ECHO BAY
DRINKING WATER SYSTEM

DWQMS OPERATIONAL PLAN
OPERATIONAL PLAN NUMBER 278-401

Operational Plan Section &Title
1. Overview of Operational Plan
2. Quality Management System Policy
3. Commitment and Endorsement
4. Quality Management System Representative
5. Document and Records Control
6. Drinking Water System
7. Risk Assessment
8. Risk Assessment Outcomes
9. Organizational Structure, Roles, Responsibilities and Authorities
10. Competencies
11. Personnel Coverage
12. Communications
13. Essential Supplies and Services
14. Review and Provision of Infrastructure
15. Infrastructure Maintenance, Rehabilitation and Renewal
16. Sampling Testing and Monitoring
17. Measurement and Recording Equipment Calibration & Maintenance
18. Emergency Management
19. Internal Audits
20. Management Review
21. Continual Improvement

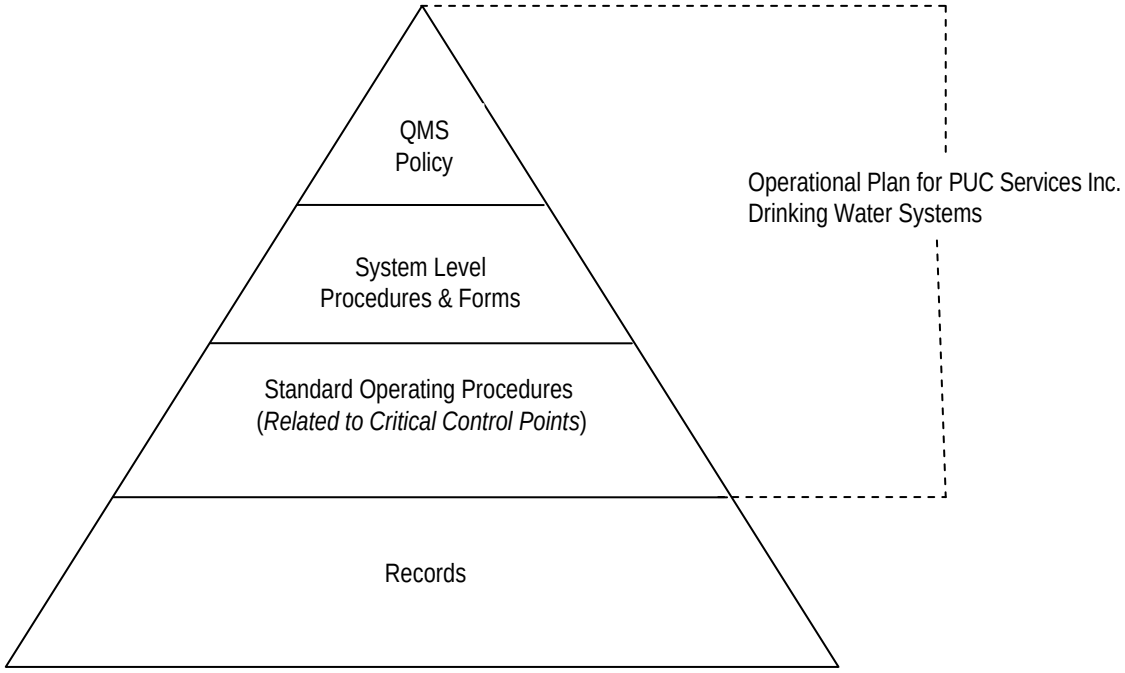
Vice President, Operations & Engineering
Dominic Parrella

Dec 17/09
Date

Overview of Operational Plan

The Operational plan is one portion of the mandated Drinking Water Quality Management System (DWQMS) that is enforced by the Ministry of Environment for all Drinking Water Systems in the province of Ontario. This operational plan is a document created by PUC Services Inc. to help ensure that safe, reliable drinking water is provided to all the citizens, businesses, and visitors of The Township of MacDonald Meredith & Aberdeen Additional. The operational plan is a document that provides an understanding of the drinking water system, the responsibilities of the owner and operator (operating authority) of the water system, and a commitment to the provision of safe drinking water. This will allow PUC Services Inc. to plan, implement, check, and continually improve, helping to build confidence and security in the Drinking Water Systems (treatment and distribution) they operate.

The Quality Management System (QMS) has been developed to meet the requirements of the DWQMS. The QMS is based on the Plan, Do, Check and Improve principle. The Operational Plan is the documentation that addresses the 21 elements of the DWQMS. The QMS for PUC Services Inc. is comprised of the Operational Plan (documentation) and the records that demonstrate implementation of the Operational Plan. The following is the structure of the QMS (including the implementation records):



As described in Element 5 - Document and Records Control of the Operational Plan, the Table of Contents has been signed off to demonstrate that the “approval date” in the Operational Plan procedures has been approved. The “revision number” is located on each separate document within the Operational Plan.

The Township of MacDonald Meredith & Aberdeen Additional

PUC Services Inc., as the Operating Authority of the municipal drinking water system (including both treatment and distribution) is committed to:

- Providing safe drinking water to our customers and the communities we serve
- Complying with applicable legislation and regulations as related to the provisions of the Safe Drinking Water Act
- Maintaining and continually improving the effectiveness of our Quality Management System

This quality policy has been developed in accordance with the objectives of the Ministry of the Environment's Drinking Water Quality Management Standard and is aligned with our Corporate Mission.

	DWQMS Operational Plan	QMS-03
	Date: July 25, 2011	Revision: 1
	Approved By: Vice President, Operations & Engineering	
Title: **Commitment and Endorsement**		**Page** 1 of 1

The Owner endorses the Operational Plan through a Resolution. The Owner's commitment to an effective QMS is evidenced by the resources provided during implementation and maintenance of the Operational Plan and QMS.

The Owner and Top Management of the Operating Authority (as defined in QMS-09) are committed to the implementation, maintenance and continual improvement of a Quality Management System that meets the requirements of the Drinking Water Quality Management Standard. The QMS for the drinking water systems is documented in the Operational Plan. Endorsement by the Owner and Top Management acknowledges the need for and supports the provision of sufficient resources to maintain and continually improve the QMS. Top Management demonstrates their endorsement of the Operational Plan through reporting to the Owner on the results of Management Review and by the key signatures below.

Top Management's commitment to an effective QMS is evidenced by:

a) Ensuring that a QMS is in place that meets the requirements of the DWQMS,
b) Ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements,
c) Communicating the QMS according to procedures (QMS-12), and
d) Determining, obtaining or providing the resources needed to maintain and continually improve the QMS.

Date:	Signature & Title:
April 30, 2010	Lynne Duguay Lynn Watson Lynne Duguay CA / Lynn Watson Mayor (Town of Echo Bay)
Dec 17/09	President & CEO PUC Services Inc, **Brian Curran**
Dec 17/09	Vice President of Operations & Engineering, **Dominic Parrella**

1 PURPOSE

To identify a Quality Management System (QMS) Representative and outline their specific responsibilities.

2 PROCEDURE

2.1 Designation Process

2.1.1 Top Management appoints and provides authority to the Quality Management System Representative, irrespective of their other responsibilities. The authority, roles and responsibilities are provided in QMS-09.

2.1.2 A letter of appointment of the QMS Representative has been signed by Top Management and is included in Appendix 4-A.

3 REFERENCES

QMS-09 Organizational Structure, Roles, Responsibilities and Authorities

4 APPENDICES

QMS 04 Appendix A Management Representative Appointment

NOTICE OF APPOINTMENT

QMS Representative

Top Management for the Operating Authority (PUC) for the drinking water systems for the Township of MacDonald Meredith and Aberdeen Additional has appointed the Quality Management System Representative to be:

Dan Tonon, Manager, Water Treatment Operations

The Quality Management System (QMS) Representative is the liaison between Top Management of PUC Services Inc. and the Owner. The QMS Representative, irrespective of other responsibilities shall:

a) administer the QMS by ensuring that processes and procedures needed for the QMS are established and maintained,
b) report to Top Management on the performance of the QMS and any need for improvement,
c) ensure that current versions of documents required by the QMS are being used at all times,
d) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the drinking water systems, and
e) promote awareness of the QMS throughout PUC Services Inc. (the Operating Authority).

Vice President of Operations & Engineering
Dominic Parrella

Dec 17/09
Date

1 PURPOSE

To document a procedure that describes how:

a) Documents required by the QMS are kept current, legible, readily identifiable, retrievable; as well as stored, protected, retained and disposed of; and
b) Records are kept legible, readily identifiable, retrievable, as well as stored, protected, retained and disposed of

2 PROCEDURE

2.1 Documents

Controlled documents include the Operational Plan and its associated policies, procedures (including applicable Standard Operating Procedures), forms, exhibits, flowcharts or other documents that are subject to revision and are maintained on the Document Master List (Form 05-01).

Controlled documents (excluding drawings) of both internal (refers to documents created by the Operating Authority) or external origin are included on the Document Master List. The QMS Representative is responsible for maintaining the electronic list and ensuring an updated hard copy is included in the Operational Plan.

All electronic controlled documents (excluding drawings) for the QMS are available on the network drive. Data is pulled from remote servers and stored to disk nightly, in real-time the data backup is automatically replicated to Disaster Recovery site for off-site data protection. Data is also written to tape media for long term data retention and stored in a fire proof safe.

Documents have revision numbers and a date listed on them to identify the current version. The “revision number” is located on each separate document within the Operational Plan. Revisions are made to a document when a change in content occurs. A formatting, grammar, or spelling change does not require a revision change.

The electronic documents are normally in Word and/or PDF format on the network drive under a software program called Springboard. If the document is printed from Springboard then the document is considered uncontrolled and not subject to revision.

The QMS Representative determines the distribution list that controlled documents are to be made available to via Springboard. The distribution list (along with the title and revision number) is maintained in Springboard.

All staff are responsible for ensuring that documents remain legible and readily identifiable. If a document has been damaged or made illegible, staff are responsible for downloading the most current version for replacement. All staff are responsible for ensuring they have the correct revision of the document printed.

Documents that are only available in hard copy are kept in a safe, dry location that will ensure no damage or deterioration.

2.2 Document Changes

Any employee can make a request for the creation or a change to a QMS document (e.g., system procedures in the Operational Plan). Changes to documents can be a result of change in procedure, results of an audit or suggestion for improvement.

The request is recorded in Part A on a Document Change Form (Form 05-02). Suggested changes can also be attached to the Document Change form.

The Document Change Form is then sent to the QMS Representative who will forward the Form to the appropriate management staff (responder) who initially approved the document.

Prior to processing document changes the QMS Representative will be responsible for ensuring that the changes will not affect the integrity of the QMS or the processes.

The responder notes the decision on the Document Change Form and forwards the form to the QMS Representative.

The QMS Representative ensures that Part C of the Document Change Form is completed, dated, and filed.

If the request is denied the responder will send notification to the requester advising of the decision and the reason why.

An employee also has the opportunity to suggest changes in the Springboard system. Comments or suggested changes come into the QMS Representative. A group comprised of the QMS Representative, Supervisor of Water Treatment Operations, Admin Assistant DWQMS and applicable staff if needed for the area of concern will review the comments and make changes as required. The Springboard system provides a response to the individual making the comment. These comments are made available for all to see.

The Springboard system allows for an auditing trail which can be downloaded for auditing, tracking and document and record control.

The QMS Representative then updates the Document Master List (Form 05-01). The QMS Representative will send an updated document for review if there has been a significant change in content. Management are responsible for advising any staff affected by the change.

Obsolete documents must be marked “Obsolete” if retained for legal and/or historical purposes, otherwise they are disposed of once a current version is made available. Only current versions of documents are maintained on the Document Master List by the QMS Representative. The user of the obsolete document is responsible for disposing of the document once they determine there is no further use for the document. The retention time for obsolete documents is not pre-set and is based on the user’s requirements.

QMS documents are retained until they are replaced by a more current version (e.g., forms) or the life of the asset (e.g., manufacturing specifications). Documents that have identified as obsolete or superseded by updated versions are disposed of by being thrown out.

The QMS Representative will review the Document Master List a minimum of once per year to verify that any documents that have not been revised since the previous review are still adequate.

2.3 Records

The Records Master List (Form 05-03) identifies all of the records that this procedure applies to. Records may be paper-based or electronic.

The electronic documents and records associated with the QMS are maintained on the network drive which is backed up daily with a weekly rotation of tapes. All electronic controlled documents (excluding drawings) for the QMS are available on the network drive. Data is pulled from remote servers and stored to disk nightly, in real-time the data backup is automatically replicated to Disaster Recovery site for off-site data protection. Data is also written to tape media for long term data retention and stored in a fire proof safe.

The QMS Representative, in consultation with department management, determines the retention time (active and storage) for records.

Electronic on-line data (i.e., production data, lab reports, SCADA) storage and management of these records is by daily and weekly backing up of electronic versions and a paper copy of records is filed, where necessary, as identified on Form 05-01.

QMS records are tracked on Form 05-03 Record Master List for retention times, and stored on the Springboard software server (RRAM). A paper copy is also kept in the Operational Plan records binder.

The person completing the record must ensure the record is legible, accurate and complete with regard to recording requirements.

When records are removed from the active filing system, they are logged by the QMS Representative on Form 05-03 Records Master List form and put into inactive storage for a period of 10 years. They are identified, packed in suitable containers and stored in a safe, dry location that will ensure no damage or deterioration.

Disposal of records, where applicable, is approved by the department management in consultation with the QMS Representative. Management determines the method of disposition at the time that the records are no longer required.

2.4 Drawings

Drawings (electronic or paper copies) are kept for the life of the asset or 10 years, whichever is longer, and are then disposed of by being thrown out.

Distribution drawings are maintained by a Consulting Engineering if requested by the Township. Paper copies of drawings are located at the Municipal Office and the Water Treatment Plant and are available to

operational field staff.

Original physical plant drawings are stored at the Municipal Office. Paper copies for each facility are located at the Water Treatment Plant.

3 REFERENCES

Form 05-01	Document Master List
Form 05-02	Document Change Form
Form 05-03	Records Master List

The Township of MacDonald Meredith & Aberdeen Additional Water Treatment Plant Overview

The Echo Bay Water Treatment Plant (WTP) is part of the Echo Bay Environmental Centre which is capable of treating both water and wastewater independently for the village on one site. The Water Treatment Plant has a design capacity of 1345 m3/day (20 yr. max. day demand). The plant consists of an intake structure, an intake pipeline, a coarse raw water screen, three (3) low lift pumps, two (2) Napier Reid package water treatment plants, and two granular activated carbon filters. Treated water is pumped from the underground reservoirs to the distribution and an elevated tank by four (4) high lift pumps.

Raw water is processed into potable water by the package water treatment plant through coagulation, flocculation, sedimentation, and filtration. Alum is used to assist the clarification process, while chlorination is used for disinfection purposes. The granular activated carbon filters are used primarily as a safeguard against the presence of organics in the supply water, as well as to prevent possible taste and odor problems. Backwash water is also processed into clean effluent through settling. The treatment plant was constructed on the same site as the sewage treatment plant in order to take advantage of common infrastructure requirements as the standby diesel generator. The two plant buildings are physically separated by a service corridor.
The discharge header from the treatment plant is connected to a 250mm trunk water main, which extends to the elevated storage tower. The storage tower has a capacity of 682 cubic meters, and is used for the supply equalization and storage for demand flows. There are approximately 200 connections in the system servicing a population of 500.

The Environmental Centre and Water Treatment Plant are owned by the Township of Macdonald, Meredith and Aberdeen Additional.

Echo Bay Raw Water Source

The Echo Bay water treatment plant receives raw water from Lake George via an intake structure located 1300 meters from the shoreline and in approximately 4.5 meters of water. The shoreline of Lake George adjacent to the plant is shallow and covered in Marsh vegetation. The water quality in Lake George is generally good; however Lake George has been designated under the St. Mary's River Area Remedial Action Plan (RAP) as an area of concern, primarily due to the presence of contaminated sediment. Although the water entering the St. Mary's River from Lake Superior is of good quality, industrial and municipal discharges from Sault Ste. Marie have led to some degradation of the water quality, along with the deposition of contaminated sediment, and impacts on the biota. In the area of Lake George adjacent to the Village of Echo Bay, the primary concern is related to the presence of sediments contaminated with Polycyclic Aromatic Hydrocarbons (PAH). The concentration of many of the contaminants in the sediment, however, have decreased in recent years. Lake George is highly susceptible to wind action due to its shallow depth, and during windy days sediments can

become re-suspended within the water. This trait, along with heavy run-off during rain events or snow melt will fluctuate the incoming water (turbidity and micro), as well as spring and fall turnover events due to water temperature.
The community consists of residential and small commercial zoning, with wastewater from the community being treated and discharged back into Lake George downstream of the water intake. Upstream is the twin cities of Sault Ste. Marie (Ontario and Michigan), which poses the potential risks of water contamination due municipal and industrial activity. Also there is commercial shipping in the St. Mary's River.

Distribution System

In the Village of Echo Bay, an underground reservoir and an elevated tower are provided to store treated water for reserve capacity. The Echo Bay Water System is equipped with a 682 m3 (150,000 gal) elevated steel water tower that serves to supplement the storage capacity of the underground reservoirs. The water storage system performs a variety of functions including equalizing supply and demand, leveling out pumping requirements, and providing water to meet fire demands.

The tower's operating storage "floats" on the distribution system so the tank fills when demand is low and empties when demand exceeds the supply rate.

When in service, the tower's minimum and maximum operating levels regulate the distribution system pressure and maintain it such that:

1. A minimum residual pressure of 275 Kpa (40 psi) is maintained at all locations in the distribution system under peak hourly flow demands.
2. A minimum residual pressure of 138 Kpa (20 psi) is maintained at a fire location under simultaneous maximum day demand plus fire flow demands.
3. A maximum pressure of 700 Kpa (100 psi) is not exceeded at any location in the distribution system.

The Echo Bay distribution system is comprised of 150 mm diameter to 250 mm diameter PVC water mains installed between 1996 and 1997. Over 8300 metres of water mains have been installed. Service connections to existing domestic consumers are generally 19 mm diameter copper pipe.

There are no water use restrictions in effect. The treatment plant is capable of satisfying present demands as the system is recently constructed and demand is at a much lower level that the maximum design.

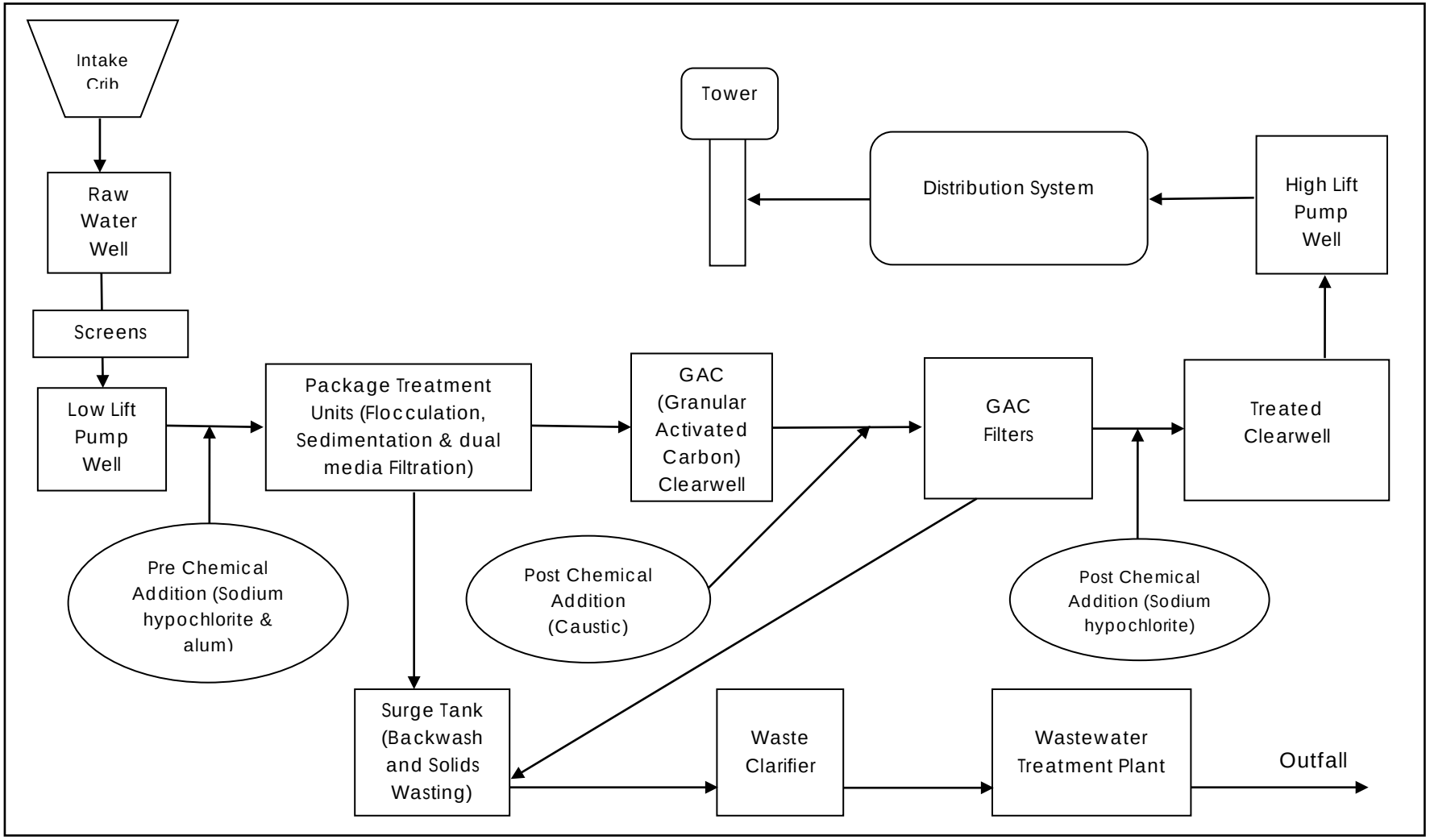

Intake Crib
Raw Water Well
Screens
Low Lift Pump Well
Pre Chemical Addition (Sodium hypochlorite & alum)
Package Treatment Units (Flocculation, Sedimentation & dual media Filtration)
Surge Tank (Backwash and Solids Wasting)
GAC (Granular Activated Carbon) Clearwell
Post Chemical Addition (Caustic)
GAC Filters
Post Chemical Addition (Sodium hypochlorite)
Waste Clarifier
Wastewater Treatment Plant
Outfall
Treated Clearwell
High Lift Pump Well
Distribution System
Tower

Figure
Village of Ec

1 Purpose

To document the procedure used to complete a risk assessment in order to identify the vulnerabilities within the drinking-water systems operated by PUC Services. The risk assessment process will:

- Identify potential hazardous events and associated hazards
- Assess and rank the risks associated with the hazards
- Identify control measures to address the hazards
- Identify critical control points within the drinking water system
- Identify a method to verify the risk assessment validity and assumptions at least once a year
- Ensure a risk assessment is conducted at least once every three years
- Consider the reliability and redundancy of the equipment

2 PROCEDURE

2.1 Annual Review Process

At least once per year, or following a major process change, the QMS Representative facilitates a review of the currency of the information and validity of the assumptions used in the risk assessment process for the drinking water system. This is undertaken by a team comprised of (at a minimum) Manager of Water Treatment Operations, Supervisor of Water Treatment Operations and other applicable staff.

When reviewing the currency of the risk assessment information, the following may be considered:

- Process changes
- Reliability and redundancy of equipment
- Emergency situations
- Critical control point deviations (including adverses)
- QMS non-conformances related to standard operating procedures

Risk Assessment Methodology

The risk assessment is completed by filling out the Risk Assessment Form (Table 08-T1) in the order of the drinking water system steps so that the risk assessment outcomes are created (as per QMS-08). The previous years' completed form is used as a template during the annual review: newly identified hazards are inserted into the previous year's form and the columns are filled out as described below and removed hazards are deleted.

Column in Risk Assessment Form	Information in Column
A – *Step* B – *Hazard Description*	Column A is populated with the treatment process steps and distribution system components, and associated hazards are documented in Column B. At least annually the information in these columns is reviewed to ensure the drinking water system steps have been captured, and associated hazards are identified and described.
C – *Team Notes (includes Control Measures)*	The "Team Notes" section is used to provide additional information such as: • Brief description of the applicable prerequisite program • Description of applicable control measures • Standard Operating Procedures that address the hazard
D – *Likelihood* E – *Consequence* *F - Detectability*	The likelihood (L) and consequence (C) of the hazardous event occurring are assessed using the Risk Assessment Rating (Table 07-T1) as a guide. (D) Detectability, vulnerability and/or critical customers may also be considered when assigning the likelihood and/or consequence rating. Using this methodology, the higher number indicates a higher likelihood or consequence.
G – *Risk*	The risk (R) is then assigned for each hazard based on the calculation of the likelihood of the event occurring (L) plus the consequences of the event (C) plus the detectability of the event or R = L + C + D.
NOTE: use of control measures in determining risks	*In completing the table to this point consideration has been given for the use of control measures, which would likely affect (i.e., reduce) the likelihood of a hazardous event occurring. For the remainder of the table (columns H through L) the questions are answered without consideration of the use of control measures to better understand the potential risks through the identification of Critical Control Points (CCP).*
H through L – *CCP Screening Questions*	The five questions in these columns are then answered: 1) If the hazard is controlled by a best management practice (summarized in Table 07-T1), then the practice is noted in this column and the hazard may not[1] be a "Critical Control Point (CCP)" and it may not be necessary to answer the remaining four questions. 2) For a hazard to be identified as a CCP, the answers to the next three questions must be "yes" and the last question must be "no". • To answer "yes" to the third question ("If control was lost could someone be hurt?"), the calculated risk (Column G). 3) "Control Point (CP)" are identified as hazards that • Are controlled by a prerequisite program. • Have a calculated risk value that will be determined by a risk assessment review (initial SOPs have been developed for the CCPs). The calculated risk value determines the priority for SOP development. • CP's may be initiated if the rating value is >=10
M – *CCP#*	The identified CPs and CCPs are numbered sequentially and highlighted.

[1] If the hazard is controlled by a best management program, it is generally not carried through as a CCP.

The outcome of the Risk Assessment is the completed Risk Assessment Form, which is an output generated for the Risk Assessment Outcomes QMS-08 Procedure Risk Assessment Outcomes. Additionally, the identified CCPs are summarized in Table 08-T2 (Summary of Critical Control Points).

2.2 Three-Year Review Process

Every three years a more comprehensive review of the drinking water system risk assessment process is conducted. This is an opportunity to review the risk assessment process and outcomes. For example, the reviewers could consider changes in microbial risks based on new research, or changes to the risk assessment process as a continual improvement feature. To undertake this more comprehensive review the QMS Representative facilitates a team comprised of (at a minimum) Manager of Water Treatment Operations, Supervisor of Water Treatment Operations and other applicable staff.

In the years where the three-year review process is completed, the annual risk assessment review will be completed at the same time.

2.3 Document and Records Management

The completed Risk Assessment Form (08-T1) is made available to the Vice President for review in the Springboard software.

The QMS Representative is responsible for ensuring that minutes are taken during the annual and three-year review meetings and that these are maintained as per Document and Records Control (QMS-05).

The QMS Representative is responsible for maintaining and making any necessary changes/updates to the Risk Assessment Form as per Document and Records Control QMS-05.

The QMS Representative is responsible for ensuring that any necessary changes are made to the training requirements, standard operating procedures, system procedures or other parts of the QMS resulting from changes to the Risk Assessment.

3 REFERENCES

EBY QMS-05 Document and Records Control
EBY Table 07-T1 Risk Assessment Rating & Best Management Practices
EBY Table 08-T1 Risk Assessment Form
EBY Table 08-T2 Summary of Critical Control Points

4 APPENDICES

Not Applicable

1. Risk Assessment Rating

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances	1
Unlikely	Could occur at some time, historically has occurred less than once every 5 to 10 years	2
Possible	Has occurred or may occur once every 1 to 5 years	3
Likely	Has occurred or may occur on a yearly basis	4
Very Likely	One or more occurrences on a monthly or more frequent basis	5

Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk	1
Minor	Limited public exposure, minor health risk	2
Moderate	Minor public exposure, minor illness	3
Major	Major public exposure, serious illness (no risk of death)	4
Catastrophic	Major impact for large population, serious risk of death, complete failure of systems	5

Description	Detect ability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require an operator to walk by and notice the alarm; problem is indicated promptly by in-house lab test results	2
Normally Detectable	Normally detectable, visually detectable on rounds or regular maintenance	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; nor normally detected before the problem becomes evident; lab tests results are not done on regular basis (e.g. quarterly)	4
Undetectable	Cannot be detected	5

Risk = Likelihood + Consequence + Detectability
Highest Risk = 15 (which is 5 + 5 + 5)
Control Points (CPs) may be initiated if the rating value is >= 10

2. Best Management Practices

Best Management Practices	Description
1. Premises	• Outside Property
	• Building
	• Sanitary Facilities
	• Water Quality
2. Transportation & Storage	• Receiving of Raw Materials
	• Ingredients, Packaging Materials
	• Storage
3. Equipment Performance & Maintenance	• General Equipment Design
	• Equipment Installation
	• Preventative Maintenance
	• Calibration of Equipment
4. Personnel Training Program	• Manufacturing Controls
	• Training
	• Hygienic Practices
	• Controlled Access
5. Sanitation	• Sanitation Program (documented by piece of equipment and room)
	• Pest Control Program

3. Risk Assessment Decision Tree for Determining Critical Control Points (CCP)

The following table provides details for the questions asked on Table 08-T1 Risk Assessment Outcomes.

Question	Explanation	No	Yes
1 (Column H): Is This Hazard Controlled by a Best Manufacturing Practice?	Listed above for reference	Proceed to the next question.	This is not a CCP, but you must identify how this hazard will be controlled before and after the process (in column H), and then proceed to the next identified hazard. If you feel that it is necessary, follow through the remaining questions.
2 (Column I): Is there a Control Measure?	Could a control measure(s) be used by the operator at any process step? Is there anything the operator can do to control the hazard?	This is not a CCP, but you must identify how this hazard will be controlled before and after the process (in column H), and then proceed to the next identified hazard.	Describe the control measure (in column H), and proceed to next question.
3 (Column J): If control was lost, could someone be hurt?	Is it likely that contamination with the identified hazard could occur in excess of the acceptable level or could increase to an unacceptable level? Is it likely that the product could become or could reach an unacceptable level of contamination?	This is not a CCP. Proceed to the next identified hazard.	Proceed to the next question.
4(Column K): Is there a step designed to deal with the hazard?	Is there a process step specifically designed to eliminate/reduce the likely occurrence of the identified hazard to an acceptable level? Will this process step reduce the risk to an acceptable level?	This **is** a CCP. Proceed to next question.	Proceed to next question.
5 (Column L): Is there a later step designed to deal with the hazard?	Will a subsequent step eliminate the identified hazard or reduce its likely occurrence to an acceptable level? Will another, subsequent process step reduce the risk to an acceptable level?	This **is** a CCP. Proceed to column N and identify as a CCP.	This is not a CCP. Identify the subsequent steps and proceed to the next identified hazard.

1 PURPOSE

To document a procedure ensuring that the Owner, Operating Authority and Top Management are defined, the organizational structure of the Operating Authority is described and the roles, responsibilities and authorities of Top Management and key positions within the Operating Authority are identified.

2 PROCEDURE

2.1 Identifying Key QMS Roles

The organizational structure of the Operating Authority is outlined in Appendix 9-A: DWQMS Organizational Chart.

Top Management (within the Operating Authority), QMS Representative and the Owner of the drinking water system are defined in Appendix 9-B.

Top Management is responsible for conducting management review as outlined in procedure QMS 20 Management Review.

The QMS Representative is appointed by Top Management and irrespective of other responsibilities has specific QMS related responsibilities and authorities as outlined in Table 09-T1.

The appointment letter for the QMS Representative is included in procedure QMS 04.

2.2 Organizational Roles, Responsibilities and Authorities

Specific responsibilities and authorities for positions with key roles in the Drinking Water Quality Management System are detailed in the various system procedures and standard operating procedures that form the Operational Plan.

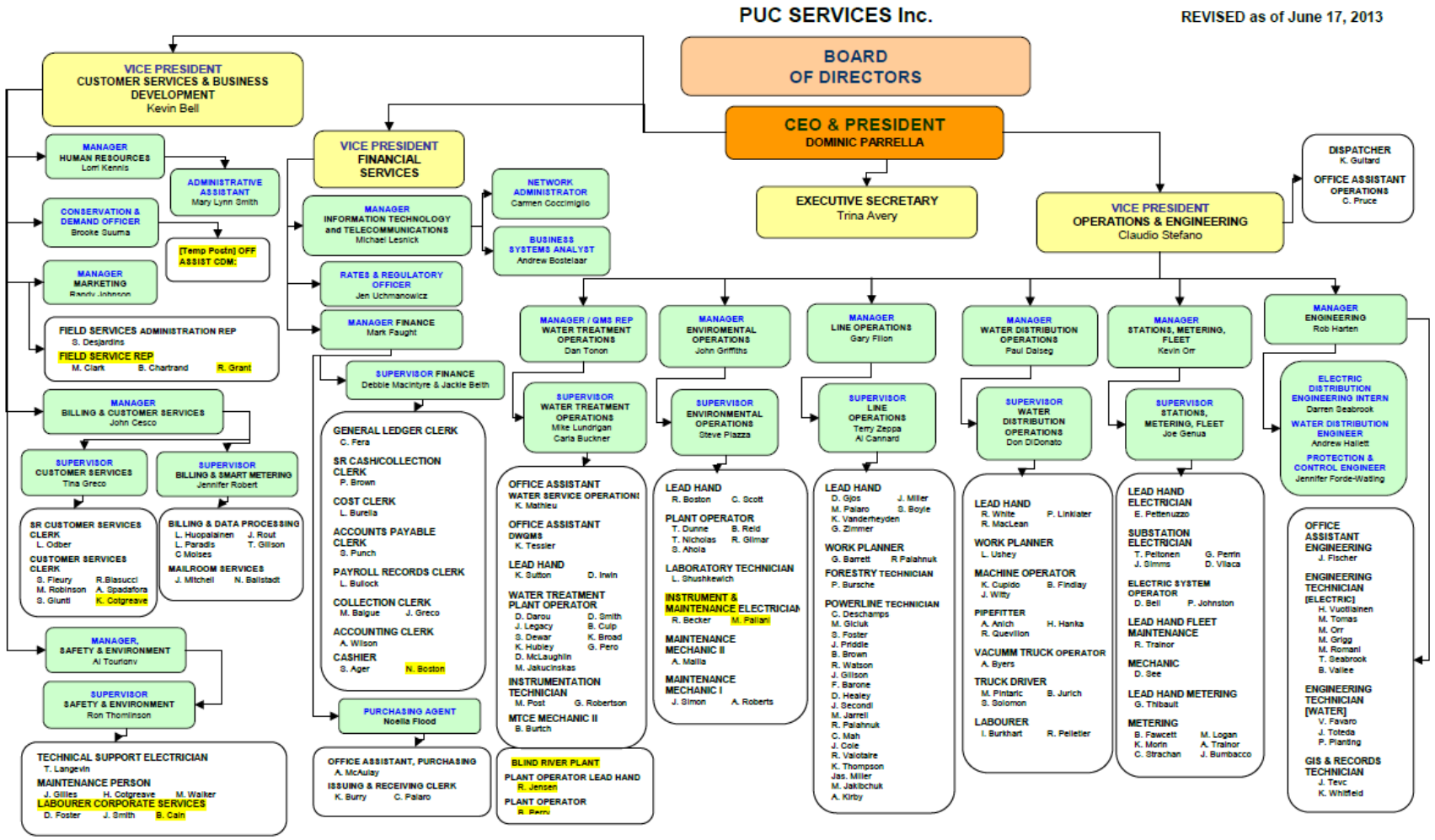
Table 09-T1 provides a summary of the overall roles, responsibilities and authorities related to the provision of safe drinking water in the drinking water system.

3 REFERENCES

QMS 04 QMS Representative Appointment
QMS 20 Management Review
Table 09-T1 DWQMS Roles, Responsibilities and Authorities

4 APPENDICES

QMS-09 Appendix A DWQMS Organizational Chart
QMS-09 Appendix B Key QMS Roles


PUC SERVICES Inc.
REVISED as of June 17, 2013
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DOMINIC PARRELLA
EXECUTIVE SECRETARY
Trina Avery
VICE PRESIDENT CUSTOMER SERVICES & BUSINESS DEVELOPMENT
Kevin Bell
VICE PRESIDENT FINANCIAL SERVICES
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Claudio Stefano
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Mary Lynn Smith
CONSERVATION & DEMAND OFFICER
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MANAGER MARKETING
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FIELD SERVICES ADMINISTRATION REP
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N. Ballstadt
MANAGER, SAFETY & ENVIRONMENT
Al Tourigny
SUPERVISOR SAFETY & ENVIRONMENT
Ron Thomlinson
TECHNICAL SUPPORT ELECTRICIAN
T. Langevin
MAINTENANCE PERSON
J. Gilles
H. Cotgreave
M. Walker
LABOURER CORPORATE SERVICES
D. Foster
J. Smith
B. Cain
MANAGER INFORMATION TECHNOLOGY and TELECOMMUNICATIONS
Michael Lesnick
NETWORK ADMINISTRATOR
Carmen Coccimiglio
BUSINESS SYSTEMS ANALYST
Andrew Bostelaar
RATES & REGULATORY OFFICER
Jen Uchmanowicz
MANAGER FINANCE
Mark Faught
SUPERVISOR FINANCE
Debbie Macintyre & Jackie Beith
GENERAL LEDGER CLERK
C. Fera
SR CASH/COLLECTION CLERK
P. Brown
COST CLERK
L. Burella
ACCOUNTS PAYABLE CLERK
S. Punch
PAYROLL RECORDS CLERK
L. Bullock
COLLECTION CLERK
M. Balgue
J. Greco
ACCOUNTING CLERK
A. Wilson
CASHIER
S. Ager
N. Boston
PURCHASING AGENT
Noella Flood
OFFICE ASSISTANT, PURCHASING
A. McAulay
ISSUING & RECEIVING CLERK
K. Burry
C. Palaro
MANAGER / QMS REP WATER TREATMENT OPERATIONS
Dan Tonon
SUPERVISOR WATER TREATMENT OPERATIONS
Mike Lundrigan
Carla Buckner
OFFICE ASSISTANT WATER SERVICE OPERATIONS
K. Mathieu
OFFICE ASSISTANT DWQMS
K. Tessier
LEAD HAND
K. Sutton
D. Irwin
WATER TREATMENT PLANT OPERATOR
D. Darou
D. Smith
J. Legacy
B. Culp
S. Dewar
K. Broad
K. Hubley
G. Pero
D. McLaughlin
M. Jakucinskas
INSTRUMENTATION TECHNICIAN
M. Post
G. Robertson
MTCE MECHANIC II
B. Burtch
BLIND RIVER PLANT
PLANT OPERATOR LEAD HAND
R. Jensen
PLANT OPERATOR
MANAGER ENVIROMENTAL OPERATIONS
John Griffiths
SUPERVISOR ENVIRONMENTAL OPERATIONS
Steve Plazza
LEAD HAND
R. Boston
C. Scott
PLANT OPERATOR
T. Dunne
B. Reid
T. Nicholas
R. Gilmar
S. Ahola
LABORATORY TECHNICIAN
L. Shushkewich
INSTRUMENT & MAINTENANCE ELECTRICIAN
R. Becker
M. Pallani
MAINTENANCE MECHANIC II
A. Mallia
MAINTENANCE MECHANIC I
J. Simon
A. Roberts
MANAGER LINE OPERATIONS
Gary Filion
SUPERVISOR LINE OPERATIONS
Terry Zeppa
Al Cannard
LEAD HAND
D. Djos
J. Miller
M. Palaro
S. Boyle
K. Vanderheyden
G. Zimmer
WORK PLANNER
G. Barrett
R Palahnuk
FORESTRY TECHNICIAN
P. Bursche
POWERLINE TECHNICIAN
C. Deschamps
M. Gliciuk
S. Foster
J. Priddle
B. Brown
R. Watson
J. Gillson
F. Barone
D. Healey
J. Secondi
M. Jarrell
R. Palahnuk
C. Mah
J. Cole
R. Valotaire
K. Thompson
Jas. Miller
M. Jakibchuk
A. Kirby
MANAGER WATER DISTRIBUTION OPERATIONS
Paul Dalseg
SUPERVISOR WATER DISTRIBUTION OPERATIONS
Don DiDonato
LEAD HAND
R. White
P. Linklater
R. MacLean
WORK PLANNER
L. Ushey
MACHINE OPERATOR
K. Cupido
B. Findlay
J. Witty
PIPEFITTER
A. Anich
H. Hanka
R. Quevillon
VACUMM TRUCK OPERATOR
A. Byers
TRUCK DRIVER
M. Pintaric
B. Jurich
S. Solomon
LABOURER
I. Burkhart
R. Pelletier
MANAGER STATIONS, METERING, FLEET
Kevin Orr
SUPERVISOR STATIONS, METERING, FLEET
Joe Genua
LEAD HAND ELECTRICIAN
E. Pettenuzzo
SUBSTATION ELECTRICIAN
T. Peltonen
G. Perrin
J. Simms
D. Villaca
ELECTRIC SYSTEM OPERATOR
D. Bell
P. Johnston
LEAD HAND FLEET MAINTENANCE
R. Trainor
MECHANIC
D. See
LEAD HAND METERING
G. Thibault
METERING
B. Fawcett
M. Logan
K. Morin
A. Trainor
C. Strachan
J. Bumbacco
MANAGER ENGINEERING
Rob Harten
ELECTRIC DISTRIBUTION ENGINEERING INTERN
Darren Seabrook
WATER DISTRIBUTION ENGINEER
Andrew Hallett
PROTECTION & CONTROL ENGINEER
Jennifer Forde-Watling
OFFICE ASSISTANT ENGINEERING
J. Fischer
ENGINEERING TECHNICIAN [ELECTRIC]
H. Vuotilainen
M. Tomas
M. Orr
M. Grigg
M. Romani
T. Seabrook
B. Vallee
ENGINEERING TECHNICIAN [WATER]
V. Favaro
J. Toteda
P. Planting
GIS & RECORDS TECHNICIAN
J. Tevc
K. Whitfield

Owners – The Township of MacDonald Meredith & Aberdeen Additional

Operating Authority – PUC Services Inc.

QMS Representative – Manager Water Treatment Operations

Top Management (within the Operating Authority):

- President & CEO PUC Services Inc.
- Vice President of Operations & Engineering

1 PURPOSE

To document a procedure that identifies:

a) competencies required for personnel performing duties directly affecting drinking water quality,
b) activities to develop and maintain competencies for personnel performing duties directly affecting drinking water quality, and
c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.

2 PROCEDURE

2.1 Competencies

The Departmental Managers and Supervisors are responsible for identifying required competencies for employees performing duties directly affecting drinking water quality. The minimum levels of competencies required for personnel with duties affecting drinking water quality are identified in job descriptions.

Job descriptions are reviewed periodically for currency by the Departmental Managers. The Job Descriptions describe responsibilities and duties, accountabilities, job specifications, license requirements and minimum educational requirements for each position.

New or transferred employees undergo a probationary period. At the end of the probationary period the Departmental Supervisor evaluates the employee's competency to confirm them into the position.

Individual competency is assessed by management through consideration of the education, training, skills, experience and license level of each employee. Continuing competency is maintained through periodic assessment of training needs.

Competency for management positions is reviewed at least annually during performance reviews conducted by the manager one level up.

Copies of current operator licenses are posted in the facilities. Copies of training certificates are maintained and filed as per QMS-05.

2.2 Training Needs Identification

Departmental Managers and Supervisors identify training needs and ensure competencies are maintained for employees performing duties directly affecting drinking water quality based on the identified competencies.

Each individual employee is responsible for maintaining their individual licenses. This includes advising

management of potential training needs.

The Lead Hands assist with the identification of training needs for the Operational staff. The Supervisor provides the training and/or determines what training is required and ensures they receive this.

The need for training (to ensure competency is maintained) may also be determined based on the following:

- Comparison of the person's skills and abilities with the requirements of the job description and qualifications, in particular for new, temporary and transferred employees;
- Corrective action (e.g., resulting from internal audits or non-conformances) if the need for training is found to be a root cause (QMS-21);
- Changes due to updates to the risk assessment outcomes (QMS-08); and
- Changes in legislative/regulatory requirements.

2.3 Training Plan

Departmental Managers and Supervisors plan throughout the year the training for positions affecting drinking water quality for the next year. They refer to the required competencies, the completed training from previous years, and other currently available courses to develop the training plan for the year.

Departmental Managers and Supervisors review the training schedule annually to determine additional requirements (e.g., CEUs, on-the-job training, Ministry of Environment Director approved courses) and to assist in monitoring the required training hours for positions with duties directly affecting the drinking water quality.

The Administrative Assistant (for Treatment) and Supervisor (for Distribution) records the completed training hours in the Training Database for each employee. Training Records are maintained as per QMS-05 Document and Records Control.

2.4 Employee DWQMS Orientation

The Departmental Supervisor ensures a Drinking Water Quality Management Standard (DWQMS) awareness session is provided to new or transferred employees. The following types of information are included in the DWQMS awareness session:

- introduction to management systems and QMS Representative;
- review of pertinent procedures and Standard Operating Procedures; and
- review of QMS policy and ensuring that personnel are aware of the relevance of their duties and how they affect safe drinking water.

The Administrative Assistant (for Treatment) and Supervisor (for Distribution) records completion of the DWQMS awareness session and other applicable training.

2.5 Training Methods

Competency requirements can be satisfied through the use of in-house, off-site, or on-line training, attendance at seminars/conferences, presentations by subject matter experts, crew meetings, internal training sessions related to emergency and/or standard operating procedures or on-the-job training.

On-the-job training is determined by the Departmental Supervisors including what should be done, who they should work with in order to demonstrate and monitor how to perform various job duties using the appropriate documented procedures.

2.6 Effectiveness of Training

When external trainers conduct courses, the trainer may review and verify training effectiveness though various means (e.g., mini quiz or mini workshops are undertaken for CEU courses). If the employee is knowledgeable and able to demonstrate the skills, then the external trainer often issues a certificate to indicate the training was effective.

When internal training courses are conducted, the Departmental Managers and Supervisors talk to staff following completion of the course to determine the effectiveness of the training. In addition, they may ask the instructor to provide feedback on the trainee's understanding of the information.

Training needs may be identified through the Continual Improvement process (QMS-21), and documented in a Corrective Action Report (CAR). For these training needs, the employee's Supervisor is responsible for ensuring the training is completed and competency is achieved and reporting it to the QMS Representative.

On-the-job training is provided to employees through courses and job shadowing and is determined to be effective by the Departmental Supervisor.

3 REFERENCES

QMS-05 Procedure Document and Records Control
QMS-08 Risk Assessment Outcomes
QMS-21 Continual Improvement
Form 10-02 Training Assessment Form
Training Database
Corrective Action Report
Job Descriptions

4 APPENDICES

None

1 PURPOSE

To describe the means for ensuring there are sufficient personnel meeting the identified competencies are available for duties that directly affect drinking water quality.

2 PROCEDURE

Regular hours for the drinking water system are:

Water Distribution:

- Monday to Friday 8:00 am to 4:30 pm
- On call after hours and weekends (Standby Operator)

Water Treatment (Sault Ste Marie - only):

- 24 hours/365 days per year (SSM Shift Operator – 12 hour shift rotation)
- Monday to Friday – 8:00 am to 4:30 pm (regular day operators)
- On call after hours and weekends (Standby Operator)

Water Treatment: (Desbarats, Echo Bay, Blind River, North Shore)

- Monday to Friday – 8:00 am to 4:30 pm
- On call after hours and weekends (Standby Operator)
- Weekends – 4 hours Saturday and Sunday (this applies to Blind River staff only)
- 24 hours per day/365 days per year (SSM Shift Operator – accessible by phone)
- Operator assistance is available during the hours outlined above for Richard's Landing

Non-regular hours are:

Water Treatment (All locations):

- Monday to Friday 4:30 pm to 8:00 am (Standby Operator)
- Weekends Friday at 4:30 pm to Monday at 8:00 am (Standby Operator)
- Holidays 12:00 am to and 12:00 am (Standby Operator)

Only licensed operators are employed and they follow a rotating schedule to ensure there is coverage by licensed operators all day, every day. Operators are required to enter a cycle of on call duty that ensures an operator is available for emergencies at all times.

During regular hours, Operators are available to conduct inspections, calibrations, investigations, station checks, sampling and monitoring, maintenance and other work as assigned at the drinking water facilities, including the distribution system.

When problems occur during regular hours that are not able to be resolved, Operators can contact their Lead Hand or their immediate Supervisor. Supervisors/Managers are the designated Overall Responsible Operator (ORO) unless otherwise designated. When a problem or alarm occurs during non-regular hours, the SSM Shift Operator will contact the Supervisor on call. A decision can be made to call out a Standby Operator or Maintenance Personnel or additional staff. A list of phone numbers is made available to the SSM Shift Operator. If the on call person is unreachable, the SSM Shift Operator will contact the designated ORO.

In the event that the designated ORO is unable to act for a period of time, a backup ORO is designated at that time. The SSM WTP Shift Operator has a listing of the ORO at all times which is updated on the whiteboard in the SSM WTP Control Room.

At the end of the year, the Water Treatment Supervisor creates the on-call list for the next year and this is posted in the SSM WTP Control Room available to all Operators. The current staff member that is on call is identified on the whiteboard for quick reference.

Operators may request changes (i.e., due to vacation schedules) to the schedule during the year. These are made through the Water Treatment Supervisor and/or by making arrangements with another Operator and informing the Control Room for the week affected. The Office Admin Assistant updates the spreadsheet based on the change.

The person designated as on-call is the Operator in Charge (OIC) during non-regular hours.

The Control Room receives emergency calls during after hours as well as water system alarms through the SCADA system.

If the after-hours situation requires work on the distribution system and/or equipment operators, the on call person refers to the Water Department Callout Procedure to determine the Operators required. The WDO Callout Procedure includes contact numbers for key functions. In the case of outside contracts, the on call person will contact the Town to make arrangements for contractors. The Town Officials are listed on QMS 18 Appendix A Emergency Contact Listing for each location.

3 REFERENCES

Not applicable

4 APPENDICES

Not applicable

1 PURPOSE

To describe how the Quality Management System is communicated between the operating authority's top management and:

- Owner
- Personnel
- Suppliers
- Public/consumers

2 PROCEDURE

The Quality Policy is made available to all operating authority personnel and the public as it is posted in the Owner's facilities and on the PUC's website.

The Quality Management System is communicated between top management and the owner, personnel, suppliers and public/consumers through various methods, such as: meetings (formal and informal), e-mails, telephone calls, website postings, log books, memos, and continual improvement forms etc. The communication with each group varies and is described below.

2.1 Owner

Communication is through the quarterly meetings with municipal staff and/or Council, e-mails and a quarterly operation status report. As well, contact during emergency situations may be made directly between Top Management and the applicable municipal staff/official.

Communication from the owner back to Top Management could be through e-mails, and Council meetings with PUC Services Inc. staff.

Communication on the Quality Management System is also achieved through the Owner retaining an uncontrolled copy of the Operational Plan. This is one means of informing the Owner about the Quality Management System.

2.2 Personnel

Communication with personnel may occur through meetings, memos, emails, work instructions, etc. These communications will keep staff informed of the DWQMS progress and revisions. Management has an "open door" policy for communication to and from operational staff. Any minutes taken are maintained as per Procedure QMS-05 Document and Records Control.

Managers and/or Supervisors apprise staff of information (e.g., corporate) and are responsible for relaying specific information to staff. Information sessions (e.g., new Employee Orientation sessions, tailgate talks, formal information sessions) are additional means of communicating between supervision and personnel.

Communication with the QMS Representative is through similar means as outlined above. Additional communication is outlined in QMS-20 Management Review.

2.3 Suppliers/Contractors

Communication is described in Procedure QMS-13 Essential Supplies and Services. Examples of the means of communication include purchase orders and contracts (which may include a copy of the QMS Policy). Communication with suppliers is also through emails, phone calls and sales calls.

Copies of applicable operating procedures and the QMS Policy are provided with contracts and/or purchase orders to inform essential suppliers and contractors that there is a QMS maintained by Operations & Engineering.

2.4 Public / Consumers

Annual water reports (as required by the Ministry of Environment) will be available at the Town Municipal office. The QMS policy and a description of the DWQMS are accessible to all customers. Information is communicated to the public through notices, advertisements and/or inserts in billings.

Communication may also be through direct telephone calls and/or e-mails. The public may call Municipal office staff during regular and after hours. Municipal staff can contact the Operating Authority directly.

3 REFERENCES

QMS-05 Document and Records Control
QMS-13 Essential Supplies and Services
QMS-20 Management Review

4 APPENDICES

Not applicable

1 PURPOSE

To document a procedure ensuring the quality of essential supplies and services, in as much as they may affect drinking water quality. The procedure shall include identification of these supplies and services and a means to ensure their procurement.

2 PROCEDURE

2.1 Procurement Process

Distribution

The acquisition of goods and services related to the provision of drinking water is addressed by Purchase Orders which is administered by the Purchasing /Stores Department.

The Purchasing Agent obtains specifications and/or certification of product requirements for supplies and services from the Manager prior to issuance of new and/or renewal of purchase orders, standing purchase orders, tenders, etc.

If required, the applicable Manager ensures that Standard Operating Procedures are developed and provided to establish conduct/ specifications of suppliers and contractors.

The Manager or Supervisor issues a requisition to Purchasing who generates a Purchase Order to a supplier of the product. Stores then receives the product and notifies the Supervisor or Manager if requested when it is in stock.

Standing Purchase Orders are used to obtain frequently purchased products. These are issued by Purchasing based on specifications and/or certification of product requirements provided by the Manager. Lead Hands or Supervisors may purchase materials directly from suppliers and/or through Purchasing and the issuance of a Purchase Order.

A copy of the relevant procedures/specifications, a copy of the Quality Policy and general information regarding the presence of a QMS are included in the appropriate “contract specifications” for capital works projects.

The Manager of Water Treatment Operations also keeps a listing of parts and equipment available at the Towns municipal garage and on-site at the Town’s water treatment plant.

Treatment

Availability and quality of chemicals is ensured by having back-up suppliers and/or additional chemicals that are rotated through to ensure they have not expired. All supplies (including chemicals) are received at the Water Treatment Plant and re-distributed to appropriate facilities by the Lead Hands.

2.2 Stores

Supplies that are kept in stock (e.g., repair clamps, pipes, etc.) which includes quantities for emergency repairs are maintained by Stores.

During regular business hours, staff may come in and pick up appropriate material, which is tracked by Stores through completion of a material requisition.

For stock that is in inventory, the Issuing & Receiving Clerk completes the data entry on stock issued to a job to maintain minimum/maximum levels of stock (including seasonal variances). Minimum/maximum reports are maintained and reviewed by the Issuing & Receiving Clerk to ensure adequate supplies are available.

For supplies needed while operators are on the job site, they may contact the Issuing & Receiving Clerk (during regular business hours) to see if the item is stocked otherwise Managers may purchase these goods directly.

If stores inventory is depleted then Issuing & Receiving Clerk issues a requisition to obtain stock which is forwarded to Purchasing to create a Purchase Order.

After hours, Lead Hands call in to the Shift Operator requesting Stores staff meet them at Stores.

2.3 Identification of Supplies & Services and Requirements

Form 13-01 Essential Supplies and Services for drinking water identifies the essential supplies and services critical to the provision of safe drinking water.

The form provides a description of the Procurement of Supplies or Services including:

- how do you ensure it is available, when required
- how do you ensure it is made available, when required (daily operations & emergencies)

The form also includes identification of the Quality Requirements:

- what requirements are needed related to quality of supply or service (e.g., product/service quality; performance of supplier/service provider; method of delivery; on-site activities) and
- how the requirements are satisfied.

2.4 Monitoring Supplies and Services

For products that are received at the Sault Ste Marie Water Treatment Plant, an Operator is present during receiving in order to inspect and receive the product. The Operator accepts the product and verifies that it is correct and meets specifications. The Operator notifies the Shift Operators that a load and/or product has been delivered and is acceptable.

For products that do not meet the specifications or are incorrect (e.g., wrong material delivered), the Operator refuses the product by sending it back. The Operator contacts the supplier and identifies any problems and informs Purchasing of the issue.

When products are delivered to Stores the Issuing & Receiving Clerk ensures that it conforms to the order that was made. Any discrepancies are resolved by the Issuing & Receiving Clerk.

Periodically Stores provides a printout of the stock levels (Shortage Report) and current amount available for review by the Managers to determine if min/max quantities should be adjusted.

Any problems that are encountered regarding the supplies and/or services are documented (generally by e-mail) and forwarded to the Purchasing Department. Managers, Supervisors and/or Operators may also contact suppliers or contractors directly if problems arise.

3 REFERENCES

EBY Form 13-01 Essential Supplies and Services
EBY QMS 13 Appendix A Pre-Qualified Contractor Listing

4 APPENDICES

Not Applicable

1 PURPOSE

To describe the annual review process that results in the provision of drinking water infrastructure. The objective is to annually review what infrastructure is necessary to operate and maintain the drinking water system and to determine if that infrastructure is in place as needed. The procedure also describes how the findings of the review are communicated to the Owner.

2 PROCEDURE

Review and provision of the drinking water infrastructure needs is achieved through two different means depending on whether the infrastructure is existing, or intended to address growth needs. The review of infrastructure is based on the fixed operating contract that exists with the Owner.

2.1 Review of Infrastructure Needs

The Manager Water Treatment Operations undertakes an assessment of the infrastructure needs (operational level and not capital works) and upgrades and presents this information at the scheduled quarterly meetings with the Owner.

The municipality maintains their own budget process for reviewing and determining capital projects and this does not involve PUC Services Inc. However the Manager Water Treatment Operations, VP Operations and Engineering and the operators review the operating performance of the drinking water systems and identify deficiencies and/or constraints related to the infrastructure for consideration by the municipality for the following year. This information is presented by the Manager Water Treatment Operations to the Owner during the quarterly meeting held in the fall.

2.2 Provision of Infrastructure

The Owner provides updates to the Manager Water Treatment Operations during the quarterly meetings on capital works projects to be undertaken in order to discuss implementation issues. Any infrastructure issues that are identified but not approved and/or constructed by the Owner are carried forward to the subsequent year and raised during the next infrastructure review process.

3 REFERENCES

None

4 APPENDICES

None

1 PURPOSE

To document a procedure for infrastructure maintenance, rehabilitation and renewal programs for the drinking water systems. This is a continuation from the review and provision of infrastructure and is a summary of the infrastructure rehabilitation, renewal and maintenance programs and activities that are undertaken.

2 PROCEDURE

2.1 PREVENTATIVE MAINTENANCE

Maintenance programs are developed based on requirements established by the operating authority taking into account manufacturer's instructions, regulatory requirements, industry best practice and/or standards.

Standard Operating Procedures exist for some of the maintenance activities and these are available to Operations staff that are required to complete the maintenance activities.

Distribution

Maintenance programs for the distribution system include: exercising valves, hydrant flushing winterizing and annual inspections.

Exercising Valve Program – valves are exercised annually within the distribution system, with a goal of achieving full system coverage over the annual cycle. Deficiencies are noted and work orders are issued for repair.

Valves exercised are documented in the valve operator record sheets after the daily activity. A valve maintenance sheet is used for valves operated manually within the system.

Hydrant Annual Inspections - hydrants are exercised annually within the distribution system, with a goal of achieving full system coverage over the annual cycle. Deficiencies are noted and work orders are issued for repair.

Hydrants exercised are documented in the hydrant operator record sheets after the daily activity. A hydrant maintenance sheet is used for valves operated manually within the system.

Treatment

The facility preventative maintenance program has been implemented by the Manager of Water Treatment into the computerized maintenance system. All re-occurring work orders are issued to the Lead Hand who provides the work orders to treatment operations staff where work completed is recorded. The completed work orders are returned to the Water Treatment Admin Assistant and processed.

2.2 UNPLANNED MAINTENANCE

Distribution

Notification is given to the Town to address any unplanned maintenance activities. These unplanned activities may arise from a customer complaint, inspection or other emergency situation.

The Work Request is issued to the Town's Road Superintendent for authorization. Once the Work Request is authorized then a work order is developed and issued. Work may be completed by municipal staff or a contractor may be brought in to provide service for the Town. Licensed operational staff from PUC Services will be available to oversee any of the distribution activity.

Treatment

The facility preventative maintenance program has been implemented by the Manager of Water Treatment into the computerized maintenance system. All re-occurring work orders are issued to the Lead Hand who provides the work orders to treatment operations staff where work completed is recorded. The completed work orders are returned to the Water Treatment Admin Assistant and processed. Unplanned activity will occur after discussion as taken place between the Manager and the Lead Hand Water Treatment Operations. If necessary, a work order can be created after the work has been completed in unplanned maintenance situation. For example: to track additional costs to the contract or labour.

2.3 EFFECTIVENESS OF MAINTENANCE

The work order system supports tracking the effectiveness of maintenance activities.

Effectiveness in part is tracked through:

- number of completed work orders
- percentage of overdue planned maintenance activities
- frequency of unplanned maintenance activities (e.g., mainbreaks)

Reports on the maintenance activities are forwarded to Top Management for review under Management Review Element (QMS-20).

2.4 COMMUNICATION TO OWNER

Major unplanned maintenance issues require authorization of the Owner. Minor unplanned maintenance can be performed without the consent of the council, but notification is made to the Owner at the quarterly meetings.

2.5 REHABILITATION / RENEWAL

The Town's capital works budget covers issues that are not operations and maintenance and includes extending the life of plant, replacement of plant and/or increases in capacity.

Rehabilitation and renewal works are identified and defined through the capital budget process.

The annual budget includes allowances for replacement of capital assets (e.g., hydrants, services). As well, planned replacement programs are identified for these assets.

Operations may also identify where additional programs (e.g., lead services) are required that may need additional operating budget.

Distribution

Distribution renewal projects are usually tied in with the Town's major road works program and typically watermains are replaced at that time. There is a capital works budget for these projects.

Treatment

Breakdown maintenance (e.g., pumps) and minor replacement are covered under the operating budget. Instrument Technicians provide reports on the state of the pumps based on the schedule for preventative maintenance.

Additional rehabilitation projects may include: monitoring of filter media and upgrading of chemical feed systems.

3 REFERENCES

QMS-05 Document and Records Control
QMS-20 Management Review
Standard Operating Procedures

4 APPENDICES

Not Applicable

1 PURPOSE

To document a procedure for sampling, testing and monitoring activities completed for all drinking water quality. The procedure describes how the sampling, testing and monitoring results are recorded and shared with the Owner, where applicable.

2 PROCEDURE

2.1 Sampling & Testing

Sampling, testing and monitoring is completed on the drinking water to:

- provide operators with knowledge required to proactively operate the drinking water system, especially at Critical Control Points,
- ensure water quality is maintained as water moves through treatment process and travels through the distribution system, and
- ensure compliance with applicable Ontario Drinking Water Regulations.

For the purposes of this procedure, "sampling" is defined as the process of collecting water samples for laboratory analysis, and "testing" is considered to be the laboratory analysis. "Monitoring" consists of on-site data collection (e.g., SCADA instrumentation or handheld equipment) and analysis.

The samples, tests and monitors are undertaken according to regulation 170, and 169 or more often. The sampling program is coordinated by the Lead Hand and is based on a weekly schedule.

Samples are taken at various locations throughout the system to ensure the water meets the environmental guidelines. Sampling parameters, frequency and locations are outlined in the DWQMS Sample Protocol.

To further ensure disinfection throughout the distribution network, Operators collect water samples at various points for microbiological analyses and chlorine residuals.

The sampling points and corresponding analyses are listed on the chain of custody sheets (which track the sample from the point of collection to the lab for analysis). The person responsible for completing the sampling is also noted on the sheets.

There are multiple sampling points and monitoring points that are used for process control. A sampling, testing and monitoring schedule provides details of how PUC Services Inc. samples, tests and monitors the process from raw water to finished product.

The Lead Hand is responsible for organization of the monthly, quarterly, yearly and lead sampling and for maintaining the database.

The sampling frequency (monthly, quarterly, yearly) for the various parameters is identified in DWQMS Sample Protocol.

The protocols for collecting and handling water samples (including the control limits) are provided in the standard operating procedures.

On a yearly basis Managers and Supervisors are responsible for reviewing the water quality sampling program for changes required to the water quality parameters, sampling frequency and sampling locations. The Supervisor is responsible for updating the sampling schedule based on this review.

2.2 Sampling & Testing Results

Analytical results are compared to the Ministry of Environment's Ontario Drinking Water Standards (ODWS, O. Reg. 169/03) and other applicable drinking water standards. The analytical results are compiled annually and listed along with the Maximum Acceptable Concentration (MAC) (based on the ODWS) and internal PUC limits (min, max, average) for each parameter that is tested.

Samples are submitted to an accredited and licensed lab. All results from the lab are received in digital format and maintained on the network drive and a copy is printed and managed as per QMS-05 (Document and Records Control).

In-house samples are analyzed following approved laboratory procedures. The results of these activities are recorded by Operators in the station log books or on the Lab Data Sheet for handhelds. Any adjustments made to process parameters are recorded in the applicable station log book.

Flushing is undertaken in the distribution system (based on the SOP for flushing) and the residuals are recorded on a Leak Repair form and transferred to the diary. The information is entered electronically as part of the watermain repair documentation that is updated by the Supervisor.

Adverse conditions are identified through alerts from SCADA and/or lab notification along with operator field monitoring. Should the analytical results indicate an adverse condition the Standard Operating Procedures are followed that indicate how these adverse conditions are reported and addressed.

Sampling and testing records are managed in accordance with QMS-05 (Document and Record Control System Procedure).

2.3 Monitoring

SCADA instrumentation (alarms) and handheld equipment are used to monitor drinking water quality in the plant and distribution system.

The SCADA system documents and monitors water levels, temperature, turbidity, pH (surface water plant), pressure, chlorine dosing, and equipment operations/failures. There is a separate door alarm set up through the auto dial system. Monitoring results are maintained within the SCADA system through daily reports.

Monitoring is completed by operators, and when controlled by the SCADA system an on-call operator is notified of alarms indicating when control limits are exceeded. All parameters for the SCADA system designs are reviewed by the Supervisor to ensure monitoring requirements are met.

Raw water turbidity, filter water turbidity and treated water chlorine residual are monitored continuously with online analyzers. Operators verify online treated water chlorine residual by comparing to handheld equipment.

Station logbooks or data entry sheets are used to track information.

Activities undertaken related to monitoring are recorded in station logbooks. Daily and monthly reports are developed by the Operator and provided to the Lead Hand/Supervisor for reference and review.

The Echo Bay plant has SCADA with dial-in access to the information for reference and review.

2.4 Reporting to the Owner

Quarterly reports are made to the owners regarding the drinking water systems and/or when an adverse or significant event occurs. In addition an annual report is made to the owner.

The Manager reports to the owner on the sampling, testing and monitoring for the system on an annual basis. The annual report of the drinking water system is provided to the owner on a yearly basis and this provides a summary of the results.

In accordance with relevant legislation, summary reports are provided and located at the Town's municipal office, with an emphasis on outlining problems/issues (abnormal conditions) that have occurred during the past year. The summary report includes a spreadsheet showing a summary of the results.

3 REFERENCES

QMS-05 Document and Records Control
EBY Form 05-08 Echo Bay WTP - Lab Analysis (Raw-Filter)
EBY Form 05-09 Echo Bay WTP - Lab Analysis (Treated)
EBY Form 16-01 DWQMS Sample Protocol
SSM Form 05-11 Leak Repair Form

4 APPENDICES

Not Applicable

1 PURPOSE

To document the calibration and maintenance of measurement and recording equipment used for safe drinking water quality.

2 PROCEDURE

2.1 Calibration and Maintenance Frequency and Schedule

Measurement and recording equipment is maintained and calibrated as per equipment manufacturer's specifications or as required by O. Reg. 170-03; whichever is more frequent.

The frequency and responsibility for calibration and maintenance of each equipment type is summarized on Form 17-01. Calibration work orders are generated by the maintenance management system to operational staff to indicate when calibration of monitoring equipment is required.

The Supervisor and/or Manager are responsible for ensuring that the calibration is undertaken and the appropriate forms are completed by the Operator/Instrument Tech (for in-house calibration and maintenance) or the designated outside contractor.

The SCADA alarm system is maintained and calibrated through daily, weekly and yearly activities that Operators and the instrument technicians undertake for the alarms and settings.

SCADA alarm communication for remote sites is verified by testing and operating the field sensors for annunciation at the control centre. During checks of the Environmental Center, the Echo Bay Operator reviews the status of the alarm conditions on the SCADA display and records to system logbook. The SCADA system records all status changes to an event printer and to an electronically dated file.

2.2 Annual Review

On an annual basis the Manager/Supervisor undertakes a review of the schedule (refer to Form 17-01 Measurement and Recording Equipment Calibration Schedule) to confirm which work has been completed.

At least once per year the Manager/Supervisor and the QMS Representative review the calibration and maintenance schedules to ensure the information is up to date.

3 REFERENCES

QMS-05	Document and Records Control QMS System Procedure
Form 17-01	Measurement & Recording Equipment Maintenance & Calibration Schedule

1 PURPOSE

The purpose of this procedure is to document how we maintain a state of emergency preparedness, including:

a) a list of potential emergency situations or service interruptions
b) processes for emergency response & recovery
c) emergency response training & testing requirements
d) Owner & Operating Authority responsibilities during emergency situations
e) references to municipal emergency planning measures
f) emergency communication protocol and up-to-date list of emergency contacts

2 PROCEDURE

2.1 Identification of Emergency Situations or Service Interruptions

On an annual basis the Manager Water Treatment Operations, Supervisor Water Treatment Operations, VP Operations and Engineering and/or their designates will meet. The purpose of the meeting is to review the QMS-18 Appendix B which includes a list of emergency situations or service interruptions that have been identified and to examine current operations to determine if additional emergency situations or service interruptions exist.

In addition, during the risk assessment process (including the annual and three year reviews) the outcomes (QMS-08) are identified which include some emergency situations or service interruptions. This is another opportunity where the review process may identify emergency situations or service interruptions that can be added to the list from the above noted meeting.

Emergencies can stem from man-made or natural occurrences such as:

- Major service disruption - large scale watermain breaks affecting water supply
- Ice/snow storms or flooding (e.g., road closures)
- Hazardous material spillage
- Mechanical or electrical failure which may disrupt a the water supply system
- Power outage causing a disruption of service
- Adverse water quality – microbial or chemical contamination
- Large scale health issue (e.g., Pandemic)

The QMS Representative is responsible for maintaining and updating the potential emergency situations or service interruptions (see Appendix B).

2.2 Process for Emergency Response and Recovery

Based on the emergencies identified, the QMS Representative is responsible for ensuring that Standard Operating Procedures (SOPs) are developed.

The SOPs outline the roles and responsibilities for various staff and the activities related to the response and recovery from the emergency situation or service interruption.

The municipality has a municipal emergency plan that outlines communication procedures during emergency situations and the roles and responsibilities of the Owner, depending on the level of emergency.

The Emergency Coordinator is responsible for initiating communications with the municipality for emergencies that have escalated to a higher level of response than PUC Services Inc. Operations staff.

For escalation of emergencies, the Emergency Communications Protocol (Appendix B) should be referred to as it provides the emergency communication protocol for situations that have the potential to escalate to higher level impacts. The emergency list of contacts is included in the Water System Emergency Plan.

2.3 Emergency Response Training and Testing Requirements

The Managers are responsible for ensuring that appropriate staff receive emergency response training. Training is tracked as per QMS-10 Competencies.

In addition a debriefing after larger scale emergencies will be undertaken by the Manager responsible for the affected area and will include the QMS Representative and other applicable staff. Any corrective actions related to the QMS that are identified during the debriefing will be recorded as per QMS-21 Continual Improvement and utilizing Form 21-01.

Periodically the emergency procedures (response and recovery) will be evaluated and modifications made to the procedures where required based on the review and/or debriefing following emergency situations.

3 REFERENCES

QMS-08 Risk Assessment Outcomes
QMS-10 Competencies
QMS-21 Continual Improvement
Standard Operating Procedures
Water System Emergency Plan
Municipal Emergency Plan
EBY Form 05-31 Echo Bay Emergency Testing (Template)

4 APPENDICES

Appendix 18-A Emergency Contact List
Appendix 18-B Emergency Communications Protocol

1 PURPOSE

To document the procedure for internal audits that:

- Evaluates conformity of the QMS with the requirements of the DWQMS
- Identifies internal audit criteria, frequency, scope, methodology and record keeping requirements
- Considers previous internal and external audit results
- Describes how the QMS corrective actions are identified and initiated

2 PROCEDURE

2.1 Audit Team Structure and Roles

The audit team roles are as follows:

- The ***QMS Representative*** acts as a liaison between the audit team (through the Lead Auditor) and the auditees
- The ***Lead Auditor(s)*** is responsible for overseeing the internal audit process and ensuring qualified auditors conduct internal audits
- The ***Audit Team Leader*** is the auditor responsible for managing the internal audit of a specified element or process. The Lead Auditor can also act as an Audit Team Leader
- ***Auditors*** work with the Audit Team Leader to prepare for and conduct internal audits

2.2 Auditor Qualifications and Selection

The Lead Auditor(s) and Auditors must meet the following criteria:

- Knowledge of the DWQMS and the drinking water QMS
- Independent of the work that is going to be audited
- Ability to make objective observations and record the results
- Successfully complete an auditing course

The Lead Auditor(s) along with the QMS Representative will select several internal auditors and assign Team Audit Leaders for each audit.

2.3 Audit Process

2.3.1 Schedule

Each element of the QMS for the drinking water system must be audited a minimum of once per year. Additional audits can be scheduled based on the importance of the process or area, or in response to previous audits results (internal and external). Typically, the internal audit focuses on the previous calendar year.

The Lead Auditor(s) creates an Annual Internal Audit Schedule using Form 19-01, with assistance from the QMS Representative. The Lead Auditor(s) appoints an Audit Team Leader and Auditor(s) for each element or process and ensures that Auditors do not audit their own work. The Lead Auditor or QMS Representative forwards the Audit Schedule to the Manager and Supervisors for review.

An email notification of the audit schedule is sent out by the QMS Representative to the Manager, Supervisors at least one week in advance.

2.3.2 Checklist

The Audit Team Leader works with the QMS Representative and other Auditor(s) to prepare an Internal Audit Checklist Form 19-02 or other similar documents that record questions asked and points verified. The checklist defines the scope (i.e., applicable area of the QMS, time period to be audited, organizational unit and/or facility) and audit criteria (i.e., applicable manuals and standards).

The checklist reflects the current policies and procedures of the area that are being audited. A copy of the procedures with the points highlighted that are going to be checked can be attached to the checklist and referenced for the audit.

2.3.3 Audit

The audit is performed by the auditing team using the Internal Audit Checklist Form 19-02 or applicable document. Observations that provide evidence of conformance or non-conformance are noted on the Internal Audit Checklist.

2.3.4 Audit Findings

The results of the audit are reviewed by the Audit Team. Agreement is reached under the leadership of the Audit Team Leader. The Auditors complete the summary of findings on the Audit Report Form 19-03 or similar document.

The Lead Auditor(s) records non-conformances from the internal audits on Non-conformance Report (NCR) Form 19-04 which records:

- Audit report number
- Report date
- Brief description of non-conformance

The QMS Representative tracks the internal audit non-conformances by recording the NCR number in the Non-conformance Report Log Form 19-05.

2.3.5 Closing Meeting

The results of the audit are presented at the closing meeting, if one is held. At a minimum the Supervisor responsible for the area audited and the Audit Team would attend.

The closing meeting will include the following:

- Thank the staff for their cooperation
- Review the commendable features
- Review documented observations – what is effective, what needs improvement and what is unsatisfactory
- Ensure the issue is understood and get agreement on a response date for the Corrective Action for each finding or NCR with the person responsible for the area audited
- Record the NCR number on the Audit Report to ensure audit results are understood

2.4 Audit Report

The Auditors draw up an Internal Audit Report Form 19-03 and fill out any Corrective Actions that may be required from the audit. The report has to be signed by the Audit Team Leader and the person responsible for the audited area.

A copy of the report is given to the Division VP, Managers & Supervisors of the affected areas and the QMS Representative; the original is kept by the Lead Auditor(s) and used for follow up. The report is filed according to QMS-05 Procedure Document and Records Control.

2.5 Audit Follow Up and Report

The Lead Auditor makes sure that the follow up audit is carried out. The follow up audit has to be carried out to verify that the action has been taken and that it is effective. The results of the follow up are recorded in the original Internal Audit Report Form 19-03 and by the QMS Representative on the NCR Log (including the date closed).

The results of the internal audits and the follow up audits are reviewed by management at the annual Management Review meeting as per QMS-20 (Management Review) or more frequently, if required.

3 REFERENCES

Form 19-01 Annual Internal Audit Schedule
Form 19-02 Internal Audit Checklist
Form 19-03 Internal Audit Report
Form 19-04 Non-conformance Report
Form 19-05 Non-conformance Report Log
QMS-05 Document and Records Control
QMS-20 Management Review

4 APPENDICES

Not Applicable

1 PURPOSE

To document the procedure for describing how the QMS will ensure its continuing suitability, adequacy and effectiveness. To ensure the necessary information is collected for Top Management to review and to provide review output of any decisions and actions related to the QMS and maintain records of the reviews.

2 PROCEDURE

2.1 Management Review

QMS-09 Organizational Roles, Responsibilities and Authorities identify the management team for Top Management. A Management Review will be held once per year by Top Management to review the overall suitability, adequacy and effectiveness of the QMS. At a minimum, the Vice President Operations & Engineering and the QMS Representative must be in attendance at the Management Review meeting. The President & CEO PUC Services Inc. should be provided with a report if not available for the meeting.

The QMS Representative communicates directly with Top Management on the QMS and is responsible for:

- establishing the date for the Annual Management Review meeting
- forwarding notification of the meeting to participants
- forwarding the agenda for the meeting to the participant
- tracking the status of action items identified during Management Review meeting
- reporting to the Owner

2.2 Management Review Input

Top Management will review information in the agenda on Form 20-01, where applicable on:

a) Incidents of regulatory non-compliance
b) Incidents of adverse drinking water tests
c) Deviations from critical control point limits and response actions
d) Efficacy of the risk assessment process
e) Results of audits (internal and external)
f) Results of relevant emergency response testing
g) Operational performance
h) Raw water supply and drinking water quality trends
i) Follow-up action items from previous management reviews
j) Status of management action items identified between reviews
k) Changes that could affect the QMS
l) Summary of consumer feedback
m) Resources needed to maintain the QMS
n) Results of the infrastructure review
o) Operational Plan currency, content and updates
p) Summary of staff suggestions

q) New Business – Other issues that impact on the quality management system
r) Date of Next Meeting

2.3 Management Review Output

Management review outputs will include identification of specific actions items to address deficiencies, personnel responsible for delivering those action items and proposed implementation timelines. During Management Review, Top Management will provide a record of any decisions and actions related to:

- Improvement of the QMS and related procedures
- Improvement of the Operating Authority's ability to implement consistently the QMS
- Human and financial resource needs

A summary will be compiled on Form 20-02 for reporting to the Owner.

The QMS Representative will track the status of the action items identified during Management Review meeting and will report on this at subsequent meetings. The QMS Representative will track this on Form 20-01 by filling in the "status" column. A copy of Form 20-01 will be kept (as per QMS-05) as the minutes of the meeting with the "status" column left blank. The column will then be filled in by the QMS Representative as a means of tracking the status of the action items.

2.4 Recording of Management Review

Minutes of the meeting will be recorded on Form 20-01 and maintained as per QMS-05 Document and Records Control. These minutes will reflect the review inputs for the meetings. Copies of the minutes are distributed to Top Management by the QMS Representative.

The QMS Representative will ensure the results of the management review, the identified deficiencies, decisions and action items are conveyed to the Owner on Form 20-02.

3 REFERENCES

Form 20-01 Management Review Agenda & Meeting Minutes
Form 20-02 Report on QMS to Owner
QMS-05 Document and Records Control

4 APPENDICES

Not Applicable

1 PURPOSE

To document the procedure established for the Operating Authority to strive to continually improve the effectiveness of its Quality Management System through the use of the quality policy, audit results, corrective actions and management review.

2 PROCEDURE

Corrective action involves taking measures to eliminate causes of identified quality problems (e.g., related product, process or service) to ensure the problems do not recur.

Corrective action may be initiated as a result of the following indicators of a breakdown in the Quality Management System:

- Internal audits
- Management Review
- External audits
- Customer complaints
- Trends identified in management reports
- Springboard document review

Any employee can initiate corrective action by issuing a Corrective Action Report (CAR) Form 21-01.

The Issuer completes Part A of the CAR Form 21-01 and forwards the CAR to the QMS Representative. The QMS Representative will issue the CAR number and determine who is assigned as Team Leader to address the issue. The QMS Representative records the CAR in the CAR Log Form 21-02 and notes the CAR number on the report.

The Team Leader creates a cross-functional team which includes the Manager of the affected area (minimum of 2 people) and completes Part B of the CAR.

The Team Leader is responsible for the process which includes:

- describing and implementing the corrective action
- investigating who is involved in the corrective action
- determining the root cause of the problem or potential problem
- identifying actions required to correct the non-conformance
- identifying and making changes to documentation as per QMS-05 Document & Record Control
- ensuring that the necessary actions are taken in an appropriate timeframe
- completing the Corrective Action Report (Form 21-01)

The Team Leader forwards the CAR Form 21-01 to the QMS Representative to determine that the corrective action has been taken and is effective. The QMS Representative completes Part C of the CAR.

The QMS Representative reviews the CAR Log during Management Review and records if any further action is required.

CAR and CAR Log are maintained as per procedure QMS-05 Document and Record Control.

3 REFERENCES

Form 21-01 Corrective Action Report
Form 21-02 Corrective Action Report Log
QMS-05 Document and Record Control

4 APPENDICES

Not Applicable