Welcome!
Community Listening Sessions
Every year, millions of gallons of sewage mixed with rainwater pollute our local waterways.

Alexandria’s century-old **combined sewer system** consists of only one pipe that conveys both sanitary sewage and rainwater.

There are four types of underground pipes in Alexandria’s water system:

- **WATER PIPES**: Bring clean drinking water to your faucet. Virginia American Water operates Alexandria’s drinking water system.

- **STORM SEWER PIPES**: Take rainwater that lands on roofs, sidewalks, and streets and discharges it to our waterways. The City of Alexandria manages Alexandria’s storm sewer system.

- **SANITARY SEWER PIPES**: Carry dirty water that you flush down your toilet and sink. The City of Alexandria operates the sanitary sewers, and Alexandria Renew Enterprises cleans the dirty water at its treatment plant.

- **COMBINED SEWER PIPES**: Carry a mixture of both sewage and rainwater.
  - **When it rains**: the pipe fills up and the mixture of sewage and rainwater overflows into our rivers and streams.
  - **During dry weather**: the pipe transports sewage for treatment at AlexRenew.

Every year, millions of gallons of sewage mixed with rainwater pollute our local waterways.
In 2017, Virginia passed a law requiring Alexandria to remediate all four of its combined sewer outfalls by July 1, 2025.

**THE LAW REQUIRES:**

- **OUTFALL 001**
  - Reduce overflow events to 4-6 events per year

- **OUTFALL 002**
  - 80% reduction of bacteria

- **OUTFALL 003**
  - 99% reduction of bacteria

- **OUTFALL 004**
  - 99% reduction of bacteria

**Average Overflow Volume and Events per year (2000-2016):**

Total of approximately **140 million gallons** from all outfalls

<table>
<thead>
<tr>
<th>Outfall</th>
<th>Overflow Volume</th>
<th>Event Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTFALL 001</td>
<td>63 million gallons</td>
<td>37 events</td>
</tr>
<tr>
<td>OUTFALL 002</td>
<td>38 million gallons</td>
<td>46 events</td>
</tr>
<tr>
<td>OUTFALL 003</td>
<td>31 million gallons</td>
<td>70 events</td>
</tr>
<tr>
<td>OUTFALL 004</td>
<td>12 million gallons</td>
<td>45 events</td>
</tr>
</tbody>
</table>
RiverRenew is a major initiative in response to the 2017 Virginia law to achieve cleaner, healthier waterways in Alexandria.

Led by a five-member citizen board, Alexandria Renew Enterprises (AlexRenew) is a special-purpose authority that has been serving the City of Alexandria and parts of Fairfax County for the last 60 years. AlexRenew treats an average of 35 million gallons of wastewater per day, from more than 300,000 people, at its water resource recovery facility, located in Alexandria’s southwest quadrant.

RiverRenew includes the following major components:
• A two-mile-long, 100-foot-deep tunnel system
• New sewer infrastructure
• Upgrades to the process for debris and bacteria removal treatment at AlexRenew

AlexRenew, with support from the City of Alexandria, will implement RiverRenew.

Anticipated Volume & Frequency
(based on averages from 2000-2016)

<table>
<thead>
<tr>
<th>Overflow Volume (million gallons)</th>
<th>Events (per year)</th>
<th>Total Overflow Volume (million gallons)</th>
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</thead>
<tbody>
<tr>
<td>OUTFALL 001</td>
<td>8</td>
<td>2</td>
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<tr>
<td>OUTFALL 002</td>
<td>5</td>
<td>2</td>
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<tr>
<td>OUTFALL 003</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>OUTFALL 004</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>TOTAL</strong>: 16 million gallons from all outfalls</td>
<td></td>
<td>96% capture</td>
</tr>
</tbody>
</table>

Program Cost: $350M–$550M
We’re conducting an Environmental Assessment to analyze RiverRenew’s potential impacts on the community and environment.

An Environmental Assessment is a pathway to comply with the National Environmental Policy Act. The National Park Service is the federal agency for the Environmental Assessment because the proposed action may require permits for activities on lands managed by the National Park Service.

What will the Environmental Assessment cover?

**NATURAL RESOURCES**

**CULTURAL RESOURCES**

**THE COMMUNITY**

What happens next?

1. Comments received from this scoping process will be incorporated into the alternatives analysis.
2. Once the Environmental Assessment has been drafted, it will be circulated for public comment.
3. The National Park Service will respond to substantive comments and conclude the National Environmental Policy Act process by documenting a decision.

The purpose of scoping is to engage the community and stakeholders to obtain feedback on proposed project alternatives.
Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their undertakings on any structure, site, or district listed or eligible for listing in the National Register of Historic Places.

Who are the Consulting Parties?

• Federal agencies
• State Historic Preservation Officer
• Federally recognized tribes
• Local government
• Other stakeholders/public
• Advisory Council on Historic Preservation

Overview of the Section 106 process:

• National Park Service initiates consultation with State Historic Preservation Officer
• Identify consulting parties
• Identify historic resources
• Analyze effects on historic resources
• Avoid or address and resolve any adverse effects to historic resources

The Section 106 process will ensure historic resources are carefully considered and any potential adverse effects are appropriately mitigated.
We’ve started to analyze historic resources in Alexandria to comply with Section 106.

Legend
- National Park Service Lands
- AlexRenew
- Existing Outfall
- Study Area
- Historic District
- Architectural Resources
- Potentially Contributing Architectural Resources
- Alexandria Historic District
- Expanded Alexandria Historic District
- Architectural Resource Within Study Area

Architectural Resources Within Study Area

1. Bruin’s Slave Jail
2. Orange and Alexandria Railroad Bridge
3. Alexandria National Cemetery
4. Gunston Hall Apartments
5. Freedman’s Cemetery, Contraband Cemetery
6. Mt. Vernon Memorial Highway/George Washington Memorial Parkway
7. Fairfax-Moore House
8. Old Dominion Bank/Athenaeum
9. Bank of Alexandria
10. John Carlyle House

Archaeological Resources Within Study Area

- Bruin’s Slave Jail
- Railroad Bridge
- St. Mary’s Cemetery
- Freedman’s Cemetery, Contraband Cemetery
- Unnamed Cemetery
- St. Mary’s Cemetery
- Military/Defense
- Dwelling (Single)
- Dwelling (Multiple)
- Railroad
- Domestic, Subsistence/Agriculture
- Carlyle House
- Lee Street Site
- Warehouse
- Wharf
- Artifact Scatter, Dwelling (Multiple), Warehouse
- Robinson Terminal South
- Harborside
- Distillery

* Locations withheld.
Where are the Combined Sewer Outfalls?

**Outfall 001**
- Flow to AlexRenew
- Outfall 001 and Regulator
- Pendleton Street
- Combined Sewer
- Oronoco Bay Park
- Oronoco Bay
- Flow from CSO 001
- 36" Potomac Interceptor
- Potomac River

**Outfall 002**
- Flow to AlexRenew
- Outfall 002 Regulator
- Royal St Sewer
- 31½" X 34"
- 42" Potomac Interceptor
- Woodrow Wilson Bridge
- Mt Vernon Trail

**Outfalls 003 and 004**
- Outfall 003 Regulator
- Outfall 004 Regulator and Siphon
- Outfall 004
- Jamieson Ave
- Outfall 003
- Commonwealth Interceptor
- Prince St
- Duke St

**Legend**
- Dry Weather Flow
- Wet Weather Flow
- Dry Weather Regulator
- Existing Outfall
Diversion Facilities will direct millions of gallons of combined sewage into the new tunnel system.

The construction of these structures, which will be mainly below ground when complete, requires surface and ground disturbance.

Construction Process

- Construction Staging Area
- Excavation Support
- Excavation
- Permanent Construction
- Post Construction
To build the deep tunnel, RiverRenew will use a state-of-the-art tunnel boring machine.

Our TBM will move at about **40 feet per day**, on average. The TBM’s front face is called the **cutterhead**, its body is called the **shield**, and the equipment is called the **trailing gear**.

---

1. The TBM is lowered into a shaft at AlexRenew.

2. The cutterhead rotates, loosening the ground, while hydraulic jacks push the machine forward. Soil, aka “muck,” is pulled into the openings of the cutterhead and deposited to a conveyor belt.

3. The TBM balances the external soil and groundwater by pressurizing a soil paste behind the cutterhead, significantly minimizing the potential for ground movement.

4. A ring of segments is brought from AlexRenew to the front of the tunnel on a locomotive, or “loki.”

5. The segments are lifted into position with a vacuum, creating a tunnel “ring.”

6. The TBM uses its hydraulic jacks to push off the newly installed ring and moves forward in approximately 6-foot increments, leaving a new concrete tunnel behind it.

---

We need to consider proximity to existing structures when determining tunnel routes:
We want to avoid existing structures near the tunnel routes.

<table>
<thead>
<tr>
<th>Location</th>
<th>Historic Structures</th>
<th>Total Structures</th>
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</thead>
<tbody>
<tr>
<td>Lee-Green</td>
<td>84</td>
<td>422</td>
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<tr>
<td>Lee-Church</td>
<td>85</td>
<td>406</td>
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<tr>
<td>Union-Green</td>
<td>42</td>
<td>291</td>
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<tr>
<td>Union-Church</td>
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<td>229</td>
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<tr>
<td>Potomac-Green</td>
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<td>116</td>
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<tr>
<td>Potomac-Church</td>
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<td>58</td>
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</table>

**Legend**
- ◀️ Existing Outfall
- ● Relocated Outfall
- ▲ Mining Shaft
- ● Potential Diversion Facility Location
- ✄ Historic District
- 001/002 Alignment Study
- ⬛ Lee-Green
- ● Union-Green
- ● Potomac-Green
- ✕ Lee-Church
- ✕ Union-Church
- ● Potomac-Church
Potential Routes 003/004 – Hooff’s Run

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<tr>
<th>Description</th>
<th>Details</th>
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<td>Depth (feet)</td>
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<tr>
<td>Shaft diameter (feet)</td>
<td>N/A</td>
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<tr>
<td>Construction Work Hours</td>
<td>7 AM – 6 PM</td>
</tr>
<tr>
<td>Haul Rates (trucks per hour)</td>
<td>1-5</td>
</tr>
</tbody>
</table>

Legend:
- PROPOSED STRUCTURES
- TUNNEL/GIRDERS ALIGNMENT
- EXISTING DRAINAGE UTILITIES
- CONSTRUCTION STAGING AREA
- AT SURFACE FEATURES

- Diversion Facilities

- Hooff’s Run Diversion Sewer
- Commonwealth Diversion Chamber
- Duke Street Diversion Chamber
- Construction Staging Area

- Potential Routes 003/004 – Hooff’s Run
- Route
  - Duke St
  - Hooff’s Run
  - Holland Dr
Potential Routes 003/004 – Holland Lane

Route

Diversion Facilities

Diameter (feet) 6
Depth (feet) 20–40
Construction Staging Area (acres) 0.5
Construction Duration (years) 2
Shaft diameter (feet) N/A
Construction Work Hours 7 AM – 6 PM
Haul Rates (trucks per hour) 1-5
Potential Routes 003/004 – Deep Tunnel

Route

Diversion Facilities

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>Depth (feet)</td>
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<tr>
<td>Construction Staging Area (acres)</td>
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<tr>
<td>Construction Duration (years)</td>
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<tr>
<td>Shaft diameter (feet)</td>
<td>34</td>
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<td>Construction Work Hours</td>
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<td>Haul Rates (trucks per hour)</td>
<td>1-7</td>
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Outfall 001
Diversion Facility Alternatives

Robinson Terminal North

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<tr>
<td>Construction Duration (years)</td>
<td>2.5</td>
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<tr>
<td>Shaft Diameter (feet)</td>
<td>30-40</td>
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<td>Construction Work Hours</td>
<td>7 AM – 6 PM</td>
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<tr>
<td>Hauling Rates (trucks/hour)</td>
<td>1-7</td>
</tr>
</tbody>
</table>

Oronoco Bay Park East

<table>
<thead>
<tr>
<th>Diameter (feet)</th>
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</thead>
<tbody>
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<td>Depth (feet)</td>
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<td>Construction Duration (years)</td>
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<tr>
<td>Shaft Diameter (feet)</td>
<td>30-40</td>
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<tr>
<td>Construction Work Hours</td>
<td>7 AM – 6 PM</td>
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<tr>
<td>Hauling Rates (trucks/hour)</td>
<td>1-7</td>
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</table>
Outfall 001
Diversion Facility Alternatives

Oronoco Bay Park North

<table>
<thead>
<tr>
<th>Feature</th>
<th>North</th>
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<td>Construction Work Hours</td>
<td>7 AM – 6 PM</td>
<td>7 AM – 6 PM</td>
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<tr>
<td>Hauling Rates (trucks/hour)</td>
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<td>1-7</td>
</tr>
<tr>
<td>Shaft Diameter (feet)</td>
<td>30-40</td>
<td>30-40</td>
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<td>Construction Staging Area (acres)</td>
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<td>2.0</td>
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<td>Depth (feet)</td>
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<td>115</td>
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<tr>
<td>Diameter (feet)</td>
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<td>12</td>
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<tr>
<td>Construction Staging Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Work Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hauling Rates (trucks/hour)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Outfall 002
Diversion Facility Alternatives

Royal Street

<table>
<thead>
<tr>
<th>Diameter (feet)</th>
<th>12</th>
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</thead>
<tbody>
<tr>
<td>Depth (feet)</td>
<td>118</td>
</tr>
<tr>
<td>Construction Staging Area (acres)</td>
<td>1.0</td>
</tr>
<tr>
<td>Construction Duration (years)</td>
<td>2.5</td>
</tr>
<tr>
<td>Shaft Diameter (feet)</td>
<td>30-40</td>
</tr>
<tr>
<td>Construction Work Hours</td>
<td>7 AM – 6 PM</td>
</tr>
<tr>
<td>Hauling Rates (trucks/hour)</td>
<td>1-7</td>
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</tbody>
</table>

Green Street

<table>
<thead>
<tr>
<th>Diameter (feet)</th>
<th>12</th>
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</thead>
<tbody>
<tr>
<td>Depth (feet)</td>
<td>118</td>
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<tr>
<td>Construction Staging Area (acres)</td>
<td>1.2</td>
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<td>Construction Duration (years)</td>
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<tr>
<td>Shaft Diameter (feet)</td>
<td>30-40</td>
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<tr>
<td>Construction Work Hours</td>
<td>7 AM – 6 PM</td>
</tr>
<tr>
<td>Hauling Rates (trucks/hour)</td>
<td>1-7</td>
</tr>
</tbody>
</table>
What’s happening at AlexRenew?

Alternative for Holland Lane and Hooffs Run

- Diameter (feet): 6
- Depth (feet): 135
- Construction Staging Area (acres): 3
- Construction Duration (years): 4.5
- Shaft diameter (feet): 50
- Construction Work Hours: 7 AM – 6 PM
- Hauling Rates (trucks/hour): 2 - 15

Alternative for Deep Tunnel

- Diameter (feet): 12
- Depth (feet): 135
- Construction Staging Area (acres): 3
- Construction Duration (years): 4.5
- Shaft diameter (feet): 65
- Construction Work Hours: 7 AM – 6 PM
- Hauling Rates (trucks/hour): 2 - 15

Legend:
- **Proposed Structures**
- **Existing Sewer Utilities**
- **AT SURFACE FEATURES**
- **Sewer Alignment**
- **Construction Staging Area**
- **Proposed Building**
### What might happen during construction?

<table>
<thead>
<tr>
<th>IMPACT</th>
<th>MITIGATION</th>
</tr>
</thead>
</table>
| TRAFFIC DISRUPTIONS | • Develop design that minimizes traffic impacts  
• Ensure safe corridors are maintained for pedestrians and bicyclists  
• Develop alternate travel routes |
| NOISE AND VIBRATIONS | • Locate proposed facilities away from sensitive areas  
• Engage noise and vibration specialist  
• Install noise barriers  
• Restrict work hours |
| SOIL DISTURBANCES, DUST, AND EMISSIONS | • Stabilize exposed soils  
• Maintain good housekeeping practices  
• Direct haul routes away from sensitive areas |
| REMOVAL OF CONTAMINATED SOIL AND GROUNDWATER | • Conduct environmental sampling of soil and groundwater  
• Minimize potential for groundwater movement  
• Follow proper treatment and disposal requirements |
| UTILITY DISRUPTIONS | • Develop plan for utility relocations  
• Notify residents and businesses of potential outages in advance  
• Locate facilities to avoid utility impacts |
| POTENTIAL IMPACTS TO NATIONAL PARK SERVICE LANDS | • Coordinate with the National Park Service via the NEPA process  
• Mitigate temporary and permanent impacts through the National Park Service permit process |
| POTENTIAL IMPACTS TO HISTORIC AND CULTURAL RESOURCES | • Survey and monitor structures before, during, and after construction  
• Develop robust structure protection program  
• Conduct preliminary archeological assessments at construction staging areas to identify potential archaeological resource sites  
• Coordinate with State Historic Preservation Officer and City to establish protocol for data recovery and curation of artifacts |
Healthier waterways for our wildlife

Safer waterways for our community

Cleaner waterways for our future generations

96% capture of combined sewer flows

From 60 to 4 or fewer overflow events per year, on average
Have feedback? We’re listening.

Please tell us what you think about:

- Tunnel Routes
- Diversion Facility Locations
- Environmental Concerns
- Cultural Resource Concerns
- Community Impacts
- Any data you think will help us
How will we meet the July 1, 2025 schedule?

**NOTE:** Potential tunnel alignments are conceptual only and are currently under evaluation. Alignments other than those shown are possible and will be studied as part of the NEPA process, planning and preliminary engineering efforts. This conceptual geographic schedule is intended to suggest the probable critical path for construction. Activities are simplified for visual clarity.
How will we meet the July 1, 2025 schedule?


Planning & Design

Build Connection to CSO 003 and CSO 004
Build 003/4 Diversion Structure
Build SDWWP Junction Structure
Build TDPS Junction Chambers & Connecting Conduits
Connect to CSO 003 and CSO 004
Wet Well Improvements / Install Pumps
Build HGL Control Structure
Build WWPS Junction Structure

July 1, 2025 Compliance Deadline

Wet Weather Pump Station (WWPS)

Build WDWP Tunnel Dewatering Pump Station (TDPS) (AlexRenew)

NOTE: Potential tunnel alignments are conceptual only and are currently under evaluation. Alignments other than those shown are possible and will be studied as part of the NEPA process, planning and preliminary engineering efforts. This conceptual geographic schedule is intended to suggest the probable critical path for construction. Activities are simplified for visual clarity.
## What happens next?

<table>
<thead>
<tr>
<th>Activity</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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<tbody>
<tr>
<td>Site Investigations</td>
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<td></td>
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<td>June 2018</td>
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<td>Third Party Coordination</td>
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<td>Preliminary Engineering Report</td>
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### We want your feedback!

Submit comments and questions:

parkplanning.nps.gov/alexrenew

Submit comments and questions by October 25, 2018.

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**STAY IN TOUCH**

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