

# ROYAL RIVER YARMOUTH, MAINE AQUATIC ECOSYSTEM RESTORATION STUDY

CONTINUING AUTHORITIES PROGRAM  
SECTION 206

FEBRUARY 13, 2024



Presenters:

Janet Cote (Project Manager/Planner)

Ben Loyd (Environmental Resources &  
Marine Programs Section, Chief)

Tom Mhlbachler , Civil Engineer (Hydraulic)

New England District,  
U.S. Army Corps of Engineers



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# MEETING STRUCTURE

- We will begin with a short presentation and then we will open the meeting for questions.
- Hold your questions until after the presentation.
- State your name and business/agency (if you are an official representative) before making a comment and speak clearly for recording to capture comment accurately.







# MEETING STRUCTURE

- Comments received verbally during the public meeting or in writing will be captured as part of the studies official record.
- We will do our best to address the questions asked tonight, but we may need to get back to you with additional information.
- Meeting is being recorded and will be transcribed for the record.

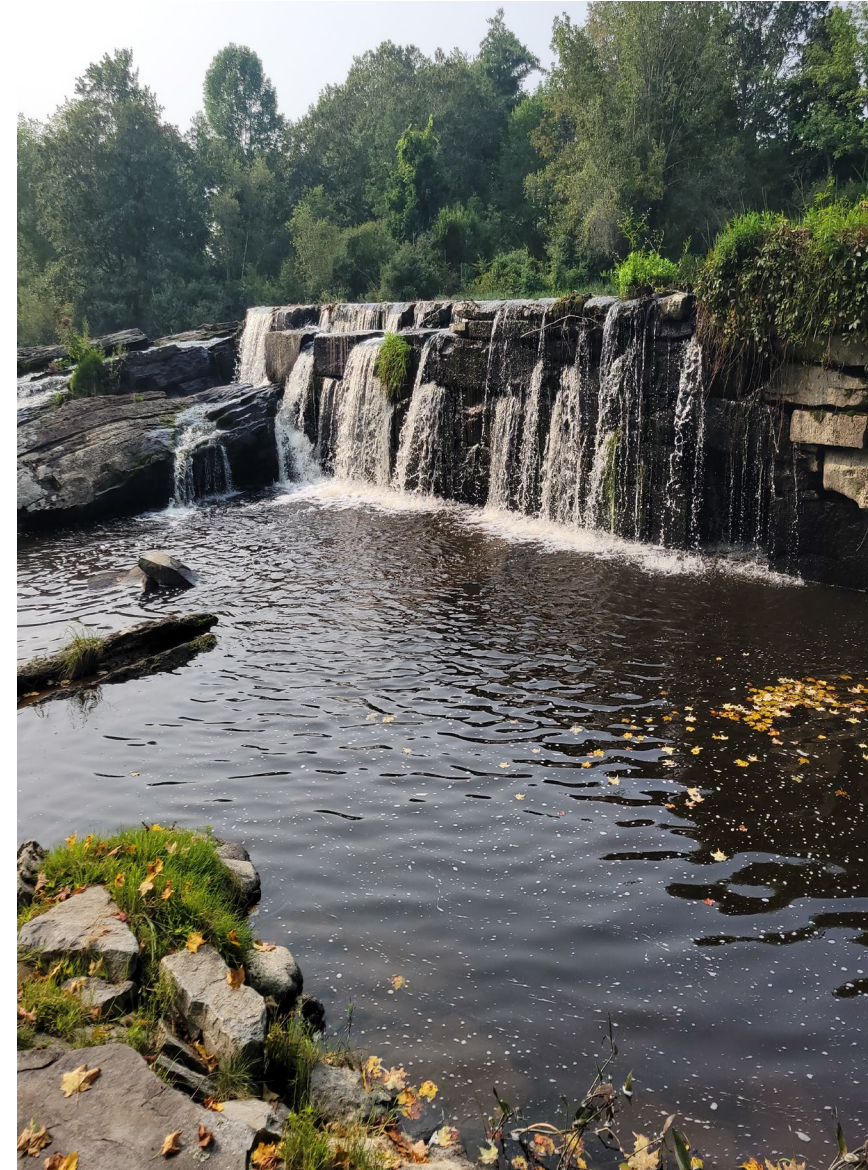






# RULES OF THE ROAD

- Turn your cameras off to save bandwidth.
- Please ensure your microphones are on mute.
- Be respectful of the other participants.
- Avoid disrespectful comments in the chat or when asking questions
- Refrain from using foul language.





## MEETING PRESENTERS

US Army Corps of Engineers (USACE) presenters include:

Beth Gosselin, Moderator (Public Affairs Office)

Janet Cote, Project Manager/Planner

Ben Loyd, Environmental Resources & Marine Programs Section, Chief

Tom Mihlbachler, Civil Engineer (Hydraulic)

Town of Yarmouth

Scott LaFlamme, Assistant Town Manager & Director of Economic  
Development

Also USACE Team Members attending:

Donnie Faughnan, Environmental Resource Specialist

Marc Paiva, Archeologist

Bill Mehr, Reality Specialist

Mike Andryuk, Geotechnical Engineer

Matthew Fleming, Civil Engineer (Geotechnical)



# MEETING AGENDA



## Meeting Goals

- Provide information about the Continuing Authorities Program study process.
- Provide an update on the Royal River study.
- To present new information about the sediment sampling efforts.

## Agenda

- Continuing Authorities Program
  - Overview of CAP and process
  - Feasibility Phase
- Sediment Information
  - Sediment Composition
  - Sediment Probing Data
- Study Update
  - Study Schedule
  - What is still left to do?
  - Public Review

# CONTINUING AUTHORITY PROGRAM (CAP)



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# CONTINUING AUTHORITIES PROGRAM (CAP)



- CAP consists of nine legislative authorities to plan, design, and implement certain types of water resources projects without additional project specific congressional authorization.
- The Royal River, Yarmouth, ME project is authorized by Section 206 - focuses on aquatic ecosystem restoration projects that 1. Improve the quality of the environment, 2. Are in the public interest, and 3. Are cost effective.
- CAP projects have two phases, a feasibility phase followed by a design and implementation phase.



1. Letter of Intent (from the nonfederal sponsor)  
Feasibility Phase
- 2. Federal Interest Determination
  - 3. Feasibility Cost-Share Agreement (FCSA)
  - 4. Feasibility Study/Environmental Assessment

- Design & Implementation Phase
- 5. Project Partnership Agreement (PPA)
  - 6. Design
  - 7. Construction
  - 8. Operations & Maintenance





# FEASIBILITY PHASE – WHAT IS IT?



**Goal** – To obtain authority to construct a solution to a problem

1. Determine federal interested – Federal interest determination Report  
√ Completed
2. Recommend a project to decision-makers

**Scoping**

**Alternative Evaluation**

**Feasibility Analysis of Selected Plan**

**Review & Approval**

Develop & evaluate a range of alternatives to identify a tentatively selected plan

Refine and optimize the selected plan

➤ Must comply with Federal Laws (National Environmental Policy Act - NEPA)

**Phase Completion** - Once the final report/Environmental Assessment (EA) has been approved.

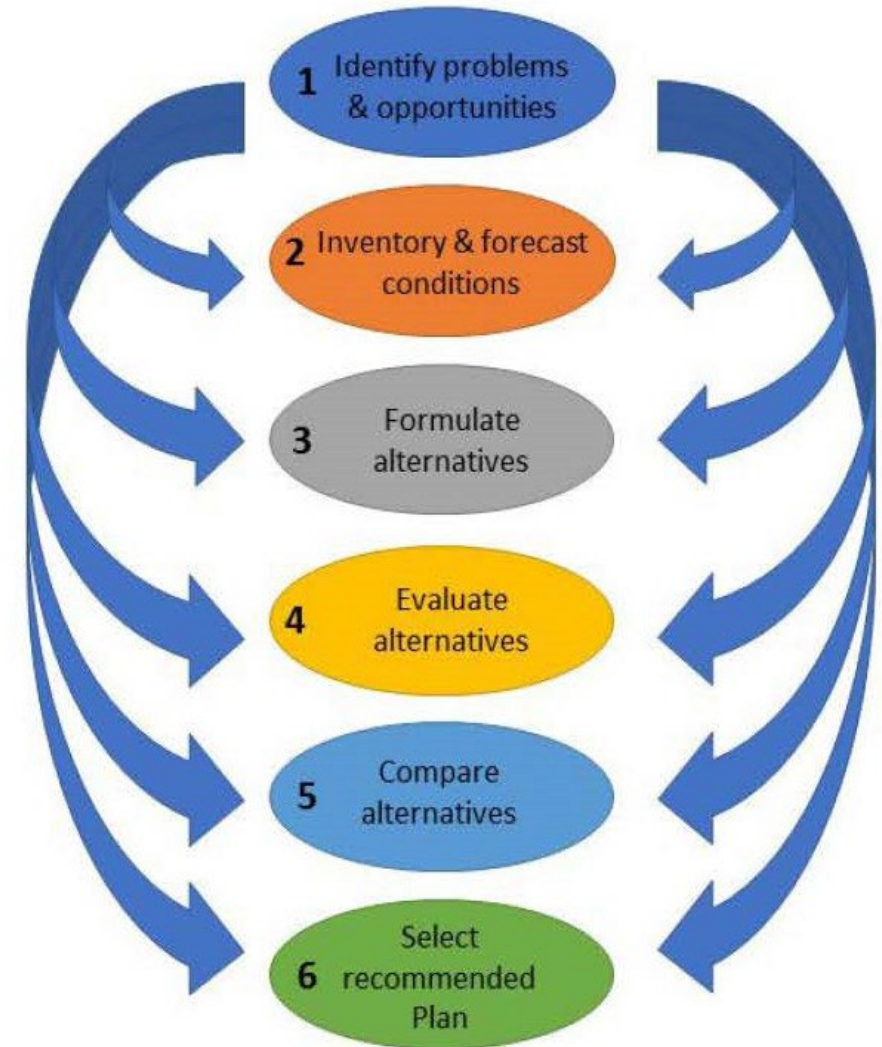


# FEASIBILITY PHASE – WORK TO DATE



- Described the existing conditions of the study area using existing information and collecting new data.
- Develop H&H modeling to describe existing and future channel conditions.
- Developed measures at each dam location that benefit the environment and provide aquatic ecosystem restoration.
- Developed initial designs, begun assessing benefits and costs of each measure.
- Formulating a reasonable range of alternatives, with significantly different approaches to address aquatic ecosystem restoration.
- Coordinated and completed a site visit with resources agencies
- Assessed property ownership and other real estate concerns in the study area.

USACE 6 Step Process





# MEASURES FOR ECOSYSTEM RESTORATION



## Current Measures

### Bridge Street Dam

1. Remove the existing fish ladder & construct of a new fish passage structure
2. Dam & fish ladder removal

### East Elm Street Dam

3. Remove the existing fish ladder & construct of a new fish passage structure
4. Dam & fish ladder removal

### Middle Falls

5. Currently in development.

*Resources agencies, including the USFWS and Maine DIFW, have identified Middle Falls as a barrier to fish passage from the Bridge Street impoundment to Elm Street Dam.*



- Develop an array of **Alternative Plans** from the measures.
- Each plan will include a measure at East Elm Street + a measure at Bridge Street + Middle Falls.



# NEW SEDIMENT INFORMATION



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# OCTOBER 2023 SAMPLING AND TESTING



USACE October 2023 field effort to fill project data gaps:

- Assess the extent and level of mercury contamination below the Bridge Street Dam as indicated by 2009 Stantec efforts
- Characterize the sediments in the East Elm Street Dam impoundment
- Samples of the sediment overlying the bedrock surface collected at 5 stations downstream of the Bridge Street Dam and at 10 stations upstream of the East Elm Street Dam
- Analyzed for grain size, moisture content, total organic carbon (TOC), metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and pesticides







# SEDIMENT SAMPLING



## Below Bridge Street Dam

- Riverbed is scoured bedrock with areas of boulder/cobble substrate
- Samples collected immediately adjacent to banks, the only apparent sediment source in vicinity
- Depth of sediment overlying bedrock was shallow (0.1-1ft)
- Sampled bank material was sand and organic silt or cobble/gravel







# SEDIMENT SAMPLING



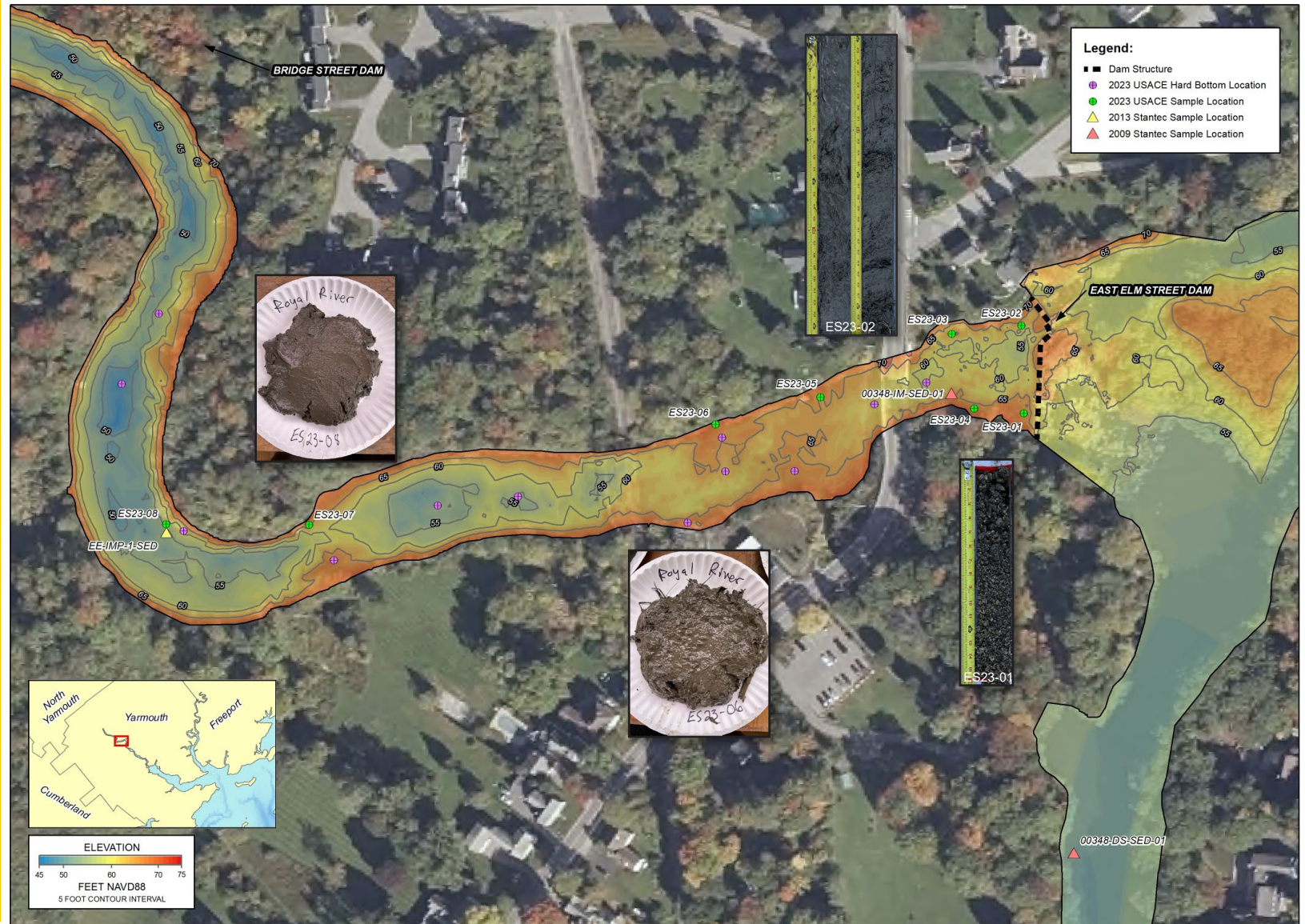
## East Elm Street Impoundment

Riverbed is primarily scoured bedrock

Only significant accumulation of sediment is along banks adjacent to the dam (cores 1 - 4ft long)

Samples upstream collected immediately adjacent to banks or isolated pockets of sediment in channel (vaneer of sediment sampled with grab)

Poorly graded sand and organic silt with gravel or all sand/gravel





# TESTING RESULTS



Analysis results compared to data from upstream portion of the Federal Navigation Project (FNP) and screened using applicable Sediment Quality Guidelines (SQGs):

*Threshold Effect Concentrations (TEC) and Probable Effects Concentrations (PEC) MacDonald et al (2000)*

## **Below Bridge Street Dam**

- All concentrations below TECs and mean concentrations documented in FNP

## **East Elm Street Dam Impoundment**

- Samples immediately adjacent to the Dam on either shoreline (ES23-01 and ES23-02) contained individual PAHs, a single pesticide group (DDx isomers) and lead (*in ES23-02 only*) at concentrations above TECs, but below associated PECs. Somewhat higher than found at the FNP.
- One upstream station along the eastern bank (ES23-03) also contained individual PAHs and DDx isomers. Somewhat higher than FNP.
- Concentrations at all other stations were below TECs and mean concentrations documented in the FNP.



# CONCLUSIONS



- Riverbed in both areas is primarily scoured bedrock and coarse substrate with a fringe of sediment along portions of each bank
- Majority of the sediments within channel profile appear to be highly mobile
- No trace of the mercury contamination downstream of Bridge Street Dam
- Bulk chemical concentrations documented in sediment samples from both areas were generally very low
- PAHs, DDX, and lead in a subset of samples from isolated depositional areas above the East Elm Street Dam were above mean FNP concentrations/ TECs, but below (typically well below) PECs

*Resuspension and downstream transport will result in significant mixing and dilution  
Resulting in Concentrations comparable to or lower those documented in the FNP*



- Study area sediments pose minimal potential risk to the marine environment in the Royal River estuary and Casco Bay under any of the proposed restoration project alternatives





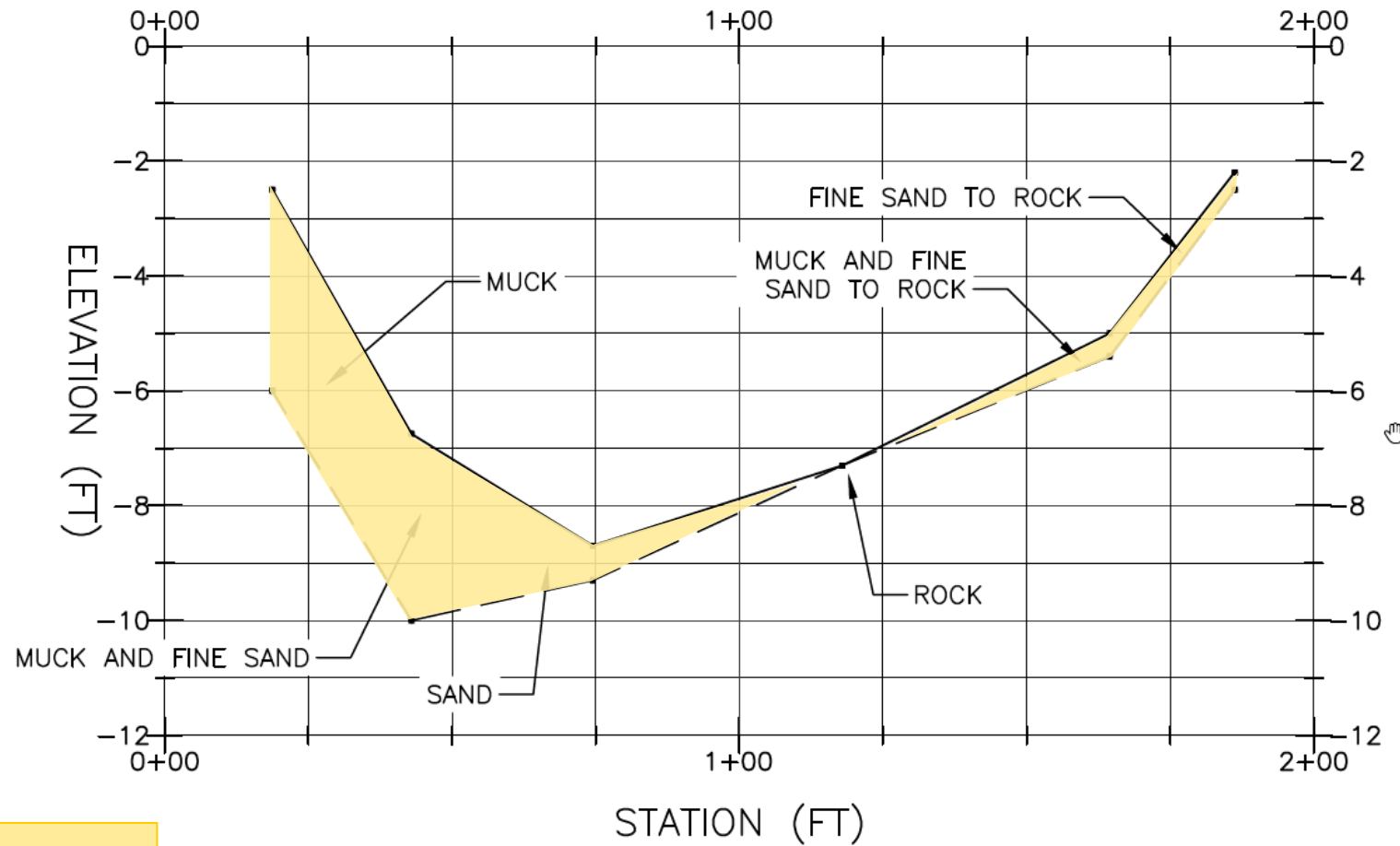
# DECEMBER 2023 SEDIMENT PROBING



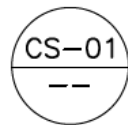
- Stantec Consulting Services Inc. performed on December 15, 2023
- Sampling Objectives:
  1. Estimate the depth of accumulated sediment along transects upstream of the East Elm Street and Bridge Street dams.
  2. Characterize the sediment along the transects by general substrate type.
  3. Prepare figures and a summary table of the sediment depth and characterization data.
- Approximately 1,800 ft section upstream of Bridge Street Dam and approximately 500 ft section upstream of Elm Street Dam.
- Six transects at each site were collected.



# SEDIMENT PROBING PROFILE



**Solid Line – River Bottom**  
**Dashed Line – Bedrock**  
**Space between – Sediment Layer**

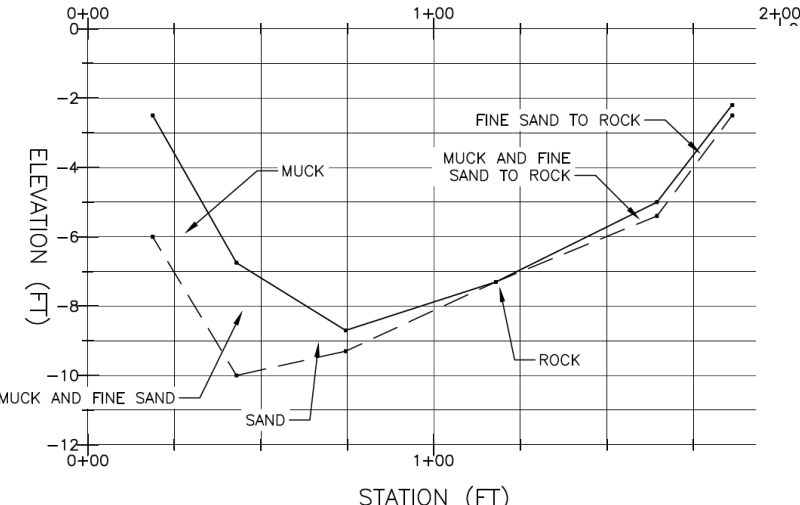


CROSS-SECTION 01

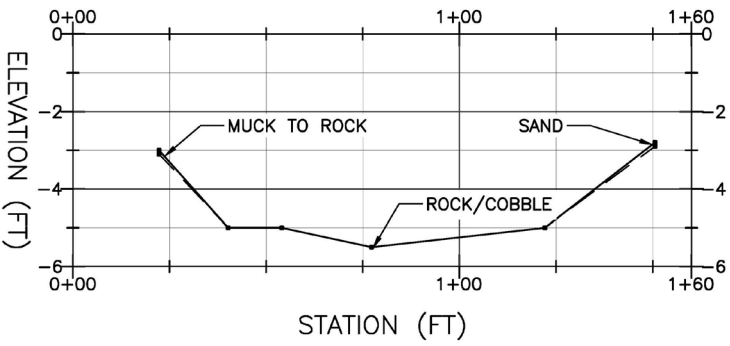
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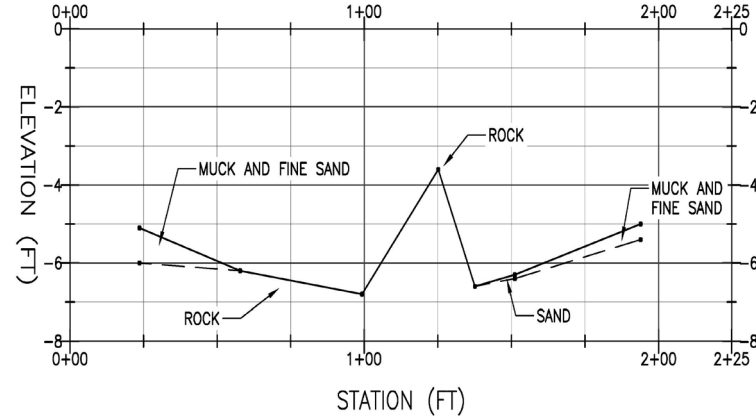
# BRIDGE STREET SEDIMENT PROBING



CS-01 CROSS-SECTION 01  
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CS-04 CROSS-SECTION 04  
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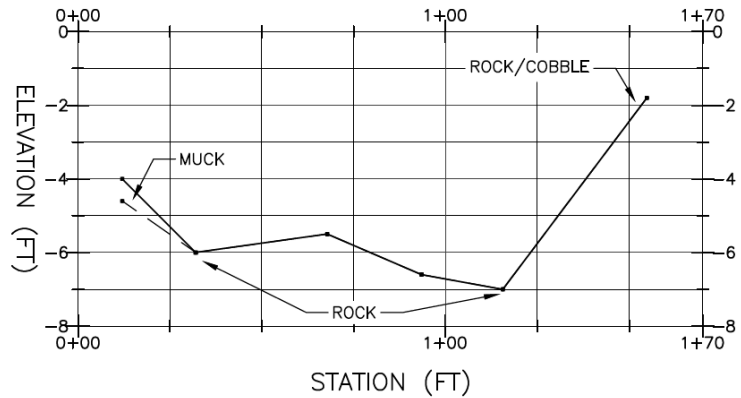
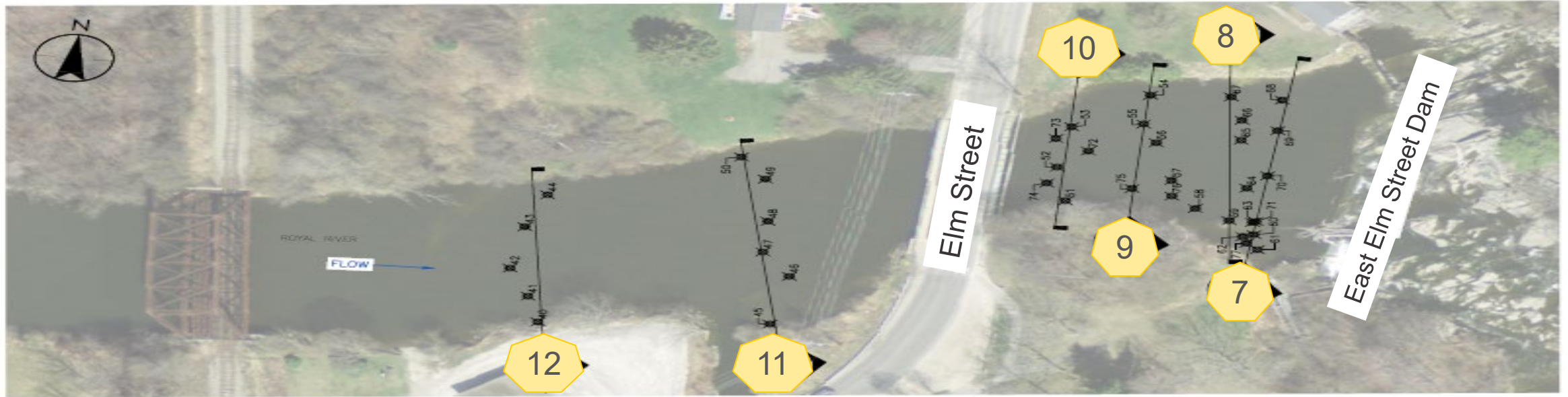


CS-06 CROSS-SECTION 06  
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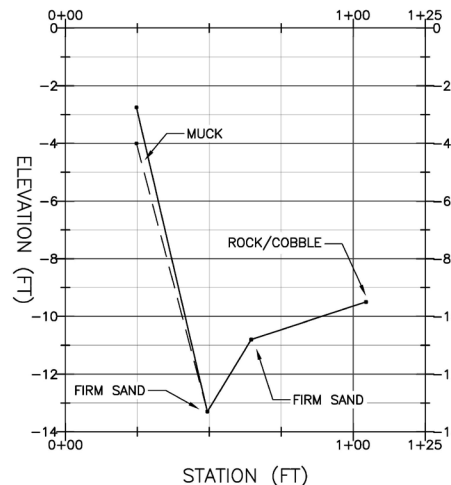




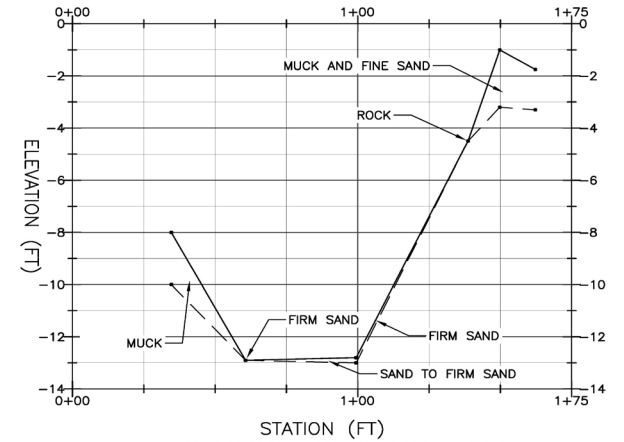
# EAST ELM STREET SEDIMENT PROBING



CS-11 CROSS-SECTION 11  
SCALE: AS SHOWN



CS-09 CROSS-SECTION 09  
SCALE: AS SHOWN



CS-07 CROSS-SECTION 07  
SCALE: AS SHOWN





# CONCLUSIONS



- The findings of the effort were consistent with the Oct 2023 sampling effort in that the river bottom has little to no soft sediment and consists of bedrock/cobble.
- When soft sediment were present, they were mostly found along riverbanks.



# THE ROYAL RIVER, SECTION 206 FEASIBILITY STUDY



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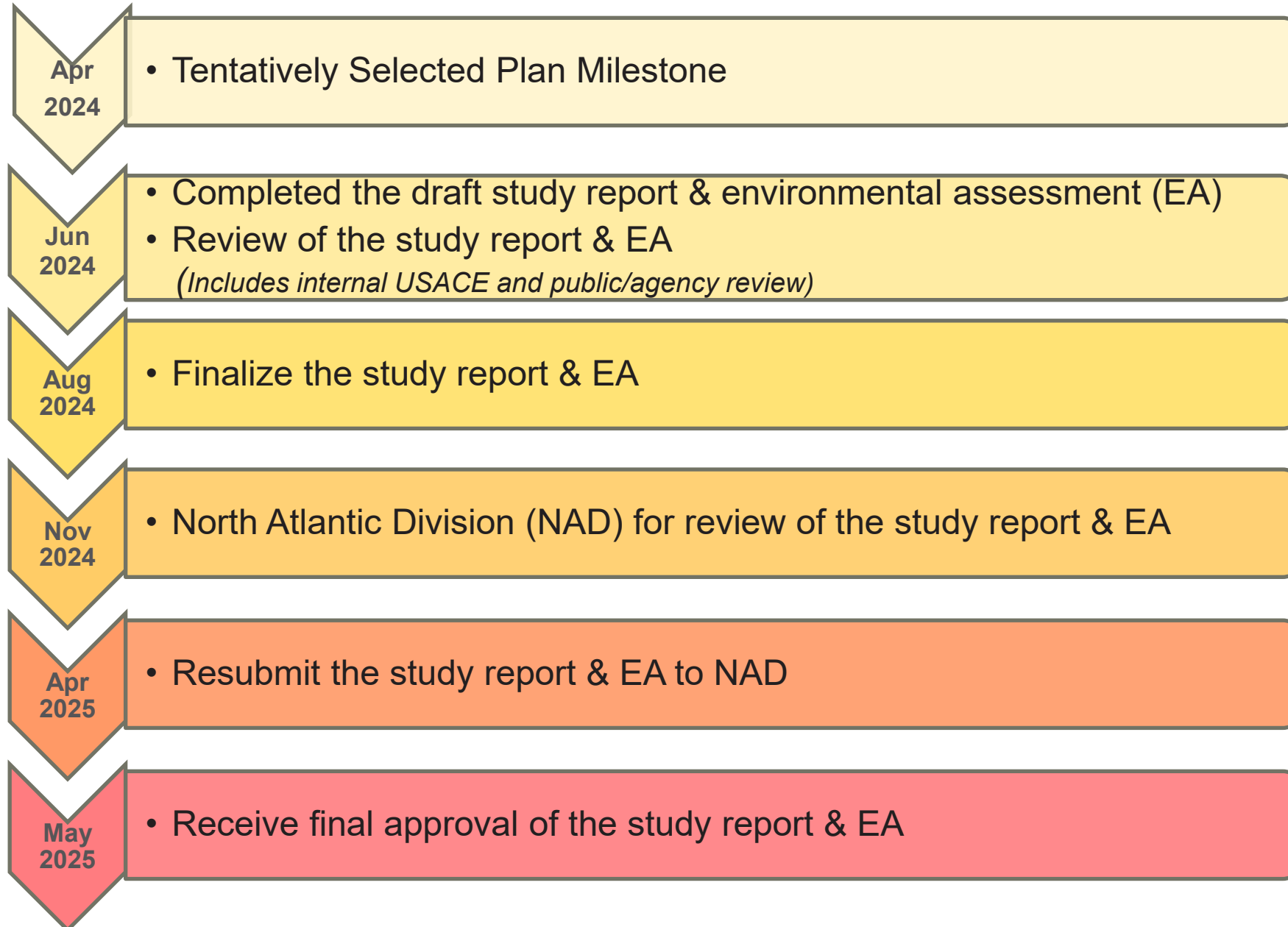
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# WHAT'S NEXT?





# TASKS TO COMPLETE BEFORE THE TSP MILESTONE



**Sediment Transport Assessment** – To understand the impacts of water level changes upstream of the East Elm Street Dam, an expert from the Engineer Research & Development Center (ERDC) is assessing fluvial geomorphological and sediment production/transport. The expert is considering another visit to the study site and will complete their assessment.

**Middle Falls Measure** – Design a measure at Middle Falls to ensure fish passage past the falls.

**Tentatively Selected Plan** – Develop alternative plans, which will be compared. The TSP must:

1. Generates the most benefits per dollar (Best Buy plan) and,
2. Best aligns with the study objectives will be the TSP





# PUBLIC REVIEW – JUNE 2024



**Draft Detail Project Report & Environmental Assessment** – The draft study report & EA will be completed and made available to the public, resource agencies and stakeholders.

**Public Review Period** – Is required by NEPA. A minimum 30-day comment period is required. During that time, interested parties will be able to provide comments. Comments received verbally during the public meeting or in writing will be included in the Responsiveness Summary section of the Record of Decision.

**Public Meeting** – Another public meeting will be held at the start of the Public review period. The meeting will focus on the tentatively selected plan and how it was developed.







# SUMMARY



- The Royal River study is part of the Continuing Authority Program and is authorized by Section 206, which focuses on Aquatic Ecosystem Restoration
- The study is currently in the Feasibility Phase.
- The team is investigating ecosystem restoration measures at the East Elm Street Dam, Bridge Street Dam and Middle Falls.
- New information about the river sediment has been collected.
- Riverbed in both areas is primarily scoured bedrock and coarse substrate with a fringe of sediment along portions of each bank
- Bulk chemical concentrations documented in sediment samples from both areas were generally very low. Found 3 sites with PAH and DDx and 1 site with lead concentrations above TEC.
- The next milestone for the study is the Tentatively Selected Plan milestone.
- Review of the draft Detail Project Report/EA is currently scheduled to begin in June 2024. As part of that review period, there will be a public review, when we will ask for comment.

# QUESTIONS

## CONTACT INFORMATION

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**WEBSITE:** <https://www.nae.usace.army.mil/missions/projects-topics/royal-river-aquatic-ecosystem-restoration-study/>



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