STATE OF VERMONT

SUPERIOR COURT Environmental Division Unit	ENVIRONMENTAL DIVISION Docket No. 169-12-16 Vtec
Diverging Diamond Interchange A250	DECISION ON THE MERITS Following Remand

RL Vallee, Inc. (Vallee) and Timberlake Associates, LLC (Timberlake) appeal Act 250 permit #4C1271 and permit amendments #4C0676R-16, #4C0288-21, #4C0757-24, and #4C0471-7 (the Act 250 Permit), issued jointly on November 28, 2016 by the District #4 Environmental Commission to the Vermont Agency of Transportation (VTrans) for the construction of the Diverging Diamond Interchange and related improvements (the Project).

The Court held an original five-day trial on March 26–30, 2018 and issued a Merits Decision granting the Act 250 permit on June 1, 2018. Vallee and Timberlake appealed that decision to the Vermont Supreme Court. On August 30, 2019, the Supreme Court ordered a remand on the narrow issue of the Project's compliance with Act 250 Criterion 1. At issue are Vallee's Amended Questions 1.a and 1.b, asking whether the Project will cause undue water pollution through increased chloride and phosphorous discharges. We held an additional three days of trial on January 14 – 16, 2020 on these two questions.

Vallee is represented by Jon T. Anderson, Esq. and Alexander J. LaRosa, Esq. Timberlake is represented by David L. Grayck, Esq.

The Vermont Agency of Transportation (VTrans) is the permittee in this matter. VTrans is represented by Justin E. Kolber, Esq., and Jenny E. Ronis, Esq.

The Agency of Natural Resources (ANR), is represented by Hannah W. Smith, Esq., and Kane Smart, Esq.

The Natural Resources Board (NRB) participated in the Act 250 appeal pursuant to 10 V.S.A. § 8504(n)(3) and is represented by Evan P. Meenan, Esq.

Costco Wholesale Corporation (Costco), is represented by Mark G. Hall, Esq.

Based upon the evidence presented at trial the Court issues the following Findings of Fact, Conclusions of Law, and Judgment Order that accompanies this Merits Decision.

Findings of Fact

Project Overview

1. VTrans' submitted its Act 250 Application in November 2013. The District #4 Environmental Commission issued Land Use Permit # 4C1271 Findings of Fact, Conclusions of Law, and Order approving the project on November 28, 2016. RL Vallee, Inc. and Timberlake Associates, LLC timely appealed the Commission's approval. This Court held an original five-day trial on March 26–30, 2018 and issued a Merits Decision granting the Act 250 permit on June 1, 2018. Vallee and Timberlake appealed that decision to the Vermont Supreme Court. On August 30, 2019, the Supreme Court ordered a remand on the narrow issue of the Project's compliance with Act 250 Criterion 1.

2. I-89 at Exit 16 is located in the Town of Colchester, Chittenden County. The interstate crosses in an east-west direction via an overpass bridge over US Route 2/7 (aka Roosevelt Highway), which is oriented north-south. On- and off-ramps connect I-89 and Route 2/7. Route 2/7 leads from the City of Winooski to the south into the Town of Colchester to the north.

3. Route 2/7 from South Park Drive (south of I-89) to the Mountain View Drive intersection (north of I-89) is designated as a high-crash location. Safety problems in this area are caused by traffic congestion. The Project area is the third highest in the state for accident severity and has the eight highest number of accidents. The purpose of the Project, which was determined by a 2011 scoping study conducted by the Chittenden County Metropolitan Planning Organization (the Exit 16 Scoping Study), is to improve safety for all users, to increase mobility and decrease traffic congestion, specifically around the Exit 16 interchange and the Route 2/7 intersections with Mountain View Drive, Lower Mountain View Drive, Hercules Drive, and Rathe Road.

4. The Project covers a total area of 18.4 acres. It begins at the Winooski / Colchester town line and extends north for 1.05 miles to the Sunderland Woods Road intersection.

5. The Project proposes additional turn lanes, new crosswalks, upgraded signal infrastructure, harmonized shoulder widths, a separated shared-use path through the interchange connected to sidewalks to the north and south, and the reconfiguration of the I-89 interchange into a Diverging Diamond Interchange (DDI). North of the Mountain View Drive intersection the Project is primarily a repaving operation, with additional widening of roadways and corrections to banking and curves.

6. The Project also involves installing a stormwater collection and treatment system. There is currently no designed and permitted stormwater system in the Project area.

Experts

7. Michael LaCroix, the lead designer and manager of the Project, testified on behalf of VTrans as both a fact and expert witness. A Project Manager at VTrans, Mr. LaCroix has been involved with designing traffic projects for 12 years and has designed 40–50 traffic projects, about 12 of which included a stormwater component.

8. Jeff Nelson, Director of Energy and Environmental Services for the Vermont office of Vanasse Hangen Bruslin, Inc. (VHB), testified on behalf of VTrans as a water quality expert. Mr. Nelson spoke to the Project's stormwater system and his analysis of phosphorus impacts from the Project. Mr. Nelson and his team conducted wetlands mapping, prepared a downstream analysis for the Project, and reviewed the stormwater elements of the Project.

9. Todd Law, Director of Maintenance and Operations at VTrans, testified as to VTrans' winter maintenance practices including the use of chloride in snow and ice removal operations. Mr. Law is responsible for the oversight of all VTrans Maintenance Districts and winter maintenance activities. He has been the Public Works Director or Assistant Director for three Vermont municipalities.

10. Donald Kretchmer, Principal at DK Water Resource Consulting, LLC, testified on behalf of Vallee as a water quality expert. Mr. Kretchmer testified as to how stormwater from the Project, including phosphorus, would move through Sunnyside Brook and downstream waters.

11. Andres Torizzo, President and Principal Hydrologist of Watershed Consulting Associates, LLC, testified on behalf of Vallee as a water quality expert. In addition to critiquing the stormwater system proposed by VTrans, Mr. Torizzo offered his own analysis of phosphorus discharges from the Project, chloride levels in Sunnyside Brook, and additional mitigation measures for both phosphorus and chloride pollution.

12. Paul Brown, Owner and President of Roadtech, Inc., testified on behalf of Vallee as an expert in winter road maintenance. He provided analysis on snow and ice removal and best practices for reducing road salt use. Mr. Brown has previously worked as the Director of Snow and Ice Operations for the Massachusetts Department of Transportation and he now consults with other agencies and creates programs related to snow and ice control.

Route 2/7 Overview

13.

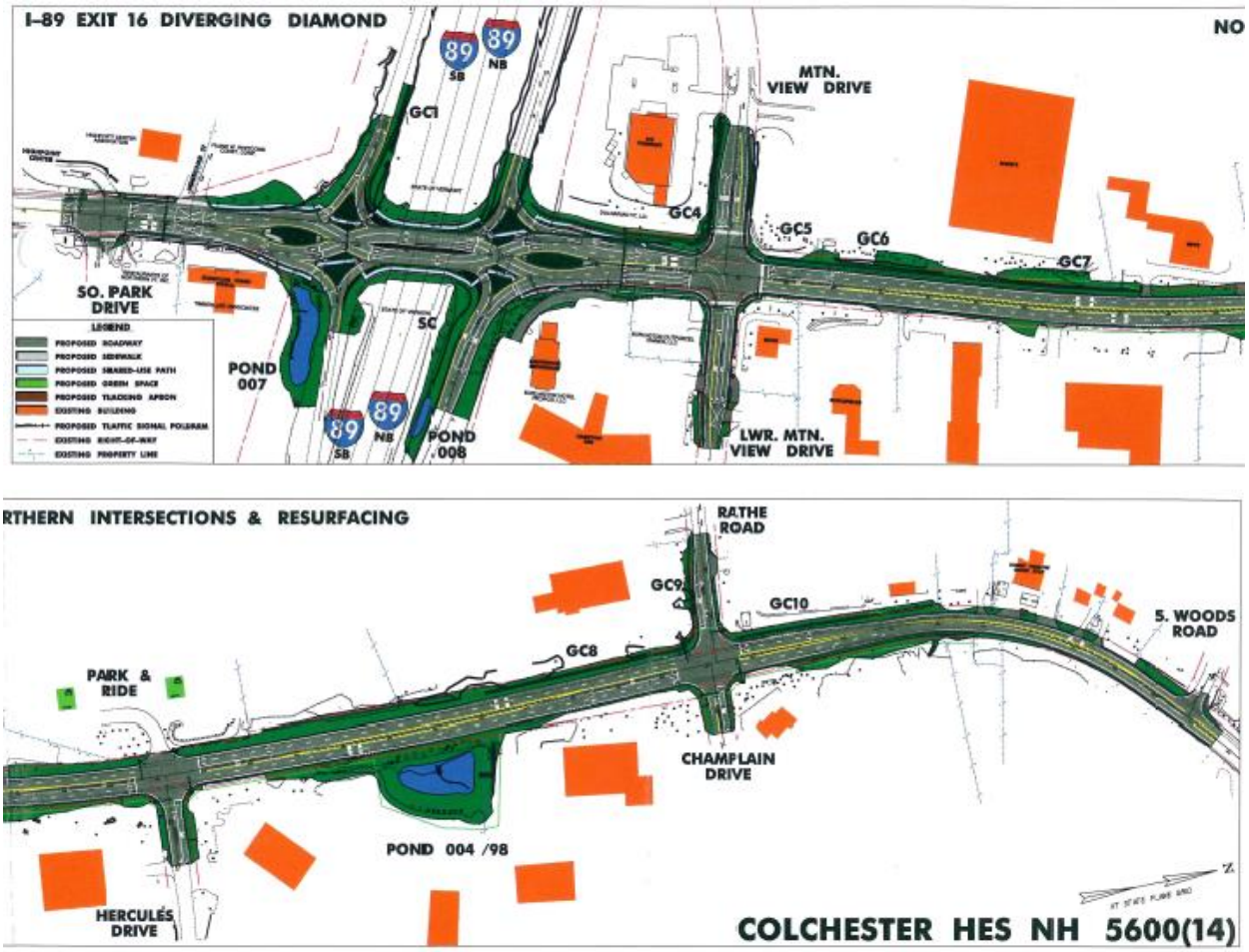

Exhibit 99 (for illustrative purposes).

14. The Route 2/7 element involves widening the road in some areas and improving two sub-standard horizontal curves by regrading the roadway banking within those curves. These curves are along Route 2/7 between Mountain View Drive and Hercules Drive and between Rathe Road and Sunderland Woods Road.

15. New pavement markings will delineate new turn lanes for the following locations:

a. A dedicated right turn lane from Route 2/7 northbound to Lower Mountain View Drive.

b. An additional left turn lane from Lower Mountain View Drive to Route 2/7 southbound.

c. An additional right turn lane from Mountain View Drive to Route 2/7 southbound.

d. Dedicated left turn lanes on Route 2/7 for the Hercules Drive intersection.

e. An additional through lane for Route 2/7 northbound at Rathe Road.

16. Retaining walls will be built on the east side of Route 2/7 along the Hampton Inn property and on the north side of Lower Mountain View Drive along the North Country Federal Credit Union property. These retaining walls are intended to minimize the impact of slope construction from their respective roadways.

17. Upgraded LED street lighting, traffic signal equipment, signing and pavement markings will be installed at each intersection along Route 2/7 in the Project, including at the intersection of Main Street and Tigan Street in the City of Winooski. Street lighting will be added along Route 2/7 from South Park Drive through the interchange to the Mountain View Drive intersection.

18. Concrete sidewalks and asphalt shared-use paths will be built through a portion of the Route 2/7 corridor. Concrete barriers will separate the roadway from the shared-use paths under the overpasses.

19. The Project will promote connectivity and safe transportation by providing access to future bus stops.[1] This includes a left turn lane leading to a park and ride that will be located on the west of Route 2/7 across from Hercules Drive and a concrete bus stop pad on the southwest corner of the Mountain View Drive intersection.

Exit 16 Interchange Overview

20. The Exit 16 interchange will be reconfigured into a DDI. Route 2/7 will cross to the left side of the road under the interstate to improve traffic flow by minimizing conflicting crossing traffic movements at the signalized ramp intersections. All approaches to these crossovers are channelized with curbed islands. The lanes in the interchange area on Route 2/7 will be widened to accommodate large trucks. A heavy-duty, dual sided guardrail will be installed through the middle of the roadway to separate traffic where it has been shifted to the left side of the road.

21. Short, channelizing one-way ramps, called slip ramps, will be constructed at all freeway ramps to facilitate the movement of vehicles through the interchange. Two of these ramps (off-ramp right turns) will be controlled by traffic signals to assist in the protection of pedestrian crossings and to create gaps in arterial traffic for downstream drives and intersections.

22. Overhead guide signs to indicate lane assignment and to provide destination information will be installed on structures in advance of approaching the interchange along Route 2/7 and both Exit 16 off-ramps.

[1] These bus stops are not part of the Project proposed here.

23. The Project will result in an increase in roadway lane miles of 0.38 miles. The Project has a total of 5.25 pre-construction lane miles and 5.63 post-construction lane miles. Of the 0.38 additional lane miles, VTrans will be responsible for winter maintenance of 0.29 lane miles and the Town of Colchester will be responsible for 0.09 lane miles.

24. The Project will increase impervious surface by 1.2 acres.

25. The Sunnyside Brook watershed, including the Project area, contains 110.6 acres of impervious surface.

26. Sunnyside Brook is the surface water receiving stream for the Project area.

27. The Project discharges stormwater runoff to Sunnyside Brook.

28. The Project proposal includes stormwater collection and treatment measures.

29. Runoff from the Project will flow from Sunnyside Brook into Sunderland Brook, before entering the Winooski River and ultimately the "Main Lake Segment" of Lake Champlain.

Criterion 1: Water Pollution

Standing

30. Vallee owns property on the east side of US Routes 2/7 near the Project area.

31. Stormwater from the Project area runs off US Routes 2/7 and sheet flows onto Vallee's property.

32. The stormwater from US Routes 2/7 enters a channel or swale on Vallee's property, commingling with other stormwater from the property.

33. The stormwater from US Routes 2/7 carries pollutants including phosphorus and chloride. These pollutants enter Vallee's property.

34. The Project, as proposed, will not eliminate phosphorus and chloride pollution flowing onto Vallee's property.

35. Mr. Torizzo testified that there are measures VTrans could take to reduce the pollution flowing onto Vallee's property.

36. There is no dispute as to Timberlake's standing under Criterion 1, and Timberlake has adopted all of Vallee's filings, witnesses, questions, and arguments in this case.

Phosphorus

37. Stormwater runoff contains a variety of constituents, including phosphorus.

38. Sunnyside Brook is not currently listed as impaired for phosphorus.

39. Lake Champlain is currently listed as impaired for phosphorus.

40. The Project must comply with the 2002 VSMM, the 2011 Vermont Water Quality Standards (VWQS), and the Stormwater Management Rule in Chapter 18 of the Vermont Environmental Protection Rules.

41. The Project received an Operational Stormwater Discharge Permit from the Department of Environmental Conservation on May 11, 2016 (stormwater permit) to address discharges from the new impervious surface. The permit was issued pursuant to the 2002 Vermont Stormwater Management Manual (VSMM) and certifies compliance with the 2011 VWQS.

42. The Project proposes to treat stormwater runoff from impervious areas using eight grass channels. The use of grass channels is an acceptable treatment practice under the 2002 VSMM.

43. The 2002 VSMM finds that grass channels can remove 40 percent of total phosphorus load from stormwater for the treated area.

44. Applicants are not currently required to perform a phosphorus loading analysis to receive an Operational Stormwater Discharge Permit. The 2002 VSMM did not require such calculations.

45. Phosphorus in stormwater runoff enters Sunnyside Brook in dissolved form where it then binds with other particles. Most often, phosphorus binds with small particles that are suspended in the water flow.

46. Floodplains and wetlands along the flow path to Lake Champlain, of which there are approximately 3,000 acres and 800 acres respectively, can retain phosphorus through assimilation and immobilization.

47. Expert witnesses disagreed on the amount of potential phosphorus retention in wetlands and floodplains. As streams will likely stay within their banks under normal flow conditions the water will not enter the wetlands. Some amount of phosphorus retention will likely occur during extended high flow periods.

<u>Testimony of Jeff Nelson</u>

48. VTrans' water quality expert Mr. Nelson used a model called the "Simple Method" to calculate an estimate of the amount of phosphorus discharged from the Project under existing and post-development conditions.

49. The Simple Method is a recognized and valid model for estimating pollutant loading from stormwater runoff.

50. The Department of Environmental Conservation (DEC) required applicants to use the Simple Method when the "Interim Procedure for Offsets for Discharges of Phosphorus to Lake

Champlain" was in effect from 2015-2016. The "Interim Procedure" is no longer in effect but the Simple Method remains valid.

51. Mr. Nelson's Simple Method calculations showed that the existing phosphorus load from the Project area is 19.97 pounds per year..

52. His post-development calculations showed a phosphorus load of 20.08 pounds per year, a net increase of 0.11 pounds per year. These calculations assumed that the Project's stormwater treatment practices would remove 40 percent of the total phosphorus load as stated in the 2002 VSMM.

53. Mr. Nelson stated that an increase of 0.11 pounds per year is "unmeasurable" in part because (1) the amount would be spread across multiple storm events producing runoff over the course of a year, and (2) in his experience, a measurable change in the amount of phosphorus in Sunnyside Brook and Lake Champlain would require the addition of several pounds.

54. The total phosphorus loading for Lake Champlain is 359,000 pounds per year to the Main Lake segment.

Testimony of Andres Torizzo

55. Vallee's water quality expert, Mr. Torizzo, calculated that the Project would add 1.62 pounds of phosphorus per year as opposed to the 0.11 pounds asserted by Mr. Nelson.

56. Both Mr. Nelson and Mr. Torizzo used the Simple Method to arrive at their conclusions, but Mr. Torizzo changed the value of a key input: the phosphorus removal efficiency of the proposed grass channel treatment system. While Mr. Nelson used the 40 percent removal efficiency stated in the 2002 VSMM, Mr. Torizzo used the "Stormwater Treatment Practice Calculator" (STP Calculator) to calculate the efficiency of the grass channels.

57. The STP Calculator is a valid tool for measuring pollutant load changes.

58. Mr. Torizzo found that the grass channels could be expected to remove 8.81 percent of the total phosphorus load. He then used that value to re-run Mr. Nelson's Simple Method calculations, resulting in an estimated phosphorus increase of 1.62 pounds per year.

59. The STP Calculator is a newer tool than the Simple Method, and it fulfils a different function. The STP Calculator was developed by DEC based on performance curves from the United States Environmental Protection Agency (EPA). It was designed to measure the removal efficiency of stormwater treatment practices in the Lake Champlain Basin. In Mr. Torizzo's

opinion, the STP Calculator provides a more accurate estimate of phosphorus removal efficiency than the VSMM, thanks in part to more recent underlying data.

60. As inputs for the STP Calculator, Mr. Torizzo used the impervious areas, pervious areas, and channel sizes from VTrans' stormwater permit application. Mr. Torizzo included off-site areas draining into each channel when performing his calculations.

61. On cross examination, Mr. Torizzo acknowledged that some of the off-site impervious area may be treated for phosphorus under other stormwater permits. VTrans asserts that including these areas led to an inaccurate estimate of the phosphorus discharge from the Project itself. Mr. Torizzo stated that the STP Calculator requires these areas to be included; otherwise the results would be inaccurate. He did not explain the impact of off-site areas on his conclusion that the Project itself would discharge an additional 1.62 pounds of phosphorus per year.

62. Mr. Torizzo indicated that the STP Calculator might not be suitable for assessing complex stormwater treatment practices, though in his opinion the Project is not too complex.

63. Mr. Torizzo offered two suggestions for additional phosphorus mitigation: (1) alterations to the proposed grass channels, and (2) phosphorus offset projects.

64. He testified that the channels could be improved by adding a different filter material; a soil with a high sand component which would allow for better infiltration into the ground.

65. Mr. Torizzo stated that a filter of the type he suggested would be highly effective in removing phosphorus, would be consistent with the 2002 VSMM, and would mitigate any phosphorus increases from the Project.

66. Vallee introduced a 2017 memorandum prepared by consultants for VTrans, discussing "potential voluntary opportunities to reduce existing phosphorus loading" off-site and thereby offset phosphorus discharges from the Project.

Testimony of Donald Kretchmer

67. Mr. Kretchmer visited Sunnyside and Sunderland Brooks several times in 2015 to collect water samples for testing.

68. The tests show that phosphorus levels in Sunnyside Brook exceeded the 2017 VWQS criterion of 0.27 mg/L on some occasions, though Mr. Kretchmer acknowledged the results do not show consistent levels above .27 mg/L. The 2017 VWQS standards were not in place at the time of the sampling and are not binding on the Project.

69. Mr. Kretchmer opined that Sunnyside Brook is impaired for phosphorus, though he acknowledged that the Agency of Natural Resources (ANR) has not listed it as such.

70. After on-site observation and sample testing, Mr. Kretchmer concluded that "virtually all" of the phosphorus from the Project would reach Lake Champlain.

Lake Champlain Phosphorus TMDL and VTrans' TS4 Permit

71. EPA approved a Phosphorus Total Maximum Daily Load for "Vermont Segments of Lake Champlain" (Phosphorus TMDL) on June 17, 2016.

72. The State of Vermont approved a "Phase 1 Implementation Plan" (Implementation Plan) for the Phosphorus TMDL in September of 2016. VTrans Ex. 112.

73. These regulatory measures were adopted after the Project received its Stormwater Permit and after the Act 250 application was complete. The Project is not bound by their requirements. The Phosphorus TMDL and the Implementation Plan do provide helpful context on Vermont's approach to phosphorus pollution, and guidance on ANR's current policies and priorities.

74. "A TMDL is a 'pollution budget' that calculates the amount of pollution the water body can tolerate and still maintain water quality standards."

75. The Phosphorus TMDL requires "Developed Land" to reduce phosphorus discharges by 20.2 percent for the Main Lake Segment of Lake Champlain. "Developed Lands" include roads and other impervious surfaces.

76. The TMDL anticipates future development and phosphorus discharges. The required reduction for developed land "includes reductions needed to offset future growth."

77. The Main Lake Segment currently receives 162.2 metric tons, or 359,000 pounds, of phosphorus per year.

78. The Implementation Plan frames Vermont's path to meeting the TMDL requirements.

79. According to the Implementation Plan, developed lands contribute approximately 18 percent of Vermont's phosphorus loading to Lake Champlain. This is a "relatively minor" contribution compared to the agricultural sector, but it is a "disproportionate share" when considered acre-for-acre.

80. The Phosphorus TMDL and Implementation Plan do not prohibit future road development or phosphorous discharges. Rather, stormwater permitting in various forms is envisioned as the primary mechanism to achieve TMDL compliance.

81. Stormwater runoff from state highways will be addressed through a Transportation Separate Storm Sewer System (TS4) General Permit, which ANR issued to VTrans in 2017. The TS4 Permit is not yet binding, making any conditions or allowances immaterial to the matter presently before the Court, and VTrans does not rely upon it here.

Chloride

82. Chloride is a water pollutant that has damaging effects on water quality and aquatic biota.

83. In the Project area and the Sunnyside Brook watershed, most chloride is added to the environment through runoff containing road salt or winter "de-icing material."

84. Chloride enters Sunnyside Brook as a component of stormwater, particularly during rain or melt events.

85. The State of Vermont declared Sunnyside Brook impaired for chloride in 2016, and the brook remains listed as impaired for chloride. The brook was not listed as impaired at the time of the original Act 250 application for the Project.

86. DEC is preparing a chloride TMDL for the Sunnyside Brook watershed. There is no chloride TMDL presently in effect.

87. In 2014, Vermont adopted two chloride standards set by EPA. The first is the "acute criteria" at 860 mg/L, "defined as the highest concentration to which aquatic life can be exposed for a short period of time (one-hour average) once every three years without deleterious results." The second is the "chronic criteria" at 230 mg/L, "defined as the highest concentration to which aquatic life can be exposed for an extended period of time (four-day average) once every three years without harmful effects."

88. The Project is required to comply with the 2011 Vermont Water Quality Standards (VWQS). The 2011 VWQS do not specifically address chloride.

89. VTrans' stormwater permit certifies that the Project complies with the 2011 VWQS.

90. VTrans has a statutory obligation to maintain certain winter road conditions or "levels of service" on state highways, including U.S. Routes 2/7 and Interstate 89. See, e.g., 23 U.S.C. § 116(a); 19 V.S.A. § 1(20)

91. I-89 has the highest level of service requirement and therefore the highest priority for snow and ice control. VTrans must achieve bare pavement across the full road width as soon as practicable following a storm. US Routes 2/7 are second-tier priority, still requiring bare pavement across the full road width following a storm.

92. VTrans adheres to a policy established by the Legislature: to maintain safe roads at safe speeds. VTrans determines what maintenance activities are needed to keep the roads safe.

93. In practice, Vermont policy requires roadways to be travelable but not necessarily bare during storms.

94. VTrans uses chloride in its winter maintenance activities to prevent snow and ice from bonding to the roads.

95. Winter storm duration and intensity have a significant impact on the amount of chloride used.

96. Unlike phosphorus, chloride cannot be removed from stormwater through structural treatment practices. Managing chloride in Sunnyside Brook can be achieved by employing Best Management Practices (BMPs) designed to limit the amount of chloride applied to the roads while maintaining the levels of service required for safe travel.

97. VTrans has a Snow and Ice Control Plan (SIC Plan) setting forth chloride reduction BMPs, levels of service, performance measures, and application rate guidance for highways across the state. The most recent iteration of the SIC Plan went into effect on January 8, 2020.

98. The SIC plan was developed with chloride-impaired watersheds in mind, "to address source control and reduction in usage of Chlorides in these impaired watersheds."

99. The SIC plan opts to carry out chloride reduction measures statewide, "[t]o the extent practicable . . . to minimize costs and impacts to the environment outside Chloride impaired watersheds."

100. VTrans commits to the following BMPs in the SIC Plan: pre-wetting; pre-treating; anti-icing; equipment calibration; in-cab air and ground temperature sensors; and training, storage, and handling. The SIC plan shows potential chloride reduction percentages for each BMP: pre-wetting (20–30 percent); pre-treating (10–30 percent); anti-icing (10–30 percent); equipment calibration (5–20 percent); temperature sensors (1–10 percent), and training, storage, and handling (10–25 percent).

101. The potential chloride reductions listed for each BMP in the SIC Plan are accurate.

102. The SIC Plan is designed to accommodate the variability of winter weather, allowing for flexibility and adaptability. It is a "living document" that is intended to evolve over time and allow VTrans to experiment with more efficient technologies and innovative techniques "in a cost effective and environmentally sensitive manner."

103. One example of VTrans' experimentation is the use of "live-edge" or articulating plow blades. VTrans is currently piloting 12 articulating plows. The plows could reduce salt usage up to 20 percent; VTrans is still validating their efficiency and feasibility for operations in Vermont.

104. The SIC Plan sets chloride application rates based on pavement temperature. A variety of factors including the type of precipitation, air temperature, surface friction, icing events, and forecast changes can lead to further adjustments.

105. It is important for plow operators to have flexibility as they adapt to changing conditions. Operators confer with their supervisors and make real-time adjustments to balance safety, environmental concerns, and cost concerns during unpredictable weather.

106. VTrans reviews the SIC Plan often and revises it periodically. The goal is to stay up to date on best management practices while maintaining flexibility and opportunities for future innovation.

107. VTrans uses and abides by the SIC Plan, though application rates are modified based on weather conditions.

108. VTrans also developed a Chloride Management Plan (CMP) for the Project area, in accordance with the principles and BMPs found in the SIC Plan. VTrans is committed to following the CMP and any future versions of the SIC Plan.

109. VTrans does not implement separate BMPs for specific watersheds because it is important to maintain predictable travel conditions across different areas. Employing BMPs at the watershed level creates a safety concern.

110. The CMP states that it was prepared in accordance with the Town of Colchester's Snow and Ice Removal Plan (SIR Plan). The CMP incorporates the SIR Plan by reference.

111. Vtrans' Project Manager, Mr. Lacroix, testified that he reviewed the SIR Plan in preparing the CMP, and that elements in the SIR Plan resemble elements of the SIC Plan. He believes the SIR Plan is reasonable.

112. VTrans has a finance and maintenance agreement with the Town of Colchester. Under the agreement, Colchester is obligated to carry out snow and ice removal on the roads it owns within the Project area.

113. Both the SIC Plan and the CMP balance the interests of safety, mobility, environmental protection and fiscal responsibility.

114. VTrans has already implemented the BMPs in the SIC Plan; most of the BMPs were adopted in 2013 and some were in use before 2013.

115. VTrans has refined its use of brine, or liquid sodium chloride, and liquids in general. The agency has been able to improve efficiency over time, using less sodium chloride while maintaining the same levels of service.

116. VTrans has also improved the efficiency of the anti-icing BMP over time, across iterations of the SIC Plan, by changing the timing: prior practice involved applications as much 24 hours before a storm and now material is applied just before a storm hits.

117. Budgetary concerns bolster VTrans' commitment to maximizing efficiency in salt usage. The price of salt, at approximately 80 dollars per ton, helps employees understand the value of salt reduction.

118. VTrans employs approximately 45 "Road Weather Information Systems" (RWISs) across the state. RWISs are equipped with cameras, sensors for ice and other road conditions, surface temperature sensors, wind speed sensors, and more. The RWISs help determine conditions at each location including the important consideration of grip, or friction, on the roads. VTrans does not have an RWIS in the project area but does have one "just north" in Milton.

119. VTrans' winter maintenance activities are carried out by in-house plow drivers who must (1) carry a commercial driver's license, (2) attend a full day of training, and (3) attend supplemental winter maintenance training on an annual basis.

120. Winter maintenance activities in the Sunnyside Brook watershed, including the Project area, are based out of the Chimney Corner Garage in Maintenance District 5. The Chimney Corner Garage serves 181.6 lane miles, which are of some of the busiest and most urban in the state.

121. Over the four winters from 2014 through 2017, Vermont used an average of 19.2 tons of de-icing material per lane mile, per year.

122. Privately-owned and maintained parking lots are the largest contributor of chloride pollution to the Sunnyside Brook watershed, accounting for 59.74 percent of the total. Roads maintained by VTrans account for 22.02 percent of the total.

Testimony of Jeff Nelson

123. On behalf of VTrans, Mr. Nelson analyzed salt use data from the Chimney Corners Garage and compared average salt use before 2013 with that of years 2013–2016. He concluded that

chloride use at the garage dropped by 9 percent after 2013, and he attributed this to VTrans implementing many of the BMPs in the SIC Plan and the CMP.

124. Based on his analysis, Mr. Nelson expects VTrans' chloride usage in the Project area to remain the same even after the addition of 0.29 lane miles.

125. Mr. Nelson excluded 2017 and 2018 from his analysis, because VTrans used a different de-icing product that did not perform as expected or as advertised. This de-icing material required additional applications and resulted in an increase in chloride usage. VTrans no longer uses the product.

126. The analysis of Chimney Corners Garage was limited in two other respects. First, though Mr. Nelson accounted for weather differences with a severity index, it is not clear how the weather related to the amount of salt used on an annual basis or how the index was used. Second, the analysis was not tailored to the Project itself. Data from the Chimney Corners Garage provides a rough idea of the trends in chloride application for the area, but it does not show specific application rates for the roadways involved in the Project.

127. VTrans used 17.5 tons of salt per lane mile in the Chimney Corners Garage in the winter of 2016. This was the last year before VTrans encountered problems with its de-icing material. In 2017 and 2018, VTrans used 34.5 and 28.8 tons per lane mile respectively. Excluding 2017 and 2018, VTrans used an average of 13.8 tons of salt per lane mile while the SIC plan was in place. Before the SIC plan was implemented, VTrans used an average of 15.3 tons per lane mile. VTrans Ex. 108.

128. We give little weight to Mr. Nelson's weather severity index or his finding that the BMPs in the SIC Plan resulted in a 9 percent reduction in salt use.

129. Based on the salt usage data in Mr. Nelson's report and the testimony of VTrans' Operations Manager Mr. Law, we do find that the disproportionate increase in salt usage for 2017 and 2018 reflected a problem with the de-icing material combined with unusually severe weather during those years. We also credit Mr. Nelson's empirical conclusion that average salt usage was nine percent lower from 2013–2016 than from 2008–2012.

Testimony of Andres Torizzo

130. Mr. Torizzo described his study of chloride levels in Sunnyside Brook.

131. Mr. Torizzo conducted the study over the course of two years, from 2014 to 2015.

132. He deployed a probe to measure in-stream conductivity every 15 minutes, collecting 45,000 data points in total. He also gathered physical samples for testing on some occasions.

133. Using a linear regression developed by the New Hampshire Department of Environmental Services (DES), Mr. Torizzo translated conductivity readings to in-stream chloride levels. Lab testing of physical samples confirmed the accuracy of the calculations. The accuracy of Mr. Torizzo's methodology is not in question.

134. The results of the study show that chloride concentrations in Sunnyside Brook are nearly always above the "chronic" standard set by EPA and adopted in Vermont. Chloride concentrations also rose above the "acute" standard on 32 occasions during the two-year study. In one instance, chloride concentrations were above the acute standard for 20 days.

135. The spikes above the acute standard arose from weather conditions where a period of temperatures below freezing were followed by warmer weather which led to melting ice and snow. The runoff created by ice and snow melt can wash accumulated road salt into Sunnyside Brook, resulting in these spikes or "ionic pulses."

136. The Court finds that this analysis is consistent with Sunnyside Brook's status as an impaired stream. It is undisputed that Vermont has declared the brook impaired for chloride.

137. Using salt application rates from VTrans, Mr. Torizzo calculated that VTrans applies 79.4 tons of chloride per year in the Sunnyside Brook Watershed. He calculated that the total chloride application from all sources in the watershed is 360.7 tons per year.

138. Mr. Torizzo estimated the amount of chloride the Project would add to the watershed, concluding that VTrans would apply an additional 3.3 tons of per year to maintain the roads. Using average salt usage data from six New Hampshire municipalities, obtained from the New Hampshire DES, he estimated that locally maintained roads would contribute 1 additional ton per year. His estimate includes roads maintained by the Town of Colchester. Mr. Torizzo noted that New Hampshire experiences similar winter weather conditions to Vermont.

139. Mr. Torizzo also recommended the use of a "live-edge" or articulated plow blade. He acknowledged he is not an expert in winter maintenance, and he did not know the effectiveness of the plow alone in reducing chloride usage.

Testimony of Paul Brown

140. Vallee's winter maintenance expert, Mr. Brown, testified about measures to help ensure that VTrans does not apply excess chloride in the Project area.

141. Mr. Brown believes that chloride pollution will increase as a result of the Project.

142. He stated that Vermont does a "very good job" at managing de-icing material.

143. Mr. Brown recommended that VTrans conduct post-storm analyses and track its salt usage in the Sunnyside Brook Watershed to allow for better accountability and to provide a baseline for measuring the effectiveness of other BMPs.

144. VTrans reports salt usage on a weekly basis and conducts some post-storm analyses. In tracking salt usage, VTrans does not specifically isolate data from the Sunnyside Brook watershed.

145. Mr. Brown recommended enhanced use of "AVL" technology: a gps-based system that enables tracking of information specific to each truck: speed, ambient temperature, road temperature, and application rate. He recommended a software upgrade to allow data logging and tracking within the Project area and suggested the use of temperature sensors.

146. VTrans has AVL in all its trucks and has the capability to track application rates, speed, location, and other data. VTrans has surface temperature sensors in approximately 50 percent of its trucks. VTrans does not currently have the capability to generate reports for specifically mapped geographic areas.

147. Mr. Brown recommended cameras for VTrans' trucks, to enable recording, real-time monitoring of road conditions, and evaluation of operators to ensure they are using appropriate application rates for the conditions. He believed cameras would not be costly.

148. VTrans' AVL capabilities provide an effective way to monitor operators and their application rates in real time.

149. Mr. Brown recommended a technique called "geo-fencing," where software pre-sets salt application rates for a designated area such as a sensitive watershed. With this type of geo-fencing, application rates would automatically change when a plow truck crosses into a designated area in the gps. This eliminates reliance on operators to change their application rates, though operators could override the system. Mr. Brown does not believe geo-fencing creates safety issues.

150. Mr. Brown described his experience with geo-fencing in Massachusetts. He also explained that comparisons between practices in different states are difficult, because snow and ice policies and the expectations for road maintenance and travel conditions are different. In Massachusetts for example, snow on the road is considered unacceptable.

151. It is not uncommon for VTrans to stop plowing after a certain time of night, which would be unacceptable in Massachusetts.

152. VTrans has some geo-fencing capabilities, but the technique described by Mr. Brown raises safety concerns. Automatically changing application rates could create hazards because the operators may not realize the change occurred. This is true even if operators could override the system, because some operators might still be unaware of the automatic reduction.

153. Mr. Brown recommended that VTrans implement better training for its operators, including site-specific training for the particular concerns in the Sunnyside Brook watershed.

154. VTrans' training programs meet the recommendations described in Mr. Brown's witness disclosure, which includes yearly trainings and refresher courses. VTrans does not provide site-specific training; specific concerns are generally addressed at the annual trainings.

155. Mr. Brown expressed some concern about the reliability of plow operators, particularly independent contractors.

156. VTrans uses in-house operators. Their performance is validated by checking application rates against the guidelines and weather conditions. Trustworthy operators are essential to VTrans' work across the state, and the agency invests in them accordingly.

Conclusions of Law

The question in this appeal, on remand from the Vermont Supreme Court, is whether the Project complies with Act 250 Criterion 1; specifically, whether the Project will cause undue water pollution through increased chloride and phosphorous discharges. In answering this, there are four preliminary issues that must be resolved: (1) Vallee's standing in this matter; (2) how VTrans' vested rights affect the Criterion 1 analysis; (3) whether the Court can consider evidence of additional mitigation measures under Criterion 1; and (4) whether VTrans is entitled to a presumption of compliance with Criterion 1.

I. Vallee's Standing

On January 10, 2020, VTrans filed a pre-trial motion to dismiss Vallee's remaining Act 250 questions for lack of standing under Criterion 1. In March 2017, long before the present remand, we granted Vallee party status on Criterion 1 pursuant to 10 V.S.A. § 6085(c)(1)(E). Diverging Diamond Interchange A250, No. 169-12-16 Vtec, slip op. at 2–4 (Vt. Super. Ct. Envtl. Div. Mar. 17, 2017) (Walsh, J.) ("Vallee has again demonstrated a reasonable possibility that the DDI project

may impact its particularized interest regarding the condition of Sunnyside Brook and its own ability to discharge chloride into the brook."). We later dismissed Vallee's Criterion 1 questions without addressing party status. See Diverging Diamond Interchange Act 250 and SW Permits, Nos. 169-12-16 Vtec, 50-6-16 Vtec, slip op. at 54 n.12 (Vt. Super. Ct. Envtl. Div. June 1, 2018) (Walsh, J.) ("The [March 2017] entry order also granted Vallee status under Criterion 1, which is no longer before the Court.").

At trial on remand, Vallee presented evidence in addition to its 2017 evidence. See Diverging Diamond Interchange A250, No. 169-12-16 Vtec at 2–4 (Mar. 17, 2017). Vallee's water quality expert, Mr. Torizzo, offered additional testimony of how stormwater carrying phosphorous and chloride enters onto Vallee's property and how VTrans could reduce that occurrence. For the reasons outlined in our March 2017 decision, we find that Vallee has demonstrated standing on Criterion 1 pursuant to 10 V.S.A. § 6085(c)(1)(E). See id. at 2–4. Regardless of Vallee's standing, we find it necessary to consider the questions on remand. Timberlake's standing is undisputed, and it has adopted all of Vallee's questions, arguments, and evidence. See In re Diverging Diamond Interchange SW Permit, 2019 VT 57, ¶ 41 n.20, 218 A.3d 564 (seeing "no point" in asking the Environmental Division to consider Vallee's standing, because Timberlake joined Vallee's Criterion 1 questions and arguments on appeal). Thus, we turn to the remaining issues in this appeal.

II. Criterion 1: Undue Water Pollution

Criterion 1 requires a finding that the Project "[w]ill not result in undue water or air pollution." 10 V.S.A. § 6086(a)(1). Specifically, we must determine whether chloride or phosphorus discharges from the Project will create undue water pollution in Sunnyside Brook or Lake Champlain.[2] See id. While Criterion 1 does not specify what amounts to "undue" pollution, the longstanding definition of "undue" under Criterion 1 is "that which is more than necessary––exceeding what is appropriate or normal." See In re N. E. Materials Grp., LLC/Rock of Ages Corp. Act 250 Permit, 2019 VT 55, ¶ 28(quoting Re: John A. Russell Corp., No. 1R0849-EB, Findings of Fact, Conclusions of Law, and Order, slip op. at 43–44 (Vt. Envtl. Bd. Jul. 10, 2001)) (noting that the definition has been used "in the air-pollution context").

[2] At issue are Vallee's Amended Questions 1.a and 1.b. Amended Question 1.a asks: "Will the Project cause undue water pollution due to an increase in chloride discharges to Sunnyside Brook?" Amended Question 1.b asks: "Will the Project cause undue water pollution due to an increase in phosphorus discharges to Lake Champlain?"

"[W]hether 'undue' pollution will result from a proposed project is a highly fact-specific inquiry that depends on a wide variety of factors." In re Diverging Diamond Interchange SW Permit, 2019 VT 57, ¶ 44 (citing N. E. Materials Grp., 2019 VT 55, ¶ 28). We consider issues such as:

> The elevation of land above sea level; and in relation to flood plains, the nature of soils and subsoils and their ability to adequately support waste disposal; the slope of the land and its effect on effluents; the availability of streams for disposal of effluents; and the applicable Health and Environmental Conservation Department regulations.

10 V.S.A. § 6086(a)(1); Diverging Diamond SW Permit, 2019 VT 57, ¶ 45. It is clear, however, that our analysis need not stop there. Other key factors include "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 reduce the pollution." N. E. Materials Grp., 2019 VT 55, ¶ 28 (quoting Re: Mclean Enters. Corp., No. 2S1147-1-EB, Findings of Fact, Conclusions of Law, and Order, at 41 (Vt. Envtl. Bd. Nov. 24, 2004)). We may consider "any factors relevant to a determination of whether a proposed project will cause undue pollution." Diverging Diamond SW Permit, 2019 VT 57, ¶ 45 (citing In re Hawk Mt. Corp, 149 Vt. 179, 184 (1988)). Thus, our task is to weigh factors which speak to the question whether chloride or phosphorus pollution from the Project will be "more than necessary—exceeding what is appropriate or normal" given the specific facts and circumstances of this case. See Re: John A. Russell Corp., No. 1R0849-EB at 43–44 (Jul. 10, 2001) (quotation omitted); Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. We address the remaining preliminary issues before continuing to the merits.

1. VTrans' Vested Rights Determine Which Regulations Apply Under Criterion 1

In our June 1, 2018 merits decision, we held that VTrans' Act 250 application for the Project vested in November 2013, when the original complete application was filed. Diverging Diamond Interchange SW Permit, Nos. 50-6-16 Vtec & 169-12-16 Vtec at 61 (June 1, 2018). The Vermont Supreme Court affirmed that holding. Diverging Diamond SW Permit, 2019 VT 57, ¶ 33. The Project was not subject to phosphorus or chloride discharge regulations at the time of the original application.

VTrans "has a vested right to the laws in effect at the time of its original Act 250 permit application." In re Times and Seasons, LLC, 2011 VT 76, ¶ 12, 190 Vt. 163. "These laws include the [Act 250 criteria] . . . in effect at the time," as well as any regulations bearing on the application. See id.; Re: Waterbury Shopping Vill., Inc., No. 5W1068-EB, Mem. of Decision, at 1–2 (Vt. Envtl. Bd. June 26, 1990) (finding wetland rules inapplicable because they were not in effect when the application was filed). Thus, any phosphorus or chloride regulations that took effect after November 2013 are not directly "applicable" to the Project under Criterion 1. See 10 V.S.A. § 6086(a)(1) (requiring that we consider "applicable . . . Environmental Conservation Department regulations"); Times and Seasons, 2011 VT 76, ¶ 12; Waterbury Shopping Vill., No 5W1068-EB at 1–2 (June 26, 1990).

Nonetheless, the inquiry under Criterion 1 is not whether the Project complies with applicable regulations but whether it will create undue water pollution. See Diverging Diamond SW Permit, 2019 VT 57, ¶¶ 46–47. "[C]ompliance with applicable regulations is only one" of many non-dispositive factors in a Criterion 1 analysis. See id. ¶¶ 46, 44; see also N. E. Materials Grp., 2019 VT 55, ¶ 28 (citing Hawk Mt. Corp., 149 Vt. at 185–86). "Criterion 1 generally protects state waters from pollution where state regulation has not adequately protected those waters." NRB Training Manual, https://nrb.vermont.gov/sites/nrb/files/documents/1% 28water% 29final.pdf [https://perma.cc/4ZR4-HTE7]; see also Diverging Diamond SW Permit, 2019 VT 57, ¶ 46 (noting "Criterion 1's generally independent inquiry as to whether a project will create undue water pollution"). Therefore, the Court may consider any relevant evidence that helps to identify when chloride or phosphorus pollution is "undue" including standards or policies which are not directly applicable to the Project. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 45 (citing Hawk Mt. Corp, 149 Vt. at 184) (stating that the Court is not limited to the factors listed in 10 V.S.A. § 6086(a)(1) and may consider "any factors relevant to a determination of whether a proposed project will cause undue pollution"). We now turn to the issue of mitigation.

2. Mitigation is a Relevant Factor Under Criterion 1

Vallee asserts that VTrans could reduce chloride and phosphorus discharges from the Project by implementing pollution reduction or offset measures beyond those already proposed. Mitigation is relevant to our analysis under Criterion 1, as one factor among many. See N. E. Materials Grp., 2019 VT 55, ¶ 28 (whether pollution is undue depends on a variety of factors including "whether effective measures will be taken to reduce the pollution"); In re Katzenbach

Act 250 Permit, No 124-9-17 Vtec, slip op. at 5 (Vt. Super. Ct. Envtl. Div. Jan 2, 2019) (Walsh, J.) (listing the same factors and using "mitigate" instead of "reduce"). In contrast to inquiries under other Act 250 criteria, no single factor is dispositive here. Compare N. E. Materials Grp., 2019 VT 55, ¶ 28 (noting that the Criterion 1 inquiry is "highly fact-specific" and "compliance with government air standards is an important, but nondispositive, factor") with 10 V.S.A. § 6086(a)(8)(A) (stating that "[a] permit will not be granted" if development imperils necessary habitat or endangered species without undertaking sufficient mitigation). Thus, we will consider whether the Project includes "effective" mitigation measures, but the fact that additional measures may be available does not itself determine whether pollution is "undue." See N. E. Materials Grp., 2019 VT 55, ¶ 28.

3. VTrans is Entitled to a Presumption of Compliance with Criterion 1.

VTrans contends that the Project's final and binding stormwater permit creates a rebuttable presumption of compliance with Criterion 1, satisfying its burden of proof and shifting the burden to Vallee to show noncompliance. We agree. Acceptance of certain ANR permits "create[s] 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." 10 V.S.A. § 6086(d). "Under Act 250 Rule 19, the permits create a rebuttable presumption that the project meets relevant Act 250 criteria." In re Woodstock Cmty. T. & Hous. Vt. PRD, 2012 VT 87, ¶ 26, 192 Vt. 474. Rule 19(E)(1)(b) states that an "individual discharge permit[]" like VTrans' stormwater permit creates a presumption "that waste materials and wastewater can be disposed of . . . without resulting in undue water pollution." See Act 250 Rules 19(E)(1), (E)(1)(b). Thus, the "stormwater permit creates a rebuttable presumption that the subject project meets relevant Act 250 criteria, including Criterion 1."[3] Diverging Diamond SW Permit, 2019 VT 57, ¶ 43 (citing In re Woodstock

[3] Vallee argues that the stormwater permit creates a presumption of compliance only with respect to the pollutants specifically addressed in the permit. The cases Vallee cites do not support that proposition. In Killington Parking Project, the Court said "it would be illogical to find compliance with Criterion 1(E)'s mandate that streams be kept in their natural condition based on a stormwater permit that only addressed water pollution, but not volume of water discharged." Killington Resort Parking Proj. Act 250 Amended Application, No. 173-12-13 Vtec, slip op. at 18 (Vt. Super. Ct. Envtl. Div. Mar. 7, 2016) (Durkin, J.). Moreover, in Sherman Hollow, the Environmental Board stated that deference to the Health Department regarding drinking water would leave "the potential impact upon groundwater and surface water, as well as upon the aquatic biota" to be reviewed under the criteria at issue. See Re: Sherman Hollow, Inc., No. 4C0442-5-EB, Findings of Fact, Conclusions of Law, and Order, at 8 (Vt. Envtl. Bd. Feb. 17, 1989). Here, the permit creates a presumption regarding "undue water pollution" and Criterion 1 evaluates whether water pollution is undue. See Act 250 Rules 19(E)(1), (E)(1)(b); 10 V.S.A. § 6086(a)(1). The scope of the permit matches the scope of Criterion 1. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 43.

Cmty. T., 2012 VT 87, at ¶ 26); see also In re Costco Stormwater Discharge Permit, 2016 VT 86, ¶¶ 41–45, 202 Vt. 564 (holding that the appellant failed to rebut the presumption of Criterion 1 compliance arising from the project's stormwater permit).

We are mindful, however, that the unique facts of this case create friction between the goals of Criterion 1 and the framework of presumptions contemplated in the Act 250 statute. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 46 (highlighting the importance of Criterion 1's "independent inquiry" as to water pollution); 10 V.S.A. § 6086(d) (allowing the acceptance of agency permits as presumptions. The Project's stormwater permit vested in the regulations in effect in 2014. Diverging Diamond SW Permit, 2019 VT 57, ¶ 26. Those regulations did not include project-specific standards for phosphorus and chloride discharges.

The unique conflicts in this case are as follows. Phosphorus and chloride are the only pollutants at issue, and they are carried in stormwater. The stormwater permit creating a presumption under Criterion 1 was approved pursuant to regulations which did not include phosphorus or chloride discharge standards. VTrans' Act 250 application is vested in regulations that did not include phosphorus or chloride discharge standards. The Project will discharge stormwater into waterbodies impaired for phosphorus (Lake Champlain) and chloride (Sunnyside Brook). The inquiry regarding undue water pollution under Criterion 1 is broad and independent; it considers many non-dispositive factors. Only one of those factors is whether the Project complies with applicable regulations.

We are concerned about the strength of a presumption arising under these circumstances. For that reason, and because we conclude that the Project complies with Criterion 1 even without the benefit of a presumption, we find it appropriate to proceed to the merits and discuss the evidence in detail.[4]

III. Phosphorus Pollution

Vallee's Amended Question 1.b challenges the Project's compliance with Criterion 1, asking whether phosphorus discharges will cause undue water pollution in Lake Champlain. We must conduct a "fact-specific inquiry" to determine whether the phosphorus discharges will be

[4] The Vermont Supreme Court stated that "Vallee has the burden of demonstrating that the proposed Project does not satisfy Criterion 1." See Diverging Diamond SW Permit, 2019 VT 57, ¶ 48. This appears to reflect the Supreme Court's conclusion that VTrans is entitled to a presumption of compliance. See id. at ¶ 43, 46. Though we agree, we find it appropriate to conduct a thorough evaluation for the reasons described above.

"more than necessary—exceeding what is appropriate or normal." See Diverging Diamond SW Permit, 2019 VT 57, ¶ 44; N. E. Materials Grp., 2019 VT 55, ¶ 28. As the applicant, VTrans bears the initial burden to produce "evidence sufficient to enable [the district commission or this Court] to make the requisite positive findings" on Criterion 1.[5] Katzenback Act 250 Permit, No. 124-9-17 Vtec, slip op. at 4 (Vt. Super. Ct. Envtl. Div. Jan. 2, 2019) (Walsh, J.) (quoting In re Rinkers, Inc., No 302-12-08 Vtec, slip op. at 11 (Vt. Envtl. Ct. May 17, 2010) (Wright, J.)) (modification in original). VTrans also has the burden of persuasion on Criterion 1. See 10 V.S.A. § 6088(a); In re Eastview at Middlebury, Inc., No. 256-11-06 Vtec, slip op. at 4 (Vt. Envtl. Ct. Feb. 15, 2008) (Durkin, J.). Both burdens are satisfied here.

Through exhibits and expert testimony, VTrans established a "prima facie case" that the Project will not result in undue water pollution. See Katzenback Act 250 Permit, No. 124-9-17 Vtec at 4 (Jan. 2, 2019) (quoting In re Champlain Parkway Act 250 Permit, 2015 VT 105, ¶ 15, 200 Vt. 158) (describing the standard for the burden of production). The Stormwater Permit establishes the Project's compliance with applicable regulations, including the 2002 VSMM and the 2011 VWQS. See 10 V.S.A. § 6086(a)(1) (requiring consideration of "Environmental Conservation Department regulations"). In the 2002 VSMM, ANR determined that grass channels of a certain design were an acceptable treatment practice and would remove 40 percent of the total phosphorus load from the treated area. The Stormwater Permit certifies that the grass channels proposed for the Project are acceptable, providing evidence of "effective measures to reduce" phosphorus loading. See N. E. Materials Grp., 2019 VT 55, ¶ 28 (listing factors for determining whether pollution is undue).

Vtrans' water quality expert, Mr. Nelson, credibly testified that the Project would discharge 0.11 pounds of phosphorus per year. He explained that, practically speaking, an addition of 0.11 pounds per year is "unmeasurable" in Lake Champlain. Mr. Nelson further testified that he expected wetlands and floodplains along the flow path from Sunnyside Brook to Lake Champlain to assimilate phosphorus and reduce the eventual discharge to the lake. See N. E. Materials Grp., 2019 VT 55, ¶ 28 (noting that the "nature and amount of the pollution" is a factor in determining whether pollution is undue); 10 V.S.A. 6086(a)(1) (requiring consideration of "floodplains"; specifically the "ability [of soils] to adequately support waste disposal"). The

[5] As explained above, our conclusion that the Project complies with Criterion 1 is the same regardless of whether VTrans relies on a presumption arising from its stormwater permit. Our analysis here disregards the presumption to show why that is the case.

total phosphorus loading for the segment of the lake affected by the Project is 359,000 pounds per year. Taken as a whole, this evidence supports a finding that the Project will not create undue phosphorus pollution. See Katzenback Act 250 Permit, No. 124-9-17 Vtec at 4 (Jan. 2, 2019).

A closer look at the details of the Project and the evidence presented persuades us that the Project complies with Criterion 1. We begin with the important context that frames this case. Phosphorus is a pollutant of great concern in the waters of Lake Champlain. The lake is impaired for phosphorus and EPA has approved a Phosphorus TMDL, which acts as a "budget" setting the amount of pollution the lake can tolerate while maintaining water quality standards. While the Phosphorus TMDL and Vermont's TMDL Implementation Plan call for reductions in phosphorus loading across different sectors, they anticipate future growth in developed land and do not prohibit new discharges. Here, VTrans' Project increases impervious surface, which in turn will increase phosphorus discharges through stormwater runoff.

The Project reconfigures an interchange at I-89 Exit 16 in Colchester and makes changes to the surrounding area including new crosswalks, shoulder widths, and road widths. These changes increase the impervious surface by 1.2 acres for the purpose of improving safety, increasing mobility, and decreasing congestion in a high-crash location. The total impervious surface in the Sunnyside Brook watershed is 110.6 acres. VTrans filed its original and complete Act 250 application in November of 2013, before the Phosphorus TMDL was in place, and the Project is not subject to specific phosphorus discharge standards.

The Project represents a relatively small development of impervious surface in the Sunnyside Brook watershed. The question is whether the Project's phosphorus discharges are undue, exceeding what is appropriate or normal under the circumstances. See N. E. Materials Grp., 2019 VT 55, ¶ 28. Without applicable phosphorus discharge standards to guide our analysis, we rely more heavily on other evidence that speaks to the relevant factors under Criterion 1.

First, the Project complies with applicable regulations. See 10 V.S.A. § 6086(a)(1). Vtrans' stormwater permit shows that the Project fits the design and treatment criteria in the 2002 VSMM and complies with the 2011 VWQS. Vallee does not contend that the Project violates any applicable regulations. This factor weighs in favor of compliance with Criterion 1.

Second, the Project will create an exceedingly small amount of pollution. See N. E. Materials Grp., 2019 VT 55, ¶ 28 (listing relevant factors). The Court heard credible testimony from VTrans' expert Mr. Nelson regarding phosphorus loading. Using a model called the "Simple

Method," Mr. Nelson estimated that the Project would discharge 0.11 pounds of phosphorus per year. Both he and Vallee's expert, Mr. Torizzo, testified that the Simple Method is a valid analytical tool. Both experts used the Simple Model to reach their conclusions on phosphorus loading.

Despite using the same tool, Mr. Nelson and Mr. Torizzo reached different conclusions as the amount of phosphorus that would enter Sunnyside Brook. This is because a key input to the Simple Method is the removal efficiency of the Project's stormwater treatment practices: the amount of phosphorus discharged naturally depends on how much is removed through treatment. To determine the removal efficiency of the grass channels proposed by VTrans, Mr. Nelson relied on the 2002 VSMM. The VSMM sets forth ANR's determination that certain acceptable treatment practices, including grass channels, would remove 40 percent of the total phosphorus load.

VTrans' stormwater permit certifies that the Project complies with the 2002 VSMM, and ANR's determination with respect to removal efficiency is entitled to substantial deference. See 10 V.S.A. § 6086(d) ("In the case of approvals and permits issued by [ANR], technical determinations of the Agency shall be accorded substantial deference . . . ."); In re Costco Stormwater Discharge Permit, 2016 VT 86, ¶ 45, 202 Vt. 564 (discussing the same aspect of the 2002 VSMM and stating: "[t]he decision to use the chosen design standards is well within ANR's discretion"). This is true even if the permit itself is not creating a presumption of compliance. See Killington Resort Parking Proj. Act 250 Amended Application, No. 173-12-13 Vtec, slip op. at 18 (Vt. Super. Ct. Envtl. Div. Mar. 7, 2016) (Durkin, J.) ("Even after a permit has been rebutted, technical determinations by ANR receive substantial deference from this Court.").

Mr. Torizzo did not rely on the 2002 VSMM to determine removal efficiency. Instead, he calculated the effectiveness of the grass channels using a tool called the "Stormwater Treatment Practice Calculator" (STP Calculator) which was developed by ANR. Mr. Torizzo testified that the grass channels would remove 8.81 percent of total phosphorus load at most, rather than the 40 percent put forward by VTrans. Rerunning the Simple Method analysis with this lower removal efficiency, Mr. Torizzo found that the Project would discharge 1.62 pounds of phosphorus per year rather than 0.11 pounds. In Mr. Torizzo's opinion, the STP Calculator provides a more accurate estimate of removal efficiency than the 2002 VSMM, in part because it uses more recent and comprehensive data.

While the Court found both experts credible, Mr. Torizzo left an important question unanswered. Mr. Torizzo's calculations for removal efficiency included off-site impervious areas draining into the grass channels which may be treated for phosphorus under other stormwater permits. According to VTrans, the inclusion of these areas leads to "double counting" of phosphorus discharges or, put another way, incorrectly attributing discharges to the Project that may come from other areas. Mr. Torizzo conceded that the STP calculator requires these areas to be included in order to make accurate calculations. We have no reason to doubt Mr. Torizzo's assertion regarding accuracy in pure modeling terms, yet he failed to explain how the inclusion did or did not affect his discharge estimate of 1.62 pounds of phosphorus per year. Without more information, the Court can neither assess the significance of the off-site areas in Mr. Torizzo's analysis nor conclude that Vallee presented "clear and convincing" evidence to refute ANR's determination that the grass channels remove 40 percent of the total phosphorus load. See In re ANR Permits, 2014 VT 50, ¶ 15, 196 Vt. 467 ("Absent a clear and convincing showing to the contrary, decisions made within the expertise of such agencies are presumed correct. . . ."); In re Costco Stormwater Discharge Permit, 2016 VT 86 at ¶ 45 (indicating that ANR's determinations on stormwater treatment practices in the 2002 VSMM are entitled to substantial deference).

Even if we credit Vallee's estimate of 1.62 pounds per year, the amount of phosphorus pollution is exceedingly small. VTrans and Vallee agree that "both the [0].11 lbs[.] advocated by Mr. Nelson and the 1.62 lbs[.] advocated by Mr. Torizzo, are extremely small amounts of additional phosphorus when measured against all the phosphorus discharged to Lake Champlain on a yearly basis." R.L. Vallee, Inc's and Timberlake, LLP's Joint Proposed Findings of Fact and Conclusions of Law at 26, filed February 21, 2020 [hereinafter Vallee and Timberlake Joint Brief]. We agree with Vallee that there is no precedent justifying an automatic allowance for *de minimis* water pollution under Criterion 1. Yet an important factor in the analysis is the "amount of the pollution" and VTrans presented credible evidence that the amount is small. See N. E. Materials Grp., 2019 VT 55, ¶ 28. Mr. Nelson testified that 1.62 pounds per year represents approximately .00045 percent of the 162.2 metric tons or 359,000 pounds of phosphorus entering Lake Champlain on a yearly basis. Vallee did not refute this and did not present any alternative method of quantifying the significance of 1.62 pounds of phosphorus per year. Instead, Vallee's position appears to be that any additional phosphorus in Lake Champlain is undue if "reasonably available mitigation exists." Vallee and Timberlake Joint Findings, at 28. We address Vallee's

mitigation argument below. We conclude that the small "amount of the pollution" in this case weighs in favor of the Project's compliance with Criterion 1.

The third factor in our analysis is "floodplains, the nature of soils and . . . their ability to adequately support waste disposal." See 10 V.S.A. § 6086(a)(1). Mr. Nelson testified that some of the phosphorus discharged by the Project would be retained in wetlands and floodplains along the flow path from Sunnyside Brook to Lake Champlain. Vallee presented testimony from Mr. Kretchmer that "virtually all" of the phosphorus discharged from the Project would reach Lake Champlain. Though Mr. Kretchmer acknowledged the capacity of wetlands and floodplains to immobilize and retain phosphorus, he gave his opinion that phosphorus from the Project could be retained only during significant storm events which occur much less frequently than more typical "one inch" storms. Neither expert conducted on-site testing to determine the extent of any retention. Thus, we conclude that there are floodplains and wetlands with the capacity to assimilate and retain phosphorus, and that some retention is likely to occur on some occasions. We afford little weight to this conclusion.

The fourth relevant factor is mitigation, or "whether effective measures will be taken to reduce the pollution." See N. E. Materials Grp., 2019 VT 55, ¶ 28. We have explained that mitigation is one of many non-dispositive factors the Court may consider under Criterion 1. See id.; Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. As evidence of measures to reduce pollution, VTrans relies on its proposed stormwater treatment system consisting of eight grass channels to collect runoff. Grass channels are an acceptable treatment practice under the 2002 VSMM and ANR determined that they will remove 40 percent of total phosphorus load for the treated area. VTrans' stormwater permit certifies that the proposed channels are designed appropriately. On behalf of Vallee, Mr. Torizzo testified to his calculations that the removal efficiency of the grass channels will be 8.81 percent. Even assuming the channels remove 8 to 9 percent of the total phosphorus load, they are still "effective" in that they reduce phosphorus pollution from the Project. See N. E. Materials Grp., 2019 VT 55, ¶ 28, 35 (considering the effectiveness of mitigation systems).

Vallee points to evidence of additional mitigation measures and argues that "[f]ailure to employ available mitigation means pollution is undue." Vallee and Timberlake Joint Findings, at 28. This misstates the law. No single factor is determinative here. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. Vallee's contention that Criterion 1 requires applicants "to reduce

their water pollution to the smallest degree practicable" simply has no basis in our precedent. See Joint Response by R.L. Vallee, Inc. and Timberlake, LLP at 6, filed February 28, 2020. Effective mitigation is undoubtedly an important consideration, but Criterion 1's fact-dependent analysis requires a holistic review of the Project's impacts. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. Other Act 250 criteria have a narrower focus and are accompanied by more specific standards. Under Criterion 8's Quechee Test, for example, an adverse aesthetic impact will be undue if "the applicant has failed to take generally available mitigating steps." In re Application of Lathrop, Ltd. P'ship I, 2015 VT 48, ¶ 74, 199 Vt. 19. While a court could reach a similar conclusion after weighing relevant factors under Criterion 1, the starting point is less prescriptive.

In any event, available mitigation is relevant under Criterion 1 and we must consider Vallee's proposed measures. First, Mr. Torizzo testified that the grass channels could be improved by installing a better filter material at the bottom of the channels. He explained that adding topsoil with a high sand component would allow more stormwater to infiltrate the ground. Mr. Torizzo did not opine as to how much phosphorus this practice would remove; only that it would "mitigate" any phosphorus increases. Vallee did not provide evidence of the impacts of discharging 1.62 pounds of phosphorus per year as compared to a lesser amount. Vallee's sole contention in that regard appears to be that any phosphorus discharge to Lake Champlain is undue, and complete mitigation is required. Faced with evidence of the Project's carefully designed stormwater treatment system, and without evidence as to the relative impacts of other mitigation measures, we decline to accept Vallee's argument that complete mitigation is required. See Hinesburg Hannaford Act 250 Permit, No. 113-8-14 Vtec, slip op. at 30 (Vt. Super. Ct. Envtl. Div. Apr. 12, 2016) (Walsh, J.) (noting that Criterion 1 does not prohibit "all impacts . . . outright") rev'd on other grounds, 2017 VT 106, 206 Vt. 118.

Mr. Torizzo also commented on mitigation opportunities found in a memo prepared for VTrans and introduced by Vallee. The memo discusses potential off-site treatment practices designed to offset phosphorus loading from the Project. Neither Mr. Nelson nor Mr. Torizzo provided reasons why the measures could not be constructed, but Vallee's own argument illustrates why we afford little weight to its offer. Vallee advocates for a finding that the pollution will be undue without updated grass channels and new off-site mitigation. In the same breath, Vallee argues that remand is required because VTrans cannot propose these measures without amending its Act 250 application. See Vallee and Timberlake Joint Brief at 29 (stating that the

off-site measures expand the scope of involved lands). We struggle to see how mitigation measures representing such a change, substantial enough to require remand and amendment, could be considered "reasonably available" for purposes of the proposal before the Court. The only evidence offered to justify the measures is the fact that they are available to reduce phosphorus loading. VTrans has demonstrated that it will take "effective measures to reduce the pollution," and Vallee has not given us reason to require additional mitigation. See N. E. Materials Grp., 2019 VT 55, ¶ 28.

The final factors that warrant discussion concern the "nature" of the pollution and the area affected. See id. Lake Champlain is impaired for phosphorus, and Vermont has begun important efforts to reduce phosphorus pollution.[6] The broad purpose of Act 250 is "to protect and conserve the environment of the state." Hawk Mt. Corp., 149 Vt. 179, 184 (1988) (quoting In re Juster Assocs., 136 Vt. 577, 580 (1978)). It is significant, however, that "the conservation goals of Act 250 have always been balanced against the economic necessity of development." In re Village Assocs. Act 250 Land Use Permit, 2010 VT 42A, ¶ 17, 188 Vt. 113. We must ensure that the Project will not result in undue phosphorus pollution, while recognizing that Criterion 1 does not require applicants to eliminate *all* pollution.

Vallee takes the position that "undue water pollution results when a project increases the discharge of pollutants to an already polluted waterbody." Vallee and Timberlake Joint Brief at 23. In essence, Vallee contends that any phosphorus discharge would be undue given the impaired state of Lake Champlain. We cannot agree. Neither Act 250 nor Vermont's current policy toward phosphorus pollution support that position.

In the case of Criterion 1, "it is clear that all impacts are not prohibited outright." Hinesburg Hannaford Act 250 Permit, No. 113-8-14 Vtec at 30 (Apr. 12, 2016); see also N. E. Materials Grp., 2019 VT 55, ¶ 28 (whether pollution is undue depends on a variety of factors). Likewise, Vermont's TMDL Implementation Plan does not prohibit phosphorus discharges. Vallee cites the Environmental Board's decision in Upper Valley Regional Landfill to support its position, but the case involves contaminated drinking water and does not create a prohibition on discharges to polluted waterbodies. See Re: Upper Valley Regional Landfill, No. 3R0609-EB, Findings of Fact, Conclusions of Law, and Order (Vt. Envtl. Bd. Nov. 12, 1991). In Upper Valley

[6] Vallee provided additional evidence relating to phosphorus levels in Sunnyside Brook. Vallee's Amended Question 1.b concerns undue water pollution in Lake Champlain. While Sunnyside Brook is undoubtedly relevant as the receiving stream for the Project area, our analysis is focused on water pollution in the lake.

the Board acknowledged the fact-specific nature of the Criterion 1 inquiry and discussed prior cases indicating that "discharge of [pollutants] to groundwater does not necessarily result in undue water pollution." Id. at 32–33. The Board stated that "[p]ollution of groundwater may not always be undue," but found substantial evidence showing that "leachate from the landfill has contaminated the water supplies of residents" and "the contamination appears to be increasing." Id. at 34. The evidence of contamination, showing that "the water is clearly not safe to drink," convinced the Board that the landfill created undue water pollution. Id. Neither the holding nor the facts of Upper Valley justify a complete prohibition on phosphorus discharges to Lake Champlain. See id. at 32–34.

Discharging phosphorus does not create undue water pollution *per se*, nor does the fact that opportunities exist to further reduce the discharge. To determine whether pollution is undue, we must weigh the relevant factors in each case. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. VTrans has shown that the Project: (1) complies with applicable regulations, (2) contributes an extremely small amount of phosphorus to Lake Champlain, and (3) uses effective measures approved by ANR to reduce the total phosphorus load. VTrans has also shown that Vermont's plan to address phosphorus in Lake Champlain anticipates future development and accounts for the resulting increase in phosphorus. Vallee has demonstrated that there are additional opportunities to mitigate phosphorus loading from the Project and contends that undue water pollution will result without further reductions. It states that it is "immaterial" whether Project adds 0.11 or 1.62 pounds of phosphorus per year, while maintaining that the Project's treatment practices are insufficient. See Vallee and Timberlake Joint Brief at 26. Vallee argues that the only acceptable level of pollution is zero, in direct contrast with the governing law and policy on the matter. The cumulative evidence on relevant factors weighs in VTrans' favor. Therefore, we conclude that the Project's phosphorus discharges will not create undue water pollution.

IV. Chloride Pollution

Vallee's Amended Question 1.a asks whether the Project's chloride discharges will create undue water pollution in Sunnyside Brook. VTrans has the burden of production and the burden of persuasion. See Katzenback Act 250 Permit, No. 124-9-17 Vtec at 4 (Jan. 2, 2019); 10 V.S.A. §

6088(a). We find that both burdens are satisfied. VTrans presented its stormwater permit[7], its statewide Snow and Ice Control (SIC) Plan and its Chloride Management Plan (CMP) for the Project. Both the SIC Plan and the CMP balance VTrans' obligation to maintain road safety and travel conditions with the importance of reducing salt usage in chloride-impaired watersheds. There is no dispute that Sunnyside Brook is impaired for chloride.

VTrans presented evidence that Vermont used 19.2 tons of de-icing material per lane mile per year over a four-year average from 2014 through 2017. Four-year average salt usage in Maintenance District 5, where the Project sits, was 13.8 tons per lane mile per year from 2013 through 2016. Vallee's evidence shows that VTrans currently applies 79.4 tons of chloride per year in the Sunnyside Brook watershed and will apply an additional 3.3 tons per year if the Project is completed. See Katzenback Act 250 Permit, No. 124-9-17 Vtec at 5 (Jan. 2, 2019) (citing In re Denio, 158 Vt. 230, 237 (1992)) ("An applicant can be relieved of its burden of production even if the necessary proof is introduced by an appellant."). Witnesses credibly testified to VTrans' use of best management practices (BMPs) and the agency's efforts in efficiency and innovation. VTrans' Operations Manager, Mr. Law, testified that VTrans has reduced chloride use over time by refining its use of liquids and BMPs. The SIC Plan is reviewed and revised consistently to allow this process to continue in the future. Mr. Law also explained how unpredictable winter weather and VTrans' maintenance obligations affect salt application rates and BMP implementation. In all, VTrans produced sufficient evidence for a finding that chloride pollution will not be "more than necessary—exceeding what is appropriate or normal." See N. E. Materials Grp., 2019 VT 55, ¶ 28 (listing relevant factors including "the nature and amount of pollution"); Diverging Diamond SW Permit, 2019 VT 57, ¶ 45 (noting that the Court may consider "any factors relevant to a determination of whether a proposed project will cause undue pollution").

Vallee argues that our decision in Katzenbach Act 250 Permit mandates a different conclusion. We disagree. In that case, the applicant relied on his personal opinion to determine whether pollution control measures were necessary despite having no expertise in the matter. See Katzenback Act 250 Permit, No. 124-9-17 Vtec at 5 (Jan. 2, 2019). Moreover, the applicant provided no information regarding air quality concerns, presented no evidence on noise levels,

[7] For the reasons detailed earlier in this decision, our analysis disregards the rebuttable presumption arising from VTrans' stormwater permit. Here, as in our discussion of phosphorus pollution, the stormwater permit shows that the Project will comply with "applicable . . . Environmental Conservation Department regulations." See 10 V.S.A. § 6086(a)(1).

and failed to address water quality concerns in any meaningful way. See id. at 5–6. In direct contrast, VTrans has satisfied its burden of production with extensive expert testimony and information relevant to the question before us. We now turn to the key considerations and our conclusion that the Project will not create undue chloride pollution under Criterion 1.

We first address the degree to which this inquiry differs from our analysis of phosphorus pollution. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 45 (whether pollution is undue is "highly fact-specific"). While Sunnyside Brook is impaired for chloride, there is no chloride TMDL currently in place. Indeed, the Court has no information regarding Vermont's present or future chloride pollution plans or policies. There are no chloride discharge standards governing the Project. VTrans has obligations set in statute and policy to maintain safety and travel conditions on winter roads, and it applies chloride in various forms across the state to fulfil those obligations. Against this backdrop we must carefully weigh the evidence before us. See id., ¶ 45 (the Court may consider any relevant factors).

This Project is not a large-scale development: it is an interchange reconfiguration generating a small amount of new road surface. VTrans will be responsible for maintaining an additional 0.29 lane miles if the Project is completed, while the Town of Colchester will be responsible for 0.09 lane miles. Nonetheless, the Project will likely increase chloride pollution in Sunnyside Brook. In accordance with the SIC Plan and the CMP, VTrans will apply road salt to the new lane miles in its area of responsibility. Stormwater will wash chloride from the roads into the brook. As to the amount of pollution, Vallee's water quality expert Mr. Torizzo found that the new lane miles maintained by VTrans will add 3.3 tons of chloride to the total of 360.7 tons applied per year in the watershed. See N. E. Materials Grp., 2019 VT 55, ¶ 28 (the "amount" of pollution is relevant). Mr. Torizzo's report also indicates that the new lane miles maintained by towns, including the Town of Colchester, would add 1 ton of chloride per year.[8] Vallee did not present evidence regarding the significance of 3.3 tons, 4.3 tons, or any lesser amount entering the watershed. VTrans showed that average salt usage in Maintenance District 5, where the Project sits, was 13.8 tons per lane mile per year from 2013–2016. Statewide, Vermont used an average of 19.2 tons per lane mile per year from 2014– 2017.

[8] Neither party provided data regarding Colchester's actual salt usage. Mr. Torizzo used average salt usage from six New Hampshire municipalities to calculate his estimate. He noted that New Hampshire experiences similar winter weather to Vermont.

VTrans has shown a history of chloride reduction and a commitment to further improvement. In Maintenance District 5, VTrans' average salt usage from 2013–2016 was 9 percent less than the average usage from 2008–2012. The 9 percent reduction coincided with the period when VTrans began using the SIC Plan. The SIC Plan itself contains several chloride reduction BMPs, and is intended to allow VTrans to experiment with more efficient technologies and innovative techniques. VTrans reviews and revises the plan on a regular basis, in part to ensure that the chloride reduction BMPs are up to date. The CMP for the Project was developed in accordance with the latest SIC Plan and commits to following future versions. VTrans' Operations Manager, Mr. Law, testified that the agency has refined its anti-icing BMP and use of liquid sodium chloride over time to achieve chloride reductions. He verified that VTrans abides by the SIC Plan, and that the potential chloride reductions listed for each BMP are accurate. The implementation of these strategies speaks to VTrans' ongoing efforts and motivation to improve efficiency, to reduce the environmental impacts associated with chloride use, and manage budgetary concerns.

While VTrans is committed to chloride reduction, it must also ensure that Vermont's state highways are safe and travelable. VTrans has statutory maintenance obligations[9] and adheres to a policy requiring "safe roads at safe speeds." VTrans must also maintain certain levels of service for Vermont roads. I-89 requires the highest level of service in the state and has the highest priority: VTrans must achieve bare pavement across the full road width as soon as practicable following a storm. US Routes 2/7 are second in priority, requiring the same pavement conditions. Mr. Law stressed that flexibility is important for VTrans to meet its obligations. Weather conditions have a significant effect on salt application rates, and plow operators work with supervisors to adjust their rates as storms and conditions change. VTrans relies on licensed in-house operators who are trained in winter maintenance. VTrans monitors its operators through regular performance reviews. Operators' salt application rates are routinely checked to ensure they are consistent with guidelines and weather conditions.

Vallee contends that chloride pollution will be undue without the following additional mitigation: (1) Project-specific chloride tracking and recording; (2) Project-specific reporting; (3)

[9] This fact is undisputed and well established. See, e.g., Ondovchik Family Ltd. P'ship v. Agency of Transp., 2010 VT 35, ¶ 11, 187 Vt. 556 (citing 23 U.S.C. § 116(a)) ("[U]nder federal law, [VTrans] has a duty to remove snow and engage in other routine maintenance . . . .").

employing an articulated plow blade in the Project area; (4) employing AVL technology and geo-fencing when appropriate; (5) installing a "Road Weather Information Station" in the Sunnyside Brook watershed; and (6) as part of annual training, including information about the chloride impairment of Sunnyside Brook and the impacts of de-icing material on the brook's water quality.

VTrans' expert, Mr. Law, demonstrated that many aspects of the recommendations are already implemented or in testing to determine their effectiveness. VTrans is currently piloting 12 articulated plows to evaluate their efficiency. It equips all trucks with AVL technology, including the capability to track salt application rates and location in real time. VTrans does not use "geo-fencing" as described by Mr. Brown, where salt application rates are automatically adjusted based on gps location. Mr. Law testified that he had significant safety concerns with geo-fencing, because plow operators may not realize the automatic changes are taking place.[10] VTrans maintains RWISs across the state, including one near the Project area. As to training, Mr. Law testified that VTrans' current program fulfils Mr. Brown's general recommendations. While VTrans does not conduct site-specific training, specific concerns are addressed in the annual training sessions. Mr. Law also explained why VTrans implements management practices statewide rather than modifying its approach based on the area. Using different BMPs in different locations creates a safety concern relating to maintaining predictable road conditions.

To the extent VTrans has not already implemented Vallee's proposed mitigation measures, we note that the mere presence of available mitigation is not a determinative factor under Criterion 1. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. Once again, Vallee appears to suggest that VTrans must take all available steps to reduce pollution when that is not the standard for what is "undue." See N. E. Materials Grp., 2019 VT 55, ¶ 28; see also Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. Vallee argues that VTrans has not shown how its BMPs or other chloride reduction efforts impact the Project's chloride discharges to Sunnyside Brook. Though we recognize this concern, there are no discharge standards or policies before us to guide an assessment of increases or reductions in chloride. Thus, we must rely on other evidence in the record and the testimony of experts to determine whether the pollution generated by de-icing activities in the Project area exceeds "what is appropriate or normal." See N. E. Materials Grp., 2019 VT 55, ¶ 28; Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45.

[10] Vallee implies that Mr. Law's concerns were alleviated when he was told that operators could fully control the geo-fencing system. We do not agree with Vallee's interpretation of the testimony.

Mr. Brown's expertise is not in question, and he has had success with some of his recommended practices in Massachusetts. In Vermont, however, Mr. Law is directly responsible for VTrans' winter maintenance activities. He is in the best position to know what methods and equipment best achieve the required balance between environmental and safety concerns. Mr. Law is also in the best position to know what is effective for operations in Vermont as opposed to other states. We assign great weight to Mr. Law's testimony.

Vallee asks us to require the Town of Colchester to follow VTrans' SIC Plan and CMP for maintenance activities on Colchester roads in the Project area. Colchester has its own Snow and Ice Removal (SIR) Plan, which includes elements of the SIC Plan. The CMP for the Project was developed in accordance with Colchester's SIR Plan. VTrans' Project Manager reviewed the SIR Plan and found it reasonable. Vallee's own evidence suggests that municipal winter maintenance operations use less chloride than their state-level counterparts, and that town roads in the Project area will contribute about 1 ton of chloride per year as opposed to VTrans' 3.3 tons.[11] We find it appropriate for the Town of Colchester to continue managing its own winter maintenance obligations.

As with phosphorus in Lake Champlain, there is no question that chloride is a pollutant of significant concern in the Sunnyside Brook watershed. Sunnyside Brook is impaired, and Vallee's evidence shows that chloride levels are already above EPA's chronic criteria with spikes into acute territory. The Project will likely increase chloride pollution in Sunnyside Brook. See N. E. Materials Grp., 2019 VT 55, ¶ 28 (relevant factors include the "nature" of the pollution, "the character of the surrounding area, [and] whether the pollutant complies with certain standards or recommended levels"). Despite this, there are no standards or policies against which to judge the Project's discharges. VTrans's proposal aims to improve road safety in an urbanized area and uphold its obligation to maintain certain winter travel conditions while minimizing salt usage. VTrans has shown its compliance with all applicable regulations. It has shown a history of chloride reductions and a commitment to continue refining its approach. It developed a CMP for the Project area, which mirrors the SIC Plan and balances the interests of safety, mobility, environmental protection, and fiscal responsibility. VTrans will utilize chloride reduction BMPs and has already implemented aspects of Vallee's suggested mitigation measures. Some of the additional measures proposed by Vallee create legitimate safety concerns.

[11] We reiterate that Mr. Torizzo estimated municipal salt usage based on towns in New Hampshire.

In considering whether chloride discharges from the Project will be undue we review the above factors, and on balance we are persuaded that the pollution will not be "more than necessary—exceeding what is appropriate or normal." See N. E. Materials Grp., 2019 VT 55, ¶ 28; see also Diverging Diamond SW Permit, 2019 VT 57, ¶ 44–45. The central argument and the only evidence to the contrary is that there are additional steps VTrans could take to reduce chloride application in the Project area. Vallee has not shown what the extent or effects of those reductions are. Criterion 1 does not prohibit all impacts, nor does it require applicants to reduce pollution to the greatest extent possible. See Diverging Diamond SW Permit, 2019 VT 57, ¶ 44 ("[W]hether 'undue' pollution will result from a proposed project is a highly fact-specific inquiry that depends on a wide variety of factors."). We conclude that the Project's chloride discharges will not create undue water pollution. Considering the facts and circumstances before us, we conclude that the Project complies with Criterion 1.

Conclusion

For the reasons detailed above, we find that the Project complies with Criterion 1. We therefore **GRANT** VTrans' application for an Act 250 land use permit, with the conditions imposed by the District Commission set out at VTrans Ex. 3, Bates 022019–24. A Judgment Order accompanies this decision. This completes the current proceedings before the Court.

Electronically signed on March 20, 2020 at 1:05 PM pursuant to V.R.E.F. 7(d).

Thomas G. Walsh, Judge
Superior Court, Environmental Division