

# **Bell Bay Pulp Mill**

## **Environmental Impact Management Plan (EIMP)**

### **Module N: Remedial and Response Strategies**

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Prepared for the  
Commonwealth Minister for Sustainability, Environment, Water, Population and  
Communities in accordance with approval EPBC 2007/3385

GNS-PLN-1000-1400-0019

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Appendix A: Integrated EIMP progress update

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### Revision Status

Revision	Date	Revision Description	Prepared	Reviewed	Approved
A	22 August 2008	For submission to DEWHA for review	IW	JD	CF
B	10 October 2008	For submission to DEWHA for review	IW	JD	CF
C	25 November 2008	For submission to DEWHA for review	IW	CF	CF
D	1 December 2008	For submission to DEWHA for review	IW	CF	CF
E	10 December 2008	For submission to DEWHA for review	IW	CF	CF
F	16 December 2008	For submission to DEWHA for review	IW	CF	CF
G	22 November 2010	Finalised after hydrodynamic modelling and effluent studies for submission to SEWPaC for approval by Minister	IW	LB	LB/TP
H	15 December 2010	Clarifications added following meeting with IEG	IW	LH	LB/TP
I	2 February 2011	Revised following comments from SEWPaC	IW	LH	TP
I	16 February 2011	Correction of reference to SMEWW	LH	LH	TP

# 1. OVERVIEW

A previous version of this module (version F) was submitted to the Minister for approval in December 2008. On 5 January 2009, the Minister determined not to consider approval of the module until it had been finalised following the hydrodynamic modelling and related studies described in that version. Those studies have now been completed and accordingly the module is now finalised for the Minister's consideration.

## 1a. A description of the proposal and associated infrastructure

A description of the pulp mill project has been provided in EIMP Module A.

The activity to which this module relates is remedial and response strategies.

The approval requires that the EIMP must *"identify specific remedial management responses to be undertaken when trigger levels are exceeded or maximum limits are reached, so as to ensure no unacceptable environmental impacts on matters of national environmental significance. It is an operational objective of the pulp mill that trigger points and maximum limits are not to be reached"* (Schedule 2 of the approval).

Trigger levels are defined in the approval to be *"levels of specified parameters that, when reached, require the implementation of a response strategy within a specified timeframe as agreed by the Minister"*.

The approval specifies six trigger levels:

- Concentration of dioxins and furans, chlorate and total chloroacetic acids in effluent
- Additional effluent contaminants, including nitrate, resin acid and colour
- Numbers of Tasmanian devils, quolls and Eastern barred bandicoots that may become trapped in pipeline excavation trenches
- Numbers of listed threatened species that may be victims of roadkill
- Underwater noise impacts on Australian grayling during pile driving for the construction of the wharf
- Underwater noise impacts on listed threatened and migratory marine species during construction of the wharf and ocean outfall.

The approval establishes four maximum limits:

- Volume of effluent that may be discharged
- Concentration of dioxins and furans, chlorate and total chloroacetic acids in effluent
- Additional effluent contaminants, including nitrate, resin acid and colour
- Concentration of dioxins and furans in benthic sediments.

Schedule 2 of the approval additionally specifies that maximum limits and trigger levels should be established for the receiving environment and in sentinel biota.

Remedial and response strategies that will be undertaken when the above trigger levels are exceeded or the above maximum limits are exceeded are described in modules of the EIMP relevant to those issues.

This Module N collates those remedial and response strategies into a single summary module.



## 1a.1 Purpose

On 4 October 2007, the Commonwealth Minister for the Environment and Water Resources approved the taking of an action under the *Environment Protection and Biodiversity Conservation Act 1999*, namely “to construct and operate a bleached Kraft pulp mill at Bell Bay, Tasmania, and associated infrastructure” (EPBC 2007/3385).

Condition 2 of the approval requires Gunns to develop and submit an Environmental Impact Management Plan (EIMP), the objective of which is to ensure that there are no adverse impacts on matters of national environmental significance as a result of the action.

The purpose of the EIMP, and the further investigations that are required in order to prepare some of its components, is to ensure that matters of national environmental significance are protected during the construction and operation of the pulp mill project.

The EIMP and those investigations are not a continuation or extension of the project’s approval assessment process. The approval process concluded with the issue of approval EPBC 2007/3385 on 4 October 2007. The EIMP is designed to ensure that the conditions of the EPBC approval are satisfied.

This module of the EIMP addresses those conditions of the approval that are relevant to remedial and response strategies.

## 1a.2 Scope

The EIMP deals only with matters relevant to the EPBC approval. It does not deal with the much wider range of matters relevant to the State approval conditions other than those that are also relevant to the EPBC approval.

The staging of the project will be different for different elements of the project. For example, construction work on the mill site itself will commence before the construction of the ocean outfall commences.

Hence, in accordance with conditions 7 and 8, which recognise a sectional and staged approach, the EIMP development and approval has a modular structure.

This EIMP, Module N: Remedial and Response Strategies, should be read in conjunction with the other EIMP modules that have been prepared and submitted in accordance with the timing of the various stages of the project.

Module N is a collation of remedial and response strategies associated with trigger levels or maximum limits identified in the suite of EIMP modules. It therefore collates and summarises existing information rather than introducing new material.

Further information about the environmental management measures that will be implemented for the pulp mill project is available at [www.gunnspulpmill.com.au](http://www.gunnspulpmill.com.au).

### 1a.3 EIMP Structure

Schedule 2 of the EPBC 2007/3385 approval provides an outline for the EIMP (although the Schedule does not address all the permit conditions relating to the EIMP). The EIMP must set out specific issues and specific measures at each of the key preliminary phases of the project, these being:

- Preconstruction
- Construction
- Precommissioning.

The EIMP must also describe environmental management measures that will be implemented once the mill is operational, including:

- Ongoing monitoring
- Remedial and response strategies if trigger levels are likely to be exceeded or maximum target levels reached.

The operational phase modules of the EIMP describe trigger levels, maximum limits, response measures and a monitoring program to ensure protection of matters of National Environmental Significance from the operation of the mill.

The Department of Environment, Water, Heritage and the Arts (DEWHA, now SEWPaC) has specified that the EIMP structure must reflect the structure of Schedule 2 of the EPBC 2007/3385 approval.

These structural requirements overlay the project's staging, leading to the modular breakup shown in Table 1 that Gunns will adopt for EIMP preparation. Table 1 also shows the submission and/or approval dates for each module.

Note that the original separation of the pipelines into the four modules and the solid waste disposal facility and reservoir into two modules (shown in Table 1) was based on the projected construction timetable at that time. Subsequent project delays and consequential changes to the construction timetable mean that the separation is no longer warranted. In addition, recent advice from SEWPaC is that the approval conditions treat the effluent pipeline as a single action, which means that construction of any one element of the pipeline cannot proceed until all EIMP modules relating to it have been approved.

To minimise unnecessary duplication, EIMP Modules F, G, H and K have therefore been combined into a single module that will address those elements of the EIMP that are relevant to the water supply pipeline construction, effluent pipeline construction, shore crossing and ocean outfall construction. Similarly, EIMP Modules I and J have been combined into a single module that will address those elements of the EIMP that are relevant to the solid waste disposal facility and the reservoir.

**Table 1: Modular elements of the EIMP and submission (or approval) dates**

	Module	Date	Gunns document number
<b>Overview</b>			
A	EIMP Overview	Approved 01-Feb-08	GNS-PLN-1000-1400-0006
<b>Preconstruction and construction</b>			
B	Vegetation clearing - mill site and wharf access	Approved 01-Feb-08	GNS-PLN-1000-1400-0007
C	Bulk earthworks mill site	Approved 31-Mar-08	GNS-PLN-1000-1400-0008
C1	Mill construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0022
D	Wharf construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0009
E	Accommodation facility construction	Approved 23-May-08	GNS-PLN-1000-1400-0010
F	Water supply pipeline construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0011
G	Shore crossing	Approved 05-Jan-09	GNS-PLN-1000-1400-0011
H	Ocean outfall construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0011
I	Solid waste disposal construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0014
J	Local reservoir construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0014
K	Effluent pipeline construction	Approved 05-Jan-09	GNS-PLN-1000-1400-0011
<b>Precommissioning</b>			
L	Precommissioning management	Submitted 22-Nov-10	GNS-PLN-1000-1400-0017
<b>Ongoing monitoring</b>			
M	Monitoring program	Submitted 22-Nov-10	GNS-PLN-1000-1400-0018
<b>Remedial and response strategies</b>			
N	Remedial and response strategies	Submitted 22-Nov-10	GNS-PLN-1000-1400-0019
<b>Habitat measures</b>			
O	Habitat offsets & reserves	Approved 05-Jan-09	GNS-PLN-1000-1400-0020

Note that although the modules are labelled sequentially for convenience, as shown by the anticipated submission dates they have not been submitted in strict sequential order.

The detailed EIMP requirements are described in the separate EIMP Overview module. This EIMP Remedial and Response Strategies module should be read together with the EIMP Overview module. This EIMP module will also reference other previously approved modules where appropriate.

The EPBC 2007/3385 conditions addressed by each EIMP module are shown in Table 2.

**Table 2: Modular elements of the EIMP and the EPBC 2007/3385 conditions they address**

Module		Conditions addressed	
<b>Overview</b>			
A	EIMP Overview	1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 20, 44, 45, 46, 47, 48	
<b>Preconstruction and construction</b>		Preconstruction	Construction
B	Vegetation clearing - mill site and wharf access	14, 15, 17, 18, 20, 23, 25, 26	14, 15, 17, 18, 20, 23, 25, 26
C	Bulk earthworks mill site	14, 17, 18, 20, 23, 25, 26	14, 17, 18, 20, 23, 25, 26
C <sub>1</sub>	Mill Construction	14, 17, 20, 23, 25, 26	14, 17, 20, 23, 25, 26
D	Wharf construction	14, 20, 27, 28, 29, 30	14, 20, 27, 28, 29, 30
E	Accommodation facility construction	14, 20, 23, 25	14, 20, 23, 25
F	Water supply pipeline construction	14, 20, 21, 22, 23, 25	14, 19, 20, 21, 23, 25
G	Dune crossing	14, 20, 23, 25, 27	14, 20, 23, 24, 25, 27
H	Ocean outfall construction	14, 20, 27, 28, 30, 38, 39	14, 20, 26, 27, 28, 30
I	Solid waste disposal construction	14, 17, 20, 23, 25	14, 17, 20, 23, 25, 26
J	Local reservoir construction	14, 17, 20, 23, 25	14, 17, 20, 23, 25, 26
K	Effluent pipeline construction	14, 20, 21, 23, 24, 25	14, 19, 20, 21, 22, 23, 24, 25
<b>Precommissioning</b>			
L	Precommissioning management	3, 4, 9, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42	
<b>Ongoing monitoring</b>			
M	Monitoring program	3, 4, 15, 31, 32, 33, 36, 37, 40, 41, 42, 43*	
<b>Remedial and response strategies</b>			
N	Remedial and response strategies	3, 4, 5, 19, 26, 29, 30, 31, 32, 33, 39	
<b>Habitat measures</b>			
O	Habitat offsets & reserves	15, 16, 17, 18	

\*For completeness Module M also reiterates monitoring described in other modules relevant to conditions 15, 16, 17, 18, 19, 20, 22, 25, 26, 27, 29, 30, 31, 34, 35, 36 and 38

Module A Overview was the first module prepared and approved. Table 2 of that module listed the conditions which at that time were anticipated to be addressed by each of the succeeding modules. As those other modules have been developed, some changes to the allocation of conditions to modules emerged as being desirable to best reflect the scope and contents of each module and their relationship to the approval conditions. The changes from the Module A anticipated allocations are indicated in the above table. Additions are shown in dark blue and removals are shown in light grey. Module G has been renamed from Dune crossing to Shore crossing.

Note also that Module C1 has been added since Module A was finalised. Module C1 does not introduce any environmental issues not already addressed by Modules B and C but it is provided as an informative document to describe the pulp mill's buildings and structures.

This module follows the outline required by Schedule 2 of the conditions of approval.

The EIMP Overview Module A provides additional detail that demonstrates relationships between approval conditions, project elements, EIMP modules and EIMP components from various perspectives.

Appendix A provides an integrated summary of all those perspectives. Note that there have been some changes to the allocation of Schedule 2 issues to modules since Module A was approved. These changes emerged during the development of the modules as being desirable to best reflect the scope and contents of each module and their relationship to the Schedule 2 issues.

The EIMP modules cover both the construction (B-K, O) and operational phases of the project (L, M, N), with module A being an overview of the EIMP.

All EIMP modules have been prepared and submitted to the Minister to achieve final approval under condition 7 of the approval by 5 January 2009. This date was extended from the original 4 October 2008 approval date by consent of the Minister in accordance with that condition.

The construction phase modules describe management measures that will be implemented to ensure that there are no significant impacts on matters of national Environmental Significance due to the construction of the pulp mill and associated infrastructure.

The operational phase modules describe trigger levels, maximum limits, response measures and a monitoring program to ensure that there are no significant impacts on matters of National Environmental Significance due to the operation of the pulp mill.

The operational phase modules also describe additional studies and investigations that will be undertaken to address residual risks and uncertainties identified by the Chief Scientist.

These studies and investigations are intended to further inform understanding of effluent characteristics and the design of the monitoring program. Gunns may also use the results of some of these studies and investigations to contribute to a request to the Minister to revise the trigger levels and maximum limits as provided for under condition 32.

The findings of the completed studies will need to be approved by the Department prior to commissioning commencing.

The results of the approved studies will need to be incorporated into the monitoring program (known as the Commonwealth Baseline and Operational Monitoring Plan, C-BOMP), or other documents as required, to the satisfaction of the Department prior to commissioning commencing. The results of background surveys being undertaken to inform the monitoring program will also be incorporated into the monitoring program.

An example of how the results of the further studies described in this module will influence the design of the final monitoring program is through the revision to and addition of sampling sites.

The hydrodynamic and sediment transport model required by condition 38 of the approval are central to the further studies and investigations described in this module. As required by condition 39 a range of responses are outlined in this module depending on the sediment deposition and effluent plume behaviour predicted by the hydrodynamic modelling study.

As with the other studies, the results of the hydrodynamic modelling will be used to inform the design of the monitoring program prior to commissioning commencing. In addition, if the result of the modelling study show that a more significant response than this are required, such as changing the design of the diffuser or implementing tertiary treatment, the Minister would then determine under condition 44 of the approval to request Gunns to revise the EIMP as necessary. On receipt of such a request Gunns would revise the EIMP and submit the revision to the Minister for approval.

## 1a.4 Relevant environmental commitments

Gunns' environmental commitments for the project as they relate to matters of Commonwealth interest are described in documents submitted to the Minister under the EPBC Act approval process:

- Preliminary Documentation: Gunns Limited Bell Bay Pulp Mill Project Impact Assessment under the *Environment Protection Biodiversity Conservation Act 1999*; and
- Response to Submissions: Gunns Limited Bell Bay Pulp Mill Project Response to Submissions under the *Environment Protection Biodiversity Conservation Act 1999*.

These commitments are described in section G of EIMP Module A.

Commitments relevant to the approval's specified trigger levels and maximum limits are:

- Open trenches will be constructed with trench ramps and trench plugs to enable fauna to escape. Trenches will be checked for fauna at intervals during the day and first thing in the morning. Trapped fauna will be removed from the trench by trained personnel.
- If impact pile-driving operations for the wharf construction indicate that there is acoustic damage to fish, bubble curtains may be used to reduce underwater noise.
- Key constituent concentrations within the treated effluent will be measured and monitored in the effluent treatment plant prior to its disposal via the effluent pipeline and diffuser.
- Treated effluent dispersion monitoring, and monitoring of the long-term impacts of treated effluent on the marine environment will be undertaken.
- The effluent treatment plant will feature the following main operations:
  - pre-treatment, primary clarification and stabilisation of the raw effluent quality to remove coarse impurities, control effluent pH, remove suspended solids and level down the variability of raw effluent quality. These stages are necessary to safeguard the highest possible performance of the biological treatment process of the effluent;
  - an emergency basin to prevent the potential shock loads from jeopardizing biological effluent purification process in the secondary treatment stage;
  - a secondary treatment stage, where most of the dissolved organic matter and certain inorganic constituents in the raw effluent are removed by a sequence of an anoxic reactor (chlorate removal), selector basins and the final aeration basin (COD and residual toxicity removal); and
  - two secondary clarifiers, in which the final effluent is clarified before being discharged into a surge basin and pumped through the effluent outfall pipeline.
- The effluent treatment plant components are designed to cope with the daily variability of effluent loads, such that the final loads to Bass Strait are virtually constant and change only slowly as a function of longer term protection levels.

## 1a.5 Relevant approval conditions and management measures

EPBC 2007/3385 approval conditions 3, 4, 5, 19, 26, 29, 30, 31, 32, 33, 39 specify that remedial and/or response strategies must be implemented if trigger levels are exceeded and/or maximum limits are reached. The trigger levels themselves are established in other modules (see Table 4 in section 1e).

Schedule 2 of EPBC 2007/3385 requires the EIMP to reflect commitments made by Gunns in its preliminary documentation and also in its response to public submissions. Schedule 2 also requires the EIMP to address issues and concerns raised by the (then) Department of the Environment and Water Resources in its Recommendation Report and also matters raised in the Chief Scientist's report to the Minister. The EIMP satisfies those requirements also.

## 1b. Identification of clear environmental objectives

Overarching environmental objectives for the project are to ensure that no adverse impacts occur on matters of national environmental significance, those matters being:

- World Heritage properties
- National heritage places
- Wetlands of international importance (Ramsar wetlands)
- **Threatened species and ecological communities**
- **Migratory species**
- **Commonwealth marine areas**
- Nuclear actions (including uranium mining).

Matters relevant to the project are shown above in **bold**.

The specific objective of this module is:

- Collate remedial and response strategies that will be implemented if trigger levels are exceeded and/or maximum limits are reached.

## 1c. Identification of environmental indicators, and translation of objectives into agreed targets and performance measures

EIMP modules identify specific environmental objectives and associated performance measures relevant to the particular activities covered by them.

Some of those performance measures in turn have associated trigger levels.

For construction activities, examples of performance measures are:

- No harmful underwater noise levels in areas where the Australian Grayling (*Prototroctes maraena*) may be present.
- No harmful underwater noise levels in areas where whales, dolphins and seals may be present.

For operational activities, performance measures are defined by trigger levels and maximum limits. Ongoing monitoring against those trigger levels and maximum limits is required, including:

- Effluent monitoring
- Continuous monitoring of the effluent plume and its dispersion
- Sediment quality monitoring
- Sentinel biota monitoring
- Ecological surveys.

The determination of the trigger levels to be applied when the pulp mill is operating will be informed by monitoring undertaken during the Precommissioning phase, including:

- Chemical and ecotoxicological assessments
- Baseline monitoring of contaminants in sediments, water and biota.

## 1d. Design and implementation of an appropriate monitoring program

Refer to Module M Monitoring of this EIMP for a description of the monitoring program.

## 1e. Identification of, and commitment to, agreed trigger or response levels for key indicators

A number of the EPBC 2007/3385 approval conditions require the development of specified trigger levels that will be used to invoke response and remedial strategies to avoid approval conditions being breached and ensure that unacceptable environmental harm does not occur.

The EPBC 2007/3385 approval defines trigger levels to be: “levels of specified parameters that, when reached, require the implementation of a response strategy within a specified timeframe as agreed by the Minister. Trigger levels will be below any maximum limits that are relevant to the trigger levels in question”.

Approval conditions specifying trigger levels are shown in Table 3.

**Table 3: Approval conditions specifying trigger levels**

Condition	Condition wording
3	<p>The EIMP must include trigger points and maximum limits in relation to effluent discharge from the operation of the pulp mill as well as specific remedial management responses to be undertaken by Gunns Limited if trigger points are exceeded or maximum limits are reached.</p> <p>It shall be an operational objective of the pulp mill, and reflected in the EIMP, that trigger points, and maximum limits, are not to be reached.</p>
5	<p>If at any time during the taking of the action the trigger levels for effluent discharge in this approval, or in the EIMP, are exceeded, then Gunns Limited must immediately implement the response strategies in the EIMP, in accordance with stipulated timeframes.</p>
19(d)	<p>To minimise impacts during pipeline construction on the Tasmanian Devil, Spot-tailed quoll and Eastern Barred Bandicoot, and as part of the EIMP, Gunns Limited must:</p> <p>...(d) If at any time the number of fauna found in the trenches, reaches or exceeds the trigger levels defined in the EIMP, then response strategies must be implemented within the stipulated timeframes.</p>
26(b)	<p>To manage the risks to listed threatened species associated with roadkill, Gunns Limited must, in accordance with the EIMP:</p> <p>...(b) Monitor roadkill and implement response strategies, as necessary, in accordance with the EIMP if the number of road killed mammals exceeds the trigger levels in the EIMP.</p>
29(c)	<p>To minimise impacts on the Australian Grayling (<i>Prototroctes maraena</i>) Gunns Limited must put in place and implement, as part of the EIMP, measures including:</p> <p>...(c) If necessary, bubble curtains or other agreed response strategies must be implemented if trigger levels in the EIMP are exceeded.</p>
30(c)	<p>To minimise impacts on listed threatened and migratory marine species during construction of the wharf and the ocean outfall, Gunns Limited must put in place and implement, as part of the EIMP, measures, including:</p> <p>...(c) If necessary, bubble curtains or other agreed response strategies must be implemented if trigger levels in the EIMP are exceeded.</p>
32	<p>...Maximum limits and trigger levels on additional effluent contaminants (for example, nitrate, resin acid and colour) will also be developed in the EIMP in accordance with Schedule 2.</p>
33	<p>Prior to commissioning, trigger levels for effluent discharge for all phases of development must be included in the EIMP together with agreed response strategies and timeframes if trigger levels are exceeded or maximum limits reached.</p>
39	<p>In accordance with the EIMP, if the results of the modelling resulting from condition 38 indicate that effluent hydrodynamics and deposition will result in chemicals reaching trigger levels, Gunns Limited must implement approved response strategies, including, if necessary, changing the design and operation of the effluent pipeline and diffuser.</p>

Condition	Condition wording
41(a)	<p>In accordance with the EIMP, Gunns Limited must prepare and have approved by the Minister, prior to commencement of mill commissioning, strategies for monitoring the impacts of the mill effluent on the marine environment. These strategies must include but not necessarily be limited to:</p> <p>(a) Appropriate early warning of reaching trigger levels in Commonwealth waters.</p>
	<p>In addition, the EIMP must detail the arrangements for environmental management once the pulp mill is operational. These include:</p> <p>a. Ongoing monitoring; and</p> <p>b. The development of remedial and response strategies if monitoring shows trigger levels are likely to be exceeded or maximum target levels are to be reached.</p>
	<p>The plan must include but not necessarily be limited to:</p> <p>...e. Identification of, and commitment to, agreed trigger or response levels for key indicators; and</p> <p>f. Identification of specific remedial management responses to be undertaken when trigger point levels are exceeded, so as to ensure environmental targets and objectives will be achieved.</p>
Schedule 2	<p>The EIMP must address the management of all issues associated with protection of the Commonwealth marine environment, including:</p> <p>...c. Establish both maximum limits and trigger levels of pollutants in effluent discharge, in the receiving environment and in sentinel biota;</p>
	<p>The EIMP must establish the design and measures to implement an appropriate monitoring program to ensure there are no unacceptable impacts on matters of national environmental significance as a result of the action. The monitoring program must also identify and measure agreed trigger or response levels for key indicators.</p>
	<p>The EIMP must identify specific remedial management responses to be undertaken when trigger levels are exceeded or maximum limits are reached, so as to ensure no unacceptable environmental impacts on matters of national environmental significance. If necessary, remedial changes could include retrofitting of new technology, for example tertiary treatment of the effluent.</p> <p>It must be an operational objective of the pulp mill that trigger points, and maximum limits, are not to be reached.</p>

The trigger levels that arise from the approval conditions described in Table 3 are shown in Table 4, together with the EIMP modules that address them.

**Table 4: Trigger levels and the EIMP modules that deal with them**

Trigger	Module
Concentration of dioxins and furans, chlorate and total chloroacetic acids in effluent	L
Additional effluent contaminants, including nitrate, resin acid and colour	L
Numbers of Tasmanian devils, quolls and Eastern barred bandicoots that may become trapped in pipeline excavation trenches	F-G-H-K
Numbers of listed threatened species that may be victims of roadkill	C, C1, I-J
Underwater noise impacts on Australian grayling during pile driving for the construction of the wharf	D
Underwater noise impacts on listed threatened and migratory marine species during construction of the wharf and ocean outfall	D, F-G-H-K

## **1f. Identification of specific remedial management responses to be undertaken when trigger point levels are exceeded**

The EIMP must identify specific remedial and response strategies to be undertaken when trigger levels are exceeded or maximum limits are reached, so as to ensure no unacceptable environmental impacts on matters of national environmental significance.

It must be an operational objective of the pulp mill that trigger points, and maximum limits, are not to be reached.

Where relevant to the issues that they address, other modules have described remedial and response strategies.

A collation of these strategies is provided in this module, in section 6.

## 2. PRECONSTRUCTION

This issue has been addressed in other modules and is not relevant to this Module N, which is a collation module for remedial and response strategies from all those other modules.

## 3. CONSTRUCTION

This issue has been addressed in other modules and is not relevant to this Module N, which is a collation module for remedial and response strategies from all those other modules.

## 4. PRECOMMISSIONING

This issue has been addressed in other modules and is not relevant to this Module N, which is a collation module for remedial and response strategies from all those other modules.

## 5. ONGOING MONITORING

This issue has been addressed in other modules and is not relevant to this Module N, which is a collation module for remedial and response strategies from all those other modules.

## 6. REMEDIAL AND RESPONSE STRATEGIES

The remedial and response strategies described in EIMP modules relevant to trigger levels and maximum limits are collated in the following tables:

- Table 5: Remedial and response strategies for the construction phase of the pulp mill project (condition 19(d), 26(b), 29(c) and 30(c) responses to construction phase triggers)
- Table 6: Remedial and response measures and response timeframes for discharge effluent trigger levels (DETLs) and maximum limits (DEMLs) (condition 3, 4 and 5 responses to condition 31, 32 and 33 and Schedule 2 trigger levels and maximum limits)
- Table 7: Remedial and response measures and response timeframes for receiving environment trigger levels (RETLs) and maximum limits (REMLs) (Schedule 2 trigger levels and maximum limits)
- Table 8: Monthly maximum limits (DEMLs) and weekly discharge effluent trigger levels (DETLs) for the Bell Bay pulp mill during commissioning and ramp-up phases (relating to condition 3, 4 and 5 responses to condition 32 and 33 trigger levels and maximum limits)
- Table 9: Discharge effluent trigger levels (DETLs) and maximum limits (DEMLs) for the Bell Bay pulp mill during normal operations (relating to condition 3, 4 and 5 responses to condition 32 and 33 trigger levels and maximum limits)
- Table 10: Receiving environment trigger levels (RETLs) and maximum limits (REMLs) in Commonwealth waters (conditions 39 and 41)
- Table 11: Effect trigger levels for water chemistry, sediment chemistry, biota and ecological community indicators (condition 3, 4 and 5 responses to Schedule 2 trigger levels and maximum limits, and condition 41(a)).

### Update of condition 32 to reflect the complete EIMP

Condition 32 of the approval relates to the ongoing operation of the mill but was necessarily worded in an anticipatory form because at the time of the approval the additional studies required by the approval had not been conducted nor had the EIMP been prepared.

Now that the trigger and maximum limit development requirements of condition 32 have been satisfied and the EIMP prepared, the wording of the condition is no longer relevant and will need to be replaced so that the condition is appropriate to the ongoing regulation of the operating mill.

The update of condition 32 should reflect the purpose of the EIMP established by condition 3, namely that *“The EIMP must include trigger points and maximum limits in relation to effluent discharge from the operation of the pulp mill as well as specific remedial management responses to be undertaken by Gunns Limited if trigger points are exceeded or maximum limits are reached. It shall be an operational objective of the pulp mill, and reflected in the EIMP, that trigger points, and maximum limits, are not to be reached”*.

This now completed EIMP module includes all trigger levels, maximum limits and response strategies for the mill’s effluent discharge, as described in the above tables.

An appropriate replacement wording of condition 32 accordingly would be:

*“32. Effluent from the mill must be discharged in accordance with the maximum limits described in the EIMP.”*

Condition 44 of the approval allows the minister to direct Gunns to revise the EIMP for specified reasons. However, the approval currently has no provision for Gunns to propose amendments.

It would be appropriate to insert a new condition to provide for this.

Table 5: Remedial and response strategies for the construction phase of the pulp mill project (condition 19(d), 26(b), 29(c) and 30(c) responses to construction phase triggers)

Trigger issue	Applicable trigger approval condition	Applicable EIMP Module	Objectives	Trigger level	Remedial/response strategy	Timeframe	Monitoring																																
Numbers of Tasmanian devils, quolls and Eastern barred bandicoots that may become trapped in pipeline excavation trenches	19 (d)	F-G-H-K	Prevent Tasmanian Devils, Spot-tailed quolls and Eastern Barred Bandicoots from becoming trapped in a trench	A single Tasmanian devil, quoll or Eastern barred bandicoot becoming trapped in a pipeline excavation	<p>When an animal is noted as trapped, work in the immediate vicinity (ie. 50 m) will stop immediately and the Site Supervisor will be notified.</p> <p>Fauna trapped in trenches will be removed as soon as possible. No operations will commence or continue until fauna have been removed. Surviving fauna will be relocated to a suitable habitat by an ecologist trained in fauna handling procedures. Records will be kept of all live and dead fauna, including amphibians, removed from the trench.</p> <p>Procedures will be immediately reviewed and the improved procedures implemented. These may include but are not limited to increasing the number or reducing the spacing of trench ramps and plugs.</p>	<p>If a trapped animal is found it will be removed as soon as possible.</p> <p>The preventative measures will be reviewed within 12 hours of an animal being found trapped and enhanced within a further 24 hours if potential improvements are apparent.</p>	<p>Daily monitoring inspections of trenches by a suitably qualified person agreed to by SEWPaC</p> <p>Records kept of any fauna removed from trench</p> <p>Records provided to SEWPaC within three months of commencement of trench construction and progressively each month until all trenches have been filled</p> <p>Summary of records provided to SEWPaC in annual report</p>																																
Numbers of listed threatened species that may be victims of roadkill	26 (b)	C, C1, I-J	Manage the risks to listed threatened species associated with roadkill	Zero roadkill	<p>The following response strategy will be adopted from the start of vegetation clearing:</p> <ul style="list-style-type: none"> <li>Speed reductions from 60 km/hr to 40 km/hr will be imposed on the site access road from the East Tamar Highway and a 20 km/hr limit will be imposed on the mill construction site internal networks.</li> <li>Traffic counters will be installed on the pulp mill access road and the solid waste disposal facility access road.</li> <li>Pulp mill access roads will be monitored for roadkill and any roadkill carcasses will be removed to minimise risks of roadkill from carcass feeding.</li> <li>Car pooling and bus transport will be implemented to minimise construction worker vehicle movements associated with construction of the mill to achieve a 36% reduction in the construction worker traffic levels proposed in the Preliminary Documentation</li> <li>A daily bus service from George Town or Launceston (or both) will be implemented when construction workers travelling from either of those locations exceeds 50.</li> <li>Construction related heavy vehicle (ie. non-employee movement) traffic will be scheduled to minimise traffic during crepuscular periods (dawn and dusk) to minimise fauna roadkill.</li> <li>A feasibility study into the possibility of a cross-river ferry service for transportation of workers from the West Tamar to the site will be conducted.</li> <li>Site induction for all employees will include alerting them to the impact of roadkill and the need for care.</li> <li>Monitoring compliance with the above measures</li> </ul> <p>Explanations will be provided to SEWPaC for construction scheduling related variances, with significant non-scheduling related variations from the expected quarterly cumulative totals in the table at right to be addressed as necessary. Gunns will develop corrective measures and action plans to bring any such over-accumulation 'back in line' with the expected</p>	Start of construction	<p>In order to demonstrate compliance with this commitment, Gunns will monitor and report quarterly on the cumulative construction worker vehicle entries to the pulp mill site. The table below shows the expected cumulative number of construction worker vehicle entries to the site as indicated in the Draft IIS and also the cumulative construction worker vehicle entries taking into account the 36% reduction commitment.</p> <p><b>Expected quarterly cumulative totals of construction worker vehicle entries to the mill site</b></p> <table border="1"> <thead> <tr> <th rowspan="2">End of quarter</th> <th>Project assessed expected cumulative total</th> <th>Committed expected cumulative total</th> </tr> <tr> <th>Draft IIS construction worker vehicle entries</th> <th>36% reduction construction worker vehicle entries</th> </tr> </thead> <tbody> <tr> <td>Quarter 1</td> <td>2,042</td> <td>1,307</td> </tr> <tr> <td>Quarter 2</td> <td>11,669</td> <td>7,468</td> </tr> <tr> <td>Quarter 3</td> <td>31,798</td> <td>20,351</td> </tr> <tr> <td>Quarter 4</td> <td>65,930</td> <td>42,195</td> </tr> <tr> <td>Quarter 5</td> <td>121,649</td> <td>77,855</td> </tr> <tr> <td>Quarter 6</td> <td>198,761</td> <td>127,207</td> </tr> <tr> <td>Quarter 7</td> <td>277,527</td> <td>177,617</td> </tr> <tr> <td>Quarter 8</td> <td>306,699</td> <td>196,288</td> </tr> <tr> <td>Construction end</td> <td>306,699</td> <td>196,288</td> </tr> </tbody> </table> <p>The 36% reduction commitment reduces the total number of construction worker vehicle entries allowed over the life of the construction project to 196,288.</p> <p>In order to track progress against this cap, monthly averages and total cumulative data will be available for on-site review by the Independent Site Supervisor at any time, with cumulative data provided to SEWPaC each quarter. Explanations will be provided to SEWPaC for construction scheduling related variances, with significant non-scheduling related variations from the expected quarterly cumulative totals in the above table to be addressed as necessary.</p> <p>Construction worker vehicle entries will be monitored using established procedures (a traffic counter on the pulp mill access road and construction worker site records) and reported.</p> <p>Information obtained by this process will be used for:</p> <ul style="list-style-type: none"> <li>Monitoring adherence to speed limits</li> </ul>	End of quarter	Project assessed expected cumulative total	Committed expected cumulative total	Draft IIS construction worker vehicle entries	36% reduction construction worker vehicle entries	Quarter 1	2,042	1,307	Quarter 2	11,669	7,468	Quarter 3	31,798	20,351	Quarter 4	65,930	42,195	Quarter 5	121,649	77,855	Quarter 6	198,761	127,207	Quarter 7	277,527	177,617	Quarter 8	306,699	196,288	Construction end	306,699	196,288
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Trigger issue	Applicable trigger approval condition	Applicable EIMP Module	Objectives	Trigger level	Remedial/response strategy	Timeframe	Monitoring
					cumulative total, to ensure that the cap is not exceeded over the life of the construction project.		<p>movements from crepuscular periods);</p> <ul style="list-style-type: none"> <li>Dissemination of actual performance against targets in relation to condition 26 (roadkill) will be provided on a regular basis to the construction workforce as a means of reinforcing our objectives and commitments for this issue; and</li> <li>Preparation of quarterly reports to SEWPaC including: <ul style="list-style-type: none"> <li>Directional class/speed matrix;</li> <li>Total number of worker days (for construction activities) for the reporting period;</li> <li>Monitoring of construction worker vehicle entries</li> <li>Daily mean individuals transported by bus for the period from Launceston and George Town and</li> <li>Actual verses projected cumulative vehicle movements to the site (with passenger(s) relating to construction).</li> </ul> </li> </ul> <p>Summary of records provided to SEWPaC in annual report.</p>
Underwater noise impacts on Australian grayling during pile driving for the construction of the wharf	29 (c)	D	No significant acoustic impacts on the Australian Grayling ( <i>Prototroctes maraena</i> )	A cumulative sound exposure level of 195 dB re 1 $\mu\text{Pa}^2\cdot\text{sec}$ at 500 m from piling activities	<p>Based on the expert study (Appendix C of Module D), the trigger level will be a cumulative sound exposure level of 195 dB re 1 <math>\mu\text{Pa}^2\cdot\text{sec}</math> (which is a measure in decibels of the cumulative sound pressure referenced to 1 micropascal). Underwater noise from pile strikes will be measured at this distance to determine the typical noise level from a single pile strike.</p> <p>The cumulative sound loading (CSEL) at this distance will then be calculated from the relationship:</p> $\text{CSEL} = \text{RL} + 10\log_{10}N$ <p>where</p> <ul style="list-style-type: none"> <li>= the measured typical level of underwater noise from a single pile strike; and</li> <li>= the number of pile strikes in a typical 30 minute period of pile driving activity.</li> </ul> <p>A trigger level of CSEL = 195 dB re 1 <math>\mu\text{Pa}^2\cdot\text{sec}</math> at 500 m will be adopted.</p> <p>Before continuous pile driving commences, a small number of trial strikes will be undertaken to obtain a measure of RL, the noise level caused by a single pile strike at the trigger level distance of 500 m. This value of RL will then be used in the above equation to determine N, the maximum number of pile strikes per 30 minute period that can be made in the absence of bubble curtains without exceeding the trigger level cumulative sound exposure level (CSEL) of 195 dB at the 500 m distance.</p> <p>For operation purposes, the actual hammer rate limit will be set at 10% below this maximum allowable rate to provide a conservative margin. During the initial hammering, monitoring of the operational hammering will also be conducted to confirm the calculated CSEL at this rate.</p> <p>If the maximum allowable hammer rate needs to be exceeded due to the required pile driving program, bubble curtains will be installed and the above monitoring and calculations will be repeated to recalibrate the maximum allowable hammer rate.</p>	The hammering rate will be reduced if CSEL readings above 195 dB at 500 m are confirmed	<p>Underwater noise will be monitored during the initial piling driving to validate the model predictions of the acoustic expert's study report. If measured values deviate significantly from the predictions, further advice will be taken from the study authors. The validation monitoring (which addresses condition 29(b) of the approval) will involve measuring underwater noise using a hydrophone lowered to mid-water depth at maximum interval distances of 100 m from the trial pile driving out to a distance of 500 m across the river (the direction and distance modelled in the study). Validation monitoring will be undertaken at both low tide and high tide. The monitoring findings will be compared with the study predictions (in particular Figure 17 of the report in Appendix C of Module D).</p> <p>In addition to this validation monitoring, underwater noise measurements will be undertaken with a hydrophone lowered to mid-water depth (at both low tide and high tide) at a location 500 m along the shore from the wharf site to enable an underwater noise trigger level at this location to be calibrated against pile hammering rate. This is the distance to the nearest creek that might be visited by Australian grayling.</p>

Trigger issue	Applicable trigger approval condition	Applicable EIMP Module	Objectives	Trigger level	Remedial/response strategy	Timeframe	Monitoring
					<p>This new rate will be the maximum hammer rate that will not be exceeded in the presence of bubble curtains.</p> <p>If the pattern or method of pile driving changes significantly, the field measurements and CSEL calculations will be repeated. To account for potential changes in underwater noise transmission due to seasonal water conditions (eg. salinity and temperature), calibration measurements and calculations will be repeated once a month during the pile driving period.</p> <p>Any dead fish found floating or washed up in the vicinity of the pile driving area will be collected, photographed and recorded by the Site Environmental Officer. If any such fish are Australian grayling, the specimens will be sent to the State government's Animal Health Laboratory for determination of probable cause of death. If the probable cause of death is determined to be trauma potentially related to pile driving, the maximum allowable hammer rate will be reduced by 30% until a review of the trigger levels and management measures has been completed to the satisfaction of SEWPaC.</p>		
Underwater noise impacts on listed threatened and migratory marine species during construction of the wharf and ocean outfall	30 (c)	D, F-G-H-K	<p>No marine mammal vessel strikes by vessels associated with construction of the wharf and ocean outfall.</p> <p>No harmful underwater noise levels in areas where whales, dolphins and seals may be present.</p>	<p>A whale enters the 1.0 km safety zone</p> <p>A seal or dolphin enters the 0.5 km safety zone.</p>	<p>A study of potential underwater noise from the outfall construction has been undertaken. The study findings and recommendations are summarised in section 2k.1 of Module F-G-H-K and the full report is provided in Appendix D of Module F-G-H-K.</p> <p>The study found that potential significant underwater noise impacts on listed threatened and migratory marine species may occur if a marine mammal is within 500 m during rock popping inside the temporary berm or within 200 m during sheet piling within the berm. These distances are based on a maximum noise level of 180 dB re 1 µPa msp, which is the level at which temporary threshold shift (TTS) occurs in cetaceans (the TTS of seals and fish is higher). TTS is where hearing sensitivity is temporarily reduced.</p> <p>Using conservative assumptions, this level is predicted to only be reached during sheet piling, at distances up to 200 m, or during rock popping inside the berm, at distances up to 500 m. A TTS in marine mammals will therefore be avoided by ceasing rock popping if they are within 500 m of that activity and ceasing sheet piling if they are within 200 m of that activity.</p> <p>Condition 30 of the approval requires construction activities to cease anyway if whales are in a safety zone within 1 km of noise-generating activities or if seals and dolphins are in a safety zone within 500 m of noise-generating activities. Those safety zones achieve the TTS avoidance and no additional management measures are considered necessary.</p>	Noise generating activities will cease when a marine mammal enters an applicable safety zone	<p><b>Ocean outfall noise monitoring</b></p> <p>In accordance with condition 30(b), underwater noise will be monitored during the first stages of construction to validate the model predictions of the noise modelling study (Appendix D). The validation monitoring will involve measuring underwater noise using a hydrophone lowered to mid-water depth at a distance of 500 m and 1000m away from the source of noise. Validation monitoring will be undertaken at both low tide and high tide. The monitoring findings will be compared with the study predictions. If measured values deviate significantly from the predictions, further advice will be taken from the study authors. If noise measured during validation exceeds 190dB re 1 µPa msp at 500m (the level at which TTS occurs in pinnipeds) or 180dB re 1 µPa msp at 1000m (the level at which TTS occurs in cetaceans) then the safety zones will immediately be extended accordingly so that construction that may cause underwater noise is suspended if a mammal is within a distance where TTS is possible.</p> <p>This will be achieved by recalibrating the underwater noise model using the measured underwater noise data, and using the revised underwater noise model to predict new safety zone distances and implementing those new safety zones. The new underwater noise model (if required) will be validated with underwater noise monitoring by hydrophone at the new predicted safety zone distances using the same method as the original validation monitoring.</p> <p>If the noise model requires recalibration and construction work cannot be suspended until that is complete and new safety zones are established, underwater noise from the construction will be measured at 50 m intervals outwards from the 500 m and 1000 m safety zones until a consistent measurement of less than 190 dB re 1 µPa msp and 180 dB re 1 µPa msp respectively is achieved. The distances at which those noise levels are not exceeded would temporarily be used as the safety zones, until the model is recalibrated and new safety zone distances are formally established.</p> <p><b>Ocean outfall Marine Mammal Observers</b></p> <p>At least one observer will be on duty at the ocean outfall site and solely dedicated to observing marine mammals at all times during any activity that could generate underwater noise.</p> <p>MMOs will be equipped with appropriate equipment (e.g. range finder binoculars, camera and recording documents) and will be sited at strategic vantage points on the shore or on board vessels, as is most appropriate for the</p>

Trigger issue	Applicable trigger approval condition	Applicable EIMP Module	Objectives	Trigger level	Remedial/response strategy	Timeframe	Monitoring
							<p>circumstances. The observer location will be whatever is necessary on a particular day (and time of day) to observe the area around the outfall construction without obstruction or glare. Potential observer sites include on patrol vessels, on the berm (if constructed) and on shore.</p> <p>MMOs will be in direct or radio contact with the person overseeing construction activities to enable communications regarding any whale, dolphin or seal observations.</p> <p>When construction activities that generate underwater noise are occurring at the outfall, regular visual surveillance at 10 to 15 minute intervals within the alert zones will be conducted.</p> <p>A trigger level of a single marine mammal entering the relevant safety zone will be adopted. A 2 km radius alert for whales will be implemented with a 1 km radius safety zone, within which underwater noise generating activities will be ceased if a whale approaches. A 1 km radius alert for seals and dolphins will be implemented with a 0.5 km radius safety zone, within which underwater noise generating activities will be ceased if a seal or dolphin approaches.</p> <p><b>Wharf Marine Mammal Observers</b></p> <p>At least one observer will be on duty at the wharf site and solely dedicated to observing marine mammals at all times during pile driving and any other activity that could generate significant underwater noise.</p> <p>At the start of each continuous pile driving period there will be gradual build-up in the hammering rate over at least a 10 minute period so that marine mammals have time to leave and/or avoid the area before the full hammering rate is reached.</p> <p>MMOs will be equipped with appropriate equipment (e.g. range finder binoculars, camera and recording documents) and will be sited at strategic vantage points on the shore or on board vessels, as is most appropriate for the circumstances. The observer height and location will be whatever is necessary on a particular day (and time of day) to observe the entrance to Long Reach (the arm of the estuary within which the wharf is located) without obstruction or glare. Potential observer sites include on patrol vessels, the wharf site itself, the nearby power station, the observation point at Bell Bay, the wharf at Bell Bay and at Rowella.</p> <p>MMOs will be in direct or radio contact with the person overseeing construction activities to enable communications regarding any whale, dolphin or seal observations.</p> <p>When construction activities that generate underwater noise are occurring at the wharf, regular visual surveillance at 10 to 15 minute intervals within the alert zones will be conducted.</p> <p>A trigger level of a single marine mammal entering the relevant safety zone will be adopted. A 2 km radius alert for whales will be implemented with a 1 km radius safety zone, within which underwater noise generating activities will be ceased if a whale approaches. A 1 km radius alert for seals and dolphins will be implemented with a 0.5 km radius safety zone, within which underwater noise generating activities will be ceased if a seal or dolphin approaches.</p>

**Table 6: Remedial and response measures and response timeframes for discharge effluent trigger levels (DETLs) and maximum limits (DEMLs) (condition 3, 4 and 5 responses to condition 31, 32 and 33 and Schedule 2 trigger levels and maximum limits)**

Trigger or maximum limit	Reference in this EIMP module for levels	Primary response if exceeded	Timing of primary response initiation	Secondary response if primary response fails	Timing of secondary response initiation
<b>Commissioning and ramp-up phase effluent</b>					
Within month <sup>1</sup> and monthly DETLs	Table 8	Undertake Root Cause Analysis and implement remedial measures. Continue to monitor real-time using statistical process tools with in-line parameters to confirm that they move back into control ranges.	Within 24 hours of weekly review or monthly result	Modify production until real-time, in-line parameters return to within control ranges. Inform SEWPaC of the excursion event and of the action taken within 7 days.	Within 24 hours of subsequent 7-day or monthly result
Monthly DEMLs	Table 8	Undertake Root Cause Analysis and implement remedial measures. Modify production or process variables until subsequent monitoring activities confirms limit is satisfied.	Within 24 hours of monthly result	Modify production until the cause has been determined and rectified. Submit report on the problem and action taken to SEWPaC within 14 days. Consider intensification of relevant monitoring activities in the receiving environment.	Within 24 hours of subsequent monthly result
Average monthly volume limit (Averaged over the months since start-up)	Condition 31	Review production and operational schedules and adjust as necessary to confirm that the average monthly volume limit will not be exceeded at the end of the 12 month commissioning and ramp up averaging period.	Within 24 hours of average monthly metric being determined	Adjust effluent flow to ensure that the average monthly volume limit will be attained at the end of the 12 month commissioning and ramp up averaging period.	Within 24 hours of subsequent monthly determination
<b>Operational phase effluent</b>					
Within month DETL	Table 9	Undertake Root Cause Analysis and implement remedial measures.	Within 24 hours of weekly review	Intensify investigation to determine source. Check measurements systems.	Within 24 hours of subsequent result
Monthly DETL	Table 9	Undertake Root Cause Analysis and implement remedial measures. Continue to monitor real-time using statistical process tools with in-line parameters to confirm that they move back into control ranges.	Within 24 hours of monthly rolling average recalculation (reviewed weekly)	Detailed risk assessment. Determine if modifying production or process further will resolve issue if an identifiable cause(s) has not been determined and rectified. Submit report on the excursion event and action taken to SEWPaC within 1 month.	Within 24 hours of subsequent monthly average result
Monthly DEML	Table 9	Undertake Root Cause Analysis and implement remedial measures. Modify production levels or process variables until subsequent monthly metric confirms operations are compliant to limit(s). Continue to monitor key performance indicators. Inform SEWPaC of the exceedence and of the action taken.	Within 24 hours of monthly rolling average recalculation (reviewed weekly)	Conduct extensive failure analysis, including ecological impact assessment. Modify production and/or process until the cause has been determined and rectified. Submit report on the exceedence event and action taken to SEWPaC within 1 month.	Within 24 hours of subsequent monthly average result
Average monthly volume limit (Averaged over a rolling 12 month period)	Condition 31	Adjust mill configuration and/or operational schedules to effect a continuous reducing trend* in the 12 month rolling average and continue with the adjusted configuration/schedule until the average monthly flow has returned to below its limit. Confirm then current pollutant loading rates are and remain within control limits. Inform SEWPaC of the exceedence and of the action taken.  *Sudden large changes to the effluent treatment plant loadings can upset the stability and hence performance of the plant, which may lead to adverse environmental outcomes. This, together with the nature of a 12-month rolling average, means that a return to below the average monthly volume limit cannot be stepwise and must necessarily occur as a steadily reducing trend.	Within 24 hours of average monthly metric being determined	If the primary response's reduction trend line is unable to be held to, prepare and implement an effluent flow rate correction plan to ensure that the trendline is regained within 3 months. Submit the plan to SEWPaC within 1 month.	Within 24 hours of average monthly result showing the reduction trend line is not being achieved

<sup>1</sup> Within month is the laboratory based determination of any individual sample

Table 7: Remedial and response measures and response timeframes for receiving environment trigger levels (RETLs) and maximum limits (REMLs) (Schedule 2 trigger levels and maximum limits)

Trigger or maximum limit	Reference in this EIMP module for levels	Primary response if exceeded	Timing of primary response initiation	Secondary response if primary response fails	Timing of secondary response initiation
Receiving environment water chemistry, sediment chemistry, biota and ecological communities					
Low level effect	Table 10 & Table 11	Review C-BOMP design to ensure that effects are monitored.	For next sampling round	Continue to monitor.	Next sampling round
Medium level effect	Table 10 & Table 11 & Condition 39	<i>General:</i> Review C-BOMP design to ensure that effects are monitored → Characterise risk → Identify response options → Evaluate options → Advise SEWPaC of proposed actions → Implement appropriate options → Monitor effectiveness of response.	Within 1 month of sampling result	Submit report to SEWPaC on the ecological significance of effects and options available to mitigate impacts, if any, including the design and operation of the effluent pipeline and diffuser within 1 month.	Within 1 month of subsequent sampling round result
		<i>Additionally for water chemistry toxicants:</i> Implement a pulsed discharge regime (using temporary effluent storage in the spill basin) linked to tidal state so as to avoid discharge at slack water and monitor the effectiveness of this at the relevant Impact Location(s) with hourly sampling over at a full tidal cycle. If this does not bring water quality concentrations below trigger values at the following week's sampling, reduce production and hence discharge rates until hourly monitoring over a full tidal cycle confirms that trigger levels are no longer exceeded beyond the edge of the mixing zone.	Within 48 hours of sampling result		
High level effect	Table 10 & Table 11	<i>General:</i> Review C-BOMP design to ensure that effects are monitored → Characterise risk → Identify response options → Evaluate options → Advise SEWPaC of proposed actions → Implement appropriate options → Consider program to identify potential causal agents applicable to operation of the mill. Monitor effectiveness of response for next monitoring cycle(s) or other nominated confirmation period.	Within 1 month of the next monitoring cycle or a nominated confirmation period.	Cease production. Submit report to SEWPaC within 1 month on the ecological significance of the observed effect(s), including where possible an assessment of cause (undesirable impacts could arise if maximum limits for water quality, sediment quality and/or biota are exceeded) and options available to mitigate the effect(s) if they can reasonably be attributed to the mill. The report will include an assessment of the potential efficacy of implementing tertiary treatment to resolve the issue, and where relevant a timetable for remediation of any undesirable impacts on matters of National Environmental Significance. The mill will not be restarted until approved to do so by the Minister.	Within 1 month of subsequent sampling round result
		<i>Additionally for water chemistry toxicants:</i> Reduce or cease production and hence discharge rates until hourly monitoring over a full tidal cycle confirms that trigger levels are no longer exceeded beyond the edge of the mixing zone.	Within 48 hours of sampling result		

**Table 8: Monthly maximum limits (DEMLs) and weekly discharge effluent trigger levels (DETLs) for the Bell Bay pulp mill during commissioning and ramp-up phases (relating to condition 3, 4 and 5 responses to condition 32 and 33 trigger levels and maximum limits)**

Parameter	Units	DEML	Units	DETL
				0 to 12 months from start-up
Dioxins and furans	pg TEQ/L	3.4	pg TEQ/L	2
Total chloroacetic acids	µg/L	237	µg/L	237
Chlorate	t/month	7	mg/L	5

**Table 9: Discharge effluent trigger levels (DETLs) and maximum limits (DEMLs) for the Bell Bay pulp mill during normal operations (relating to condition 3, 4 and 5 responses to condition 32 and 33 trigger levels and maximum limits)**

Parameter	Units	Within month DETL	Monthly DETL	Monthly DEML
		(determination of any individual sample)	(30-day rolling average)	
Dioxins & furans	pg TEQ/L	2.0	2.0	3.4
	mg TEQ/month	-	-	6.53
Total chloroacetic acids	µg/L	237	237	237
	t/month	-	-	0.46
Total resin acids	mg/L	0.25	N/A	0.25
	t/month	-	-	0.48
Chlorate	mg/L	1.9	1.9*	2.0*
	t/month	-	-	3.84*
<b>General pulp mill effluent indicator</b>				
AOX	kg/day	-	300*	400*
<b>Physicochemical stressors</b>				
TSS	kg/day	-	1540	3840
COD (total)	kg/day	-	28000	40000*
Total N	kg/day	-	360**	630
Total P	kg/day	-	60	110
Colour	kg/day	-	37800	52400

Note: Samples will be taken and analysed in accordance with Australian Standard 5667:1998 Water Quality - Sampling and/or the Standard Methods for the Examination of Water and Wastewater (APHA/AWWA/WEF).

**Table 10: Receiving environment trigger levels (RETLs) and maximum limits (REMLs) in Commonwealth waters (conditions 39 and 41)**

Parameter	RETL µg/L	REML µg/L
Aluminium (filtered)	6	7.2
AOX	29	34.8
Chlorate	30	36
Monochloroacetic acid (a chloroacetic acid)	0.58	0.7
Trichloroacetic acid (a chloroacetic acid)	3	3.6
Resin acids excluding dehydroabietic acid	52	62.4
Dehydroabietic acid (a resin acid)	13	15.6
Chlorophenols	2	2.4

**Table 11: Effect trigger levels for water chemistry, sediment chemistry, biota and ecological community indicators (condition 3, 4 and 5 responses to Schedule 2 trigger levels and maximum limits, and condition 41(a))**

Effect level	RETL or REML		
	Water chemistry	Sediment chemistry	Biota and ecological communities
<b>Low level effect</b>	<ul style="list-style-type: none"> <li>The time series trend of a toxicant at any Impact Location indicates that it is trending upward and may breach the applicable RETL in Table 10.</li> </ul>	<ul style="list-style-type: none"> <li>Dioxin and furan concentrations in consecutive independent serial samples exceed 100 pg TEQ/kg at any Location in Commonwealth waters.</li> </ul>	<ul style="list-style-type: none"> <li>Previously unobserved statistical change in fish abundance, algae and infauna abundance or infauna species richness at any Impact Location.</li> </ul>
<b>Medium level effect</b>	<ul style="list-style-type: none"> <li>The maximum (100%ile) concentration of a toxicant at any Impact Location exceeds its applicable RETL in Table 10.</li> </ul>	<ul style="list-style-type: none"> <li>Statistical difference of a toxicant at any Impact Location of more than 1 standard deviation relative to controls; or</li> <li>Dioxin and furan concentrations in consecutive independent serial samples exceed 460 pg TEQ/kg at any Location in Commonwealth waters; or</li> <li>Statistical increasing trend predicting dioxin and furan concentrations will exceed 850 pg TEQ/kg at any Location in Commonwealth waters.</li> </ul>	<ul style="list-style-type: none"> <li>Statistical change (with at least 2 years of data) at any Impact Location as a percentage of control greater than 50% (fish abundance), 75% (algae and infauna abundance) or 25% (infauna species richness); or</li> <li>Mean dioxin and furan concentration in fish flesh exceeds 0.7 pg TEQ/g fw.</li> </ul>
<b>High level effect</b>	<ul style="list-style-type: none"> <li>Consecutive independent serial samples exceed a toxicant REML in Table 10 at any Impact Location.</li> </ul>	<ul style="list-style-type: none"> <li>Statistical difference of a toxicant at any Impact Location of more than 2 standard deviations relative to controls; or</li> <li>Statistical difference of a toxicant at any Location (other than Impact) of more than 1 standard deviation relative to controls; or</li> <li>Dioxin and furan concentrations in consecutive independent serial samples exceed 850 pg TEQ/kg at any Location in Commonwealth waters.</li> </ul>	<ul style="list-style-type: none"> <li>Statistical change (with at least 2 years of data) at any Location (other than Impact) as a percentage of control greater than 50% (fish abundance), 75% (algae and infauna abundance) or 25% (infauna species richness); or</li> <li>Fish condition index exceeds critical effect size; or</li> <li>Mean dioxin and furan concentration in fish flesh exceeds 7 pg TEQ/g fw.</li> </ul>

Note: In this table, “Location” and “Impact Location” have the meanings described in the Commonwealth Baseline and Operational Monitoring Plan (EIMP Module M). Critical effect sizes for fish condition indices are also described in that document. “Independent serial samples” means samples taken in a temporal sequence but which are not autocorrelated - they may or may not be able to be sequential samples depending on the degree of temporal correlation.

# Appendix A Integrated EIMP progress update

		MODULE																
		A	B	C	C1	D	E	F	G	H	I	J	K	L	M	N	O	
Phase	EPBC 2007/3385 Schedule 2 Component	EIMP Overview	Vegetation clearing - mill site and wharf access	Mill site bulk earthworks	Mill construction	Wharf construction	Accommod- ation facility construction	Water supply pipeline construction	Shore crossing construction	Ocean outfall construction	Solid waste disposal facility construction	Local reservoir construction	Effluent pipeline construction	Pre- commission management	Monitoring program	Remedial and response strategies	Habitat offsets & reserves	
	1. Overview	a	A description of the proposal and associated infrastructure															
		Identification of clear environmental objectives																
		Identification of environmental indicators, and translation of objectives into agreed targets and performance measures																
		Design and implementation of an appropriate monitoring program																
		Identification of, and commitment to, agreed trigger or response levels for key indicators																
		Identification of specific remedial management responses to be undertaken when trigger point levels are exceeded																
<b>EPBC approval condition(s)</b>		1,2,6,7,8,9,10,11,12,13,20,44,45,46,47,48	14,15,17,18,20,23,25,26	14,17,18,20,23,25,26	14,17,20,23,25,26	14,27,28,29,30	14,20,23,25	14,19,20,21,22,23,25	14,20,23,24,25,27	14,20,26,27,28,30,38,39	14,17,20,23,25,26	14,17,20,23,25,26	14,19,20,21,22,23,24,25	3, 4, 9, 31, 32, 33, 34, 35, 37,38,39,41,42	3,4,31,32,33,36,37,40,41,42,43*	3,4,5,19,26,29,30,31,32,33,39	15,16,17,18	

\*For completeness Module M also reiterates monitoring described in other modules relevant to conditions 15, 16, 17, 18, 19, 20, 22, 25, 26, 27, 29, 30, 34, 35 and 38

Not applicable	Other modules	This module
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		MODULE																	
		A	B	C	C1	D	E	F	G	H	I	J	K	L	M	N	O		
Phase	EPBC 2007/3385 Schedule 2 Component	EIMP Overview	Vegetation clearing - mill site and wharf access	Mill site bulk earthworks	Mill construction	Wharf construction	Accommod- ation facility construction	Water supply pipeline construction	Shore crossing construction	Ocean outfall construction	Solid waste disposal facility construction	Local reservoir construction	Effluent pipeline construction	Pre-commission management	Monitoring program	Remedial and response strategies	Habitat offsets & reserves		
	2. Preconstruction	a	Management of impacts on the Wedge-tailed Eagle - Tasmanian																
b		Management of risks to listed flora from plant pathogens																	
c		Management of risks and uncertainties associated with the non-detection of listed flora																	
d		Management of risks associated with the decline of difficult-to-detect listed flora																	
e		Management of risks associated with the decline of Xanthorrhoea aff. bracteata																	
f		Management of risks associated with the amphibian chytrid fungus Batrachochytrium dendrobatidis																	
g		Management of risks associated with trenching																	
h		Mitigation of impacts on the pipeline corridors																	
i		Establishment of baseline surveys for roadkill																	
j		Undertaking appropriate surveys and establishing mitigation measures for impacts on listed migratory birds																	
k		Undertaking appropriate examination of likely impacts of pile-driving noise associated with the wharf construction [or outfall construction noise]																	
l		Establishing baseline levels of vessel strike in the region																	
m		Monitoring the baseline levels of contaminants in listed species																	
n		Developing rehabilitation and offset plans for listed threatened species																	
o		Establishing measures for habitat protection																	
EPBC approval condition(s)		1,2,6,7,8,9,10,11,12,13,20,44,45,46,47,48	14,15,17,18,20,23,25,26	14,17,18,20,23,25,26	14,17,20,23,25,26	14,27,28,29,30	14,20,23,25	14,19,20,21,22,23,25	14,20,23,24,25,27	14,20,26,27,28,30,38,39	14,17,20,23,25,26	14,17,20,23,25,26	14,19,20,21,22,23,24,25	3, 4, 9, 31, 32, 33, 34, 35, 37,38,39,41,42	3,4,31,32,33,36,37,40,41,42,43*	3,4,5,19,26,29,30,31,32,33,39	15,16,17,18		

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		MODULE																
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3. Construction	a	Management of risks associated with the amphibian chytrid fungus																
		Management of risks associated with roadkill																
		Management of pile-driving noise[or outfall construction noise]																
	d	Development of strategies to minimise vessel strike																
	e	Appropriate strategies to minimise impacts on listed migratory birds																
		Strategies to ensure no increase in the levels of contaminants in listed species																
	g	Management of risks associated with listed crayfish																
4. Precommissioning		Toxicity testing of Elemental Chlorine Free mill effluents																
		Studies to establish the properties affecting fate of fine particulate organic matter in effluent																
		Establish maximum limits and trigger levels of pollutants in effluent, receiving environment and sentinel biota																
	d	Measurement of background contaminants in sediments and biota																
	e	Background ecological surveys																
		Improved modelling (hydrodynamic and sediment) of fate and impact of effluent																
		Design of the monitoring program for marine effluent																
EPBC approval condition(s)		1,2,6,7,8,9,10,11,12,13,20,44,45,46,47,48	14,15,17,18,20,23,25,26	14,17,18,20,23,25,26	14,17,20,23,25,26	14,27,28,29,30	14,20,23,25	14,19,20,21,22,23,25	14,20,23,24,25,27	14,20,26,27,28,30,38,39	14,17,20,23,25,26	14,17,20,23,25,26	14,19,20,21,22,23,24,25	3, 4, 9, 31, 32, 33, 34, 35, 37,38,39,41,42	3,4,31,32,33,36,37,40,41,42,43*	3,4,5,19,26,29,30,31,32,33,39	15,16,17,18	

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Not applicable	Other modules	This module
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Phase		EPBC 2007/3385 Schedule 2 Component	MODULE															
			A	B	C	C1	D	E	F	G	H	I	J	K	L	M	N	O
		EIMP Overview	Vegetation clearing - mill site and wharf access	Mill site bulk earthworks	Mill construction	Wharf construction	Accommodation facility construction	Water supply pipeline construction	Shore crossing construction	Ocean outfall construction	Solid waste disposal facility construction	Local reservoir construction	Effluent pipeline construction	Pre-commission management	Monitoring program	Remedial and response strategies	Habitat offsets & reserves	
5. Ongoing monitoring	a	Effluent monitoring																
	b	Continuous monitoring of the effluent plume and its dispersion																
	c	Sediment quality monitoring																
	d	Sentinel biota monitoring																
	e	Ecological surveys																
6. Remedial response		Remedial management responses to be undertaken when trigger levels are exceeded or maximum limits are reached																
EPBC approval condition(s)			1,2,6,7,8,9,10,11,12,13,20,44,45,46,47,48	14,15,17,18,20,23,25,26	14,17,18,20,23,25,26	14,17,20,23,25,26	14,27,28,29,30	14,20,23,25	14,19,20,21,22,23,25	14,20,23,24,25,27	14,20,26,27,28,30,38,39	14,17,20,23,25,26	14,17,20,23,25,26	14,19,20,21,22,23,24,25	3, 4, 9, 31, 32, 33, 34, 35, 37,38,39,41,42	3,4,31,32,33,36,37,40,41,42,43*	3,4,5,19,26,29,30,31,32,33,39	15,16,17,18

\*For completeness Module M also reiterates monitoring described in other modules relevant to conditions 15, 16, 17, 18, 19, 20, 22, 25, 26, 27, 29, 30, 34, 35 and 38

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