ROEJ WATERSHED AN COMMUNITY

**Quality Assurance Project Plan**

**2019**

**Bard College**

**Project Manager: M. Elias Dueker, Assistant Professor of Biology and Director of Environmental and Urban Studies Programs (office phone: 845-752-2338, email: edueker@bard.edu)**

**PROJECT MANAGEMENT**

5/20/19

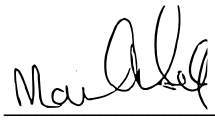
M. Elias Dueker, Ph.D. Project Manager
Bard College

Date

5/20/19

Kaare Christian, President
Roe Jan Watershed Community

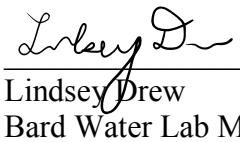
Date



5/20/19

Maureen O'Callaghan-Scholl Bard College
Biology Laboratory Manager

Date



5/20/19

Lindsey Drew
Bard Water Lab Manager

Date

**Table of Contents**

PROJECT MANAGEMENT
Approval Sheet ..... 2
Table of Contents ..... 3
Distribution List ..... 3
Project/ Task Organization ..... 4
Problem Definition/Background ..... 4
Special Training/Certification ..... 4
DATA GENERATION AND ACQUISITION ..... 4
Sampling Process Design (Experimental Design) ..... 4
Sampling Methods ..... 15
Sample Handling and Custody ..... 16
Instrument/Equipment Testing, Inspection, and Maintenance ..... 17
Data Generation and Acquisition ..... 17

**Distribution List**

The following individuals must receive a copy of the approved QAPP in order to complete their role in this project.

| **Name** | **Title** | **Organization** | **Document Type** |
|---|---|---|---|
| M. Elias Dueker | Project Manager/Project Investigator | Bard College | Electronic |
| Kaare Christian | President | Roe Jan Watershed Community | Electronic |
| Maureen O'Callaghan-Scholl | Biology Lab Manager | Bard College | Electronic |
| Lindsey Drew | Bard Water Lab Manager | Bard College | Electronic |
| Volunteers | Citizen Scientists | Bard College | Electronic |

## Problem Definition and Background

The Roe Jan Watershed Community started as a citizen-science project to sample the Roe Jan, so we would have a better idea of its condition. Using Riverkeeper for guidance, and the Bard Water Lab for assistance and testing, and with strong support from Trout Unlimited, the first sampling was in May of 2016 and continued monthly for five more months. In 2016, we sampled fourteen sites along the 50+ mile length of the Roe Jan, from north of Hillsdale all the way to the mouth of the Roe Jan, in between Germantown and Livingston, including 3 sites on the banks of the Hudson. In 2017, we added several new sites, and initiated Student Sampling Day in May.

The Bard Water Lab provides the sampling gear and coordination of the sampling gear drop off, but does not participate in the sampling process. In addition, the Bard Water Lab conducts turbidity and Enterolert analyses of the Roe Jan samples. For the procedures on these analyses refer to the Bard Water Lab QAPP.

## Special Training/Certification

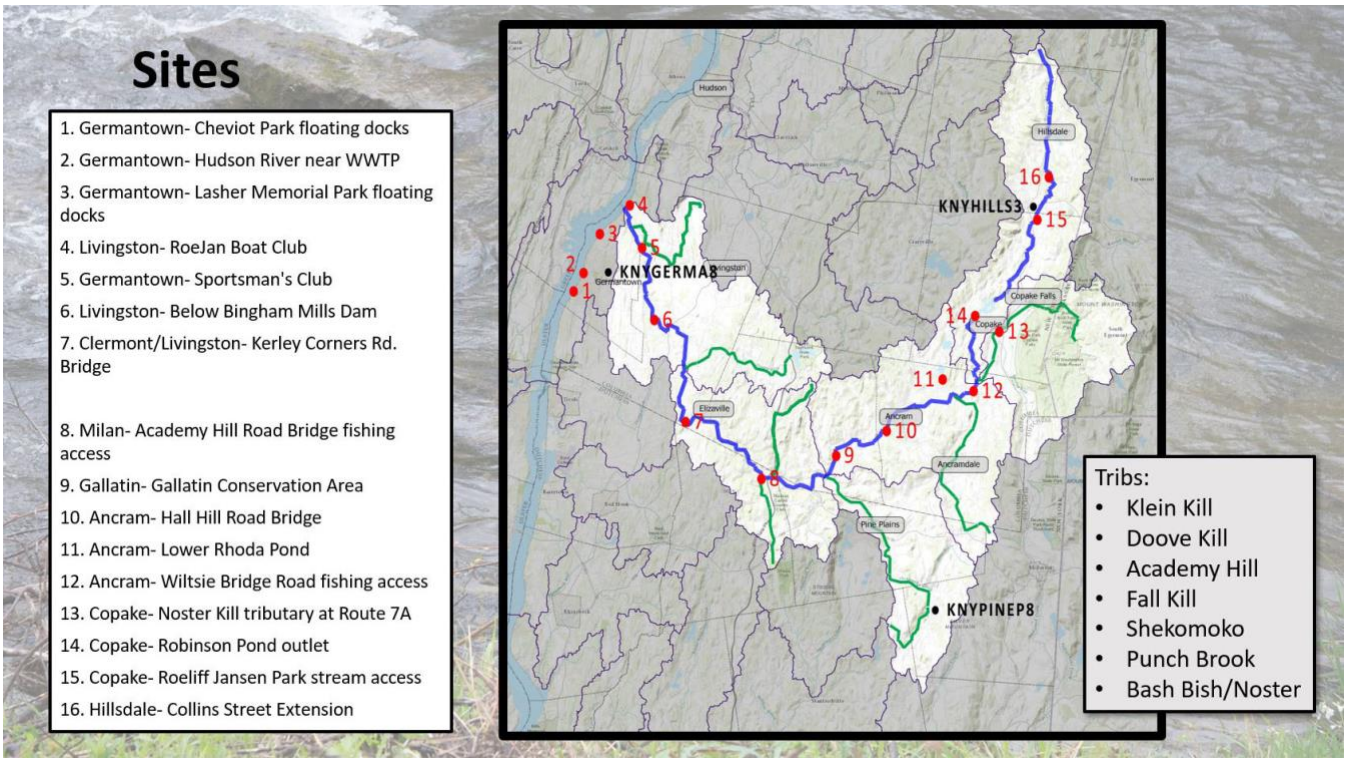
In order to maintain consistent lab work, staff, faculty, and students must be trained in lab safety and all protocols before participating on sampling days. This training occurs regularly in the Bard Biology Labs, and all are required to engage in training annually. Maureen O'Callaghan-Scholl and Lindsey Drew provide these trainings on a regular basis, and participants are tracked by the Biology Program. The Project Manager will work closely with Maureen O'Callaghan-Scholl and Lindsey Drew to ensure that all staff and students involved in this project are trained to the extent necessary. Roe Jan sampling volunteers are trained by the leaders of the Roe Jan Watershed Community.

# DATA GENERATION AND ACQUISITION

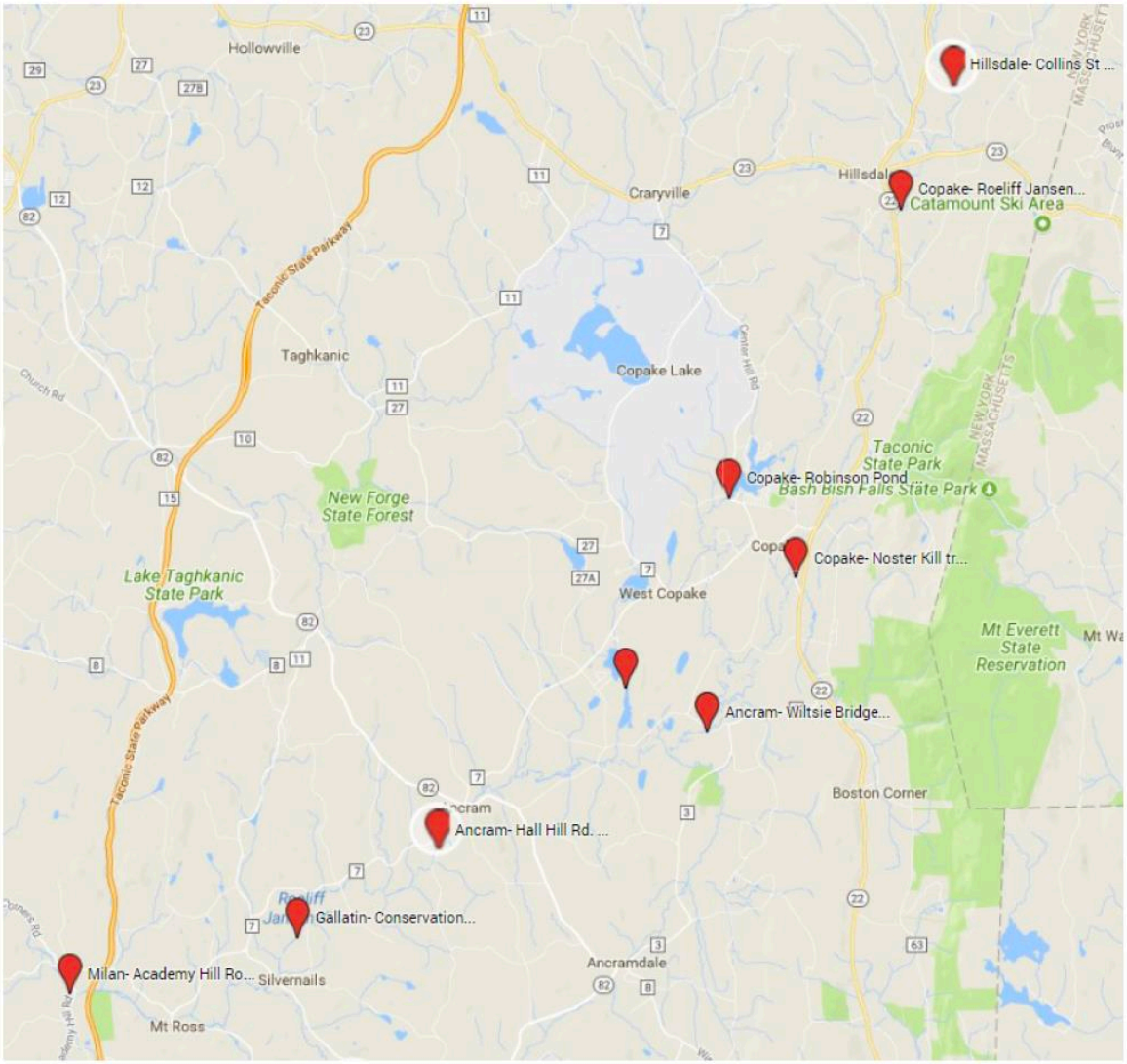
## Sampling Process Design (Experimental Design)

The Roeliff Jansen Kill spans over 54 miles from its origin north of Hillsdale in Columbia County to its discharge into the Hudson River estuary at Linlithgo, New York (Figure 1). It is one of the largest tributaries to the Hudson River. The watershed, which is located mostly in New York's Columbia County, covers 212 square miles. The Bard Water Lab measures sewage-indicating bacteria concentrations and turbidity levels in samples from the Roeliff Jansen Kill. We also record temperature and conductivity data collected by Roe Jan Watershed Community volunteers while sampling.

**Figure 1. Maps of Roe Jan Sites and Descriptions**



# Upstream Sampling Map



## Upstream Site Descriptions

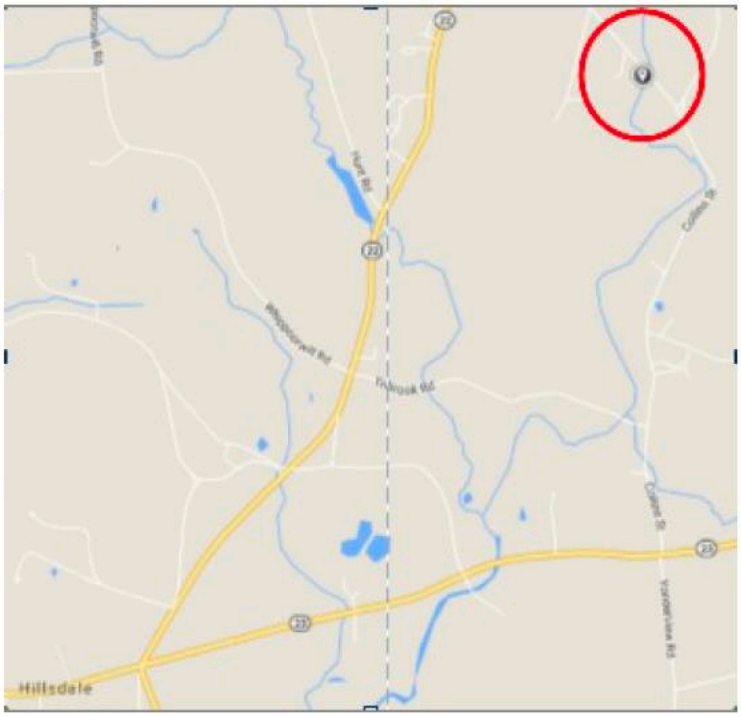
### RJ-43.30 Hillsdale- Collins Street Extension

This site is located about six miles downstream of the headwaters of the Roe Jan Kill. Between the stream's source and this site, much of the riparian area is cleared for agricultural use.

***GPS***: 1040 Collins St Ext Hillsdale

***Parking & Access***: There is pull-off on the south side of the road just west of the bridge. Be sure to sample at the bridge on Collins St. *Extension*, not at Collins St.

***Note***: If water is deep enough, sample from bridge.

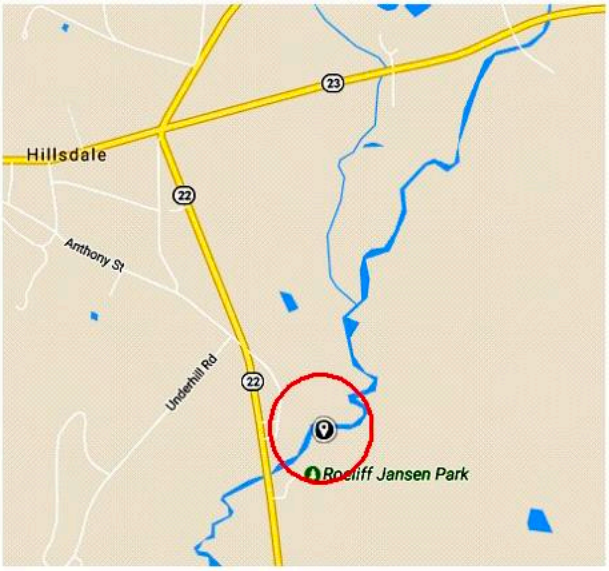



### RJ-40.78 Copake- Roeliff Jansen Park stream access

This sampling site is located in an area where NYS DEC and the Columbia County DOH have noted water quality impacts due to septic systems since at least 1993.

***GPS:*** Roe Jan Park Copake

***Parking & Access***: There is a parking lot at the site. Walk north about 200 yards from the parking area, going past the children's play area, to the grassy area along the river.



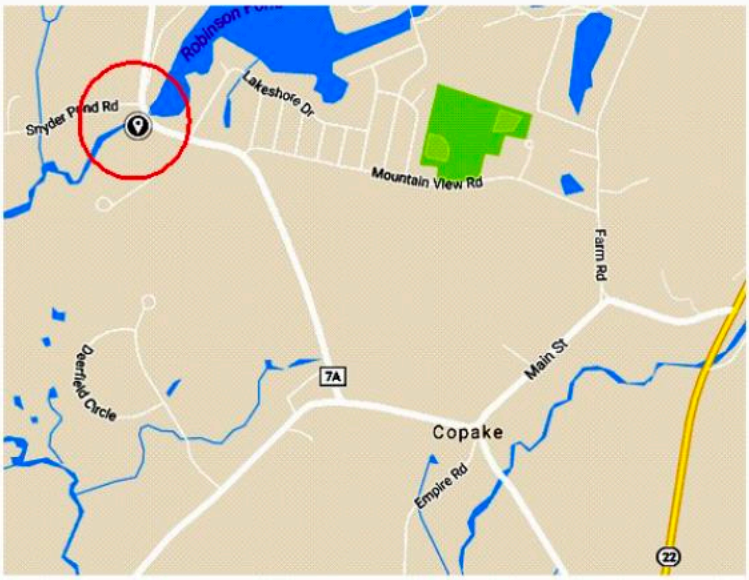
### RJ-37.58 Ancram- Robinson Pond outlet

This sampling point is located in the main stem of the Roe Jan, upstream of the confluence of the Bash Bish Brook, at the outlet of Robinson Pond. Onsite septic systems are thought to be sources of nutrient pollution in Robinson Pond. This is a fishing access location.

***GPS:*** County Route 7A & Snyder Pond Rd, Copake

***Parking & Access***: There is limited shoulder parking at the site south of the bridge across from the lake.

***Note***: Even though there is a bridge, sampling is easier with dipper or wading in.




### RJ-NK-0.30 Copake- Noster Kill tributary at Route 7A

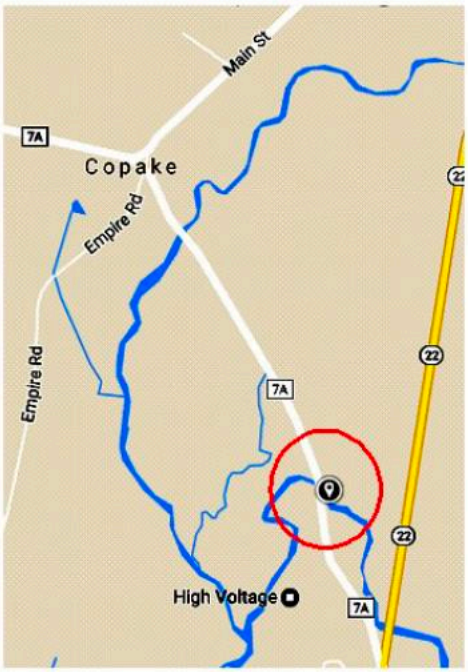
This sampling site is located in the Noster Kill, a tributary to the Roe Jan that is a designated trout spawning stream.

***Map***: Find 7A and Rt 22, go N on 7a to the small bridge over the RJ.

***GPS:*** "Jim's auto body Copake", then about 500' south on 7A to a closed garage/car-wash at a small bridge over the Noster Kill.

***Parking & Access***: Park in front of the closed garage/car wash. Walk across the road and then walk back along the path to the stream near the foot of the bridge. Be careful because there are one or two dangerous sinkholes.

***Note:*** If water is deep enough, sample from bridge.



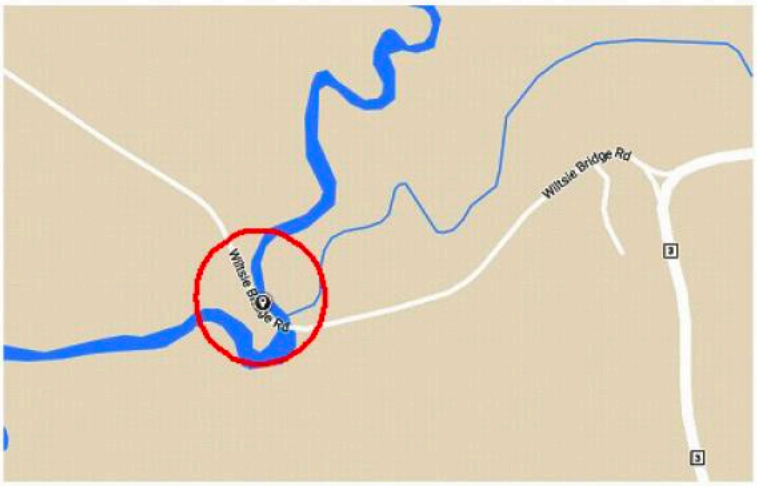
### RJ-31.26 Ancram- Wiltsie Bridge Road fishing access

This DEC fishing access location sits between the Bash Bish Brook (upstream of here) and the Punch Brook (downstream of here), two of the Roe Jan's major tributaries. There are agricultural operations near this sampling point.

***GPS:*** Herondale Farm Ancram

***Parking & Access***: Park on the side of Wiltsie Bridge Rd. Just east of the bridge on the south side the shoulder is a bit wider next to the farm road entrance.

***Note:*** If water is dep enough, sample from bridge.




### RJ-25.22 Ancram- Hall Hill Road Bridge

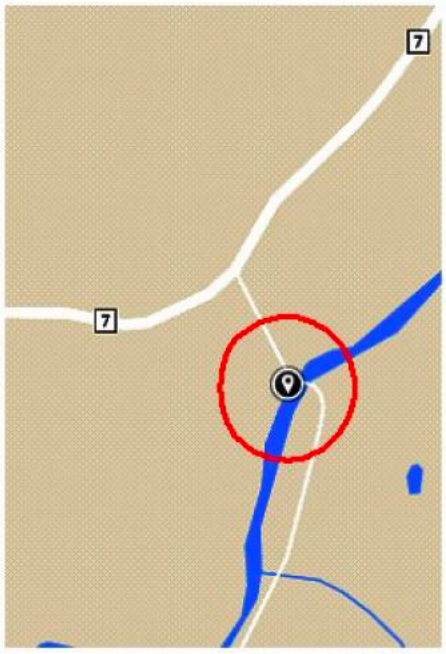
Two wastewater treatment plant outfalls (both privately owned) are located less than one mile upstream of this sampling site.

***Map:*** Find the intersection of Hall Hill Rd and 7. Go south on Hall Hill Rd. a few hundred yards to the bridge.

***GPS:*** "County Rt 7 & Hall Hill Rd, Ancram", and then down Hall Hill Rd. about 200 yards to the bridge.

***Parking & Access***: Park near the bridge and use the rocky path down to the stream.

***Note:*** If water is deep enough, sample from bridge.



### RJ-22.44 Gallatin Conservation Area

***Map:*** Find Gallatinville Rd and Rt 7. Go south on Gallatinville till you see the parking area marked "fishing" on the rifht.

***GPS***: "119 Gallatinville Rd", then right into parking area marked for "fishing"

***Parking & Access***: Park at the small unpaved lot, and then walk south past the gate into a large downward sloping field. Go downhill and to the right , where you'll see a path leading into the woods, leading to the Roe Jan. Steep bank, be careful.


### RJ-17.94 Milan- Academy Hill Road Bridge fishing access

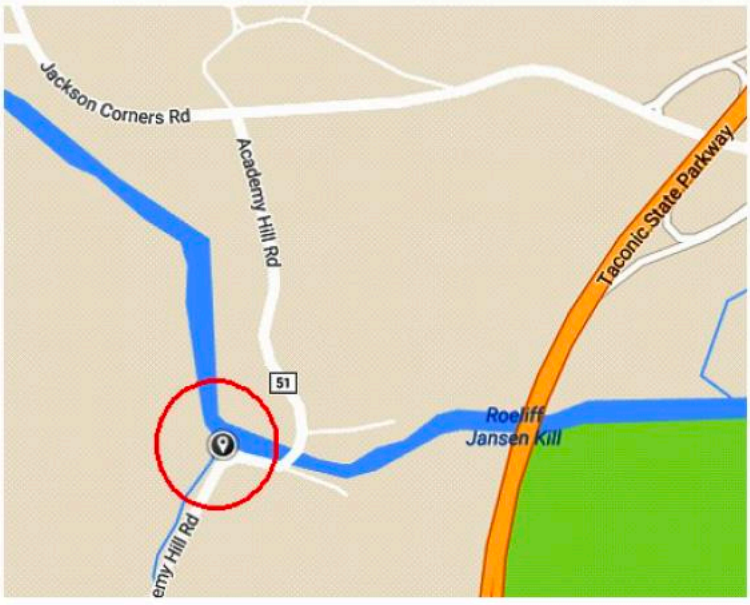
This sampling site is a DEC fishing access site near the Taconic State Parkway. Land cover surrounding this portion of the Roe Jan is forest.

***GPS:*** "Jackson Corners Rd & Academy Hill Rd" then down Academy Hill Rd just over a quarter mile, past the bridge to the pullout area on the left.

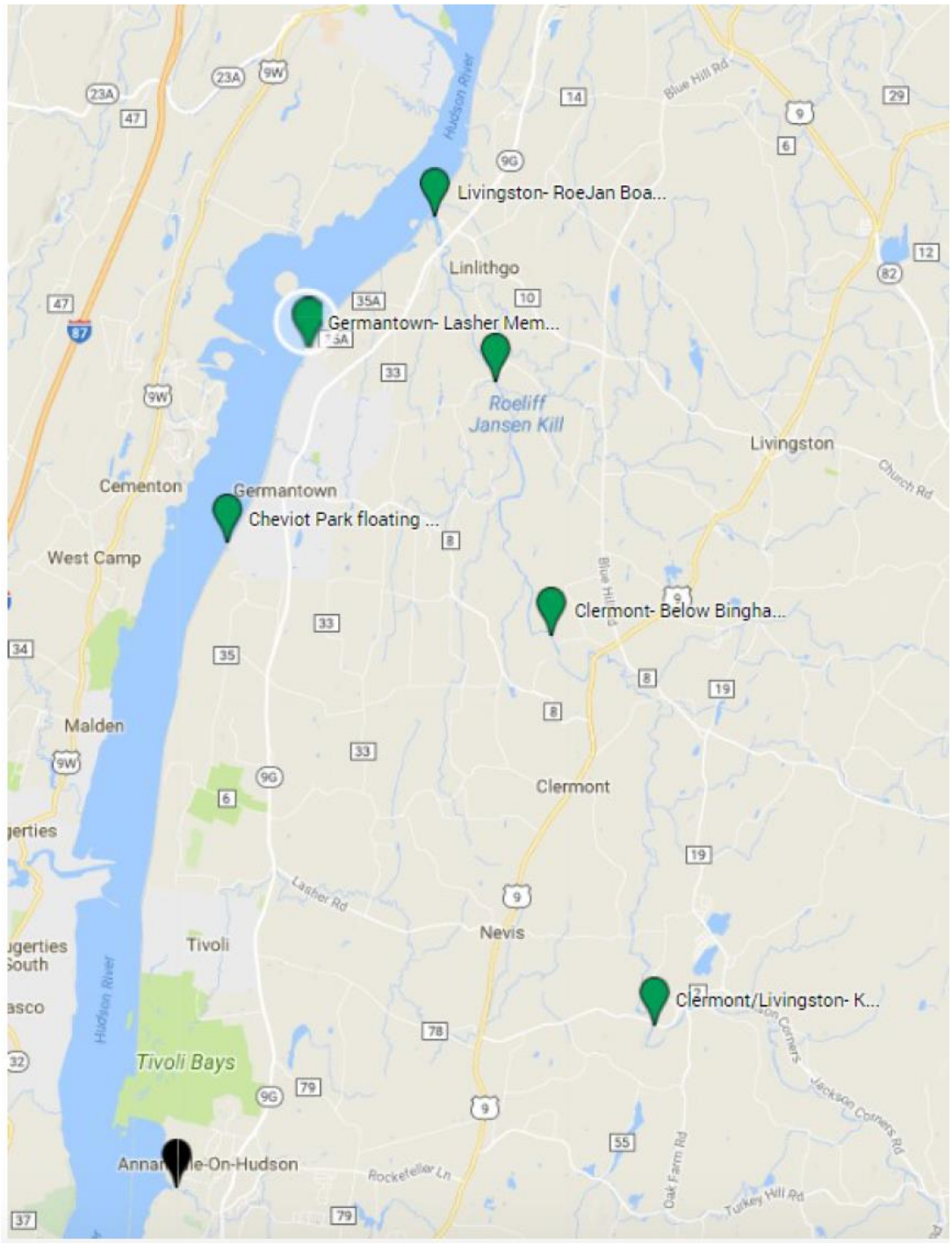
***Parking & Access***: There is a rough parking area about 100 yards past the bridge. Walk down the path on the north side of the road. Be careful to sample Roe Jan water, not the joining Academy Creek water, coming from the south.

***NOTE***—Do not sample from the bridge.

***NOTE***—the bridge adjacent to the that was out in 2017 is now repaired and open.



# Downstream Sampling Map



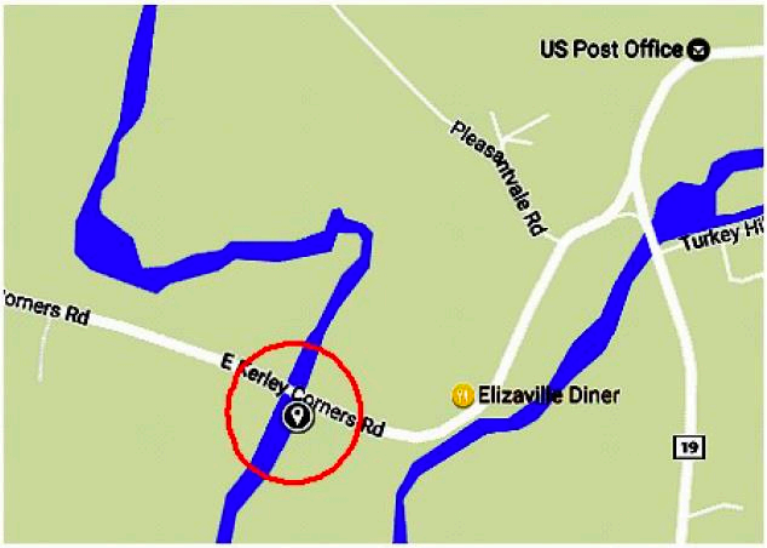
## Downstream Site Descriptions

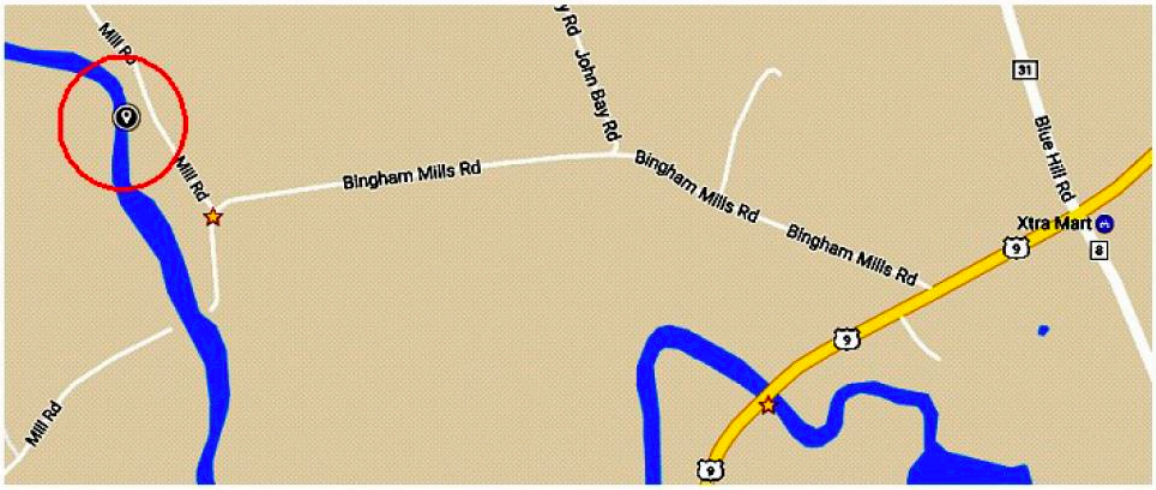
### RJ-12.76 Clermont/Livingston- Kerley Corners Rd. Bridge

This sample is collected on the bridge just west of the Elizaville Diner on Kerley Corners road.

***Map or GPS:*** Elizaville Diner, then west to the bridge.

***Parking***: There is a wide pulloff on the south side of the road just east of the bridge.




### RJ-5.76 Livingston- Below Bingham Mills Dam

This sample is collected just downstream of the Bingham Mills Dam, which is the first dam on the main stem of the Roe Jan upstream of the Hudson River.

Map: Goto the Xtra Mart on Rt 9 in Livingston, south a few hundred yards to Bingham Mills Rd, then right on Mill Rd. half way down the hill to pullout on the left marked private, where you may see a yellow chain.

***GPS***: "206 Mill Road, Livingston", which will take you to a brick building near the dam, and then continue downhill to a small pullout on the left marked private, where you may see a yellow chain.

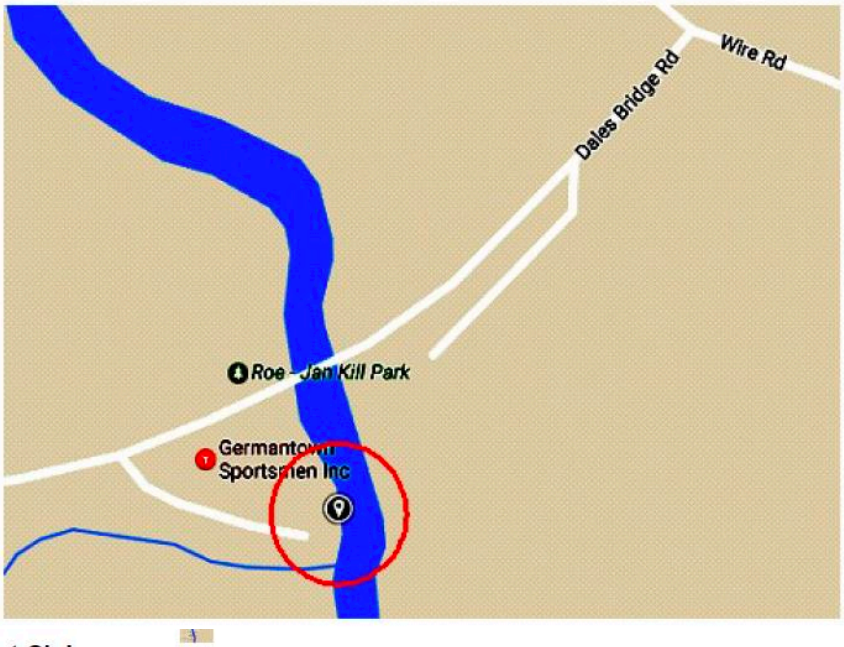
***Parking***: We have permission from owner Michael Hamilton to park by the yellow chain and access the stream. Walk upstream on the dirt road about 50ft past the yellow chain to access the river from a steep, but short, bank. Be careful, as there may be a strong current.

### RJ-2.00 Germantown- Sportsmen's Club

This sampling site is located at the Sportsmen's Club on Dale's Bridge Road, where there is easy access to the stream. Upstream from here, agricultural land use begins to be more prominent in the watershed.

***GPS:*** Germantown Sportsmen's Club

***Parking & Access***: Park in the lower lot, across from the picnic area. Walk down the dirt road at the far end of the parking lot to the grassy lawn along the river, and sample where the bank makes it easy to get to the river.



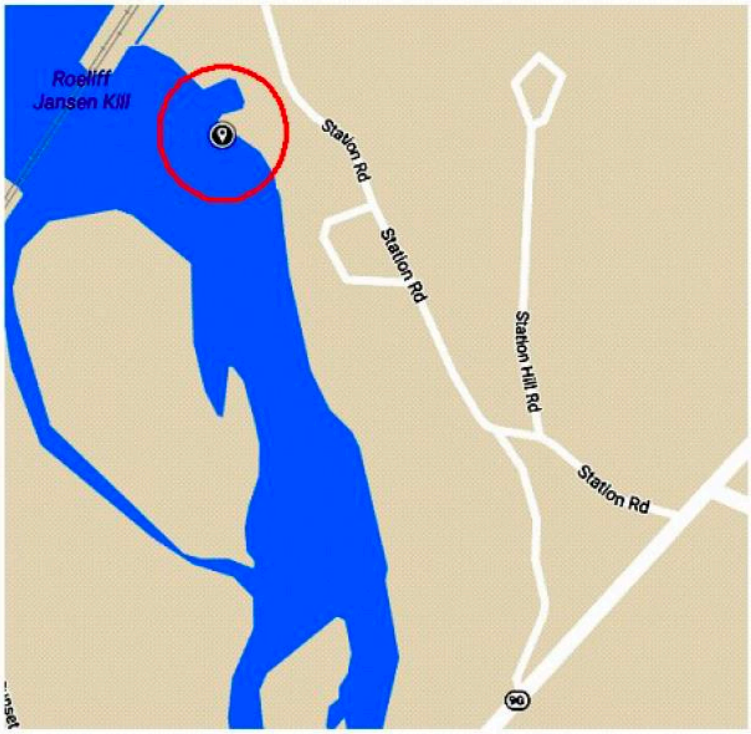

### RJ-0.00 Livingston- RoeJan Boat Club

This location is in the mouth of the Roe Jan, where there is tidal influence. Directly upstream from here, the Roe Jan flows through a forested riparian zone for about two miles, until the previous sampling site at the Sportsman's Club.

***Map:*** Go to the bridge on 9G over the RJ,. Just N of bridge is Station Rd., follow Station to the club.

***GPS:*** "station rd & Rt 9G, Livingston", then down Station Rd till you see the yellow gate and fence and the boat club on the left.

***Parking & Access***: There is a parking lot across the road from the boat club. It is marked "Members Only" but we have permission. Alternately, park along the roadside. Sample just to the left (south) of the boat basin area, on a small rocky beach often used as a canoe/kayak launch. We have permission to sample on RJBC property by Chris Delmolino, the Commodore.



**RJ-HR-108.5 Germantown– Ernest R. Lasher Jr. Mem. Park**

This site is at Lasher Park in Germantown, on the shoreline of the Hudson. The sample should be collected at the northern floating dock. Samples from this site, just two miles south of the Roe Jan's mouth, help us learn how far into the Hudson the Roe Jan's influence extends, and under what conditions.


***Map:*** Find intersection of Northern Blvd. and Anchorage Rd. Drive down Anchroage to the park.

***GPS:*** Lasher Park Germantown

***Parking & Access***: There is a parking lot at the site. Sample from the northern floating dock, at the far edge. Note whether the tide is flooding or ebbing.

**RJ-HR-106.5 Cheviot Park floating dock**

This sample is collected at the Hudson River public boating access point at Cheviot Park.

***Map:*** Goto the American Legion on Woods Rd, then down Cheviot Rd. to the Park.

***GPS:*** "Cheviot & Disher, Germantown", then to end across the tracks

***Parking & Access***: There is a parking lot at the site. Sample from the western floating dock, at the far edge. Note whether the tide is flooding or ebbing.

**Sampling Methods**

Where bank access to the stream is easy, samples are collected by gathering sub-surface waters using a long-handled dipper (cleaned before use and rinsed repeatedly downstream of the collection site before gathering sample) and placing water in a sterile (acid-washed and autoclaved) 250mL sampling bottle. At other sites sampling is done from a bridge, using a bucket on a rope, following the same procedures. The 250mL bottle is then stored on ice in an insulated cooler and transported to the Bard Water Lab within 3 hours of sample collection. Any deviation from these procedures is reported to the Project Manager/Project Investigator and noted in data logs, field notes, and data spreadsheets. In the field temperature and conductivity values are recorded. Conductivity is recorded uncompensated in micro-Siemens per centimeter. Temperature is recorded in degrees Celsius. Physical observations are also recorded.

**STEPS TO FOLLOW WHEN COLLECTING WATER**

1. Write the time in the sampling log
2. If not already connected, connect the YSI probe to the meter, ensuring the twist lock is tight. Don't use force, it fits together smoothly.
3. Turn on the YSI meter.
4. **Put rubber gloves on both hands at the outset, before handling bottle. Only handle bottle with gloved hands.**
5. No matter how you are sampling, **look for clear moving water, and collect water coming towards you**.

| **Wade out to moving water** | **Sample from shore with the Dipper** | **Sample with the Bucket from a Bridge**<br>You need 18" or more of depth. If too shallow, sample with dipper or by wading out. |
|---|---|---|
| Find a safe place to wade into the stream. Try not to disturb sediment, face upstream, wait for sediment to dissipate. Uncap the bottle. | Find good footing on the streambank, within 3-4' of clear running water. Uncap the bottle. | Both samplers should wear the safety vest. Watch for oncoming traffic. Have your partner slow traffic. Use the line on the handle to raise lower the bucket, and the line on the bottom to tilt. You can see the bucket better on the downstream side of the bridge. |
| Submerge the bottle upside-down. While still underwater, tilt the bottle upwards until air escapes, with opening facing upstream. Repeat 3X, discarding the first two fills and then keeping the 3rd one. | Rinse the dipper at least 3X in the running water. Don't touch the bottom. Dip water from beneath the surface, pour into bottle, and repeat 3X, discarding the first two fills and then keeping the 3rd one. | Rinse bucket in running water. Fill and dump. Fill and bring up, and set it down. Place YSI probe into water to the top of the strain relief, wait for the readings to stabilize, then have partner write conductivity (top) and temperature in the log. |
| Leave air in neck of bottle, cap and place on ice. | Leave air in neck of bottle, cap and place on ice. | Lower bucket, rinse again, bring it up again and set it down. Dip bottle in bucket and discard, dip again and discard, dip and keep. ***Collect from fresh water; do not collect water contaminated by the probe.*** |
| Place YSI probe into water to the top of the strain relief, wait for the reading to stabilize, then have partner write conductivity (top) and temperature in the log. | Loop YSI cable loosely around hook on the end of the dipper, lower it into the water to the top of the strain relief, wait for the reading to stabilize, then have partner write conductivity (top) and temperature in the log. | Leave air in neck of bottle, cap and place on ice. |
| Turn off meter. Discard gloves | Turn off meter. Put dipper in protective bag. Discard gloves. | Turn off meter. Put bucket in protective bag. Discard gloves. |

6. Place your observations in the log book, such as cloudy water, tide ebb/flow on Hudson shoreline sites, or anything else of note.

## Sample Handling and Custody

In the field, sample bottles are clearly labeled with site number and samplers record time, data, and their names on the data sheet for that site (Figure 2). Once the bottles are transported to the Bard Water Lab, samplers fill out chain of custody forms (Figure 3). Data entry occurs at the Bard Water Lab, the procedure can be referred to in the Bard Water Lab QAPP.

**Figure 2. Site Sheet**

| May 12, 2018 | Temp | Conductivity | Time | Notes |
|---|---|---|---|---|
| RJ-43.30<br>Collins St Ext. | | | | |
| RJ-40.78<br>RJ Park | | | | |
| RJ-37.58<br>Robinson Pd. | | | | |
| RJ-NK-0.30<br>Noster/7A | | | | |
| RJ-31.26<br>Wiltsie Br. | | | | |
| RJ-25.22<br>Hall Hill Rd | | | | |
| RJ-22.44<br>Gallatin Cons. | | | | |
| RJ-17.94<br>Academy Hill | | | | |

**Figure 3. Chain of Custody Form**

Bard Water Lab

# Water Sample Chain of Custody

| Sample Number | Sample Name | Sample Source (SKMP or RJMP, etc.) | Sampler(s) (who got the sample?) | Date of Sampling | Time of Sampling | Time received at Bard Water Lab | Processor(s) (who processed the sample in the lab?) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Instrument/Equipment Testing, Inspection, and Maintenance**

Field Instruments and Equipment:

- long-handled dippers
- bucket with rope
- Calibrated YSI EcoSense EC300A- calibrated the week prior to sampling
- sterile (autoclaved and acid-washed) 250mL sample bottles
- insulated cooler
- ice
- Nitrile gloves

All supplies and equipment will be maintained, cleaned, and tracked by the Bard Water Lab Manager. The Bard Water has three extra dippers, at least 20 back-up sample bottles, and several extra insulated coolers for use in the field.

**Data Generation and Acquisition**

Refer to the Bard Water Lab QAPP for information regarding lab analyses.

**2019 Sampling Dates**

May 11th
June 15th
July 13th
Aug 10th
Sept 14th
Oct 12th