Summary of BMP's

Treatment	Distribution
1. Efforts to reduce lead (incl. pH adjustment) 2. Algal blooms (record inspections, plan for hit, ways to reduce, consider continual monitoring data) 3. Optimizing treatment processes to reduce chemical and/or water consumption 4. Sign off on chemical deliveries (by operator) to ensure safe handling and proper offloading (or SOP) 5. CT calc – how to do 6. Filter efficiency – how monitor 7. How are calibrations scheduled? 8. Are verifications performed regularly 9. What process sampling program is in place? 10. Redundancy (equipment and/or treatment train) 11. Preventative maintenance program 12. Emergency equipment and alarm testing 13. Use work orders to assign and track maintenance activities 14. Implement process to track changes to plant manuals 15. Frequent data collection to enable operational trending 16. Set alarm thresholds to alarm before regulatory limit has been reached to allow for action to be completed 17. Document all corrective actions taken when responding to an alarm 18. Create SOPs for tasks (e.g. cleaning clear well) 19. Continuous monitoring of turbidity on SCADA 20. Ensure liquid chlorine is in spill containment 21. Keep records of calibration/verification in close proximity to the equipment so it can be easily referred to 22. Collect more samples than required 23. Set CCLs in excess of regulatory requirements 24. Establish timelines for completing work orders and track 25. Intake inspections and cleaning 26. In house lab tests 27. Operator training in procedures 28. Extra process sampling in plant 29. Condition assessments/capital projects 30.	1. How do you communicate DWWP/MDWL to contractors? 2. Provide WM commissioning plans to staff to oversee commissioning 3. Review WM commissioning documents to ensure completed properly 4. Dead end flushing/uni-directional flushing 5. Preventative maintenance schedules (hydrants, valves etc.) 6. Residual management 7. Leak detection 8. Sampling at best locations for HAAs, THMs and NDMAs 9. Discoloured water/aesthetic objective tracking 10. Backflow prevention by-law 11. Hydrant maintenance program/dip testing 12. Pipe assessments/asset management 13. GIS accuracy/updates 14. Water meter replacements 15. Install auto flushers for dead ends 16. Valve exercising program 17. Verify that Form 1s match work completed 18. Rotate sample locations (don't sample the same locations all the time) 19. Ensure staff have access to up-to-date maps and plans 20. If analyzers are used in the distribution system, record the daily max and min values in addition to the average daily value 21. Chlorine analyzer maintenance and calibration 22. Encourage certificate upgrades 23. Hydrant use by-law 24. Customer complaint response (timely and proper response) – and tracking of common cause events 25. Operator training in maintenance procedures 26. Ensure FAC collected with bactis 27. Lead sampling status/exemption/results 28. Pressure maintenance/CCP limits 29. Secondary disinfection – grabs vs. analyzer (process vs. compliance) or sample both as redundancy

Log Books/Recordkeeping	Security and Contingency
1. How do you record out-of-service equipment in log book 2. Maintaining accurate records during transition from paper to electronic logs 3. Provide training to staff on what information to record and how to record it to promote consistency 4. Implement system to ensure operators are accessing/using most current form 5. Log book review to ensure all tasks are being completed and documented 6. Log book protection at remote sites 7. Electronic log book access and protection 8. Electronic log book back ups – how access in event of cyber attack/internet failure etc. 9. Record retention requirements 10. Aligning retention times (municipal by-laws vs. Ministry requirements) 11. Moving to digital log books 12. Track changes and revision history in SOPs (how long is too long to keep in revision history? i.e. do need to track 10 years worth of revisions, or just the past few years?) 13. Frequency of data collection/logbook info 14. Where hard copy log books are stored and for how long 15. Ensure handwritten logs are legible 16. Chronological entries 17. Routine audits/checks of log book entries 18. Establish review period for documents/records to help keep them up-to-date 19. Maintain a signature page to have a record of each operator's signature and initials 20. Ensure policies are defined and communicated 21. Ensure ORO/OIC is recorded and communicated 22. Track on call and call out records 23. Ensure all directions from ORO are recorded in log book 24. Electronic maintenance program 25. Measures to prevent data falsification 26. Access to historical records (e.g. log books, lab reports etc) 27. OIT oversight (documenting who provided direction to OIT) 28. Decommissioning damaged logbooks 29. Procedure for late entry/log addendum	1. Have SCADA on it's own server 2. Not allowed to connect devices (i.e. no USB connections) to the plant computers 3. Require multifactor identification 4. Test cybersecurity with "attacks" (vulnerability assessment) 5. Password updating 6. Back up chemical suppliers/ensure have enough chemical 7. Service agreements for essential supplies 8. Building locks/security protocols (i.e. restricted access, cameras) 9. Regular emergency scenarios to test emergency plan 10. Back up plan for staffing shortages (i.e. pandemic, work stoppage) 11. Process to ensure former employees no longer have access to computer systems nor to facilities 12. Cybersecurity awareness training for all staff 13. Intrusion alarms for facilities 14. Plan in place in the event of a cyber attack (IT systems, SCADA backups) 15. Fencing around sites and posted signs 16. Join ONWARN and/or arrange for emergency back up from other municipalities 17. Regular patrol of all facilities, especially remote buildings/sample stations/well sites to ensure locked and secure 18. Provide training to staff on how to do work manually in event of a cyber security breach (i.e. where record data, where access hard copy procedures etc.) 19. Use VPN to access computer systems 20. Equipment redundancies 21. Skill/expertise redundancy (e.g. cross-training) 22. External hard drive to back up systems/documents 23. Visitor sign in 24. How many people have access to the system?

Storage	Planning and Management
1. Frequency of cleaning and inspections for water storage infrastructure 2. What is inspected? 3. Required/recommended storage capacity 4. Key performance indicators and action steps 5. Sufficient security at storage facilities (fencing, locks, restricted access etc) 6. Condition of storage asset and lifecycle planning 7. How do you ensure and monitor residuals within the storage asset? (water age) 8. How do you ensure adequate power /utility to the storage facility for monitoring purposes 9. Inspection plans 10. Plans for winter cycling of full cycles in towers to prevent freezing/ice accumulation (SOP) 11. Check air vents – free of obstructions and proper screen sizing on vents to stop insects etc. 12. Regular checks of reservoir hatches to ensure secure and locked 13. Ensure groundwater is not entering the reservoir 14. Not permitting fertilizer/pesticide use around reservoir (i.e. if public park located on reservoir, or adjacent to, don't allow Parks department to spray fertilizer/pesticides) 15. Ensure adequate storage for fire protection 16. Create SOPs for inspection/maintenance tasks (e.g. inspection and cleaning) 17. If DBP are an issue, extra monitoring of storage 18. Regular checks of cathodic protection 19. Routine checks of pumps 20. Collect more samples than required 21. Online monitors and re-chlorination 22. Offline condition assessments 23. Annual backflow device inspections 24. Ensure conformance with AWWA standards 25. Efforts to reduce DBP 26.	1. Considerations/long term planning for future growth 2. Operator retention/sufficient staffing 3. How plan for infrastructure replacement 4. Backup QMS Rep 5. Emergency line/number for residents 6. Annual reports provided to council 7. Upper management financial plans/asset management 8. How do you plan to have competent people in appropriate roles-succession planning? How verify competency? 9. ORO/On call staffing arrangements, including back ups 10. Emergency plans in place 11. Plan to ensure adequate staffing in high turnover situations 12. Prepare 10 year capital budget 13. Track water loss 14. Capacity assessments 15. Master Servicing Plan 16. Risk assessment 17. Water use study 18. Water conservation initiatives 19. Create SOP for operator ethics 20. Standard of Care training for councillors/top management 21. Infrastructure review – track action items and consider in budget 22. Set up schedules and reminders (e.g. sampling, maintenance etc) 23. Follow AWWA standard for system management 24. Procedures for how to communicate to public during water emergency 25. Operator monitoring (GPS, cameras, security, logs of entry/exit) to verify sampling activities 26. Operator calibration/auditing (baseline competency requirements, training, skills) 27. Documenting change/change management 28. Organizational chart adjustments 29. Budget/infrastructure plans/status of projects (does project address needs/priorities of system, BMPs) 30. Define roles/responsibilities outside of immediate department (top management, engineering/planning, council) 31. Implementation of action items from management review/action item status and assignment

Accreditation Suggestions/Improvements:

- Timing – overlap with MECP Inspection, pushed back with Accreditation Body
- Transition challenge, changing hands - Scope, $
- Open-minded, understand process, being prepared
- Helpful auditor feedback
- Unexpected price increase
- Certificate delay
- A.B change – communicated to clients, schedule changes
- More options
- Auditor rotation
- Terms and conditions – municipality has to sign
- Owner change challenges – multiple quotes, all different
- Pricing inconsistencies between bodies
- Communication between A/Band their contract auditors
- Accreditation certificates – not being issued timely
- Good auditor, knowledgeable
- Schedule, chasing to get
- Timing of audit, not done before expiry
- Communication – response
- Certificate issuance
- Helpful auditors
- Auditor flexibility
- Transparent auditor – no surprises
- Stay in scope
- Audit calibration
- Audit lengths – standardize (ie. Process – 2-day/3-day)
- Accreditation transparency ($, expectations)
- Procurement
- Auditor rotation
- Switch up auditors
- Admin changes to accreditation
- Contact changes
- Limited system audit when change OA
- Limited scope – change of OA ~ change of contact, get accreditation quickly to remain compliant, new OA ~ emeg accreditation
- Align accreditation cycle with MDWL/DWWP cycle, desktop every other year
- Auditor stay in scope
- Inconsistency between auditors
- Some auditors are persistent when asking for things even if they are not required
- More ability to select vendor
- Input into scheduling of audits
- Auditors making NC out of things that aren't really NC. (ie. Not having management review completed before the external audit)
- Consider a 5-year cycle
- Recognition of different systems
- Not enough auditors for flexible scheduling
- Operating Authority in some smaller systems distribution group is not always clear
- Have to spend a lot of time explaining how the system works to auditors
- What is the purpose of the different types of audits?