STATE OF VERMONT

SUPERIOR COURT — ENVIRONMENTAL DIVISION
Docket No. 75-6-17 Vtec

NE Materials Grp, LLC et al A250	DECISION ON THE MERITS

This is an appeal of a decision denying an Act 250 permit application for a rock crushing operation in the Town of Barre, Vermont. At issue is whether the proposed operation complies with Act 250 Criterion 1 with respect to air pollution, and Criterion 8 with respect to noise and dust.

The applicants, North East Materials Group, LLC (NEMG) and Rock of Ages (ROA) Corporation (collectively, Applicants), are represented by James P.W. Goss, Esq., David R. Cooper, Esq., and Alan P. Biederman, Esq.

Other parties are Neighbors for Healthy Communities[1], represented by Elizabeth M. Tisher, Esq. and Vermont Law School Environmental and Natural Resources Law Clinic students Margaret Galka and John Wadleigh (both granted limited admission on motion), the Natural Resources Board (NRB), represented by Peter J. Gill, Esq., and the Agency of Natural Resources (ANR), represented by Elizabeth Lord, Esq. and Megan O'Toole, Esq.

Procedural History

The District 5 Environmental Commission Coordinator determined in a December 17, 2008 jurisdictional opinion, No. 5-01, that the proposed crushing operation did not require an Act 250 permit. On appeal, this Court agreed that the operation was not subject to Act 250 jurisdiction. In re N.E. Materials Grp. LLC A250 JO #5-21, No. 143-10-12 Vtec, slip op. at 14–15 (Vt. Super. Ct. Envtl. Div. Apr. 28, 2014) (Walsh, J.). That decision was then reversed and remanded for further findings by the Vermont Supreme Court. In re N.E. Materials Grp. LLC Act 250 JO #5-21, 2015 VT 79, ¶ 35, 199 Vt. 577.

[1] The neighbors are Lori Bernier, Marc Bernier, Russell Austin, Pamela Austin, Melyssa Danilowicz, Padraic Smith, Suzanne Smith, Suzanne Bennett, Gustave Osterberg, Julie Barre, and Rock Pariseau (together, Neighbors).

On remand the parties declined to reopen the evidence and we again concluded that an Act 250 permit was not needed. N.E. Materials Grp. LLC A250 JO #5-21, No. 143-10-12 Vtec at 20–21 (Dec. 23, 2015). The Supreme Court reversed and determined that NEMG requires an Act 250 permit to operate the crusher at its current location. In re N. E. Materials Grp. LLC Act 250 JO # 5-21, 2016 VT 87, 202 Vt. 588. NEMG filed an application for an Act 250 permit with the District 5 Environmental Commission which concluded in a June 14, 2017 decision that the project complied with all Act 250 criteria except Criterion 1 with respect to air pollution, and Criterion 8 with respect to noise and dust. NEMG appealed the District Commission's decision to this Court.

The Court held a bench trial from January 9–12, 2018 at the Vermont Superior Court, Civil Division, Washington Unit in Montpelier, Vermont. No site visit was conducted. Based upon the evidence presented at trial, the Court renders the following Findings of Fact and Conclusions of Law.

Findings of Fact

At trial, the parties stipulated and agreed that the Court may find certain facts numbered 1 through 49 filed with the Court as an executed stipulation. We have incorporated these facts; however, they have been renumbered and relocated within the Court's following factual findings. Additionally, at times, the Court supplemented the stipulated facts with additional detail.

General Findings

Quarrying and Crushing Activity Generally

1. Granite quarrying is a process of cutting and extracting large blocks of stone for sale or to be further processed into monuments or other industrial products and then sold. The large blocks of granite suitable for monuments and similar uses are referred to as "dimension stone."

2. Quarrying activity moves deeper into the earth over time. Typically, higher quality material is found the deeper one mines a quarry.

3. The depth of a quarry is limited by the ability of derricks to lift the blocks out of the quarry or by the horizontal acreage available to build roads down into the quarry.

4. At the inception of a quarry, the overburden soil and rock are removed to expose the underlying granite. The granite closest to the surface is called "bedding" and is typically

unsuitable for sale or use as dimension stone. It is typical for ROA to need to remove 80 to 200 feet of bedding to reach suitable dimension stone. Removal of overburden soil and bedding is referred to as quarry "development." Development is expensive and produces considerable volumes of soil and stone which is either trucked off-site or piled on-site.

5. This overburdened soil is waste material unless the rock component is crushed into a usable and salable product.

6. Up to 80 percent of quarry material is waste.

7. "Grout" is waste granite which is not suitable for high-end dimension stone.

8. Crushing makes use of the waste from development material, including grout, by reducing the material to usable and salable sizes.

9. Crushing entails drilling, blasting, removing, and transporting rock to the crusher equipment. While many of today's crushing operations use portable equipment, material is typically moved from the extraction area to the crusher.

The Quarry Site

10. ROA corporation is a quarrying operation comprised of several smaller individual quarries adjacent to one another and aligned in a roughly north–south configuration.

11. These quarries are now all aggregated as a single parcel under ROA ownership and operation. The operation is comprised of approximately 930 acres in Barre, Vermont and 230 acres in Williamstown, Vermont.

12. Several roads transect the ROA property, including Graniteville Road. Roads also connect work areas throughout the ROA property.

13. The operation of individual quarries has occurred on the site for over 100 years. Some of the historic individual quarries were previously owned and operated by the Boutwell, Milne & Varnum Corporation, the E.L. Smith & Company, the Wetmore & Morse Granite Company, and the Wells-Lamson Quarry Company.

14. Three sites, including the Smith Quarry and the former Wells-Lamson crusher site, are located north of Graniteville Road. Two quarrying sites, including the Adams Quarry, are located south of Graniteville Road.

15. Also located south of Graniteville Road are the ROA rock processing and storage yard, a previously permitted hot mix plant owned by NEMG, and the NEMG crushing operation at issue in this appeal.[2]

Graniteville

16. Graniteville is a small village in the Town of Barre, Vermont. It is comprised of Upper Graniteville and Lower Graniteville. Upper Graniteville is located uphill from, and to the southeast of the site of, NEMG's proposed crushing operation. Lower Graniteville is located downhill from, and to the northwest of, the crusher site.

17. Graniteville Road passes through both Upper and Lower Graniteville. Graniteville Road is officially designated as a Truck Route by the Town of Barre from the ROA access and leading through Lower Graniteville (i.e. turning left onto Graniteville Road when leaving the ROA access).

18. Upper and Lower Graniteville each contain a dense cluster of residences. Upper Graniteville contains a playground and church, and Lower Graniteville contains a general store, church, post office, playground, and school bus stop.

19. The Barre Town Forest is located to the north of Graniteville Road. The Town Forest contains an extensive network of trails and is a regional destination for biking, hiking, skiing, snow-shoeing, and other recreational activities.

Neighbors

20. Lori and Marc Bernier live at 11 Park Street. Their house is approximately 3000 feet from the crusher site. Marc and Lori moved into their current home in 1993. Prior to that, they lived with Lori's mother, Suzanne Bennett, at 5 Park Street.

21. Lori has lived on Park Street in Graniteville for more than 55 years.

22. Padraic and Suzanne Smith live at 2 Pearl Street. Their house is located approximately 2107 feet from the crusher site. They have lived in their home since 1989.

23. Alice Cloud has lived at 743 Graniteville Road since 1992. Her house is adjacent to the ROA quarry access road.

[2] The Act 250 permit for the hot mix plant was litigated in a separate docket. See In re N.E. Materials Group Amended A250 Permit, No. 35-3-13 Vtec (Vt. Super. Ct. Envtl. Div. Apr. 18, 2016) (Walsh, J.).

24. Pamela and Russell Austin live at 735 Graniteville Road. The house is approximately 1325 feet from the crusher site. Pamela Austin has lived on Graniteville Road since 1982. Before that, she lived two houses down on Graniteville Road since 1969.

25. Lee Larson has lived at 737 Graniteville Road since 1982. Her house is situated between Alice Cloud's and Pamela and Russell Austin's.

26. Rock Pariseau lives at 696 Graniteville Road. His house is located approximately 1700 feet from the crusher site.

27. Melyssa Danilowicz lives at 856 Graniteville Road. Her house is located approximately 2695 feet from the crusher site.

28. Suzanne Bennett lives at 5 Park Street. Her house is located approximately 2977 feet from the crusher site. She has lived in her current home since 1961.

29. Gustave Osterberg lives at 769 Pirie Road. His house is located approximately 1500 feet from the crusher site.

30. Julie Barre lives at 38 Cogswell Street. Her house is located approximately 2721 feet from the crusher site.

The Proposed Crushing Operation

31. The crushing operation began running in 2009 after the December 17, 2008 jurisdictional opinion determined that no Act 250 permit was required.

32. In 2011, NEMG crushed on 53 days. In 2012, NEMG crushed on 83 days, and in 2013, NEMG crushed on 43 days.

33. On February 19, 2014, the Appellants received an Air Pollution Control Permit to Construct for the crushing operation from ANR (the Air Pollution Permit). The Air Pollution Permit included a condition requiring the installation of wet suppression controls, and their operation as necessary.

34. Material is often trucked from the crushing operation even when the crusher plant is not operating. Trucks transported material from the crusher operation on 226 days in 2012, 220 days in 2013, 188 days in 2014, 215 days in 2015, and 202 days in 2016.

35. The operation ceased in August 2016 after the Supreme Court held that an Act 250 permit is required. The crushing operation ran for two days in December 2016 to perform sound testing.

36. Applicants submitted an Act 250 application for the crushing operation on September 30, 2016.

37. The proposed crushing operation is situated between the Smith and Adam quarries, close to the ROA rock processing at the stone trimming and cutting yard, inventory storage and loading area, the operating Adams stone quarry, and the hot mix asphalt plant.

38. The crushing plant has one jaw crusher, two secondary/tertiary cone crushers, one secondary/tertiary impact crusher, and related screeners, feeders, and conveyors.

39. The plant uses two loaders, one haul truck, two excavators, and a rock hammer. The rock hammer would be used only when the crushing plant is not operating. The primary crusher breaks large material into smaller pieces that fit into the jaw crusher.

40. After rock is crushed in the primary crusher, the secondary and tertiary crushers reduce the rock further in size. The crushed rock is then moved from the crusher to screens that sort the crushed rock by size. The sorted crushed rock is stockpiled on site for pickup by customers.

41. NEMG does not own transport trucks. Material is transported off-site by customer-owned trucks. NEMG owns one truck that hauls grout.

42. Some crushed rock from the proposed crusher will be trucked to a hot mix asphalt plant located on ROA property via internal quarry roads.

43. Most trucks entering the site to load crushed material, also called aggregate, for transport off site will enter from Lower Graniteville by coming up Graniteville Road, turning right onto the ROA access road and passing by properties owned by Padraic Smith, Pamela and Russell Austin, Lee Larson, and Alice Cloud.

44. Trucks will then exit via one of three routes. First, trucks will go out the access road and turn left on Graniteville Road towards Lower Graniteville. Second, trucks will exit via Pirie Road, without using the access road. Finally, trucks will go out the access road and turn right on Graniteville Road passing properties owned by Lori and Mark Bernier, Suzanne Bennet, and Melyssa Danilowicz.

45. The proposed hours of operation are "6AM – 4PM Monday through Saturday (Rock of Ages operational hours) with a maximum of 20 Saturdays per year – crusher primarily operates April 1 – December 15 – trucks may transport aggregate from the site year round."

46. The application proposes a maximum stone production of 250,000 tons per year.

47. The application proposes a maximum of 150 off-site truck trips by loaded customer trucks per day, with an average over the year of 60 per day. The application limits loaded customer trucks using Quarry Hill Road "until Quarry St/Route 14 intersection signalization project is completed by VTrans" to 70 per day. In addition, the application proposes that "exceedances of the above may occur with permission of the District Coordinator."

48. At trial, Applicant agreed to reduce the maximum number of off-site truck trips by loaded customer trucks to 100 per day, with an average over the year of 60 per day.

Criterion 1: Air Pollution

The Air Pollution Control Permit

49. The Project is a Minor Air Pollution Source under the Vermont Air Pollution Control Regulations.

50. The Project's 2014 Air Pollution Permit is intended to ensure that the crusher operation will comply with the Vermont Air Quality Standards and will not cause undue air pollution.

51. The Air Pollution Permit limits the operation to 250,000 tons of aggregate throughput and 47,000 gallons of fuel consumption per year. The assumptions in the permit are based on the operation's maximum capacity.

52. The Air Pollution Permit limits air contaminant emissions as follows: 2.6 tons per year of particulate matter and particulate matter of 10 micrometers in size or smaller (PM/PM_{10}); <0.1 tons per year sulfur dioxide (SO_2); 4.6 tons per year oxides of nitrogen measured as NO_2 equivalent (NO_x); 2.5 tons per year carbon monoxide (CO); <0.1 tons per year volatile organic compounds (VOCs); <10/25 tons per year hazardous air pollutants (HAPs).

53. The Air Pollution Permit explains that, because the combined emissions of PM/PM_{10}, SO_2, NO_x, CO, and VOCs is less than 10 tons / year, federal air pollution control regulations do not require the crushing operation to obtain a Permit to Operate.

54. The Air Pollution Permit conditions include the following:

> (2) At a minimum, the Permittee shall install wet suppression controls at the following locations, or use equivalent control measures as approved by the Agency: All crusher inlet or discharge points; all conveyor to conveyor transfer points unless the transfer point is fully enclosed sufficient to prevent emissions in excess of those allowed under this permit; all screen deck inlet points unless the screen decks have screen deck covers sufficient to prevent emissions in excess of those allowed under this permit or the screens are wash screens, and;

all transfer points on conveyors leading to dry drop piles. The Permittee shall operate said controls as necessary and shall take whatever other means are necessary to prevent visible emissions in excess of those allowed under this permit. The water control system shall be maintained in good working order with sufficient water pressure and flow rates to achieve optimum dust control efficiency.

(3) The Agency may require the installation and operation of additional water control points on the crushing Crusher or other dust control measures based on Agency inspections of the actual operations at this facility.

. . .

(15) Fugitive Emissions: The Permittee shall take reasonable precautions at all times to control and minimize emissions of fugitive particulate matter from the operations at the facility. Reasonable precautions to be taken shall include, but may not be limited to, the following measures or other equally effective measures:

a) The unpaved traffic and parking areas at the facility shall be maintained by the application of water and/or generally accepted chemical treatments, such as calcium chloride unless otherwise restricted, which are applied at a rate and frequency to effectively limit visible dust emissions;

b) The paved traffic and parking areas at the facility shall be periodically maintained as necessary to prevent build up of material that may generate fugitive dust emissions. Sweeping shall be performed in a manner to minimize fugitive dust air emissions, and may include lightly wetting the paved surface immediately before sweeping, or preferably by the use of a vacuum, regenerative or high efficiency sweeper;

c) All trucks owned, operated or under the control of the Permittee shall be securely covered when operated on public roadways when loaded with materials that may generate fugitive dust

. . .

(16) Nuisance and Odor: The Permittee shall not discharge, cause, suffer, allow or permit from any source whatsoever such quantities of air contaminants or other materials which will cause injury, detriment, nuisance or annoyance to any considerable number of people or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which causes or has a natural tendency to cause injury or damage to business or property. The Permittee shall not discharge, cause, suffer, allow or permit any emissions of objectionable odors beyond the property line of the premises.

Testimony of John Hinckley

55. NEMG's expert witness with respect to air pollution, dust, and particulate matter is John Hinckley, Q.E.P., of Resource Systems Group, Inc. (RSG). Mr. Hinckley has education and training in air pollution control and the assessment and designing of industrial and commercial projects with relevant air pollution control measures.

56. Mr. Hinckley has extensive knowledge and experience with respect to Vermont Air Pollution Control Permits, the Vermont Ambient Air Quality Standards (VAAQS), regulations and practices of the Vermont Agency of Natural Resources with respect to Air Pollution Control, Federal Clean Air Act statutes, and regulations including the National Ambient Air Quality Standards (NAAQS). He is experienced and knowledgeable about particulate matter, the pollutant primarily at issue in this case under the VAAQS and NAAQS (which regulates PM 2.5 and PM_{10}) and silica ambient air levels under the VAAQS.

57. Mr. Hinckley has been trained and certified in United States Environmental Protection Agency (EPA) testing for visual opacity using the Method 9 test required for EPA testing for particulate matter under 40 CFR Parts 60, 61, and 62, and specifically in 40 CFR 60.675(b)(2), in which Method 9 is described in Appendix A-4 to 40 CFR 60.675. The interplay of the Project and Method 9 is discussed further below.

58. Mr. Hinckley is further trained in and has extensive experience modeling air pollution with AERMOD modeling software. AERMOD modeling is approved by the EPA as its preferred air quality modeling method. See, Final Rule amending 40 CFR Part 51 "This action includes enhancements to the formulation and application of the EPA 's preferred near-field dispersion modeling system... " [referring to AERMOD] Fed. Reg. vol 82, No. 10, Page 5182 January 17, 2017.

59. In addition to his general air pollution experience and training, Mr. Hinckley has extensive hands-on experience with the equipment used at the Project. Mr. Hinckley prepared and filed the application for the Air Pollution Permit granted to the Project, did the estimates of emissions and other analyses that were submitted with the Air Pollution Permit applications, and personally examined the equipment associated with the Project. While the Project was operating, and during a test operation in December 2016, Mr. Hinckley has repeatedly observed the equipment in operation, including the test conditions where all equipment components

were operated simultaneously. Mr. Hinckley has also personally examined and monitored the wet suppression equipment on the Project machinery. Testimony of John Hinckley.

60. While not required by any state or federal regulation, in connection with the Act 250 proceeding now pending before the Court, NEMG engaged Mr. Hinckley to perform AERMOD air emissions modeling for the Project. That modeling was relied upon and described to the Court by Mr. Hinckley. Some aspects of the data from that modeling is also before the Court. Id.

61. The AERMOD modeling not only modeled air emissions from the Project alone, but also included and described the cumulative air pollutant emissions from all industrial activities in the crusher vicinity including activities at the Project itself, at numerous ROA operations in the area, including major internal haul roads, and the NEMG hot mix plant, as well as a section of Graniteville Road. Testimony of John Hinckley; Exhibits 12-26 AERMOD Calculation Worksheets.

62. The modeling assumed that all the operations being modeled were operating at maximum capacity and all at the same time. This is a true demonstration of "worst possible case" modeling and is an assumption least favorable to NEMG. Id.

63. The AERMOD model results indicate that emissions, including particulate matter and silica, produced cumulatively by all the above sources are well within the VAAQS and NAAQS for particulate matter at all off-site locations, including the properties of all the Neighbor Appellees and the Town Forest. Testimony of John Hinckley; Ex. 43-46, AERMOD Results.

64. The EPA utilizes a method for calculating air emissions likely to be generated from industrial sources called AP-42. AP-42 provides a method to compile air pollution emissions factors. Emission factors are “representative value[s] that attempt[] to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant." Ex. D (AP-42 Introduction). For example, the AP-42 assigns an emission factor to each individual piece of equipment used in a rock-crushing operation. By adding up the emission factors for each piece of equipment, one can estimate the amount of pollution caused by the whole operation.

65. Different data are adjudged by EPA in AP-42 to be of better or lesser quality. Emission factors are rated for reliability on a scale from A to E, with A being the highest rated (Excellent) and E being the lowest rated (Poor). Generally, those factors based on a larger number of

observations and more reliable tests are assigned higher ratings, whereas factors based on fewer observations or that are extrapolated from other factors are typically rated lower. Ex. D.

66. AP-42 applies to numerous industries including mineral processing. AP-42 Chapter 11; Testimony of John Hinckley.

67. AP-42 provides the investigator with data concerning emissions from various stages of rock crushing. Mr. Hinckley relied upon certain AP-42 data information in creating his AERMOD model. Id.

68. Certain aspects of the data relied upon had specific ratings of E (Poor) although the final rating of the quality of such data was C (Average). Id.

69. Mr. Hinckley personally reviewed all of the data and their respective reliability ratings and concluded that they were sufficiently reliable to use in his model. In particular, he noted that some of the "Poor" quality ratings were based on the scarcity of data considered by EPA. When he reviewed the quality of such scarce data, he determined that the actual testing done was considered reliable. There just were not many tests done, which EPA cautioned makes the data lower rated. Mr. Hinckley further opined that if the data were unreliable, EPA would say so, rather than including the data in AP-42 as guidance for air pollution experts and professionals. Mr. Hinckley also indicated, and the Court finds credible, that many AP-42 models and estimates rely on data rated D (Below Average) or E. He further opined that within the field of air pollution, such data is considered reliable, although the professional must use their professional judgment when determining the use of such data and all other data. Id.

70. The Court finds Mr. Hinckley's explanation of AP-42 and modeling helpful, reasonable, credible, and based on science that guides air pollution professionals, including government agencies and the EPA. The Court finds that Mr. Hinckley's model and expert opinion are valid and persuasive evidence that undue air pollution will not result from the Project even when taken cumulatively with all other air pollution sources in the area.

71. Mr. Hinckley noted that the Crusher is allowed to produce some dust without violating the VAAQS or its Air Pollution Permit. Ex. 37 Air Pollution Permit, Conditions 11-13; Testimony of John Hinckley.

72. Mr. Hinckley supports the use of wet suppression at the Project as required by the Air Pollution Permit. Wet suppression is the "best practice" method for reducing such dust to non-problematic levels. Testimony of John Hinckley.

73. NEMG has paved the first 500 feet of the Project access road and uses water application by a sprinkler system and sweeping on the road to reduce dust from trucks accessing Graniteville Road from the Crusher site. Applicants also maintain a water truck on site to water down the Crusher yard on days when dust from equipment movement is problematic. Testimony of John Hinckley.

74. As noted above, the best and generally accepted test of whether particulate matter is being emitted by the Project is the visual opacity methodology known as Method 9. See Citations to 40 CFR above. Notably, the Air Pollution Permit requires use of Method 9 opacity testing and other testing. Air Pollution Control Permit, Ex. 37, at Condition 17.

75. The Project was tested by Model 9 opacity testing in 2013, 2015 and 2016. Exhibits 5, 30–32 present the results of those tests, all of which the Crusher has passed. Additionally, efficiency estimates show that wet suppression eliminates 89% of silica dust from the Crusher emissions. Ex. 47. Therefore, 11% (100% - 89%) of the remaining dust emissions are emitted to ambient air. Approximately half of the dust particles produced by the Crusher are respirable. Ex. 27. Therefore, half of the 11% emitted (the particles not captured by wet suppression), or 5.5% of the total emissions, is respirable at the site of the Crusher. Silica constitutes 23.3% (roughly one quarter) of the particles emitted.

76. No particular training is required to perform wet suppression. However, Mr. Hinckley suggests that the supervisory personnel at NEMG's site be trained in Method 9 testing. That would permit a test if and when visible dust of any significance was seen at the Project and would encourage application of additional wet suppression when needed.

Neighbors' and Linden Witherell testimony.

77. Neighbors testified that the crushing operation and associated truck traffic generate silica dust, which enters their homes, interferes with their use and enjoyment of their properties, and prevents them from enjoying outdoor activities around Graniteville. Neighbors supported their testimony with photographs and videos of dust at the crusher site, dust blowing off-site, and trucks kicking up dust along Graniteville Road.

78. Many (but not all) of the neighbors testified that while there was dust at their homes before, after NEMG began crushing the quality and quantity of dust became worse.

79. The Court finds these photographs and videos to be of limited utility in determining whether the Project complies with air pollution regulations. The photos and videos are snapshots in time, or brief moments on video. Many of them are modified by magnification, and therefore difficult to put into perspective. Some were taken when the project was not operating, and in many it is not possible to distinguish the source of visible airborne dust (i.e. whether the dust was produced by the crushing operation proposed here).

80. Some Neighbors who live along the truck route also testified to smelling diesel emissions in their homes and along Graniteville Road.

81. Neighbors also offered Mr. Linden Witherell as an air expert. Mr. Witherell's testimony focused on the public health impacts of silica dust and diesel emissions. He explained that the location of the crushing operation, coupled with the topography of the area, allows for the airborne silica particles to travel off site to neighboring residences. He testified that the Air Pollution Permit does not address the cumulative impacts of silica emissions, and that there is no information on the quantity of silica dust residents of Graniteville are actually breathing in. He also offered that wet suppression, which is required by the Air Pollution Permit, is not an effective dust control mechanism because particles become re-suspended by trucks or other machinery driving over the site.

82. Mr. Witherell offered testimony about silicosis, a disease involving scarring of the lung tissue caused by the long-term inhalation of silica particles. He admitted, however, that there are currently no available studies on whether silica particles from a quarry or rock-crushing operations have any negative health impact, or any negative health impact, on surrounding populations.

Criterion 8: Aesthetics

Zoning and Town Plan

83. The location of the Crusher is designated as "Earth Extraction/Industrial" under both the Barre Town Plan and the Barre Zoning Regulations.

84. Neighbors live in an area zoned residential under the Barre Town Plan and the Barre Zoning Regulations.

85. The Barre Town Plan provides as a land use goal: "Consider requiring all industrial uses to be reviewed as conditional uses to help mitigate potential conflict between them and residential uses." Barre Town Plan, § 2.10.

86. The Barre Town Plan provides that the purpose of the industrial and earth resource extraction designations is to "recognize significant existing patterns with regard to granite quarrying and the extraction of gravel. Barre Town's foundation sits on granite and the importance of that resource is significant. Residential development patterns have, to a large degree, been created because of the granite industry. . . . Industry is important to any community's economic development and it is important to find a balance between land uses given the proximity of industrial land (including earth resource extraction) and highly dense residential areas. Utilizing the conditional use process is a good way to help mitigate concerns." Id. at § 2.3.

87. Neighbors described Graniteville as a close-knit, friendly, and peaceful residential community, surrounded by natural areas and wildlife, and a great, safe place to raise a family. Upper and Lower Graniteville were focal points of the community and gathering places for residents. Generations of families have remained in Graniteville or returned to Graniteville to enjoy the peaceful environment.

Recent Historical Crushing at ROA

88. From July 1990 to November 1990 McCullough Crushing removed more than 55,000 tons of crushed granite from the Adams quarry.

89. McCullough Crushing's equipment included a jaw crusher, a cone crusher, a conveyor, and a screen. This equipment is similar to NEMG's current crushing equipment.

90. During the 1990s, McCullough's crushing took place in a similar area to NEMG's current location. This activity included similar truck traffic.

91. In 1992 and 1993, Pike Industries, a crushing subcontractor, primarily crushed rock at the northern Wells-Lamson parcel (off-site), but also crushed 18,118 tons of rock on the current NEMG site.

Project Operations

92. The Project is located within the 100-year-old ROA quarry and immediately adjacent to an active granite quarry hole, permitted hot mix plant, a rock cutting and shaping yard, a block

storage and inventory area, compressor house, numerous active quarry haul roads and related heavy equipment, blasting and truck operations.

93. The ROA quarry and its related industrial operations overwhelmingly define the acoustical and dust-related aesthetic context of the area and of Upper and Lower Graniteville in general. Ex. 1, Act 250 Application; Ex. 4 - 5 Aerial Photos; Trial Testimony.

94. Existing industrial operations at ROA, unrelated to the crushing operation proposed here, already cause noise, dust and off-site truck traffic on Graniteville Road during ROA business hours. The Project proposes to operate during those hours but will limit Saturday operations to 20 Saturdays per year.

95. Crushed material is typically transported off-site in dump trucks from its current location. Dimension stone is typically transported on flatbed tractor trailer trucks. ROA's dimension stone operations also use dump trucks.

96. ROA's dimension stone quarrying activities create noise, dust, and truck traffic.

97. Neighbors in the area of the crushing site experienced noise, dust, and traffic. Common noises are material being loaded or unloaded. Dust accumulated on house windows, outside furniture, lawns, and cars. When traveling on area roads, it is common to encounter dump trucks on Graniteville Road traveling to or from the crushing activity.

A. Dust

98. Neighbors expressed general concerns regarding the aesthetic impact from dust at the Project, including both dust from the Crusher itself and the dust from trucks exiting the Project site and proceeding through Lower Graniteville. The Neighbors provided various photographic and video exhibits of dust in support of their testimony. Opponent Testimony and Exhibits. Neighbors generally testified that the dust effected their enjoyment of their properties. Id.

99. Mr. and Ms. Bernier and Ms. Bennett testified that dust accumulated both outside and inside their respective homes. Testimony of Marc Bernier, Lori Bernier, and Bennett.

100. Mr. Smith, Ms. Danilowicz, and Ms. Austin testified that dust accumulated on the outside areas of their respective properties. Testimony of Smith, Danilowicz, and Austin.

101. Mr. and Ms. Bernier, Ms. Danilowicz, and Ms. Austin testified that trucks from the crusher cause further dust accumulation. Testimony of Marc Bernier, Lori Bernier, Danilowicz, and Austin.

102. Mr. Bernier also testified that he can see dust from his home through the trees, when the leaves have fallen. Testimony of Marc Bernier.

103. Lee Larson and Alice Cloud, the two closest neighbors to the Crusher, testified that they do not find dust from the Crusher or from trucks exiting onto Graniteville Road to be annoying or obtrusive. Ms. Larson, who is retired and spends significant amounts of time outdoors and gardening at her home in the summertime, testified that she did not even know that the NEMG Crusher had been established at the ROA property until objections were raised by the more distant neighbors in this case. Testimony of Larson and Cloud.

104. The Air Pollution Permit includes the following specific mitigation measures as dust control at the Project:

a. Use of wet suppression at all aggregate transfer points in the Crusher mechanism;
b. the paving of the first 500 feet of the Project access road;
c. the continued use of a sweeper on the Project road to remove excess dirt and mud as needed;
d. the continued use of an automatic sprinkler system to keep the paved section of the access road watered down during dry periods;
e. Method 9 opacity testing of the Crusher to ensure that problematic quantities of dust are not being produced; and
f. the use of a water truck to control dust on adjacent haul roads.

105. The Barre Town Plan in effect on September 30, 2016 does not contain any clear written dust-related community aesthetic standards. No party called the Court's attention to any other clear written aesthetic standard with respect to dust effective in the Town of Barre which the Project would violate. Ex. 82, Barre Town Plan.

B. Noise

106. NEMG presented expert testimony and evidence with respect to noise from Eddie Duncan. Mr. Duncan is a Board-Certified Noise Control Engineer from RSG with a Bachelors degree in Engineering Science and a Masters in Environmental Studies. Ex. 51, Eddie Duncan Resume.

107. Mr. Duncan has done sound models for over 100 projects. His employer, RSG, conducts follow up studies for much of its sound modeling as Quality Assurance/Quality Control (QA/QC) of their sound modeling work. This follow up is done by comparing actual sound monitoring

data collected after a project is completed and comparing it to the predicted sound levels described in modeling done before construction of the project. Testimony of Eddie Duncan.

108. Mr. Duncan conducted detailed two-day sound monitoring with respect to the Crusher while it was operating during an approved sound test in December 2016 (hereinafter, the Sound Study). This included measurement of background noise levels in the Project vicinity and monitoring of the actual Crusher noise and its related equipment and operations over the two-day period. He then modeled the impact of that noise on the surrounding area. The Sound Study used the actual sound from Crusher and related equipment in its analysis, rather than a generic sound source. Testimony of Eddie Duncan; Ex. 53 - 63, Sound Monitoring Results.

109. Mr. Duncan then modeled a worst-case noise scenario, that is, assuming that the Crusher, all of the related equipment and the NEMG hot mix plant were operating at their maximum levels simultaneously on the site. This is a scenario that is not likely to occur in real world operation. Testimony of Eddie Duncan.

110. When designing and modeling the Project, Mr. Duncan considered methods to mitigate the noise from the Project, including numerous scenarios utilizing many potential methods of mitigation.

111. The model submitted to the Court incorporates the following noise mitigation measures, which NEMG requests be imposed as conditions of Project approval:

a. The construction and maintenance of two aggregate stockpile berms 15.5 and 13 in height in the locations depicted on the scaled map submitted as Exhibit 65.
b. Installation of sound barrier blankets on the primary crusher and the primary screener as described on Exhibit 65, 74 and Exhibit 77 and as depicted on Exhibits 66 - 73.
c. The installation of a rubber screen deck on the primary screener.
d. Installation of broad band back-up alarms on all NEMG onsite mobile equipment.
e. Limiting the use of the freestanding rock hammer to periods when the main Crusher plant is not operating as described in Exhibit 65.
f. Limitation of Crusher equipment and off-site truck operations to the normal Rock of Ages business hours recited elsewhere herein.

Ex. 65, NEMG Crusher-Noise Mitigation; Testimony of Eddie Duncan.

112. In performing its sound modeling, RSG used the ISO 9613-2 Sound Standard, which is an internationally recognized standard for modeling noise impacts from sound sources and is

commonly used by noise control professionals to predict noise from industrial operations. The methodology is implemented using the CADNA A computer model, which has been relied upon in innumerable cases for this purpose by District Commissions, the former Environmental Board and the Environmental Division. The model considers surrounding terrain, vegetation, topography on the site and similar factors which can influence sound propagation. Id.

113. The purpose of a proper sound model is to predict what the actual noise impacts from the Project would be on the surrounding area under worst-case circumstances. Id.

114. When Mr. Duncan compared preliminary results of the sound model to actual results of monitoring, he found that the predicted results from the model disagreed with the actual monitoring results obtained. This is not uncommon. Just as the actual equipment noise levels when measured may differ from more general data respecting types of equipment, it is preferable to make certain adjustments in the model to conform to actual data. Mr. Duncan did this. This is appropriate when one has both actual monitoring data from a site and theoretical data from modeling the same site. This calls for application of sound professional judgment. Otherwise, while one may have a perfect model as a theoretical exercise in modeling, that model does not reflect actual noise produced from the site. Mr. Duncan made appropriate adjustments to utilize both monitoring data and modeling. Id.

115. The former Environmental Board in In re Barre Granite Quarries, No. 7C1079 (Rev.)-EB (Dec. 8, 2000) designated a general standard for on-site noise which satisfies aesthetic concerns under Criterion 8 for commercial and industrial projects (the "Barre Granite standard"). Under the Barre Granite standard, on-site noise from a prospective project under normal circumstances should not exceed 55 dBA Lmax at homes and areas of frequent human use, or 70 dBA Lmax at the property line. The Vermont Supreme Court and the Environmental Division have held that the Barre Granite standard is to be applied flexibly and may be departed from depending on the acoustical context of the project area. In re Lathrop Ltd. P'ship I, 2015 VT 49, ¶¶ 81–82, 199 Vt. 19.

Noise from the Crushing Operation, Excluding Off-site Trucking

116. RSG's sound model showed that noise from the on-site crushing operations did not exceed 55 dBA Lmax under worst-possible case conditions at homes and areas of frequent human use or 70 dBA at the property line. Ex. 77, Noise Assessment Summary; Ex. 76, Model

Results Summary Areas of Frequent Human Use. RSG specifically prepared a summary of the noise levels from the Project at all the Appellees' homes. All of these levels are below the Barre Granite noise standard even when the Crusher and the hot mix plant are operating simultaneously. Testimony of Eddie Duncan; Ex. 75, Model Results Summary Appellees Homes.

117. At the Bernier, Bennett, Danilowicz, Barre, Austin, Pariseau, Smith, and Osterberg residences, sound modeling, from crushing operation only, recorded a range of 38 to 52 dBA Lmax. From crushing operations and asphalt operations, sound model results at these residences ranged from 40 to 52 dBA Lmax. Finally, from rock hammer and asphalt operations, results at these residences ranged from 39 to 51 dBA Lmax. Id.

118. In multiple QA/QC follow up studies performed with respect to Mr. Duncan's modeling, the actual sound monitoring done after the Project was built confirmed the accuracy of Mr. Duncan's pre-construction modeling methods. Post-construction sound monitoring by RSG of projects modeled pre-construction by RSG shows that the modeling approach used by RSG and by Mr. Duncan typically over-predicts noise impacts, that is, the noise impacts ultimately experienced in modeled area are typically less than what the RSG sound model predicted. Id.

119. Mr. Duncan's results were challenged by Neighbors' noise expert, Les Blomberg of the Noise Pollution Clearinghouse in Montpelier. Mr. Blomberg has a Bachelors degree in Philosophy and Mathematics and a Masters degree in Environmental Philosophy. He has worked in the area of noise for 20 years. Testimony of Blomberg.

120. Mr. Blomberg opined that Mr. Duncan's model relies on incorrect assumptions, and the noise levels that it predicts will therefore be inaccurate.

121. Mr. Blomberg did not measure noise from the crushing operation during the two-day sound test. Instead, his assumptions are entirely reliant upon Mr. Duncan's sound level inputs. Mr. Blomberg used these inputs despite appear to question their accuracy. However, there was no evidence or basis provided to support the suggestion that Mr. Duncan's inputs were either inaccurate or flawed in anyway. Blomberg Cross-examination.

122. Mr. Blomberg modified several of the model parameters that Mr. Duncan had used in his model to create what he opined is a more accurate representation of the proposed project's noise. Id.

123. Mr. Blomberg eliminated the noise-reducing impacts that Mr. Duncan's model assumed would result from foliage because the Project operating year continues in autumn to periods when there are no leaves on the trees. This changed the results of Mr. Duncan's model by fractionally increasing the dBA max level. Mr. Blomberg conceded that when significant figures are considered, results ought not be expressed beyond integers as several inputs were expressed only as integers with no decimal places. Mr. Blomberg considered this to be meaningless because of the 3 dBA accuracy rate in the model discussed below. Id.

124. Mr. Blomberg raised the level of the sound receptors used in the model from 1.5 meters to 4 meters. He examined the houses in the neighborhood and determined that many had windows on the second floor. He conceded that when inside a residence, sound is attenuated by the house structure. However, the receptors he posited are positioned outside of the structure without any attenuation by the house structure. He conceded that there is in fact attenuation below the levels he used. Id.

125. Mr. Blomberg also changed the model with respect to a pond area to be highly sound reflective as described by the ISO standard. Mr. Duncan agreed that the ISO standard presents the pond as sound reflective. However, when Mr. Duncan ran the model with the pond as highly sound reflective, the result differed significantly from the actual sound levels recorded and measured over the two-day period. As described above, when this happens there are modifications sound professionals make to the model to reflect real world data that has been actually measured. Mr. Duncan concurred that in a pure modeling exercise, Mr. Blomberg's approach with respect to the pond is correct. However, to obtain a real-world estimate of actual sound levels at the Project, Mr. Duncan's modification to conform to known data is the correct approach.

126. Mr. Blomberg further added 3 dBA to every result he obtained in his model run. The ISO standard notes that results generated by the ISO standard have a +/- 3 dBA accuracy factor. Mr. Blomberg therefore suggested that it is appropriate to add 3 dBA to every result. However, if ISO intended to apply a +3 dBA level to each value, it would have simply done so and instructed users to do their modeling and then add 3 dBA. As this is a margin of error, it is as likely that a given result will be lower than, rather than higher than, the reported result. Likewise, there is no basis to believe that results might not be 0.1 or 0.2 or 0.3 dBA above or below reported

results for a given receptor location. It is pure speculation to assume that all results are more likely than not to be 3 dBA above the modeled value. The Court rejects this notion.

127. Mr. Blomberg also suggested that the Lmax standard in Barre Granite should be measured using a response value of 1/8 of a second (fast response), rather than Lmax over one second (slow response). He did not have any evidence that the Environmental Board used the fast response approach in Barre Granite. Testimony of Blomberg.

128. The Barre Granite decision contradicts Mr. Blomberg's claim that the applicable standard should be Lmax measured by fast response. The former Environmental Board specifically noted that the sound meter in fact had been set on slow response. See Barre Granite, No. 7C1079 at 43 ("The measurements were taken using a calibrated Bruel and Kjaer 2236 (Type l) sound level meter fitted with a wind screen. The meter was set on slow response.' (emphasis added)).

129. Mr. Blomberg opined that if fast response were used, an increase of 2 to 8 dBA Lmax could be expected. That would effectively alter the Barre Granite standard, which this Court is not inclined to do in this matter.

130. When Mr. Blomberg added all of the above values to Mr. Duncan's model and made all of the above adjustments, multiple residences were over 75 dBA Lmax. He presented this information in the form of numerous exhibits.

131. There are, however, problems with several of the exhibits. On cross examination, Mr. Blomberg conceded that he clearly used two different sets of data from Mr. Duncan. He could not state which of the data sets represented the Project as it is currently proposed. Testimony of Blomberg. The Court cannot know if the data is correct or not as Mr. Blomberg did not know himself. Cross examination of Blomberg.

132. In fact, in Exhibit TT, Mr. Blomberg used data that was later modified to include the mitigation measures now proposed by NEMG through Mr. Duncan. In two small photographs contained in that Exhibit, which Mr. Blomberg testified came to him from Mr. Duncan's data, there appears a small crescent shaped line that is not present in that data. Mr. Blomberg said that he does not know which data correctly represents the current Project.

133. Mr. Blomberg stated that nevertheless his tables in later exhibits were accurate depictions of the data Mr. Duncan used. However, when the Court questioned him, Mr. Blomberg could not state whether the final values were Lmax values or were Leq values, whose

use Barre Granite rejected. Mr. Blomberg testified that he suspected that some values were not Lmax. Testimony of Blomberg.

134. In considering Mr. Blomberg's testimony and exhibits, the Court declines to place significant weight on Mr. Blomberg's evidence, in part because Mr. Blomberg could not even state which unit of measure his results depict. Because Mr. Blomberg himself could not do this, the Court cannot determine that the results are Lmax or Leq results. Further, the Court cannot determine whether Mr. Blomberg considered data from the Project as now proposed with the mitigation factors presented to the Court because Mr. Blomberg could not do so and conceded that he was unsure of which of Mr. Duncan's data he used.

135. Even if these flaws in Mr. Blomberg's testimony did not exist, the Court notes that:

a. Mr. Duncan has more experience with sound modeling than does Mr. Blomberg.
b. Mr. Duncan conducted actual monitoring of the Project and used that monitoring in reaching his conclusions. Mr. Blomberg entirely ignored the real-world monitoring. His reasoning is that the ISO standard should be modeled purely. The approach taken by Mr. Duncan seems more reasonable.
c. Mr. Duncan's prior modeling work and the modeling approach used by RSG has been subjected to QA/QC comparing predicted to actual results. Mr. Blomberg has never done such QA/QC.
d. Several Mr. Blomberg's alterations of the model seem unreasonable including the placement of hypothetical receptors outside second floor windows where, in fact, no person can stand or walk. Likewise, his addition of 3 dBA to every sound result is entirely unpersuasive.

136. Thus, even if Mr. Blomberg had not used incorrect data, and even if he could express all results as Lmax (which he cannot), the Court would find Mr. Duncan's testimony and results more credible and persuasive.

137. Based upon the above and the evidence before the Court, the Court finds as fact that the on-site elements of the proposed crushing operation will not generate noise above 70 dBA Lmax (slow response) at the ROA property line and will not exceed 55 dBA Lmax (slow response) at any residence or place of frequent human use.

138. The Court also finds that NEMG has carefully considered many methods to mitigate

impacts of noise, and that the measures proposed will result in mitigation of noise impacts.

Truck Noise

139. Before the Project started in 2009 and continuing to the present, numerous trucks have travelled up and down the Graniteville Road Truck Route including haul trucks carrying ROA material. It is also well traveled by cars with many hours of the day having overall vehicle travel of more 5 cars per minute. According to Alice Cloud, a neighbor who lives directly on Graniteville Road next to the NEMG access road, there was even more traffic up and down Graniteville Road some years ago before ROA constructed its visitor's center further down Graniteville Road than its prior location. Testimony of Alice Cloud; Testimony of Eddie Duncan.

140. The Project initially sought a maximum of 150 daily off-site loaded truck trips and an average of 60 loaded truck trips per day as averaged over a calendar year. At the close of evidence in this matter, the Appellants reduced those truck trips to a maximum of 100 loaded off-site crushed aggregate trucks per day and an average of 60 loaded off-site crushed aggregate trucks per day averaged over a calendar year.

141. As noted above, some trucks will exit the Project site and turn left onto the Graniteville Road Truck Route toward Lower Graniteville. Some trucks going to local jobs will turn right onto Graniteville Road Toward Upper Graniteville. Some trucks will exit the site through internal quarry roads onto Pirie Road, rather than Graniteville Road. Ex. 1, Act 250 Application, Overview, Testimony of Eddie Duncan and John Hinckley; Stipulated Facts.

142. The focus of testimony at trial was on the effect of noise from off-site truck passes from the Project on houses along the Graniteville Road Truck Route. Trial Testimony.

143. The maximum sound level, the Lmax, from trucks going to and from the Crusher will be the same as the Lmax of the existing trucks from ROA and the approved NEMG hot mix plant which presently use the Graniteville Road Truck Route. That Lmax was estimated by Mr. Duncan to be between 66 and 82 dBA Lmax.

144. This is not a situation where the trucks to be added to the road system will be creating a different or louder noise than existing trucks. Trucks from the Project are similar to trucks from the hot mix plant and from ROA operations. Trucks from the Project will be following the exact same route and acceleration areas as existing trucks; thus, the new Lmax sound levels from new truck passes will be the same as those from existing truck passes. As a result, there

will be no change in instantaneous Lmax sound levels due to the additional truck traffic associated with the Project.

145. The only thing that will change with respect to off-site truck noise as a result of the Project is the frequency of those truck passes during ROA business hours. Testimony of Eddie Duncan.

146. Mr. Duncan performed traffic counts on April 14, 2015 in relation to his modeling. A baseline of traffic, with the asphalt operation but without crushing trucks, results in 179 one-way truck trips. Under the proposed average crushing scenario (60 loaded trucks per day), 299 one-way truck trips would occur. At the maximum crushing scenario (100 loaded trucks per day), 379 one-way truck trips per day would take place.

147. At trial, the Applicants submitted the actual off-site truck trip records from the Crusher prior to its being shut down in August 2016. Those records show that in the four-year period from January 2012 through 2016, the Crusher met or exceeded the maximum number of daily trips requested in this application on a total of 15 days, or approximately 1% of the time. On most days, maximum truck trips were less than half the maximum requested number. On many days, there were less than 20 trucks per day, or two trucks an hour. On some days, no trucks at all were generated by the Crusher. Ex. 81, NEMG Crushing Records.

148. The Court has carefully considered the cumulative noise impacts arising from the fact that the Project will increase the number of tucks on the road, i.e., the number of trucks that pass by a neighbor's residence.

149. To analyze such cumulative impact, Lmax measurements standing alone are only part of the consideration. Lmax only measures sound levels at one very short interval of time. While that level must be considered in comparison to the context of the area, which here includes an existing background level of similar trucks and many cars, the Court has elected to analyze noise impacts associated with increasing the number of truck passes using additional sound levels. The Court has considered the evidence before it and finds it helpful to consider the equivalent sound level, or Leq, in addition to Lmax and in addition to consideration of the testimony of all of the lay witnesses.

150. Leq is a "compilation of successive instantaneous sound measurements." It provides guidance with respect to the noise environment of the area that exists now when the Project is not operating. Testimony of Eddie Duncan.

151. Lmax sound measure is not generally accepted for assessing cumulative noise impacts over longer periods of time. Rather, such impacts are generally measured by Leq 1-hr which measures the weighted sound impact of multiple noise events over a 1-hour period. Testimony of Eddie Duncan.

152. NEMG also modeled traffic noise from the Project based on a Leq 1-hr measure. A one-hour timeframe is an appropriate time period to capture and reflect the impact of additional truck traffic caused by the Project. Testimony of Eddie Duncan. The Court finds that Leq 1-hr information will provide assistance when determining the impacts of truck traffic, considered along with Lmax data, data concerning the frequency of truck trips, neighboring witness testimony, and all other factors.

153. Mr. Duncan found that without the Project, the baseline sound level with existing truck traffic on the road is 61 to 63 dBA Leq 1-hr. With the Project operating at its yearly maximum, the sound level on an average day would be 64 to 65 dBA Leq 1-hr. Under a single day maximum scenario with the Crusher and NEMG hot mix plant producing trucks at their maximum permitted levels of operation, noise levels at area residences would be 66 dBA Leq 1-hr. This results in a 1-4 dBA change across the course of an hour and is a very modest and reasonable increase. Ex. 78, Sound Level Monitoring of Traffic Noise; Ex. 79, Future Sound Levels from On-Road Trucks.

154. The Court is persuaded that the noise context of the area, and of Graniteville Road and roads that adjoin it, is already far from pastoral. While some Neighbors, notably Padraic Smith, consider Graniteville Road to be infrequently traveled, objective vehicle counts demonstrate that this is not the case. It is a well-traveled road. Notably, Mr. Smith testified that he wasn't even aware that crushing was occurring at the ROA site before the recovery period from Hurricane Irene in September through December 2011 and did not notice anything, presumably including the increase in truck traffic, until he learned of the application for the NEMG hot mix plant. Smith Cross-examination.

155. While this Project is not subject to any VTrans review, the Court finds it helpful to look to other sources of information beyond the modeling and trial testimony. One source is the Noise Abatement Policy adopted by VTrans in connection with certain types of road projects. That policy uses the Leq 1-hr measure to assess whether noise from changes in truck traffic in connection with VTrans projects will have an adverse impact on surrounding communities and whether those changes merit noise mitigation consideration. That policy notes that noise abatement should be considered if traffic noise will reach or exceed the noise abatement criteria of 67 dBA (Leq 1 -hr) for the exterior of residences or if there is a substantial noise increase which is defined as a change of 15 dBA above existing levels. Ex. 80, VTrans Noise Abatement Policy.

156. Were this Project subject to VTrans jurisdiction, no noise mitigation under the VTrans Guidelines applicable to highway projects would be required. Ex. 80, VTrans Noise Abatement Policy.

157. Truck noise from the Project will fit into the context of the Graniteville Road Truck Route, surrounding roads in the ROA area and will not shock an average person.

Neighbor's Testimony on Noise

158. As of December 2013, Ms. Bennet experienced noises like stone on metal that were loud enough to wake her up in the morning and that continued until 8:00 or 8:30 at night. These noises started in roughly 2011.

159. Melyssa Danilowicz testified that she works from home but that trucks from the Crusher do not pass by her house unless they have obtained a "variance" from the Town of Barre because her home is not located along the Graniteville Road Truck Route. She testified that in the summer of 2017, she was hearing the same noises which she has heard at the last four or five years coming from the area of the Crusher, even though the Crusher did not operate at all during 2017. She further testified that she cannot tell whether truck noises coming from the Project are from ROA or from NEMG. Danilowicz Cross-examination.

160. Lori Bernier does not reside along the Graniteville Road Truck Route. She testified that she does not work and is home almost all of the time and that she typically stays up until after midnight and gets up after 8:00 AM or later in the morning. She described the noise from the Crusher as being constant even though the Crusher has only operated intermittently over the

last five years. She further testified that there has never been an extended time when the Crusher was not running, even though the Crusher has not operated at the site since 2016. Lori Bernier Cross-examination; Testimony of Don Murray.

161. Ms. Bernier testified that she never noticed any previous crushing at the NEMG site even though crushing with similar equipment and at the same site occurred in the 1990s, and even though Ms. Bernier lived at the same location during that time. Lori Bernier Cross examination; Stipulated Facts.

162. Ms. Bernier presented a recording of a repetitive noise she claimed was coming from the area of the Crusher. However, the noise on the video lasted less than two minutes. From footsteps and other background sound, the volume of that recording clearly did not depict sound levels that actually existed at the time. Lori Bernier Video.

163. Donald Murray, Chief Engineer of ROA, testified that no piece of equipment owned or operated by ROA or NEMG sounds like the piece of equipment recorded in the Lori Bernier video. He further testified that while Ms. Bernier believed it to be a rock hammer, no rock hammer could operate at that level for as long as the noise persisted on the recording without experiencing equipment failure. Testimony of Donald Murray.

164. The Court concludes that whatever the repetitive sound is, it was not a rock hammer or other piece of equipment at the Project. There is insufficient evidence to determine where it originated or what was the cause of the recorded sound, or how loud the sound actually was.

165. Alice Cloud and Lee Larson are the two closest neighbors to the Project. Both have lived along the Graniteville Road Truck Route for the entire time that the Crusher has been operating. Ms. Cloud lives at the intersection of the Project access road and Graniteville Road where trucks stop and then accelerate while turning left onto Graniteville Road. Ms. Larson indicated that she spends virtually all of her time outside during the warm weather months and that she has extensive gardens right along Graniteville Road. Testimony of Alice Cloud and Lee Larson.

166. Neither Ms. Larson nor Ms. Cloud have found off-site truck noise from ROA, the hot mix plant or the Crusher itself to be shocking, unduly disturbing, out of context with existing ROA operations or problematic for their day to day living or occupancy of their homes in any way. Id.

167. As of December 2013, Ms. Austin (who lives next to Ms. Larson) experienced loud noises from the Crusher, which are distinct from the noises she hears from the ROA compressor house located behind her property.

168. The Project does not involve any unusual noises or ones which are out of context with an existing earth extraction operation in an industrially zoned area. The Project will operate during ROA normal business hours. Testimony of John Hinckley and Eddie Duncan.

169. The Barre Town Plan and Zoning Regulations do not contain any clear written community noise-related aesthetic standards. No other applicable clear, written community standard with respect to noise was cited by any party. Exhibit 77, NEMG Crusher Noise Assessment Summary; Exhibit 82, Barre Town Plan.

Conclusions of Law

The issues in this Act 250 appeal are whether the Project will produce undue air pollution under Criterion 1 and whether the Project will have undue adverse aesthetic impacts under Criterion 8 with respect to noise and dust.

I. Criterion 1: Air Pollution

Act 250 Criterion 1 requires applicants to show that their project will not cause "undue water or air pollution." 10 V.S.A. § 6086(1). This matter reviews only air pollution. Criterion 1 does not prohibit a project from emitting any air pollution at all but only air pollution which is "undue." Whether pollution is "undue" is highly fact-specific; it depends on "the nature and amount of the pollution, the character of the surrounding area, whether the pollutant complies with certain standards or recommended levels, and whether effective measures will be taken to mitigate the pollution." Re: McClean Enters. Corp., No. 2S-1147-1-EB, Findings of Fact, Conclusions of Law, and Order at 41 (Vt. Envtl. Bd. Nov. 24, 2004) (citations omitted). Compliance with government air quality standards is an important factor in whether air pollution is "undue," but it is neither necessary nor sufficient to show compliance with Criterion 1. See Re: David and Joyce Gonyon, No. 5W1025-EB, Findings of Fact, Conclusions of Law, and Order at 7 (Vt. Envtl. Bd. Jul. 17, 1991) (noting the Environmental Board was not required to determine compliance with relevant regulations when making an "undue air pollution" determination); In re Rivers Dev. Conditional Use Appeal, Nos. 7-1-05 Vtec, 68-3-07 Vtec, slip op. at 14 (Vt. Envtl.

Ct. Mar. 25, 2010) (Durkin, J.) (noting the historical interpretations of Criterion 1 does not "establish a sole reliance upon governmental air quality standards, but rather vest[s] the adjudicating tribunal with the responsibility of determining" whether there is "undue air pollution").

While Act 250 does not define what pollution is "undue," it is clear that "undue" means something more than mere annoyance. See RE: John A. Russell Corp., No. 1R0849-EB, Findings of Fact, Conclusions of Law, and Order at 43–44 (Vt. Envtl. Bd. Jul. 10, 2001) (citing Re: Brattleboro Chalet Motor Lodge, Inc., No. 4C0581-EB, Findings of Fact, Conclusions of Law, and Order at 6 (Vt. Envtl. Bd. Oct. 17, 1984).

Applicants bear the burden of showing that they satisfy Criterion 1 of Act 250. 10 V.S.A. § 6088(a). 10 V.S.A. § 6086(d) and Act 250 Rule 19 provide that certain ANR permits create presumptions of compliance with certain of the Act 250 Criteria. Under Act 250 Rule 19(E)(2) an air pollution control permit from ANR creates a presumption that no undue air pollution will result from a project. The issuance of such a permit creates a presumption that the application is not detrimental to the public health and welfare with respect to the specific requirement for which it is accepted. Act 250 Rule 19(F). This presumption is rebuttable. In re Hawk Mountain Corp., 149 Vt. 179, 186 (1988); see also Act 250 Rules, Rule 19(F).

In this case, ANR issued an Air Pollution Control Permit for the Crusher. Appellants are thus entitled to the presumption of conformity with Criterion 1, Air Pollution, under Act 250 Rule 19.

To rebut the presumption, opponents must introduce admissible evidence that allows a "rational inference to be drawn" that the development will likely cause undue pollution. Hawk Mountain, 149 Vt. at 186. Once the presumption is rebutted, "the applicant shall have the burden of proof under the relevant criteria and the permit . . . shall serve only as evidence of compliance." Act 250 Rules, Rule 19(F).

The evidence provided by the Neighbors in this case to rebut the presumption primarily consisted of testimony about dust and diesel smells in the area and pictures and videos of past operations at the ROA quarry. Neighbors testified that the crushing operation and associated truck traffic generate silica dust, which enters their homes, interferes with their use and enjoyment of their properties, and prevents them from enjoying outdoor activities around

Graniteville. Neighbors supported their testimony with photographs and videos of dust at the crusher site, dust blowing off-site, and trucks kicking up dust along Graniteville Road. Some Neighbors who live along the truck route also testified to smelling diesel emissions in their homes and along Graniteville Road.

Neighbors also offer Mr. Linden Witherell as an air expert. Mr. Witherell's testimony focused on the public health impacts of silica dust and diesel emissions. He testified that silica particles can cause silicosis, which is scarring to the lung tissue caused by extensive inhalation of silica particles. He explained that the location of the crushing operation, coupled with the topography of the area, allows for the airborne silica particles to travel off site to neighboring residences. He testified that the Air Pollution Permit does not address the cumulative impacts of silica emissions, and that there is no information on the quantity of silica dust residents of Graniteville are actually breathing in. He also offered that wet suppression, which is required by the Air Pollution Permit, is not an effective dust control mechanism because particles become re-suspended by trucks or other machinery driving over the site.

Neighbors also offer that the crushing operation cannot comply with the conditions of the Air Pollution Permit or with the relevant air pollution control regulations. They supported this offer again with photographs and videos of dust at the crusher site.

The Neighbors' evidence therefore provides a "rational inference to be drawn" that the development will likely cause undue pollution. Thus, the Neighbors successfully rebut the presumption of compliance under Criterion 1 created by the Air Pollution Control Permit. The burden shifts back to NEMG to prove the crushing operation will not create undue air pollution. See Act 250 Rules, Rule 19(F).

Because the Neighbors have successfully rebutted the presumption of compliance, we now review their evidence in greater detail and weight that evidence with NEMG's offered evidence. For the following reasons we conclude that Neighbors evidence does not convince the Court that the Project will result in undue air pollution. Rather, we conclude that the detailed and credible evidence offered by NEMG shows that the Project will NOT result in undue air pollution.

The Project's location and long-term prior operations have some significance in the determination of undue air pollution. The Project is in an Industrial Zone pursuant to the Town

Plan and Zoning Regulations. The 1150-acre ROA quarry property and has been in operation for over 100 years. Some level of dust and noise is to be expected from an operating rock quarry and the various pieces of equipment and trucks that service it. In addition, it should be the reasonable expectation of anyone moving to or living adjacent to an existing rock quarry to experience environmental impacts, such as dust and noise. These impacts would likely be greater than those found in non-industrialized or rural areas. Lastly, impacts may vary over time.

The testimony of property owners in the area varied greatly. The two neighbors closest to the Crusher, Ms. Cloud and Ms. Larson, testified that they have not experienced dust or other air emissions from the Crusher to be unduly onerous or problematic for them or their properties. Ms. Larson specifically testified that the Project has not impacted the significant time she spends outside in the warm months. Ms. Larson, in fact, testified that she did not know about the Crusher, even after it had been operating for some time, until this appeal was initiated. Individuals from the Neighbors group testified to significant impacts. Important to the Court's conclusion is the fact that these Neighbors could not distinguish Crusher dust from other general dust from non-Crusher equipment or from dust in the area given the industrialized nature of the vicinity.

The Neighbors' also offered photographs and videos in support of impacts. The Court concludes that these are not a fair or accurate representation of how the Crusher will operate in the future. First, by their very nature, this visual evidence is of very short duration and limited to the dates on which the Neighbors collected the evidence. Importantly, many of these visuals were modified by the use of magnification. Additionally, limiting the value of this evidence is the fact that some pictures and video were taken when the Project was not operational.[3] Lastly, Mr. Hinckley testified that the neighbors' videos did not clearly show the source of the dust. For these reasons, the Court cannot conclude that these visual representations are a realistic depiction of the Project operation as it has existed or as it may exist in the future.

The Court therefore finds the testimony of the closest residential neighbors, Ms. Cloud and Ms. Larson, more compelling evidence that undue emissions will not occur.

[3] Mr. Murray credibly testified that the dust in Mr. Bernier's videos was coming from ROA's operations not the crusher.

Additional support for the conclusion that the Project will not result in undue air pollution and conforms with Criterion 1 is evidenced by NEMG's AERMOD modeling not only of the Project's air emissions but also cumulative emissions from industrial activity unrelated to the Crusher, but in its vicinity. Mr. Hinckley testified that his modeling presents the worst-case scenario, assuming the maximum amount of crushing, and assuming all operations are operating at their maximum levels simultaneously. This "conservative" approach promotes reliability in the modeling results. The modeling followed the only methodology approved by both ANR and EPA and corroborated the conclusion embodied in the Air Permit that the Project will satisfy the VAAQS and NAAQS at all off-site locations, including each of the neighboring Appellees' properties and the Town Forest, and will not cause undue air pollution.

We note that NEMG's AERMOD model included emission factors having a poor rating. Mr. Hinckley credibly testified, however, that he reviewed all of the relevant data, and the data's poor rating was due to the scarcity of data as opposed to the quality of the data itself. Therefore, Mr. Hinckley opined, that the data and the modeling results are reliable.

The Neighbors and their air expert raised issues of silica dust emissions. As detailed above, Mr. Witherell's testimony focused on the public health impacts of silica dust and diesel emissions. He testified that silica particles can cause silicosis. He explained that the location of the crushing operation, coupled with the topography of the area, allows for the airborne silica particles to travel off site to neighboring residences. He testified that the Air Pollution Permit does not address the cumulative impacts of silica emissions, and that there is no information on the quantity of silica dust residents of Graniteville are actually breathing in. He also offered that wet suppression, which is required by the Air Pollution Permit, is not an effective dust control mechanism because particles become re-suspended by trucks or other machinery driving over the site. Although Mr. Witherell raised the potential for impacts due to silica dust, he acknowledged that there is no known standard for use in regulating the project with respect to silica dust. Instead, Mr. Witherell offered that NEMG should be required to undertake a study and create such a standard; such study taking up to 10 years to conclude. Our regulatory system does not operate in this fashion to impose such burdens on applicants. In the end, Mr. Witherell did not provide evidence that the Project will cause undue air pollution.

NEMG presented evidence demonstrating that the Air Pollution Permit conditions are effective at preventing the undue silica dust emissions. Mr. Hinckley's modeling showed emissions are compliant with the relevant regulations. Mr. Hinckley testified that the wet suppression system operates to decrease dust emissions and knocks dust down back on the storage piles. Additionally, he testified that wet suppression, which is required by the Air Pollution Permit, would successfully remove 89% of silica dust and only 5.5% of all respirable dust that would be emitted from the project would be emitted into the ambient air. Therefore, Mr. Hinckley concluded that the silica emissions do not pose a health hazard.

After careful consideration of all the evidence, the Court concludes that the Crusher, operating in conformity with its Air Pollution Permit and in compliance with the VAAQS, will not cause undue air pollution.[4] For the reasons set forth above, we find Mr. Hinckley's opinion that undue air pollution will not occur from the Project operations to be credible. Furthermore, we conclude that wet suppression is the best way of ensuring that problematic silica dust is controlled. These conclusions are supported by NEMG's AERMOD modelling, and Mr. Hinckley's Method 9 opacity testing conducted in 2013, 2015, and 2016. Additionally, we conclude that dust from trucks existing the Crusher site will be further reduced by sweeping and wetting down the access road on a regular basis. The Court therefore conditions Criterion 1 approval as follows to ensure that undue air pollution will not be caused by the Crusher in the future:

> The Project shall be completed and operated in accordance with Air Pollution Control Permit to Construct #AP-14-007 issued by the Agency of Natural Resources Air Pollution Control Division and dated February 19, 2014. The Permitee will abide by all conditions and protocols set forth in that Permit including, but not limited to, conditions regarding the general operation and maintenance of the Crusher, conditions pertaining to ongoing inspection, wet suppression, monitoring and testing and provisions regarding dust control. Non-material amendments to the Air Pollution Control Permit shall be deemed automatically incorporated herein.
>
> The Permittee shall sweep or spray down the paved portion of the access road to the Crusher with water and shall spray down the immediate area of the Crusher as needed so as to minimize fugitive dust.

[4] We note that that the Crusher can produce some dust under its Air Pollution Permit without violating the VAAQS or its Air Pollution Permit.

With these conditions, we find that the Project will not cause undue air pollution and will be in conformance with Criterion 1, Air Pollution, of Act 250.

II. Criterion 8: Aesthetics

To receive an Act 250 permit, an applicant must provide evidence sufficient to enable the Court to find that the proposed project will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare and irreplaceable natural areas. 10 V.S.A. § 6086(a)(8). In this matter our Criterion 8 review is limited to dust and noise, including the on-site noise from the Crusher operation and off-site truck noise. If an applicant satisfies the initial burden of production, then the ultimate burden of proving that a project does not conform to Criterion 8 rests upon the project's opponents. 10 V.S.A. § 6088(b); In re Route 103 Quarry, No. 205-10-05 Vtec, slip op. at 8 (Vt. Envtl. Ct. Nov. 22, 2006) (Durkin, J.), *aff'd*, 2008 VT 88, 184 Vt. 283. The cornerstone of our analysis under Criterion 8 is the question: "[w]ill the proposed project be in harmony with its surroundings—will it 'fit' the context within which it will be located?" Re: Quechee Lakes Corp., Nos. 3W0411-EB and 3W0439-EB, Findings of Fact, Conclusions of Law, and Order, at 18 (Vt. Envtl. Bd. Nov. 4, 1985); *aff'd* In re Quechee Lakes Corp., 154 Vt. 543 (1990). Criterion 8 is not, however, a guaranty that aesthetics in an area will never change but ensures that such change will be reasonable. Re: Times & Seasons, LLC, No. 3W0839-2-EB (Altered) Findings of Fact, Conclusions of Law, and Order at 39 (Vt. Envtl. Bd. Nov. 4, 2005); Re: John J. Flynn Estate, No. 4C0790-2-EB, Findings of Fact, Conclusions of Law, and Order at 25 (Vt. Envtl. Bd. May 4, 2004).

A general analysis of aesthetic impacts can be subjective, and thus we follow the two-part test established by the former Environmental Board known as the "Quechee test" to evaluate a project under Criterion 8. Quechee Lakes Corp., Nos. 3W0411-EB and 3W0439-EB, at 17 (quoting Re: Brattleboro Chalet Motor Lodge, Inc., No. 4C0581-EB, Findings of Fact, Conclusions of Law, and Order (Vt. Envtl. Bd. Oct. 17, 1984)); In re Rinkers, Inc., 2011 VT 78, ¶ 9, 190 Vt. 567 (approving use of the Quechee test). First, we examine whether a proposed project may cause an adverse impact on the character of the area. Quechee Lakes Corp., Nos. 3W0411-EB and 3W0439-EB, at 19. If so, then we must determine whether that impact will be "undue." Id.

To determine whether a project will have an "adverse" aesthetic impact, the Court is charged to look at how the project fits within the context of its area in terms of size, scale, nature of use and various off-site impacts, here with specific regard to dust and noise. Id.; See also, In re Free Heel, Inc., No. 217-9-06 Vtec, slip op. at 5 (Vt. Envtl. Ct. Mar. 21, 2007). If a project fits within its aesthetic context, it will not have an "adverse" aesthetic impact and will comply with Criterion 8.

Even if the Court finds that a project does not fit within its context, and therefore has an "adverse" aesthetic impact on the area, a project will still be found to comply with Criterion 8 unless the adverse aesthetic impact is found to be "undue." An impact is undue if:

> (1) it violates a clear, written community standards intended to preserve aesthetics or scenic, natural beauty of the area; (2) it offends the sensibilities of the average person; or (3) the applicant has failed to take generally available mitigating steps that a reasonable person would take to improve the harmony of the proposed project with its surroundings.

Lathrop, 2015 VT 49, ¶ 74 (quotation omitted).

a. Noise

Vermont does not have a quantitative noise standard. See, e.g., In re Chaves, 2014 VT 5, ¶ 31 n. 4. We use a benchmark known as the Barre Granite standard for measuring whether noise is adverse under the Quechee test: 70 decibels (dBA) (Lmax) at the property line of a project and 55 dBA (Lmax) outside an area of frequent human use. Re: Barre Granite Quarries, LLC, No. 7C1079 (Revised)-EB, Findings Fact, Conclusions of Law, and Order, at 80 (Vt. Envtl. Bd. Dec. 8, 2000); see also Lathrop Ltd. P'ship I, 2015 VT 49, ¶ 80. Even with the benchmark, the question of whether noise is "adverse" ultimately depends on whether the noise suits the existing soundscape, considering the nature and volume of existing noise and the qualitative character of the noise that will be added. Lathrop, 2015 VT 49, ¶ 81; In re McLean Enters. Corp., No. 2S1147-1-EB, Findings of Fact, Conclusions of Law, and Order, at 53–54 (Vt. Envtl. Bd. Nov. 24, 2004).[5]

[5] There also is a question about which "prong" of the Quechee test the Barre Granite standard is intended apply to: adverse or undue impact. In the past, the Environmental Board had applied Barre Granite to the second, "undue," prong. See Re: Cerosimo, No. 2W0813-3 (Revised)-EB, Findings of Fact, Conclusions of Law, and Order (Vt. Envtl. Bd. Apr. 19, 2001). More recently, the Vermont Supreme Court, and the Environmental Division, have applied the standard to the "adverse" prong of the Quechee test. See Lathrop, 2015 VT 49, ¶ 80; Chaves, 2014 VT

Instantaneous Lmax readings for purposes of determining compliance with the Barre Granite standard should be taken with sound meters set on slow response, as done by Appellants in this matter. See Barre Granite, No. 7C1079 at 43 ("The measurements were taken using a calibrated Bruel and Kjaer 2236 (Type 1) sound level meter fitted with a wind screen. The meter was set on slow response.") (emphasis added).

The Barre Granite standard must be applied flexibly. See Lathrop, 2015 VT 49, ¶¶ 81-82 (stating "a 50 dBA Lmax standard may not make sense in noisy areas [and it] may be of questionable logic and practically impossible to enforce a 50 dBA Lmax when trucks passing by already register 78 dBA at an adjacent residence.") (citations omitted); see also Chaves, 2014 VT 5, ¶ 33; In re McCullough Crushing Inc., No. 179-10-10 Vtec, slip op. at 21-22 (Vt. Super. Ct. Envtl. Div. Feb. 16, 2017) (Walsh, J.) (citation omitted). This is logical, considering the fact that different sound levels will be perceived differently depending on the context in which they occur, such as the character of the area. Therefore, a sound level that may be adverse under the Quechee test in one situation may not be in another.

The import of the Vermont Supreme Court cases interpreting the Barre Granite standard is that a project could potentially have an "adverse" aesthetic impact, but still satisfy Criterion 8 if that impact is not "undue" under the Quechee test.

i. On-site Noise

1. Adverse Aesthetic Impact

We first analyze noise made from on-site activities. RSG's noise study indicates that, with the implementation of the mitigation measures proposed by Applicants, the Crusher plant will satisfy the Barre Granite standard at all adjoining residences and areas of frequent human use, including the neighboring Appellees properties. The mitigation measures include:

1. The construction and maintenance of two aggregate stockpile berms 15.5 and 13 feet in height in the locations depicted on the scaled map submitted as Exhibit 65.
2. Installation of sound barrier blankets on the primary crusher and the primary screener as described on Exhibit 65, 74 and Exhibit 77 and as depicted on Exhibits 66 - 73.
3. The installation of a rubber screen deck on the primary screener.

5; In re McCullough Crushing, Inc., No. 179-10-10 Vtec, slip op. at 21-22 (Vt. Super. Envtl. Div. Feb. 16, 2017) (Walsh, J.). We continue to apply the Barre Granite standard to the first prong of the Quechee test.

4. Installation of broadband or white noise back-up alarms on all NEMG onsite mobile equipment.
5. Limiting the use of the freestanding rock hammer to periods when the main Crusher plant is not operating as described in Exhibit 65.

Additional limiting conditions offered my NEMG include the crusher equipment and off-site truck operations limited to Rock of Ages business hours. Normal hours of Crusher operation will be 6:00 AM to 4:00 PM Monday through Saturday. Saturday operations will be limited to a maximum of 20 Saturdays per year. Variance from these hours and days may be allowed in special circumstances with prior permission of the District Coordinator.

Along with mitigation measures, we note that the Crusher is in an existing, large rock quarry. Quarrying activities include the use of heavy equipment, blasting, and general intensive industrial activity and its associated noise, such as that from truck traffic, all of which have associated noise impacts. Further, the Crusher area is zoned for industrial use under the Town Zoning Regulations and Town Plan. The Project area is not immediately adjacent to any residences or public roads.

As conditioned by these mitigation measures, we conclude that noise from on-site activities will be consistent with background noise in the area presently dominated by heavy industrial use and its associated noises, including that of quarrying activities. We therefore conclude that on-site activities meet the Barre Granite noise standard, fit the context of the area, and will not have an adverse aesthetic impact with respect to noise.

We recognize that noise levels at some neighboring properties closely approach the Barre Granite limit of 55 dBA Lmax. We have studied the Supreme Court's recent Lathrop decision and understand that the Barre Granite limits or standard should be applied flexibly. See Lathrop, 2015 VT 49, ¶¶ 81-82. We therefore take the conservative approach and complete the second 'undue' adverse analysis even though we conclude there is no adverse impact.

2. Undue Adverse Aesthetic Impact

a. Clear Written Community Standard

When determining if there is a clear, written community standard, we generally look to town plans. See McLean Enters. Corp., No. 2S1147-1-EB, Findings of Fact, Conclusions of Law,

and Order, at 55 (Vt. Envtl. Bd. Nov. 24, 2004). Statements signaling a dominant policy with a town plan, are sufficiently clear. Id. at 56.

Neither party provided evidence of the existence of community standards that were intended to preserve the aesthetics of the area at trial. Neighbors have broadly asserted in post-trial briefing that such standards exist but have not reference or provided any specific provisions or plan sections which could be clear written standards. Because the Neighbors have the burden of showing that a project does not conform to Criterion 8, they fail to meet this burden and we conclude that the Project does not violate any clear, written community standard. See McCullough Crushing, Inc., No. 179-10-10 Vtec at 22 (Feb. 2, 2017).

b. Shocking to an Average Person

We begin by noting that, for the reasons set forth above, the Project satisfies the Barre Granite standard at all area residences and locations of frequent human use. Additionally, the Project will suit the existing soundscape.

While the Neighbors testified that noise will shock them, this Court must consider the Project's impacts from the perspective of the average person. In re Goddard Coll. Act 250 & CU, Nos. 175-12-11 Vtec, 173-12-12 Vtec, slip op. at 14 (Vt. Super. Ct. Envtl. Div. Jun. 1, 2014) (Walsh, J) *aff'd* In re Goddard Coll. CU, 2014 VT 124, 198 Vt. 85.

Neighbors testified that they found noise from the Crusher "shocking." The Court notes that this noise did not incorporate all of the mitigation measures that the NEMG has now proposed for the Crusher. Additionally, the Neighbors frequently conflated Project noise with other ROA operational noise. We weight this evidence against the testimony of two neighbors residing very close to the Project that do not believe the Project noise is "shocking." In fact, these neighbors do not find noise shocking even without the proposed mitigation.

Considering the Project's noise complying with relevant standards, and the nearest neighbors' credible testimony that the Project noise does not shock them, the Court concludes that noise from the Crusher operation itself would not be shocking to an average person.

c. Reasonable Mitigation

Applicants have incorporated the following measures for the Crusher:

1. The Crusher is located 1500 feet to the interior of the ROA adjacent to other ROA and permitted NEMG commercial and industrial operations and not immediately adjacent to any residences, public roads or public areas.
2. The Crusher will only be operated during ROA business hours and has limited Saturday operations to a maximum of 20 Saturdays per year.
3. Applicants will construct and maintain aggregate berms in the locations and with the dimensions shown on the Appellants' Noise Mitigation Exhibit.
4. The Crusher and screener will incorporate noise barrier blankets on the mechanisms themselves as recited in the Appellants' Noise Exhibit.
5. The primary screener will use a rubber screen deck.
6. Applicants will not operate their rock hammer while the main Crusher plant is operating.
7. All NEMG mobile equipment will be equipped with broadband or white noise backup alarms.

Neighbors assert that "mitigation" of Crusher noise should consist of moving the Crusher to a totally different location on the ROA property. They specifically argue the Crusher should be moved to the bottom of an unspecified quarry hole located somewhere on the property. Mr. Murray, ROA's chief engineer, testified that this would not only be impractical or impossible due to de-watering and access issues, but also would potentially not be permittable under the relevant Federal Mine Safety Regulations.

Requiring such a relocation would not constitute "mitigation" but a wholly different project. It is not this Court's role to instruct an applicant to design an entirely different project. Re: Bernard & Suzanne Carrier, No. 7R0639-EB, Findings of Fact, Conclusions of Law, and Order at 11 (Vt. Envtl. Bd. Aug. 14, 1997) ("The Board does not design projects for Applicants nor does it provide advisory opinions on what hypothetical elements of design would receive the Board's approval."); See also Goddard Coll., 2014 VT 124, ¶¶ 10-11 (concluding that the Environmental Division did not act arbitrarily, capriciously, or clearly erroneously when it did not discuss relocation as a mitigation measure). Thus, we decline to adopt the Crusher's relocation as a mitigation measure.

We conclude that the mitigation measures imposed by Applicants are reasonable and ensure compliance with Criterion 8.

For the foregoing reasons, the Court concludes that on-site noise from the Crusher operation will not cause an undue adverse aesthetic impact and complies with Criterion 8.

ii. Off-site Crushing Noise

1. Adverse Aesthetic Impact

We next review off-site noise associated with the Project; the focus for this matter being truck noise.

The Vermont Supreme Court in Lathrop specifically, and with great detail, analyzed off-site truck noise. 2015 VT 49. We understand that the Lathrop decision requires District Commissions and this Court to consider and make findings regarding impacts from the instantaneous (Lmax) sound level and frequency of vehicle trips. We cannot rely exclusively on equivalent (Leq) or average sound levels. See Lathrop, 2015 VT 49, ¶ 88 (finding the failure to make findings on the instantaneous Lmax levels from truck traffic an error and remanding case back to the Environmental Division to make such findings).

Instantaneous noise levels more accurately demonstrate what people are actually hearing as opposed to an average sound reading over any period of time. See Id. at ¶ 86 (citing In re Casella Waste Management, Inc., No. 8B0301-7-WFP, Findings of Fact, Conclusions of Law, and Order at 22 & 34 (Vt. Envtl. Bd. May 16, 2000) (quoting In re OMYA, Inc., No. 9A0107-2-EB, Findings of Fact, Conclusions of Law, and Order at 15 (Vt. Envtl. Bd. May 25, 1999)).

Lathrop also requires that we apply the Barre Granite standard flexibly to off-site truck traffic considering the context of the area for noise impacts. See Id. at ¶¶ 81-82 and ¶ 87 (noting that previous Environmental board decisions generally "reflect a more thorough analysis of the changes in traffic patterns" of a proposed project.)

This review is further supported by the Supreme Court favorably citing Chaves, in which a project was permitted despite involving truck traffic operating at 69 dBA (Lmax) as measured at a residence. See Lathrop, 2015 VT 49, ¶¶ 80-84 ("[In Chaves, we] disagreed with the neighbors' claim, even though the applicant's expert witness conceded that trucks accelerating past the neighbors' inn would produce sounds up to 69 dBA and stated that '[this statement does not undermine the court's overall finding that noise levels would generally remain under 55 dBA and that the noise was not adverse to the area's aesthetics.'").

Because the Barre Granite standard applies to truck traffic, this Court must make findings regarding Lmax noise impacts from off-site trucks on area roads and whether the increased number of trucks proposed would have an undue, adverse aesthetic impact.[6]

The Project proposes to generate a maximum of 100 off-site loaded round-trip truck trips per day into the surrounding roadways. The annual average of off-site loaded round-trip truck trips is 60 per day.[7] This results in an increase of the average number of one-way truck trips from crushing operations of 120 trucks from the existing level of 179 one way truck trips per day. The maximum crushing scenario has an increase of 200 one-way truck trips per day.

There are three routes which trucks can take going to and from the Project. The primary route, down Graniteville Road, is designated a Truck Route by the Town of Barre. This designation is evidence that the Town intended for the area of Graniteville Road relevant to the Project to serve as a route for a heightened level of truck traffic. Evidence submitted at trial indicates that the road has served this purpose for many decades. Trucks also have the option to exit the property onto Pirie Road, avoiding the area of Lower Graniteville all together. In addition, some trucks may turn right out of the Project access and go up Graniteville Road.

The evidence at trial indicated that Lmax sound levels from trucks traveling to and from the Crusher will be the same as Lmax sound levels from existing trucks traffic on the roads. This is not a situation where the trucks to be added to the road system will be creating a different or louder noise than existing trucks. Trucks from the Project will be following the same routes and through the same acceleration areas as existing trucks. As a result, there will be no change in Lmax sound levels due to the additional truck traffic associated with the Project.

Further, sound from the existing trucks form the context and soundscape of the surrounding area, zoned for industrial use and designated, in part, as a Truck Route. The instantaneous sound level of existing trucks on area roads is between 66 and 82 dBA Lmax. The exact level varies due to setback distances, natural buffers, landscaping, and whether trucks are coasting or accelerating when measured. The sound level of the trucks proposed to be added

[6] We note that we remain free to refer to other noise metrics to corroborate findings and conclusions regarding Lmax of off-site trucks, the frequency of passes of those trucks and overall compliance with Criterion 8. Mr. Duncan credibly testified that Leq levels are helpful to assess cumulative noise impacts from additional off-site truck traffic and that Leq 1-hr is an appropriate measure of this.

[7] Applicants offer that they have specified the average number of loaded crushed stone truck trips to ensure that the maximum noted will not be occurring an excessive number of days.

by the Project along the same area roads is the same, between 66 and 82 dBA Lmax, varying for the same reasons. Further, the Crusher trucks will be operating during normal ROA business hours, which is also when other trucks unrelated to the Crusher will also be going up and down the road, consistent with the existing industrial uses in the area. Therefore, the Court concludes the noise levels alone would not result in an adverse aesthetic impact on the area. This is further supported when considering the Project context and the actual experience with trucks travelling to and from the Crusher and the ROA site in the past. The Project and its associated truck traffic therefore will "fit" within the character of the surrounding area, which is itself currently characterized by industrial uses and the sounds that are associated with industrial uses, as analyzed below when considering if an impact is "undue." This is not the end of our analysis of off-site truck traffic, however.

The frequency of truck traffic will increase because of the Project. We note that traffic will be dispersed among three entry and exit routes. Project truck traffic is of the same type and has the same noise and level of noise as existing truck traffic. While instantaneous Lmax sound levels of new trucks from the Project will be identical to the existing sound levels of trucks currently traveling on the roadways the increase in frequency will be apparent, even when considering the existing industrial character of the surrounding area. Therefore, the Court concludes off-site truck traffic proposed by Project will have an adverse impact on the area.

While the Barre Granite standard is formulated in Lmax and, under Lathrop, we are required to make findings regarding the frequency of truck trips for off-site truck traffic, we note that Appellants' expert, Mr. Blomberg, testified that this is an inappropriate way to measure noise impacts over time from an acoustical science perspective. Rather, Mr. Blomberg opined that to understand noise impacts associated with increasing the number of truck trips, we must consider sound levels across a longer time span, which would require us to at least consider an equivalent sound level, or Leq.

Applicants did this by modeling traffic noise from the Project based on a Leq 1-hr measure in addition to their Lmax analysis. Mr. Duncan credibly testified that one hour is an appropriate length of time to capture and accurately reflect the impact of additional truck traffic caused by the Project. RSG modeled equivalent Leq sound levels from the 150-maximum level

of trucks originally proposed by Applicant and assumed that all truck traffic would travel down Graniteville Road. Based that level of traffic, the Project would account for a 1 to 4 dBA Leq increase in sound, averaged across a one-hour period. We conclude that this is a slight increase in sound levels, especially considering this is an area categorized by industrial use and the road has been identified by the Town as a designated truck route. It is also significant that the noise levels would not require mitigation under the VTrans Guidelines applicable to highway projects. See VTrans Noise Analysis and Abatement Policy. Further, Mr. Duncan testified that actual sound levels typically prove in practice to be lower than those predicted using RSG modeling software.

In summary, we conclude that noise from off-site truck trips will fit within the existing acoustical context of the Rock of Ages/Graniteville Road area and comply with the Barre Granite standard, however, the increase in frequency of truck trips resulting from the Project will have an adverse aesthetic impact with respect to off-site tuck noise.

2. Undue Adverse Aesthetic Impact

We analyze whether the adverse aesthetic impact with respect to off-site tuck noise is undue.

a. Clear Written Community Standard

As set forth above, no party offered evidence of a clear written community standard relating to noise. We therefore conclude that the off-site truck noise does not violate a clear, written community standard.

b. Shocking to an Average Person

The use of a Truck Route by trucks during business hours along a road which historically has experienced heavy trucks is within the context of the area. While the Neighbors have testified that the noise will shock them, this Court must consider the Crusher's operational impacts from the perspective of the average person. Goddard Coll., Nos. 175-12-11 Vtec, 173-12-12 Vtec, at 14 (Jun. 1, 2014) *aff'd* In re Goddard Coll. CU, 2014 VT 124, 198 Vt. 85.

Mr. Duncan testified that the noise from new trucks associated with the Project will be the same as the maximum instantaneous, Lmax, sound levels from existing trucks that are

already using this road. Although the frequency of truck trips may increase, we conclude that the limits of truck trips proposed the Applicants (maximum and average), the fact that the increase in traffic will result in only a slight increase in equivalent Leq 1-hr sound levels, and the limitation on traffic by the Project's operational hours ensure that noise from additional trucks will not be shocking.

This conclusion is supported by the actual experience of truck traffic from the Project over the last five years. In addition, because trucks may exit onto Pirie Road, or turn through Upper Graniteville, not all truck traffic will be directed onto Graniteville Road.

Again, the Court finds it probative that the two closest neighbors to the Crusher, both of whom who live along the Graniteville Road Truck Route, have not experienced off-site trucks relating to the Crusher operations to be shocking or unduly intrusive.

For all of these reasons, we conclude that off-site truck noise from the Crusher in terms of both frequency and intensity would not be shocking to an average person.

c. Reasonable Mitigation

Lastly, the Court concludes that the Project incorporates sufficient mitigation measures intended to reduce the impact of off-site truck noise on surrounding areas. First, operation of off-site trucks will be limited to ROA business hours, which is consistent with when truck traffic is already being experienced on Graniteville Road. Truck traffic is further limited to 20 Saturdays per year.

Second, Applicants have provided for a second principal access to the quarry through Pirie Road. The result of this being that not all Project traffic will be going down the Graniteville Road Truck Route. Additionally, truck traffic may move up to Upper Graniteville at times.

Finally, at trial Applicants reduced the maximum number of trucks per day by a third, from 150 trucks to 100 trucks with an average of 60 per day per year. This reduction is further substantial mitigation of the impacts associated with off-site truck traffic from the project.

No additional reasonable mitigation measures were suggested at trial. We conclude that the Project has incorporated all reasonable mitigation measures with respect to noise from off-site trucks.

The Court therefore concludes that off-site truck noise from the Project will not cause an undue adverse aesthetic impact and, therefore, complies with Criterion 8 of Act 250 with the following condition offered by NEMG:

> Off-site loaded customer trucks exiting the Project with crushed material shall be limited to a maximum of 100 loaded customer trucks per day. No more than 70 loaded customer trucks per day exiting the Project with crushed material shall use Quarry Hill Road until the planned Quarry St./Route 14 intersection signalization project is completed by VTrans. The average number of loaded customer trucks exiting the Project with crushed material shall not exceed 60 loaded customer trucks per day as averaged over a calendar year. Exceedances of the above limits may occur for specific jobs with the permission of the District Coordinator.

b. Dust

i. Adverse Aesthetic Impact

By their nature, earth extraction operations produce some dust. Dust, in amounts compliant with relevant regulations and permitting regimes, should therefore be expected at an existing quarry operation and from its associated industrial activities, such as rock crushing.

As discussed above in the context of Criterion 1, the Project incorporates significant dust control and mitigation measures approved in the Project's Air Pollution Permit. First, under the Air Pollution Permit, the Crusher is prohibited from discharging undue air pollutants, including dust and particulate matter, from the ROA property.

For the reasons set forth in Criterion 1, the Neighbors' fail to provide credible evidence of adverse impacts from dust. Under our Criterion 1 analysis the Neighbors' evidence failed to show that the Project operations would result in undue air pollution. We similarly find it fails to reliably show an adverse aesthetic (Criterion 8) impact from Crusher dust. We again find compelling the testimony of neighbors Ms. Cloud and Ms. Larson, who credibly testified to the lack of adverse impacts from dust relating to the Project. Mr. Hinckley's modeling supports our conclusion that the Project would not result in an adverse dust impact.

We conclude that the Project, as permitted under its Air Pollution Permit and with the conditions imposed by this Court, fits within the context of the area with respect to dust and will not have an "adverse" aesthetic effect on the area.

In light of the Neighbors' offer of dust impacts, we take the conservative approach and complete the second 'undue' adverse analysis for potential dust impacts even though we conclude there is no adverse impact.

ii. Undue Adverse Aesthetic Impact

1. Clear Written Community Standard

The parties provided no evidence of a clear, written community standard concerning dust. The Court therefore concludes that aesthetic impacts from dust do not violate a clear, written community standard.

2. Shocking to an Average Person

We concluded above that dust from the Project complies with Criterion 1 and will not cause undue air pollution. Several of the Neighbors complained about dust from the Project and provided videos and photographs in support of their assertion that the dust was shocking. As detailed above with respect to Criterion 1, we do not find these videos to be a fair an accurate representation of the Project's impacts. We do find it compelling that the two closest neighbors to the Crusher credibly testified that they do not experience shocking dust impacts from crushing operations; including the periods when the Project was operational. One of the closest neighbors spends extensive amounts of time outside gardening and has not noticed dust effecting her garden, yard or house.

While we acknowledge that the Neighbors have provided testimony regarding how the dust impacts are shocking to them, this Court must consider the Crusher's impacts from the perspective of the average person. Goddard Coll., Nos. 175-12-11 Vtec, 173-12-12 Vtec, at 14 (Jun. 1, 2014) *aff'd* In re Goddard Coll. CU, 2014 VT 124, 198 Vt. 85. Considering the Project's potential dust impacts, and the nearest neighbors' credible testimony that Project dust does not impact them, the Court concludes that Project dust impacts would not be shocking to an average person.

3. Reasonable Mitigation

The Project has incorporated significant mitigation measures with respect to dust, as discussed with above under Criterion 1. Measures imposed by the Air Pollution Permit include

the continual use of wet suppression at the Crusher transfer points and wetting down and sweeping of the Project access road.

These measures reduce the potential for dust from the Project or its related truck or equipment operations to move off-site in amounts which would be distinguishable from the existing environmental conditions present in the Project area. NEMG provided credible evidence that the use of wet suppression would be 89% effective at the site. Although the Neighbors disagree with this offer, they did not provide credible refuting evidence.

Parties did not propose alternative or additional mitigation measures for dust. The Court therefore concludes that the Project employs all reasonable mitigation with respect to dust.

c. Criterion 8 Conclusion

For the foregoing reasons, the Court concludes that the Project satisfies the Quechee test with respect to aesthetic impacts related to noise and dust, including off-site truck noise, and that the Project therefore satisfies Criterion 8, Aesthetics, of Act 250. As analyzed above, we reach this conclusion, in part, by imposing conditions limiting or reducing noise impacts.

As conditioned, the Project will not have an undue adverse aesthetic impact with respect to noise and dust and, therefore, conforms with Criterion 8.

Conclusion

We conclude that NEMG's crushing Project satisfies Criterion 1 with the following conditions:

1. The Project shall be completed and operated in accordance with Air Pollution Control Permit to Construct #AP-14-007 issued by the Agency of Natural Resources Air Pollution Control Division and dated February 19, 2014. The Permitee will abide by all conditions and protocols set forth in that Permit including, but not limited to, conditions regarding the general operation and maintenance of the Crusher, conditions pertaining to ongoing inspection, wet suppression, monitoring and testing and provisions regarding dust control. Non-material amendments to the Air Pollution Control Permit shall be deemed automatically incorporated herein.

2. The Permittee shall sweep or spray down the paved portion of the access road to the Crusher with water and shall spray down the immediate area of the Crusher as needed so as to minimize fugitive dust.

We further conclude that the crushing Project will comply with Criterion 8 as to the on-site noise impacts from the Crusher itself and noise impacts from off-site truck traffic with the following conditions:

3. The construction and maintenance of two aggregate stockpile berms 15.5 and 13 feet in height in the locations depicted on the scaled map submitted as Exhibit 65.

4. Installation of sound barrier blankets on the primary crusher and the primary screener as described on Exhibit 65, 74 and Exhibit 77 and as depicted on Exhibits 66 - 73.

5. The installation of a rubber screen deck on the primary screener.

6. Installation of broadband or white noise back-up alarms on all NEMG onsite mobile equipment.

7. Limiting the use of the freestanding rock hammer to periods when the main Crusher plant is not operating as described in Exhibit 65.

8. Limitation of Crusher equipment and off-site truck operations to Rock of Ages business hours as noted below.

9. The Project loaders and on-site haul truck will use broadband or white noise back-up alarms.

10. Normal hours of Crusher operation will be 6:00 AM to 4:00 PM Monday through Saturday. Saturday operations will be limited to a maximum of 20 Saturdays per year. Variance from these hours and days may be allowed in special circumstances with prior permission of the District Coordinator.

11. Off-site loaded customer trucks exiting the Project with crushed material shall be limited to a maximum of 100 loaded customer trucks per day. No more than 70 loaded customer trucks per day exiting the Project with crushed material shall use Quarry Hill Road until the planned Quarry St./Route 14 intersection signalization project is completed by VTrans. The average number of loaded customer trucks exiting the Project with crushed material shall not exceed 60 loaded customer trucks per day as averaged

over a calendar year. Exceedances of the above limits may occur for specific jobs with the permission of the District Coordinator.

Lastly, we conclude that the crushing Project will comply with Criterion 8 as to dust.

This matter is remanded to the District 5 Environmental Commission for the ministerial act of issuing a Land Use Permit consistent with the Commission's June 14, 2017 decision as modified by this decision.

A judgment order is issued concurrently with this decision. This concludes this matter.

Electronically signed on June 20, 2018 at 10:39 AM pursuant to V.R.E.F. 7(d).

_____

Thomas G. Walsh, Judge
Superior Court, Environmental Division