

Title: Sampling		Control Number: SLD 16a	
Revision: 2.0	Effective Date: Aug. 7, 2009	Section: SE & O&M	
Author: WESA, H. Dutaud & P. Solymos		Reviewers: Operational Top Management	Approver: E. Wu

1.0 Purpose

This procedure describes the sampling activities for Waterworks.

2.0 Scope

This procedure applies to the sampling activities for Waterworks related to process control and finished drinking water quality, including that required by SDWA regulations.

3.0 Definitions

- IMS – Information Management Section
- MOE – Ministry of the Environment
- O&M – Operations & Maintenance
- SE – System Engineering
- ORO – Overall Responsible Operator
- SDWA – Safe Drinking Water Act

4.0 Procedure

- 4.1 The Water Quality Regulatory Compliance and Non-Regulatory Compliance Flowcharts shows the sampling program in place for Waterworks.
- 4.2 Testing of samples shall be performed as per the Testing Procedure and as per SDWA current regulations.
- 4.3 The lead sampling program shall be handled separately, as per the **Community Lead Testing Program SOP** and as per SDWA current regulations.

Regulatory Sampling Schedule and Map

- 4.4 At least annually and as required, the Water Quality Coordinator (SE) and Waterworks Supervisor responsible for Water Quality (O&M) shall review, update, and document the schedule and

- sampling locations, and display results on the Map for regulatory sampling.
- 4.5 The Water Quality Coordinator (SE) shall review applicable regulatory sampling requirements, as per the **Regulation Tracking SOP**. Input from the execution of this procedure, and other Section's requirements, shall be considered when updating and documenting the schedule and map for regulatory sampling.
 - 4.6 The schedule shall include the applicable regulation, reference, frequency, schedule period, and number to sample, at a minimum.
 - 4.7 The schedule for microbiological sampling shall be documented by the Water Quality Coordinator (SE) on the 'Microbiology Sampling Schedule' sheet. The schedule for all other regulatory sampling shall be documented in the 'Regulatory Sampling' schedule by the Water Quality Coordinator (SE).
 - 4.8 Locations for sampling shall be documented by the Water Quality Coordinator (SE) on the 'Town of Markham Sampling Locations' map.
 - 4.9 The Manager of Operations and Maintenance and the Manager of System Engineering shall review and approve new issues or changes to the schedules and the map, to ensure functionality.
 - 4.10 The Water Quality Coordinator (SE) shall provide the schedules and map to IMS, who shall create work orders in the Maintenance database to reflect planned sampling.
 - 4.11 The ORO may, from time to time, increase the sampling beyond legislated requirements due to challenging conditions in the system. For example, known dead ends may be sampled for chlorine residual more frequently than other areas of the distribution system, especially in the summer months.

Collection of Regulatory Samples

- 4.12 The Waterworks Supervisor responsible for Water Quality (O&M) shall ensure qualified personnel are assigned to collect samples as required from the work orders, as per the **Maintenance SOP**.
- 4.13 For microbiological, inorganic, organic, nitrate, nitrite, lead, sodium, fluoride and trihalomethane testing, assigned personnel shall collect samples using sterile sample bottles.
 - 4.13.1 Appropriate sterile sample bottles shall be provided by the contracted accredited laboratory.
 - 4.13.2 Protocols for sampling, called 'York-Durham Regional Environmental Laboratory Table of Recommended Sampling

- Requirements', shall be provided to sampling personnel when issued.
- 4.13.3 Protocols for sampling shall be followed, as provided in the 'York-Durham Regional Environmental Laboratory Table of Recommended Sampling Requirements'.
- 4.13.4 Sampling shall be performed as per requirements in SDWA and applicable regulations.
- 4.14 For chlorine residuals, assigned personnel shall sample as per assigned work orders.
- 4.14.1 Sampling shall be performed as per requirements in SDWA and applicable regulations
- 4.15 The Chain of Custody Form shall be submitted as required documentation upon completion of sampling:
- 4.15.1 The sampling personnel shall record information in the work order, as per the **Maintenance SOP**, and submit the completed work order to the Waterworks Supervisor responsible for Water Quality (O&M) for review.
- 4.15.2 The Waterworks Supervisor responsible for Water Quality (O&M) shall submit a copy of the Chain of Custody form to the Water Quality Coordinator (SE).
- 4.15.3 The Water Quality Coordinator (SE) shall review the submission form and work order, then submit the work order to IMS for entry into the Maintenance database.
- 4.15.4 The Water Quality Coordinator (SE) shall file the Chain of Custody Form and the closed work order together.

Non-Regulatory Sampling

- 4.16 Non-regulatory sampling may include sampling for new development, capital works projects, infrastructure projects, and other projects.
- 4.17 Sampling requests for such projects shall be made by the appropriate Section Manager or other departments requesting sampling from System Engineering. As a result, the Water Quality Coordinator (SE) and the Waterworks Supervisor responsible for Water Quality (O&M) shall review the request.
- 4.18 If satisfactory, the Waterworks Supervisor responsible for Water Quality (O&M) or Water Quality Coordinator (SE) shall create the appropriate work order for sampling, as per the Maintenance SOP.
- 4.19 The Waterworks Supervisor responsible for Water Quality (O&M) shall ensure qualified personnel are assigned to collect required

- samples as stipulated in the work orders, as per the **Maintenance SOP**.
- 4.20 Assigned personnel shall collect samples using sterile sample bottles.
- 4.20.1 Appropriate sterile sample bottles shall be provided by the contracted accredited laboratory.
- 4.20.2 Protocols for sampling, called 'York-Durham Regional Environmental Laboratory Table of Recommended Sampling Requirements', shall be provided to sampling personnel when issued.
- 4.20.3 Protocols for sampling shall be followed, as provided in the 'York-Durham Regional Environmental Laboratory Table of Recommended Sampling Requirements'.
- 4.20.4 Sampling shall be performed as per requirements in applicable regulations.
- 4.21 For chlorine residuals, assigned personnel shall sample as per assigned work orders.
- 4.21.1 Sampling shall be performed as per requirements in applicable regulations.
- 4.22 Documentation shall be prepared as per 4.15.

Ad-Hoc Sampling

- 4.23 Ad-hoc regulatory samples may be required from time to time (such as after watermain isolation).
- 4.24 Such sampling requests for such projects shall be made by the appropriate Section Manager or other departments requesting sampling from System Engineering. As a result, the Water Quality Coordinator (SE) and the Waterworks Supervisor responsible for Water Quality (O&M) shall review the request.
- 4.25 If satisfactory, the Waterworks Supervisor responsible for Water Quality (O&M) or the Water Quality Coordinator (SE) shall create the appropriate work order for sampling, as per the Maintenance SOP.
- 4.26 The Waterworks Supervisor responsible for Water Quality (O&M) shall ensure qualified personnel are assigned to collect required samples as stipulated in the work orders, as per the **Maintenance SOP**.
- 4.27 Assigned personnel shall collect samples using sterile sample bottles.
- 4.27.1 Appropriate sterile sample bottles shall be provided by the contracted accredited laboratory.

- 4.27.2 Protocols for sampling, called 'York-Durham Regional Environmental Laboratory Table of Recommended Sampling Requirements', shall be provided to sampling personnel when issued.
- 4.27.3 Protocols for sampling shall be followed, as provided in the 'York-Durham Regional Environmental Laboratory Table of Recommended Sampling Requirements'.
- 4.27.4 Sampling shall be performed as per requirements in applicable regulations.
- 4.28 For chlorine residuals, assigned personnel shall sample as per assigned work orders.
- 4.28.1 Sampling shall be performed as per requirements in applicable regulations.
- 4.29 Documentation shall be prepared as per 4.15.

Upstream Sampling

- 4.30 The Region of York and the City of Toronto perform sampling as required by applicable regulations.

5.0 Associated SOPs

- SOP - Regulation Tracking
- SOP - Maintenance
- SOP - Community Lead Testing Program

6.0 References

- DWQMS Element 16 – Sampling, Testing and Monitoring
- SLD - Testing
- Process Flow - Water Quality Regulatory/Non-regulatory Compliance
- Regulatory Sampling (Schedule)
- Town of Markham Sampling Locations (Map)
- York-Durham Regional Environmental Laboratory Table of Recommended Sampling Requirements
- Chain of Custody Form

7.0 Records

- Completed work orders

- Regulatory Sampling (Schedules)
- Microbiology Sampling Schedule
- Town of Markham Sampling Locations (Maps)
- Community Lead Testing Program-Related Records
- Completed Chain of Custody Forms
- Residual Chlorine Sampling

8.0 History of Changes

Revision	Date	Description	By
2.0	Jul. 22, 2009	Sections 4.1, 4.4, 4.12, 4.15.2, 4.17, 4.18, 4.19, 4.22, 4.24, 4.25, 4.26, 4.29, 6.0	H. Dutaud / E. Wu