ECOfluid Systems Inc.

USBF® WASTEWATER TREATMENT PROCESS

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Westside Solutions Innovation Days

Royal Roads University, Victoria, BC

April 28, 2015

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Agenda

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- About ECOfluid
- Wastewater Treatment Unit Processes
- USBF® Process and Benefits
- Westside Solutions Proposal
- Case Studies

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About ECOfluid

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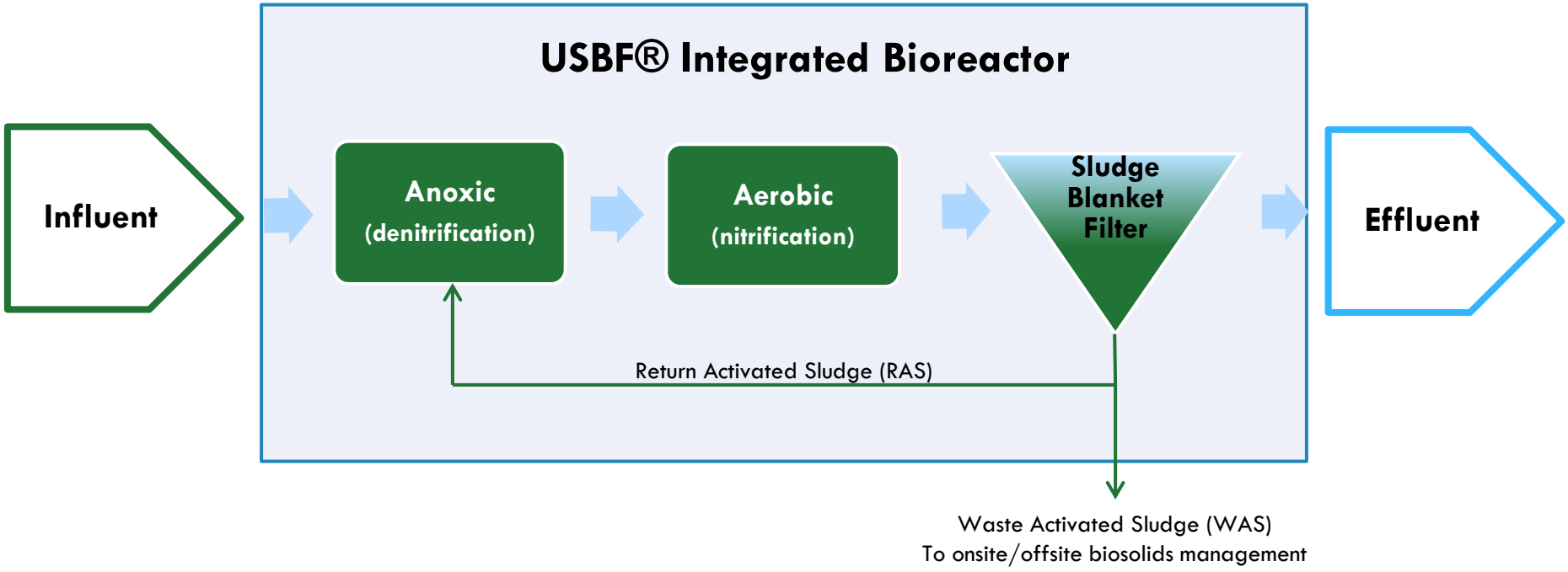
- Established in 1995; provider of advanced wastewater treatment systems
  - Over 150 installations across North America and the Caribbean
  - Process Design I Equipment Supply I Design-Build
- Full contract O&M services division launched in 1998
  - Close and immediate crosscheck between designers and operators
  - Facilitates continuous improvement of technologies and processes
- In 2012, ECOfluid was acquired by NORAM Engineers and Constructors Ltd., who among other are well recognized worldwide leader in the fields of nitration, sulphuric acid and electrochemical plant design and construction.
  - Provides strong technical and financial backing

Our interdisciplinary team of engineers, designers, operators and business specialists, backed by NORAM resources, provide clients with extensive and well-rounded industry knowledge and experience.

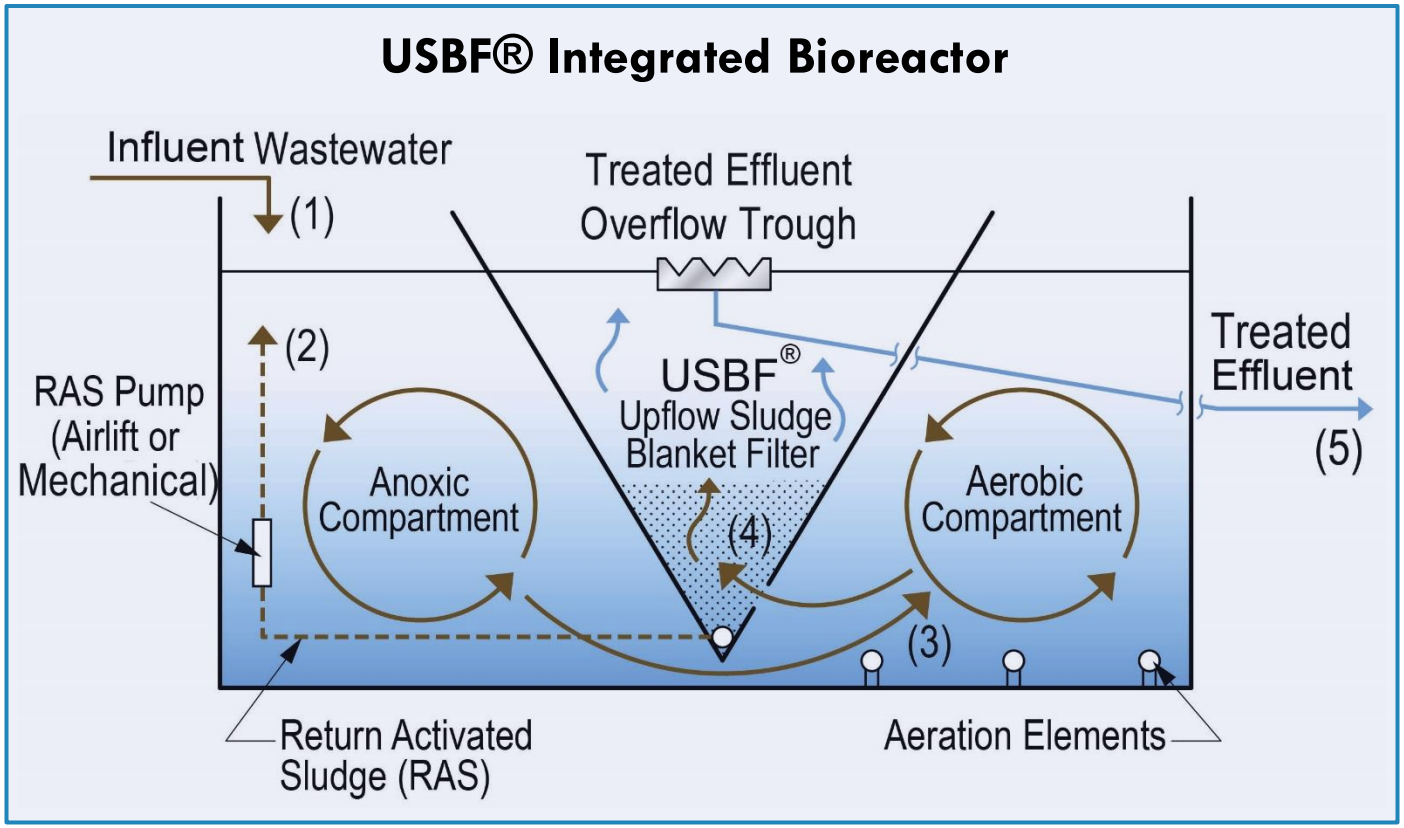
Wastewater Treatment Unit Processes

- Pre-Treatment / Headworks Systems
- Biological Treatment:
  - USBF® (Upflow Sludge Blanket Filtration)
  - MBR (Membrane Bioreactor)
  - IFAS / MBBR
- Tertiary Treatment:
  - Sand Filtration
  - Microscreen Filtration
  - Cloth Media Filtration
  - Membrane Filtration
  - UV Disinfection
- Sludge Dewatering and Processing Systems

An integrated bioreactor that incorporates anoxic and aerobic compartments, and upflow filter(s)



USBF® Process



1. Sewage enters anoxic compartment
2. Sewage and RAS mix
3. Flows into aerobic compartment
4. Enters bottom of Sludge Blanket Filter
5. Effluent collected in trough; gravity discharge (to disposal or post-treatment)

USBF® - Benefits

- High treatment efficiency, including BNR
- Modular, expandable, compact
- Reduced odor and noise
- Minimal amount of moving parts; gravity flow
- Reduced CAPEX / OPEX
- Fluidized bed filtration efficiency
- Self-regulating hydraulic flexibility

Paves the way to economical water reclamation facilities…

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Westside Solutions Treatment Levels

Parameter	MTL (1)	ATL 1 (2)	ATL 2 (3)
BOD	< 25 mg/L	< 10 mg/L	< 5 mg/L
TSS	< 25 mg/L	< 10 mg/L	< 5 mg/L
TRC	< 0.02 mg/L	-	-
Un-ionized NH_3	< 1.25 mg/L	-	-
Turbidity	-	2 NTU (5 max.)	< 1 NTU
Fecal Coliform	-	1 CFU (14 max.)	< 1 CFU

Notes:

1. MTL: Mandated Treatment Level; WSER
2. ATL 1: Additional Treatment Level 1; MWR Reclaimed Water, Greater Exposure Potential
3. ATL 2: Additional Treatment Level 2; MWR Reclaimed Water, Indirect Potable Reuse

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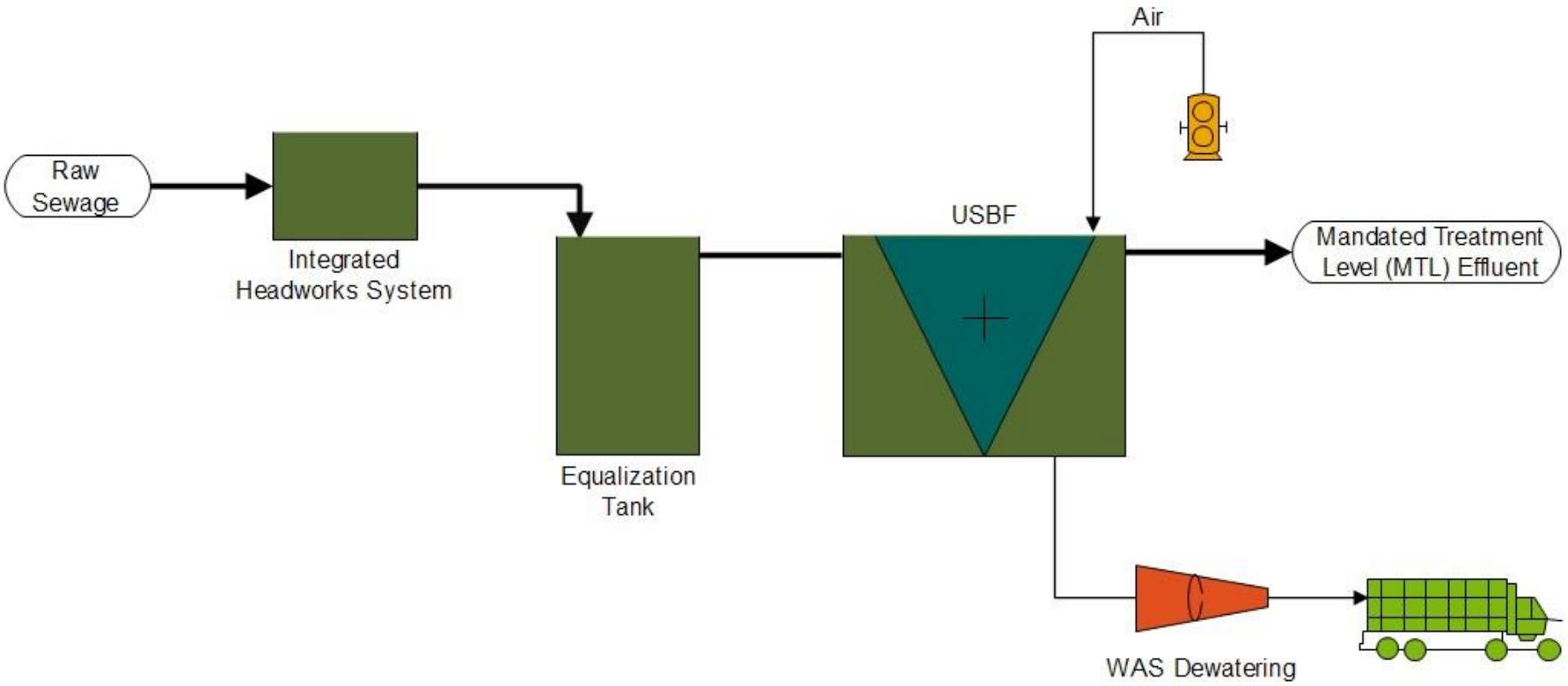
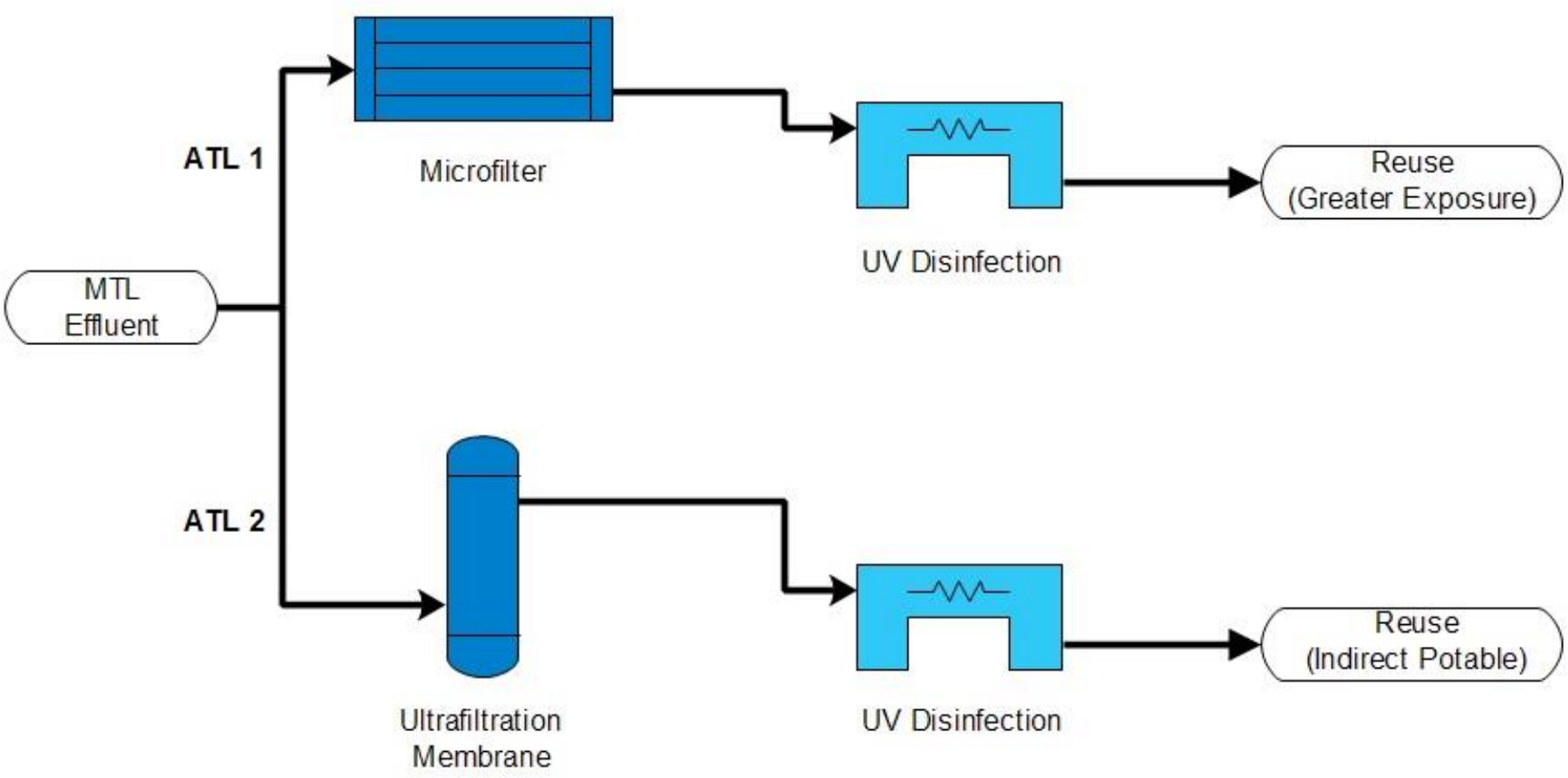
Process Configuration - MTL



Process Configuration – ATL 1/2



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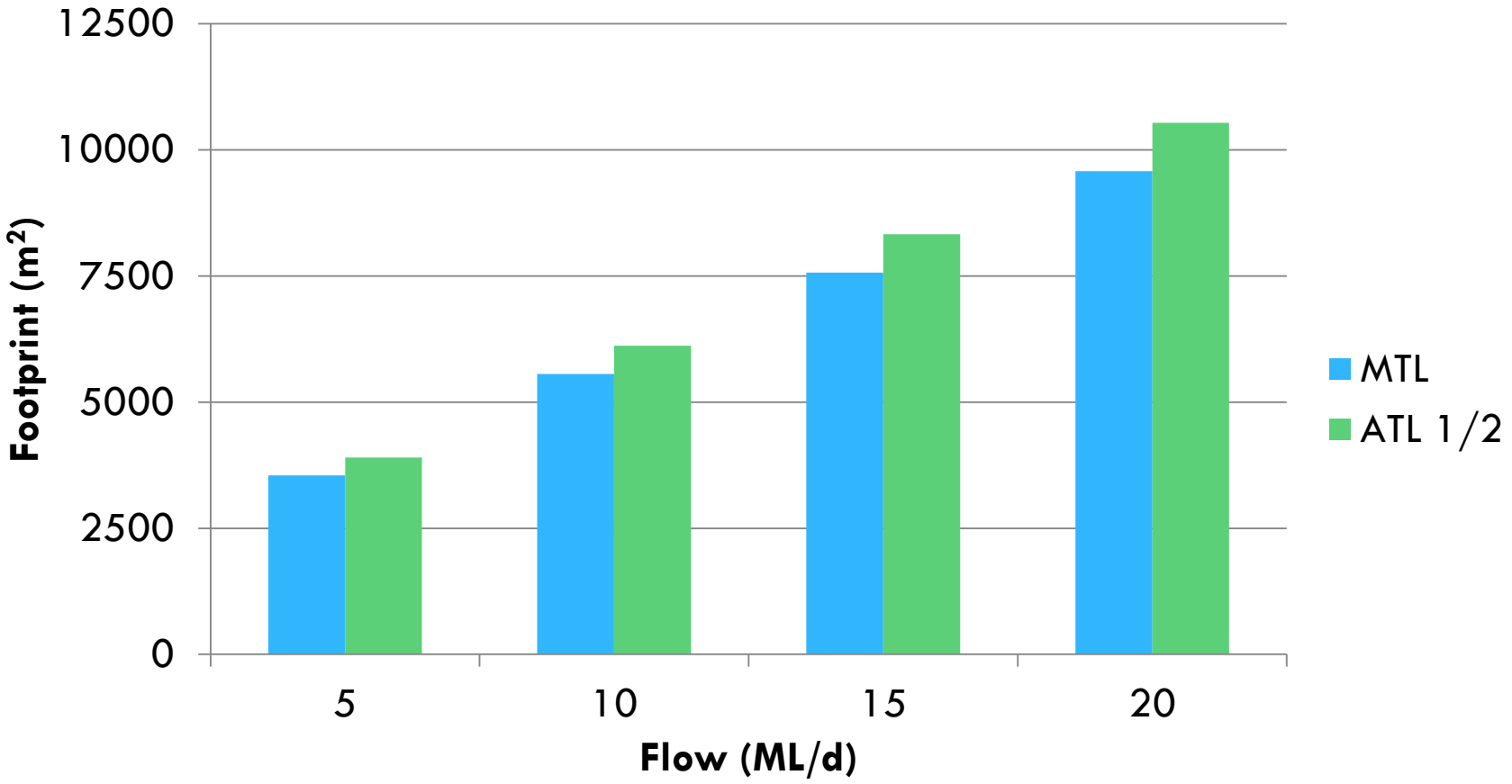
Land Requirement



Notes:

1. Includes overall process requirements with buildings and parking/roads

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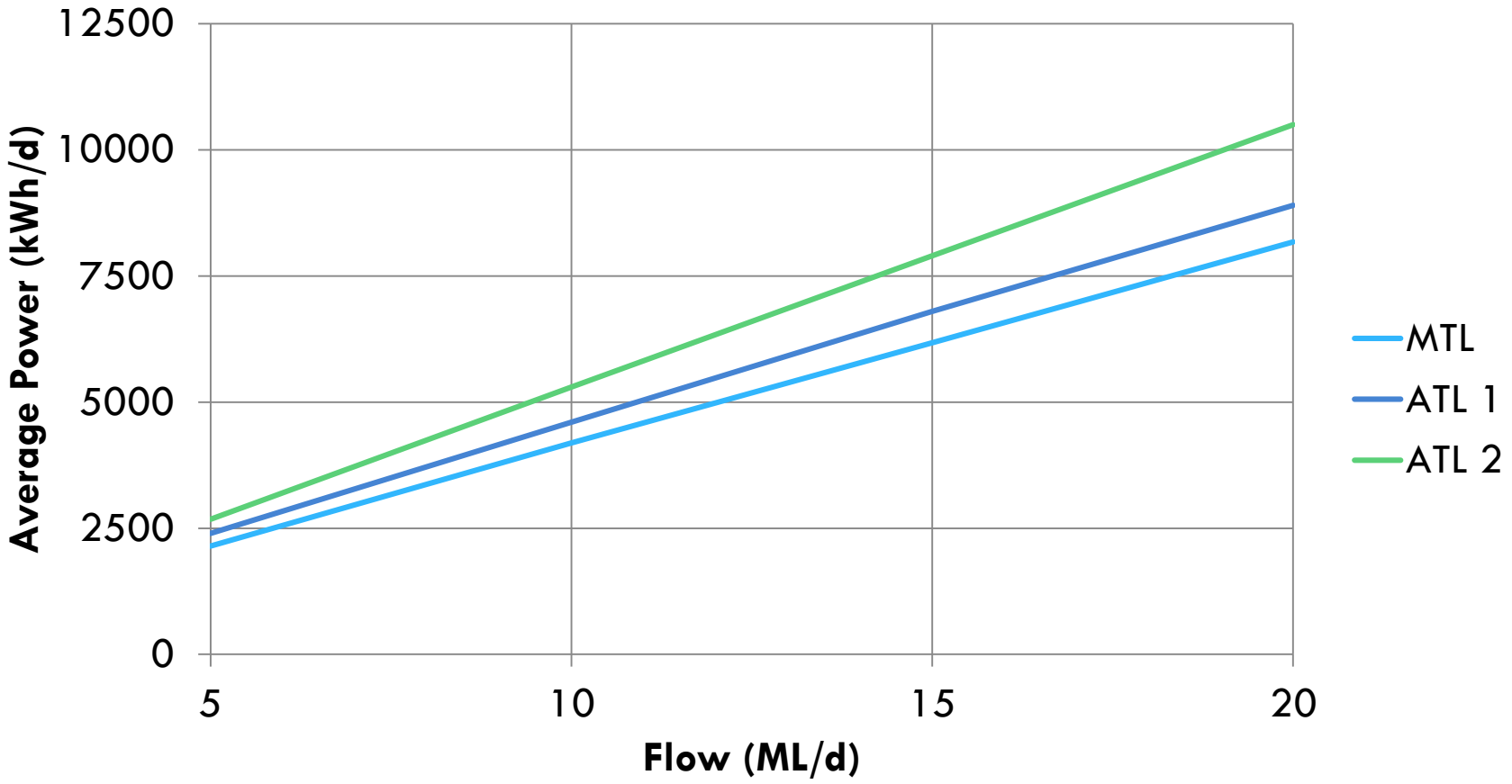
Power Consumption



Notes:

1. Includes all process equipment

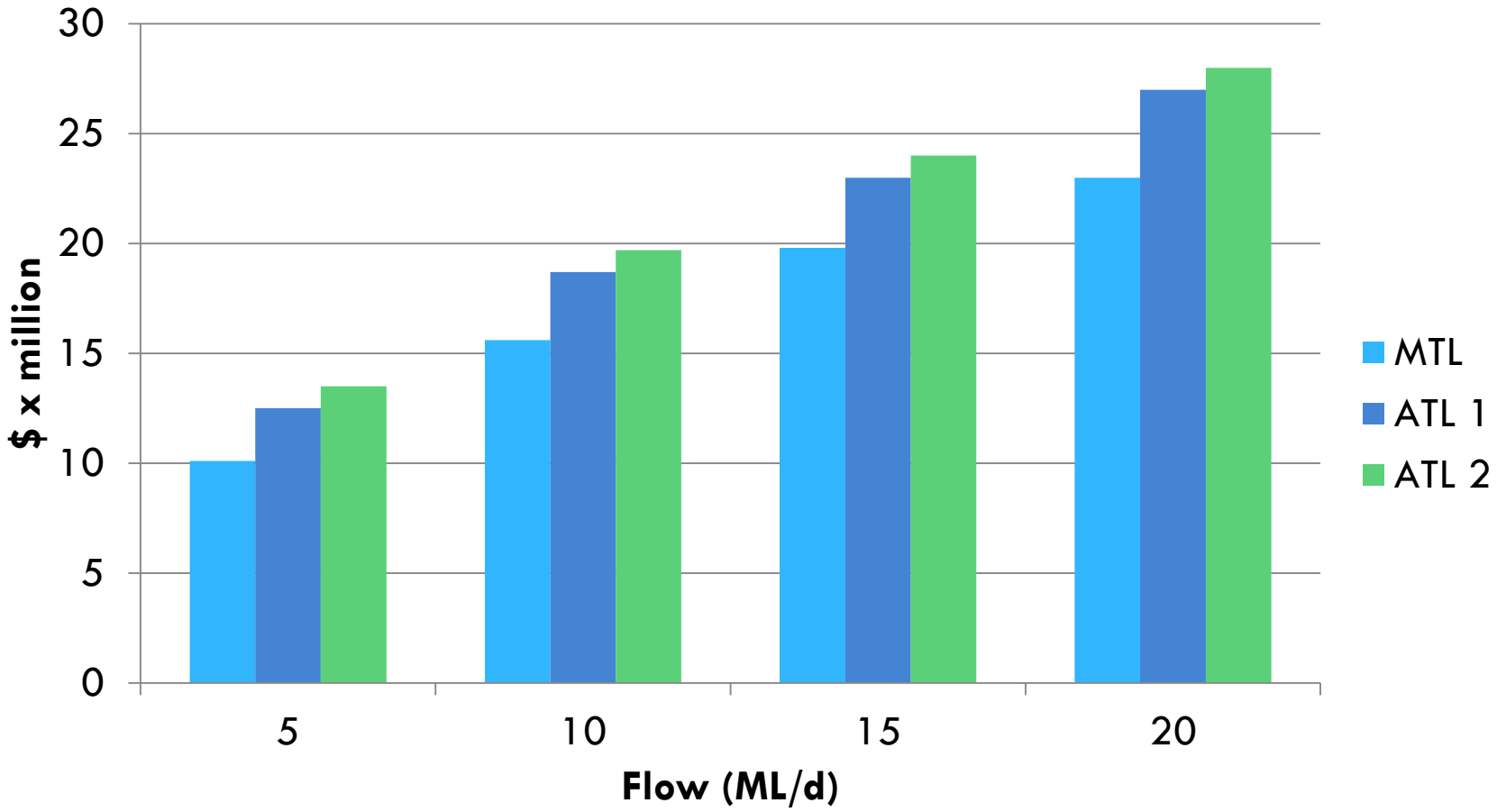
Operations

Flow (ML/d)	Treatment Level	Full-time Employees (FTE)
5	MTL	3
	ATL 1/2	4
10	MTL	4
	ATL 1/2	5
15	MTL	4
	ATL 1/2	5
20	MTL	5
	ATL 1/2	5

Notes:

1. Includes O&M of all process equipment

CAPEX



Notes:

1. Overall price is for a green-field ready to operate plant, excluding collection/disposal systems

Lake Alfred WWTP

- Project: Municipality
- Location: Florida
- Size: 4 ML/d (1 MGD)
- Contract: Design
- Key objectives: modular and compact; retrofit; water reuse

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Lake Alfred WWTP

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- Project: Municipality
- Location: Alberta
- Size: 4 ML/d (1 MGD)
- Contract: Design-Supply-Install
- Key objectives: cold weather operation; enhanced phosphorus reduction

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Strathmore WWTP

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Sun Peaks WWTP

- Project: Ski Resort
- Location: British Columbia
- Size: 1.5 ML/d (0.4 MGD)
- Contract: Design-Supply-Install
- Key objectives: cold weather operation; highly fluctuating flow and loading; modular and expandable

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Sun Peaks WWTP

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Other ECOfluid Facilities

Nanoose First Nation WWTP, BC

Joshua Basin WWTP, California

Senkulmen WWTP, BC

Mill Springs Village WWTP, BC

Thank you.

References available upon request