2021-2022 RiverRenew Stakeholder Advisory Group

Meeting No. 2

April 15, 2021
SAG Meeting No.2 Outline

- Questions From SAG Meeting No. 1
- RiverRenew.com Website Refresh
- Rate Adjustment Update
- Tunnel Boring Machine 101

Break

- Right of Entry to Support Surveys and Monitoring
- Tunnel Project Construction Update
- Next Steps
- Public Comment Period
Tonight’s Speakers

Karen Pallansch
Chief Executive Officer

Caitlin Feehan
Program Director

Justin Carl
Program Manager

Mike Krulc
Project Director, Tunnel Project
## Virtual Meeting Best Practices

<table>
<thead>
<tr>
<th>Video</th>
<th>Audio</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Camera turned on</strong> for SAG members, when possible</td>
<td>• <strong>Microphones muted</strong> unless speaking</td>
<td>• Questions for <strong>SAG members only</strong> will be taken <strong>after each section</strong></td>
</tr>
<tr>
<td></td>
<td>• Avoid speaking over or interrupting each other (<a href="#">see Ground Rules</a>)</td>
<td>• Please use the “Raise Hand” button to ask a question</td>
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<tr>
<td></td>
<td></td>
<td>• Questions will be <strong>answered in the order received</strong></td>
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<tr>
<td></td>
<td></td>
<td>• <strong>Public comment</strong> will be taken at the end of the meeting. Each speaker will be allotted <strong>3 minutes</strong></td>
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</tbody>
</table>
Ground Rules for a Productive SAG Meeting

Help the group enforce these ground rules

Avoid repeating what was just said; instead, build on previous comments or identify new thoughts to contribute

Every person in the group gets a chance to speak once before anyone speaks twice

Be explicit when you speak whether you are speaking for yourself, or sharing input provided by those you represent

Suspend judgment, even when you disagree

Be aware of assumptions, especially your own

Please direct all questions to Caitlin or Justin
SAG Feedback

- Review and monitor construction/program progress
- Communicate progress to the community by leveraging existing networks
- Identify concerns and receive input from the public
- Provide recommendations regarding mitigation of construction impacts
Questions from SAG Meeting No. 1
1992 Archeological Survey of Baptist Cemetery Graves

THE AFRICAN AMERICAN HERITAGE PARK, ALEXANDRIA, VIRGINIA

ADRIAN G. ANDERSON

ALLAN WESTOVER
PRINCIPAL INVESTIGATOR

TELDES CONSULTANTS
MINNEAPOLIS, MINNESOTA
1992
Existing Commonwealth Interceptor Route between Duke Street and AlexRenew
Proposed Hooffs Run Interceptor Route between Duke Street and AlexRenew
During Dry Weather, the Flow Split between Alexandria and Fairfax is 40 Percent and 60 Percent
The Wet Weather Flow Percentages Delivered to RiverRenew Facilities from Alexandria and Fairfax Established the RiverRenew Cost Share

- 92% of wet weather flow from combined sewer system to RiverRenew facilities
- 8% of wet weather flow to RiverRenew facilities

**Legend**
- Fairfax County Separate Sewer System (24,578 acres)
- Alexandria Separate Sewer System (8,254 acres)
- Alexandria Combined Sewer System (540 acres)
- Alexandria Sewershed treated at Arlington WPCF (732 acres)
## Potential Disposal Sites for Tunnel Project Excavated Materials

<table>
<thead>
<tr>
<th>Potential Disposal Site</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>King George Landfill, Inc.</td>
<td>King George, VA</td>
</tr>
<tr>
<td>Global Green Recycling, LLC</td>
<td>Waldorf, MD</td>
</tr>
<tr>
<td>Reeder Dump Holsinger North Pit</td>
<td>Brandywine, MD</td>
</tr>
<tr>
<td>SandyFill Reclamation, LLC</td>
<td>Harwood, MD</td>
</tr>
<tr>
<td>Recycling Harford Sands, Inc</td>
<td>Joppatowne, MD</td>
</tr>
</tbody>
</table>
Investing in Healthier Waterways for Alexandria

Dive into AlexRenew’s ambitious environmental initiative to help save our waterways from millions of gallons of combined sewer pollution each year.
Alexandria’s Pollution Problem

As the largest infrastructure project in Alexandria’s history, RiverRenew will prevent millions of gallons of combined sewage from polluting our rivers and streams each year.

Combined sewage is a mixture of rainwater and sewage that overflows to the Potomac River, Hunting Creek, and Hooffs Run throughout the year on rainy days. These overflows take place at four existing locations, called outfalls, around Alexandria. As little as one-quarter inch of rain causes these overflows, filling our waterways with 140 million gallons of untreated sewage each year.

Through RiverRenew, we will manage these combined sewer overflows to achieve cleaner, healthier waterways for Alexandria.
Meet Cloe!

Hi, I'm Cloe the Tunnel Boring Machine. Looking for a fun way to learn more about RiverRenew and how it will help Alexandria's waterways? Come with me!

Check out my page for interactive learning activities and games for water lovers of all ages.

In Our Community

SAG Meeting (Virtual)
Feb. 4, 2021
1:00 PM
Location
Alexandria, VA 22314

Earth Day
Apr. 22, 2021
1:00 PM
Location
Alexandria, VA 22314

Water Discovery Day
Sept. 14, 2021
1:00 PM
Location
Alexandria, VA 22314
Rate Adjustment Update
RiverRenew Spending Plan

Legend:
- Total RiverRenew Spend to Date
- Estimated RiverRenew Spend
- Total RiverRenew Spend to Date (Fairfax County)
- Total RiverRenew Spend to Date (AlexRenew)

Spent to Date:
- $87M
- $615M
RiverRenew Capital Funding Plan

- **1.88% Interest Rate Loan** through EPA’s Water Infrastructure Finance and Innovation (WIFIA) Act
  - $321M

- **1.35% Interest Rate Loan** through Virginia Clean Water Revolving Loan Fund (VCWRLF)
  - PayGo (Cash)
  - $185M
  - Fairfax Share
  - $48M
  - Virginia General Assembly Grant Received
  - $25M

*Note: Values rounded for clarity*
Current RiverRenew Fee Projections Are on the Lower End of Original Projections from April 2018 Due to Locked-In Historic Low Interest Rates

Note: Based on 4,000 gallons consumption, excluding City charge
AlexRenew is Proposing a Rate Adjustment for the Next Two Fiscal Years

### Proposed Two-Year Rate Adjustment

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Beginning on:</th>
<th>Maximum Rate Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>July 1, 2021</td>
<td>6.9%</td>
</tr>
<tr>
<td>2023</td>
<td>July 1, 2022</td>
<td>6.5%</td>
</tr>
</tbody>
</table>

### Benefits of a Two-Year Rate Adjustment:

- **Maximizes efficiency** of staff and consultant time
- **Allows for adjustment** of rates as conditions evolve
- **Provides certainty** for CIP funding, particularly in FY 2022-23 when Tunnel Project spending peaks
Estimated Future Projections Including Proposed Adjustments in Fiscal Years 2022 and 2023

Note: Based on 4,000 gallons consumption, including estimated City charge as of January 2020; Assumes City sewer charge does not increase from its $2.24 per KGAL charge.
# Estimated Cost of One Water in Alexandria, VA

## Drinking Water

<table>
<thead>
<tr>
<th>Current FY21</th>
<th>Projected FY26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly</td>
<td>Annual</td>
</tr>
<tr>
<td>$22</td>
<td>$264</td>
</tr>
<tr>
<td>$24*</td>
<td>$291*</td>
</tr>
</tbody>
</table>

**Note:** Based on known current increase projections from various Alexandria water entities

## Sanitary and Combined Sewer System

<table>
<thead>
<tr>
<th>Current FY21</th>
<th>Projected FY26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly</td>
<td>Annual</td>
</tr>
<tr>
<td>$9</td>
<td>$109</td>
</tr>
<tr>
<td>$10</td>
<td>$121</td>
</tr>
</tbody>
</table>

**Note:** Sanitary Sewer Charge appears on AlexRenew Bill

## Wastewater and Combined Sewer Treatment

<table>
<thead>
<tr>
<th>Current FY21</th>
<th>Projected FY26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly</td>
<td>Annual</td>
</tr>
<tr>
<td>$44</td>
<td>$528</td>
</tr>
<tr>
<td>$59</td>
<td>$713</td>
</tr>
</tbody>
</table>

## Stormwater

<table>
<thead>
<tr>
<th>Current FY21</th>
<th>Projected FY26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly</td>
<td>Annual</td>
</tr>
<tr>
<td>$12</td>
<td>$140</td>
</tr>
<tr>
<td>$24</td>
<td>$291</td>
</tr>
</tbody>
</table>

**Note:** Stormwater Fee appears on Real Estate Bill
Fiscal Year 2022-2023 Rate Adjustment Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 16</td>
<td>CEO presents proposed budget and rates to Board</td>
</tr>
<tr>
<td>April 20</td>
<td>Board adopts resolution to provide public notice of proposed budget and rates</td>
</tr>
<tr>
<td>May 15</td>
<td>City Council Meeting</td>
</tr>
<tr>
<td>May 18</td>
<td>Board Meeting</td>
</tr>
<tr>
<td>May 22</td>
<td>Public Hearing</td>
</tr>
<tr>
<td>June 15</td>
<td>Board Meeting: Final Budget Adoption – Budget and Rates</td>
</tr>
<tr>
<td>July 1</td>
<td>New Rates In Effect</td>
</tr>
</tbody>
</table>
Community Outreach Strategy for Rate Adjustment

SAG Feedback Requested

- Digital
  - AlexRenew.com
  - RiverRenew.com
  - Social Media (Facebook, Twitter)

- Printed Materials
  - Bill Stuffer

- Community Meetings
  - RiverRenew Stakeholder Advisory Group
  - Council-Board Workgroup

- Press and Media
  - Press Release

- Paid Advertising
  - Print Ads
  - Digital Ads
Tunneling Timeline – 1890s to Present Day

1890s
First Tunneling Shields Used

Late 1940s
Coal Saw – Fort Randall Dam, South Dakota

Early 1950s
MITtry Mole – Oahe Dam, South Dakota

Late 1970s
Wheel Excavators Saw Wider Use

Late 1980s
Digger Shields Began to be Used

Early 1990s
First Earth Pressure TBMs Used

2000s
TBMs Technological Advances
A History of Tunneling in the Washington Metropolitan Region

VDOT Hampton Roads Tunnel: Present
- 3.5 miles

- 50 miles

VDOT Midtown Tunnel: 1962, 2016
- 0.8 miles

Metro Silver Line: 2009 - 2011
- 0.5 miles

DC Water: 2010 - Present
- 13 miles

Bi-County: 2010 - 2015
- 5 miles

Dulles International Airport: 2005
- 0.5 miles
The Waterfront Tunnel will be Built with a Tunnel Boring Machine
The Earth Pressure Balance Principle
Typical Earth Pressure Balance Tunnel Boring Machine Operation

Approximately 100 feet deep

Ground Surface
Fill
Terrace
Potomac Clay
Precast Concrete Segments are Used to Support the Earth and Form the Tunnel
Lifting a Precast Tunnel Segment to its Final Location
What Is Muck?
How is Muck Transported Out of the Tunnel?

Continuous Belt Conveyors

Vertical Belt Conveyors

Photo credit: The Robbins Company; https://www.robbinstbm.com/products/conveyors/vertical/
How Do We Steer a TBM to Get Precise Line and Grade?

Continuous surveying of TBM location

TBM orientation adjusted to target position based on preset tunnel alignment coordinates
Where in the World is Schwanau?

Photo credit: Jurgen Gyro, https://www.google.com/maps/place/Herrenknecht+AG
50-foot diameter Herrenknect earth pressure balance tunnel boring machine. Schwanau, Germany
10-foot diameter Herrenknect slurry tunnel boring machine. Schwanau, Germany
# An In-Depth Look at the RiverRenew Tunnel Boring Machine

<table>
<thead>
<tr>
<th>Major Features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Herrenknecht</td>
</tr>
<tr>
<td>ID</td>
<td>OD (ft)</td>
</tr>
<tr>
<td>Shield Length (ft)</td>
<td>39.5</td>
</tr>
<tr>
<td>Overall Length (ft)</td>
<td>538</td>
</tr>
<tr>
<td># of Disc Cutters</td>
<td>20</td>
</tr>
<tr>
<td>Operating Pressure (bar)</td>
<td>4.5 bar</td>
</tr>
<tr>
<td>Conveyor Type</td>
<td>Screw and Belt</td>
</tr>
</tbody>
</table>

![Diagram of Tunnel Boring Machine](image-url)

- **Cutterhead**
- **Excavation Chamber**
- **Hydraulic Jacks**
- **Concrete Tunnel**
- **Concrete Tunnel Segment**
- **Screw Conveyor**
- **Shield**
- **Conveyor Belt**

Not ours, but very similar!
The Tunnel Boring Machine is an Underground Factory, the Length of Two Football Fields
Scheduling the Tunnel Boring Machine’s Trip from Germany to Alexandria

Design
Dec 2020 to Jul 2021

Manufacture and Factory Testing
Jun 2021 to Feb 2022

Shipping
Feb 2022

Delivery
Mar 2022

TBM Unveiling
Apr 2022

Lower TBM into Shaft
May 2022

SAG Homework: Herrenknecht Tunnel Boring Machine Video (9 min)

EPB Shield
Segmental lining with small diameters

https://www.youtube.com/watch?v=fVidVJ3Oob4
Right of Entry to Support Surveys and Monitoring
Aerial View of Waterfront Tunnel, Buffer Area, and Right of Entry Request Properties
The Tunnel Buffer Area is a Conservative Calculation of the Maximum Extents for Potential Ground Movement

Structures to be Surveyed and Monitored
Maximum Potential Extent of Ground Movement

Tunnel
0 inch
80 feet
< 1/4 inch
1/2 inch
~100 feet

NOT TO SCALE
Preconstruction Survey and Monitoring Process

Step 1
Execute Right of Entry Agreement
- May 5, 2021

Step 2
Preconstruction Survey Scheduling
- Late Spring-Summer 2021
  - Contact from AlexRenew via phone and email

Step 3
Preconstruction Survey
- Summer 2021
  - Full interior and exterior inspection of property by qualified representatives
  - 1-2 hours

Step 4
Preconstruction Condition Survey Report
- Late Summer-Early Fall 2021
  - Written report documenting materials of construction, condition, and any existing damage and/or cracks
  - Data will be kept private and secure

Step 5
Monitoring Installation
- Early 2022
Monitoring Instruments are Typically Installed on Structures within the Tunnel Buffer Area

Monitoring instruments or “targets” are passive devices used to survey the property before, during, and after tunnel construction.
Examples of Target Installation on Structures
Other Types of Instruments Typically Installed

Seismograph

Crack Gauge
Monitoring and **Postconstruction Survey Process**

**Step 6**
- **Tunnel Construction and Monitoring**
  - Summer 2022 - Early 2023
  - Most monitoring can be done remotely
  - Occasional access may be needed to property to read instruments

**Step 7**
- **Postconstruction Survey Scheduling**
  - Early 2023
  - Contact from AlexRenew via phone and email

**Step 8**
- **Postconstruction Survey**
  - Spring/Summer 2023
  - Full interior and exterior inspection of property by qualified representatives
  - 1-2 hours

**Step 9**
- **Postconstruction Condition Survey Report**
  - Summer 2023
  - Written report documenting materials of construction, condition, and any existing damage and/or cracks
  - Compare to Preconstruction Condition Survey Report
  - Data will be kept private and secure

**Step 10**
- **Claims**
  - File notice of claim or potential claim with AlexRenew
  - Supplemental Post-Construction Condition Surveys performed
Any Representative Accessing Private Property is Required to Follow Strict COVID-19 Protocols

- **Physical screening** by a licensed Nurse Practitioner licensed, including but not limited to taking personnel temperatures
- Completion of Virginia required COVID-19 safety training
- Completion of a **self-screening medical checklist** to assess individual health and infection risk
- Strict adherence to current **Centers for Disease Control guidelines**
Traylor-Shea is Currently Conducting Site Investigations in the Community

Field Surveys

Utility Locating
Mobilization to the Holland Lane Lot Started in April and will Continue through June
Setting up the Holland Lane Lot to Support the RiverRenew Tunnel Project

- **Field Trailers:** May – June 2021
- **Conex Box Placement:** April 12 – 16
- **Mechanic’s Shop:** May – June 2021
- **Working Surface:** April 5 - 16
- **Lighting:**
- **Utility Work:** May 2021 – Jun 2021
- **Construction Segments:** Mid 2022 – Early 2024
- **Cones On Site:** April 12 - 16
- **Vehicle Gate Construction:**
- **Tunnel Segment Storage Area:**
- **Temporary Utilities:**
Educational Banner to Help the Community Learn About the Equipment at the Holland Lane Lot

Setting the Stage for Our Next Phase

We’re setting things up at the Holland Lane Lot. Elaine the All-Terrain Crane knows the plot. With boxes and tunnel parts all in their slots, We’ll help RiverRenew from this staging spot!

Tunnel segments are the large concrete pieces that will line the Waterfront Tunnel behind the Tunnel Boring Machine.

Our team will work in temporary office trailers so they can stay close to the action at RiverRenew!

Scan here for a special activity from Elaine the All-Terrain Crane
To learn more about preparations at the Holland Lane Lot, visit RiverRenew.com/the-lot
AlexRenew Mobilization is Scheduled for June 2021

The First Phase of Work is Support of Excavation from August 2021 to January 2022
# Tunnel Project Look-Ahead through December 2021

<table>
<thead>
<tr>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right of Entry Agreement Open House 4/7</td>
<td>AlexRenew Listening Session 5/20</td>
<td>SAG Meeting No. 3 6/17</td>
<td>Pendleton Street Listening Session 7/15</td>
<td>SAG Meeting No. 4 8/19</td>
<td>Groundbreaking Ceremony</td>
<td>SAG Meeting No. 5 10/21</td>
<td>W.A.T.E.R Fund Virtual Event No. 2</td>
<td>SAG Meeting No. 6 12/16</td>
</tr>
<tr>
<td>SAG Meeting No. 2 4/15</td>
<td>Rates Public Hearing 5/22</td>
<td>Duke Street Listening Session 6/24</td>
<td>Royal Street Listening Session 7/22</td>
<td>TBM Outreach to Alexandria Schools</td>
<td>Council-Board Workgroup Meeting</td>
<td>Quarter 4 River Renewer</td>
<td>Council-Board Workgroup Meeting</td>
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<tr>
<td>Council-Board Workgroup 4/19</td>
<td>Quarter 2 River Renewer</td>
<td>Construction Starts at AlexRenew</td>
<td>W.A.T.E.R Fund Virtual Event No.1</td>
<td>Quarter 3 River Renewer</td>
<td>Construction Starts at Pendleton Street</td>
<td></td>
<td>Construction Starts along Hooffs Run</td>
<td>Construction Starts at Royal Street</td>
</tr>
<tr>
<td>Website Refresh Launch</td>
<td>Rate Adjustment Outreach April 21 - June 30</td>
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**Legend:**
- Digital Media
- Events
- Meetings
- General Outreach
- Construction (anticipated)
Next Steps
## Upcoming Meetings and Next Steps

<table>
<thead>
<tr>
<th>Upcoming Meetings</th>
<th>Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Community Listening Session: Mobilizing to AlexRenew Construction Staging Areas <strong>May 20, 6-8pm</strong>&lt;br&gt;• Rates Public Hearing <strong>May 22, 9:30am</strong>&lt;br&gt;• Next SAG meeting <strong>June 17, 7-9pm</strong></td>
<td>• Homework: Watch Herrenkenect <strong>Tunnel Boring Machine Video</strong> (9 min)&lt;br&gt;• Reach out with <strong>community feedback</strong> or questions&lt;br&gt;• Check out <strong>new RiverRenew.com</strong> when live&lt;br&gt;• Follow AlexRenew on <strong>Facebook and Twitter</strong>&lt;br&gt;• Sign up for <strong>The River Renewer</strong></td>
</tr>
</tbody>
</table>
Public Comment Period
To learn more, visit www.RiverRenew.com