Management Plan

BELL BAY PULP MILL MANAGEMENT PLAN

Revision	Date	Revision Description	Prepared	Reviewed	Approved
B0	19 October 2007	Revised following comments from DTAE	RF	IW	RF
C0	21 November 2007	Revised following comments from DTAE for resubmission to DTAE for approval	JRD	JD	JC
D0	19 December 2007	Revised following comments from DTAE for resubmission to DTAE for approval	JRD	JD	JC
E0	20 December 2007	Revised following comment from DTAE for resubmission to DTAE for approval	JRD	JD	JC
F0	26 October 2010	Revised following technological changes for resubmission for EPA approval	BJY	CD	LRB
G0	3 November 2010	Revised following comment from EPA for resubmission to EPA for approval	BJY	CD	LRB

Gunns reference number of this document: GNS-PLN-1000-1400-0001-G-00

Plan:	**Construction Dust Management Plan**
Purpose:	To monitor dust emissions and implement dust mitigation measures during construction activities at the mill and wharf site. Construction activities have the potential to produce fugitive nuisance dust emissions that may adversely impact the nearest residential areas, being Rowella on the western shore of Long Reach.
Objectives:	This Dust Management Plan provides a protocol for real time monitoring of dust fallout at the nearest residences to the pulp mill, as well as detailing dust mitigation procedures during major earthwork and quarrying activities.

Project phase(s): Construction **x** Commissioning Operations

Summary of Dust Management Measures

Under normal construction conditions, dust will be minimised through various measures including careful planning of works, siting and covering of stockpiles, and watering of work areas and haul roads. Real time monitoring equipment will be used to measure wind direction and speed at the construction site, and dust PM10 at Rowella, and will automatically send messages to key personnel to inform them of potential dust impact when PM10 >50 µg/m^3. On receipt of a public complaint or alert message, or when a "wind alert status" is experienced (wind direction is between 330 and 100 degrees and wind speed is >5 m/s, or wind speed is >7.5m/s in any direction), or if an unacceptable dust emission is observed by personnel on site, then the web cam dust surveillance system will be used to confirm if a dust plume is emanating from the mill construction site and to determine the source of the dust generation. Additional dust mitigation measures, including watering of affected areas, will then be used to target dust sources. If dust concentrations measured at the dust monitoring stations do not drop below trigger levels within 30 minutes, the activity generating the dust will be stopped.

This plan sets out how the dust mitigation objectives of the CEMP Environmental Program 08 Air Quality Management will be achieved, and includes additional detail with regard to monitoring of dust and implementation of on site dust mitigation in response to alert conditions. Where applicable details of the relevant permit requirements and how the management plan meets those requirements are given.

The permit does not define "nuisance", and this Plan therefore takes guidance from the definition of "environmental nuisance" in the *Environmental Management and Pollution Control Act 1994*, which is "the emission of a pollutant that unreasonably interferes with, or is likely to unreasonably interfere with, a person's enjoyment of the environment".

APPLICABLE PERMIT CONDITIONS					
Permit condition	**Schedule**	**Part**	**Section**	**Number**	**Page**
	LU1	**3**	**3**	**3AM 11.2**	**107 of 201 Sequential 120**
Permit wording	The plan must be prepared in accordance with any guidelines provided by the Director. The plan must include, but is not limited to, details of the following: (a) identification of critical wind direction arc(s) which may result in dust emissions being directed over sensitive uses; (b) identification of a wind speed threshold which may transport dust from the pulp mill site if exceeded; (c) identification of the location(s) where wind monitoring will occur to facilitate identification of times when winds are within the critical wind direction arc(s) and/or exceed the wind speed threshold; (d) development of a series of alert status levels, which are dependant on measured wind speed and directions; (e) identification of dust management prescriptions that will be triggered according to the wind alert status level; (f) a description of how site managers and workers can identify the current wind alert status level at any time; (g) a description of how web cameras and direct visual monitoring of dust emissions will be utilised for dust mitigation purposes during construction activities; (h) a description of how dust and particle monitoring methodologies will be utilised for dust mitigation purposes during construction activities; (i) a table containing all of the major commitments made in the plan; (j) an implementation timetable for key aspects of the plan; and (k) a reporting program to regularly advise the Director of the results of implementation of the plan.				

APPLICABLE PERMIT CONDITIONS					
Permit condition	**Schedule**	**Part**	**Section**	**Number**	**Page**
	LU 1	**3**	**3**	**3AM 12.1**	**108 of 201 Sequential 121**
Permit wording	Dust produced by the operation of all crushing and screening plant must be controlled by the use of one or more of the following methods to the extent necessary to prevent environmental nuisance being caused: (a) the installation of fixed water sprays at all fixed crushers and at all points where crushed material changes direction due to belt transfer; (b) the installation of dust extraction equipment at all fixed crushers and at all points where crushed material changes direction due to belt transfer, and the incorporation of such equipment with all vibrating screens; (c) the enclosure of the crushing and screening plant and the treatment of atmospheric emissions by dust extraction equipment; and/or (d) any other method that has been approved in writing by the Director.				
Permit condition	**Schedule**	**Part**	**Section**	**Number**	**Sequential page**
	LU1	**3**	**3**	**3AM 13.1**	**108 of 201 Sequential 121**
Permit wording	A web cam visual monitoring system must be established to the satisfaction of the Director to facilitate real time visual monitoring of dust emissions from the pulp mill site during construction activities: (a) each camera must produce a stream of real time date and time stamped images available for viewing on a website. An image from each camera must be archived at least every ten minutes, and remain stored for a minimum period of one year; (b) each camera must be able to be controlled remotely in order to zoom, tilt and pan the field of view; and (c) the Director must be given access to view and control the website and all associated functionality described in this condition.				

APPLICABLE PERMIT CONDITIONS	
Component	**Induction and training**
Measures	The Design Consultants will be briefed on the design aspects of the CEMP Operational Control BBA-OCO-1000-1400-0008 Air Quality Management. All employees, consultants and subcontractors involved will be inducted into the environmental aspects and controls related to the CEMP Operational Control BBA-OCO-1000-1400-0008 Air Quality Management. Awareness instructions will be provide to all relevant SSC staff, contractors and field personnel. The objectives of the awareness training include: • Dust Management Plan provisions • Purpose and operations of dust web cam system • Importance of minimising the area of exposed soil • Maintaining haul road moisture levels • Observing speed limits. • The responsibility of all staff to be aware of the potential for nuisance dust emissions All staff, contractors, and field personnel will be encouraged and empowered to report observed dust emissions to the supervisor and directly remediate dust emissions where practical. Environmental briefings will emphasize site-specific control requirements.
Component	**Earthworks and topsoil stockpiles**
Measures	The works will be planned to limit the area of exposed soil to the minimum required for the immediate works. The time lapse between stripping topsoil and the commencement of the main earthworks will be kept to the absolute minimum unless sufficient stabilisation is achieved. The surface of fill areas will be compacted when the area will be left exposed for long periods. Completed earthworks will be stabilised and rehabilitated. Earthworks areas will be watered where they are being trafficked. Stockpiles in sensitive areas will be watered during windy conditions where they are a source of dust. Water carts will be available out of hours in situations where unacceptable amounts of dust could be generated, eg. summer months, winds and extended periods without rain. Arrangements will be in place to be able to mobilise these water carts at short notice. Activities will be modified or suspended during extreme dry and/or wind conditions if dust is a problem.

MANAGEMENT MEASURES	
Component	**Crushing and screening plant**
Measures to address LU 1 3AM 12.1	Dust produced by the operation of all crushing and screening plant will be controlled by the use of one or more of the following methods: • the installation of fixed water sprays at all fixed crushers and at all points where crushed material changes direction due to belt transfer; • the installation of dust extraction equipment at all fixed crushers and at all points where crushed material changes direction due to belt transfer, and incorporation of such equipment with all vibrating screens; • the enclosure of the crushing and screening plant and the treatment of atmospheric emissions by dust extraction equipment.
Component	**Haul roads**
Measures	Long term haul roads will be constructed of crushed rock or other suitable material in locations adjacent to residential and commercial areas. Haul roads will be regularly maintained and watered as required to suppress dust. Speeds on haul roads will be limited if necessary to reduce dust generation.
Component	**On road transport of fill, muck or quarry products**
Measures	Loads will be covered as necessary to contain dust.
Component	**Dust management flow chart**
Measures	The attached dust management flow chart will be adopted.
Component	**Critical wind direction**: 3AM 11.2 (a) Identification of critical wind direction arc(s) which may result in dust emissions being directed over sensitive uses
Measures	The nearest sensitive populated areas are located on the western side of the mill (Rowella) which is within a critical arc of **330 to 100 degrees** (NW, N, NE, E).
Component	**Critical wind speed**: 3AM 11.2 (b) Identification of a wind speed threshold which may transport dust from the pulp mill site if exceeded
Measures	Wind erosion is the major source of fugitive dust. A published report of mallee dust "Mallee *Dust – The high and lows for the period 1990 to 2002* by John Leys[1] and Grant McTainsh[2] concluded that the average wind speed over the years with the highest dust loads was 7.6 m/s with the average over the 13 year period reducing to 5 m/s. 7.5m/s has been used as an investigation trigger level for the Gunns wood chip loading operation at Burnie. Two critical wind speeds have therefore been determined: • 5 m/s has been selected as the alert wind speed for when wind is in the direction of Rowella (the critical wind arc). This represents the possibility of dust being mobilised by wind erosion on site and travelling towards the most sensitive receptors.

[1] Department of Infrastructure, Planning and Natural Resources, Gunnedah NSW

[2] Faculty of Environmental Sciences, Griffith University, Qld.

	MANAGEMENT MEASURES
	• 7.5 m/s has been selected as the alert wind speed for any wind direction. This represents the capacity of the wind to carry dust a sufficient distance to other potential receptors and in sufficient quantities to cause a nuisance.
Component	**Wind monitoring locations**: 3AM 11.2 (c) Identification of the location(s) where wind monitoring will occur to facilitate identification of times when winds are within the critical wind direction arc(s) and/or exceed the wind speed threshold
Measures	Sources of wind direction/speed information for this project are: • Daily weather forecast – this will be a topic at the morning tool box meeting for the earthmoving crews with special cognisance of air humidity and wind speed. • Wind direction sensor and anemometer located on the mill site – the supervisor will be responsible for monitoring this and reporting to his crew when the wind is in the critical arc and/or speed. • Continuous data from the Rowella Air Quality Monitoring Station – mobile messaging to nominated mobile phones will alert the Construction Supervisor, Site Environmental Officer and Gunns environmental team when the wind is in the critical sector and speed. The location of the Rowella AQMS is shown on the attached map.
Component	**Alert status levels**: 3AM 11.2 (d) Development of a series of alert status levels, which are dependant on measured wind speed and directions
Measures	The alert status is a wind speed and/or direction that trigger interrogation of dust monitoring stations at Rowella, observation of the dust web cam, visual inspection on site and, potentially, implementation of additional targeted mitigation measures at the construction site. The alert critical conditions are: • Wind direction sector 330 to 100 degrees and wind speed >5 m/s, or • Wind speed >7.5 m/s regardless of wind direction If it is raining the above critical conditions will not apply.
Component	**Identification of alert status**: 3AM 11.2 (f) A description of how site managers and workers can identify the current wind alert status level at any time
Measures	Induction training for earthmoving/blasting/quarrying contractors will cover dust mitigation measures and monitoring protocols. Continuous data from the Rowella Air Quality Monitoring Station via mobile messaging of wind speed/direction to nominated mobile phones will alert the construction supervisor and site environmental officer when the wind is in the critical sector and speed for potential nuisance dust impact on Rowella. In addition the Construction Supervisor will be responsible for monitoring the wind direction sensor and anemometer on site, to determine if the wind is in the critical arc and/or speed.

	MANAGEMENT MEASURES
Component	**Particle monitoring**: 3AM 11.2 (h) A description of how dust and particle monitoring methodologies will be utilised for dust mitigation purposes during construction activities
Measures	*Dust Monitoring Stations* Two dust monitoring stations will be located at nearby Rowella residences. These stations will comprise DustTrak TSI 8530 based systems capable of real time continuous measurement of PM10. When the 15 min average PM10 exceeds 50 ug/m_3 a message will be automatically sent to a nominated mobile phone. The locations shown on the attached map are initial locations and may be varied if necessary by agreement between Gunns and the EPA. At least one of the DustTrak systems will have remote access capability allowing PM10 levels to be monitored when the wind is in the critical arc. *Observations* An observed increase in PM10 levels above the threshold will trigger the viewing of video camera surveillance information and visual inspection of the site to confirm whether a dust plume is being emitted. The source of the plume will be identified and appropriate controls implemented.
Component	**Web cam visual monitoring system**
Measures to address LU 1 3AM 13.1	A web cam visual monitoring system will be installed to facilitate real time visual monitoring of dust emissions during construction activities: The system comprises one camera, located on the roof of an existing building at the fish farm (see attached map) on the western side of the Tamar River where it has clear uninterrupted views of the mill and wharf sites. Although additional cameras could be added to the system if required and justifiable; the single camera is considered to provide adequate coverage and at this stage there is no reason to conclude that more are required. The camera will be mains powered with wireless link from the camera location. The system will provide real-time, streamed, date/time stamped images. Snapshot images will be archived every 10 minutes. It also stores continuous images to allow investigation of complaints. The camera has software to allow pan, zoom capability and is controllable over the internet by EPA using a supplied web based application. The recording system includes a web based software package to access and control live and recorded images from the camera. This application also allows remote access to archived images stored on the server. For security, only authorised users will have access to the system. The provider of the system will provide training to Gunns, its contractors and EPA to enable configuration of the VPN on any PC with internet access. Gunns will provide the EPA with the appropriate software to allow secure, remote accessibility at any time. Gunns, the Site Construction Supervisor and the EPA will have secure access at all times to the system. The Construction Dust Surveillance Web Cam GNS-MON-1000-1400-0001-C-00 has been separately submitted to and approved by the EPA. The operation and adequacy of the camera will be reviewed over the initial 3 months and the

	MANAGEMENT MEASURES
	findings reported to the Director, Environmental Management within 1 month. In consultation with the Director, the benefits of installation of additional cameras will be investigated if the single camera is found to be inadequate.
Component	**Visual monitoring**: 3AM 11.2 (g) A description of how web cameras and direct visual monitoring of dust emissions will be utilised for dust mitigation purposes during construction activities
Measures	Under normal conditions and ongoing dust mitigation, effectiveness of those measures will be assessed through daily inspection of the site by the Site Environmental Officer or Construction Supervisor with extra vigilance shown during periods of hot, dry and windy weather. During a wind alert status, after a public complaint, after an alert from the dust monitoring stations or when a dust emission is reported by any personnel on site, the Construction Supervisor or Site Environmental Officer will interrogate the surveillance camera and visually inspect the site directly. Direct visual inspection on site will include checking if significant dust plumes have the potential to impact on sensitive receptors including Rowella and the East Tamar Highway. Significant visible dust plumes leaving the site will trigger additional mitigation measures detailed in (e).
Component	**Dust management measures**: 3AM 11.2 (e) Identification of dust management prescriptions that will be triggered according to the wind alert status level
Measures	Under **normal wind conditions** dust mitigation measures will be: • Water earthworks areas where they are being trafficked • Water haul roads as required to suppress dust • Limit speeds on haul roads if necessary to reduce dust generation • Cover loads where required. Dust management under **alert status:** If, • Wind speed is >5m/s and wind direction is between 330 and 100 degrees, or • Wind speed is >7.5m/s regardless of wind direction, or • the dust monitoring stations indicate a 15 min average PM10 > 50 ug/m_3 , or • after a public complaint, or • a Construction Supervisor, Site Environmental Officer, EPA, and/or Gunns Environmental Officers at any time deems that unacceptable dust emissions are occurring then • the Construction Supervisor or Site Environmental Officer will make a visual inspection of the site and/or examine web cam video camera footage and interrogate data from dust monitoring stations to confirm the existence of a dust

<table>
<tr><th></th><th colspan="4">MANAGEMENT MEASURES</th></tr>
<tr><td></td><td colspan="4">plume and locate the sources of the dust, and

• additional dust mitigation measures will then, as soon as practicable, be applied targeting the source of the dust plume, which may include:

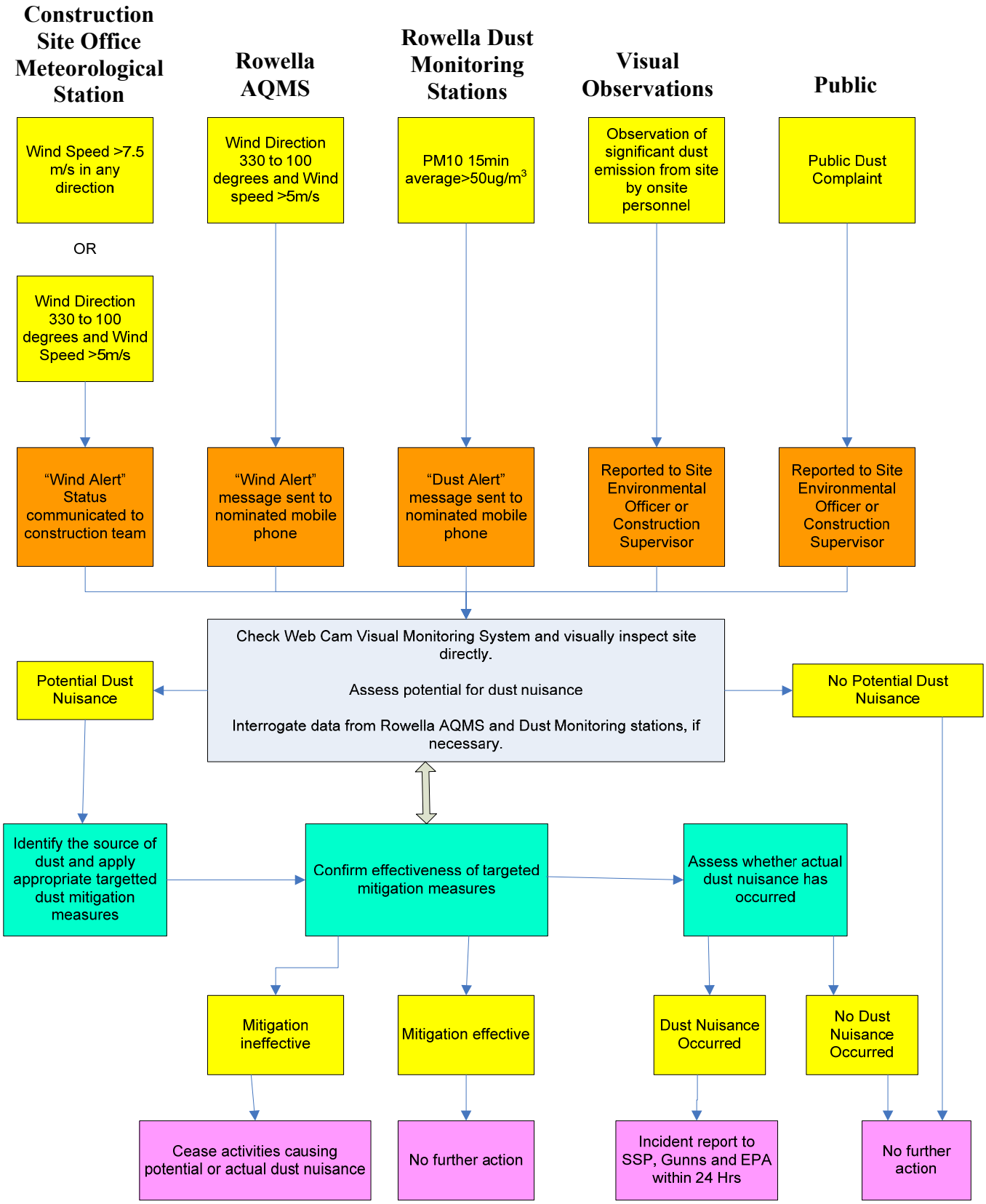
○ water stockpiles in sensitive areas during windy conditions where they are a source of dust.

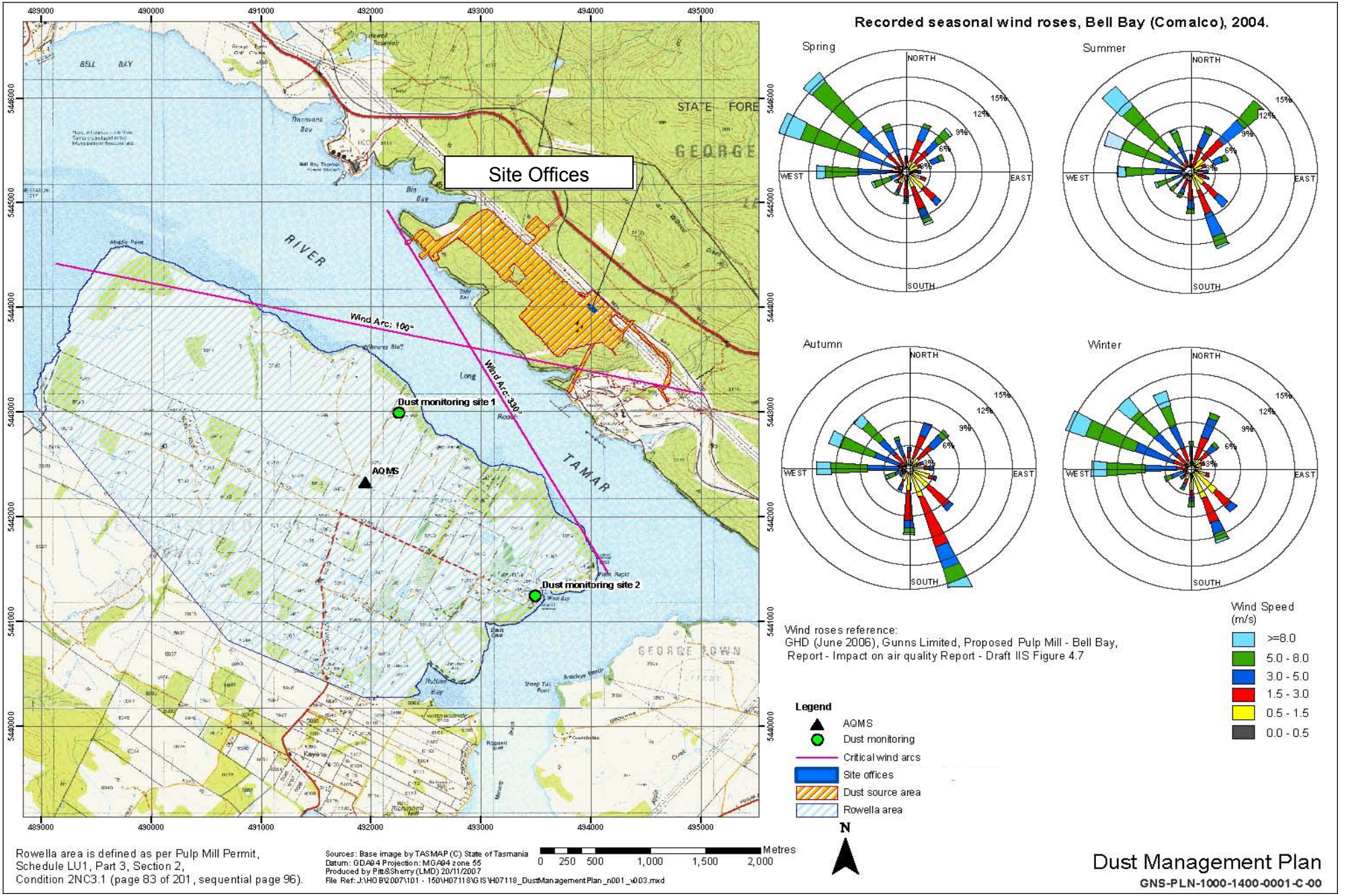
○ Subject to safety considerations, restrict blast times to periods when wind direction is outside the critical arc.

○ watering of haul roads and work faces.

If additional dust mitigation measures do not cause a reduction in measured PM10 to below trigger levels, or if significant visible dust plumes continue to leave the site and potentially impact on sensitive receptors, after 30 minutes from commencement of the additional mitigation measures, this will trigger immediate cessation of activity generating the dust until conditions moderate sufficiently to allow a resumption.</td></tr>
<tr><td>Component</td><td colspan="4">Reporting</td></tr>
<tr><td>Measures</td><td colspan="4">Results from dust monitoring stations, and frequency of significant dust plumes will be reported to SSC, Gunns and EPA on a monthly basis.

After a wind alert, dust alert, public complaint, or visual observation of significant dust emissions, the Site Environmental Officer must assess whether an actual dust nuisance occurred, using all available information gathered during the alert. If a dust nuisance did occur, an incident report must be submitted to SSC, Gunns and the EPA within 24 hrs.</td></tr>
<tr><td>Component</td><td colspan="4">Summary of commitments: 3AM 11.2 (i) a table containing all of the major commitments made in the plan; (j) an implementation timetable for key aspects of the plan; and (k) a reporting program to regularly advise the Director of the results of implementation of the plan.</td></tr>
<tr><td rowspan="6">Measures</td><td>Activity</td><td>Installation</td><td>Commencement of monitoring</td><td>Reporting</td></tr>
<tr><td>Dust Monitoring Stations</td><td>Install prior to commencement of bulk earthworks,</td><td>Commencement of bulk earthworks</td><td>Monthly reports to SSC, Gunns and EPA</td></tr>
<tr><td>Wind direction sensor and anemometer on mill site</td><td>Install prior to commencement of bulk earthworks,</td><td>Commencement of bulk earthworks</td><td>NA</td></tr>
<tr><td>Rowella AQMS</td><td>Installed and presently operating</td><td>Station is continuously monitoring wind direction/speed.</td><td>Anomalies will be reported in the monthly report.</td></tr>
<tr><td>Video surveillance</td><td>Camera and wireless communication installed at Rowella.</td><td>System will be installed, commissioned ready for continuous operation at start of major civil earthworks.</td><td>Frequency of significant dust plumes will be reported in the monthly report.</td></tr>
<tr><td>Complaints due to dust.</td><td>NA</td><td>NA</td><td>Confirmed complaint due to fugitive dust will trigger immediate report, within 24 hrs, to SSC, Gunns and EPA</td></tr>
</table>


Construction Site Office Meteorological Station
Rowella AQMS
Rowella Dust Monitoring Stations
Visual Observations
Public
Wind Speed >7.5 m/s in any direction
OR
Wind Direction 330 to 100 degrees and Wind Speed >5m/s
Wind Direction 330 to 100 degrees and Wind speed >5m/s
PM10 15min average>50ug/m3
Observation of significant dust emission from site by onsite personnel
Public Dust Complaint
"Wind Alert" Status communicated to construction team
"Wind Alert" message sent to nominated mobile phone
"Dust Alert" message sent to nominated mobile phone
Reported to Site Environmental Officer or Construction Supervisor
Reported to Site Environmental Officer or Construction Supervisor
Check Web Cam Visual Monitoring System and visually inspect site directly.
Assess potential for dust nuisance
Interrogate data from Rowella AQMS and Dust Monitoring stations, if necessary.
Potential Dust Nuisance
No Potential Dust Nuisance
Identify the source of dust and apply appropriate targetted dust mitigation measures
Confirm effectiveness of targeted mitigation measures
Assess whether actual dust nuisance has occurred
Mitigation ineffective
Mitigation effective
Dust Nuisance Occurred
No Dust Nuisance Occurred
Cease activities causing potential or actual dust nuisance
No further action
Incident report to SSP, Gunns and EPA within 24 Hrs
No further action



Rowella area is defined as per Pulp Mill Permit,
Schedule LU1, Part 3, Section 2,
Condition 2NC3.1 (page 83 of 201, sequential page 96).

Sources: Base image by TASMAP (C) State of Tasmania
Datum: GDA94 Projection: MGA94 zone 55
Produced by Pitt&Sherry (LMD) 20/11/2007
File Ref: J:\HOB\2007\101 - 150\H07118\GIS\H07118_DustManagementPlan_n001_v003.mxd

Dust Management Plan

GNS-PLN-1000-1400-0001-C-00