount of attenuation, but only if it is sufficiently dense to completely block the view along the propagation path, i.e. when it is impossible to see a short distance through the foliage. The attenuation may be

ISO 9613 Part 2, page 15

# Specific Concern #5—Foliage Continued

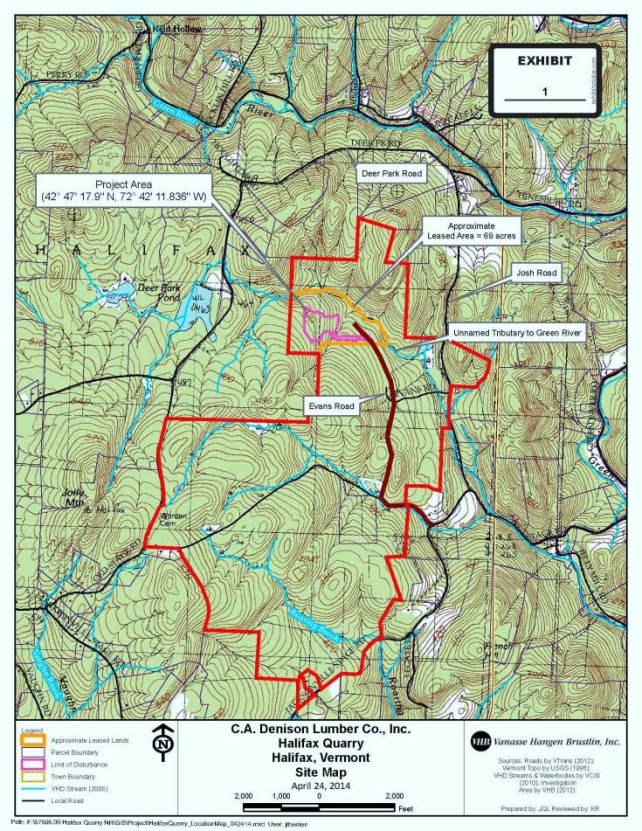


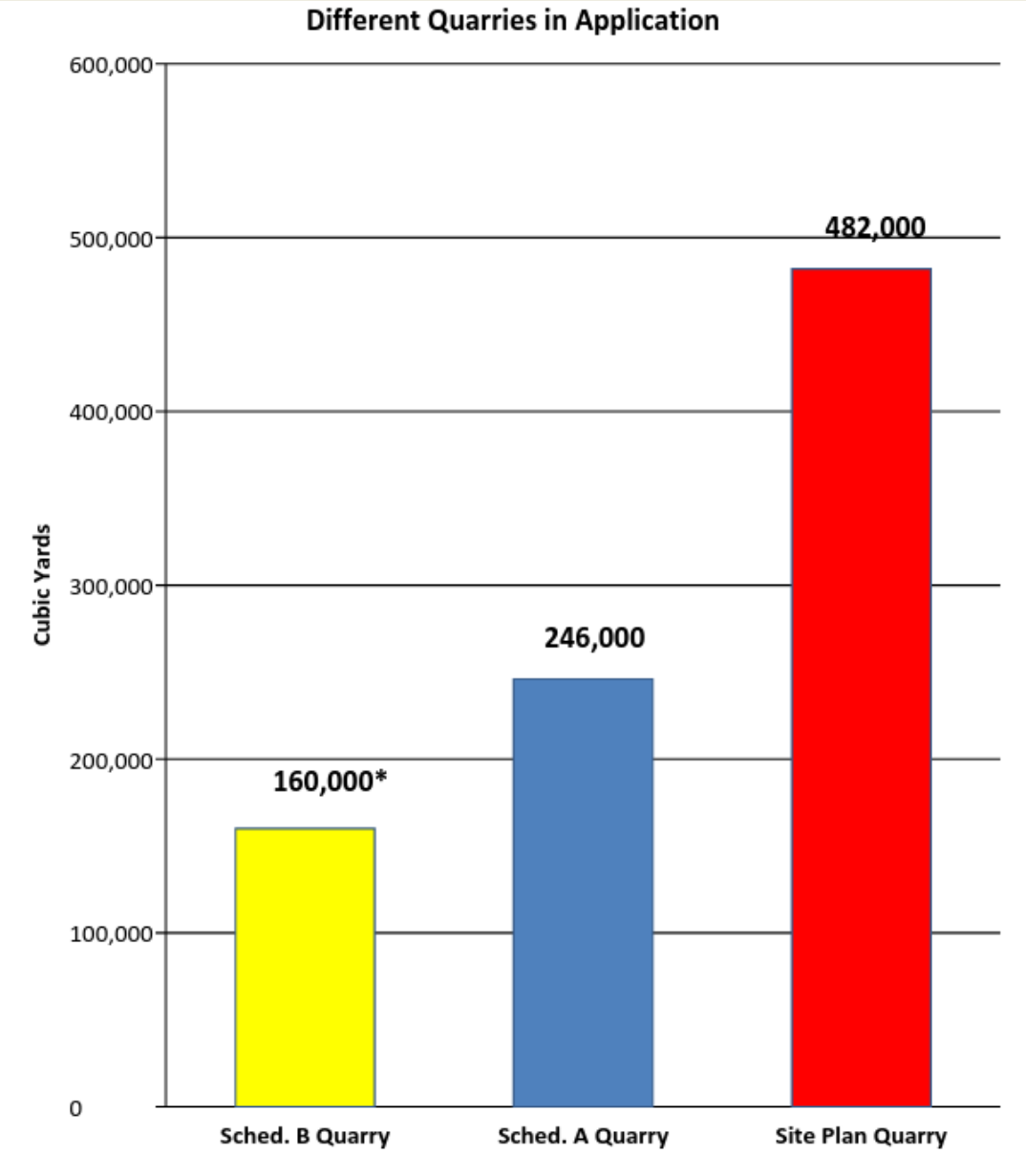

Exhibit 1 (revised)

# Specific Concern #6—Barriers

- Movable barriers are problematic
  - Indicative of insufficient setbacks or insufficient control measures
  - Very limited effectiveness
  - Need to be carefully placed as equipment moves
  - Very unlikely to be properly used

# General Concern Which One Is It?

- Accurate quarry noise modeling depends upon accurate quantification, description, and location of quarry activities
- CADNA relies upon equations which require accurate input data for accurate output predictions




* Assuming trucking does not occur in mud season or wet conditions, the value would be 130,000 cy.

# Conflicting Application Project Description

| | Sched. B Quarry | Sched. A Quarry | Site Plan Quarry |
|---|---|---|---|
| Cubic Yards | 160,000 | 246,000 | 482,000 |
| Source of Data | **Schedule B**, Truck Trip Testimony and Statements of Mr. Pratt | **Schedule A** | **Site Plan**, Reclamation Plan, and Exhibit C-7 |

# Schedule B Quarry

"The project expects to generate up [to] ten loaded truck trips per week…."

Schedule B, page 2

The project expects to generate up ten loaded trucks per week which will access the site via an access road that links to a town highway south of the extraction area. There will be additional employee trips, most likely in pickup trucks.

Equipment having the potential to produce air emissions includes a rock drill and/or saw, an excavator, a loader, trucks, and a diesel generator. Rock drills will be equipped with dust control shrouds. The proposed generator will be a 49 HP Atlas Copco generator (or equivalent) which meets EPA NECHAPs/NSPS standards. The generator will be below the State permitting threshold. No other equipment is proposed that exceeds Vermont permit applicability threshold.

The Agency of Natural Resources, Air Quality and Climate Division, has concluded that an Air Pollution Control Permit is not required at this time. *See* Exhibit 3.

The Applicants agree to periodically maintain the unpaved traffic area and parking areas by the application of water and/or generally accepted alternate treatments such as calcium chloride to limit visible dust emissions. No paved parking or traffic areas are proposed.

b) If buildings will be heated, describe the fuel source and the heating system, including its efficiency rating.

A moveable, unheated, job trailer might be utilized at the site. If used, the job trailer will not be heated.

c) Is an Air Pollution Control Permit from the Agency of Natural Resources (ANR) required for the project? [ ] Yes or [X] No? (Contact the **ANR Air Pollution Control Division at 241-3840** if you are uncertain.) If yes, what is the status of your application?

*See* Exhibit 3.

d) Indicate how dust will be controlled during and after construction.

Dust will be controlled by the application of water and/or generally accepted alternate treatments such as calcium chloride to limit visible dust emissions. The Applicants agree to the inclusion of the two conditions requested by the Agency of Natural Resources, Air Quality and Climate Division, in any permit that is issued for this project. *See* Exhibit 3 for particulars of the conditions.

As needed, water applications will be made by utilizing a pickup truck equipped with a water reservoir and a perforated water distribution bar. This method of dust control has been effective at other similar facilities operated by Ashfield Stone, LLC.

e) Indicate what restrictions will apply to the hours of construction and/or operation and how noise will be controlled, especially in residential areas.

The Applicants propose to limit the hours and days of general operation to Monday through Friday from 7:30 AM until 4:30 PM, exclusive of State and federal holidays. The operating season is proposed to commence not earlier than April 1 and conclude not later than November 30 each year. The project may open later and/or close earlier depending on weather and road conditions. Periodic site maintenance work is proposed for Saturdays. No operations or maintenance will occur on Sundays.

f) If the project involves any of the following, check them and contact the **ANR Air Pollution Control**

2

**Schedule B Quarry Calculations**

160,000 Cubic yards

- 0.463 cubic yards per ton (times)
  - Source: developer testimony last hearing—160 lb/cubic foot
- 20 tons per trip (times)
  - Source: developer testimony
- 10 loads per week (times)
  - Source: Schedule B
- 34.64 weeks per year (times)
  - Source: Schedule B—8 months per year)
- 50 years
  - Source: developer testimony
- Equals 160,000 cubic yards

# Schedule A Quarry

"…amount of total extraction proposed over the life of the permit … 246,000…"

Schedule A, page 1

**SCHEDULE A**
**Fee Information**
**(Effective July 1, 2012)**

Submit with the application a check payable to the "State of Vermont". Municipal and state agency projects are exempt from fees but should still report construction costs on this form. Not-for-profit organizations are not exempt. Calculate the fee using the table below.

Note: All lines on the schedule must be filled out. If a line does not apply, or if there is no associated cost, enter 0. An incomplete schedule will result in a delay in application processing.

1) **Number of lots to be created** 0 x $100.00 = $ 0

2) **Earth Extraction** (Gravel/Sand Pits and Quarries)
$.02/cubic yard X amount of total extraction proposed over the life of the permit up to 1 million cubic yards 246,000 x $.02 = $4,920
$.01/cubic yard X amount of total extraction proposed over the life of the permit exceeding 1 million cubic yards = 0

3) **Construction costs**:*

| | | | | |
|---|---|---|---|---|
| Site preparation . . . . . | $ | 0 | | |
| Buildings: | | | | |
| a) sq. ft. _____ | | | | |
| b) $ per sq. ft. _____ | | | | |
| Total (a x b) . . . . . | $ | 0 | | |
| Roads and parking . . . . . | $ | 100,000 | | |
| Utilities . . . . . | $ | 0 | | |
| Off-site improvements . . . . . | $ | 0 | | |
| Landscaping . . . . . | $ | 0 | | |
| Other _____. . . . . | $ | 0 | | |
| **Total costs:** | $ | 100,000 x 0.00540 = | $ | $540** |

4) **Total Fee (Sections 1 + 2 + 3) = $ $4,920*****

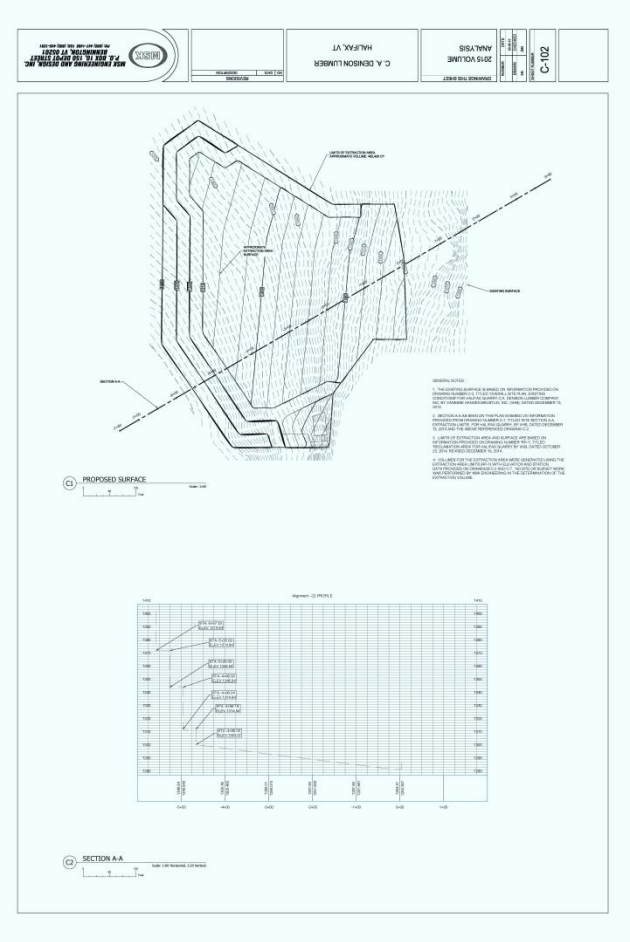
* For residential subdivisions, include the estimated construction cost of all improvements proposed to be constructed by the applicant or a related person or entity, including common facilities, infrastructure, dwellings, and other. (For more information, see definition of "person" at 10 V.S.A. § 6001(14).) (www.nrb.state.vt.us/lup/statute.htm)

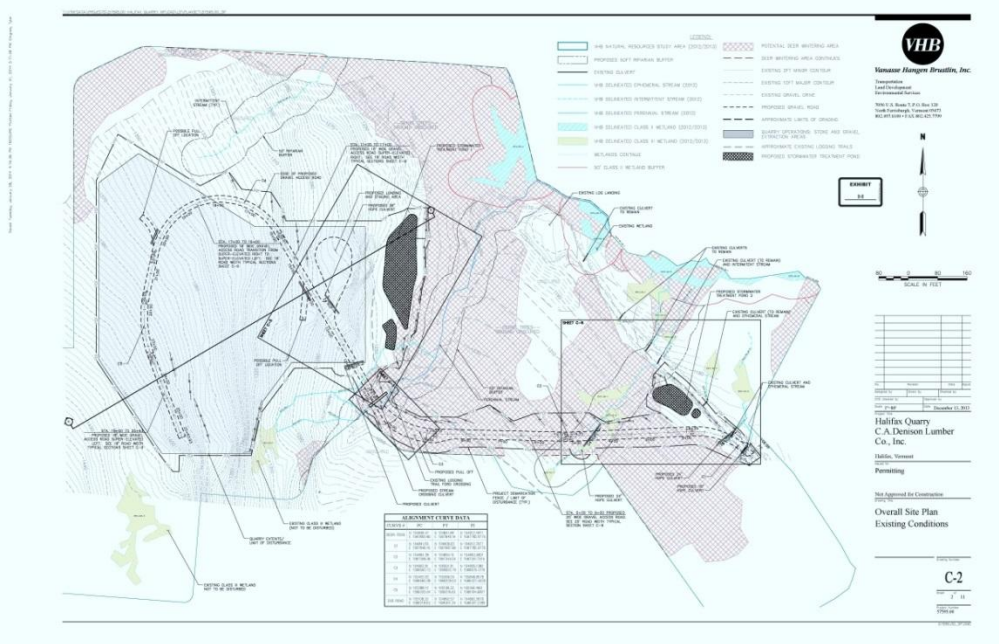
** For projects exceeding $15,000,000 in total cost, multiply the first $15,000,000 in costs X .00540; multiply the balance of the costs X .00250. See 10 V.S.A. § 6083a (www.nrb.state.vt.us/lup/statute.htm) for the complete schedule of fees.

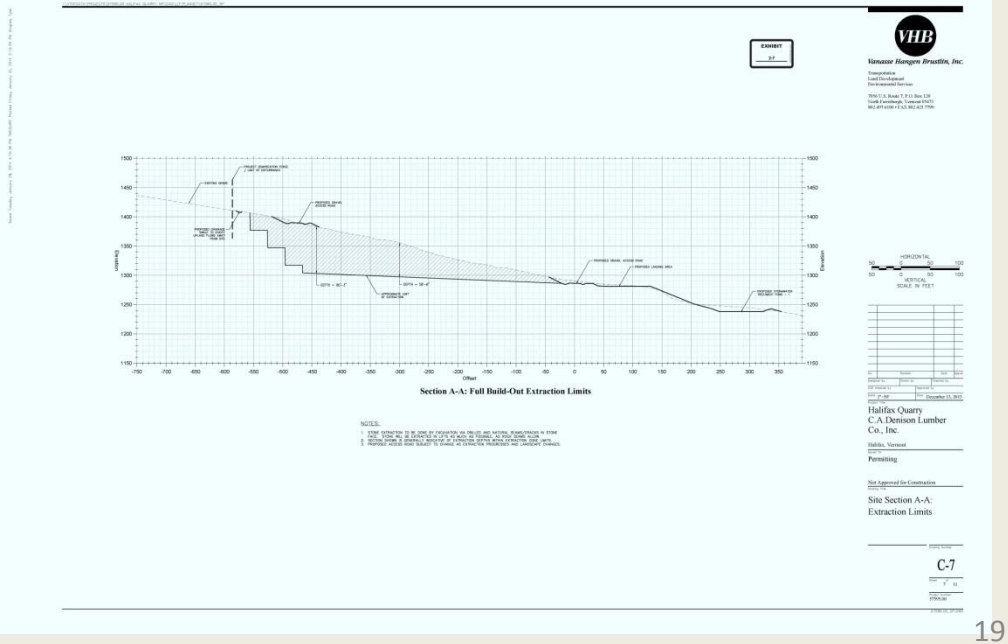
*** Minimum fee of **$150** for new applications; minimum fee of **$50** for amendment applications
Maximum total application fee is $150,000.00
**Treat expansions of approved projects as new applications.**

Note: As provided in 10 V.S.A. § 6083a(a)(4): "For projects involving the extraction of earth resources, including but not limited to sand, gravel, peat, topsoil, crushed stone, or quarried material, the greater of: a fee as determined under subdivision (1) of this subsection; or a fee equivalent to the rate of $0.02 per cubic yard of the first million cubic yards of the total volume of earth resources to be extracted over the life of the permit, and $.01 per cubic yard of any such earth resource extraction above one million cubic yards." (emphasis added)

# Site Plan Quarry



# Questions and Problems

## What's Getting Quarried?

| | Schedule B Quarry | Schedule A Quarry | Site Plan Quarry |
|---|---|---|---|
| **Yards$^3$** | 160,000 | 246,000 | 482,000 |
| **Question** | Which 1/3?<br>1/3depth<br>1/3 area<br>Trench<br>Combination | Which 1/2?<br>1/2 depth<br>1/2 area<br>Trench<br>Combination | |
| **Problems** | Answer not in:<br>Site Plan<br>C-7<br>Rec. Plan<br>Sched. A | Answer not in:<br>Site Plan<br>C-7<br>Rec. Plan | |

# More Questions and Problems

## What Happens to the Extra Material that Is Not Trucked Away?

| | Schedule B Quarry | Schedule A Quarry | Site Plan Quarry |
|---|---|---|---|
| **Yards$^3$** | 160,000 | 246,000 | 482,000 |
| **Question** | | What happens to 86,000 Cubic Yards?<br>Reclaim it<br>Haul it | What Happens to the 322,000 Cubic Yards?<br>Reclaim it<br>Haul it |
| **Problems** | | Answer not in:<br>Site Plan<br>C-7<br>Rec. Plan | Answer not in:<br>Site Plan<br>C-7<br>Rec. Plan<br>Sched. A<br>Sched. B |

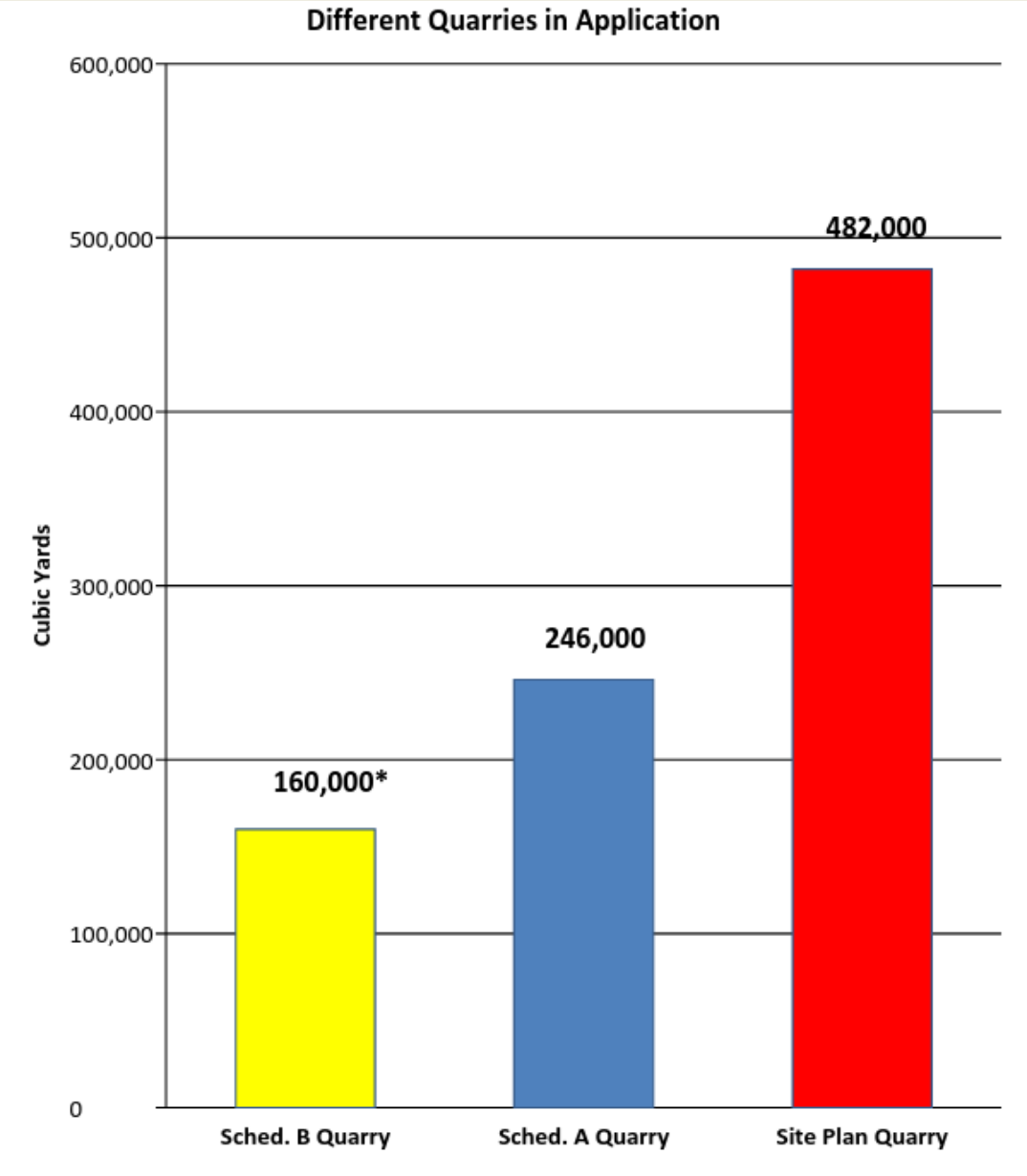
# Still More Problems

## Contradictions in Testimony

| | Schedule B Quarry | Schedule A Quarry | Site Plan Quarry |
|---|---|---|---|
| **Yards$^3$** | 160,000 | 246,000 | 482,000 |
| | Scenario contradicts testimony concerning:<br>Looks like in 50 yrs. | Scenario contradicts testimony concerning:<br>Looks like in 50 yrs.<br>Very little waste<br>Number of trips | Scenario contradicts testimony concerning:<br>Very little waste<br>Number of trips |

## Which One Is It?

- After you know which quarry it is, you can then assess the noise impacts.
- RSG modeling cannot be relied upon because of the contradictions inherent in the application and “Quarries” or scenarios.



# Conclusions

- Address the 6 specific modeling concerns
  - Fast Lmax
  - 3 dBA range
  - Use reflections
  - Model worst case locations
  - Turn off foliage in modeling
  - Do not rely on movable barriers
- Eliminate contradictions in quarry size from application and model results