River Street Pump Station Upgrade

Dover, NH

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John Storer, Director of Community Services
Tim Vadney, PE, Wright-Pierce

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Presentation Overview

- Introduction
- Proposed Funding
- Station Condition & Concerns
- Previous Projects & Planning
- Facility Plan
- Proposed Upgrade
- Schedule
- Next Steps

Funding

- **2020 General Permit**
  - **No upgrades required at WWTF due to stability of existing processes**
- **Shift Focus on next highest priority**
  - **Waterfront development**
  - **Increased public presence**
  - **Address odor and reliability**

Funding

- **Capital Improvement Plan (CIP)**
  - **Current budget includes $1M for Odor Control Upgrades**
  - **Ongoing meetings with Cathartes**
- **Proposed CWSRF Funding**
  - **$7.2 Loan**
  - **> $900K in Principal Forgiveness**

River Street Pumping Station

- **Constructed in 1991**
  - **Allowed for relocation of WWTF to its current location**
  - **Serves as headworks for 80% of City's flow to WWTF**
- **The River Street Pump Station is the City's largest wastewater pumping station**
- **Conveys flows up to17 MGD to the WWTF**
  - **Dry & Wet Weather Flow Pumping**
  - **Influent Screening & Grit Removal**

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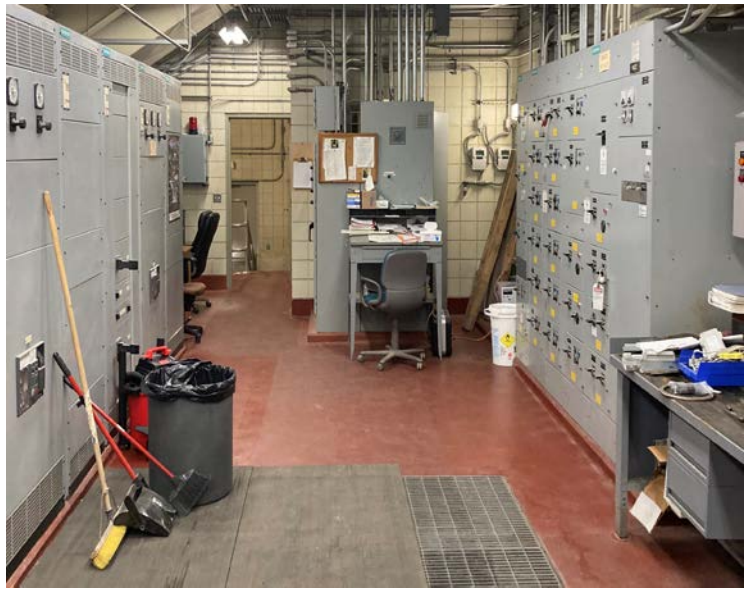
River Street Pumping Station

Most of the building systems, control systems, and electrical gear are outdated and beyond their useful life

In 2018, a VFD failed due to fire incident. In 2019, VFDs were replaced and will be reused as part of upgrade



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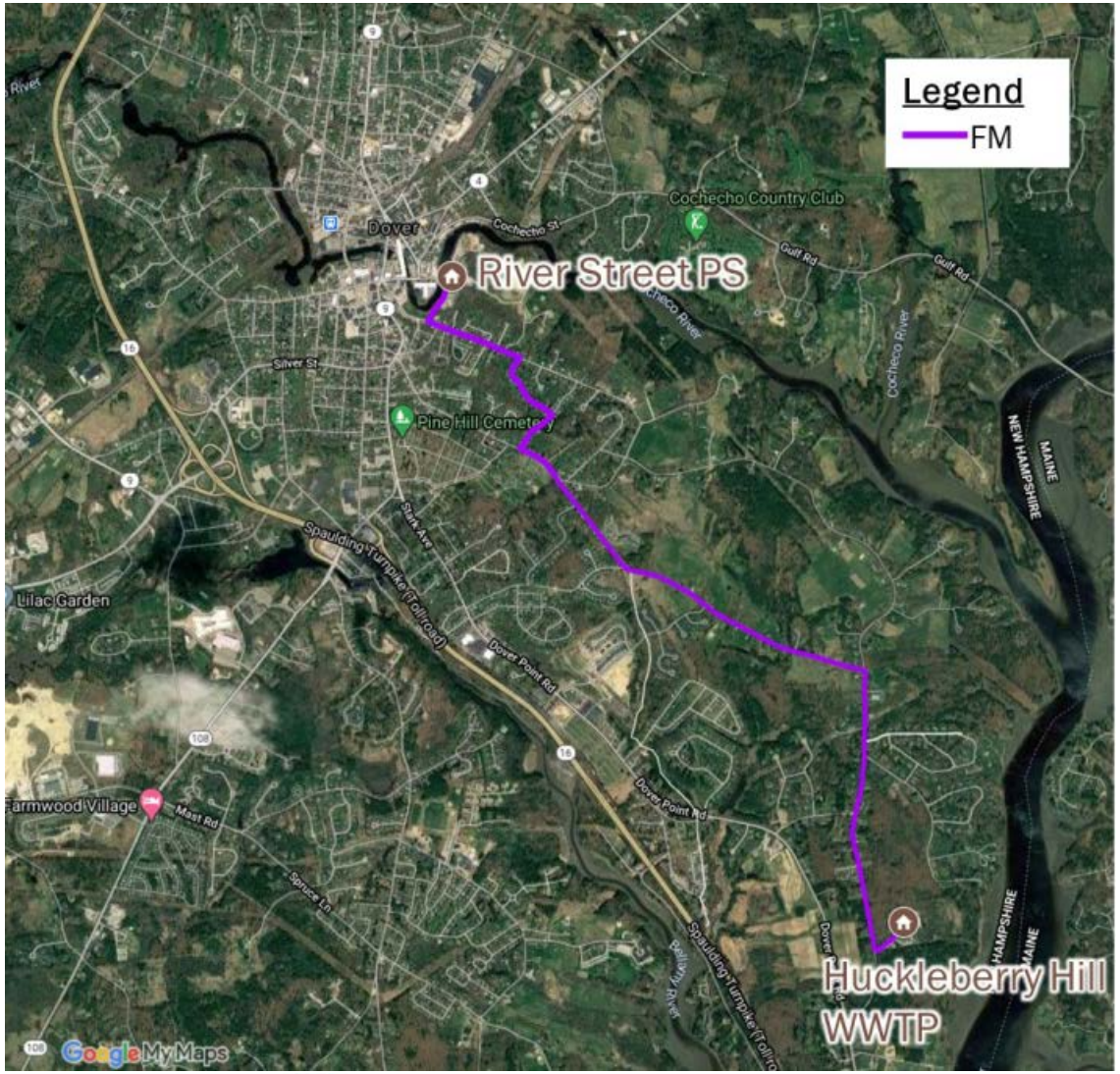
Why Upgrade Now?

1. **Address aged equipment and ancillary systems for this critical station**

2. **2020 Facility Plan indicated select areas of the station are in poor condition**

3. **Address odor concerns ahead of waterfront development**

Reliability Concerns



- **Force Main**
  - **Single, 36-inch prestressed concrete pipe**
  - **~ 3-mile**
  - **30 years old**
  - **Biggest redundancy and emergency response concern**
- **Development of bypass plan**
- **Consideration of overflow tank**

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City of Dover Wastewater Experience

WWTF Upgrades

- 2014 Upgrade & MLE conversion
- 2021 Cleanings Facility Upgrade

Pump Station and Force Main Upgrades

- 2007 Varney Brook PS Force Main Replacement
- 2007 River St PS Master Plan
- 2010 River St PS Upgrade
- 2019 River St PS VFD Replacement
- 2020/2021 Varney Brook PS Upgrade

Collection System I/I Initiatives

- Manhole inspections, CCTV, Dye and Smoke Testing
- Infiltration/Inflow evaluation & mitigation
- Roof Leader Investigations
- Sewer replacement

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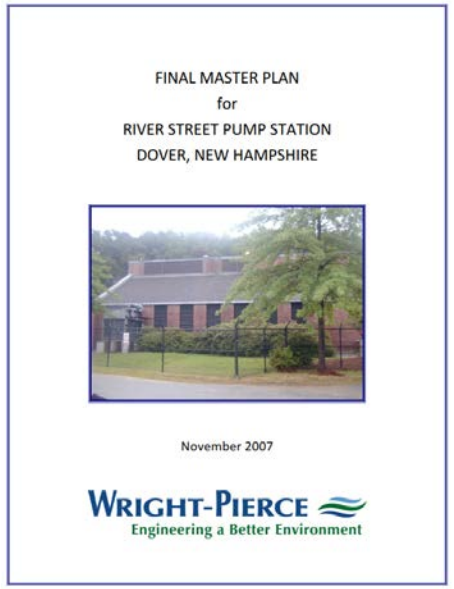
Previous River Street Pump Station Work



2007 Master Plan

2010 Upgrade

- New Influent Screening;
- Grit Removal;
- Chemical Feed;
- Dry Weather Pumping
- Construction of sodium hypo chemical storage and garage

2019 VFD Replacement

- Replaced existing pump variable frequency drives (VFD) in kind

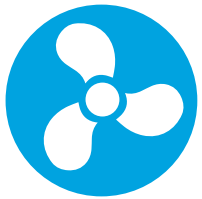
2021 Facility Plan

- Condition Assessment
- Conceptual Design
- Recommended improvement projects for future upgrade

River Street Pump Station Facility Plan

- **River Street Pump Station - next highest priority for City**
  - **Performed comprehensive pump station evaluation**
  - **Prepared recommendations for select building upgrades**
  - **Review of process systems for current and future conditions**
  - **Framed the blueprint for next upgrade**

Architectural/ Structural



Mechanical/ Plumbing

Electrical/ Instrumentation

Civil-Site Work

Process

SCADA Integration

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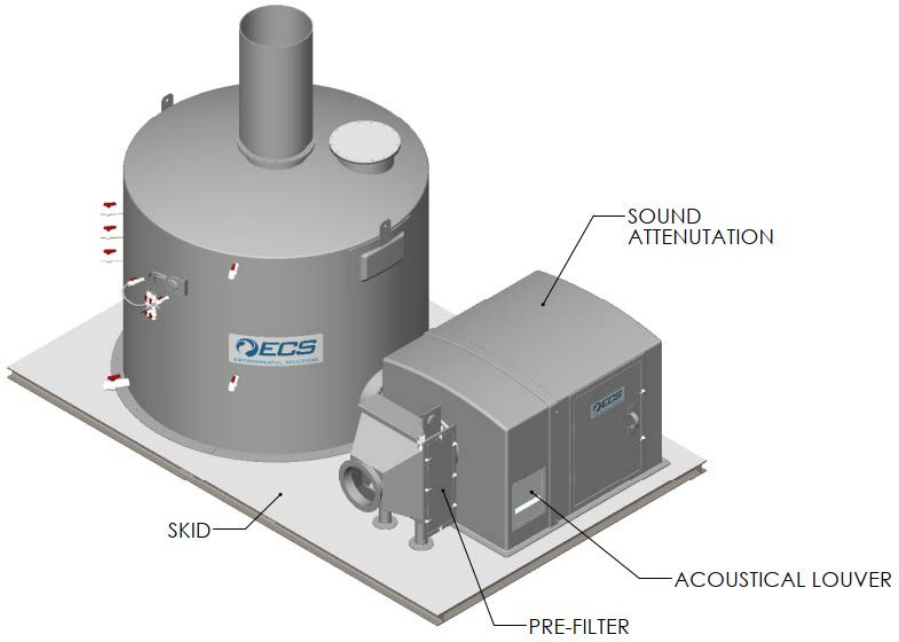
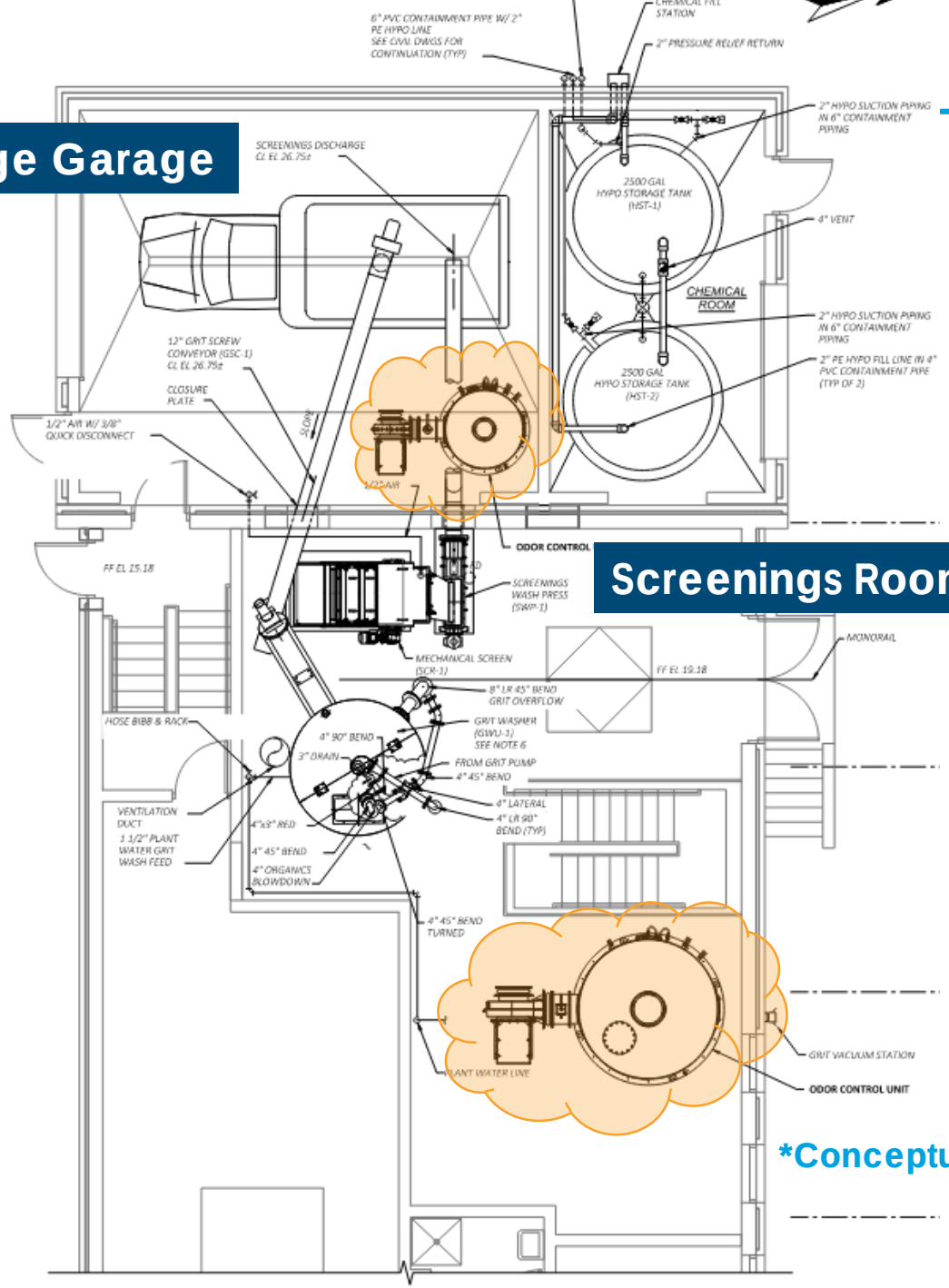
Odor Control Mitigation

- **Surrounding area to be developed - Cathartes**
- **Sludge Garage is source of significant odor production**
- **Odor Control = High Priority!**

Odor Control

- **Activated Carbon Units**
- **Reliable performance**
- **Low capital and maintenance costs**
- **Easy operation**





*Conceptual Design

Sequence of Work

- **Consideration given to initial Odor Control Upgrades**
  - **Requires additional planning for integration of:**
    - **HVAC**
    - **Electrical**
    - **Instrumentation**
  - **Cost-effective to complete all improvements at once**
  - **Single project allows for all work to be complete prior to waterfront development**

Proposed Upgrade

1

Odor Control

- Install two new Odor Control Units with one unit dedicated for the Sludge Garage
- Consider activated carbon systems
- Reduce on-site odors

2

Update Process Systems

- Grit system improvements
- New Grinder
- New process piping, valves, and gates
- Updates to chemical feed system

3

Building Updates

- Upgrades to the building structure including the roof, masonry, doors, and louvers
- HVAC updates
- PLC/SCADA updates
- New electrical room
- New Generator and automatic Transfer equipment

4

Ancillary Improvements

- Cleanout and Air Release Valve replacements along force main
- Surge Tank updates
- Establish emergency bypass plan for force main and purchase response equipment

Proposed Schedule

Milestone	Date*
Begin Design	**September 2021**
Bid Opening	**May 2022**
Begin Construction	**June 2022**
Project Substantial Completion	**April 2023**
Initiation of Operation	**May 2023**

***Dates subject to change**

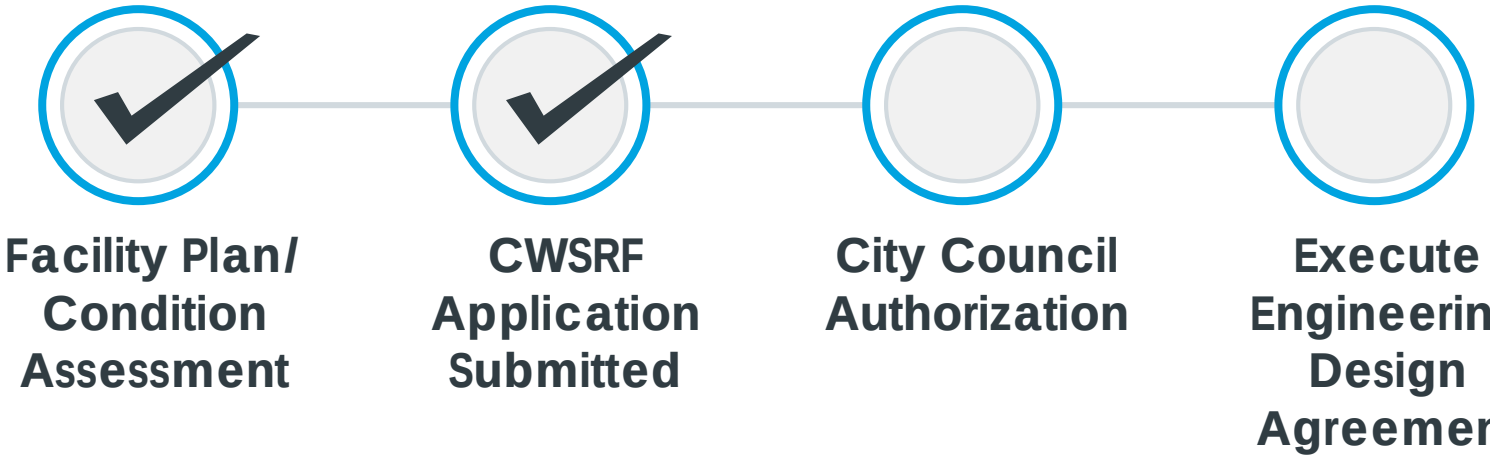
Proposed Project Costs

CITY OF DOVER, NEW HAMPSHIRE
W-P PROJECT NO. 20494A – RIVER STREET PUMP STATION UPGRADE
CONCEPTUAL DESIGN
PROJECT COST ESTIMATE, APRIL 2021

PROJECT COMPONENT		COST
CONSTRUCTION		$6,110,000
CONSTRUCTION CONTINGENCY	10%	$610,000
TECHNICAL SERVICES ALLOWANCE	20%	$1,222,000
MATERIALS TESTING	1%	$61,000
LEGAL/ ADMINISTRATIVE	2%	$122,000
SUBTOTAL		$8,125,000
FINANCING	1.0%	$81,000
ENGINEER'S ESTIMATE OF PROJECT COST		**$8,206,000**

Notes:
1) Cost estimate is based on ENR CCI 11749 (dated March 2021).

Next Steps


Facility Plan/ Condition Assessment
CWSRF Application Submitted
City Council Authorization
Execute Engineering Design Agreement

THANK YOU