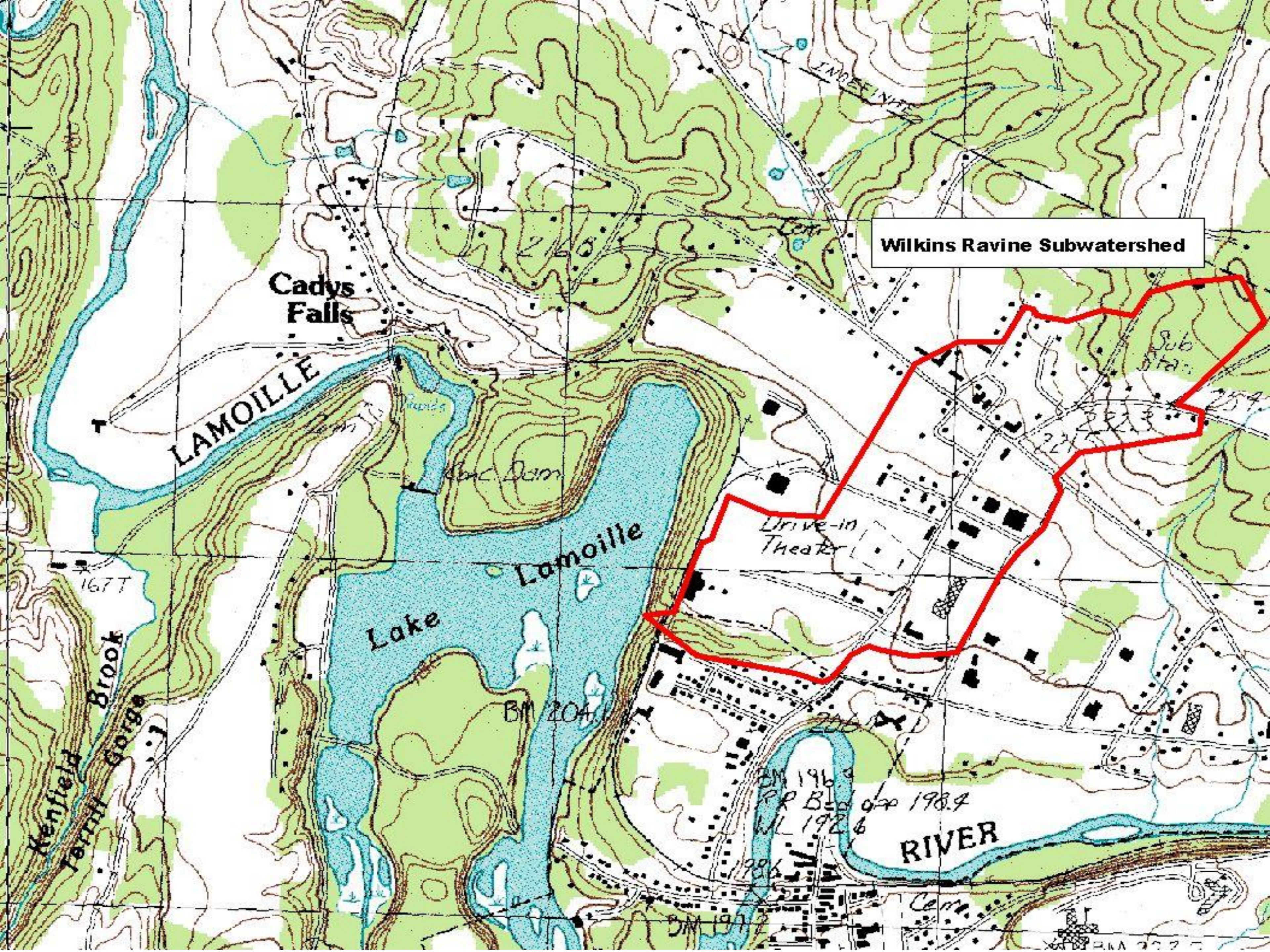
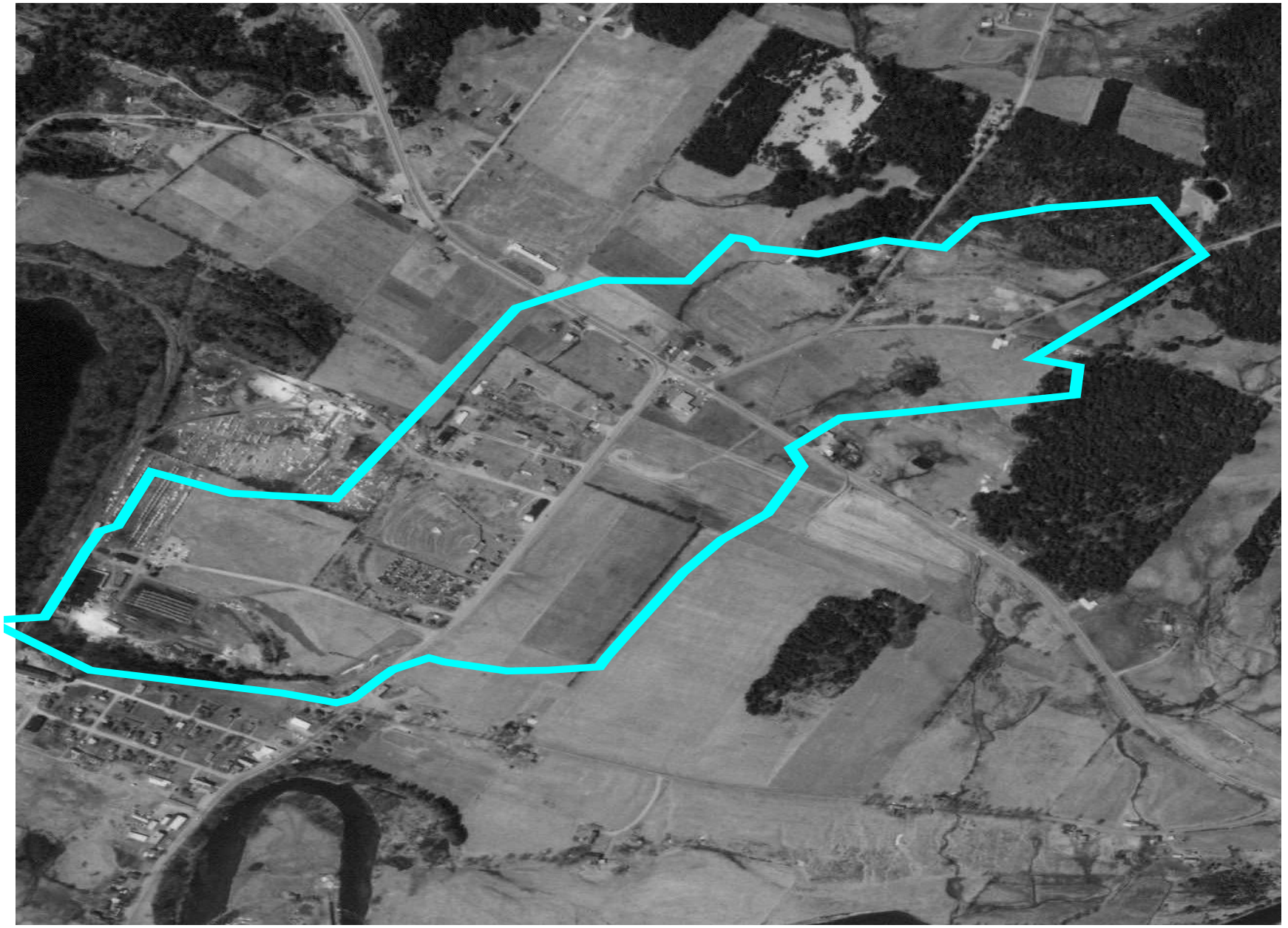
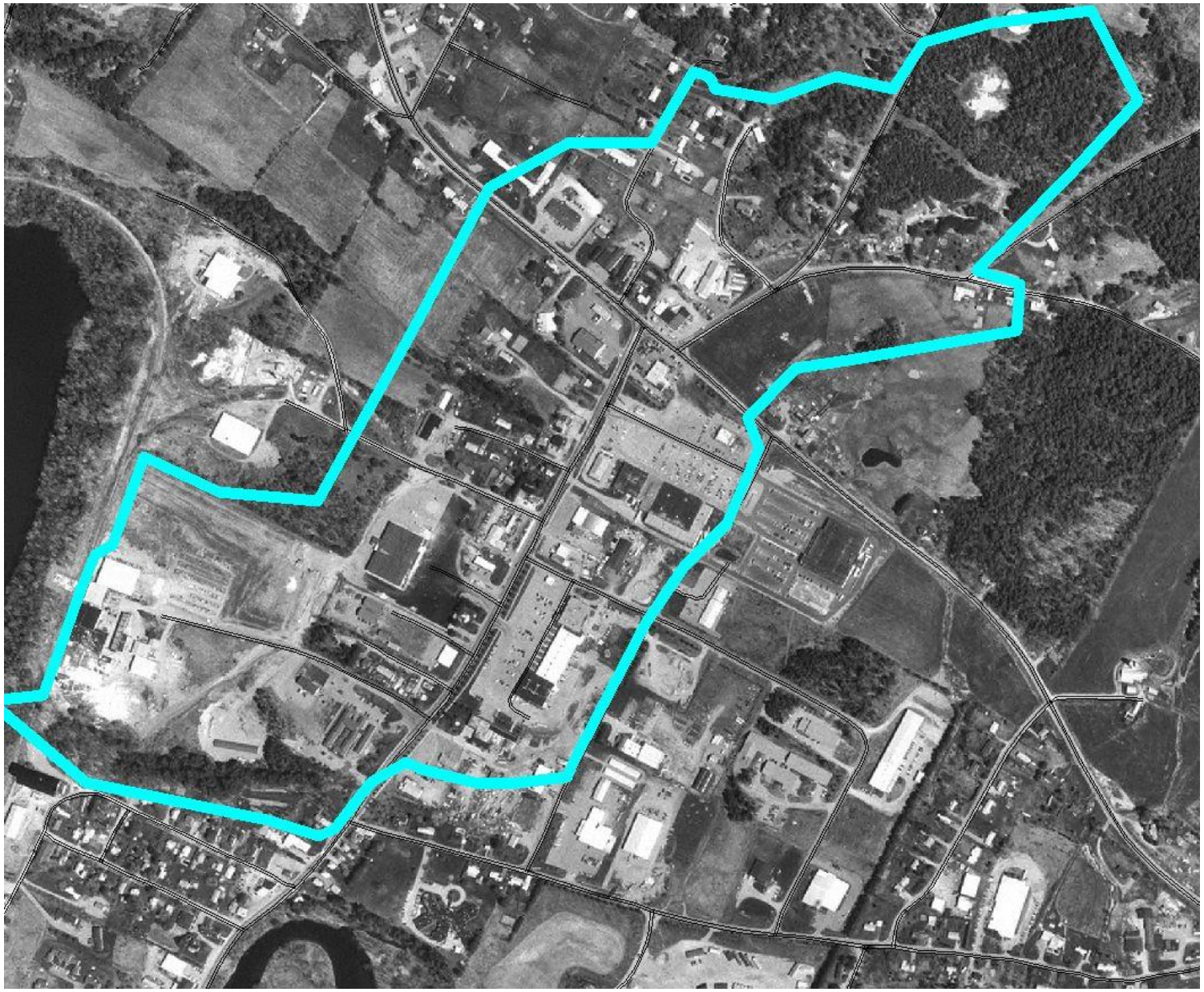


Wilkins Ravine Subwatershed
Cadys Falls
LAMOILLE
Lake
Lamoille
Drive-in Theater
RIVER
Kenfield Brook
Terrill Gorge
BM 204.1

WILKINS RAVINE WATERSHED-MORRISTOWN (1962)



WILKINS RAVINE WATERSHED-MORRISTOWN (2005)



Chronology

January 1988 -Local landowner complains about erosion and property damage. Planning Commission recognizes threat to LVRR culvert. No comprehensive action taken but PC does review future projects on a case by case basis.

July 1998 -VTrans upgrades Rte.100 culvert due to runoff surcharging. Increasing erosion after upgrade; private sewer line undermined below culvert.

March 2000 -Act 250 permit amendment-LUP #5L0934-6, board requests reduction in building footprint, decision based on VT F&W Dept. concerns: "potential increase in runoff from the project increasing erosion and siltation in the ravine and into the lake." Threat to the rainbow and brown trout fishery population and habitat below Cadys Falls-Lamoille River.

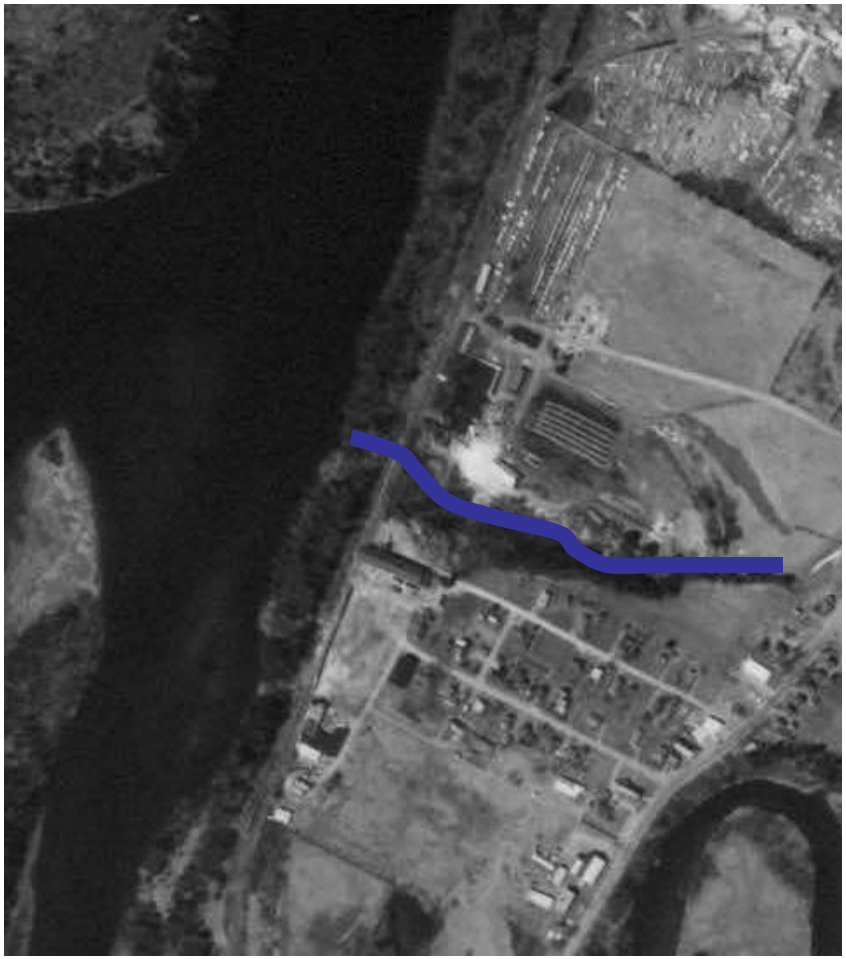
June 2002 -heavy rains-runoff cause major failure of LVRR culvert-embankment resulting in erosion into lake; total monthly rainfall 8.04".

July 2004 -303(d) listing-Part C. Waters in Need of Further Assessment-Lake Lamoille-sediment, nutrients, E.coli

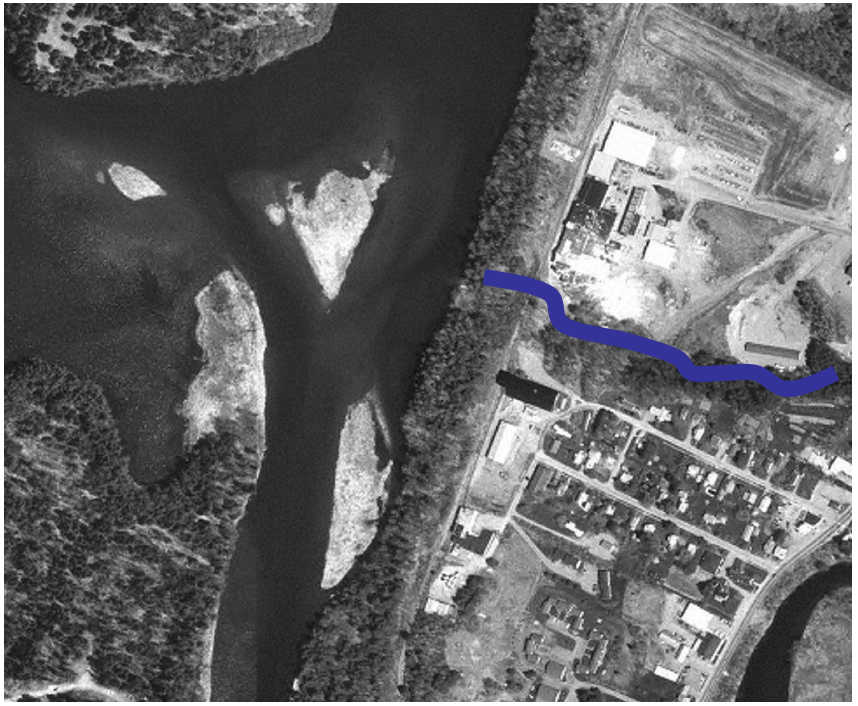
Town Concerns About North-end Commercial District

- Act 250 decision could influence future development patterns in town regional growth center.
- Proposed and long awaited Alternate Truck Route-Route 100 Bypass could be delayed.
- 2001 Storm drainage and wastewater expansion feasibility study (DHCA funded): “There is inadequate existing drainage infrastructure along Route 15 and Route 100.” Development options might be limited.
- 2003 Town Plan: “Wastewater and other infrastructure issues continue to hamper economic development in the entire north end. Additionally, stormwater runoff has appeared more recently as a barrier as well.”

1962-Lake Lamoille



1998-Lake Lamoille



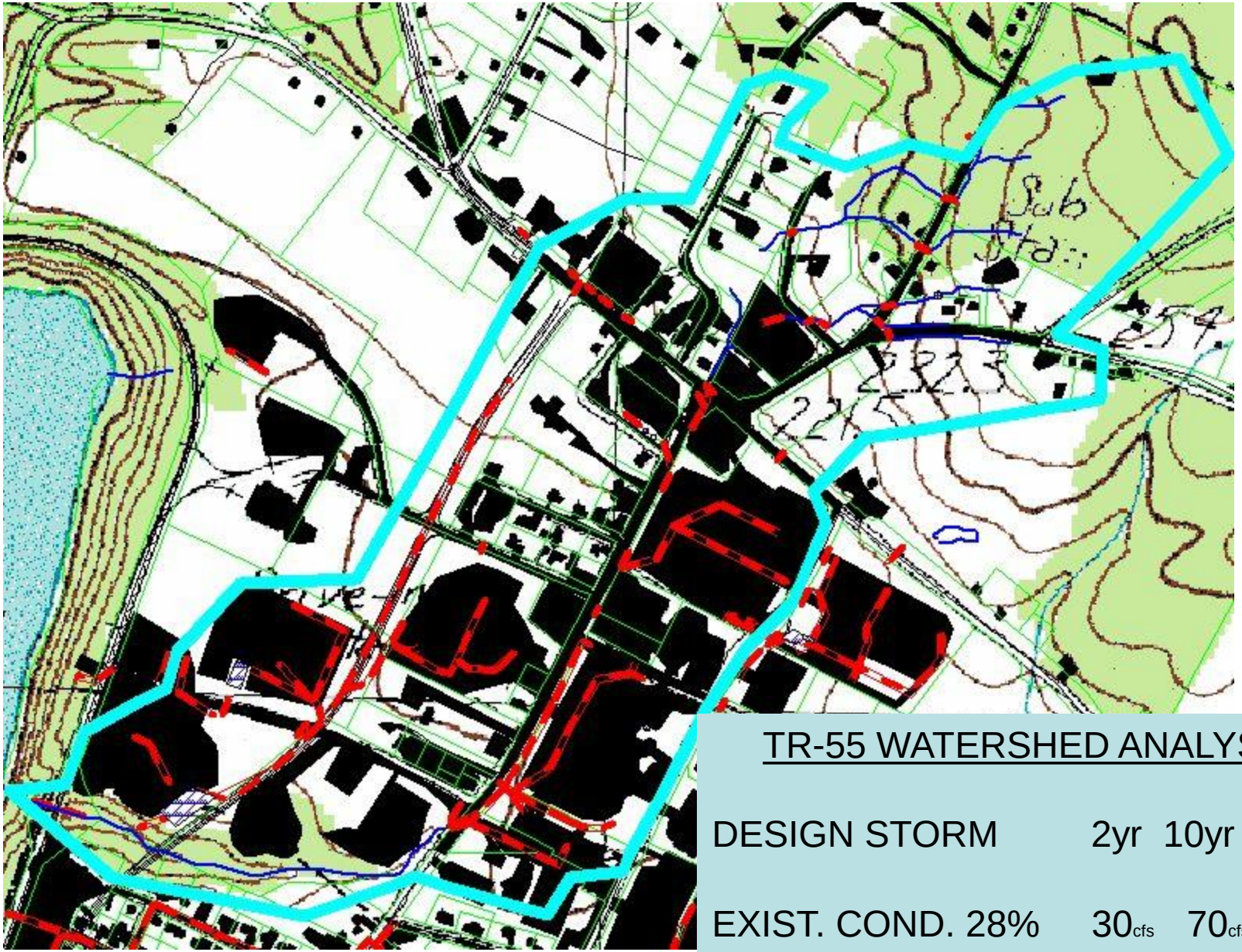
Wilkins Ravine outfall to Lake Lamoille-2003

Lower Wilkins Ravine-2002

Mid-Wilkins Ravine
2002

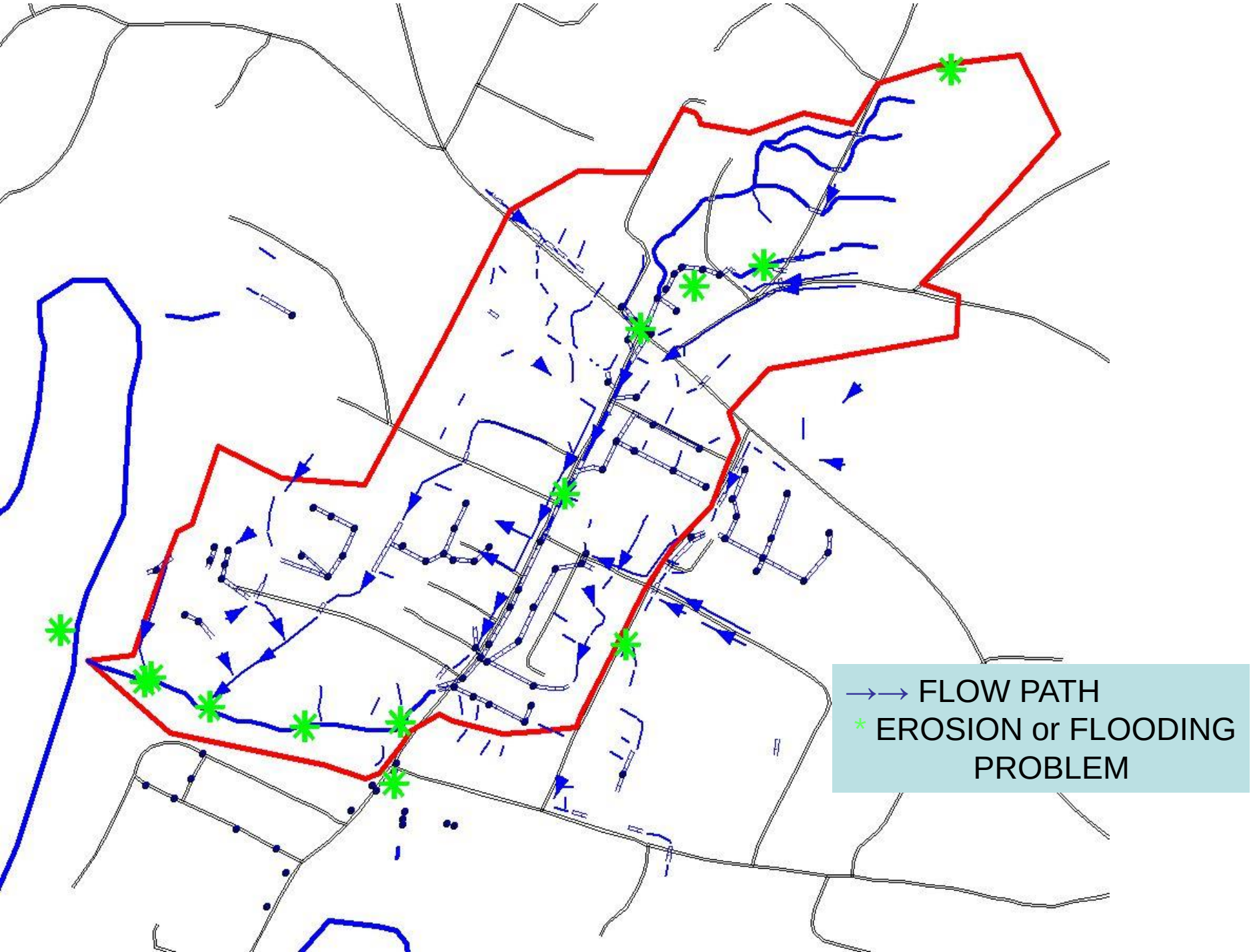
- **The Wilkins Ravine plan involves a three-prong approach with 12 specific tasks. The plan proposes to:**
- *Stabilize and clean up the Wilkins Ravine area.*
- *Install stormwater quality treatment controls and, where possible, quantity treatment controls in the developed area drainage network upstream of the Ravine.*
- *Reduce the overall volume of stormwater discharging to the Ravine by retaining water on-site and infiltrating to groundwater as much clean runoff as possible. Existing soils are all NRCS A.*

WILKINS RAVINE WATERSHED-MORRISTOWN (FUTURE)



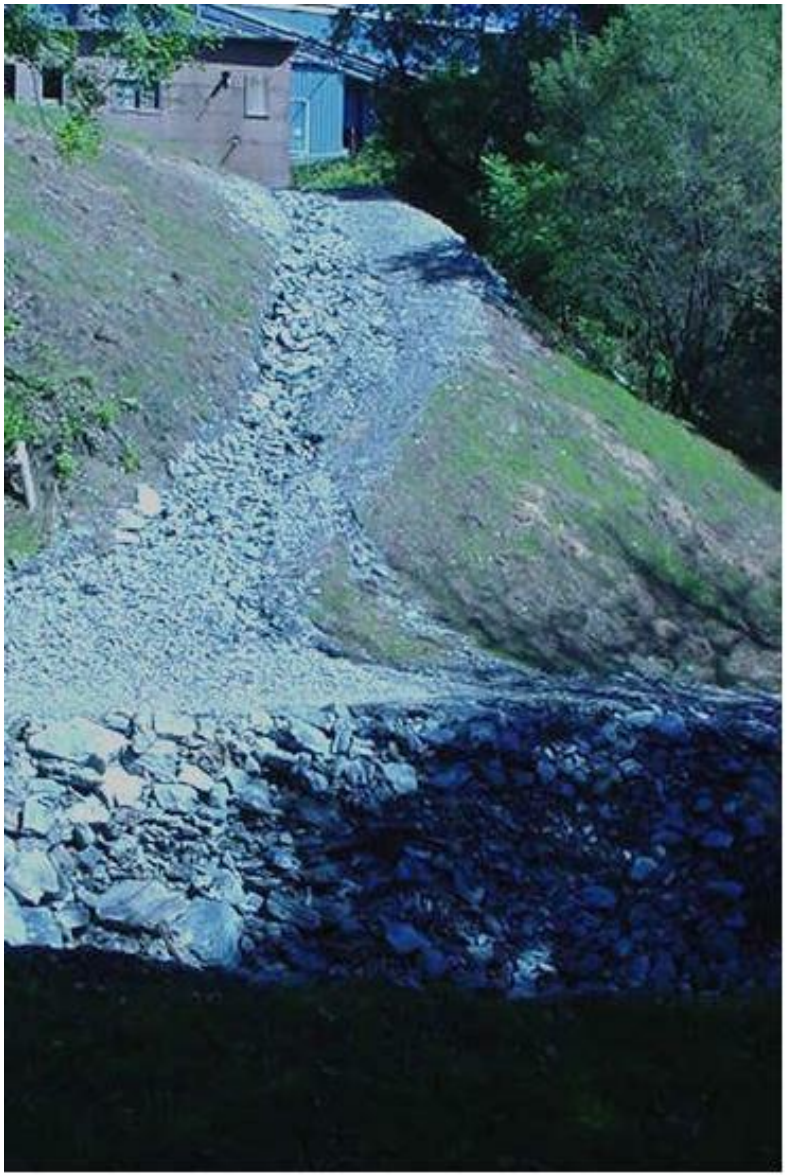
TR-55 WATERSHED ANALYSIS

DESIGN STORM	2yr	10yr	100yr
EXIST. COND. 28%	30cfs	70cfs	125cfs
FUTURE COND. 48%	66cfs	126cfs	212cfs


→→ FLOW PATH
* EROSION or FLOODING PROBLEM

Lower Wilkins Ravine-2003

Lower Wilkins Ravine-2004



Lower Wilkins Ravine-2003

Hannaford's Swale-2003

Hannaford's Swale-2004

Middle Wilkins Ravine

Upper Wilkins Ravine

Houle-Demars Property

Dry Detention Basin

Town-Country Home Center

Infiltration Basin

Upper Wilkins Ravine Watershed

VYCC-DeBenedetto

Check Dam

Town- Country Home Center

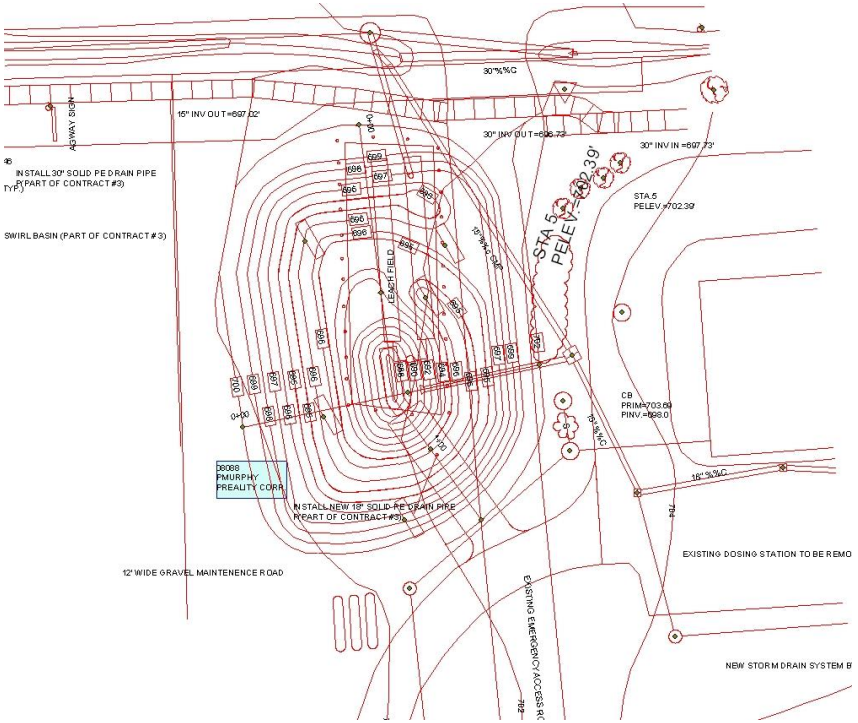
Swirl Separator

Upper Wilkins Ravine Watershed

Route 100

Infiltration Gallery

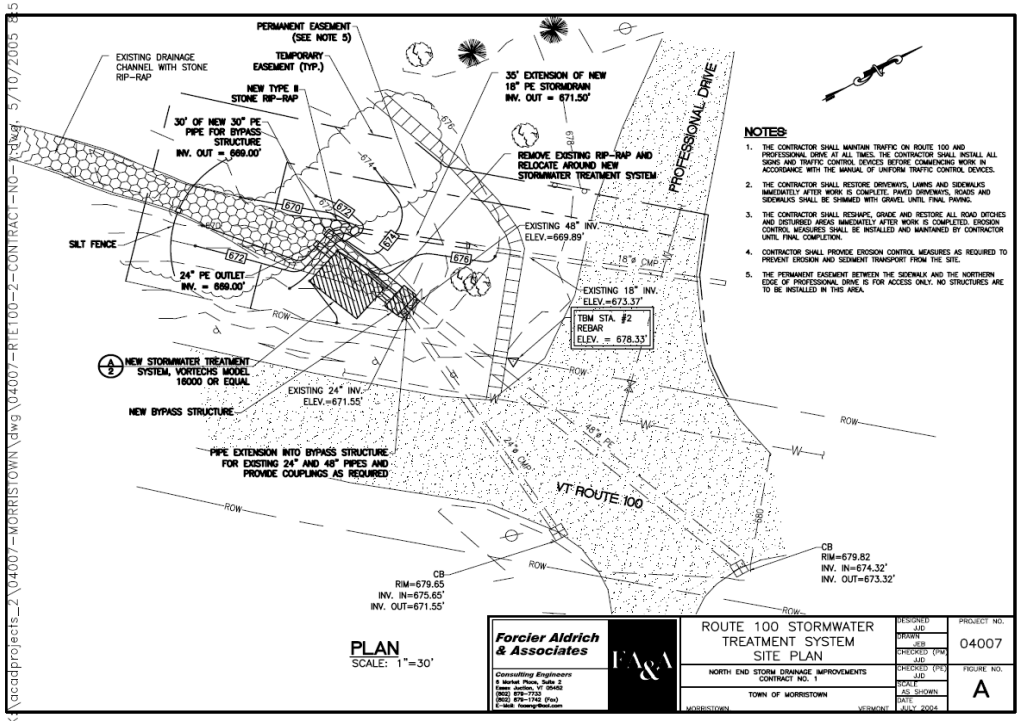
Town-Morrisville Plaza



Swirl Basin
2006

Middle Wilkins Ravine Watershed

Town-Demars Property



Swirl Separator and Bypass

Middle Wilkins Ravine Watershed

State Permits and Local Zoning Actions

(1) Renew all expired state stormwater permits (3) √

(2) New development/redevelopment subject to 2002 stormwater design standards including Alternate Truck Route (2) √

(3) Adopt Section 638 in Zoning Regulations

"Conditional uses that create new impervious cover.. that are not subject to a state stormwater permit (<1 acre impervious) will be subject to the following requirements: ..treatment by infiltration of stormwater runoff from all new rooftop impervious surfaces to suitable soils shall be maximized for all land uses… ..treatment practices used should be sized to handle at a minimum the first .4" of runoff from the rooftop impervious surface(s)" √

The Transcript

"COVERING NORTH CENTRAL VERMONT"

LOCAL POSTAL PATRON
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VOLUME 32 • NUMBER 8 | Morrisville, Vermont | APRIL 4, 2005

Cleaning Stormwater in Morristown

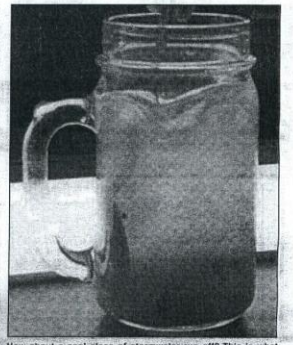
by James Pease

Since the establishment of the federal Clean Water Act in 1972, Vermont and the rest of the country have been working to clean up our nation's waterways. Wastewater treatment plants have been built and upgraded in over 100 communities across the state. These plants remove biosolids, trash, phosphorus and bacteria before discharging safe water to our rivers, streams and lakes. Urban areas like Burlington and Barre-Montpelier have also separated their combined wastewater-stormwater pipes. In almost every community, stormwater is left untreated and allowed to flow directly to our waterways.

Why is stormwater a problem? Today, stormwater runoff coming from communities, farms and forest operations is the major cause of the nation's polluted waterways. In 2004, about 350 miles of rivers and streams in Vermont were considered impaired by stormwater runoff from land runoff. From Vermont to Florida the cause is the same – rainwater washing off the land's surface carries silt, sand and often other pollutants into our waterways. This sediment smothers aquatic life, destroys fish habitat and makes water unsafe for drinking.

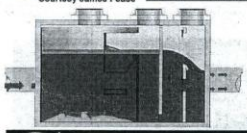
Imagine taking a handful of sand pouring it into a glass of water and stirring it vigorously. The result is a swirling action forcing the sand to make a cone in the center of the glass. This "vortex" action of swirling water, believe it or not, is a method of advanced water pollution control technology! It is also a technology soon to be demonstrated in Morristown!

A cooperative effort between local landowners, the Town of Morristown, VTrans and the VT Department of Environmental Conservation (VTDec) will result in the installation of three "vortex" swirl separator stormwater control practices in the commercial north end district of Morristown. The first separator will be installed in April at the Country Home Center. A second and larger separator will be installed within the year on the Demars Properties site at the corner of Professional Drive and Brooklyn Street. Both sites have space constraints and require that the swirl separators be placed underground. The third separator, which will be built when the Ames Plaza is redeveloped, will be above ground and located behind the TD Banknorth building. Instead of using the patented and more expensive underground design, this third separator will resemble a small rock-lined landscaped pond. This design was developed by Bernard Amell, of EarthTech and the University of Alberta. It uses the same "vortex" principle as the other separators, but costs 50% less to build and maintain. It will be the first time a stormwater "swirl basin" will be built in Vermont, although the design has been built and tested on Canadian highways.



How about a cool glass of stormwater run off? This is what immediately heads downhill to the nearest stream or river, from our parking lots, roofs, driveways and fields.
Photo courtesy James Pease

At right, this photo of two culverts in the north end of Morristown shows how stormwater run off has increased and drainage has been modified to remove the water. Noyes photo



Below is a diagram of the type of swirl separator being used for stormwater sediment removal in Morristown.
Courtesy James Pease

In Morrisville's north end commercial district, the VTDec has estimated about 20 tons of sediment washes off into the Lamoille River annually. The three swirl separators will be able to remove about 2/3 of this sediment, or 15 tons. Along with the sediment, the total volume of rain draining from paved surfaces can be enormous. When this water drains into small streams it can cause incredible soil erosion.

For example, in the Wilkins Ravine near Professional Drive in Morrisville, before repairs were made, the USDA Natural Resources Conservation Service estimated that 90 tons of sediment per year were being discharged into Lake Lamoille and the Lamoille River. This is the equivalent of four large (14 cubic yard) dump trucks per year!

What can you do to prevent stormwater erosion and pollution? First, if you live in an urban area, find out where stormwater goes during a rain storm or snow melt. Many communities and industries have or will be developing stormwater pollution prevention plans. In both urban and rural areas every resident or landowner should make the effort to keep hazardous materials, sand or salt containers, and other lawn or garden chemicals out of the path of rainfall or snow melt. Exposed soil should be seeded and mulched. If your roof or driveway drains to a village street or roadside swale, see if you can divert water into vegetated areas or flower beds but keep it away from foundations. If your soil is sandy, a simple and easy-to-build rain garden can be built.

A demonstration rain garden constructed by the Lamoille Natural Resources Conservation District can be seen in front of the Demars Properties building on Brooklyn Street.

What you do on your property may seem very small or insignificant, but multiply your effort by 1,700 (the number of residences in Morristown alone) or by the millions of residences in the United States and there's nothing small about it. All together we can have a huge impact on preventing water pollution. Remember clean and safe water for swimming, fishing, boating and drinking is important to everyone.

This sign marks the rain garden already in place at the Demars Building on Brooklyn St.

n Stormwater Update

roject includes the in-
n of a swirl separator at
ner of Brooklyn Street
ofessional Drive. The
r is designed to filter oil
ris from stormwater
efore it enters Wilkins
nd the Lamoille River.
rant requires a 20% lo-
tary match. Pease said
e match will come from
tion from the H.A.
Corporation. Additional
ve been set aside by the
the project. A fine levied on Morrisville Water & Light by the state has also been earmarked for the project.

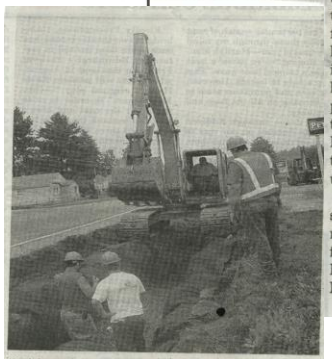
Demars Properties is donating to the town a perpetual easement for the swirl separator to be placed on .15 acres of its land, as well as maintenance access to the unit. The Vermont Youth Conservation Corps, this summer, cleared the site where the swirl separator will be installed.

Pease explained the unit includes a trash baffle and an oil baffle, both of which will have to be maintained to remain effective. Pease said the town will have to hire a contractor to come in and pump out the unit at least once a year. In a previous project, a smaller swirl separator was installed by Country Home Center. Pease estimated the annual maintenance of both units will cost about $1,500.

Pease explained the stormwater project has been a multi-year endeavour. He said former Zoning Administrator Ken Sweetser was the first Morristown official to start looking into grants to address stormwater runoff issues in Morristown's north end shopping district. Now, Pease said, the town is up to a half-million dollars in stormwater projects to address the problem. Pease added he has been impressed with the cooperation from town.

The installation of the swirl separator by Professional Drive is the tenth of 12 tasks Pease identified. Engineering firm, Forcier Aldrich & Associates, has prepared plans for the project and all the necessary permits have been secured. Construction costs are estimated to be $105,000. The project will be going out to bid shortly. Once construction starts, Pease said it should take two to three days to install the unit.

The final two remaining projects include a stormwater pond behind TD Banknorth and a project near Precision Woodworking that is scheduled to be part of the Alternative Truck Route construction.



Work is currently being done to implement the Wilkins Ravine-North End Commercial District stormwater cleanup plan. These projects have been funded by grants from the state Agency of Natural Resources under Section 319 or Section 104b of the Federal Clean Water Act. The federal funds were matched with local funds or resources from the Country Home Center, Pete's Repair and the Town of Morristown. Here the Morristown Highway and Street Department install the stormwater infiltration gallery in front of Menard's Agway and Pete's Repair. Dave Hoisington is operating equipment loaned by Pete's Repair. Jim Pease photo

Project Budget

VTDec – 2003-04 CWA Grants----------	$65,104	(37%)
VTrans – 2005 Enhancement Grant--------	$74,709	
VTrans – District 6 Maintenance funds---	$126,000	(34%)
Morristown –Local funds and in-kind-----	$106,327	(29%)
Total	$372,140	

Additional Project Partners

Forcier Aldrich & Associates, USDA-NRCS, Lamoille SWD, Morrisville Water and Light, Hannaford Brothers, Country Home Center/Goss Tire, Menard's Agway, Pete's Repair, Demars Properties, Murphy Realty, TD BankNorth, Manosh Corporation, Lamoille NRCD and Nature Center, Philip and Phyllis Houle, Anthony and Joan DeBenedetto, Johnson State College Upward Bound

- PROS
  - Partnership with VTrans
  - Community support and effort
  - Select board and town staff commitment
  - Media interest and support
  - Projects solved landowner problems (flooding, safety) and mitigated runoff

- CONS
  - Delays in commercial redevelopment plans
  - 3 yrs and 2 tries on Enhancement Program grant
  - Planning Commission lack of knowledge on technical issues
  - Coordination of multiple grants and funding sources
  - In stream construction