

Town of

Wilmington

(802) 464-8591 (Voice)

(802) 464-8477 (FAX)

www.wilmingtonvermont.us

Received

APR 14 2016

April 12, 2016

VTrans
PDD-LTF

Alan May
Agency of Transportation, Environmental Section
1 National Life Drive
Montpelier, VT 05633

Re: FY 2017 Vermont Better Roads Grant Applications

Dear Mr. May:

Enclosed are the Town of Wilmington's applications for a grant through the referenced program for replacing a culvert on Sturgis Rd and stabilizing the stream bank on Look Rd.

Thank you for your help. I look forward to hearing from you.

Please call if you have any questions.

Sincerely,



Jessica DeFrancesco
Administrative Assistant

Enclosure: FY 17 Vermont Better Roads Grant Applications, Category C & D



Vermont Better Roads Grant Program Application

Please complete one application per category and/or project you are applying for. You may make copies of the application for multiple applications per category and/or multiple categories.

Please check the Category you are applying for:

- B. Correction of a Road Related Erosion Problem and/or Stormwater Mitigation Retrofit for both gravel and paved roads
- C. Correction of a Stream Bank or Slope Related Problem
- D. Structure/culvert upgrades

Town/Organization: Town of Wilmington

Project Name: Sturgis Rd- Culvert #1

Road Name: Sturgis Rd TH #: 78 Structure # (if applicable): 1

Road Type: Unpaved Uncurbed

Class 3

Watershed: _____

Please provide a thorough description of the problem (ex. Roadway has steep slope with no ditch which is causing roadway erosion):

Culvert is in very poor shape and is undersized. There are two ditches that should be stone lined to prevent sediment from going directly into the stream.

Description of Project and how you plan to complete the work (ex. Stone line 500' of ditch by reshaping ditch and stone lining, working from the top of the project down to the bottom):

Replace existng 48" culvert with an 81" x 59" x 42' steel poly coated pipe arch. Stone two ditches from the top down to the new structure to prevent silt from dumping into the stream.

Expected Effects (+ & -) on water quality (ex. Erosion will be eliminated by placing the stone ditch):

Water quality and aquatic passage should be improved dramatically.



Distance from end of project to nearest water (stream, lake, or stormwater system that outlets directly to water). 0-50'

Progress to Date:

Is there an emergency reason this project must be completed quickly? If yes, please explain:

Structure is in very poor condition.

Has this project been identified through a municipal road inventory, capital budget plan, tactical basin plan, culvert inventory, or other management plan? If yes, please list which.

Yes: Class A Better Roads Capital Budget Plan No

Please list any professionals you may have contacted for assistance with this project (ANR River

Management Engineer, Army Corps of Engineers, VTrans District Technical staff, Basin Planner etc.):

In 2014, Windham Regional Commission conducted a Class A study through the Better Roads Program and rated this site Critical High.

Todd Manees, VT River Management Engineer, has also visited this site.

Is the project located in the town "Right of Way?" Yes, No, Both (if "Both" please explain further).

Yes

Will the town road crew complete this work? Yes, No, Some (if "some" please explain further).

Yes



Describe how the grant funds will be spent and/or attach a project budget:

Cost Estimate Form is attached.

How do you plan to meet the required 20% match on this grant?:

In-kind match

Requested Grant Amount (\$20,000 max Category B, \$40,000 max Categories C & D): \$ 14,536.40

Estimated Total Project Cost (including 20% local match): \$ 18,170.50

Estimated Completion Date: 10/15/2016

REQUIRED ATTACHMENTS:

- Itemized Cost Estimate (labor, equipment, materials)
(For assistance, call Better Backroads at 802-828-4585)
- Project Location Map
(Please show location of affected water; 1:12,000 USGS map, if possible)
- Sketch of proposed erosion control measures, including:
 - Distances (ft.)
 - Estimate of waste & borrow quantities
 - Approx. location of town/other right-of-way and/or property lines
- Photo(s) of the project area.
- Agreement for Entry and/or Deed of Easement (if project is outside Town ROW).
- If project involves stream or river/road conflict, include documentation of consultation with a River Management Engineer.
- Other appropriate supporting documents.

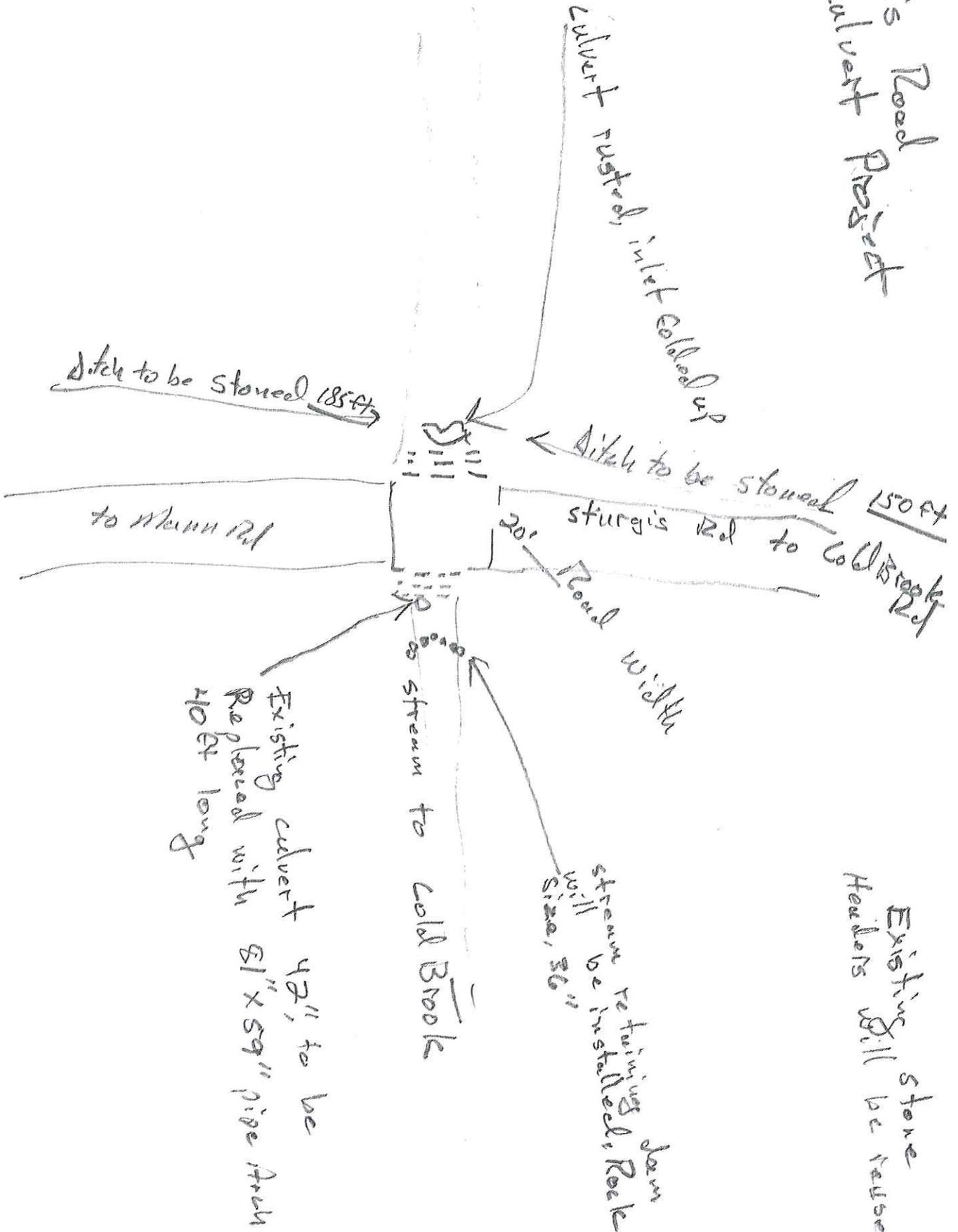
By signing this application I certify that all the information provided is accurate to the best of my knowledge. We will comply with all the requirements of the grant including making our books available for audit if required.

SIGNATURE OF APPLICANT: (Must be Town Administrator/Manager or Select Board Chair)

Name: *[Handwritten Signature]*

Title: *Town manager*

Sturgis Road Culvert Project



Existing Stone Headers will be reused

dam stream retaining dam will be installed, Rock Size, 36"

Existing culvert 42", to be Replaced with 81" x 59" pipe Arch 40ft long

stream to Cold Brook

Ditch to be Stowed 150ft
sturgis Rd to Cold Brook Rd

Ditch to be Stowed 185ft

Culvert rusted, inlet Colloped up

to Mann Rd

20' Road width

**VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION
HYDRAULICS UNIT**

TO: Matt Mann, Senior Transportation Planner, Windham Regional Commission
Chris Taft, District 1, Project Manager

FROM: Justin Hadley, Hydraulics Project Engineer

DATE: February 2, 2015

SUBJECT: Wilmington, TH 78 Sturgis Rd, 950' from TH 1 Cold Brook Rd
GPS coordinates: N 42.91113° W 72.87944°

We have completed our hydraulic study for the above referenced site, and offer the following information for your use:

Hydrology

This site has a hilly to mountainous drainage basin that is mostly forested with about 20% a golf course. The total contributing drainage area is about 0.27 sq. mi. There is an overall length of 4,500 feet from the divide to the site, with a 305-foot drop in elevation, giving an average overall channel slope of a little less than 7%. The stream slope at the site was estimated to be about 2%. Using several hydrologic methods, we selected the following design flow rates:

<u>Recurrence Interval in Years</u>	<u>Flow Rate in Cubic Feet per Second (CFS)</u>
Q2.33	30
Q10	60
Q25	80 - Town Highway Design Flow
Q50	95
Q100	110 - Check flow

Channel Morphology

The channel upstream is flat gradient and fairly straight with a tributary coming in just above the inlet. The channel downstream is of a similar gradient as upstream with a sinuous plan form. There is little coarse sediment transport at the site due the shallow grade above the inlet and the small culvert. Field measurements of bankfull width varied from 4 to 8 feet upstream and 6 to 8 downstream; the departure likely due to confluence of the tributary at the inlet. The Vermont Hydraulic Geometry Relationships anticipate a bankfull width of 7 ft. for stream channels in equilibrium at this watershed size. The hydraulic relationship may not be valid at this site due to the small drainage area. No indications of active vertical or horizontal instability were observed. A scour hole exists at the existing structure outlet indicating that the structure causes a hydraulic constriction.

Existing Conditions

The existing structure is a 42" corrugated metal pipe that provides a waterway opening of about 9.6 sq. ft. The structure has a mortared stone headwall at the inlet and a dry laid stone headwall at the outlet. Just downstream of this structure is a 60" CMP under TH 1 Cold Brook Rd.

Our calculations, field observations and measurements indicate the existing structure does not meet

the current standards of the VTrans Hydraulic Manual nor does the existing structure meet state stream equilibrium standards for bankfull width (span length). The existing structure constricts the channel width, resulting in scour at the outlet and increased potential for debris blockage. Headwater to depth ratios exceed allowable values established in the current VTrans Hydraulics Manual.

Recommendations

In sizing a new structure we attempt to select structures that meet both the current VTrans hydraulic standards, state environmental standards with regard to span length and opening height, and allow for roadway grade and other site constraints.

Based on the above considerations and the information available, we recommend any of the following structures as a replacement at this site:

1. A concrete box with a 6' wide by 6' high inside opening, with 6" high bed retention sills (baffles) in the bottom. The box invert should be buried 24", so the top of the sills will be buried 18" and not be visible. That will result in a 6' wide by 4' high waterway opening above streambed, providing 24-sq. ft. of waterway area. Sills should be spaced no more than 8'-0" apart throughout the structure with one sill placed at the inlet and one at the outlet. Sills can be cast flat. This structure will result in a headwater depth at Q25 = 3.0' and at Q100 = 3.7', with no roadway overtopping up to Q100.
2. A 6' diameter CMPP with the invert buried 2' similar to the box above could also be considered, and would perform similar to an open bottom arch. This structure will provide around 20 sq. ft. of waterway area and result in a headwater depth at Q25 = 4.0' and at Q100 = 4.9'.
3. Any similar structure with a minimum clear span of 6' and at least 20 -sq. ft. of waterway area, that fits the site conditions, could be considered. Any closed bottom structure should have bed retention sills and a buried invert as described above.

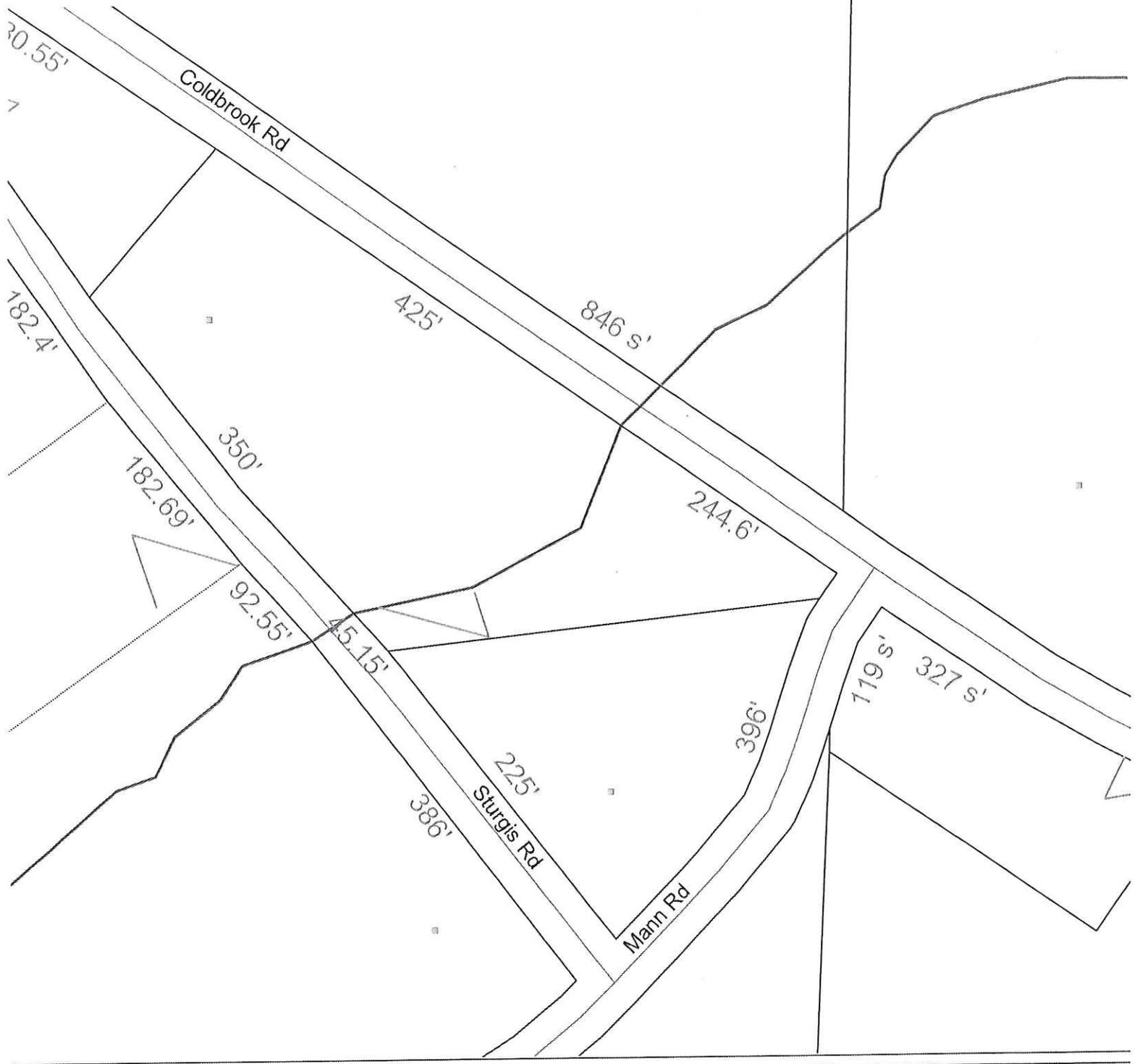
Prior to any further action toward implementation of any of the above recommendations, structure size and type must be confirmed, and may be modified, by the VT ANR River Management Engineer to ensure compliance with state environmental standards for stream crossing structures.

General comments

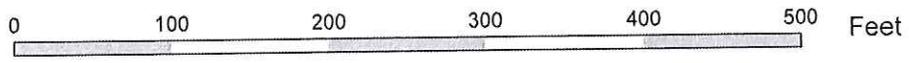
If a new box is installed, we recommend it have full headwalls at the inlet and outlet. The headwalls should extend at least four feet below the channel bottom, or to ledge, to act as cutoff walls and prevent undermining.

If the round pipe option is installed, concrete headwalls should be constructed at the inlet and outlet. The headwalls may be either half height or full height. The headwalls should extend at least four feet below the channel bottom or to ledge, to prevent undermining of the structure. We recommend a minimum cover of 3' over all pipe structures. Obtaining the minimum cover of 3' should be no problem at this site. Pipe manufacturers can provide specific recommendations for minimum and maximum fill heights and required pipe thickness.

It is always desirable for a new structure of this size to have flared wingwalls at the inlet and outlet, to smoothly transition flow through the structure, and to protect the structure and roadway approaches from erosion. The wingwalls should match into the channel banks. Any new structure should be properly aligned with the channel, and constructed on a grade that matches the channel. A



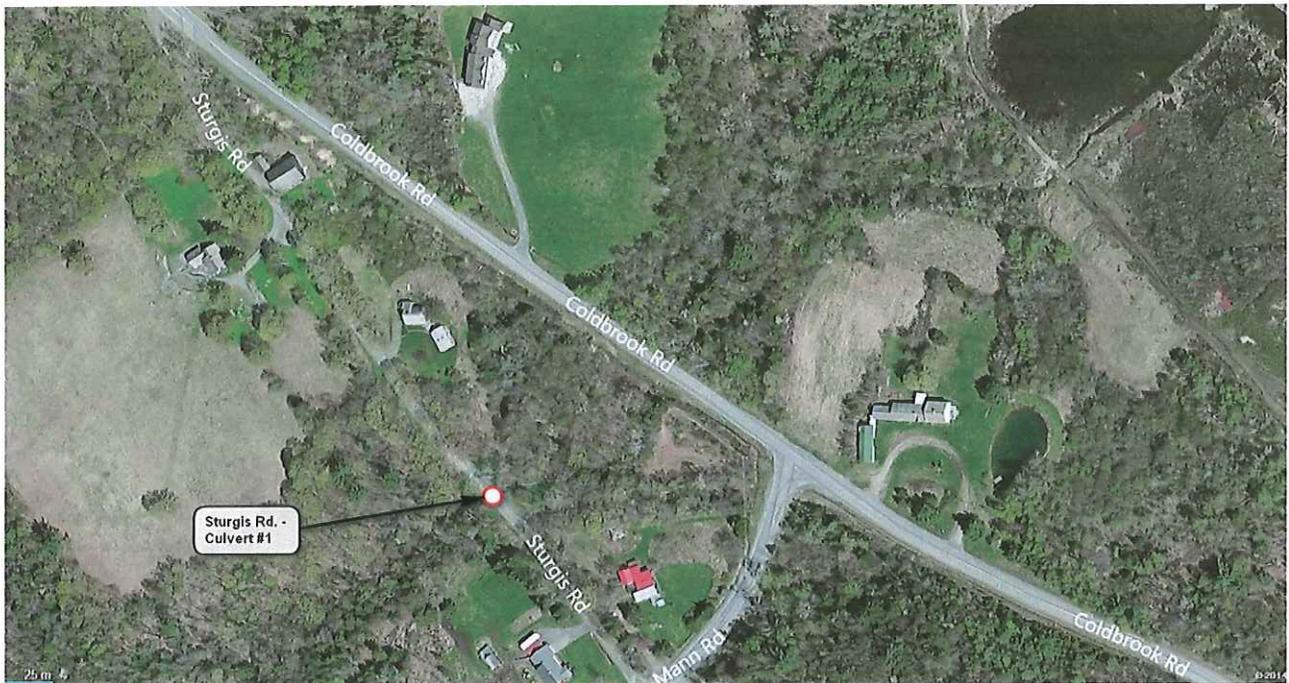
Scale: 1:1,450
1" = 121 feet



Printed on: May 1, 2015

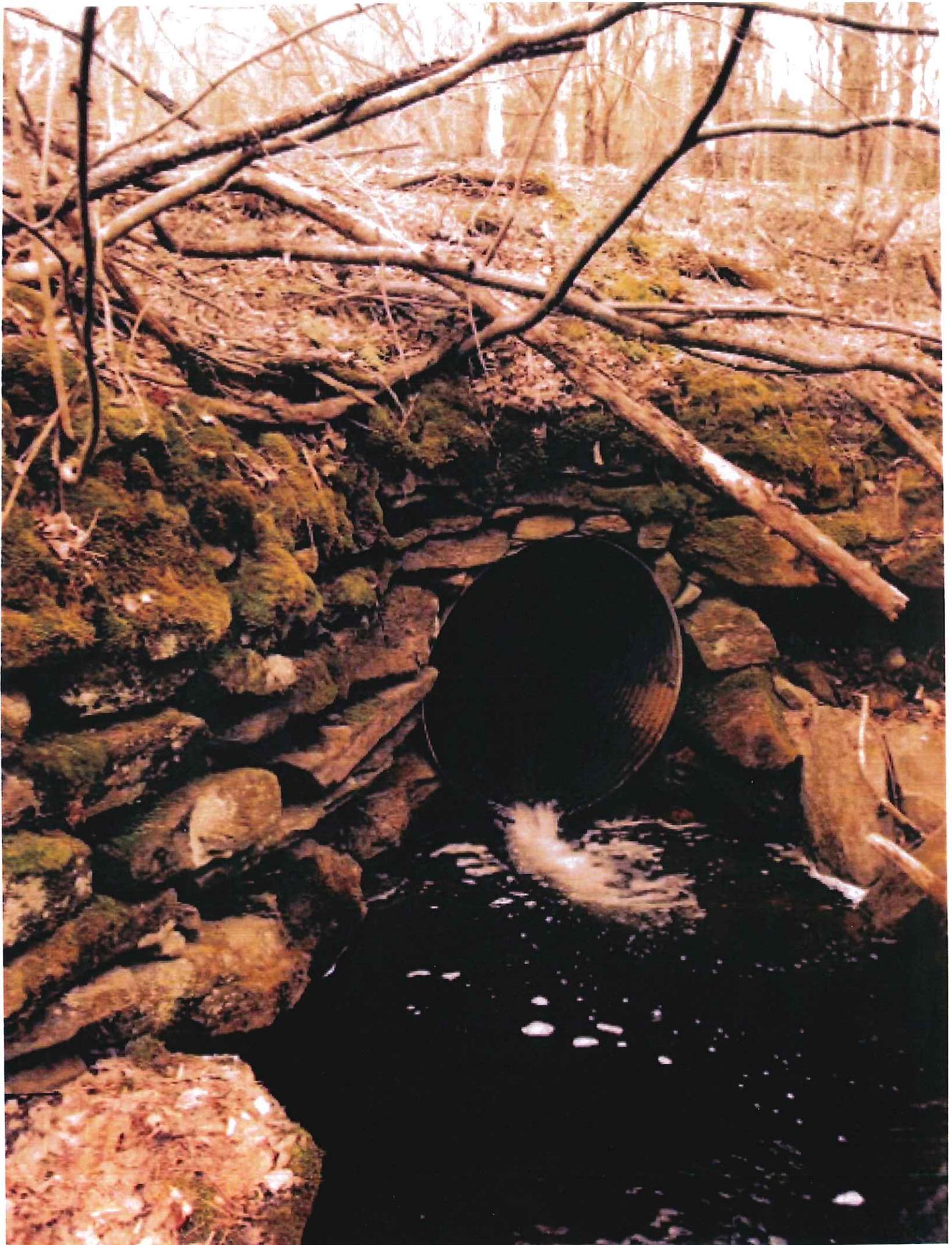
Site 1: Sturgis Road – Culvert #1 Replacement

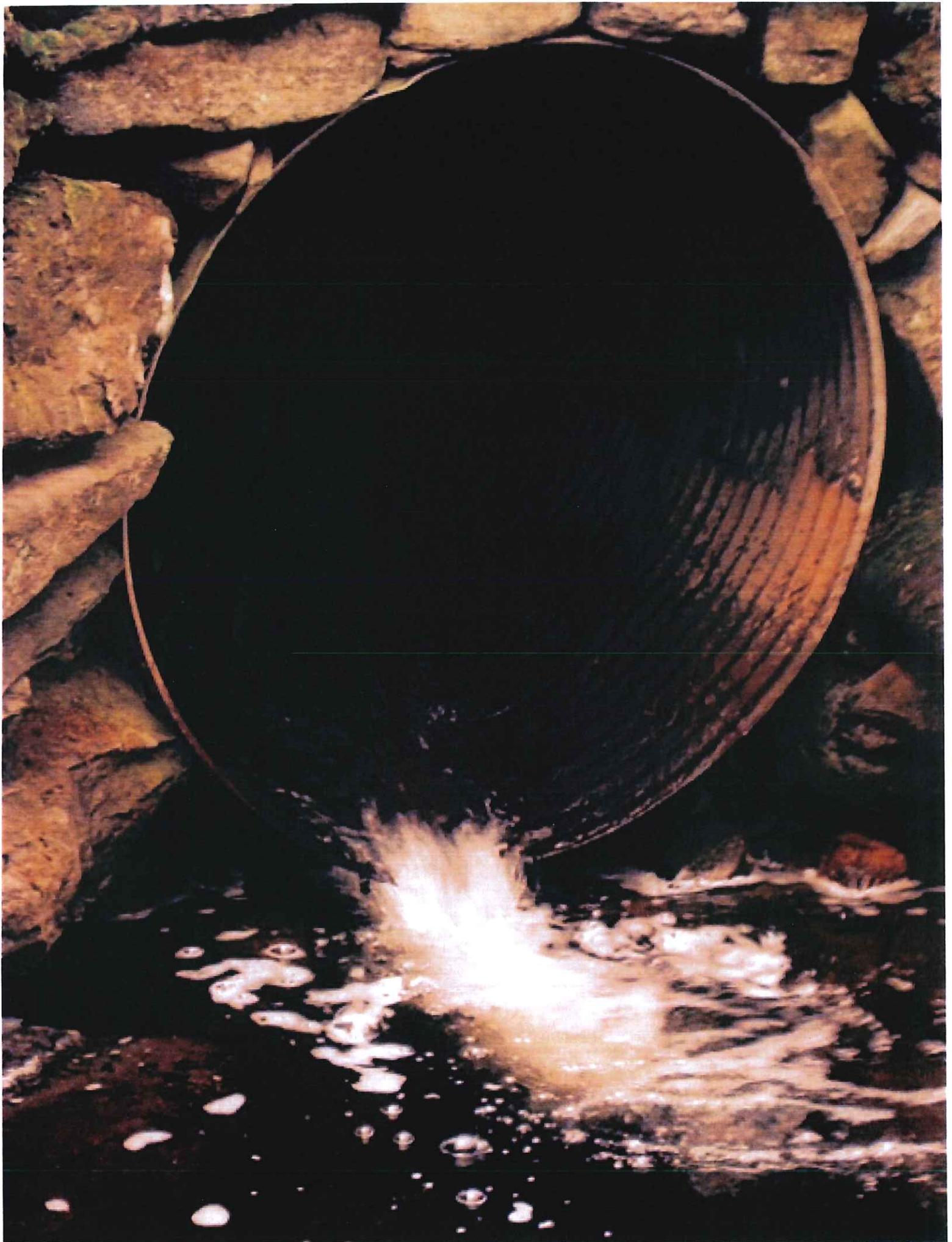
Map of project location:

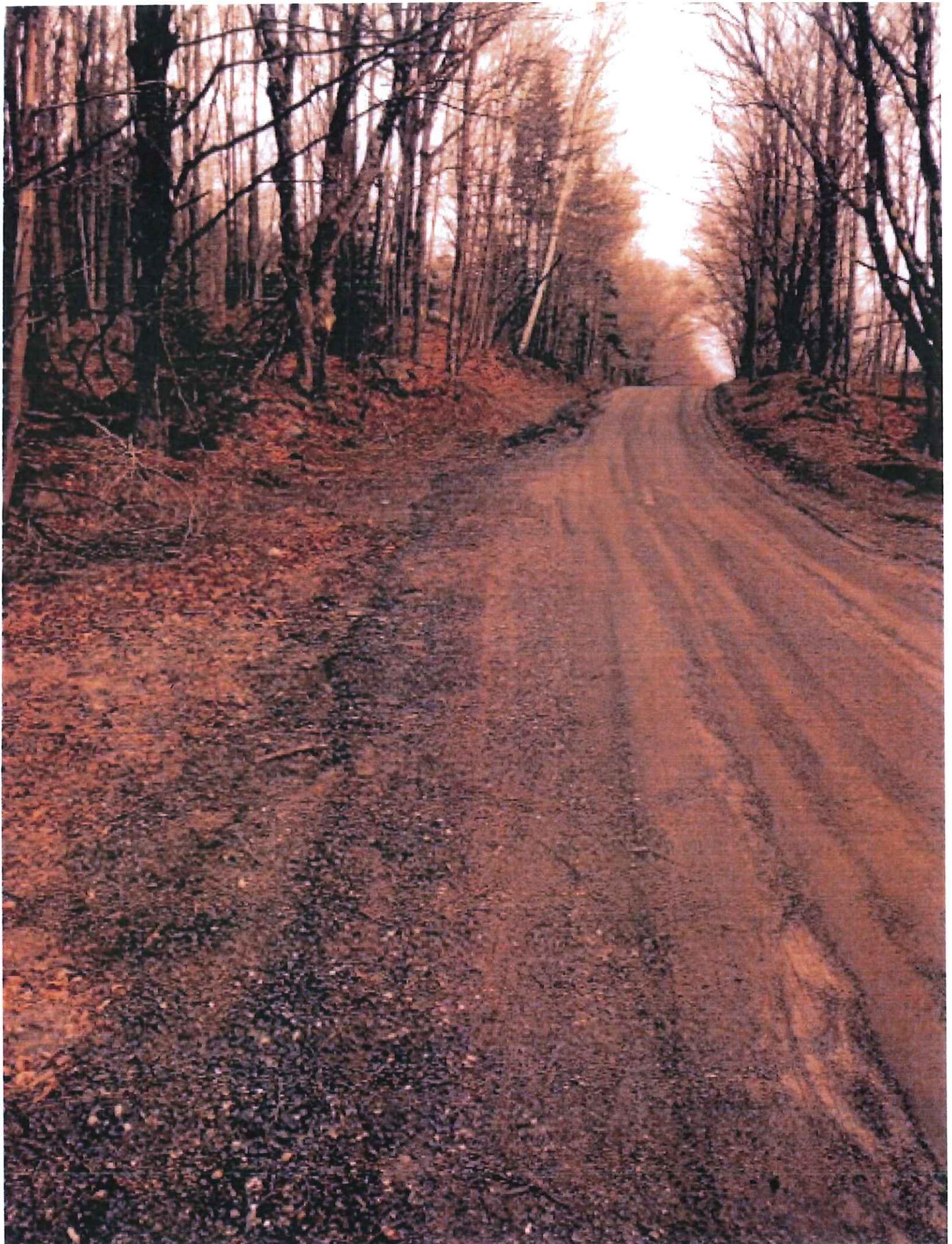


Site Photos:

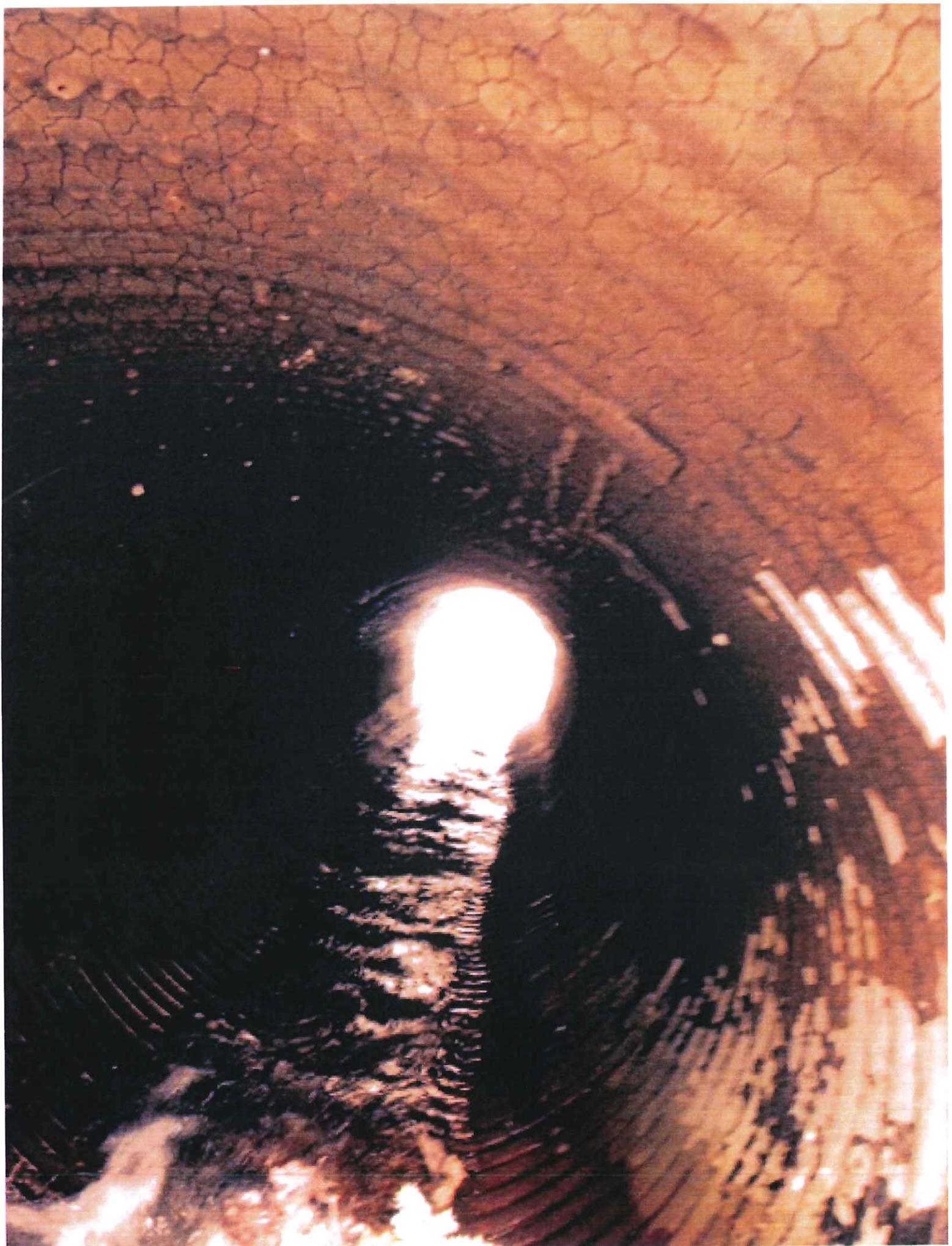






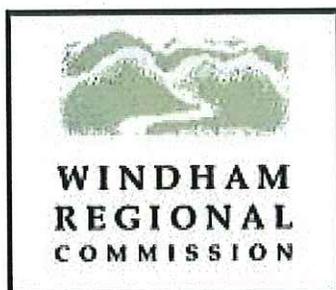






STURGIS DR





April 10, 2016

Bill Hunt
Road Supervisor
2 East Main Street
Post Office Box 217
Wilmington, Vermont 0536

Dear Bill:

I am pleased to provide a letter of support for the **Town of Wilmington's** application submission for a Category C and D Better Roads grant. The Category C grant will provide much needed stream bank stabilization, along Look Road. Regarding Category D, the need exists to upsize culvert #1 on Sturgis Road; this culvert is a high priority, identified in the Town's Capital Improvement Plan. This application conforms to the policies found in the Windham Regional Plan (September 2014):

- 1. Maintain and restore the chemical, biological, and physical quality of the region's surface water per the objective in State water regulations.*
- 2. Improve existing roads and design culverts and bridges to carry a 50-year flood event without damage.*

Please contact me if you have any questions.

Sincerely,

Matt Mann

Matt Mann
Senior Transportation Planner