Improving Soil Health and Water Quality in the Thames River Watershed

A multi-partner project funded through a Regional Conservation Partnership Program grant from the USDA Natural Resources Conservation Service.

TLGV Regional Conservation Partnership Program

Improving Soil Health & Water Quality in the Thames River Watershed

- TLGV NRCS Agreement # 68-1106-15-04
- Project Technical Assistance and Implementations

Technical Assistance to Producers for EQIP Enrollment and Planning

- provided TA assistance to 18 producers including resource assessments, mapping, conservation planning, EQIP application assistance, assistance with design and implementation of conservation practices and contract development
- assisted 13 additional producers to determine eligibility and to begin the EQIP application process implementing soil health conservation practices
- under the Phase V extension, focused on Little River watershed to assess and inventory resources and plan for implementation of soil health practices (designated by NRCS under its National Water Quality Initiative, the Little River watershed is prioritized because it provides drinking water to the Town of Putnam)

Implementation of NRCS Practices

6 contracts were awarded by NRCS totaling $125,504.38 and covering 365.6 acres

The following practices were implemented:

340, Cover crop – multispecies

329, Residue Management no till

382, Fence

516, Livestock Pipeline

528, Prescribed Grazing

561, HUA

614, Watering Facility, and

484, Mulching.

All of the Financial Assistance (FA) funds allocated to the TLGV RCPP was expended quickly under these 6 contracts. One of the contracts was awarded to a Beginning Farmer.

Matching CWA 319 Projects Implemented in Little River watershed

- Little River Water Quality Improvement - Farm Fields Nutrient Reduction Project: constructed a denitrifying woodchip bioreactor and purchased precision planting equipment (PPE) to be used on 650 acres

Matching CWA 319 Projects Implemented in Little River watershed

- Little River Water Quality Management - Farm Agricultural Waste Management Practices Project: implemented best management practices reflecting USDA/NRCS CPS Codes for the subsurface drainage system (CPS 606), leachate collection system (CPS 765I), waste transfer system (CPS 634), waste storage facility (CPS 313), pumping plant (CPS 533) and waste separation facility (CPS 632)

Matching CWA 319 Projects Implemented watershed

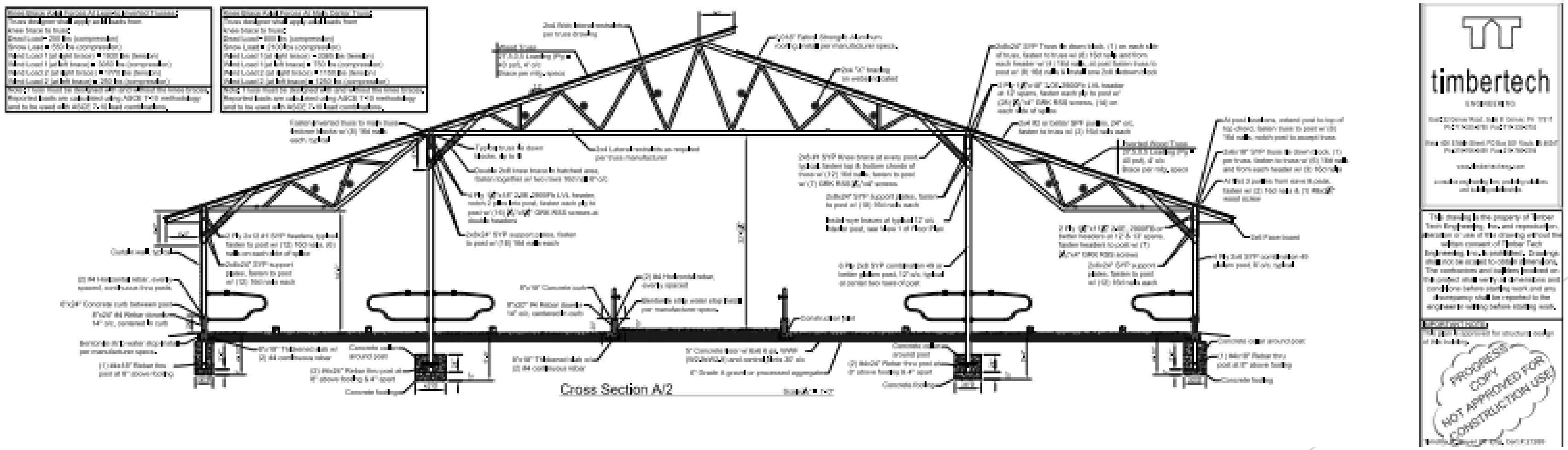
- <u>Little River Watershed Plan Implementation - Aerated Compost System for Dairy Mortality</u>: constructed an aerated compost facility for dairy mortalities and heifer manure

Matching CWA 319 Projects Implemented in Little River watershed

- Little River Waste Storage Design and Innovative Field Equipment Project: designed a waste storage facility for a farm in Woodstock, CT and purchased innovative field equipment for two farms (manure injectors and precision planting equipment)

Matching CWA 319 Projects Implemented in Little River watershed

- <u>Little River Waste Storage Design and Innovative Field Equipment Project</u>: designed a waste storage facility for a farm in Woodstock, CT and purchased innovative field equipment for two farms (manure injectors and precision planting equipment)



Little River Agricultural Waste Storage & Management

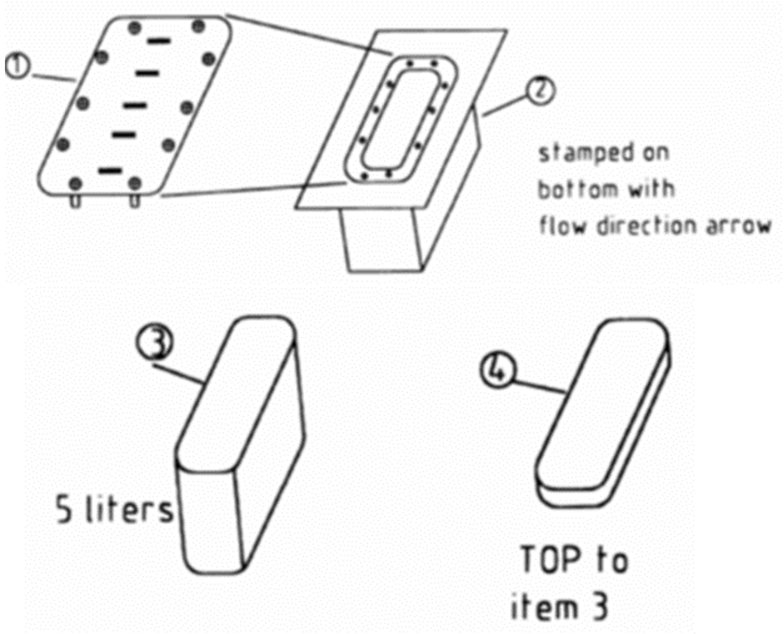
The free-stall barn with agricultural waste storage & management facilities is constructed.

Although funded by CT DEEP with CWA 319 funding, this project was not used as match for the TLGV RCPP.

Technical Assistance to Producers for Water Quality Monitoring

- ECCD conducted edge-of-field water quality monitoring at 2 sites in eastern CT (farm fields in Baltic and Bozrah)
- Edge-of-field monitoring conducted using passive stormwater collection boxes known as FirstFlush Samplers

GKY First Flush Sampler

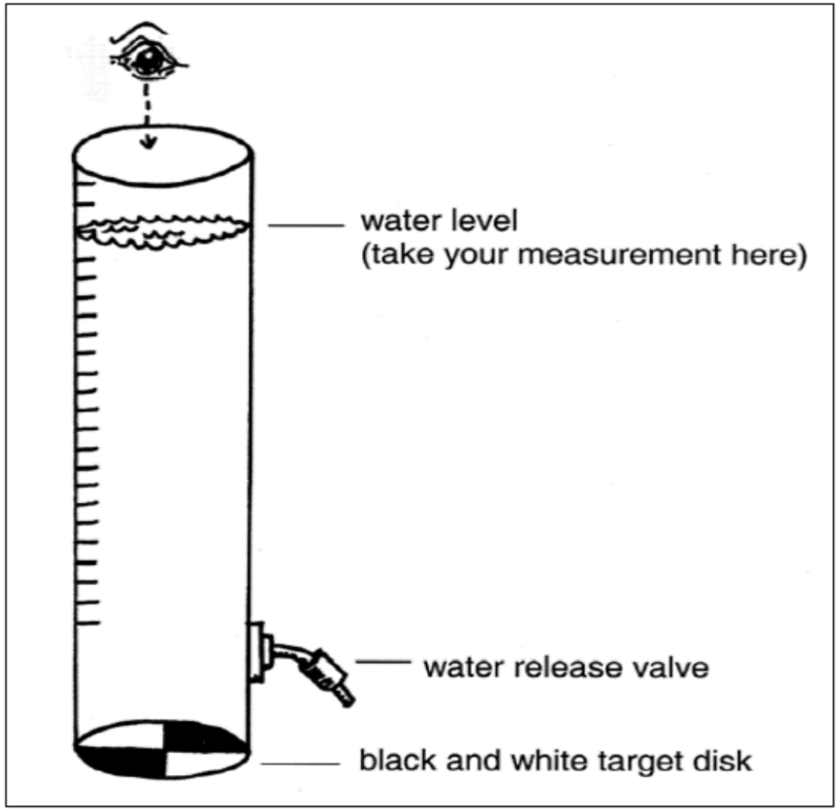


Conservation Innovation Grant (GIG)

ECCD, in partnership with UCONN, compared ISCO auto-sampling system to GYK passive stormwater collector

Conclusion by Dr. Jack Clausen, UCONN (now retired) was there was no difference in the water quality between the two sampling systems. There was a big difference in the cost between the 2 sampling systems.

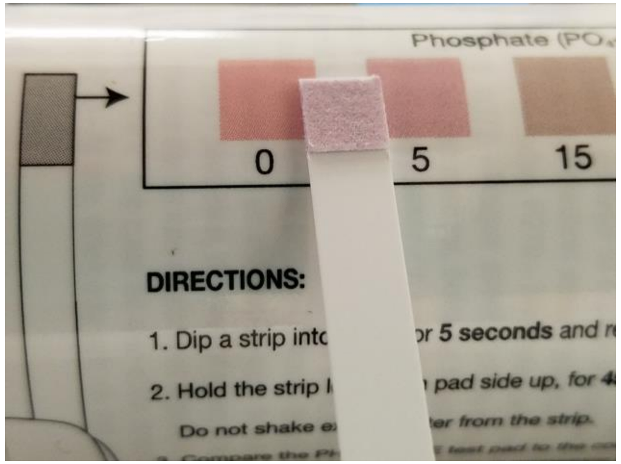
Water quality testing



- HACH test strips for nitrate/nitrite, ammonia and dissolved phosphorus
- Turbidity Tube for estimating Total Suspended Solids (TSS)

LaMotte Smart2 Colorimeter

- Dissolved phosphorus measurements using HACH test strips were unreliable.
- LaMotte Smart2 colorimeter substituted



Blank phosphate test strip

Results

Field 1					
Year	NO2	NO3	NH3	PO4	Turbidity
	mg/l	mg/l	mg/l	mg/l	NTU
2019	0.00	0.83	0.38	13.18	108
2020	0.82	1.05	0.41	11.16	215
2021	0.00	0.20	0.41	8.25	170

No field buffer strip
Field sloped
Noticeable eroded flow channel leading to sampler

Results

Field 2					
Year	NO2	NO3	NH3	PO4	Turbidity
	mg/l	mg/l	mg/l	mg/l	NTU
2019	0	0.27	0.42	1.51	96
2020	0	0.13	0.45	1.25	25
2021	0	0.20	0.48	2.62	53

Field Buffer Strip
Less slope

When the sampler looks like this, it should be obvious you are losing topsoil (and nutrients) off your field.

Lessons learned

- A well thought out plan of work may not necessarily be compatible with the speed at which a government contract can be executed
  - The 5 species cover crop mix was applied to the fields before any pre-practice water quality data could be collected.
- Rainfall predictions for 1” rain events are not reliable
  - Opportunities to collect samples were missed due to unexpected rainfall events that occurred before samplers could be properly prepared.
- A three-year sampling period may not be long enough to capture the transition to healthy soil that can take five or more years to become established.
- A better design of the fastener system for attaching the cover to the passive samplers would make the sampling process easier.