

Making the Most of a Retrofit: Lake Cook, Alexandria, Virginia

Chesapeake Water Environment Association

May 18, 2017



AECOM

WHAT'S AHEAD...

- INTRODUCTIONS
- PROJECT DRIVERS
- PROJECT BACKGROUND
- PROJECT GOALS AND OBJECTIVES
- STORMWATER LOCAL ASSISTANCE FUND (SLAF)
- PROJECT DEVELOPMENT
- ANTICIPATED WATER QUALITY IMPROVEMENTS
- PROJECT CHALLENGES



PROJECT DRIVERS

City of Alexandria's MS4 Permit Obligations

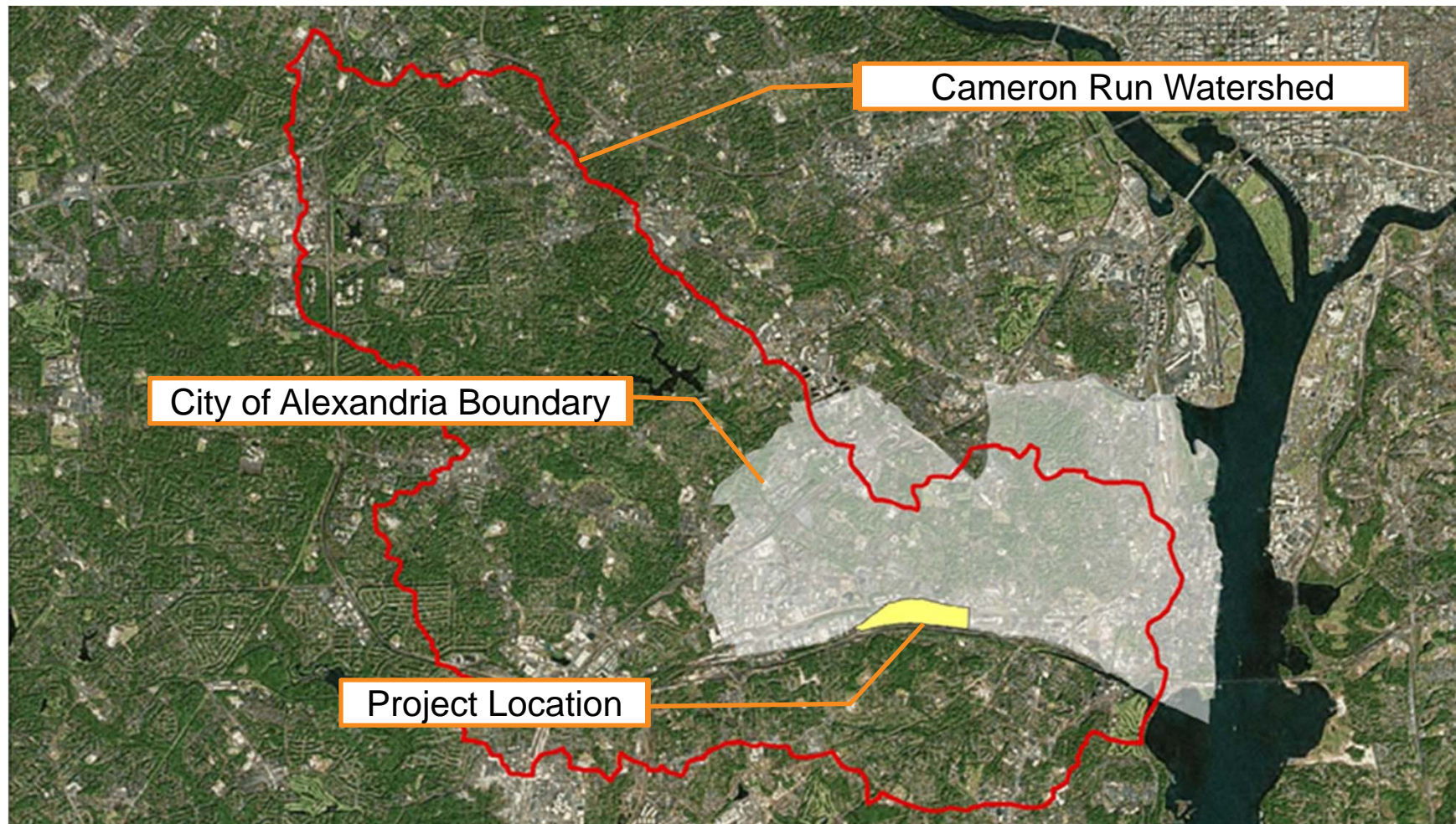
Pollutant Load		Pollutant Total (lbs./yr.)			Approximate Equivalent Acres Treated
		TN	TP	TSS	
2009 Pollutant Loads (Baseline)		97,810	7,712	4,704,400	-
Total Pollutant Reductions Required (Phases I-III)		7,597	1,004	861,937	~ 2,220-2,400
Phase I* (2013-2018)	5%	395	39	43,242	~ 120-300
Phase II (2018-2023)	35%	2,675	354	302,749	~ 660
Phase III (2023-2028)	60%	4,585	607	518,999	~ 1,440

How to Meet These Goals?

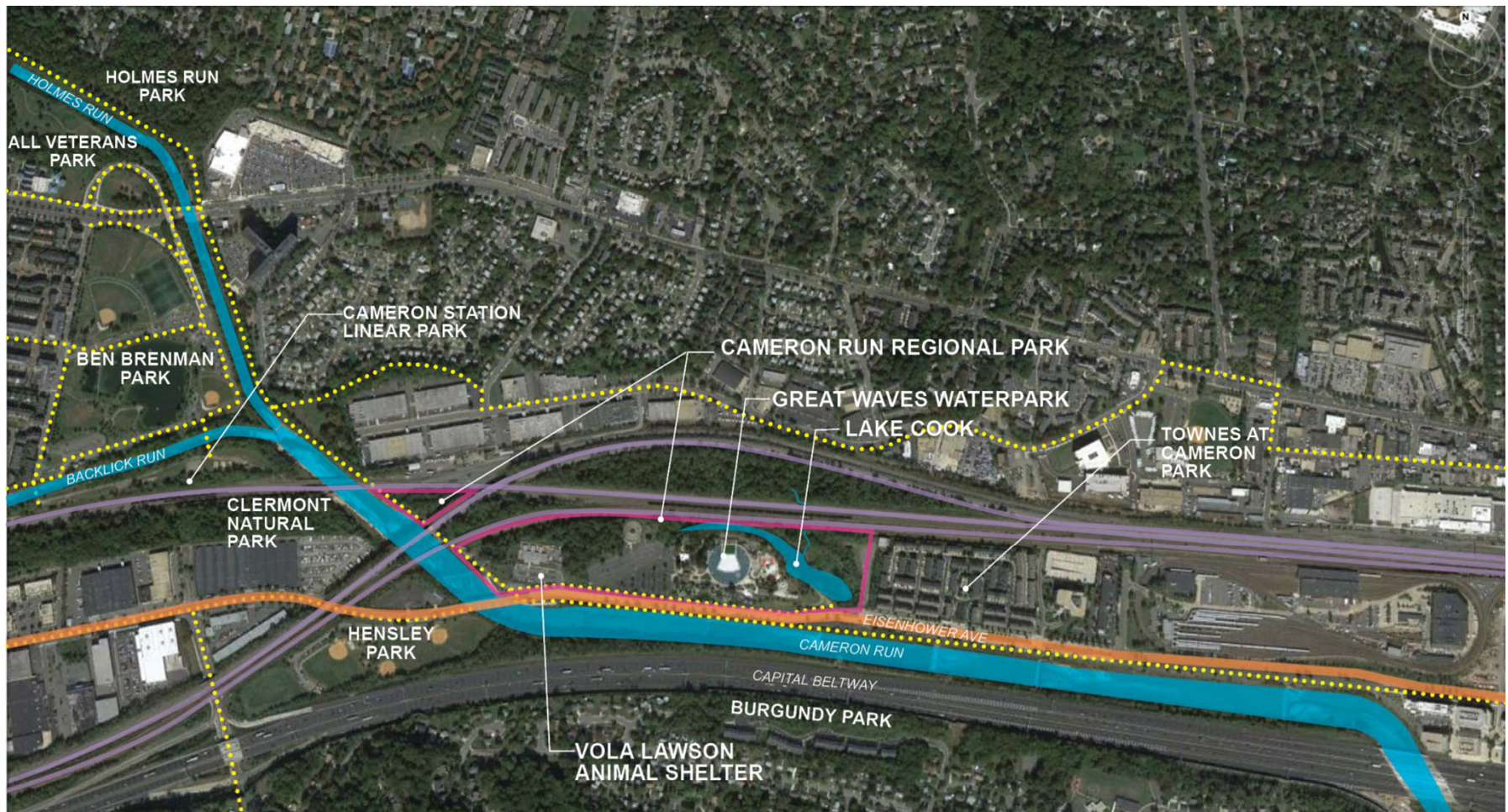
- Compliance Analyses and Options Study (2012)
- Recommended retrofit of existing ponds as the first step in meeting goals



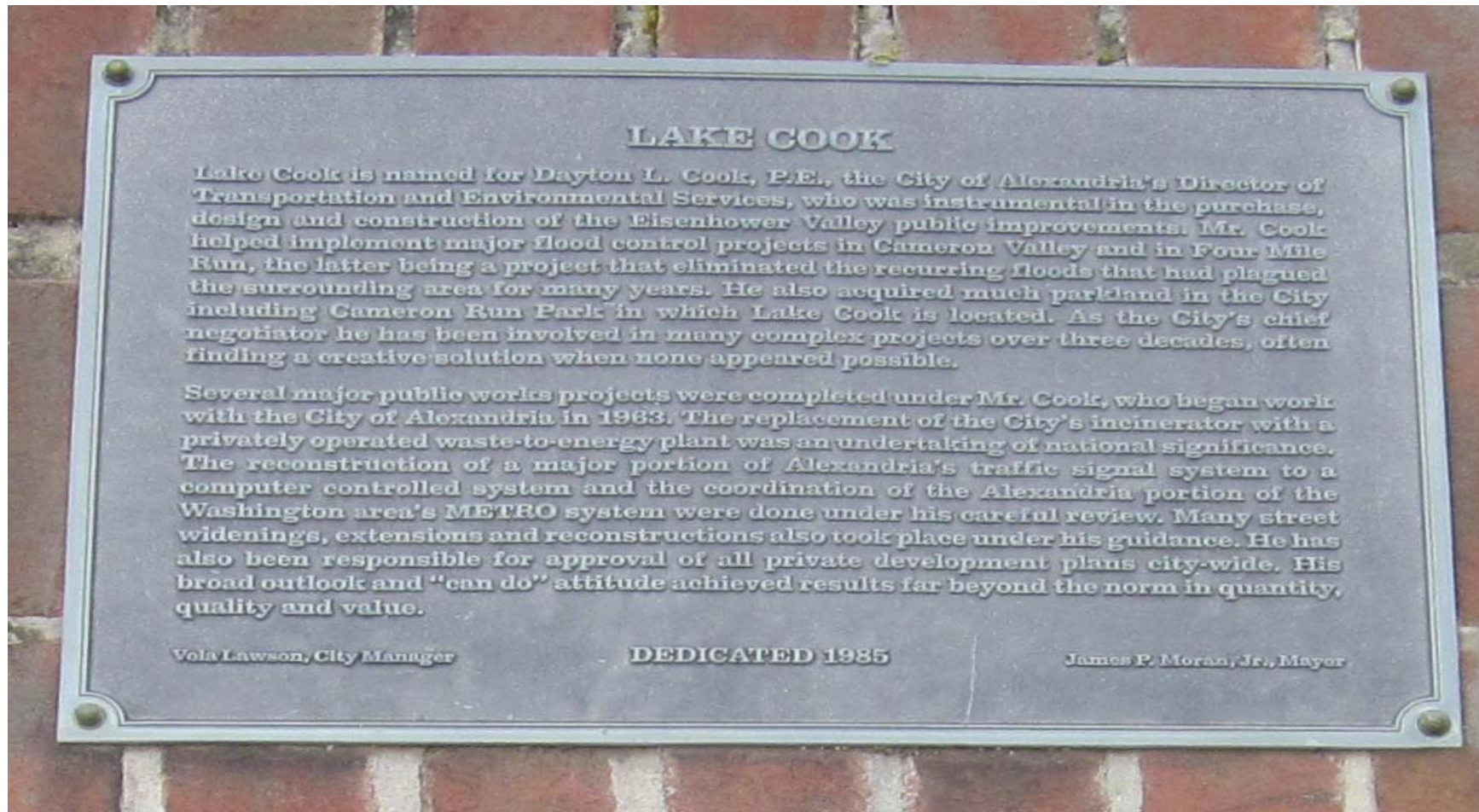
PROJECT BACKGROUND: LOCATION



PROJECT BACKGROUND: LOCATION



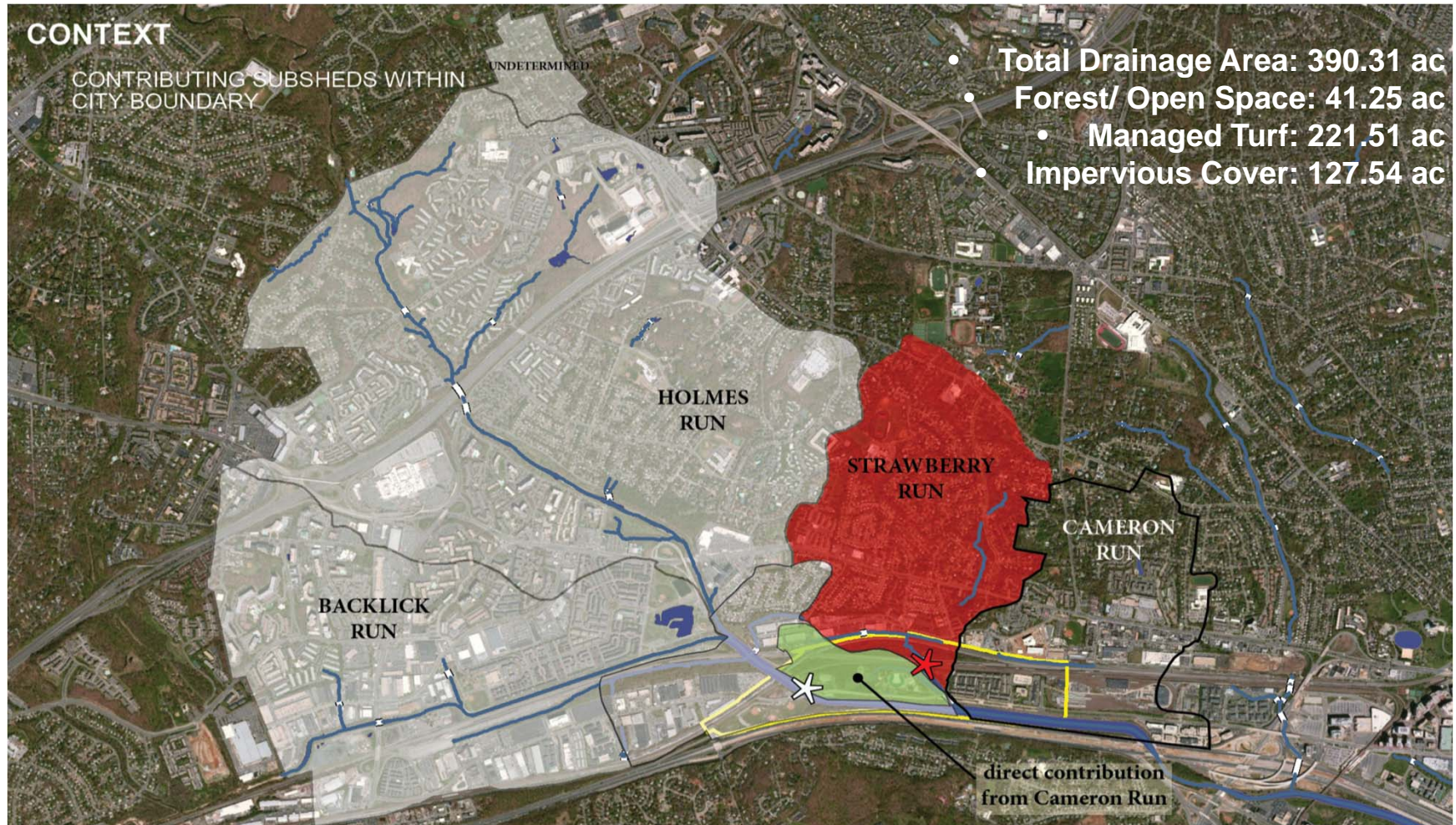
PROJECT BACKGROUND: HISTORY



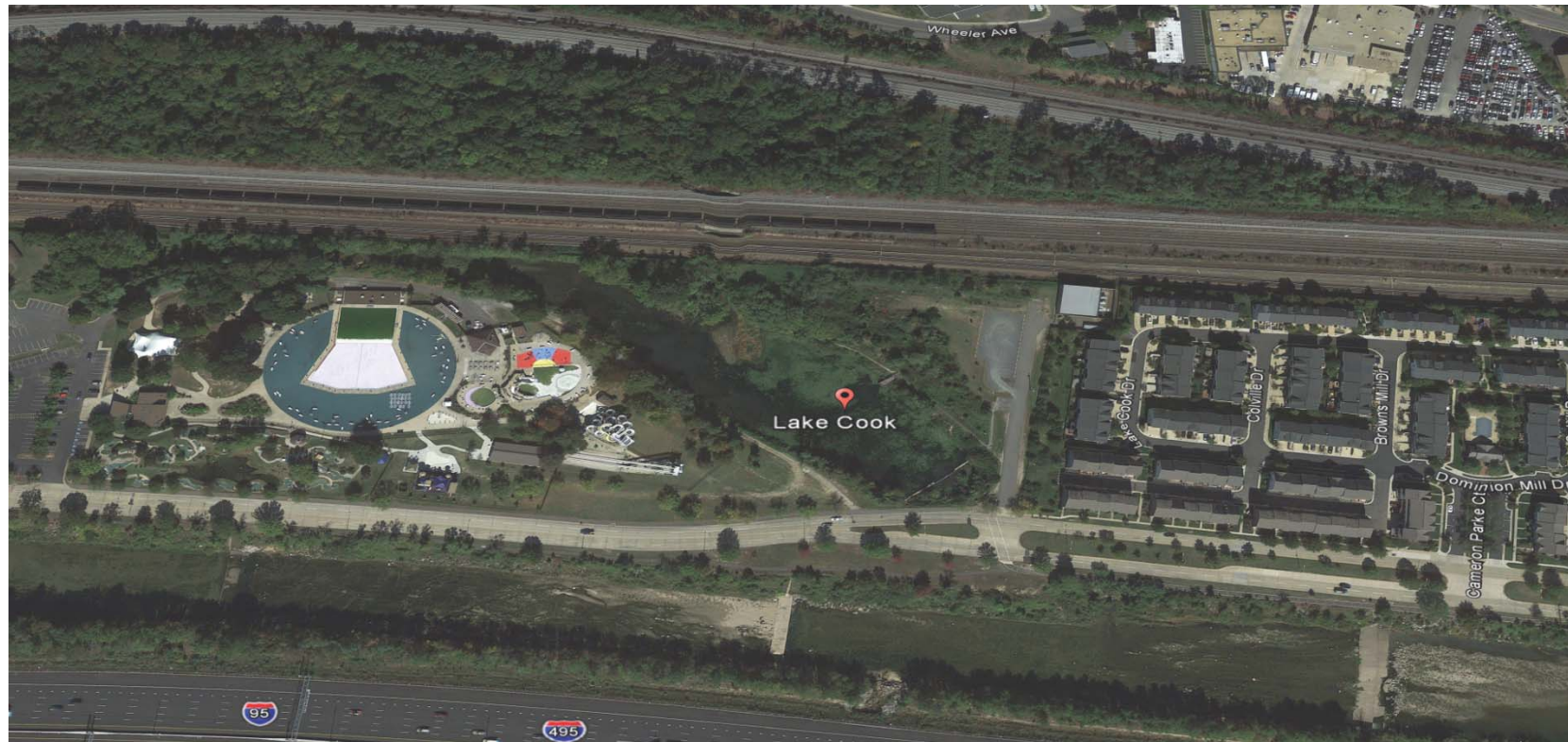
PROJECT BACKGROUND: EXISTING CONDITIONS



PROJECT GOALS AND OBJECTIVES



PROJECT GOALS AND OBJECTIVES



Project Goals

- Help City Meet Regulatory Requirements (MS4 and Chesapeake Bay TMDL)
- Control Algae Growth
- Control Excessive Sedimentation
- Bacteria Reductions
- Increase Pedestrian Circulation
- Increase Views from Eisenhower
- Increase Public Amenities / Education
- Engage Stakeholders

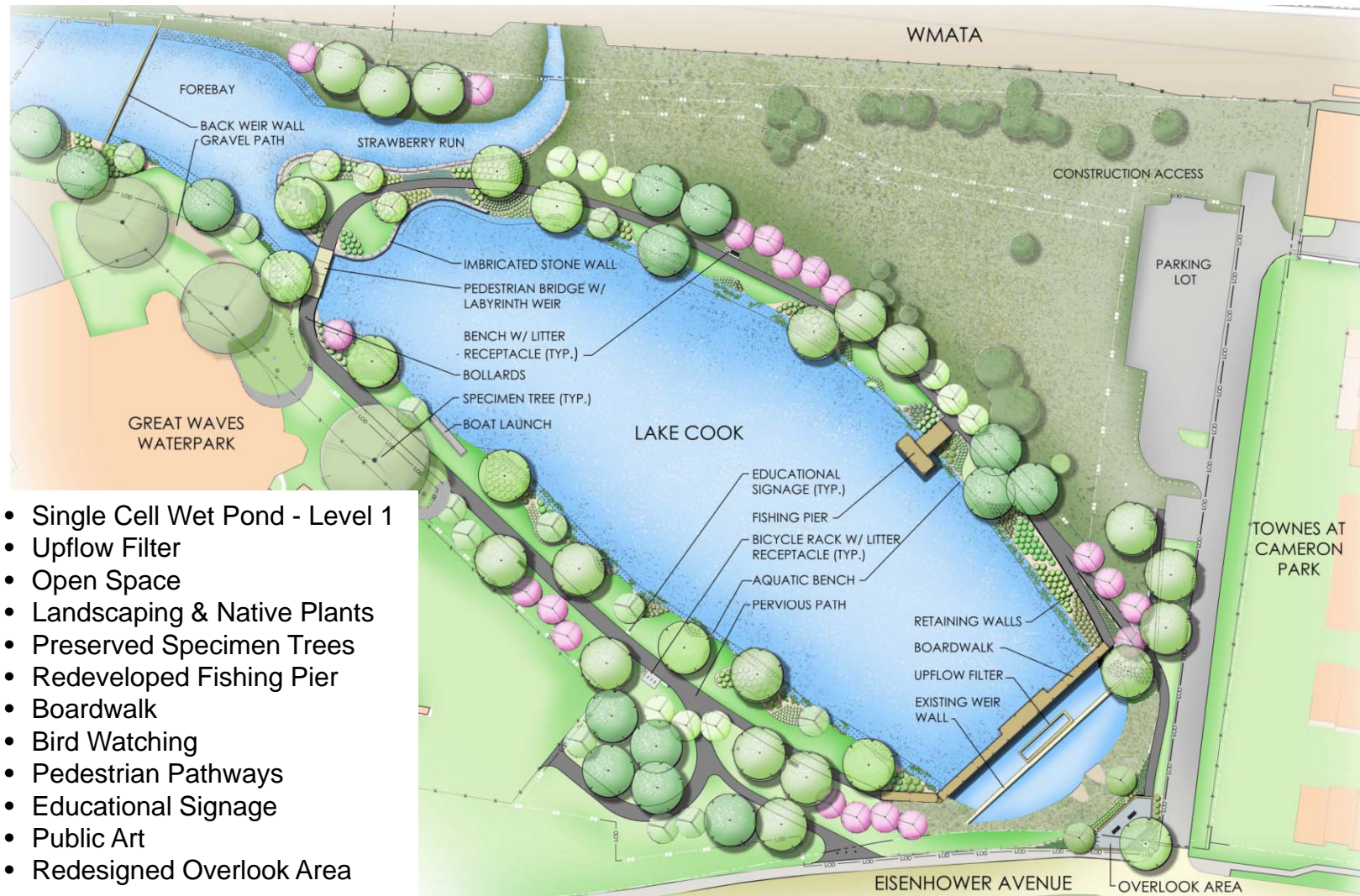


STORMWATER LOCAL ASSISTANCE FUND (SLAF)

- VDEQ grant program to help municipalities fund stormwater projects (50/50 cost match grant)
- In December 2013, City applied for and was awarded a \$1.2M grant for Lake Cook retrofit
- Cost effectiveness is a major consideration in awards. Only applications with costs below \$50,000 per pound of Total Phosphorous were authorized for funding.



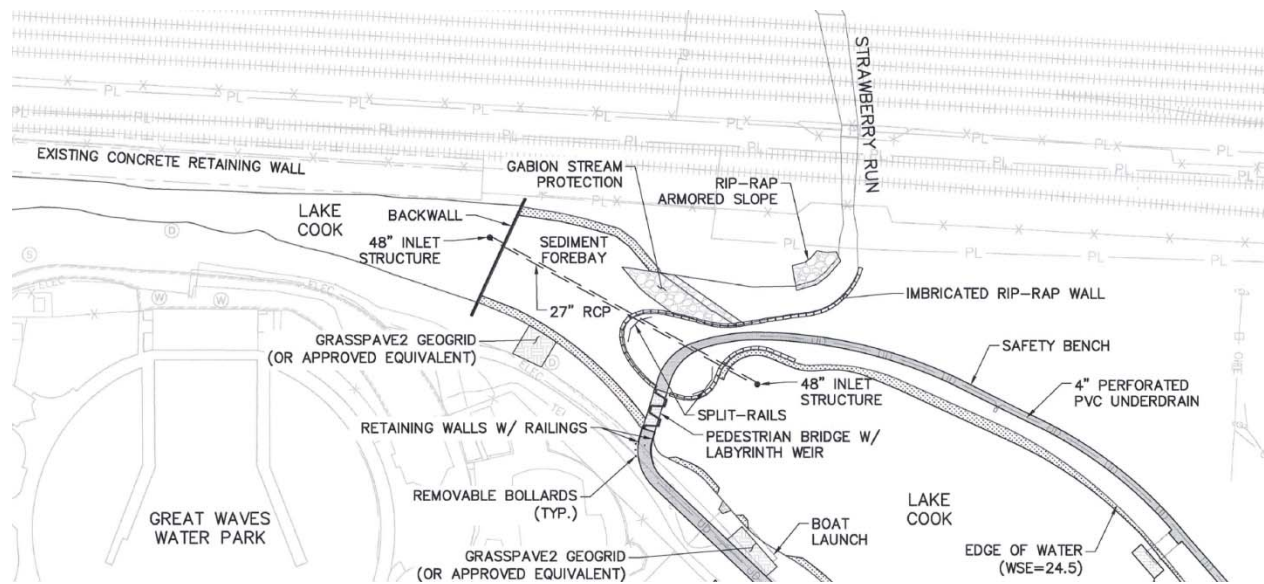
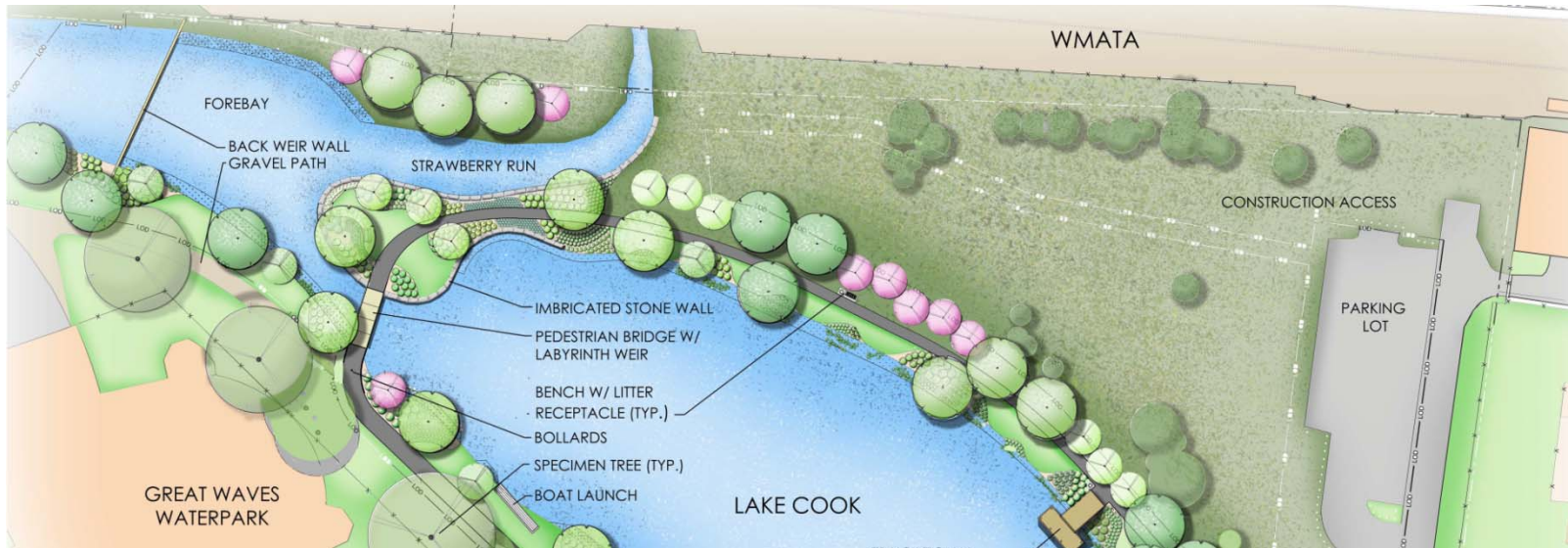
PROJECT DEVELOPMENT (FINAL DESIGN)



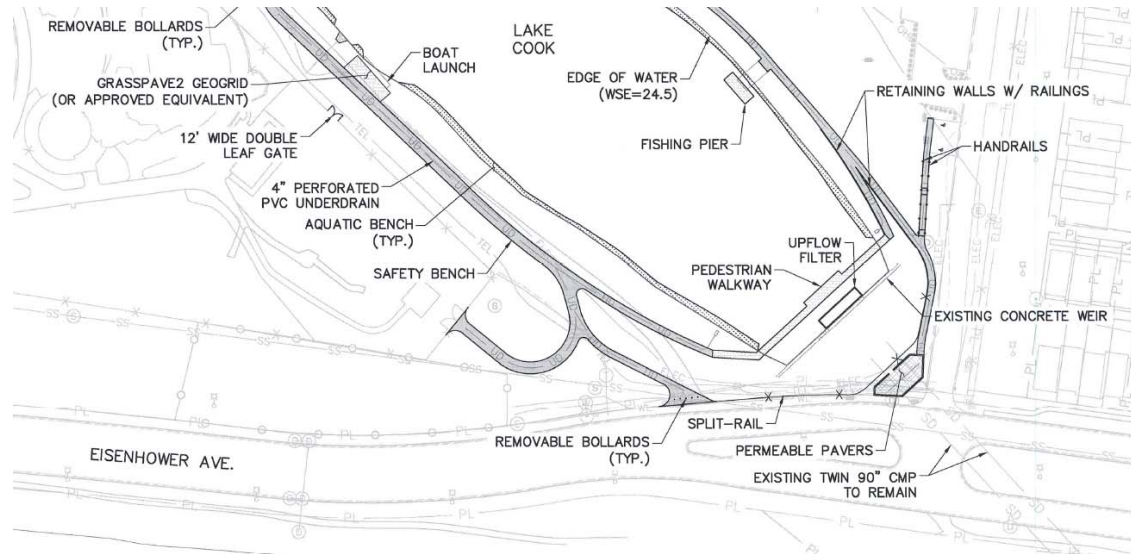
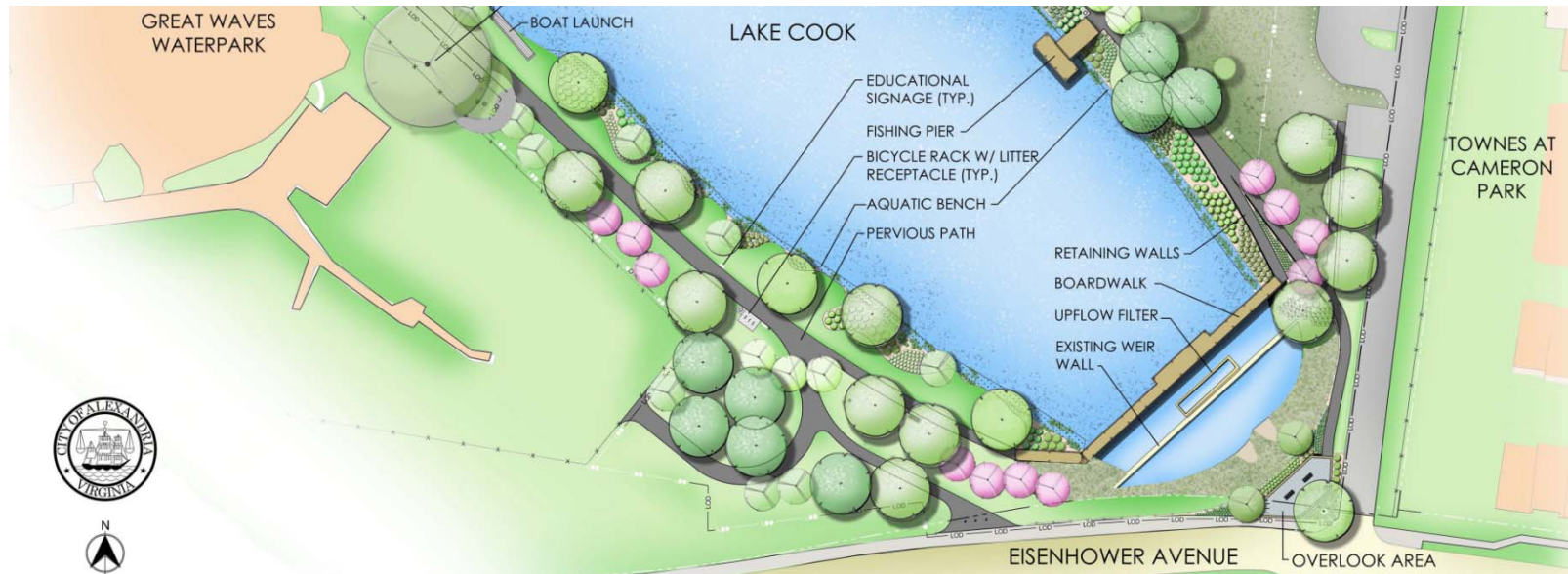
- Single Cell Wet Pond - Level 1
- Upflow Filter
- Open Space
- Landscaping & Native Plants
- Preserved Specimen Trees
- Redeveloped Fishing Pier
- Boardwalk
- Bird Watching
- Pedestrian Pathways
- Educational Signage
- Public Art
- Redesigned Overlook Area



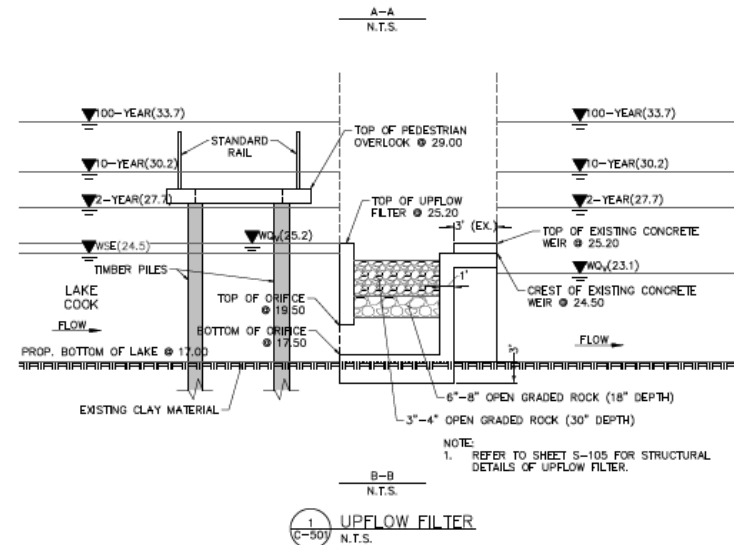
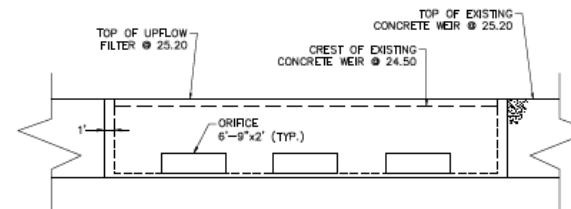
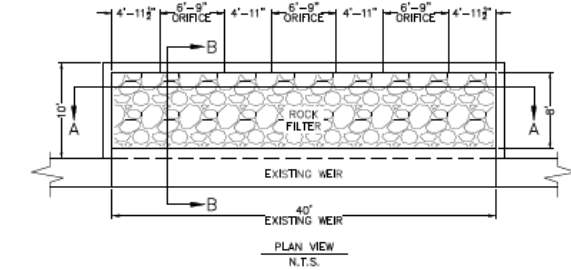
PROJECT DEVELOPMENT (FINAL DESIGN)



PROJECT DEVELOPMENT (FINAL DESIGN)



PROJECT DEVELOPMENT (FINAL DESIGN)

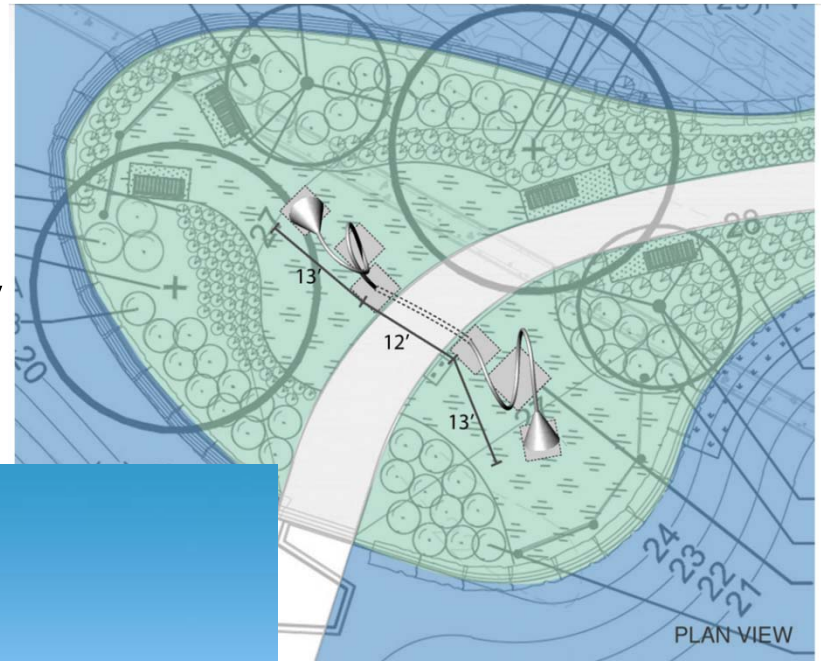


PROJECT DEVELOPMENT (FINAL DESIGN)



PUBLIC ART

- Artist David Hess
- Interactive artwork
- Will capture and carry sound created by the surrounding environment



ANTICIPATED WATER QUALITY IMPROVEMENTS

Expected Pollutant Load Reductions

Pollutants	Annual Pollutant Removal Rates After Retrofitting (lbs./yr.)
Nitrogen	1,610
Phosphorous	167
Total Suspended Solids	134,140

Estimated Cost Per Pound of Phosphorous= \$24,000/lb.



PROJECT CHALLENGES

Challenge	Approach
Evolving DEQ Regulations for Retrofits	Preparation of a Water Quality Technical Memo at Preliminary Design and early coordination with DEQ
Public Input	Held public and stakeholder meetings at various intervals of project and incorporated elements of concern into final design
Disposal of Dredge Material (limited on-site space)	Considered various sites within City for storage and alternative uses of dredged material
Construction Phasing	Work must be done in the dry, employed proprietary diversion measure for 357 acre drainage through Strawberry Run
Long Term Maintenance	Engaged various stakeholders (NOVA Parks Authority and City Dept. of Recreation, Parks and Cultural Activities) at early phases of project to design features such that maintenance of proposed elements was considered in material selection, access, life cycle costs, etc.
Wildlife Protection / Relocation	Preparation of a Wildlife Management Plan and coordination with VDGIF to relocate existing fish, suspend restocking and to relocated beavers, turtles, etc.



Questions?

Contact Info:

Umar Shahid, (301) 820-3240, Umar.Shahid@aecom.com

Sara DeGroot, (703) 746-4127, Sara.DeGroot@alexandriava.gov

