

**Independent investigator recommendations and
compliance actions required by the Office of the
Water Supply Regulator—North Pine Water
Treatment Plant fluoride incident**

June 2009

Prepared by:
Office of the Water Supply regulator
Department of Environment and Resource Management
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Contact (07) 340 43070 or email <communications@derm.qld.gov.au>

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Summary of Outcomes from Investigations into the North Pine Water Treatment Works Fluoride Incident – April 2009

The table below represents a summary of the recommendations from Independent Investigators Report on the Fluoride Dosing Incident and Compliance Action required by the Office of Water Supply Regulator

Findings	Cause/Issue	Recommendation	Responsibility	Compliance Actions required by Office of the Water Supply Regulator
Equipment failure	Erratic flow signal from Treated Water Flow meter caused fluoride dosing to start	1. Ensure that erratic performance in future cannot initiate dosing and that a system alarm is incorporated	Seqwater	Seqwater to review and revise the procedures for: <ul style="list-style-type: none"> re-starting the water treatment plant after shut down (commence review by 1 July 2009, revise procedure by 31 August 2009). Train operational staff and implement this procedure (by 30 September 2009) responding to alarms, particularly when the SCADA system is monitored remotely at Mt Crosby (commence review by 1 July 2009, revise procedure by 31 August 2009). Train operational staff and implement this procedure (by 30 September 2009) ensuring fluoride dosing facilities are isolated during any water treatment plant shut down (by 30 September 2009). Instruction to ensure fluoride dosing facilities are isolated during shut down has been issued.

Findings	Cause/Issue	Recommendation	Responsibility	Compliance Actions required by Office of the Water Supply Regulator
		2. Urgent maintenance of flow meter to reinstate accurate performance	LinkWater /Seqwater	<p>As the plant will not be back online until 30 September 2009, all of these actions will be in place prior to this date. LinkWater to replace the faulty flow meter (commenced, and to be completed by 30 September 2009).</p> <p>Seqwater to collaborate with LinkWater to replace the faulty flow meter (commenced, and to be completed by 30 September 2009).</p> <p>Seqwater and LinkWater to improve communication protocols and responsibility on any shared infrastructure (commence review immediately, and to be completed by 31 December 2009).</p>
Control System Interlocks not functioning	1. Despite flow switch being disabled the dosing system was still operable	1. Control System should be modified to ensure compliance with Water Fluoridation Regulation in respect of interlocks that ensure that the dosing plant cannot operate with disabled or non-functioning flow devices.	Seqwater	<p>Seqwater to review and revise hazard assessments and procedures. This should address amendments to emergency response plans and SCADA alarms and procedures relevant to water fluoridation processes:</p> <ul style="list-style-type: none"> • revise priority documentation (control systems, operational manuals, etc.) to ensure the design plans and procedures use consistent nomenclature and reflect all additions and modifications made to the system (commence by 1 July 2009, priority documentation

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	<p>2. The fluoride dosing system is not well integrated into the overall plant control system</p>	<p>2. An additional interlock between treated water pump status and the fluoride dosing system should be incorporated.</p>		<p>to be completed by 31 December 2009, and asset identification and standard nomenclature by 31 December 2009)</p> <ul style="list-style-type: none"> develop a process to ensure plans and procedures are revised periodically or as modifications occur (by 30 September 2009). <p>Seqwater to improve control system interlocks between the flow meter and flow switch of the fluoride dosing facility (commenced, and to be completed by 30 September 2009).</p> <p>Seqwater to interlock the control systems for the treated water pumps and fluoride dosing facility (commenced, and to be completed by 30 September 2009).</p>
<p>System Operating Procedures inadequate or not adhered to</p>	<p>1. Flow Switch was disabled by maintenance staff and the action was not recorded or communicated effectively.</p>	<p>1. System Operating Procedures should be thoroughly reviewed and re-structured if necessary to incorporate the fluoride dosing system and its operation. This review must incorporate a review of all procedures</p>	<p>Seqwater</p>	<p>Seqwater to include in its Integrated Management System (IMS) routine internal audits of fluoride dosing procedures in consultation with the regulator (by 30 September 2009). This will contribute to Seqwater's third party accreditation of its IMS. First round of audits to be undertaken (by 31 December 2009).</p>

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	2. Fluoride Alarm was not responded to	2. Operations and Maintenance staff should be instructed in the revised procedures 3. Provide supplementary operator training and instruction on the installed fluoride dosing equipment, its control philosophy and the importance of alarm response procedures		Seqwater to enforce operator training with respect to fluoridation of drinking water and protocols and processes for managing chemicals including fluoride used for drinking water treatment (commence immediately). Seqwater to undertake further intensive training and monitoring to improve the understanding of the control and operation of the fluoridation process. This should include improved documentation of the fluoridation plant operation (commence immediately, and to be completed by 31 December 2009).
Regulatory requirements not adhered to	Inadequate investigation and reporting of identified fluoride overdosing (Form 4a)	1. Operations staff should be instructed on the requirements of the legislation in respect of the dosing of fluoride and other treatment plant operations 2. Procedures should be instituted to ensure that clear reporting lines are established internally to the operations group.	Seqwater	Seqwater to undertake training of staff on the obligations and responsibilities relating to drinking water quality management under the Water Supply (Safety and Responsibility) Act 2008 (commence immediately, and completed by 31 December 2009). Seqwater to develop communication procedures including: <ul style="list-style-type: none"> • between operational staff and those responsible for reviewing water quality monitoring results (by 31 December 2009)

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				<ul style="list-style-type: none"> operator, supervisor and managerial levels of communication with LinkWater, specifically in relation to shared assets and responses to real or potential water quality issues (by 31 December 2009).
Failure to identify water flow direction	Incorrect notification to consumers of the potential for having received contaminated water	1. Institute procedures to ensure thoroughness of data analysis for problem identification	Seqwater	Seqwater to review record keeping practices and train staff directly involved with fluoridation record keeping (by 31 December 2009).
Fluoride Dosing System Design	Fluoride was able to be delivered without buffer in the system	1. A design review should be undertaken to specifically investigate if an alternative, less risk prone, dosing point can be identified.	Seqwater	Seqwater to investigate a new fluoride dosing location and dedicated flow meter located within Seqwater's assets in the North Pine Water Treatment Plant to ensure each entity has control of its assets it needs to meet its accountabilities for water quality (commence by 1 July 2009, and to be completed by 31 December 2009).

The table below represents a summary of the recommendations from Independent Investigators Report relating to overall Water Supply System management.

Findings	Cause/Issue	Recommendation	Responsibility
Incident Management failed to identify the mode of failure	The management of the incident was co-ordinated well though still failed to correctly identify the consumers affected in the first instance	DERM and QH should work together with the Grid participants to modify the Incident Management process. Such modification could include the establishment of a water quality incident management specialised group	DERM / QH
Reduced consumer confidence in Water Quality	The fluoride dosing incident	<ol style="list-style-type: none"> 1. DERM should give careful consideration to the development of a Water Quality Monitoring and Reporting system which is co-ordinated across the water supply grid. There should be a both a water service provider focus and a regulatory focus to this initiative 2. Laboratory capacity and reliability should be assessed with reference to the existing work commissioned by QWC 	DERM – The Water Grid Manager has begun work in this area
Need for improved integration of management systems	The development and approval of Drinking Water Quality Management Plans is a requirement of current regulation and for SEQ is to be implemented by July 2011	<ol style="list-style-type: none"> 1. It is recommended that the regulated date for approval of DWQMPs by water service providers be brought forward 2. Further there should be an integrated DWQMP for the SEQ water grid 	<p>DERM in consultation with QH and water service providers</p> <p>DERM</p>