

**Table 3: Recommendations from the 2014 LMWUA WTP Audit report** (the status label from Table 1 is used to indicate progress; completed items in *italics* have been completed prior to the last report, whereas shaded only items have been completed since the last report)

ID	Area	Issue	Recommendation	Priority	Status
MEN001	<i>Information systems</i>	<i>Daily plant operational data sheets are currently stored in an electronic format at the council office. However, the collected data is not utilised to identify possible efficiency improvements</i>	<i>Utilise plant operational data to optimise chemical dosing and plant performance (ie monitor plant flows and configurations and chemical usage trends and compare to water quality)</i>	<i>High</i>	<i>C</i>
MEN002	Information systems	Currently there are no standard operating procedures that exist for the plant. General operating procedures are being developed in unison with the alliance	Develop operating procedures that cover the following areas: <ul style="list-style-type: none"> <li>• Plant operations</li> <li>• Routine/scheduled maintenance</li> <li>• Plant troubleshooting</li> <li>• Laboratory tasks/procedures</li> </ul>	High	I
Note: NSW Health engaged Hunter H2O to develop 12 SOPs. Remaining required SOPs still to be developed, at Council's expense.					
MEN003	Information systems	Instantaneous and daily chemical dose rates are currently not monitored or compared to instantaneous and daily plant flows.	<ul style="list-style-type: none"> <li>• Perform daily chemical drop rates. This will allow operators to monitor pump performance and compare against instantaneous plant flow rate to calculate chemical dose rate</li> <li>• Record daily (24 hr) chemical usage and plant flow. This will allow actual chemical dose rate to be calculated</li> </ul> <p>This information is useful for plant performance optimisation and troubleshooting</p>	High	I
Note: Drop tests are being performed, however daily chemical usage not yet recorded/calculated. The Automation Audit identified additional instrumentation required (such as storage level indicators/scales) to monitor chemical usage online; <b>implementation cannot be completed before the construction phase, DPIE advised that funding for the WTP upgrade is likely to be provided – the preparation of a Business Case for the Concept Design is outstanding to initiate funding.</b>					

MEN004	Information systems	Currently, no equipment maintenance plan exists	Develop an equipment maintenance plan that covers: <ul style="list-style-type: none"> <li>• Equipment scheduled and reactive maintenance</li> <li>• Critical spares list</li> <li>• Protocol for identifying failed equipment and response</li> </ul>	High	I
Note: O&M schedules as part of the NSW Health support project prepared; critical spares list to be formalised; protocol for identifying failed equipment/response to be developed.					
MEN005	Information systems	Plant pressure vessels currently do not have calibration certificates displayed	Perform pressure vessel calibration and display certificates on site.	High	C
MEN006	<i>Process unit – Aeration, coagulation</i>	<i>Poly aluminium chloride and potassium permanganate are both dosed through the same diffuser into the top of the aeration stairway</i>	<i>Perform jar tests to determine optimum coagulant dose rates and mixing configurations.</i>  <i>Investigate (by performing jar tests) using separated dosing diffusers for improved efficiency of both coagulation and metal removal</i>	Medium	C
MEN007	Wash water recovery	Wash water is directed to the sedimentation ponds for recovery. A concentration of contaminants unable to be removed in the sedimentation process may occur increasing the load on the filters	Consider a sedimentation stage with long residence times prior to returning the wash water to the inlet works. This may be achieved through installing baffles in the lagoon to reduce short circuiting	Medium	I
Note: Is considered as part of the WTP Upgrade (current stage – concept design); however <b>implementation cannot be completed before the construction phase, DPIE advised that funding for the WTP upgrade is likely to be provided – the preparation of a Business Case for the Concept Design is outstanding to initiate funding.</b>					
MEN008	<i>Sludge handling</i>	<i>Sludge is pumped out of the sedimentation ponds and disposed of onsite</i>	<i>Sample and test the sludge prior to removing from the lagoon to ensure it is appropriate to apply/dispose on site. The sludge should be tested for metals, organics, pH and moisture content</i>	High	C
Note: the sludge is being carted to the tip, biosolids testing for disposal at the tip is not required.					
MEN009	<i>Iron and manganese issues</i>	<i>The plant experiences high manganese levels</i>	<i>Perform jar testing to determine optimum manganese removal dosing configurations</i>	High	C

MEN010	Safety	The eyewash station experiences low pressure.	Investigate methods to maintain a higher pressure in the eyewash station water line. This may include: <ul style="list-style-type: none"> <li>• Booster pump</li> <li>• Constant pressure valve</li> </ul>	High	C
MEN011	Security	The clear water tank lids/covers are unsecured.	Ensure access to the treated water tanks are secured and locked	High	C
MEN012	Security	Critical equipment is currently exposed	Install a door with lock on the existing treated water delivery pumps to reduce risk of pump damage	High	C
MEN013	Signage	The plant entrance gates do not contain the appropriate signs	Erect signs on the entrance gates that display the following information: <ul style="list-style-type: none"> <li>• Chemical hazard signs of the chemicals contained on site</li> <li>• Plant contact details</li> </ul>	High	C
MEN014	Reservoir hypochlorite	The sodium hypochlorite dosing line and dosing point is exposed and unsecured. There is the potential for damage for damage, contamination or vandalism	Cover and secure the dosing line and dosing point.	High	C
MEN015	Reservoir hypochlorite	The sodium hypochlorite bulk storage tank and fill point is not currently bunded. Any chemical leaks/spills will be unable to be contained	Install a chemical bund in the hypochlorite dosing room. Consider constructing a bunded fill point for the delivery vehicle	High	C