STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7628

Joint Petition of Green Mountain Power Corporation, Vermont Electric Cooperative, Inc., and Vermont Electric Power Company, Inc. for a certificate of public good, pursuant to 30 V.S.A. Section 248, to construct up to a 63 MW wind electric generation facility and associated facilities on Lowell Mountain in Lowell, Vermont, and the installation or upgrade of approximately 16.9 miles of transmission line and associated substations in Lowell, Westfield and Jay, Vermont	)

Order entered: 4/3/2012

ORDER RE NOISE MONITORING PLAN

INTRODUCTION

On May 31, 2011, the Public Service Board ("Board") issued an Order (the "Order") and Certificate of Public Good ("CPG") in this docket approving, subject to certain conditions, the construction and operation of the proposed wind electric generating facility. Among other things, the Order required the Petitioners to make a number of post-certification compliance filings. Condition 41 of the Order and CPG required Green Mountain Power Corporation ("GMP") to file with the Board a Noise Monitoring Plan (the "Plan") for comment by the parties and review and approval by the Board. Condition 41 required that the Plan be consistent with the noise monitoring plan approved by the Board in Docket 7156 (the "Sheffield Plan"),[1] that it extend from construction through the first two years of project operation, and that it address a number of specific items that were not addressed in the Sheffield Plan.[2]

For the reasons set forth below, in this Order we approve, subject to certain conditions, the revised Plan filed by GMP on October 7, 2011.

1. *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 9/20/10 at 2-3.
2. Docket 7628, Order of 5/31/11 at 165-66.

PROCEDURAL HISTORY

On June 10, 2011, GMP submitted its proposed Noise Monitoring Plan.

On June 29, 2011, the Towns of Albany and Craftsbury (the "Towns") filed comments asserting that the proposed Plan did not provide sufficient oversight to ensure that the project would operate within the noise limits set by the Board, and that it left too many issues unresolved for the Board to approve the Plan. Lowell Mountains Group, Inc. ("LMG") adopted the comments of the Towns. Additionally, on July 1, 2011, the Department of Public Service ("DPS") filed comments requesting both clarifications and additions to the Plan.

On July 1, 2011, GMP responded to the comments of the DPS and the Towns asserting that the Plan complied with Board requirements, and requesting that the Board approve the Plan with instructions that GMP consult with the commenting parties to resolve their concerns and address them in a subsequent filing, or that the Board extend the deadline for approval so that construction could commence.

By Order dated July 27, 2011, we clarified that the pre-construction deadline in Condition 41 applied only to the filing of the Plan, not its approval. Accordingly, we gave the parties an additional 60 days to consult with each other in an attempt to reach consensus on a revised noise monitoring plan for Board review and approval. In the event parties were unable to reach consensus on the contents of a plan, GMP was directed to file a revised plan 60 days from the date of the July 27 Order, and other parties would have a two-week period to review the revised proposal and submit comments. Lastly, we clarified that GMP needed to obtain approval of the Plan prior to commencing commercial operations.[3]

On September 23, 2011, having been unable to reach consensus on a proposal, GMP and the Towns, along with LMG, filed competing proposals for Board review and approval. GMP's filing consisted of a clean version of its revised proposal, as well as redline/strikeout version showing changes from its original proposal. The Towns and LMG's filing consisted of a clean version of their proposal, as well as a redline/strikeout version showing their proposed changes to GMP's revised proposal, and included comments in support of their requested changes.

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3. Docket 7628, Order of July 27, 2011, at 6-7.

On October 7, 2011, GMP filed an additional revised proposal in both clean and redline/strikeout versions. The redline/strikeout version indicated GMP's agreement to certain requests by the Towns and LMG, sometimes with modifications to the language proposed, and indicated GMP's opposition to other requested changes. Comments were included to explain GMP's position on each of the requested changes.

On October 17, 2011, GMP filed a letter in which it asserted that the Plan as revised in its October 7, 2011, filing is consistent with the Sheffield Plan, that no party has argued otherwise, and that the Plan complies with the additional requirements of Condition 41 of the Order and CPG.[4]

On October 20, 2011, the Board's Deputy Clerk issued a memorandum announcing the Board's intent to hold a technical hearing to examine some of the issues that remained in dispute among the parties. The memorandum set forth a number of questions to be addressed by the parties, and established dates for the prefiling of testimony, service of and responses to a single round of discovery, and a technical hearing.

The parties' prefiled testimony addressing the questions posed by the memorandum on November 7, 2011. Discovery was served on November 14, 2011, and responses were served on December 2, 2011. The Board held a technical hearing on December 13, 2011. Following the technical hearing, the parties filed briefs on January 20, 2012. Reply briefs were filed on January 27, 2012.

SUMMARY OF ISSUES IN DISPUTE

At the conclusion of the technical hearing on December 13, 2011, it was apparent that the parties were not as far apart on matters as it originally appeared. However, a number of issues remain in dispute. The issues that remain in dispute relate to how much data should be collected each monitoring period and what conditions need to be present to consider the data usable, whether GMP's proposed monitoring locations are appropriate and sufficient in number, how

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4. GMP's letter was ostensibly filed as a response to comments filed by the Towns on October 11, 2011. However, the Towns submitted those comments electronically. Because they were not received by the Clerk's Office in hard copy, they were not properly filed. *See*, PSB Rule 2.204. Accordingly, those comments have not been considered in reaching our decision in this Order.

microphones should be placed at monitoring locations, how GMP responds to noise complaints from area residents, whether GMP is allowed to engage in numerical rounding in calculating whether or not a violation has occurred, and whether GMP must include in its monitoring results data collected when temperatures are below 14 degrees Fahrenheit.

POSITIONS OF THE PARTIES

GMP

GMP asserts that its Plan, as revised in its October 7, 2011, filing, complies with Condition 41 because it meets all of the requirements set forth in Condition 41, and is more detailed and more stringent than the Sheffield Plan. GMP asks that the Plan be approved without modification.[5]

GMP asserts that the changes proposed by the Towns and LMG should be rejected because their proposals substitute standards "of their own creation" for the standard established by the Board in Condition 41. Specifically, GMP contends that the following proposals by the Towns and LMG should be rejected: (1) compliance with worst-case sound power levels and atmospheric conditions; (2) additional monitoring sites beyond the four proposed by GMP; (3) a 168-hour usable-data requirement based on specific atmospheric conditions; (4) sound monitoring during construction; (5) reduced distance between monitored structures and microphones; (6) data gathering at property lines with a setback rather than at residences; (7) alteration of an ASTM standard; (8) requirement that all turbines be operating in order for data to be considered usable; and (9) a requirement that the turbines operate at maximum sound power for at least 48 hours during any monitoring period.[6] GMP maintains that these proposals should be rejected because none of them are included in the Sheffield Plan, nor are they based on any standards articulated in that plan.[7]

GMP asserts that the requirements proposed by the Towns and LMG constitute new standards for testing noise levels and are thus inconsistent with the Order, which already has

5. GMP Brief at 1.
6. GMP Brief at 4.
7. GMP Brief at 4.

established the appropriate standards. Because the proposals constitute new standards, GMP argues, they are not appropriate in the context of a compliance filing because they seek to relitigate issues already decided in the Order.[8]

GMP also contends that the requirements proposed by the Towns and LMG should be rejected both because they are inconsistent with the Order and for policy reasons. GMP characterizes the requirements proposed by the Towns and LMG as falling into three broad categories, being: (1) sound monitoring during the construction phase; (2) requirements related to field conditions to consider data useful, such as worst-case sound power levels and silent or nearly silent background noise levels, minimum usable-data requirements, and a requirement that 100% of turbines be operating during monitoring; and (3) changes to the physical manner in which data is collected and the technical standards used to assess it.[9]

With respect to category 1, GMP asserts that it is uncontested that Condition 41 applies to the project's operational phase, not its construction phase.[10] As to category 2, GMP contends that imposition of the proposed requirements would result in costly additional testing, and that the requirements are unnecessary to ensure the project's compliance with the noise standard set by the Board. GMP states that the Plan provides a high degree of assurance that the maximum sound level of the project will be captured during the two-year monitoring period, rendering the requirements for worst-case scenario testing conditions unnecessary.[11] With respect to category 3, GMP maintains that its Plan will result in proper placement of microphones consistent with the applicable ANSI standard, and in a location with the fewest line-of-sight obstructions to the project.[12] GMP contends that the Towns and LMG's proposal departs from the applicable ASTM standard for placement of a source and receiver for outside-to-inside testing, and in any event is redundant, and should therefore be disregarded. GMP also asserts that its proposal,

8. GMP Brief at 5.

9. GMP Brief at 5-6.

10. GMP Brief at 6-7. The Towns and LMG did not request that the Board require sound monitoring during the construction phase of the project in their brief. Accordingly, we need not address it in this Order.

11. GMP Brief at 7.

12. GMP has stated its agreement with a DPS proposal to utilize an unbiased third-party observer to review the first two-week monitoring period, including micrositing of the microphones used for monitoring. GMP Brief at 3-4, 8.

which relies on use of recording devices to eliminate short-term background noise events, is consistent with the intent of ANSI S12.9 Part 3 and should therefore be approved. GMP maintains that the methodology it has proposed for determining background sounds is sufficient for determining the project's compliance with the noise standard imposed by the Board. Lastly, GMP asserts that the Gebbie camp is an inappropriate location to perform monitoring because the Gebbies have waived their right to assert any noise-related claim based on the construction or operation of the project, and that there are five other residences along Eden Road within one mile of the project where monitoring could take place.[13]

GMP states that it has worked cooperatively with the Towns and LMG and incorporated a number of suggestions to address their concerns. However, GMP continues to argue that the remaining changes the Towns and LMG seek would result in the Plan not being consistent with the Sheffield Plan, and have no support in the evidentiary record.[14] Specifically, GMP maintains that the requirement for worst-case testing conditions is unworkable and unsupported by any record evidence or the broader scientific community.[15] GMP also contends that the record evidence supports the conclusion that its Plan will capture the maximum sound levels from the project at some time during the course of the Plan, claiming that the Board can review the effectiveness of the Plan based on the reports GMP will file with the Board showing the results of each monitoring period.[16] GMP further asserts that its complaint-resolution procedure is sufficiently protective and that the proposal by the Towns and LMG is technically unsound and will produce less reliable results, that microphone placement should be no closer than 25 feet from structures consistent with the applicable ANSI standard, that the Dyer-Dunn camp, the Gebbie camp and the Christiansen monitoring locations proposed by LMG and the Towns should be rejected, that monitoring below 14 degrees Fahrenheit is technically unsound, and that Board approval of microphone micrositing is not necessary.[17]

13. GMP Brief at 8-10.
14. GMP Reply Brief at 2-3.
15. GMP Reply Brief at 4-5.
16. GMP Reply Brief at 6.
17. GMP Reply Brief at 6-12.

The Towns and LMG

The Towns and LMG dispute, as an initial matter, GMP's reliance on consistency with the Sheffield Plan as a basis for recommending rejection of the Towns and LMG's proposals. They argue that consistency with the Sheffield Plan is a minimum requirement and constitutes a starting point from which the parties can propose improvements to ensure compliance with the noise standard set by the Board.[18]

The Towns and LMG recommend that the Board require the collection of at least 168 hours of usable data at each monitoring location for each monitoring period. According to the Towns and LMG, for data to be usable requires background sound-pressure levels at or below 45 dBA, no rainfall, and wind speeds at ground level of less than 5 meters per second. They further recommend that all turbines be operating during these time periods, and that the 168-hour requirement include at least 48 hours where 100% of the turbines are expected to be operating at maximum sound power, and when modeling indicates it is likely that Noise Reduced Operation ("NRO") mode will be triggered. According to the Towns and LMG, the minimum-usable-data requirement will ensure both that GMP chooses appropriate locations for microphone placement, and that it conducts monitoring under conditions that are most likely to show whether the project violates the noise standard imposed by the Board.[19]

The Towns and LMG also recommend that the siting of microphones not be left to GMP's discretion because it may result in the collection of large amounts of unusable data due to excessive background noise, and may result in data that is not representative of actual noise levels being experienced by neighboring residents. The Towns and LMG recommend that microphone placement be based on worst-case scenario locations so that potential violations of the noise standard are not overlooked, and that an independent third party be used to review the placement to ensure the requirement is being met. The Towns and LMG also argue that four monitoring locations are insufficient to address variability in the surrounding terrain and exposure to the turbines throughout the project area. They recommend that monitoring be performed at the Dyer-Dunn camp and the Gebbie residence to address their concern. Further,

18. Towns/LMG Brief at 2-4.
19. Towns/LMG Brief at 4-10.

the Towns and LMG maintain that GMP's proposed monitoring locations will not show what the noise levels are at other residences closer to the project site than those chosen for monitoring. They cite the Christiansen residence as an example, due to the existence of additional residences in the area several hundred feet closer to the project. The Towns and LMG recommend that if noise levels at the Christiansen residence are within 3 dBA of the standard, that additional nighttime testing be performed at residences closer to the project, and that, at the request of a homeowner, outside-to-inside testing be performed to ensure compliance with the noise standard.[20]

The Towns and LMG also take issue with a number of matters in the Plan's proposed complaint-resolution protocol. First, they contend that the requirement that exterior sound levels be reasonably likely to be within 3 dBA[21] of the noise standard before additional testing will occur in response to a complaint is too lenient, and will allow GMP to avoid testing in circumstances that would result in a violation of the interior noise limit established by the Board, particularly where a structure attenuates sound by only 10 dBA. They recommend that testing in response to a complaint be required if noise levels are within 5 dBA of the exterior limit.[22] Second, the Towns and LMG claim that the Plan should be changed so that the primary method for determining attenuation by a particular structure be outside-to-inside testing at that structure, rather than assuming an amount of attenuation based on information gathered at a similar structure.[23] Lastly, the Towns and LMG assert that the amount of time that the Plan allows GMP to perform monitoring in response to a complaint, up to three months, is excessive and could result in an inability to replicate the conditions that led to the complaint in the first instance. They recommend that monitoring in response to a complaint take place within four weeks of the complaint's receipt, and that follow-up monitoring be required under conditions similar to those

20. Towns/LMG Brief at 10-14.

21. As discussed later in this Order, these exterior sound levels will be determined either through modeling or extrapolation from a nearby location where monitoring is already taking place.

22. Towns/LMG Brief at 14-16.

23. Towns/LMG Brief at 16.

existing at the time of the complaint, if conditions are significantly different at the time of the initial monitoring.[24]

The Towns and LMG also object to GMP's intention to use rounding to determine whether the standard has been violated, and maintain that any reading in excess of the 45 dBA (exterior)(Leq)(1 hr) or 30 dBA (interior)(Leq)(1 hr) standards constitutes a violation.[25]

With respect to microphone placement, the Towns and LMG urge the Board to reject GMP's proposal to place microphones at least 25 feet from a monitored residence to avoid the impacts of reflection on the monitored readings. They argue that microphone placement should account for the impacts of reflection because that is what people living in the residences will experience when they are outside and nearby the exterior of their homes. The Towns and LMG recommend that where there are porches or other areas of recreation within 25 feet of a monitored structure, that monitoring be conducted both 25 feet from the structure and 6 feet from the structure to determine the noise levels people will actually be experiencing.[26]

The Towns and LMG also argue that monitoring should be required at the Dyer-Dunn and Gebbie camps, asserting that they constitute "residences" for purposes of applying the noise standard established by the Board.[27]

Lastly, the Towns and LMG argue that monitoring data collected during times when the temperature is below 14 degrees Fahrenheit should be included in the results. In the alternative, they recommend that one additional night of monitoring be required anytime the temperature falls below 14 degrees for five or more hours during the nighttime in a monitoring period.[28]

The Towns and LMG filed a letter in lieu of a reply brief. In that letter, they state their reliance on their initial brief for the issues raised therein. However, they point to one specific issue raised by GMP that they believe requires a response. The Towns and LMG assert that GMP's argument that the changes proposed by the Towns and LMG constitute new standards for noise testing, and thus do not meet the standard for a compliance filing and are therefore

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24. Towns/LMG Brief at 16-17.
25. Towns/LMG Brief at 18.
26. Towns/LMG Brief at 18-20.
27. Towns/LMG Brief at 20-21.
28. Towns/LMG Brief at 21-22.

inconsistent with the Order, is "ridiculous for several reasons."[29] First, they point out that the compliance filing was the first opportunity they had to substantively review the Plan because it was not included with GMP's testimony. They contend that if all that is required is for GMP to submit a plan that fits within the "limited and very general requirements" contained in the Order, that GMP could develop a biased plan that would not sufficiently protect public health.[30] Second, the Towns and LMG maintain that their proposed changes to the Plan are consistent with Condition 41's requirement that any noise monitoring plan be able to confirm compliance with the noise standards established for the project under a variety of seasonal and climatic conditions. Because their proposed changes are designed to ensure compliance, the Towns and LMG assert, they are consistent with the standards set by the Board.[31]

The Department of Public Service

The DPS recommends that the Board approve the Plan as proposed by GMP, subject to the condition that an independent third party selected by the Board review the results of the first two-week monitoring period to determine whether the monitoring is consistent with the requirements established in the Order and CPG. Additional third-party review could be required if the Board determined it was appropriate. The reviewer would be compensated by the Petitioners.[32]

DISCUSSION

Condition 41 states:

> Prior to commencement of construction, Petitioners shall prepare a Noise Monitoring Plan, subject to review by the parties and approval by the Board, which is consistent with the Plan recently approved by the Board in Docket 7156, but which extends from construction through the first two years of operations and includes: (a) monitoring for low frequency sound with the same regularity as monitoring for all frequencies; (b) a monitoring program to confirm under a variety of seasonal and climactic conditions compliance with the maximum

29. Towns/LMG Reply at 1.
30. Towns/LMG Reply at 1.
31. Towns/LMG Reply at 2.
32. DPS Brief at 1.

> allowable sound levels described above; (c) a means for ensuring that noise monitoring events shall be timed to coincide with those time periods when Petitioners' modeling indicates the likelihood that the noise reduced operation ("NRO") mode will be triggered; (d) monitoring reports that document every instance when NRO mode is triggered, with a description of how NRO affected operations; (e) at the request of a homeowner, monitoring to ensure compliance with the interior noise standard; and, (f) a process for complaint resolution shall be established for the entire life of the project.

As an initial matter, we must address GMP's claim that the Towns and LMG's recommendations are not appropriate for consideration in response to this compliance filing under Condition 41. We conclude that they are appropriate under the circumstances and consistent with the language of the Order and CPG. First, because GMP made the decision to file a detailed plan only after the Order and CPG were issued, the Towns and LMG are correct that this is the first opportunity parties have had to examine the details of the Plan and provide comments and recommendations on whether or not it complies with the Order and CPG. Second, the language in the Order and CPG did not simply say that GMP must file a plan that is consistent with the Sheffield Plan. Rather, it said the Plan should be consistent with the Sheffield Plan and must address a number of additional factors. Among those additional factors was the requirement that the Plan contain a monitoring program capable of confirming compliance with the maximum allowable sound levels under a variety of seasonal and climatic conditions. Much of the relief requested by the Towns and LMG reflects their belief that the Plan does not meet this requirement. Accordingly, we are unpersuaded by GMP's argument that we should not consider the recommendations put forth by the Towns and LMG.

We will address each of the issues raised by the parties on an individual basis below.

1. Use of a Third Party to Review the First Monitoring Period[33]

All parties filing briefs on the noise monitoring issue agree that use of a third party to review the results of the initial two-week monitoring period would be helpful in ensuring that the

33. We address this issue first because we believe it will assist in resolving some of the other issues still in dispute.

requirements of the Order and CPG are met. We agree, and therefore require such an independent third-party review.

The third party's role shall include not only review of the data collected, but the placement of microphones at the monitored locations to maximize the amount of usable data collected. The third party shall also file a report with the Board within 30 days of the completion of the first two-week monitoring period setting forth his/her opinion as to the sufficiency of the data collected, whether the turbines' sound levels were accurately captured at the monitoring locations, and, if any, recommendations for alterations to the Plan to ensure that maximum project sound levels are being captured by the monitoring.

The DPS recommends that the Board select the third party to be used in this role. Because the third party will be under contract with and paid for by the Petitioners, we believe it would be most efficient for GMP, the DPS, the Towns and LMG to seek to reach consensus on the identity of the third party. We stress that we expect the parties to negotiate in good faith to find an unbiased third party that will provide objective review and analysis of the monitoring protocol. In the event the parties are unable to agree on a third party, they should so notify the Board and submit a list of candidates under discussion with their relevant qualifications and experience clearly set forth. Each party may also submit comments indicating its preferred ranking of candidates on the list and why they favor one candidate over the others. In that event, the Board will select the final candidate from the list provided by the parties. The parties shall have 90 days from the date of this Order to either inform the Board of their selection or submit the information described above.

Lastly, as recommended by the Department, the Board reserves the right to direct that third-party supervision continue beyond the first monitoring period in the event the third party's report identifies material concerns with the manner in which the monitoring was conducted in the first monitoring period.

2. Requirement for a Minimum Number of Hours of Usable Data[34]

The Towns and LMG claim that requiring a minimum amount of usable data is necessary to ensure both that GMP chooses appropriate locations for microphone placement[35] and conducts monitoring under conditions that are most likely to show whether the project violates the noise standard imposed by the Board.[36]

GMP contends that the requirement is not necessary and would add unwarranted costs to the monitoring program because the evidence of record shows a high likelihood that the monitoring will capture the wind turbines within 1 dBA of maximum sound power at some point during the monitoring process.[37]

We decline to impose the conditions requested by the Towns and LMG because Mr. Kaliski's testimony convinces us that the proposed Plan will capture the maximum sound levels produced by the project under a variety of seasonal and climatic conditions. The witness for the Towns and LMG, Mr. Blomberg, did not challenge Mr. Kaliski's analysis of weather data and sound output levels over the course of a year. Rather, the Towns and LMG's proposal is based more on concerns that GMP will pick inappropriate locations for microphone placement, rendering much of the data collected unusable, and that GMP will choose to monitor under conditions that are not likely to result in noise violations being found.[38]

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34. This refers to the requirements proposed by the Towns and LMG that each monitoring period include at least 168 hours of background sound pressure levels at or below 45 dBA, no rainfall, and wind speeds at ground level of less than 5 meters per second, that all turbines must be operating during the monitoring periods, and that the 168-hour requirement include at least 48 hours when 100% of the turbines are expected to be operating at maximum sound power, and when modeling indicates it is likely that NRO mode will be triggered.

35. The Towns and LMG argue that if microphone placement is left to GMP's discretion without a minimum usable data requirement, GMP could place the microphones in locations that would result in large amounts of unusable data. Towns/LMG Brief at 10.

36. Towns/LMG Brief at 4-10.

37. There appears to be a difference between Mr. Kaliski's prefiled testimony and his testimony given live during the December 13, 2011, technical hearing. In his prefiled testimony, Mr. Kaliski states that there is a 94% probability that the monitoring will capture sound levels within 1 dB of maximum during any two-week monitoring period, and that the probability increases to 100% for two or more monitoring periods. Kaliski pf. at 3-4. However, during the technical hearing, Mr. Kaliski stated that there is a 100% probability of capturing maximum sound levels in any two-week monitoring period. Tr. 12/13/11at 22 (Kaliski). To be conservative, our Order today relies on Mr. Kaliski's prefiled testimony.

38. Towns/LMG Brief at 5.

While we recognize the Towns and LMG's concerns, we do not find them to be warranted. GMP has a strong incentive to perform the monitoring in a manner that demonstrates it is actually capturing maximum project sound levels, or it runs the risk of being directed to conduct additional monitoring at its own expense. This is especially so since we are requiring the use of the third-party observer during at least the first two-week monitoring period. The use of the third-party observer will ensure proper site selection and microphone placement, and will result in a report being filed with the Board regarding the results of the monitoring and whether maximum sound levels are being captured. This extra degree of oversight, coupled with Mr. Kaliski's uncontradicted testimony regarding the likelihood of capturing maximum sound levels as a result of the duration and number of monitoring periods, leads us to conclude that the minimum usable data requirement unnecessarily adds a layer of complexity and expense to the Plan without providing an appreciable benefit. Accordingly, we decline to impose the requirement at this time. However, if review by the third-party observer discussed above indicates that the testimony provided by GMP is incorrect, and that sufficient data is not being collected to ensure compliance with the noise standard, we are prepared to reconsider our decision on this issue at that time.

3. Monitoring at the Gebbie and Dyer-Dunn camps

We decline to direct monitoring at the Gebbie and Dyer-Dunn camps because they do not constitute "residences" as that term was used in the Order. The American Heritage Dictionary defines "residence" as, "The place in which one lives; dwelling," and defines "reside" as, "To live in a place for an extended or permanent period of time."[39] Thus, the commonly accepted meaning of the term "residence" is a place where someone lives for extended periods of time, and that is what we intended by our use of that term in the Order. There is no evidence in the record that either the Dyer-Dunn or Gebbie camps are utilized in this fashion. Additionally, GMP has

39. American Heritage Dictionary, Second College Edition.

demonstrated that the Gebbies have executed an agreement waiving any noise-related claims they may otherwise have against GMP.[40]

GMP's opposition to monitoring at the Gebbie camp does not mean that monitoring will not take place in that area. According to Vermont's E-911 database, there are five residences along Eden Road within a mile of the project site where monitoring could take place.[41] Accordingly, we condition our approval of the Plan on GMP securing, in consultation with the third-party observer, an appropriate monitoring location along Eden Road that is designed to capture maximum sound levels from the project. A location on the Gebbie property that is representative of the sound levels that will be experienced by the residences on Eden Road in this area would be acceptable.

4. Monitoring at the Christiansen residence

The Towns and LMG and GMP disagree over a monitoring location to capture sound levels in the area of Route 100. The Towns and LMG are concerned that if GMP uses the same location for monitoring that was used to assess background levels for GMP's prefiled testimony, the data will be rendered useless due to contaminating traffic noise because of its proximity to Route 100, and propose that monitoring take place at the Christiansen residence instead.[42]

GMP argues that both Mr. Kaliski's and Mr. Blomberg's earlier monitoring efforts yielded a daytime L90 of 30 dBA for this location,[43] and that there was no testimony given to

40. GMP Brief at 10.

41. Kaliski pf. at 7.

42. Blomberg pf. at 4. Mr. Blomberg suggests using the Christiansen residence as the monitoring location because of the presence of a hill that would screen traffic noise from Route 100. Blomberg pf. at 4. However, in their Brief, the Towns and LMG argue that the Christiansen residence is not the most highly-impacted residence in the area due to the presence of residences located closer to the project site. Rather than propose what they believe is a more appropriate site, they appear to accept the Christiansen residence as a monitoring location and then propose additional testing at these closer residences if noise levels at the Christiansen residence are 42 dBA or higher. The Towns and LMG do not explain why a different location should not be utilized that could avoid the need for potential additional testing. Towns/LMG Brief at 13-14.

43. The relevance of the L90 measurements is not clear with respect to the dispute over this monitoring location. While it tells us that the level of 30 dBA is exceeded 90 percent of the time, it does little to tell us if background sound levels are high enough for a sufficient percentage of the time to render data unusable.

demonstrate that the location favored by the Towns and LMG would yield 168 hours of data in a monitoring period with background sound levels below 45 dBA.[44]

The Plan provides that the Route 100 monitoring location will be located closer to the project site than the Christiansen residence if possible.[45] Additionally, the Vermont E-911 database indicates that there are seven residences in this vicinity that are closer to the project site than the Christiansen residence where monitoring may be conducted if appropriate.[46] Accordingly, we conclude the proposed Plan, in conjunction with the use of the third-party observer, addresses the issues raised by the Towns and LMG over monitoring in the Route 100 area. Our approval of the Plan is conditioned upon GMP securing an appropriate monitoring location in this vicinity that is designed to capture maximum sound levels from the project, and at a location representative of the closest residence to the project in this area, if reasonably possible.

We decline to impose the Towns and LMG's proposal for additional nighttime monitoring at residences closer to the project site if monitoring is performed at the Christiansen residence and levels are 42 dBA or higher. If such a scenario should occur, the Plan allows for the owners of those closer residences to file a complaint, and if monitoring or modeling suggests a reasonable possibility that levels at the complaint location are within 3 dBA of the 45 dBA limit, then location-specific testing must be performed. If monitored levels at the Christiansen residence are within 3 dBA of the noise standard, it stands to reason that they will likely be within 3 dBA of the standard at a residence closer to the project, meaning that GMP would likely be required to conduct monitoring in response to a complaint from that location. Accordingly, we see no need to impose a requirement for automatic, additional monitoring.

5. Placement of microphones

The dispute between the Towns and LMG and GMP on the placement of microphones revolves around two major issues. First, the Towns and LMG propose that microphones be

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44. GMP Brief at 10.
45. Exh. Pet.-KHK-5 at 4.
46. Kaliski pf. at 7.

placed in locations that provide worst-case sound conditions so that potential violations of the noise standard are not overlooked. According to the Towns and LMG, absent this requirement, the Plan allows GMP to select quieter locations over noisier locations to perform its monitoring. They maintain that the Plan's "line of sight not obscured by structures" requirement is insufficient because it allows GMP to select locations where terrain features act as a barrier to noise from the project. They also assert there is nothing preventing GMP from choosing a location where there are fewer turbines in line-of-sight, thereby reducing the monitored levels.[47]

GMP counters that its proposal for microphone placement is consistent with the Sheffield Plan, and that it provides for needed flexibility because there are often constraints on placement due to landowner restrictions, proximity to other sound sources, and other limitations. GMP maintains that the Plan provides for placement adjacent to a residence (or a location representative of the residence) with the fewest line-of-sight obstructions to the project. As long as this is the case, GMP contends, then representative sound levels from the project will be captured.[48]

We conclude that a "worst-case scenario" requirement for microphone placement imposes too many potential restrictions and could result in an inability to monitor at certain locations. For example, the worst-case placement at a monitoring location vis-a-vis the project may also be inappropriate due to excessive background noise, or a desire by the property owner not to have monitoring take place in that specific location. Accordingly, we conclude that some flexibility in micrositing the microphones is needed and decline to impose the requested requirement.

However, we stress that our approval of the Plan is conditioned on GMP making every reasonable effort to site the microphones in a manner that will maximize the probability of capturing the maximum noise levels at each monitoring location, taking into account all relevant factors such as minimizing line-of-sight obstructions between microphones and the project, and maximizing the number of turbines in line-of-sight of the microphones at each monitoring location. Again, we anticipate that issues surrounding micrositing of the microphones will be addressed through consultation with the third-party observer discussed above. We also remind

47. Towns/LMG Brief at 12.

48. GMP Brief at 8.

GMP that insufficient monitoring resulting from its decision-making in the monitoring process could result in the imposition of additional monitoring and/or increased oversight.

The second major issue related to microphone placement is the distance from a structure that a microphone should be placed. The Towns and LMG assert that microphones should be placed as close as six feet from a monitored residence in order to capture the noise levels actually experienced by residents who are outside their homes, such as sitting on porches or decks.[49]

GMP objects to this proposal and instead maintains that the applicable standard, ANSI S12.9 Part 3, requires that microphones be placed at least 25 feet from structures to avoid the impacts from reflection off of those structures, which could increase the exterior monitored level by as much as 3 dB. GMP asserts that, because the noise standard is primarily intended to protect against sleep disturbance, the outside monitoring should be conducted in a manner that facilitates an accurate calculation of interior noise levels.[50]

We decline to adopt the proposal made by the Towns and LMG. We conclude that it is inconsistent with the applicable ANSI standard and that it increases the possibility of inaccurate interior sound level calculations. The Towns and LMG are correct that the standard does not require, in all circumstances, that microphones be placed at least 25 feet from a structure. However, what they fail to acknowledge is that when microphones are placed closer than 25 feet from a structure, then the effects of reflection must be accounted for.[51] We conclude that the ANSI standard is intended to avoid the impacts of reflection where possible, and to calculate and remove them from measurements where they cannot be avoided. Additionally, the primary concern addressed by the noise standard is sleep disturbance within the residence. Placing the microphones in an area that increases the exterior monitored levels as a result of reflection would

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49. Towns/LMG Brief at 18-20. The evidence shows that reflection could result in an increase in exterior monitored levels of up to 3 dB. However, changes in sound pressure levels below 3 dB are generally not perceptible to the human ear. Exh. Pet.-KHK-2 at 4. In short, any increases in sound pressure levels resulting from reflection will be barely, if at all, perceptible to people sitting or standing just outside their homes.

50. GMP Brief at 8.

51. GMP Reply Brief at 8-9 (citing to and quoting ANSI S12.9 Part 3, Section 8.1(b)).

artificially inflate the calculated indoor sound levels. Accordingly, we decline to impose the requirement requested by the Towns and LMG.[52]

6. Complaint-resolution protocol

The Towns and LMG and GMP disagree over three aspects of the Plan's complaint-resolution protocol. Specifically, the Towns and LMG recommend: (a) that the threshold for monitoring in response to a complaint be lowered from the level proposed by GMP; (b) that outside-to-inside testing be performed for any resident that requests it; and (c) that the amount of time in which GMP is required to conduct monitoring in response to a complaint be reduced.

A. Complaint monitoring threshold

The Plan requires GMP to conduct monitoring in response to a complaint if the impacted residence is within 1.5 miles of the turbine string and monitoring[53] and/or modeling indicates a reasonable possibility that the project's sound level is within 3 dBA of the CPG limit (i.e. 42 dBA or higher) at the complaint location.[54] The Towns and LMG argue that the trigger for requiring monitoring should be lowered to be within 5 dBA of the allowable limit (i.e. 40 dBA or higher). They assert that the trigger proposed by GMP will allow for violations of the interior standard of 30 dBA (Leq)(1 hr) to be overlooked. The Towns and LMG point to the cross-examination of Mr. Kaliski during the December 13, 2011, technical hearing when he acknowledged this possibility. The hypothetical set forth by the Towns and LMG assumes a situation in which a structure's outside-to-inside attenuation is 10 dBA with windows open, with exterior sound pressure levels of 41.5 dBA. Under the Plan, no monitoring would need to occur because the exterior level is not within 3 dBA of the allowable limit, yet the 10 dBA of attenuation would

52. The Towns and LMG premise their argument in part on the ability of a property owner to sleep outdoors. However, the sleep disturbance aspect of the noise standard is limited to indoor noise levels. The exterior maximum level of 45 dBA (Leq)(1hr) is not intended to protect against sleep disturbance outside the residence.

53. The monitoring referred to here by GMP is regular monitoring that will be conducted at primary monitoring locations under the Plan. The levels recorded at the nearest of those monitoring locations will be extrapolated to the complaint location to determine whether sound levels are likely within 3 dBA of the allowable limit at that location.

54. Exh. Pet.-KHK-5 at 12.

result in an interior level of 31.5 dBA, which if it were sustained on average over the course of an hour, would be a violation of the interior standard and would be overlooked.[55]

GMP counters that the Plan is consistent with the Sheffield Plan, and that both plans account for the possibility that not every complaint will be the result of project noise. This, GMP contends, is an appropriate basis for limiting investigation to complaints generated when it appears there is a reasonable possibility that project sound levels are within 3 dBA of the allowable maximum.[56]

We conclude that the Towns and LMG have identified a deficiency in the Plan that could result in violations of the interior noise standard that go unidentified. This is particularly problematic because one of the primary purposes of the noise standard we imposed is to protect against sleep disturbance. However, we decline simply to lower the trigger for monitoring in response to a complaint as requested by the Towns and LMG; instead we will require additional analysis under the circumstances that have been identified by the Towns and LMG. The situation identified by the Towns and LMG arises as a result of a particular structure having a lower attenuation value and will likely only occur, if at all, during times of the year when windows are open. Accordingly, if GMP receives a complaint, and monitoring and/or modeling indicates a reasonable possibility that project noise levels are within 5 dBA of the allowable maximum, then GMP must, at the request of the homeowner, perform outside-to-inside testing to determine the attenuation value of the structure. If the attenuation value of the structure is low enough to indicate a possible violation of the indoor standard based on the exterior noise levels determined in the initial screening process, then monitoring must be performed. In any event, monitoring must be performed if the initial screening done in response to a complaint indicates a reasonable possibility that project sound levels are within 3 dBA of the allowed maximum level.

We realize this condition has the potential to increase costs for GMP and that it departs in some respect from the requirements in the Sheffield Plan. However, the evidentiary record in this proceeding has identified the possibility of violations being overlooked. The condition we impose today seeks to provide the protections intended by the imposition of the noise standard

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55. Towns/LMG Brief at 15-16 (quoting tr. 12/13/11 at 51-52 (Kaliski)).
56. GMP Reply Brief at 6-7.

without requiring GMP to engage in a full period of monitoring unless it appears that an interior violation is reasonably possible.

B. Outside-to-inside testing

The Plan proposes to utilize the results of outside-to-inside testing performed at the primary monitoring locations to determine the attenuation value of a structure where monitoring is being performed in response to a complaint, provided one of the primary monitoring locations has a structure similar to the one at the complaint location. Under the Plan, outside-to-inside testing will only be performed at a complaint location with permission of the property owner, and if no similar structure exists at a primary monitoring location where such testing has been performed. In the event there is no similar structure and the complaining property owner declines to give permission to GMP to perform the testing, then 15 dBA attenuation is assumed.[57]

The Towns and LMG argue that the Plan should provide for outside-to-inside testing at a complaint location if the owner requests it, instead of relying on the use of similar structures.

During the December 13, 2011, technical hearing, Mr. Kaliski appeared to concede that his intent in drafting the Plan was consistent with the Towns and LMG's position on this issue.[58]

We conclude that the best method for determining a structure's attenuation value when monitoring in response to a complaint is to perform outside-to-inside testing at that structure, rather than attempting to rely on values calculated at similar structures.[59] GMP may rely on the attenuation value calculated at similar structures only where the complaining property owner declines to give GMP permission to conduct the testing.

C. Monitoring in response to complaints

Under the Plan, if monitoring is required in response to a complaint, GMP is required to conduct that monitoring no later than its next regularly scheduled monitoring period, or if none,

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57. Exh. Pet.-KHK-5 at 14.
58. Tr. 12/13/11 at 100-01 (Kaliski).
59. This requirement addresses the concerns of the Towns and LMG over the limited number of structures available for comparison purposes. *See*, Towns/LMG Brief at 13.

within three months.[60] The Towns and LMG contend that this time frame is too long because the conditions that existed at the time of the complaint, and which may have contributed to higher sound-pressure levels at the complaint location, may be very different by the time GMP conducts its monitoring, allowing a previous violation of the noise standard to go undetected due to the changed conditions and their impacts on noise levels. The Towns and LMG recommend that GMP be required to conduct initial monitoring within four weeks of receiving a complaint, and if conditions are significantly different at the time the monitoring is performed, that GMP be required to conduct follow-up testing at a time when the conditions that existed at the time of the complaint are replicated.[61]

GMP contends that the Plan is designed to assess the conditions that gave rise to a complaint. GMP characterizes the Towns and LMG's proposal as arbitrary and one that will produce less reliable results. The Plan, argues GMP, will determine the root cause of complaints by requiring that monitoring be performed under the same conditions that existed at the time of the complaint.[62]

We find GMP's arguments to be unconvincing. The time frame proposed in the Plan to conduct monitoring in response to a complaint does not contain a requirement that conditions at the time of the complaint be replicated. There is only one reference to accounting for conditions at the time a complaint is made, and it is expressed as "should" rather than "shall" and applies only to one of five permissible methods for determining background noise levels.[63] GMP's proposal appears to be designed more for GMP's convenience than for timely and relevant monitoring, as it primarily revolves around times when GMP expects to be conducting monitoring anyway, at least during the first two years of operation. While we agree that complaint monitoring should take into account the conditions existing at the time of the complaint, GMP's proposed three-month window to conduct testing actually increases the risk that conditions will be different from those that existed when the complaint was made. In addition, while Mr. Kaliski testified at the technical hearing that taking conditions into account

60. Exh. Pet.-KHK-5 at 13.
61. Towns/LMG Brief at 16-17.
62. GMP Reply Brief at 7-8.
63. Exh. Pet.-KHK-5 at 13-14.

may mean having to wait as much as a year to conduct monitoring, the Plan makes no such mention. It states plainly that monitoring, if required, will be performed no later than the next scheduled monitoring period, or if none, no later than three months after a complaint is received.[64]

We conclude that, with some modification, the Towns and LMG's proposal is reasonable. Conducting testing within four weeks of receipt of a complaint will increase the likelihood of environmental conditions similar to those that existed at the time of the complaint. The four-week window gives GMP sufficient time to prepare and study weather forecasts to identify the best opportunity for monitoring during the desired conditions, and we expect GMP to make every reasonable effort to conduct monitoring under such conditions. An additional benefit of requiring that monitoring be performed within four weeks of a complaint, is that the noise levels complained of may be the result of something more general in nature that is occurring during normal turbine operation. While the risk of this may be slight, according to Mr. Kaliski's testimony, it is a possibility that GMP's proposal overlooks. We will not require GMP to perform the follow-up testing proposed by the Towns and LMG if conditions at the time of complaint cannot be replicated during monitoring. Nothing in the Plan prevents a homeowner from initiating the complaint resolution process again in the event similar circumstances lead to increased noise levels in the future.

7. Rounding

During the December 13, 2011, technical hearing, Mr. Kaliski, for the first time in the course of this proceeding, indicated that GMP would utilize rounding to determine whether or not the noise standard was violated. Specifically, levels between 45 dBA and 45.49 dBA would be rounded down to 45 dBA and not considered a violation. Levels of 45.5 dBA and above would be considered a violation.[65]

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64. Exh. Pet.-KHK-5 at 13.

65. Tr. 12/13/11 at 65-67 (Kaliski). We note that the proposed rounding would always work in GMP's favor because levels above 45 dBA can be rounded down to eliminate a violation, but levels below 45 dBA will never be rounded up above that level to create a violation.

The Towns and LMG contend that rounding should not be allowed because there is nothing in the record to support that interpretation of the noise standard.[66]

We clarify in today's Order that the rounding described by Mr. Kaliski is not permissible under the Order and CPG. The standard we imposed for protecting against undue adverse noise impacts was based on the testimony received on the topic during the course of the technical hearings. No witness for GMP discussed rounding at that time and there is therefore no evidentiary basis that supports Mr. Kaliski's apparent interpretation of the Order. The maximum allowable levels established in the Order and CPG are just that, maximum allowable levels. No rounding is allowed.

8. Temperature restrictions

The Plan provides that data will be removed from the monitoring results when temperatures fall below 14 degrees Fahrenheit.[67]

The Towns and LMG maintain that the Board should require GMP to monitor below the 14 degree cutoff point, or require GMP to conduct one additional night of monitoring for each night that temperatures fall below 14 degrees for five hours or more. The Towns and LMG point out that Mr. Kaliski testified that he has confidence in the monitoring equipment at temperatures below 14 degrees, and that he has conducted monitoring in the past under such conditions. The Towns and LMG are particularly concerned because temperatures are more likely to be below 14 degrees during the overnight hours, thus resulting in the removal of data most relevant to compliance with a standard that is primarily aimed at preventing sleep disturbance.[68]

GMP argues that the data from periods below 14 degrees should be removed to comply with the applicable ANSI standard, and that it should be followed because the sound meters' specifications indicate accuracy when the temperature is 14 degrees or higher. GMP also asserts

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66. Towns/LMG Brief at 18.
67. Exh. Pet.-KHK-5 at 10.
68. Towns/LMG Brief at 21-22.

that winter conditions are the least problematic for testing of complaints since most Vermonters will be sleeping with their windows fully closed when temperatures fall below 14 degrees.[69]

We direct GMP to file two reports when it files reports of its winter season noise monitoring. One report must include the data from times when temperatures fall below 14 degrees, and the other must reflect the removal of that data. We are directing GMP to file a version with the data from times when temperatures fall below 14 degrees because its noise expert, Mr. Kaliski, testified that he was confident in data collected below 14 degrees, that he had operated sound monitors below that temperature in the past, and if there was some way he could do it here, he would consider it because the 14 degree limitation is very restrictive. The only reason he gave for not utilizing the data collected below 14 degrees is to meet the requirements of the ANSI standard.[70] Given Mr. Kaliski's confidence in the data collected below 14 degrees and his characterization of the standard as being very restrictive, we conclude it is appropriate to include the data in the reports, particularly since the most likely time the temperature will fall that low is during the night. Strict application of the ANSI standard could result in the exclusion of large amounts of data relevant to the question of nighttime noise levels and sleep disturbance. If GMP believes the meters are not producing accurate data during these colder times, it may file comments detailing the problems it believes exist and explaining how they are impacting the data.

CONCLUSION

Subject to the conditions and modifications described above, GMP's proposed Sound Monitoring Plan, as revised in its October 7, 2011, filing is approved. GMP shall file a revised plan incorporating the following elements within 30 days of the date of this Order:

1. A neutral third-party observer shall be utilized during the first two-week monitoring period to assess compliance with the noise-monitoring requirements of the CPG and Order. The third party's role shall include review of the placement of microphones at the monitored locations, as well as review of the data collected. The third party shall file a report with the

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69. GMP Reply Brief at 10-11.

70. Tr. 12/13/11 at 112 (Kaliski).

Board within 30 days of the completion of the first two-week monitoring period setting forth his/her opinion as to the sufficiency of the data collected, whether the turbines' sound levels were accurately captured at the monitoring locations, and, if any, recommendations for alterations to the plan to ensure that maximum project sound levels are being captured by the monitoring. Based on the contents of the third-party observer's report, the Board may direct that third-party review be extended to one or more additional monitoring periods. Within 90 days of the date of this Order, the parties shall either inform the Board of the identity of an agreed-upon third-party observer, or submit a list of candidates for the Board to select from. Costs associated with the third-party monitor shall be borne by GMP.

2. GMP shall, in consultation with the third-party observer, secure an appropriate monitoring location along Eden Road that is designed to capture maximum sound levels from the project. A location on the Gebbie property that is representative of the sound levels that will be experienced by the residences on Eden Road in this area would be acceptable.

3. GMP shall, in consultation with the third-party observer, secure an appropriate monitoring location in the vicinity of the Christiansen residence that is designed to capture maximum sound levels from the project, and, if reasonably possible, at a location representative of the closest residence to the project in this area.

4. GMP shall, in consultation with the third-party observer, make every reasonable effort to site microphones in a manner that will maximize the probability of capturing the maximum noise levels at each monitoring location, taking into account all relevant factors such as minimizing line-of-sight obstructions between microphones and the project, and maximizing the number of turbines in line-of-sight of the microphones at each monitoring location.

5. If GMP receives a noise-related complaint, and monitoring and/or modeling indicates a reasonable possibility that exterior project noise levels are within 5 dBA of the allowable maximum, then GMP must, at the request of the homeowner, perform outside-to-inside testing to determine the attenuation value of the affected structure. If the attenuation value of the structure is low enough to indicate a possible violation of the indoor standard based on the exterior noise levels determined in the initial screening process, then monitoring must be performed. In any event, monitoring must be performed if the initial screening done in response to a complaint

indicates a reasonable possibility that exterior project sound levels are within 3 dBA of the allowed maximum level.

6. The primary method for determining the attenuation value of a particular structure shall be outside-to-inside testing. GMP may rely on the attenuation value calculated at similar structures only where a complaining property owner declines to give GMP permission to conduct outside-to-inside testing.

7. If sound monitoring in response to a complaint is required, then GMP shall perform such monitoring no later than four weeks from receipt of the complaint. GMP shall make all reasonable efforts to conduct such monitoring under conditions similar to those existing at the time the complaint arose.

8. When GMP files the results of its winter season noise monitoring, it shall file two reports; one report shall include the data from times when temperatures fall below 14 degrees Fahrenheit, and the other shall reflect the removal of that data. If GMP believes the sound meters are not producing accurate data during times when the temperature falls below 14 degrees Fahrenheit, it may file comments detailing the problems it believes exist and explaining how they are impacting the data.

So Ordered.

Dated at Montpelier, Vermont, this 3rd day of April, 2012.

s/ James Volz	)	
	)	PUBLIC SERVICE
	)	
s/ David C. Coen	)	BOARD
	)	
	)	OF VERMONT
s/ John D. Burke	)	

OFFICE OF THE CLERK

FILED: April 3, 2012

ATTEST: s/ Susan M. Hudson
Clerk of the Board

NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: psb.clerk@state.vt.us)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this Order, absent further Order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and order.