



2019 Update on Sustainability Innovation Fund Projects

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Liquid Waste Committee Meeting - September 19, 2019

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Liquid Waste Committee

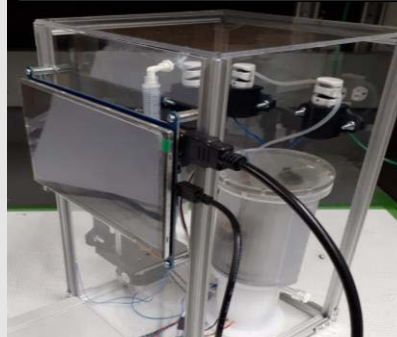
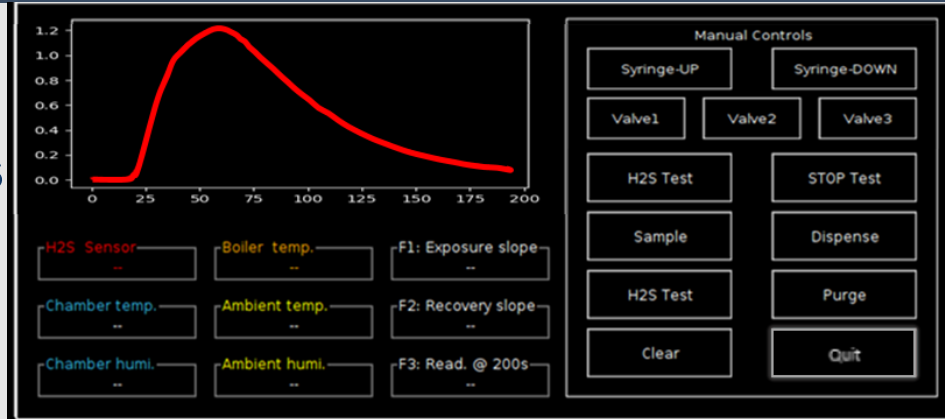


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Smart Sewers - Development of Wireless In-Situ Sensors: In Progress

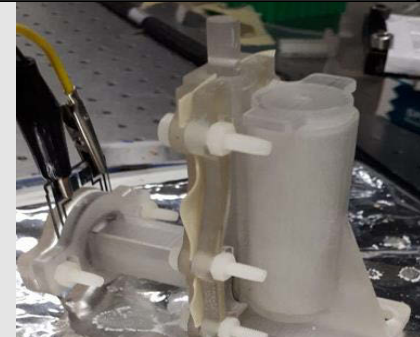
Purpose: early detection of odour and corrosion compounds

- \$320,000 federal funding added
- Bench-testing of two prototypes
- Measurement of hydrogen sulphide in solution
- Touchscreen GUI
- Annacis Research Centre in fall



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Volatilization Sensor



Direct Liquid Sensor

High Efficiency Aeration Demonstration: In Progress

Purpose: to improve aeration performance and reduce energy use

- Perlemax contracted
- Water Research Foundation – independent evaluator
- Collaborating with DC Water
- Testing to begin Q3 2019



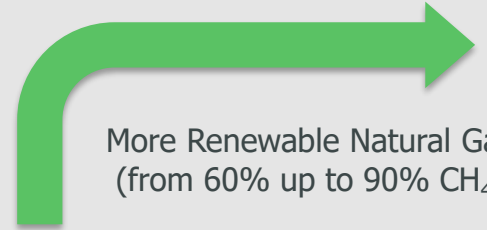
Genomics Approach to Anaerobic Digestion (AD) Optimization: In Progress

Purpose: to increase biomethane from AD processes

- Four federal grants over \$700K
- Sequencing analysis identified methane-limiting conditions
- Developing RNG Optimizer to boost methane production



Renewable Natural Gas Optimizer



More Renewable Natural Gas
(from 60% up to 90% CH₄)

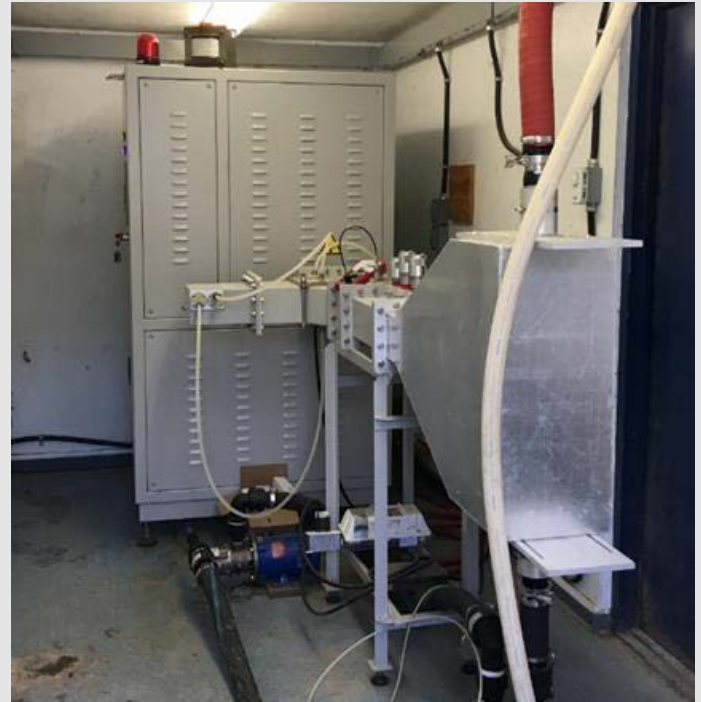


Existing Digester

Microwave-enhanced Advanced Oxidation Process Sludge Destruction Pilot: In Progress

Purpose: to test microwave-enhanced advanced oxidation process for sludge destruction

- \$518,000 federal funding added
- Installation at Annacis Research Centre
- Tests to be completed by Q4 2019



Capture of Wastewater Contaminants of Concern and Beneficial Use of Residuals: In Progress

Purpose: To produce a sludge-based activated carbon to capture waterborne contaminants

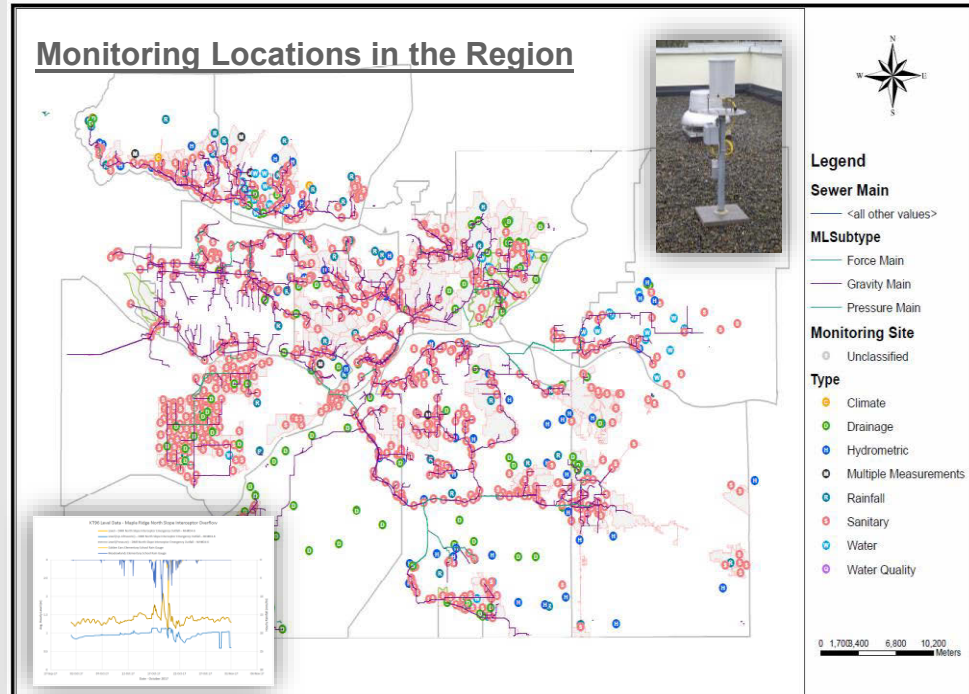
- Research Agreements signed with UBC and KWL (consultant)
- External funding secured \$88K
- Testing to start Q3 2019



Intelligent Water Systems – Making Use of Sensors and Big Data Analytics: In Progress

Purpose: turning data to knowledge for decisions

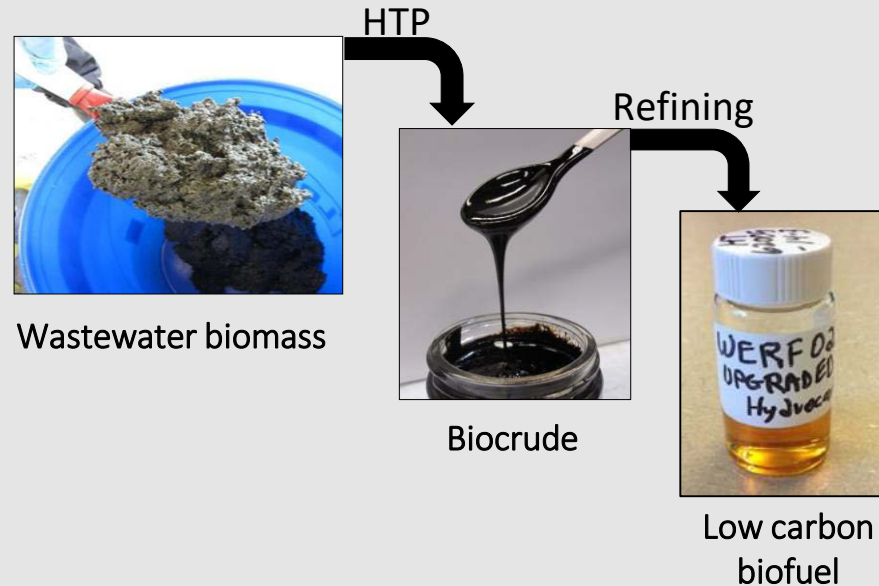
- Joint project with Water Research Foundation
- \$200K MV funding
US\$200K WRF funding
- database integration, data QA/QC using A.I.



Hydrothermal Processing – Biofuel Demonstration Facility: In Progress

Purpose: convert wastewater biomass to biocrude and produce low carbon fuels

- External funds
 - \$750K from the Province of BC
 - \$2.475M from Parkland Fuel Corp.
- Access to Genifuel technology secured
- Consultants and fabricator to be retained in 2019





Questions



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2018 GVS&DD Environmental Management & Quality Control

ANNUAL REPORT

Andjela Knezevic-Stevanovic

DIRECTOR, ENVIRONMENTAL MANAGEMENT &
QUALITY CONTROL, LIQUID WASTE SERVICES

Liquid Waste Committee – September 19 , 2019

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Environmental Management & Quality Control Annual Report

- Regulatory requirement
- Documents operational effectiveness, technical and regulatory performance of wastewater treatment plants (WWTPs)
- Assesses environmental health of water bodies that are receiving liquid waste discharges from Metro Vancouver
- Provides information to the public

Metro Vancouver's WWTPs

3 Secondary - freshwater discharge



2 Primary – marine discharge



Lions Gate WWTP



Annacis Island WWTP



Lulu Island WWTP



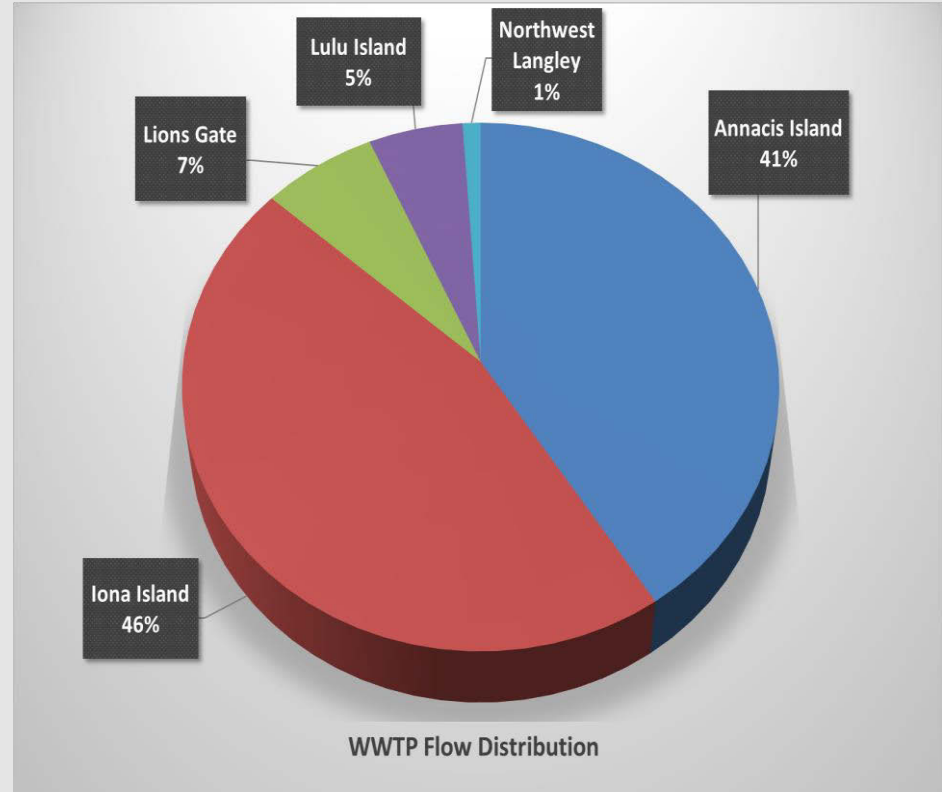
North Langley WWTP



Iona Island WWTP

Metro Vancouver's WWTPs

- Over 456 billion litres of wastewater treated in 2018



WWTP Technical Performance

- Over 207,000 analyses by Metro Vancouver laboratories alone
- About 57,000 tonnes of suspended solids (TSS) and about 58,000 tonnes of biochemical oxygen demand (BOD) removed
- Treatment efficiency met or exceeded expectations

WWTP	% BOD Reduction	% TSS Reduction
Iona Island	45	61
Lions Gate	41	67
Annacis Island	94	91
Lulu Island	97	96
Northwest Langley	95	93

WWTP Regulatory Performance

- WWTPs consistently met the Operational Certificate requirements

Biosolids Quality Monitoring



Effluent Toxicity Monitoring

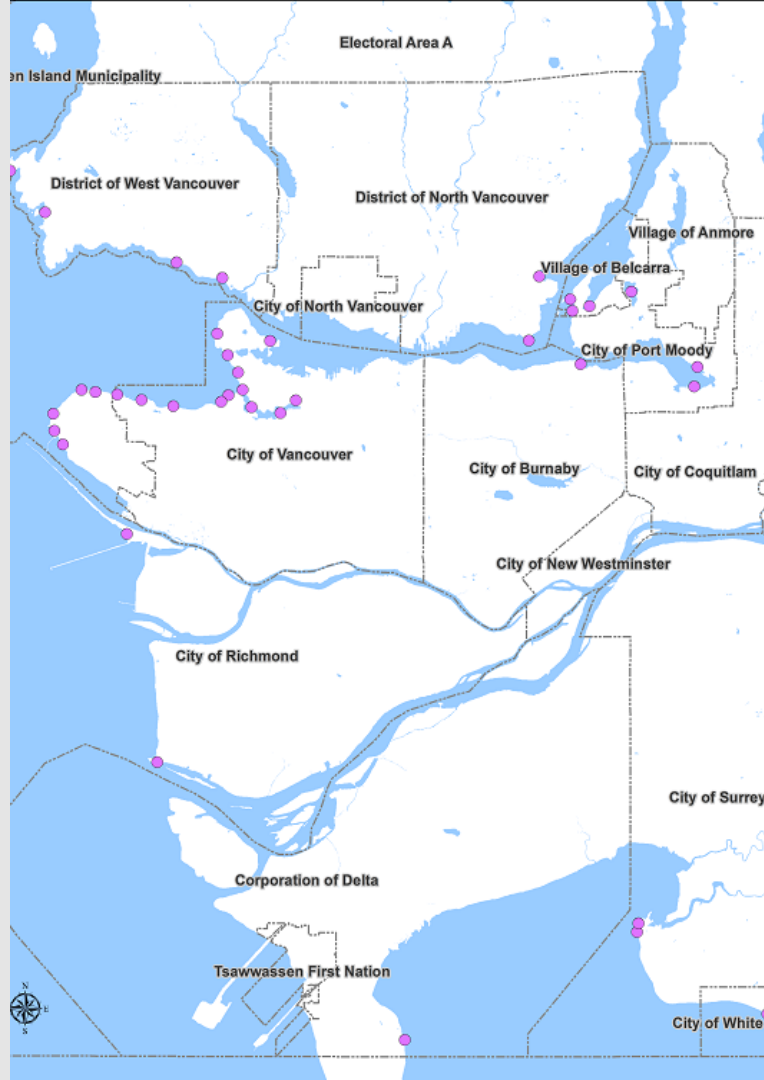


Endocrine Disrupting Substances and Trace Organics Monitoring

- Included substances:
 - Pharmaceuticals and personal care products (PPCPs)
 - Surfactants
 - Hormones and sterols
 - Polybrominated diphenyl ethers (PBDEs)
 - Polychlorinated biphenyls (PCBs)
 - Polyaromatic hydrocarbons (PAHs)
 - Phenolic compounds
 - Volatile organic compounds (VOCs)
 - Organochlorine pesticides (OCPs)

Beach Monitoring

- Bacteriological water quality monitored at 41 beaches
- Most bathing beaches met the primary-contact recreation guideline during the bathing beach season except at 9 locations
- West and Central False Creek met the secondary-contact recreation guideline throughout the season
- Swimming advisories were posted by the Health Authorities for 2 to 21 days



Monitoring of Regional Water Bodies

- Strait of Georgia
- Burrard Inlet
- Boundary Bay
- Fraser River



Conclusions

- Metro Vancouver WWTPs operate in compliance with the applicable regulatory requirements
- Treatment plants meet performance expectations and consistently provide an ongoing benefit to the region by reducing contaminant loading to the environment
- Regional liquid waste discharges are effectively managed in a manner that is protective of human and aquatic life



Thank You

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