



**US Army Corps  
of Engineers**  
New England District

# Update Report for Vermont



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Public Affairs Office, 978-318-8264

Current as of  
November 30, 2008

Home Page: <http://www.nae.usace.army.mil/>

## Introduction/Mission

Both the New England and New York districts provide service to the residents of the Green Mountain State. New England District is responsible for all civil works activities within the Connecticut River Basin, while New York District handles activities in the Lake Champlain drainage area. The New England District is responsible for the entire state for the Regulatory and Defense Environmental Restoration Programs, all Emergency Operations and is the Corps' lead for the Planning Assistance to States Program. This division of responsibility between the New York and New England districts is seamless to our customers, because the Corps strives to provide access to all our capabilities through a "One-Door-to-the-Corps" policy. Unless specifically noted, all activities included in this report are managed by the New England District.

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The missions of the New England District, U.S. Army Corps of Engineers, include flood damage reduction, emergency preparedness and response to natural disasters and national emergencies, environmental remediation and restoration, natural resource management, streambank and shoreline protection, navigation maintenance and improvement, support to military facilities and installations, and engineering and construction support to other government agencies. The six New England states cover 66,000 square miles and have 6,100 miles of coastline, 11 deep water ports, 102 recreational and small commercial harbors, 13 major river basins, and thousands of miles of navigable rivers and streams. The district operates and maintains 31 dams, two hurricane barriers and the Cape Cod Canal. Through its Regulatory program, the district processes about 5,000 applications per year for work in waters and wetlands of the six-state region. We employ about 510 professional civilian employees, with about 300 stationed at our headquarters in Concord, Mass. The other Corps of Engineers employees serve at Corps projects and offices throughout the region.

## Streambank Protection

**RICHFORD WATER SUPPLY, MISSISQUOI AT RICHFORD** - The New York District began construction on Nov. 1, 2004 and completed it in December 2004. The project was authorized under Section 14 of the Continuing Authorities Program. The project entailed relocating the primary water supply line for the community of Richford. The new water main has been installed and is now providing the town with water. Landscaping at the

construction site was completed in the summer of 2005.

**WHITE RIVER, HANCOCK** – New England District has recommended termination of this investigation due to an inability to identify a sponsor willing and able to provide the assurances required for federal partnerships. Should an eligible sponsor be identified, there would be an opportunity to revisit the project.

## Environmental Restoration

**MAD RIVER, WARREN** – The New York District determined that federal interest in a Section 205 (flood damage reduction) study was not warranted. A Section 206 (aquatic ecosystem restoration) study was recommended, for which study the local sponsor sent a letter of support. The preliminary restoration report recommended removal of the dam and the associated sediments, and approximately 2,000 linear feet of

channel restoration. The New York District is nearly complete with the planning, design and analysis phase of the project. A project cooperation agreement (PCA) execution is dependant upon the town of Warren's decision to proceed with the project. Dam removal has become a public issue. Uncertainties in the project future have put the project on hold.

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**NEW HAVEN RIVER, BRISTOL** - The New York District determined that federal interest in a Section 205 (flood damage reduction) study was not warranted. A Section 206 (aquatic ecosystem restoration) study was recommended. A preliminary restoration report was completed in September 2002. In October 2003 the local sponsor indicated that the New Haven study is not considered a priority, but might be pursued at a later date.

**WILD BRANCH, WOLCOTT** - The New York District conducted a site visit along with state officials to assess flooding problems and opportunities for environmental restoration along the Lamoille River. The Lamoille watershed forms part of the drainage divide, which separates the Connecticut and St. Lawrence River Basins. Based upon initial findings and a letter of support from the Vermont Environmental Conservation Department, a Section 206 study (ecosystem restoration) has been initiated for the Wild Branch of the Lamoille River in Wolcott. The New York District completed a preliminary restoration report, which determined that there is federal interest in continuing into the feasibility phase of study. Feasibility study scope, cost and schedule finalization is dependent upon available funds.

**LAKE CHAMPLAIN WATERSHED, VT & NY** – The New York District coordinated with the Lake Champlain Basin Program (LCBP) on the establishment of an environmental restoration program that was authorized by Section 542 of the Water Resources Development Act of 2000. The program provides assistance to Vermont

and New York with planning and project implementing to improve water quality in Lake Champlain as well as ecosystem restoration projects in the entire Lake Champlain Watershed. The program is cost shared at 65 percent federal and 35 percent nonfederal. The New York District in partnership with the LCBP prepared a general management plan (GMP), which defines the selection and implementation process of projects to be accomplished under this program. The GMP was completed in March 2004 and updated in June 2007. Construction was completed on Oct. 30, 2006 on the pilot project, Lake George Storm Water Project in New York. The Lake George Project Cooperation Agreement (PCA) was executed in February 2006. The other pilot project, Tyler's Branch in Vermont, was terminated by the local sponsor. The other projects are located in Plattsburg, N.Y. (PCA executed July 2006); Keene, N.Y. (PCA executed April 2008); and South Burlington, VT. (PCA executed June 2007). Six new requests were initiated in FY 2008 and Project Management Plan (PMP) negotiations are ongoing.

**LAKE CHAMPLAIN SEA LAMPREY BARRIERS, VT & NY**- In cooperation with the U.S. Fish and Wildlife Service and the Lake Champlain Basin Program, New York and Vermont, the New York District conducted a site visit Aug. 31, 2004. A preliminary restoration report has been finalized. New York State Department of Environmental Conservation (DEC) has indicated its willingness to be the non-federal sponsor. The Project Management Plan has been completed and the feasibility study was initiated; however, changes in the project scope have put work on hold.

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## Superfund

**WORK FOR THE ENVIRONMENTAL PROTECTION AGENCY** - The New England District is designated as the Corps of Engineers total support agency for the Environmental Protection Agency's (EPA) Region I (New England) Superfund program for those federal-lead projects assigned to the Corps by EPA. This includes responsibility for design and/or construction execution of remediation projects. In addition, the District is providing technical assistance upon request to EPA New England for other federal-lead projects assigned by EPA to private firms as well as for some potentially responsible party (PRP) remediation.

**ELIZABETH MINE SUPERFUND SITE, SOUTH STRAFFORD** – The site is an abandoned copper and iron-sulfate mine that operated from 1806 until its closure in 1958. The operations consisted of open-pit type mining. The mine workings were abandoned without any closure measures to restrict access or prevent runoff from entering the mine. In addition, there are about 40 acres of exposed tailings piles which are still producing acid mine drainage. This acid runoff is causing water quality problems in receiving waters of the drainage, Copperas Brook, and downstream in the West Branch of the Ompompanoosuc River.

New England District was approached by the EPA in 1999 to assist in characterization of the Acid Mine Drainage issues at this site. In 2002, New England District supported preparation of an Engineering Evaluation/Cost Analysis supporting cleanup of the tailing piles at a total estimated cost of about \$15 million. Work began on this effort in 2006. To date, surface water has been diverted away from some of the tailing piles in an effort to reduce acid runoff. In addition, design of closure and cover system is underway and was completed this year. Work began in May 2007 to divert the remaining surface and groundwater away from two of the tailing piles. That work was completed in December 2007 and work in 2008 *is focusing* on reducing iron load to the West Branch Ompompanoosuc River.

A comprehensive remedial investigation/feasibility study (RI/FS) has been completed by the District recommending actions for the remainder of the 1,800-acre site. New England District has received approximately \$7 million to support site investigations to date. EPA's selected remedy includes consolidation of remaining waste and covering of exposed ore and waste rock. Total cost of these efforts is anticipated to be about

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\$15 million. Design of features to cap lead-contaminated soil associated with this remedy were initiated in January 2007. *Planning for the abatement of lead-contaminated*

*soil is underway. Archaeological recovery work associated with this effort will begin in 2008, with remediation of the lead scheduled for the spring of 2009.*

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## Defense Environmental Restoration Program

This Congressionally directed program (PL 98-212) provides for an expanded effort in environmental restoration. It emphasizes the identification, investigation and prompt cleanup of hazardous and toxic waste; unexploded ordnance; and unsafe buildings, structures and debris at current and former military facilities. Site and project eligibility investigations have been completed at all 13 formerly used defense sites in Vermont, including nine where no work was found to be necessary. Of the four sites where work was needed, remedial actions for the remaining four have been completed. They are formerly used facilities at **Burlington International Airport, Fort Ethan Allen in Burlington, and the St. Albans and Lyndonville Air Force stations.** Follow-up investigations at the **St. Albans and Lyndonville Air Force stations** are currently underway. Johnson Company has completed a remedial investigation for groundwater at the site in order to delineate nature and extent of bedrock groundwater contamination at the site and evaluate human health risk. The draft report for this effort was completed in February 2008 and a final report was submitted to the state of Vermont in June 2008. Additionally, field work was completed in July 2008 for Lyndonville Air Force Station in order to address remedial investigation data gaps associated with past efforts. A preliminary draft report

*was completed in September 2008 and is currently being reviewed.*

**FUDS Investigations** — The Corps is conducting Site Inspections of Formerly Used Defense Sites (FUDS) to determine if any munitions and explosives of concern (MEC) or munitions constituents (MCs) are present on property formerly owned or leased by the Department of Defense. Many of the sites visited during this project may not have been used since the World War II timeframe, or their use changed when the property was transferred to another branch of the military or other private or public landowners. Alion Science & Technology, Inc. is assisting the Corps' Baltimore District in performing this evaluation at FUDS in the Northeast region. Alion and the District will review historical records and maps, meet with site regulators and key stakeholders, and conduct field inspection activities in the area(s) of interest. The outcome from these Site Inspection activities will be to determine if the project site poses any threat to human health or the environment, and if further work needs to be done either through a Remedial Investigation/Feasibility Study (RI/FS) or some type of removal action. Presently funded *site inspections* are in Maine, Rhode Island, Connecticut and Massachusetts.

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## Planning Assistance

Cost sharing (50/50) for the Section 22, Planning Assistance to States Program has presented challenges to the state in identifying funds that would be used for the

nonfederal contribution. The state's interest in the program continues, and it plans to identify future needs within the state of Vermont.

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## Flood Damage Reduction

**WINOOSKI River, Montpelier, VT** – The New York District has recently completed a Project Management Plan with the city of Montpelier, Vermont. In 1996, the Winooski River Flood Damage Reduction Reconnaissance Study was completed and approved, but did not progress into the Feasibility phase. As a result of a potentially serious freezeup ice jam event in January 2006, the city of Montpelier, VT expressed their renewed interest in carrying the study forward into the feasibility phase. The NY District has held several meetings with the City and the State of Vermont to discuss current

problems, opportunities, and constraints and what differences exist between current conditions and conditions that existed at the time the 1994 Reconnaissance Study Report was completed. The Project Management Plan (PMP) is a plan to update the information in the 1994 Reconnaissance Phase, shift focus to ice-jam induced flood damages, remove focus on fluvial flood damages, and complete a feasibility study. A *Feasibility Cost Share Agreement* (FCSA) is scheduled for execution in FY2009.

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## Flood Plain Management

**DAM BREACH ANALYSIS, LAKE CHAMPLAIN DRAINAGE AREA** - The New York District, in conjunction with the state of Vermont, has used the Flood Plain

Management Services (FPMS) program to conduct dam breach analyses throughout the Lake Champlain drainage area. Over the past decade, the District has



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prepared 32 such studies. Currently, funding is being pursued for several FPMS studies including East Long Pond Dam, Mackville Pond Dam, Warren Lake Dam, Lake Hardwick Dam, Nichols Pond Dam, Stevens Brook and Rugg Brook.

**FIRST FLOOR ELEVATION SURVEYS LUDLOW, WATERBURY AND CHELSEA** - The state of Vermont requested the New England District to conduct, under the Flood Plain Management Services (FPMS) program, an investigation of first floor flood elevations for Ludlow, Waterbury and Chelsea. The study involves performing a first floor elevation survey of structures located within the 100-year floodplain for designated areas within each community. The surveyed data (first floor elevation, address, low ground elevation) is given to the state floodplain coordinator as well as an orthophoto-based map showing the properties surveyed. Fiscal year (FY) 2005 funds were used for the village of Chelsea. The

survey for Chelsea was completed and a report mailed to the state. FY-06 funding was used to survey parts of the Town of Waterbury. Future funding will be used to survey Waterbury and Ludlow effected properties.

**DAM BREACH ANALYSIS, MINARDS POND DAM** - This Flood Plain Management Services (FPMS) study is a year-to-year effort where the District completes dam failure analyses for the Vermont Agency of Natural Resources, Office of Dam Safety. The FY 2003 analysis focused on the Lake Ninevah Dam in Mount Holley. The analysis was completed and the final report and flood maps have been provided to the state. The analysis for Minards Pond Dam in Rockingham was initiated in 2005. FY-06 funding was used to complete cross-section surveys of the Halladay Brook and Minards Pond dam. When funding becomes available, hydrologic and hydraulic modeling will be conducted.

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## Regulatory Activities

**STATUS OF PROGRAM** - Department of the Army permits are required from the Corps under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The Corps reviews permit applications for work affecting navigable waters under its Section 10 authority and the discharge of fill material into all waters, including inland wetlands, under Section 404. *For the period Sept. 1, 2008 to Nov. 30, 2008 the following final actions were taken: 1 resolved compliance action, 0 resolved enforcement actions, 15 no permit required, 3 permit modifications and 2 Individual Permits. For Programmatic General Permits (PGPs), 21 Category 1 activities were reported. For Category 2 PGP activities, 0 were denied without prejudice, 0 exempted and 13 issued.*

**PROGRAMMATIC GENERAL PERMIT** - The New England District has comprehensive Programmatic General Permits (PGPs) in place in each of the six New England states covering work with minimal impact on the aquatic environment. Up to 98 percent of all permits issued in New England are PGPs. The PGPs are based on the state thresholds for most categories of environmental impacts, and applicants generally need only file with the state. The federal screening is virtually transparent to applicants, and the PGP approval is either included in the state approval letter or mailed simultaneously. Applications appropriately covered under the PGPs are generally approved in under 30 days. Applicants have commented favorably about the simplicity, predictability and efficiency of the PGPs. The Vermont GP was re-issued on Dec. 5, 2007.

**AGRICULTURAL CONVERSIONS** - We continue to investigate unauthorized conversions of wetland to cropland in Orleans and Franklin Counties. The unauthorized activities range from an acre or less to 20+ acres in size. The Corps continues to provide one-on-

one help to farmers applying for permits and is available for group outreach/educational meetings to assist the Vermont farming community in understanding the permit process.

**MIDDLEBURY RAIL SPUR** - The Federal Highway Administration is preparing an environmental impact statement (EIS) for the Vermont Agency of Transportation's proposed Middlebury Rail Spur in Middlebury. The Corps is a cooperating agency. An interagency scoping meeting was held in November 2004. Concurrence on the alternatives to carry forward for further study has been reached. Concurrence has also been reached on potential mitigation sites. The draft EIS was released on April 23, 2007, and a public hearing was held on June 7, 2007. The Corps Public Notice expired on June 29, 2007. A permit decision and Record of Decision are expected in *the spring of 2009*.

**VERMONT AGENCY OF TRANSPORTATION CHITTENDEN COUNTY CIRCUMFERENTIAL HIGHWAY** - This project involves the construction of a regional four-lane bypass highway from I-89 in Williston to Vermont Route 127 in Colchester, VT. The Corps, U.S. Environmental Protection Agency, U.S. Fish & Wildlife Service, and state resource agencies participated in the preparation of an environmental impact statement (EIS) for the project in the mid-1980s.

The entire alignment was evaluated, and consensus was reached that the proposed alignment represented the least environmentally damaging practicable alternative (LEDPA). Consensus was also reached on mitigation sites, and that the project could be split into three segments for purposes of permitting. Segment 1 goes from I-89 in Williston to VT Route 15 in Essex. Segment 2 goes from VT Route 15 in Essex to VT Route 2A in Essex (this segment also includes a connector road from VT

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Route 2A to Susie Wilson Road in Essex). Segment 3 starts at VT Route 2A and ends at VT Route 127 in Colchester. Two lanes of Segment 1 from VT Route 117 to VT Route 15 and two lanes of Segment 2 have been constructed. The entire project was permitted by the Corps. The final EIS was issued in 1986. A final environmental assessment re-evaluating Segments 1 and 2 was released for comment in 2003.

Several environmental groups appealed the Environmental Assessment to federal court. In May 2004, the district federal court ruled that the environmental documentation on the project was insufficient and that a new or supplemental EIS was necessary. The Federal Highway Administration (FHWA) and the Vermont Agency of Transportation (VTAOT) are in the process of preparing a new EIS for Segments 1 and 2 of the project. The Corps is a cooperating agency. An

interagency scoping meeting was held on Feb. 10, 2005. Public information meetings were held in March, June and November 2005. Public workshops to assess cumulative impacts were held in June and September 2005 and March and September 2006. Interagency meetings are being held monthly.

Concurrence on the alternatives to carry forward for further study has been reached. On-site review of potential mitigation sites is on-going. Additional public workshops to discuss design of the alternatives were held in February 2006. The draft EIS was released on July 31, 2007. The Corps Public Notice was issued in September 2007, and a joint Public Hearing was held on Oct. 4, 2007. Comment periods for the DEIS and Public Notice expired on Nov. 21, 2007. Interagency coordination is on-going, with the selection of the Least Environmentally Damaging Practicable Alternative anticipated in *the winter of 2009*.

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## Dam Safety Assurance Program

**WATERBURY DAM, WATERBURY** - The Waterbury Dam, built by the Civilian Conservation Corps during the 1930s under U.S. Army Corps of Engineers supervision, was constructed on and over a natural gorge of the Little River about two miles from its confluence with the Winooski River. The dam is operated and maintained by the state of Vermont. The dam was constructed of compacted earthfill with a clay core, covered with two feet of rock riprap, and it provides flood control benefits for the Little and Winooski river basins during major rainfall events.

The 860-acre Waterbury Reservoir and surrounding lands is a popular recreation area. The project also includes a hydropower facility operated by Green Mountain Power. Borings conducted at the dam in the mid-1980s by the Corps revealed less compacted areas and voids in that portion of the dam, which rests on and over the Little River gorge. This situation allows seepage of water through the dam, raising the potential for piping, boils and internal erosion problems.

The New England District assisted the New York District in addressing seepage problems at Waterbury Dam. As part of that effort, a Dam Safety Report and an Environmental Assessment were completed and approved by Corps Headquarters in January 2001. Subsurface exploratory work to assist in evaluating repair alternatives was completed in December 2000.

A number of alternatives were evaluated, including doing nothing; removing the entire dam structure; building an entirely new dam; implementing partial corrective measures, such as reducing water levels and adding impervious blankets or filters; and rehabilitation to include installing cutoff walls, reconstructing the entire gorge section and building a multistage filter shaft in the gorge area. The recommended plan, the installation of

the filter shaft, was modified during the value engineering study in April 2001. The modified plan installed the filters and cut-off wall through drilling instead of open excavation. FY 2001 funds of \$2 million were used to initiate plans and specifications, cultural and environmental resources investigation and continue subsurface work.

The environmental and cultural investigation work were performed by New England District. FY 2002 funds of \$4 million were appropriated to complete the plans and specifications, negotiate the project cooperation agreement and initiate construction. The addendum to the dam safety assurance report, outlining the modified plan, was completed in January 2002. The final plans and specifications were completed by Baltimore District in February 2002. The Vermont Department of Environmental Conservation received the permit to perform the repairs from the Vermont Public Service Board in March 2002.

The Project Cooperation Agreement (PCA) was executed on May 20, 2002. The construction contract was awarded May 31, 2002 to RAITO, Inc., of San Leandro, Calif. Construction of the seepage control features was initiated on July 15, 2002. Funds totaling \$6 million were appropriated in FY2004. The FY 2004 appropriation bill also directed the Corps to design and construct repairs to the spillway structure, which was deteriorated due to an alkali aggregate reaction. Construction continued in FY 2005 utilizing the \$3 million appropriated for that fiscal year. Construction of the spillway repairs was completed in December 2005. Construction of the seepage control features was completed in 2006. Construction of bank stabilization features was also carried out in the summer of 2006 as mitigation for the project. The state of Vermont refilled the reservoir in the fall of 2006.

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## Interagency and International Support

**WORK FOR THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT** - The Corps of Engineers has entered into an interagency agreement with the Department of Housing and Urban Development. In accordance with the agreement the Corps performs physical inspections, contract administration reviews, drawings and specifications reviews, and final inspections for Housing Authorities located throughout the state of Vermont.

**BORDER PATROL STATION – HIGHGATE SPRINGS, VT** – The Department of Homeland Security (DHS), through the DHS Architect - Engineer Resource Center

located at the Corps' Fort Worth District, originally tasked the New England District to provide a new turnkey 50-agent Border Patrol Station to replace an existing station in Swanton, VT as part of their Ramp Up 6000 Program that requires Border Patrol occupancy by the end of the calendar year. NAE's involvement with the design and construction of this project has since been cancelled by DHS. Separately and under direction at the national level, NAE Real Estate continues to assist with site selections and NAE Environmental continues to assist with the review of environmental activities being performed under contract.

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## Special Studies

**AQUATIC PLANT CONTROL PROGRAM** - Authorized by the River and Harbor Act of 1958, the Aquatic Plant Control Program for Lake Champlain provides for the control and eradication of aquatic plants in navigable waters, tributary streams, connecting channels and other allied waters in the interest of navigation, flood control, drainage, agriculture, fish and wildlife conservation, public health and related purposes. Approximately 1,615 acres of aquatic plants, water chestnuts and Eurasian water-milfoil infest the Lake Champlain Basin. Unharvested acreage of these foreign plants is a constant source of future infestation and requires removal, since they have adverse effects on navigation and the ecosystem, especially native aquatic plants. Funds (\$400,000) were allocated to the New York District in FY2007 to continue conducting similar cost-shared (50-50) planning and control operations work within the Lake Champlain Basin. A Project Cooperation Agreement (PCA) for this work was executed in May 2007 and the harvesting program was completed in September 2007. NYD has executed a PCA for similar work in FY 08 in the amount of \$394,000 (Federal funds).

**CONNECTICUT RIVER ECOSYSTEM RESTORATION STUDY** – Authority to conduct an ecosystem restoration study along the Connecticut River in New Hampshire and Vermont is provided through a resolution adopted by the Committee on Environment and Public Works of the United States Senate on May 23, 2001. FY2002 appropriations provided the Corps with funds to initiate the investigation, which was done in February 2002. The reconnaissance study was completed in August 2002 with the assistance of the Connecticut River Joint Commissions, the Vermont Department of Environmental Conservation, the New Hampshire Department of Environmental Services, the U.S. Fish and Wildlife Service, and the Natural Resources Conservation Service. The reconnaissance report identified several ecosystem restoration opportunities along the main stem of the Connecticut River. At this time, the Connecticut River Joint Commissions is unable to obtain their share of

the feasibility study funds so further efforts to finalize this study scope and execute a cost sharing agreement have been suspended. In the meantime, The Nature Conservancy (TNC) has expressed an interest in expanding the scope of study to the West (VT) and Ashuelot rivers (NH). Approval to expand the scope of the reconnaissance report was provided and the supplemental reconnaissance information was approved by Corps headquarters in February 2005. A feasibility cost sharing agreement and project study plan were signed by the Corps and TNC in August 2005. However, that agreement was determined to be inconsistent with current policy. Since then the Water Resources Development Act of 2007 authorized the Corps to partner with The Nature Conservancy, retroactive to the 2005 agreement. Funding was provided in the Corps 2008 budget to begin the feasibility study, *which is currently being expanded to include the entire watershed.*

**CONNECTICUT RIVER FLOOD CONTROL DAMS** - The New England District initiated efforts to evaluate various structural modifications to the five Corps of Engineer dams in Vermont to determine the most effective way to provide fish passage and to better regulate flow and water temperature releases to mitigate downstream impacts on aquatic habitat and fisheries. Our initial efforts involved coordinating the scope for the report with the Vermont Agency of Natural Resources (VT ANR) and the U.S. Fish and Wildlife Service (USFWS). We have coordinated an agreed to scope of work with the above cited agencies. The evaluation report to address the agreed to scope of work was completed in March 2007. Comments have been submitted in May 2007 by VTANR & USF&WS on the March 2007 report. Comments were addressed and incorporated into a final Evaluation Report issued in July 2007.

**BURLINGTON HARBOR BOLLARDS REMOVAL** – The New York District has initiated efforts with the city of Burlington, Vermont, to complete a design document,



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execute a project partnering agreement (PPA), and initiate project implementation for removal of eight bollards (gravel filled steel sheet pile cells and timber pile clusters) located in Burlington Harbor, Vermont, that were formerly used in support of operations for loading

and unloading petroleum products. Removal of these bollards will eliminate a potential obstruction to navigation caused by continued deterioration of these obsolete structures.

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## **Flood Damage Reduction Dams, Recreation and Natural Resources Management**

The New England District has constructed, operates and maintains five flood damage reduction dams in Vermont. In addition to flood damage reduction activities, the Corps also manages the natural resources at these projects for multiple uses such as recreation and wildlife management. Information on each is provided below. The Corps of Engineers is responsible for the conservation of natural resources held in public trust at civil works water resources projects. In some areas, management is delegated to the states for specific purposes, e.g., campgrounds, wildlife management and forestry. The Corps also works with state and local officials and the public to ensure that the Corps projects meet their recreation and natural resources needs.

**BALL MOUNTAIN LAKE on the West River in Jamaica** was constructed at a cost of \$11 million in 1961. The 915-foot-long, 265-foot-high dam can impound a 54,600-acre-foot reservoir, which is equivalent to 17.8 billion gallons of water. During the 1987 floods, Ball Mountain Dam utilized 100 percent of its storage capacity and prevented damages of \$18.3 million. Since it was placed in operation in 1961, it has prevented damages of \$126.9 million. The reservoir area offers fine recreational opportunities, including swimming, picnicking, fishing, hunting, canoeing, nature study and camping at Winhall Brook Camping Area in South Londonderry. This popular camping area offers 111 sites for tent or RV campers; some sites have hookups and others have lean-to shelters for rent. Ball Mountain welcomes over 130,000 visitors each year.

**NORTH HARTLAND LAKE on the Ottauquechee River in Hartland** was completed in 1961 at a cost of \$7.3 million. The 1,640-foot-long, 185-foot-high earthen structure can impound a 1,100-acre lake capable of storing 23.2 billion gallons of water, and the facility has prevented damages to date of \$103 million. More than 377,000 visitors annually enjoy picnicking, swimming, fishing, hunting, hiking, and snowmobiling available at the 1,467-acre North Hartland reservation. The New England District and the state of Vermont are partners in the management of the reservoir. Vermont manages Quechee Gorge State Park in the upper third of the reservoir and provides a campground, picnic facilities and trails for the visiting public. The New England District operates a large day-use area on the shore of North Hartland Lake with a developed beach area, picnic

facilities and trails.

A dedication ceremony for the Quechee Gorge Visitor Center was held June 23, 2005. The project is the result of many years of work by the town of Hartford and other organizations. This group has been instrumental in developing the Quechee Gorge Master Plan and securing \$1.25 million for implementation from the Public Lands Highway discretionary program. The Quechee Gorge Visitor Center was built on Corps property by the town of Hartford, donated to the Corps and operated by the Quechee Chamber of Commerce under a cooperative agreement with the Corps.

The Visitor Center was designed to provide the public with information about the local area, including the natural and cultural history of the gorge. Additionally, the public is able to gather information on other attractions in the state. The Corps maintains an interpretive display in the center, and has volunteers help staff the center and offers a computer system that allows the public to access the Corps webpage.

**NORTH SPRINGFIELD LAKE on the Black River in North Springfield** was completed in 1960 at a cost of \$6.8 million. The 2,940-foot-long, 120-foot-high earthen dam can impound a 1,200-acre lake, capable of storing 16.5 billion gallons of water. Nearly \$103.7 million in flood damages have been prevented by North Springfield Dam. Picnicking, swimming, hiking, hunting, fishing and snowmobiling are enjoyed at the 1,372 acres of land and water by more than 30,000 visitors each year.

**TOWNSHEND LAKE on the West River in Townshend** is 1,700 feet long, 133 feet high and cost \$7.4 million to construct. Its lake can hold a 33,700-acre-foot reservoir with a capacity to store 10.8 billion gallons of water. During the 1987 floods, the dam utilized 100 percent of its storage capacity and prevented damages of \$14.2 million. Since it was placed in operation in 1961, it has prevented damages of \$106.8 million. The reservoir area offers fine recreational opportunities, including swimming, picnicking, fishing, hunting, canoeing, boating and nature study and annually attracts nearly 81,000 visitors. Townshend Lake, in conjunction with Ball Mountain Lake, provides scheduled white water releases in the spring and fall. Over 800 canoeists, kayakers and rafters take advantage of each event.

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**UNION VILLAGE DAM, a dry-bed reservoir project on the Ompompanoosuc River in Thetford,** is a 1,100-foot-long, 170-foot-high earthen structure capable of storing 12.3 billion gallons of water in a 740-acre lake. Construction on the \$4 million dam was completed in 1950, and since that time the facility has prevented damages of more than \$37.6 million.

More than 41,000 visitors annually enjoy the picnicking, swimming, hiking, fishing, hunting and snowmobiling available on Union Village's 991 acres of land and water.

In addition, the Corps' New York District designed three dams in the Lake Champlain drainage area during the mid-1930s. These include **EAST BARRE DAM** on the Jail Branch of the Winooski River in Barre, **WATERBURY DAM** on the Little River in Waterbury, and **WRIGHTSVILLE DAM** on the North Branch of the Winooski River in Montpelier. These dams were constructed by the Civilian Conservation Corps under the direction of the New York District, and all are operated and maintained by the state of Vermont.

