Attendees:

Joseph Janeczek – Johnson Controls
Rich Mator – Johnson Controls
Ryan Suennen – Tyco Fire Protection Products
Jeff Danko – Tyco Fire Protection Products
Heather Ziegelbauer – CH2M
Dave Finney – CH2M
Kristin DuFresne – WDNR
Judy Fassbender - WDNR
Jim Killian - WDNR
Conor Neal – US EPA
Kyle Winslow – CH2M
Angie Carey - WDNR

On December 20, 2017, US EPA, WDNR, and Tyco/Johnson Controls representatives met in Milwaukee. Tyco asked for the meeting in its *September 2017 Pilot Dye Test Results Technical Memorandum and Meeting Request* submitted November 17, 2017. The purpose of the meeting was to discuss the pilot dye test methods and results, alternatives for the full scale dye test, an update on the stormwater improvement project, and to discuss aspects of the five-year review, including sediment sampling, groundwater sampling, and the ongoing pump down program.

Tyco presented data from pilot dye test locations T1, T2, and T3 in the turning basin, eastern main channel, and western main channel, respectively. The results are also presented and summarized in the November 17, 2017 submittal. Tyco calculated dye dilution factors of >400x within 10' of the two injection points in the main channel. Tyco also reported in the meeting that visibility within the Menominee River was limited to the top ~5' below the surface, and that dye was not visible at concentrations of 10 ug/L as reported by the manufacturer. In the November report, Tyco concludes that "the full-scale dye test is not practicable and will not provide the necessary certainty to assess barrier wall performance." Since the objective of the full scale dye test is to determine if any portions of the wall in the Main Plant are leaking below the water line, the EPA and WDNR agreed with Tyco's conclusion during the meeting.

To replace the dye test, Tyco presented alternative leak investigation methods for leaks through and beneath the barrier wall. Among the alternatives proposed, those retained for further evaluation after discussion between all parties are: direct arsenic sampling using passive samplers along the barrier wall, a pore water investigation supplemented with vibrating piezometers to measure locations of groundwater upwelling, measuring total dissolved solids in the near-barrier wall water column, and a temperature differential survey. Tyco committed to planning and implementing the dye test alternative in 2018.

Tyco provided an update on the Stormwater Improvement Plan for remaining activities to be completed in 2018. These activities include catch basin repair and lining, installation and modification of a catch basin near Building 14 and another near Building 70, installation of a gate valve at outfall 5 and 6, seam sealing in the areas of outfalls 3, 5, and 6. Tyco also reaffirmed that post-improvement stormwater sampling will be conducted for comparison to the *Outfall Arsenic Investigation, Spring and Summer 2015 Sampling Event Summary* submitted on October 30, 2015.

The discussions on five-year review activities involved the planned sediment and groundwater sampling events in 2018, and continuation of the pump down program. EPA notified Tyco that it is retaining contractor support to collect split samples from Tyco during the sediment sampling and requested that Tyco coordinate with EPA through the planning process.

Tyco notified EPA that groundwater quality sampling is planned for April and October, if necessary. As with last Fall, Tyco plans to re-evaluate the need for bi-annual sampling after the April event. Due to the discovery of Perfluorinated Chemicals (PFCs) at Ansul's fire training school in Marinette, WI, EPA requested that Tyco add PFCs to the list of additional parameters in the 2018 groundwater quality sampling event. EPA took the following notes from Tyco's description of historic PFC usage at the Stanton Street Facility:

- Fluorosurfactants (which may contain PFCs) have been blended into Aqueous Film-Forming Foams (AFFF) at Stanton Street since around the early-to-mid 1970s. Historically, Ansul/Tyco purchased those fluorosurfactants, which may have contained long-chain PFCs, from others and did not make them at Stanton Street.
- Products at Stanton St that have contained PFCs include AFFF and Alcohol Resistant-AFFF (AR-AFFF).
- Examples of products blended at Stanton St. that are not believed to contain PFCs include dry agents and high expansion foams.
- Historically, there was a training field at Stanton St but that pre-dated the use of AFFF as a fire fighting agent.
- No activities suggest application to the ground or groundwater occurred at the facility. Interviews with employees are still being conducted to verify this.
- Since the mid-2000s a 3rd party that Tyco leases to does manufacture fluorosurfactants at the facility.
    - Tyco clarified that this is ChemDesign.

Tyco inquired about who would be responsible for the cleanup of PFCs if it is found. EPA said that under RCRA, the owner of the facility is responsible for cleanup of contamination. Tyco also asked for clarification from EPA after it was stated that they would be held to State of Michigan water quality standards since the waters that Tyco discharges to are shared by Wisconsin and Michigan. Tyco committed to providing EPA a list of wells where sampling will be conducted based on where PFCs were handled and to sampling the waste water treatment plant effluent.

The discussion about the pump down program was related to three topics: winter water level management, a root cause analysis for recharge into the Salt Vault (SV) and 8th Street Slip (8SS), and alternative methods for maintaining groundwater elevations below the Target Elevation. Tyco committed to continued operation, 24 hours per day, 5 days per week of EW-2 and EW-3 during the winter months. Each well can pump at ~0.5 gallons per minute and water will be sent to the groundwater treatment system for treatment. Tyco will conduct a clean out of all Site extraction wells in January to improve communication with the surrounding aquifer and potential improve well efficiency.

Tyco's root cause analysis estimated individual recharge rates into the SV and 8SS. Using design specifications of the slurry walls, the river-facing barrier walls, and asphalt, Tyco estimates that 0.8 gpm and 0.6 gpm infiltrate into the SV and 8SS, respectively. This compares to the measured recharge rates of 1.1 gpm and 0.4 gpm into the SV and 8SS, respectively, within the first two weeks after shutdown in October and November 2016. Tyco believes that work completed in 2017 in the Stormwater Improvement plan may reduce surface infiltration into the SV.

Tyco is considering multiple alternative approaches for long term groundwater level management in the PDP, including:

- Seasonal direct disposal
- Year round direct disposal
- Partial disposal through the GWTS

- Pump and evaporate
- Phyto-transpiration
- In-situ sediment stabilization
- Former SV/8SS bisecting slurry wall
- RO-based pre-treatment
- Ultrafiltration-based pre-treatment
- GWTS volume expansion
- Zero valent iron/sulfate reduction

Tyco plans to continue evaluation of the latter five options, and EPA asked Tyco to add seasonal direct disposal for the 8SS back into consideration based on observed groundwater levels remaining below the Target Elevation throughout the winter. Tyco will submit to EPA and report on January 12, 2018 summarizing their findings of each evaluation.