

DRAFT
WATER QUALITY MANAGEMENT PLAN
For the
NORTHERN LAKE CHAMPLAIN DIRECT
DRAINAGES

Appendices and Statutory Index

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February, 2009

Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
Waterbury, Vermont 05671-0408

Appendix A: Water quality improvement plans developed between 2002 and January 2009 to address water quality problems in Basin 5

Lake Champlain Watershed

- Lake Champlain Basin Program. April 2003. *Opportunities for Action*. A Lake Champlain Basin Program internal report prepared for the Lake Champlain Steering Committee. Grand Isle, Vt.
- Vermont Agency of Natural Resources. 2008. *Center for Clean and Clear Work Plan*. Waterbury, Vt. May 15, 2008.
- Vermont Department of Environmental Conservation and New York State Department of Environmental Conservation. 2002. *Lake Champlain Phosphorus TMDL*. Waterbury, Vt. and Albany, NY.
- Source Water Protection Plans by individual water systems as required under federal law. Contact the DEC Water Supply Division

Englesby Brook Watershed

- Medalie, Laura, *Concentrations and Loads of Nutrients and Suspended Sediments in Englesby Brook and Little Otter Creek, Lake Champlain Basin, Vermont, 2000–2005*. U.S. Geological Survey Scientific Investigations Report 2007-5074, U.S. Geological Survey, Reston, Virginia: 2007.

Malletts Bay Watershed

- Stone Environmental, Inc. *Draft Colchester Strategic Water Quality Plan*. Prepared for the Colchester Department of Public Works, Colchester Vermont. May 30, 2003.

Potash Brook Watershed

- Nelson, J.A. and M.M. Nealon. 2003. *Potash Brook watershed restoration plan*, South Burlington, Vermont. Final report. Pioneer Environmental Associates, LLC. Middlebury, Vermont. January 27, 2003.

Stevens and Rugg Brook Watershed

- Dubois, &, King, and Inc. 2003. Watershed study report: Stevens Brook and Rugg Brook. Northwest Regional Planning Commission. St. Albans, Vt.

St. Albans Bay

- Gaddis, Erica J.B. *Landscape Modeling and Spatial Optimization Of Watershed Interventions To Reduce Phosphorus Load To Surface Waters Using A Process-Oriented And Participatory Research Approach: A Case Study In The St. Albans Bay Watershed, Vermont*. Ph.D Thesis. University of Vermont, 2007

Appendix B: Public Participation - Importance of Watershed Council and other public participation

Non-point source pollution is Vermont's largest water quality problem. Non-point source pollution is generated from numerous land uses and is not easily ascribed to any one polluter. In addition, much of it is a result of an accumulation of environmentally damaging land use practices that are culturally accepted or driven by economics. A plan for controlling non-point source must include a process that helps us as a society understand why we pollute and identifies solutions that we can accept and will implement voluntarily.

Traditional forms of public participation usually depend upon a series of public meetings where people's concerns are heard. This form of one-way communication is used by planners almost solely for data collection. It fails to change people's minds and does not ensure that all of the values of the community are considered. The basin planning process facilitates a two-way discussion between the community and the Agency of Natural Resources through a series of meetings. The meetings also include strategy development through collaborative decision-making. The discussions allow all participants' opinions to be molded by a better understanding of their ecosystem and the social and economic needs of their community.

The following is a list of meetings that were part of the collaborative basin planning process

2003

- February 7 - Franklin County Conservation District – discussed basin planning process
- March 13 - Georgia Conservation Commission meeting – discussed basin planning process
- April 17 – MS4 Stormwater Education Steering Committee (towns) – discussed basin planning process
- April 29 – Initial basin-wide meeting (first watershed council meeting) where the following was decided:
 - The Franklin Natural Resources Conservation District would discuss with Franklin county residents the coordinator's proposal that Rock and Pike River watersheds would be moved into the Missisquoi River Basin planning process
 - The coordinator would work with local groups to develop strategies the first draft of strategies that would then be brought to the council for review and revisions.
- Public concerns regarding water quality were identified during the following meetings (meeting summaries can be found at : http://www.anr.state.vt.us/dec/waterq/pl_northernlcb.htm)
 - May 21- St. Albans meeting
 - June 2- North Hero meeting
 - June 4 - Shelburne meeting

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- May 14 – Winooski Natural Resources Conservation District presentation regarding basin planning
- July 30 - St. Albans Area Watershed Association hosted a discussion on controlling aquatic nuisance plants in St. Albans Bay from 6 to 8 p.m. Participants included the Vermont Department of Environmental Conservation, Lake Champlain Basin Program and the Town of St. Albans.
- July 31- The watershed council for the northern Lake Champlain basin planning process met from 7 to 9 p.m. at the Agency of Natural Resources' Essex Junction District Offices on West Street. The meeting focused on defining the council's role.
- October 21– basin planning presentation to Rotary Club in South Hero
- October 22– Aquatic Nuisance Species discussion sponsored by the Pelots Bay Assoc. 15 participants - meeting evolved from a discussion with the Pratt's about the difficulty the public has in identifying and implementing appropriate ANS management plans. This discussion would be the basis for the first draft of strategies addressing aquatic nuisance species management in the northern Lake Champlain basin planning process.
- October 23 - St. Albans Bay watershed agricultural meeting hosted by NRCS to discuss programs. The coordinator discussed basin planning.
- October 29 – Basin planning update to the Chittenden County Regional Planning Commission's Natural Resource Committee.
- December 4, - Vt. Green Lawn Coalition to discuss strategies relating to lawn and garden related pollutions

2004

- January 12 – LaPlatte River Partnership to review draft strategies relating to stream instability and corridor degradation.
- January 14 - Watershed council meeting – to review the LRP's draft strategies relating to stream instability and corridor degradation.
- January 28 - Vt. Green Lawn Coalition to continue to discuss strategies relating to lawn and garden related pollutions
- February 5 - Burlington Conservation Commission – described basin planning process and possible roles. Provided them with draft strategies relating to lawn and garden and other urban activities
- Feb 17 - St. Albans Bay agricultural community meeting to discuss strategies
- February 12 – Watershed council meeting discussed strategies relating to management of aquatic nuisance species
- February 19 – Meeting to discuss integration of Source Protection Plans and basin planning process with the Lake Champlain Coalition of Water Suppliers
- February 19 – Meeting with MS4 towns to discuss draft strategies relating to lawn and garden and other urban activities
- April 12 - Meeting with the Federation of Vermont Lakes and Ponds to review strategies to date

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- Other meetings: Coordinator attended meetings with LaPlatte River Partnership and St. Albans Area Watershed Assoc. to assist them with the development of projects. In addition the coordinator attended steering committee meetings to develop the Stevens and Rugg Brooks watershed study.
- November 16 – Watershed council meeting – to discuss draft strategies relating to water supply protection

2008

- July 9 – Meeting with Chittenden County Regional Planning Commission staff and members of Natural Resource Committee to ensure compatibility with regional plan.
- September 10 – Meeting with Northwest Regional Planning Commission staff and members of Policy/Project Review committee to ensure compatibility with regional plan.
- November 6, 12 and 13 – Three publically warned meetings in South Hero, Hinesburg and South Burlington to review the draft Interim Final Water Quality Management Plan For The Northern Lake Champlain Direct Drainages

Appendix C: Agriculture's Role in Water Quality Protection and Improvement in the Northern Lake Champlain Direct Drainages

Prepared by the Vermont Agency of Agriculture, Food and Markets

Introduction

Agriculture in the Northern Lake Champlain Basin ranges from primarily dairy in the north to a mixture of horses and dairy elsewhere. Agriculture has been identified as a contributor to surface and ground water pollution in Vermont. In 1986, the St. Albans Bay Rural Clean Water Program Annual Report estimated that agriculture is responsible for 48 percent of the total phosphorus load entering the St. Albans Bay. Of this, they estimated 41.6 percent comes from cropland erosion, 16.9 percent from barnyards, 3.4 percent from stacked manure, 7.6 percent from milkhouse wastes, 27.1 percent from spread manure and 3.5 percent from other sources. The study also estimated that biologically available phosphorus or the phosphorus that directly contributes to eutrophication comes from the following agricultural sources: barnyards, 26.4 percent; milkhouses, 11.9 percent; crop erosion, 13 percent; manure spreading, 42.3 percent; stacked manure, 5.3 percent; other practices, 1.1 percent. According to the Lake Champlain Phosphorous TMDL published in 2002, agriculture accounts for 56% of the phosphorous loading to Lake Champlain.

While significant strides have been made to reduce agricultural nonpoint source pollution through the voluntary implementation of soil, manure, and fertilizer management practices, agriculture remains one of the most significant potential sources of nonpoint source pollution. Inadequate animal waste, soil and nutrient management results in nutrient loading to surface waters and ground waters and is the major source of agricultural nonpoint source pollution in the State. For example, manure applied to frozen or snow covered ground creates the potential for nutrients and organic matter to run off during snowmelt, floods or other runoff-producing events. A large fraction of non point source pollution is a result of cropland erosion. Soil erosion is often the result of poor soil quality. Efforts to improve soil quality reduce soil loss from farm fields, protect water quality and improve farm productivity. Organic matter is a critical component of soil quality effecting soil structure, biological activity and soil chemistry. Efforts to build soil organic matter and otherwise enhance soil health are important components in improving agricultural soils and protecting water quality.

Farmers in the St. Albans Bay watershed responded early in the planning process to the stated need for phosphorus reduction in the watershed in a participatory and questioning way. They have been implementing proven and innovative practices and technologies for many years. Farmers partnered with the NRCDs, USDA-NRCS, AAFM, UVM Extension and industry, in conjunction with the St. Albans Bay Watershed Group to consider their role in the basin planning process and how best to meet the challenges in the current economic climate, and how to monitor the effectiveness of the process for themselves.

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From 1980 to 1990 farmers participated in a ten year effort (RCWP) to reduce P loading to the Bay through BMP implementation. At the end of the period 61 of 102 key watershed farms had signed contracts to implement best management practices. The contracts covered 74% of the critical areas, 79% of the animal units, and 80% of the total manure P loads. Since then a large percentage of Bay farmers have been participating in conservation programs administered by USDA and VAAF.

Achieving further P reduction goals for agriculture would require implementation of a full range of practices. Again, farmers in the St. Albans Bay watershed, joined by others in the Lake Champlain Direct watershed, provided their assessment of available conservation programs. This has resulted in changes to CREP delivery, BMP cost share rates, industry solutions (i.e. Contract Manure Injection), initiation of on-site Phosphorus Filters Research conducted by UVM, and CNMP implementation with Technical Service Providers. Some initiatives soon to be implemented are technological, like methane generation, and the use of equipment from ElectroCell Technologies. Farmers formed the Watershed Alliance, both to write their own Nutrient Management Plans and to have a voice in water quality. Farmers also encouraged and participated in a Gund Institute computer modeling project meant to determine sector responsibilities for non-point source pollution, which contribute to excess algae in the Bay. At the same time, the VAAF provided an assessment of regulations which led to changes in the Accepted Agricultural Practices and the establishment of the Medium Farm Operation permit.

Basin 5 farmers remain active participants in their watershed. They will benefit from data that links funds spent and practices implemented with documented increases in water quality. For many years there was a debate about P load on farmland and whether it left the field edge. This can be restated as a concern that that P being measured in the water column may originate from not only new inputs but also legacy Phosphorus in the stream beds, as seen further south in the watershed, in the La Platte River. The legacy P in St. Albans Bay streams is a result of both urban and agricultural activity and predates upgrades to the St. Albans wastewater treatment system.

LFOs in Basin 5

There are 18 Large Farm Operations in the State of Vermont; 16 are dairy farms and one each poultry and beef operations. An LFO is defined as a dairy farm with 700 or more mature cows (dry or lactating), 1000 beef animals, 500 horses, or a poultry operation with over 30,000 birds. None of these facilities are located in Basin 5.

MFOs in Basin 5

There are approximately 200 Medium Farm Operations (MFOs) in Vermont. Of these up to 10 may be all or partially within the boundaries of Basin 5, with another 3 in Grand Isle County. This rule applies to farms with 200 or more mature cows (dry or lactating), 300 or more young stock or heifers, 150 horses, 3000 sheep, or 9000 hens. The significant requirements of the general permit are twofold. First, there may not be a discharge from an MFO. This means no waste (manure, spoiled feed, milk house liquids, barnyard runoff, etc.) may leave the production area and enter surface water. Second, the

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MFO must complete (by March 2008) and follow a nutrient management plan for the land application of wastes and additional nutrients. Land application of wastes may not result in the primary or secondary groundwater standard or nitrogen being exceeded.

SFOs in Basin 5

There are approximately 6,000 Small Farm Operations (SFOs) in Vermont. This applies to farms with 199 or less mature cows (dry or lactating), 299 or less youngstock or heifers, 129 or fewer horses, 2999 or less sheep, or than 8900 or less hens.

Of these up to 400 may be all or partially within the boundaries of Basin 5 including Grand Isle County. Up to 150 may be dairy farms, including farms raising dairy heifers. More than 100 are non-dairy farms involved in animal agriculture. The fastest growing segments of small farm operations are horses, including ponies. Forty percent of the small farm operations in this watershed raise horses. Horse operations include a range of farm types, including stables that board horses, breed horses or train horses, and riding stables. Beef cows and dairy heifers are next in the number of small farms. Sheep, goats, llamas, elk, and birds are raised on the smallest percentage of small farms.

Organic Farms

There has been a significant increase in the number of organic dairy farms in the past few years. Of the estimated 6,000 farms in Vermont, 446 are currently certified organic with NOFA. As of 2006 there are currently an estimated 10 organic dairy farms in the Basin 5 watershed (NOFA-VT 2007) and it is expected that number will rise in 2007. Only one fourth of the certified organic farms in Vermont ship milk or make cheese. Thus, it can be expected that an additional 30 farms in the watershed are certified organic, with the majority selling vegetables, herbs and flowers or hay. These farms encompass 4,821 acres of farmland in organic hay and pasture. Another 304 acres of field crops are grown on 2 farms and approximately 424 acres have been certified as organic for the production of fruits and vegetables on 10 different farms. There are also 10 organic farms in Grand Isle County. Three of these are dairy farms. The remaining 7 have crops, vegetables, herbs and flowers.

Farm Economics

Of the 770 farms listed in the 2002 Census for Franklin County, farming is the primary occupation of 65% of the farm operators. The total market value of the agricultural products sold in Franklin County in 2002 was \$115,435,000 - up 26% from 1997 (USDA Census of Agriculture, 2002 County Data).

Of the 99 farms listed in the 2002 Census in Grand Isle County, farming is the primary occupation of 52% of the farm operators. The total market value of the agricultural products sold in Franklin County in 2002 was \$294,000 (USDA Census of Agriculture, 2002 County Data).

Strategies Currently In Process

Conservation Reserve Enhancement Program

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The Vermont Agency of Agriculture Food and Markets (VAAFMM) hired a CREP coordinator to work with individuals in the Lake Champlain watershed. The intent is to increase the number of CREP contracts and acreage enrolled in CREP. Ben Gabos focused first on raising the rental rates for agricultural land in Franklin County after hearing low rental rates were keeping farmers from participating in CREP. After a more equitable rate was established through the Farm Service Agency, Ben conducted site visits and field work to further CREP implementation.

Lake Champlain Direct CREP participation

Signed Contracts: 27.8 crop and marginal pastureland acres, including 10.8 acres of cropland
Progressing toward sign-up: 24 cropland acres and 50 marginal pasture acres.

Accepted Agricultural Practices

The Accepted Agricultural Practices Regulation passed in 1996 provided for on-farm assistance to farmers to work towards voluntary nonpoint source pollution reduction. Three technical staff members were hired in partnership with USDA-NRCS and the Vermont Association of Conservation Districts. Early efforts included assisting producers with the ban on land application of manure in winter, site assistance visits for spreading exemptions, and implementation of the Farm*A*Syst program, an early whole farm planning tool which in Vermont included testing the farm's drinking water.

The Agriculture Resource Specialist (ARS) visited farms in the watershed, particularly the St. Albans Bay, the Champlain Islands, and the La Platte River. The ARS also participated in and hosted farmer meetings to discuss the goals of watershed planning, and Phosphorus reduction goals for St. Albans Bay. A full report of Conservation District programs including work of the Agriculture Resource Specialist is available on request.

Changes to the Accepted Agricultural Practices as of April 2006 include streamside buffers, new waste storage systems built to USDA-NRCS standards and specifications, soil testing every five years, and increased management of stream banks where animals cross or water. Current efforts focus on education and outreach surrounding the changes.

Best Management Practices - Cost Share Increase

The Vermont Legislature funded a program provide design and cost share assistance to farmers upon passage of the Accepted Agricultural Practices Regulation in 1996. The Vermont Agency of Agriculture Best Management Practices Program has provided a state source of assistance at times apart from USDA-NRCS programs and also in partnership with USDA-NRCS. In 2005, a number of farmers started a conversation about how best to get to phosphorus reduction. The concern was stated that USDA-NRCS whole farm fixes are so expensive that only a handful of farms are being treated every year even in the larger dairy counties. The Vermont Agency of Agriculture supported legislative changes to the BMP to increase cost share in the 2006 legislative session and

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received authorization to change cost share rates for some practices to be determined. The goal is to implement practices on farmland with more flexibility.

Best Management Practices Receiving Cost Share in Basin 5 Watershed

Practice	Number	State Dollars
Access Road	10	\$11,043.84
Agricultural Fuel Secondary Containment Facility	3	\$2,078.30
Alternative Manure Management Practice	2	\$25,050.00
Animal Trails & Walkways	21	\$24,981.40
Brush Management	2	\$43.50
Closure of Waste Impoundments	3	\$7,463.40
Compost Facility	10	\$12,337.20
Conservation Crop Rotation	12	\$3,726.12
Critical Area Planting	6	\$825.50
Diversion	5	\$4,033.35
Fencing	41	\$36,908.66
Filter Strip	5	\$2,443.90
Grassed Waterway	1	\$195.20
Heavy Use Area Protection	44	\$112,890.46
Hedgerow Planting	1	\$352.80
Lined Waterway	1	\$604.00
Livestock Shade Structure	3	\$2,077.30
Manure Digester	1	\$50,000.00
Milkhouse Waste Transfer	2	\$847.22
Milkhouse Waste Treatment	2	\$22.55
Nutrient Management	24	\$26,310.92
Pasture & Hayland Planting	14	\$4,239.15
Pest Management	10	\$11,128.25
Pipeline	26	\$10,454.53
Pond	1	\$265.50
Prescribed Grazing	1	\$2,248.95
Pumping Plant	3	\$3,889.65
Riparian Forest Buffer	3	\$517.15
Roof Runoff Structure	23	\$15,351.70
Spring Development	7	\$3,318.95
Stream Crossing	9	\$3,722.64
Streambank & Shoreline Protection	1	\$971.60
Subsurface Drain	2	\$2,086.80
Tree / Shrub Establishment	8	\$11,057.85
Underground Outlet	1	\$1,684.20
Use Exclusion	4	\$730.80
Waste Storage Facility	51	\$463,415.69
Waste Storage Pond	10	\$33,237.82
Waste Transfer	27	\$64,581.84
Waste Water Treatment Strip	2	\$3,830.40
Watering Facility	20	\$2,986.41
Well	1	\$1,505.26
Totals	423	\$965,460.76

March 15, 2006

Table 1 Vermont Agency of Agriculture BMP Program as of March 15, 2006

Environmental Quality Implementation Program (EQIP)

From the 2002 Farm Bill, EQIP consolidates and better targets the functions of the Agricultural Conservation Program (ACP) in the 1990s to the present concerns and needs. A large percentage of EQIP funding goes towards the installation of liquid manure storages, although some alternative systems were implemented including compost stacking pads, and a methane digester. In the 1990s there was an effort to include milk house waste water in the manure storages. The present challenge is to contain concentrated silage leachate from bunker silos and to retrofit that into the existing barnyard layout. EQIP also funds a wide range of other agricultural conservation practices, including all of those listed in Table 3. In addition to the state dollars in Table 3, USDA-NRCS funded \$3,228,357.00 for practices implemented in the Basin for the same time period 1997 to March 16, 2006. (Source: Vermont Agency of Agriculture/ARMES) This represents a total combined amount of \$4,193,817.76 remembering that farm owners and operators spent at least \$419,381.77 of their own funds during the same time period to complete these practices - \$4,513,199.54.

Nutrient Management Planning

In an effort to assist Vermont farms comply with Federal Concentrated Animal Feeding Operation (CAFO) and State Medium Farm Operation (MFO) regulations, the Agency of Agriculture, Food, and Markets offered financial assistance for the development and maintenance of Nutrient Management Plans. Nutrient Management Plan Incentive Grants offer payment of soil and manure/waste testing and assistance for 3 additional years of Nutrient Management Plan updates. Vermont AAFM has contracted for 15 NMPs in Basin 5 (Lake Champlain Direct).

Plans are typically prepared by Technical Service Providers (TSPs), certified to work in Vermont. Currently working in Vermont are a Canadian firm, a New York state firm, a Vermont firm, and a number of individuals, both with the NRCDs and independent consultants.

NRCD Land Treatment Planners working in cooperation with NRCS and the Vermont Agency of Agriculture prepare the land treatment portion for about 50 plans each year.

UVM Extension Agronomist, Jeff Carter is also available to assist farmers and their Technical Service Providers (TSPs). Jeff Carter will work with farmers to navigate the choices, with the goal to get a plan and be ready for the Medium Farm Operation regulation. It is anticipated that all the Medium Farms in Vermont will have plans in place by the end of 2008. One million dollars has been spent on CNMPs to date.

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In 2007 the LCBP has more than \$200,000 in contract with Bordeau & Bushey, Inc. to provide technical assistance to 30 small farms (less than 200 dairy cows) to create nutrient management plans.

Heather Darby, UVM Extension Agronomist and Nutrient Management Specialist, received a grant from Vermont Agency of Agriculture to work with farmers interested in writing their own Nutrient Management Plans. The Franklin Natural Resource Conservation District planner prepared the Land Treatment Plan portion of the CNMPs. This course was developed collaboratively with farmers, USDA NRCS and the Franklin and Grand Isle NRCDs and UVM extension. The course was held over a five week period (January – February 2006). 10 farmers enrolled from farms in Franklin and Grand Isle Counties. The Farmers Watershed Alliance received a commitment from the Lake Champlain Basin Program for \$62,000 for development of farmers groups.

Low Cost and Local: Phosphorus Filters Research

Farmers are interested in comprehensive solutions to reduce phosphorus runoff. As monitoring and modeling of the St. Albans Bay watershed have continued, an interest in P runoff from ditches has been noted. One response has been an effective, low cost alternative which is being studied both at the University of Vermont and in the field. This method includes laying rock slag at ditch outlets to bind Phosphorus, thereby preventing its transport into lakes and streams. Building on work in progress at the UVM Constructed Wetland and previous work in Canada, UVM Research Assistant Professor, Aleksandra Drizo is teaming with UVM Agronomist and Nutrient Management Specialist, Heather Darby, to conduct a study of this practice on a farm site in Grand Isle County.

UVM Research Assistant Professor, Aleksandra Drizo is the Principal Investigator on seven research projects on constructed wetland research. These projects involve cross-disciplinary teams of scientists working on methods to remove nutrients from dairy farm effluent. Her position was specifically created to develop environmental research, carry out outreach and education in constructed wetlands for agricultural effluent treatment. She has twelve years of experience in subsurface flow constructed wetland systems. During this time she has investigated their potential for nutrient removal from wastewater (rural and agricultural effluents); the physico-chemical properties of various iron, aluminum and calcium based materials (both natural and industrial by-products) and their suitability for phosphorus removal from wastewater.

Methane Digestion and Power generation in St. Albans Bay

Methane Digestion and Power generation has the potential to reduce 1 ton phosphorus per year from the watershed if modeled on the Blue Spruce Farm operation in Bridport. One of the systems being installed in northwestern Vermont is in the St. Albans Bay Watershed.

Contract Manure Injection

Manure injection uses a minimum till injector and drag hose line application to inject dairy manure below the ground surface. It has the advantage over surface application in that less runoff occurs in weather events which occur between the times that manure is surface applied and incorporated as part of the cropping cycle. Less runoff may translate to less P reaching surface waters and exported from the watershed. The reductions in P loss are expected to be measurable, based on previous studies accomplished by UVM Extension. In the spring of 2006 Gene Branon of Branon Enterprises, Inc. worked to add to his contract manure application business a minimum till injector and drag hose line application of dairy manure. Gene Branon started operating the system, but was unable to sustain operation without startup funding. Farmer interest in using manure injection remains high.

Organics Reclamation Trial in St. Albans Bay

A St. Albans Bay dairy farmer hosted a trial of Tim Camisa's project titled Vermont Organics Reclamation Demonstration of an At Farm Manure Management System for Efficient Removal of P from Dairy Manure. This system was installed by 2006.

Watershed Level Process Planning

As farmers considered on-farm challenges they also noted considerable past P contributions from St. Albans City waste treatment plant overflows and new development including stormwater flows in the impaired brooks. Uniquely, farmers in St. Albans Bay then went a step further to encourage and participate in a computer modeling project meant to determine sector responsibilities for nonpoint source pollution which contribute to excess algae in the Bay. The project encourages a two-way flow of information between researchers and local stakeholders. It was funded by the Northeastern States Research Cooperative at the University of Vermont's Gund Institute for Ecological Economics and the Rubenstein School for the Environment and Natural Resources.

The goal of the model is to compare different patterns of land use and different management practices in terms of their effect on ecosystem functions and services, such as water quality in the stream network. Human impacts in the landscape are to be clearly expressed and valued in terms of impaired ecosystem services. Reciprocally, stakeholders have valuable information about system dynamics and processes that are most relevant to issues.

The modeling framework used encouraged participation of stakeholders in all the stages of the process, to create an essential two way flow of information in all the stages of the process. Stakeholders have local knowledge, values and concerns, can provide critical data and assist in determining management goals. Researchers in exchange help stakeholders understand the interconnections and tradeoffs between alternative watershed uses and values and become familiar with stakeholder concerns and drivers. The

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modeling project recognizes the ongoing process of collaborative learning is at least as important as the development of the models themselves.

Actions for Agricultural NPS Improvement in Basin 5 watershed

1] Work toward the goals of Clean and Clear to accomplish maximum P reduction on an accelerated time table as practical. These activities include: CREP, CNMPs, LTPs, BMPs, AAPs.

2] Complete requirements of the Medium Farm Operations regulations.

Lead Partners: NRCDS, NRCS, AAFM, UVM Extension, Medium Farm Operators, Technical Service Providers.

Potential Funding Sources: AAFM, EQIP, farm operators and local partners.

Time frame: 2009.

3] Support the expanded use of technology to get to P reduction while maintaining and enhancing ag economic viability including methane digestion and Electro-Cell treatment.

Lead Partners: NRCDS, NRCS, AAFM, UVM Extension, Farm Operators, LCBP and industry.

Potential Funding Sources: AAFM, EQIP, farm operators and local partners.

Time frame: On-going.

4] Support the efforts of farmer groups, contractors, and industry groups in recognition that all efforts are necessary to achieve agricultural goals to include contract manure injection-, and multiple small-source phosphorus capture using high calcium rocks.

Lead Partners: NRCDS, NRCS, AAFM, UVM Extension, Farm Operators, Farmers Watershed Alliance, LCBP, Contractors.

Potential Funding Sources: AAFM, LCBP, farm operators and local partners.

Time frame: On-going.

5] Work to create and sustain partnerships with all sectors of agriculture, including the equine community, which result in all sectors being equal partners in water quality.

Identify roles for associations, business, and individuals within groups.

Lead Partners: NRCDS, AAFM, UVM Extension, Farm Operators, Associations including but not limited to the Vermont Horse Council, Contractors.

Potential Funding Sources: AAFM, farm operators and local partners.

Time frame: On-going.

Appendix D: Relevant Grant and Funding Sources Covering Basin 5

This appendix includes funding sources that are referenced in the Basin 5 Plan strategies. There are also a number of funding and grant programs managed by the Natural Resources Conservation Service related to agriculture and wildlife habitat that are listed Appendix E.

Federal section 319 program to address NPS pollution (319)

Federal NPS implementation funds 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. Funds support activities to restore water quality or implement nonpoint source pollution controls in priority watersheds that are impaired or threatened by nonpoint source pollution.

Contact: Water Quality Division (802) 241-3769

Federal Section 604b pass-through funding for RPC's (604b)

The DEC is required to pass through to "regional comprehensive planning organizations" 40% of its annual federal Clean Water Act Section 604b allocation to conduct a variety of water-related planning activities. These funds go directly to the 13 regional planning commissions across Vermont for a wide variety of water related planning activities

Contact: Water Quality Division (802) 241-3769

Better Back Roads Grant (BBR)

The Better Backroads Program has been offering grants and technical assistance since 1997. New additional funding made available through Clean and Clear will significantly increase the funds available for grants and technical assistance. During the first years of the Clean and Clear, efforts will be made especially to involve towns in the Missisquoi Bay and St Albans Bay watersheds, although grants and assistance will still be available elsewhere in the Champlain basin and statewide.

A. Road Inventory and Capital Budget Planning

Reduction of road erosion requires planning and budgeting to realize cost savings and road improvements. Eligible projects under this category must include: (1) an inventory of road related erosion problems affecting water quality in a particular watershed or the whole town; (2) the sites identified must then be prioritized by problem area and; (3) this must be followed up by the development of a capital budget plan to correct these problems over a certain period of time.

B. Correction of a Road Related Erosion Problem

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The Better Backroads Selection Committee will base its evaluation on the following criteria: water quality benefits, longevity and effectiveness of solution, specific support available to meet match obligation, use of aesthetic vegetative solutions where applicable and partnering efforts. Projects can be enhancements of a scheduled project that provide additional erosion control benefits such as ditch stabilization in conjunction with a culvert replacement, or it can be a stand alone erosion control solution.

Example projects:

- Rock lined ditch
- Add turnouts
- Diversion berm
- Stabilize bank
- Add “daylighted” culvert
- Energy dissipaters
- Culvert header
- Velocity reducers
- Streambank stabilization

The maximum grant is \$7000, and a 25% local match is required. Grant availability notices are sent to towns in early spring of each year. The state-wide grant program is administered by the Northern Vermont Resource Conservation and Development Council, who can be contacted about the grant program, technical assistance and for a copy of the Vt Better Backroads Manual.

Contact: 802-828-4583 or 802-793-7816

Center for Clean and Clear Ecosystem Restoration Grants (C&C)

As part of the State Clean and Clear Program to reduce phosphorus and sediment pollution discharged into the state’s waters, the Vermont Center for Clean and Clear (CCC) has established an Ecosystem Restoration Program with capital funds from the state budget.

Program Goals and Funding Categories

The goal of the CCC Ecosystem Restoration Program is to reduce the long-term nutrient and sediment loading from and/or increases nutrient and sediment storage in Vermont watersheds. To achieve this goal, the Center for Clean and Clear has established three broad categories for Ecosystem Restoration projects: project identification, project development, and project implementation.

Who May Apply

Vermont municipalities, local or regional governmental agencies, non-profit organizations, and citizens groups are eligible to receive CCC Ecosystem Restoration Grants. Individuals and state and federal agencies are not eligible to receive funds directly, but may partner with an eligible project sponsor

Contact: Agency of Natural Resources 802-241-3687

EPA Loan– EPA Equipment Loan Program for Volunteer Water Monitoring

The U.S. Environmental Protection Agency (EPA) has identified improved water quality monitoring as one of its highest priorities, in recognition of the value of monitoring data in guiding EPA's and the states' and tribes' efforts to improve the health of the Nation's waters. There are waters, however, that states, tribes and EPA are not able to monitor at all or only on at a very limited frequency. Here in New England, volunteer groups have

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played a valuable role in supplementing the available monitoring data. With this equipment loan program, EPA New England expects to support and enhance the work of existing monitoring groups and assist the start up of new groups who seek to monitor waters for which there is no current data.

Contact: 617-918-8377

Vermont Aquatic Nuisance Species Grant-in-Aid Grants (GIA)

The Grant-in-Aid Program provides financial assistance to municipalities and state agencies for aquatic nuisance species management programs. The Grant-in-Aid Program, established under 10 V.S.A. § 922, is administered by the Vermont Aquatic Nuisance Species Management Program within the Department of Environmental Conservation's Water Quality Division. Funding for Grant-in-Aid grants comes from a portion of annual revenues from motorboat registration fees, federal funds, and proceeds from the voluntary [Aquatic Invasive Species Sticker Program](#).

Who May Apply

Municipalities are eligible to receive Grant-in-Aid Grants for work controlling or preventing the spread of aquatic nuisance species. Local interest groups such as lake associations must apply through the municipality in which the waterbody is located. If the waterbody is located in more than one municipality, affected municipalities may apply jointly.

Eligible Projects

All types of aquatic nuisance control projects, for both native and non-native species management, are eligible for funds. Projects supported to date by Grant-in-Aid grants include the control of Eurasian watermilfoil, purple loosestrife and nuisance native aquatic plants, and aquatic nuisance species spread prevention programs. Supported Eurasian watermilfoil management methods have included the use of mechanical harvesters, hydrorakes, diver-operated suction harvesters, benthic barriers, and chemicals (herbicides); physical removal by hand; surveys; and education and outreach initiatives. Previously supported projects include: mechanical harvesting of native aquatic plants; aquatic nuisance species spread prevention programs, including public access area "greeter" programs; boat wash stations; searches for non-native aquatic nuisance species in a waterbody; and education and outreach initiatives.

Project Selection

Municipalities may be awarded a grant for 75 percent or less of the total estimated project cost. Recipients must contribute at least 25 percent of the final eligible project cost through in-kind labor (unpaid personnel), in-kind services and/or actual cash expenditures (all from non-state sources).

Contacts: (802)-241-3782

Lake Champlain Basin Program (LCBP)

Since 1992, the Lake Champlain Basin Program has awarded more than \$3 million in local grants and funded more than fifty important research and demonstration projects about the Champlain Basin. The local grants are key to implementing the plan, *Opportunities for Action* at the grassroots level. Research and demonstration projects provide the sound science that is key to implementing the plan. Additional technical support to communities has been provided through the Watershed Environmental Assistance Program, in cooperation with the US Army Corps of Engineers. Grant programs include: **Local Implementation Grants; Annual Priority Grants** (\$5,000-20,000 for technical projects), **Partnership Grants** (up to \$5,000 for projects in partnership with other organizations), **Organizational Support Grants** (up to \$4,000 for organization building) and **Education Grants** (up to \$7,500 for educational projects) and **Watershed Association Professional Development Mini-Grants** (up to \$500 annually). Contact: Lake Champlain Basin Program, 54 West Shore Road Grand Isle, VT 05458; **Tel.** 802/372-3213 or 800/468-5227 (NY & VT).

Landowner Incentive Program (LIP)

The is a federally funded program to protect and restore habitats on private lands to benefit species and natural communities determined to be at risk and in need of conservation. LIP funds are provided annually to state fish and wildlife agencies through a national competitive grant program administered by the US Fish and Wildlife Service. Costs are reimbursed at up to 75 percent. The remaining 25 percent cost share can be in-kind services or funding from partner organizations. Funding is based on the scope and duration of each individual project. There is no maximum amount of funding an individual applicant can receive. Eligible lands are any that are not government owned. Species at risk includes any wildlife or plant identified by the State as in need of conservation. These include Federal and State listed plants and animals, wildlife and habitats at risk, and exemplary natural communities tracked by the Vermont Fish & Wildlife Department.

Contact: Vermont Department of Fish and Wildlife: (802) 479-4405

LaRosa Laboratory Analytical Services Grant (LaRosa lab)

LaRosa Laboratory Analytical Services Grant provides analytical services for water quality monitoring performed by local volunteer groups. No funds are awarded. Grants are in the form of free analytical services to support water quality monitoring programs addressing joint local and DEC needs. Number of analyses available will depend on laboratory capacity for the requested test parameters. Volunteer organizations participating in the program need collect samples and deliver them to the lab in Waterbury where samples are processed.

Contact: Vermont Department of Environmental Conservation (802) 241-3795.

SAFETEA-LU's Municipal Stormwater Mitigation Grants (MSM grants)

Vermont Municipal Stormwater Mitigation Grants were established for the purpose of providing financial assistance grants to towns, cities and villages in Vermont for projects to reduce water pollution generated by, or directly associated with existing public roads and road maintenance activities. Municipalities must supply not less than 20% of total project costs, not to include other federal funds.

The Vermont Local Roads Program and the Northern Vermont Resource Conservation and Development Council (RC & D) will be available for assistance to municipalities both on-site and by telephone. VTrans district offices and regional planning commissions will also be involved.

Funds must be used to reduce water pollution generated by, or directly associated with existing public roads and road maintenance activities in Vermont. The following represent possible projects.

- Stabilize ditches, culverts & other drainage facilities against erosion and flooding
- Stabilize critical roadside slopes having a negative impact on public waterways
- Related planning and engineering
- Purchase land or easements required to complete a project under this program.
- Construct or reconstruct salt/sand storage facilities and other road related facilities to reduce impact on public waterways.
- Purchase high efficiency street sweeping equipment
- Develop local regulations to improve water quality
- Construction of stormwater best management practices, such as detention basins, oil-grit separators, swales, etc.

Applicants should demonstrate that they are using sound stormwater treatment practices such as those described in the Agency of Natural Resources' Stormwater Management Manual and the Vermont Better Backroads Manual. Applicants must document the impact of the project on reducing water pollution generated by, or directly associated with existing public roads and road maintenance activities.

Send completed application to: William McManis; Vermont Agency of Transportation - Operations Division; One National Life Drive; Montpelier, VT 05633-5001.

Vermont Watershed (Conservation License Plate) Grants (VW)

Vermonters have an exciting new opportunity to protect and restore watersheds through the Vermont Watershed Grants program. Half of the proceeds from Vermont Conservation License Plate sales fund the new Vermont Watershed Grants program which distributes grants for local and regional water-related projects in Vermont.

Funds are available for water-related projects that:

- Protect or restore fish and wildlife habitats;
- Protect or restore water quality, and shorelines;

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- Enhance recreational use and enjoyment;
- Identify and protect historic and cultural resources;
- Educate people about watershed resources; or
- Monitor fish and wildlife populations and/or water quality.

Who May Apply

Municipalities, local or regional governmental agencies, nonprofit organizations, and citizen groups are eligible to receive Watershed Grants for work on public or private lands. Individuals and state and federal agencies are not eligible to receive funds directly, but may be partners of a project.

Funding Categories

Watershed Mini-Grant: \$200 to \$1,000 awards. Mini-grants are intended for small projects, or for discreet, identifiable portions of larger projects.

Watershed Grant: Awards larger than \$1,000. Grants are intended for complete projects or for discreet, identifiable portions of larger projects.

Application Information

Grant awards are made on an annual cycle, with applications due in the fall and funding decisions made the following mid-winter.

Contact: Vermont Department of Environmental Conservation (802) 241-3769

Appendix E: Regulatory and Non-regulatory Programs that Contain Best Management Practices Applicable to Protecting and Restoring Waters within the Basin

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

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waste discharges. Best Management Practices (BMP's) typically require installation of structures, such as manure storage systems, milkinghouse 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 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: The Large Farm Operations (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.

<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

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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.

<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 \$9 per acre, plus the cost of soil (\$15 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>

The **Conservation Reserve Enhancement Program (CREP)** is a State-federal conservation partnership program targeted to address specific State and nationally significant water quality, and soil erosion 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

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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>

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. The Winooski Conservation District and the Franklin County Conservation District serve the basin.

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>

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 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. The program addresses targeted watersheds on a rotating basis and different watersheds are eligible each year. 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

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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 ranchland 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. Unless reauthorized by the 2007 Farm Bill, this program is no longer available.

<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 5 to 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>

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 Department of Environmental Conservation (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. Outside of wastewater treatment plant discharges, there are 34 discharge and pre treatment permits for basin 5 as of March 2008.

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

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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 (WWTF)

Four wastewater treatment facilities discharge into Basin 5 waters. Hinesburg's WWTF discharges to the LaPlatte; Shelburne's discharges to McCabe's Brook and Shelburne Bay; Alburgh's, Burlington's and South Burlington's discharge to Lake Champlain; and both the St. Albans Northwest Correctional facility and St. Albans' city discharge to Stevens Brook.

South Burlington, Hinesburg are planning flow increases to their waste water treatment facilities.

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.

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

As of March 2008, 23 indirect discharge permits for sewage existed in 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 office for the basin is in Essex Junction.

Statutory Reference:

10 VSA Chapter 61

18 VSA Section 1218

Stormwater Program

The Stormwater Program in the Water Quality Division issues separate permits for runoff from impervious (i.e. hard) surfaces, construction sites and industrial facilities.

The **State Stormwater Permit Program** addresses runoff from impervious surfaces (rooftops, paved and non-paved parking/roads etc.). The State Stormwater Discharge Permit program has specific jurisdictional thresholds based on the amount of impervious surface. General Permit 3-9015 applies to project unless it is located in a watershed impaired for stormwater, in which case an individual stormwater discharge permit is required.

Statutory Reference:

10 V.S.A 1264

The **Construction Stormwater Permit Program** addresses stormwater runoff from construction activity that disturbs one or more acres of land.

The **Multi-Sector General Permit (MSGP) Program** addresses stormwater runoff associated with *industrial facilities*. A facility must seek coverage under the MSGP if the Standard Industrial Classification (SIC) code that describes the facility is listed in Table D-1 of the permit.

The **Municipal Separate Storm Sewer Systems (MS4)** is administered by the Vermont Agency of Natural Resources through the Stormwater Program under the National Pollutant Discharge Elimination System (NPDES). The federal stormwater regulation covers census defined metropolitan areas of less than 100,000 people. In Vermont, nine municipalities with municipal separate storm sewer systems (MS4) are required to come into compliance with this rule along with three publicly owned 'non-traditional' separate storm sewer systems that were also designated. Each MS4 must design a program to meet the following:

- Reduce the discharge of pollutants to the "maximum extent practicable" (MEP);
- Protect water quality; and

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- Satisfy the appropriate water quality requirements of the Clean Water Act.

The permit has a 5 year permit cycle and requires that the MS4s implement a stormwater program consisting of at least 6 elements. The MS4s file program updates every 5 years and annual reports yearly.

The entities in basin 5 include: Towns of Colchester, Essex, Milton, Shelburne, Williston; the Cities of Burlington, South Burlington, Winooski; the Village of Essex Junction; the Burlington International Airport; the University of Vermont; and the Vermont Agency of Transportation.

Statutory Reference:
the federal Clean Water Act

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.

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- 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).

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.

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.

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

Flow Regulations and Dams

1) Dam Safety Program

The DEC Dam Safety Program is the state entity responsible for the safety of non-hydroelectric dams. (The Public Service Board regulates hydroelectric dams.) The program periodically inspects the 85 state-owned dams found throughout Vermont for their repair/improvement needs and administers a permit program for construction and alteration of dams under its jurisdiction to serve the public good and provide adequately for the public safety. A permit is required to alter any dam, pond or impoundment 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 program 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 (Dam order)

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)

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).

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 (UIC)

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. As of March 2008, 7 UIC permits existed in the basin.

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

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.

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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

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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).

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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.

Other 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

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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 rivers in Basin 5 are underway, see the Agency of Natural Resources Stream Geomorphic Assessment Data Viewer (http://maps.vermont.gov/imf/imf.jsp?site=ANR_SGAT_RiversDMS)

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:
Chris Brunelle at 802-879-5631.

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)

Appendix E

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 F: Draft Vermont Anti-Degradation Implementation Existing Use Determination for Use during River Basin Planning (6-02-08)

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.¹ 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

¹ 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."

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.

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 of Natural Resources fully supports and actively promotes fishing in Vermont's waters. While fishing may occur in most waters of the State, in many places this use may be occurring on merely an incidental level. As part of the river basin water quality management planning process, the Agency recognizes that fishing occurs in all lakes and ponds and in certain reaches of flowing waters (i.e. streams and rivers).

The existing uses for fishing were identified by staff using an Agency procedure developed specifically for use only during the preparation of basin plans. This procedure focuses solely on the identification of well recognized and documented existing uses with public access and therefore is not meant to be an exhaustive list of existing uses for fishing within any particular river basin. It is expected that additional existing uses for fishing will be identified in the future, both as a result of additional information gathered by staff during basin plan updates and as part of Agency reviews of permitting applications for projects that affect the basin. The Agency plans to develop an additional procedure to guide staff in further identifying existing uses in the context of permit application reviews.

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 the following condition:

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.

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 and chapters 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. **Chapter 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. **Chapter 4 and Chapter 5**
4.shall consider approved municipal and regional plans adopted under 24 V.S.A. Chapter 117. **Section 1.4 and Appendix C**
5.shall coordinate and cooperate with the Commissioner of VAAF&M, as provided for in 6 V.S.A. Chapter 215. **Section 4.5 and Appendix B**
6.shall identify strategies, where necessary, by which to allocate levels of pollution between various sources as well as between individual discharges. **Chapter 5**
- 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 6**
 - salmonoid spawning or nursery areas important to the establishment or maintenance of such fisheries **Chapter 6**
 - reference conditions appropriate for specific waters **Chapter 6**
 - any recommended changes in classification and designation of waters (**Not included in accordance with Bill H 154**)
 - schedules and funding for remediation **Chapters 4 and 5**
 - stormwater management **Chapters 4 and Chapter 5**
 - riparian zone management **Chapters 4 and Chapter 5**
 - other measures or strategies pertaining to the enhancement and maintenance of the quality of waters within the basin. **Chapters 4 and Chapter 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. **Not included in accordance with bill H154**

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 2-6**

11. WQM plans are used to direct implementation. **Chapters 2-6**

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 2-6**

13. State annual work programs shall be based upon the priority issues identified in the State WQM plan. **Chapters 2-6**

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 E**
- (3) Identification of anticipated municipal and industrial waste treatment works, including
 - (a) facilities for treatment of stormwater-induced combined sewer outfalls; **Appendix E**
 - (b) programs to provide necessary financial arrangements for such works; **Appendix E**
 - (c) establishment of construction priorities and schedules for initiation and completion of such treatment works. **Appendix E**
- (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 E**
- (ii) Land disposal **Appendix E**
- (iii) Agricultural and silvicultural **Chapters 4.5 and Appendix B and E**
- (iv) Mines **Appendix E**
- (v) Construction **Appendix E**
- (vi) Urban stormwater **Chapter 4.3, Chapter 5 and Appendix E**

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 E**
- (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]. **Appendix E**

***Interim Water Quality Management Plan for the Northern Lake
Champlain Direct Drainages***
Response to Public Comments on the October 28, 2008 Draft
**Prepared by the Vermont Department of Environmental
Conservation**

The Vermont Department of Environmental Conservation received the following written comments on the October 28, 2008 Draft Interim Water Quality Management Plan for the Northern Lake Champlain Direct Drainage. In this document, the Agency of Natural Resources (ANR) has responded to comments made by the public between October 28 and November 28, 2008. Public meetings regarding the plan were held on November 6, 2008 in South Hero, on November 12, 2008 in Hinesburg and on November 13, 2008 in South Burlington.

The comments listed below represent all the major points provided in letters received by the Department as part of the public participation process for the plan. The comments have been edited and paraphrased in some cases for greater clarity and brevity, but every effort was made to preserve the original meaning and context. The comments are grouped by subject area. Department responses follow each comment.

Chapter 3

Comment: More information on fisheries should be included.

Response: Fishing and aquatic biota habitat are both uses that the basin plan recognizes and strives to protect through the improvement or protection of water quality. Additional information regarding the impact of phosphorus levels, sediment, mercury and aquatic invasive species on fish habitat and fishing will be added to Section 3.1, Water Quality Assessment.

Additional information regarding the Agency of Natural Resources' priorities and proposed actions for managing fisheries is included in The Draft Strategic Plan for Lake Champlain Fisheries².

Comment: The Vermont Lay Monitoring Program should be acknowledged.

Response: Additional information about the Lay Monitoring Program will be included to Strategy 2 on page 49.

² Fisheries Technical Committee, 2008. **Draft Strategic Plan for Lake Champlain Fisheries.** Lake Champlain Fish and Wildlife Management Cooperative, USFWS, Essex Junction, Vt.

Section 4.1

Comment: Please explain more how community concerns were identified/prioritized, and how they correlate and compare to state concerns and priorities. Aquatic Life Support and riparian & lake bay habitat, point sources and the additional pollutants should be listed as community concerns.

Response: Concerns raised by the public during the four initial public meetings were noted and then discussed at the watershed council's first meeting (Appendix B). Ensuing watershed council meetings resulted in continued discussion and ultimately the council agreed upon the community concerns identified in Table 2. The concerns are listed and addressed in Chapter 4.

Table 2 also shows how community concerns correspond to the predominant pollutants in the basin identified by the Agency. The Agency of Natural Resources' water quality concerns and priorities are reflected in the 2008 EPA-approved 303d list of impaired waters and the 2008 state's list of water outside of the scope of 303d (Table 4, 5 and 6). To clarify the relationship between community concerns and the Agency's concerns and priorities, a reference to Table 4, 5 and 6 will be added to Table 2.

Of the above requested additions to community concerns, riparian habitat was addressed under the community concern, river instability, in Section 4.2, Protecting River Corridors. The remaining requests were addressed in other sections of the plan. Point sources in the basin are further described in Appendix E. Chapter 3 includes basic information about other pollutants as well as point sources under the subheading Phosphorus. The assessment methodology used by the Agency to identify state priorities and concerns takes into account the ability of surface waters to support aquatic biota/habitat (life uses).

Section 4.4

Comment: Add the following from the February 2005 International Joint Commission report, pages 59 and 60 to provide a more accurate summary to description of the Carry Bay Causeway on pages 46 and 47: "These calculations indicate that because the Carry Bay causeway opening is significantly smaller than the Missisquoi Bay causeway opening, the Carry Bay causeway is the major restriction to water exiting both from Missisquoi Bay and the North East Arm."

Response: The suggested change will be made.

Comment: The following underlined words should be added to page 47, paragraph. 2: The Northern Lake Champlain Advisory Committee is advocating for the removal of a third of the Carry Bay causeway as recommended by the Binkerd study.

Response: The suggested change will be made.

Comment: On page 47, delete the remainder of the paragraph after: "The majority of the phosphorous load in the Passage and Carry Bay originates in the Missisquoi River watershed." The remainder is an erroneous interpretation of my original 2004 submission to the International Joint Commission and does not reflect the current Northern Lake

Champlain Advisory Committee.

Response: The suggested change will be made.

Comment: on page 47, paragraph 3, change first sentences as follows:

"The Agency has initiated the planning process for modifying the Missisquoi Bay and the Causeway Bay causeways. The risks and benefits of modifying the causeways will be assessed as part of the planning process.

Response: The suggested changes will be made.

Comment: Page. 23, paragraph. 4: The current phrasing of the last sentence dilutes the importance of the *E. coli* water quality standard and does not note the importance of either the magnitude of the *E. coli* counts or the frequency of violations for a given sample site. Suggest strengthening or clarifying the primary intent of this paragraph.

Response: The primary intent of this paragraph is to explain that although *E. coli* is an indicator of pathogenic pollution, the concentrations are known to vary considerably over space and time in response to natural and human-related factors. Vermont's stringent criterion can complicate efforts to identify actual impairment (or threat) of recreational uses caused by human or livestock or domesticated animal sources. The paragraph will be rewritten to better reflect the intent. The extent of the violations of the *E. coli* criterion in surface waters can be seen in Table 4 and 5 of the basin plan.

Comment: Strongly urge the Agency to recognize the role that Town Conservation Commissions can play in facilitating monitoring activities, incentive programs, and education and outreach efforts to Planning Commissions, Select Boards, Public Works Departments and the public regarding watershed and water quality status, concerns, best management practices, and recommendations. Adopting this principle would both serve the Agency's needs and encourage municipalities to further include CC's in their planning, regulatory, and review protocols as needed. Although the Agency has turned to not-for-profit organizations and lay programs in these efforts, the current draft plan appears to largely overlook the potential role and value of Conservation Commissions.

Response: Conservation Commissions will be added to strategy 10, 11 and 12 in the plan as suggested. In future basin 5 planning processes, the chairperson of conservation commissions in basin 5 towns will be added to email and/or mailing lists to apprise them of opportunities to participate in the planning process and comment on the plan.

Section 4.5

Comment: Page 51 paragraph 1. Add following paragraph, "phosphorus sequestered in the stream sediments may also release slowly over time and will add to the load measured at the mouth of streams. Streams that do not drop significantly in elevation and have clay or silt beds are more likely to sequester larger amounts of phosphorus over time and may be the reason greater gains are not measured after agricultural practices change or improve."

Response: The section referred to, Section 4.5, compiles comments from area farmers during a discussion about the agricultural community's contribution to protecting water

quality in the basin. DEC does not dispute that phosphorus sequestration occurs or that the reservoir of phosphorus in streams or lake bay sediments may compromise its ability to detect water quality improvement due to land treatment. DEC does not feel that this is an appropriate addition to page 51 as it was not part of the discussion.

Comment: Support placement of an equine specialist in Chittenden County to work with horse owners to work toward best management practices. An individual with strong contacts with the University of Vermont, Animal Science Equine Program, Vermont Agency of Agriculture, Food and Markets (AAFM) and the Vermont Horse Council could work effectively toward water quality goals and opportunities in the equine community. Lead agencies could include Natural Resources Conservation District, Vt. Horse Council, AAFM. Partners could include equine owners, Vt. Horse Council, agribusinesses. Potential funding source could include the equine community.

Response: Strategy 3 in Section 4.5 states: “Provide the growing equine industry with best management practice information.” If the organizations listed as partners or lead agencies decide to fund such a position, the strategy in the plan clearly supports the action.

Chapter 5

Comment: On Page 73, 74, the topic of “areas in need of further assessment” needs more background explanation of how this all links to the Vermont Water Quality Standards (VWQS).

Response: The introduction to Chapter 5, Section 5.1, includes the following explanation: “If a violation of the VWQS is suspected in a waterbody, but not yet substantiated, the Agency lists the waterbody as in need of further assessment (*Vermont 2008 List of Priority Surface Waters Outside the Scope of the Clean Water Act Section 303(d), Part C.*) Table 5 includes all waters in the basin recognized by DEC as in need of further assessment. The Agency has and will continue to gather more water quality data on waters needing further assessment, as well as support remediation actions.” A reference to Section 5.1 will be added to Section 5.5 to ensure that the reader can find the explanation.

Comment: The long list of projects is missing many LaPlatte and direct to lake activities. Please include:

- Munroe Brook water quality monitoring
- LaPlatte Fluvial Erosion Hazard discussions
- LaPlatte Rapid geomorphic assessment and rapid geomorphic assessment
- LaPlatte and direct drainages Project Identification
- LaPlatte Corridor Plan for Shelburne and Charlotte
- LaPlatte River and McCabes Brook water quality monitoring
- Kimball Thorp Frogbit (Aquatic Invasive Species) Removal Project
- Direct drainages in Shelburne, Charlotte and Ferrisburgh rapid geomorphic assessment and rapid habitat assessment

Response: Certain projects identified above are included in Table 7. The remaining projects will be added to Table 7.

Comment: Please also include recognition that Lewis Creek Association and LaPlatte Watershed Partnership reports on Stream Corridor and LaRosa in stream data results suggest:

- a. that storm and high water events (both spring runoff and increasingly frequent flashy storms) are the documented primary points in time when the bulk of NPSP impacts take place in rural areas, and that no state policy yet exists to guide development of sufficient protective practices to ensure avoidance of NPSP/stormwater runoff after predictably polluting storm events
- b. that Lake Valley land users in the lake floodplain areas are not implementing adequate NPSP avoidance strategies
- c. the sole NPSP guidance we have today is the 1992 AAFM and ANR MOU with its associated AAPS that is, to date, even farther from sufficiently controlling pollution from NPSP
- d. that to advance desired WQ improvement of our streams, ponds and lakes, we should promptly update our state policies, goals, objectives and strategies
- e. today's plethora of data generated by ANR LaRosa Lab, RMP SGAT and state lake monitoring must be used together to identify, prioritize and eliminate instream locations of pollution source areas.

Response: In response to (a) and (b), DEC has long recognized the significant effects to local and downstream water quality that are associated with storm events and with high water events such as during spring runoff and flashy storms. Based on somewhat extensive stream flow measurements and water quality data gathered from monitoring, DEC does not dispute the majority of sediment and phosphorus loads to streams and lakes are typically delivered during high water events (see Section 4.3). DEC does, however, dispute the absence of policies and alleged lack of practices to ensure avoidance of NPSP/stormwater runoff. Policies, rules, procedures and general and individual permits are in place to help control stormwater runoff during construction activities and, through operational permits, after the completion of construction. Disconnection of roof top drains, minimizing impervious pavement and reduced lawn fertilizer use are activities that are being promoted by DEC. Projects before Act 250, typically are required to implement and employ an undisturbed vegetated buffer of between 50 and 100 feet in width. Agricultural lands being used for corn or other row crop production need a vegetated buffer as well. Several towns in Vermont have building set backs to water and or vegetated buffer requirements in their municipal land use regulations. These are just a few notable examples to illustrate the presence of policies, practices and avoidance strategies to address pollutants and pollutant delivery from stormwater and high water events.

In response to (c), DEC is a party to the agricultural nonpoint source MOU noted above (correct citation is April 1993). The MOU resulted in the development of the AAPs which affect all farms in Vermont regardless of size, type and location. The AAPs were revised and improved in 2006. In addition to that MOU, another MOU between DEC and Vermont AAF&M is in place concerning medium farm operations (MFO), large farm operations (LFO) and concentrated animal feeding operations (CAFO). The Vermont AAF&M is responsible for permitting of each MFO and LFO in Vermont. A third MOU

exists between DEC and AAF&M concerning agricultural non-manure waste management.

In response to (d), DEC has and continues to update, where appropriate, state policies, goals, objectives and strategies to protect and restore waters. Changes to the Water Quality Standards and the river basin planning process are two very different tracks to identify, achieve and maintain surface water resource management efforts. Ongoing monitoring and assessment, impaired waters listing and total maximum daily load determination represent three linked processes adaptable to restoring specific waters. Changes to other rules and to water quality related land use practices are occurring constantly (for example on-site sewage disposal and treatment, stormwater manual, flood hazard area). DEC continues to work with other state agencies to modify policies and regulations that are outside of its authority.

In response to (e), DEC takes seriously the need to maximize its use of limited data concerning Vermont's surface waters. Coordination between various water quality, aquatic habitat and stream geomorphic programs is the best opportunity for integrating data that is collected separately. While there is always room for improvement, DEC does integrate available data to identify, prioritize and eliminate pollution source areas within large and small watersheds.

Comment: Clarify definition of aquatic nuisance species (ANS) and aquatic invasive species (AIS).

Response: Both ANS and AIS have been used to describe aquatic organisms introduced into new habitats that produce harmful impacts on aquatic natural resources. DEC has included native nuisance plants in the definition of ANS. Presently, aquatic invasive species (AIS) is the more commonly used term. To increase clarity of the document, the term ANS will not be used except when in a title to a referenced document. Native species that alter surface water will be referred to as native nuisance species.

Comment: Add more information about aquatic endangered/threatened/rare species in the basin.

Response: Additional information will be added to Section 2.2.

Comment: Provide additional information on high chloride levels from the following report: *A Chloride Assessment of Select Urban Streams in Chittenden County, Vermont* Prepared by the Biomonitoring and Aquatic Studies Section Vermont Department of Environmental Conservation. July, 2007.

Response: Additional information will be added in Section 4.3 and will read as follows: Chlorides most probably from winter road salting, have also become a pollutant of concern in stormwater. Certain urban streams in the greater Burlington area have the highest chloride concentrations observed to date in Vermont and these streams are experiencing levels considered harmful to aquatic biota.

In addition, the following bullet will be added to Section 5.2 C

- The Agency will continue to monitor chloride and conductivity in urban streams and begin to assess possible biological impacts.