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Sydney Water Corporation 2023 Operational Audit (your ref: D23/12745)

Dear Ms Coco

Thank you for writing about Sydney Water Corporation's Operating Licence audit 2022-23.

Recommendations for audit:

- Review procedures to ensure timely and appropriate debrief of incidents
- Review the installation and operation of emergency pre-treatments at Warragamba and Orchard Hills, and progress on permanent upgrades
- Review Sydney Water's control of recycled water cross connections, including engagement with NSW Fair Trading, and actions to reduce cross-connection risk
- Review the progress on consistency of controls for critical processes
- Review the progress on prioritisation of maintenance and renewal of assets

NSW Health maintains an effective and open relationship with Sydney Water at officer and strategic levels. Regular meetings provide the opportunity to discuss matters of mutual concern. NSW Health is satisfied that Sydney Water has considered water quality and public health risk under the Operating Licence and Memorandum of Understanding for matters raised during the audit period. NSW Health expects that Sydney Water will maintain a process of review and audit to confirm compliance with the *Australian Drinking Water Guidelines* and *Australian Guidelines for Water Recycling*.

Sydney Water continues to engage with NSW Health on the management of drinking water quality and recycled water. Over the audit period NSW Health participated in risk assessments for nine water filtration plants (and associated networks), three recycled water schemes, the Prospect clear water tank roof tears, the extension of the Sydney Desalination Plant operation to manage public health risks and emergency dosing of Prospect Reservoir.

During the audit period, Sydney Water and NSW Health have agreed an approach to implement the updated public health risk matrix, which includes realignment with the matrices of contract plants. These actions are in response to the 2019-2020 audit recommendation on the corporate risk matrix.

Sydney Water has made good progress with the recommendation for a procedure to track and respond to reservoir roof inspections identified in the 2021-2022 audit, and has updated NSW Health. The North Richmond network reservoir was identified as the only network reservoir that had not been inspected in the last 12 months and has been included for the current year.

Extreme weather and complex events involving close collaboration between Sydney Water and WaterNSW highlighted the strong and effective operational relationships between the two organisations. Consequences of events were minimised or avoided due to knowledgeable staff working under fatigue conditions to ensure the protection of public health. Deteriorating raw water quality was safely treated, at or beyond water filtration plant design limits, by highly skilled Sydney Water operators and engineers.

Sydney Water provides water quality reports to NSW Health and notifies incidents in accordance with agreed protocols. NSW Health is satisfied that Sydney Water has effectively managed incidents that were reported during the audit period. NSW Health notes that the debrief for the July 2022 incident is yet to be completed. NSW Health recommends the auditor review policies and procedures to ensure timely and appropriate debriefs are conducted following incidents.

In July 2022 changes in the water quality leaving Prospect water filtration plant were observed by Sydney Water, and investigations identified a broken seal around the treated water pump and a large tear in the clear water tank roof that allowed ingress from local rainfall. Sydney Water maintained close communication with NSW Health and responded by increasing monitoring and chlorine dosing while organising the repair to ensure no impact to public health. The repair was completed in May 2023, as it required changes to the operation of the clear water tanks and diversion of contractors from the Potts Hill reservoir repair (raised in the 2020-2021 audit).

In July 2022, a major rainfall event impacted the water quality in Lake Burragorang, posing risks to water quality and treatability. Close communication with NSW Health and WaterNSW leading up to and during the rain event ensured safe drinking water continued to be delivered to consumers. Pre-emptive configuration changes were carried out to avoid potential water quality or treatability impact including rezoning some areas, increasing production from the Sydney Desalination Plant, supplying the majority of Sydney directly from Prospect Reservoir rather than from Warragamba Dam, extended resourcing plans and emergency projects to manage risks in the interim period while permanent upgrades are progressed.

- At Orchard Hills, the limited capacity of the sludge lagoons at the plant restricted the plant's ability to manage challenging source water quality in the event, as short run times and frequent backwashing would lead to a spill of the lagoons. Sydney Water conducted extensive jar test and pilot plant trials to optimise chemical dosing, and adjusted operations including supernatant return to reduce the solids load to the filters. Sydney Water put out conserve water messaging and prepared communication for a boil water alert if required in consultation with NSW Health.
- At Prospect, the rising manganese in Lake Burragorang presented a risk of discoloured water. While Prospect water filtration plant has treatment to reduce manganese, supply chain delays with chemical import meant there was insufficient chemical available to treat the elevated manganese. Raw water was sourced from Prospect Reservoir and the Upper Canal rather than from Lake Burragorang to avoid the elevated manganese and impacts of the major rainfall event.
- At Nepean, Sydney Water adjusted operations based on the prior incidents to improve plant production and reduce the solids load to the filters. Sydney Water also worked to quickly reinstate filters that were offline for maintenance and introduced emergency tankering and worked with the major customer to reduce demand and help maintain supply in the network. Sydney Water prepared conserve water messaging in consultation with NSW Health.
- Sydney Water has since installed emergency pre-treatment projects at Warragamba (ACTIFLO system) and Orchard Hills (refurbished sedimentation tank) to mitigate risks in the interim while upgrades are implemented. NSW Health recommends the auditor review the installation and operation of these pre-treatments, and progress on permanent upgrades.

In May 2023, Woronora water filtration plant was shut down due to increased filtered water turbidity. Investigations identified an issue with the chemical dose rate due to an unapproved change to the supervisory control and data acquisition (SCADA). Sydney Water notified NSW Health,

isolated and backwashed the filters, and rezoned some areas to reduce demand on the treatment plant while bringing the plant back online to ensure no impact to public health.

In May 2023, Sydney Water identified a cross-connection in the dual reticulation area impacting multiple properties following a customer complaint. Investigations identified that the recycled water had been connected to both the drinking water and recycled water services, due to a plumbing error. Sydney Water worked with the building manager and NSW Health to rectify the plumbing and provide information to residents. Sydney Water is also engaging with NSW Fair Trading, as the regulator for plumbing inspection and certification. NSW Health raised potential risks related to backflow and cross-connection of recycled water and drinking water services in the 2018-2019, 2019-2020 and 2020-2021 audit letters. NSW Health recommends the audit consider Sydney Water's control of recycled water cross connections, including engagement with NSW Fair Trading, and supports actions to address this risk.

In June 2023, an issue with the joints at the Prospect Reservoir connection to the inlet channel of Prospect water filtration plant was identified. Sydney Water worked with Water NSW to turn off Prospect Reservoir and reinstate supply from Warragamba while investigations and repair progress. While there is no immediate risk to water quality, the unavailability of Prospect Reservoir limits supply options if water quality in Lake Burragorang is impacted by rainfall, and has also delayed planned maintenance of the Warragamba pipelines.

In the 2021-2022 audit, NSW Health recommended the auditor review the consistency of controls for critical processes including interlocks across plants and Sydney Water's process for prioritising and addressing outstanding issues with water filtration plant and network assets. Participation in risk assessments and interaction in incidents has highlighted that ongoing work is required to ensure consistency of controls between Sydney Water and contract plants, and to complete outstanding maintenance/repairs. In addition to the incidents raised, the North Richmond raw water pumping station upgrade, reservoir renewal, SCADA upgrade and filter refurbishment are still outstanding. At Nepean, the temporary chlorination system is still in place and the roughing filters (which were manually cleaned in the 2022 incidents) require overhaul. At Orchard Hills, several reservoirs have been identified for urgent repairs due to asset condition. At Macarthur, the disinfection critical control point does not have an interlock. At Cascades, the chlorine gas system renewal has been delayed. NSW Health recommends the audit consider progress on consistency of controls for critical processes across plants, and prioritising and addressing outstanding issues with assets. NSW Health strongly supports actions in these areas.

Thank you again for writing. For more information, please contact Dr Katrina Wall, A/Manager Water Unit, at katrina.wall@health.nsw.gov.au or on [REDACTED]

Yours sincerely

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Dr Kerry Chant AO PSM
Chief Health Officer and Deputy Secretary, Population and Public Health