



**ATLANTIC FIRST NATIONS
WATER AUTHORITY INC.**

ASSET MANAGEMENT PLAN

Category G: Project Management



ASSOCIATION OF CONSULTING
ENGINEERING COMPANIES | CANADA

ASSOCIATION DES FIRMES
DE GÉNIE-CONSEIL | CANADA



Atlantic First Nation Water Authority Office

PROJECT SUMMARY

Atlantic First Nations Water Authority (AFNWA) retained Dillon to **develop individual asset management plans for water and wastewater systems in 17 participating First Nation communities in Atlantic Canada (NS, NB and PEI)**. The purpose of the Asset Management Plans is to help increase financial sustainability with long-term planning for individual First Nation communities by identifying asset inventory and condition, calculating capital investments required, and understanding system operation and maintenance needs.

The project included completing water and wastewater treatment assessments, which included Environmental Risk Assessments for wastewater systems (which are not typically part of asset management plans) and investigations to determine if any wells exhibited Groundwater Under Direct Influence (GUDI) of surface water. Results from these assessments were integrated into first generation asset management plans for each community, and were used to establish target levels of service performance metrics.



COMPLEXITIES

Available data for this project was spread across multiple sources in many different formats, resulting in significant data gaps. Dillon worked with the Atlantic First Nations Water Authority (AFNWA) to establish a standard asset hierarchy for the project, as well as data management and governance initiatives to clearly establish responsibilities related to data inventory and upkeep. During a workshop and several site visits to the communities, Dillon utilized this time to listen to the operators, which provided our engineering and environmental teams a better understanding of each system’s operations, limitations, and opportunities.

Additionally, this project included an operational survey, where the Dillon team located, assessed, and recorded GPS locations of individual drinking water and wastewater appurtenances, such as hydrants and manholes, to understand required operational upgrades related to the water and wastewater linear networks. Our team worked closely with system operators to better understand system limitations and capacity to produce a comprehensive and useful legacy tool for each community operator. This task

provided an opportunity to digitize the linear networks and provide critical record information to the AFNWA and First Nation system operators. These digital linear maps also provide the opportunity for the operators to review site specific information in real time while in the field, significantly improving their ability to locate assets, identify pertinent information, and update information directly on-site and in real time.

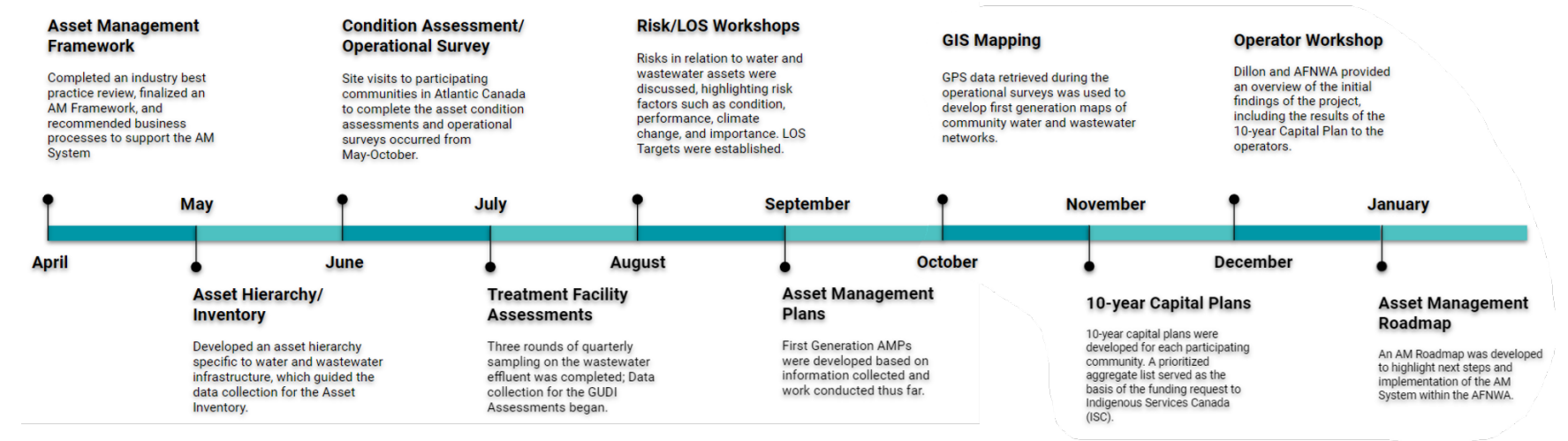
The project faced significant external challenges related to the COVID-19

pandemic, as the 17 First Nation communities were located across three provinces and 14 health regions with varying health and safety requirements. Strong project management and communication skills helped our team maintain momentum throughout this important project.

The capital prioritization framework that helped develop the 10-year Capital Plans also included risk characterization considering asset condition, performance,



Service “hubs” for participating First Nation communities



Project Timeline

and external factors such as climate change as it relates to asset location. The risk calculations also included scores for the importance of the service the asset provides, therefore many layers were incorporated into the Capital Plans to improve system operations and reduce the risk to community members in participating communities.

should be afforded equal access to safe drinking water, and equal access to upgrade their wastewater systems to national standards. Through this project, 17 individual communities are now better equipped with the knowledge and tools to make informed decisions on their assets.

Dillon worked diligently in partnership with the AFNWA to complete many related deliverables, including establishing the utility's Asset Management System, identifying asset inventory and condition, understanding system operation and maintenance needs through the Environmental Risk Assessments for wastewater systems and GUDI Assessments for water systems, and identifying lifecycle costs and replacements to calculate capital investments required.

The deliverables supported the AFNWA's efforts to create a new approach to managing water and wastewater infrastructure in First Nation communities, considering the disparity in federal

MEETING CLIENT NEEDS

This project demonstrated an important pilot project that offers a revised approach to management of Indigenous water and wastewater systems by Indigenous peoples in Canada. First Nation communities



Asset Management Framework

investments for water and wastewater systems across Canada.

Being federally funded, the project faced pressures in terms of accelerated timelines to complete the 10-year Capital Plans, which was an important deliverable used to communicate investment needs to the Federal treasury for budget approval. The 10-year Capital Plans were requested 1.5 months ahead of schedule, and Dillon was able to adjust team members and employ stringent project management principles to provide the plans on time.

In December 2022, the AFNWA started to assume responsibility for the operation and maintenance of water and wastewater systems in participating First Nation communities.

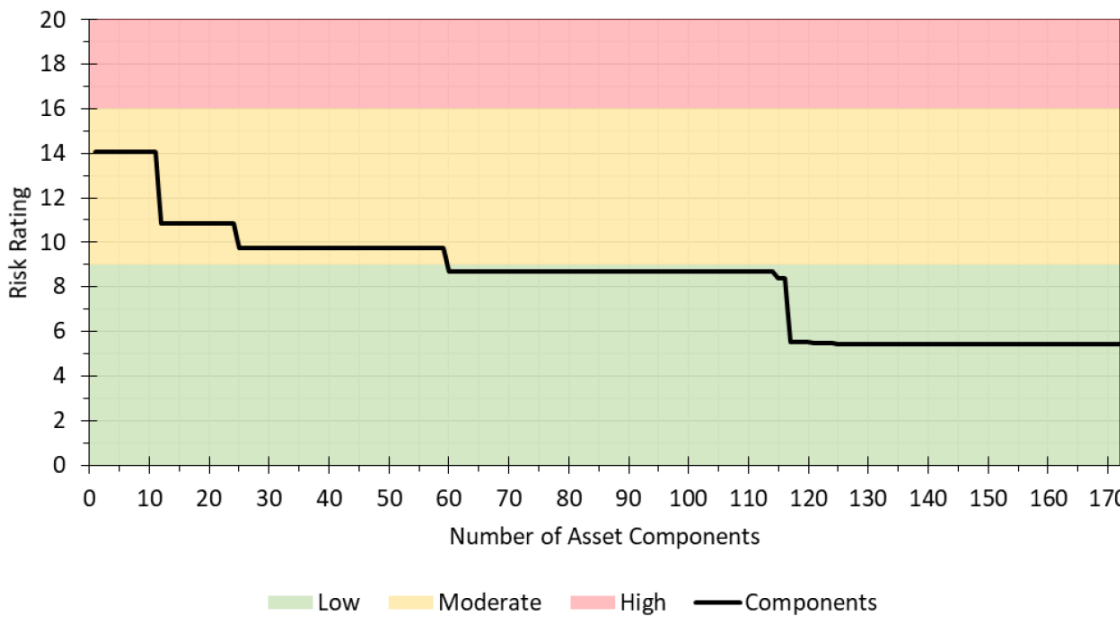
ENVIRONMENTAL BENEFITS

The AFNWA has taken on a risk management approach as it relates to wastewater treatment and understanding the sensitive receiving environment called *Nujo'tme'k Samqwan* (we take care of the water). This approach, which was named by the AFNWA Elders Advisory Lodge,

is the essence for the completion of Environmental Risk Assessments (ERAs) for wastewater systems, which is not typically a component of asset management planning.

Dillon completed ERAs on participating and applicable wastewater treatment systems discharging into a receiving environment. Currently, wastewater systems discharging to Canadian water bodies are required to comply with Wastewater Systems Effluent Regulations (WSER). This regulation sets the minimum effluent quality for organic

compounds, suspended solids and chlorine residual parameters, but does not consider the receiving environment. An ERA was required to determine Effluent Discharge Objectives (EDOs) to meet the AFNWA's risk management requirements in consideration of protecting the receiving environment and its designated water uses. A higher standard of technical due diligence was applied for the purposes meeting the Elder's desire to focus on sustainability and the environment.



Example of Risk Profile produced as part of the Asset Management Plans



Sipekne'katik Mi'kmaw Nation Wastewater Treatment Lagoon

This aspect of the project presents a direct environmental benefit for receiving waters, as upgrades and system operations are expected to be modified to meet the proposed EDOs, which are more stringent than the current regulations established by WSER.

INNOVATION

The AFNWA is the first Indigenous owned and operated water and wastewater utility in Canada and represents a step towards self-determination for First Nation communities. The AFNWA represents progress, innovation, and a long-term solution for water and wastewater problems that affect Atlantic First Nation communities. **This was a milestone project to support and action the initiatives of the AFNWA in consideration of this vision.** Additionally, the 10-year Capital Plans completed as part of this project were submitted to the Federal Treasury Board to support the AFNWA's vision. Funding approval was received in April 2022.

Dillon collaborated closely with the AFNWA and the individual participating communities' water and wastewater operators. The Dillon project team was

represented by staff that focus primarily on Indigenous services work and also included Indigenous persons that have a deep understanding of First Nation governance, community services, funding, and regulatory matters. This resulted in a collaborative process where solutions were co-developed through a shared learning environment, highlighting the importance of Two-Eyed Seeing (Two-Eyed Seeing is a concept developed by *Mi'kmaw* Elder Albert Marshall in 2004 which seeks to reconcile the use of Western method and theory with Indigenous knowledge). The success of this project demonstrates that the principle of Two-Eyed Seeing should become a

standard in the Engineering industry as it builds community-based solutions from a foundation of understanding of the complex differences experienced by Indigenous communities, which improve outcomes and fosters trust and understanding in a space that has been largely absent of this basic principle.

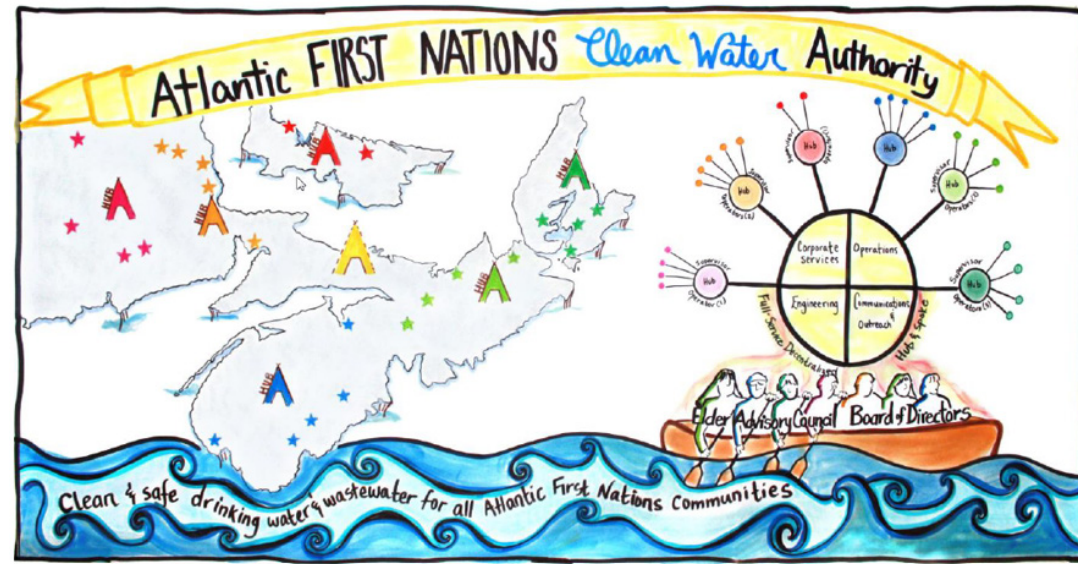
From a technical perspective, the operational surveys completed as part of this project, which included tagging individual hydrants, valves, manholes, and other water and wastewater appurtenances, were completed using Arc-GIS and Esri-based software. This software

allowed field staff to collect and map assets in real time, and offers the AFNWA and water and wastewater operators to utilize the maps on their own devices (through downloading an application) to make changes or rectify information as required. This represents an innovative approach to collecting inventory information that has been previously unavailable, or spread across many formats and sources.

SOCIAL & ECONOMIC BENEFITS

The AFNWA is a First Nation owned non-profit organization that is providing a framework for a new approach to managing water and wastewater systems in First Nation communities by incorporating social, economic, and environmental outcomes into their service delivery.

Indigenous communities across Canada have been plagued with access to clean drinking water. This is a basic human right that all should have access to. Indigenous communities across Canada have had similar experiences, resulting in a position of mistrust, restrictive



Vision Board for AFNWA operations, showing participating communities and service 'hubs'

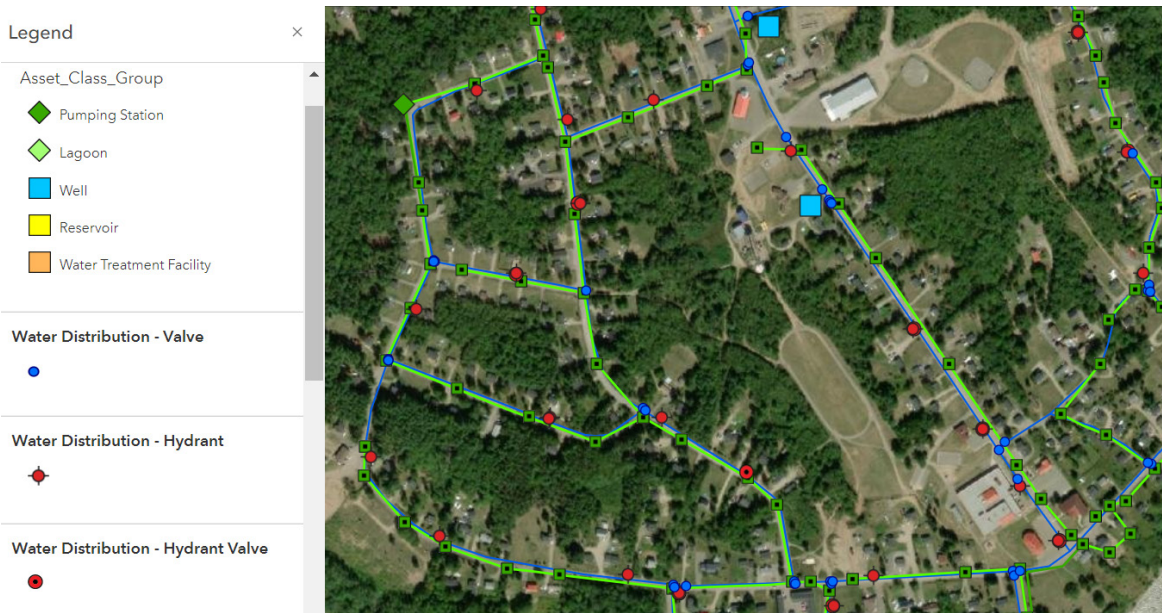
bureaucracy, and miscommunication leading to further degradation of infrastructure. This project intends to break down the barriers of mistrust by providing the necessary tools, basis for funding, and a support structure for Indigenous leaders to regain control of their infrastructure on their path to self-sufficiency. This will provide opportunities for employment, as well as capital investments in their infrastructure (across the Atlantic economy) of \$136M dollars.

The outcome of this study will allow participating First Nation communities in Atlantic Canada to establish a new baseline of infrastructure on par with their municipal

neighbours, as well as provide a guiding tool for proactive planning thus reducing the amount of emergency response as well as reactive, costly, and oftentimes, inappropriate repairs.



Potlotek Water Treatment Facility



Depiction of ArcGIS map with individually-tagged assets



ASSOCIATION OF CONSULTING
ENGINEERING COMPANIES | CANADA
ASSOCIATION DES FIRMES
DE GÉNIE-CONSEIL | CANADA

