

City of Alexandria, Virginia

Sanitary Sewer Master Plan

December 17, 2012
Community Meeting



Sewer Master Plan Objectives

- Understand How Systems Work
- Analyze Impacts of Growth
- Analyze Wet Weather Impacts
- Incorporate Regulatory Requirements
- Evaluate Infrastructure Improvements and Costs
- Identify Funding Strategies for System Needs

Sanitary Sewer Master Plan Key Conclusions

- Planning document to address existing and future sanitary sewer needs
- Growth-related needs to be paid for by growth
- Existing needs to be paid for by existing customers
- Plan to be updated as required

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Schedule

- Work session with Planning Commission January 3, 2013
- Present to Planning Commission February 5, 2013
- Adopt as separate chapter to the City's Master Plan

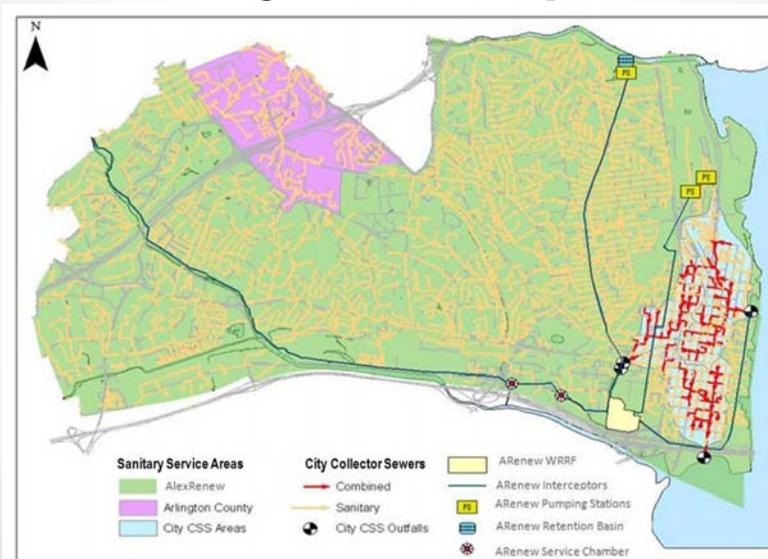
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Sanitary Sewer System Components

- City Owned Collection System
- AlexRenew Interceptor Sewers and Sewer Assets
- Treatment Facilities
 - AlexRenew Water Resource Recovery Facility (WRRF)
 - Arlington County Water Pollution Control Plant (WPCP)

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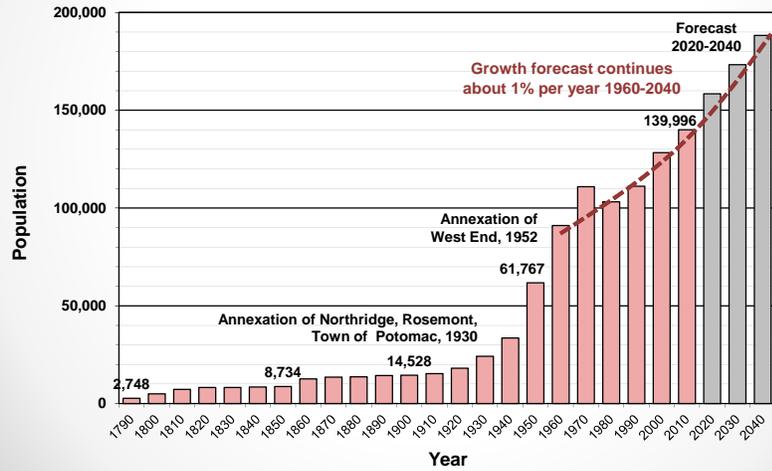
System Map



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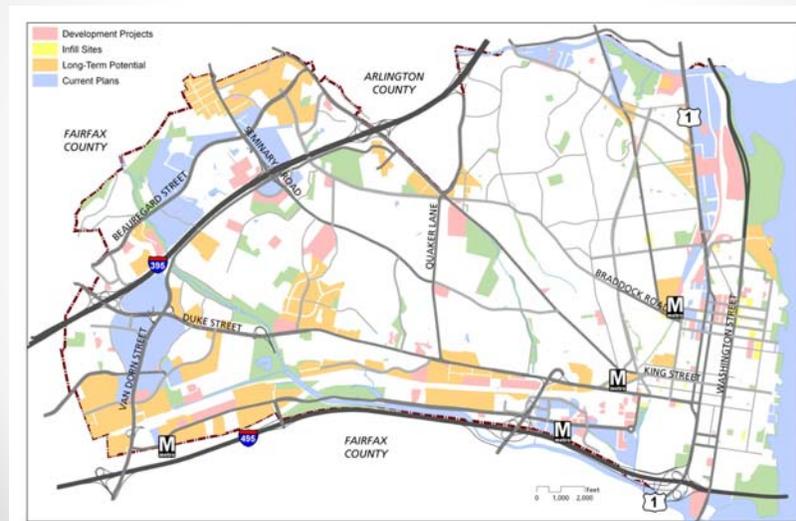
Growth Forecasts

Historical and Forecast Population of Alexandria
1790 - 2040



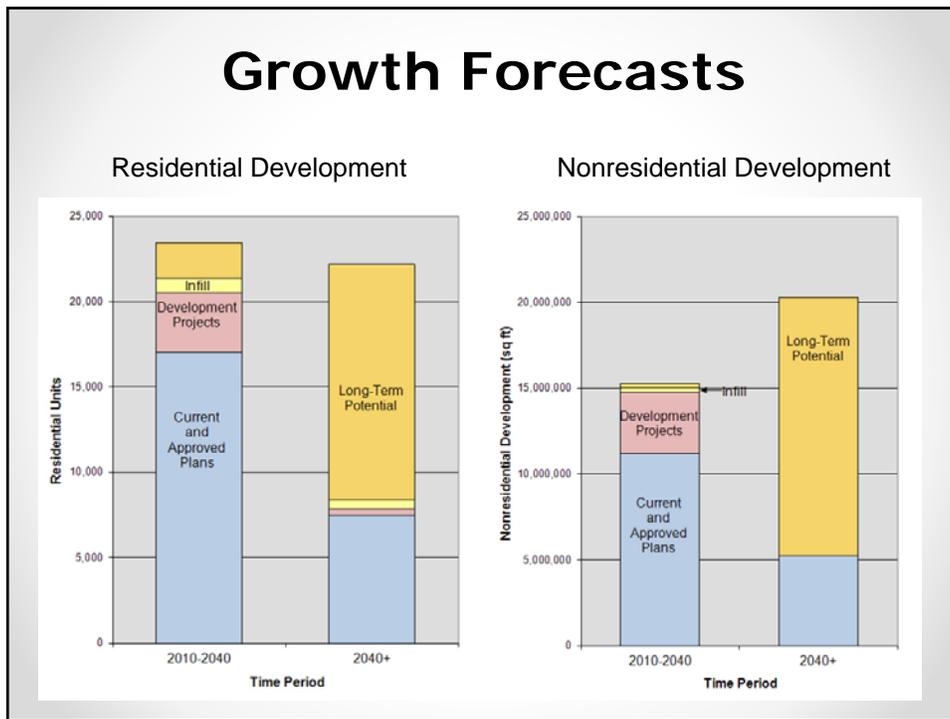
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Growth Forecasts



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Growth Forecasts



Growth Related Needs

- Collection System Improvements
 - To be constructed with associated development
- Holmes Run Trunk Sewer
 - Capacity in upper reaches under evaluation
 - Future Beauregard, Landmark, Fairfax County growth
- Additional Treatment Capacity
 - Sufficient capacity at Arlington based on current forecasts
 - 4 mgd needed at AlexRenew post-2040
 - Nutrient load allocation increase

Growth Impacts on Treatment Capacity

	Total Average Annual Wastewater Flow (million gallons per day)					
	Existing	2015	2030	2040	Build-out	City Allocation
AlexRenew Service Area	16.3	16.5	19.0	20.4	25.8	21.6
Arlington Service Area	1.4	1.6	1.7	1.7	2.4	3.0

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AlexRenew Treatment Capacity Options

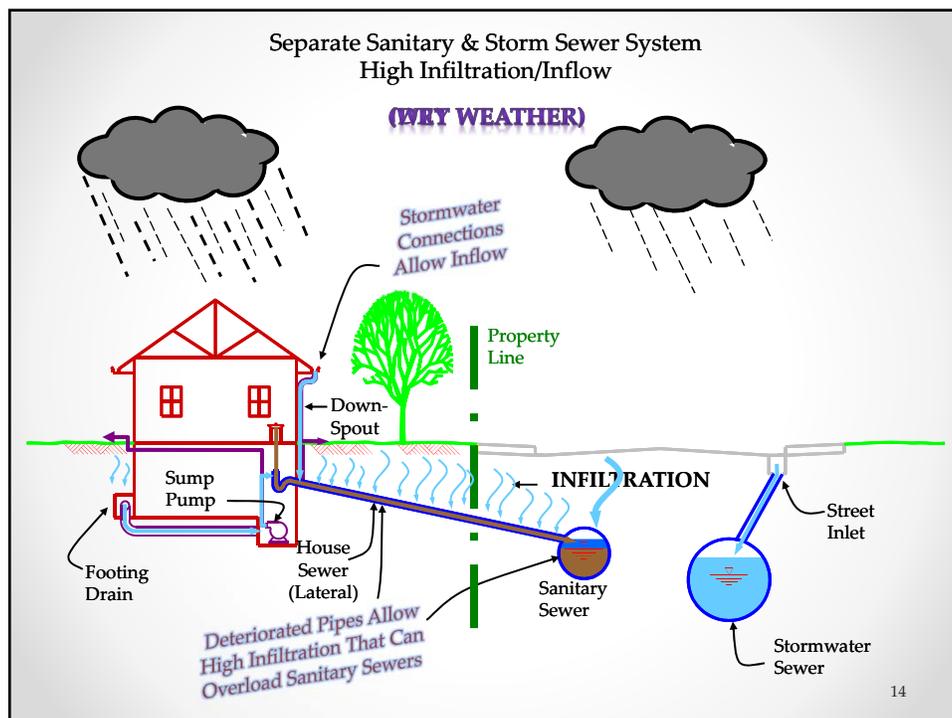
- Expand AlexRenew hydraulic capacity
 - Total cost = \$35.2m
 - Most upgrades to be completed 2021-2025
- Purchase existing AlexRenew capacity from Fairfax County
 - Total cost = \$56m
 - Includes additional nutrient loading
 - Purchase in near-term

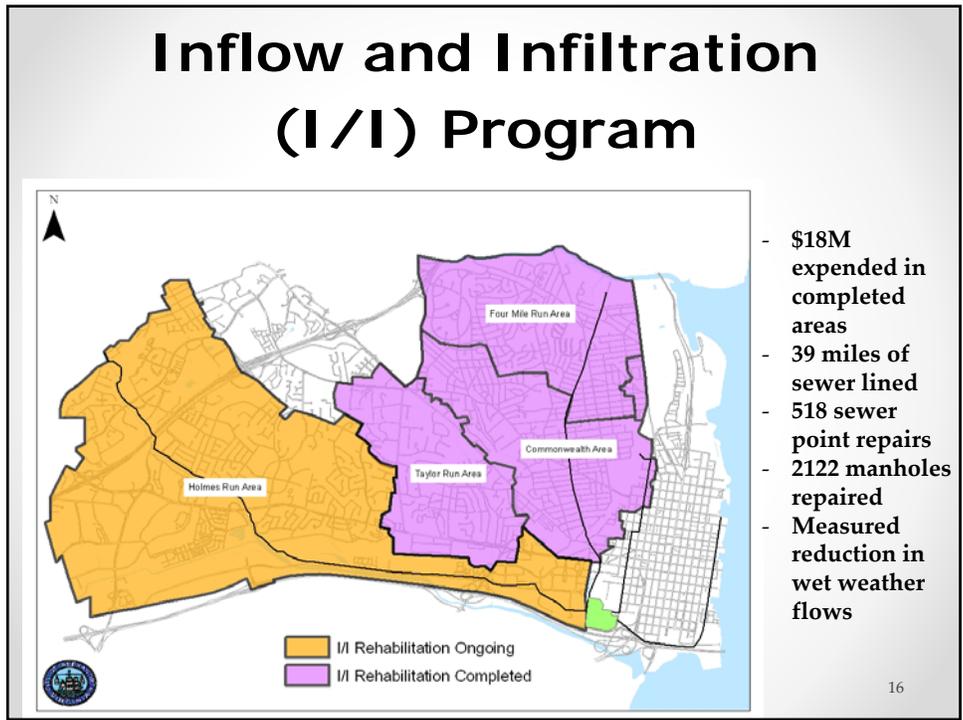
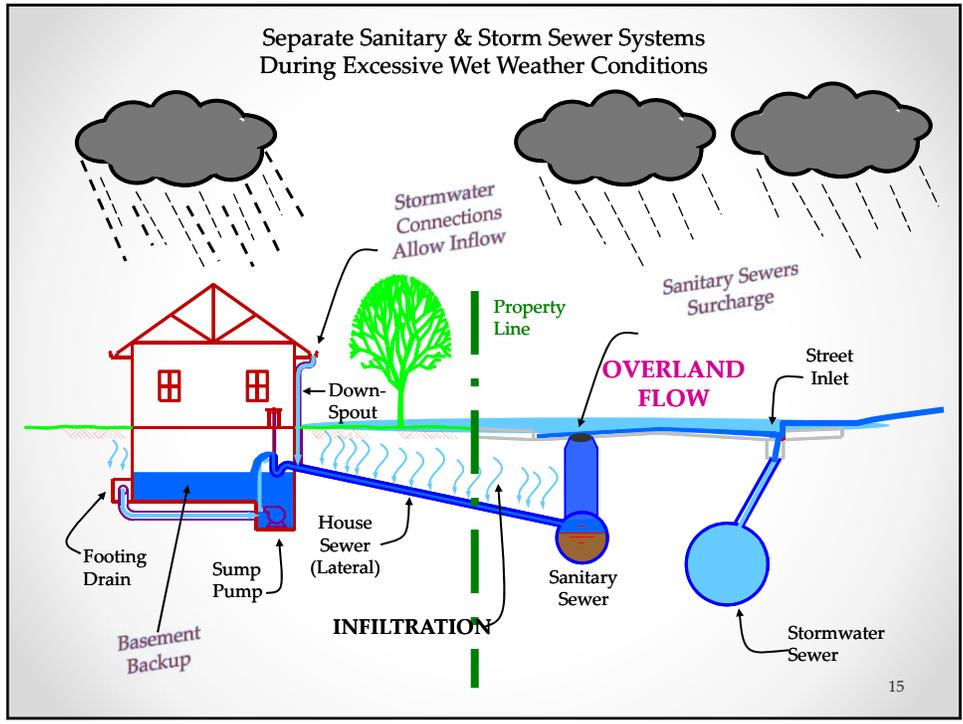
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Wet Weather Capacity

- Extreme wet weather events can lead to increased infiltration and inflow in the sanitary sewers causing surcharging (flow above top of pipe), sanitary sewer overflows and sewer back-ups into basements
- Sanitary sewer overflows caused by extreme wet weather may discharge into Hooff's Run and Four Mile Run
- Sanitary sewer overflows are not permitted

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Wet Weather/Existing System Needs

- Holmes Run Infiltration and Inflow Remediation
 - \$19.9m to complete (FY 2013 to FY 2017)
- Proposed Wet Weather Management Facility
 - Includes storage tunnel, pumping facilities, increase peak flow through primary treatment at AlexRenew
 - Helps protect against basement back-ups and eliminates sanitary sewer overflows into Hooff's Run
 - \$31.5m estimated City share

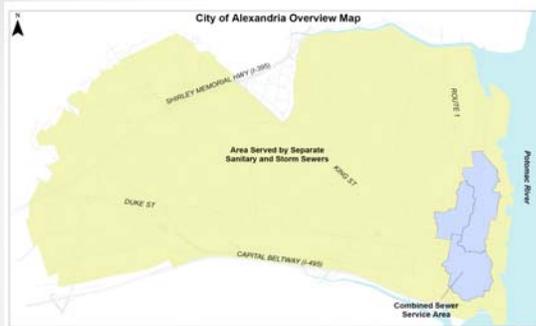
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Regulatory Considerations

- City of Alexandria
 - Hunting Creek Bacteria TMDL – *E. coli* bacteria at three of the four City permitted combined sewer outfalls
- AlexRenew
 - Chesapeake Bay Total Maximum Daily Load (TMDL)
 - Nutrient load caps for nitrogen, phosphorous and sediment
 - Impacts wastewater treatment plant costs
- Increased attention by Federal and State governments related to wet weather overflows from separate sanitary sewer systems
 - EPA inspection on June 27, 2012

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Unknown Needs Combined Sewer System (CSS)



FACTS

- VDEQ permit No. VA0087068, administratively continued, permit discussions ongoing
- Three CSS Areas: King/West Streets, Pendleton Street, Royal Street (Four Outfalls) ~ 540 acres

Combined Sewer System

- CSS Permit in renewal process and discussions with VDEQ ongoing
- Permit must be consistent with Hunting Creek Bacteria TMDL
- Current combined sewer mitigation program
 - Sewer separation (or contribute \$ towards separation) as a condition of development
 - Existing CIP – sewer separation projects
 - Future green infrastructure demonstration projects
- Additional combined sewer controls TBD

Sanitary Sewer Master Plan Identified Needs

- FY2013 – FY2022 CIP: \$102m in sanitary sewer expenditures
- Existing system needs projects: \$67m
- Growth related projects: \$35m
- FY2014 – FY2023 CIP under development

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Sanitary Sewer Funding (Enterprise Fund)

- Two sources of sanitary sewer revenue
 - Maintenance (user) fees - customers
 - Connection fees - developers

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Sanitary Sewer Funding (Enterprise Fund)

- Current User Fees
 - City: \$1.25/1000 gallons
 - AlexRenew: \$6.36/1000 gallons
- Current Connection (Tap) Fees (City)
 - \$8,404 per single-family unit or townhome
 - \$4,201 per multi-family or condo unit
 - Non-residential fee based on meter size
- FY2012 Connection Fees Include
 - The Madison - \$1,290,000
 - Harris Teeter - \$760,000
 - The Calvert - \$600,000

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Funding Strategies – Sanitary Sewer Financial Model

- Basis for model
 - Growth related needs funded by the connection fee
 - Existing system needs funded by the maintenance fee
- Model assumptions
 - 3% annual rate of inflation for connection fees
 - 0.75% rate of growth for sewer line maintenance fees
 - Increase the multi-family connection fee from 50% of the single-family fee to 90% over 2 years (starting in FY 2014)
 - Unknown needs not included

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Sewer Connection Fee Discussion for Multi-Family

Jurisdiction	Single-Family Connection Fee	Multi-Family Connection Fee	Ratio of MF to SF
City of Alexandria	\$8,404	\$4,201	50%
Prince William County	\$10,800	\$8,640	80%
Fairfax County	\$7,750	\$6,200	80%
WSSC	\$3,500 (unimproved area), \$10,750 (improved area)	\$3,500 (unimproved area), \$10,750 (improved area)	100%
Arlington County	\$110/DFU	\$110/DFU	varies

- Ratio of multi-family to single-family water usage = 0.87
(Source: 2010 Washington Metro Area Water Supply Reliability Study)

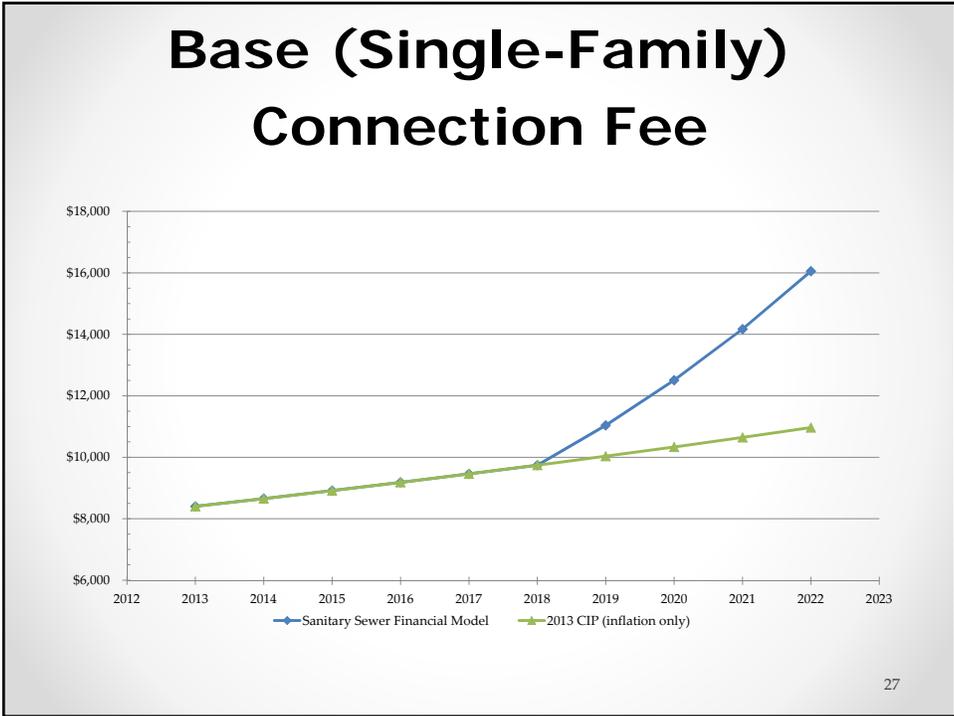
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Sanitary Sewer Financial Model Summary

Sewer Maintenance (User) Fee (\$/1000 gallons of water consumption)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
FY2013 – 22 CIP	\$1.25	\$1.25	\$1.38	\$1.38	\$1.47	\$1.77	\$2.05	\$2.05	\$2.29	\$2.29
Sanitary Sewer Financial Model	\$1.25	\$1.25	\$1.25	\$1.25	\$1.36	\$1.64	\$1.88	\$1.90	\$1.99	\$2.15

- Connection fee increase summary:
 - FY2014: Increase the multi-family fee from 50% to 70% of the single-family fee
 - FY2015: Increase the multi-family fee from 70% to 90% of the single-family fee
 - Increase base (single-family) fee by 10% annually starting in FY2019 through FY2022 to pay for AlexRenew expansion.

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Credit for Teardowns

Jurisdiction	Teardown Credit?	Full or Partial?
City of Alexandria	No	N/A
Arlington County	Yes	Partial
Fairfax County	Yes	Full
Prince William County	Yes	Full
WSSC	No	N/A

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Funding Strategies Recommendations

- Growth related needs paid for by the developer connection fees
- Raise multi-family rate from 50% to 90% of the single-family rate over 2 years
- Teardown credit of 50%
- Existing system needs paid for by the sewer line maintenance (user) fees
- Unknown needs TBD (combined sewer system permit, Holmes Run Trunk Sewer capacity)

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Schedule

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For Further Information

- Draft on website:
 - <http://alexandriava.gov/Engineering>
 - Click on the link for Sanitary Sewer Master Plan
- Comments may be submitted by email:
 - sewerplan@alexandriava.gov
- For additional information, contact:
 - Erin Bevis-Carver, P.E.
Civil Engineer III
T&ES Engineering Division
703.746.4154

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City of Alexandria, Virginia

Thank You
Questions and
Answers

