ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

REPORT to the ATLANTIC FIRST NATIONS WATER AUTHORITY

REVIEW AND RECOMMENDATIONS ON THE BUSINESS CASE

SUBMITTED BY
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1 Introduction & Project Understanding

The Ontario Clean Water Agency (OCWA) is pleased to assist the Atlantic First Nations Water Authority (AFNWA) through our Review and Recommendations on the Atlantic First Nations Water Authority Business Case. Indigenous Services Canada (ISC) retained OCWA to review the Business Case and we have consulted with AFNWA throughout our review process.

The AFNWA Business Case was developed to consolidate and validate over a decade of work undertaken by Atlantic First Nations. The purpose of the work is to establish the AFNWA and achieve outcomes resulting in a culturally appropriate, service oriented, and technically strong First Nations water authority that will own, operate and maintain water and wastewater facilities in their communities.

Key stakeholders include 15 First Nations located in three provinces, ISC and the Government of Canada, plus 18 additional interested and potential communities—including three in Newfoundland. There is much at stake with the project and its success would lead to it evolving as a viable model for other First Nations throughout Canada.

In accordance with the scope of work, we reviewed the proposed structure and service delivery model with a focus on present day operational and maintenance costs and with additional consideration of planned upgrades. Based on our own hub and spoke delivery model, we reviewed the level of service vis-à-vis the proposed organizational design for the 15 member First Nations.

As discussed, level of service details will be included in an asset management plan that will be developed by future AFNWA staff. OCWA's Asset Planning specialist provided feedback and guidance for an Asset Management Plan Request for Proposals framework for development in 2021.

Our review of the service delivery model and its designed ability to provide support services through the lens of Operations and Maintenance, Management & Administration, and Corporate Services was based on:

- Geographic locations
- Types of water and wastewater systems currently existing
- Capital upgrades being proposed
- Regulatory standards that will be developed and adhered to

With the information made available, our Report includes comment on the flexibility of the proposed solution to accommodate future support for additional communities. We have also documented further recommendations regarding the:

- Atlantic First Nation Water Authority as it moves towards startup and operations through transition towards normalized operations

- Government of Canada in its due diligence process on the AFNWA including service delivery audits/reviews for the contract duration

1.1 Background & Methodology

OCWA operates over 900 facilities across Ontario through a Regional hub and spoke network. Our clients include First Nations, municipalities, private industry, and public entities such as schools and hospitals. Related to this review, our organization's history includes:

- October 1993: OCWA established as a public utility competing in the competitive water and wastewater treatment sector in Ontario
- 1995: Environmental Management System (EMS) based on ISO 14001 implemented and amended to Quality Environmental Management System (QEMS) in 2007
- 1996: Hub and spoke network implemented
- 1997: Process Data Collection system
- 1999: Implementation of an industry-specific risk-based asset protection program and computerized maintenance management system
- 2000: Wide-area SCADA system specifically designed for water and wastewater treatment

Since inception, OCWA has worked to evolve, update and refine these foundational systems.

The AFNWA's Business Case explains how the Authority will work to achieve their goals across multiple communities. The Business Case parallels OCWA's history and the way we continue to deliver services today. Within the context of this institutional experience, we reached out to a variety of experts in our company to review, assess, and provide comment. Each area was read and feedback provided. We followed up with individual feedback via interviews, conference call discussions, and larger group online workshops. OCWA's review team includes:

- Regional Hub Operations Managers for overarching structure, organizational resources, staffing, training, information technology, remote monitoring needs and costing
- Business Process Engineer for hub modelling and financial analysis
- Director of Compliance for review of current/future environmental and drinking water regulations and standards, and health and safety
- Business Development Managers to asses viability of administration, organization and future growth
- Senior Project Managers for asset management and capital forecast assessment

Specific to our hub modelling comparison, OCWA's team:

- Reviewed the proposed AFNWA hub model and list of facilities provided including all treatment types and operating requirements, community populations, and connections to determine appropriate facility comparisons
- Found facilities within OCWA's structure that were similar to those of the AFNWA

- Undertook a costing assessment of our facilities including labour, sampling/testing, administration, management, chemicals, staffing levels, regional and corporate overhead, and travel
- Compared the proposed AFNWA budget with OCWA's actual budgets for those facilities and clusters
- Re-modelled the AFNWA hubs to try to find efficiencies

We utilized our team of experts to provide comment and analysis on the Business Case and the results of our review are expressed in this Report.

1.2 Assumptions

The AFNWA Business Case involves 24,000 people spread over a large geography. For our comparison models (**Attachment 1A**), we chose to analyze our hubs with facilities and distances similar to those of the AFNWA. However, there are too many known and unknown differences between facilities and systems — making a perfect comparison impossible. Even within OCWA's own operations, finding hub to hub comparison matches is not possible with the multiplicities of local conditions and operational nuances.

The Business Case points to the City of Kawartha Lakes Hub structure which includes facilities that OCWA has operated for decades. Economies of scale that are in the Kawartha Lakes Hub model are not likely available in the AFNWA scenario.

Our review is based on those assumptions as listed under *6.3 Financial Assumptions* of the Business Case (pages 44 to 48).

We are not making any recommendations in the areas where the program information was at a macro level.

We have assumed that the Authority will have proper operator certification, management skills and experience.

Our financial assumptions include overhead and upper management expenses.

We recognize that there are many details that cannot be assumed at this point in the process—namely the asset condition of the facilities. As correctly noted in the Business Case, these aspects will be determined once the asset management plan is completed—many months or years after the launch. **We support the methodology of structuring the Asset Management Plan after the facilities have been assumed and recognize that a mature AMP takes time and is an iterative process**.

2 Executive Summary

The *Atlantic First Nations Water Authority Business Case* provides a convincing and compelling rationale for the Authority to deliver water and wastewater services through a regional hub and spoke model. Our peer review corroborates the service delivery methodology, model, and plan. Clearly well researched and well written, the AFNWA Business Case encompasses and reflects:

- Milestones that are appropriately sequential and reasonably timed
- Intertwining of organizational structures and services that validate the hub configurations
- Scalability for future growth and structure to support a regulatory framework
- Extensive and inclusive communication keeping all stakeholders informed
- Reasonable financial predictions that align with operating requirements

OCWA's recommendations are limited to:

- The applicable regulatory framework requires further development and may increase program costs
- Compliance and Training staff are needed to ensure quality control and continuous improvement
- The error in Table 16 regarding costs associated with the Integrated Resource Plan and initial startup costs will need to be corrected in the final version of the Business Case. The costs could be reallocated to a one time cost or amortized

We have provided a snapshot table below that points to key elements of the Business Case and our accompanying remarks and recommendations where warranted.

OCWA FEEDBACK AND RECOMMENDATIONS		
Business Case Section	**AFNWA Core Concept**	**OCWA Feedback**
1. Business Needs and Desired Outcomes	Ownership and responsibility be transferred to AFNWA with core funding from Government of Canada	Concerns, issues and opportunities are fully addressed
2. Current State	Confirms participation of communities and notes regulations will be developed	The establishment of a regulatory framework will be critical to the success and sustainability of the Authority
3. Environmental Analysis	AFNWA will operate in Regional Hubs	Best model chosen
4. Analysis and Recommendations	Full-Service Decentralized is preferred approach	Agree with this approach

OCWA FEEDBACK AND RECOMMENDATIONS		
Business Case Section	**AFNWA Core Concept**	**OCWA Feedback**
5. Project Opportunity and Description	Consistent and high quality service can be provided under the FSD	Agree with this approach
6. Financial Analysis	Model is financially feasible and sustainable	Financial numbers align with the assumptions listed in the Business Case and other variables as realized through the course of our review
7. Management Strategy	Governance and organizational structure for long-term success, scalability and flexibility Regulatory Oversight Asset Management	• Hub and spoke model is sound and we agree that the proposed groupings are suitable • Recommend 2 additional compliance positions • Recommend more robust compliance and training program • Correct approach to asset management
8. Implementation Strategy and Transition Period Implementation Plan	Staged approach, contingent upon funding with layers of approval and continuous communication Transition plan to be finalized after senior management hired	Sound timelines with well-thought-out process of execution and constant communication

3 Review & Recommendations

As highlighted above, OCWA did not find a multitude of deficits in the proposed structure as detailed in the AFNWA Business Case. Our key recommendations for improvement to the model fall under **Staffing** positions, **Compliance**, and **Training**. We have also included information from our experience with technology tools, supervisory control and data acquisition (SCADA), and computerized maintenance management system (CMMS) as established through a hub network.

3.1 Management Strategy

3.1.1 AFNWA Governance Plan

OCWA's Board is responsible for the overall supervision of the affairs of the Agency, including setting strategic direction, monitoring agency performance and ensuring appropriate systems and controls are in pace for the proper administration of the Agency in accordance with the Agency's governing documents. The Board is accountable to the Provincial Legislature through the Ontario Minister of the Environment, Conservation and Parks.

OCWA has eight members on our Board of Directors. The Agency can have a maximum of 13 (including the Chair) at one time. Board members are typically appointed for 3-year terms with the possibility for extension. Board meeting sessions include:

- Annual Strategy Session
- Quarterly day-long sessions
- Ad hoc or specialized committee meetings

The Chair and Vice Chair provide additional support to the Agency where required for client and stakeholder meetings, Board/Agency strategic initiatives, etc.

We serve hundreds of communities over a vast geographical area. In contrast, the AFNWA proposes a governance structure with 15 Board members. The rationale for the large number is expressed under the *Governance Plan* (page 51). The AFNWA Board will set the strategic direction, provide high-level oversight and risk management framework. The AFNWA CEO will report to the Board. OCWA supports the staggering of terms to ensure continuity and the flexibility for a Director to be able to serve an additional term.

While understanding the AFNWA Board requirements, OCWA notes the following recommendations and concerns for the AFNWA to consider:

- Determine a threshold—as communities increase in AFNWA, what is the optimum number of directors to ensure both representation, effective decision making and oversight
- Governance costs increase with the ratio of directors

OCWA supports a structure to continuously improve and implement governance best practices at all levels of the organization to enhance transparency and accountability. We note that the

AFNWA's Governance Manual was approved November 6, 2020 but it was not included in our review.

Page 51 of the Business Case states that a "Director Competency Matrix" has been developed. OCWA concurs with this approach as a method the Authority can leverage to ensure selected members hold the necessary experience. A diverse board of directors representing a breadth of professional background, technical expertise, cultural representation, and regional connections is an important aspect to this work.

3.1.2 AFNWA Corporate and Operational Management Structure

OCWA reviewed the organization charts provided (pages 52 and 53). The *Governance and organizational chart for the AFNWA* shows corporate support for communications, engineering, capital, asset maintenance and technical areas. OCWA recommends that corporate support for Compliance — regulatory and process — also be included in the organization.

We have provided further information on this recommendation below in section **3.1.4 Compliance Recommendations and Auditing Options** and we have augmented these recommendations with our compliance structure, roles and responsibilities chart as aligned with our Quality and Environmental Management System (QEMS) in **Appendix A.**

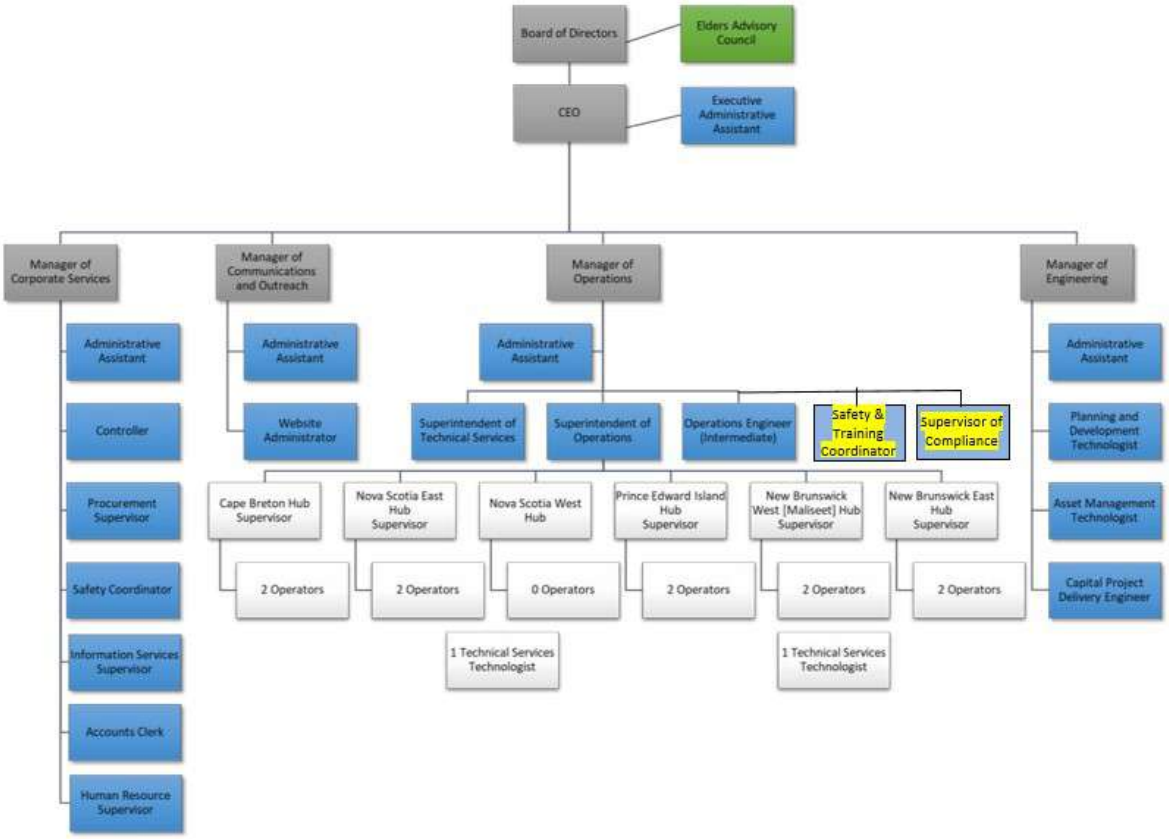
As an example of our recommendation for a function dedicated to corporate compliance, we recommend the following positions be placed into the organizational chart:

1. **Supervisor of Compliance** to oversee industry changes, policy changes, oversight and to ensure consistent regulatory and policy protocols across the Authority and who would act as a Process and Compliance Technician for all hubs and be able to manage additional regulatory reporting as communities come on board

And that the Safety Coordinator, presently under the Manager of Corporate Services, be changed as follows to:

2. **Safety & Training Coordinator** reporting to the Manager of Operations will centralize the training and safety across the Authority, promoting consistency and providing quality assurance and oversight

We have added in these two positions to the proposed AFNWA organizational chart below.



As communities join the AFNWA, the number of supervisors and reporting requirements will likely increase. Such growth can be managed by adding a Process & Compliance Technician to support the Supervisors. Regulatory changes influence reporting levels as highlighted in **3.1.4**. Regulatory change in coming years will require the Authority to develop new staffing positions.

The Business Case (page 17) refers to a regulatory framework based on 16 elements. A proposed Supervisor of Compliance would be responsible for developing and updating site-specific operational plans and templates in accordance with both internal and external compliance requirements. With the Authority's staffing structure, we believe that only one of these positions is required if that position is assisted with remote monitoring.

Key services provided by a Supervisor of Compliance would include:

- Monitoring and identifying legislative and regulatory requirements and any related operational risks and proposing policies, programs and work practices to effectively mitigate those risks
- Providing advice/support for regulatory inspections and environmental compliance-related activities and seeking clarification on requirements from regulatory authorities as needed
- Participating in regulatory and stakeholder working groups and providing feedback on pending legislative changes

- Developing training and communications to support Operations in implementing compliance programs at the hub and facility level

As an overview of the position responsibilities, we have attached a job advertisement for a Process & Compliance Technician with **Appendix A**.

OCWA's Corporate Compliance group develops, maintains and continually improves programs and procedures under the QEMS and provides local implementation support to Operations Management and staff. These programs and procedures set the minimum standards to be achieved at OCWA-operated water and wastewater facilities and are supplemented by local, site-specific operational policies and procedures implemented and maintained at the facility level.

Key aspects of the QEMS include:

- Operations and Maintenance Manuals/Standard Operating Procedures
- Internal Auditing
- Staff Training
- Emergency Planning
- Documentation and Record-Keeping

Please see **3.1.4 Compliance Recommendations and Auditing Options** for information on establishing a compliance structure for the AFNWA.

3.1.3 Proposed Hub Structure

Contract Local Skilled Trades

Ideally, skilled trades such as millwrights, electricians, and instrumentation specialists would be included in the hub staffing complement and shared across area facilities. However, based on the distance between facilities, it would not be economical for the AFNWA to do so. We recommend that the hub Supervisor be responsible for establishing regular contacts with third-party providers. The Supervisor could outsource to First Nations professionals or contractors who have established and positive relationships with the local community.

Establishing a roster of third-party contractors provides contingency for staffing shortages and allows for a timely response to call-ins. For example, a contracted instrumentation specialist would connect with the AFNWA (Technical Services Technician) and, in conjunction with the supervisor, more efficiently manage specialized maintenance. Another example is an electrician. As many call-ins are electrical in nature, in some circumstances, a local electrician would save time and travel costs.

Administrative Support Comments

The overall structure with one admin support is manageable with the initial 15 communities. An additional administration position reporting to the Manager of Operations may be required to support the increase in supervisory responsibilities as the Authority integrates up to 18 additional communities within the structure. Aspects to consider include:

- Billing and accounts receivable
- Agreements

For those communities that receive drinking water from a municipality, there will remain the extra clerical burden of negotiating, securing, and renewing agreements.

Administrative support offers a conduit of communication between departments and service areas. As the Authority grows in the number of communities served, administrative tasks are critical to supporting the flow of information and responsiveness between Regions.

A Note on Agreements:

The Business Case indicates (page 66) that the AFNWA will be assuming the agreements with municipal entities and that transfer agreements and Band Council Resolutions will facilitate land access and facility ownership/management. As OCWA does not lease or take over land or undertake Transfer Agreements, we are unable to comment on this aspect of the Business Case.

OCWA recommends that municipal agreements align with the ISC agreements so that for example, with 20 years of Government of Canada funding, then AFNWA should strive to secure agreements for 20 years with the municipality. Long-term agreements offer financial stability and mitigate risk. The Authority may choose the communications specialist to support this area as outreach, clarity and detail are key to the success of any agreements.

Hub Modelling Exercise

The proposed hub structure will help entrench organizational consistency across the Authority—a critical factor for the success and long-term viability of the Authority.

Throughout our review, we undertook exercises and discussion to re-model the hub structure to try to identify efficiencies — as initially we thought that the proposed structure was top heavy. However, upon analysis, reflection, and taking into account the AFNWA's goal of expansion, we believe that the structure proposed in the Business Plan will support the addition of communities joining the Authority.

From the facilities per community spreadsheet provided by AFNWA, we built similar hub and financial models based on populations and distances between facilities. Please see our review below in section **3.2 Operations and Maintenance Delivery** and **Attachment 1A Hub Scenarios and Budget Analysis**.

3.1.4 Compliance Recommendations and Auditing Options

> *Developing of a compliance and enforcement framework is to be co-developed with ISC.* (page 26)
>
> *A federal regulatory body is recommended as First Nations communities fall under federal jurisdiction. Environment Canada currently regulates municipal wastewater systems through the federal Fisheries Act, and federal oversight would address the significant differences that exist between Atlantic Canada jurisdictions.* (page 56)

Regulatory compliance is a strategic driver, impacting all program elements as underscored throughout the Business Case. Asset management planning takes into consideration the regulatory threshold. Capital costs projected for wastewater was based on meeting federal effluent regulations (page 59). Further, *Appendix 2 Key AFNWA Engagements* and the *Risk Assessment for developing Regulatory Compliance* table (pages 105, 106) indicates a deep analysis of and the need for consistent regulatory standards.

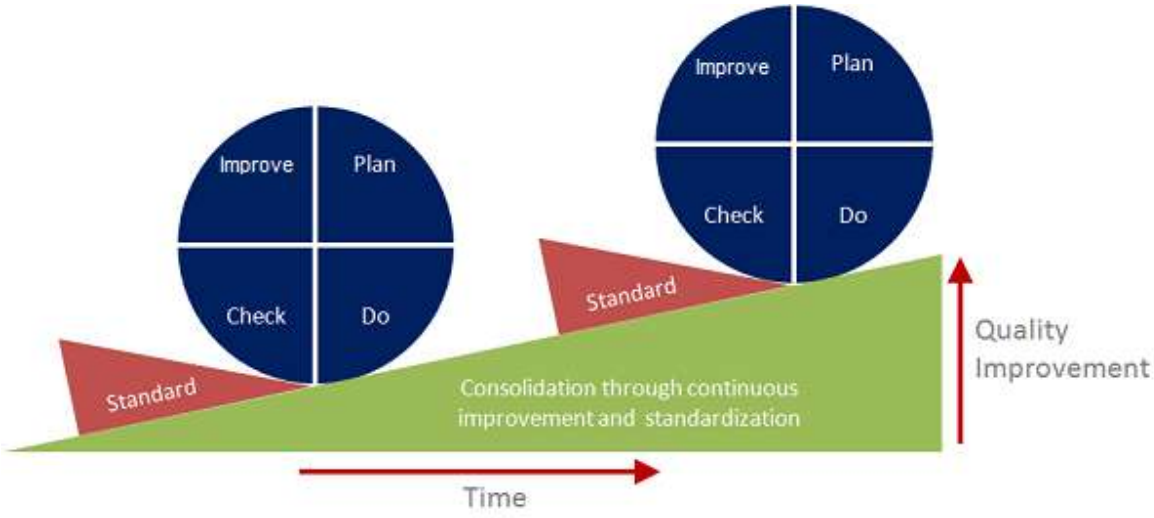
In light of the need for consistent standards across the Authority and consequently each community, OCWA recommends establishing a more thorough compliance structure — the one area we found that should be substantially strengthened in the Business Case.

Quality & Environmental Management System

A Quality and Environmental Management System (QEMS) is recommended for all water and wastewater systems that fall under the AFNWA umbrella. This is a systematic way of ensuring environmental and public health responsibilities are consistently met and promote:

- Compliance leadership, best practices and regulatory adaptability
- Trust in ability to effectively and efficiently manage environmental/public health risks
- Consistent approach across the organization ensuring all personnel have access to the same information and understand their roles and responsibilities
- Operational excellence—setting the framework for staff to maintain regulatory compliance and provides a focus on preventative rather than reactive strategies to identify risks

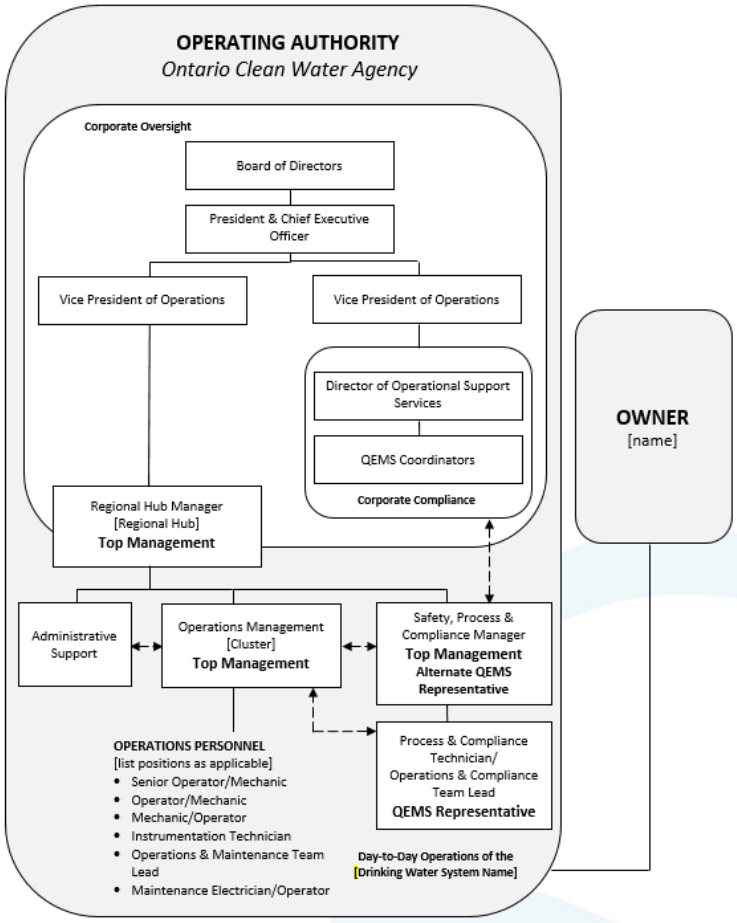
OCWA employs a Plan-Do-Check-Improve model in accordance with Ontario's Drinking Water Quality Standard and we have provided overview material for the Authority in **Appendix A**. The image below represents the continuous progress of improvement through this model.



Along with regulatory details and health and safety protocols, elements of a QEMS include:

- Organizational structure and QEMS roles and responsibilities
- Mandatory training program
- Standard Operating Procedures and operations manuals
- Emergency Management System
- Documentation, records and control
- Reviews and Audits

OCWA encourages a clear structure for compliance which places the onus on the supervisor or—preferably—a compliance technician rather than the operator to implement, monitor and support corporate programs relating to environmental compliance. A compliance technician can support management by evaluating and implementing process control systems at his/her assigned facilities. The regulatory compliance technician and consequently the supervisor would provide reports to the regulator and interact with the inspector during and after inspections or audits. This both protects the operator and provides feedback for improvement to the operator.

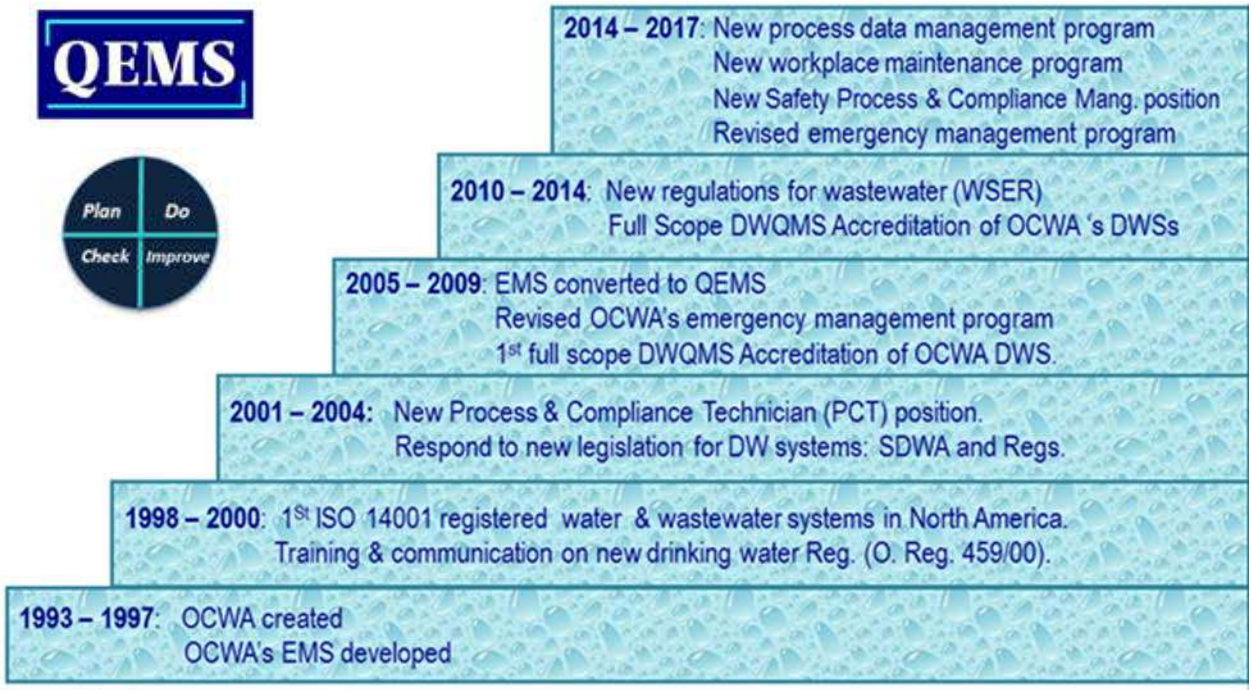


All positions in an organization have a part to play related to the QEMS—from Directors to facility operators to office administrators. Additional duties of employees are detailed in their job specifications and in the various QEMS programs and procedures that form, or are referenced in, the QEMS. We have shared our QEMS organizational structure in **Appendix A**.

A QEMS promotes a model of self-governance for the First Nations Water Authority while adhering to regulatory requirements. It is recommended for both water and wastewater treatment systems. As regulations, the industry and environmental factors change over time, a well-built QEMS can respond accordingly.

OCWA's QEMS includes our organizational structure, planning activities, responsibilities, policies, procedure, processes and resources needed to implement the QEMS Policy. It supports all OCWA operated facilities in maintaining compliance with applicable environmental laws.

OCWA led the Ontario water and wastewater industry in being the first to implement an environmental management system at water and wastewater facilities. As an example, the following is a historical snapshot of our QEMS development over a decade.



3.1.4.1 Auditing Options

The AFNWA Business Plan does not specify which regulatory frameworks the AFNWA will be mandated to meet. However, OCWA recommends the Authority establish internal auditing regimes to promote and ensure transparency, service quality, health and safety practices, environmental oversight and continuous improvement throughout all levels of the organization.

Internal auditing would be part of the portfolio of the **Supervisor of Compliance** — one of the new positions OCWA recommends (section **3.1.2**). Internal audits can be undertaken annually for water treatment facilities and every two years for wastewater treatment plants. The risk-based matrix can be developed to determine the auditing schedule which can be adapted depending upon the complexity of the plant and the compliance demands.

A QEMS and established compliance support structure facilitates achievement of full regulatory compliance at the corporate and facility level by ensuring that current information and expert advice are available regarding environmental laws, regulations, guidelines, policies, and codes of practice, relevant to the operation of water and wastewater treatment facilities.

Safety, process and compliance management prepare all sampling and monitoring requirements as per applicable regulations. Annual sampling calendars include a checklist for the operator/mechanic to sign-off ensuring sampling has been completed. Should any non-compliance issues arise, these are assessed and reported with an action plan to ensure compliance in the future.

An Internal Audit Program evaluates the capability of the QEMS and Occupational Health & Safety System (OHSS) to ensure compliance with legal requirements, contractual obligations, and other policies and procedures. To demonstrate Internal Audit process and components, we have provided a sample **Internal Audit Checklist** in **Appendix B** for the Authority.

Documentation is a critical element of QEMS and OHSS and typically includes the following:

- Use and complete entry of facility log books
- Review and customization of standard operating procedures
- Review and customization of Facility Emergency Plans
- Record of meeting minutes
- Training records for staff
- Inspection and audit reports
- Incident reports
- Facility's approvals and other legal instruments and associated documentation
- Internal/External Communication (memos, reports, etc.)

Corporately, OCWA has developed template forms and internal databases/applications to assist facilities with tracking and reporting on operational data, maintenance activities, incidents and regulator activities (inspections, investigations, and orders).

OCWA's OPEX (Operational Excellence) database is OCWA's customized reporting database which includes:

- Environmental Incidents reports
- Health & Safety Incidents reports
- Insurance Claims
- Action Plans
- Internal Audit reports
- Community Complaints

Supervisor Spotchecks

In addition to the more formal internal compliance audit tools, OCWA relies on Supervisor Spotchecks to ensure compliance with Occupational Health and Safety legislation and corporate policy. A Supervisor Spotcheck is intended as a snapshot of the active implementation and compliance of health and safety policies, procedures and programs. For new program elements, or areas where performance indicators may suggest room for improvement, supervisors check and report on specific program elements to ensure facility-level conformance. We recommend the AFNWA include development and integration of such a program.

3.2 Operations and Maintenance Delivery

3.2.1 Efficiencies

As stated throughout our review, we see the hub and spoke model as the most efficient to deliver services. With effective communication across hubs, this model promotes knowledge exchange, access to technical resources, and consistent practices across the Authority. Efficiencies are realized in the sharing of staff resources and specialists while core activities to operate and maintain the water and wastewater infrastructure across multiple communities.

The Business Case and support materials clearly outline plans for IT tools such as SCADA and CMMS. We have commented on those elements in section **3.2.5**. Efficiencies will be realized through remote monitoring and the integration of IT programs. Tools such as automated lab-data transfer and standardized training program can be developed.

The AFNWA's Integrated Resource Plan provides additional analysis for efficiencies to be realized. As a road map to the future, it includes asset management projections and financial projections. Having one integrated plan is in itself an efficient method for long-term planning. It also facilitates the amortization of capital investments over a longer term. It allows stakeholders a longer vision for better decision making.

3.2.2 Scalability & Flexibility

As mentioned in **Hub Modelling Exercise** under in section **3.1.3** OCWA's review included building four hub models from the AFNWA list of communities and facilities. Through a variety of configurations, we arrived at alternatives and analyzed these in light of cost, efficiencies and scalability. These are detailed in section **3.4 Financial Analysis.**

The Business Case points out that the hub structure has been designed to be the most flexible. OCWA agrees that the established hubs and spoke models as described in the Business Case provide the optimum service delivery.

We found a more cost-effective model (Scenario 3) if future expansion does not materialize. However, our Scenario 3 model is not conducive to additional communities joining the AFNWA. (See section **3.4**.)

The hub and spoke model presented in the Business Case supports the anticipated growth. OCWA supports the present staffing and hub model as the most flexible — although it is less cost effective than other options. The AFNWA proposed model is based on projected staff requirements. This approach is preferred to a reactive hiring model which often proves a challenge to securing certified staff and experienced professionals in a timely manner.

It was determined that although the scenarios 1 through 3 would allow for a reduced staffing levels and combined efficiencies for shared services , they would not allow for scalability for additional oncoming First Nations Communities.

> *While currently designed to accommodate 15 communities, the hub and spoke model is a highly scalable and efficient design which can be*

> *expanded to accommodate additional satellite communities, address growing or declining populations and changing (geographic) groupings of participating communities as BCR's are finalized.* (page 54)

3.2.3 Training

> *Establishing organizational hubs allows for the creation of specific centres of operational knowledge and expertise in areas close to several communities.* (page 95)

The Training element proposed in the AFNWA Business Case addresses:

- Financial implications as included through the report's financial models
- Operational funding and structure for management to develop a formal training program and that training impacts all positions within the organization (pages 11, 53, 62)
- Need to ensure consistency of operator compensation, training and career development that is competitive with the municipal sector (pages 18, 61)
- Education, long-term training offer economic opportunities for local communities (page 20)
- Connecting to available programs such as the Atlantic Canada asset management training and guidance to develop and promote capacity in this area (page 59)
- Policies for Training & Development will be developed around an industry standard (page 63)
- Align certification with skill-based pay (page 71)

This multi-pronged approach will support the Full Service De-centralization model and bolster operational responsiveness and flexibility. OCWA's experience is that the hub and spoke model promotes:

- Cross-training for operators to become certified in both water and wastewater treatment, distribution and collection
- Mentoring opportunities from other regions and corporate career development support
- Corporate assessment to ensure appropriate levels of staffing and redundancy/coverage for emergencies, illness or other staffing shortages
- Sharing best practices
- Succession management throughout the organization

Appendix 10 Risk Register Staff and Training (pages 106-108) explains the risk response actions, of which OCWA concurs. In developing the Training program, OCWA recommends the following:

- Establishing a wide-area mandatory training program and performance appraisal to identify training milestone

- Hands-on training to occur in a variety of facilities within each cluster to promote cross-training and flexible operations
- Practical, relatable and site-specific hands-on equipment training for operators directly from the knowledgeable supplier/installer is critical when commissioning new equipment
- Internal procedures for managers to review training plan and mandatory training requirements for each operator via an annual performance plan process with discussion at the 6-month mark
- Clear understanding of advancement opportunities in the organization
- Succession planning through programs such as "Aspiring Leaders" to find and nurture future team leads/managers
- Pay for licence/certification program
- Tap into municipal training programs and AFNWA can also invite municipal operators to attend your training programs for efficiencies and to offset the cost of resources
- Corporate database to track certification and/or connect with a third-party system to track and notify operator renewal
- New manager training to establish management consistency across authority
- Standard curriculum and training manuals managed by the corporate department
- Actively promote cross-communication and connection between clusters for continuous information and knowledge sharing and to ensure silos do not form

With diverse operational experience, some trainers are operators or operations managers while others are adult education specialists. OCWA is able to draw from our staffing resources and industry knowledge to develop and present courses suited to operational and corporate needs. Technical trainers all participate in operational work terms regularly. Internally, we provide training to all OCWA operational staff on confined space entry, environmental compliance, and occupational health and safety, as well as the full range of technical courses.

3.2.3.1 First Nations Training and CRTP

> *It is difficult to find and retain qualified and certified operators. While programs such as the Circuit Rider Training Program have been around for more than 10 years, operators may not show initiative, choose or receive the community supports to attend the required training. As such many operators do not have the qualifications required. As most First Nations communities are small, there are few qualified candidates to enable time away from operations to pursue training.* (page 17)

The report mentions Circuit Rider Training Program. OCWA has decades of experience in training and working alongside First Nations operators in Ontario. Consequently we are also aware of the limitations of this type program. Specifically, we have often found it to be more of a desktop exercise rather than direct mentoring which is where the need really lies.

To continue to build an operator's confidence and capacities, we have found active communication with weekly on-site visits to be a successful model of mentoring and training. Working with the Tribal Council and/or First Nation community to provide support services in response to the specific needs of each water treatment system and local operator assists communities in building professional relationships to promote long-term capacity. Site-specific Training Plans — developed using both on-the-job and certification courses and customized to each operator's needs — are helpful to supporting a successful outcome and learning engagement.

3.2.4 Transition Period Implementation Plan

The Transition Implementation Plan is as thoughtful and as thorough as the Business Case. It reflects the years of collaboration and expert consultation. It is staged for gradual transition from 2020-2022.

OCWA's peer review of the plan is limited by the fact that we do not know all that has been accomplished in the transition implementation plan to date. Indicators that the plan is workable and will be successful are as follows:

- Key milestones follow a proper sequence
- Events are listed in correct chronology
- Stages are spaced with the appropriate amount of time between them
- Communication with all stakeholders will be informative and continuous
- The plan reflects multiple people, positions and communal intersections

Implementation Planning has commenced and the Transition Plan will be further developed, finalized and delivered by Senior Management Team after their recruitment. As timelines and details will be developed in the future, our review of a full Transition Plan is limited.

OCWA believes that the hiring strategy is reasonable and prudent in its plan to stagger onboarding over a few years. Gradual and well-defined implementation— slow and steady with constant communication — is very good strategy for keeping all people involved and aware of the stages unfolding.

The Transition Implementation Plan includes milestones to develop human resource strategies, standard operating procedures, policy and procedures, and operational initiation. These all run in parallel with OCWA's typical transition plans. However, we cannot comment on the transfer of ownership or licence agreements.

The Transition Implementation Plan lists numerous policies to be developed. The list appears to be comprehensive at this point in the timeline.

3.2.5 IT, SCADA and CMMS Options and Recommendations

While we recognize that this area is in progress for the AFNWA, we are sharing a few comments and recommendations on Information Technology (IT), Supervisory Control and Data Acquisition (SCADA) and Computerized Maintenance Management System (CMMS) as established throughout a hub network.

3.2.5.1 IT Reporting Resources

Having integrated technologies through the years, OCWA recommends that AFNWA establish one provider to offer the SCADA, CMMS and process data tools. If not all IT tools can be established from the onset due to budget restrictions, then AFNWA should ensure that the contractor builds in capacity for accessible implementation in the future. Electronic tools can increase compliance while offsetting labour costs. E-tools to consider include:

- Electronic log books which allow for the authorized online review of logbooks at any facility—increasing oversight and security while minimizing data entry errors
- Process Data Management which provides a standard, systematic, and reliable way of collecting, storing, and retrieving operational data and also enables benchmarking for our facility operations
- Electronic lab data transfer system that directly connects with accredited labs for compliance and regulatory reporting
- Financial system integration
- Vehicle tracking system provide huge savings in fuel and increase safe operation

3.2.5.2 SCADA

OCWA's Director of Operational Systems reviewed the SCADA Master Plan Final Scope document—a guide for AFNWA's Request for Proposals for SCADA services. The Director reported that the document is sound, easily understood, and allows for future expansion. OCWA has no recommendations to make in regards to the scope document.

SCADA systems are a critical component to the operations of water and wastewater systems. They enable efficiencies by leveraging technology to provide remote control, monitoring, and alarming services, and also to collect critical process data. SCADA systems bring active and visible information to operations which help minimize risk and identify potential process improvements and energy saving initiatives.

Rather than integrating a variety of software products in different plants, OCWA supports the Business Case which indicates that all facilities will be tied into the same SCADA system. This offers the most secure and efficient approach and provides a stable and consistent tool for staff and management operating various facilities. Additional benefits to standardizing SCADA across all facilities include:

- Consistent interface means staff familiarity of HMI ease of use across facilities
- Consistent and standardized training

- One device, one licence with compatibility between products
- Simplifies purchasing with consistent instrumentation parts, fewer spare parts, more manageable and consistent stock plus discount for bulk purchase
- Revisions, fixes, updates and troubleshooting are smoother and more effective

3.2.5.3 CMMS & Asset Management

Efficient operations and effective services are supported with maintenance systems and resources including the following:

- Asset Stewardship Quality Management System (ASQMS) helps an Operating Authority meet asset management regulations and make informed decisions about infrastructure investment
- Computerized Maintenance Management System (CMMS) to house best maintenance practices, track work orders and trend future needs
- Routine and preventative maintenance framework provides reliable support for asset health and longevity
- Electronic reporting tools support sustainability and ensures staff undertake the proper maintenance

Optimizing maintenance requires balance between maximizing performance and controlling costs. This balance can be managed through the proper blend of preventive and corrective maintenance. To help achieve this, we employ an IBM Maximo-integrated CMMS.

Key milestones to establishing a maintenance program upon the start of operations include:

- Upon receiving the final condition survey from the existing operating authority, build an initial condition survey and integrate this into an equipment replacement plan and optimization plan
- Within the first six months, a condition survey should be completed and include availability of tools/equipment, inventory of spare parts, instrumentation status, and any health and safety issues
- Within 90 days, a detailed schedule of all routine and preventative maintenance activities should be established for AFNWA approval

Equipment warranties will require documentation, enforcement and monitoring with work activities performed to preserve such warranties. This will apply to equipment in effect on the date of the operational start and for new equipment purchased afterwards. Equipment warranty data should be populated in the CMMS.

Records of completed work in the form of completed work orders stored in the CMMS reflect completed activities and include deviations or additions to planned procedures. Asset performance measures are also documented on the completed work order where applicable.

Types of work orders include:

- Corrective
- Operational
- Preventative
- Weekly Preventative Maintenance
- Capital

CMMS Reporting

A sound CMMS organizes data along multiple parameters to report on asset and maintenance information critical to decision making. Operating Authorities are able to use this information to demonstrate compliance, analyze performance, assist in identifying potential capital projects, and inform continuous improvement.

A variety of customized reports can be adapted and applied to the specific system requirements. The CMMS can also create key reports including:

- Facility Work Order Summary Report
- Individual Work Order Detail Report
- Call Back Work Order Detail Report
- Asset Detail Reporting
- Expenditure Requests
- Asset Calibration Due Date Report
- Community Complaint Report

STANDARD CMMS REPORTS INCLUDE:

- Work order status
- Maintenance mix (e.g. routine, planned, breakdown work performed)
- Maintenance and repair costs
- Maintenance and work management performance
- Asset inventory and performance
- Due diligence reports to meet compliance and audit requirements

Reports from various applications and databases help promote integrated business intelligence for asset management data. For additional information on **CMMS and Asset Protection**, please see **Appendix C**.

3.2.6 Communications and Outreach

Developing close communication with the communities will be essential to the success of the AFNWA. Building, maintaining and enriching relationships of trust and transparency will strengthen the overlapping circles of communication. The Business Case links Change Management to the Communication and Outreach Strategy and OCWA concurs that these elements go hand in hand and filter both internally throughout an organization and externally to all those who are connected to the services.

OCWA encourages and facilitates communication with the public on issues regarding water and wastewater treatment, environmental management and public health. Communications and outreach are fostered through activities such as:

- Corporate communications including online accessible information
- Provincial, regional and industry-specific associations, committees and working groups
- Public events such as water festivals
- Attending meetings with local representatives and public
- Facility signage with clear contact information and notification process

As noted in the Business Case on page 68:

> *The change management strategy will be supported by a communications and public relations strategy which will help build a broad awareness of the issues AFNWA will be addressing. The strategy will build support through the engagement, education and understanding of stakeholders, identify champions, and provide information to mobilize supporters to communicate the benefits associated with AFNWA.*

OCWA agrees that communications and public relations are coupled to the success of the AFNWA and the sustainability of water and wastewater services for First Nations communities. We applaud the effort to identify champions from within each community and highlight that we have found the best champions to be our staff. OCWA encourages staff to participate in public events, hold tours and even support education through in-school programs (see **3.2.6.1** below).

As explored in section **3.1.4** of our review, OCWA encourages the AFNWA to expand the role of compliance in staffing and structure through a quality and environmental management system. Compliance support is key to consistent standards and procedures.

Communication through health and safety protocols, training, online resources, weekly email blasts, and regional/corporate-wide meetings all support the shared vision and mission. Success is both inspired and measured by engaged staff working in concert toward shared goals.

3.2.6.1 Promoting Water Careers from within the Community

In the course of our review, we would like to share with the Authority a few recommendations for programs and resources designed to spark career interest in youth:

- Develop education program—for example, OCWA's OneWater® program teaches the value of water by providing activity-based lessons on water and the water cycle. This unique program brings OCWA water/wastewater operators and teachers together to educate students about water treatment in their communities

- Connect with high schools and career guidance counsellors through career day and scholarship programs for those entering the environmental field with one designated for First Nations students
- Community Water Festivals and facility tours that help the public learn about water and wastewater treatment and how our usage affects the systems

Please see **Appendix D** for an overview of the OneWater Program along with some of OCWA's experience in connecting with First Nations in Ontario through mentoring and training programs.

3.3 Capital Program Delivery

The AFNWA Business Case expands upon the steps that will be undertaken to ensure that the 10-year capital program is based on an Asset Management Plan (AMP) that identifies key definitions, methods, models, and monitoring — among other aspects (pages 63-64).

OCWA's Asset Management specialist reviewed the *CBCL Report — Asset Condition Assessments for water and wastewater assets in 22 First Nation, Communities in Atlantic Canada*. Our findings are below.

3.3.1 Capital Forecast Review

Forecasting future capital expenditures is an important process in an effective (corporate) asset management system. The Authority retained CBCL Limited to complete a condition assessment of the water and wastewater infrastructure that supports the twenty-two (22) communities that are involved with the project. The CBCL report also provides an opinion of the costs associated with potential upgrade requirements to the infrastructure assets.

OCWA's review compared the CBCL report against industry best practices. The intention is to provide insight to all stakeholders to inform how the report is used to support future capital planning and financing planning processes.

Assessment Process

The assessment of the infrastructure systems documented in the report goes beyond simply a condition assessment by looking at issues such as water/wastewater treatment standards and technological (i.e. SCADA) best practices. This is considered best practice in the industry and aligns with ISO 55000 which considers asset performance as "the ability of an asset to fulfill objectives or requirements of the organization."

This approach provides confidence that the future capital works forecasted in the report represent a more holistic set of projects that are designed to improve the infrastructure assets to a point where they are fit for purpose to meet asset performance objectives over the planning horizon.

Planning Horizon

The report identifies that the recommended capital works are designed "to bring the systems up to a level of quality useful for the next 20 to 30 years." This is a best practice planning horizon that takes a long-term perspective to the recommended works.

Cost Estimate Classification

The capital costs in the report are identified as being Class C estimates. This is better than best practice capital forecasts which typically have a combination of Class D and Class C estimates. Class D estimates are for projects that are less defined and have a greater uncertainty range as compared with Class C estimates. While not highlighted in the report, it should be noted that cost estimates for the identified capital works are appropriate for financial planning purposes but not pre-tender budgeting purposes. The cost estimates should be reviewed and confirmed as each project moves closer to implementation and specific budgets are being allocated.

Prioritization of Capital Works

There is no explicit prioritization of the proposed works. It is common for capital forecasts to group projects into short, medium and long-term periods. This is typically supported by an opinion on the criticality of each recommendation relative to service delivery objectives. For example, capital works to address water quality issues may be considered more critical than manhole replacements to reduce extraneous flow from entering a wastewater collection system.

Summary

The condition assessment document in the CBCL report generally align with industry best practice. Examples include the effort to document the systems, complete site visits to assess the infrastructure assets, review all aspects of performance that are relevant to ensure the facilities can provide services over the long term, and develop rigorous capital cost estimates. **All of these elements provide confidence that the information in the report is appropriate for financial planning and capital planning processes**.

Moving forward, the AFNWA should develop internal processes to prioritize the recommended capital works. The prioritization should consider factors such as:

- Current system performance
- Availability of funding
- Local contractor capacity
- Benefits expected from each project

Once completed, the Risk Assessments of Treatment Plant Upgrades will reveal a more accurate state of the facilities. In tandem with the Asset Management Plan, the assessments will advance the development of a 10-year capital program.

3.4 Financial Analysis

3.4.1 Regional Hub Analysis

As part of the financial analysis, OCWA first examined the Authority's proposed hub structures to evaluate the proposed operational staffing levels including supervisory positions. Our primary focus was on the grouping of the 15 communities that have indicated a commitment to joining the AFNWA model. Our evaluation and remodeling for comparison involved:

- Geographic locations with distances and estimated travel times between facilities
- Facility types and operational complexity based on information received
- Community size and if a municipal agreement is currently in place

Based on OCWA's experience with a hub structure that we use throughout Ontario, we focused on optimizing the potential benefits in terms of the economies of scale achievable with the hub and spoke model. This is generally accomplished by finding the right balance between the number of hubs and the ability to oversee operations while responding to local operational circumstances in a timely manner.

OCWA's review found three alternative Regional hub structures that could be utilized for the operations and maintenance of all 15 communities. These three Scenarios have been attached following this report in **Attachment 1A Hub Scenarios and Budget Analysis** and are further described below.

Scenario #1 involves two Regional hubs instead of the proposed six and is based on an assumption that minimal support will be required for the Acadia communities in the western part of Nova Scotia.

Scenario #2 involves three Regional hubs — once it is determined that additional support is required for the Acadia communities.

Scenario #3 involves four Regional hubs to improve support capabilities for Tobique and in preparation of additional clients in Western New Brunswick.

Please see the attached spreadsheet for detailed explanation.

It was determined that although these scenarios promote staffing level reduction and combining efficiencies for shared services, the options explored cannot support scalability for additional oncoming First Nations Communities.

In our Regional hub analysis, we also analyzed staffing, both direct and indirect in terms of total number of full-time employees (FTEs) required to operate the facilities. Our comparison used OCWA's FTE count which includes the Operator/Mechanics, Instrumentations Technicians, Process and Compliance Technicians, Operations Managers and Administrative Support, and Regional Management.

Our FTE inclusion did not include engineering employees and consequently we did not include the AFNWA engineering staff in our FTE comparison count. **The total FTE count for OCWA-operated facilities is 28.25 compared to the 35 designated by AFNWA**.

The remoteness and distance between the First Nation communities increases FTE count when shared resources cannot be deployed. While OCWA also manages across distances, we can leverage less FTEs over distances similar to the AFNWA because of the number and type of facilities we operate within one hub.

3.4.2 Operating Budget Analysis

In the course of our financial review, OCWA queried the Authority on various line items in *Table 15* and *Table 16*. From subsequent email and dialogue, it was realized that the proposed budget included annual expenses for Integrated Resource Plan (IRP) and one-time start-up costs. We have addressed this below. We have also noted the impact of the clarification on $3M allocated annually for the Testing Program.

Attachment 1A Hub Scenarios and Budget Analysis for 15 and 22 Communities represents the analysis of the operating budget outlined in *Table 15 Management Structure Operating Expense Comparison* included on page 41 of the AFNWA business case. After discussions with AFNWA on November 20th it was determined it would be more appropriate for OCWA to compare our budget with Table 15. This is because *Table 16* on page 42 includes costs for the Integrated Resource Plan which is mandated in Atlantic Canada. OCWA's **Budget Analysis** for 15 and 22 Communities do not include the one-time start-up costs of $1,623,735 or the $3,247,471 cost for the Integrated Resource Plan.

The major cost of an IRP would fall in the development year. Once developed, the cost to update would be every 5 years. OCWA recommends the budget be adjusted accordingly.

We used comparable OCWA operated facilities within Ontario and included their operating budgets, maintenance costs, and regional and corporates expenses in our comparison to AFNWA costs. For example, we matched OCWA facilities with AFNWA similar type facilities, such as AFNWA RBC treatment with OCWA RBC treatment, with similar class and technology.

OCWA's operating budgets include costs for preventative maintenance, routine maintenance and major maintenance items, but does not include capital upgrades, similar to the AFNWA operating budgets. The OCWA facilities utilized within the analysis have water distribution systems and wastewater collection systems included with the operating costs for treatment. OCWA's budgets also include all corporate and regional overhead and management expenses but do not include costs for Engineering. Engineering services are billed directly to our clients.

Using the Methods described our budgetary comparison is as follows:

- AFNWA operating budget as outlined in *Table 15 Management Structure Operating Expense Comparison*: **$10,908,741**
- OCWA operating budget total for 15 communities within a similar model as summarized on the attached spreadsheet: **$6,428,999**
- Difference **$4,479,742**

The difference of almost $4.5M between OCWA and AFNWA operating budget models can be explained as follows:

- The annual $3 million expense for the water and wastewater sampling program includes an estimated cost of $1M for the current water quality monitoring program with the remaining costs for enhanced regulatory and operational testing, and ongoing costs for environmental risk assessments
- There is an assumed increase of 50% for Wastewater Treatment facilities which will be upgraded to tertiary treatment in future years as per *Business Case* page 45 point #19 *Table 19*
- OCWA has been structured in a hub and spoke model for decades, so the % of overhead expenses to income has lessened through efficiencies and operational growth over time
- OCWA's budgets include administration, corporate services, communications, operations and maintenance but do not include costs for engineering which represents $517,204 in AFNWA's Table 15
- Distance to travel to remote facilities increases the cost of operations because, for example, equipment and parts can't be shared—labour and scale of number of facilities (mentioned above)
- OCWA vehicle and insurance expenses are lower due to large scale purchasing and government fleet purchasing
- Telecommunications and internet services at OCWA costs are decreased due to bulk purchasing
- The AFNWA Regional hub structure is built for scalability which will produce lower operating costs in the future with a higher up front budget

The reasons listed above justify the budget discrepancy between OCWA and AFNWA hub models. Although the budget is preliminary and based on various assumptions, OCWA believes that the AFNWA financial predictions are reasonable and align with operating requirements.

We conducted a further financial analysis of the additional 7 First Nations Communities which expressed interest in joining AFNWA. We found that overhead expenses will decrease as additional First Nations Communities join and staffing levels will require only minimal adjustment.

The attached **Budget Analysis** for 15 and 22 Communities spreadsheets shows OCWA's operating costs for the facilities owned by the additional 7 First Nations. Under OCWA's model, we estimate an additional cost of $1,794,643 and 8 FTEs to operate and maintain the infrastructure owned by the communities. Although the AFNWA Business Case does not outline the additional costs for these communities, it does list an additional staffing requirement of 3 FTEs in *Table 25 FSD Full Time Equivalent requirements to Accommodate Future Community Interest*, on page 55. This difference of 5 FTEs (our model requirements of 8 and the Authority's planned 3) confirms that the AFNWA proposed structure supports scalability and that future operational savings will be realized.

4 Conclusion

The Ontario Clean Water Agency congratulates the Atlantic First Nations Water Authority on the vision and commitment expressed in the Business Case. The document and supplemental materials are well researched, logical, coherent, and convincing. The Business Case is a powerful testament to the viability of the AFNWA objectives and future success.

Our activities involved re-modelling the proposed Regional hubs and comparing budgets to ensure the projections aligned with industry best practices and how OCWA structures and costs similar hub and spoke operations. In the course of these activities, we communicated with AFNWA for additional clarification and found budgetary errors and anomalies that will be corrected in the subsequent version of the Business Case.

OCWA found very few concerns with the Business Case with recommendations limited to:

- Regulatory framework requires further development and may increase program costs
- Compliance and Training staff are needed to ensure quality control and continuous improvement
- Costs for the Testing Program, initial start-up, and the Integrated Resource Plan should be incorporated as a one-time, periodic or amortized expense

Our assessment included reviews of the SCADA Master Plan Final Scope document—a guide for AFNWA's Request for Proposals for SCADA services and the AFNWA Asset Management Plan Request for Proposals framework development for which we provided feedback and guidance. These documents further support OCWA's assessment that the Authority is on the right path to achieve sustained success.

In closing, we appreciate the opportunity to review and provide comment on the Atlantic First Nations Water Authority Business Case. We hope you find our recommendations and supplemental material useful as you move into the next phase of development.

The accomplishments of the AFNWA to date are exciting and impressive. OCWA believes that the Business Case reflects that the AFNWA is on course to achieve their goal to provide safe drinking water and wastewater services for First Nations in the Atlantic Region of Canada.

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

Attachment 1A

Hub Scenarios and Budget Analysis

Hub Structure Analysis

Two Hub Scenario:

					Water System			Wastewater System					
Hub	Community	Travel Distance (km)	Travel Time	Population	Community Owned Ground Water System	Community Owned Surface System	Municipal Water Transfer Agreement	Community Owned Lagoon	Community Owned Mechanical Plant	Small Communal System (15 homes)	Private (1 Community)	Municipal Agreement	Cluster
New Brunswick/PEI	Elsipogtog*	0	0	3,456	Y			Y					Cluster A1
	Eel River Bar	229	2 hours, 22 mins	772			Y					Y	
	Lennox Island	226	2 hours, 42 mins	1,004	Y			Y					Cluster A2
	Abegweit	244	2 hours, 44 mins	338	Y					Y			
	Oromocto	163	2 hours	743			Y					Y	Cluster A3
	Tobique	279	3 hours, 18 mins	2,553	Y			Y					
	Sub-total:			8,866									
Nova Scotia East	Paqtnkek Mi'kmaw*	0	0	599	Y				Y				Cluster B1
	Pictou Landing	86	1 hour	672	Y			Y					
	Membertou	168	2 hours	1,573			Y					Y	
	Eskasoni	135	1 hour, 45 mins	4,642	Y				Y				Cluster B2
	Potlotek	92	1 hour	773		Y		Y					
	Millbrook	146	1 hour, 25 mins	1,995			Y					Y	
	Glooscap	250	2 hours, 30 mins	393			Y				Y		Cluster B3
	Sipekne'katik	182	1 hour, 45 mins	2,771	Y			Y					
	Sub-total:			13,418									
Nova Scotia West ?	Acadia - Greenfield	0	0	1,664			Y					Y	N/A
	Acadia - Yarmouth	186	2 hours										
	Acadia - Gold River	72	53 mins										
	Total:			23,948									

Three Hub Scenario:

					Water System			Wastewater System					
Hub	Community	Travel Distance (km)	Travel Time	Population	Community Owned Ground Water System	Community Owned Surface System	Municipal Water Transfer Agreement	Community Owned Lagoon	Community Owned Mechanical Plant	Small Communal System (15 homes)	Private (1 Community)	Municipal Agreement	Cluster
New Brunswick/PEI	Elsipogtog*	0	0	3,456	Y			Y					Cluster A1
	Eel River Bar	229	2 hours, 22 mins	772			Y					Y	
	Lennox Island	226	2 hours, 42 mins	1,004	Y			Y					Cluster A2
	Abegweit	244	2 hours, 44 mins	338	Y					Y			
	Oromocto	163	2 hours	743			Y					Y	Cluster A3
	Tobique	279	3 hours, 18 mins	2,553	Y			Y					
	Sub-total:			8,866									
Nova Scotia East	Paqtnkek Mi'kmaw*	0	0	599	Y				Y				Cluster B1
	Pictou Landing	86	1 hour	672	Y			Y					
	Millbrook	146	1 hour, 25 mins	1,995			Y					Y	
	Membertou	168	2 hours	1,573			Y					Y	
	Eskasoni	135	1 hour, 45 mins	4,642	Y				Y				Cluster B2
	Potlotek	92	1 hour	773		Y		Y					
	Sub-total:			10,254									
Nova Scotia West	Acadia - Greenfield*	0	0										
	Acadia - Yarmouth	186	2 hours	1,664			Y					Y	Cluster C1
	Acadia - Gold River	72	53 mins										
	Glooscap	132	1 hour, 39 mins	393			Y				Y		Cluster C2
	Sipekne'katik	180	2 hours	2,771	Y			Y					
	Sub-total:			4,828									
	Total:			23,948									

Four Hub Scenario:

					Water System			Wastewater System					
Hub	Community	Travel Distance (km)	Travel Time	Population	Community Owned Ground Water System	Community Owned Surface System	Municipal Water Transfer Agreement	Community Owned Lagoon	Community Owned Mechanical Plant	Small Communal System (15 homes)	Private (1 Community)	Municipal Agreement	Cluster
New Brunswick East/PEI	Elsipogtog*	0	0	3,456	Y			Y					Cluster A1
	Eel River Bar	229	2 hours, 22 mins	772			Y					Y	
	Lennox Island	226	2 hours, 42 mins	1,004	Y			Y					Cluster A2
	Abegweit	244	2 hours, 44 mins	338	Y					Y			
	Sub-total:			5,570									
New Brunswick West	Tobique*	0	0	2,553	Y			Y					Cluster B1
	Oromocto	203	2 hours	743			Y					Y	
	Sub-total:			3,296									
Nova Scotia East	Paqtnkek Mi'kmaw*	0	0	599	Y				Y				Cluster C1
	Pictou Landing	86	1 hour	672	Y			Y					
	Millbrook	146	1 hour, 25 mins	1,995			Y					Y	
	Membertou	168	2 hours	1,573			Y					Y	
	Eskasoni	135	1 hour, 45 mins	4,642	Y				Y				Cluster C2
	Potlotek	92	1 hour	773		Y		Y					
	Sub-total:			10,254									
Nova Scotia West	Acadia - Greenfield*	0	0										
	Acadia - Yarmouth	186	2 hours	1,664			Y					Y	Cluster D1
	Acadia - Gold River	72	53 mins										
	Glooscap	132	1 hour, 39 mins	393			Y				Y		Cluster D2
	Sipekne'katik	180	2 hours	2,771	Y			Y					
	Sub-total:			4,828									
	Total:			23,948									

*Proposed Hub Office Location

Budget Analysis Comparing Similar OCWA Operated Water Facilities

		Water System			Water System Characteristics											OCWA Comparison			
Community	Status	Community Owned Ground Water System	Community Owned Surface System	Municipal Water Transfer Agreement	Water Source	Water Treatment	Disinfection	Infrastructure	WT Class	SCADA	Storage	Distribution	WD Class	Hydrants	# of Homes Connected	Facility Budget	Distribution Budget	Total Budget	FTE
Elsipogtog	Participant	Y			4 wells		Sodium hypochlorite, UV disinfection		I	Yes	Elevated storage reservoir	9500 m	II	50	645	$201,804	$35,751	$237,555	1.3
Lennox Island	Participant	Y			4 wells	None	Sodium hypochlorite		I	Yes	Standpipe	6096 m	I	40	120	$120,350	$24,804	$145,154	1
Abegweit - Scotchfort	Participant	Y			3 wells		Sodium hypochlorite		I	Yes	Standpipe	1600 m	I	12	~58	$113,442	$81,515	$194,957	1
Abegweit - Rocky Point	Participant	Y			2 wells		Sodium hypochlorite		I	Yes	Pressure tanks	450 m	I	3	~12	$113,442	$81,515	$194,957	1
Abegweit - Morell	Participant	Y			2 wells		Sodium hypochlorite		I	Yes	Pressure tanks	250 m	I	None	~5	$113,442	$81,515	$194,957	1
Eel River Bar	Participant			Y								6130 m	I	23	170	$145,470		$145,470	0.3
Tobique	Participant	Y			2 wells (GUDI)		Chemical Feed pump		I	No	Concrete storage tank	9500 m	II	55-60	307	$129,929	$114,596	$244,525	1
Oromocto	Participant			Y												$145,470		$145,470	0.3
Paqtnkek Mi'kmaw	Participant	Y			3 wells	greensand filtration for 1 well	Sodium hypochlorite	Pump house	I	Yes	2 below grade concrete tanks	5100 m	I	26	125	$242,761	$115,822	$358,583	1.5
Pictou Landing	Participant	Y			3 wells		Sodium hypochlorite		I	Yes	Standpipe	5000 m	I	26	161	$201,805	$35,751	$237,556	1.3
Millbrook	Participant			Y							Storage tank	11,810 m	I	unkown	370	$152,000		$152,000	0.6
Membertou	Participant			Y								8735 m	I	31	318	$152,000		$152,000	0.6
Eskasoni	Participant	Y			3 wells	None	Sodium hypochlorite		I	Yes	concrete tank, steel tank	26,000 m	II	107	980	$118,955	$51,203	$170,158	1
Potlotek	Participant		Y		Indian Lake	Dissolved Air Flotation with greensand filtration and GAC	UV Disinfection, ProMinent Sodium hypochlorite drum		IV	No	Standpipe	5780 m	I	35	156	$243,348	$312,695	$556,043	1.5
Acadia - Greenfield	Participant																		
Acadia - Yarmouth	Participant			Y								1695 m	I	10	65	$42,050		$42,050	0.53
Acadia - Gold River	Participant																		
Glooscap	Participant			Y							In-ground reservoir	1700 m	I	7	32	$42,050		$42,050	0.53
Sipekne'katik - Indian Brook	Participant	Y			2 wells	Greensand Filters	Sodium hypochlorite		I	Yes	Reservoir	17,000 m	I	60	380	$242,761	$115,822	$358,583	1.5
Sipekne'katik - New Ross	Participant	Y			1 well	Greensand Filters	Point of use UV disinfection		I			525 m	I	0	7	$129,929	$114,297	$244,226	1
																	Sub-Total:	$3,816,294	16.96
Buctouche	EOI	Y			2 wells	Inline strainer for each well	Sodium hypochlorite	Pump House, Booster station	I	Yes	Reservoir	1315 m	I	19	35	$113,442	$81,515	$194,957	1
Indian Island	EOI														25				
Metepenagiag	EOI	y			1 well		Duplex sodium hypo package		I	Yes	Buried reservoir	7200 m	I	40	135	$100,324	$74,929	$175,253	1
Kingsclear	EOI	Y			2 wells (non-GUDI)		Duplex Trojan UV Swift units, ProMinent duplex chlorine feed skid		I	Yes	In-ground reservoir	3000 m	I	32	180	$147,409	$141,596	$289,005	1.25
St Mary's	EOI			Y								4850 m	I	35	270	$145,470		$145,470	0.3
Woodstock	EOI	Y			4 wells		chlorine feed pump		I	Yes	2 underground storage tanks	4100 m	I	19	113	$120,350	$24,804	$145,154	1
Waycobah	EOI	Y			1 well	None	Sodium hypochlorite		I	Yes	Storage tank	9000 m	I	50	240	$100,324	$74,929	$175,253	1
																	Total:	$4,941,387	22.51

*Distribution budgets that are left empty are included in the treatment costs

Budget Analysis Comparing Similar OCWA Operated Wastewater Facilities

Community	Status	Community Owned Lagoon	Community Owned Mechanical Plant	Small Communal System (15 homes)	Private (1 Community)	Municipal Agreement	Collection System	WWC Class	Infrastructure	Primary Treatment	Secondary Treatment	Disinfection	WWT Class	Sludge Mgmt	Facility Budget	FTE
Elsipogtog	Participant	Y					9800 m	II	5 pumping stations	N/A	3 cell facultative lagoon	N/A	I		$271,884	1.5
Lennox Island	Participant	Y					3100 m	I	7 pump stations		2 Cell Facultative lagoon	UV disinfection	I		$305,829	1.2
Abegweit - Scotchfort	Participant			Y			625 m	I		Recirulation tank	Recirulating textile filter	Sub surface discharge	I		$142,122	0.86
Abegweit - Rocky Point	Participant															
Abegweit - Morell	Participant															
Eel River Bar	Participant					Y	6130 m	I	3 pump stations						$35,000	0.2
Tobique	Participant	Y					8500 m	II	3 pumping stations	N/A	Aerated lagoon	N/A	I		$197,112	1
Oromocto	Participant					Y										
Paqtnkek Mi'kmaw	Participant		Y				3900 m	I	7 pump stations	Channel grinder, grit chamber	SBR	UV disinfection	II	Sludge tank	$431,000	1.5
Pictou Landing	Participant		Y				3600 m	I	1 pump station	Grinder and screen, primary clarifier	RBC, secondary clarifier	UV disinfection	I	Sludge digester	$82,100	0.53
Millbrook	Participant					Y	11,810 m	I	2 pump stations						$35,000	0.2
Membertou	Participant					Y	8735 m	I							$35,000	0.2
Eskasoni	Participant		Y				22,000 m	II	16 pump stations	bar screen, aerated grit chamber	SBR	UV disinfection	II	Aerobic disgester	$431,000	1.5
Potlotek	Participant	Y					4830 m	I	6 pumping stations	Grinding	4 cell aerated lagoon	UV disinfection	I		$305,829	1.2
Acadia - Greenfield	Participant															
Acadia - Yarmouth	Participant					Y	1695 m	I	3 pump stations						$35,000	0.2
Acadia - Gold River	Participant															
Glooscap	Participant				Y											
Sipekne'katik - Indian Brook	Participant	Y					11,624 m	I	4 lift stations with duplex pumps	Grinding, screening	2 cell aerated lagoon, sand filtration	UV disinfection	I		$305,829	1.2
Sipekne'katik - New Ross	Participant															
														Sub-Total:	**$2,612,705**	**11.29**
Buctouche	EOI						N/A									
Indian Island	EOI															
Metepenagiag	EOI	Y					7200 m	I	4 pumping stations	N/A	3 cell facultative lagoon	UV disinfection	I		$305,829	1.2
Kingsclear	EOI	Y					3000 m	I	no pump stations	Fine screening	2 cell aerated lagoon	UV disinfection	I		$85,080	0.4
St Mary's	EOI					Y	4850 m	I							$35,000	0.2
Woodstock	EOI		Y				4100 m	I	Triplex lift station	Primary Clarifier	RBC	UV disinfection	I	Aerobic disgester	$208,641	0.6
Waycobah	EOI					Y	6200 m	I	7 pump stations						$35,000	0.2
														Total:	**$3,282,255**	**13.89**

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

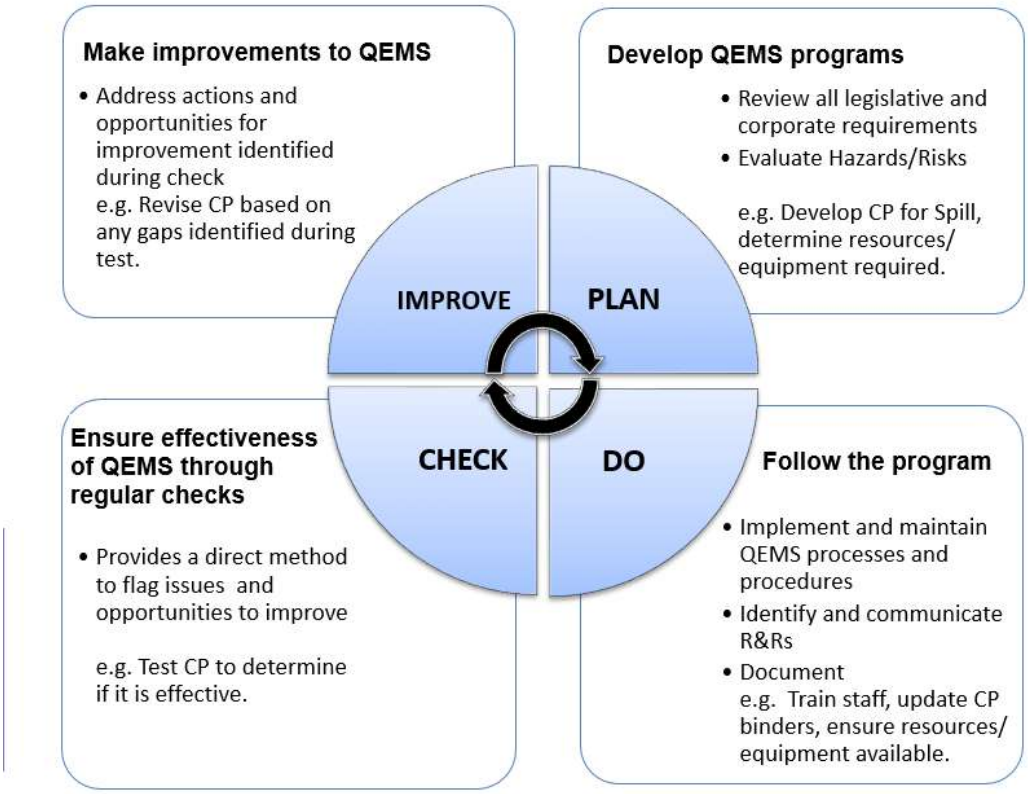
Appendix A — Supplemental Material

- Compliance and QEMS Programs
- Job Ad for Process & Compliance Technician

Compliance & QEMS Programs

The Ontario Clean Water Agency (OCWA) is including this information in the interest of sharing our experience with the Atlantic First Nations Water Authority (AFNWA).

OCWA's QEMS was originally based on the international standard for Environmental Management Systems (ISO 14001). The ISO standard followed a continual improvement cycle:



How can a QEMS benefit you?

There are a multitude of Acts and regs., legal instruments, and regulator policies that must be followed to maintain compliance. They set out requirements for sampling, operational checks, monitoring, recording, reporting, emergency response, training etc. In addition to these legal requirements, you need to understand any client requirements, the limitations of your facility and risks associated with the operations. To work effectively you would want to use all the expertise of the staff at your facility and throughout the organization, as well as industry standards, best practices, and new research/scientific findings. It is also important to be aware of common issues/incidents that may occur at other facilities similar to yours and to learn from those incidents.

To take all of this into consideration would be an overwhelming task to deal with, if you didn't have a plan. A QEMS is a plan that you can follow so that you can get on with your day and feel confident that you are working with the best knowledge behind you.

All positions in an organization have a part to play related to the QEMS. The following table represents OCWA's roles, responsibilities and authorities from Directors to facility operators to office administrators. This information is kept current as per Document and Records Control procedures and is communicated to staff as per communications procedures.

QEMS Roles, Responsibilities and Authorities

Role	Responsibilities and Authorities
Board of Directors	• Set the Agency's strategic direction, monitor overall performance and ensure appropriate systems and controls are in place in accordance with the Agency's governing documents • Review and approve the QEMS Policy
Senior Leadership	• Establish the Agency's organizational structure and governing documents and ensure resources are in place to support strategic initiatives • Monitor and report on OCWA's operational and business performance to the Board of Directors • Review the QEMS Policy and recommend its approval to the Board • Approve corporate QEMS programs and procedures
Corporate Compliance	• Manage the QEMS Policy and corporate QEMS programs and procedures • Provide support for the local implementation of the QEMS • Monitor and report on QEMS performance and any need for improvement to SLT • Consult with the MOECC and other regulators and provide compliance support/guidance on applicable legislative, regulatory and policy requirements • Manage contract with OCWA's DWQMS accreditation body
All Operations Personnel	• Perform duties in compliance with applicable legislative and regulatory requirements • Be familiar with the QEMS Policy and work in accordance with QEMS programs and procedures • Maintain operator certification (as required) • Attend/participate in training relevant to their duties under the QEMS • Document all operational activities • Identify potential hazards at their facility that could affect the environmental and/or public health and report to Operations Management • Report and act on all operational incidents • Recommend changes to improve the QEMS

Role	Responsibilities and Authorities
Regional Hub Manager (Top Management)	• Oversee the administration and delivery of contractual water/wastewater services on a Regional Hub level • Fulfill role of Top Management • Ensure corporate QEMS programs and procedures are implemented consistently throughout the Regional Hub • Manages the planning of training programs for Regional Hub • Report to VP of Operations/SLT on the regional performance of the QEMS and any need for Agency-wide improvement
Operations Management (Top Management)	• Manage the day-to-day operations and maintenance of his/her assigned facilities and supervise facility operational staff • Fulfill role of Top Management • Ensure corporate and site-specific QEMS programs and procedures are implemented at his/her assigned facilities • Determine necessary action and assign resources in response to operational issues • Report to the Regional Hub Manager on facility operational performance • Ensure operational training is provided for the cluster (in consultation with the SPC Manager as required) • Act as Overall Responsible Operator (ORO) when required. Refer to SOPXXX.
Safety, Process & Compliance (SPC) Manager (Top Management)	• Supervise facility compliance staff and provide technical and program support to the Regional Hub related to process control and compliant operations • Fulfill role of Top Management • Ensure corporate/regional QEMS programs and procedures are implemented consistently throughout the Regional Hub • Assist in the development of site-specific operational procedures as required • Ensure training on applicable legislative and regulatory requirements and the QEMS is provided for the Regional Hub (in consultation with Operations Management as required) • Monitor and report to the Regional Hub Manager and Operations Management on the compliance status and QEMS performance within his/her Regional Hub and any need for improvement • Act as alternate QEMS Representative (when required)

Role	Responsibilities and Authorities
Process & Compliance Technician (PCT)/ Operations & Compliance (O&C) Team Lead (QEMS Representative)	• Implement, monitor and support corporate programs relating to environmental compliance and support management by evaluating and implementing process control systems at his/her assigned facilities • Fulfill role of QEMS Representative (OP-04) • Monitor, evaluate and report on compliance/quality status of his/her assigned facilities • Implement facility-specific QEMS programs and procedures consistently at his/her assigned facilities • Participate in audits and inspections and assist in developing, implementing and monitoring action items to respond to findings • Report to the SPC Manager on QEMS implementation and identify the need for additional/improved processes and procedures at the regional/cluster/facility level (in consultation with the Operations Management as required) • Communicates to Owners on facility compliance and DWQMS accreditation as directed • Deliver/participate in/coordinate training including applicable legislative and regulatory requirements and the QEMS • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX.
Senior Operator/Mechanic	• Perform duties as assigned by Operations Management • Prepare and/or coordinate operational staff work assignments and follow up to ensure completion • Assist management in providing recommendations for annual capital forecasts and gathering information for operational reports as required • Assist in the preparation of facility manuals and documenting operating processes and procedures for staff • Act for management during vacations or periodic absences. • Perform duties of Operator/Mechanic as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX.
Operator/Mechanic	• Perform duties as assigned by Operations Management or designate • Monitor, maintain and operate facilities in accordance with applicable regulations, approvals and established operating procedures • Collect samples and perform laboratory tests and equipment calibrations as required • Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned • Participate in facility inspections and audits • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX.

Role	Responsibilities and Authorities
Mechanic/Operator	• Perform duties as assigned by Operations Management or designate • Act as lead with other staff on extensive maintenance/repair projects • Schedule and perform maintenance on equipment and processes in accordance with established procedures and record the maintenance data • Regularly inspect operating equipment, perform routine preventive maintenance and repairs • Perform duties of Operator/Mechanic as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX
Instrumentation Technician	• Provide advice and technical expertise on the services required for process control and automation systems • Discuss and advise on detailed system and programming requirements, modify existing and new software in response to plant requests, analyze and resolve problems/error conditions, document changes/modifications and configure, install and support related software, hardware and network for such systems • Conduct inspections of the process control and automation systems to validate that all is operating within established parameters as requested • Install and commission new electrical/electronic equipment and automation systems • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX.
Operational and Maintenance (O&M) Team Lead	• Perform duties as assigned by Operations Management • Oversee maintenance activities on equipment and process in order to maintain compliance with applicable legislation, regulations, approvals and established operating procedures • Prepare and/or coordinate staff work assignments and follow up to ensure completion • Act for management during vacations or periodic absences. • Develop and provide O&M reports to management and recommend changes in operating procedures/processes to improve facility operations • Assist with facility operations including monitoring facility processes, reviewing process data and trouble-shooting • Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX.

Role	Responsibilities and Authorities
Maintenance Electrician/Operator	• Perform repairs, inspections, preventive maintenance and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data • Monitor facility processes through visual inspection, the SCADA system or by taking readings from the process control equipment • Operate and adjust equipment/processes to maintain compliance with applicable legislation, regulations, approvals and established operating procedures • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to SOPXXX
Administrative Assistant/Project Clerk	• Support the administrative functions of the regional hub/cluster/facility including coordinating delivery of training as directed • Assist with entering operational data (including operational training records, process data and maintenance records) into the appropriate database as directed

We have provided further details on the role and responsibilities of a Process and Compliance Technician in a job ad following this page.

PROCESS & COMPLIANCE TECHNICIAN

Division: Operations, Kawartha Trent Region, Ontario
Location: Brechin & Lagoon City Water Treatment Facility, 2 Poplar Crescent, Brechin, Ontario
Job Term: (1) Permanent
Job Code: Environmental Officer 3 (61504)
Salary: $1,150.90 to $1,369.63 per week (plus pay for certification)
Posting Status: Open
File No: OCWA-90-20-KT
Job ID: 152390

The Ontario Clean Water Agency (OCWA) believes in Our Communities, Our Environment and Our People. As a trusted partner to municipalities, First Nations communities, businesses, governments and institutions across Ontario, we provide our clients with total solutions in water and wastewater. We are dedicated to working closely with our clients to help them build healthy sustainable communities and organizations and provide safe and reliable drinking water to thousands of Ontarians each day.

Join our team as a water/wastewater professional with OCWA

In this role, you will implement programs to support environmental compliance, process control programs, and health and safety requirements for water and wastewater treatment processes within the Kawartha Trent Region.

What's in it for you?

- Flexible learning and development opportunities.
- Opportunities for career advancement and specialization with the largest provider of water and wastewater services in Ontario.
- You will be eligible for additional pay for certification, should you be successful in completing and maintaining facility water/wastewater operator's licenses
- Work with the partner of choice for more communities than any other water and wastewater service organization in Ontario for over 25 years.
- Work with an organization committed to innovation and advanced technology.
- A defined benefit pension plan; Comprehensive Health Plan; Life and Disability Insurance.
- Maternity and parental leave top-up benefits including for adoptive parents.

What we are looking for:

Mandatory

- Class 2 certification in Water Treatment, Class 2 in Wastewater Treatment.
- May consider lesser qualified candidates as underfill - minimum Operator-in-Training (OIT), as specified in O.Reg. 128/04 of the Safe Drinking Water Act and O.Reg. 129/04 of the Ontario Water Resources Act.
- Post-secondary education in an environmental discipline or field knowledge
- Valid Class G driver's license.
- Must be available after regular working hours for emergency situations or on-call.

Knowledge

- Good knowledge of water and wastewater treatment operations.
- Extensive knowledge in environmental compliance and health and safety requirements.
- Excellent knowledge of the processes related to the water and wastewater treatment.
- Good knowledge of the Occupational Health and Safety Act and other relevant regulatory and legislative acts, codes, policies, guidelines and procedures related to workplace safety.
- Good knowledge of environmental compliance including relevant regulatory and legislative acts, codes, policies, guidelines and procedures related environmental compliance and the impact on the operation of the water and

wastewater treatment systems.

- Good knowledge and understanding is required to apply, interpret, implement and maintain programs based on legislated requirements and various internal operational processes.
- Excellent knowledge of computers, operating programs and systems.

Skills and Ability include

- Analytical, problem-solving, planning and scheduling skills to inspect, operate and monitor processes and equipment. Make process control adjustments; resolve operating issues.
- Demonstrate analytical skills to analyze data, monitor local performance against legal requirements and corporate goals, and resolve compliance issues.
- Evaluative skills to evaluate compliance and quality status of water and/or wastewater treatment facilities.
- Auditing and inspection skills to conduct internal audits, respond to findings, participate in inspections and make recommendations to assigned facilities.
- Excellent oral and presentation skills to provide technical compliance advice to a variety of internal and external contacts in addition to facilitating in-house training to operations staff.
- Excellent written skills with an ability to prepare written technical letters, reports, procedures which will include photos, charts and graphs.
- Proficiency with Microsoft Office Suite.
- Knowledge of database functions and maintenance programs.
- Ability to work in a team environment and independently.
- Effective time management skills with the ability to prioritize and take initiative.
- Strong attention to detail

How to Apply

1. You must apply by e-mail and the job competition quoted in the subject line with the location you are applying for.
2. You must show how you meet what we are looking for clearly, completely and concisely; we rely on the information you provide to us.
3. OPS employees are required to quote their WIN EMPLOYEE ID number when applying.

Send application/resume with covering letter (PDF format preferred) saved as JOB ID – First Last Name to:
Ontario Clean Water Agency
Hiring Manager: Wes Henneberry
Attention: Helena Milchin-Raposo
Email: HMilchin-Raposo@ocwa.com
Posting Date: July 30, 2020
Closing Date: August 14, 2020

Ontario Clean Water Agency is an inclusive employer.
We will accommodate your needs under the Ontario Human Rights Code

The Ontario Clean Water Agency is an agency of the Province of Ontario, reporting to the Ministry of the Environment, Conservation and Parks. As the largest provider of water and wastewater services in Canada, we manage over 800 facilities from small well systems and lagoons to large water and wastewater treatment plants. Consider this opportunity if you are a motivated, team oriented individual seeking a career in the water and wastewater industry.

Note: Thank you for your interest, we will contact you only if we choose you for further screening or an interview.

ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

Appendix B — Supplemental Material Integrated Systems Audit

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

2020 INTEGRATED SYSTEMS AUDIT

Wastewater Treatment Facility or Water Treatment Facility

QEMS OHSS

Facility Org Unit Number: _____

Facility Works Number: _____

Facility Name: _____

Date Integrated Systems Audit Performed: _____

The information contained in this Integrated Systems Audit (ISA) is **CONFIDENTIAL.** Access to the ISA in OPEX by OCWA employees requires authorization from Management. The ISA is

not to be released to any party outside of OCWA without first consulting Legal Services. Printed copies of the ISA and related action plans must be stored in a secure location in a file marked ‘Confidential’.

Guidance for Completing an Integrated Systems Audit

Corporate Compliance has developed a 'Conducting an Integrated Systems Audit' training module to provide you with training on how to conduct an ISA. This training is intended for OCWA personnel involved in conducting an Integrated Systems Audit of an OCWA operated facility. This training module are available for your use in the PCT folder \\Torwan\pct\Internal Audit Program (IAP)\Integrated Systems Audits (ISA). The objectives of this training are to:

- Understand what an internal audit is
- Understand fundamental concepts and principles of internal auditing
- Understand why we conduct internal Integrated Systems Audits
- Review requirements for conducting an internal Integrated Systems Audit
- Maintaining proper audit documentation and creating effective action plans

In addition, please refer to Internal Audit Program Procedures IAPP-02 - Integrated Systems Audit and IAPP-04 - Completing an ISA using OPEX located in Appendix A of the ISA for further information. To assist in clarifying the intent of the protocol questions, Corporate Compliance and Corporate H&S provides supporting information in the document "ISA Reference Text Boxes" also located in Appendix A of the ISA which is reviewed and updated along with the ISA checklist. Additional support for completing the ISA is available through your SPC Manager, Corporate Compliance and/or Corporate H&S.

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Appendix B - 2020 ISA for printing

ONTARIO CLEAN WATER AGENCY

Integrated Systems Audit

Note: Reference text boxes with additional information for each section below are available in Appendix A.

QUALITY AND ENVIRONMENTAL MANAGEMENT SYSTEM

1.0 Facility Administration

a) The QEMS Policy has been posted and applicable staff are aware of it.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) There are regular meetings/communications with the Owner to review the facility/facility requirements.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Approvals, licenses, permits and other legal instruments are being reviewed upon receipt to ensure any requirements are being addressed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) Changes to system information/contact information have been updated, communicated and all required notifications have been completed (e.g. information in the ERRIS Identification Report/DWIS/WW System Profile Information Form, internal contact list(s) updated when facility contact person changes).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

e) All required actions from the most recent regulatory inspection(s) and/or orders, (i.e. MECP, MOHLTC, TSSA, EC, etc.) issued to OCWA have been addressed by the due date.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

f) Inspection reports (i.e. MECP, MOL, MOHLTC, TSSA, EC, etc.) and the Analysis & Action Plan are being forwarded to the appropriate internal and/or external parties.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

g) Facility site level information (metadata) has been entered into PDM and is current.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

h) There is a current on-call schedule that ensures that sufficient facility coverage is provided.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

i) Timelines have been taken into account to ensure that reports are completed and submitted in accordance with any regulatory and/or site specific requirements (e.g. Owner review/approval prior to official submission).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

2.0 Certification and Training

a) There is documentation that an overall responsible operator (ORO) with the appropriate level of certification has been designated and staff and the Owner are aware of who has been designated as the ORO.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) When the facility is operated by a non-OIC (e.g., an Operator-in-Training) and the OIC is off-site, there is documentation (e.g., log book entries, emails, faxes, etc.) that demonstrates/confirms oversight by the designated OIC.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) OCWA's procedure for tracking and maintaining operator certification is being followed to ensure that all operators working at the facility, including those providing on-call/back-up coverage, hold a valid (i.e. unexpired) certificate/licence applicable to the type of facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) There is a process in place to ensure that copies of the valid certificates/licences of every operator who is employed in the facility (including ORO, Operations Managers (if performing operational duties) and all operators who rotate on-call or provide vacation relief) are conspicuously displayed at the operator's workplace or at the premises from which the facility is managed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

e) There is a system/process in place for ensuring that facility staff are scheduled to attend training to meet certification and OCWA's mandatory compliance training requirements.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

f) Training records are being entered into the Training Summary database.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

3.0 Log Books and Record Keeping Mechanisms

a) The facility log book is being maintained according to O. Reg. 128/O. Reg. 129 (e.g., chronological entries, entries made by authorized individuals, person making the entry can be unambiguously identified, operating shift information is recorded).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Sufficient details are being recorded in the facility log book (i.e. equipment taken out of service, maintenance, directions given to an OIT by an OIC, departures from normal operating procedures, situations observed outside normal conditions, conclusions drawn and actions taken).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Documentation is clear as to who completed the facility rounds/checks and at what time.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) The most current facility round/check sheets are being used and they are up to date.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

4.0 Operations and Maintenance Manuals / Drawings/SOPs

a) There is an effective process in place to ensure that the operations and maintenance manual including procedures/drawings for the facility are current/accurate and that any required updates are made or communicated to the Owner and documented.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) The operations and maintenance manual contains the information/procedures/drawings as required by the facility approval/licence/manufacturers recommendations/Engineer's Reports/Service Agreement/Directive.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

5.0 Supplies and Services

a) There is a process in place for verifying chemicals and materials used in the alteration or operation of the drinking water system that come into contact with water within the system meet industry best practices (e.g. NSF 60/61/371 and AWWA Standards).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) There is a process in place for verifying chemicals (content and/or volume) and/or materials upon delivery (i.e. verifying the delivery manifest versus what was ordered).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

6.0 Sampling, Testing and Monitoring

a) The facility has a current sampling schedule that includes all applicable regulatory and facility-specific requirements and it is made available to all relevant staff.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Staff are aware of their responsibilities with respect to facility sampling, testing and monitoring.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) When requirements change, there is a process in place to ensure that the sampling program

(e.g. schedule, chain of custodies) is updated and communicated to applicable facility staff.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) In-house sampling (process control) has been established for this facility and incorporated into the sampling program.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

e) The current sampling program is being followed and any deviations/changes are made within required sampling timelines and are documented.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

f) Required data, in accordance with applicable regulations, facility approvals/permits and/or the service agreement, is being captured and validated in PDM.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

g) There is a process in place to ensure that sampling and monitoring results are being reviewed and evaluated on a timely basis to identify any potential water/wastewater quality trends.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

h) There is documentation that demonstrates that results from continuous monitoring equipment are being examined within 72 hours, including any issues identified and any actions taken as applicable.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

i) As applicable, drinking water lab results are being compared to the 1/2 MAC limits at least quarterly to determine if increased sampling is required.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

j) Facility staff have been trained on the facility normal operating ranges, objectives and compliance limits and how to respond to any deviations.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

k) Schedules for checking and calibrating monitoring equipment (e.g. flow meters, level meters, hand-held analyzers, on-line analyzers, etc.) have been established according to regulatory/approval/manufacturer's instructions.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

l) Third Party calibration records are being reviewed and appropriate actions taken (if any) to

address any issues.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

m) Procedures for in-house verification/calibration have been established and are being followed, including documentation specifying the type of calibration activity (i.e. verification vs. calibration, etc.), results achieved and any action(s) taken.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

n) Chemical volumes and dosages are being calculated and recorded.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

o) Flow rates are being monitored to ensure that they are maintained below the maximum allowed flow rates/rated capacity.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

p) There is a process in place to ensure that reagents/chemicals used for in-house testing and monitoring equipment verification/calibration are not expired prior to use.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

7.0 DWS Operations

a) There is documentation (including a site-specific procedure for calculating CT) to ensure that the facility is meeting its primary disinfection requirements. [Refer to the system's MDWL (Schedule E)/EER/Directive and the Procedure for Disinfection of Drinking Water in Ontario].

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) CT calculations are being conducted at the appropriate frequency and documented.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) A schedule is in place for inspecting above and below grade well components.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

8.0 WW System Operations

a) For wastewater facilities, the facility's performance assessment report is being reviewed to ensure that flows and data are accurate prior to the quarterly corporate submission to the MECP.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) All equipment is installed in accordance with the facility ECA.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) There is a procedure(s) in place for monitoring and recording situations outside of Normal Operating Conditions.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) Applicable staff are aware of approval requirements for when modifications are made to the facility (i.e, need for a Notice of Modifications to Sewage Works under Limited Operational Flexibility (LOF) or ECA amendment vs. repair and maintenance)

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

9.0 Asset Management

a) Work Orders are being completed and closed according to the scheduled date.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) All corrective and/or breakdown type maintenance is being logged in WMS (Maximo).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) All equipment which has been removed from service and/or replaced has been expired in WMS and/or new equipment has been tagged and entered in WMS with the preventative maintenance schedules attached.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) An annual infrastructure review of the facility is being conducted and documented and the results are being communicated to the Owner for review/approval.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

10.0 Facility Emergency Planning

a) The Facility Emergency Plan is up-to-date (i.e., most recent corporate updates have been incorporated and implemented as applicable, all sections are current and applicable to the facility).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) A schedule is in place to review/update the emergency contact and essential supplies and services list at least once per calendar year and the schedule is being followed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) There is a process in place to ensure that each contingency plan is reviewed at least once in a five calendar year period.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) A schedule is in place to ensure that at least one contingency plan is tested each calendar year and the schedule is being followed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

e) The results of contingency plan tests and reviews are being recorded on OCWA's "FEP-01 Contingency Plan Review/Test Summary Form".

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

f) All operations personnel with responsibilities for responding to an emergency have been trained on the current Facility Emergency Plan.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

g) There is a list of critical alarms that are being tested in accordance with a schedule and the results are being documented (e.g., in WMS).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

h) There is a process in place to ensure spill kits/emergency equipment, containment areas etc. are adequate and are checked on a regular basis.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

11.0 Incident Reporting

a) A procedure is in place to ensure that all notifications and corrective actions with respect to adverse results/non-compliance events are completed as required.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) A procedure for dealing with overflows/bypasses including notifications, sampling, record-keeping and reporting (as specified in the ECA and/or the WSER) has been established and is being followed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) A procedure for responding to and recording community complaints, including any follow-up/corrective actions taken if required, has been implemented at the facility and is being followed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) Spills, bypass/overflows and/or other discharges are being documented using OPEX or another tracking mechanism.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

12.0 Continual Improvement

a) Action plans from previous internal and/or external audits have been resolved and the results documented. If all action plans have not been resolved, there is a documented plan in place to address the issue(s) including timelines and assigned responsibility for completion.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Action items are being checked for completion and effectiveness.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Facility trends are being considered to identify possible recurring issues (e.g. deteriorating water quality, AWQIs, non-compliances, etc.). If recurring issues have been identified, there is a documented plan in place to address them.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) There is a formal/informal process in place for facility staff to provide feedback and/or

suggestions for improvement.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

13.0 General Posting Requirement

a) A current copy of the Occupational Health and Safety Act is posted at every full time manned facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) A copy of the current OCWA OHS corporate policy is posted at every full time manned facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) A copy of the OPS Workplace Violence Prevention Policy and OPS Respectful Workplace Policy is posted at every full time manned facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) A copy of the 2018 version "Health & Safety at Work - Prevention Starts Here" poster is posted at every full time manned facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

14.0 First Aid

a) A copy of the WSIB 'In case of an injury' poster (form 82) is posted.

○ Conforms
○ Action Required

Objective Evidence:

b) Copies of valid first aid certificates are posted.

○ Conforms
○ Action Required

Objective Evidence:

c) First aid kit are provided and appropriate to the number of staff at the facility and in are each OCWA vehicle.

○ Conforms
○ Action Required

Objective Evidence:

d) Facility and work vehicle first aid kits are being inspected at least quarterly by a certified first aider.

○ Conforms
○ Action Required

Objective Evidence:

15.0 JHSC / H&S Reps

a) Workers not exercising managerial responsibilities have selected a H&S Rep (6 to 19 workers or when ordered by the MOL) or JHSC (20 or more workers, or designated substance present).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) At least one certified management member and one certified worker member and the names of current members are posted in the workplace for facilities requiring a JHSC.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

16.0 Workplace Inspections

a) Where required, monthly workplace inspections are scheduled, conducted and documented and written recommendations from the JHSC to OCWA are available for review.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) All issues arising from the past year's workplace inspections have been addressed.

○ Conforms
○ Action Required

Objective Evidence:

c) Annual workplace inspection has been completed and documented with findings using the appropriate Workplace Inspection Checklist For Facilities where a H&S Rep or JHSC are not required.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

17.0 Accident Reporting and Investigation

a) Staff are aware of OCWA's Incident Reporting Process for reporting an injury in the

workplace found in the OHS Reporting section of OCWA's Safety Manual.

○ Conforms
○ Action Required

Objective Evidence:

18.0 Physical Premises

a) Adequate measures (e.g., life jackets, procedures, rescue equipment, etc.) are in place where there is the risk of drowning.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Guardrails are in place around uncovered opening in floors, roofs, or other surfaces that workers have access to and appear to be in good condition and secured in place.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

19.0 Confined Spaces

a) Hazard assessments to identify confined spaces are retained at the facility, are up to date and the results have been communicated to employees.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Confined Space Entry Plans including Rescue Procedures have been developed for each confined space and entry scenario.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) The most current Confined Space Entry Permit is being used and being fully completed for each confined space entry.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) Portable gas detectors are being maintained according to the manufacturers specifications and applicable staff have been trained on bump testing.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

20.0 Contractor Safety

a) OCWA's Contractor Safety Program has been implemented for the facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Contractors have taken OCWA's Online Contractor E-Learning Module and have been provided with site-specific safety orientation.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Related contractor documentation is on file (i.e. Copies of training/qualifications, WSIB clearance certificate and certificate of liability insurance).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) A Contractor/Visitor's Site Log Book is available for the site.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

21.0 Designated Substances

a) Designated Substances present at the facility (check all that apply):

☐ Arsenic
☐ Asbestos
☐ Lead
☐ Mercury
☐ Silica
○ N/A

Objective Evidence:

b) Where there are Asbestos Containing Materials (ACM) at a facility, an Assessment Management Report has been completed.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) A control program and inventory is in place and reviewed as required.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) A Silica Monitoring and Assessment Report been completed for those facilities using Silica.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

22.0 Electrical Safety

a) Single-line electrical diagrams are available for the facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Warning signage is in place as required for rooms or enclosures with live electrical parts.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) GFCIs are available for outdoor use or wet conditions.

○ Conforms
○ Action Required

Objective Evidence:

d) Non-conductive (e.g. Fiberglass) portable ladders are available where risk of contact with

overhead wires or fixtures exists.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

e) The Electrical Safety Program has been implemented.

○ Conforms
○ Action Required

Objective Evidence:

23.0 Equipment Safety

a) Machine guards are in place where required (e.g. pumps, other equipment with moving parts).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

24.0 Fall Protection

a) Fall protection equipment, elevating aerial work platforms and other similar types of equipment have been tagged and entered in WMS along with routine maintenance schedules.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Fall protection equipment has been annually inspected or as required.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

25.0 Fire Safety

a) Portable fire extinguishers are located in the appropriate/required location and inspected monthly.

○ Conforms
○ Action Required

Objective Evidence:

26.0 Industrial Hygiene

a) Functional eyewash fountains and deluge showers are available as required [Audit should include activation of the equipment to ensure they are compliant and operational in case of emergency].

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) Eyewash fountains and deluge showers are installed and maintained as per the current ANSI Z358.1 Standard for Emergency Eyewash and Shower Equipment.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Sound intensity surveys have been conducted for the facility [NOTE: noise meters are available from the Corporate Health and Safety Group or SPC Manager].

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

27.0 Lifting Devices

a) Annual lifting device inspections are being conducted and copies of the inspection reports are being retained (e.g. forklifts, powered pallet movers, scissor lifts, overhead cranes, etc.).

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

28.0 Personal Protective Equipment & Uniform

a) Employees are provided with and trained on the appropriate use and care of required PPE.

○ Conforms
○ Action Required

Objective Evidence:

b) Employees were observed wearing required PPE.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Employees are maintaining PPE & uniforms in good condition.

○ Conforms
○ Action Required

Objective Evidence:

d) Employees have been provided with CSA Green Triangle and 'orange omega' safety footwear.

○ Conforms
○ Action Required

Objective Evidence:

29.0 Tailgate Meetings for Non-Routine Work

a) Tailgate meetings for non-routine work are being held and documented using the Tailgate Meeting for Non-Routine Work form as required.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

30.0 WHMIS / Chemical Safety

a) SDSs are available for all controlled products present in the workplace.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

b) SDSs for the facility are being reviewed annually by staff who work with controlled products.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

c) Original containers have supplier labels.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

d) Secondary containers for decanted products have required workplace labels.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

e) Contents of chemical storage tanks, associated piping and chemical transfer pumps are clearly identified.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

f) OCWA's Respiratory Protection Program has been implemented for the facility.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

g) Respirators are being maintained according to manufacturers instructions and WMS schedules.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

31.0 Working Alone

a) A working alone procedure has been put in place and employees are trained, aware and following this procedure.

○ Conforms
○ Action Required
○ N/A

Objective Evidence:

OTHER ISSUES RAISED BY THIS AUDIT

32.0 Other Identified Issues

a) Any other issues identified during this audit
Use this section to document other issues identified during this audit that are not covered by a specific requirement in the protocol

Description of Issue	Issue addressed / resolved
a)	○ Yes ○ No
b)	○ Yes ○ No
c)	○ Yes ○ No
d)	○ Yes ○ No
e)	○ Yes ○ No
f)	○ Yes ○ No
g)	○ Yes ○ No
h)	○ Yes ○ No
i)	○ Yes ○ No
j)	○ Yes ○ No

Objective Evidence:

Additional Comments:

Report Sign-Off

This report was prepared by _____ and _____ following an inspection of the facility. All information is complete and accurate to the best of my/our knowledge.

NOTE: It is the responsibility of the Safety, Process & Compliance (SPC) Manager to complete and sign-off on the ISA. For Regional Hubs that do not have a SPC Manager, the Regional Hub Manager must designate an individual to fulfill the SPC Manager's responsibilities. Refer to IAPP-02 Integrated Systems Audits in Appendix A.

I have reviewed the report and the resulting action plans with the facility's Operations Management.

Date: _____

Review/Consultation Details:

End

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Appendix C — Supplemental Material Asset Maintenance & Asset Protection Strategy

Asset Maintenance & Protection

OCWA continues to innovate and customize asset protection for water and wastewater treatment systems in Ontario, most recently developing our Asset Stewardship Quality Management System (ASQMS). Evolved from continuous improvement of our work management system, O&M experience, and computerized maintenance management system (CMMS), OCWA's ASQMS aligns with ISO 55000 and O.Reg. 588/17.

OCWA's asset maintenance and protection strategy is designed to protect municipal investments, maximize equipment life and ensure assets continue to provide the capacity to deliver services. We use the ASQMS to support active engagement with our clients and to act as stewards of the public infrastructure systems that we collectively manage. Like other management systems, the ASQMS documents the series of integrated processes that work together to realize value from assets.

Our approach to developing, integrating, and delivering a total solutions asset maintenance program embraces the following commitments and actions:

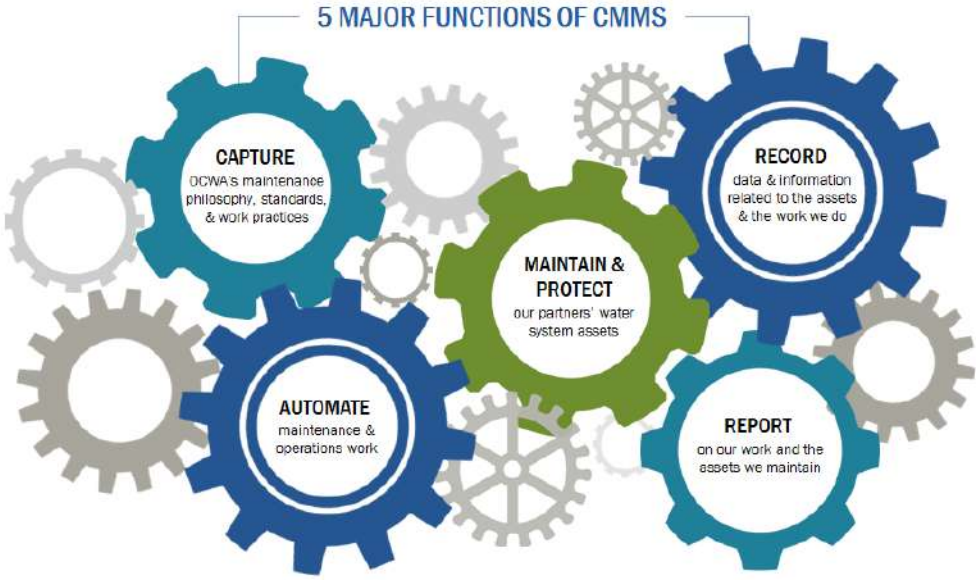
- A commitment to maintenance excellence
- Training and motivation of both operation and maintenance personnel
- The use of leading maintenance techniques, tools, and equipment
- The use of work orders, asset and equipment numbering systems for work control, and equipment performance monitoring
- Proper planning and scheduling of maintenance work

- Preventive maintenance of equipment in order to avoid catastrophic failures
- Appropriate inventory and spares to mitigate risk
- Monitoring equipment and requiring vendors to perform maintenance when equipment falls within a warranty period
- Providing an up-to-date equipment library with information on repair procedures, parts list, operating manuals, as-built drawings, and vendor listings
- Measuring maintenance performance and productivity
- Using service contracts to balance maintenance staffing requirements
- Using maintenance shops for the production of unavailable equipment parts and fabrication of specialty equipment
- A framework and methodology for continuous analysis and improvement

These elements are the foundation of OCWA's ASQMS. They prevent severe deterioration of equipment and increase the quality of our client service.

CMMS to Support ASQMS

OCWA's Asset Stewardship Quality Management System manages the work we do to maintain our partner's assets. Optimizing maintenance requires balance between maximizing performance and controlling costs. This balance can be managed through the proper blend of preventive and corrective maintenance. To help achieve this, OCWA employs an IBM Maximo-integrated computerized maintenance management system (CMMS).



5 Major Functions of CMMS: *Our CMMS allows our staff and our clients the ability to analyze more than just maintenance-related activities.*

Operational duties, administrative tasks, and even project-based activities like major maintenance can be examined.

The system provides much more comprehensive information than a typical maintenance management system.

The system provides a dynamic environment for users to store and manage assets, plan and schedule work, and perform reporting and analysis for our clients. It integrates the systems needed to effectively and efficiently maintain municipal treatment systems.

OCWA's CMMS is the virtual reflection of both physical assets and the work completed on your assets. Automation means accuracy and increased compliance. Maximo's database saves time in data entry and duplication, and keeps things well-organized with inventory, best practices, and safety information as part of its knowledge base.

Designed with a focus on safety, reliability, efficiency, and best practices, OCWA's CMMS incorporates:

- Setting up and implementing a complete database of the Facilities
- Scheduling and controlling Preventative Maintenance
- Providing a record of repair for each piece of equipment or line section
- Monitoring of predictive and corrective maintenance programs and associated costs
- Issuing work orders
- Maintaining a Spare Parts inventory
- Issuing equipment status and repair priority reports
- Major maintenace planning and financial analysis
- Data security, risk management, and advanced IT disaster recovery
- Additional support and powerful capabilities for functions such as GIS integration, dashboards, risk models, and financial information

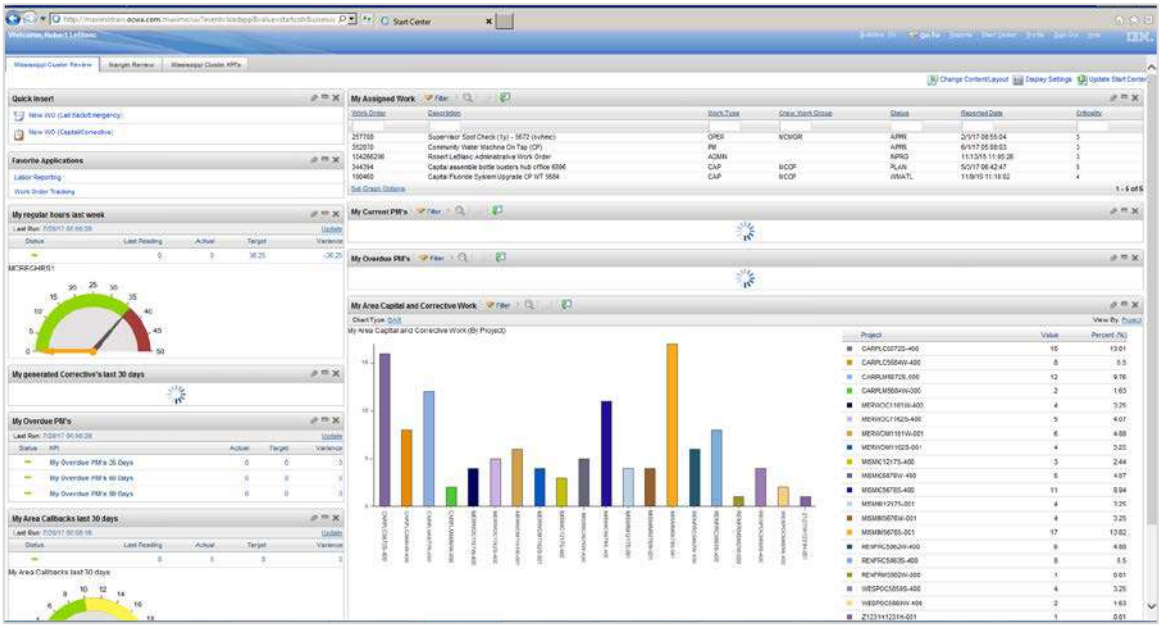
OCWA'S CMMS ADVANTAGES:

- ✓ All work time is accounted for & documented
- ✓ Minimizes error, avoids data entry duplication and saves time
- ✓ Leverages best practices and information from experienced operators while facilitating knowledge sharing across service regions
- ✓ Inventory, work orders, assets or maintenance tasks can be sorted in thousands of ways for robust analysis and reporting
- ✓ Advanced search engine allows users to quickly and accurately find information
- ✓ Customizable to enhance user experience
- ✓ Revised job plans are corporately reviewed for best practices—including health and safety—and then shared with all users
- ✓ Mobile capabilities
- ✓ Generational knowledge is automatically embedded
- ✓ Standard process for documenting and recommending replacement or rehabilitation work items (including integrations with financials)

Through the CMMS, our clients benefit from:

- An automated preventive maintenance program based on industry leading practices and standards
- Integration with other applications to reduce data duplication or errors, and to analyze relevant information from one interface
- Electronic tracking and reporting of work orders and history

- Extended capabilities that can be customized to your needs
- Data exports that can be directly imported into the municipal asset management software



Maximo software screen shot. Users can tailor their views for organized planning and accessible information.

Data Security

We share your concerns when it comes to system and data security and are committed to protecting your data. Our advanced IT tools provide complete security through a Citrix Network which is continually updated to reflect the highest level of cyber security standards.

Operations and maintenance staff can access asset and work management information in the field and in the office. Information is also accessible at remote locations – even outside the physical boundaries of the systems through a number of interfaces and tools.

Flexible access means information must be absolutely secure. Water system information is gathered within a strict regulatory environment and is controlled and protected through various levels of security access. This extends to servers and computer terminals. It also extends to the production of appropriate and timely back-ups.

Information collected in our CMMS is stored on OCWA's corporate servers and is encrypted and password protected to ensure data integrity and security. Data is backed-up multiple times every day and information is archived appropriately.

While data is owned by our clients, OCWA's enterprise systems are dedicated to data processing and offer additional confidence to municipalities that their data is stored on additional servers for another layer of compliant, efficient and safe operations.

As an agency of the Government of Ontario, OCWA is further bound to Information and Technology Standards which follow the NIST Cybersecurity Common Control Framework. In addition to our ongoing internal audits, Ontario's Audit Division conducts annual reviews of OCWA's Information Technology procedures, controls, designs and implementations to ensure that network components provide confidentiality, integrity and availability.

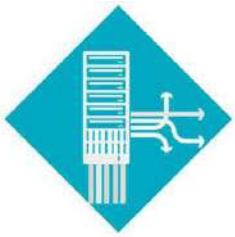
Continuous Improvement

Process and application enhancements reduce maintenance costs and risks such as unplanned equipment failure. They increase our ability to analyze asset performance, recommend potential rehabilitation and renewal needs, and ensure the assets we care for on behalf of our clients are sustainable. Our Maximo-based system supports our asset maintenance and protection practices and helps us manage an inventory of over 70,000 assets on behalf of our clients.

The comprehensive system helps ensure our operations and maintenance staff have enhanced information and access needed to support their complex responsibilities. It also enables us to review and analyze asset and performance data.

Extended Capabilities in Asset Maintenance & Protection

OCWA strives to add value to the services we provide, and to deliver all components of complex water and wastewater needs. We have vast experience providing total solutions to clients including advanced maintenance and asset management services.



Integrating Applications

Information can be used to populate the CMMS from sources such as vibration analysis, infra-red thermography, and/or other condition monitoring & assessment devices and methods.

Asset Data Entry

The number of new assets from capital projects can be substantial -- including civil structures, mechanical and electrical equipment, control devices and SCADA/PCS equipment.

Monitoring & Control of Equipment

Some major upgrades might require investing in additional monitoring and control devices for critical equipment, the development of systems interfaces, and/or the collection and organization of large amounts of data.

As a total solutions provider with extensive experience across the industry, OCWA supports increasingly sophisticated and challenging operations and maintenance, asset management, capital planning, and capital project delivery programs.

OCWA's ASQMS Framework is applicable to not only water and wastewater infrastructure, but all infrastructure assets within a municipality.

Our OCWA Asset Management team has completed full asset management plans for many communities including the Town of Petawawa, Town of Renfrew, Municipality of Northern Bruce Peninsula. We also support municipalities in their asset management processes such as developing financial models, completing asset performance assessments, and creating capital investment plans.

Infrastructure assets are critical to Ontario communities. Proven maintenance practices and advanced technologies have significant positive impacts on asset operating health and life expectancy. OCWA's continued investment in innovation and technology helps us deliver efficiencies directly to our clients.

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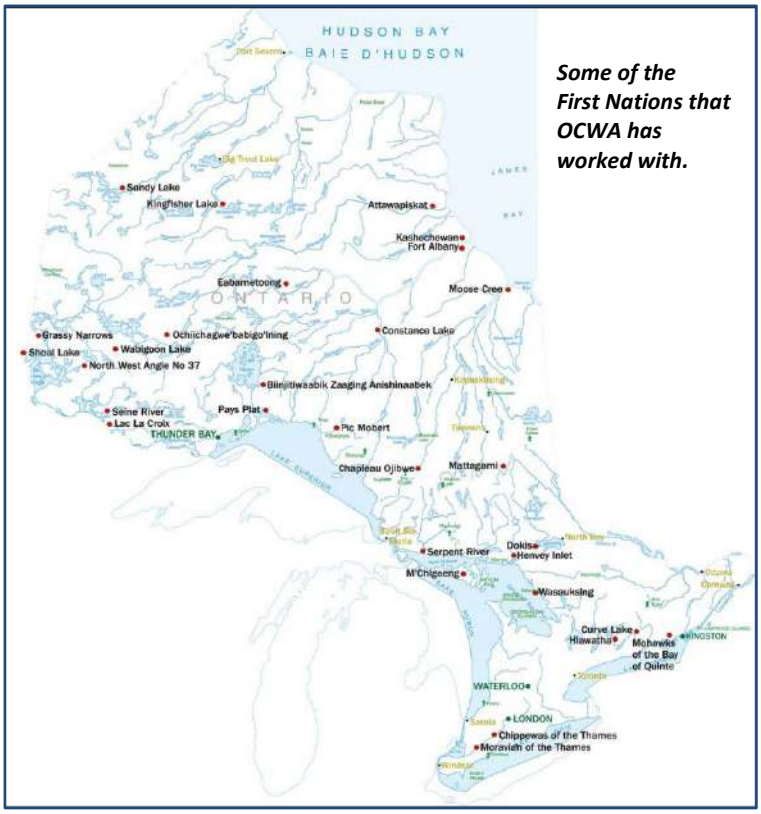
Appendix D — Supplemental Material Mentoring and Training Programs for First Nations Operators and OneWater Educational Program

Mentoring and Training Programs for First Nations Operators & OneWater Educational Program

The Ontario Clean Water Agency (OCWA) is including this information in the interest of sharing our experience with the Atlantic First Nations Water Authority (AFNWA).

OCWA provides a wide range of services to First Nations across Ontario. Many First Nations have and presently use OCWA's training, oversight and support services. We have a suite of support tools and systems to assist operators in the delivery of effective and efficient services including Supervisory Control and Data Acquisition (SCADA) and Computerized Maintenance Management Systems (CMMS).



Some of the First Nations that OCWA has worked with.

For example, there are First Nations using our maintenance system to complete maintenance activities. The local operators complete the actual field work that we help them plan, manage and report on through our system. This partnership enables them to access a fully developed maintenance system while they are focusing on skill and licensing development for the future.

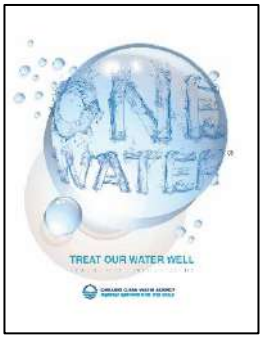
Throughout the past 10 years we have worked with over 50 First Nations in various support roles. In addition to our engineering, technical and operational services, a sample of training, mentoring and support for First Nations programs include:

- Hub support pilot programs— working with First Nations to improve the operations and maintenance of existing infrastructure by implementing support tools like CMMS and SCADA
- Overall Responsible Operator and training for First Nation co-op students
- Standard Operating Procedures development and maintenance plans
- Remote monitoring, teleconferencing, developing modules and providing training for local operators, and quarterly onsite visits for remote communities
- O&M support, operator training and ozone system rebuild
- Capital repairs and operator training

With diverse operational experience, some trainers are operators or operations managers while others are adult education specialists. OCWA is able to draw from our staffing resources and industry

knowledge to develop and present courses suited to operational and corporate needs. Technical trainers all participate in operational work terms regularly. Internally, we provide training to all OCWA operational staff on confined space entry, environmental compliance, and occupational health and safety, as well as the full range of technical courses.

OCWA's OneWater® Education Program



OneWater teaches the value of water by providing activity-based lessons on water and the water cycle. This unique program brings OCWA water/wastewater operators and teachers together to educate students about water treatment in their communities.

By incorporating hands-on demonstrations that illustrate the treatment process, OneWater provides an opportunity for students to become good stewards of their environment and help protect our water systems both now and in the future.

Nearly 3,000 students in more than 50 Ontario schools have participated in the program since its launch. Staff have enjoyed the opportunity to share their water knowledge in a classroom setting and teachers have been extremely receptive to the hands-on activities that help improve water literacy for students. The classroom visit by a local OCWA operator is consistently rated as key to the learning experience, because students and teachers hear how water and wastewater services are delivered in their own community.

We will be adding a new module to the OneWater program called **Water from an Indigenous Perspective**. Developed by an Anishinabe teacher and Indigenous Education Curriculum specialist, the material explores the relationship between Indigenous people and water. Water from an Indigenous Perspective was well received during the pilot stage and we look forward to rolling out the module more broadly in 2021.