

Water and Sanitation Summary for Yukon, Canada

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Geography and Demographics

- Country/Region size
 - 482,443 km² (28% *Alaska*)
- Population: 37,642 (5% *Alaska*)
 - Urban: 32,671
 - Largest city – Whitehorse area (29,092 – 77%)
 - Rural: 4,971
 - 18 communities, 12 - 913 people in size
- Racial or ethnic groups (self-reported)
 - 7,796 Indigenous (21%) – 13 First Nations
 - 29,846 non-Indigenous (79%)

The Yukon



- Only 1 Arctic community (Old Crow)
 - Freezing Index: 4,400 degree-days-C
- Rest are road accessible year-round
 - Freezing Index: 1,800 to 3,300 degree-days-C

Water and Sanitation Services

- 600 (1.7%) of population without in-home water and sewer service
 - ~450 (1.2%) rural without service
 - ~150 (0.5%) urban without service
 - Coordination difficulties in First Nation vs. non-First Nation communities
 - Overall community responsibility (Territorial) vs. FN subdivisions
 - Many rural residential without adequate on-site services

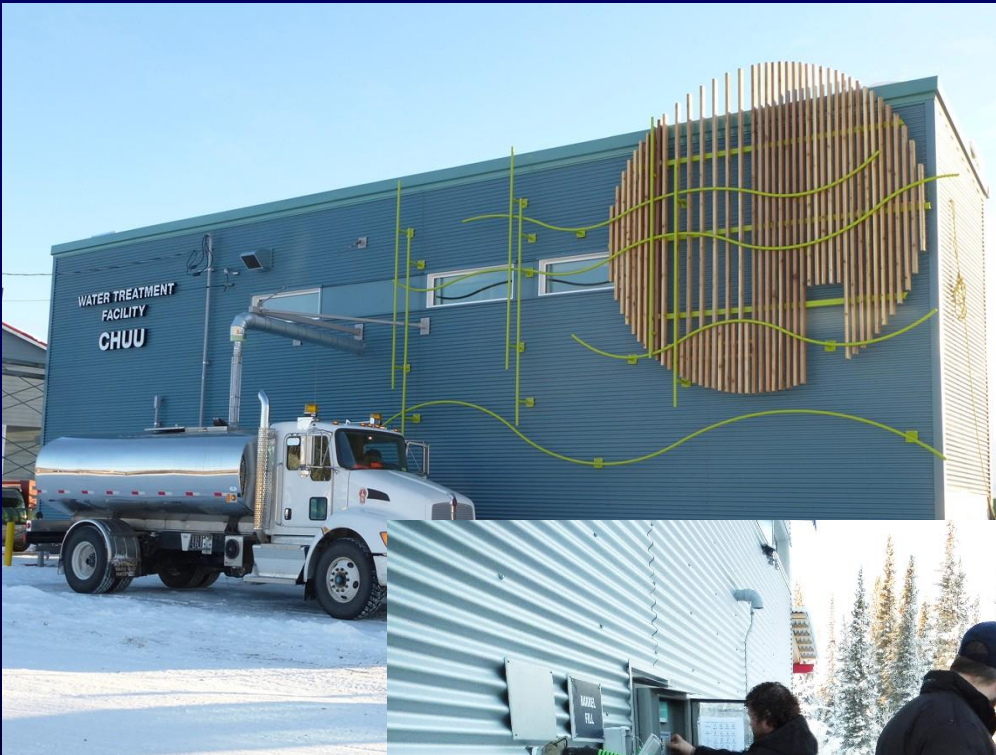
Water Treatment / Source

- New Guidelines on Canadian Drinking Water Quality require enhancement of treatment in many communities
 - GUDI groundwater sources generally require UV, chlorination
 - Hardness, iron, manganese common in ground water
- All but one community use groundwater sources (“local preference” to not use surface water)

Water Service

- 60% are Large Public Drinking Water Systems
 - Piped systems (7): ~29,000 (77%)
 - Whitehorse dominates this (75%)
 - Trucked haul: ~2,000 (5%)
- 40% are Small Water Systems or private wells
 - Private wells: ~5,000 (13%)
 - Self-haul: ~1,500 (4%)

Water Service - Hauled



Water Service - Piped



Water Service - Piped

- **Freeze protection!**
 - Community choice drastically influences water use – Dawson City (2,000) uses 1,600 Lpcd (420 gal/cap/day), approx 65% of which is bleeders



Sewage Service

- Sewage collection
 - Piped service: 29,000 (77%)
 - Again, dominated by Whitehorse (~75%)
 - Trucked pump-out: ~2,000 (5%)
 - Septic systems (on-site): ~6,500 (17%)
 - Large impact on water safety planning
 - Self-haul: negligible
 - Outhouses: unknown (by choice)

Sewage Service, Household Solid Waste

- Sewage treatment methods
 - Lagoons: ~29,000 (77%)
 - Mechanical (2 systems): 2,600 (7%)
 - On-site (septic field): ~6,500 (17%)
- Solid waste: 19 sites managed by Yukon Government, 7 managed by municipalities

Sewer Service



Mechanical Sewage Treatment



- Poor experience in Yukon

Lagoons



Costs

- Jurisdiction influences funding:
 - First Nations communities - Federal
 - 9 self-governing, 4 Indian Act
 - Unincorporated communities – Territorial
 - Municipalities – Self-funding / Territorial

Costs

- Construction, engineering
 - Gas Tax funding
 - \$163M, 2014-2024
 - New Build Canada Fund (75% Federal, 25% Territorial) – administered by Yukon Gov't, can be accessed by municipalities
 - \$342M, 2014-2024
 - Yukon Government capital funding
 - Municipality water/waste funds (user fees)
 - First Nations: INAC contribution agreements

Costs

- Operations and maintenance
 - Local users (user fees)
 - Yukon Government / INAC subsidies in many communities (or directly operate some systems)

Operations and Maintenance

- How is this organized?
 - Municipalities
 - First Nations
 - Yukon Government directly operates some (water - 7 community supplies, 4 trucked)
- Local user fees (if exist): collected by municipality / First Nation
 - Larger communities are able to self-fund

Regulation Authority

- Federal: Canada
 - Guidelines for Canadian Drinking Water Quality (GCDWQ) – Health Canada
 - Wastewater Systems Effluent Regulations (WSER)
- Territorial: Yukon
 - Environmental Health Services
 - Yukon Water Board
 - Acts & Regulations
- Municipal / Community
 - Construction standards
 - Bylaws

Challenges

- Climate change
 - Impact on operation of lagoon systems
 - Melting permafrost – piped systems
- New federal regulations
 - Have prompted need for upgrade of nearly every water system (and sewage systems in future)
 - Large capital, O&M cost implication (\$\$\$)
- Federal/Territorial/FN overlap
 - Ex: leads to one half of a community having good water & sanitation service; other half on boil water advisories

Challenges

- Sludge – how to handle this resource?
- Solid waste – lack of coordinated approach
- Lots of new funding available: How to determine appropriate levels of investments
 - Levels of service
 - Lifecycle cost
 - Prioritization
- Water use volumes & wastage
 - Bleeders (freeze protection), user education

Opportunities

- New Yukon Operator Training Program
 - EOCP (Environmental Operators Certification Program) at Yukon College in Whitehorse (2011)
- INAC Circuit Rider Program
- Self-governing First Nations and financing of infrastructure
- Sharing water and sanitation infrastructure between municipalities & nearby First Nation
- Use of SCADA & remote monitoring

Thank You

- Yukon Government
 - Community Services
 - Environmental Health Services
- Stantec colleagues
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