

Mill Road Neighbors' Hydro Meeting

A multidisciplinary endeavor by citizens, engineers, and scientists

NYSERDA

Bard



Neighbors' Hydro Meeting Overview

- 6:00pm** **Welcome, Introductions and Project Overview**
- 6:20** **Mill Road Dam**
Overview of the dam site and Mill Road Pond
- 6:30** **Project Findings**
The project team will share structural, ecological, and flooding-related findings about the Mill Road Dam from an investigation conducted in spring 2018 to explore the feasibility of installing microhydro power at the site.
- 7:00** **Discussion**
Open conversation among participants and the project team about the potential for microhydro and associated opportunities and concerns.
- 7:50** **Next steps**
- 8:00** **Adjourn**

Multidisciplinary Site Assessment Goals

- Is the dam appropriate for micro hydropower?
- Can it physically sustain turbine installation?
- Is there a steady local use for the power that would be generated?
- Would the power generated justify the hydro installation cost?
- What stakeholders need to be involved?
- Can fish migration be enhanced?
- Will water quality be affected - can it be improved?
- What other ecological considerations must be taken into account?
- What social and cultural impacts will the project entail?
- Would a better alternative be to remove the dam?

Mill Road Multidisciplinary Team

- Laurie Husted, Bard staff, project manager
- Robyn Smyth, Bard faculty, water quality
- Erik Kiviat, Director of Hudsonia, scientist
- Norm Bishop, Knight Piesold, hydropower engineer
- Stuart Findlay, Cary Institute, scientist
- Jan Borchert & Joel Herm, Current Hydro, hydropower developer, financing options, flooding grant
- George Cronk, Chazen Companies, civil engineer, looked at civil works - structure of the dam
- Ona Ferguson, Consensus Building Inst., stakeholder engagement and facilitator



Neighbors' Input From Survey

- overall positive view of the pond and dam: aesthetic qualities, recreation, wildlife, property value, water source for crops
- flooding concern? in backyard, garden
- desire to see weed and algae maintenance, dam safety, a fish ladder, assessment of noise or environmental impact from micro hydropower
- Dam Removal: 9 out of 12 do not believe that removal of the dam would result in recreational or aesthetic benefits in a free-flowing stream
- Most agree that microhydro implementation would be positive, but asked who would benefit
- Concern about added noise and the possible impacts on stream flow and wildlife
- Depending on cost, most respondents say they would be willing to purchase renewable energy generated by the dam

Multidisciplinary Experts' Conclusions

- Hydro power could work structurally and ecologically at the site
- Appropriate hydro intake location exists and drop is high enough.
- Given the topography, the dam cannot address major flooding risks
- Not an appropriate place to consider dam removal
- No significant ecological concerns with installing micro hydropower
- Several ecological questions that warrant more investigation
- Use Coanda screen to keep animals and debris out of the penstock

Ecological Findings

- Wood turtles: hydro screen size with no more than 2cm opening
- Brophytes/lichens: May be present downstream side of dam
- Vegetation: Disturb as little vegetation as possible
- Shoreline trees provide habitat, buffer zone, and soil stability.
- Eels: Eel ladder likely not necessary
- Bald Eagles/Osprey/American Kestrel: Hydropower should not affect
- Blanding Turtles: More assessment may be needed

Water Quality Findings

- Monitoring of the pond and below the dam to understand the risk of modifying flows
- Mill Road Pond and Saw Kill is vulnerable to shifting over to a floating algae dominated system, indicative of reduced ecosystem quality and value. Whether or not potential algae domination is related to microhydro, expert cautions that without monitoring data, local residents will perceive the problem as being caused by the micro-hydro project

Engineering Findings re: Flooding

- Concern that the dam spillway is not sized for the probable maximum precipitation event or 100-year event
- Add spillway capacity when seeking permits for intake structure
- Current hydraulic reservoir infrastructure configuration passes flood laws
- Flood evaluation is outside the scope of microhydro assessment
 - => Fuss & O'Neill, 2018, Saw Kill Watershed and Flood Mitigation Assessment

Engineering Findings re: Hydro Power

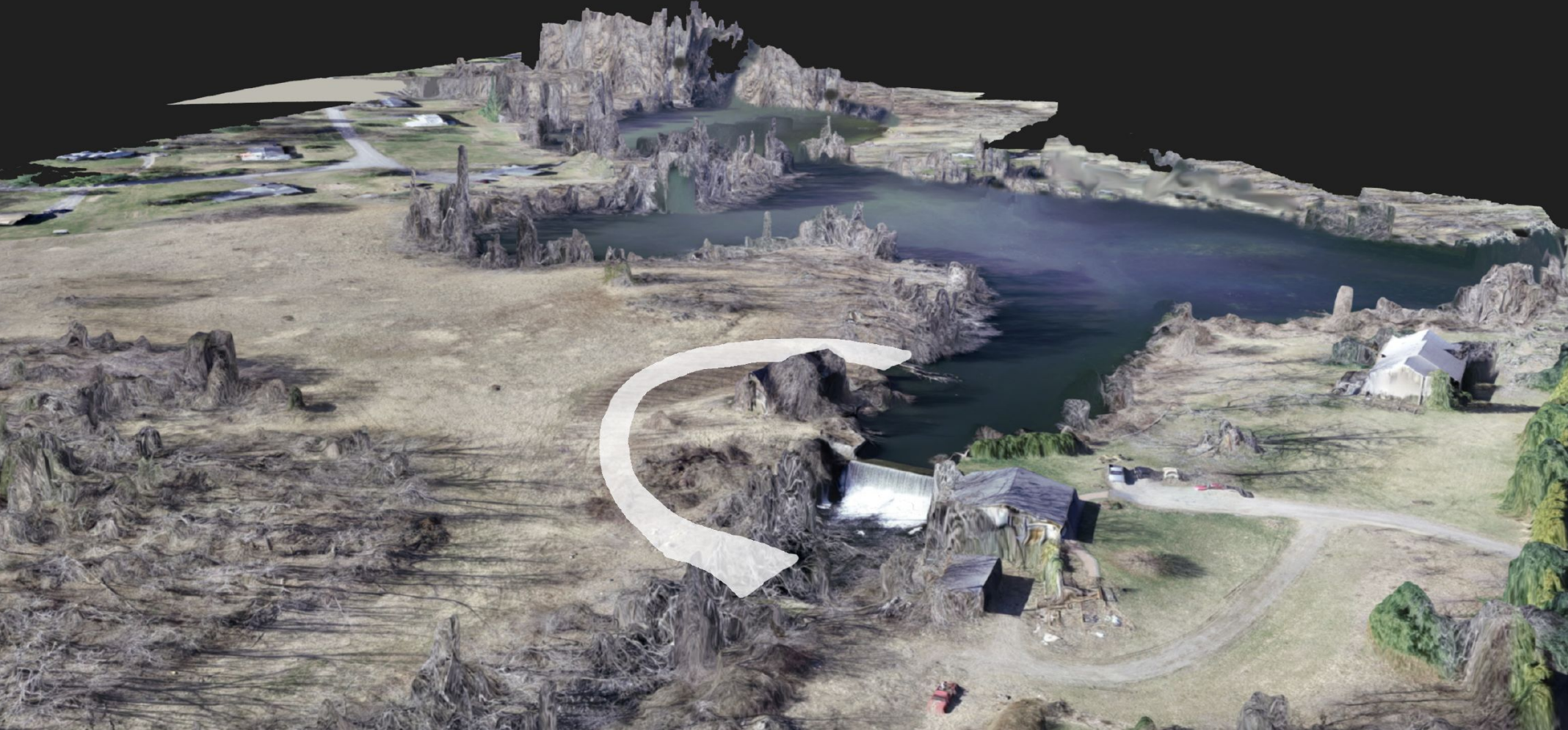
- Intake depth should be a precast concrete structure ~ 6 ft deep
- Penstock pipe would be about 6-6.5 feet deep, which would be at least 14 feet from soil surface to bedrock
- Microhydro installation would require an estimated 24 in. diameter pipe, with top of pipe 4 ft from average water surface. Invert would be about 6 ft below the crest of the dam. This would result in minor pond excavation and sediment relocation when placing intake structure. Excavated material would then likely be piled, graded, and seeded in field area near penstock alignment

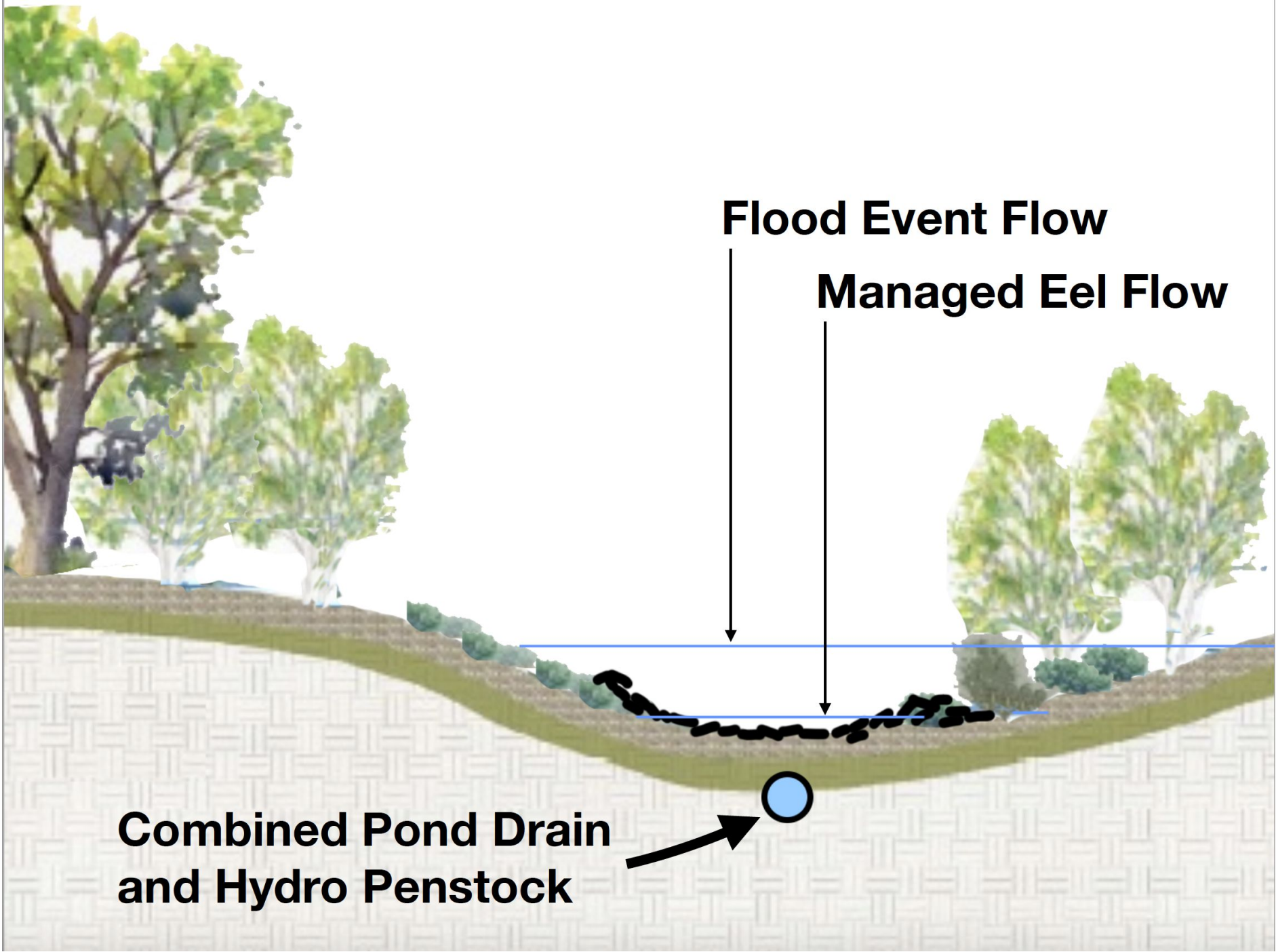
Moving forward with what's possible

Project Design Parameters

- Noticeable Flood Mitigation
- Maintain Beauty and Recreation
- Facilitate American Eel Migration
- Clean Energy Generation for 15 Homes

Path of Flood Channel, Eel Passage, Hydro Penstock





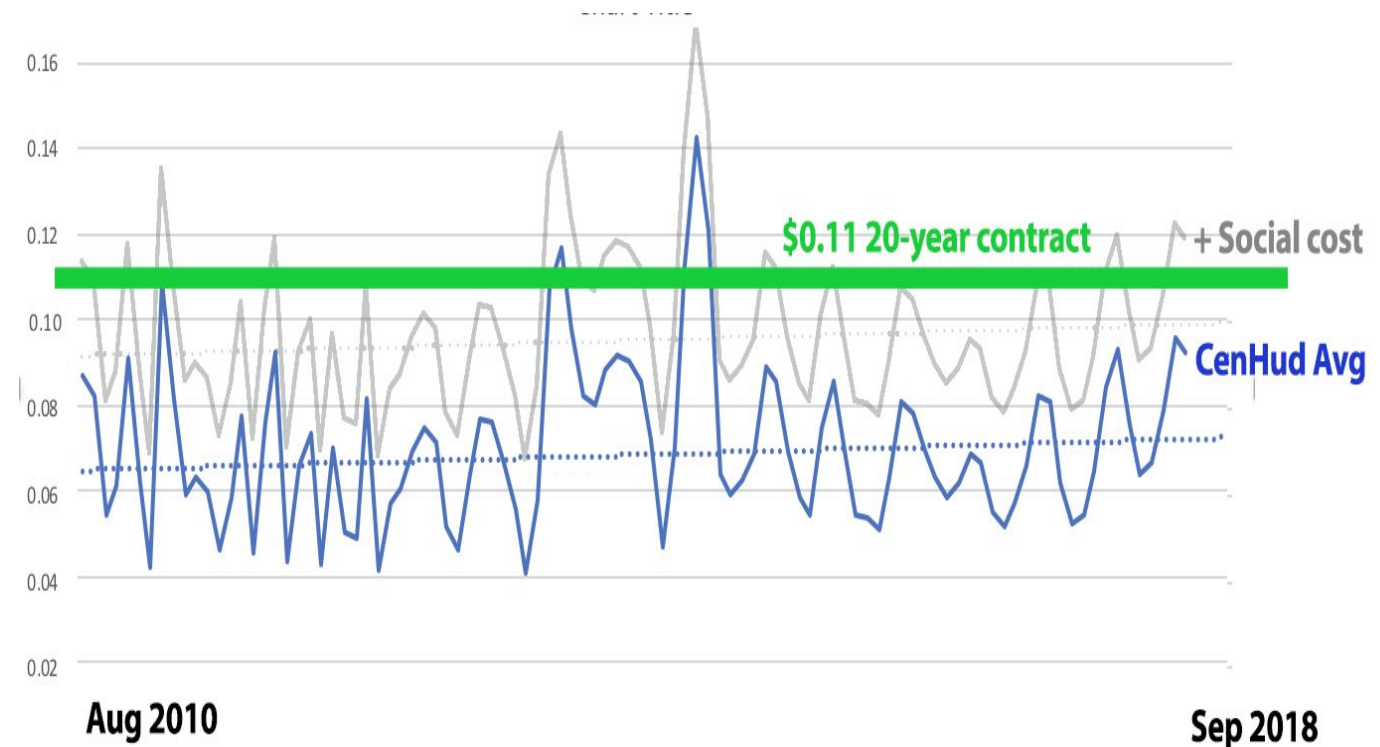


Passive Flood Channel
Active Low Level Outlet
Managed Eel Upstream Passage
Underground Microhydro Penstock



Costs, funding, sustainable revenue

- 20 kilowatt nameplate output
- 110,000 kilowatt-hours generated per year
- 15 homes supplied at \$0.11 energy charge
- \$27,000 expert assessment
- \$27,000 NYSERDA grant
- \$160,000 facility cost
- \$50,000 DEC flood grant
- \$110,000 private capital



Discussion and Next Steps

- What questions or comments do you have on the project?
- Any hopes or concerns?

THANK YOU!

For more info about NYS hydropower:

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