ARLINGTON RE-GEN

Arlington County Water Pollution Control Plant

Arlington Re-Gen

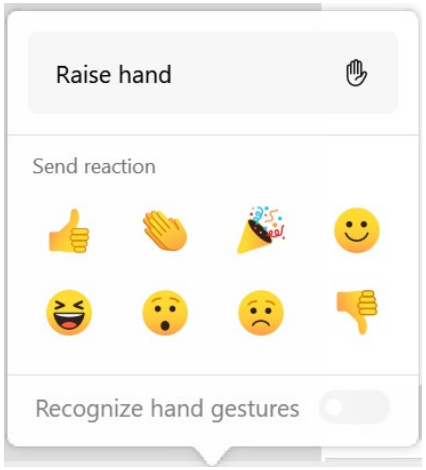
Biosolids Advisory Panel

May 24, 2023

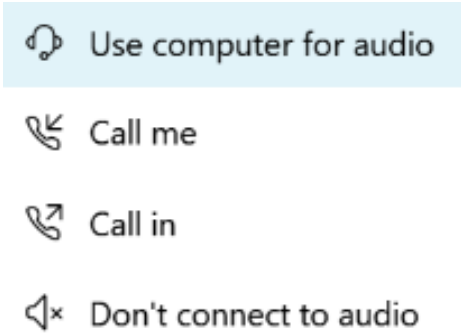
ARLINGTON VIRGINIA

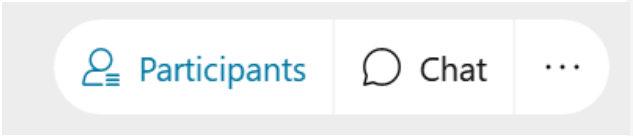
Meeting Logistics

WEBEX CONTROLS



MEETING PREVIEW AUDIO SELECTION





TO BE UNMUTED

*Click the "**Raise Hand**" button pressing ***3 on your phone***

*You can also ask to be unmuted in the "**Chat**" box*

ISSUES HEARING AUDIO?

Re-join using "Call me" Audio Selection

Introductions

Mary Strawn	**Antron Sutton**	**Lisa Racey**	**Fasil Haile**	**Peter Golkin**	**Mike Collins**
Arlington County Water Pollution Control Bureau	Arlington County Water Pollution Control Bureau	Arlington County Water Pollution Control Bureau	Arlington County Water Pollution Control Bureau	Arlington County DES Communications	Arlington County DES

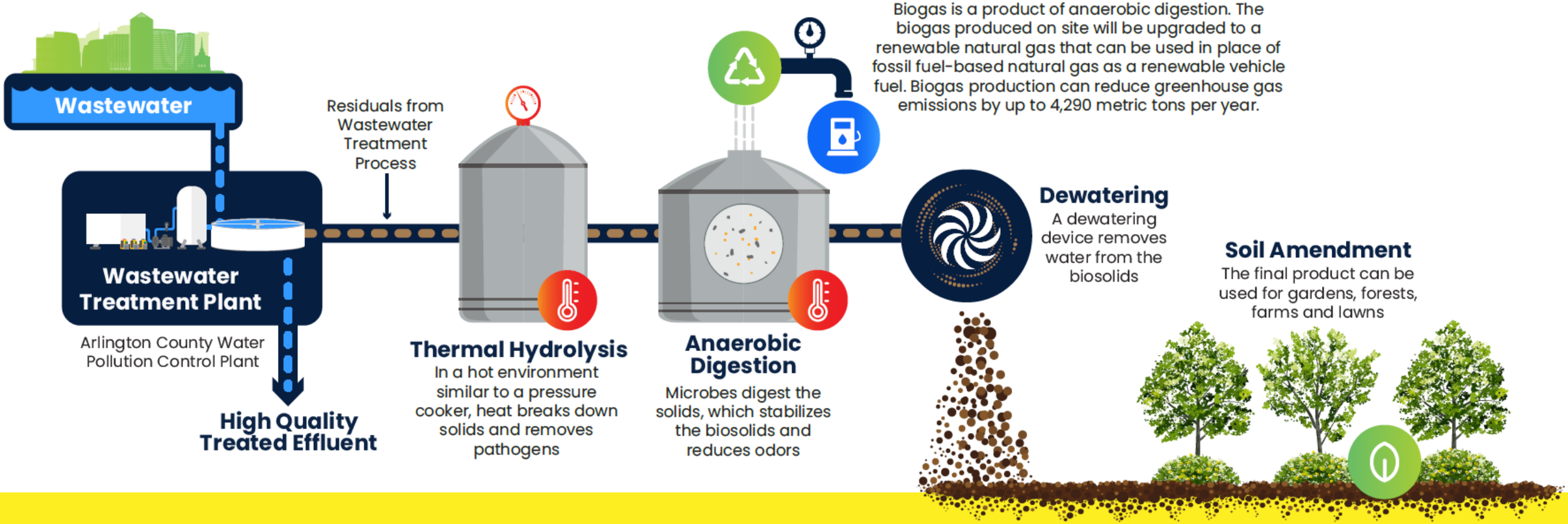
Brian Balchunas	**Stephanie Spalding**	**Jessica Host**	**Melanie Deggins**	**Samantha Villegas**
HDR	HDR	HDR	HDR	Raftelis

Agenda

01	6:00 – 6:05	**Introductions**
02	6:05 – 6:15	**Overall Program Updates**
03	6:15 – 7:10	**PFAS Results and Analysis**
04	7:10 – 7:20	**ART RNG and Environmental Attributes and Updates**
05	7:20 – 7:25	**Envision Checklists**
06	7:25 – 7:30	**Next Steps**

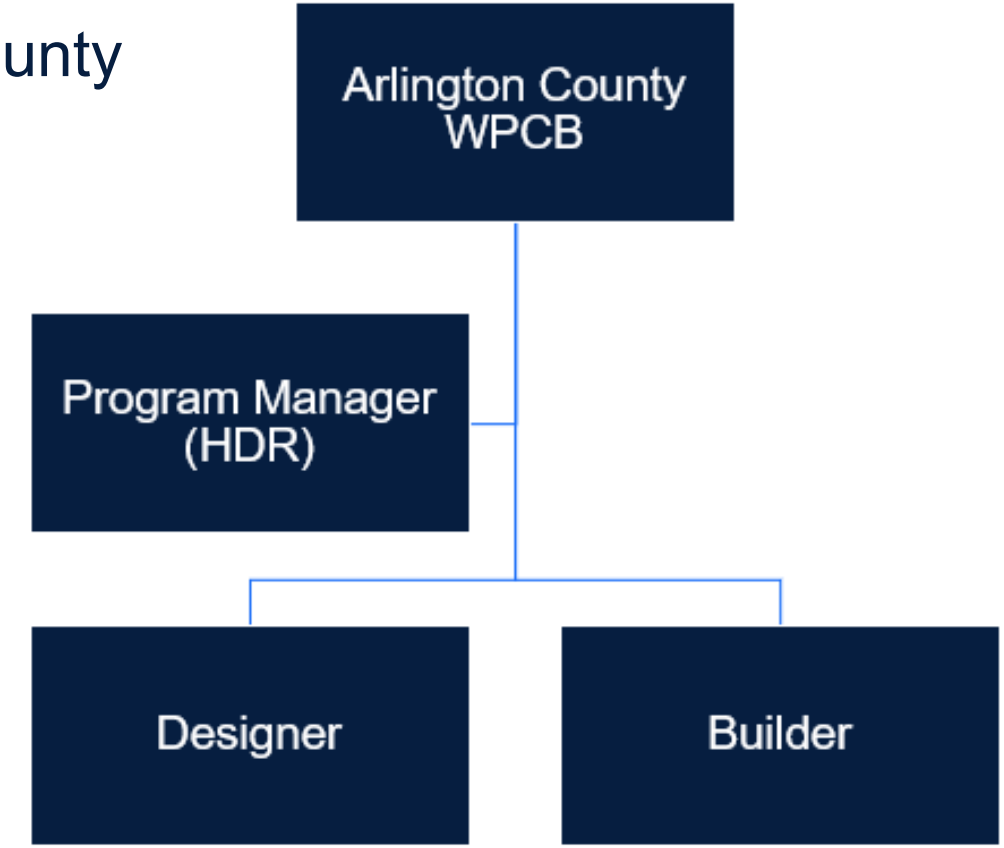
Program Overview

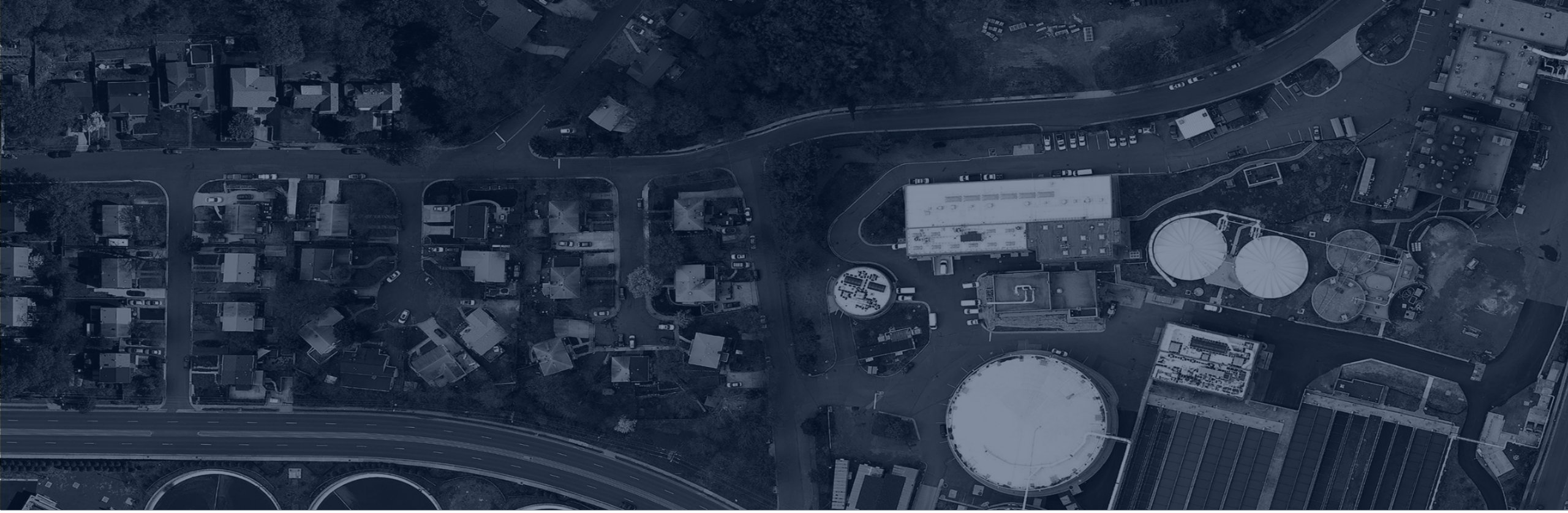
Recovering renewable resources from wastewater



Roles and Responsibilities

- HDR serves as an advisor to Arlington County
- Current phase:
  - Define program scope
  - Define program delivery
- Future phases:
  - Oversee design and construction
  - Assist with start-up and commissioning
- HDR is prohibited from participating in any design and construction





02

Overall Program Updates

Technical Updates

"What"

- Data Analysis
- Condition Assessment
- Technology Review
- Process Evaluations
- Gas Utilization
- Air Emissions
- Site Development
- Facilities Plan

Completed

- 21 Technical Memos
- Biogas Utilization Report
- Facilities Plan

Upcoming

- Consideration of carbon capture
- Asset planning
- Preparation for design

Delivery Updates

"How"

- Risk Analysis
- Project Packaging
- Delivery Evaluation
- Procurement of Delivery Teams

Completed

- Gravity thickeners – awarded design contract
- Design Build work – issued request for proposals

Upcoming

- Begin design of gravity thickeners
- Select Design Builder (proposals submitted May 8)

Program Components

Program Management

- Assistance with program development and oversight

Gravity Thickeners

- Rehabilitate existing gravity thickeners

Early Work Package

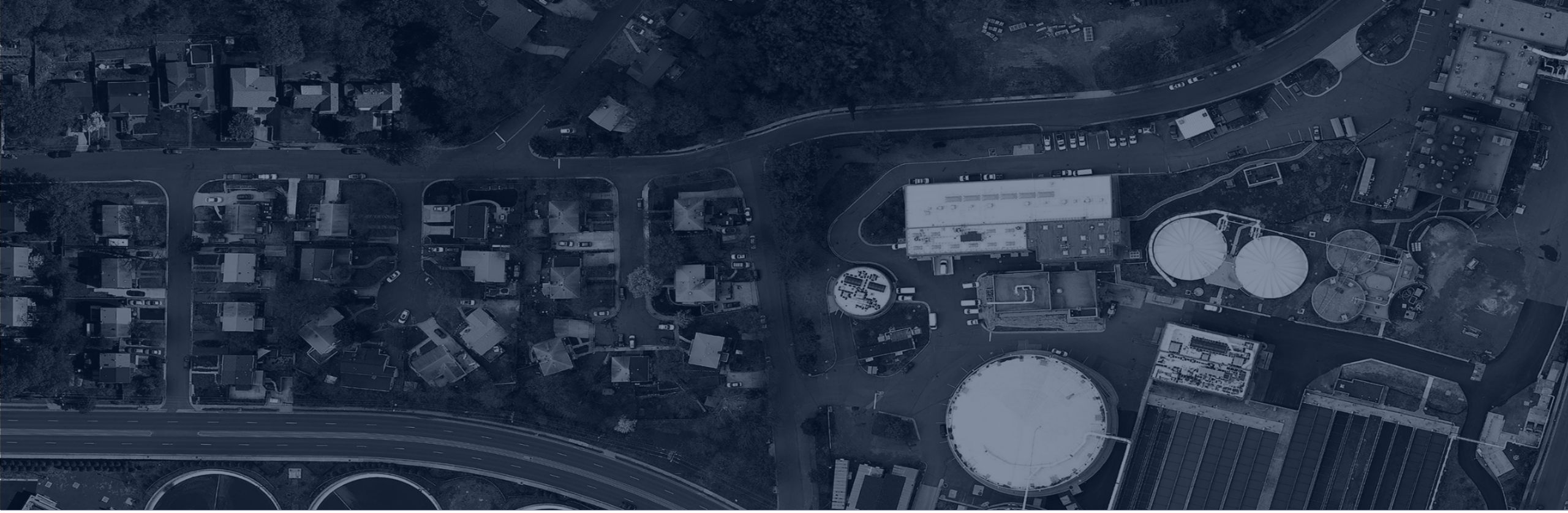
- Demolition
- Utility relocation
- Site Preparation

Main Work Package

- New processes and facilities

Tentative Program Timeline

Program Management	Facilities Plan Biogas Utilization	Facilities Plan Procurement	Procurement Design Oversight	Design and Construction Oversight	Design and Construction Oversight	Construction Oversight	Construction Oversight	Start-up Assistance	Start-up Assistance
Gravity Thickeners	--	--	Design	Construction	Start-up				
Early Work	--	--	--	Design and Construction	Construction				
Main Work Package	--	--	--	Design	Design Construction	Construction	Construction	Construction Check-out	Start-up



03

Per- and Poly-fluoroalkyl Substances (PFAS) Results and Analysis

First, the good news…

- As expected, Arlington's sampling results are normal for domestic wastewater
- Results are not comparable between Arlington and industrial contaminated solids, such as the situation in Maine
- Source control is key
- Robust research is underway to determine PFAS impacts of municipal biosolids land application

…now on to the details!

Agenda

3a PFAS Overview

3b PFAS and the Re-Gen Program

3c WPCB PFAS Initial Testing Results

3d Comparison and Analysis of WPCB PFAS Testing Results

3e Conclusions, Next Steps and Discussion

3a PFAS Overview

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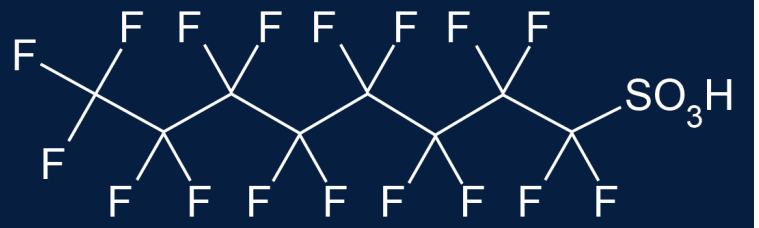
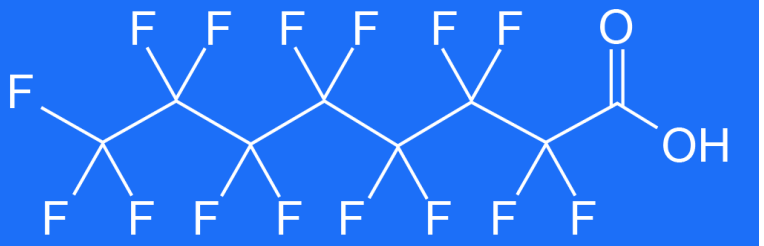
Understanding PFAS

PFOS

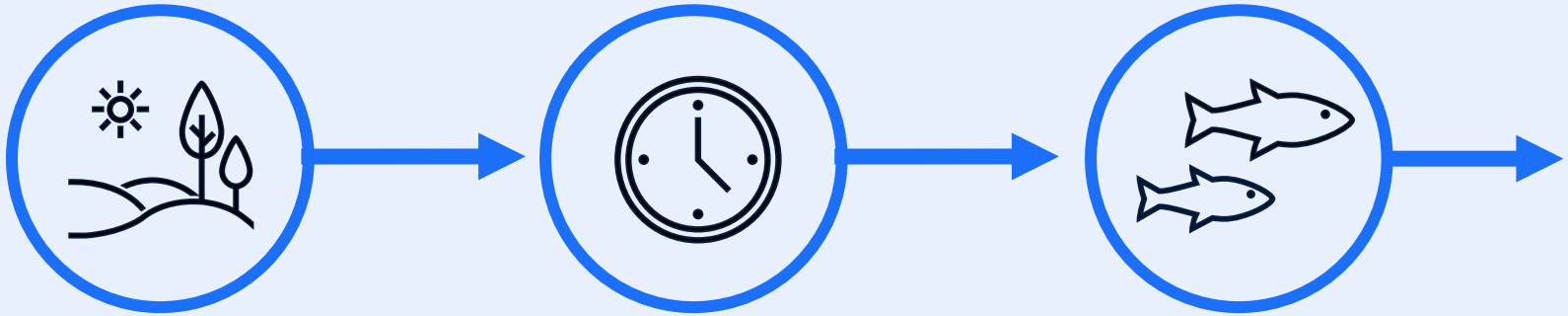


Over 6,000
PFAS compounds exist

PFOA



WHY WE ARE CONCERNED ABOUT PFAS



HIGH SOLUBILITY
Mobile in Water Systems

PERSISTENT
Doesn't Degrade

BIOACCUMULATE
Biomagnify Up the Food Chain

WHAT IS BEING DONE

RESEARCH AND REGULATIONS
Regulation Development Informed by Ongoing Research

PFAS are found in industrial and commercial applications

PFAS and the Environment

Sources

Use of AFFF

Industry

Consumers

Receivers

Drinking Water Plants

Wastewater Treatment Plants

Landfills

3b PFAS and the Re-Gen Program

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PFAS and Biosolids

- Spotlight has been on land application sites with high levels of PFAS in soil or groundwater
  - Contamination from industrial sources likely the cause
- Municipal biosolids PFOS concentrations are many orders of magnitude lower than would be required to develop the level of PFOS contamination seen on farms in Maine
- Research is ongoing to investigate impacts of municipal biosolids on soils and groundwater
- Exposure pathways for biosolids do not involve direct consumption and are still being researched. Exposure pathways are different for drinking water and products we use in our households

PFAS and Re-Gen

- Upgrades to our biosolids facilities are required
  - Aging equipment
  - Environmental impacts of existing operations
  - Ability to beneficially use resources
- Low levels of PFAS provide us confidence that land application is likely still a viable use of biosolids
- However, if research and regulations show additional treatment is required, we benefit from having 50% fewer solids to treat

3c WPCB PFAS Initial Testing Results

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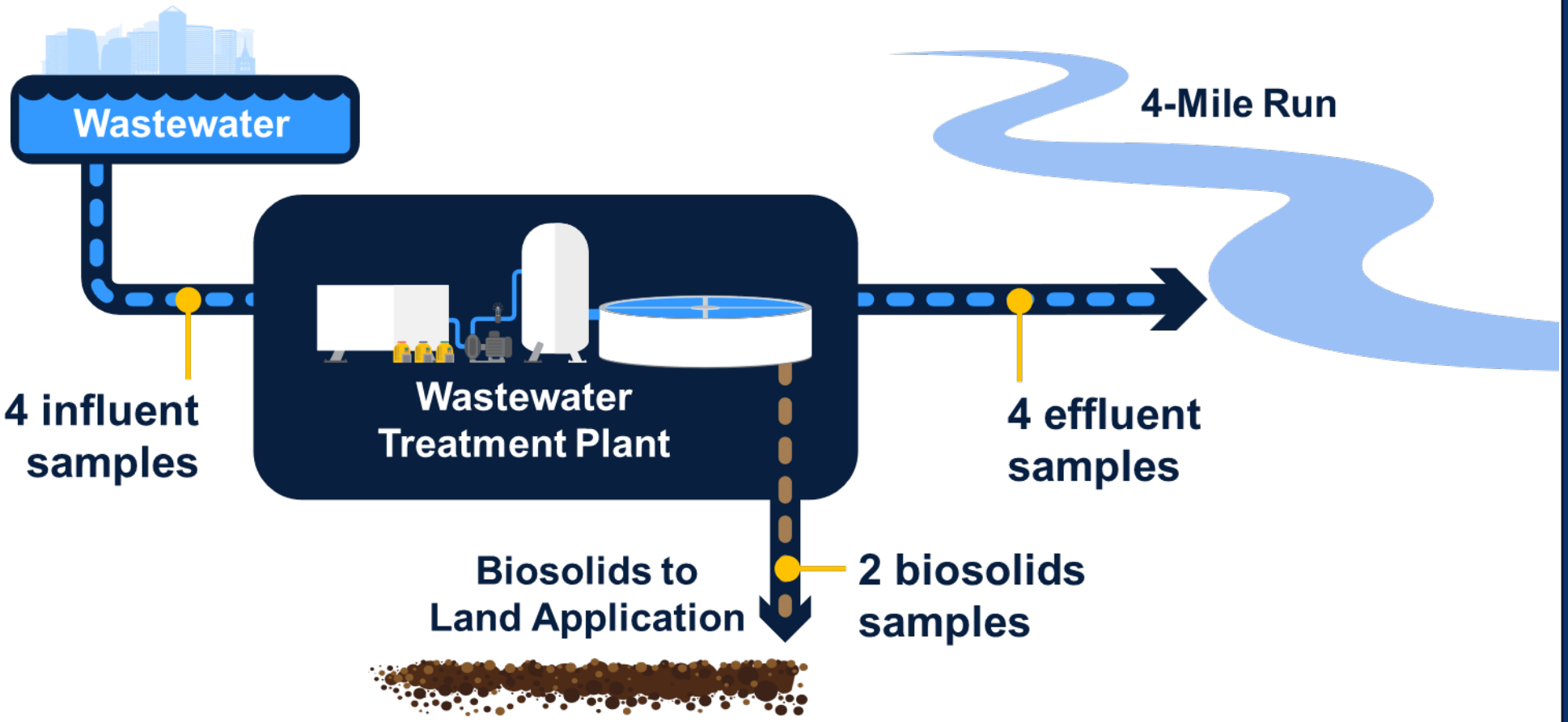
Testing Completed – October ‘22



Tested per EPA Draft Method 1633

- Developer per EPA’s PFAS Roadmap
- Tests 40 specific compounds in the PFAS Family

Units of Measurement

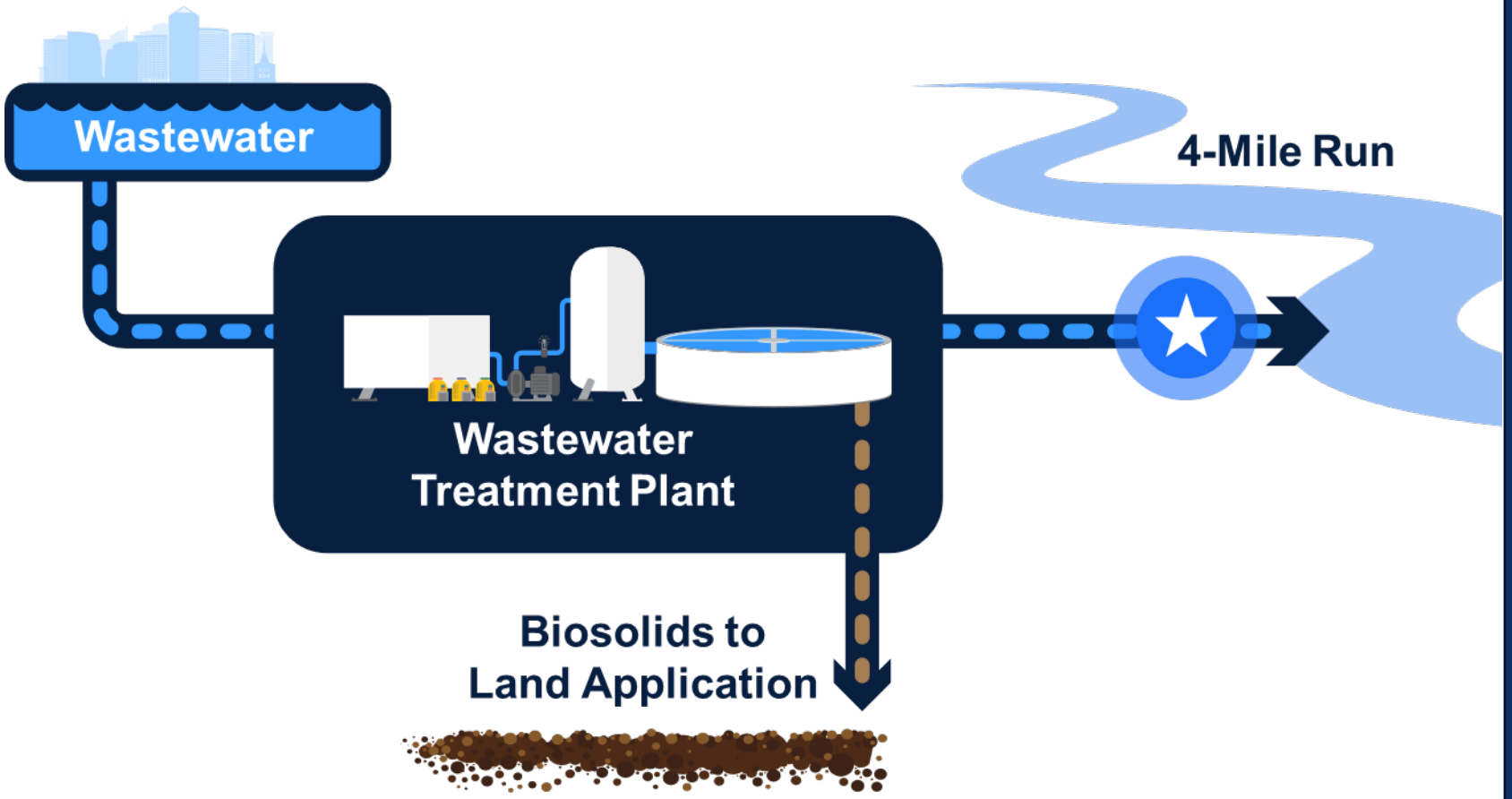
Liquid

- ng/L = nanograms/liter = part per trillion = ppt
- 1 ppt = 5 days out of the 13.8 billion years since the Big Bang

Solids

- μg/kg = micrograms per kilogram = part per billion = ppb
- ng/g = nanograms per gram = part per billion = ppb
- 1 ppb = 1 second in a 32-year old's life

Estimated Mass Equivalence



23 million gallons per day

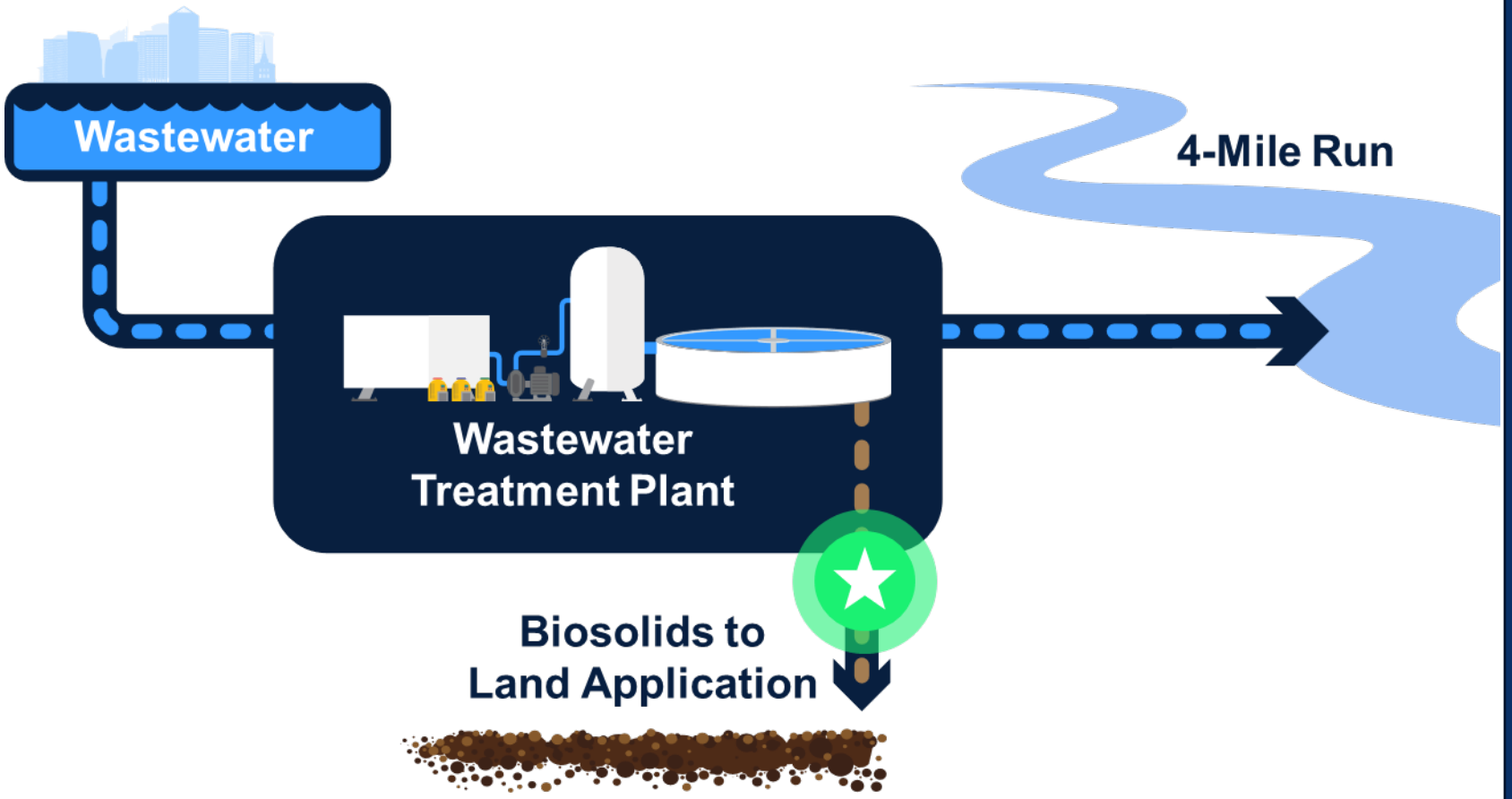
35 Olympic swimming pools

87 million kilograms per day of water

0.008 kilograms per day of measured PFAS compounds

8 paper clips

Estimated Mass Equivalence



200,000 pounds per day of biosolids with lime

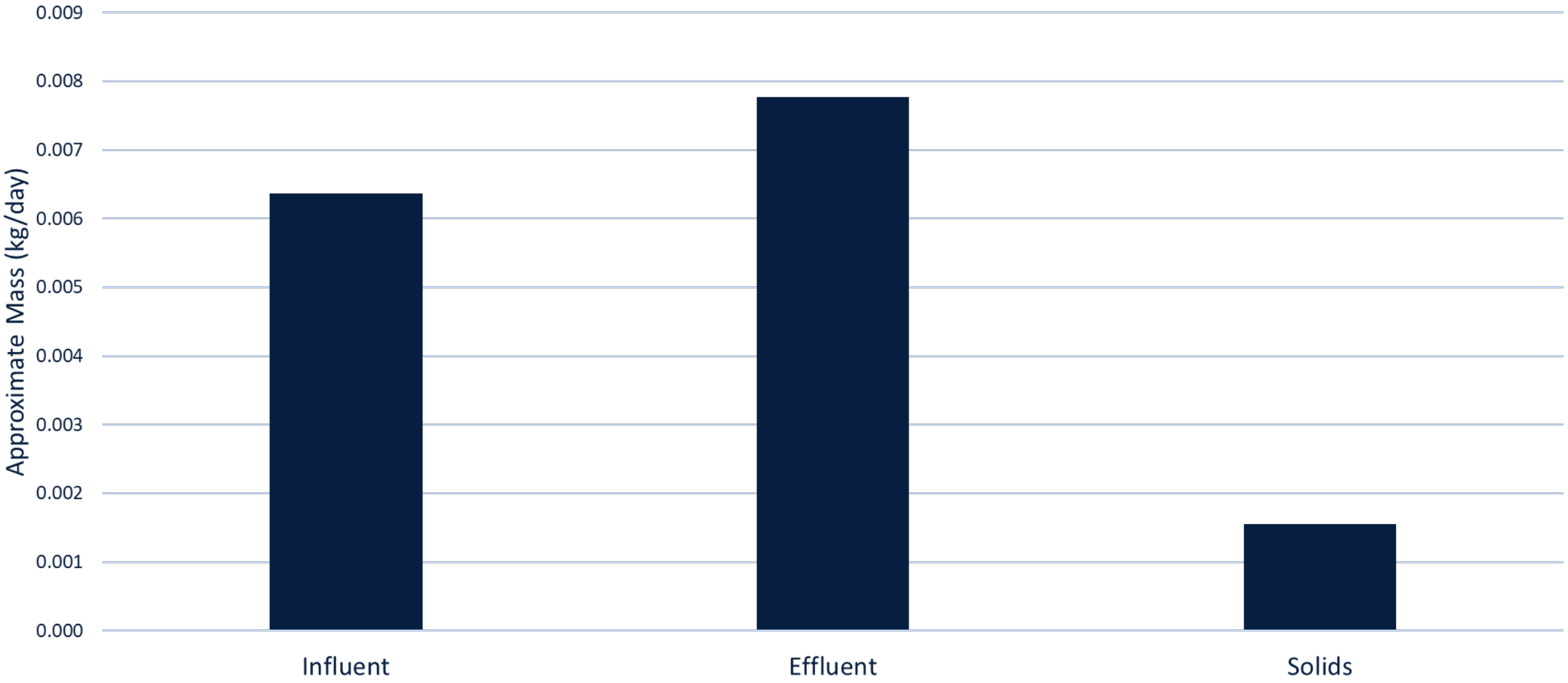
10 dump truck loads

90,000 kilograms per day of biosolids with lime

0.002 kilograms per day of measured PFAS compounds

2 paper clips

Arlington Initial PFAS Results (estimated mass, 40 compounds), October '22



3d Comparison and Analysis of WPCP PFAS Testing Results

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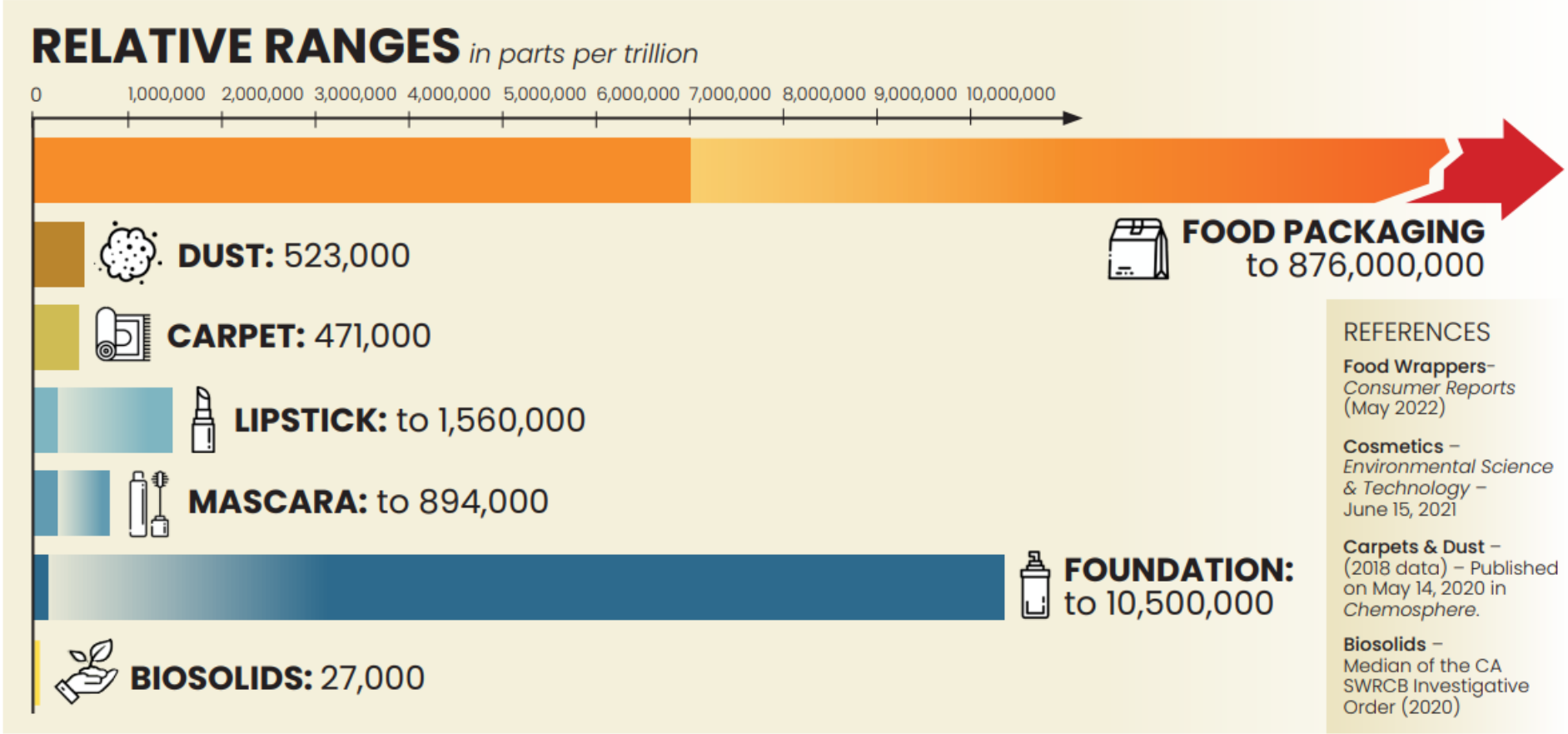
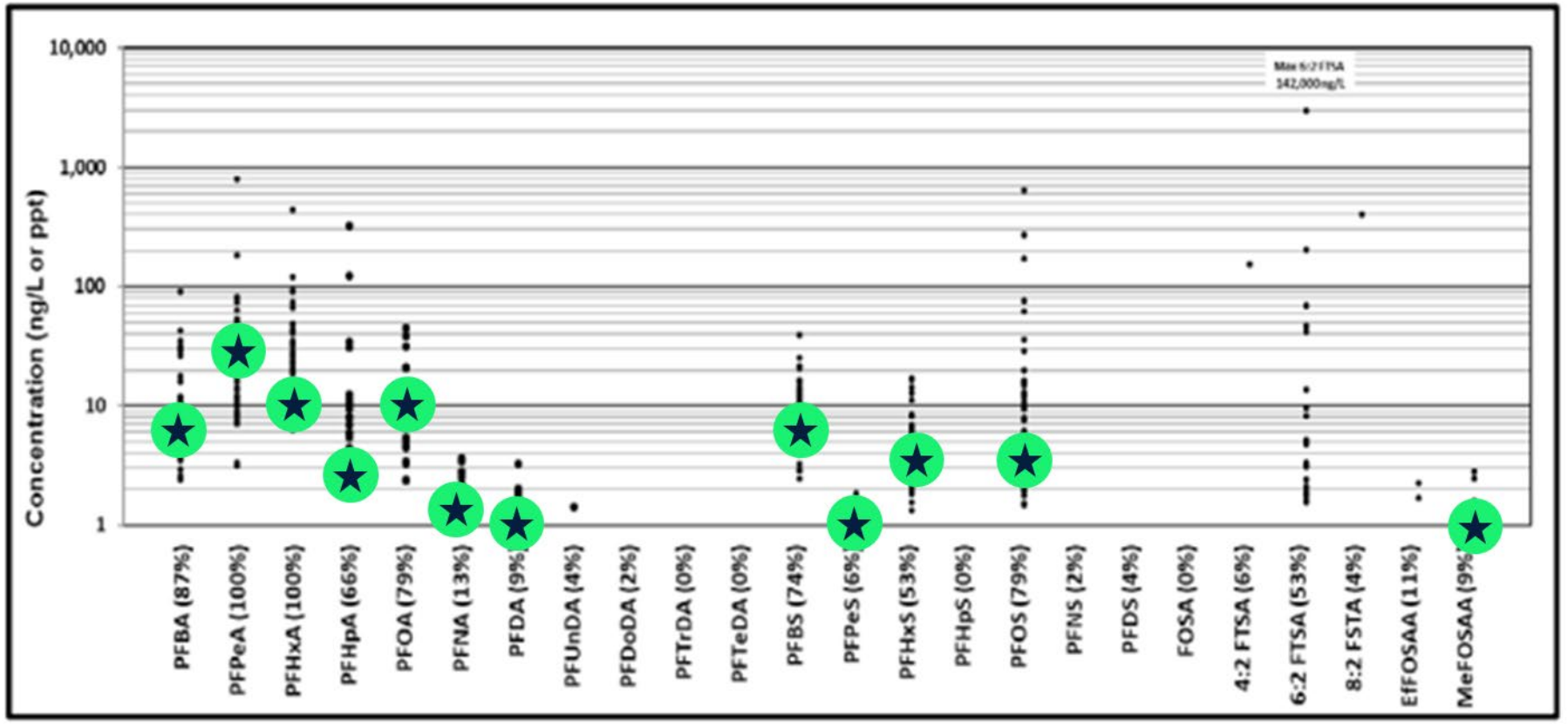
PFAS in Biosolids Compared to Other Exposure



https://www.virginiabiosolids.com/wp-content/uploads/2022/08/Pie_Chart_PFAS_2022_-_Graph_for_VBC_web.pdf

Wastewater Effluent Compared to Michigan Study

Figure 30. Effluent PFAS Detection Frequency and Concentrations for 42 WWTPs – Box Plot



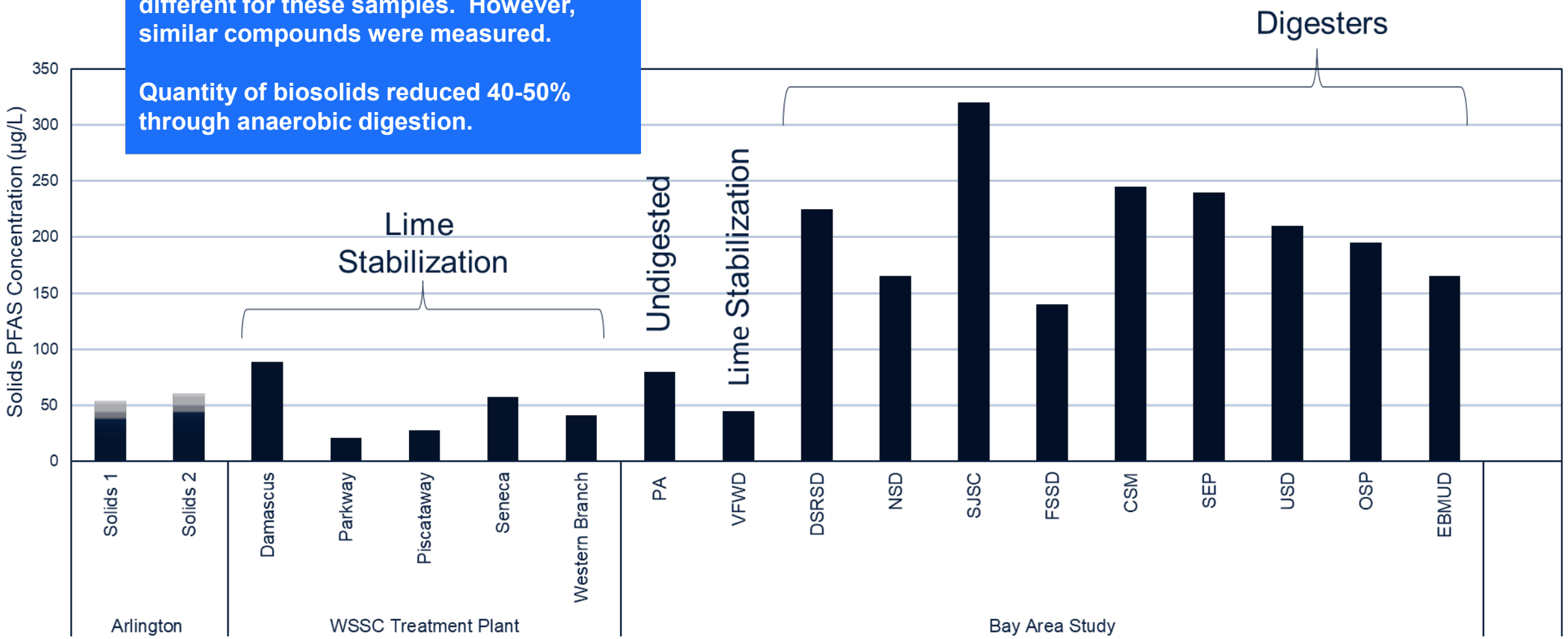
★ Arlington

(2021) Evaluation of PFAS in Influent, Effluent, and Residuals of Wastewater Treatment Plants (WWTPs) in Michigan

Biosolids PFAS Concentration Comparison

Test methods have evolved and are different for these samples. However, similar compounds were measured.

Quantity of biosolids reduced 40-50% through anaerobic digestion.

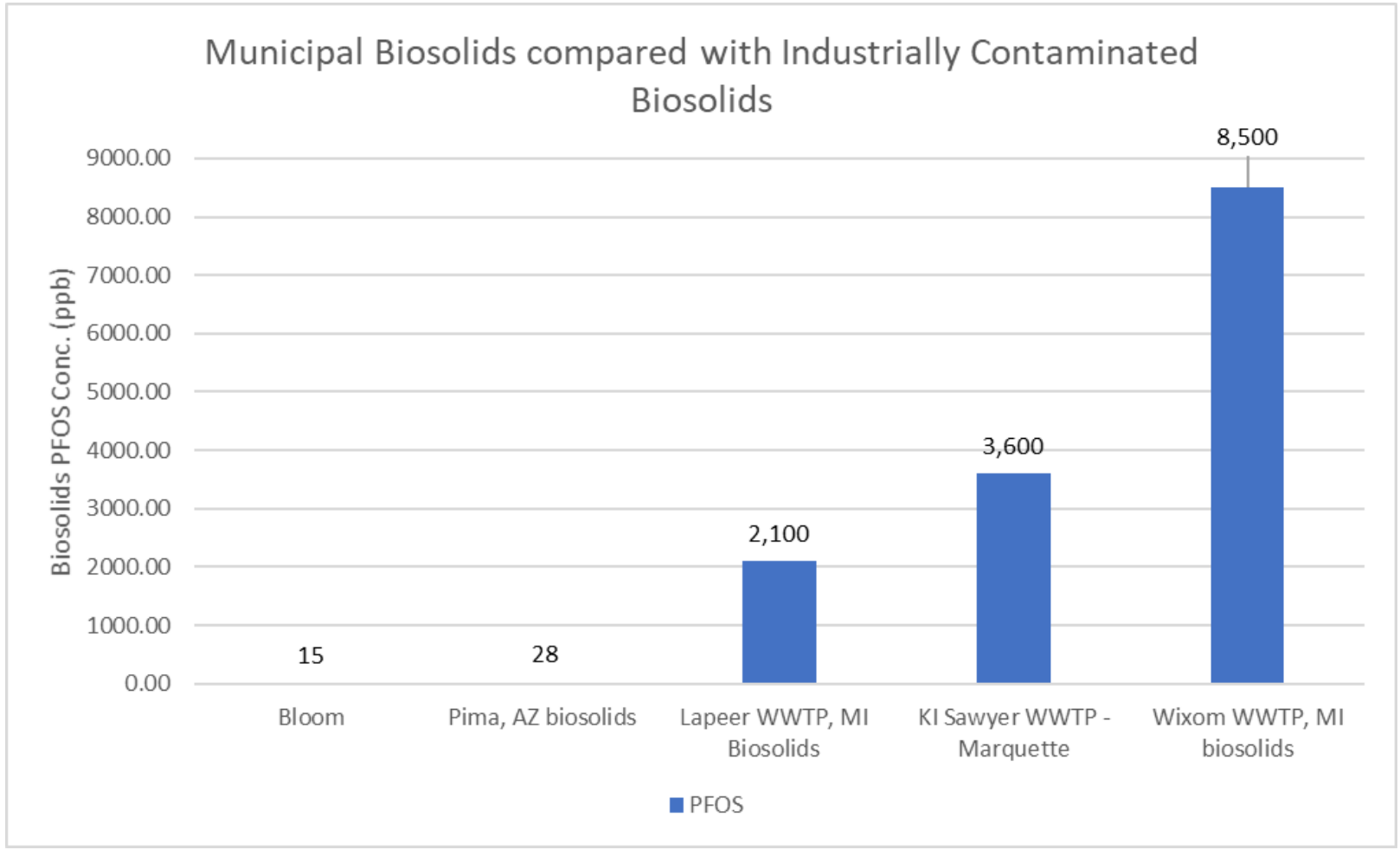


Solids – Comparison to Bloom (Sampled by DC Water)

Compounds	Arlington Wastewater Solids	Bloom Solids
PFOS	5.9 ng/g	15.5 ng/g
PFOA	1.1 ng/g	3.1 ng/g
PFHxS	4.2 ng/g	ND
PFNA	0.6 ng/g	3.1 ng/g
TOTAL	11.8 ng/g	21.7 ng/g

For reference, the European Union has set limits for ingestion of PFAS in food for these compounds. DC Water estimates that an average man would need to ingest 2 lbs of Bloom per year to reach those limits. Ingestion of biosolids is not a common pathway and exposure to PFAS in our daily environment likely presents a greater risk.

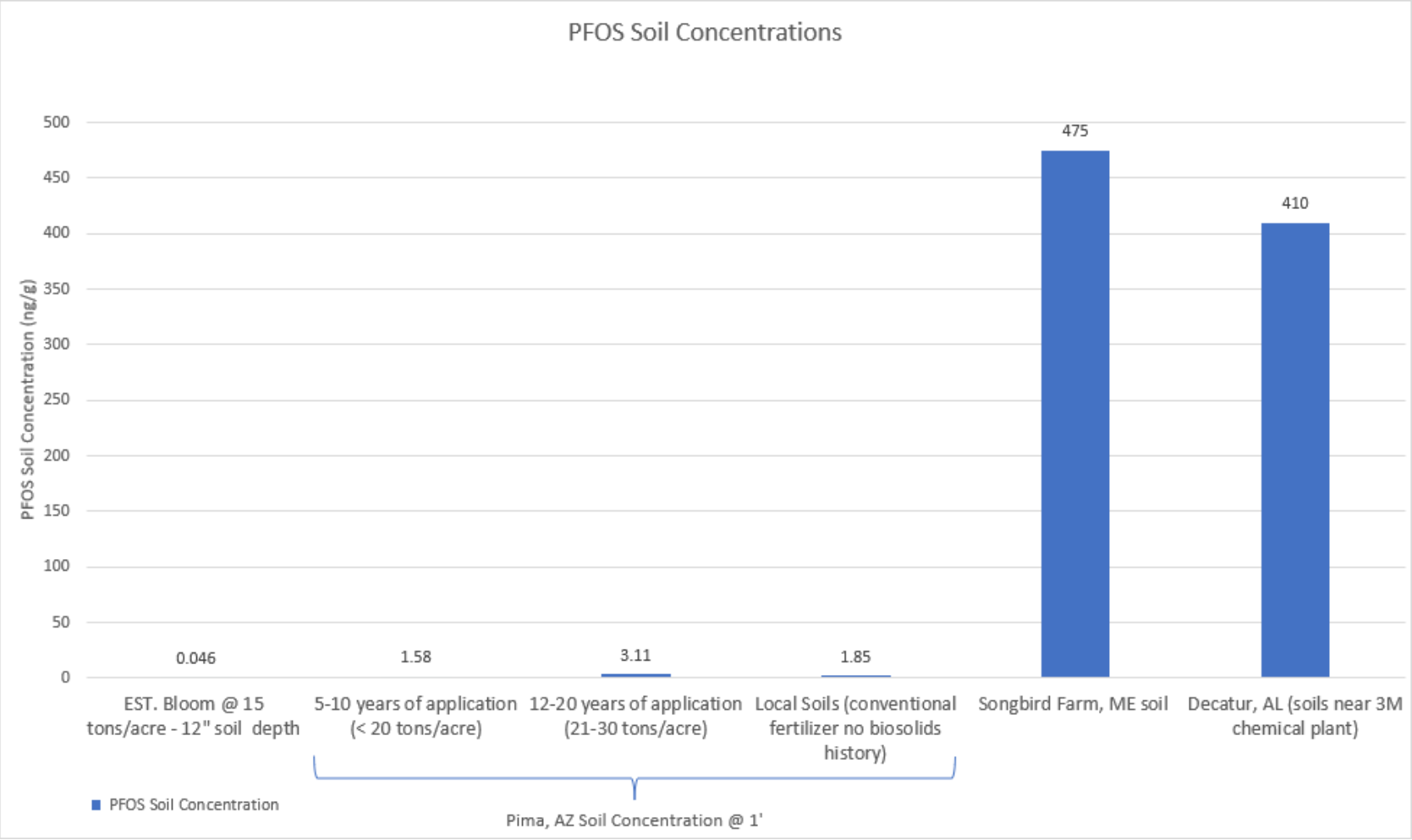
Other Comparisons - PFOS



Arlington = 6 ppb

Update: National Collaborative PFAS Study
University of Arizona
Dr. Ian Pepper
April 2022

Other Comparisons - PFOS



Current Arlington = expected to be ½ of Bloom

Update: National Collaborative PFAS Study
University of Arizona
Dr. Ian Pepper
April 2022

3e Conclusions, Next Steps, and Discussion

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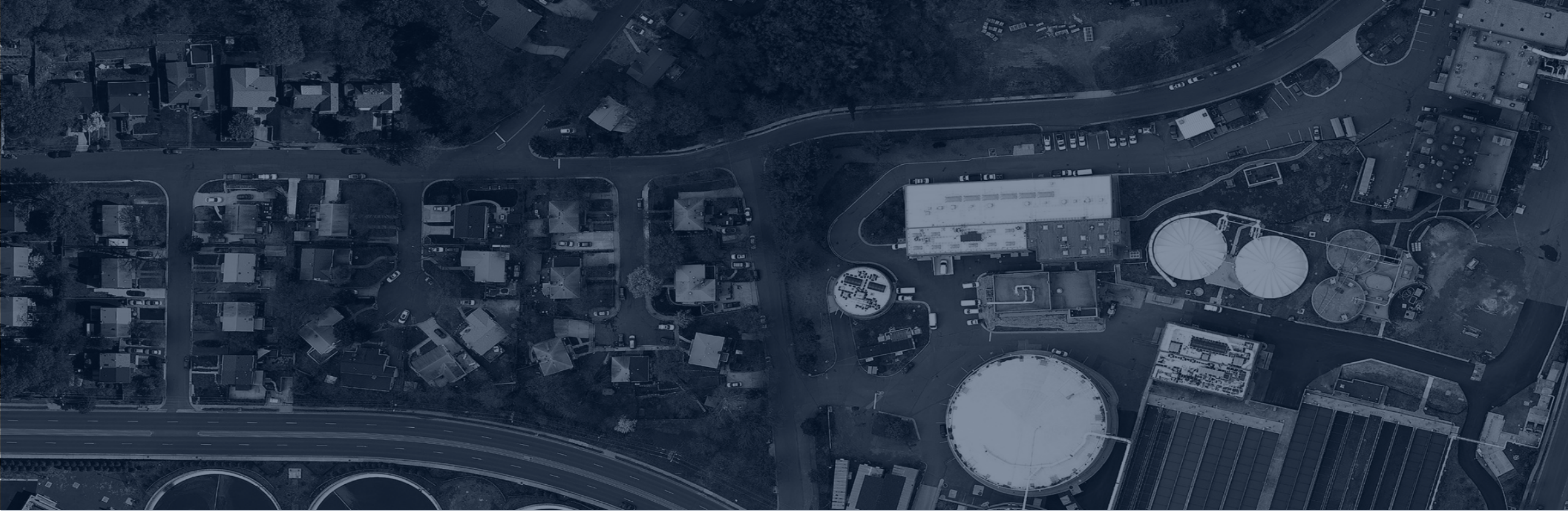
Conclusions, Next Steps and Discussion

- As expected, Arlington WPCP PFAS levels are much lower than plants with industrial impacts and similar to what is seen at other municipal wastewater treatment plants
- We would like to take more samples to confirm results of first set
- One key to tackling PFAS is source control/elimination, and we will continue to advocate for this
- Robust research is underway to understand the science of PFAS in biosolids and land application – we are monitoring this research
- We do not expect any changes to the Re-Gen Program based on the results of the PFAS testing
  - If any PFAS treatment is required, it will likely be thermal treatment and would benefit from the reduced quantity of biosolids
- We will continue to comply with regulations as they are implemented, including any for PFAS



05

ART RNG and Environmental Attributes and Updates

ART and Renewable Natural Gas

- ART has expressed desire to utilize RNG (sourced from others initially, WPCP ultimately) as bus fleet transitions to electric
- Timing of bus transition outside the control of the WPCB
- Discuss GHG benefits of Re-Gen Program

Project Carbon Footprint with 100% Renewable Energy (2037)

MT CO_2e/year

Category	Lime Stabilization	THP, Anaerobic Digestion, RNG	Comment
Scope 1 – Direct (Natural Gas)	50	1,970	Fuel combustion (natural gas) for steam generation
Scope 2 – Indirect (Electricity)	0	0	Electricity is renewable
Scope 3 – Indirect (Other)	3,860	1,940	Reduced truck traffic and chemicals
Total	**3,910**	**3,910**	
RNG Production	--	(6,150)	RNG displacing fossil fuel
Adjusted Total	***3,910***	***(2,240)***	***Net difference of 6,150 metric tons/year***

Environmental Attributes and RINs

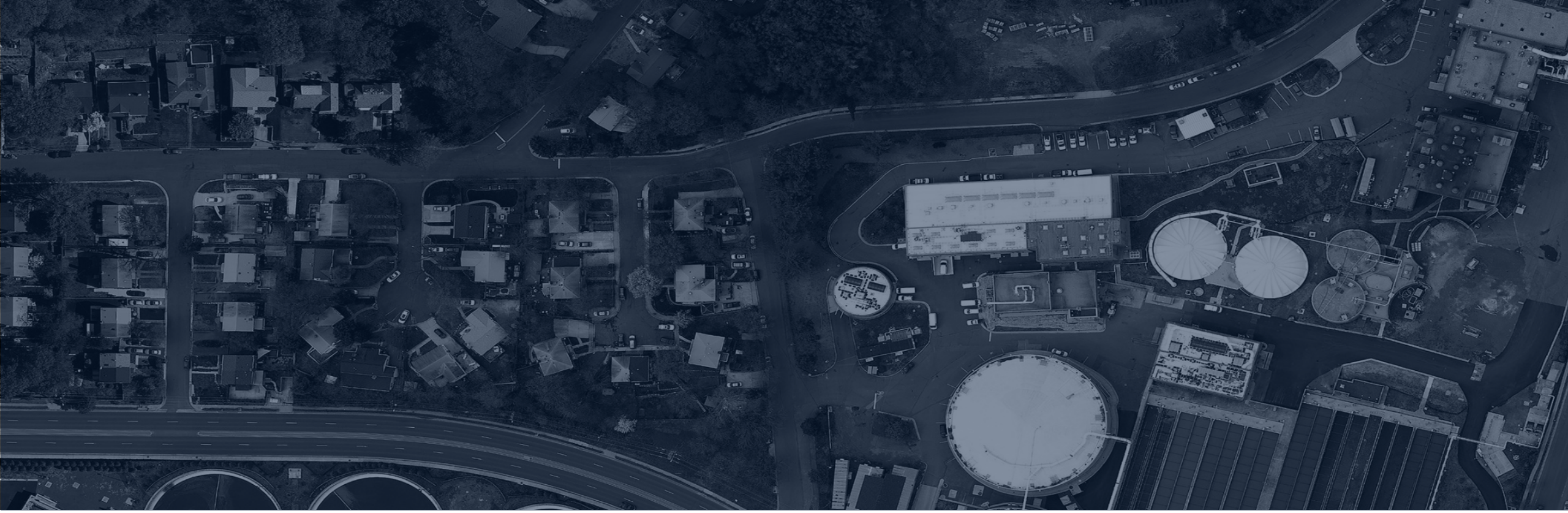
- Additional discussions held with marketers and Owners on separation of RINs and GHG credits
- Consensus: GHG accounting in Arlington is un-regulated, and you should be able to count GHG reductions towards Arlington goals if gas used in Arlington County
- Regardless of accounting, GHG emission reductions are real as we are displacing the use of fossil fuel natural gas

Request for Information

- WPCB is drafting a Request for Information to obtain feedback from the market on:
  - Contractual arrangement
  - Disposition of environmental attributes

Goals of a Project with RNG Provider

1. Develop a business model that manages the risk and maximizes the capabilities of the biogas from the WPCB
2. Provide effective risk and revenue allocation
3. Provide sustainability benefits to Arlington County, including accounting for reduction of GHG within the County
4. Provide reliable RNG to County operations (ART)
5. Benefit from private-sector competition (innovation)
6. Minimize complexity, management, and administrative burden
7. Equitable wastewater rates



06

Envision Checklists

Quality of Life	Well-being • Mobility • Community
Leadership	Collaboration • Planning • Economy
Resource Allocation	Materials • Energy • Water
Natural World	Siting • Conservation • Ecology
Climate & Resilience	Emissions • Resilience

Program Sustainability Goals with Envision Alignment

	County Goals	Facility Goals
Reduce operating costs	✓	✓
High-performing and efficient project	✓	✓
Support staff and community health	✓	✓
Environmental, economic, and social stewardship	✓	✓
Carbon-neutral by 2050	✓	✓
Open, transparent, and collaborative process	✓	
Class A biosolids and biogas for renewable energy	✓	

Envision Credits and Points

Categories	# Credits	Max Points
Quality of Life	13	200
Leadership	11	182
Resource Allocation	13	196
Natural World	13	232
Climate & Resilience	9	190
Totals	59	1,000

Category Summary

Category	Max Points	Applicable Points*	Low Estimate	%	High Estimate	%
Quality of Life	200	182	98	54%	113	62%
Leadership	182	182	133	73%	146	80%
Resource Allocation	196	196	81	41%	89	45%
Natural World	232	100	35	35%	35	35%
Climate & Resilience	190	174	83	48%	122	70%
Total	1000	834	430	51.6%	505	60.6%

Envision Recognition Levels

Envision Guidance Manual Structure – Credit

Credit # and title

Intent: Purpose of the credit

Max Points

Levels of Achievement

Description Details on purpose and objectives; why credit is important

Performance Improvement Getting to the next LOA

Metric: How the credit will be measured

Related Credits

Evaluation Criteria & Documentation
Criteria questions with potential documentation sources noted beneath. Provide sufficient documentation to answer the criteria questions and demonstrate achievement

QUALITY OF LIFE: MOBILITY

QL2.1 Improve Community Mobility and Access

14 POINTS

INTENT
Plan the project as part of a connected network that supports all transportation modes for the efficient movement of people, goods, and services.

METRIC
The extent to which the project broadens mode choices, reduces commute times, reduces vehicle distance traveled, and improves levels of service.

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A + B	A + B + C	A + B + C + D	A + B + C + D + E	A + B + C + D + E + F
(1) Satisfactory Coordination	(3) Controlled Access	(7) Increased Access and Flow	(11) Connected Networks	(14) Restoring Community Connections

(A) The project team demonstrates consistency with local and regional transportation plans.

(B) The project team obtains input from the community and key stakeholders (e.g., public officials and operators of adjacent facilities, amenities, or transportation hubs) regarding improved access.

(C) The project includes strategies to increase capacity, manage congestion, reduce vehicle distance traveled, or lower accident rates

(D) The project team works with the community to expand mobility and access options and/or incorporate complete streets policies.

(E) The project addresses long-term mobility and access needs of the community.

(F) The project creates new or restores previous connections between communities.

DESCRIPTION

This credit addresses community mobility as a connected network for all modes, including private automobile usage, and focuses on the broader community benefits achieved from the efficient movement of people, goods, and services. It assesses quality-of-life benefits that mobility provides through greater access to jobs, education, and critical services. These include reducing commute times, reducing vehicle distance traveled, or improving levels of service.

Greater mobility provides freedom of choice when it comes to access to education, jobs, affordable housing, and even healthy food and activities. Barriers and impediments to mobility are also a source of discontent within communities and often be found calculating the loss of economic activity due to congestion.

Teams should consider how even non-transportation projects can become multi-benefit projects by contributing to more efficient mobility in the community. This may include how site access is configured, the mode with which it is accessed, or the frequency of trips to and from the site. For example, a park that incorporates a pedestrian overpass can improve the mobility of both cars and pedestrians.

PERFORMANCE IMPROVEMENT

The assessment of mobility in this credit is scalable, and expectations regarding the geographic scope of the assessment are relative to the scale of the project. For example, large rail projects might assess mobility across an entire region, while a small park project may assess mobility to and from local neighborhoods.

Improved: The project is consistent with local transportation plans that were developed and adopted through an inclusive public involvement process. Wherever possible, the project should consider its relationship to nearby housing, employment, shops and community facilities. The project team demonstrates a reasonable, inclusive, and coordinated approach to addressing mobility impacts.

Enhanced: Overall mobility is enhanced with a connected network that helps reduce congestion, improves traffic flow, and/or contributes to community livability. Project teams implement strategies to accommodate or support automobile, transit, and commercial vehicles while promoting complete streets policies leading to more active, healthier lifestyles. With the increasing role of technology, project teams should consider ways to utilize open data to enhance project performance.

Conserving: The project team is proactive in identifying the limitations and future mobility needs of the community and incorporating strategies to address them.

Restorative: The project creates or restores community connections. Beyond improving existing performance, the project has created new mobility opportunities with potentially cascading benefits (e.g., better access to schools, commercial districts, healthcare, etc.).

Applicability: Consideration is given to whether the project has any potential to impact mobility. Non-transportation projects that do not include any mobility impacts (positive or negative), and can demonstrate no potential for positively impacting mobility, may apply to have this credit deemed not applicable with supporting documentation. This credit is inherently applicable to all transportation infrastructure projects.

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Is the project consistent with local transportation plans?

1. *Documentation demonstrating consistency with local and regional transportation plans. When applicable, documentation may include an amendment to the transportation plan(s).*

B. Has the project team obtained input from the community and key stakeholders regarding issues of mobility and access?

1. *Documentation (e.g., reports, memoranda, and/or minutes) of meetings with the community and key stakeholders (e.g., community officials or managers and operators covering access to adjacent facilities, amenities, and transportation hubs).*
2. *Records of decisions made and actions taken.*

C. Does the project include strategies to increase capacity, manage congestion, reduce vehicle distance traveled, or lower accident rates?

1. *Reports documenting access and mobility principles, concepts, requirements, and expected outcomes of the project.*
2. *Documentation of how the project increases transportation capacity, efficiency (e.g., reduced congestion and/or vehicle distance traveled), or safety (lower accident rates).*

D. Has the project team worked with the community to expand mobility and access options and/or incorporate complete streets policies?

1. *Assessment of the availability, feasibility, and use of transportation options (e.g., rail, water, active transportation, or mass transportation access).*
2. *Documentation of how the project expands mobility and access options, including a rationale for making or not making changes to transportation modes.*
3. *When applicable, reports demonstrating the use of complete streets policies and guidelines.*

E. Has the project team considered the long-term mobility and access needs of the community?

1. *Documentation of the long-term mobility and access needs of the community (e.g., existing studies, reports, memoranda, and/or minutes).*
2. *Design components showing the extent to which long-term mobility and access needs and issues were incorporated into the constructed work. For example, expanding considerations to anticipated traffic flows and volumes, changes in technology, preferred modes of access, and effects on mobility and connectivity.*
3. *Documentation showing how the project addressed the community as a connected network, including long-term transportation infrastructure efficiency, walkability, and incentivized transportation efficiency.*

F. Does the project create new or restore previous connections between communities?

1. *Documentation of meetings with community officials discussing the need for new connections/reconnections between communities (e.g., reports, memoranda, and/or minutes).*
2. *Documentation of how the project provides new or improved connections between communities in order to increase overall mobility. For example, connecting housing, jobs, shops, and/or community facilities by utilizing or improving existing transportation infrastructure.*

RELATED ENVISION CREDITS

QL1.1 Improve Community Quality of Life

QL3.1 Advance Equity and Social Justice

LEADERSHIP: PLANNING

LD2.1 Establish a Sustainability Management Plan

18 POINTS

INTENT

Create a project sustainability management plan that can manage the scope, scale, and complexity of a project seeking to improve sustainable performance.

METRIC

Extent of organizational policies, authorities, mechanisms, education, and business processes put in place.

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A + B	A + B + C	A + B + C + D	A + B + C + D + E	Not Available
(4) Plan	**(7) "Plan-Do-Check-Act"**	**(12) Full Implementation**	**(18) Managing Change**	

(A) Roles and responsibilities for addressing sustainability are assigned to key members of the project team. Their authority on the project to affect change is sufficient and clear.

(B) The project team develops a sustainability management plan, or adopts existing sustainability management plans or policies sufficient in scope and scale to address the sustainable performance of the project.

The plan includes an index of all project features related to sustainability, and an assessment of the environmental, social, and economic aspects of the project.

Sustainability goals and performance objectives are established and prioritized to reduce the project's impact. They are aligned with community needs and issues.

(C) The project management plan contains sufficient processes, action plans, and management controls to achieve its sustainability goals and performance targets.

(D) Implementation of the sustainability management plan, and progress toward established goals, is revisited periodically through meetings or written reports.

(E) The plan is adaptable, flexible, and resilient enough to manage changes in environmental, social, or economic conditions of the project over time.

Envision Checklists

- Set up workshop to review base Envision scorecard
- Gage interest:
  - Group exercise?
  - Subcommittee for those interested?

07

Next Steps

Next Steps

- Next meeting in Fall 2023
  - Agenda topics TBD
  - The next meeting will be in-person at the WPCP

Project Contact

Mary Strawn
Chief Engineer
Arlington County Water Pollution Control Bureau
(703) 228-6829
MStrawn@arlingtonva.us

Thank you!