

## RMOW- MANNHEIM WTP GAS CHEMICAL SYSTEM OPERATIONAL REVIEW & SAFETY AUDIT

Delivering Value Through the Water Cycle: Source to Tap, Tap to Source™

### Overview

The Region of Waterloo, Water Services Division, embarked on an upgrade implementation program for the operational, maintenance, automation and alarming practices of gas chemical systems at the Mannheim Water Treatment Plant. A total of four (4) process chemical systems at the Mannheim WTP and Reservoir facility require review, including:

- Ozone
- Anhydrous Ammonia
- Gas Chlorine
- Liquid Oxygen

C3 Water Project Objectives and deliverables include:

- Project initiation, collection and review of background information. In conjunction with a series of site visits with operations and maintenance staff, C3W reviewed background information and prepared a draft understanding of the existing failsafe operation of each of the gas chemical systems.
- Preparation of Technical Memoranda. Technical Memorandum (TM) for each Mannheim WTP chemical system were developed to document current failsafe operation and safety monitoring with respect to potential hazards. Industry Health and Safety (H&S) requirements specific to each operating system were also included.
- Failure Mode, Risk, Consequences and Mitigation Review. C3 Water facilitated a series of workshops in which each chemical system was reviewed to identify potential failure modes. The relative risk of the failure happening and the consequences of each failure were discussed and monitoring and mitigation options identified. Findings were incorporated into the updated TM's for each chemical system describing the existing and additional desired features of failsafe operation and safety monitoring for each system.
- Recommended Upgrades for Failsafe Operation and Safety Monitoring. C3W prepared a draft summary TM documenting all of the proposed upgrades identified to the chemical systems at the Mannheim WTP. Any of the deficiencies found in existing record documentation were also identified in this TM.
- Update Mannheim WTP Safety Equipment Layout Drawing. C3 Water prepared an updated plant layout drawing for the Region, incorporating the location of all gas safety monitoring systems.



*Ozone Generator*



*Anhydrous Ammonia Storage Tank*

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