NPDES Permit Compliance: Chlorine Residual Limit Exceedance

Board of Directors Meeting
October 14, 2020

Delta Diablo

Chlorine Residual Limit Exceedance
Overview

- On September 8, 2020, the District incurred a minor exceedance of the effluent chlorine residual limit in its NPDES permit (0.0 mg/L)
- Staff notified the Regional Water Board and indicated this was likely due to “operator error”
- No water quality impacts in the Delta receiving water or risks to public health
  - Chlorine limit was exceeded for 1 minute at 0.12 mg/L (0.004 pounds)
- District’s last NPDES permit exceedance occurred on December 3, 2020 (span of 21 months)

Chlorine Residual Limit Exceedance
Background

- Following treated effluent disinfection with chlorine, sodium bisulfite (SBS) is used for “dechlorination” to ensure residual chlorine is removed prior to discharge
- Two automated SBS analyzers (duty, standby) are used to control SBS feed pumps and continuously monitor and maintain excess SBS residual
- These critical SBS analyzers are checked daily and frequently calibrated in accordance with established District standard operating procedures (SOPs)

Chlorine Residual Limit Exceedance
Preliminary Findings

- NPDES permit exceedance occurred when an operator attempted to calibrate the SBS analyzers in a manner that did not conform with established SOPs
- Because the SBS analyzers were not properly functioning during the calibration process, an insufficient SBS dose was applied
  - Limited to a duration of 1 minute, because the effluent flow diversion gate closed automatically once chlorine was detected
- Staff conducted detailed root cause investigation
  - Issue No. 1: Omission of critical step by operator during SBS analyzer calibration procedure
  - Issue No. 2: Two SOPs in place with differing procedures for SBS analyzer calibration

Regulatory Compliance Event
Root Cause/Corrective Actions

- **Issue No. 1** – Omission of critical step by operator during SBS analyzer calibration procedure
  - **Root Cause**: Lack of operator awareness and adherence to established SOPs with insufficient reminders at local station
  - **Corrective Actions**:
    1. Revise SOP to require positive confirmation of SBS analyzer mode and configuration prior to proceeding with calibration
    2. Add signage at the SBS analyzer station to ensure only the unit being calibrated is offline
- **End Result** – Operational status of both SBS analyzers is established prior to calibration, and visual reminders are provided to Operators locally to ensure proper performance of each step in the SOP

Chlorine Residual Limit Exceedance
Root Cause/Corrective Actions

- **Issue No. 2** – Two SOPs in place with differing procedures for SBS analyzer calibration
  - **Root Cause**: Presence of multiple, overlapping SOPs contributed to procedural deviation in performing the critical SBS analyzer calibration task (Note: Both SOPs, if followed, would have prevented permit exceedance).
  - **Corrective Actions**:
    1. Review existing SOPs and develop and adopt a single SOP that effectively manages regulatory compliance risks during the SBS analyzer calibration task
    2. Conduct required training to ensure Operations staff properly executes task using updated SOP
- **End Result** – Mitigate regulatory compliance risk during SBS analyzer calibration by improving SOP clarity and ensuring consistent application