



**SHOALHAVEN STARCHES PTY LTD IMPLEMENTATION PLAN FOR RECOMMENDATIONS
 IDENTIFIED IN THE ODOUR AUDIT CONDUCTED BY GHD**

Administrative Items 1-7					
Item No	Priority	GHD Reference	GHD Recommendations 14.2	Implementation Plan	Implementation Timing
1	1A	14.2.7	Modify the irrigation and wastewater management procedures to take into account the results of the odour emission modelling conducted during the audit. In particular, consider procedures to control the high odour emission rate associated with spray irrigation.	1. Oxidant introduced at end of lines when required as per procedures. 2. Recirculated wastewater to lime tank 3. Upgrade nozzles on pivot sprinklers. 4. Manage ponding as per procedures. 5. Sulphuric acid dosing – controlling biological activity. 6. Manage irrigation activity as defined by meteorological conditions.	Completed Completed Completed Completed Completed
2	1A	14.2.1	Develop and implement an environmental management system that is consistent with AS/NZS ISO 14001:2004. Incorporate the recommendations of this audit into the environment management plan to be prepared as part of the EMS.	Improve Environmental Management System and implement	Commenced October 07 Plan Complete December 07 Training completed January 08 Full implementation December 08
3	2A	14.2.8	Ensure that all personnel receive annual refresher training in accordance with Shoalhaven Starches training requirements.	Annual refresher training ongoing.	Commenced October 07 Plan Completed Dec 07 Refresher training to commence January 08 All refresher training completed by December 08 then ongoing.



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4	3A	14.2.2	Consider employing an environmental professional to support the Technical & Environment Manager. The roles of this person could include responsibility for the EMS and, through that process, foster a systematic approach to proactive environmental management at Shoalhaven Starches.	Employ environmental professional.	Completed December 07
5	4A	14.2.5	Prepare and implement a procedure for plant housekeeping. The primary aim of the procedure would be to control odour generation from equipment and infrastructure including exhaust ducts, drains and pump wells and in areas where spilled raw materials and product might accumulate.	Incorporate in Environmental Management System.	Works to commence January 08. Full implementation December 08.
6	4A	14.2.6	Modify the respective plant procedures to incorporate odour minimization controls identified during the audit.	Incorporate in Environmental Management System.	As above.
7	5A	14.2.4	Prepare and implement a complaints-management system which would be incorporated into the EMS.	Incorporate existing system into Environmental Management System. Daily advice of any odour complaints to Manildra would greatly assist in speedy investigation and resolution of complaints.	Commenced October 07. Completed December 07.



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Capital Items (8-14)					
8	1C	14.2.13	Implement, following confirmation of efficacy using source-specific modeling of more detailed engineering design, the odour control measures for the DDG plant identified in Table 40 in Section 10 of this report, as amplified in Section 11.2 of this report.	<p><u>DDG Dryer (Solids) Area</u></p> <ol style="list-style-type: none"> 1. Improve DDG Dryer Fume handling system including the following: <ul style="list-style-type: none"> - Equipment under negative pressure. - Adequate change-overs of air. - Air stream to boilers for combustion. - Sufficient boiler stack heights for dispersion of stack emissions. 2. Cover or vent condensate tank (DDG Dryers). 3. Greater control of housekeeping. 4. Measure effectiveness of above. 5. Design and implement other odour reduction options if required. 	<p>September 08</p> <p>March 08</p> <p>December 07</p> <p>October 08</p> <p>December 09</p>



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				<p><u>DDG Evaporator (Liquids) Area</u></p> <ol style="list-style-type: none"> 1. Modify process tank vents. 2. Test odour reduction effectiveness. 3. Investigate venting process vapours to boilers if required. 4. If (3) not possible, design and implement other odour reduction options if required. 	<p>25% complete, balance complete February 08</p> <p>March 08</p> <p>September 08</p> <p>December 09</p>
9	2C	14.2.3	<p>Use an existing wastewater treatment plant, or install a wastewater treatment plant, that meets or better the projected odour emission reductions listed in Table 49 in Section 12 of this report. Reuse treated effluent in the factory where practicable and where consistent with applicable hygiene controls.</p>	<ol style="list-style-type: none"> 1. Treat condensate. 2. Negotiations have commenced with Shoalhaven City Council to treat and reuse the wastewater. Refer attached letters, Manildra to Shoalhaven City Council dated 18/10/07 and Shoalhaven City Council to Manildra dated 1/11/07. 3. Treatment of wastewater by Shoalhaven City Council. 4. Cover Ponds if effective, considering odour reduction, operational requirements and cost. 	<p>June 08</p> <p>October 07</p> <p>December 09</p> <p>December 08</p>



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				5. Investigate and implement other water treatment options.	December 2010
10	3C	14.2.14	Implement, following confirmation of efficacy using source-specific modeling of more detailed engineering design, the odour control measures for the environmental farm identified in Table 41 in Section 10 of this report, as amplified in Section 11.1 of this report.	1. Oxidant introduced at end of lines when required as per procedures. 2. Recirculated wastewater to lime tank. 3. Upgrade nozzles on pivot sprinklers. 4. Manage ponding as per procedures. 5. Sulphuric acid dosing – controlling biological activity. 6. Cover over washdown Pond 4. 7. Install submerged delivery pipes to ponds. 8. Treat condensate. 9. Cover Ponds if effective, considering odour reduction, operational requirements and cost.	Completed Completed Completed Completed Completed Completed 80% complete June 08 December 08



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				<p>10. Negotiations have commenced with Shoalhaven City Council to treat and reuse the wastewater. Refer attached letters, Manildra to Shoalhaven City Council dated 18/10/07 and Shoalhaven City Council to Manildra dated 1/11/07.</p> <p>11. Treatment of wastewater by Shoalhaven City Council.</p> <p>12. Investigate and implement other water treatment options.</p>	<p>October 07</p> <p>December 09</p> <p>December 2010</p>
11	4C	14.2.9	Implement, following confirmation of efficacy using source-specific modeling of more detailed engineering design, the odour control measures for the starch plant identified in Table 36 in Section 10 of this report, as amplified in Section 11.2 of this report.	To be addressed when items 8-10 completed if required.	
12	4C	14.2.12	Implement, following confirmation of efficacy using source-specific modeling of more detailed engineering design, the odour control measures for the distillation plant identified in Table 39 in Section 10 of this report as amplified in Section 11.2 of this report.	To be addressed when items 8-10 completed if required.	



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13	4C	14.2.11	Implement, following confirmation of efficacy using source-specific modeling of more detailed engineering design, the odour control measures for the fermentation plant identified in Table 38 in Section 10 of this report, as amplified in Section 11.2 of this report.	To be addressed when items 8-10 completed if required.	
14	4C	14.2.10	Implement, following confirmation of efficacy using source-specific modeling of more detailed engineering design, the odour control measures for the glucose plant identified in Table 37 in Section 10 of this report, as amplified in Section 11.2 of this report.	To be addressed when items 8-10 completed if required.	
		14.2.15	If source-specific modelling of more detailed engineering design of any of the odour control measures recommended in this report determines that the efficacy of the control measure is substantially less than was modeled in Section 12 of this report, identify an alternative control measure that achieves a reduction in odour emissions that, at a minimum, meets the modelled emission rate.		



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		14.2.16	Shoalhaven Starches may identify an odour minimization option for a specific source that differs from that identified in this audit report. Such an option may be considered as being a suitable control measure provided that it is a sustainable means of odour minimisation that meets or betters the projected odour emission reductions listed in Table 48 in Section 12 of this report.		
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