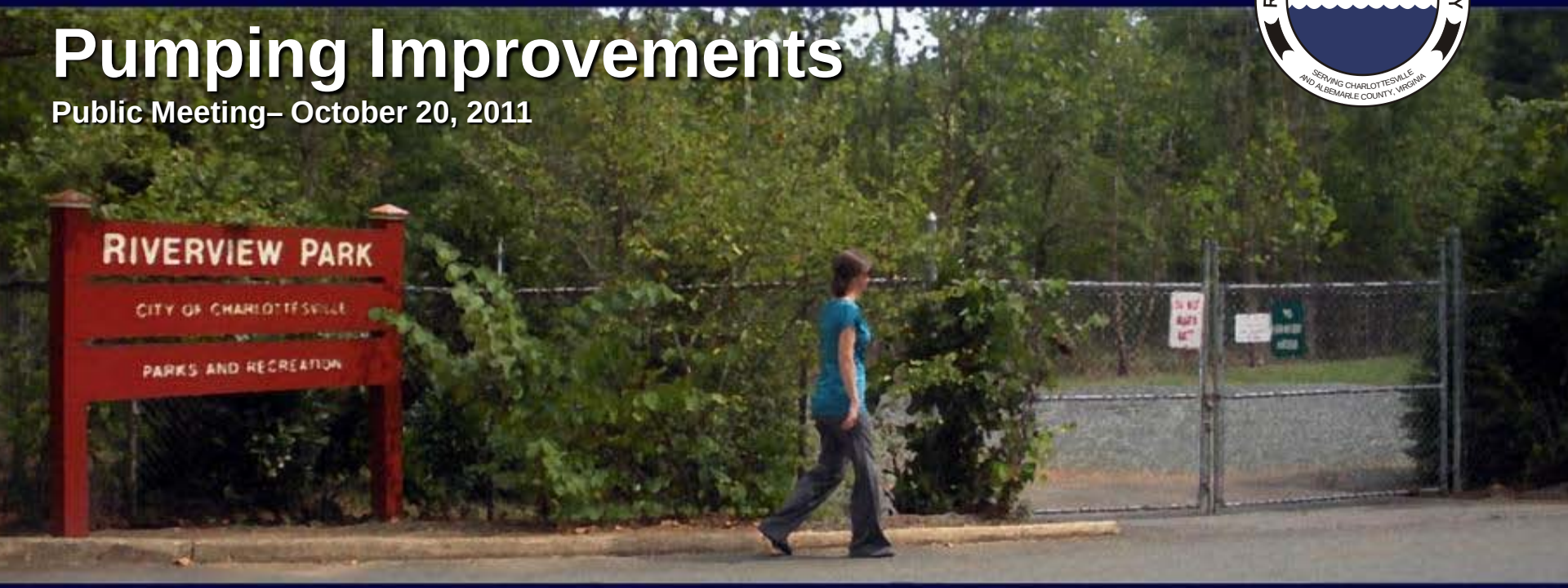
Rivanna Pump Station

Rivanna Water and Sewer Authority

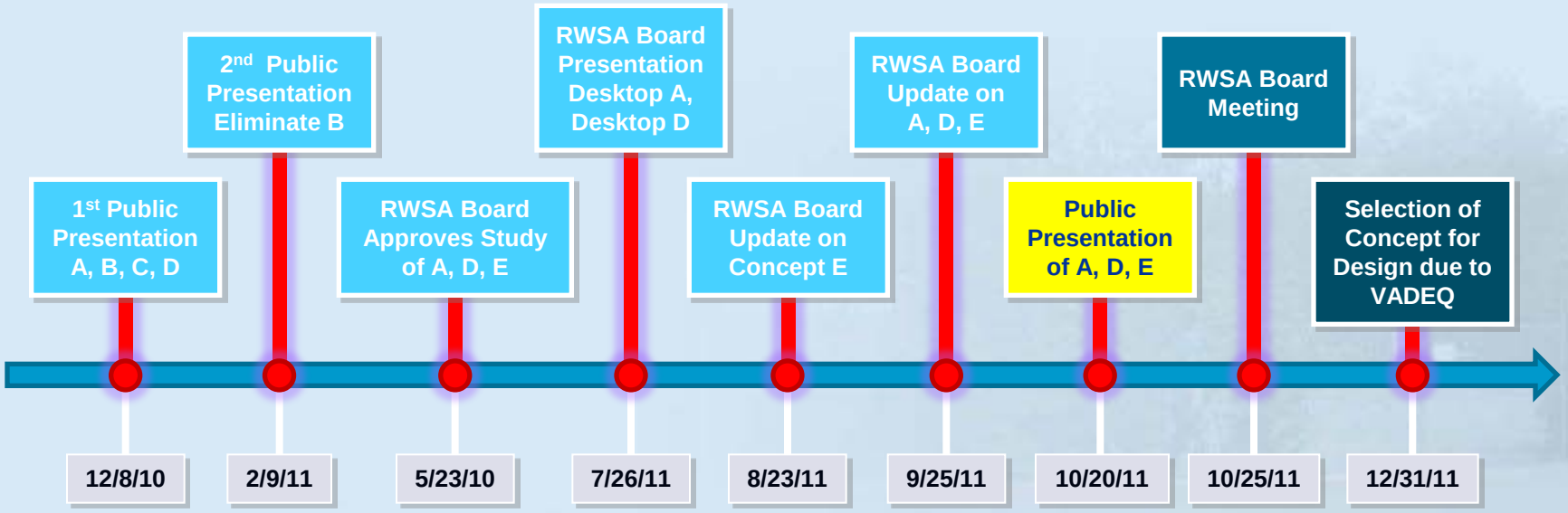
Pumping Improvements

Public Meeting– October 20, 2011



Agenda

- Background
- Concept D
- Concept E
- Concept A
- Summary



Background

What Needs to Be Done?

- ***Upgrade peak pumping rate from 25 million gallons per day (mgd) to 53 mgd***
  - **Required wet weather capacity**
  - **Minimize interceptor overflows during major rain events**
  - **Reduce potential for trail/park closures**
- ***Comply with VA DEQ Consent Order***
  - **Select a concept by December 31, 2011**
- ***Fix current environmental issue***

Overflowing Manhole

Concept Development Phase Requires Selection of a Site for Pumping Upgrades

RWSA Board May 2011 - Three concepts to be evaluated

- ***Concept A***: Vicinity of existing site
- ***Concept D***: Across the Rivanna River, to the East
- ***Concept E***: At the Moores Creek WWTP, with extension of the interceptor via a tunnel

Site E

Multidisciplinary Field Investigations and Engineering/Architectural Evaluations Are Complete

Investigation/Evaluation Area	Concept A	Concept D	Concept E
Geotechnical Investigation	X	X	X
Topographic Survey	X	X	X
Wetlands Delineation/Threatened and Endangered Species Survey	X	X	X
Tunneling Feasibility Evaluation			X
Preparation of Architectural Renderings	X	X	
Development of Landscape Architectural Plan	X	X	
Additional Engineering Evaluations (site, mechanical, electrical)	X	X	X
Refined Cost Estimate	X	X	X

Guiding Themes for the Work Effort

1. **Develop *CONCEPTS* to assess feasibility and cost**

2. **Seek to address and neutralize the negatives for each concept**
   - Evolution of Concept E
   - Architectural/landscape architectural work for Concepts A and D

3. **Leave no stone unturned**
   - Hybrid A/E and A/D alternatives
   - Generator fuel
   - Generator locations

Existing View from Chesapeake Street

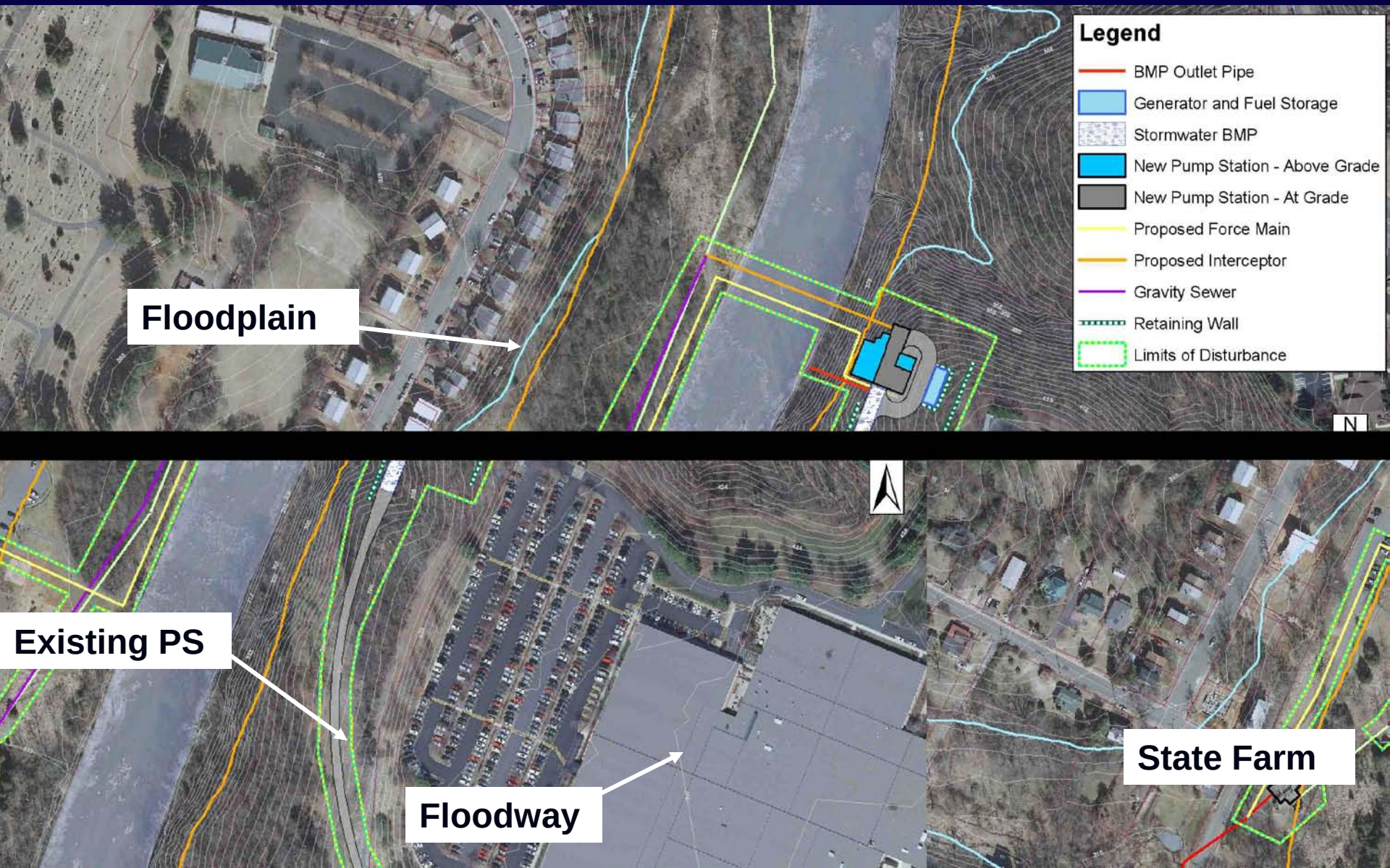
Concept Summary – By The Numbers

Item	Concept D	Concept E	Concept A
Disturbance	10.5 Acres	1.0 Acre + WWTP	1.25 Acres
Estimated Construction Time	3.0 – 3.5 years	2.7 – 3.2 years	2.5 – 3.0 years
Total Installed Horsepower	2,600 Hp	1,800 Hp	2,100 Hp
River Crossing Required	Yes – two	No	No
Estimated Project Cost	$54-$55M	$38-$40M	$25-$27M
Increased Average Monthly Household Cost	$5.85	$4.24	$2.85

Concept D


RIVERVIEW PARK
CITY OF CHARLOTTESVILLE
PARKS AND RECREATION

Concept D Overall Site Plan



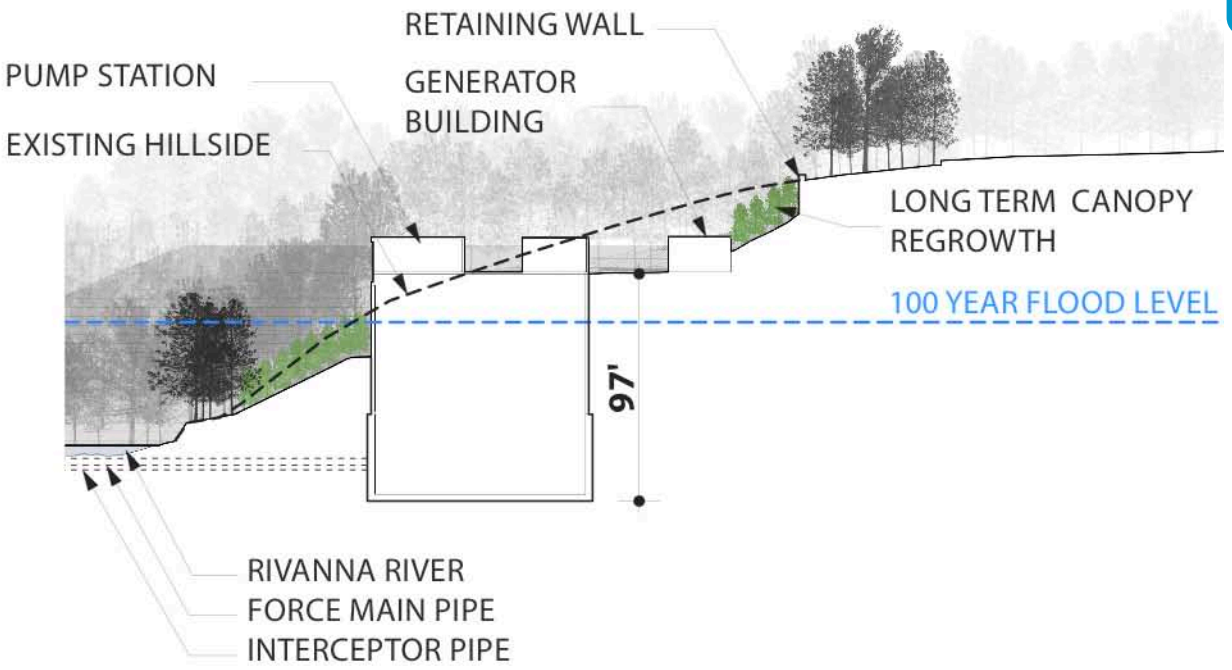
Concept D - Issues

- Topography
- Geology
- Site access
- Work required on both sides of the Rivanna River
- Extended park closure

Rock from Site D Borings

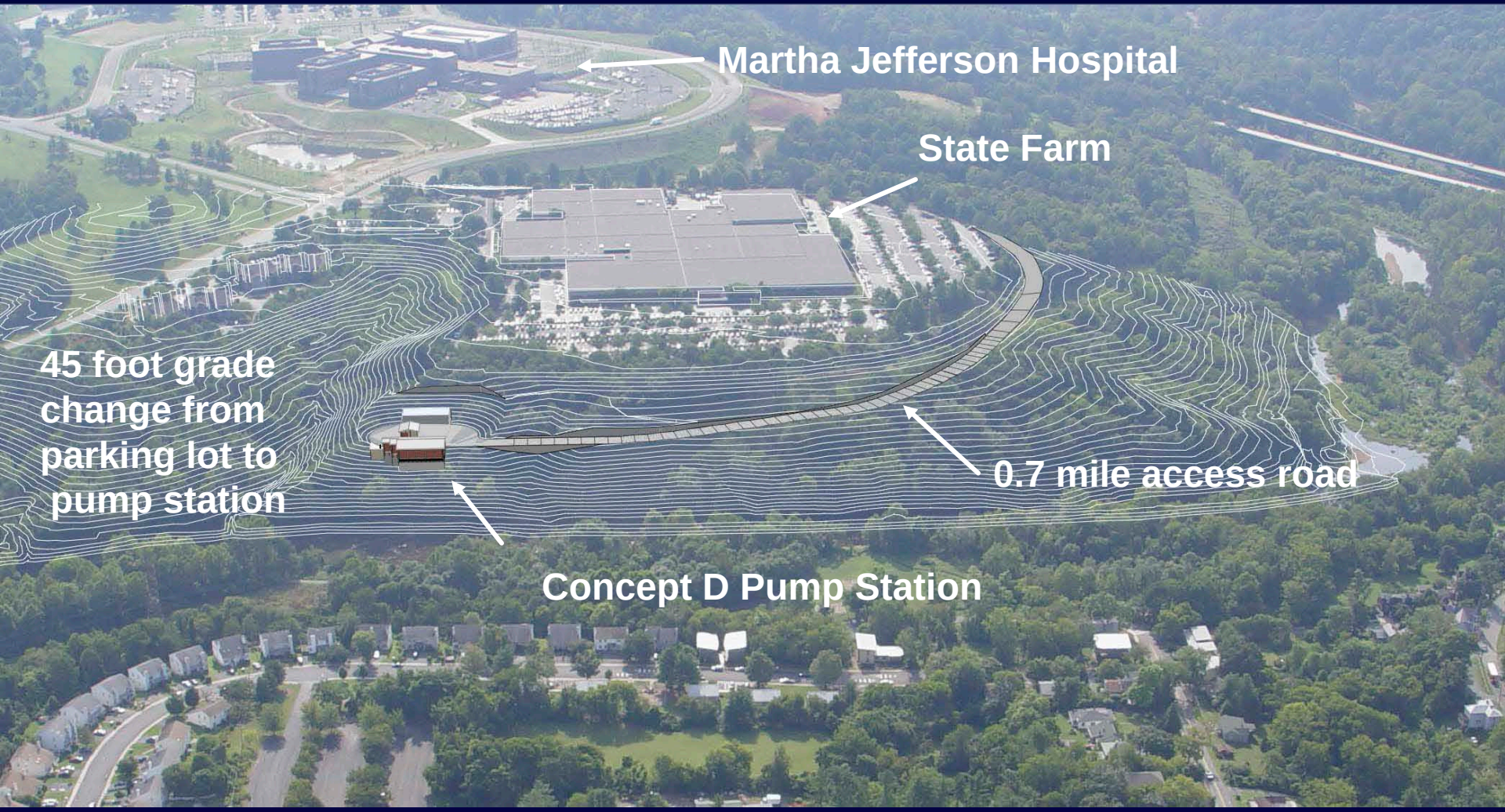
View towards Concept D from Riverview Park

Concept D – Site Topography and Station Depth



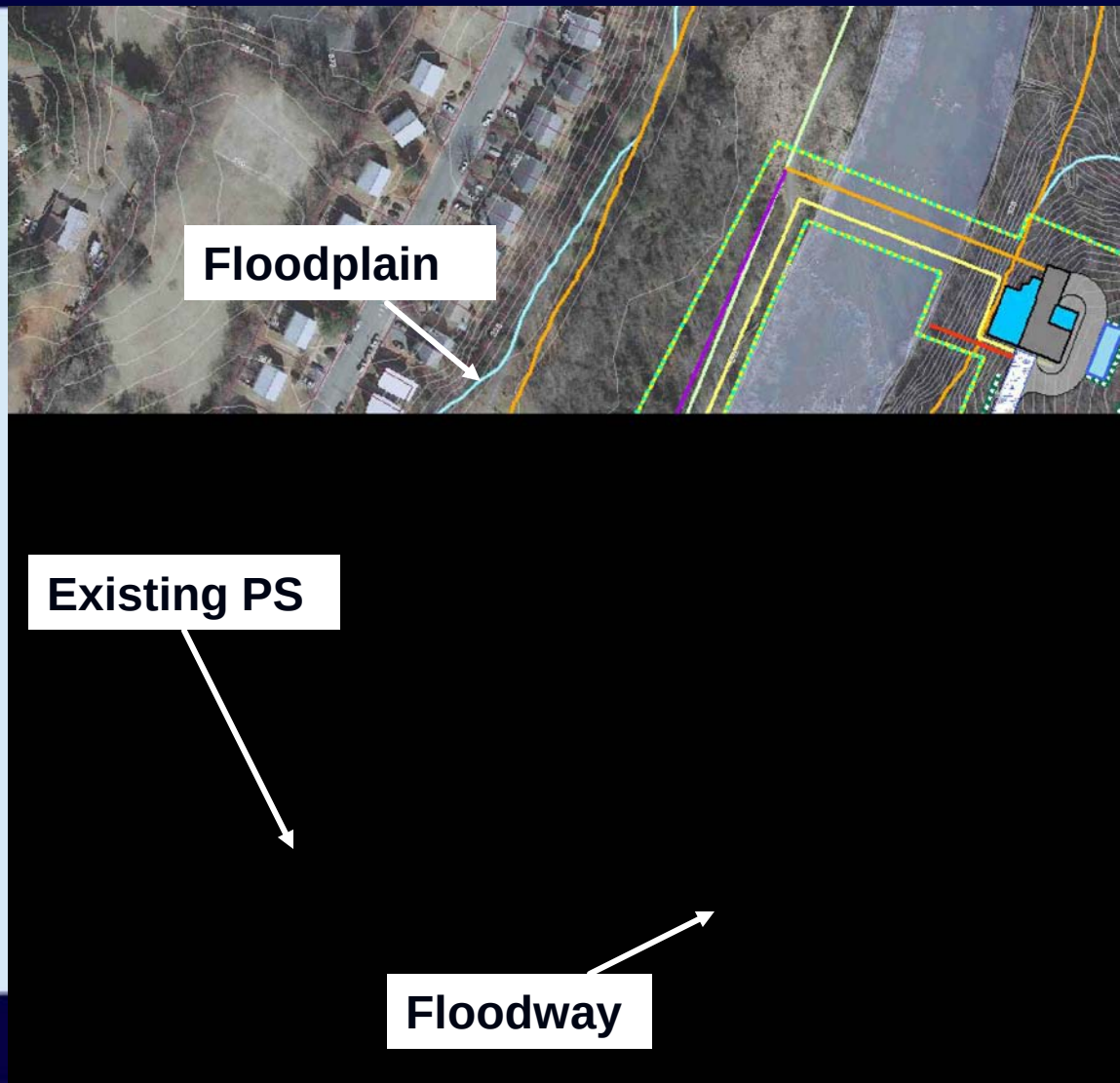
- Rock formation with fractures and joints
- Blasting with excavation deeper than river bed
- Risk of rockslides and excavation inundation
- High risk, high cost and lengthy construction

Concept D – Site Access

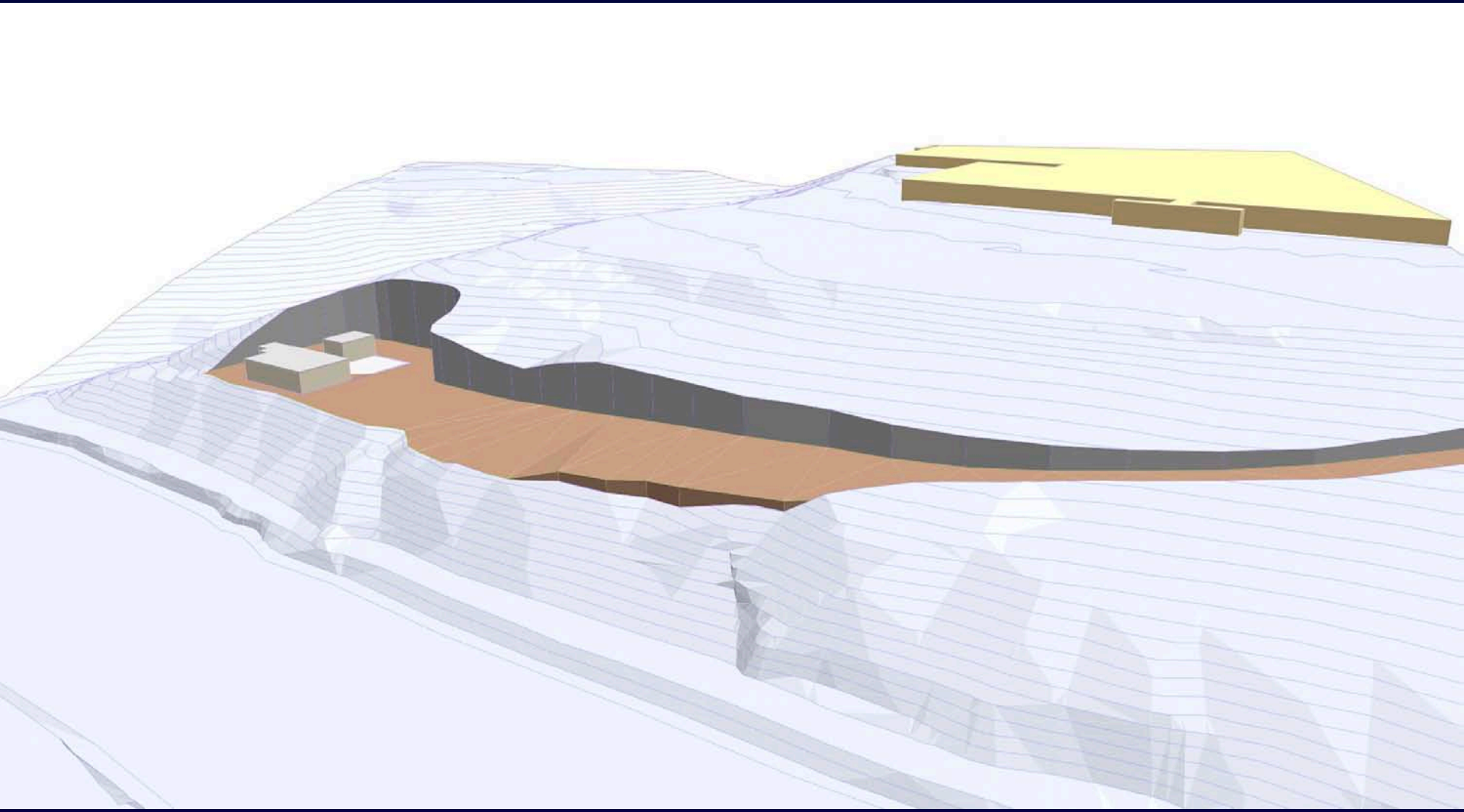


Concept D – Impacts to Riverview Park

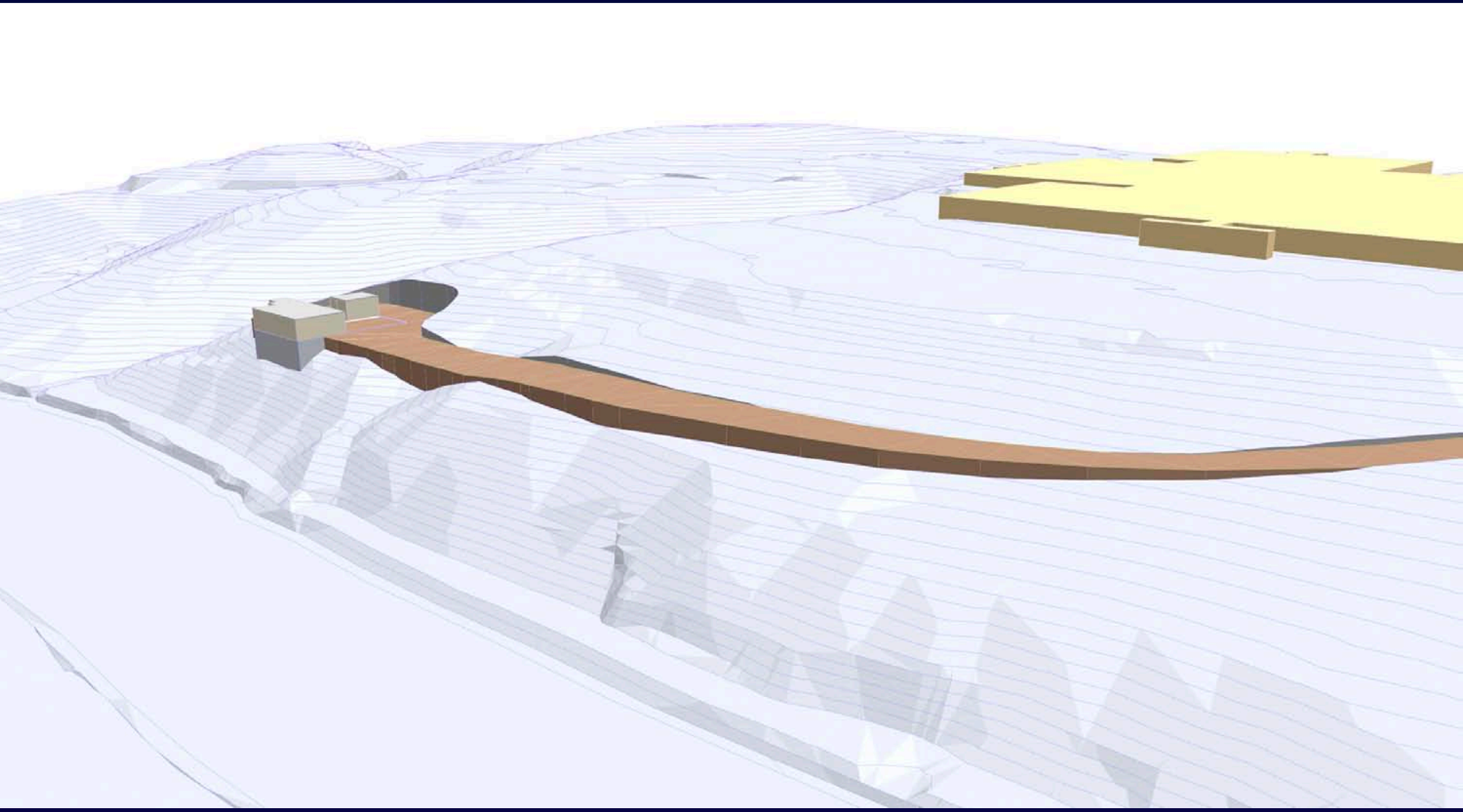
- Total disturbed acreage: 10.6
- Disturbed acreage West of Rivanna River: 3.4



A 3D Diagrammatic Look at Concept D Elevation 352



A 3D Diagrammatic Look at Concept D
Elevation 375

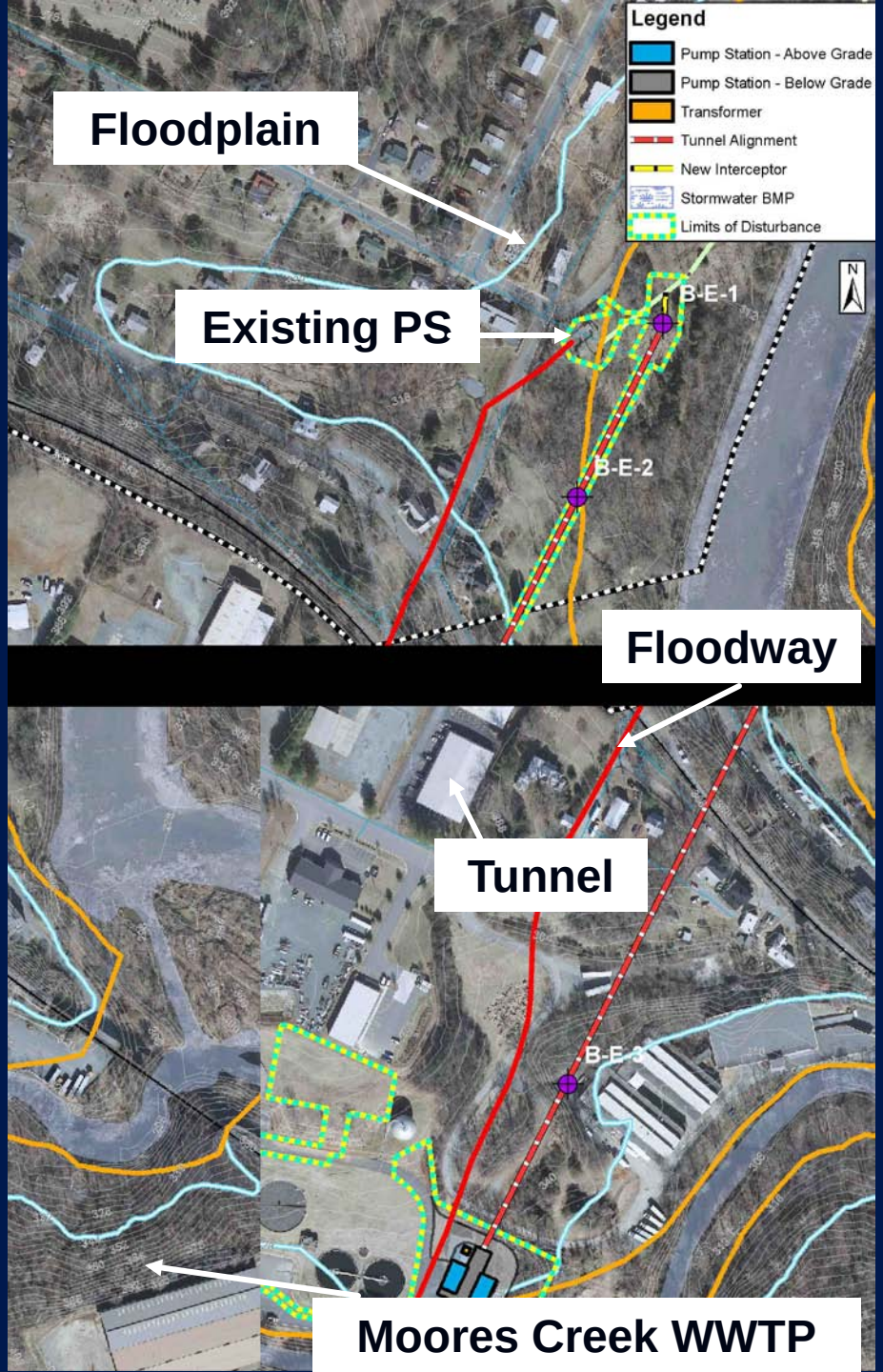


Site Restoration at Concept D Up to ***30 Years***

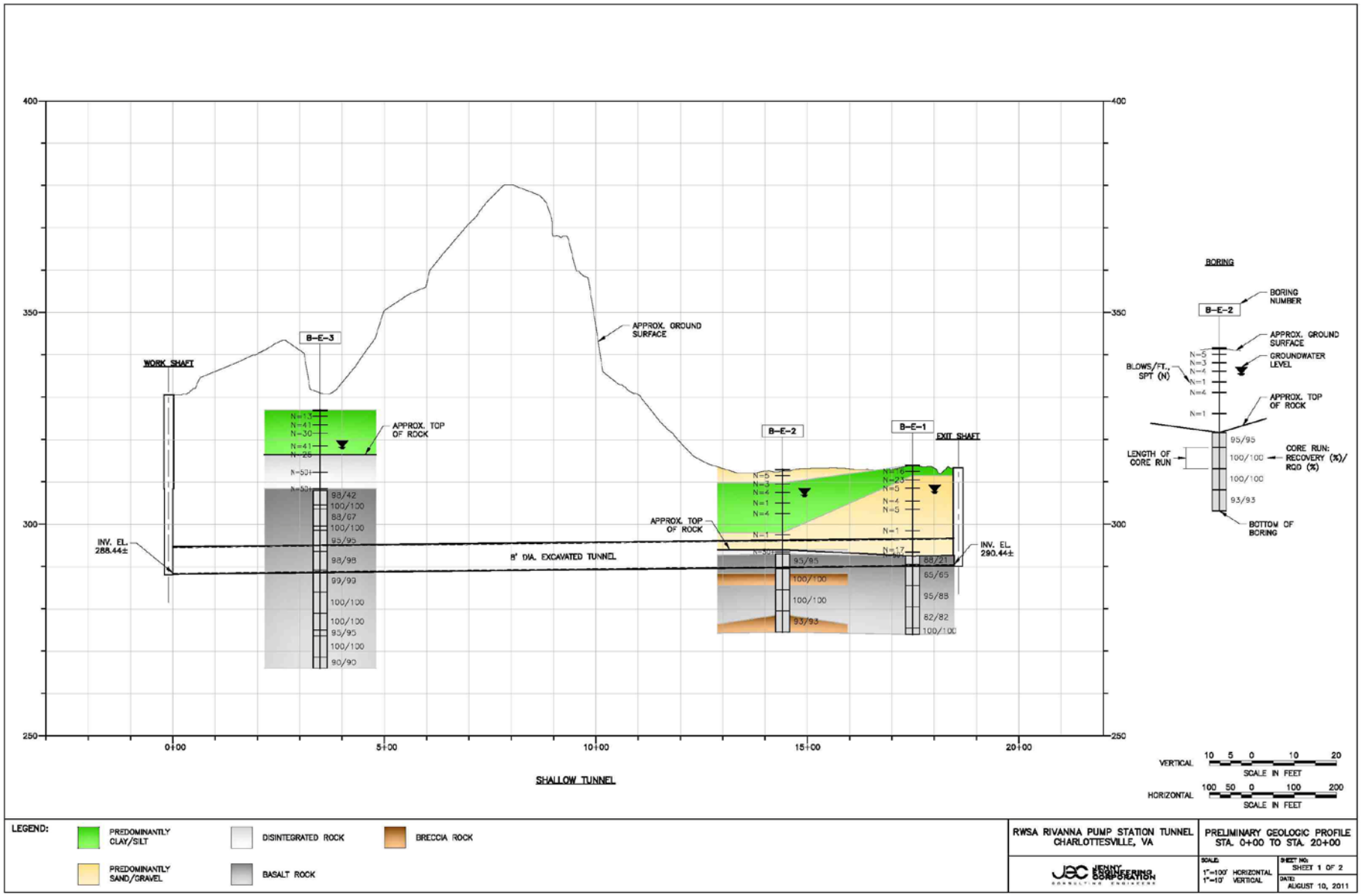
Architectural Options for Concept D – Approach 1
View in 2047

Architectural Options for Concept D – Approach 2
View in 2047

Concept E


Legend
Pump Station - Above Grade
Pump Station - Below Grade
Transformer
Tunnel Alignment
New Interceptor
Stormwater BMP
Limits of Disturbance
Floodplain
Existing PS
B-E-1
B-E-2
Floodway
Tunnel
B-E-3
Moores Creek WWTP

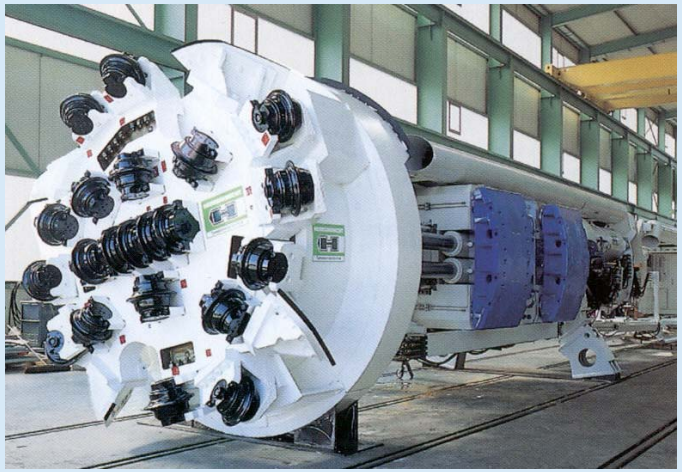
Concept E - Tunnel Section



Tunnel Construction 101

- **How is it constructed?**
  - Work shaft/exit shaft
  - Tunnel boring machine
- **Will there be blasting?**
- **What about vibration?**

Shaft Construction



Tunnel Boring Machine (TBM)

Exit Shaft

Tunnel Construction 101

- **What are the impacts to affected properties?**
  - Soil pre-conditioning
  - Surface easement
  - Subterranean easement

Jet Grout Truck

Impacts in the Vicinity of the Existing Pump Station

- Exit shaft
- Tie-in from tunnel to existing interceptor
- Soil pre-conditioning
- Disturbance: existing RPS parcel + 0.5 acre

Secant Pile Wall Excavation Support

After Project Completion

Concept E Pump Station On Moores Creek WWTP Site

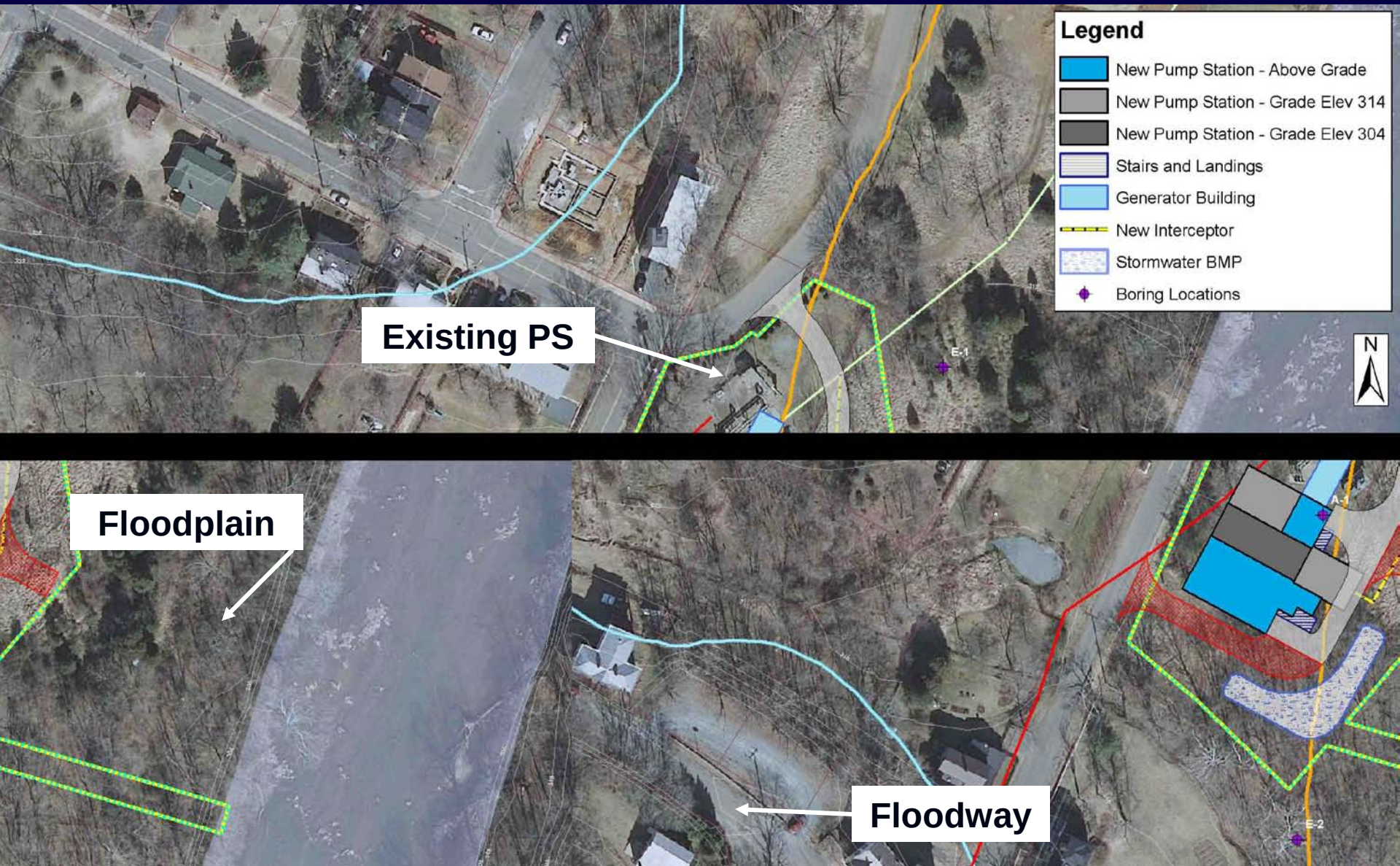
- All PS construction on WWTP site
- Tunnel work shaft on WWTP site
- No river crossing required
- Generator would be located on WWTP site
- Architecture consistent with WWTP and County requirements

Plant Architectural Style

Concept A


RIVERVIEW PARK
CITY OF CHARLOTTESVILLE
PARKS AND RECREATION

Concept A Overall Site Plan



Concept A - Issues

- **Floodplain**
  - Operating floor
  - Equipment access
  - Overall building height
- **Working in concert with the neighborhood**
  - Odor control
  - Noise
  - Natural gas generator
  - Architecture
  - Landscape architecture

Concept A Height Requirements

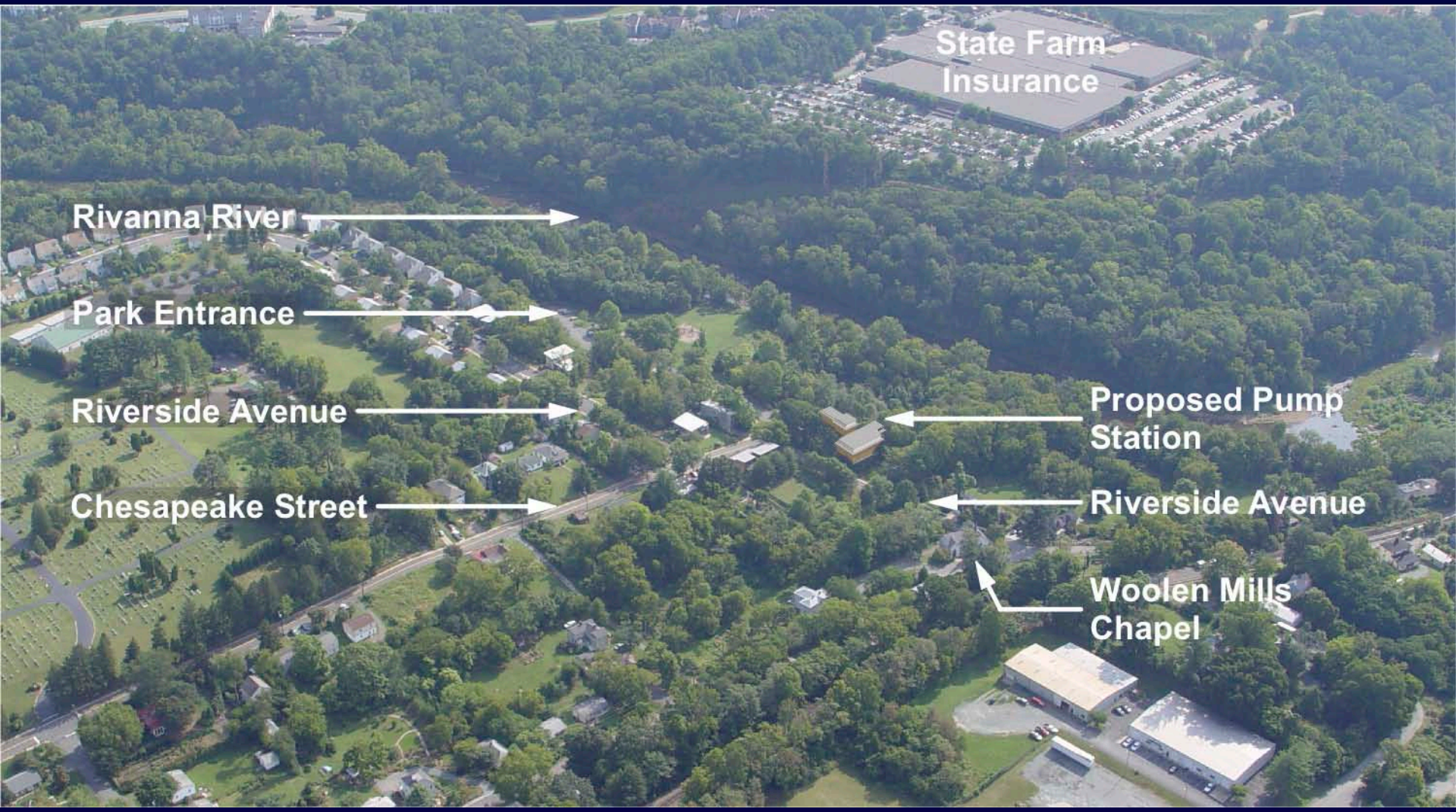
Grade to flood elevation:	17 feet
Height for equipment:	15 feet
Roof structure:	2.5 feet
TOTAL HEIGHT:	34.5 feet

Architecture and Landscape Architecture Are Critical Components for Concept A

- Aerial views
- Site plan with park amenities
- Site sections
- Precedent architecture
- Precedent materials
- 3-D renderings

BUSHMAN DREYFUS | SITEWORKS

Concept A – Site Concepts



Concept A – Conceptual Site Plan

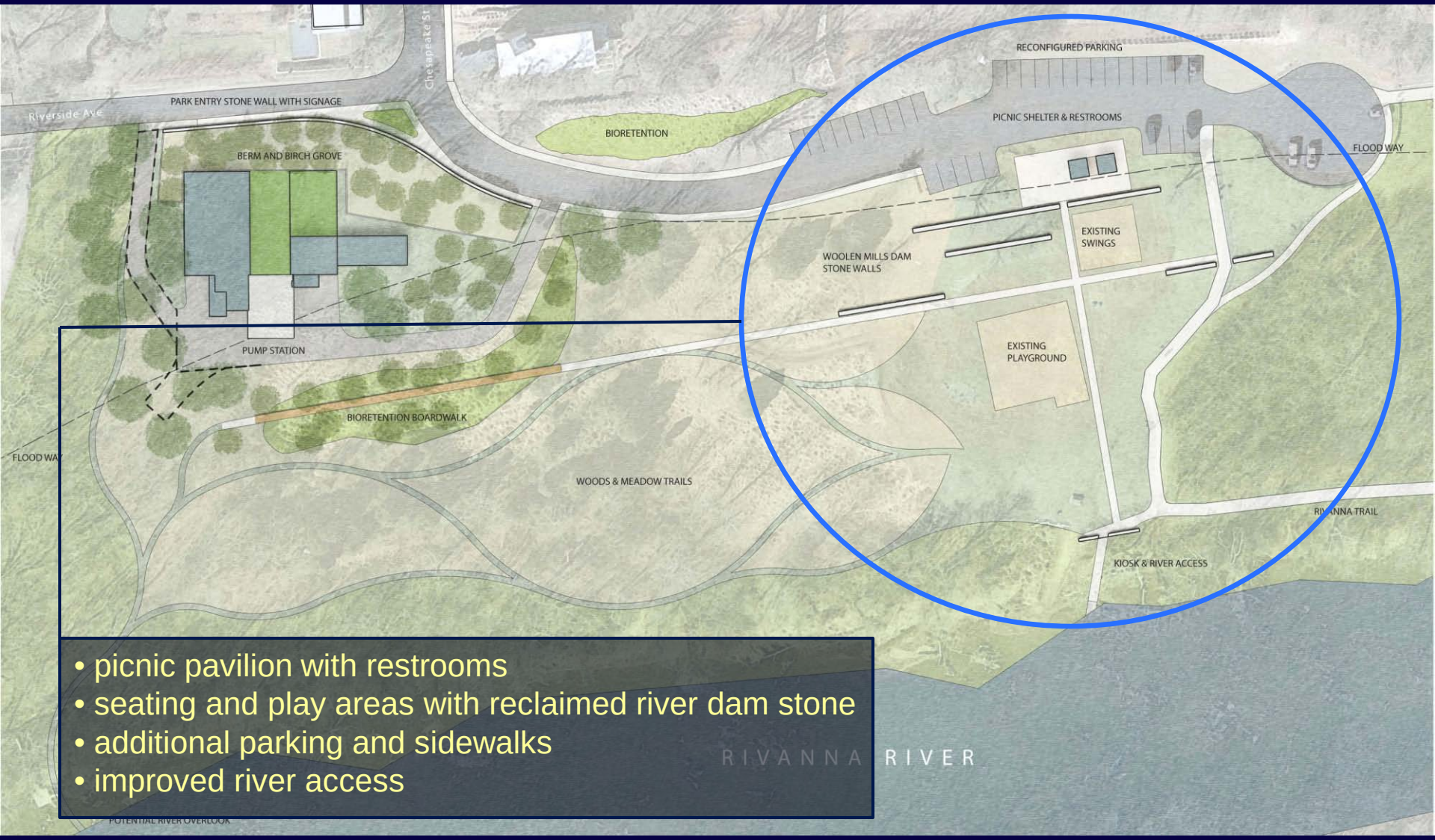
Concept A – Conceptual Site Plan

Riverview Park Entrance

- entry wall with reclaimed stones from river dam
- berm with birch grove
- park signage

Concept A – Conceptual Site Plan

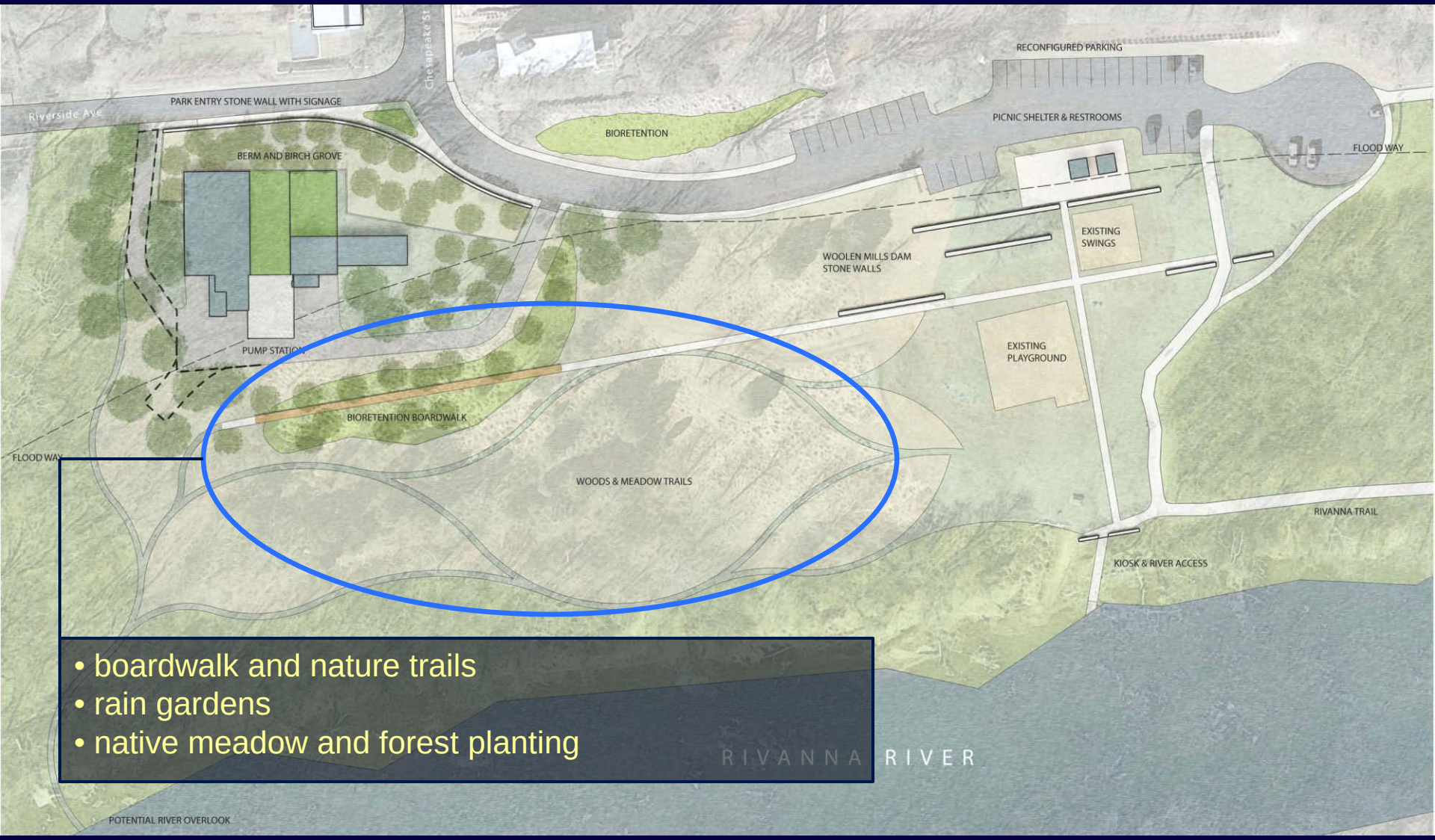
Riverview Park Improvements



- picnic pavilion with restrooms
- seating and play areas with reclaimed river dam stone
- additional parking and sidewalks
- improved river access

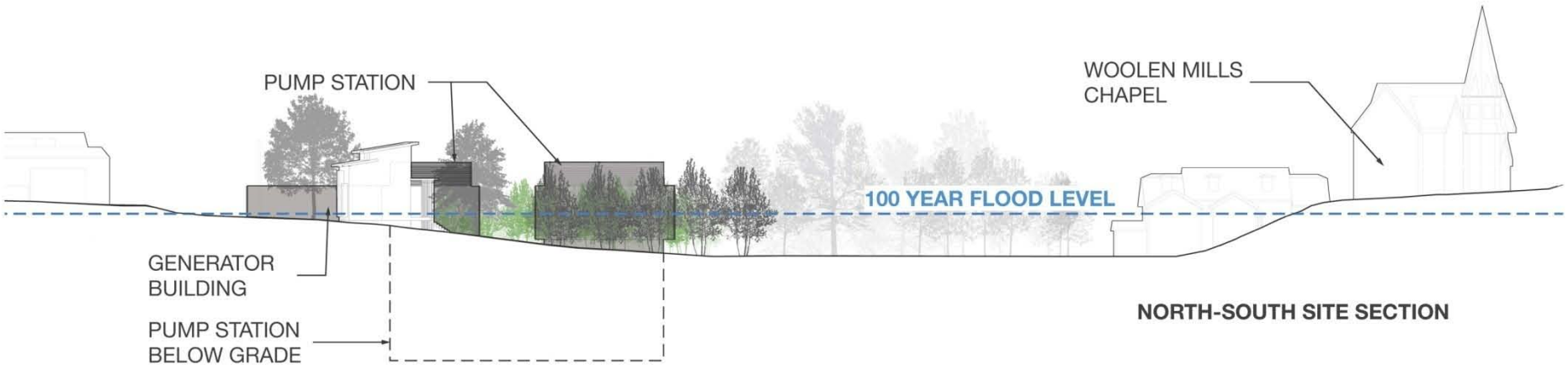
Concept A – Conceptual Site Plan

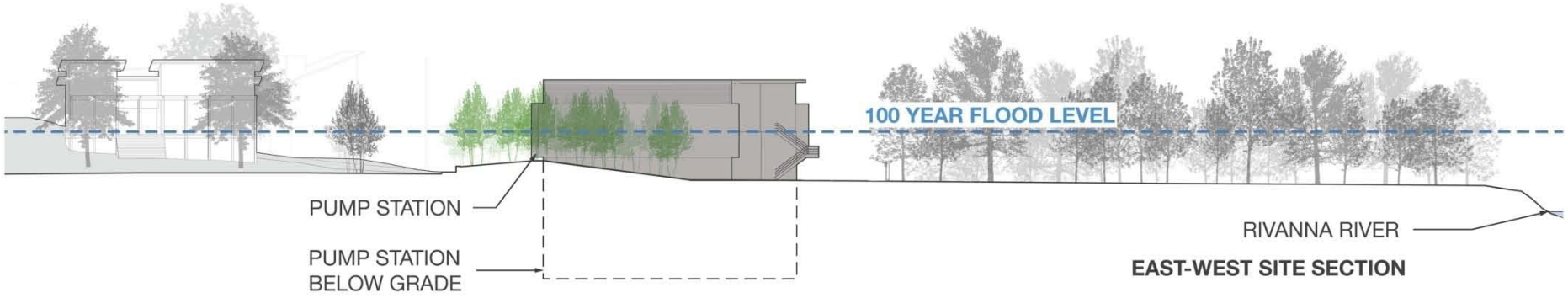
Riverview Park Improvements



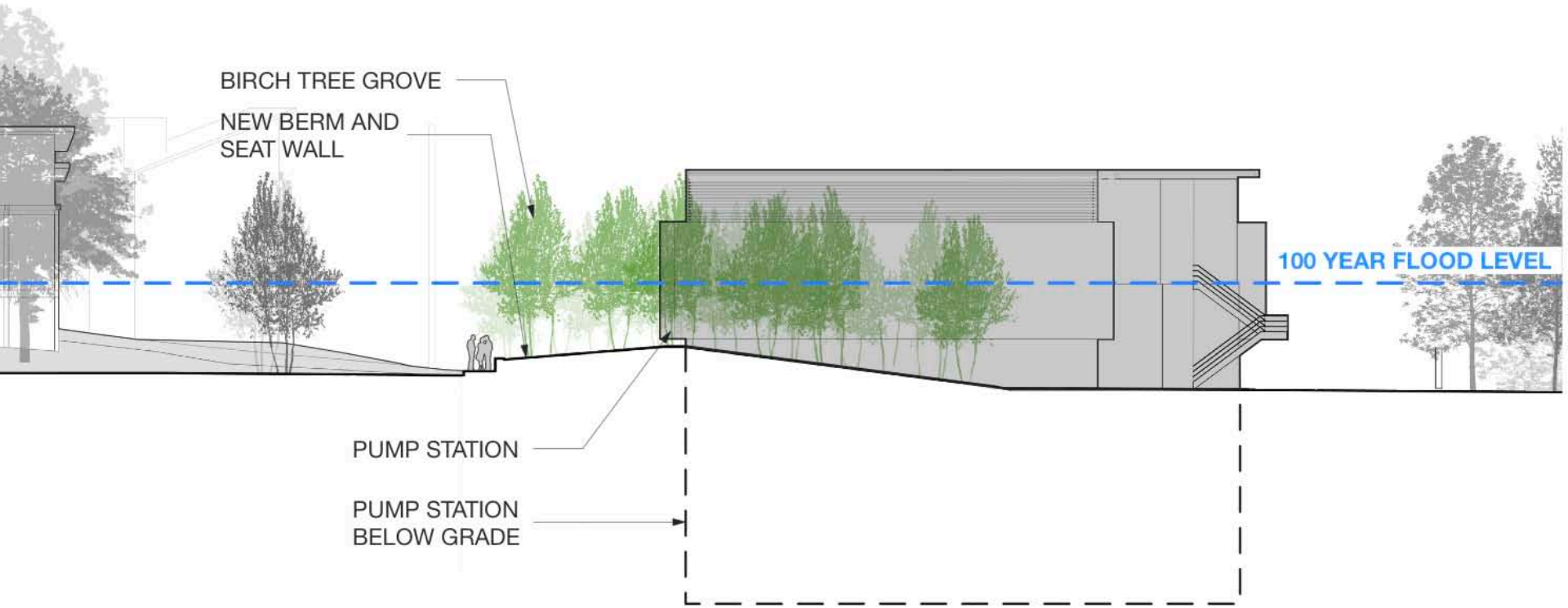
- boardwalk and nature trails
- rain gardens
- native meadow and forest planting

Concept A Site Sections

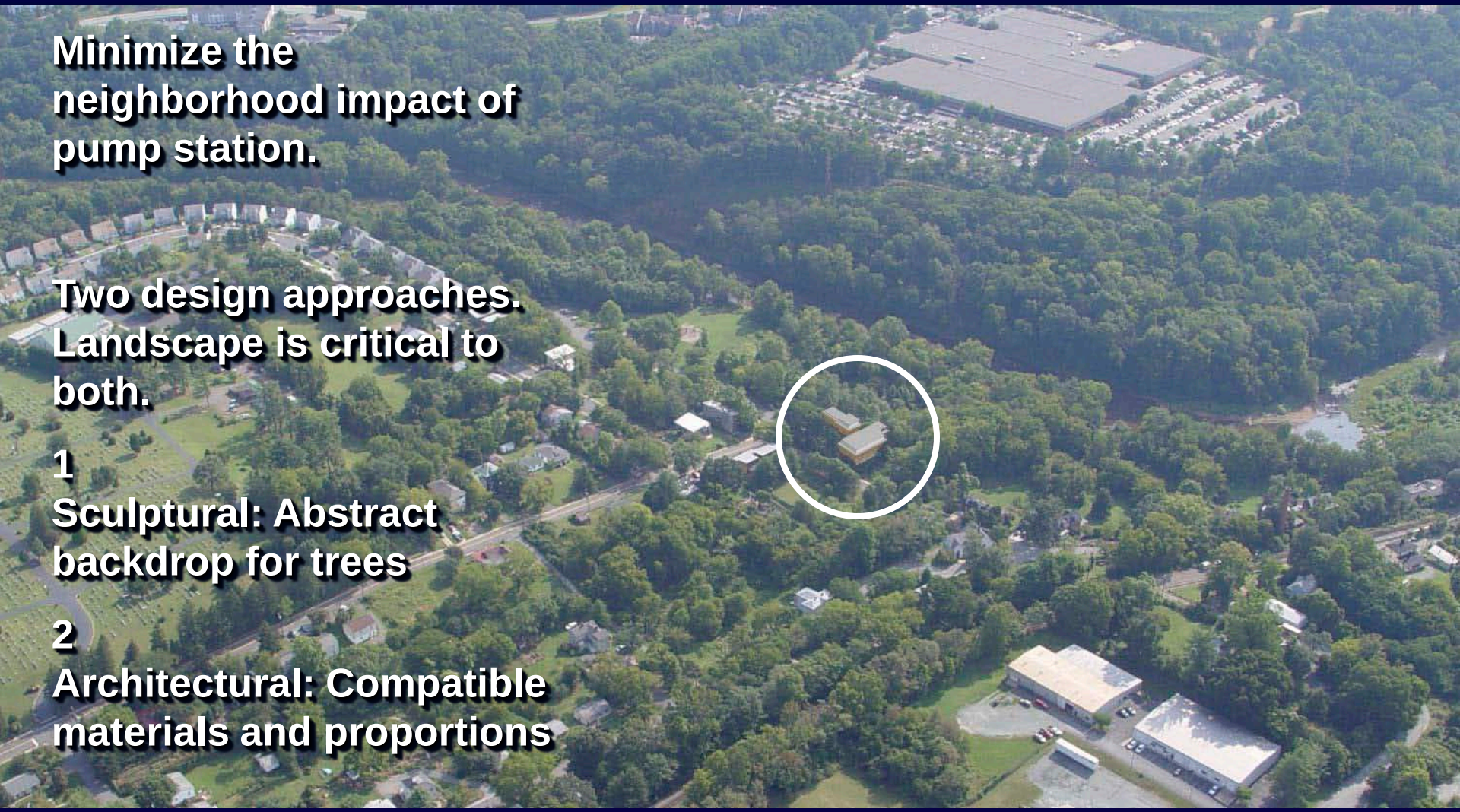




Concept A Site Section



Concept A – Architectural Concepts



Minimize the neighborhood impact of pump station.

Two design approaches. Landscape is critical to both.

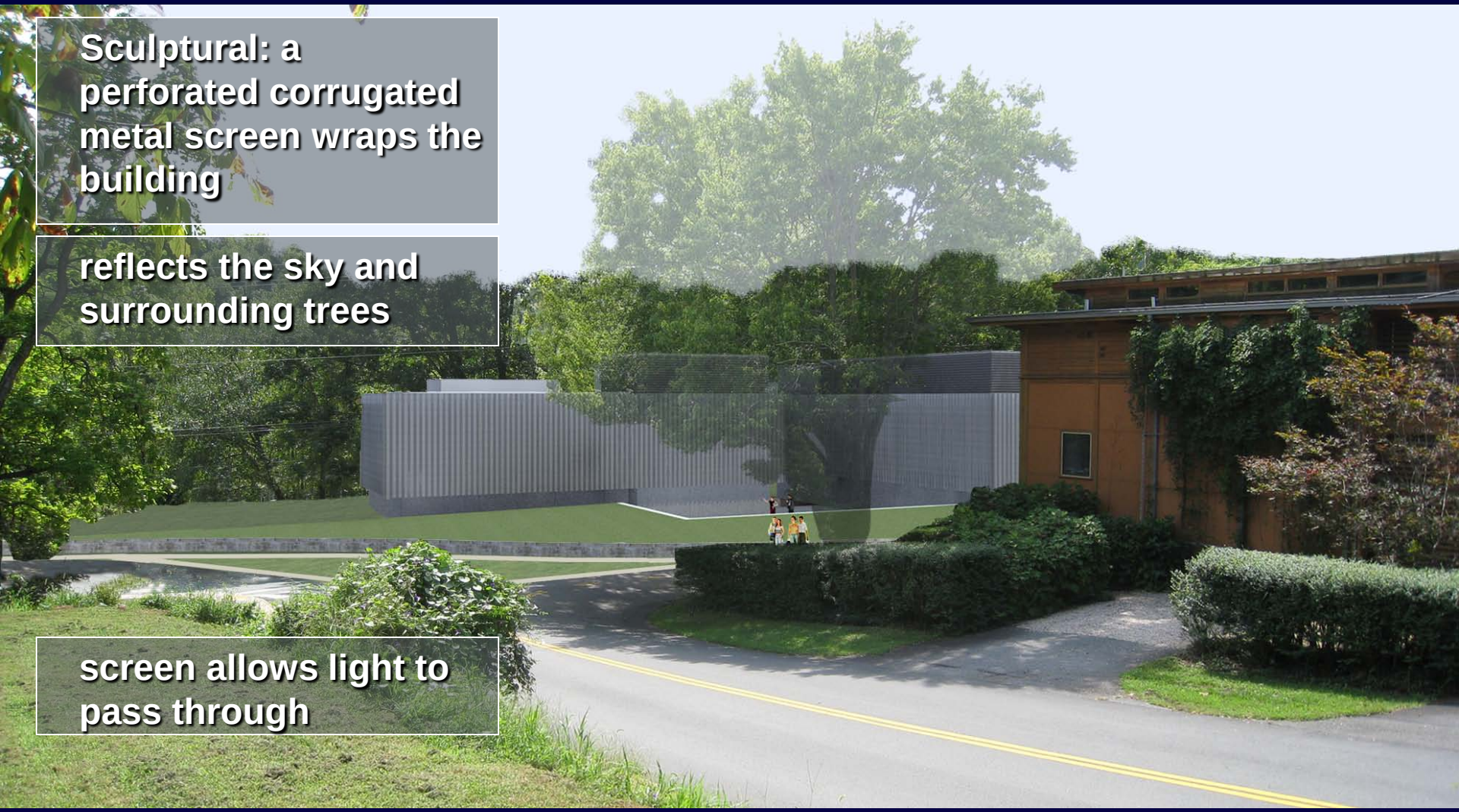
1
Sculptural: Abstract backdrop for trees

2
Architectural: Compatible materials and proportions

Concept A – Existing Condition

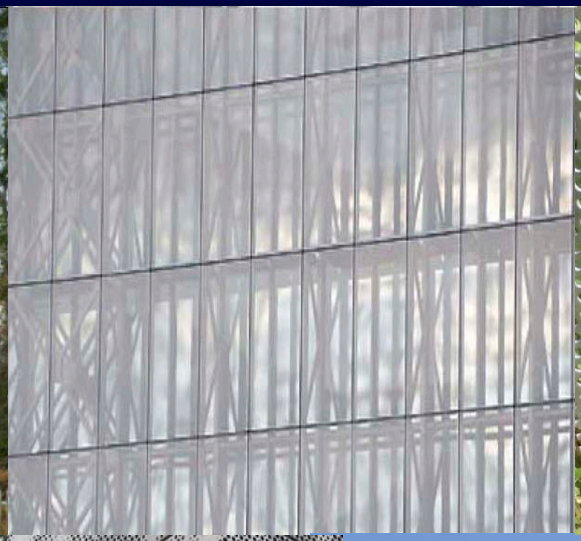
Concept A – Street Edge

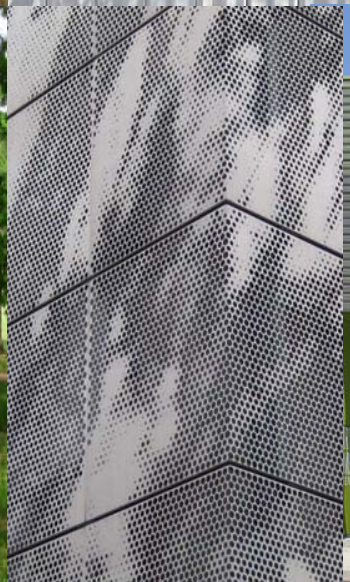
Concept A – Street Edge + Building



Concept A – Landscape

Concept A – First Design Approach





Concept A – Street Edge

Concept A – Street Edge + Building

Concept A – Landscape

Concept A – Second Design Approach

Concept A –
Elements common to both design approaches

- Utility areas are located at the back, away from the neighborhood
- Berm screens base of building
- Strong horizontal line 8 to 10 feet below roof, visually lowers the building
- Subtle changes throughout the day, year, and in different weather

Summary

Concept Summary

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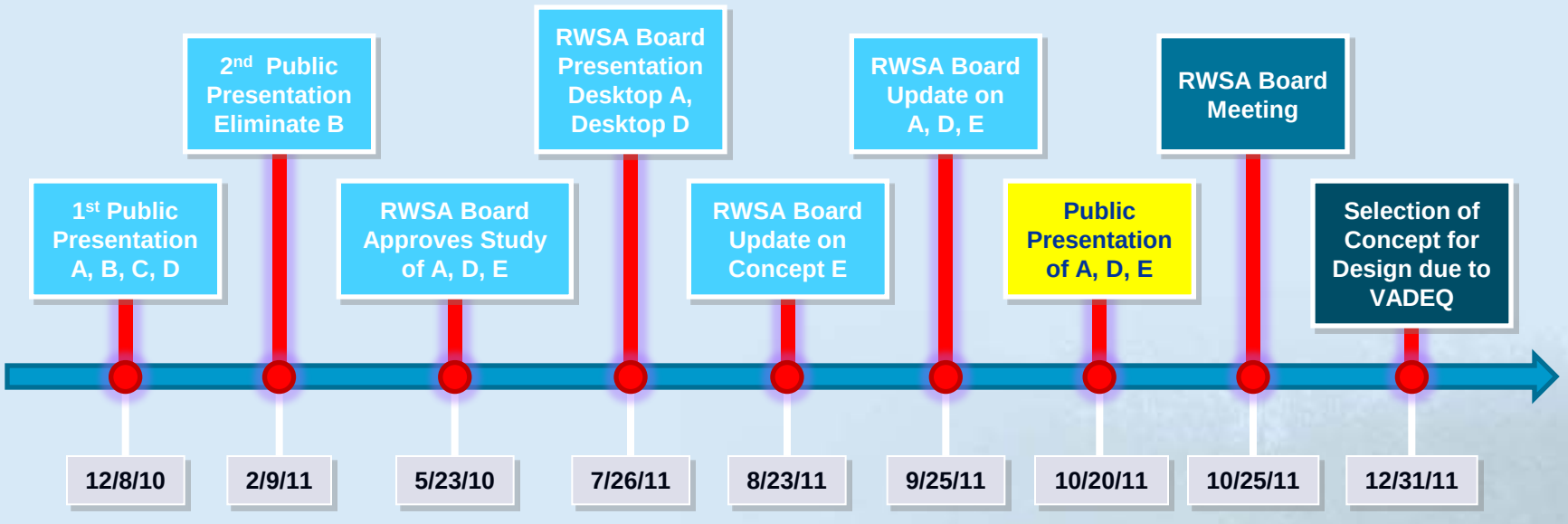
Rivanna Pumping Improvements – Moving Forward



Rivanna Pump Station – Focus Questions

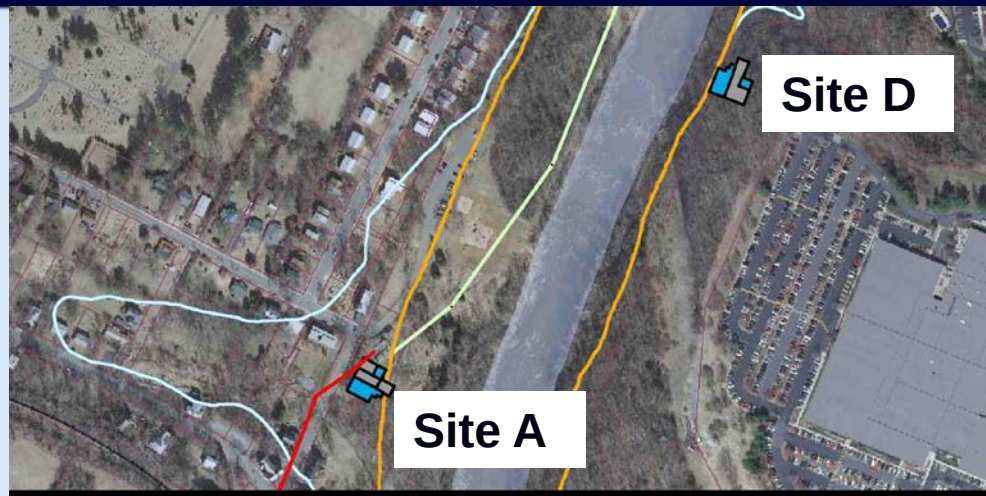
What are the drivers from the presentation that create the best potential outcomes for the Rivanna Pump Station, its neighbors and the community?

Site Disruption…Geological Impact…. Construction Impact… Architectural Continuity…. Noise and Odor Management…. Community Assets… Other?

Questions and Answers

- ***For the latest information please contact:***

  Michelle Simpson, Project Manager
  Rivanna Water and Sewer Authority
  434-977-2970, ext. 202
  msimpson@rivanna.org



Site E

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