

Basin 11 Management Plan

ANR June 2008

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APPENDIX A

APPENDIX A.1 - Statutory Index

Federal and State law and regulation call for the review of specific topics in each basin plan. The following is a listing of basin planning requirements that have been extracted from the Vermont Water Quality Standards (WQS), the Federal Register and the Agency of Agriculture, Food and Markets' (AAFM) Accepted Agricultural Practice Regulations (Effective June 29, 1995), their Best Management Practice Regulation (Effective January 27, 1996), and the Memorandum of Understanding between the ANR and the VAAF&M. The requirements below are addressed in this basin plan in the section noted in bold adjacent to each requirement.

The Vermont Water Quality Standards

1. Basin plans inventory the existing and potential causes and sources of pollution that may impair the waters. **Chapters 3 and 5**
2. Basin plans establish a strategy to improve or restore waters. **Chapters 4 and 5**
3.shall seek public participation to identify and inventory problems, solutions, high quality waters, existing uses, other water uses, and significant resources of high public interest. **Chapters 1, 2, 3, A.2 and A.3**
4.shall consider approved municipal and regional plans adopted under 24 V.S.A. Chapter 117. **Appendix A.11**
5.shall coordinate and cooperate with the Commissioner of VAAF&M, as provided for in 6 V.S.A. Chapter 215. **Chapters 2, 3, 4, and 5**
6.shall identify strategies, where necessary, by which to allocate levels of pollution between various sources as well as between individual discharges. **Chapters 4 and 5, and Appendix B.2**
- 7.....should, to extent possible, contain specific recommendations by the secretary that include, but are not limited to the identification of all known:
 - existing uses **Chapter 2**
 - salmonoid spawning or nursery areas important to the establishment or maintenance of such fisheries **Chapter 2**
 - reference conditions appropriate for specific waters **Chapter 6**
 - any recommended changes in classification and designation of waters **Chapter 6 and Appendices A.9 and A.10**
 - schedules and funding for remediation **Chapters 4 and 5**
 - stormwater management **Chapters 3, 4, and 5**
 - riparian zone management **Chapters 3, 4, and 5**
 - other measures or strategies pertaining to the enhancement and maintenance of the quality of waters within the basin. **Chapters 4 and 5**

8. In basins that include class B waters which have not been allocated into one or more Water Management Type or Types pursuant to Section 3-06 of the WQS, the basin planshall propose the appropriate Water Management Type or Types based on both the existing water quality and reasonably attainable and desired water quality management goals. **Chapter 6 and Appendices A.9 and A.10**

40 CFR, Section 130.6

9. Water Quality Management (WQM) plans....consist of initial plans produced in accordance with sections 208 and 303e of the Clean Water Act (CWA) and certified and approved updates of those plans.

10. State water quality planning should focus annually on priority issues and geographic areas and on the development of water quality controls leading to implementation measures. **Chapters 3, 4, and 5**

11. WQM plans are used to direct implementation. **Chapters 4 and 5**

12. WQM plans draw upon the water quality assessments to identify priority point and non-point water quality problems, consider alternative solutions and recommend control measures, including the financial and institutional measures necessary for implementing recommended solutions. **Chapters 3, 4, 5, and Appendix A.8**

13. State annual work programs shall be based upon the priority issues identified in the State WQM plan. **Chapters 3, 4 and 5**

14. The following plan elements shall be included in the WQM plan or referenced as part of the WQM plan if contained in separate documents when they are needed to address water quality problems:

- (1) Total maximum daily loads. **Chapter 5**
- (2) Effluent limitations - including water quality based effluent limitations and schedules of compliance. **Appendix B.2**
- (3) Identification of anticipated municipal and industrial waste treatment works, including
 - (a) facilities for treatment of stormwater-induced combined sewer outfalls; **Appendix B.2**
 - (b) programs to provide necessary financial arrangements for such works; **Appendix B.2**
 - (c) establishment of construction priorities and schedules for initiation and completion of such treatment works. **Appendix B.4**
- (4) Nonpoint source management and control
 - (a) describe the regulatory and non-regulatory programs, activities and best management practices (BMPs). (Economic, institutional and technical factors shall be considered.....)..... BMPs shall be identified for the nonpoint sources identified in Section 208(b)(2)(F)-(K) of the CWA and other nonpoint sources as follows:

- (i) Residual waste **Appendix B.6**
- (ii) Land disposal **Appendix B.3**
- (iii) Agricultural and silvicultural **Chapters 3, 4, 5, and Appendix B.1**
- (iv) Mines **Appendix B.7**
- (v) Construction **Chapters 3, 4, 5, and Appendix B.4**
- (vi) Urban stormwater **Chapters 3, 4, and 5**

The nonpoint source plan elements outlined in #14 above shall be the basis of water quality activities implemented through agreements or memoranda of understanding between EPA and other departments, agencies or instrumentalities of the United States in accordance with section 304(k) of the CWA.

- (5) Identification of management agencies necessary to carry out the plan and provisions for adequate authority for intergovernmental cooperation..... **Chapters 4 and 5**
- (6) Identification of implementation measures necessary to carry out the plan, including financing, time needed to carry out the plan, and the social, economic and environmental impact of carrying out the plan in accordance with 208(b)(2)(E). **Chapters 4 and 5**
- (7) Identification and development of programs for the control of dredge or fill material in accordance with section 208(b)(4)(B) of the CWA. **Appendix B.10**
- (8) Identification of any relationship to applicable basin plans developed under section 209 of the CWA. **This is the basin plan**
- (9) Identification and development of programs for control of groundwater pollution including the provisions of section 208(b)(2)(K) of the CWA. States are not required to develop groundwater WQM plan elements beyond the requirements of section 208(b)(2)(K) of the CWA, but may develop a groundwater plan element if they determine it is necessary to address a groundwater (water) quality problem [see section 130.6(c)(9) for specifics of the groundwater plan element]. **Chapter 2 and Appendix B.11**

	Peter Miller Charlie Robb Karen Robb Ross Thurber Rob Wheeler Mike Zaluzny
Farm Bureau	Ross Thurber - Windham County Jackie Folsum
Local Organizations	BEEC - Patti Smith Great River Arts Grafton Nature Museum - Margo Ghia Jenks Foundation - Polly Wilson & Del Ames Manito Project - Em Richards Rock River Preservation - Tom Johnson Stratton Area Citizens Committee - Darlene Palola Trout Unlimited - Jeff Novy Windham Environmental Coalition - Marcia Bourne
Educators	Michael Caduto Jan Chaillou Margo Ghia Bruce Parks - VDEd Patti Smith
Loggers/Foresters	Stewart Bevins
Large landowners	Bromley Mountain - John Cueman Bromley Mountain – Rolf Van Schaik Stratton Resort - Bill Nupp Stratton Resort - Jenna Pugliese
Residents	Erica Bowman Michael Caduto Lynn Capen Gary Carruthers David Charis-Mink Jim Coughlin John Cueman Mari-Beth DeLuca Margaret Dwyer

	<p>Susanna Grannis Celia Ives Leo Maslan Michael Morantz Bruce Parks Caroline Peck Charlie Peck Gordon Robbins Deb Robinson John Spicer Targ Spicer Joe Steiner Robert Turner Matthew Yakovlef</p>
Businesses	<p>The Marina - Dennis Smith Townshed Outdoor env consultant on stormwater</p>
Regional Planning Commissions	<p>John Bennett – Windham Regional Commission Matt Mann – Windham Regional Commission Jeff Nugent - Windham Regional Commission Cyndy Kozara – Southern Windsor County RPC Becky Basch - Southern Windsor County RPC April Harkness - Southern Windsor County RPC</p>
Anglers	<p>David Deen – Westminster Del Ames Fred Hard</p>
Technical Advisors	
Land Trusts	<p>Alan Parker - The Nature Conservancy Rose Paul - The Nature Conservancy Joan Weir - Vermont Land Trust</p>
USACE	<p>Gary Pelton Donna Vondle Dale Berkness Philip Morrison Greg Fontaine</p>
USDA/NRCS/FSA	<p>Drew Adam - Windham County District</p>

	Lynette Hamilton - USDA/FSA Dana Young – Ottauquechee District
USFS	Chris Alexopoulos Kevin Lowry Steve Roy Scott Wixsom
USFWS	Eric Derlith
Vermont Agency of Agriculture, Foods, and Markets	Phil Benedict Louise Calderwood
Vermont Agency of Transportation	Andrea Cabral Glenn Gingras Heather Hibbard Nelson Hoffman Stephen Jerome
Vermont Department of Environmental Conservation	Ann Bove - Lakes and Ponds Chris Brunell - River Management Marie Levesque Caduto - Planning - Watershed Coordinator Barry Cahoon- River Management Jeff Cueto - Hydrology Kim Greenwood - Hydrology Mike Hauser - Lakes and Ponds Neil Kamman - Lakes and Ponds Mike Kline - River Management Kellie Merrill - Lakes and Ponds Padraic Monks- Stormwater Management Shannon Morrison April Moulaert - Wetlands Rodney Pingree – Water Resources Alan Quackenbush - Wetlands Ethan Swift - Planning Stephan Syz - Planning Susan Warren - Lakes and Ponds
Vermont Department of Fish and Wildlife	Christa Alexander Len Gerardi Brian Chipman

	Eric Sorenson Jay McMenemy Ken Cox
VT Dept of Forests and Parks	Bill Guenther Jay Maciejowski
Vermont Local Roads Program	Hank Lambert

APPENDIX A.3 - Basin 11 Planning Partners

Aiken Resource Conservation and Development Council
Antioch College
Bonnyvale Environmental Education Center
Brattleboro Area Chamber of Commerce
Brattleboro Union High School Science Department
Bromley Mountain
Community College of Vermont
Connecticut Joint River Commissions
Connecticut River Watershed Council
Dummerston Conservation Commission
Friends of the West River Trail
Great River Arts Institute
Landmark College
Nature Museum in Grafton
Rock River Preservation
Southern Windsor County Regional Planning Commission
Stratton Mountain Corporation
The Nature Conservancy
The Vermont Land Trust
Trout Unlimited
University of Vermont Extension Service
US Army Corps of Engineers
US Environmental Protection Agency
US Fish and Wildlife Service
US Forest Service, Green Mountain National Forest
USDA – Farm Service Agency
USDA - Natural Resource Conservation Service
Vermont Agency of Agriculture, Foods and Marketing
Vermont Agency of Transportation
Vermont Back Roads Program
Vermont Coverts
Vermont Department of Education
Vermont Department of Environmental Conservation
Vermont Department of Fish and Wildlife
Vermont Department of Forests, Parks and Recreation
West River Watershed Alliance
Windham County Natural Resources Conservation District
Windham Regional Commission

APPENDIX A.4 – Public Meeting Held in Basin 11

Basin 11 Planning Initiative – Meetings

The Windham County NRCDC, with grant funding received from various local sources and EPA Section 319 monies in 2003, 2004, and 2005, hired a watershed coordinator to conduct basin planning tasks including erosion control projects in the West, Williams, and Saxtons River watersheds. Working in partnership with the WRWA, WRC, and SWCRPC, the NRCDC and its watershed coordinator(WC) organized, conducted and sponsored public forums, focus groups and project-related meetings as prescribed under the state's basin planning guidelines (2002). The following is a list of all meetings concerned with the Basin 11 planning initiative held between April 1, 2002 (date WC hired) and December 31, 2005.

Basin 11 Public Forums and Focus Group Meetings 2003 - 2005

During May and June of 1999, five forums were held in the towns of Brattleboro, Newfane, Townshend, Stratton, and Londonderry respectively. Approximately 125 people attended these watershed public forums organized by the West River Watershed Alliance. Public comments and recommendations from these meetings have been acknowledged and incorporated into the Basin 11 plan

2003

November 20 – NRCDC/WRC/TNC/SWCRPC/WRWA/VT DEC – Basin 11 Planning initiative public kick-off. Joint presentation to invited Vermont State Legislators at public meeting, Grafton

2004

January 20 – Basin Planning Public Forum, Newfane

February 19 - Basin Planning Public Forum, Saxtons River

March 15 –Educational Focus Group meeting, Great River Arts, Bellows Falls

March 22 - Educational Focus Group meeting, Great River Arts, Bellows Falls

April 1 –Basin 11 Watershed Council meeting, South Londonderry

June 3 – Basin 11 Watershed Council meeting, Water Quality Focus Group (WRWA SAC) report, Newfane

August 24 – WRWA SAC – Swimming Hole/Public Access Focus Group, Brattleboro

September 2 – Basin 11 Watershed Council meeting, Education report, Saxtons River

September 24 – Dams and Impoundments Focus Group meeting, Brattleboro

October 6 – Public Access (Rock River) Focus group, Newfane

October X – Basin Planning Public Forum, Chester

October 20 – Dam Focus Group, Brattleboro

November 2 – Dam Focus Group meeting, Brattleboro

November 11 – Basin 11 Watershed Council meeting, Dams panel discussion, Jamaica

2005

January 10 – NRCDC Legislator's Breakfast, Basin Planning Presentation

February 5 – Basin 11 Watershed Council Meeting, Swimming Hole/Public Access reports, Bellows Falls Waypoint Center

April 7 – Watershed Council Meeting – Round Table Discussion concerning Agricultural Land Use, Brattleboro
 June 2 – Watershed Council Meeting – Round Table Discussion concerning Forestry Land Use issues, South Londonderry
 August 15 – Swimming Hole and Public Access (Rock River) Focus Group meeting
 September 1 – Watershed Council Meeting – Round Table Discussions concerning Developed Land Use, Bellows Falls Town Hall.
 September 15 - Swimming Hole and Public Access (Rock River) Focus Group meeting, Newfane
 October 6 – Watershed Council Meeting – Roundtable Discussion concerning Water Withdrawals, Wardsboro
 October 13 - Swimming Hole and Public Access (Rock River) Focus Group meeting, Brattleboro
 December 1 – Basin Watershed Council Meeting, Round Table Discussion concerning Roads and Road Maintenance Issues, Jamaica
 December 19 – Dam Focus Group meeting, VT ANR offices, Springfield

Basin 11 Planning Coordination and Project Implementation Meetings

2002

April 17 – WRC/NRCD – DEC presentation at NRCD. Initial discussions of basin planning, Brattleboro
 April 24 – WC at DEC presentation – Basin planning introduction, Townshend
 May 1 – WRC/NRCD – Coordination meeting
 May 7 – WRWA - WC basin planning presentation to the WRWA Board of Directors, Brattleboro
 May 14 – USFS/NRCD – Basin planning partnering meeting at GMNF, Manchester
 June 10 – RC&D/NRCD – Basin planning partnering and funding meeting, Brattleboro
 June 19 – WC basin planning presentation to Windham Regional Planning Commissioners, Annual Picnic, Townshend Dam
 June 21 – WC basin planning presentation to NRCD Board of Supervisors, Brattleboro
 July 9 – BEEC/NRCD/WC – Basin planning partnering meeting, West Brattleboro
 July 22 – WC basin planning update and report to NRCD Board of Supervisors, Brattleboro
 August 9 – WC basin planning report and project objectives to WRWA Board of Directors, Brattleboro
 August 22 – RC&D/NRCD/WRC – Basin planning project funding options, Brattleboro
 September 16 – BEEC partnering meeting, basin planning objectives, West Brattleboro
 September 18 – WRC Natural Resources Committee – WC basin planning presentation
 September 19 – WC at Dummerston, Newfane, and Townshend town office visits to discuss watershed projects.
 September 23 - WC basin planning update and report to NRCD Board of Supervisors, Brattleboro
 September 24 - WC basin planning report and SGA project objectives to WRWA Board of Directors, Brattleboro
 September 26 – WRWA Annual Meeting – WC basin planning presentation to WRWA membership with SGA information from DEC representatives, Jamaica.
 October 16 - WRC Natural Resources Committee – WC basin planning presentation and discussion. Brattleboro
 October 17 – NRCD annual meeting WC report and basin planning update – Brattleboro Solid Waste District
 November 8 – USDA/NRCS breakfast meeting – WC basin planning partnering discussions, Brattleboro

November 12 – WRWA Board Meeting – WC basin planning update and project report
 November 11/12 – USACE dam tours –WC basin planning partnering discussions, Townshend Dam and Ball Mountain, Jamaica.
 November 18 – The Nature Conservancy (TNC) – Stewardship Committee Picnic, WC basin planning and partnering presentation, Townshend Reservoir
 November 20 – WRC Natural Resources Committee – WC Basin planning discussions and WRC Regional Plan update. Brattleboro
 November 25 – WRWA Stream Action Committee (SAC) – WC/NRCS/NRCD/WRWA volunteers formed SAC to plan stream WQ monitoring program, Brattleboro
 December 9 – Grafton Nature Museum – WC basin planning presentation and discussion
 December 13 – TNC – WC partnering and funding discussions, Montpelier
 December 18 – WRWA Board Meeting – Basin planning update and project reports, Brattleboro

2003

January 6 – WRWA Board meeting – WC basin planning report and update, Saxtons River
 January 7 – WRC/WRWA/NRCD – Basin 11 planning initiative discussions of proposed budget analysis for DEC. Brattleboro
 January 9 –Brattleboro WWTP – WRWA and WC tour and WQ project discussions
 January 14 – VT DEC – WC basin planning budget and funding discussions with Water Quality Division, Waterbury
 January 16 – WRWA SAC – WQ monitoring program planning with WRWA Volunteers, NRCS, NRCD, Bellows Fall Union High School, Brattleboro
 January 17 – WRC.NRCD/WC – Basin planning coordination, Brattleboro
 January 23 – VTDEC – WC Basin 11 planning initiative discussion, Waterbury
 February 7 – WRC/NRCD – Basin planning coordination and Section 319 funding meeting, Brattleboro.
 February 10 – WRC/NRCD – Basin planning coordination and Section 319 funding meeting, Brattleboro
 February 20 – WRWA Board meeting – WC basin planning update, WQ project report and funding options, Wardsboro
 April 2 NRCS – WC basin planning partnering discussions, Brattleboro
 April 8 WRC – WC/WRC personnel public access trail project, West River watershed
 April 10 WRWA SAC – WC presentation at WQ Monitoring Volunteer recruitment meeting, Newfane
 April 22 – NRCD – WC basin planning report and project updates, Brattleboro
 April 23 – WRC – WC Public access meeting and site visits, West River Watershed
 April 28 - WRC – WC Public access meeting and site visits, West River Watershed
 April 29 – WRC – WC Public access meeting and site visits, West River Watershed
 May 21 – WRWA SAC – WQ monitoring planning meeting, Brattleboro
 May 28/31 - WRWA SAC - WC WQ monitoring program presentation and sampler training
 June 10 – WRWA SAC – WC-lead WQ Volunteer Training
 June 18 –NRCD/WRC – WC basin planning discussions – GIS mapping and municipal plan review update, Brattleboro
 July 2 –NRCD/WRC – Section 319 award basin planning funding discussions
 July 8 – NRCD/WRC – Section 319 award basin planning funding discussions
 July 16 – Basin Planning Committee (BPC) meets for first time with WC and reps from NRCD, WRC, WRWA, SWCRPC.
 July 17 – NRCD/WRWA – WC macroinvertebrate sampling program planning, Brattleboro

July 23 - NRCD/WRWA – WC macroinvertebrate sampling program planning, Brattleboro
 August 4 – BPC – Basin planning coordination, Brattleboro
 August 5/6 – VT DEC – WC hosted Stream Geomorphic Assessment Phase 1 training workshop, Brattleboro
 August 9 – WRWA/NRCD/WC – WC organized macroinvertebrate sampler all-day training workshop, Grafton
 August 13 - WRWA/NRCD/WC – WC organized macroinvertebrate sampler all-day training workshop, Grafton
 August 20 – CRWC – WC basin planning coordination and partnering meeting.
 August 20 – Town of Dummerston – WC presentation to Select Board – erosion control project plan for Dummerston Covered Bridge, Dummerston
 August 20 – BPC – Basin planning coordination, Brattleboro
 August 21 – Dummerston Conservation Commission (DCC) – WC presentation to DCC, erosion control project plan for Dummerston Covered Bridge, Dummerston
 September 3 – BPC – Basin planning coordination, Brattleboro
 September 13 BCP – Basin planning coordination, Brattleboro
 September 17 – VT DEC – WC VT DEC State offices tour, Waterbury
 September 29 - NRCD – WC basin planning report and project updates, Brattleboro
 October 2 – WRC – WC coordination meeting SGA/GIS projects, Brattleboro
 October 8 – BPC - Basin planning coordination, Brattleboro
 October 14 – WRWA Board meeting - WC basin planning report and project updates, Brattleboro
 October 15 – NRCD – WC presentation to NRCD Annual meeting
 October 16 – DCC – WC presentation and discussion regarding Dummerston Covered bridge erosion control project, Dummerston
 October 28/29 – VT DEC – WC hosted GIS/SGAT training workshops, Brattleboro
 October 31 – BEEC – WC basin planning discussions with partnering organization
 November 5 – BPC - Basin planning coordination, Brattleboro
 November 6 – CRJC – WC participates in regional stormwater workshop, White River Junction
 November 12 – WRWA/NRCD/BAMS – WC organized macroinvertebrate sampling processing lab and training workshop for students and volunteers, Brattleboro Area Middle School
 November 13 – WRWA Board meeting – WC basin planning report and project updates, Brattleboro
 November 17 – BPC - Basin planning coordination, Brattleboro
 November 19 – CRJC – WC presentation to Connecticut River Commissioners meeting. Westmorland
 December 4 – BPC - Basin planning coordination, Brattleboro
 December 4 – WRWA/VTDEC – WC organized in-field meeting, Jamaica
 December 11 – BPC - Basin planning coordination, Brattleboro
 December 16 – WRWA Board meeting – WC basin planning report and project updates, Brattleboro

2004

January 8 – BCP Basin planning coordination, Brattleboro
 January 12 – NRCD - WC basin planning report and project updates to NRCD Board of Supervisors, Brattleboro
 January 14 – WRC – Dummerston Covered Bridge project collaboration meeting
 January 17 – NRCD/WRWA – WC oversight MacroLab at BAMS
 January 19 - NRCD/DEC - WC SGA coordination meeting with DEC, Waterbury
 January 20 – NRCD/WRC – WC SGA coordination meeting with WRC, Brattleboro

January 22 – WRWA – WC basin planning report and project updates to WRWA Board of Directors, Brattleboro

January 26 – BPC – Basin Planning coordination, Brattleboro

January 31 – WRWA/NRCD – WC oversight MacroLab at BAMS

February 4 – CRJC – WC basin planning and WQ report to River Commissioners, Westmorland

February 12 – TU/WRC/NRCD – WC organized project coordination meeting, Brattleboro

February 14 – MacroLab at BAMS, Brattleboro

February 17 – BPC – Basin Planning coordination meeting, Brattleboro

February 19 – NRCD/WRC/DEC – WC SGA database setup with GIS specialists, Brattleboro

February 19 – DCC – Dummerston Covered Bridge project coordination meeting, Dummerston

February 23 – NRCD WC basin planning report and project updates to NRCD Board of Supervisors, Brattleboro

February 26 – TU/NRCD/USFS – Project Coordination meeting – BAMS trout rearing activities, Brattleboro

March 2 – BPC – Basin Planning Coordination

March 4 – WRC/NRCD – WC SGA /GIS project work, Brattleboro

March 6 – WRWA/NRCD – MacroLab at BAMS

March 9 – WRWA SAC – WQ monitoring program planning meeting, Brattleboro

March 18 – WRWA – WC basin planning report and project updates to Board, Brattleboro

March 18 – DCC – Dummerston Covered Bridge erosion control project and park and ride planning and development, Dummerston

March 20 – WRWA/NRCD – MacroLab at BAMS

March 22 – TU/USFS/NRCD – BAMS trout rearing project planning coordination, Brattleboro

March 24 – CRJC - WC basin planning and WQ report to River Commissioners, Westmorland

March 29 – NRCD - WC basin planning report and project updates to Board, Brattleboro

March 30 – DEC – WC visit to VT DEC state agencies, Waterbury

April 3 – NRCD/WRWA – MacroLab at BAMS

April 15 – WRWA - WC basin planning report and project updates to Board, Brattleboro

April 20 – WRWA/NRCD/Antioch – Basin Planning/WRWA Website development meeting, Brattleboro

April 28 – Dummerston Select Board – WC erosion control project and park and ride presentation and discussion with Town select board, Dummerston

April 29 – WRWA SAC – WQ monitoring program planning

April 30 – DCC – Dummerston Covered Bridge erosion control and park and ride project planning, Dummerston

April 30 – Student Conservation Association (SCA) – WC site assessments trail erosion projects, Lower West River

May 6 – USFS/NRCD – WC watershed presentation at Floodbrook Elementary, Peru

May 6 – DCC – Covered Bridge project planning and development

May 12 – WRWA – WC organization and presentation Volunteer Sampler recruitment meeting, Newfane

May 18 – DCC – Covered Bridge erosion control and park and ride planning

May 21 – WRC/SWCRPC/NRCD – RPC basin planning coordination, Brattleboro

May 24 – BPC – Basin Planning coordination, Brattleboro

May 27 – USFS – Salmon Release 6th graders in Flood Brook

June 4 – DEC/NRCD – WC coordination with state basin planner, Brattleboro

June 5 – WRWA/NRCD – WC led WRWA WQ sampler training workshop, Dummerston
 June 9 - WRWA/NRCD – WC led WRWA WQ sampler training workshop, Dummerston
 June 17 – CRJC – WC presentation at Partnership Awards reception, White River Junction
 June 30 – BPC – SGA discussion, planning and coordination meeting, Brattleboro
 July 14 – WRWA/NRCD- Macroinvertebrate sampling planning, Brattleboro
 July 15 – DCC – Covered Bridge project planning
 July 16 – Multi-agency – WC participation in Traffic Safety Audit, Route 30
 July 16 – NRCD/WRWA/DEC – WC organized SGA Phase 2 training workshop, Jamaica
 August 19 – WRWA – WC basin planning report and project updates to Board, Brattleboro
 August 21– WRWA/NRCD - Macro program organization and site visit meeting, Brattleboro
 August 22 – VT Department of Education – WC with DE rep on new state science curriculum
 August 29 – WRWA/NRCD – WC organized macroinvertebrate sampler training workshop
 August 30 - WRWA/NRCD – WC organized macroinvertebrate sampler training workshop
 August 30 – BPC – Basin planning meeting
 September 7 – WRC/NRCD/BPC/ – Basin planning stream typing meeting
 September 23 – WRWA – WC presentation at WRWA Annual meeting, Jamaica
 September 29 – CRJC – WC presentation at Wantasticut river commission meeting, Westmorland
 September 29 – NRCS/NRCD – Kiosk siting, Dummerston and Newfane
 October 20 – TNC/NRCD – WC partner coordination meeting, Brattleboro
 October 21 - August 30 – BPC – Basin planning meeting, Brattleboro
 October 21 – WRC/NRCD/BPC/ – Basin planning stream typing meeting
 November 5 – BPC – Basin planning coordination, Brattleboro
 November 16 – WRWA SAC – WQ monitoring program 2005 planning
 November 17 – WRWA/NRCD – MacroLab at USDA Service center, Brattleboro
 November 22 – Landmark College/NRCD/WRWA – WC presentation to Landmark administration and faculty, Putney
 November 24 – USFS/TU/NRCD – Meeting with BAMS science department – trout rearing program planning, Brattleboro
 December 7 – DCC – WC presentation update to commissioners, Dummerston
 December 8 – WRWA/NRCD/DEC – SGA planning and coordination, Brattleboro
 Decemeber 15 – BPC – Basin planning coordination, Brattleboro
 December 16 – WRWA/NRCD – MacroLab set up at Landmark College science department, Putney
 December 27 – NRCD – WC presentation to Westminster planning commission re: wetlands and stream buffers in draft town plan, Westminster

2005

January 10 - NRCD – WC discussions with Westminster planning commission re: wetlands and stream buffers in draft town plan, Westminster
 January 13 - WRC/NRCD/BPC/ – Basin planning stream typing meeting
 January 26 – WRC – WC basin planning coordination with WRC staff, Brattleboro
 February 16 – DCC and Dummerston Select Board – WV presentation re: Dummerston “steps” project plan at covered bridge, Dummerston
 February 23 - WRC/NRCD/BPC/ – Basin planning stream typing meeting
 February 15 – Westminster Town Manager/WC – Zoning ordinance discussions, Westminster
 February 15 – DCC – Dummerston “steps” planning, Dummerston
 March 21 – NRCD – WC report and update to the Board of Supervisors

March 21 - Westminster Planning Commission /WC – Zoning ordinance presentation, Westminster
 March 28 – BPC – Basin planning coordination, Brattleboro
 April 20 – WRWA/NRCD – MacroLab at Landmark College
 April 23 – WRWA/NRCD– Macro ID workshop at Landmark College, Putney
 April 28 – WRWA/NRCD – WC meeting with Brattleboro Union High School students to discuss
 collaboration with WQ monitoring program, Brattleboro
 May 4 – WRWA/NRCD – MacroLab at Landmark College, Putney
 May 12 – WRWA/NRCD – WC presentation at WRWA Volunteer Recruitment meeting, Newfane
 May 25 – SIT/NRCD/WRWA – WC meeting with School for International Training Administrator –
 student involvement with WRWA erosion control and other basin planning projects.
 June 1 – WRWA/NRCD – MacroLab at Landmark College, Putney
 June 2 – WRWA/NRCD/BUHS – WQ Monitoring coordination, Brattleboro
 June 15 – WRWA/NRCD – MacroLab at Landmark College, Putney
 June 15 – CRJC – River Commissioner’s meeting, Westmorland
 June 16 – BPC – Basin Planning Coordination, Brattleboro
 June 16 – WRWA – WC report and update to WRWA Board
 June 22 – SCA/NRCD/SIT – WC planning meeting on erosion control projects
 June 29 – NRCD/DEC – SGA project coordination and site visit, Ball Mountain Brook
 July 11 – NRCD/DEC/ - WC presentation to Jamaica Select Board re: SGA Phase 2 in Ball Mountain
 Brook, Jamaica
 July 23/24 – DCC/WRWA/NRCD/WRC/Town of Dummerston Road Crew/Community Volunteers –
 Dummerston “Steps” project implementation
 July 25 – SCA/SIT/NRCD – Williamsville Station trail erosion control project coordination,
 Williamsville
 July 30/31 – SIT/SCA/WRWA – Williamsville Station trail erosion control project implementation.
 August 8 – NRCD – WC Annual Report to Board Supervisors
 October 24 –DEC/WRWA/NRCD – WC presentation and progress report to Jamaica Select Board,
 Jamaica
 October 27 – SCA/NRCD – Williamsville Station trail erosion control project completion.
 November 2 – BPC – Basin planning coordination, Brattleboro
 December 12 – WRWA/NRCD – Macroinvertebrate sampling program planning and coordination

2007

March 5 – Basin Plan Public Presentation and Comment Meeting – South Londonderry
 March 8 – Basin Plan Public Presentation and Comment Meeting – Grafton
 March 14 – Basin Plan Public Presentation and Comment Meeting – Newfane
 March 15 – Basin Plan Public Presentation and Comment Meeting – Jamaica
 March 19 – Basin Plan Public Presentation and Comment Meeting – Brattleboro
 March 20 – Basin Plan Public Presentation and Comment Meeting – Chester
 March 27 – Basin Plan Public Presentation and Comment Meeting – Townshend (WRC)
 April 6 – Agricultural Section review - VAAF & WCNRCD ARS/BP
 August 1 – Dummerston Selectboard Meeting on Rock River
 August 2 – Newfane Selectboard Meeting on Rock River
 August 15 – Dummerston Selectboard Meeting on Rock River
 September 20 – West River Watershed Alliance Annual Meeting
 October 10 – West River Watershed Alliance Board Retreat and Planning

November 28 – Windham County NRC D Annual Meeting

December 6 – Windham County NRC D Trees for Stream project planning meeting

2008

January 15 - Basin Plan Public Presentation and Comment Meeting – Andover

January 17 - Basin Plan Public Presentation and Comment Meeting – Winhall

January 23 - Basin Plan Public Presentation and Comment Meeting – Bellows Falls

January 31 - Basin Plan Public Presentation and Comment Meeting – Townshend

June 4 – Existing Uses Public Presentation and Comment Meeting – Bellows Falls

June 5 – Existing Uses Public Presentation and Comment Meeting – Brattleboro

APPENDIX A.5 - Municipal Meetings Regarding Surface Water Classification and Typing

2006

January 23 – Andover Selectboard
February 1 – Chester Selectboard
February 6 – Chester Planning Commission
April 19 – Chester Selectboard

2007

January 31 – Wardsboro Planning Commission
February 1 – Newfane Selectboard
February 7 – Rockingham Planning Commission
February 8 – Londonderry Planning Commission, Conservation Commission
February 12 – Grafton Selectboard
February 26 – Jamaica Selectboard
February 27 – Weston Selectboard
February 28 – Townshend Planning Commission

APPENDIX A.6 - Functions and Values of Selected Wetlands

Wetland Complex Name Location	Wetland Features
ADAM POND VICINITY- WEST RIVER JAMAICA	Small swamp basin in generally hard and acid bedrock hills. Large forested and undeveloped area.
BLOODSUCKER POOL ROCKINGHAM	A wetland complex formed by flooding from the Bellows Falls dam at the mouth of the Williams River. Marshy area of 3-5 acres w/1-2 acre pond.
COUNTY LINE SWAMP STRATTON	Approximately 15 acres in a headwater seepage of the Winhall River. Successional beaver meadow; mature spruce-fir swamp, Some intact wet-mesic red maple-yellow birch-balsam fir forest.
FRENCH HOLLOW WINHALL	A small seep in excellent condition as much of it is the mature hemlock forest.
HARMONYVILLE ISLANDS TOWNSHEND	The lower end of Mill Brook is a rapid, cobbly stream.
HERRICKS COVE ROCKINGHAM	A small pond/backwater marsh at the mouth of the Williams River, in the pool of the Bellows Falls dam.
HERRICKS COVE ROCKINGHAM	Emergent wetland dominated by sedges, grasses, cattails and leafy bulrushes.
JENNY COOLIDGE BROOK WETLAND WESTON	
JOY BASIN TOWNSHEND	Chain of beaver ponds constructed along small stream draining from Rattlesnake Mtn and Ober Hill.
MINARD'S POND, BELLOWS FALLS VILLAGE FOREST ROCKINGHAM	The 218-acre section of the Bellows Falls Village Forest is a very nice extension of Appalachian oak forest. The vegetation and the natural communities clearly show affinities with more southern ecosystems. Red maple-black gum swamps and the upland forest with three oak species, chestnut and sassafras.
MUD POND-PERU PERU	Tannic water pond with a 4 to 5 acre bog at the south end and along the west shoreline.
RETREAT MEADOWS BRATTLEBORO	A large, backwater pond, ringed by emergent wetland that is a densely vegetated deep marsh grading into a shallow marsh.

SAXTONS RIVER FLOODPLAIN ROCKINGHAM, GRAFTON	Riverine floodplain forest with large sycamore and cottonwood trees; one of the few sycamore-dominated floodplain forests in Vermont.
SIMPSONVILLE SWAMP	Hemlock Swamp. Although only 15 acres, the hemlock-hardwood swamp is a gem. Much of it is untouched and has red maple and hemlock trees over 140 years old. Two distinct swamp forest types occur in the bedrock depression.
TOWNSHEND	
SIMPSONVILLE SWAMP	Sweet Gale Shoreline Swamp. Although only 15 acres, the hemlock-hardwood swamp is a gem. Much of it is untouched and has red maple and hemlock trees over 140 years old. Two distinct swamp forest types occur in the bedrock depression.
TOWNSHEND	
STRATTON MEADOW BOG	Extensive beaver-influenced wetland complex with bog in one lobe of the complex.
STRATTON	
TOWNSHEND DAM FLOODPLAIN	A very large and diverse site, with many interesting features. The West River in this section moves in a fairly broad floodplain (nearly 1/2 mile wide in places), yet the gradient is high. The river is very active here, moving often within its flo
TOWNSHEND	
TOWNSHEND NORTHEAST SWAMP	Two swamps at this site. One is a small Red Maple-Black Ash Seepage Swamp adjacent to Athens Road that has been disturbed by beaver activity. The second is a Hemlock-Hardwood Swamp.
TOWNSHEND	
WEST RIVER HEADWATERS	Near the headwaters, this site includes the upper-most stretch of the West River passing through valley bottom flats; and a headwater cove.
MOUNT HOLLY, WESTON	
WEST RIVER-GALE MEADOWS POND	Two small floating shrub bog mats with living pole size larch groves and some black spruce. Larger mat is about 1/2 to 1 acre and the smaller mat is about 1/10 acre.
WINHALL	
WEST RIVER-REDWING FARM	Very interesting and diverse site, only a short distance downstream of the Townshend Dam. There is a very deep pool at the upstream end of the site.
TOWNSHEND	
WEST RIVER-SOUTH OF GALE MEADOWS POND	This ca. 15 acre spruce-fir-tamarack swamp lies at the head of a small drainage lacking surface flow south of Gale Meadows Pond. With very mild relief, this vicinity of the watershed might be considered a high basin.
WINHALL	
WINHALL RIVER HEADWATER BEAVER FLOWAGE	Vegetation is an unusual combination of short rush - sphagnum - Viburnum and stunted red spruce. Woody clumps totalling 25-35% cover. Small seepage pool/channels present, but no main drainage channel.
STRATTON	

WINHALL RIVER HEADWATER
BEAVER FLOWAGE

An exceptionally large beaver flowage at an unusually high elevation. With relatively mild relief, this length of the Green Mountains' spine can perhaps be described as a plateau. The flowage stretches out for over 2 miles.

STRATTON

APPENDIX A.7 - Summary of Physical, Chemical, and Biological Assessments of Basin 11 Completed or Underway

Assessment Title	Date	Lead Organization(s)	Waterway/Location	Protocols/Summary
<i>Geomorphic/Physical Assessments</i>				
Geomorphic Assessment	2004 - 2008	Windham County NRC	Ball Mountain Brook	ANR Phase 1 and 2 Geomorphic Assessment Protocols Corridor Plan
	2006 - 2009	Windham County NRC	Rock River	ANR Phase 1 and 2 Geomorphic Assessment Protocols Corridor Plan
	2006-2007	Windham County NRC	West River and tributaries	ANR Phase 1 and 2 Geomorphic Assessment Protocols
	2007-2009	Windham County NRC	Whetstone Brook	ANR Phase 1 and 2 Geomorphic Assessment Protocols Corridor Plan
	2007-2009	Windham County NRC	Crosby Brook	ANR Phase 1 and 2 Geomorphic Assessment Protocols Corridor Plan
	2007	Windham County NRC / Windham Regional Commission	Saxtons River and tributaries	ANR Phase 1 and 2 Geomorphic Assessment Protocols
Surface Water, Wetland & Vegetation Inventory	2003	Stratton Corp. (Pioneer Environmental Asso.)	North Branch, Ball Mountain Brook, Styles Brook, Tributary 1	USACE Wetlands Delineation Manual
Chester Streambank Survey	2005	SWCRPC, Chester Conservation Committee	Chester & Andover Streambanks	Streambank erosion, buffer condition
<i>Biomonitoring/Biological Assessments</i>				
Macroinvertebrate & fish community diversity monitoring	5 year rotation	DEC BASS Lab	Williams River, South Branch Williams River, Saxtons River, West River, Rock River, Turkey Mountain Brook, Cobb Brook, North Branch Ball Mountain Brook, Kidder Brook, Sunbowl Brook, Braser Brook, Styles Brook, Stratton Pond Trib 1, Stratton Pond Trib 2, Winhall River	Monitoring data is one parameter used in determining if waterways meet Vermont Water Quality Standards (impaired waters list)

Macroinvertebrate monitoring	2003-2004	WRWA.	West River, Williams River, Saxtons River, Middle Branch-Williams, South Branch-Saxtons, Rock River, North Branch Brook	Family level ID
Chemical Assessments				
West River monitoring program	On-going since 1980's	WRWA, BEEC, CRWP, LGHS	West River and tributaries	E. coli, phosphorus, turbidity, TSS, DO, pH & temperature sampling
USACE	On-going since 1971	USACE	West River, Wardsboro Brook, Winhall River watersheds	E. coli, alkalinity, ammonia, nitrate, phosphorus, hardness, mercury, chlorophyll
Stratton Master Plan Water Quality Remediation Plan	On-going since 2000	Stratton Mountain Corporation (Pioneer Environmental Asso.)	Ball Mountain Brook watershed	Nutrients, TSS, turbidity
Wetlands Assessments				
Inventory	1996	ANR / NNHP	West River	ecological inventory of wetland natural communities
Lake Assessments				
Spring Phosphorus	On-going rotational	DEC- Lakes Section	Basin 11 lakes & ponds	Phosphorus, dissolved oxygen, clarity
Lake Assessments	On-going	DEC- Lakes Section		Substrate, access, shoreline features, adjacent land use, pH, DO, clarity, algae, shoreline development & erosion, wilderness characteristics, natural communities, & non-native species

<i>Hazardous Waste, Landfill, & Wastewater Treatment Facility Monitoring</i>				
Various DEC site monitoring database inventories	On-going	DEC- Waste Management & Wastewater Management Divisions	Sites throughout Basin 11	Groundwater and surface water monitoring at hazardous waste sites, wastewater treatment facilities, and landfills.
<i>Comprehensive Watershed Assessments & Plans</i>				
Basin 11- Assessment Report	2001 5- year rotation	DEC- Planning Section	West, Williams and Saxtons Rivers Watersheds	Comprehensive review of physical, chemical, & biological monitoring & assessments.
Upper West River Basin Water Quality Management Plan	1989	DEC	West River Watershed	Inventory of water related resources, public desires for waters and DEC plans to address conditions.
West-Williams-Saxtons Basin Water Quality Management Plan	1975	DEC	West, Williams and Saxtons Rivers Watersheds	Addresses municipal wastewater facility needs and to a lesser degree non-point source pollution & lake eutrophication.

Key:

DEC- Vermont Department of Environmental Conservation **VDFW-** Vermont Department of Fish and Wildlife

DEC's BASS Lab- Biomonitoring and Aquatic Studies Section **NRCS-** USDA Natural Resources Conservation Service

RPCs- Windham Regional and Southern Windsor County Regional Planning Commissions

APPENDIX A.8 – Threatened and Endangered Species in Basin 11

Common Name	Scientific Name	River	Town	State Status	Fed Status	State Rank
Animals						
Brook Floater	<i>Alasmidonta varicosa</i>	WEST	BRATTLEBORO BROOKLINE DUMMERSTON JAMAICA NEWFANE TOWNSHEND	T		S1
Eastern Pearlshell	<i>Margaritifera margaritifera</i>	WEST	JAMAICA LONDONDERRY	T		S2
Freshwater Mussel Concentration Area		WEST	BROOKLINE NEWFANE			
Blue-spotted Salamander	<i>Ambystoma laterale</i>	WEST	BRATTLEBORO DUMMERSTON	SC		S3
Fowler's Toad	<i>Bufo fowleri</i>	SAXTONS	ROCKINGHAM	SC		S1
Great Blue Heron (rookeries)	<i>Ardea herodias</i>	WEST	LONDONDERRY PERU			S2(B)
Whip-poor-will	<i>Caprimulgus vociferus</i>	SAXTONS	ROCKINGHAM	SC		S2(B)
Bicknell's Thrush	<i>Catharus bicknelli</i>	WEST	STRATTON	SC		S3(B)
Boulder-beach Tiger Beetle	<i>Cicindela ancocisconensis</i>	WEST	JAMAICA			S1
Cobblestone Tiger Beetle	<i>Cicindela marginipennis</i>	WEST	BRATTLEBORO	T		S1
Sedge Wren	<i>Cistothorus platensis</i>	SAXTONS WEST	ROCKINGHAM WINHALL	E		S1(B)
Bay-breasted Warbler	<i>Dendroica castanea</i>	WEST	STRATTON			S1(B)
Rusty Blackbird	<i>Euphagus carolinus</i>	WEST	STRATTON	SC		S3(B)
Orchard Oriole	<i>Icterus spurius</i>	WILLIAMS	ROCKINGHAM			S1
Black-backed Woodpecker	<i>Picoides arcticus</i>	WEST	WINHALL	SC		S2(B)
Pied-billed Grebe	<i>Podilymbus podiceps</i>	WILLIAMS	ROCKINGHAM	SC		S2(B)
Sora	<i>Porzana carolina</i>	WILLIAMS	ROCKINGHAM	SC		S2
American Marten	<i>Martes americana</i>	WEST	STRATTON	E		S1?
Plants						

Poke Milkweed	<i>Asclepias exaltata</i>				S3
Four-leaved Milkweed	<i>Asclepias quadrifolia</i>				S3
Smooth False-foxglove	<i>Aureolaria flava</i>	WEST	BRATTLEBORO		S2
Summer Sedge	<i>Carex aestivalis</i>	WEST	JAMAICA WESTMINSTER WESTON WILLIAMS ANDOVER		S1
Clustered Sedge	<i>Carex cumulata</i>		DUMMERSTON		S1
Long Sedge	<i>Carex folliculata</i>	WEST	LONDONDERRY STRATTON		S3
Loose Sedge	<i>Carex laxiculmis</i>	WEST	NEWFANE		S2
Shore Sedge	<i>Carex lenticularis</i>	WEST	JAMAICA LONDONDERRY		S2
Hairy Sedge	<i>Carex trichocarpa</i>	WILLIAMS	ROCKINGHAM		S2
Spotted Wintergreen	<i>Chimaphila maculata</i>	WEST SAXTONS	DUMMERSTON ROCKINGHAM		S2
Flowering Dogwood	<i>Cornus florida</i>	WEST	BRATTLEBORO	T	S1
American Hazelnut	<i>Corylus americana</i>	SAXTONS	ROCKINGHAM		S2
		WEST	BRATTLEBORO		
Fragile Rockbrake	<i>Cryptogramma stelleri</i>	WEST	MOUNT TABOR		S3
Nuttall Waterweed	<i>Elodea nuttallii</i>	WEST	BRATTLEBORO TOWNSHEND		S2
Hairy Wild-rye	<i>Elymus villosus</i>	WEST	BRATTLEBORO		S1
Hyssop-leaved Fleabane	<i>Erigeron hyssopifolius</i>	WILLIAMS	ROCKINGHAM		S2
Fringed Gentian	<i>Gentianopsis crinita</i>	WILLIAMS	ROCKINGHAM		S3
Plains Frostweed	<i>Helianthemum bicknellii</i>	WEST	DUMMERSTON	T	S2
Canada Frostweed	<i>Helianthemum canadense</i>	WEST WILLIAMS	BRATTLEBORO DUMMERSTON CHESTER		S2
Harsh Sunflower	<i>Helianthus strumosus</i>	WEST	DUMMERSTON	T	S2
Orange-grass St. John's-wort	<i>Hypericum gentianoides</i>	WEST	BRATTLEBORO		S2

River-bank Quillwort	<i>Isoetes riparia</i>	WILLIAMS	ROCKINGHAM		S1
Tuckerman's Quillwort	<i>Isoetes tuckermanii</i>	WEST	MARLBORO		S1?
Greene's Rush	<i>Juncus greenei</i>	WEST	DUMMERSTON TOWNSHEND	E	S1
Grass Rush	<i>Juncus marginatus</i>	WILLIAMS WEST	ROCKINGHAM BRATTLEBORO DUMMERSTON JAMAICA TOWNSHEND		S2
Mountain Laurel	<i>Kalmia latifolia</i>	WEST	BRATTLEBORO DUMMERSTON		S3
Hairy Pinweed	<i>Lechea mucronata</i>	WEST	BRATTLEBORO	E	S1
Spicebush	<i>Lindera benzoin</i>	SAXTONS	WESTMINSTER		S3
Many-fruited False-loosestrife	<i>Ludwigia polycarpa</i>	WILLIAMS	ROCKINGHAM	E	S1
Small-flowered Rush	<i>Luzula parviflora</i>	WEST	STRATTON		S2
Large-leaved Sandwort	<i>Moehringia macrophylla</i>	WEST	DOVER NEWFANE		S2
Sprout Muhly	<i>Muhlenbergia sobolifera</i>	SAXTONS WEST	ROCKINGHAM WESTMINSTER BRATTLEBORO		S3
Slender Muhly	<i>Muhlenbergia tenuiflora</i>	SAXTONS	ROCKINGHAM WESTMINSTER		S3
Fall Dropseed Muhly	<i>Muhlenbergia uniflora</i>	WEST	STRATTON		S2?
Farwell's Water-milfoil	<i>Myriophyllum farwellii</i>	WEST	LONDONDERRY		S2
Low Water-milfoil	<i>Myriophyllum humile</i>	WEST	LONDONDERRY WINHALL		S2
American Ginseng	<i>Panax quinquefolius</i>	WEST	WINHALL		S2
Slender Paspalum	<i>Paspalum ciliatifolium</i>	WILLIAMS	WEST		S2
Arrowleaf	<i>Peltandra virginica</i>	WEST	NEWFANE TOWNSHEND		S1
Tuberclad Orchis	<i>Platanthera flava</i>	WEST	BRATTLEBORO BROOKLINE DUMMERSTON JAMAICA NEWFANE	T	S1

Drooping Bluegrass	<i>Poa saltuensis</i>	WEST	JAMAICA LONDONDERRY			S2
Riverweed	<i>Podostemum ceratophyllum</i>	WEST	BROOKLINE NEWFANE			S1
Field Milkwort	<i>Polygala sanguinea</i>	WEST	DUMMERSTON			S2
Whorled Milkwort	<i>Polygala verticillata</i>	WEST	DUMMERSTON			S2
Snail-seed Pondweed	<i>Potamogeton bicipulatus</i>	WEST	JAMAICA LONDONDERRY MARLBORO			S2
Tuckerman's Pondweed	<i>Potamogeton confervoides</i>	WEST	JAMAICA PERU WESTON			S2
Vasey's Pondweed	<i>Potamogeton vaseyi</i>	WEST	BRATTLEBORO			S2
Low Sand Cherry	<i>Prunus pumila var. depressa</i>	WEST	BRATTLEBORO DUMMERSTON JAMAICA TOWNSHEND			S2
Scarlet Oak	<i>Quercus coccinea</i>	SAXTONS	WESTMINSTER			S1
Scrub Oak	<i>Quercus ilicifolia</i>	WEST SAXTONS	DUMMERSTON ROCKINGHAM	E		S1
Canada Burnet	<i>Sanguisorba canadensis</i>	WEST	BRATTLEBORO BROOKLINE DUMMERSTON JAMAICA LONDONDERRY TOWNSHEND			S2
Barbed-bristle Bulrush	<i>Scirpus ancistrochaetus</i>	SAXTONS WEST WILLIAMS	ATHENS GRAFTON BROOKLINE DUMMERSTON NEWFANE TOWNSHEND ROCKINGHAM	E	LE	S2
Pursh's Bulrush	<i>Scirpus purshianus</i>	WILLIAMS SAXTONS WEST	ROCKINGHAM GRAFTON JAMAICA NEWFANE TOWNSHEND WARDSBORO			S2
Smith's Bulrush	<i>Scirpus smithii</i>	WILLIAMS	ROCKINGHAM			S1

		WEST	TOWNSHEND		
Narrow Blue-eyed Grass	<i>Sisyrinchium angustifolium</i>	WILLIAMS	CHESTER		S2
Water Bur-reed	<i>Sparganium fluctuans</i>	WEST	LONDONDERRY WESTON		S2
Shining Ladies'-tresses	<i>Spiranthes lucida</i>	WEST	DUMMERSTON		S3
Pygmyweed	<i>Tillaea aquatica</i>	WILLIAMS WEST	ROCKINGHAM BRATTLEBORO		S2
Coffee Tinker's-weed	<i>Triosteum aurantiacum</i>	SAXTONS	WESTMINSTER		S3
Three-bird Orchid	<i>Triphora trianthophora</i>	WEST	BRATTLEBORO BROOKLINE DUMMERSTON	T	S1
Hidden-fruited Bladderwort	<i>Utricularia geminiscapa</i>	WEST	JAMAICA LONDONDERRY		S3
Purple Bladderwort	<i>Utricularia purpurea</i>	WEST	LONDONDERRY		S3
Northeastern Bladderwort	<i>Utricularia resupinata</i>	WEST	JAMAICA	T	S1
Dwarf Bilberry	<i>Vaccinium cespitosum</i>	WEST	JAMAICA LONDONDERRY TOWNSHEND		S2
Lance-leaved Violet	<i>Viola lanceolata</i>	WEST	MARLBORO	T	S1
Three-lobed Violet	<i>Viola triloba</i>	WEST	BRATTLEBORO		S2
Blunt-leaved Woodsia	<i>Woodsia obtusa</i>	WEST	BRATTLEBORO		S3
Yellow-eyed-grass	<i>Xyris difformis</i>	WEST	JAMAICA NEWFANE		SH
Northern Yellow-eyed Grass	<i>Xyris montana</i>	SAXTONS	ATHENS	T	S1

Natural Communities

Dwarf Shrub Bog		WEST	STRATTON PERU WINHALL WESTON	S2	S2
Hemlock Swamp		WEST	JAMAICA TOWNSHEND	S2	S2
Mesic Maple-Ash-Hickory-Oak Forest		WEST	DUMMERSTON WESTON	S3	S3
Mesic Red Oak-Northern Hardwood Forest		WEST	WESTON	S3	S3

Pitch Pine-Oak-Heath Rocky Summit	WEST	DUMMERSTON	S1	S1
Poor Fen	WEST	STRATTON	S2	S2
Red Maple-Black Gum Swamp	SAXTONS	ROCKINGHAM	S2	S2
Red Pine Forest or Woodland		DUMMERSTON	S2	S2
River Cobble Shore	WEST	DUMMERSTON LONDONDERRY JAMAICA TOWNSHEND	S2	S2
	SAXTONS	ROCKINGHAM GRAFTON		
Rivershore Grassland	WEST	BROOKLINE NEWFANE TOWNSHEND BRATTLEBORO DUMMERSTON	S3	S3
Riverside Outcrop	WILLIAMS WEST	ROCKINGHAM DUMMERSTON	S3	S3
Spruce-Fir-Tamarack Swamp	WEST	WINHALL STRATTON	S3	S3
Sugar Maple-Ostrich Fern Riverine Floodplain Forest	WEST SAXTONS	TOWNSHEND ROCKINGHAM GRAFTON	S2	S2
Sweet Gale Shoreline Swamp	WEST	TOWNSHEND	S3	S3
White Pine-Red Oak-Black Oak Forest	SAXTONS	ROCKINGHAM	S3	S3

CODES:

E- Endangered	LT-Listed Threatened	SH-Historical Records
T-Threatened	S1-Very Rare	?-Provisional Rank
SC-Special Concern	S2-Rare	
LE-Listed Endangered	S3-Uncommon	

APPENDIX A.9 - Dams

Existing Dams in Basin 11

Dams of the West River Watershed

Dam Name	Stream	Town	Status	Use	Built	Re-built	State ID
Townshend	West River	Townshend	In Service	CR	1961		209.01
Wantastiquet Lake	West River-TR	Weston	In Service	R	1880	1990	237.01
Weston Mill	West River	Weston	In Service	P		1979	237.02
Williams	West River	Londonderry	In Service	O	1900		115.01
Ball Mountain	West River	Jamaica	In Service	RC	1961		105.01
Lowell Lake	West River-TR	Londonderry	In Service	R	1850	1981	115.02
Magic Mountain	West Brook-TR	Londonderry		R	1968		115.05
Thomson	West River-OS	Londonderry			1993		115.06
Gale Meadows	Mill Brook	Londonderry	In Service	R	1965		115.07
Burbee Pond	Turkey Mountain Brook	Windham	In Service	R	1900		247.01
Cole	Ball Mountain Brook	Stratton			1979		201.01
Mahoney Pond	Winhall River-OS	Winhall	In Service	R	1997		249.06
Gulf Brook Reservoir	Gulf Brook	Stratton	In Service	O	1975		201.03
Stiles Brook Reservoir	Gulf Brook	Stratton	In Service		1961		201.04
Kenny Pond	Baker Brook-TR	Newfane	In Service	R	1900		139.01
Hapgood Pond	Flood Brook	Peru	In Service	R	1939	1980	152.01
Lyons Pond	Burnt Meadow Brook	Peru					152.02
Farnum	Farnum Brook	Peru	In Service	R	1973		152.03
Lords Prayer Pond	Mill Brook-OS	Peru	In Service		1966		152.04
Newman	Burnt Meadow Brook	Peru	In Service	R	1981		152.05
Bromley Snow Pond	Mill Brook-TR	Peru	In Service	O	1984		152.06
Hapgood Pond	Flood Brook-TR	Peru	In Service	R	1939	1980	152.07
Strattonwald	Red Brook	Winhall	In Service	R	1977		249-01
Stratton Mountain Lake	North Branch Brook	Winhall	In Service	R	1977		249.02
Maud	Bromley Brook	Winhall	In Service				249.03

Gale Meadows Dike	Eddy Brook-TR	Winhall	In Service	R	1965		249.05
Sunset Lake	Stickney Brook	Brattleboro	In Service	S	1930	1974	122.01
Manley	Worden Brook-TR	Marlboro			1956		122.02

Dams of the Williams River Watershed

Dam Name	Stream	Town	Status	Use	Built	Re-built	State ID
Brockway Mills	Williams River	Rockingham	In Service	H		1988	169.08
Trask	Williams River-TR	Rockingham					169.03
Upper Chester Reservoir	Williams River-TR	Chester	Not In Use	O	1915	1971	48.01
Lower Chester Reservoir	Williams River-TR	Chester	Breached	S	1890		48.02
Tomasso	Williams River-TR	Chester			1983		48.05

Dams of the Saxtons River Watershed

Dam Name	Stream	Town	Status	Use	Built	Re-built	State ID
Lawrence Four Corners	Saxtons River	Windham					247.02
Cambridgeport	Weaver Brook	Rockingham	Breached				169.01
Holbrook	Weaver Brook	Grafton	In Service	R	1978		83.01
Athens Pond	Athens Brook-TR	Athens					6.01

Use Codes:

- C – flood control
- H - hydropower
- P – fire protection
- R - recreation
- S – water supply
- O – other

Abbreviations:

- TR - tributary
- OS – off stream

Basin 11 Dams Breached or Removed

River	Town	Name	Location	Certainty	Documentation	Year Gone	Removal Mode	Current Status
Rock	Newfane	Williamsville	in Williamsville village	certain		1987	breached during flood	ledge drop
Saxtons	Westminster		approx. 0.2 mi upstream from Connecticut R.	certain	likely			remnants
West	Dummerston	CVPS	approx. xx mi upstream from Connecticut R.	certain	photos, district file	1970		remnants

APPENDIX A.10 – Agriculture in Basin 11

Basin 11 Watershed Plan - Agricultural Aspects West, Williams & Saxton's Rivers

FINAL
Harris

4/24/07

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Introduction

The most striking aspect of agriculture in Basin 11 is the diversity of crops produced. What was dominated by dairy 20 years ago has today become the most diverse agricultural base in the state. Over 87 different animal types and field crops are known to be grown in Windham County.

Of the 618 square miles of land in the Basin agriculture makes up only 3.2% of the land use.¹ Yet, in Windham County alone, agricultural products bring in over \$18,321,000 to 397 farm operations in 2002. A total of 12,614 acres of the Basin are in some type of agricultural production. Crops as common as feed corn and sweet corn are complemented by plums, hazelnuts and chili peppers. Dairy and beef cows are balanced with horses, bison, deer and alpaca. Windham County has the highest sheep count in the state. The county also boasts the second highest number of orchards in state.²

Unfortunately the reality of farm economics is brought to light in seeing that the total amount spent on production in 2002, \$18,875,000, is over \$550,000 more than the market value of what is produced. These farms are struggling.

Agricultural activities have been impacting the environment of the Basin for well over 300 years.³ The accumulated effects of animal and crop production have sent varying degrees of pollutants into our waterways over the centuries. Today however, there are no agriculturally impaired river segments and only one stretch of river within the Basin that the Vermont DEC has listed as “In Need of Further Assessment” because it may be impaired by agricultural activities. This segment from the mouth of the Williams River, up to the confluence of the Middle Branch, DEC has concerns about sediments, nutrients and temperature.⁴

Given the financial status of farming in Windham County, it is interesting to note that farmers have contributed over \$225,000 (30% of total cost) towards federal cost-share programs that address on farm impacts to water quality through implementation of best management practices (Table 5 & 6).

Agriculture also provides many environmental benefits. Farm owned fields, pastures and forestland maintain large tracks of open space often used by both locals and tourist visitors. Fewer pollutants are released from an acre of agricultural land than from an acre of developed land.⁵ Unlike impervious surfaces, field and forest soils allow water to percolate into the ground rather than quickly running off into rivers. Farms recycle their farm-produced wastes as fertilizer, and actively work to prevent runoff of soil, nutrients and pathogens.

¹ Vermont Agency of Natural Resources. 2001. Water Quality and Aquatic Habitat Assessment Report- West, Williams, and Saxton Rivers Watersheds. Department of Environmental Conservation, Water Quality Division.

² USDA 2002. Census of Agriculture, Vermont State and County Data, Windham County.

³ Ebeling, W. 1979. The Fruited Plain: The Story of American Agriculture. University of California Press.

⁴ Vermont Agency of Natural Res. 2004. 303(d) List of Waters. Department of Environmental Cons, Water Quality Division.

⁵ USGS. 2000. Water Resources of the United States.

Agriculture in the Basin

USDA agricultural statistics are kept by county rather than by watershed. Therefore the following numbers reflect agriculture in Windham County and not the West, Williams and Saxtons' Rivers watersheds. While the majority of the Basin is within Windham County, the majority of the dairy farms are not in Basin 11.

The most recent USDA data from 2002 show the diversity of farm types in Windham County (Table 1). Cattle still outnumber other types of animals in the Windham County and dairy animals make up the largest share. The 48 dairy operations and the farms raising heifers keep a large amount of land open and productive. Hay is produced on over 10,000 acres and corn products on over 2100 acres.

There are 6 certified organic farms in the Basin that encompass a total of 5,481 acres.⁶ Additionally, while there are no Large Farm Operations in the Basin, there is 1 Medium Farm Operations.⁷

Table 1. Windham County: Types of Farms – 2002²

	Number of Farms	Animals or Acres
Beef	32	614
Dairy	48	3764
Other Cattle	70	3594
Bees	6	39
Goat	19	319
Hog	22	179
Horse	111	747
Llama	28	175
Poultry-All	83	2942
Sheep	44	2544
Corn grain	3	NR
Corn silage	23	2110
Berries	22	73
Christmas Trees	13	74
Hay-Total	153	10357
Maple Sugar	123	49288 gal.
Nursery	65	52
Orchards	29	643
Potatoes	10	18
Vegetables	39	303

(NR = Not Reported)

⁶ NOFA Vermont. 2007. Personal communication from E. Clark.

⁷ VAAFM. 2007. Personal communication from M. Kittredge and K. Gehr.

Agricultural Water Use

Water from the West, Williams and Saxtons Rivers is an important resource for agriculture in the Basin. Access to water for crop irrigation and animal watering is crucial to area farmers. In 2002, USDA reported that 71 Windham County farms were using some type of irrigation on 336 acres of crops. This is an over 6 fold increase over the 9 farms & 55 acres that were irrigated in 1982. Between 1985 and 2000, the USGS reports that the number of acres under irrigation in Windham County has doubled from 170 to 340 acres (Table 2).

The most recent USGS water use data available, reported herein, is by county.

Table 2. Estimated Use of Water in the United States, County-Level Data ⁸

Windham County - Water Withdrawal (Mgal/Day)

	Year	Ground Water	Surface Water	Acres Irrigated
All Uses	1985	5.28	20.94	
	1990	3.14	18.22	
	1995	3.64	4.02	
	2000	3.18	2.70	
Irrigation	1985	0	0.08	170
	1990	0.01	0.13	530
	1995	0.04	0.32	610
	2000	0.02	0.22	340
Livestock	1985	0.81	0.27	
	1990	1.03	0.34	
	1995	0.88	0.29	
	2000	nr	nr	

Figure 1.

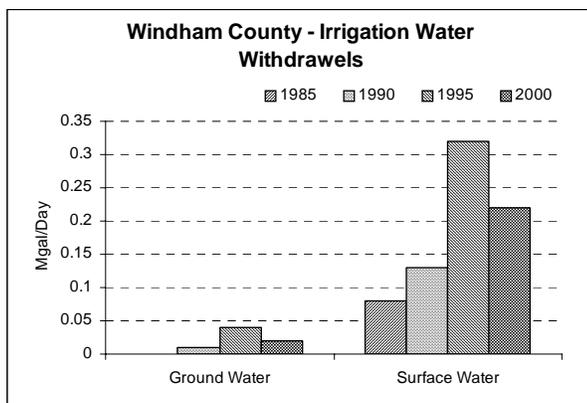
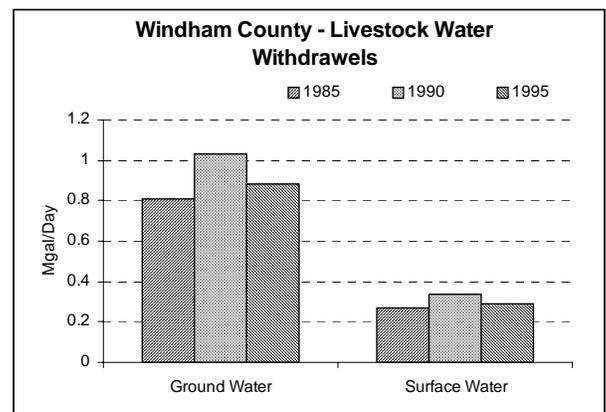


Figure 2.



⁸ USGS. 2000. Estimated Use of Water in the United States, County Level Data.

Agricultural Pesticide Use

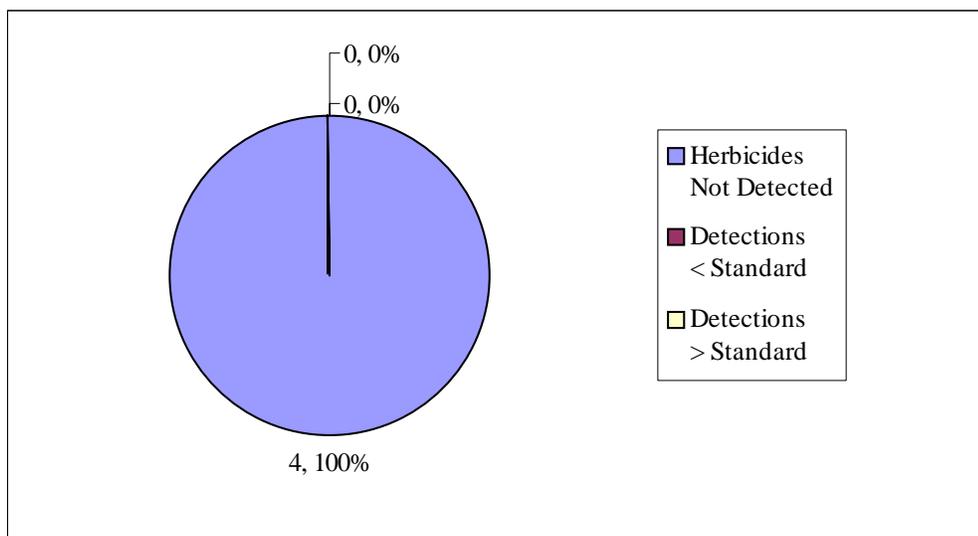
Each farm operation uses a unique and specific combination of tools to combat insect, disease and weed problems. Perhaps following the recent conversion of many conventional farms to organic operations, there were 25.6% fewer acres treated with agrichemicals in 2002 than 15 years earlier (Table 3). Likewise, the use of these products is concentrated on 7.2% fewer farms. While the number of farms using insecticides increased by 23.8%, the number of acres treated dropped by 22% in that 15 year period. The number of farms using herbicides dropped by 24.5% and the number of acres treated dropped accordingly by 30.6%. The number of farms using chemical control for plant diseases has increased slightly by 7.7%, however, the number of acres treated has dropped by 7.8% during the same 15 year period.

Table 3. Pesticide Use in Windham County⁹

	1987	1992	1997	2002
# Farms Using Chemical Treatment for Insect Control	21	73	54	26
Acres Treated for Insects	1,652	1,769	2,922	1,289
# Farms Using Chemical Control for Weeds	49	74	58	37
Acres Treated for Weeds	3,788	3,183	3,579	2,628
# Farms Using Chemical Control for Plant Disease	13	49	55	14
Acres Treated for Diseases	727	1,470	1,784	670

Drinking water samples are collected and analyzed for a suite of corn herbicides including chemicals such as atrazine and metolachlor. Over the past 5 years, 4 samples have been collected in Windham County there were 0 detections (0 %).

Figure 3. Herbicide Detections in Drinking Water Samples 2002-2006¹⁰



⁹ USDA. 2002 & 1992. Census of Agriculture, Vermont State and County Data, Windham County.

¹⁰ VAAF. 2007. Personal Communication from J. Comstock.

Further compounding the complexity of agrichemical use is the weather, cost of chemical control from year to year, the insect and disease resistance of some crops, and the natural lifecycle of pests and diseases. However, each agrichemical has unique formulations that dictate their fate and transport in the environment making it difficult if not impossible to screen for each and every possible compound in groundwater. Therefore, nitrates and herbicides are good indicators of groundwater quality based on hydrogeologic factors.

Agricultural Fertilizer Use

While the number of acres treated with commercial fertilizers has increased by 7.1%, the number of farms using commercial fertilizers decreased by 2.1% in the past 15 years (Table 4).

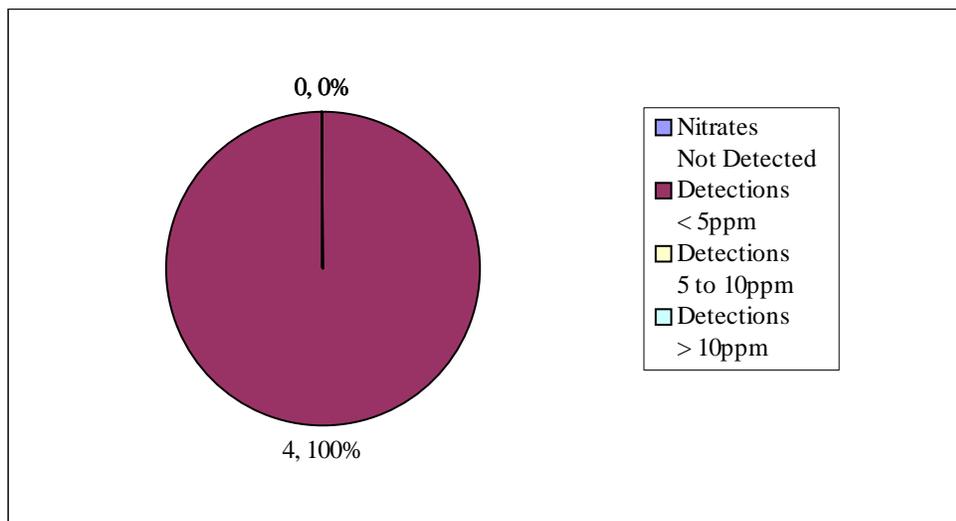
Table 4. Fertilizer Use in Windham County¹¹

	1987	1992	1997	2002
# Farms Using Commercial Fertilizer, Lime, Soil Conditioner	145	173	168	142
# Acres Treated	10,149	10,491	11,143	10,870
# Farms Using Manure	na	na	na	112
# Acres Where Manure Spread	na	na	na	7,231

The Agency of Agriculture manages a groundwater monitoring program to determine the quality of groundwater near Vermont farms. The program includes nitrates and corn herbicides. Given that nitrates are highly soluble and are therefore transported with runoff water and leach into permeable soils it is not uncommon to find low levels of nitrates in the groundwater samples extracted from farm wells and those of adjacent landowners.

Between 2002 and 2006, a total of 4 well samples in Windham County were analyzed for nitrates. Of those sampled 0 or 0% had no detections of nitrates. All 4 wells (100%) had detections between 1 and 10 ppm. However, no wells sampled had detections of nitrates above the drinking water standard of 10 ppm. Sampling continues to provide baseline data for groundwater quality on farms that contract for conservation practice cost share dollars.

Figure 4. Nitrate Detection in Drinking Water Samples 2002-2006¹²



¹¹ USE

¹² VA

Conservation Practices In Place In The Basin

There are currently 16 operating dairy farms in the Basin with approximately 1370 animal units. Only 3 of these farms have a manure storage facility that meets NRCS standards. Only 4 of the farms have improved barnyards (Table 7). Each year several of these farms apply for USDA cost-share programs but are rarely selected to receive funding for a waste storage facility or an improved barnyard. Unless this inequity of funding is addressed, there will be little improvement in agricultural impacts on water quality.

Farms in the Basin have received cost share funding for other practices such as spring development, fencing, grazing plans, nutrient management plans and water diversions. These practices help reduce erosion, phosphorus runoff and pathogen loading of waterways and assist farmers in better managing nutrients on their farms. Cost-share funds for BMP's in Basin 11 have derived from USDA-NRCS, USDA-FSA, VTAAF, and USFS programs (Table 5, 6).

Table 5. Best Management Projects COMPLETED West/Williams/Saxton Basin 1999-2007

Fiscal Year	Farms Funded	Completed Practices	Actual Total Cost	Actual Federal Cost	Actual State Cost	Actual Landowner Cost
1999	1	2	\$3,300	\$2,325	\$0	\$975
2002	2	4	\$14,910	\$10,813	\$0	\$4,097
2003	2	2	\$31,178	\$23,384	\$2,759	\$6,110
2004	1	3	\$7,001	\$6,500	\$590	\$1,501
2005	3	4	\$36,515	\$27,237		\$12,763
2006	2	2	\$3,600	\$750	\$2,000	\$850
2007	1	1	\$144,899		\$50,000	\$94,899
Totals	12	18	\$241,403	\$71,009	\$55,349	\$121,195

Table 6. Best Management Projects IN PROGRESS West/Williams/Saxton Basin 1999-2007

Fiscal Year	Farms Funded	Remaining Practices	Estimated Total Cost	Estimated Federal Cost	Estimated State Cost	Estimated Landowner Cost
2003	1	8	\$51,903	\$38,926	\$5,190	\$7,787
2004	3	12	\$68,991	\$43,977		\$25,014
2005	1	3	\$12,609	\$9,457		\$3,152
2006	2	8	\$370,000	\$239,000	\$75,000	\$64,000
2007	1	3	\$12,735	\$10,188	\$1,200	\$3,183
Totals	8	34	\$516,238	\$341,548	\$81,390	\$103,136

Figure 5.

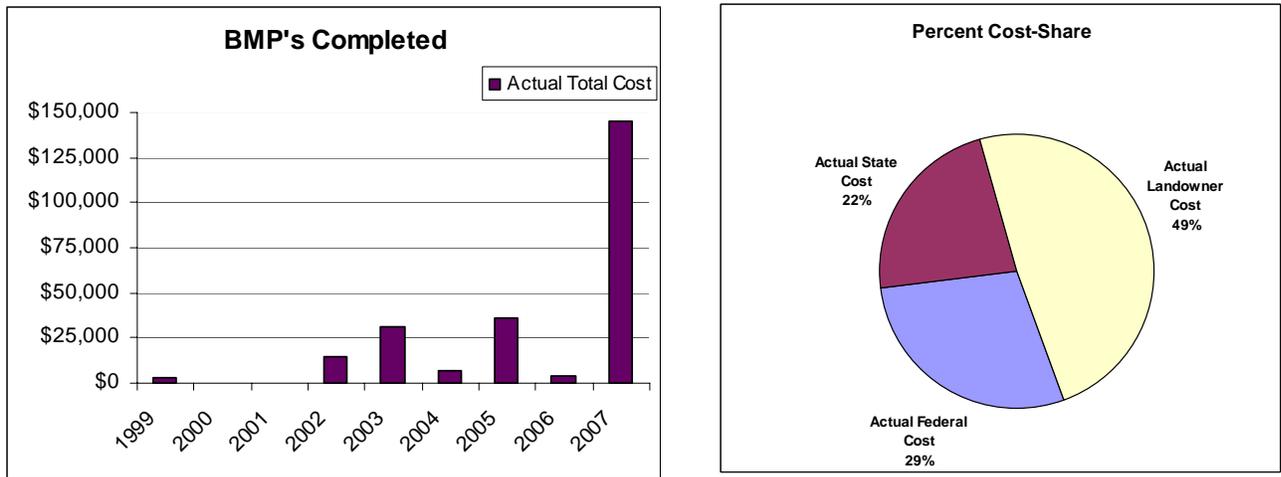


Figure 6.

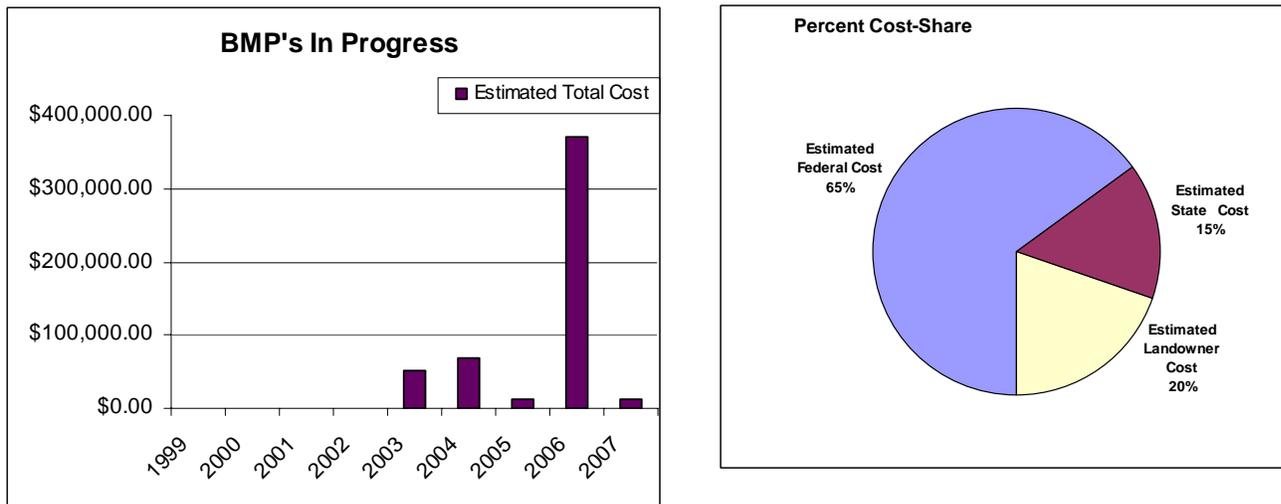


Table 7. Percent of Animal Units in Dairy Operations Treated Through BMP's

	Farms	Animal Units	% Treated
Total Farms	16	1370	
Farms with Improved Barnyards	4	325	24
Farms with Manure Storage	3	445	32

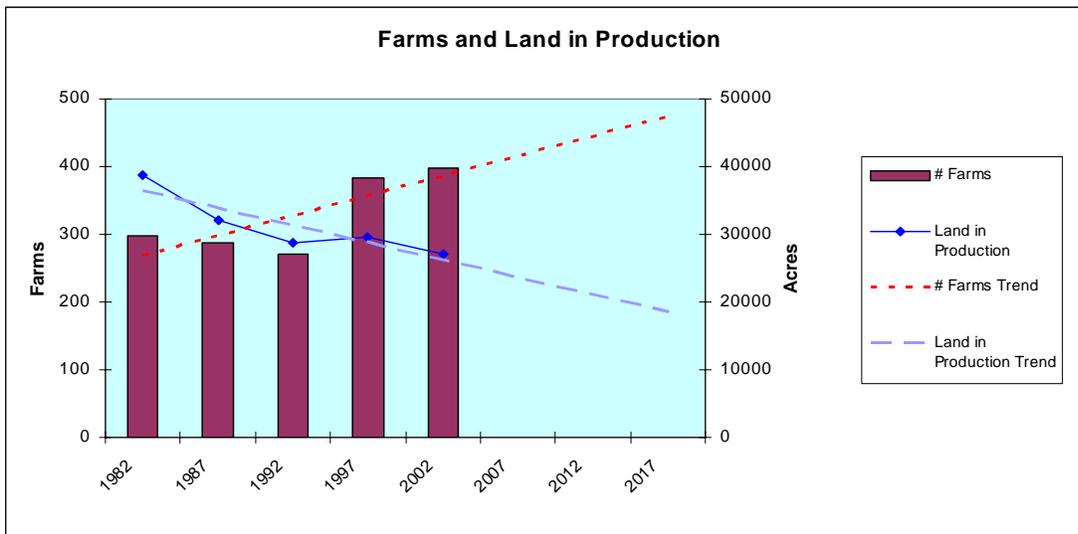
Current Status

The most recent USDA agricultural data available from 2002¹³ reveals that the number of farms in Windham County has increased by nearly 100 over the past 20 years.¹⁴ (Table 8) While this seems to be an encouraging trend, the amount of land that is in some type of agricultural production has actually decreased by 30 % over the same period.

Table 8.

	1982	1987	1992	1997	2002
# Farms	298	287	270	384	397
Total Land in Farms	61243	53474	43987	50882	61596
Acres in Cropland	23423	19834	18467	19622	18042

Figure 7.



The loss of open agricultural land has many implications. If it is lost to development, the land will never again be available for food and fiber production in the future. Development has been shown to have a greater adverse impact on water quality than does agricultural land. The increase in pavement and other impervious areas can increase runoff and carry toxic pollutants into waterways.

Increased development also means greater disturbance to soils, greater impact on natural resources and greater stress on existing farmland to both produce more on less land and to maintain the pastoral nature of the

¹³ USDA 1987, 1992, & 2002. Census of Agriculture, Vermont State and County Data, Windham County.

¹⁴ USDA Census data is tracked on a county basis. The majority of Basin 11 is within Windham County so data for Windham County is used in all report statistics.

landscape. This becomes increasingly difficult with the concurrent increase in the cost of farming due to higher land costs and higher tax rates. Loss of Vermont's pastoral aesthetic may ultimately impact the State's tourism industry.

Projecting out at the present rate of loss, Windham County will have fewer than 20,000 acres in agriculture by the year 2017 (Figure 7). This is only 4% of the land base of the county and would dramatically change the cultural and environmental qualities of the area. It is possible that the growth trend in the number of farms will come to a quick halt as agricultural land becomes scarcer.

The current economic impact of agriculture in the watershed is also noteworthy. The market value for agricultural products sold in the county has steadily increased from \$13 million in 1982 to \$18 million in 2002. With total production expenses of nearly \$19 million including nearly \$2 million in property taxes, agriculture puts a significant amount of money into the local economy.

Trends for the Future

Current trends indicate that in the coming decades it is likely that agriculture in the Basin will continue to diversify toward smaller operations with more vegetable and truck farms and specialty food operations such as cheese also increasing. More organic production is likely as the demand continues to grow for organic vegetables, fruit, meat and dairy products.

Recently, one of the largest and most widely known dairy farms in the area, the Retreat Farm in Brattleboro, has been forced to sell off its cows. It is hoped that the dairy farm and petting farm will continue in some way, but its future is uncertain. The loss of this farm and its educational facilities could have long-lasting effects on the face of agriculture in the area.

Successes

Now, more than ever, farmers are under considerable pressure to sustain economically viable and environmentally sound farming operations. Farmers must face labor issues, foreign competition, competing land use pressures, regulations concerning animal husbandry, genetics, food safety and stricter water quality regulations under the State's Accepted Agricultural Practices (AAP). In complying with these new AAP's, farmers must address five key water quality protection concepts:

- Riparian buffer development and stream bank management criteria
- Livestock impacts on stream banks
- Setbacks from wells and property boundaries
- Soil testing for manure spreading and record keeping
- On-site disposal or composting of animal mortalities

Federal, State and private agencies have taken steps to protect farmland and farm water quality through many of the programs listed in the 'Programs to Address Issues' section. This land protection ensures the availability of agricultural land for future food and fiber production and provides those presently working the farm with some financial assistance to help them succeed. These programs often include assistance for installing conservation

practices on the farm that reduce non-point source pollution such as fencing animals out of streams to prevent damage to streambanks and providing them with alternative watering systems.

Within Basin 11, USDA's EQIP program is in the process of installing a waste storage facility, a roofed loafing area, streambank exclusion fencing and other BMP's on 3 farms. Many practices have also been implemented in past years such as walkways and access lanes, streambank stabilization and heavy use area protection on 4 farms. USDA's WHIP program has worked with 2 farms implementing practices such as wildlife food plots and invasive species removal. The NRCD's Southern Vermont Nutrient Management Program and the Land Treatment Planning services, which assist farmers with environmental issues, have developed nutrient management plans for 3 farms and land treatment plans for 1 farm in the basin. These programs often incur no cost to farmers due to funding from VAAFMs Nutrient Management Plan Incentive Grants or support of the Southern Vermont Nutrient Management Program.

Areas in Need of Attention Due to Agricultural Impacts

There are currently no waters in Basin 11 that are listed on the State of Vermont 303(d) list as impaired due to agricultural impacts. One stretch is listed as “In Need of Further Assessment” for possible agricultural reasons.

Current Condition:

- VT11-01, Lower Williams River (Mouth upstream to Middle Branch confluence)
 - Possible pollutants include sediments, nutrients and temperature.
 - Possible problems needing assessment include encroachments and runoff from agriculture and development, and poor riparian condition.
- One major farm is currently participating in EQIP and will be implementing several best management practices.

Agricultural Needs:

- Irrigation
- Animal Watering

Remediation Options:

The Lower Williams River could benefit from the following Best Management Practices:

- Waste Storage Facilities and Systems
- Improved Barnyards and Heavy Use Area Protection
- Roof Runoff Management
- Milkhouse Waste Management
- Silage Leachate Management
- Stream Crossings for Animals, Walkways and Access Lanes
- Fencing Along Streams to Exclude Animals
- Buffers Along Waterways, Forest and Herbaceous
- Nutrient Management Planning
- Pasture Management
- Surface Water Diversions
- Sediment Basins
- Streambank Stabilization
- Stream Channel Stabilization
- Streambank and Shoreline Protection
- Strip Cropping
- Wildlife Habitat Management

Recommendations for Agricultural NPS Improvement in the Basin

The following recommendations were developed from input to the Basin 11 Watershed Council through public forums and focus groups held from January 2004 to December 2005.

STRUCTURAL PRACTICES

- **Recommendation:** Seek increased funding opportunities for water quality BMP's and equitable distribution of the funds statewide.

Strategies:

- 1) Work with USDA/NRCS to increase funding for programs such as EQIP, AMA, CRP, CREP, WHIP, etc.
- 2) Work with VT AAFM to increase funding for programs such as VT Buffer Program, NMP and FAP.
- 3) Work with USF&WS to increase funding for PFW program to install more riparian buffers and fencing.
- 4) Work with USDA/NRCS, VAAFAM, and others to improve statewide equitability of EQIP ranking system.

Lead Agencies: VAAFAM, NRCD's, WRWA, VDEC, VT Farm Bureau, local watershed groups

Funding options: NA

Timeline: On-going

- **Recommendation:** Implement water quality BMP's on willing farms.

Strategies:

- 1) Increase funding for and technical assistance available on BMP's.
- 2) Enroll farms in the appropriate cost-share programs.
- 3) Implement planned and funded improvement projects.

Lead Agencies: NRCS, VAAFAM

Funding options: EQIP, AMA, CRP, CREP, WHIP, PFW, etc.

Timeline: On-going

LAND-BASED PRACTICES

- **Recommendation:** Continue outreach to farmers about AAP's and cost-share programs.

Strategies:

- 1) Work through NRCD technical assistance programs like ARS, SVNMP, and LTP to increase knowledge and understanding of AAP's and potential funding opportunities to address water quality issues on farm.
- 2) Increase outreach efforts to target horse and small animal producers with information on technical assistance programs, AAP's and funding opportunities.
- 3) Work with area land trusts and conservation organizations on farmland protection programs.

Lead Agencies: NRCD's, VAAFAM, NRCS, UVM Extension

Funding options: CWA Sec. 319 grants, ARS, LTP, SVNMP budgeting

Timeline: On-going

- **Recommendation:** Continue work with farmers, through programs like CREP and VABP to increase voluntary effort to establish buffers along surface waterways. Work in partnership with DEC to establish these buffers while maintaining the economic integrity of the agricultural land base in the basin.

Strategies:

- 1) Promote the cost share programs available for animal exclusion fencing and buffer establishment including EQIP, AMA, CREP, CRP, PFW, VT Agricultural Buffer Program, etc.
- 2) Organize volunteers to plant buffers on participating agricultural land.

Lead Agencies: FSA, NRCS, VAAFAM, NRCD's, DEC

Funding options: EQIP, AMA, CREP, CRP, PFW, VT Agricultural Buffer Program, TNC

Timeline: On-going

INFRASTRUCTURE

- **Recommendation:** Increase funding to promote farm viability through programs that assist farmers in diversification or transitioning to alternative systems or support conventional dairy farming.

Strategies:

- 1) Work through Vermont NOFA to provide technical assistance to farmers on transitioning to organic.
- 2) Work through groups such as VFB and Rural VT on providing technical assistance on diversification.
- 3) Work through local and regional power companies to increase capacity of farm generated power.
- 4) Work through USDA RD for technical assistance in developing farm business plans and funding projects.

Lead Agencies: USDA NRCS & RD, VAAFAM, NRCD's, UVM Extension, VT NOFA, VFB, Rural Vermont

Funding options: EQIP, CVPS, VT Alternative Manure Management grants

Timeline: On-going

- **Recommendation:** Support tax programs like Current Use that keep land in agriculture.

Strategies:

- 1) Work with State and Federal legislators to address state tax programs effecting farmland

Lead Agencies: VAAFAM, NRCD's, VT NOFA, Vermont Farm Bureau, Rural Vermont

Funding options: NA

Timeline: On-going

- **Recommendation:** Support programs that better serve the farming industry in Vermont.

Strategies:

- 1) Work with State and Federal legislators to address milk pricing issues through regional policies.
- 2) Work through groups such as VFB and Rural VT to establish infrastructure for transport, storage and processing of diversified farm products.

Lead Agencies: VAAFAM, NRCD's, VT NOFA, Vermont Farm Bureau, Rural Vermont, FSA, RD, RC&D

Funding options: NA

Timeline: On-going

- **Recommendation:** Create a database to compile agricultural statistics by watershed rather than political boundaries.

Strategies:

1) Work with NEAS and USDA to begin compiling statistics in more flexible and/or searchable format.

Lead Agencies: FSA, NRCS, VAAFM, NRCD's, NASS

Funding options: NA

Timeline: On-going

Programs To Address Issues

See APPENDIX B.1 - Agricultural Runoff Control Programs

APPENDIX A.11 - Maps of Basin 11 with Proposed Typing and Classification

**Held Pending
Water Resources Panel Decision**

APPENDIX A.12 - Description of Proposed Water Management Type B1 in the Basin

**Held Pending
Water Resources Panel Decision**

APPENDIX A.13 – Existing Uses in Basin 11 Waters

Determination of Existing Uses for Flowing Waters in Basin 11

Contact Recreation

Site	Waterbody	Location of Use	Town	Documentation of Existing Use
Brookline Bridge	West River	West River crossing Newfane/Brookline town line	Brookline/Newfane	Swimming hole below bridge
Dummerston Covered Bridge	West River	Rte. 30 jct. of Eastwest Rd.	Dummerston	Swimming hole below bridge
Dumplings	West River	Jamaica State Park	Jamaica	Swimming hole in state park
Jamaica State Park Beach	West River	Jamaica State Park	Jamaica	Swimming beach in state park
Salmon Hole	West River	Jamaica State Park	Jamaica	Swimming hole in state park
Scott Covered Bridge	West River	USACE lands	Townshend	Swimming hole below bridge
South Londonderry	West River	USACE lands	South Londonderry	Swimming hole below bridge
Townsend Lake Beach	West River	USACE lands	Townshend	Swimming beach at USACE dam
Winhall Campground	Winhall & West confluence	USACE lands	Winhall	Swimming beach at USACE campground
Kendall Farm Road – end of road	Winhall River	GMNF lands	Winhall	Swimming hole
Indian Love Call, Rock River 1 mi up	Rock River	Town legal trail along Depot Rd.	Newfane	Series of swimming holes from mouth to 1 mile up river
Hamilton Falls	Cobb Brook	Jamaica State Park	Jamaica	Swimming hole in state park
Pikes Falls	North Branch Ball Mountain Brook	Town of Jamaica conservation lands along Pikes Falls Rd.	Jamaica	Swimming hole in town preserve
Saxtons River Falls	Saxtons River	Below falls under Rte. 121 bridge crossing	Saxtons River	Swimming hole at end of town road

Boating

Waterbody	Location of Use	Town	Documentation of Existing Use
West River	Weston to Londonderry	Weston, Londonderry	Rated as IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: Bridge off Village Green Take Out: Rte 11 crossing at dam
	Londonderry to Ball Mountain Dam	Londonderry, Jamaica	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: Rte 11 crossing at dam Take Out: USACE Ball Mountain Dam
	Ball Mountain Dam to Townshend Dam	Jamaica, Townshend	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992), nationally known whitewater releases, national team trials site Put In: USACE Ball Mountain Dam Take Out: USACE Townshend Dam
	Townshend Dam to the Connecticut River	Townshend, Newfane, Brookline, Dummerston, Brattleboro	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: USACE Townshend Dam Take Out: Retreat Meadows boat launch
Winhall River	Kendall Farm Road to the West River	Winhall, Jamaica, Londonderry	Rated as HIGHLY IMPORTANT for boating, continuous Class III run of over 4 miles (source: Jenkins & Zika, 1992) Put In: GMNF land at Arthur Court bridge crossing Take Out: USACE Winhall Campground
Wardsboro Brook	Wardsboro to Jamaica	Wardsboro, Jamaica	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: South Wardsboro Road crossing Take Out: Eaton Rd. crossing USACE property
Williams River	Chester to Brockways Mills	Chester, Springfield, Rockingham	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: Flamstead Rd. bridge crossing Take Out: Above Brockways Mills Dam
Middle Branch Williams River	Five miles above Chester down to Chester center	Andover, Chester	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: Rte. 11 bridge crossing east of Hill Top Rd. Take Out Pull off at Jct. of Rte's 11 and 103
Saxtons River	Grafton to Saxtons River village	Grafton, Rockingham	Rated as HIGHLY IMPORTANT for boating (source: Jenkins & Zika, 1992) Put In: Town park on South Branch of the Saxtons River 0.5 miles up from confluence with the Saxtons mainstem Take Out: Rte. 121 left bank road pull off 0.3 mi. upstream of Pleasant Valley rd jct.

Fishing

Waterbody	Location of Use	Town	Documentation of Existing Use
West River	Stoddard Market to Thompsonburg bridge	Londonderry	Trout Stocking
West River	Cobb Brook to Jamaica State Park entrance bridge	Jamaica	Trout Stocking
West River	Rte 5 bridge above confluence with the Connecticut River	Brattleboro	Special Fishing Regulation Area
West River	Rte 5 bridge above confluence with the Connecticut River to Townshend Dam	Townshend, Jamaica	Special Fishing Regulation Area
West River	Above Townshend Dam to Rte 100 bridge in Jamaica	Townshend, Jamaica	Special Fishing Regulation Area
Grassy Brook	Mouth to first bridge above confluence with the West River	Brookline	Trout Stocking
Rock River	Hunter Brook Rd bridge to Williamsville Fire Depart		Trout Stocking
Utley Brook	Landgrove School to FR 10 & 279	Mt. Tabor, Landgrove	Trout Stocking
Wardsboro Brook	Mouth to first Rte 100 bridge above confluence with the West River to W. Wardsboro Cemetery	Wardsboro, Jamaica	Trout Stocking
Winhall River	Winhall Brook Campground bridge to IP road bridge		Trout Stocking
Williams River - upper	Cavendish Gulf Rd to Rte 11 bridge	Chester	Trout Stocking
Williams River - lower	RR crossing on Green Mountain Turnpike to Parker Hill rd bridge	Chester, Rockingham	Trout Stocking
Williams River - Middle Branch	Chester Rod & Gun Club to Rte 103 bridge	Chester	Trout Stocking
Williams River	Mouth to first Rte 5 bridge above confluence with the Connecticut River	Rockingham	Special Fishing Regulation Area
Williams River	First Rte 5 bridge above confluence with the Connecticut River to above Brockways Mills Dam	Rockingham	Special Fishing Regulation Area

Waterbody	Location of Use	Town	Documentation of Existing Use
Saxtons River - lower	I-91 overpass to jct. of Rte's 121 & 35		Trout Stocking
Saxtons River - upper	Bridge near jct. of 121 & 35 to Grafton Town Garage	Grafton, Rockingham	Trout Stocking
Saxtons River	Mouth to first Rte 5 bridge above confluence with the Connecticut River	Westminster	Special Fishing Regulation Area

Water Supply

Waterbody	Water Supply For	Town	Documentation of Existing Use
Bolles Brook	Saxtons River & Vermont Academy	Rockingham	Class A2, Emergency Use
Chester Reservoir & the outlet stream	Village of Chester water supply - emergency	Chester	Class A2, Emergency Use
Stickney Brook, above water intake	Town of Brattleboro water supply	Marlboro, Newfane, Dummerston	Class A2
Styles Brooks	Stratton Corp.	Stratton	Class A2, Emergency Use
Sunset Lake	Town of Brattleboro water supply	Marlboro, Newfane, Dummerston	Class A2

(DRAFT)
VERMONT ANTI-DEGRADATION IMPLEMENTATION

**EXISTING USE DETERMINATION FOR USE
DURING RIVER BASIN PLANNING**

It is the policy of the State of Vermont to protect and enhance the quality, character and usefulness of its surface waters, prevent the degradation of high quality waters, and prevent, abate or control all activities harmful to water quality. Further, Vermont's Anti-Degradation Policy requires that the existing uses and the level of water quality necessary to protect those existing uses shall be protected and maintained (Section 1-03, Vermont Water Quality Standards). Determinations on the presence of an existing use can be made during basin planning or on a case-by-case basis such as during consideration of a permit application.¹⁵ The Agency of Natural Resources will use the following process to identify existing uses of contact recreation, fishing, boating and public drinking surface water supplies during river basin planning and the development of river basin water quality management plans.

1. The Agency will presume that all lakes and ponds that exist within a river basin have existing uses of fishing, contact recreation and boating. This simplifying assumption is being used for two principal reasons: first, the well known and extensive use of these types of waters for these activities based upon their intrinsic qualities; and, secondly, to avoid the tedium associated with the production and presentation of exhaustive lists of all of these types of waterbodies across any given river basin. This presumption may be rebutted on a case-by-case basis during the Agency's consideration of a permit application which might be deemed to affect these types of uses.
2. Each river basin plan will include a list of existing uses of contact recreation, fishing, boating in/on flowing waters and a list of public drinking surface water supplies, which will be identified using the criteria set forth below.
3. To determine the presence of an existing use of contact recreation, fishing or boating on/in flowing waters or a public drinking water supply during the river basin planning process, positive findings with respect to several conditions need to be made. The unique set of criteria for each particular existing use is set forth below.
4. The list of existing uses in each river basin plan is not intended to represent an exhaustive list of all existing uses, but merely an identification of very well known existing uses. Additional existing uses of contact recreation, boating and fishing

¹⁵ As per the Vermont Water Quality Standards, "existing use means a use which has actually occurred on or after 11/28/1975, in or on waters, whether or not the use is included in the standard for classification of the waters, and whether or not the use is presently occurring."

on/in flowing waters and additional public drinking water supplies may be identified during the Agency's consideration of a permit application.

Contact Recreation in Flowing Waters

The Agency may base its determination of the presence of an existing use for contact recreation in flowing waters if it can be shown there is more than an incidental level of use of the specified water body. The application of existing use determination criteria for contact recreation shall not apply to contact recreation situations that may be occurring but at a level deemed to be incidental, irregular and/or infrequent or in situations where there is no clearly defined or previously established access to the water. In determining the presence and level of use in a specified water body, positive findings are needed for both condition 1 and 2:

Condition 1. There is documentation and/or physical evidence that people have access to the waters for contact recreation.

Documentation or physical evidence may consist of:

- a. Existence of road pull-off areas, public parking areas, and public access trails.
 - ☞ Video and/or pictures taken from adjacent roads and from the water.
- and
- b. Status of land ownership: public lands and/or public easements defining access locations
 - ☞ Previously designated public contact recreation or public beach area.
 - ☞ Maps of municipal, state, or federal lands (including road rights-of-ways and bridge crossings).
 - ☞ Documents referring to easements on private lands granting public access to the water for contact recreation purposes;

Condition 2. There is documentation and/or physical evidence of attractive contact recreation sites in and along the affected water.

Documentation or physical evidence may consist of:

- a. Presence of any sandy or grassy beach or rock outcropping areas where people can comfortably rest out of the water.
 - ☞ Maps, video or pictures taken along the shore land of the affected waters.
- b. Presence of area with sufficient depth, deep water holes, cascades, gorges, rock outcroppings or large boulders in or along the affected waters that create a slow and safe water area for swimming, wading, floating, tubing and/or bathing.
 - ☞ Maps, video or pictures taken of the affected waters.
- c. Presence of aesthetically pleasing waters.

- ☞ Observations concerning water clarity and substrate composition.
- ☞ Water quality data concerning level of human health risk (such as E.coli abundance) has been regularly collected.

Recreational Boating on Flowing Waters

The Agency may base its determination of the presence of an existing use for recreational boating if it can be shown there is more than an incidental level of use of the specified water body. The application of existing use determination criteria for boating shall not apply to those recreational boating situations that may be occurring but at a level deemed to be incidental, irregular and/or infrequent or in situations where there is no clearly defined or previously established public access to the water. In determining the presence and level of boating use in, on or along a specified water body, positive findings are needed for both condition 1 and 2:

Condition 1. There is documentation and/or physical evidence that people have access to the specified reach of water for recreational boating.

Documentation or physical evidence may consist of:

- a. Evidence of road pull-off areas, public parking areas, and public access to the waters edge for boat put-ins, take-outs and portage routes.
 - ☞ Maps (digital or hardcopy) of designated public boating access points and public pathways to the water.
 - ☞ Video and/or pictures taken from adjacent roads and from the water.
 - ☞ Video and/or pictures taken of specified access area in use.
 - ☞ Video and/or pictures taken of designated public boating access points and public pathways to the water.

and

- b. Status of land ownership: public lands and/or public easements defining access locations.
 - ☞ Maps of municipal, state, or federal lands (including road rights-of-ways and bridge crossings) detailing public boating access points and public pathways to the water.
 - ☞ Documents referring to easements on private lands that grant public access to the water for recreational boating purposes;

Condition 2. There is documentation and/or physical evidence of attractive recreational boating in, on or along the specified reach of water.

Documentation or physical evidence may consist of:

- a. Features (unique or otherwise noted) valued for recreational boating (whitewater or flat-water).
 - ☞ Video or pictures taken along the shore land of the specified waters and features.
- b. Pooled water, rapids, ledges, cascades, gorges, rock outcroppings or large boulders in or along the specified reach that create rapids or pools for boating.
 - ☞ Video or pictures taken of the specified waters.

c. Aesthetically pleasing waters.

☞ Observation of water clarity and substrate composition.

Recreational Fishing in Flowing Waters

The Agency may base its determination of the presence of an existing use for recreational fishing if it can be shown there is more than an incidental level of use of the specified water body. The application of existing use determination criteria for fishing shall not apply to situations where fishing may be occurring but it is being done at a level deemed to be incidental, irregular and/or infrequent or in situations where there is no clearly defined or previously established public access to the water. In determining the presence and level of use in a specified water body, positive findings are needed for both condition 1 and 2 or for either condition 3 or 4:

Condition 1. There is documentation and/or physical evidence that people have public access to the waters for recreational fishing.

Documentation or physical evidence may consist of:

- a. Existence of road pull-off areas with public parking areas, public access trails, publically accessible streambanks or similar features.

☞ Video and/or pictures taken from adjacent roads and from the water.

and

- b. Status of land ownership: public lands and/or public easements defining access locations.

☞ Previously designated public boat launching area with vehicle parking.

☞ Maps of municipal, state, or federal lands (including road rights-of-ways and bridge crossings).

☞ Documents referring to easements on or across private lands granting public access to the water for recreational fishing purposes.

☞ Documentation of private ownership by 501c3 non-profit conservation organizations and/or land trusts that promote or grant public access for fishing.

AND

Condition 2. There is documentation and/or physical evidence of sites to fish in, on or along the specified reach of water.

Documentation or physical evidence may consist of:

- a. Presence of any land areas along rivers where people can comfortably engage in angling.

☞ Video or pictures taken along the shore land of the affected waters.

- b. Presence of pools, fish refuge areas and other habitats in, on or along the affected waters (especially rivers) that create sufficient habitat structure and diversity suitable for fish targeted by Vermont anglers.

☞ Video or pictures taken of the affected waters.

- c. Presence of fish populations targeted by Vermont anglers.

☞ Fish population surveys documenting the presence of target species.

☞ Survey data concerning angler use and catch rates.

- ☞ Water quality data concerning target fish suitability and sustainability has been regularly collected.

OR

Condition 3. There is documentation of reaches where special regulations for fishing have been imposed by the State of Vermont (whether stocked fish or not).

Documentation or evidence may consist of:

- a. Type, nature and subject species of special fishing regulation(s).

OR

Condition 4. There is documentation of reaches or affected waters that are stocked as a result of being identified on the State's Managed Request for Cultured Fish.

Documentation or evidence may consist of:

- a. Species being stocked and stocking history of affected waters.

Public Drinking Surface Water Supply

The Agency may base its determination of the presence of an existing use for a public drinking surface water supply if there is more than an incidental use of the specified water body as a public drinking surface water supply. The application of existing use determination criteria for public drinking surface water supplies shall not apply to non-public or domestic water supply withdrawals (e.g. single family residence) from a specified surface water. In determining the presence of an existing use of a public drinking surface water supply source in a specified water body, positive findings are needed for one the following two conditions:

Condition 1. Documentation and/or physical evidence exists that the specified waters are used as a source for public drinking water supply.

Documentation and physical evidence may consist of:

- a. Recorded regular use of specified water body as an active public drinking water supply source.
 - ☞ Maps and documents detailing supply intake locations, permits, source protection areas and approximate number of connections or people served.
- b. Recorded use of specified water body as a designated emergency (not in active use) public drinking water supply source.
 - ☞ Maps and documents detailing supply intake locations and inclusion in source protection areas, plans or permits, etc.
- c. A physical intake for treatment and distribution of water for public drinking water supply from specified water body.

OR

Condition 2. Documentation and/or physical evidence exists that the specified groundwater source for public water supply meets the State's criteria for "groundwater under the direct influence of surface water."

Documentation and physical evidence may consist of:

- a. Maps and documents detailing surface water infiltration of public drinking water groundwater source from specified surface water body, including but not limited to pumping tests results and microscopic particulate analysis.
- b. Infiltration of groundwater sources from specified surface water body.
- c. Proximity and depth of groundwater source to adjacent surface water.

APPENDIX A.14 - Municipal Planning and Water Resources Review

Town Plan					
TOWN	Andover	Athens	Brattleboro	Brookline	Cavendish*
Date in effect	9-Mar-98	No Plan	May-07	17-Aug-05	9-Jan-07
WQ Areas Covered in Plan					
Water Quality	No		Yes	Yes	Yes
Classification	No		No	Mentioned	No
Rivers & Streams	No		Yes	Yes	Yes
Inventory	No		Yes	partial	partial
Lakes and Ponds	No		Yes	No	Yes
Inventory	No		Yes	No	partial
Wetlands	No		Yes	Yes	Yes
Inventory	No		Yes	No	No
Buffers	No		Yes	Yes	Yes, 50-100'
Floodplains	No		Yes	Yes	Yes
Flood Hazard Areas	No		Yes	Yes	Yes
Shorelands	No		Yes	No	No
Swimming Areas	No		No	No	Yes
Water Recreation	No		Yes	No	Yes
Dams & Impoundments	No		No	No	No
Inventory	No		No	No	No
Riparian Zone	No		No	No	No
Groundwater / Aquifers	No		Yes	Yes, groundwater	Yes
Water Supply Protection	No		Yes	Yes	Yes
Wastewater Systems	No	Sewer ordinance (1987)	Yes	Yes	Yes
Fisheries	No		No	No	Yes
Natural Habitats	No		Yes	Yes	Yes
Natural Communities	No		Yes	Yes	Yes
Exotic Invasive Species	No		No	No	No
Agriculture	No		Yes	Yes	Yes
Forestry	Yes		Yes	Yes	Yes
Earth Resource Extraction	in zoning		Yes	Yes	Yes

ZONING					
TOWN	Andover	Athens	Brattleboro	Brookline	Cavendish*
Date in effect	10/24/05 interim	No Zoning	24-Oct-06	No Zoning	No Zoning
Areas Covered in Ordinances					
Floodplain Protection	in PUD only		Yes	Yes	
Flood Hazard Area Protection	Yes		Yes	Yes (not NFIP participant)	Yes
Shoreline Protection	No		Yes, for CT & West Rivers only		
Wetlands Protection	in PUD only		No		
Riparian Protection	in PUD only		No		
Fisheries Protection	No		No		
Public Access Protection	No		No		
Setbacks from water	No		No		
Buffers Required	No		Yes, no width requirement		
Stormwater Ordinances	No		Yes		
Erosion & Sediment Control	No		Yes		
Steep Slope / Ridgeline Development	in PUD only		No	Yes in Town Plan	in town plan
Subdivision Regulations PRD / PUD	No Yes		Yes Yes		
Site Plan Review	Yes		Yes		
Road Standards	No		No	Yes	
Bridge and Culvert Assessments	No		No	No	
TOWN GOVERNMENT					
Planning Commission	Yes		Yes	Yes	Yes
Zoning Board of Adjustment	Yes		No	No	
Development Review Board	No		Yes	No?	
Conservation Commission	No			No	

Town Plan					
TOWN	Chester	Dover *	Dummerston	Grafton	Jamaica
Date in effect	18-Jun-03	4-Dec-01	11-Aug-04	29-Jul-03	12-Jun-06
WQ Areas Covered in Plan					
Water Quality	Yes	Yes	Yes	Yes	Yes
Classification	No	No	Yes	Yes	Yes
Rivers & Streams	Yes	Yes	Yes	Yes	Yes
Inventory	No	No	partial	No	Yes
Lakes and Ponds	Yes	Yes	Yes	Yes	Yes
Inventory	No	No	Map	No	Yes
Wetlands	Yes	Yes	Yes	Yes	Yes
Inventory	No	No	Map	No	NWI
Buffers	Yes	Yes	Yes	Yes	Yes
Floodplains	No	Yes	Yes	Yes	No
Flood Hazard Areas	No	Yes	Yes	Yes	Yes
Shorelands	No	Yes	in zoning	No	Yes
Swimming Areas	No	No	Yes	No	No
Water Recreation	No	No	Yes	No	No
Dams & Impoundments	No	No	No	No	No
Inventory	No	No	No	No	No
Riparian Zone	Yes	No	No	Yes	No
Groundwater / Aquifers	Yes	Yes	Yes	No	Yes
Water Supply Protection	Yes	Yes	Yes	No	No
Wastewater Systems	Yes	Yes	No	in zoning	Yes
Fisheries	No	Yes	No	No	No
Natural Habitats	No	Yes	No	No	Yes
Natural Communities	No	No	Yes	No	Yes
Exotic Invasive Species	No	No	No	No	No
Agriculture	Yes	Yes	Yes	Yes	Yes
Forestry	Yes	Yes	Yes	Yes	Yes
Earth Resource Extraction	Yes	Yes	Yes	Yes	Yes

ZONING					
TOWN	Chester	Dover *	Dummerston	Grafton	Jamaica
Date in effect	17-Jul-06	8-Nov-88	20-Jun-07	various	
Areas Covered in Ordinances					
Floodplain Protection	Yes	Yes	Yes	No	No
Flood Hazard Area Protection	Yes	Yes	Yes	Yes	Yes (1991)
Shoreline Protection	Yes for lakes & aquifers only	No	Yes	No	No
Wetlands Protection	No	Yes	No	No	No
Riparian Protection	No	No	No	No	No
Fisheries Protection	No	Yes, only for Sensitive Wildlife Resource Overlay District	No	No	No
Public Access Protection	No	No	No	No	in town plan
Setbacks from water	No	No	Yes - 100' septic - 50' developments	No	No
Buffers Required	Recommended	Yes only for Sensitive Wildlife Resource Overlay District	No	No	No
Stormwater Ordinances	Yes for subdivisions	No	No	Yes for subdivisions	No
Erosion & Sediment Control	Yes	Yes	Yes	Yes for subdivisions	No
Steep Slope / Ridgeline Development	No	Yes for PUDs	No	No	in town plan
Subdivision Regulations PRD / PUD	Yes	Yes	No	Yes	No
Site Plan Review	Yes for subdivisions	Yes, limited	Yes	Yes	No
Road Standards	Minimum adopted	No	No	Yes for subdivisions	No
Bridge and Culvert Assessments	No	No	No	partial in town plan	No
TOWN GOVERNMENT					
Planning Commission	Yes	Yes	Yes	Yes	Yes
Zoning Board of Adjustment	No	No	No	No	No
Development Review Board	Yes	Yes	No	No	No
Conservation Commission	Committee	No	Yes	No	No

Town Plan					
TOWN	Landgrove	Londonderry	Ludlow*	Marlboro	Mount Holly*
Date in effect		1-Oct-05	20-Sep-04	25-Apr-02	Draft May 2007
WQ Areas Covered in Plan					
Water Quality Classification		Yes	Yes	Yes	No
Rivers & Streams Inventory		No	No	Yes	No
Lakes and Ponds Inventory		Yes	Yes	Yes	No
Wetlands Inventory		No	partial	partial	No
Buffers		Yes	Yes	Yes	Yes
Floodplains		No	partial	Yes	Yes
Flood Hazard Areas		Yes	Yes	Yes	Yes
Shorelands		No	No	NWI	partial
Swimming Areas		Yes	Yes	Yes	No
Water Recreation		Yes	No	Yes	Yes
Dams & Impoundments Inventory		No	Yes	No	No
Riparian Zone		1 mentioned	No	Yes	No
		No	No	No	No
Groundwater / Aquifers		Yes	No	Yes	No
Water Supply Protection		Yes	Yes	Yes	No
Wastewater Systems		No	Yes	in zoning	No
Fisheries		No	No	No	No
Natural Habitats		No	No	Yes	No
Natural Communities		No	No	Yes	Yes
Exotic Invasive Species		No	No	No	No
Agriculture			Yes	Yes	No
Forestry			Yes	Yes	No
Earth Resource Extraction			Yes		No

ZONING					
TOWN	Landgrove	Londonderry	Ludlow*	Marlboro	Mount Holly*
Date in effect			17-Jul-06	Mar-03	no zoning
Areas Covered in Ordinances					
Floodplain Protection			Yes	Yes	No
Flood Hazard Area Protection			Yes	Yes (2003)	No
Shoreline Protection			No	Yes	No
Wetlands Protection			No	No	No
Riparian Protection			No	No	No
Fisheries Protection			No	No	No
Public Access Protection			No	mentioned in town plan	No
Setbacks from water			Yes for Aquifer Protection and Lake zoning districts only	100' for septic, 75' for structures, 50' buffer	No
Buffers Required			No	Yes, 25' most shorelines	No
Stormwater Ordinances			No	Yes, for new dev.	No
Erosion & Sediment Control			No	Yes	No
Steep Slope / Ridgeline Development		Yes in Town Plan	No	no development on slope >25%	No
Subdivision Regulations PRD / PUD			Yes	Yes Yes	Yes No
Site Plan Review			Required for landfills	Yes	No
Road Standards			No	No	Yes
Bridge and Culvert Assessments			No	No	No
TOWN GOVERNMENT					
Planning Commission			Yes	Yes	Yes
Zoning Board of Adjustment			No	Yes	No
Development Review Board			Yes	No	No
Conservation Commission			No	Yes	No

Town Plan						
	TOWN	Mount Tabor	Newfane	Peru	Putney*	Rockingham
	Date in effect		13-Sep-06		no mapped hydrology	20-Mar-01
	WQ Areas Covered in Plan					
	Water Quality Classification		Yes			Yes
	Rivers & Streams Inventory		Yes			A's only
	Lakes and Ponds Inventory		Yes			Yes
	Wetlands Inventory		partial			partial
	Buffers		No			Yes
	Floodplains		No			partial
	Flood Hazard Areas		Yes			No
	Shorelands		NWI			No
	Swimming Areas		Yes			Yes
	Water Recreation		Yes			No
	Dams & Impoundments Inventory		Yes			Yes
	Riparian Zone		No			No
			Yes			Yes
	Groundwater / Aquifers		Yes/no mapping			Yes
	Water Supply Protection		Yes			Yes
	Wastewater Systems		No			Yes
	Fisheries		Yes			No
	Natural Habitats		Yes			No
	Natural Communities		Yes			No
	Exotic Invasive Species		No			No
	Agriculture		Yes			Yes
	Forestry		Yes			Yes
	Earth Resource Extraction		Yes			Yes

ZONING					
TOWN	Mount Tabor	Newfane	Peru	Putney*	Rockingham
Date in effect		1-Dec-05			June 22, 1982 and as amended
Areas Covered in Ordinances					
Floodplain Protection		No			Yes
Flood Hazard Area Protection		Yes			Minimums
Shoreline Protection		Setback			No
Wetlands Protection		Yes / NWI			No
Riparian Protection		Setback			No
Fisheries Protection		no dams on major rivers & streams			No
Public Access Protection		No			No
Setbacks from water		Yes, 75'			No
Buffers Required		Setback			Yes in Town Plan
Stormwater Ordinances		No			No
Erosion & Sediment Control		No			Yes
Steep Slope / Ridgeline Development		no dwelling on slope >25%			No
Subdivision Regulations PRD / PUD		No			Yes
Site Plan Review		Yes			Yes, w/ exceptions
Road Standards		No			Yes
Bridge and Culvert Assessments		42 bridges			No
TOWN GOVERNMENT					
Planning Commission		Yes			Yes
Zoning Board of Adjustment		No			Yes
Development Review Board		Yes			No
Conservation Commission		Yes			No

Town Plan				
TOWN	Springfield	Stratton	Sunderland*	Townshend
Date in effect	12-Apr-04	27-Sep-04	no mapped hydrology	17-Nov-03
WQ Areas Covered in Plan				
Water Quality Classification	Yes	No		Yes
Rivers & Streams Inventory	No	No		Yes
Lakes and Ponds Inventory	Yes	Yes		Yes
Wetlands Inventory	partial	partial		partial
Buffers	Yes	Yes		No
Floodplains	Yes	Yes		No
Flood Hazard Areas	Yes	Yes		Yes
Shorelands	No	No		No
Swimming Areas	Yes	No		No
Water Recreation	Yes	No		No
Dams & Impoundments Inventory	Yes	No		Yes
Riparian Zone	Yes	No		No
	No	Yes		No
Groundwater / Aquifers	Yes	Yes		No
Water Supply Protection	Yes	No		Yes
Wastewater Systems	Yes	No		Yes
Fisheries	No	No		No
Natural Habitats	Yes	Yes		Yes
Natural Communities	Yes	Yes		No
Exotic Invasive Species	Yes	No		No
Agriculture	Yes	Yes		Yes
Forestry	Yes	Yes		Yes
Earth Resource Extraction	Yes	Yes		Yes

ZONING				
TOWN	Springfield	Stratton	Sunderland*	Townshend
Date in effect		draft 12/1/04		no zonig
Areas Covered in Ordinances				
Floodplain Protection	Yes	No		No
Flood Hazard Area Protection	Yes	No		Yes (1998)
Shoreline Protection	CT & Black Shoreline Overlay Dist	No		No
Wetlands Protection	Buffer for Class III	No		No
Riparian Protection	Yes	No		No
Fisheries Protection	No	No		No
Public Access Protection	No	No		No
Setbacks from water	River Front Protection Dist 75'	No		No
Buffers Required	Yes, 25'	No		No
Stormwater Ordinances	No	Yes, in subdiv. reg.		No
Erosion & Sediment Control	No	No		No
Steep Slope / Ridgeline Development	slope	No		No
Subdivision Regulations PRD / PUD	Yes Yes	Yes Yes		No No
Site Plan Review	Yes	Yes		
Road Standards	Yes	Yes		No
Bridge and Culvert Assessments	Yes, AOT	No		partial bridge inventory
TOWN GOVERNMENT				
Planning Commission	Yes	Yes		No
Zoning Board of Adjustment	No	No		No
Development Review Board	Yes	No		No
Conservation Commission	No	No		No

Town Plan						
TOWN	Wardsboro	Westminster	Weston	Wilmington	Windham	Winhall
Date in effect	9-Sep-03	24-Sep-02	28-Aug-06	no mapped hydrology	7-Sep-04	19-Jul-06
WQ Areas Covered in Plan						
Water Quality Classification	Yes	No	Yes		Yes	Yes
Rivers & Streams Inventory	No	No	No		Yes	
Lakes and Ponds Inventory	Yes	Yes	Yes		Yes	Yes
Wetlands Inventory	partial	partial	No		partial	No
Buffers	No	No	Yes		Yes	Yes
Floodplains	No	No	partial		partial	No
Flood Hazard Areas	Yes	Yes	Yes		Yes	No
Shorelands	No	Yes	No		partial	No
Swimming Areas	Yes	Yes			No	No
Water Recreation	No	No	No		No	No
Dams & Impoundments Inventory	No	No	No		No	No
Riparian Zone	No	No	No		No	No
Groundwater / Aquifers	No	Yes	Yes		No	Yes
Water Supply Protection	No	Yes	Yes		No	Yes
Wastewater Systems	No	Yes	No		No	Yes
Fisheries	Yes	No	No		No	No
Natural Habitats	Yes	Yes	Yes		No	Yes
Natural Communities	No	Yes	No		No	Yes
Exotic Invasive Species	No	No	No		No	No
Agriculture	Yes	Yes	Yes		Yes	Yes
Forestry	Yes	Yes	Yes		Yes	Yes
Earth Resource Extraction	Yes	Yes	Yes		Yes	Yes

ZONING						
TOWN	Wardsboro	Westminster	Weston	Wilmington	Windham	Winhall
Date in effect	25-Jan-00	28-Apr-05	6-Mar-07		1-May-01	draft 2005
Areas Covered in Ordinances						
Floodplain Protection	Yes	No	Yes		No	No
Flood Hazard Area Protection	Yes	Yes	Yes		No	No
Shoreline Protection	Yes, setback	No	Yes, Wantastiquet Lake only		No	No
Wetlands Protection	Yes	Yes	No		No	No
Riparian Protection	Yes, setback	No	No		No	No
Fisheries Protection	No	No	No		No	No
Public Access Protection	No	mentioned in TP	No		No	No
Setbacks from water	Yes, 100'	50' w/ exceptions	400' structures, 300' septic		No	No
Buffers Required	No, see setback	Yes, 50' wetlands & named streams, 20' other streams	No		No	100' for ag in C&D zone
Stormwater Ordinances	No	No, mentioned in TP	No		No	No
Erosion & Sediment Control	No		No		No	Yes
Steep Slope / Ridgeline Development	No	Yes,draft 6/07	No		No	No
Subdivision Regulations PRD / PUD	No No	Yes Yes	Yes No		Yes	Yes (1971) Yes
Site Plan Review	Yes	Yes	Yes		Yes	Yes
Road Standards	No	No	No		Yes	No
Bridge and Culvert Assessments	No	No	No		No	No
TOWN GOVERNMENT						
Planning Commission	Yes	Yes	Yes		Yes	Yes
Zoning Board of Adjustment	Yes	Yes	Yes		No	Yes
Development Review Board	No	Yes	No		No	No
Conservation Commission	No	No	Yes		Yes	No

APPENDIX A.15 – USACE / VT ANR / USFWS Agreement & ANR Factsheet

U.S Army Corps of Engineers & Vermont Agency of Natural Resources Coordination Plan for Operating Federal Flood Control Dams in Vermont

Background

In recent years, a number of concerns have been raised pertaining to the operation and maintenance of Federal flood control dams in Vermont and across the New England District. To address these concerns, the Vermont Agency of Natural Resources (VANR), U.S. Fish and Wildlife Service (USFWS), and U.S. Army Corps of Engineers (Corps) have engaged in collaborative discussions since 1999 to identify ways to improve operations at the five Corps' flood control projects in Vermont: Union Village, North Hartland, North Springfield, Ball Mountain and Townshend. As a result of these discussions, operational improvements have been enacted, including implementation of conservation flows and ramping standards.

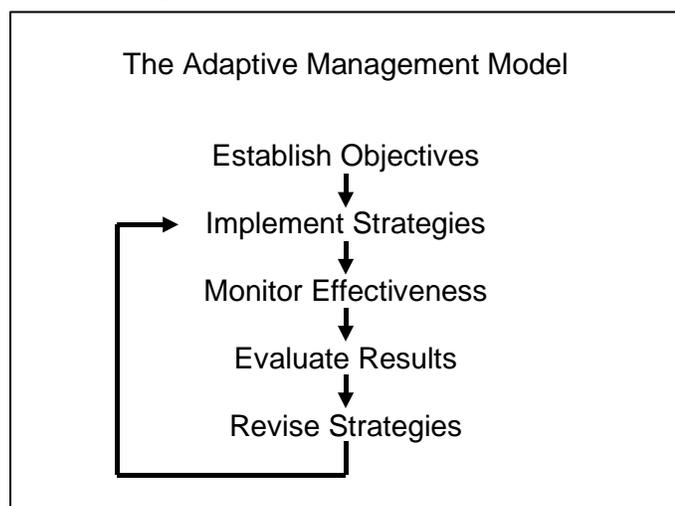
To build on the work performed to date, the three agencies are implementing a three-year adaptive management process (AMP) to use as a framework for identifying and resolving issues of concern. The goal of the process is to evaluate current operational and maintenance practices and identify ways to maintain and restore the integrity of the downstream and upstream aquatic and terrestrial ecosystems while maintaining the projects' primary purpose of flood control and recognizing other recreation and natural resource management objectives.

The Adaptive Management Process

A basic tenet of adaptive management involves continued monitoring and evaluation leading to revised strategies that will achieve the desired results (see figure). This approach allows the participants to address problems and areas of uncertainty over time. In this case, issues related to the operation, maintenance and modification of the flood control projects will be addressed.

Each of the three participating agencies will designate representatives to a working group that will implement this plan. Other participants will be called in as needed to provide their expertise on specific issues.

A key part of the process is the annual interagency coordination meeting, to be held in January of each year. This meeting will provide the agencies with an opportunity to review the previous years' operations, revise operational and monitoring procedures, and raise new issues. Other meetings or site visits will be held as needed.



A number of issues identified and discussed in this plan require resolution or effectiveness monitoring. Adaptive management relies upon the collection of data that can be used to make appropriate adjustments. Assessment plans (for monitoring/assessment/evaluation) will be developed for each pending issue so that participating agencies have the information needed to move forward at each annual meeting.

Responsibility for administering the adaptive management process will rotate among the three agencies on an annual basis. The U.S. Fish and Wildlife Service will take the lead in the first year, followed by the Vermont Agency of Natural Resources, and then the U.S. Army Corps of Engineers. Administrative duties include organizing meetings (scheduling, preparing agendas, preparing meeting notes) and site visits. Each agency will be responsible for suggesting meeting agenda topics and preparing any necessary background material. Any modifications or operational changes agreed to by the parties will be incorporated into the operating and maintenance policies and practices of each project.

The Adaptive Management Plan

Regulation of flood control dams involves both flood control and non-flood control operations. In general, flood control operations involve the coordinated regulation of dams located on tributaries to reduce flood damages downstream of the dam and to reduce flood damages collectively on the Connecticut River. Flood control operations are authorized by Congress and implemented by the reservoir regulation manual for projects in the Upper Connecticut River Basin.

Non-flood control operations describe the scheduled or recurring regulation of the dams for other purposes. Flood control projects in Vermont are authorized to perform natural resources management activities and provide public recreational opportunities. A hydropower facility was added to North Hartland Dam at a later date.

Objectives:

- Maintain the dams' flood control function while mitigating the ecological impacts of flood control operations.
- During non-flood control periods, maintain downstream flows as close to instantaneous run-of-river as feasible, with outflow equal to inflow.

The following sections discuss a number of issues related to dam operation and identify those that will be addressed in the adaptive management process.

Flood Control Operations:

The Corps has maintained that it is necessary to maintain maximum operational flexibility during flood control periods. However, VANR and USFWS have expressed concerns about the

ecological impacts of flood control operations. While the Corps has implemented ramping and conservation flow standards, the VANR and USFWS do not consider those standards protective of downstream resources and have advocated that more information be provided on how more protective standards would affect flood control capabilities.

Both ANR and USFWS have expressed an interest in learning when the projects are in flood control operations. The Corps will provide background information on how these decisions are made. Rather than try to define theoretically what may constitute flood operations at the dams, the Corps prefers to find a reliable way to contact and notify ANR and USFWS and incorporate this into the Communication Procedures.

Conservation flow, ramping, and reservoir release/refill standards for flood control operations will be addressed during the adaptive management period.

Routine Operations:

The Corps, ANR, and USFWS have agreed to the concept of routinely operating the dams in instantaneous run-of-river mode (outflow equal to inflow) outside of flood control periods. Differences remain on how closely releases from the dams should equal inflow. These differences are most evident at North Hartland and Ball Mountain, where pools are maintained year-round and outflow is controlled by the gate openings. It is also an issue, to a lesser extent, at Union Village, which has a pool in the winter only. VANR has identified problematic flow fluctuations and instances where flows fall below ABF during routine operations at these projects.

Over a 3-year period, the Corps will increase flow monitoring and gate adjustment frequency to twice a day during the work week and on the weekends if necessary, at Union Village (winter only), North Hartland, and Ball Mountain. Further, the parties will review the procedures used to monitor and adjust gate settings and develop procedures to improve routine daily flow management. The objective of this exercise is to develop procedures that will maintain outflow equal to inflow to the greatest extent feasible.

Non-Flood Control Operations:

While the general goal is run-of-river operation, the parties have identified circumstances, outside of flood control operations, when flow or reservoir stage manipulation is necessary or appropriate. Those circumstances are listed below and described in more detail in subsequent sections.

1. Whitewater boating releases
2. Periodic inspections
3. Beach maintenance
4. Major maintenance and rehabilitation

5. Emergency operations

As noted in the detailed descriptions, there is not consensus among the parties regarding when flow or stage manipulation is necessary.

During such periods, the Corps will employ conservation flow, ramping, and reservoir refill standards that serve to protect the ecological integrity of the downstream reach.

With respect to conservation flows, the Corps has implemented the USFWS Aquatic Base Flow (ABF) standard for non-flood control operations at all projects. The ABF standard is based on the drainage area at the dam and is expressed in cfs/mile or csm. The rates vary seasonally:

October – March: 1.0 csm (or inflow)

April – May: 4.0 csm (or inflow)

June – September: 0.5 csm (or inflow)

The Corps has agreed to maintain the seasonal ABF flow at all times when flows are being manipulated (i.e., non run-of-river) outside of flood control operations, provided inflows are equal or greater than ABF.

Similarly, ramping rates have been adopted at all projects for use during all operations (including routine) outside of flood control periods. The ramping rates are 0.5 csm/hr for flows up to 4.0 csm, and 1.0 csm/hr for flows greater than 4.0 csm.

Reservoir water level management is the final water management issue. Reservoir refill standards have been implemented by the Corps. When refilling the reservoir or raising the reservoir to an increased target level during non-flood periods, the seasonal ABF will be maintained at all times except when flows are below ABF. If inflows are less than ABF, then a 70/30 rule will be implemented whereby the dam will pass at least 70 percent of inflow while storing no more than 30 percent.

The Agency of Natural Resources contends that the 70/30 rule does not provide adequate protection for downstream resources, and has proposed a 90/10 rule, with 90 percent of inflow being released downstream. Resolution of this issue will be a priority of the adaptive management process.

During the AMP, a clear statement of seasonal reservoir target elevations will be developed. Other issues related to reservoir water level management will be identified by the parties within the first year of the adaptive management process and addressed.

Whitewater boating releases

The Corps has provided releases to accommodate scheduled recreational boating events at many of its dams for over forty years. At present there are two whitewater release events scheduled at Ball Mountain Dam and Townshend Lake. These releases, which are timed to coincide with planned seasonal regulations of the conservation pool, are scheduled for the last weekend in April and again in late September. In recent years, the resource agencies have raised concerns

about the ecological impacts of these releases. In response, beginning in 2003, the Corps adopted the minimum conservation flows and ramping rates recommended by the U.S. Fish and Wildlife Service for each project.

For the spring release on the West River, the Corps will follow the ANR/USFWS ramping and refill rates agreed to by the parties. In addition, an overnight flow of 4.0 csm will be maintained. The target pool elevation at the start of this release will be approximately 75 feet with a target pool elevation of 25 feet at the end. Releases beyond the last weekend in April will not be considered due to the need to pass salmon smolts downstream in the spring.

For the fall release on the West River, the Corps will follow the ANR/USFWS ramping and refill rates agreed to by the parties. Beginning in 2003, the Corps has released water to support a one-day event. A full two-day event may be possible under conditions ~~when~~ where there is sufficient inflow to support a second day while employing ramping and 4.0 csm flows overnight. The target pool elevation at the start of this release will be 65 feet with a target pool elevation of 35 feet at the end.

Periodic inspections

To assure the integrity and ability of a flood control dam to perform its authorized purposes, inspection of the entire dam and related structures is performed every five years. Periodic inspection is required for the continued operation of the dam. In the future, the Corps will perform conduit and outlet works and gate inspections without restricting outflows from the control structures if and when possible. During these inspections, the flood control gates must be operated for structural, mechanical and electrical performance. Minor fluctuations to the outflow could be encountered during periodic inspection; however, testing of flood control gates will generally not occur during low-flow periods.

The preferred time to conduct conduit inspections will be during low-flow periods when this can be completed without interrupting river flows. The Corps will attempt to perform conduit inspections both prior to and during the scheduled fiscal year of the periodic inspection. If this is not feasible, some reduction of river flows may still be required in order to conduct a satisfactory inspection. Periodic inspections of dams in Vermont are scheduled as follows:

- 2002 – North Springfield Lake, Townshend Lake
- 2003 – None
- 2004 – Ball Mountain Dam, North Hartland Lake, Union Village Dam
- 2005 – None
- 2006 – None
- 2007 – North Springfield Lake, Townshend Lake

The following monitoring and operational procedures will be performed to minimize impacts during the inspection event:

If the outlet works and conduit can be safely inspected without disruption of flow during low-flow periods, the periodic inspection, and/or the inspection of the conduit/flood control gates, will be conducted at that time. To increase the probability of being able to perform conduit

inspections during low-flow periods, the Corps will conduct inspections, if possible, whenever these naturally occur.

If reductions of flow are necessary to perform conduit inspections, outflow will be reduced only to the extent needed to safely inspect the conduit (historically < 1 hour). Under extenuating circumstances, the inspections may take longer to complete. Prior to and during each conduit/flood control gate inspection, the Corps will have biologists evaluate the impact of any planned gate operation on the upstream and downstream communities and habitat. During any shutdown, biologists will be stationed downstream of the conduit to monitor river conditions and rescue stranded fauna. These monitoring activities and protocols will be coordinated with the VANR and USFWS. In 2002, monitoring protocols for performing conduit inspections were developed and implemented at North Springfield Lake. Further refinement of periodic inspection and monitoring procedures are a high-priority for the AMP.

Beach Maintenance

The Corps maintains public swimming beaches in Vermont at North Hartland Lake, Townshend Lake and at Stoughton Pond at North Springfield Lake. These beaches are maintained annually to inspect the public swimming area and to remove debris and sedimentation that collects on the beach over the winter and when flood storage events inundate the beach and swimming area. The Corps will attempt to perform maintenance of the public swimming beaches without drawing down the conservation pool. As part of this AMP, the parties will develop a process to determine if a satisfactory and safe facility can be maintained without water level manipulation.

The Corps has prepared a draft beach maintenance SOP that addresses issues surrounding the timing and mechanics of performing beach maintenance to minimize impacts to both downstream and reservoir aquatic habitats and species. VANR and USFWS will review the SOP and provide suggestions and alternatives for maintenance activities. Upon review and finalization, the beach maintenance SOP will be submitted to the agency representatives for their review and concurrence.

Major Maintenance and Rehabilitation:

Major maintenance and rehabilitation of the dams and appurtenant structures are necessary for their continued operation. These are large-scale projects, so they will be planned and coordinated separately from other routine or recurring activities. Close coordination with VANR and USFWS will begin early in the planning process and continue through project completion.

Emergency Operations:

Occasionally, the Corps will need to operate the dams in response to unplanned emergencies. These emergencies include acts of God, casualties, disasters, national defense or homeland security emergencies. At these times it may become necessary to take immediate steps to contain, limit, or alleviate an emergency in order to protect human health, safety, and welfare prior to initiating any form of coordination or consultation with other agencies or individuals. In

these instances, the Corps will contact VANR and USFWS, among others, as soon as practicable, if emergency modification or interruption of flows has occurred.

Fish Migration and Passage:

Ball Mountain Dam and Townshend Lake have been modified to allow for passage of Atlantic salmon. The facilities at Ball Mountain Dam consist of one automated gate and at Townshend Dam a modified weir to allow for outmigration of salmon smolts. A trap-and-truck facility was constructed at Townshend Lake in 1993 to allow migrating adults to be trapped from the West River below Townshend Dam and transported above Townshend Lake and Ball Mountain Dam to locations identified by Vermont Fish and Wildlife. In 2002, the trap-and-truck facility at Townshend Lake was upgraded to a variable array electric barrier that was designed, constructed and operated in a manner that has significantly reduced gate operations and minimizes impacts to the downstream aquatic habitat. North Springfield Lake also has a modified outlet pool to protect salmon smolts.

Project Modifications:

The Corps recognizes a need to study the performance of the outlet works at Union Village Dam, North Hartland Lake and Ball Mountain Dam. At these projects, the Corps ability to maintain permanent or seasonal conservation pools, as well as maintaining run-of-river conditions, without a weir or static flow control structure is difficult. Another related issue is the repair or modification of the outlet gates at Townshend Lake.

In 1995, the Corps prepared a sedimentation study for Ball Mountain Dam that identifies and evaluates structural alternatives to the project. The study addressed the prevention of unplanned silt discharges into the West River resulting from faulty gate operations or failure of the automated gate operators.

The Corps recognizes the need for further study to identify and implement structural changes to the Vermont flood control dams to alleviate flow regulation problems and enhance the aquatic habitat. Any future study to modify these dams would need to be conducted under existing authorities. If current authorities are not workable, the agency representatives will pursue other funding or authorities. As part of the adaptive management process, the Corps will investigate water temperature problems at North Springfield and Townshend Lakes to address potential warm water invasion created by shallow conservation pools and top-spilling weirs. The Corps Water Quality Team is available to prepare study parameters and provide an alternative analysis of possible solutions.

The agencies have prioritized their respective needs. The agencies will jointly prioritize the respective priorities and propose a plan to implement studies or improvements.

- Vermont Agency of Natural Resources priorities:
 - Flow regulation improvement at Ball Mountain

- Flow regulation improvement at North Hartland
- Winter flow regulation improvement at Union Village
- Downstream temperature impacts at Townshend
- Downstream temperature impacts at North Springfield
- U. S. Fish and Wildlife Service priorities:
 - Feasibility studies of weirs at all gate-operated projects
 - Feasibility studies of converting projects with conservation pools to dry bed systems
- Corps of Engineers priorities:
 - Feasibility of weirs at Ball Mountain and N. Hartland Lake
 - Instream flow study on West River downstream of Ball Mountain Dam
 - Instream flow study on Black River downstream of N. Springfield Dam
 - Instream flow study on Ompompanoosuc River downstream of Union Village Dam

Coordination:

The following agency representatives should continue to serve in the capacity of moderators for meetings and dispute resolution. This Adaptive Management Plan and attachments will prevail unless amended and agreed to by all agencies. All parties involved in the preparation, implementation and evaluation of this plan agree to present their recommendations to these representatives for resolution or implementation prior to elevating their concerns to other persons, offices or agencies.

 Supervisor, New England Field Office
 U.S. Fish and Wildlife Service

 Date

 Acting Director, Water Quality Division
 Department of Environmental Conservation
 Vermont Agency of Natural Resources

 Date

 Chief, Construction/Operations Division
 New England District
 U.S. Army Corps of Engineers

 Date

Whitewater Paddling Releases on the West River

Vermont Fish and Wildlife Department; September 2004



What is the concern associated with the whitewater paddling release?

In the past, the paddling release has been turned on and off like a faucet, resulting in very rapid increases and decreases in the river flow. These abnormally rapid changes create problems for fish and other aquatic life in the river because they cannot react quickly enough to the changing conditions. Perhaps the most obvious impact is stranding. Fish get stuck in the rocks and left high and dry when the water levels drop rapidly (such as upon completion of the paddling release). The rapid increase in flow associated with the beginning of the paddling release is also a concern. Aquatic insects and mussels living on the bottom become dislodged, and along with smaller fish, are dislocated. This situation is not unlike the difficulty a paddler experiences when faced with an unexpected swim down a rapid. It's hard to find and get to shelter, and it saps your energy.

What characteristics of the release are of concern?

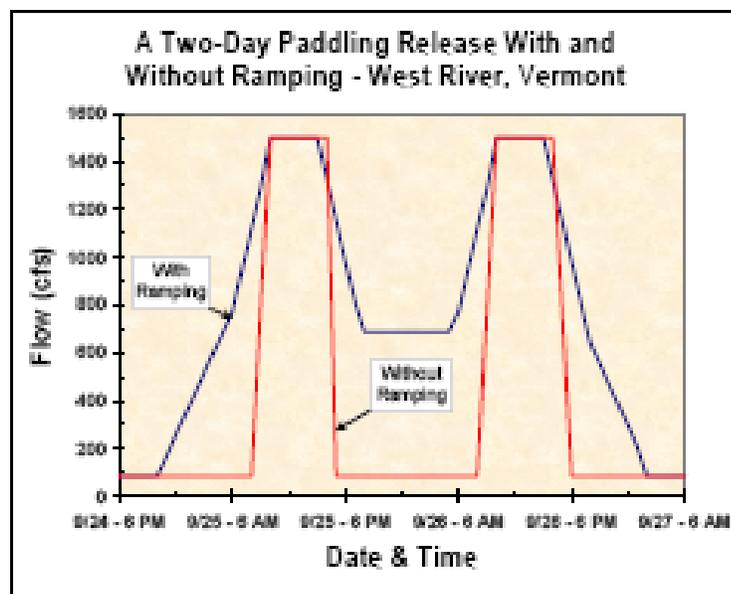
The magnitude of the 1500 cfs paddling release is acceptable. Natural river flows of this amount are not unusual during the spring and fall. The concern is with how fast the river flow is increased and then decreased again. To lessen the extent of the disturbance to aquatic organisms caused by a two-day release (a rapid flow drop at the end of day 1 followed by a rapid increase just hours later), the overnight flow should not be lowered beyond a certain point.

What is ramping?

In order to address the problems associated with overly rapid transitions on each end of the paddling release, the release can be changed in small steps over a specified period of time. This is called "ramping," because the flow is ramped up to the paddling release and then ramped down afterward.

Has the Agency of Natural Resources recommended ramping protocols to minimize the negative impacts of the paddling release on aquatic organisms?

Yes, ANR developed ramping rates that mimic the rates at which flows change naturally before and after a heavy rain. Flow data from a gage on the nearby, unregulated Williams River were used to develop the protocol. The logic is simple: aquatic organisms have become adapted to the dynamic character of the natural flow regime, so ramping that is similar to what occurs in nature should be fine.



Why is a two-day release in September no longer assured?

The second day has always been weather-dependent, although the need for ramping means that enough water will only be available in years when a lot of rain falls within a few days prior to the release. It takes more water to change flows at a slower, environmentally sound rate, and that means less water is available for

paddling releases. Ball Mountain Reservoir is much smaller in size than Army Corps reservoirs that support famous paddling releases in other parts of the country, such as the Gauley River in West Virginia.

If there isn't enough water for the release with ramping, why can't more water simply be stored in the reservoir?

There are a couple problems with trying to fill the reservoir up more. The reservoir is lowered in the spring to provide the spring paddling release. Refilling the reservoir is problematic when natural flows into the reservoir are low. The second problem is that filling the reservoir to higher levels floods out more of the river upstream, as well as upland areas, negatively affecting those resources.

Doesn't the U.S. Army Corps of Engineers manipulate river flows year around to such an extent that the whitewater paddling release represents little additional impact?

There have been a number of flow-related problems associated with Ball Mountain and other Vermont dams operated by the U.S. Army Corps of Engineers. However, the Corps, Vermont Fish and Wildlife Department, Vermont Department of Environmental Conservation and U.S. Fish and Wildlife Service are working cooperatively to resolve them. The paddling release is only one of a number of areas being worked on. For example, the same ramping protocol used during the paddling release will now be applied at all times, unless the project is in flood control mode, which generally happens a few times a year and is still under discussion. Other issues include low flow management, flow maintenance during conduit inspections and more.

Have site-specific studies been done that document environmental damage to the West River?

These studies have not been conducted, because they would be very expensive, requiring considerable field work to be done over a period of years. But, we are not inventing the wheel here. Many studies have been done elsewhere in the U.S. and in other countries. There is a large body of scientific evidence about the relationship between flows and aquatic resources. The effects of rapid changes in stream flows are known. An expensive study could be done but it is unrealistic to expect that it would show "no impact." Typically, the burden of proof is on a water user to demonstrate that the proposed activity will not harm the public resources.

Is there a concern about the spring release too?

The concerns are the same but because the river flow is much higher in the spring, there is almost always enough water for a two-day release with proper ramping.

Is this a choice between the paddling release and the environment?

It must be recognized that special releases are not without their harmful effects. However, an attempt has been made to enable the paddling releases to occur in a way that reduces their environmental impacts. This means that in most cases the spring paddling release will be a two-day event and the fall paddling release will be a one-day event. In addition to enjoying their sport, most paddlers are river stewards and support natural resource conservation.

APPENDIX A.16 - Fluvial Geomorphology and historic river corridor management

Fluvial geomorphic science explains the physical river processes and forms that occur in different landforms and geologic and climatic settings (DEC, 2002). The term “in adjustment” is used to describe a river that is undergoing change in its channel form and/or fluvial processes outside the range of natural variability.

Between the 18th and 19th centuries, the building of roads and railroads within the floodplains, land clearing for agriculture and housing, and the moving of streams to accommodate agriculture resulted in unstable river channels. Following floods large-scale channelization practices were employed to reclaim damaged lands. The 1970s and 1980s were also a period of extensive gravel mining in many rivers and tributaries. Post-flood channel straightening and gravel mining has had the effect of steepening the stream channels. A steep channel in a relatively flat valley may initiate a bed degradation process referred to as “headcutting.” Once a stream begins to headcut, it will typically erode its way through the five-stage channel evolution process, depicted in Figure (A.7), until it has created a new floodplain at a lower elevation in the landscape.

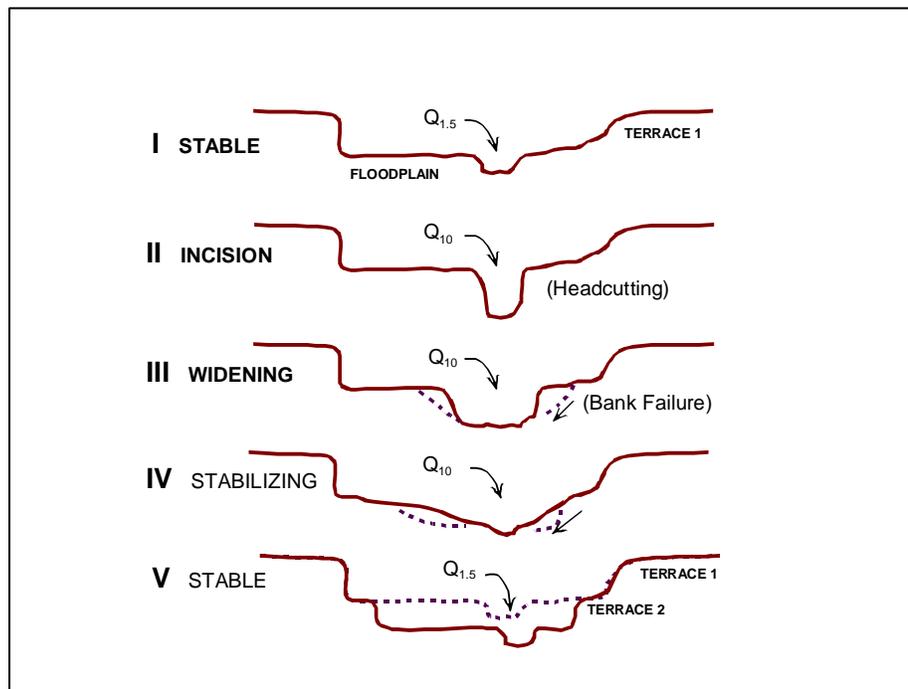


Figure A.7. Five Stages of Channel Evolution

The bed erosion that occurs when a meandering river is straightened in its valley is a problem that is compounded through its effects on other reaches of the river. Headcuts can travel upstream and into tributaries, eroding sediments from otherwise stable streambeds. These bed sediments will move into and clog areas downstream leading to lateral scour and erosion of the streambank. Channel evolution processes may take decades to play out. Landowners that have maintained wooded areas along their stream and riverbanks, or have stabilized the riverbanks with rip-rap have experienced eroding banks as the river channel slopes have undercut banks as

they adjusted to match the valley slopes, triggered by downstream or upstream channel disturbances.

A significant percentage of Vermont rivers have undergone channelization. Typically, channelized streams are straighter, steeper, wider, and largely devoid of instream and riparian features that maintain natural channel stability and provide a diversity of aquatic and riparian habitats (ANR, 2003). Channelization practices that were started over 100 years ago to accommodate early settlement, roads, railroads, logging, farms, mills, and other “human investments” have been periodically maintained through gravel removal, realignment, channel armoring, and post flood remediation projects. Many channels have incised, eroding downward, losing access to their flood plains that are essential to maintaining natural channel stability over time. Many miles of rivers have lost access to their flood plains run-off events resulting in a tremendous increase in channel adjustment and erosion.

While channelization continues today, many straightened reaches are now widening and aggrading (building up). The physical adjustment processes (most commonly observed as streambank erosion) lead to planform or meander changes that are imperative for the river system to attain a natural balance within its watershed. Each time a river has been straightened, dredged, bermed, and armored to mitigate flood damage without respect for the physical form and function of its channel and flood plain, adjustments were set in motion that, more often than not, led to further erosion. The decades that often intervene between major floods have given people the misperception that their channelization projects actually worked.

The cumulative impact of these human actions has degraded the physical habitat necessary to support healthy populations of some fish species and other aquatic life. Repeated channelization reduces the river bed and riparian structures upon which aquatic biota rely for shelter, food, and reproduction.

APPENDIX A.17 – Draft Plan Public Comment Responsiveness Summary

Basin 11 Water Quality Management Plan Public Comments Responsiveness Summary May 2008

Agriculture

Comment:

The draft plan does not have the most current version of the Ag section.

Response:

Updates will be made to reflect the most up-to-date information.

Development

Comment:

Pg 34 ¶5. - The Plan states “Fewer pollutants are released from an acre of agricultural land than from an acre of developed land.” This statement is unquantified and therefore seems more like opinion than fact.

Pg 37 ¶2 - The Plan states “Development has been shown to have a greater adverse impact on water quality than does agricultural land. The increase in pavement and other impervious areas can increase runoff and which can which can then carry toxic pollutants into waterways.” This statement is unquantified and therefore seems more like opinion.

Response:

The citation for these statements is from the Lake Champlain *Opportunities for Action*, April 2003:

“The major categories of land use within the Lake Champlain Basin are agricultural land (15% of Basin area), forested land (75% of Basin area), and urban and other developed land (6% of Basin area). Agricultural activities contribute approximately 55% of the annual nonpoint phosphorus load to the Lake. Forests cover a majority of the Basin's surface area but contribute only an estimated 8% of the average annual nonpoint source phosphorus load. Urban land covers only a small portion of the Basin, yet it produces approximately 37% of the average annual nonpoint source phosphorus load to the Lake—much more phosphorus per unit area than either agricultural or forested land (Hegman et al. 1999). Earlier estimates indicate that natural background sources of phosphorus account for only 24% of the present day total load, indicating that human activities in the Basin have increased phosphorus loading to Lake Champlain fourfold over the original predevelopment levels (VTDEC and NYSDEC 1994).”

Comment:

Pg52 ¶1 - The Plan states “Today, over 240,000 Vermont residents engage in wildlife associated activities including viewing, hunting, fishing, and photography. Interestingly, this is 11 percent more than ski in Vermont.” This comment is unquantified.

Response:

Wildlife viewing data is taken from a USFWS public opinion survey done in 2001.

Citation: **2001 National and State Economic Impacts of Wildlife Watching**, Report 2001-2, August 2003

Vermont and the Vermont Market Region, March 2004, reports on the number of people in the State of Vermont that participate in recreational activities as:

Activity	Percent Participating	Number of Participants
View/Photograph other Wildlife	61.6	295,227
Downhill Skiing	18.1	86,747

In order to properly cite the reference, the statement will be changed to: “Today, over 290,000 Vermont residents engage in wildlife associated activities including viewing, hunting, fishing, and photography. Interestingly, this is 43 percent more residents than ski in Vermont.”

Comment:

Pg 22 - Within the Table titled Basin 11 Priority Projects, is an entry titled “Investigate Source Water Capacity Limits” under “water withdrawals.” The description of this entry is that the intent is to develop limits on groundwater capacity for towns and planning commissions. We [Stratton Mountain Resort] believe that the limits on groundwater usage while maintaining safe yields and avoiding undue impacts is already well handled through the existing Public Water System source permitting regulatory review and approval process administered by the Vermont Department of Environmental Conservation (DEC) Water Supply Division (WSD). Any such further limits should be based on a demonstrated need for additional regulation and must also be based on complete and sound scientific investigations.

Response:

Groundwater resources and their utilization as both a public and private resource is a concern throughout the state. The Vermont legislature is discussing this issue in the 2007-08 session. The bills under discussion (H.601 & S.304) propose to declare the groundwater resources of the state to be a public trust resource and to implement a groundwater withdrawal permit program. At the time of this writing the bill is in committee and no action has been taken. Any outcomes from that process will be incorporated into future versions of the basin plan.

Comment:

Pg 66 - The New Hampshire Department of Environmental Services (NHDES) reference regarding construction runoff is unsupported. Pioneer has examined the referenced document and it does not appear to contain this particular passage. Although other resources have suggested similar values for sediment export, the comment should be qualified to reflect that these values

represent the type of sediment loading that could occur without the implementation of construction phase best management practices.

Response:

Citation will be corrected to read as:

Technical Note #86 from Watershed Protection Techniques. 2(3): 443-444

Impact of Suspended and Deposited Sediment

<http://www.stormwatercenter.net/Library/Practice/14.pdf>

The sentence in the plan contains the phrase “without erosion control practices in place” to qualify this statement.

Comment:

Pg 122 - Recommendation 55 is unnecessary, beyond the scope of the basin plan, and ill-informed. Currently, all Public Community Water System, and non-community water systems are required by DEC WSD to identify a source protection area and develop a source protection plan. This program is in place and is working. To the extent that there is an interest in this recommendation by municipal surface water systems, the recommendation should be reworded to limit the scope.

Response:

The intent of this recommendation is to look at the land use practices around public wellheads to examine any opportunities for further protection beyond the SPA requirements. Working with landowners to implement practices that protect water quality and obtaining easements or fee purchase of wellhead areas will provide added security for water supply protection. The recommendation is worded to encourage all public system suppliers to examine this option.

Comment:

Page 122 - Recommendation 56, in particular, is of great concern. However, we [Stratton Mountain Resort] see all of these recommendations as clearly beyond the scope of a basin plan. Specifically, unless a study is properly designed in a scientifically robust and defensible manner, such efforts are likely to result in misleading, incomplete, and inaccurate conclusions. Past work has shown that there is ample groundwater recharge in Vermont to easily sustain the magnitude of groundwater uses now and in the future. Setting arbitrary “aquifer capacity” limits based on faulty science is not a wise planning approach. This recommendation should be deleted.

Response:

The recommendation states in Strategy 2) “Through scientific study in conjunction with the Vermont Geological Survey determine aquifer capacity and withdrawal limits.” The ANR is confident that studies designed and carried out by VGS will be sound, accurate and provide valuable information to help guide local and regional planning efforts. As stated above groundwater capacity and use is being addressed by the legislature. Any outcomes from that process will be incorporated into future versions of the basin plan.

Comment:

Pg 128 - The bypass of Stratton Lake should not be characterized as a “diversion.” Reword to: “In 1999, Stratton implemented an innovative pipe bypass system to ensure the reliable downstream passage of low to moderate flows below Stratton Lake to the North Branch of Ball Mountain Brook, and eliminate downstream water quality impacts previously associated with the lake.”

Response:

Statement will be reworded to: An innovative pipe bypass system under Stratton Lake has resulted in the elimination of the discharge and ensures reliable downstream passage of low to moderate flows below Stratton Lake to the North Branch of Ball Mountain Brook. Staining of the substrate is no longer occurring – however, staining from previous discharge has not yet dissipated.

Comment:

Pg 138 - 139 - 6.4.1 - In 2005, the Vermont Water Resources Board (WRB) issued its decision in case ORW-03-01 *In re Waters of the Green Mountain National Forest* which was based on a petition filed to attach ORW status to a large number of streams and ponds. Included in the petition was the upper portion of the Winhall River, the watershed of which includes several existing Stratton facilities. The WRB decision denied the petition based on the absence of sufficient evidence, and other deficiencies in the petition, including that “only a water body can be designated as an ORW, and not a watershed.” (WRB decision at page 16). This water body now appears in the current draft plan under the category of “waters to consider for future ORW protection”. Stratton believes that the findings and conclusions of the WRB decision must be fully and carefully followed in any future petition seeking ORW designation.

Response:

Inclusion of the upper Winhall River in the list of potential ORW is based on its exceptional water quality and natural community attributes plus interest expressed by local residents. Any potential ORW petition will take all existing information and decisions into account and will include ample opportunity for public comment.

Comment:

Pg 100 ¶2 - The Plan states “While just over 1% of the Basin is developed land, this small portion has large impacts on the quality of the water and the condition of stream, river, and lake habitat.” This plan makes little note of the positive impact that funds and associated environmental restoration projects have had on water quality. In other words, there can be a balanced approach.

Response:

ANR agrees that many positive steps are and have been taken in developments throughout the Basin. Some of these are discussed in 4.2.3 Developed Lands. Low impact development strategies are being implemented in some development in the basin and educating and promoting these strategies further is recommended in the plan.

Ball Mountain Brook - Stratton

Comment:

Pg 39 ¶3 - The Plan states “Some legislative intervention in the form of forest management regulation and creation of the Current Use Program for agricultural and forest lands have had a positive influence on practices which protect water quality on private forest land.” The Stratton Corporation is in the process of applying for enrollment in the Current Use Program. We have been told by the Department of Forestry that maintaining buffers as outlined in our Act 250 Permit and the Agency of Natural Resources Buffer Guidance is not consistent with enrollment in the program. This creates a significant inconsistency between water quality protection and the Current Use Program.

Pg 99 - Recommendation # 25 states “Increase the amount of forestland being managed sustainably with water quality protection as a goal.” The above issue applies here as well.

Response:

Under the Use Value Program land that is set aside for no-cut buffers under other state programs is not eligible for inclusion in UVA acreage. Enabling legislation requires that all land under UVA must be actively managed. No-cut buffers cannot be actively managed for timber production.

Comment:

Pg 40 ¶2. - As a point of clarification, Stratton Corporation conserves a total of 1499 acres for wildlife habitat and use.

Response:

Correction made.

Comment:

Pg 100-101 ¶7-1. - The Plan states “A tributary of the North Branch of Ball Mountain Brook and a segment of Styles Brook in this watershed are listed in Part D of the 2006 List of Priority Waters for sediment impairments.” The only water that is on Stratton owned property that is on the impaired waters list is Kidder Brook. Kidder Brook is listed for acidification and not impacts related to land use by the Ski Resort.

Response:

Kidder Brook is the only stream on Part A (in need of TMDL) of 303(d) listing. Styles Brook and Trib 1 are impaired but are on Part D of 303(d) list which have TMDL's in place. These streams are still impaired however until they meet the Aquatic Life Support biocriteria.

Comment:

Pg 134 ¶2. - The Plan states that Styles Brook is listed as a Class A(2) water. Styles Brook as part of the SWQRP is defined as a class B-2. Stratton Corporation understands that Typing is not currently taking place as a part of this Basin 11 Management Plan and would like to be included in the discussion if typing is to take place in the future.

Response:

2006 Vermont Water Quality Standards page 46:

Styles Brooks Class: A2 Date: 7/26/78 Approx. River Miles: 1.0 sq. miles
Stratton Corp. water supply. (Reserved for emergency use). Styles Brook and all waters in its watershed above the diversion to Styles Reservoir.

Unless the classification is changed by the Water Resources Panel it remains listed as an A2 waterbody.

Comment:

Pg 118 - As a general matter, the basin plan is intended to address surface water issues in the West River watershed. This section has entered into a discussion of groundwater issues, with no presentation of a nexus with the purpose of the plan. Furthermore, it is incomplete and unreasonable to single out the ski areas with respect to groundwater withdrawals for such an extensive discussion of domestic water consumption. There are many municipalities, other public community and noncommunity water systems, and private homes that rely on groundwater in the West River basin, yet this discussion combined with the cursory treatment of municipal water usage in Section 4.6.4. would lead the reader to believe that ski areas are the only users of groundwater in the basin. This is particularly true since section 4.6.3 provides no information whatsoever on any other water systems. For all of the above reasons, we recommend that all discussion with respect to groundwater withdrawals be deleted.

Response:

Basin plans can incorporate groundwater issues as they relate to surface water issues. The plan includes discussions of water withdrawals from agriculture, industry and water supply. A section will be written to provide the context for groundwater discussion in the plan explaining the interface between groundwater and surface water. The following statement from *An Ounce of Prevention: A Groundwater Protection Handbook for Local Officials*, VDEC 2005 will be included:

Protecting groundwater is imperative because groundwater is currently used for drinking water by approximately 70% of all Vermonters. About 46% of the state's population is self-supplied (private wells), while about 24% is served by public water systems that use groundwater. The rest (30%) rely on surface water as their source of drinking water.

Comment:

Pg 118 ¶3 - Again, the focus on Stratton and its use of water for golf course irrigation misleadingly suggests that this is the only use of water for golf course irrigation in the basin. What other golf courses exist? Where is water for irrigation obtained?

Response:

Particular discussion of ski area development and water use in the basin is detailed in the plan because it was expressly brought up by members of the public and the watershed council in the planning process. The goal of the basin planning process is to address local concerns for water quality improvement. No other golf course issues were brought forth in planning discussions.

Three other courses are located in the basin: Tater Hill Golf Club (Chester); Brattleboro Country Club (Brattleboro); and Bellows Falls Country Club (Rockingham).

Comment:

Pg 119 ¶1 - Statements beginning, “Concern has been expressed over the cumulative impact...” and ending with “impacts on water level in Styles Brook” represents an incorrect and speculative statement, which flies in the face of detailed scientific testing done by Pioneer which demonstrated to the satisfaction of DEC and Act 250 that the permitted use of deep bedrock wells is not interfering with VWQS compliance in any surface waters in the vicinity of the resort.

Response:

The reference to Styles Brook has been corrected as the concerns are in regard to Kidder Brook.

According to the Memorandum of Decision of 9 June 2003 the District 2 Environmental Commission recognized evidence that could indicate non-conformance to Vermont Water Quality Standards and states “There appears to be agreement between both the Permittees’ expert and SACC’s expert that if the 7Q10 for Kidder Brook and Sunbowl Brook, as calculated in the 1992 Wagner, Heindel and Noyes, Inc study ... is used, the projected the water streamflow [sic] reductions in Kidder Brook would constitute 13.2 percent of 7Q10 flow. This reduction, albeit small, exceeds the Vermont Water Quality Standards which the Commission is required to apply under Criterion 1(A) Headwaters.”

It also states. “Even using the statewide average 7Q10 flow, the Permittees’ expert estimates a flow reduction of 4.77 percent of the 7Q10 flow which is quite close to the 5 percent standard.”

This narrow margin from being below or exceeding the 7Q10 standard is the cause of the expressed concern. Until further study is undertaken to determine a more accurate 7Q10 for Kidder Brook these concerns will persist.

Mill Brook – Bromley

Comment:

What is being done to address impairment of Mill Brook in Winhall?

Action on this should be pushed.

The flow alteration should be part of the discussion about the land exchange between Bromley and the USFS.

The public needs a better understanding of what the diversion is structurally and how it operates in order to pursue actions to remediate the impacts of it.

Response:

Mill Brook and a tributary to Mill Brook are listed under Part F of the “List of Priority Surface Waters Outside the Scope of Clean Water Act Section 303(d). Part “F” contains “Waters Altered by Flow Regulation.” These are waters where a lack of flow, water level or flow fluctuations, or modified hydrology is occurring and arises from some human activity. Alterations arise from flow fluctuation, obstructions, or other manipulations of water levels that originate from hydroelectric facilities or other dam operations or from water withdrawals for industrial or

municipal water supply or snowmaking purposes. The aquatic communities are altered from the expected ecological state. Waters will be removed from the Part F List as corrective actions are implemented.

Bromley Mountain Ski Resort (BMSR) is not in compliance with the February median flow standard. If they propose an expansion of snowmaking, ANR will address the conservation flow issue per the Environmental Protection Rules, *Water Withdrawals for Snowmaking*. This means that BMSR will have to do an alternatives analysis looking at source and storage options and proposing an alternative that will bring them into compliance. If no expansion is proposed, a review can be done under 10 V.S.A., Section 1003. ANR has not yet taken this action.

Comment:

The flow issue in Mill Brook needs to part of the discussion of the proposed land exchange for spray field land.

Is this a swap or a sale of land?

Where is the bill in Congress to do this at now?

Response:

The land exchange/sale is between the US Forest Service and the Resort. The State does not own the land in question. The resort plans to upgrade its wastewater treatment facility to tertiary treatment and expand sprayfield capacity by acquiring land from the Green Mountain National Forest. New regulations require ski areas to bring their surface water withdrawals into compliance with minimum flow regulations as part of any new or expanded snowmaking. Although all facilities and activities related to the resort's snowmaking and water usage adhere to existing permit requirements, Mill Brook and a tributary to it, located below Bromley's storage pond are considered altered due to "artificial and insufficient flow."

The current status of the land exchange is the bill, which proposes a land exchange and/or sale between USFS and Bromley Mountain Ski Resort, is pending in Congress. The total land involved is approximately 600 acres in five parcels and would be available for use for sprayfield and trail expansion in the future. Prior to any action the USFS will prepare an Environmental Impact Statement on the impact the exchange will have on the natural and socio-economic resources of the land. This will include the waters as well. The USFS does not have jurisdiction over the waters as all are "waters of the state." The state will be involved in the EIS preparation and the EIS will go through a public comment process. If the bill is passed in 2008 the process will take a minimum of two years and possibly upwards of four years to complete. Following the land transfer, the Resort will be required to go through the Act 250 process prior to development.

According to February 28, 2007 notes from the U.S. Senate, Committee on Energy and Natural Resources, the project is held up because non-federal lands to balance the exchange of the federal lands have not yet been identified which is why the proposal may go through as a sale.

Education

Comment:

I think that a more general “watershed appreciation” approach to the basin’s watersheds would be very beneficial to public awareness of the character and challenges to the watersheds and water quality. Perhaps this could be addressed through a series of presentations/workshops/field trips about more general topics, uses of and activities in the watershed or basin – such as local agriculture, historic, geological, recreational use (canoeing/kayaking, rowing, fishing, birding, diving, hiking, etc.)

Response:

This will be incorporated into the Watershed Education recommendations

Hydropower Production and Williams Dam – Londonderry

Comment:

Does the Basin 11 plan give any consideration for micro-hydro? Micro-hydro could be important to ease demand on "southern loop" supply.

Response:

The writing of the Basin 11 plan pre-dates the recent surge in interest in hydropower production so there was no discussion beyond the Brockways Mills dam hydro facility. A discussion on micro-hydropower potential will be added.

Comment:

What will happen to the Williams Dam? Is there funding for removal?

Response:

There are no current plans for the Williams Dam (Londonderry). No discussion has taken place with the Town of Londonderry which owns the dam about removal or restoration. This discussion should occur in the near future as questions about the dam’s safety and its suitability for producing hydropower have been asked.

No funding has been allocated for removal of the dam. There are state and federal grant funds available on a competitive basis for dam removal projects that may be applied for.

Comment:

Hydropower production has been discussed, is this feasible?

Response:

The dam would need to be evaluated for its hydropower potential and for its environmental impact on the river system. The cost of rehabilitating the dam for both safety and power production would need to be weighed against the cost of removing the dam and the environmental benefit that may bring about.

The Agency's Facilities Management Division offers dam owners a free pre-feasibility study that will look at a dam and do a preliminary evaluation of its hydropower potential.

Comment:

Large amounts of sediments have built up behind the dam, sediments need to be studied and planned for prior to removal.

Response:

Sediment release is a concern in dam removal. The dam removal process involves detailed study of how the removal will impact the river and aquatic habitat. Permits are required that ensure work is done with minimal impact on the environment.

Comment:

USACE can do analysis of the environmental and cultural resources that might be impacted by dam removal or development.

Response:

USACE does environmental and cultural surveys as part of the NEPA permitting process on their own lands only. (personal communication, Mike Curran, USACE)

Comment:

I understand the negative impacts damming a river may have, and that breaching a dam is often a desirable environmental objective. I am concerned, however, that the potential benefits of hydropower generation are not being adequately recognized, nor given appropriate weight in the recommendations on pages 112-117. Indeed, recommendation #50 suggests assessing all dams in the basin to identify candidates for removal, without also considering new potential benefits. Specifically, I am concerned that the Williams Dam in Londonderry is considered for potential removal without having been studied for micro-hydropower generation.

With the above in mind, I would like to propose an additional recommendation that ANR "*Complete assessments of all dams in the basin to identify candidates for new micro-hydropower generation,*" or add similar language to recommendation #50 as a new point #4.

Response:

A discussion of the pros and cons of further hydropower development will be added to section 4.5.5 Hydro Power Generation.

A strategy will be added to recommendation #50 stating:

"Carry out assessments of dams in the basin where there is expressed interest in potential hydropower development to identify candidates for further investigation of micro-hydropower generation."

Comment:

Page 116, Recommendation 50. Part of looking at potential dams to be removed would be to determine whether Invasive Aquatic Plants exist in the impoundment and if they do then how to minimize the transport of fragments, etc downstream.

Response:

This will be added as a strategy to recommendation #50,

Invasive Plants - Lakes**Comment:**

How many lakes/ponds in the basin are part of the VT DEC volunteer Lay Lake Monitoring (LLM) program? It would be great to organize both a basin-wide Vermont Invasive Patrollers (VIPs) program and a basin-wide volunteer lake monitoring program.

Response:

Three Basin 11 lakes are currently monitored through the LLM program – Cole Pond in Jamaica, Lowell Lake in Londonderry and Stratton Pond in Stratton. Data on these lakes is available at: http://www.vtwaterquality.org/cfm/lakerep/lakerep_select.cfm

There is no coordinated VIP or LLM program in the basin. Establishing one will be added as a recommendation in section 4.1 Water Quality and

Comment:

Page 61, related to CWA, section 319/nonpoint source pollution – Are invasive aquatic plants (IAP) considered a type of non-point source (NPS) pollutant / an impairment to water quality?

Response:

The Vermont Nonpoint Source Management Program (319) considers IAPs to be nonpoint sources of pollution. Invasive aquatic plants are not listed under causes of impacts for rivers in Basin 11, however they are listed in regard to lakes. Depending on the population densities present, the lake may be stressed, altered or impaired due to IAP's. Table 3.3 lists 25 lake acres stressed due to IAP's.

No Basin 11 lakes or rivers are currently listed in the 2006 List of Priority Surface Waters, Part E. Surface Waters Altered by Exotic Species.

Roads**Comment:**

Page 20, Roads and Road Maintenance – should minimizing/reducing the introduction and spread of invasive plants be included in this category?

Page 110, Can something be said here about assessing or adopting protocols to reduce or prevent the spread of invasive species/invasive plant species along the Basin's roadways?

Response:

Road maintenance impacts on the spread of invasive species primarily impacts terrestrial plants rather than aquatic species. Terrestrial invasives are not the principal focus of this plan.

South Londonderry

Comment:

A putting green has gone in along river and no buffer is in place.

Response:

The Watershed Coordinator is working with the Town of Londonderry on other issues and will add this to the areas for discussion.

Swimming

Comment:

I swim in the Williams River just above Chester village. The last time I went swimming I got a really bad ear infection which had to be treated with antibiotics.

Response:

Bacteria levels in the vicinity of this area have been shown to be high in sampling done by the West River Watershed Alliance. Their 5-year summary conclusion states:

SH – 14, North Street Bridge/Church Street Bridge, Chester 2003-2007
Fairly consistent results throughout the sampling period ... and increased levels of bacteria in 2004 and 2007.

5-year geometric mean:
E. coli 51 - 136

Yearly *E. coli* averages:
2003 - 97.07
2004 - 105.12
2005 - 75.03
2006 - 51.26
2007 - 136.03

Escherichia coli is a bacteria that lives in the guts of all healthy mammals, including humans, it is used as an indicator of the potential presence of pathogens. Pathogens are micro-organisms that can cause disease. Most species of *E.coli* bacteria are harmless, but there are some which are pathogenic, ... though the presence of *E.coli* is not necessarily a direct health threat it is commonly monitored because its presence is a clear indication of sewage or animal waste having entered the water body.

Pathogens in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms.

Vermont's standard for swimming waters is 77 organisms/100ml. This location is downstream and adjacent to active agricultural land where manure fertilizer is spread on fields. This may contribute to the high bacteria levels at this site.

Typing and Classification

Comment:

Typing is the teeth of water quality protection, if we don't do typing and classification what will assure compliance?

If there is no typing what will permits be in compliance with?

How would the anti-degradation policy protect water quality?

Response:

Although completed for Basin 11, typing and classification is not being proposed along with the Basin plan. Typing and classification has been put on hold temporarily until more detailed guidance comes from the Water Resources Panel on how to proceed in a way that will make typing designations transparent and consistent throughout all basin plans.

In spite of the situation concerning typing, current policy maintains some level of protection for water quality. The anti-degradation policy of the Vermont Water Quality Standards states that *“Existing uses of waters and the level of water quality necessary to protect those existing uses shall be maintained and protected regardless of the water's classification. Determinations of what constitute existing uses of particular waters shall be made either during the basin planning process or on a case-by-case basis during consideration of an application.”*

Existing uses are being addressed and determinations on the presence of existing uses for swimming, boating, fishing and public water supply are presented in the plan. These existing uses, and the water quality that supports them, will be protected. The Vermont Water Quality Standards state that *“Waters the existing quality of which exceeds any applicable water quality criteria provide important environmental, economic, social and other benefits to the people of the state. Except as provided in subsection 2 of this part, such waters shall be managed to maintain and protect the higher water quality and minimize risk to existing and designated uses. In all cases, the level of water quality necessary to maintain and protect all existing uses as well as applicable water quality criteria shall be maintained.”*

(emphasis added)

Comment:

Typing should be based on the biology not the politics.

Response:

Typing designation, as they have been determined over the last three years, are based on a number of factors. All available water quality data from state, federal and local sources are

evaluated, also taken into account are the level of development and impervious surfaces; the level of land protection; the proximity of roads, pollution sources, and discharges; the zoning and development plans for the towns involved; and the overall condition of the streambed, bank and habitat where it can be observed.

The scientific evaluation of data is a key component of the process. Less quantitative aspects come into play in the evaluation of town planning and zoning. Some towns prefer protection of resources while others prioritize economic development opportunities and feel resource protection might interfere with development. The ANR takes all aspects into account prior to recommending a typing designation which may or may not agree with a town's preference.

Comment:

Page 132 – bottom: (also pages 133, 134, 135, 136)

The call out box interrupts the narrative. Suggest moving it to the end of the discussion or remove the box but keep the text. Reword statement to make better sense (typing was completed but waiting for guidance....?)

While the plan may not include reference to typing and classification, a lot of work was done along those lines. Since the work was, in part, assisted by public funds, the work effort should not be hidden.

Response:

- Section will be re-worked to be more clear and concise.
- Many hours of time by many people have gone into the recommendations for typing and classification. This will be noted in the revisions.

Comment:

Does the plan make any recommendation for Class A1 waters found below 2500 foot elevation?

Response:

The Basin 11 plan does not make any Class A1 recommendations. Class designations are done through a petition process to the Water Resources Panel.

Comment:

Page 138 - Cobb Brook is Class A1.

Response:

Cobb Brook and its tributaries are Class A1 for essentially its entire length. Cobb Brook is included in the list of waters to consider for Outstanding Resource Water designation to further recognize its unique features and provide ORW protection.

Comment:

Pikes Falls is an ORW, not a Class A waterbody.

Response:

Correction made. ORW designations was given to Pikes Falls on 6/21/91.

Wastewater

Comment:

Page 60 Table 3:

Piper Ridge East and West utilize the same leach field area and both discharge into the North Branch of Ball Mt Brook. Since Bondville is an unincorporated village in the town of Winhall, it would be more accurate to place Piper Ridge East in Winhall. A discharge from the Bondville Village would be into the Winhall River.

Also, the Stratton Mountain Ski Area treatment plant is in the town of Winhall - not Stratton. It discharges into the North Branch of Ball Mt Brook and the Winhall River

Response:

Data in this table is documented as part of the discharge permits. Corrected information was confirmed by the Wastewater section and corrections made.

Comment:

I hope this plan includes addressing industrial, agricultural, and household waste. This should include illegal dumping of trash and sewage, regulation of septic systems and alternative systems such as composting toilets.

Response:

Regulations enacted in 2007 cover the discharge of all private and public wastewater systems.

These rules can be found at:

<http://www.anr.state.vt.us/dec/ww/Rules/OS/2007/FinalWSPWSRuleEffective20070929.pdf>

All wastewater discharges must be permitted by the Wastewater Division of the Agency of Natural Resources.

The Basin Plan addresses wastewater and solid waste in the context of water quality protection. Wastewater discharges may impact water quality and the levels of pathogens and nutrients in surface waters.

Wildlife

Comment:

There is a heavy focus on issues concerning fish, water bodies, and flowing streams and rivers, but the numerous, small, headwater wetlands (beaver flowages) where many of our streams begin are not addressed.

Response:

Beavers and their role in wetland formation and wetland communities has not been addressed. Information will be added in the revision to section 2.3.4 Wetland and Water-dependent Wildlife.

Comment:

Culverts at chronic beaver conflict sites are usually cleaned over and over again with backhoes. When the equipment operators don't arrive soon enough, roads can be washed-out. Both the cleaning and wash-outs represent "sedimentation events," which are the second most serious threat to our waters on the Plan's list. This issue, and the possible use of flow devices as an environmentally and ecologically sensitive alternative, is not mentioned under "Culvert Issues" on page 111 and they should be.

Response:

Human / beaver conflict and management strategies will be added to this section.

Comment:

Thermal modification is listed as the first water quality concern in the Basin. In multiple places it is noted that riparian trees and shrubs should not be cut. It does not specify "by humans," as it probably should.

Response:

The sentence in section 3.1 Thermal Modification, has been changed to: Human removal of trees and shrubs and the cooling shade they provide along riverbanks results in higher water temperatures.

Comment:

The document states that approximately 10,000,000 salmon fry have been stocked in the Basin. I believe the concept of restoring these runs of native fish is noble and correct, but as a taxpayer I would still like to know what it has cost, how many have returned, and if there is a point where costs begin to outweigh benefits.

Response:

Atlantic salmon fry are stocked by VFWD when they have almost used up their yolk sac and are ready to start feeding on their own. They are less than an inch long and weigh about 1/3000 of a pound. Natural mortality is high in the subsequent two years they spend in freshwater before migration to the ocean, during migration, and while at sea for two years. Over 5,000 adult salmon averaging ten pounds and 30 inches have returned to the Connecticut River since 1974. The portion of these that came from Basin 11 streams is unknown. The costs and benefits of fish restoration is beyond the scope of this document.

Comment:

It is hard to believe that road salt doesn't have a very negative effect on fish and other aquatic organisms. It seems to be used very liberally. The Plan does not give it a lot of attention.

Response:

Road salt application is discussed on page 111 and in recommendation #46.

Comment:

Is there anything that can be done to counter acidification due to acid precipitation in small water bodies?

Response:

The acidification of small waterbodies is a vexing problem in Vermont and elsewhere, but is one that is actually improving. Federal mandates and requirements are the key to solving this problem. A recent landmark case against American Electric Power (AEP) that was settled in October 2007 will help substantially. The settlement, in which Vermont was very active, involves fines and mitigation including the requirement to reduce AEP emissions of nitrogen oxide by 69% by 2016 and reduce sulfur dioxide emissions by 79% by 2018. It is expected that these reductions will result in measurable chemical recovery to Vermont's sensitive lakes. There will be an expected "biological lag", but we should anticipate some form of biological recovery.

VTANR coordinates a long-term measurement program that tracks the improvement in the acidification status of our lakes. All acid-impaired lakes in Vermont are subject to an EPA-approved acid rain control plan that VTANR prepared, that identifies necessary reductions in air deposition of acid-forming precursors to Vermont. These reductions are being implemented to the degree practical under the current national political climate, under provisions of the 1990 Amendments to the Clean Air Act, and further by USEPA's 2005 Clean Air Interstate Rule. While acidification is by no means solved, Vermont has been at the forefront of pushing USEPA to promulgate and enforce air quality regulations in jurisdictions outside of Vermont that will address the problem.

There really is not much we can do locally to counter the effects of acidification. Vermont discharges less sulfur and nitrogen than any state east of the Mississippi River from power plants. However, Vermonters rely heavily on the automobile which is the primary contributor of atmospheric nitrogen. Encouraging mass transit and use of the most fuel efficient vehicles that will satisfy our lifestyles will help.

In the meantime, the WQD continues a 27 year old sentinel monitoring program to assess sensitive lake status and acidification. (combined response from J. Kellogg & N. Kamman)

Comment:

In the second paragraph from the bottom of page 65 the importance of riparian cover for brown trout is mentioned. I hope we never get to the point in our management regimes where we are prejudicing (killing) a native, keystone species—beavers—because of the perceived threat to riparian cover used by an exotic species: brown trout.

Response:

It is the goal of the Agency to protect and enhance populations of all native wildlife species and to maintain the State's sport fishery. This is not done to the detriment of any wildlife population.

Comment:

Please mention that currently the priority for future USDA WHIP funding is to install fish passage culverts throughout the state. Studies must show that a significant amount of watershed has been cut off by a culvert. If streams pass this test, culverts (which can run \$20 to \$30K) can be installed.

Response:

This information will be incorporated into Recommendation #7.

Comment:

Sedimentation is cited as the second greatest threat to our waters; what greater filter or sediment sink is there than an active, intact, maintained beaver dam (and pond), or, even better, a series of them?

Response:

Beaver dams and ponds do play a function in sediment containment. As stream water enters a beaver pond it slows and sediments settle out and accumulate. This also assists in containing nutrients. Beaver ponds are valuable assets in flood control, sediment retention, nutrient containment and habitat diversity. Their maintenance is encouraged throughout the basin and will be inserted as a recommendation in Section 4.1.3.

Other**Comment:**

There is a lack of discussion on stormwater in the plan.

Response:

Stormwater issues are addressed mostly in the sections dealing with land use and development. A more detailed discussion of the impacts of stormwater on a watershed will be incorporated in the revision.

Comment:

Climate change is causing changes in rainfall and stream flows. Is the Plan able to speculate on how that might impact Basin 11 waters or implementation of the plan?

Response:

The plan does not attempt to predict the impact climate change will have on Basin 11 waters beyond an awareness that hydrological changes due to increased heavy rainfall events will have a deleterious effect on the morphology of rivers and streams. Actions that will mitigate hydrological changes, whether due to climate change, increases in impervious surfaces or encroachments on the floodplain, will benefit the entire river system and are addressed in the plan.

Comment:

How well addressed is preparedness for flooding and flood risk and Fluvial Erosion Hazard (FEH)?

Response:

The Plan recommends stream geomorphic assessments (SGA) be done on all Basin waterways and plans be developed and implemented to address FEH and floodplain issues. These recommendations are already being implemented in a number of areas. Phase 1 and 2 SGAs are

underway or completed on the West River, Rock River, Ball Mountain Brook, and the Saxtons River. The further step of River Corridor Planning is also underway on the Rock River and Ball Mountain Brook. These projects are being carried out through contract with the Windham County NRC. Public outreach efforts on floodplain management are being addressed with the production of an informational booklet also through WCNRC.

Windham Regional Commission and the Southern Windsor Regional Planning Commission are working with towns to develop and/or update their FEH and disaster mitigation plans.

Comment:

There has been an acceleration of mass failures (large riverbank slumps) throughout the Basin 11 area.

Does plan identify mass failure sites/area and or discuss the issue?

Response:

The Basin Plan does not identify mass failure sites. There is no past data on mass failures so it cannot be determined if there has been a recent increase in their occurrence. The SGA work being carried out is documenting the location and extent of mass failures that exist today. This will form a basis for future evaluation of the increase or decrease in their size and occurrence. Once completed, SGA results will help in making strategic decisions about how to best protect, manage, and restore streambanks and other watershed features.

Comment:

Culvert assessment/inventory is important for habitat connectivity. Does the plan address a scheme for or strategy of culvert prioritization?

Response:

The Plan addresses fish and aquatic organism passage as part of road maintenance issues in Section 4.4. A bridge and culvert assessment, including aquatic organism passage information, is being gathered as part of all Phase II stream geomorphic assessments. VAOT is gathering bridge and culvert data from towns on structural conditions, size and problems. Unfortunately, the ANR assessment protocols are different from VAOT inventory protocols and the two databases are incompatible.

A strategy will be included in the revision to address this problem and make the information available to towns for implementation.

Comment:

The Connecticut River Joint Commissions Partnership grants program cited in plan as possible funding source for actions has not funded in FFY2007 and FFY2008.

Response:

It is understood that many of the funding sources available are subject to federal and state budget support that is variable. These funders will be kept in the Plan in hopes that they will continue to be available in the future but may have periodic lapses.

Comment:

Invasive plants are pervasive along banks of all three rivers including Japanese knotweed, honeysuckle, buckthorn, bittersweet and others. The Plan should address terrestrial invasives along rivers as well as aquatic invasives.

Response:

The Basin Plan addresses invasive plants with direct or indirect water quality impacts. Aquatic species are addressed for these reasons. Japanese knotweed is also addressed due to its tendency to become a monoculture in riparian areas which causes disruption to riparian wildlife habitat, limits buffer tree establishment and contributes to destabilizing riverbanks. Other above-mentioned species do not have the same type of water quality impacts so, despite their other negative impacts, are not addressed in the Plan.

Comment:

The District Environmental Commission and the Environmental Board decision regarding the Stratton Water Quality Remediation Plan also recognized the Vermont Natural Resources Council as a participant in evaluation of the WQRP progress.

Response:

Correction made.

Comment:

On page 101, 2nd paragraph the Plan mentions long term monitoring. Kidder Brook was last monitored in 2004, and that was for event sampling only.

Response:

The on-going sampling program does not sample every site every year. Kidder Brook is likely to be sampled again in 2008.

Comment:

Appendix 12, Dams, does not list the removable dam for the Winhall snowmaking pond. The pond was created by building a dam which is under a monitoring program to ensure the safety of the town.

Response:

The pond in question is Mahoney Pond in Winhall which is a snowmaking pond for Stratton. It has an earth-filled dam. An inflatable dam in the Winhall River is used seasonally to hold water for pumping to the pond. Mahoney Pond is a high hazard dam which is inspected annually by the ANR Facilities Engineering Section. The coded use of the pond is R – Recreation.

Comment:

Appendix 12, Dams, Stratton Mt Lake on the North Branch is used primarily for snowmaking. A by-pass was constructed in 1996 so the Lake could hold more water without reducing the flow in the North Branch.

Response:

Correction made. The coded use of the pond is R – Recreation.

Comment:

The Town of Chester owns the Jaffry Barn on Route 103 north of Chester Depot and it is badly deteriorated. Whatever is to be done could impact the Williams River because the back land of the barn borders the river. What will be done to protect the river, and could funding be found to repair the 1889 Barn and make it a Watershed Education Center for school children?

Response:

The barn sits along the road and there is a considerable buffer of field between it and the river. Careful removal or restoration of the barn should not impact the river.

There are no plans to convert the barn into a usable facility, the cost of which would be significant.

Comment:

I am very concerned that the State of Vermont should NOT widen Rte. 103 north of Chester as it is very close and parallel to Williams River.

Response:

VTrans repaired and repaved this section of Route 103 in 2007 and did not widen the road. There are no plans to do so in the foreseeable future.

Comment:

Page 7, About This Plan, i.: use some dates (years) here to give timeframe/events progression perspective.

Response:

Pertinent dates will be added.

Comment:

Page 17, Is there an annual Invasive Aquatic Plant control effort occurring at Herricks Cove?

Response:

No control program is taking place in Herrick's Cove for aquatic invasives. Wording in chart will be changed to clarify that the intent is to begin control efforts there.

Comment:

Page 23, Watershed Education – Invasive Aquatic Plant workshops and “on-the-water” field outings are being presented & led by L. Callahan and are an on-going outreach effort.

Response:

This will be reflected in the chart as well as the recommendations.

Comment:

Page 46, Conserved Lands (map) – are the Retreat Farm, Woods, Hogel Trust, etc. in Brattleboro considered “conserved lands”?

Response:

Not all privately conserved lands have been incorporated into the State’s conserved lands database. The map reflects the most current data the State possesses.

Comment:

All Basins should be under one state agency. The status quo of letting local volunteer groups and advocacy organizations scurry about keeping busy trying their best to promote water quality with limited resources is not sustainable. This eventually has to be done in order to put forth a manageable statewide water conservation process.

Response:

The basin planning process is under the aegis of the Agency of Natural Resources in the Water Quality Division of the Department of Environmental Conservation. There are 17 basins statewide and all are undergoing or about to under a similar planning effort. Volunteer groups, regional and state organizations and agencies are an integral part of the implementation of water quality protection strategies laid out in the plan and funding is being actively sought to carry out the proposed action steps. It is understood by the ANR that the state has the ultimate responsibility for protecting the quality of Vermont’s waters.

Comment:

On page 137: “Contact recreation” and “secondary contact recreation” should be in the glossary. Perhaps other designated uses should also be mentioned: hunting, trapping, environmental education, and wildlife viewing.

Response:

The following definitions will be added:

Primary contact recreation – this classification protects people from illness due to activities involving the potential for ingestion of, or immersion in, water. Primary contact recreation usually includes swimming, water-skiing, skin-diving, surfing, and other activities likely to result in immersion. (EPA Water Quality Standards Handbook, 1994)

Secondary contact recreation – this classification is protective when immersion is unlikely. Examples are boating, wading, and rowing. These two broad uses can be logically subdivided into an almost infinite number of subcategories (e.g., wading, fishing, sailing, powerboating, rafting.). Often fishing is considered in the recreational use categories. (EPA Water Quality Standards Handbook, 1994)

Designated uses are specifically defined in the Vermont Water Quality Standards and apply to a specific Class of water, designated uses include:

1. Aquatic Biota, Wildlife, and Aquatic Habitat
2. Aesthetics

3. Swimming and other primary contact recreation
4. Boating, Fishing, and Other Recreational Uses
5. Public Water Supplies
6. Irrigation of crops and other agricultural uses

Comment:

CRJC hopes that the outreach effort about the importance of meaningful shoreland protection will extend to local decision-makers, as suggested in Recommendations 28 and 29, especially given the absence of statewide shoreland protection in Vermont.

Response:

This will be added to # 6.

Basin 11 Water Quality Management Plan Public Comments Responsiveness Summary June 2008

Existing Uses

Comment:

EU's as presented in the table are incomplete, do not provide a full and accurate picture of the true uses that exist in Basin 11 and therefore do not provide adequate protection of waters. The list for fishing is so incomplete as to be dangerous. There should be a complete document for use in permit reviews.

Response:

As stated in the criteria document in Appendix A.13, the list of existing uses (EU's) in each river basin plan is not intended to represent an exhaustive list of all existing uses, but merely an identification of very well known existing uses. Recreational existing uses identified in the plan are those having known public access. Additional existing uses of contact recreation, boating and fishing on/in flowing waters and additional public drinking water supplies may be identified during the Agency's consideration of a permit application and in future iterations of the Basin 11 Water Quality Management Plan. DEC intends to develop similar but different criteria for existing use determinations that can be applied on a case or site- specific basis in conjunction with permit reviews or requests to the ANR Secretary for an existing use determination.

Comment:

All waters are public waters and the Vermont Water Quality Standards (VWQS) Anti-Degradation (A-D) policy requires that "All waters shall be managed in accordance with these rules to protect, maintain, and improve water quality." Therefore ALL uses should be protected regardless of the status of ownership of access points. This is especially important for fishing where wading along waterways is an important component of the activity. If EU's are protecting

water quality, there is no relationship to public access points. EU protection only applies to the waters on the list which are limited to sites with documented public access. How many permits does the Agency get for development on public lands or those lands with easements to the waters?

The fact that Burbee Pond (cover photo) is not on the fishing list tells me that there is something fundamentally wrong with the method for determining existing uses described in Appendix A.13. The whole notion that fishing (and swimming) only occurs where there is deeded or formally designated public access is fundamentally wrong-headed. I routinely, and legally, trespass across the unposted private property of others to gain access to fishing and swimming sites.

Response:

The VWQS contain reference to designated uses and existing uses. The A-D policy is a provision that protects against the elimination and diminishment of uses described in the VWQS. Existing uses can be identified during the basin planning process and in site- or case specific situations involving a permit application. ANR has developed criteria for use during basin plan development to document the presence of an existing use for recreational uses (swimming, boating and fishing) and for public surface water supply. These criteria are not meant to identify all existing uses within a basin, but are instead designed to ensure that the ‘first cut’ identification of existing uses across all basins is done in a uniform and consistent manner. These criteria specifically state that additional existing uses may be identified during the review of permit applications. The identification of existing uses during the basin planning process and during individual permit review is specifically allowed in the VWQS.

DEC does not endorse or condone persons trespassing across privately owned land without first obtaining landowner permission. This was another reason why recreational existing use determinations were so strongly conditioned to sites with public access.

Comment:

EU’s only come into play during the permitting process and do nothing to protect waters on a day-to-day level.

Response:

As per statute and the VWQS, ANR can determine the presence of existing uses during the basin planning process. ANR has developed the criteria as a way to make those determinations in a consistent and repeatable manner. Consistent with those criteria, ANR has included a listing of existing uses that can be used to protect waters on a day-to-day basis by town boards, water users and potential applicants.

Comment:

Aquatic biota and wildlife, habitat, and ecological significance are not being considered and are required by the VWQS. Therefore the anti-degradation implementation policy as stated in the criteria is not legal policy.

Slipping a (Draft) (and almost entirely inadequate) protocol for determining EU's into the draft of a Basin Plan at the last minute, without adequate notice, discussion, and consideration of feedback, is a very poor strategy. If adopted as an officially sanctioned method for determining EU's, the protocol and criteria described in the document would amount to an unlawful revision of the definition of "Existing Use" which appears in the WQS. I do not think that the ANR secretary has the authority to do this, and I think that he ought not.

With the legislatively provided relief from incorporating water typing for reaches of the rivers in this plan any substitute standard should provide a clear and high standard under the existing uses portion of the draft plan. Unfortunately a comparison between the existing Water Quality Standards and the draft Existing Uses Guidance provided show that, this is a human-activity centered uses analysis as opposed to the full spectrum uses analysis required under the WQS. The draft anti-degradation standard set out as an appendix to the draft plan does not meet the standards set in law under VSA Title 10 Section 1250.

Response:

ANR is aware that the list of EU's is not a complete list nor does it include aquatic biota, wildlife, habitat or ecological significance. The basin planning process can and will incorporate additional and other existing uses into the list in future iterations of the plan, as appropriate. A comprehensive list of EU's is likely to develop over time as sites or areas are documented during permit applications and in future planning discussions. The determination of EU's in the basin plan is not being done as a replacement or substitute to water management typing. Legislation enacted in 2007 relieved ANR from including recommendations concerning classification and water management typing in the basin 11 plan (and basin 14 plan).

The Agency did file a report with the Legislature on 2/25/08 entitled "Act 43 Report – Alternatives to Water Management Typing." This report explores alternatives to Water Management Typing that includes expanding the use of the Antidegradation Policy (and possibly amending it) by broadening the reach of existing use determinations and, more importantly, identification of so called "high quality waters." The Agency's recent Existing Use Determination for basin planning is not intended to be a substitute for further exploration of the ideas set forth in the Agency's report.

The Agency fully expects that the identification of existing uses and their role in protecting Vermont's waters will be a topic of discussion during the upcoming review of the VWQS by the Vermont Water Resources Panel. The Agency has conducted significant research on how existing uses are identified and used to protect waters across the country and the Agency believes that a robust and public discussion of existing use should be had during the VWQS review. In light of this, the Agency has created existing use identification criteria for use in basin plans that focus on well documented existing uses and that will result in a uniform and consistent identification of existing uses across all basins during this interim period. Again, these criteria specifically state that additional existing uses may be identified during reviews of permit applications and during subsequent iterations of basin plans.

Comment:

EU's and anti-degradation, as written in the criteria, are unnecessarily restrictive, very weak and less protective than the current VWQS due to the "all existing uses" language in the VWQS. The revised plan, in its interpretation and definition of existing uses, implies that the required A-D policy can be implemented through a basin by basin process as opposed to state-wide.

Response:

The criteria do not alter the requirements in the VWQS. The criteria were created to guide ANR in developing a list of well known existing uses during the basin planning process. All provisions in the VWQS continue to apply. The VWQS contain a provision that EU's can be determined during the basin planning process as appropriate. As all 17 plans are adopted using EU criteria, EU protections will be state-wide.

Comment:

The VWQS mandate typing. ANR's attempt to adopt the EU criteria allows it to avoid Typing and Classification implementation by choosing to supplement EU's as "an alternative method of protecting water quality" as called for in H.154. It also seems to allow ANR to avoid implementing full protection of all designated uses as is required by the VWQS.

Response:

Identifying existing uses in accordance with the criteria is not being done to avoid or as a replacement to water management typing. The future of typing and classification has yet to be determined by the Water Resources Panel and will be a topic for discussion and resolution during its review of the VWQS this fall/winter. Until such guidance is provided, and in order to meet the time-frame required in H.154 of the 2007 adjourned legislative session, ANR has chosen and is authorized under the VWQS to include an initial list of EU's in order to provide some level of protection to these important areas in conjunction with additional EU protections that will occur during the permit review process. As the typing and classification issue gets resolved, ANR will implement whatever policy or procedure or guidance is put forth by the Panel. Designated uses are set management objectives for each water quality classification that are required to be met in all waters. Setting EU's does not affect or in any way alter designated use objectives or management.

In addition, the Agency did file a report with the Legislature on 2/25/08 entitled "Act 43 Report – Alternatives to Water Management Typing." This report explores alternatives to Water Management Typing that includes expanding the use of the Antidegradation Policy (and possibly amending it) by broadening the reach of existing use determinations and, more importantly, identification of so called "high quality waters." The Agency's recent Existing Use Determination for basin planning is not intended to be a substitute for further exploration of the ideas set forth in the Agency's report.

Comment:

The enforcement of water quality violations under the current standards is abysmal. Implementing EU's will not solve this problem and will only make it more difficult to enforce because it does not cover all waters and is not easily understood.

Response:

The identification of the presence of existing uses is not linked to nor should it be confused with an enforcement tool.

Comment:

The definition of EU's in the criteria is very limited and sets a precedent for future attempts to add EU's to the list. Permit applicants in the future can use the criteria to argue against inclusion of EU's brought forth by the public if those uses do not conform to the criteria conditions, including having public access points.

Response:

ANR will use the criteria to identify existing uses of contact recreation, fishing, boating and public drinking surface water supplies during river basin planning and the development of river basin water quality management plans. The criteria are not meant to restrict the public's ability to propose EU's during the permit process. At the appropriate time, ANR encourages persons wishing to document the presence of existing uses to apply the criteria and bring those findings to the attention of the Water Quality Division. ANR has made it clear that these criteria are not the final say on what constitutes the existing uses in a waterbody. ANR plans on developing additional EU criteria for use during permit reviews.

Comment:

Risk assessments by permit applicants are not always done well. In preparing risk assessments developers are likely to refer to the basin plans for EU information and will find a very limited listed. They can then claim "due diligence" and if no one follows up or challenges their assessment many EU's will be threatened because they are not on the list.

Response:

The EU criteria developed clearly state that these criteria are only for use during the basin planning process and that additional existing uses may be identified during permit reviews and during successive iterations of each basin plan. This language would clearly weigh against the validity of any claim that review of a basin plan was sufficient "due diligence" in the identification of all existing uses in a waterbody.

Comment:

There is potential for abuse of the EU policy.

- The checkerboard nature of sites on the list leave most waters in Basin 11 unprotected. No guidance is given as to how far up- or downstream the EU must be protected. It will be left to the make-up of the permitting staff or board to arbitrarily choose a protected distance.
- The permits that trigger EU consideration are limited. Many other activities not covered by permits can and will cause water quality problems. Without typing the only level of water quality that must be maintained is the floor of the current Class B. This is not enough and is why typing was instituted in the first place.
- Typing provides a seamless blanket of coverage protecting all waters of the state rather than EU's very spotty coverage. Too many waters will remain unprotected without typing.

- H. 154 6(c) – allows for the plan to be revised within 2 years to include typing or an alternative, it does not require EU's, typing should be done instead of EU's. EU's do not need to be included in plan before H.154 deadline. Typing is the appropriate method of protection; the typing in Basin 11 has been done in a way that reflects much of the new criteria. The EU list ignores the hard work of the professionals within ANR and others who put in many hours preparing the proposed typing and classification in Basin 11 and is an inadequate interpretation of the VWQS.

Response:

As stated above, ANR has chosen, and is authorized, to identify and include EU's during the basin planning process and during permit reviews in order to provide a level of protection to these important areas ANR's determination of the presence of an EU may also afford improved recognition of these areas on the local level as well. As stated earlier, ANR fully expects that the concepts of typing, anti-degradation, and existing uses will be fully discussed during the Water Resources Panel's upcoming review of the VWQS.

Comment:

If EU's are included a strong statement should be included that this is only a partial and very limited list

Response:

A stronger statement to this affect will be added to the basin plan.

Comment:

B11 plan should be adopted without EU's and the rest of Appendix A.13. The inclusion of Appendix A.13 creates obstacles to effectively developing a state-wide A-D policy after the determination of typing is concluded. EU's should be removed.

Response:

ANR feels it is appropriate to include a list of EU's in the basin plan in order to protect the uses so identified. The Agency encourages the public to nominate other EU's which will be catalogued for a more thorough investigation on a case-by-case basis during the permit review process for an activity that might adversely affect the use and will be included in future basin plans as appropriate.. Recommendations for EU considerations should be made in writing to the Agency.

Comment:

If the Draft Vermont Anti-degradation Implementation standard is adopted as part of this plan in no event should adoption of the draft anti-degradation standard become a precedent in setting out existing uses determinations in other waters. And if it is adopted in the Basin 11 plan, the plan should clearly state that adoption of this standard does not set a precedent for determining existing uses in other waters of Vermont.

Response:

ANR has developed the criteria and associated set of conditions for determining the presence of EU's found in Appendix A.13 as a way to help ensure that certain EU's are identified during the

basin planning process in a transparent, consistent and repeatable manner in each river basin plan. ANR, with assistance from its various water quality management and planning partners found in each river basin, may refine and be able to improve upon the criteria set for EU determination in the future. In addition, ANR plans on developing broader criteria for the identification of existing uses during permit reviews.

Comment:

The changes made to the Draft Basin 11 Plan erodes trust in the public planning process that was central to the development of this Basin plan.

Response:

The EU list included in the revised plan is a summation of many of the uses discussed in the Draft plan plus some additional and well-known sites. Its inclusion does not change or diminish the recommendations and strategies developed during the multiple years of the planning process or the valuable input ANR has garnered from public participation in developing the plan. Public involvement has been exceptional throughout the plan's development and ANR will work diligently to implement the recommendations it contains.

Comment:

EU inclusion is a significant change to the B11 plan and not enough outreach was done to solicit public input nor enough time allowed for response and comment.

Response:

As a result of comments received during the January 2008 meetings on the Draft Basin 11 Plan, ANR is including areas where it has been determined there is an existing use in accordance with criteria developed by ANR for the basin planning process. The Draft plan contained numerous references to the occurrence of swimming and boating and fishing. The process of documenting the presence of EU's will continue and the list will be amended in future versions of the plan.

Meeting notification and the time for public comment followed state requirements.

Comment:

The public meetings to solicit comments of the inclusion of EU's were not held within the Basin.

Response:

The meeting locations were selected as the best sites for attracting attendance. The meeting for the Williams and the Saxtons watersheds was held in Bellows Falls which is at the mouth of both rivers. The meeting for the West was held in Brattleboro which has a very good record of participation.

Additions to Existing Use Listing

Comment:

End of Kendall Farm Road in Winhall (Winhall River) has parking area and is used for swimming and fishing – this should be GMNF land and should be included on list.

Response:

This will be added to the Contact Recreation list concerning existing uses for swimming the site will not be included in the fishing EU list as it is not currently covered by the criteria used by VDFW for this initial list.

Comment:

The swimming area on the West River where the town has just purchased the land for recreational fields should be included on the list.

Response:

At the time of publication this land has not yet been purchased by the Town of Brattleboro. Once ownership is established the site will be added to a future EU list.

Comment:

Salmon stocking sites are not included in the fishing EU criteria and should be.

Response:

Salmon are stocked as part of the restoration program not specifically for fishing. Consequently, as salmon stocking was not one of the conditions used when determining the presence of fishing as an existing use, this has not been included in the listing. The condition Managed Request for Cultured Fish is not equivalent to salmon stocking.

Revisions to the Plan

Comment:

The term “Fish consumption” is included in the list of Designated Uses for waters of Basin 11. The term “Fish consumption” does not appear on the list of designated uses that appears in the WQS, and is not defined in the draft Basin 11 Plan.

Response:

Fish consumption is not a designated use and the term will be removed from the plan.

Comment:

The draft addresses one of the new threats to aquatic habitat soundness. The plan talks about didymo (*Didymosphenia geminata*), and includes a discussion of how to prevent its spread. The draft plan does not address the imminent invasion of VHS (*viral hemorrhagic septicemia*) into the waters of these river basins.

Recommendation: ANR should include in the basin plan warnings about VHS, an explanation of the reasons for and support for the VT F&W restrictions on moving uncertified disease free bait fish from one water body to another.

Response:

This information will be added to the basin plan.

APPENDIX B - REGULATORY AND NON-REGULATORY PROGRAMS THAT CONTAIN BMPS APPLICABLE TO PROTECTING AND RESTORING WATERS WITHIN THE BASIN

APPENDIX B.1 - Agricultural Runoff Control Programs

Programs To Address Issues

Vermont Agency of Agriculture, Food & Markets Programs

Accepted Agricultural Practices (AAP) are statewide regulatory guidelines for agricultural land use practices created to reduce the amount of agricultural pollutants entering waters of the state from farm land. The AAPs were designed to reduce non-point pollutant discharges through implementation of improved farming techniques rather than investments in structures and equipment. The law requires that these practices must be technically feasible as well as cost effective for farmers to implement without governmental financial assistance.

Accepted Agricultural Practices (AAP's) are intended to reduce, not eliminate, pollutants associated with non-point sources such as sediments, nutrients and agricultural chemicals that can enter surface water and groundwater that would degrade water quality. Accepted Agricultural Practices are a group of farmland management activities, which will conserve and protect natural resources. These practices will maintain the health and long-term productivity of the soils, water, and related plant and animal resources and reduce the potential for water pollution from agricultural non-point sources. Accepted Agricultural Practices include these practices among others: erosion and sediment control, animal waste management, fertilizer management, and pesticide management. Accepted Agricultural Practices are basic practices that all farm operators must follow as a part of their normal operations. Implementation of Accepted Agricultural Practices by Vermont agricultural operators creates a reputable presumption of compliance with Vermont Water Quality Standards. The presumption that the use of Accepted Agricultural Practices complies with Vermont Water Quality Standards may be overcome by water quality data or results from a water quality study deemed conclusive by the Secretary. These rules, however, do not exempt farmers from the obligation to comply fully with the Vermont Water Quality Standards and the provisions of the Clean Water Act.

<http://www.vermontagriculture.com/AgriculturalWaterQuality/AAP/AAP10.htm>

Best Management Practices (BMP) are voluntary practices that are specific practices installed to correct a current waste management problem on a specific farm. All Vermont farmers are eligible to receive available state financial assistance following the installation of on-farm improvements designed to control agricultural non-point source waste discharges. Best Management Practices (BMP's) typically require installation of structures, such as manure

storage systems, milkhouse waste treatment, stream fencing to reduce agricultural nonpoint source pollution, and a variety of other practices that improve water quality. While farmers may realize an economic benefit from Best Management Practices, it is unlikely that they will be affordable without governmental cost sharing.

Best Management Practices Cost-Share Program - The BMP program was created to provide state financial assistance to Vermont farmers in support of their voluntary construction of on-farm improvements designed to abate non-point agricultural waste discharges. The program makes maximum use of federal financial assistance and seeks to use the least costly methods available to accomplish the abatement required. The Vermont Agency of Agriculture, Food, and Markets (VAAFAM) grants are limited to a cap of 35 percent of the total actual costs of the system in cases where either the federal government or other entities cost share the system, or up to 80 percent on projects with no other source of cost share assistance. Combined federal, state and other cost share participation may not exceed 85 percent of the eligible costs; ensuring grant recipients pay at least 15 percent of the total cost of each BMP. Once funding for BMP implementation has been awarded, the farm is required to operate and maintain the practice under contract or agreement for the design life of the practice, but not to exceed 10 years. Any farm in Vermont is eligible to apply for state BMPs cost-share dollars, and the program accepts applications on a rolling basis. All water quality related BMPs listed on the Vermont NRCS practice code list are available for state funding. Both VAAFAM and NRCS engineers are available to help farmers assess what BMPs would be most beneficial on the farm.

<http://www.vermontagriculture.com/ARMES/awq/bmp.html>

Large Farm Operations (LFO) – The LFO program requires farms with more than 700 mature dairy cows (whether milking or dry), 1,000 beef cattle or cow/calf pairs, 1,000 young-stock or heifers, 500 horses, 55,000 turkeys, or 82,000 laying hens (without a liquid manure handling system) to be managed in accordance with the states LFO permit rules. A LFO permit prohibits the discharge of wastes from a farm's production area to waters of the state and requires the farm to land apply manure, compost, and other wastes according to a nutrient management plan. This program is the most stringent regulatory program coordinated by the Agency. The Agency provides LFOs with a Vermont-based regulatory program that applies the same technical standards as the federal CAFO permit. If an LFO does not comply with the state issued individual farm permit, the farm may have to obtain a National Pollution Discharge Elimination Systems permit. There are currently no farms in Basin 11 which require an LFO permit.

<http://www.vermontagriculture.com/ARMES/awq/LFO.html>

The **Medium Farm Operations (MFO)** General Permit requires farms with between 200 and 699 mature dairy cows or 300 beef cattle to prohibit a direct discharge of waste to waters of the state from any area of the barnyard or land associated with the farms production area. The MFO program provides a common-sense, Vermont-based, regulatory alternative to a potentially burdensome federal permitting program by allowing medium sized farms to seek coverage under a single Vermont state General Permit. The General Permit prohibits discharges of wastes from a farm's production area to waters of the state and requires manure, compost, and other wastes to be land applied according to a nutrient management plan. If farms do not comply with the state

MFO General Permit they may be required to obtain a National Pollution Discharge Elimination Systems permit. There are currently 2 farms in Basin 11 which will require an MFO permit.

<http://www.vermontagriculture.com/ARMES/awq/MFO.html>

<http://www.vermontagriculture.com/ARMES/awq/ResoucesforNutrientManagement.html>

Nutrient Management Incentive Grant Program - the NMPIG program provides financial assistance for the development of NMPs and three additional years of plan update and maintenance. NMPs may be developed by a certified nutrient management planner or by farmers themselves. The incentive grant provides NMP development reimbursement at rates of \$7 per acre, plus the cost of soil (\$10 per test), manure, and other waste testing (\$35 per test). Once the NMP is developed and meets the state requirements for reimbursement, the farmer is eligible for 3 years of continued update payments that provide needed dollars for implementation and maintenance of the NMP. Total NMPIG payment is limited to \$13,000 for plan development and maintenance/update per farm.

<http://www.vermontagriculture.com/ARMES/awq/NMPIG.html>

<http://www.vermontagriculture.com/ARMES/awq/ResoucesforNutrientManagement.html>

Farm Agronomic Practices Program (FAPP) provides Vermont farms with state financial assistance for implementation of soil-based practices that improve soil quality, increase crop production, and reduce erosion and agricultural waste discharges. FAPP also will provide funding incentive for NMP updates, implementation, and maintenance with the aim of improving outreach education on agricultural water quality impacts and regulations. Practices eligible for assistance are: Nutrient Management Plan Update Payments (\$2 per acre); Cover Cropping (\$20 per acre); Strip Cropping (\$24 per acre); Conservation Crop Rotation (\$25 per acre); and Cross-Slope Tillage (\$10 per acre).

<http://www.vermontagriculture.com/ARMES/awq/FAP.html>

Vermont Agricultural Buffer Program (VABP) Of the land currently enrolled in CREP, only 20 % is annual cropland (mainly corn silage). This cropland has a greater potential to contribute phosphorus and sediment through surface runoff and erosion, to waters of Vermont, and hence the VABP has been designed to allow farmers to plant harvestable grass buffer along streams. Eligible land enrolled in the program must be planted to a perennial sod-forming crop. Buffers developed under this program can only be tilled to establish the buffer, can have no manure applied on the contracted land at anytime during the contract, must maintain minimum a 25 ft width, and harvesting of the buffer is only allowed from June 1st to September 1st. A set rate of \$123 per acre is provided to the participant to cover cost of establishing grassed buffer when a suitable grass is not currently planted. An additional per acre incentive payment will be paid annually at the end of growing season for each of the 5 years participant is enrolled in VABP. The annual payment will be 40% of an estimated total 15 year per acre CREP payments, and the

VABP program allows farmers to opt out of the contract at anytime over the five year contract period.

<http://www.vermontagriculture.com/documents/VABP.pdf>

Local Government Programs

Conservation District Technical Assistance Programs

Free technical assistance and information is provided through the conservation districts.

<http://www.vacd.org/>

Accepted Agricultural Practices Assistance to help farmers meet the requirements of Vermont's AAP regulations. Technical assistance for manure and nutrient management, runoff potential, floodway determinations, streambank stabilization, vegetative buffer strips and soil erosion potential are all addressed by the program. Agricultural Resource Specialists (ARS) work with landowners on strategies specific to their farms and provide information and referrals for State and Federal cost-share programs.

<http://www.vacd.org/onrcd/ars.html>

Farm*A*Syst is a free drinking water protection program for farms based on voluntary assessments to determine how current practices and structures may pose a risk to drinking water. Voluntary Farm Assessments provide information that help ARS staff offer farm-specific suggestions for protecting the farm's drinking water.

<http://www.vacd.org/onrcd/farmasyst.html>

Land Treatment Planners are available to assist farmers in developing land treatment plans which provide detailed information on farm soil and water resources, recommendations for continued stewardship, and recommendations for compliance with State and Federal regulations.

<http://www.vermontagriculture.com/ARMES/awq/LTP.html>

Southern Vermont Nutrient Management Program Co-sponsored by Windham County NRCD, the SVNMP provides on-farm consultation, with the primary goal of working on individual nutrient management plan development. Nutrient management plans are required in Vermont on larger farms and on farms participating in Federal and State cost-share programs. A detailed plan involves field and crop histories, soil tests and sampling results, and a detailed plan for use of all on-farm nutrients so as to maximize environmental and financial sustainability.

http://www.vacd.org/wncrd/documents/SVNMP_Brochure.pdf

Federal Programs

The **Agricultural Management Assistance (AMA)** program provides cost share assistance to agricultural producers to voluntarily address issues such as water management, water quality,

and erosion control by incorporating conservation into their farming operations. Producers may construct or improve water management structures or irrigation structures; plant trees for windbreaks or to improve water quality; and mitigate risk through production diversification or resource conservation practices, including soil erosion control, integrated pest management, or transition to organic farming. Vermont's AMA program priorities are waste storage facility construction and streambank stabilization.

<http://www.vt.nrcs.usda.gov/programs/AMA/>

The **Conservation Reserve Enhancement Program** (CREP) is a State-federal conservation partnership program targeted to address specific State and nationally significant water quality, soil erosion and wildlife habitat issues related to agricultural use. The program uses financial incentives to encourage farmers and ranchers to voluntarily enroll in contracts of 15 or 30 years in duration to remove crop and marginal pasture lands from agricultural production. This community-based conservation program provides a flexible design of conservation practices and financial incentives to address environmental issues.

<http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep>
<http://www.vermontagriculture.com/CREPwebsite/Home/Home.htm>

The **Conservation Reserve Program** (CRP) is a voluntary program that offers long-term rental payments and cost-share assistance to establish long-term, resource-conserving cover on environmentally sensitive cropland or, in some cases, marginal pastureland. Converting highly erodible and/or environmentally sensitive cropland to permanent vegetative cover reduces soil erosion, improves water quality, and enhances or establishes wildlife habitat. CRP contracts are for a term of 10 to 15 years. However, for land devoted to certain practices such as hardwood trees, wildlife corridors, or restoration of cropped wetlands or rare and declining habitat, participants may choose contracts of up to 15 years. Incentives include annual rental payments of up to \$50,000 per year, cost-share payments of up to 50% of the cost for establishing cover, plus special incentive payments for wetland restoration.

<http://www.vt.nrcs.usda.gov/programs/CRP/>

The **Conservation Security Program** (CSP) is a voluntary program to assist agricultural producers implementing and maintaining new or maintaining existing conservation practices on working lands. All producers and all private agricultural lands including cropland, improved pasture land, rangeland, and forested land that are an incidental part of an agricultural operation are eligible for enrollment. The purpose of the CSP is to provide incentive payments to producers who adopt and/or maintain conservation practices on private working lands. Producers may choose from one of three tiers of conservation practices and systems, with the more complex and comprehensive tiers receiving higher incentive payments. CSP contracts are from five to 10 years. Contract payments are based on five, 10 and 15 percent of a national land rental rate per acre for Tiers I, II and III, respectively. In addition to incentive payments, producers will receive cost-share assistance to install practices, annual practice maintenance fees and potentially a bonus to encourage participation in the program. Maximum annual payments are \$20,000, \$35,000 and \$45,000.

http://www.vt.nrcs.usda.gov/programs/CSP/CSP_2006/Index_2006.html

The **Environmental Quality Incentives Program** (EQIP) provides technical, educational, and financial assistance to eligible farmers and nonindustrial private forestland owners working to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to landowners in complying with Federal and State laws, and encourages environmental enhancement. Protection of surface and groundwater resources is the major focus of EQIP. The program offers cost-share payments of up to 75% of costs up to \$450,000, to implement one or more eligible practices. Five- to ten-year contracts are made with producers to use and maintain cost-shared practices and require a conservation plan be created and carried out for the length of the contract. Priority is given to livestock operations and targeted locations within the State.

http://www.vt.nrcs.usda.gov/programs/EQIP/EQIP_2007/Index.html

The **Farm and Ranch Land Protection Program** (FRPP) provides matching funds to help purchase development rights to keep productive farm and rangeland in agricultural uses. Working through existing programs, USDA partners with State, tribal, or local governments and non-governmental organizations to acquire conservation easements or other interests in land from landowners. USDA provides up to 50 percent of the fair market easement value. To qualify, farmland must be part of a pending offer from a State, tribe, or local farmland protection program; be privately owned; have a conservation plan for highly erodible land; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services; and have surrounding parcels of land that can support long-term agricultural production.

<http://www.vt.nrcs.usda.gov/programs/FRPP/Index.html>

The **Grassland Reserve Program** (GRP) establishes a grassland reserve program for the purpose of restoring and conserving two million acres of grassland, rangeland, and pastureland. GRP uses up to 30-year rental agreements and 30-year or permanent easements. GRP lands may be used for haying and grazing under a conservation plan. Rental and easement payments are based on a percentage of the fair market value of the land less the grazing value of the land for the period during the contract or easement period. Restoration costs are cost shared at up to 75 percent.

<http://www.vt.nrcs.usda.gov/programs/GRP/Index.html>

The **Partners for Fish and Wildlife Habitat Restoration Program** provides technical and financial assistance to private landowners interested in voluntarily restoring or otherwise improving native habitats for fish and wildlife on their lands. This program focuses on restoring former and degraded wetlands, native grasslands, stream and riparian areas, and other habitats to conditions as natural as feasible. The program emphasizes the reestablishment of native vegetation and ecological communities for the benefit of fish and wildlife in concert with the needs and desires of private landowners. The assistance that the USFWS offers to private landowners may take the form of informal advice on the design and location of potential restoration projects, or it may consist of designing and funding restoration projects under a voluntary cooperative agreement with the landowner. Under the cooperative agreements, the

landowner agrees to maintain the restoration project as specified in the agreement for a minimum of 10 years. While not a program requirement, a dollar-for-dollar cost share is usually sought on a project-by-project basis.

<http://ecos.fws.gov/partners/viewContent.do?viewPage=home>

Watershed and River Basin Planning and Installation - Public Law 83-566 (PL566) Technical and financial assistance is provided in cooperation with local sponsoring organizations, state, and other public agencies to voluntarily plan and install watershed-based projects on private lands. The purposes of watershed projects include watershed protection, flood prevention, water quality improvements, soil erosion reduction, rural, municipal and industrial water supply, irrigation management, sedimentation control, fish and wildlife habitat enhancement and create/restore wetlands and wetland functions. Watershed plans involving Federal contribution in excess of \$5,000,000 for construction, or construction of any single structure having a capacity in excess of 2,500 acre feet, require Congressional committee approval. Other plans are approved administratively. After approval, technical and financial assistance can be provided for installation of works of improvement specified in the plans. Project sponsors get assistance in installing land treatment measures when plans are approved. Technical assistance is furnished to landowners and operators to accelerated planning and application of needed conservation on their individual units. There are presently over 1600 projects in operation.

<http://www.nrcs.usda.gov/programs/watershed/>

The **Wetlands Reserve Program (WRP)** is a voluntary program offering landowners a chance to receive payments for restoring and protecting wetlands. Marginal agricultural land that is too wet to produce, previously drained wetlands or land damaged by flooding are typical sites for WRP funding. Landowners retain control over access to their property and compatible uses such as haying, grazing, timber harvest, fee hunting, and trapping may be permitted upon request. Land can be resold. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the easement or agreement. Re-stored wetlands improve water quality, filter sediment, reduce soil erosion, provide habitat for wildlife and endangered species, reduce flooding and provide outdoor recreation and education opportunities.

<http://www.vt.nrcs.usda.gov/programs/WRP/Index.html>

The **Wildlife Habitat Incentives Program (WHIP)** is a voluntary program that provides financial incentives to develop habitat for fish and wildlife on private lands. It provides both technical assistance and cost sharing help to participants who agree to implement a wildlife habitat development plan. Participants work with USDA's Natural Resources Conservation Service to prepare a wildlife habitat development plan in consultation with a local conservation district. The plan describes the landowner's goals for improving wildlife habitat, includes a list of practices, a schedule for installing them, and details the steps necessary to maintain the habitat for the life of the agreement. USDA pays up to 75% (usually no more than \$10,000) of the cost of installing wildlife practices. USDA and program participants enter into a cost-share agreement that generally lasts a minimum of 10 years from the date the contract is signed.

<http://www.vt.nrcs.usda.gov/programs/WHIP/Index.html>

Additional Programs

The **Current Use Program** (CUP) Vermont's Agricultural and Managed Forest Land Use Value Program -- known as the Current Use Program -- was created in the 1970's as a companion to legislation that required towns to list property at 100% of fair market value. Because of escalating land values, these property taxes were placing a heavy burden on owners of productive farm and forest lands. The CUP offers landowners use value property taxation based on productive value of land rather than traditional "highest and best" use of the land. The CUP includes a Land Use Change Tax as a disincentive to develop land. The tax is 20% of fair market value of a property, or, in case of the sale of part of a property, a pro rata share of the fair market value of the entire property. The program is administered by the [Vermont Department of Taxes](#).

<http://www.state.vt.us/tax/pdf.word.excel/pvr/currentuse-geninfo.pdf>

The **Farmland Access Program** (FAP) goal is to provide qualified diversified farmers with access to good agricultural land and to assist with the start up or expansion of commercial agricultural businesses. In this way, Vermont Land Trust hopes to facilitate the creation of new farm enterprises and greater diversification within Vermont agriculture. VLT can work with Land Link Vermont to enroll farmers in a farmland database; assist farm seekers in securing business planning services through the Farm Viability Program; assist in farm purchases when seekers locate farms; and search for, purchase, conserve or sell farms in Vermont that are suitable for diversified farm operations. Minimum qualifications require candidates to have 3 to 5 years of commercial farming experience, strong agricultural references, plans to develop an agricultural enterprise that would gross \$100,000 per year within 5 years of start up, and sufficient financial resources (or ability to be financed) for start-up expenses. Our primary focus is on farms producing food and fiber that would use at least 25 acres of productive land.

<http://www.vlt.org/FarmlandAccessBrochure.pdf>

The **Farmland Preservation Program** (FPP) is focused on retaining the state's quality agricultural land base in strong farming regions of the state. The purchase of conservation easements on farmland preserves Vermont's working landscape--the open farm fields, woodlands and farmsteads that comprise the third largest sector in the state's economy and draw the visitors that make tourism the largest sector. Because of the Vermont Housing & Conservation Board's investment in conservation easements, Vermont's most productive farmland will remain undeveloped and the best soils will remain available for farming in the future. Selling conservation easements enables a landowner to keep land in agricultural use and also be compensated for the potential development value of the land, recognizing the asset value of the land. The landowner retains title to the land and agrees to the terms of a conservation easement limiting future ability to subdivide and develop the land.

<http://www.vhcb.org/Conspage.html#Anchor-Farmlan-65515>

Land Link Vermont (LLV) is a farm linking program at University of Vermont Center for Sustainable Agriculture. Land Link Vermont connects farm seekers with farmland and farming opportunities, and provides information and support on farm start-ups and succession by offering a matching service, education, referrals, and outreach. The matching service provides linkages

among farm seekers and farmland owners. Interested parties share information on goals, acreage, location, enterprises, and tenure options considered. Participants are interested in a variety of tenure options including buy/sell, lease, joint farming and other arrangements. Farm seekers are interested in a number of different farming enterprises including dairy, vegetables, small ruminants and CSA's. Through publications and on-going workshops, Land Link Vermont provides farmers, land owners and agriculture professionals with links to education on topics like estate and planning, effective leases, farm financing, business planning, and direct marketing. Land Link Vermont also helps link farmers and landowners to professionals and Vermont agricultural organizations through consultation and referrals.

<http://www.uvm.edu/landlinkvt/>

The **National Fish and Wildlife Foundation** conserves healthy populations of fish, wildlife and plants, on land and in the sea, through partnerships, sustainable solutions, and better education. The Foundation meets these goals by awarding challenge grants to projects benefiting conservation education, habitat protection and restoration, and natural resource management. Federal and private funds contributed to the Foundation are awarded as challenge grants to on-the-ground conservation projects. Challenge grants require that the funds awarded are matched with non-federal contributions, maximizing the total investment delivered to conservation projects. For every dollar that Congress provides, an average of \$3 in on-the-ground conservation takes place. The Foundation has made more than 4,400 grants, committing over \$165 million in federal funds, matched with non-federal dollars, delivering more than \$500 million for conservation.

<http://www.nfwf.org/programs.cfm>

The **Nature Conservancy Conservation Easements**: Land ownership carries with it a bundle of rights—the right to occupy, lease, sell, develop, construct buildings, farm, restrict access or harvest timber, among others. A landowner can give up one or more right for a purpose such as conservation while retaining ownership of the remainder. Private property subject to a conservation easement remains in private ownership. Many types of private land use, such as farming, can continue under the terms of a conservation easement, and owners can continue to live on the property. The agreement may require the landowner to take certain actions to protect land and water resources, such as fencing a stream to keep livestock out or harvesting trees in certain way; or to refrain from certain actions, such as developing or subdividing the land. Conservation easements do not mean properties are automatically opened up to public access unless so specified in an easement. The terms of a conservation easement are set jointly by landowner and the entity that will hold easement.

<http://www.nature.org/aboutus/howwework/conservationmethods/privatelands/conservationeasements/>

Technical Assistance Programs through Northeast Organic Farming Association are free to farmers - made possible by grants from the Vermont Housing Conservation Board's Farm Viability Enhancement Program and Agency of Agriculture Food & Markets. *Vegetable and Fruit Technical Assistance* provides technical assistance to organic farmers in Vermont seeking production and financial assistance on small fruit and vegetable operations. *Dairy and Livestock Technical Assistance* provides Information, Services and Support for Vermont's Organic Dairy & Livestock Community.

<http://www.nofavt.org/nofa-programs.php>

Vermont Farm Viability Enhancement Program (FVP) provides farmers with business planning and technical assistance. Developed by the Vermont Housing & Conservation Board in collaboration with the Vermont Agency of Agriculture, Food and Markets, the FVP is designed to strengthen the economic position of Vermont agriculture and to complement existing programs in farmland conservation. The Program uses consultants to provide technical assistance tailored to a farmer's needs to fulfill specific business goals. Examples include consultations on keeping better production or financial records, financial analysis, meetings with crop or animal health specialist, new farm enterprise analysis, estate and farm transfer planning, labor management, and value-added processing. The business planning process involves the farmer in assessment of farm operation's strengths and weaknesses and in exploration of possible management changes that could increase profitability. On-farm consultations result in preparation of written business plan.

<http://www.vhcb.org/viability.html>

APPENDIX B.2 - Effluent Limitations and Point Source Control Programs

1) Design/Engineering Program

Vermont municipalities need various wastewater treatment facility and conveyance system construction and improvement projects including: original treatment facility and collection line construction; enlargement and/or refurbishment of existing facilities; implementation of nutrient removal or sludge and septage treatment improvements at existing facilities; combined sewer overflow abatement; or collection line extensions. These projects enable the municipalities to meet the effluent limits in their NPDES permit in order to meet Vermont Water Quality Standards and comply with statute; provide for centralized treatment to replace problem individual on-site systems; and provide desired wastewater treatment capacity to enable municipal growth and development.

The municipalities desire to take advantage of the state and federal capital funds appropriated for municipal pollution control projects, administered by the DEC Wastewater Management Division. The WWMD assists grant and loan recipients in developing capital planning and financing plans; assists in defining project scopes to meet the technical, regulatory, and funding requirements; assures the design of appropriate facilities; oversees facility construction; and monitors the first year's operation.

Statutory Reference

State: Title 10 VSA Chapter 55 Aid to Municipalities for Water Supply, Pollution Abatement and Sewer Separation. Title 24 VSA Chapter 120 Special Environmental Revolving Fund. Federal: Clean Water Act Title VI - State Water Pollution Control Revolving Funds.

Contacts

Nopadon Sundarabhaya, P.E. - Design Section Supervisor, 241-3750.

Thomas Joslin, P.E. - Design Section, 241-3740

Eric Blatt, P.E. - Financial Management Section Supervisor, 241-3734.

2) Discharge Program (Discharging Facilities and Stormwater Management)

2.A. Permits:

A discharge permit is required whenever an individual, municipality or company wants to discharge waste directly to waters of the state. Some industries are also required to treat waste before sending it to a municipal wastewater treatment facility. This section issues discharge permits and pretreatment permits. The permitting process involves a system evaluation and design being prepared by a consultant.

2.B. Operations and Management (O&M):

This group performs oversight functions of municipally owned wastewater treatment facilities, and of privately owned treatment and pretreatment facilities, in addition to providing certification and training programs, periodic discharge sampling for permit compliance checks, and laboratory evaluations. Assistance is also provided to operators and municipal officials in the proper operation, maintenance and budgeting of their wastewater facilities.

Statutory Reference

10 VSA Chapter 47

Waste Water Treatment Facilities

There are two wastewater treatment facilities that discharge into Basin 11 waters, the Saxtons River WWTF discharges to the Saxtons River and the Chester WWTF discharges to the Williams River.

Proposed Upgrades to Wastewater Treatment Facilities

The Town of Chester is in the process of completing an upgrade to its municipal wastewater treatment facility which will accommodate the town's planned growth within the Village.

Combined Sewer Overflow (CSO) Elimination

During wet weather events, the combined volume of wastewater and stormwater runoff entering combined sewer systems often exceeds conveyance capacity. Most combined sewer systems are designed to discharge flows that exceed conveyance capacity directly to surface waters. Because CSOs contain untreated wastewater and stormwater, they can contribute microbial pathogens and other pollutants to waterways.

Permitted Basin Direct and Indirect Discharges to Basin 11

Discharges in Basin 11 West, Williams, Saxtons

Permit ID:	3-1167	Permit Program: Discharge Permit	Municipal Discharge
Permit Issue Date:	3/09/2005	NPDES Number:	VT0100609
Permit Effective Date:	4/01/2005	Facility Name:	Saxtons River
Re-Application Date:	9/30/2009	Facility Location:	Plant Road
Permit Expiration Date:	3/31/2010		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 SAXTONS RIVER	Sanitary Waste Outfall	SAXTONS RIVER WWTF E-Coli and Total Residual Chlorine only apply for 4/1 - 10/31	
Permit ID:	3-1177	Permit Program: Discharge Permit	Municipal Discharge
Permit Issue Date:	6/21/2004	NPDES Number:	VT0100081
Permit Effective Date:	6/21/2004	Facility Name:	Chester
Re-Application Date:	6/30/2008	Facility Location:	Treatment Plant Road, Chester
Permit Expiration Date:	3/31/2009		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 WILLIAMS RIVER	Sanitary Waste Outfall	CHESTER WWTF OUTFALL	
Permit ID:	3-1321	Permit Program: Discharge Permit	Pretreatment Discharge
Permit Issue Date:	11/05/2004	NPDES Number:	
Permit Effective Date:	4/01/2005	Facility Name:	Newsbank Inc
Re-Application Date:	9/30/2009	Facility Location:	Chester
Permit Expiration Date:	3/31/2010		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 Chester WWTF	Photo Finishing	WASTEWATER MICROFILMING PROCESS TO CHESTER WWTF	
Permit ID:	3-1505	Permit Program: Discharge Permit	Industrial Discharge
Permit Issue Date:	6/28/2004	NPDES Number:	VT0001198
Permit Effective Date:	6/28/2004	Facility Name:	Eagle River Mining, Inc
Re-Application Date:	9/30/2008	Facility Location:	Newfane, VT
Permit Expiration Date:	3/31/2009		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 Baker Brook	Quarry/Mine De-Watering	Seasonal: treated seepage water and stormwater runoff from a soapstone quarry	
Permit ID:	9-0005	Permit Program: Indirect Discharge	Indirect Discharge - Sewage
Permit Issue Date:	7/18/2002	NPDES Number:	
Permit Effective Date:	7/18/2002	Facility Name:	Magic Mountain WWTF
Re-Application Date:	3/31/2007	Facility Location:	289 Magic Mtn Access Rd, Londonderry VT
Permit Expiration Date:	6/30/2007		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
002 Thompsonburg Brook	Treated Domestic Sewage	New Indirect Discharge. Treated domestic sewage from aerated lagoon treatment facility sprayed in forested sprayfield.	

Discharges in Basin 11 West, Williams, Saxtons

Permit ID: 9-0019 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 5/26/2005 NPDES Number:
 Permit Effective Date: 5/26/2005 Facility Name: Stratton Mountain Ski Area
 Re-Application Date: 9/30/2009 Facility Location: RR 1 Box 145, Stratton
 Permit Expiration Date: 12/31/2009

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 North Branch of Ball Mountain Bn Treated Domestic Sewage		New Indirect Discharge. Treated domestic sewage from Sequential Batch Reactor treatment facility. Discharge is from a spray disposal system serving the Stratton Mountain Ski Area to the ground water and indirectly into North Branch of Ball Mountain Brook
002 Winhall River	Treated Domestic Sewage	New Indirect Discharge. Treated domestic sewage from Sequential Batch Reactor treatment facility. Discharge is from a spray disposal system serving the Stratton Mountain Ski Area to the ground water and indirectly into the Winhall River.

Permit ID: 9-0032 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 12/07/2005 NPDES Number:
 Permit Effective Date: 12/07/2005 Facility Name: Bromley Mountain
 Re-Application Date: 12/31/2009 Facility Location: VT Rt 11, Peru
 Permit Expiration Date: 3/31/2010

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 Unnamed tributary of Mill brook	Treated Domestic Sewage	Aerated equalization lagoon, followed by activated sludge plant with secondary clarification, then stored in a lagoon, prior to chlorination and spray disposal.

Permit ID: 9-0046 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 8/11/2005 NPDES Number:
 Permit Effective Date: 8/11/2005 Facility Name: Flood Brook Union School
 Re-Application Date: 3/31/2010 Facility Location: Route 11, Londonderry VT
 Permit Expiration Date: 6/30/2010

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 Unnamed tributary of Flood Brook	Sanitary Waste Outfall	Flood Brook Union School is an existing facility consisting of a pretreatment unit and mound disposal field. The pretreatment unit includes an activated sludge plant followed by a subsurface sand filter and settling tanks. The disposal field is a mound system with one bed with 5,400 ft ² of disposal area. This wastewater system was previously approved by Land Use Permit #PB-2-0720-R1. The present wastewater system authorized by this permit serves a school population consisting of 360 students and associated staff with a design flow of 3,600 gpd. The design flow application rate to the mound system is 0.67 gallons per square foot per day.

Permit ID: 9-0047 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 10/11/2005 NPDES Number:
 Permit Effective Date: 10/11/2005 Facility Name: Intervale at Stratton
 Re-Application Date: 3/31/2010 Facility Location: Stratton Mtn Rd, Winhall
 Permit Expiration Date: 6/30/2010

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
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Discharges in Basin 11 West, Williams, Saxtons

001 Unnamed tributary of Winhall Riv Treated Domestic Sewage		The wastewater is treated in a 1.46 million gallon aerated two-cell lagoon, then stored in a 1.19 million gallon storage tank (effective storage including freeboard), prior to chlorination and spray disposal. The spray disposal system has an approved sprayfield capacity of 45,625 gpd (320-day capacity of the system is 40,000 gpd and is treatment-limited. The sprayfield has a design maximum loading rate of 2 inches per 7-day period or 319,375 gallons per any 7-day period.	
Permit ID:	9-0055	Permit Program:	Indirect Discharge Indirect Discharge - NonSewage
Permit Issue Date:	4/10/2003	NPDES Number:	
Permit Effective Date:	4/11/2003	Facility Name:	Grafton Village Cheese Company
Re-Application Date:	9/30/2005	Facility Location:	4370 Fort Bridgman Road, Vernon
Permit Expiration Date:	12/31/2005		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 Saxtons River	Dairy Products	<p>The indirect discharge authorized by this permit is classified as a non-sewage, non-pathogenic waste. The dairy processing whey and washwater are from the production of cheese at the Grafton Village Cheese Company.</p> <p>The VT Guidelines for the Land Application of Dairy Processing Wastes dated August 14, 1990 apply to this discharge. Due to the BOD5 and nitrogen content of the whey, any land application of whey is limited to a maximum rate of one-half inch per year. There must be a minimum of three-foot separation to groundwater at the time of application. The maximum allowable land disposal volumes are limited to provide a low median monthly stream flow to whey and washwater volume ratio of at least 10:1 for the receiving stream and the disposal field.</p>	
002 See Permit for Listing of Fields at Dairy Products		New Non-Sewage Indirect Discharge. Land application of whey and washwater.	
Permit ID:	9-0069	Permit Program:	Indirect Discharge Indirect Discharge - Sewage - General Permit
Permit Issue Date:	8/03/2005	NPDES Number:	
Permit Effective Date:	8/03/2005	Facility Name:	Leland & Gray UHS
Re-Application Date:	9/30/2008	Facility Location:	Rt 30, Townshend
Permit Expiration Date:	12/31/2008		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 Mill Brook	Treated Domestic Sewage	Treated domestic sewage from subsurface disposal system	
Permit ID:	9-0070	Permit Program:	Indirect Discharge Indirect Discharge - Sewage - General Permit
Permit Issue Date:	2/13/2004	NPDES Number:	
Permit Effective Date:	2/13/2004	Facility Name:	Old Tavern at Grafton
Re-Application Date:	9/30/2008	Facility Location:	92 Main St, Grafton
Permit Expiration Date:	12/31/2008		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 Saxton's River	Treated Domestic Sewage	Treated domestic sewage from subsurface disposal system.	
Permit ID:	9-0072	Permit Program:	Indirect Discharge Indirect Discharge - Sewage - General Permit
Permit Issue Date:	2/20/2004	NPDES Number:	
Permit Effective Date:	2/20/2004	Facility Name:	Mountain Marketplace
Re-Application Date:	9/30/2008	Facility Location:	Rts 100 & 11, Londonderry
Permit Expiration Date:	12/31/2008		
<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>	
001 West River	Treated Domestic Sewage	Treated domestic sewage from subsurface disposal system serving the Londonderry Shopping Center.	

Discharges in Basin 11 West, Williams, Saxtons

Permit ID: 9-0090 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 8/25/2005 NPDES Number:
 Permit Effective Date: 10/01/2005 Facility Name: Bear Creek Inn & Condominiums
 Re-Application Date: 6/30/2010 Facility Location: 81 Upper Bear Lane, Rawsonville
 Permit Expiration Date: 9/30/2010

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>															
001 Unnamed tributary of Winhall Riv	Treated Domestic Sewage	<p>The wastewater is treated in a 15,000 gallon septic tank then passes to an effluent pump station which discharges to the disposal fields. The disposal system has an approved disposal capacity of 17,498 gallons per day and is dual alternating.</p> <p>The volume of the discharge authorized by this permit is calculated as follows (from #2W0537):</p> <table border="0"> <tr> <td>Source</td> <td>Design Sewage Flow</td> <td></td> </tr> <tr> <td>Lodge</td> <td>8 units</td> <td>= 800 qpd 26</td> </tr> <tr> <td>Condominium Units</td> <td>3 bdrm/unit</td> <td>= 11,700 qpd</td> </tr> <tr> <td>15 Condominium Units</td> <td>2 bdrm/unit</td> <td>= 4,500 qpd</td> </tr> <tr> <td>Total</td> <td></td> <td>17,498 qpd</td> </tr> </table> <p>There are two other sewage treatment and disposal systems at the project site not regulated by this permit. One serves an existing chalet; the other serves a 75-seat restaurant/bar and 15 units of the lodge.</p>	Source	Design Sewage Flow		Lodge	8 units	= 800 qpd 26	Condominium Units	3 bdrm/unit	= 11,700 qpd	15 Condominium Units	2 bdrm/unit	= 4,500 qpd	Total		17,498 qpd
Source	Design Sewage Flow																
Lodge	8 units	= 800 qpd 26															
Condominium Units	3 bdrm/unit	= 11,700 qpd															
15 Condominium Units	2 bdrm/unit	= 4,500 qpd															
Total		17,498 qpd															

Permit ID: 9-0152 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 3/08/2001 NPDES Number:
 Permit Effective Date: 7/01/2001 Facility Name: Grace Cottage Hospital
 Re-Application Date: 3/31/2006 Facility Location: Rt 35, Grafton Road, Townshend
 Permit Expiration Date: 6/30/2006

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 West River	Treated Domestic Sewage	Existing Indirect Discharge. Treated domestic sewage from subsurface disposal system serving the Grace Cottage Hospital and other buildings.

Permit ID: 9-0166 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 10/12/2004 NPDES Number:
 Permit Effective Date: 10/12/2004 Facility Name: Cool Edge Laundry
 Re-Application Date: 6/30/2009 Facility Location: Rt 100, Londonderry
 Permit Expiration Date: 9/30/2009

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 West River	Treated Domestic Sewage	Available information indicates that the sewage treatment and disposal system consists of four dry wells with a disposal capacity of 8,000 gallons per day.

Permit ID: 9-0170 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 11/20/2002 NPDES Number:
 Permit Effective Date: 11/20/2002 Facility Name: Piper Ridge Condominiums- West
 Re-Application Date: 6/30/2007 Facility Location: 29 Piper Ridge Road, Winhall
 Permit Expiration Date: 9/30/2007

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
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Discharges in Basin 11 West, Williams, Saxtons

001 North Branch of Ball Mountain Bn Sanitary Waste Outfall

Existing Indirect Discharge.

The wastewater is treated in septic tanks then flows to an effluent pump station which discharges to the disposal fields (mounds with beds). The disposal system has an approved disposal capacity of 20,736 gallons per day and is dual alternating. There are six primary beds and six alternate beds.

The volume of the discharge authorized by this permit was calculated as follows (from #2W0112-3a):

Source	Design
Sewage Flow	
126 bedrooms @ 135 gpd/bedrm	
17,010 gpd	
Athletic Facility/Pool Backwash	
2,500 gpd	
Infiltration	
1,070 gpd	
	TOTAL
20,580 gpd	

There are two other sewage treatment and disposal systems at the project site; the East Disposal Fields system is authorized under permit ID-9-0171; the Southeast Disposal Fields (design capacity 6,300 gpd) is authorized under #2W0112-3a.

Permit ID:	9-0171	Permit Program:	Indirect Discharge	Indirect Discharge - Sewage - General Permit
Permit Issue Date:	3/03/2004	NPDES Number:		
Permit Effective Date:	3/03/2004	Facility Name:	Piper Ridge Condominiums- East	
Re-Application Date:	9/30/2008	Facility Location:	29 Upper Taylor Hill Road, Bondville	
Permit Expiration Date:	12/31/2008			

Receiving Water

Discharge / Activity

Discharge Comments

001 North Branch of Ball Mountain Bn Treated Domestic Sewage

Treated domestic sewage from subsurface disposal system.

Permit ID:	9-0211	Permit Program:	Indirect Discharge	Indirect Discharge - Sewage
Permit Issue Date:	7/18/2001	NPDES Number:		
Permit Effective Date:	10/01/2001	Facility Name:	Birch Hill Apts; Black Birch & White Birch Buildings	
Re-Application Date:	6/30/2006	Facility Location:	Birch Hill, Windhall, VT	
Permit Expiration Date:	9/30/2006			

Receiving Water

Discharge / Activity

Discharge Comments

001 North Branch Ball Mountain Brook Treated Domestic Sewage

Existing Indirect Discharge.
Treated domestic sewage from subsurface disposal system to groundwater and indirectly into a tributary of the North Branch of Ball Mountain Brook.

Permit ID:	9-0212	Permit Program:	Indirect Discharge	Indirect Discharge - Sewage
Permit Issue Date:	7/18/2001	NPDES Number:		
Permit Effective Date:	10/01/2001	Facility Name:	Birch Hill Apts; Red Hickory & Shagbark Hickory Buildings	
Re-Application Date:	6/30/2006	Facility Location:	Birch Hill Road, Windhall, VT	
Permit Expiration Date:	9/30/2006			

Receiving Water

Discharge / Activity

Discharge Comments

001 North Branch of Ball Mountain Bn Treated Domestic Sewage

Existing Indirect Discharge.
Treated domestic sewage from an existing subsurface disposal system to the groundwater and indirectly into a tributary of the North Branch of Ball Mountain Brook

Discharges in Basin 11 West, Williams, Saxtons

Permit ID: 9-0213 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 7/18/2001 NPDES Number:
 Permit Effective Date: 10/01/2001 Facility Name: Birch Hill Apts; Red Maple & Moose Maple Buildings
 Re-Application Date: 6/30/2006 Facility Location: Birch Hill Road, Windhall, VT
 Permit Expiration Date: 9/30/2006

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 Winhall River	Treated Domestic Sewage	Existing Indirect Discharge. Treated domestic sewage from subsurface disposal system.

Permit ID: 9-0214 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 7/18/2001 NPDES Number:
 Permit Effective Date: 10/01/2001 Facility Name: Birch Hill Apts; Sugar Maple & Rock Maple Buildings
 Re-Application Date: 6/30/2006 Facility Location: Birch Hill Road, Windhall, VT
 Permit Expiration Date: 9/30/2006

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 Winhall River	Treated Domestic Sewage	Existing Indirect Discharge. Treated domestic sewage from subsurface disposal system serving the Sugar Maple & Rock Maple Buildings to the groundwater and indirectly into the Winhall River

Permit ID: 9-0215 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 7/18/2001 NPDES Number:
 Permit Effective Date: 10/01/2001 Facility Name: Birch Hill Apts; Post Oak & Chestnut Oak Buildings
 Re-Application Date: 6/30/2006 Facility Location: Birch Hill Road, Windhall
 Permit Expiration Date: 9/30/2006

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 North Branch of Ball Mountain Bn	Treated Domestic Sewage	Existing Indirect Discharge. Treated domestic sewage from subsurface disposal system serving the Post Oak & Chestnut Oak Buildings to the groundwater and indirectly into a tributary of the North Branch of Ball Mountain Brook

Permit ID: 9-0220 Permit Program: Indirect Discharge Indirect Discharge - Sewage
 Permit Issue Date: 4/02/2004 NPDES Number:
 Permit Effective Date: 4/02/2004 Facility Name: Leisure Lodge Condominiums
 Re-Application Date: 12/31/2008 Facility Location: Stratton West, Winhall
 Permit Expiration Date: 3/31/2009

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 Winhall River	Treated Domestic Sewage	<p>The Leisure Lodge Condominiums, also known as the Stratton West, consist of 11 buildings with 28 condominium units and a total of 105 bedrooms.</p> <p>The sewage treatment system is an AquaTair Waste Treatment system, 1000 series installed in 1969. The wastewater is discharged to a 4000-gallon septic tank. Septic tank effluent is discharged to a holding tank and pumped to a leachfield (52' x 53.75') consisting of aeration chambers. Alternating pumps in the holding tank dose alternating leachfields.</p> <p>Each leachfield has 60 chamber units, each 13' x 3.583', for a total chambered area of 2,795 sq.ft. Because both leachfields are in operation, the loading rate is approximately 2.8 gal/sq.ft./day.</p>

Discharges in Basin 11 West, Williams, Saxtons

Permit ID:	9-0238	Permit Program:	Indirect Discharge Indirect Discharge - Sewage
Permit Issue Date:	9/13/2001	NPDES Number:	
Permit Effective Date:	9/13/2001	Facility Name:	Maple Valley Ski Area
Re-Application Date:	3/31/2006	Facility Location:	Rt 30, Dummerston
Permit Expiration Date:	6/30/2006		

<u>Receiving Water</u>	<u>Discharge / Activity</u>	<u>Discharge Comments</u>
001 West River	Treated Domestic Sewage	The wastewater is reportedly treated in two septic tanks, then flows by gravity through a distribution box to the leachfield.

APPENDIX B.3 - Land Disposal (of Wastes) Program

1) Indirect Discharge Permits

DEC's Indirect Discharge Permit Section issues permits for land-based sewage treatment and disposal systems greater than 6,499 gallons per day, including septic tanks and leachfields and also treatment plants and spray disposal systems, all of which use soil as part of the waste treatment process. Following primary and/or secondary treatment, the soil provides final effluent renovation and polishing before it reaches groundwater and, eventually, surface water. This is in contrast to direct discharge systems, which may discharge through a pipe directly to surface waters.

Statutory Reference: 10 VSA, Chapter 47

Four WWTFs discharge via forested spray fields that indirectly discharge to Basin waters. Magic Mountain resort WWTF indirectly discharges to Thompsonburg Brook; Stratton Ski Area to the Winhall River and the North Branch of Ball Mountain Brook; Bromley Mountain to a tributary to Mill Brook; and Intervale at Stratton to a tributary to the Winhall River. As of January 2006, there were 25 permitted wastewater discharges to the Basin.

2) Regional Office Permits

This section issues water supply and subsurface wastewater disposal permits required for all buildings other than single family homes and all permits for subdivisions, sewer line extensions, mobile home parks and campgrounds which have flows less than 6,500 gallons per day. If the subdivision involves 10 or more lots, Act 250 may take jurisdiction. Engineers in five regional offices examine applications and approve permits. The regional offices that cover the basin include the Springfield and Rutland.

Statutory Reference:

10 VSA Chapter 61

18 VSA Section 1218

APPENDIX B.4 - Construction Runoff Control Program

Sediment discharges to waterbodies is a critical stormwater issue. The Department, through the Vermont Geological Survey, developed a guidance document for erosion and sediment control related to construction activities (Vermont Handbook for Soil Erosion and Sediment Control on Construction Sites, Vermont Geological Survey, 1982, rev. 1987). This document is frequently used by developers and their consultants for project planning and responses to Criterion 4 of the Act 250.

General Permit for Stormwater Runoff from Construction Sites

The development of an erosion control plan helps to protect water quality by preventing the discharge of sediment from construction sites, minimizing the extent and duration of soil disturbance, maintaining existing drainage ways and vegetation, and protecting riparian buffer areas from disturbance.

Any construction project that disturbs one or more acres of soil, including any disturbance of less than one acre which is part of a larger common plan that will result in a total of one or more acres of disturbance.

A General Permit to permit discharge of stormwater from construction sites; requires the development and submittal of an erosion and sediment control plan.

At least 30 days prior to the commencement of construction activity.

Where: An application can be obtained from:
Vermont Agency of Natural Resources
Department of Environmental Conservation
Division of Water Quality, Stormwater Section
103 South Main Street, Building 10 North
Waterbury, VT 05671-0408
Stormwater Hotline 241-4320
http://www.anr.state.vt.us/dec/waterq/stormwater/htm/sw_cgp.htm

APPENDIX B.5 - Solid Waste Management Program

The Solid Waste Management Program regulates the treatment, storage and disposal of solid waste, with the exception of the land management (diffuse disposal) of biosolids and septage, which is regulated by the Wastewater Management Division. In order to receive a certification, a facility must demonstrate that it complies with applicable siting, design, operation, closure and post closure requirements and standards included in the Vermont Solid Waste Management Rules. The Solid Waste Management Program also assists the Enforcement Division in illegal dumping/disposal cases.

The protection of water related resources are specifically addressed in the Vermont Solid Waste Management Rules (“SWMR”), Vermont Groundwater Protection Rule and Strategy, and Agency Procedures applicable to solid waste management facilities (with the exception of biosolids or septage diffuse disposal). These requirements are to be addressed in a solid waste facility application for certification and may be specifically addressed in the requirements of a certification issued by the Agency.

Solid Waste Disposal Facilities must be in compliance with the Vermont Ground Water Protection Rule and Strategy and the Vermont Water Quality Standards to receive certification - §6-303(d) of the SWMR, Vermont Groundwater Protection Rule and Strategy, 2/8/99 Procedure Addressing Requirements For Municipal Solid Waste Landfills To Demonstrate Compliance Of The Landfill Design With Water Quality Standards, and 2/8/99 Procedure For A Combined Solid Waste Certification and Indirect Discharge Permit.

- The SWMR identifies various types of water related resources as prohibited areas for the siting of solid waste management facilities - §6-309(c)(6), §6-502(a) and §6-1104(b)3(b)(3) of the SWMR.
- Facilities must meet performance standards in order to assure that siting of the facility will have the least possible reasonable impact on the environment, including groundwater, surface water or waters of the state. §6-503 of the SWMR and 9/12/95 Procedure Addressing the Numerical Criteria For The Distance To Drinking Water Sources From Discrete Disposal Facilities.
- Site characterization on which a facility is to be located must address groundwater and surface water - §6-603 of the SWMR.
- Facilities must be designed and operated to protect the environment, including ground water and surface water - §6-604(a)(4), §6-606(a)(3), §6-701, §6-1104(c)(2)(E) and §6-1203&1204 of the SWMR. Most landfills must be lined with leachate collection and off-site treatment and must control run-on and run-off - §6-606(b)(2) of the SWMR and 6/9/94 Procedure Addressing Requirements For Run On/Run Off Control System for Municipal Solid Waste Landfills.
- Facilities are to be monitored as deemed appropriate to detect the discharge of contaminants to groundwater and surface water. For landfills, monitoring continues

through the operational life of the landfill and the post closure period (20 years for unlined landfills that closed since 1989, 30 years for lined landfills which operated since 1994) - §6-604(a)(4) and §6-606(a)(3) of the SWMR. 2/8/99 Procedure Addressing Ground Water Quality Monitoring and Ground Water. 2/8/99 Remedial Action at Municipal Solid Waste Landfills. Procedure Addressing Post-Closure Care and Post Closure Certification At Solid Waste Landfills.

- A response involving corrective action for ground water impacts by a solid waste landfill can be required - VT Groundwater Protection Rule and Strategy and 2/8/99 Procedure Addressing Corrective Action & Financial Responsibility For Corrective Action At Solid Waste Landfills.
- Any discharge that poses a threat to the environment must be reported within 24 hours to the DEC - §6-703(c) of the SWMR.
- Facilities must be closed in a manner that prevents discharges to surface water during and after closure -§6-1001 of the SWMR.

Statutory Reference

10 VSA Chapter 159 (Waste Management)

10 VSA Chapter 48 (Groundwater Protection).

APPENDIX B.6 - Residual Wastes Program

This program in the Wastewater Management Division oversees the management of the state's residuals, such as septage and wastewater sludge. Permits are required for treatment, storage, or disposal of these residuals and for the operation or construction of such facilities.

Statutory Reference: 10 VSA Chapter 159

There are several regulatory requirements for the land application of sludge (biosolids) and septage that assist in protecting surface waters and groundwater, such as required set backs and separation distances, maximum allowed slope of site, nutrient management for site, among others. In 1998, the Solid Waste Management Rules were revised to include, along with other items, the prohibition of land application of solid waste in the area of the 100-year floodway as another measure to assist in protecting surface water quality.

APPENDIX B.7 - Mine Runoff Control Program

Sand & Gravel Pits

Non-point source pollution is a concern associated with the operation, maintenance, and closure of sand and gravel pits in Vermont. Surface runoff and erosion contribute to the sedimentation of waterbodies adjacent to sand and gravel pits. Vegetative cover can reduce erosion and sedimentation problems, enhancing aesthetic values, and improve nesting and cover areas for wildlife. Practices for the control of erosion can be found in: USDA Natural Resources Conservation Service Technical References:

A. Vegetating Vermont Sand and Gravel Pits- VT Technical Guide, Conservation Planning Application Technical Reference #10

B. Critical Area Planting-Conservation Practice Standards code 342: Technical Guide Chapter IV (www.vt.nrcs.usda.gov/standards/342vt.html)

Also refer to Hazardous Waste Management Program.

APPENDIX B.8 - Hazardous Waste Management Program

1) Hazardous Waste

The Hazardous Waste Management Program within DEC establishes the regulatory framework for all hazardous waste generated in Vermont and provides a "cradle-to-grave" tracking system for these wastes. The program establishes the standards for proper management of hazardous waste while also addressing the environmental and human health problems that arise from the mismanagement of hazardous waste. Improper management of hazardous waste can pollute vast areas of land, rivers, streams and lakes, and can lead to unacceptable human exposure to these materials. The program is a prevention program -- when it is successful, these impacts occur less frequently and with less severity.

Statutory Reference

Title 10 VSA Chapter 159, the Waste Management Act.

Specific sections include 10 VSA 6601, 6602, 6604, 6605f, 6606, 6606a, 6606b, 6607, 6607a, 6608, 6608a, 6608b, 6609, 6610a, 6612, 6615, 6616, 6617, 6618.

2) Underground Storage Tanks

All Vermonters depend on clean water. Leaking underground storage tanks (USTs) pose a substantial threat to both human health and the environment, because substances leaked from these tanks are one of the most significant contaminants polluting ground and surface water supplies. In densely developed areas, releases from underground tanks pose an additional risk, since gasoline vapors can accumulate in basements and crawl spaces, posing health hazards as well as fire dangers.

The goal of the UST Program within DEC is to protect human health and the environment by eliminating releases of hazardous materials from underground storage tanks, and fostering proper management of underground tanks in Vermont. By regulating the installation, operation, and closure of USTs, the Underground Storage Program protects the state's water resources and prevents vapor impacts to buildings.

Statutory Reference

10 VSA Chapters 59 and 159

APPENDIX B.9 - Flow Regulations and Dams

1) Dam Safety Program

The Dam Safety Section administers the State Dam Safety program, and periodically inspects the 85 state-owned dams found throughout Vermont for their repair/improvement needs. The section operates a permit program for construction and alteration of non-hydroelectric dams (the Public Service Board regulates hydroelectric dams) to serve the public good and provide adequately for the public safety. A permit is required to alter any dam, pond or impoundment not related to generation of electric energy for public use or part of a public utility system which is or will be capable of impounding more than 500,000 cubic feet of water or other liquid, as measured to the top of the dam. Submittal of a completed application form, fee, plans and specifications and design data is required. A public information meeting may be required. The section inspects privately owned dams on a resources-available basis, maintains an inventory of dams, and provides technical assistance to dam owners.

Statutory Reference

Permit program: 10 VSA Chapter 43 (Dams).

2) Hydrology Program

This program within DEC reviews all projects that may alter the natural flow of rivers and streams, such as hydroelectric projects and all manner of water withdrawals. These reviews may take place under a number of regulatory programs, including Act 250, Agency dam orders and stream alteration permits, and projects subject to federal licenses or permits (under Section 401 of the Clean Water Act). In addition, the Hydrology program evaluates projects subject to Act 250 for riparian protection provisions, erosion control measures, and general consistency with Vermont Water Quality Standards.

Statutory References

10 V.S.A. Chapter 41 (Regulation of Stream Flow)

10 V.S.A. Chapter 43 (Dams)

10 V.S.A. Chapter 151 (Act 250)

Section 401 of the Federal Clean Water Act (33 U.S.C. §1341)

APPENDIX B.10 - Wetlands, Dredge, and Fill Material Control Programs

1) Vermont Wetlands Protection

The overall goal of the program is to achieve no net loss of wetland functions and values. The program consists of three components: a regulatory component, a scientific component, and an education/outreach component. The regulatory aspects of the program include administering the Vermont Wetland Rules, making determinations of Water Quality Certification under the Clean Water Act and the Vermont Water Quality Standards, providing project review in Act 250 land use permitting, and assisting in compliance and enforcement. Inventories and scientific investigations are carried out as special grant projects and include both the Division biomonitoring section and biologists in the Fish and Wildlife Department, Nongame and Natural Heritage program. Education and outreach is provided through technical assistance and presentations to towns, stakeholder groups, conservation commissions, schools, and other Agency programs.

Statutory references:

Sections 404 and 401 of the Clean Water Act
Section 104(b) 3 of the Clean Water Act
Act 250
Title 10 VSA Chapter 37, Sec. 905 (7-9).

2) Federal Wetlands Protection

A U.S. Army Corps of Engineers permit is required for all work beyond ordinary highwater in or above navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). In New England, for the purpose of Section 10, navigable waters of the United States are those subject to the ebb and flow of the tide and a few major waterways used to transport interstate or foreign commerce. Permits are required under Section 404 of the Clean Water Act for those activities involving the discharge of dredged or fill material in all waters of the United States, including not only navigable waters of the United States but also inland rivers, lakes, streams and wetlands. In inland waters, Corps jurisdiction extends landward to the ordinary high water mark or the landward limit of any wetlands. The term "discharge" in this context may include the re-depositing of wetlands soils such as occurs during mechanized land clearing activities, including grubbing, grading and excavation.

The term "wetlands," used above, is defined by Federal regulations to mean "...those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions..." (33 C.F.R. Part 328.3 (b), as published in the November 13, 1986 Federal Register). Wetlands generally include swamps, marshes, bogs and similar areas. The term "fill material," used above, is defined by Federal regulations to mean "...any material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of a waterbody. The term does not include any pollutant discharged into the water primarily to dispose of waste..." (33 C.F.R. Part 323.2 (b), as published in the November 13, 1986 Federal Register).

APPENDIX B.11 - Groundwater Pollution Control Programs

1) Groundwater Protection

The Groundwater Protection Rule and Strategy is the groundwater management and protection strategy for the State of Vermont. The Rule outlines the principles, directives and goals relating to groundwater protection. The Rule also contains groundwater quality enforcement standards and outlines the four classes of groundwater. The Groundwater Coordinating Committee, an interagency committee, oversees the groundwater reclassification efforts and provides a forum for interagency coordination on groundwater issues. The DEC Water Supply Division provides administrative and technical support to the Committee. The program reviews weekly Act 250 applications for potential water supply and groundwater impacts. The Water Supply Division also serves as a clearinghouse on groundwater protection information. Through their regulatory and outreach programs, other divisions also protect groundwater and provide information on groundwater protection issues.

Statutory Reference

10 VSA Chapter 48

2) Underground Injection Control

This program within DEC regulates all non-sanitary sewage discharges to the groundwater. It is a federally delegated program. If the discharge receives a permit from another DEC program, the UIC permit is not required.

Statutory Reference

10 VSA Chapter 47

Section 1422 of the Federal Safe Drinking Water Act.

3) Public Water Supply (program also influences surface water)

The DEC Water Supply Division is responsible for the regulation of all public water systems in the state of Vermont. A public water system has fifteen connections or serves an average of twenty-five people at least sixty days a year. Examples of public water systems include municipalities, mobile home parks, schools, restaurants, motels. The major program functions involve permitting construction and operation, approving new sources of drinking water, review of monitoring data, technical and financial assistance, enforcement, source water protection, operator certification, enforcement, and inspections.

Statutory Reference

Federal Safe Drinking Water Act Amendments of 1996

10 VSA Chapter 56 Public Water Supply

10 VSA Chapter 55 Aid to Municipalities for Water Supply, Pollution Abatement, and Sewer Separation

24 VSA Chapter 120 Special Environmental Revolving Fund.

4) Well Driller Program

Any person who intends to engage in the business of drilling wells must obtain a license to do so. This includes both water well drillers and monitoring well drillers. Licensing is intended to

protect public health and prevent degradation of groundwater quality through competent drillers appropriately applying industry standard well construction and abandonment procedures in their work. A license may be renewed if appropriate continuing education is demonstrated on a three-year basis.

Statutory Reference
10 VSA Chapter 48

APPENDIX B.12 - Fisheries Protection Regulations

Statutory references

Title 10 and Chapters 101 through 123

This is where all the laws relating directly to fish and wildlife conservation are found. It also gives the authority to the Fish and Wildlife Board to set seasons, creel limits and size limits. Most of the laws pertaining to fish are found in Chapter 111 and primarily deal with the "taking of fish." One of these laws, section 4605 (placing fish in waters) allows for the control of introductions of exotic or competing fish species as well as diseases. Section 4607 (obstructing streams) prohibits the installation of a structure that prevents fish movement, such as a rack, weir or other obstruction, unless an approval has been granted by the Commissioner of Fish and Wildlife. This statute generally is applied to small streams with a drainage area less than 10 square miles; on larger streams Title 10, Chapters 41 or 43 is applied.

Title 10, Chapter 43 Dams

A certificate of public good is required before constructing any dam impounding more than 500,000 cu. ft. This law is administered by the Department of Environmental Conservation excepting projects involving the generation of hydroelectric energy. The Public Service Board assumes jurisdiction in those cases. Regarding public hydroelectric and flood control projects, the final authority lies with the Federal Energy Regulatory Commission.

Section 1084 requires the Fish and Wildlife Department to investigate the effect of any proposed project on fish and wildlife resources and to certify its findings to the Department of Environmental Conservation or the Public Service Board, prior to any hearing.

Section 1086 enumerates the several issue areas that must be explored before a determination of public good is made. Specifically included are recreational values; fish and wildlife; existing uses such as fishing; and the need for minimum stream flows.

Title 10, Chapter 47 Vermont Water Pollution Control Act

This law administered by the Agency of Natural Resources under auspices of the Federal Water Pollution Control Act (PL 92-500). Within the Water Pollution Control Act are sections 1252 and 1258 which, respectively, set up a classification system for state waters and authorize the Agency to manage waters to attain or maintain their classification, including the regulation of discharges to state waters. Under Section 1252, Water Quality Standards are promulgated by the Water Resources Board to establish numeric and narrative standards for the management of waters. The Standards also designate all waters as to their fish habitat type - either cold water or warm water. The Standards have the force of law and set up an important framework for management of physical water quality, such as dissolved oxygen, temperature, turbidity, and toxics and for protection of other important habitat and life-stage considerations, such as nutrient control, substrate integrity, and propagation. The authority to regulate stormwater discharges is

included in Section 1264. Section 1263(a) regulates activities pertaining to control of aquatic nuisances (Aquatic Nuisance Control).

Title 10, Chapter 41 Regulation of Stream Flow; Subchapter 1, Section 1003

This section of the statute dealing with the regulation of stream flow empowers the Department of Environmental Conservation to call to conference any dam owner that regulates natural stream flow and to require the passage of adequate flows to support the stream fishery.

Title 10, Chapter 41 Regulation of Stream Flow; Subchapter 1, Section 1004

Section 1004 makes the Secretary the state agent with respect to the Federal Energy Regulatory Commission (FERC) dam licensing process and with respect to the Federal Clean Water Act Section 401 administration. Under Section 401, federal agencies cannot issue licenses or permits for activities that may affect water quality until such activities have been certified as meeting state water quality standards. This Section 401 process has proved to be a powerful tool in the review of projects subject to FERC and Corps of Engineers jurisdiction.

Title 10, Chapter 41 Regulation of Stream Flow; Subchapter 2 Alteration of Streams

A person may not change the cross-section of a stream or modify or alter it in any way by moving more than 10 cu. yd. of material without a permit from the Department of Environmental Conservation. This subchapter does not apply to dams subject to Chapter 43 or highways and bridges subject to section 5 of Title 19. Exemptions include personal use of 50 cu. yd. of gravel/year by riparian landowners (this gravel exemption also includes streams having drainage area of less than 10 mi²) and accepted agricultural and silvicultural practices. A permit will be granted if, among other criteria, it appears the project will not significantly damage fish life. There are also special provisions for protecting outstanding resource waters.

Title 10, Chapter 151 Vermont's Land Use and Development Law (Act 250)

This law provides for broad protection of streams, shorelines, and water quality through criteria related to erosion control, effect on public investments, necessary wildlife habitat, and retention of the natural condition of streams and shorelines. Protection of fisheries resources has been primarily protecting stream habitat by imposing buffer strips, minimum stream flows, and stream crossings which provide unrestricted fish passage. The development must meet all the criteria of the Act (6086(a)1-10), but District Commissions have considerable latitude in the decision since the criteria are loosely worded (e.g. "undue water pollution").

Title 29, Chapter 11 Management of Lakes and Ponds

This statute addresses encroachment onto lands lying under public waters such as from docks, marinas, boathouses, etc. Exceptions include water pipes <2 inches (inside diameter), buoys and duck blinds, docks of certain size, rafts, etc. Criteria for granting or denying a project include determination of public good (Section 405), which addresses impacts on fish habitat and recreation. In 1989, interim procedures for issuance or denial of encroachment included whether

or not the project meets the requirements of the public trust doctrine. In a recent case the Vermont Superior Court ruled that the Department of Environmental Conservation overstepped its authority by including the public trust doctrine criteria in its interim procedures for permit denial. The interim procedures also addressed the potential cumulative effect of encroachment. In 1984, the Water Resources Board overturned the Department's denial of a permit by concluding "... the consideration of the potential cumulative effect of possible future encroachments is neither contemplated nor authorized by 29 V.S.A. 405(6)." (LaFleur Appeal).

Although there are a number of other state laws that indirectly protect fisheries resources, such as T24 Floodplain Development and T10 Chapter 159 Solid Waste Disposal, the above are most applicable.

In addition to fisheries considerations addressed in the Federal Energy Regulatory Commission's rules, there are several other Federal regulations that can afford resource protection. Two of the most notable are:

1. Section 404 of the Federal Water Pollution Control Act amendments of 1972 give the U.S. Army Corps of Engineers the authority to regulate discharges of dredged or fill material into all waters of the U.S. including wetlands.
2. Section 10 of the Rivers and Harbors Act requires a Corps of Engineers permit for construction of any structure in or over any navigable water of the U.S. This includes dredging or disposal of dredged material, excavation, channelization or other modification. Projects can range in size from small docks to large breakwaters.

APPENDIX B.13 - Other Important Programs

(Monitoring & Assessment, Geologic Surveys, Pollution Prevention, etc)

1) Surface Water Monitoring & Assessment

The overall goal of the environmental monitoring and assessment program is to ensure that good science is used to develop an understanding of the attributes of, and the forces which affect, the physical, chemical, and biological characteristics of Vermont's aquatic ecosystems, and ensure that this information is available to be used as the basis for making, and evaluating the consequences of, environmental management decisions made or influenced by DEC. The specific objectives of this program include the following:

- Determine the present and future health of aquatic ecosystems in Vermont;
- Establish empirical limits of natural variation in aquatic ecosystems in Vermont;
- Diagnose abnormal conditions to identify issues in time to develop effective mitigation;
- Identify potential agents of abnormal change;
- Assess ecological changes resulting from the implementation of environmental management activities; and
- Identify risks to human health associated with the use of aquatic resources.

In order to accomplish these objectives, this program conducts activities to monitor and assess the chemical, physical, and biological components of aquatic ecosystems. Findings relate to both ecological and human health. Activities are conducted both in response to identified issues, activities, and potential problems; and in the framework of long-term environmental status and trends monitoring.

Statutory Reference

10 V.S.A. Chapter 47

Federal Clean Water Act

2) Geologic Surveys & Information

The Geology program conducts surveys and research related to Vermont geology, topography, and mineral resources; provides information to the public, government, industry, and other institutions which request assistance; and maintains and publishes Vermont geological information. Geologic research can illuminate the nature of ground water and the interaction of ground and surface waters that maintains stream discharge and temperature during low flow periods. Erosion studies that focus on slope stability and the sources of sediment released to rivers have direct bearing on water quality.

Statutory references

3 VSA, Chapter 53, Section 2879

10 VSA, Chapter 7, Sections 101-105

HAZUS-MH (stands for FEMA's Mitigation Division powerful risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes) will be

used to not only to predict the potential damage from earthquake events but from flood events and the effects of riverine erosion.

3) Pollution Prevention Program

The focus of this program within DEC is to help businesses research and identify opportunities to reduce the amount of waste generated and the amount and toxicity of chemicals used in their operations. Technical assistance may be provided on-site at the facility's request. The program is also responsible for administering Vermont's Pollution Prevention Planning Requirement affecting over 100 businesses that generate hazardous waste and/or use certain listed toxic chemicals. The Program is located in the Environmental Assistance Division and shares a toll-free number with the Small Business Compliance Assistance Program that businesses and others can use to get answers to their environmental questions.

Statutory reference:

10 V.S.A. Chapter 159 Subchapter 2. Sections 6623-6632.

4) Section 319 Nonpoint Source Management

Water pollution control in Vermont, as well as in other states across the nation, has tended to focus on the larger, more obvious discharges referred to as point sources of pollution. Recently, much greater attention has been directed at the more diffuse, harder to quantify, more difficult to control pollution sources known as nonpoint sources of pollution. Pollution from nonpoint sources (NPS) is the major source of water use impairment to Vermont surface and ground water resources. NPS pollution is apparent in each of Vermont's seventeen river basins. The types and extent of water quality problems associated with these sources of pollution, however, exhibit a considerable degree of variation between and within basins. To a large extent, NPS pollution control and NPS pollution prevention centers about the watershed approach, land use and land management.

NPS implementation through Section 319 has been available to Vermont since federal fiscal year 1990, the first year funding was appropriated. Over twelve years of annual funding (FFY1990-2001), Vermont has been awarded about \$11 million, which has assisted over 100 NPS projects. Projects have been completed or are underway by a variety of interests including several towns, watershed associations and state departments, the University of Vermont and many Natural Resources Conservation Districts. The Vermont NPS Program is involved in the following areas of concentration:

- coordination, oversight and administration of Section 319;
- influence the direction and level of NPS planning and implementation arising from other programs or funding sources (e.g. US Department of Agriculture, Lake Champlain Basin Program, Connecticut River Joint Commissions);
- assist Vermont Agency of Agriculture, Food & Markets with new agricultural NPS responsibilities (as per Act 261 of 1992);
- distribution of Clean Water Act Section 604(b) pass-through planning funds to the 12 Vermont regional planning commissions; and,
- advocate the widespread adoption of certain land management practices (especially erosion/sediment control, phosphorus management and vegetated buffer strips).

Statutory reference:

Title 10 VSA, Chapter 47, the Vermont Water Pollution Control Law
Section 319, 1987 Amendments, Federal Water Pollution Control Act (also known as Clean Water Act)

5) River Corridor Management Program

The River Corridor Management Program provides regulatory review and technical assistance to landowners, municipalities, non-governmental organizations and other agencies to help determine the appropriate stream channel and flood plain management practices necessary to resolve and avoid conflicts with river systems. The practices selected will be designed to recognize and accommodate, to the extent feasible, the stream's natural stable tendencies. The recommended conflict resolution will recognize the stream's long-term physical response to past and proposed management practices. The resulting work will provide increased property and infrastructure protection and will maintain or enhance the ecological functions and economic values of the river system. Geomorphic assessment of the West River watershed and major subwatersheds are underway (see Appendix A.7).

Statutory Reference

10 VSA Chapter 41
10 V.S.A., Chapter 32
Section 401 of the Clean Water Act

Contact

For stream alteration regulatory and technical assistance and flood damage issues:
Fred Nicholson at 802-786-5906.

For flood plain technical assistance:

Floodplains Management Engineer
Water Quality Division
10 North, 103 South Main St.
Waterbury, VT 05676
802-241-3759

For stream stability assessment technical assistance:

Mike Kline, River Restoration Ecologist
Water Quality Division
10 North, 103 South Main St.
Waterbury, VT 05676
802-241-3774
mike.kline@anr.state.vt.us

6) Act 250

Act 250 provides a public, quasi-judicial process for reviewing and managing the environmental, social and fiscal consequences of major subdivisions and development in Vermont through the issuance of land use permits. Activities include review of land use permit applications for conformance with the Act's ten environmental criteria, issuance of opinions concerning the applicability of Act 250 to developments and subdivisions, monitoring for compliance with the Act and with land use permit conditions, and public education.

In an Act 250 application, applicants need to supply sufficient information for the District Commission to make findings on the ten environmental criteria. In so doing, certifications and/or approvals from other agencies and departments, utilities, regional planning commissions and local government may be necessary.

With regard to water pollution, Criterion 1 states that the project will not result in undue water or air pollution. This criterion deals with water and air pollution potential generally and such specific matters relating to water pollution as: (A) Headwaters; (B) Waste disposal; (C) Water Conservation; (D) Floodways; (E) Streams; (F) Shorelines; and (G) Wetlands.

7) Total Maximum Daily Load Program- (Vermont's Wasteload Allocation Process and Federal Requirements for TMDLs)

The primary goal of the Total Maximum Daily Load (TMDL) program is to develop solutions to restore those waters which do not meet Vermont Water Quality Standards and will not meet those standards even after all minimum required Best Practicable Treatment (BPT) alternatives are applied. In order to fulfill the requirements of the Clean Water Act, the program works in three phases and is dependent on several other programs within the Agency of Natural Resources to fulfill its goal. First, water quality monitoring data is gathered and analyzed to identify the condition of the State's waters. Those waterbodies that show a clear and documented violation of the Water Quality Standards substantiated by data collected through chemical, biological or physical monitoring are placed on the State's List of Impaired Surface Waters. The second phase is to develop TMDL plans for those waters that are Water Quality Limited Segments, defined as waters that will not achieve water quality standards even after BPTs are applied to all discharges. These plans essentially are a budget for the pollutant causing the impairment. Following investigations, all pollutant sources are identified that contribute to the impairment and each receives an allocation as to how much it can contribute to the total pollutant load. This is usually accomplished by determining from what sources reductions are necessary. The TMDL plans are structured in accordance with Clean Water Act regulations and EPA guidance. These plans involve public participation and ultimately need approval from EPA to verify their satisfaction of Clean Water Act requirements. The third phase is to implement the TMDL plan and conduct water quality monitoring in order to evaluate the effectiveness of implementation and document achievement of Water Quality Standards.

Statutory reference

Section 303(d) of the Clean Water Act
40 CFR §130.7

8) Current Use Program

Vermont's Agricultural and Managed Forest Land Use Value Program -- better known as the Current Use Program -- was created in the late 1970's as a companion to legislation that required towns to list property at 100 percent of fair market value. Because of escalating land values, it was clear that property taxes based on fair market value were placing a heavy property tax burden on owners of productive farm and forest lands.

The Current Use Program offers landowners use value property taxation based on the productive value of land rather than based on the traditional "highest and best" use of the land. In 2000, the current use value of the land in the program averaged about 20 percent of the full fair market value ([Vermont Department of Taxes](#), 2001).

The Current Use Program includes a Land Use Change Tax as a disincentive to develop land. The tax is 20 percent of the fair market value of a property, or, in the case of the sale of part of a property, a pro rata share of the fair market value of the entire property. The program is administered by the Vermont Department of Taxes.

Statutory reference

32 VSA §3757(a)

Land Use Change Tax Rate

9) Acceptable Management Practices

Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont(AMP's), were developed and adopted as rules to Vermont's water quality statutes and became effective August 15, 1987. The AMP's are intended and designed to prevent any mud, petroleum products and woody debris (logging slash) from entering the waters of the state. They are scientifically proven methods for loggers and landowners to follow for maintaining water quality and minimizing erosion.

Since adoption of the AMP's, the Department of Forests, Parks & Recreation has provided training, demonstrations and one-on-one consultation with logging contractors, landowners and foresters in an effort to reduce the number and severity of discharges resulting from logging operations. The Agency of Natural Resources' Enforcement Division conducts any necessary enforcement actions.

Since 1989 a reporting system has been in place to document the circumstances and outcomes of field inspections, and these activities are summarized in an annual report.

Statutory reference

Title 10 V.S.A. Chapter 47

Water Pollution Control

APPENDIX B.14 - Quarantine #3 - Noxious Weeds

Vermont Department of Agriculture, Food & Markets Quarantine #3 - Noxious Weeds

Section I: Statement of Concerns

Whereas, the Vermont Department of Agriculture, Food & Markets having found that certain noxious weeds out compete and displace plants in natural ecosystems and managed lands; and

Whereas, competition and displacement of plants by certain noxious weeds has significant environmental, agricultural and economic impacts; and

Whereas, it has been determined to be in the best interest of the State of Vermont to regulate the importation, movement, sale, possession, cultivation and / or distribution of certain noxious weeds:

Therefore, the State of Vermont is hereby establishing this noxious weed quarantine regulation by the authority of 6 V.S.A., Chapter 84, Pest Survey, Detection and Management.

Section II: Definitions

“Class A Noxious Weed” means any noxious weed on the Federal Noxious Weed List (7 C.F.R. 360.200), or any noxious weed that is not native to the State, not currently known to occur in the State, and poses a serious threat to the State.

“Class B Noxious Weed” means any noxious weed that is not native to the state, is of limited distribution statewide, and poses a serious threat to the State, or any other designated noxious weed being managed to reduce its occurrence and impact in the State.

“Commissioner” means the Commissioner of Agriculture, Food & Markets, or his or her designee.

“Noxious Weed” means any plant in any stage of development, including parasitic plants whose presence whether direct or indirect, is detrimental to the environment, crops or other desirable plants, livestock, land, or other property, or is injurious to the public health.

“Plant and Plant Products” means trees, shrubs, and vines; forage, fiber, and cereal plants; cuttings, grafts, scions, buds and lumber; fruit, vegetables, roots, bulbs, seeds and wood; and all other plants, parts of plants, and plant products.

“Possession” means to grow, manage or cultivate through planting, pruning, watering, fertilization, weeding, propagation, or any other means that promotes the growth of the noxious weed. This does not include the incidental occurrence of a noxious weed on wild or managed land.

Section III: Designation as a Noxious Weed

(A) The following conditions shall be met for a plant or plant product to be designated as a Class A or B Noxious Weed:

- (1) As determined by a pest risk assessment, a quarantined noxious weed must pose an actual or anticipated threat to a substantial agricultural, forestry or environmental interest and / or the general public.
- (2) Establishment of a quarantine for a specified noxious weed is likely to contribute to the objective of preventing introduction or for limiting the spread and / or severity of the noxious weeds impact to the agricultural, forestry or environmental interest.
- (3) No substitute or alternative mitigating action will accomplish the same pest prevention purpose.
- (4) The economic and/or environmental benefits of quarantining a specified noxious weed outweigh the economic and/or environmental benefits associated with the noxious weed.

(B) The following biological factors shall be used to evaluate whether or not a plant or plant product has satisfied the conditions for designation as a Class A or Class B Noxious Weed.

- (1) Native origin of the plant;
- (2) Known distribution;
- (3) Mechanism and potential for spread to and within Vermont;
- (4) Past, current and potential environmental, economic and human health impacts;
- (5) Feasibility of control and spread prevention;
- (6) Regional and national perspective;
- (7) Designation as a federal noxious weed; and / or
- (8) Other pertinent factors.

(C) Designation as a Class A or Class B Noxious Weed shall occur through the Administrative Rule procedure as outlined in 3 V.S.A., Chapter 25.

Section IV: Designated Noxious Weeds

(A) Class A Noxious Weeds.

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|--|---------------------------|
| (1) All weeds listed in 7 C.F.R. 360.200 as amended, which is hereby incorporated by reference including subsequent amendments and editions. | |
| (2) <i>Cabomba caroliniana</i> | (fanwort) |
| (3) <i>Egeria densa</i> | (Brazilian elodea) |
| (4) <i>Hydrilla verticillata</i> | (hydrilla) |
| (5) <i>Hygrophila polysperma</i> (Roxb.) T. Anderson | (E. Indian hygrophila) |
| (6) <i>Myriophyllum aquaticum</i> (Vell.) Verdc. | (Parrot feather) |
| (7) <i>Myriophyllum heterophyllum</i> | (variable-leaved milfoil) |
| (8) <i>Salvinia auriculata</i> | (giant salvinia) |
| (9) <i>Salvinia biloba</i> | (giant salvinia) |
| (10) <i>Salvinia herzogii</i> | (giant salvinia) |
| (11) <i>Salvinia molesta</i> | (giant salvinia) |
| (12) <i>Vincetoxicum hirundinaria</i> Medikus. | (pale swallow-wort) |

(B) Class B Noxious Weeds.

- | | |
|--|-------------------------|
| (1) <i>Aegopodium podagraria</i> L. | (goutweed) |
| (2) <i>Ailanthus altissima</i> | (tree-of-heaven) |
| (3) <i>Alliaria petiolata</i> (<i>A. officinalis</i>) | (garlic mustard) |
| (4) <i>Butomus umbellatus</i> | (flowering rush) |
| (5) <i>Celastrus orbiculatus</i> Thunb. | (Oriental bittersweet) |
| (6) <i>Fallopia japonica</i> (<i>Polygonum cuspidatum</i>) | (Japanese knotweed) |
| (7) <i>Hydrocharis morsus-ranae</i> L. | (frogbit) |
| (8) <i>Lonicera x bella</i> | (Bell honeysuckle) |
| (9) <i>Lonicera japonica</i> | (Japanese honeysuckle) |
| (10) <i>Lonicera maackii</i> | (Amur honeysuckle) |
| (11) <i>Lonicera morrowii</i> | (Morrow honeysuckle) |
| (12) <i>Lonicera tatarica</i> | (Tartarian honeysuckle) |
| (13) <i>Lythrum salicaria</i> | (purple loosestrife) |
| (14) <i>Myriophyllum spicatum</i> | (Eurasian watermilfoil) |
| (15) <i>Nymphoides peltata</i> (Gmel.) Ktze. | (yellow floating heart) |
| (16) <i>Phragmites australis</i> | (common reed) |
| (17) <i>Potamogeton crispus</i> L. | (curly leaf pondweed) |
| (18) <i>Rhamnus cathartica</i> | (common buckthorn) |
| (19) <i>Rhamnus frangula</i> | (glossy buckthorn) |
| (20) <i>Trapa natans</i> L. | (water chestnut) |
| (21) <i>Vincetoxicum nigrum</i> L. | (black swallow-wort) |

Section V: Prohibitions

(A) The movement, sale, possession, cultivation, and / or distribution of Class A Noxious Weeds designated in Section IV of this quarantine regulation is prohibited.

(B) The movement, sale, and / or distribution of Class B Noxious Weeds designated in Section IV

of this quarantine regulation is prohibited.

(C) Violation of any of the prohibitions listed in Section V of this regulation may result in:

- (1) The issuance of cease and desist orders; and / or,
- (2) Temporary or permanent injunctions; and / or,
- (3) Administrative penalties not to exceed \$1,000 per violation, as specified in 6 V.S.A., Chapter 84, Sections 1037 and 1038.

Section VI: Exemptions

(A) Scientific, economic and educational exemptions may be granted by the Commissioner to allow for the movement, possession and field experimentation of noxious weeds for scientific and educational purposes under such conditions as may be prescribed by the commissioner. When granting exemptions, the commissioner shall take into consideration the value of the scientific, economic or education purpose and the risk to Vermont's environment, economy and citizens.

(B) Transportation of any Class A or B Noxious weed on any road or highway of the state is exempt if any of the following is true:

- (1) It is for disposal as part of a management control activity; or
- (2) It is for the purpose of identifying a species or reporting the presence of a species, and the Class A or B Noxious weed is in a sealed container; or

(C) Preserved specimens in the form of herbaria or other preservation means are not subject to this regulation.

(D) Varieties, cultivars, hybrids and/or subspecies that have been shown through scientific research and analysis not to be invasive.

Adopted on 4/22/02



**Agency of Natural Resources
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Water Quality Division
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