UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF THE
REGIONAL ADMINISTRATOR

November 16, 2007

Kenneth R. Sikora, Jr.
Federal Highway Administration, Region 1
P.O. Box 568
87 State Street, Room 218
Montpelier, Vermont 05601

Robert Desista, Acting Chief
Regulatory Division, Operations Directorate
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, Massachusetts 01742

Re: Circ-Williston Transportation Project Draft Environmental Impact Statement (DEIS), Chittenden County, Vermont, Corps of Engineers Public Notice 2004-2762, CEQ # 20070344

Dear Mr. Sikora and Mr. Desista:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA), Section 404 of the Clean Water Act, and Section 309 of the Clean Air Act, we have reviewed the Vermont Agency of Transportation (VTrans)/Federal Highway Administration's (FHWA's) Draft Environmental Impact Statement (DEIS) for the Circ-Williston Transportation Project in Chittenden County, Vermont.[1]

The DEIS details plans by VTrans and the FHWA to implement transportation improvements in the Circ-Williston project area generally located between I-89 and the towns of Williston and Essex and the Village of Essex Junction in Chittenden County, Vermont. As described in the Public Notice (PN) for the project, the Corps of Engineers has determined that the basic project purpose is "to improve access to, from and within the project area and remedy existing and projected deficiencies including congestion, safety and mobility issues (including movement of both people and goods) in the Circ-Williston corridor." The DEIS does not identify a preferred alternative but does examine the No-Build and ten build alternatives. The Build Alternatives are organized into three groups: 1) the VT 2A Alternatives (2, 3, 22); 2) the Circ A-B Alternatives (16a, 16b, 16c,

[1] This letter serves as our comment on the DEIS and the Corps of Engineers' public notice for a Clean Water Act Section 404 permit for the project.

17); and 3) the Hybrid Alternatives (18, 19, 23). According to the DEIS, the Circ A-B alternatives have the greatest adverse impacts to aquatic resources (approximately 33 to 47 acres), followed by the Hybrid alternatives (approximately 28 to 30 acres). The 2A alternatives would have significantly less impact (approximately 2 to 2.5 acres) to aquatic resources. Three potential mitigation sites have been identified to compensate for these impacts. In addition to the aquatic resource impacts which are of particular interest to EPA in view of the regulatory requirements of Section 404, the DEIS describes other impacts typically associated with highway construction projects, including property takings, that all of the build alternatives involve to varying degrees.[2]

EPA has participated as a cooperating agency during the development of the DEIS for the project, providing input on the range of alternatives to be analyzed and on draft chapters and information contained in various technical reports. We appreciate the efforts of VTrans and the FHWA to actively coordinate with EPA in the development of the DEIS. Our past experience with and knowledge of environmental conditions within portions of the Circ-Williston project area helped shape our comments on this EIS. During interagency meetings as part of the EIS development/regulatory coordination process, EPA offered recommendations concerning a number of issues, including wetlands, storm water, air and water quality, alternatives, and induced development.

As discussed in the enclosed detailed comments, the DEIS and the PN present facts that show that: 1) there are only modest differences between the alternatives in terms of addressing the NEPA project purpose and need, and Section 404 basic project purpose; 2) the alternatives all appear to be practicable; and, 3) the VT 2A alternatives appear to include the least environmentally damaging practicable alternative (LEDPA). If the VT 2A alternatives are in fact the LEDPA, and it is our recommendation that they are, Section 230.10(a) of the Section 404 (b)(1) guidelines would require that only these alternatives may be permitted.

In addition to our comments related to wetland impacts and mitigation, the detailed comments address water resources and storm water, air quality, indirect and cumulative impacts, and hydrologic impacts.

Because the DEIS does not identify a preferred alternative, and the alternatives represent a range of potential impacts, we have rated each group of alternatives individually following EPA's national rating system, a description of which is enclosed. For the reasons described in the detailed comments, EPA has rated the VT 2A alternatives (2, 3, 22) as "Environmental Concerns-Insufficient Information" (EC-2) and the Hybrid and Circ A-B alternatives (alternatives 18, 19, 23 and 16a, 16b, 16c, 17, respectively) as "Environmental Objections-Insufficient Information" (EO-2).

We appreciate the opportunity my staff had to participate in numerous workgroup meetings over the past few years and to raise many of the concerns detailed in this letter. We also appreciate the meeting VTrans and FHWA held with EPA, the Corps, and the

[2] The property takings for the Circ A-B alternatives occurred when VTrans/FHWA purchased the right-of-way but are relevant for this NEPA/404 analysis.

Fish and Wildlife Service on November 13, 2007, to discuss and answer questions about the DEIS's alternatives analysis. EPA recognizes the importance of this project to the State of Vermont and Chittenden County and we reiterate our commitment to work with VTrans and FHWA to provide an objective review of new information as it is developed, and to address outstanding issues as the NEPA/404 processes advance for the project. Please feel free to contact me or Timothy Timmermann at 617-918-1025 or Matt Schweisberg at 617-918-1628 if you wish to discuss these comments further.

Sincerely,

Robert W. Varney
Regional Administrator

Enclosure

cc:

Neale Lunderville, VTrans
George Crombie, VTANR
Mike Bartlett, USFWS

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Additional Detailed Comments
Circ-Williston Transportation Project Draft Environmental Impact Statement, Chittenden County, Vermont, Corps of Engineers Public Notice 2004-2762

Wetland/Section 404 Issues

Introduction
Both the federal Clean Water Act (CWA) and the National Environmental Policy Act (NEPA) direct federal agencies to evaluate fully the impacts of a reasonable range of alternatives to meet the basic project purpose/purpose and need, and to disclose those impacts to the public. In evaluating VTrans' application for a federal permit under Section 404 of the Clean Water Act, and advising the Corps of Engineers as to whether a permit can issue, EPA focuses primarily on the aquatic environment—the rivers and streams, lakes, ponds, and wetlands subject to federal jurisdiction—that would be affected by the proposed project alternatives. The Corps and EPA have a legal obligation to ensure that only the least environmentally damaging practicable alternative (LEDPA) be permitted, and that no project be permitted that would result in significant adverse impacts to the aquatic environment.

EPA's Section 404(b)(1) guidelines (40 CFR 230) set forth the environmental standards which must be satisfied in order for a Section 404 permit to issue. Two key provisions of the guidelines are critical when considering the alternatives proposed for the Circ-Williston project. First, the guidelines generally prohibit the discharge of dredged or fill material if there exists a practicable alternative which causes less harm to the aquatic ecosystem. The guidelines state that "an alternative is practicable if it is capable of being done after taking into consideration cost, technology, and logistics in light of overall project purposes" (40CFR Part 230.10(a)(2)). Where, as here, the project is not water dependent and involves fill in wetlands and other special aquatic sites, practicable, less environmentally damaging alternatives are presumed to exist unless clearly demonstrated otherwise. Second, the guidelines prohibit issuance of a permit if the discharge would cause or contribute to significant degradation of waters of the United States, taking into consideration any compensatory mitigation that may be proposed to offset these impacts.

As discussed below, the DEIS shows that: 1) there are only modest differences between the alternatives in terms of addressing the NEPA project purpose and need, and Section 404 basic project purpose; 2) the alternatives all appear to be practicable; and, 3) the VT 2A alternatives group appears to contain the least environmentally damaging practicable alternative. As noted in the cover letter, based on the facts presented in the DEIS and the requirements of the Section 404 (b)(1) guidelines, which allow only the LEDPA to be permitted, it is EPAs recommendation that the Corps should not issue a Section 404 permit for any of the new alignment build alternatives identified in the DEIS.

Environmental Setting
The DEIS describes the project area as a variety of vegetative communities, wildlife habitat types and land uses, including deciduous, evergreen and mixed forest; emergent wetland; shrubland; old field; mowed turf; farmland; open water; and

residential/commercial development. The project alternatives are situated throughout the Winooski River, Allen Brook and Muddy Brook watersheds. The existing VT 2A corridor contains commercial and residential development with some agricultural uses. The Circ A-B corridor is characterized by open land, subdivision development, and forest land. The forests consist of deciduous and coniferous forest types. Near the Winooski River, a coniferous forest becomes dominant. A more detailed description of the biological resources can be found in the DEIS Appendix F: Biological Resource Technical Report.

According to a report entitled, "An Assessment of Wildlife Habitat in Williston, Vermont," produced by the University of Vermont in 2005 ("the UVM report"), the project area is rich in diverse wetland and upland habitat.[3]

The UVM report lists the Winooski River as the most important natural feature in this area; the River forms the town's northern and northeastern boundaries. Mixed forests, old fields, and the Winooski River riparian zone are among the habitat types present in this area. Wetland habitat types are described as diverse, and wide-ranging mammal species (e.g., bobcat) are listed as using the Winooski River riparian corridor.

Northern hardwoods dominate the deciduous forest, with bitternut hickory, basswood, hop hornbeam, and black cherry being present. The UVM report describes much of the deciduous forest as having little shrub growth; saplings are 20-30 feet high, out of reach of browsing animals. Moving northward, downhill toward the Winooski River, a coniferous forest becomes dominant, with white pine and eastern hemlock. Small streams cut deep ravines through the upland to reach the Winooski, creating steep hills along the floodplain edge. This area provides travel corridors and meets lifecycle needs for many species of wildlife; it includes ample eastern cottonwoods, an important food for ruffed grouse; and shows evidence of recent logging, which will create more browse and cover for numerous mammal and bird species.

The UVM report also describes a large coniferous forested area that is heavily used by deer, which cross Redmond Road in several places. Near the Winooski River, a young riparian forest exists on the floodplain. Animals that use this area include coyote, deer, fisher, river otter, red fox, several species of field mouse, and red and gray squirrels. The most notable feature of value to wildlife is the relatively intact floodplain forest along the Winooski River. This habitat type is described as rare in Williston because much of it has been converted to agriculture. Various upland forest and shrub habitats also exist, complementing similar habitat in other sections of town. One vernal pool is listed as being in this area.

In addition to wildlife habitat, other principal functions and values exhibited by the wetland systems include groundwater discharge; sediment/toxicant detention; and nutrient production and export.

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[3] An Assessment of Wildlife Habitat in Williston, Vermont. July, 2005. Spatial Analysis Laboratory, Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT

Alternatives

The alternatives under consideration in the DEIS and Corps Public Notice can be described as follows:

VT 2A Alternatives (Improvements to Existing Roadway)

- Alternative 2: Widen VT 2A to four lanes, with signalized intersection improvements
- Alternative 3: Widen VT 2A to four lanes with roundabouts
- Alternative 22: Tapered widening on VT 2A with signalized and roundabout intersections

Circ A-B Alternatives (New Roadway)

- Alternative 16a: Create Circ A-B limited access highway with VT 2A spot improvements. No connection to US 2 and trumpet interchange at Redmond Road.
- Alternative 16b: Create Circ A-B limited access highway with VT 2A spot improvements. Partial cloverleaf interchange at US 2 and trumpet interchange at Redmond Road.
- Alternative 16c: Create Circ A-B limited access highway with VT 2A spot improvements. No connection to US 2 and diamond interchange at Mountain View Road.
- Alternative 17: Create Circ A-B Boulevard with VT 2A spot improvements.

Hybrid Alternatives (VT 2A Improvements plus Circ Street)

- Alternative 18: Widen VT 2A to four lanes, with signalized intersection improvements plus Circ Street.
- Alternative 19: Widen VT 2A to four lanes, with roundabouts plus Circ Street.
- Alternative 23: Tapered widening on VT 2A with signalized and roundabout intersections plus Circ Street.

EPA's Section 404(b) (1) guidelines generally prohibit the discharge of dredged or fill material if there exists a practicable alternative which causes less harm to the aquatic ecosystem. Specifically, a discharge of dredged or fill material is prohibited if there "is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem so long as the alternative does not have other significant adverse environmental consequences." [40 CFR 230.10(a)] This fundamental requirement of the Section 404 program is often expressed as the regulatory standard that a permit may only be issued for the "least environmentally damaging practicable alternative" or LEDPA. Furthermore, where (as here) the project is not water dependent and involves fill in wetlands and other special aquatic sites, practicable and less environmentally damaging alternatives are presumed to exist unless clearly demonstrated otherwise by the applicant. From our review of the DEIS and PN, all of the proposed alternatives appear to meet the project purposes and needs as well as the basic project purpose, though to varying degrees.

All three groups of alternatives would improve access to, from and within the project area and address existing and projected deficiencies, including congestion, safety and mobility issues (including movement of both people and goods) in the Circ-Williston corridor. The DEIS shows that there would be relatively minor additional travel/mobility benefits produced by the Circ A-B or Hybrid alternatives in comparison to the VT 2A alternatives. In Chapter 5 of the DEIS, the tables and narrative present the traffic and transportation benefits that would accrue from the various alternatives. Tables 5-9 to 5-17 show marginal transportation benefit differences among the various alternatives.

Below is a brief comparison of the alternatives relative to project purposes and needs, costs, and adverse impacts to aquatic resources.

- The analysis suggests that building the Circ A-B options would reduce travel time by an average of 2 to 2 ½ minutes (with a range of 1 to 4 minutes) from Essex to Williston more than the VT 2A improvement options (Table 5-17, pages 5-22 and 5-23). In terms of volume to capacity ratios, VT 2A alternatives 2 and 3 lead to similar or better performance relative to the Circ A-B alignments in 3 out of 4 key road segments in the morning peak hour and 3-4 out of 5 in the evening peak hour (Table 5-11, pages 5-16 and 5-17). While it seems clear that additional capacity is needed in the VT 2A corridor, in our view the DEIS does not demonstrate that the modest transportation benefits attributable to the Hybrid and Circ A-B alternatives warrant the greater adverse impacts to aquatic resources that they would cause. The Hybrid alternatives would affect about 28 to 30 acres of wetlands, including the adverse effects attributable to the A-portion of the Circ corridor. The Circ alternatives would adversely impact 33 to 47 acres of wetlands, result in the loss of a diverse assemblage of wetland types including over twenty acres of forested wetland and fragment a larger forested wetland and upland complex. The Circ A-B options could destroy breeding habitat for a population of wood frogs found in the area and prevent east-west wildlife movement in the Winooski River watershed. By comparison, the VT 2A alternatives would adversely impact 2 to 2.5 acres with no habitat fragmentation.

- At the failing intersections shown in Table 5-10 (DEIS pg 5-15), VT 2A alternative 22 more frequently results in significant improvements (LOS B) as compared with the other VT 2A alternatives, the Circ A-B alternatives, and most of the hybrid alternatives. Further, the only build alternatives that achieve LOS B at Five Corners in the AM and PM peak hour are VT 2A alternative 22 and hybrid alternative 23. Although VT 2A alternative 2 is characterized in the DEIS as not effectively addressing congestion on roadway segments, Table 5-11 (DEIS pgs 5-16 and 5-17) indicates that it performs as well at achieving a Volume/Capacity (V/C) ratio of <1.0 as some of the other alternatives that are characterized as effectively addressing congestion, such as VT 2A alternative 3, and Hybrid alternatives 18 and 19. VTrans should clarify this apparent inconsistent characterization.

- The analysis points out that the right-of-way acquisitions and the costs of the alternatives differ significantly among the alternatives largely due to the amount of development in the VT 2A corridor. The cost comparison provided is not a fair representation. There are fewer new acquisitions for the Circ A-B corridor because VTrans previously acquired the right-of-way. For an appropriate comparison of costs, EPA recommends that this analysis take into account those original acquisition costs as well as show what the corridor would cost today in 2007 dollars.

- All of the Circ A-B alternatives leave the Industrial Avenue/Mountain View Road to South Street/River Street segment severely congested in the evening as do VT 2A alternative 22 and hybrid alternative 23. In addition, the Circ A-B alternatives would leave Five Corners functioning at LOS E or F. The DEIS appears to indicate that benefits associated with the Circ A-B options would be minimal. For example, Table 5-9 (page 5-14): Effect on Level of Service at Major VT 2A Intersections, Table 5-10 (page 5-15): Effect on VT 2A Intersections with Unacceptable Level of Service, and Table 5-11 (pages 5-16 and 5-17): Effect on VT 2A Roadway Segments (With Restricted or Severely Congested Traffic Flow) all show limited discernable change if any of the Circ A-B options are constructed. Given the public concern over congestion at Five Corners and other failing intersections, EPA believes the FEIS needs to clarify why VT 2A alternative 22 and Hybrid alternative 23, which do the most to improve traffic flow at the Five Corners, are rated as not meeting the criterion for effectively addressing congestion at intersections. With respect to Five Corners, the DEIS (page 2-5) describes considerable delays related to at-grade train crossings in the Five Corners area. It is not clear whether grade separation options were considered for the two key VT 2A intersections that cross the tracks. For example, could a single overpass be constructed to separate Park Street from the two tracks it must cross between Iroquois Ave and Park Terrace? Depending on the contribution of train crossings to intersection delays, this may be an effective part of a capacity improvement/congestion reduction alternative for the corridor.

- Truck traffic has been discussed in prior correspondence on this project. The DEIS appears to indicate that the 2A options may not reduce truck traffic on local roadways. We note that reducing truck traffic on local roads is not a part of the Corps basic project purpose. Rather, the NEPA purpose and need statement includes the phrase "accommodates truck/goods movements," which is not the same as 'reduce truck traffic on local roadways.' We are concerned that reading this phrase as a performance criterion would inappropriately constrain the analysis and would favor only those alternatives that involve construction of a new roadway. If VT 2A were reconstructed, for example, EPA believes that it could (and should) be designed to carry trucks safely and accommodate their movements as well as maintain the character of the corridor. Moreover, if a new roadway were built, safety improvements would likely still be needed to accommodate the medium and heavy trucks that will continue to use VT 2A.

- The assumption underlying the truck analysis, which is that the net change in truck traffic on roadways within the project area was assumed to mirror the net percentage change in total vehicular traffic for the same roadway (DEIS page 5-5) is unclear. It does not appear this assumption is well-founded, since the generators of truck traffic are clustered within the project area, while residential and to some extent commercial generators of personal vehicle trips are more evenly spread throughout the project area (DEIS page 5-9). Given the uneven distribution of truck traffic in the project area, we are concerned that the analysis may not accurately predict changes in truck volume. Specifically, given the locations of truck traffic generators, it appears that some--particularly those related to the industrial and commercial areas clustered west of VT 2A--would continue to take VT 2A even if any of the Circ A-B or hybrid alternatives are constructed. Thus, basing the estimated reduction in truck volume on changes in personal vehicle traffic, the analysis may overestimate the reduction in truck volume resulting from the Circ A-B alternatives. In addition, it is not clear why the number of roadway segments that would have a noticeable *increase* in truck volume were deleted prior to the analysis. The effect of this subtraction is likely to give undue attention to those segments that have less truck traffic, without giving sufficient attention to those segments that have more truck traffic.

The DEIS and PN show that the VT 2A options would meet the basic project purpose and would have the least amount of adverse impacts upon the aquatic environment. Therefore, based upon the facts presented in the DEIS and PN, it appears that one of the VT 2A alternatives would be the LEDPA.

Significance of the Impacts

General types of direct and indirect adverse environmental impacts caused by constructing new highways and, to a much lesser degree, by widening existing roadways can be summarized as follows:

- Land clearing, roadway cuts, and road base fill, removing all vegetation within the right-of-way and dramatically altering the topography and surface hydrology of the land.

- Stream and river culverting at crossings and vegetation clearing around crossings, causing loss of stream-side and -bottom habitat, sedimentation of waterways, increased water temperatures, and lowering of water quality.

- Erosion of cut slopes and unstabilized fill, causing sedimentation of adjacent water bodies and wetlands that smothers plants and sedentary animal species, degrades water quality, and renders habitat less suitable for fish and wildlife.

- Placement of long, wide permanent features through a relatively undisturbed landscape, separating forest blocks and fragmenting wildlife habitat, degrading adjacent areas and rendering remaining habitat less valuable.

VT 2A Alternatives

Wetland impacts in the VT 2A corridor would occur to between 2 to 2.5 acres of emergent wetlands (wet meadow and marsh) that are dominated by reed canary grass, with lesser amounts of cattails, giant goldenrod, sensitive fern, New England and calico asters, joe-pye weed and boneset. The principal functions of these wetlands include sediment/toxicant retention and excess nutrient removal.

Fill associated with the 2A alternatives would cause relatively minor direct adverse impacts to aquatic resources. The wetland filling associated with the widening would involve slices or sliver-takes along the edges of several wetlands that abut the existing roadway. Culverts at existing stream crossings would have to be extended several feet on each side, and some fill in wetlands might be necessary at these crossings to achieve proper slopes. Nearly all of the wetlands that would be directly affected are emergent.

As described in the DEIS, the majority of anticipated impact areas associated with the 2A alternatives would overlap areas that were previously affected by the construction of the existing roads and subsequent development. The wetland areas and streams to be affected by the upgrades and widening have been degraded by these prior disturbances--plant communities with exotic or invasive species; stream channels containing runoff sediment and other debris; and adjacent upland habitat that has been cleared, excavated, planted with exotic plant species, and developed. The construction activities associated with the 2A alternatives would cause little additional damage to the narrow wetland areas that would be affected, and common best management practices (e.g., erosion control measures), implemented effectively, could further reduce the risk of harm.

DEIS section 11.9.7, Habitat Fragmentation, discusses impacts associated with all the alternatives, and concludes that widening of VT 2A would not result in fragmentation of wildlife habitat (as the impacts would occur adjacent to an existing roadway); we agree. Because this alternative involves upgrading and widening an existing roadway in an already developed and disturbed landscape, we anticipate only minor direct and indirect adverse impacts to the aquatic ecosystem.

Circ A-B and Hybrid Alternatives

For the Circ A-B alternatives, outright loss of 27 to 36 acres of wetland habitat would occur plus indirect effects to an additional 10 to 11 acres; for the hybrid alternatives, that loss would be about 20 acres plus indirect effects to an additional 8 acres. For the Circ options, including the A-portion of the hybrids, adjacent aquatic habitats would be damaged by sedimentation and loss of canopy cover, which would increase land surface and water temperatures. Interruption and/or other decreases of the nutrient production and export function of many of the forested wetland systems to be filled or affected would occur, damaging downstream aquatic communities. All of these adverse impacts would contribute to the fragmentation effects that would be caused by these alternatives (see discussion below), and lead to an overall decrease in the productivity and functioning of the affected aquatic systems. In addition, one vernal pool, and likely

others, were found in the corridor but were not fully discussed or depicted on plans in the DEIS. The one confirmed vernal pool, identified by the VT Non-game and Natural Heritage Program, was found to have a large number of wood frog egg masses; two other small pools nearby had fewer egg masses. The Circ A-B alternatives could eliminate this wood frog population due to the direct loss of breeding habitat and lack of access to adjacent forest land.

Highway construction would destroy all plant species and sedentary aquatic wildlife species within the footprint of the road and many adjoining areas of the right-of-way, as well as less mobile wildlife species that could not escape construction activities quickly enough. Other aquatic plant and animal species would perish due to elimination or degradation of habitat in the immediate vicinity of the construction work. In addition, it is likely that for most of these wildlife species, surrounding habitat is already at carrying capacity; many displaced animals would ultimately die or displace other members of the same species that would in turn perish. Some individuals might survive relocation but, unable to establish and defend breeding territories, would not reproduce. Over time, operation of the highway would further degrade adjacent and down-slope stream and wetland systems. Among the more vulnerable groups of wildlife would be aquatic macroinvertebrates, reptiles and amphibians, the organisms that form the bulk of the food web base. Reductions in the base of the food web often impair the flow of energy to higher trophic levels, reducing the overall productivity and nutrient export capabilities of the aquatic ecosystem.

The DEIS and Corps Permit Application state that, between Mountain View Road and VT 117, Circ Alternatives 16a, 16b, 16c, and 17 would bisect a large forested wetland and upland area, approximately 630 acres in size, which extends 4.5 miles east to west across much of north Williston. The Circ A-B options would significantly fragment the ecologically intact wetland and upland habitat mosaic that comprises this corridor.[4] Fragmentation harms wildlife in a number of ways, including: 1) creating a partial or total barrier to overland and/or riparian corridor movement; 2) reducing the value of habitat for some more specialized species adjacent to where the fragmentation occurs (this "negative buffer zone" effect is species specific and, for highways, varies in proportion to the width of the cleared alignment); 3) leaving habitat patches too small, isolated or otherwise unsuitable to support certain species with minimal habitat requirements, such as some amphibians, whose local survival relies on recolonization from larger regional breeding populations; 4) allowing more tolerant, nuisance or exotic species to infiltrate and dominate an area; which, in turn, 5) increases competition for food and breeding sites with native intolerant species, lessening their breeding success; and 6) increases mortality of intolerant species from predation or parasitism by the invading tolerant species.

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[4] The report does not analyze the potential for indirect impacts to some of the biological values associated with the mosaic of wetland types (including vernal pools) north of Mountain View road. Much of the forested wetland north of Mountain View Road (Wetland G), considered by VDFW to provide habitat for fall feeding by and migration staging for woodcock would be impacted by the Circ A-B alternatives. Among other things, the analysis does not address the likely increase in wildlife road mortality and the loss of amphibian breeding and terrestrial habitat.

Generally speaking, the extent of harm from fragmentation is a function of 1) the nature and dimensions of the intrusion; 2) the size and configuration of the affected area; and 3) the size and configuration of the remaining habitat patches. We recognize that some fragmentation has occurred in the A-B corridor from secondary roads and scattered development which has diminished the value of the area for wildlife from a completely pristine condition. Nonetheless, the area still contains relatively undisturbed and unfragmented stream and wetland systems and forest blocks, and remains highly valuable for wildlife.

As described above, construction of the build alternatives in the A-B corridor would destroy plants and animals in the footprint of the fill and produce numerous other direct and indirect adverse impacts. Of less obvious but equal concern, highway construction and operation would also create increased levels of noise and human disturbance; emissions of vehicle exhaust; and storm water runoff containing gas, oil, heavy metals, sand and de-icing salts.

Section 230.10(c) of the 404(b)(1) guidelines states that no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. The information contained in the DEIS and PN clearly describe the marked contrast between the adverse impacts to aquatic resources that would result from the VT 2A and Circ A-B or hybrid alternatives. It does not appear that the VT 2A alternatives have the potential to cause or contribute to significant degradation of waters of the U.S. In contrast, we are concerned that the Hybrid or Circ A-B alternatives do have that potential.

Compensatory Mitigation

For a permit application to comply with the section 230.10(d) of the 404(b)(1) guidelines, the proposal must include all appropriate and practicable steps to compensate for unavoidable impacts. Where, as here, the adverse impacts from any of the Circ A-B and hybrid alternatives contained in the DEIS have the potential to cause or contribute to significant degradation of the aquatic ecosystem, a compensatory mitigation plan can be used to avoid a finding of significance under appropriate circumstances. In this case, however, EPA is concerned that mitigation is unlikely to be successful for the reasons that follow. Whether a compensatory mitigation plan succeeds in sufficiently reducing otherwise significant impacts normally depends upon the extent to which it replaces or offsets the harm to the aquatic environment from the project. In this case, the types of aquatic habitats most severely damaged would be forested and vernal pool. It is technically difficult to restore or create these habitats successfully, let alone replicate the unusual juxtaposition of habitats present in the project study area. Furthermore, there are myriad risks inherent in wetland restoration and especially creation that make these already difficult ventures more challenging. Among others, these risks include mistakes in project site analysis and engineering design; imperfect project implementation; and unforeseen natural events such as drought or severe storms. For example, the hydrology of forested wetlands is quite complex and difficult to duplicate.

Three sites have been identified as potential locations for compensatory mitigation for the proposed project. EPA staff visited the proposed compensation sites on October 11, 2006, with representatives from the Corps, FHWA, VTrans, and VTANR.

Jericho Site

The site includes approximately 2 acres of hayfield on non-hydric soils and approximately 15.5 acres of hayfields and pasture on hydric soils. There are two shallow ditches with low gradients which provide some drainage of the lands. Wetland could be created on the 2 acres of non-hydric hayfield. The 15.5 acres of hayfields and pastures would be expected to revert to wet meadow upon discontinuation of farming on the parcel. This site has reasonable potential to develop into roughly 17 – 18 acres of mixed wetland types. The site could prove suitable as compensation for adverse impacts to the aquatic ecosystem from the VT 2A alternatives. It also could prove suitable for a portion of the adverse impacts from the hybrid or Circ A-B alternatives, assuming either were found to be permittable.

Colchester Site

Almost the entire 103.9 acres of the site are mapped as having hydric soils. The land is all in agricultural use, primarily as cornfield. Many ditches cross roughly north-south through the site. Virtually all of the land would be expected to revert to wet meadow were cultivation and maintenance to cease. Vegetative diversity could be enhanced by plantings of wetland tree and shrub species. The site could prove suitable as compensation for adverse impacts to the aquatic ecosystem from the VT 2A alternatives. It also could prove suitable for the adverse impacts from the hybrid or Circ A-B alternatives, assuming either were found to be permittable.

Lemire Site

The DEIS states that the Lemire site was developed as part of the previously issued section 404 permit to compensate for unavoidable wetland impacts associated with Segments A-B and G-J of the Chittenden County Circumferential Highway project. About 25.4 acres of the 80-acre Lemire site consists of upland adjacent to the existing developed mitigation site. This area contains hydric soil, and suitable wetland hydrology could be provided by plugging the on-site drainage ditches. A large wetland habitat complex could be created at this site, and vegetative diversity could be enhanced by plantings of wetland tree and shrub species. The site could prove suitable as compensation for adverse impacts to the aquatic ecosystem from the VT 2A alternatives. It also could prove suitable for the adverse impacts from the hybrid or Circ A-B alternatives, assuming either were found to be permittable.

At numerous interagency meetings as well as the October 2006 site visit, EPA staff expressed serious concerns about the Lemire site, which are not addressed in the DEIS.

We summarize these concerns below.

1) While we generally agree that the Lemire site has potential for providing compensation for direct and indirect impacts associated with the Hybrid and Circ A-B alternatives, we are concerned that it does not (or any of the current wetland compensation plans described in the DEIS) fully addresses the wildlife habitat and vernal pool impacts (described above) that would occur under the Circ A-B or Hybrid groups of alternatives.

2) The original mitigation project was constructed in 1995. In its 2003 report entitled, Success of Corps-Required Wetland Mitigation in New England, the Army Corps of Engineers New England District described the objectives of this mitigation site as compensating for impacts to scrub-shrub wetland (approximately 20 acres) and to forested wetlands (5 acres), and listed the target principal functions to be restored at this site as sediment retention, flood flow alteration, shoreline stabilization, wildlife habitat, nutrient removal and recreation. The report concluded that the entire site was covered with reed canary grass (an undesirable species for mitigation sites given its tendency to form a monoculture) and that there was limited success establishing shrub communities at the site. The report determined that the major wetland functions of this site were water quality protection and flood flow retention. Given the likelihood of continuing difficulties with reed canary grass and that the previous attempt to restore forested and shrub wetlands at this site has been mostly unsuccessful, we recommend that this site should be re-evaluated for its restoration potential to determine appropriate objectives/target communities and which ecological functions a successful project might realistically replace.

3) We agree that the site is large enough to accommodate a good compensation project but we are concerned that adjacent parcels, though undeveloped currently, could be developed. Were those adjacent parcels developed, over time, the ecological values and potential we are attributing to the Lemire site would diminish, perhaps substantially, depending upon the nature of the development activities. If not currently known, we recommend that VTrans investigate the future development potential of those adjacent properties and that information be included in the evaluation of the Lemire site.

Chapter 4 of Appendix F of the DEIS, Biological Resource Technical Report, addresses impacts and potential mitigation options. The DEIS accurately states that the Circ A-B options would impact wood frog breeding habitat north of Mountain View Road and isolate it from the associated nearby forest. We do not agree with the statement in the DEIS that adequate compensation for these impacts could be achieved by creating ditches along the new road's right-of-way and/or by installing a wildlife passage culvert along Redmond Creek for seasonal movement. If vernal pools are lost or substantially degraded as a result of this highway project, compensation should be designed at an appropriate off-site area that includes suitable forest habitat conducive to supporting the life cycle requirements of wood frogs and other amphibian species that would be affected

by the project.

Conclusion

As explained above, the DEIS and PN demonstrate that the three groups of alternatives--VT 2A, Hybrids, Circ A-B--are practicable; all could meet the Section 404 basic project purpose as well as the NEPA purpose and need statement to varying degrees. The DEIS explains that the VT 2A alternatives would result in the fewest, and only minor, direct and indirect adverse impacts to the aquatic environment, and that the Hybrid or Circ A-B alternatives would have notably greater, and we believe potentially significant, direct and indirect adverse impacts. If either the Hybrid or Circ A-B alternatives are to be further considered, it is EPA's recommendation that a more complete assessment of indirect adverse impacts to aquatic resources would need to be performed. The results of this assessment would then be used as part of the determination of whether an appropriate compensatory mitigation plan could be developed that would offset the full range of direct and indirect adverse impacts.

Finally, in light of the information contained in the DEIS and the PN and its supporting Section 404 permit application, EPA believes that the VT 2A alternatives would qualify as the LEDPA for the Circ-Williston project.

Water Resources and Storm water

Road Salt Impacts to Affected Streams and Drinking Water Quality

Toler Analysis

General

To estimate future deicing salt impacts to selected streams crossed by the Circ alternatives, the DEIS employed the Toler Analysis (Toler, 1973). As stated on page 11-14, "chloride from dissolved deicing salt cannot be removed by storm water treatment practices." The Toler Analysis conservatively assumes all deicing salt applied to alternative highway surfaces reaches surface water. It ignores all other salt sources upstream of the alternative crossings, such as existing and future secondary roads, parking lots, driveways, sidewalks, salt storage areas, residential and commercial ISDS's, and water softener wastewater injection into ground water, if any. Instead, all of these sources are aggregated into one "background" concentration in the Toler equation averaged from limited available grab samples.

Model Inputs

Inputs to the analysis include the average salt loading per lane mile, the number of lane miles, average annual inches of runoff, size of the drainage areas, average annual chloride concentrations from the proposed road way only (not from other roads, salt storage sites, parking lots, driveways, etc. in the affected watersheds), and the background average chloride concentration in the stream from sampling data.

Model Limitations

While this analysis conservatively estimates that all of the applied deicing salt applied to

individual alternatives would reach surface waters, the use of average annual inputs underestimates the maximum chloride concentrations resulting from worse-case conditions of winter severity. Recent continuous monitoring data generated over the last five years from the New Hampshire DOT I-93 Chloride Assessment Study demonstrate that chloride levels in streams vary a great deal by hours, days, weeks and years due to fluctuations in tons per lane-mile of salt application, growth in treated impermeable surfaces due to development, precipitation, above-freezing temperatures, stream dilution and ground-water base flow concentrations.

The average total tons of salt used per single lane-mile on State roads in VTrans District 5 (which includes Chittenden County) has reportedly ranged from 9.13 tons in 1983 to 21.67 tons in 2003. According to this data, the overall trend of salt use since 1981 has increased from an average 13 tons to 18 tons in 2005, as land use has evolved from predominantly rural to a more commercial and residential condition. Unless strict reductions in salt use are imposed, this upward trend is likely to continue.

Because the EPA recommended standards for chloride in surface water are based on both magnitude (230 and 860 mg/l) and duration (96 and 1 hours, respectively), affecting the viability and health of aquatic species, any analysis inputting average annual estimates is likely to be insensitive to these changes and therefore unable to reliably predict exceedances in the standards for a given water body. This is important because fish and macroinvertebrates in receiving waters are not only affected by average conditions, but by sharp, pronounced pulses of concentrations that exceed the standards.

Recommended Toler Analysis Improvements

The Toler approach could be made more representative if the salt loadings included those at all road and parking lot surfaces in the upstream watershed during the worst winter (based on the amount of deicing required) since 1981 to 2007, the smallest measured seasonal precipitation over that period, and then added to the greatest background chloride concentration measured continuously in the affected stream. For example, annual salt loadings by New Hampshire DOT on I-93 in southern New Hampshire from 1993 to 2007 ranged from about 13 to nearly 30 tons per lane-mile, reflecting considerable variations in winter severity. The loadings in one winter could more than double that of the next. In any simple worst-case analysis, the Toler method should use the maximum on record, not an average, to predict impacts to aquatic habitats.

In the DEIS, the average annual deicing salt loading is given as 14.7 tons/lane-mile over 1981-2005 for all of District 5. Apparently this quantity represents a District 5-wide estimate, not an average specifically for the major highways (such as I-89 or Route 2A) within the modeled watersheds area. We recommend that the loading used should be the annual historical maximum for the roads within the watersheds under review (such as Route 2A and I-89), not simply an average over a larger area. If this loading is unavailable, EPA recommends that the maximum 21.67 tons value should be used.

The relationship between chloride concentrations in streams and runoff is complex. In winter months, large amounts of residual salt in snow and on road surfaces applied during previous snow storms can be quickly released by a modest freezing rain event

accompanied by above freezing temperatures, resulting in sharp saline pulses that may exceed acute (860 mg/l) levels. Commonly, during periods of little rain in late summer and early autumn, chloride concentrations more closely reflect ground water levels in base flow due to lack of dilution by rainfall, sometimes exceeding the chronic standard of 230 mg/l for four or more days in developed watersheds. The four or more days (or 96 hours) represents only one percent of a year. The acute standard period of one or more hours represents only 0.01 percent of a year's time. Therefore, the use of average runoff estimates cannot adequately simulate these short-term responses.

In the DEIS, the background concentrations of chloride used in the Toler Analysis apparently do not consider the full record for Allen Brook. For example, Table 2-3 on page 2-12 provides only three chloride samples for this stream at RM 2.4. However, VTDEC also collected 21 additional samples at this location from June 15, 2005 to January 12, 2006. These are available in "A Chloride Assessment of Select Urban Streams in Chittenden County, Vermont" dated July 2007, and prepared by VTDEC/WQD (contact: Rich Langdon, Project Manager). While the grab sample concentrations ranged from 43.1 to 181 mg/l over this period (which did not include the full winter in 2006), chloride estimates derived from continuous monitoring of specific conductivity ranged up to 205 mg/l (page 8 of this reference). We suggest that this is an example of a more appropriate chloride concentration that should be used in the Toler analysis, not the 96.9 mg/l cited in the DEIS.

Recommendations

Replace the Toler Analysis in the FEIS
Because of the predictive limitations associated with the Toler Analysis, we recommend that a more comprehensive model for solute transport, such as HSPF, coupled with three other runoff models, Storm Water Management Model (SWMM), Program for Predicting Polluted Particle Passage through Pits, Puddles and Ponds (P8), and Topographic-based Land Atmosphere Transfer Scheme (TOPLATS) should replace the Toler Analysis (Endreny, 2002). These combined models may also replace the Simple Method in the DEIS for storm water predictions. Used together, these four models simulate the transport pathways of concern: 1) catch basin and storm sewer hydraulics; 2) infiltration, surface runoff, sub-surface storm flow, water table dynamics; and 3) reach and reservoir processes of runoff routing and storm runoff detention. All of these pathways influence pollutant fate and the total load (including other storm water constituents) leaving the watershed. The overall goal is to more accurately predict the probability of water-quality violations (of EPA recommended standards) due to melt-water runoff and temporal climatic variations. The predictive simulations of an enhanced HSPF model are likely to exceed those generated by the Toler Analysis and we recommend that these simulations be presented in the FEIS.

Incorporate Findings of U.S. Geological Survey Activities in the Area
The U.S. Geological Survey's New Hampshire-Vermont Water Sciences Center has been cooperating with VTrans in monitoring salt levels in Allen Brook at Route 2A in Williston, Alder Brook at Route 289 in Essex, and Mill Brook at Route 117 in Jericho. This ongoing project will help to determine how much salt enters these streams from

deicing salt activities on State roads during rainfall and snow-melt events in comparison to other salt sources in the watersheds. These cooperative activities are not described in the DEIS. We recommend that the FEIS include a description of the major results of this project to date, especially its findings for Allen Brook.

Additional Baseline Characterization
We recommend that monitoring activities including continuous specific conductance measurements and chloride grab sampling be resumed for the Unnamed Tributary of Muddy Brook on or before December 2007, following the procedures and goals of the VTDEC report (cited above). The Unnamed Tributary of Muddy Brook (based on VTDEC grab sampling from June 14, 2005 to January 12, 2006) showed chloride concentrations ranging from a minimum of 208 mg/l to a maximum of 857 mg/l. Therefore, we believe it is important to monitor this stream for a full winter season (December 2007 through April 2008) to more fully understand baseline conditions and the impacts from winter deicing activities on Route 2A and other roads in this watershed. EPA is willing to offer technical assistance with this monitoring effort.

Perform Mixed Water Index of Biotic Integrity (MWIBI) Evaluations
Redmond Creek and the Tributary to Winooski River are tributaries of the Winooski River in the study area, and should be evaluated for chloride concentrations and fish and macroinvertebrate health under MWIBI protocols. The deployment of specific conductance data-loggers in these streams beginning in December 2007 through April 2008 combined with grab samples for chloride will greatly aid our understanding of road-salt impacts to these streams.

Drinking Water

The DEIS has done an excellent job in locating private and public water supply wells in the study area. To enhance our understanding of background levels of sodium and chloride in these wells, every effort should be made to sample them for these constituents prior to the FEIS. The optimum time for such sampling would be late winter and early spring 2008. This monitoring will augment the ground water background database for use in flow transport models, as well as identify any potential problems that may exist in the wells' zones of contribution for road salt.

References cited

HSPF Model (EPA site):
http://www.epa.gov/ceampubl/swater/hspf/

Coupled HSPF Model (described and recommended above):
Endreny, Theodore A., 2002, Manipulating HSPF to Simulate Pollutant Transport in Suburban Systems: ASABE Proceedings, March 11-13, 2002 Conference, Fort Worth, Texas.
abstract:
http://asae.frymulti.com/abstract.asp?aid=7572&t=2

Toler, L., 1973, Effects of Deicing Chemicals on Surface and Ground Water (Preliminary Guidelines for Estimating Chlorides: U. S. Geological Survey.

Storm water (excluding impacts from chloride)

Chapter 11 of the DEIS contains estimates of pollutant loadings (such as phosphorus and sediment) predicted to result from the various alternatives using the Simple Method. Appendix P (Preliminary Engineering Technical Report) indicates on page 3-10 that alternatives involving reconstruction and widening along the VT 2A corridor "will provide an opportunity to treat not only the widened pavement areas, but will be designed to collect and treat the existing roadway surface areas as well." Table 3-7.1 also states: "Full Depth Construction is anticipated, therefore 100% of impervious shall be treated." Please clarify whether the Simple Method estimates reflect this whole roadway treatment. If they do not currently (which appears to be the case), the analyses should be re-done to be consistent with the level of treatment described in Appendix P. This is important, because while Appendix P notes the opportunities that will be pursued to improve storm water treatment in the 2A corridor, the resulting water quality benefits (i.e., the reduced pollutant loadings and runoff volumes compared to existing conditions) do not show up in the comparative analyses in Chapter 11 (Tables 11-9 through 11-11) or Appendix H. In order to provide a true comparison among alternatives, EPA recommends that the FEIS predict runoff volume and pollutant loading changes that take into account full storm water treatment for all alternatives. In addition, it is not clear whether the concerns raised previously by VT ANR regarding whether the Simple Method has been used appropriately in this case (e.g., applied at the proper scale) have been adequately resolved.

Hydrologic Impacts

As commented on previously (see EPA's January 2007 comments on the ADEIS), the Scope of Work that EPA reviewed for this EIS (draft dated 11/30/05) indicated the EIS would assess "the effect that the additional impervious surfaces associated with each alternative may have on peak rates of runoff in the streams along the project corridor" and would "evaluate anticipated hydrologic...and geomorphic responses to each alternative." While the DEIS includes additional information on existing hydrologic conditions, no evaluation of anticipated hydrologic impacts resulting from the alternatives is included, beyond a general statement on DEIS page 11-26 that indicates that hydrology changes would be minor because Vermont's Storm Water Management Manual treatment standards will be followed for any of the build alternatives. To more fully evaluate the hydrologic impacts, EPA recommends that the FEIS quantify the runoff volume changes associated with each alternative group and storm water treatment practices detailed in Appendix P. As indicated in our comment above, EPA believes that any improvements resulting from the installation of retrofit treatment systems, as compared to existing conditions, should be included in Chapter 11.

Other Pollutant/Flow Issues

Based on our review of the DEIS, we recognize that the Circ A-B corridor alternatives include comprehensive storm water treatment practices that should minimize storm water impacts (other than those from road salt) to downstream waterbodies. While EPA believes further clarifications or revisions are needed to the Simple Method estimates in Chapter 11 and Appendix H, it appears likely that the alternatives involving reconstruction and widening of VT 2A could result in a notable reduction of water quality impacts (except impacts associated with road salt) compared to existing conditions.

Indirect Effects and Cumulative Impacts

In general, as we indicated in our comments on the Revised Preliminary Draft Indirect and Cumulative Impacts (ICI) Technical Report, we believe that the ICI analysis represents a significant amount of work and contains information that should be useful not only to this transportation project, but to the communities in Northwest Vermont. As we noted in our December 2006 comments on that draft report, although the changes in population and employment are comparatively small, the general pattern for the Build alternatives is of outward movement of households and employment from Chittenden County to surrounding counties, as well as from the more developed parts of Chittenden County to less developed areas. The pattern of outward movement is not uniform across the alternatives, however. Tables 17-28 and 17-29 (page 17-79) show the allocation of households and employment by Chittenden County Regional Planning Commission planning areas for the Build alternatives as compared with No Build. The planning areas range in intensity and type of use from Metropolitan Planning Areas, with the highest density and greatest mix of land uses, to Rural Planning Areas, which are designated to maintain traditional rural character and land uses, such as agriculture, recreation, and forestry. All of the Build alternatives will result in a loss of households in Metropolitan planning areas, except for alternative 23. The changes are nearly an order of magnitude larger for the Circ A-B alternatives, however, as compared with most of the VT 2A alternatives. Hybrid alternatives 18 and 19 also show comparatively large declines in households in Metropolitan Planning Areas. Similarly, Transition Planning Areas, which are near Metropolitan Planning Areas and have been designated for future development show much larger declines for the Circ A-B alternatives than the VT 2A alternatives and the Hybrid alternatives. Rural Planning Areas and Village Planning Areas also show greater declines under the Circ A-B and some of the Hybrid alternatives, as compared with the VT 2A alternatives. Enterprise Planning Areas, by contrast, which are designated to be the site of major employers in the region, are the only areas that show a gain in households, as compared with No Build, for all alternatives except for alternative 22.

With regard to employment, Table 17-29 (page 17-79) shows that the magnitude of job losses from Metropolitan Planning Areas, as compared with No Build, is much larger for the Circ A-B alternatives and Hybrid alternatives 18 and19 than for the VT 2A alternatives and Hybrid alternative 23. Interestingly, Enterprise Planning Areas, which are intended to be job centers, gain jobs under the VT 2A alternatives and the Hybrid

alternatives, but not the Cir A-B alternatives, which result in job losses from those areas.

Although the magnitude of change in patterns of development is comparatively small, some of the Build alternatives will pose more of a challenge in achieving more concentrated future land use, which is a goal of the Chittenden County Regional Planning Commission's Regional Plan and the 2025 Chittenden County Metropolitan Transportation Plan. This is important because the Metropolitan Transportation Plan indicates that a concentrated land use development pattern is the single most effective strategy at producing improvements in transportation system performance. Although the projected shifts in location of households and employment are small, the forecasts for the Circ A-B alternatives and to some extent the Hybrid alternatives are in directions that appear to move away from concentrated land use. Jobs appear to be moving out of Metropolitan planning areas under all alternatives, with the greatest losses in the Circ A-B alternatives and Hybrid alternatives. The largest gains in employment are forecast to occur in Rural Planning Areas. Unless these jobs are in forestry or agriculture or other rural occupations, this trend may work against the goal of concentrated development. This pattern of outward movement also occurs across county lines. All of the Build alternatives except for alternatives 3 and 23 will result in loss of population and employment in Chittenden County, with gains in many of the surrounding counties. This pattern of loss in population and employment in Chittenden County is greatest for the Circ A-B alternatives and the Hybrid alternatives. In summary, although the changes in location of households and employment are comparatively small, they do appear to run counter to goals in regional plans, particularly for the Circ A-B and Hybrid alternatives.

Air Quality

The proposed project is located in an area currently in attainment for all six criteria air pollutants. Since the project is located in attainment areas for the National Ambient Air Quality Standards (NAAQSs), General and Transportation Conformity requirements do not apply.

The DEIS did not include the air quality technical support documentation for the mesoscale [area-wide volatile organic compounds (VOC) and nitrogen oxide (NOx)] emission analysis, the microscale [localized carbon monoxide (CO) or nitrogen dioxide (NO_2)] air quality analysis, or the mobile source air toxics (MSATs) regional emissions analysis described in Section 8 "Effects of the Evaluated Alternatives on Air Quality." Therefore, EPA is unable to independently evaluate the air quality analyses, modeling, methodology or assumptions.

The results of the air quality analysis for the no-build alternative, and ten build alternatives [the VT 2A Alternatives (2, 3, 22); the Circ A-B alternatives (16a, 16b, 16c, 17); and the Hybrid alternatives (18, 19, 23)] do not eliminate or dictate an alternative based solely on air quality. However, given the public health concerns about diesel exhaust from heavy duty diesel trucks and other heavy duty construction equipment, EPA strongly encourages VTrans to implement measures to reduce fine particle emissions from diesel engines during construction. Emissions from older diesels engines can be

controlled with retrofit pollution control equipment such as diesel oxidation catalysts or particulate filters that can be installed on the exhaust of the diesel engine. Retrofits have been successfully applied to many diesel engines across the country and oxidation catalyst technology has been successfully applied to construction equipment used on several projects in the Northeast, including the Central Artery/Third Harbor Tunnel project in Boston and the Q Bridge Reconstruction project near New Haven, CT. Based on this success, some New England states (e.g., MA and CT) are now requiring construction equipment to be retrofitted with retrofit control devices or use clean fuels.

EPA recommends that during construction of the project, VTrans specifically require the use of diesel retrofits, cleaner fuels, and idle reduction measures for construction and other diesel equipment. We note that the DEIS already identifies the use of low sulfur diesel fuel in construction equipment, and limiting unnecessary idling times on diesel powered engines to 5 -10 minutes as construction air quality mitigation. EPA recommends that the FEIS identify the construction mitigation measures the lead agency is committed to implement. Retrofit technologies may include EPA-verified emission control technologies and fuels and CARB-verified emission control technologies. These lists can be accessed at http://www.epa.gov/otaq/retrofit/verif-list.htm.

The table for the "National and Vermont Ambient Air Quality Standards," [Table 8-1 on page 8-3 of the Draft EIS, and Table 2-1 on page 2-3 of the Air Quality and Energy Technical Report] should be updated to reflect revisions to the National Ambient Air Quality Standards (NAAQSs). Effective December 18, 2006, 5 the PM_{10} annual standard of 50 $\mu g/m^3$ was revoked. In addition, effective June 15, 2005, 6 (one year after designation of areas for the eight-hour ozone standard) the one-hour ozone standard was revoked. The National Ambient Air Quality Standards can be found on EPA's web site at URL address: http://www.epa.gov/air/criteria.html

[5] National Ambient Air Quality Standards for Particulate Matter, Final Rule, Tuesday, October 17, 2006, (71 FR 61144-61233).

[6] Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard—Phase 1, Friday, April 30, 2004, (69 FR 23951-24000.)