

Table 3.2.2.1.1 Summary of Baseline (Pre Operational) Marine Water Quality – Sub Programs

Sub Program	Objective	Period	Frequency	Location(s)	Methodology	Parameters	Interpretation & reporting	Other details
Spatial Water Quality (Baseline)	Assess pre existing optical qualities including spatial characteristics of Bass Strait waters in the region of the proposed outfall	Commencing 2007	Monthly	Sample sites defined as, D, EOP, WOP on Figure 3.2.2.1	Black Disc Viewer- horizontal sighting of a 200mm black disc.	Water clarity @ surface (metres)	Annual Return. Full data set with statistical summaries with comparison of observed values to historic data when collated.	Black Disc Viewer as per Davies-Colley et al, 1997
As above	As above	As above	As above	Sample sites defined as NE250, NE400, NE500, SW250, SW400, SW500, NW250, NW400, NW500, SE250, SE400, SE500 D, EOP, WOP on Figure 3.2.2.1 or as required by the Director @ surface	Modified Black Disc Viewer	Colour (Munsell)	As above	As above
As above	As above	As above	As above	As above, vertical transect to benthos	Light penetration in the water column – up and downwelling (Reflectance) Photosynthetic Active Radiation (PAR) by 2 simultaneous sensors	Ratio of upwelling PAR to downwelling to determine reflectance coefficient.	Annual Return. Full data set with statistical summaries with comparison of observed values to historic data when collated.	Meter calibration records to be maintained and made available to The Director of Environmental Management on request.
As above	As above	As above	As above	As above vertical transect to benthos	Single PAR Sensor as above	Light levels in the water column- transect to bottom. ($\mu\text{Em}^{-2}\text{s}^{-1}$)	Annual Return. Full data set with statistical summaries with comparison of observed values to historic data when collated. (With % of surface radiation at approximately 1m depth classes)	Establish euphotic depth if less than total depth.

Sub Program	Objective	Period	Frequency	Location(s)	Methodology	Parameters	Interpretation & reporting	Other details
	Assess pre existing physico-chemical properties including spatial characteristics of Bass Strait waters in the region of the proposed outfall	As above	As above	As above vertical transect to near benthos	A suitable Water Quality Field Meter maintained and operated in accordance with manufacturers instructions.	Mean value for 5m depth classes of: pH (pH scale), Salinity (by electrical conductivity and expressed as ppt) Dissolved Oxygen (% saturation), Temperature (deg C), Oxidation Reduction Potential (mV)	Annual Return. Full data set with statistical summaries with comparison of observed values to historic data when collated.	Meter calibration records to be maintained and made available to The Director of Environmental Management on request.

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Section 3.2.2.1 Marine Water Quality Summary Tables V4.0.doc
Pulp Mill Project Environmental Monitoring Program



Sub Program	Objective	Period	Frequency	Location(s)	Methodology	Parameters	Interpretation & reporting	Other details
Water Quality (Baseline Trigger Value)	Assess pre existing chemical properties of Bass Strait waters in the region of the proposed outfall. (Application of ANZECC Guidelines for determination of Site Specific Trigger Values)	As above	As above	Sample site defined as EOP, WOP, NE500 & SW500 on Figure 3.2.2.1	Paired separate marine water samples taken from the top (<1m) & at 1 m above the bottom.	Analytes from Table 3.2.2.1.3 Or as required by the Director	As above	<p>Sampling and storage protocols to be undertaken in accordance with a documented Standard Operating Procedure (SOP) approved by the Director of Environmental Management.</p> <p>Inclusion of Pilot Phase monitoring data may be considered to enhance the overall objective.</p> <p>The Director of Environmental Management will decide approval for inclusion of any Pilot Phase data on a case by case basis.</p>

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Table 3.2.2.1.2 Summary of Operational Marine Water Quality – Sub Programs

Sub Program	Objective	Period	Frequency	Location(s)	Methodology	Parameters	Interpretation & reporting	Other details
Spatial Water Quality (Operational)	Assess operational optical qualities including spatial characteristics of Bass Strait waters in the region of the proposed outfall	Ongoing, with first review after 2.5 Years. Commencing less than one month after process effluent release commences.	Weekly as practicable for the first 6 months after commissioning, then monthly	At least sample sites defined as NE250, NE400, NE500, SW250, SW400, SW500, NW250, NW400, NW500, SE250, SE400, SE500, D, EOP, WOP or Figure 3.2.2.1 Locations and number of sites may change subject to review or as required by the Director	Black Disc Viewer-horizontal sighting of a 200mm black disc.	Water clarity @ surface (metres)	Monthly Return for the first 12 months. Annual Return thereafter. Full data set with statistical summaries including comparison of observed values to historic data when collated.	Black Disc Viewer as per Davies-Colley et al, 1997
	As above	As above	As above	As above	Water Clarity Sensor (250 mm Transmissometer @ 532 nm)	Beam Attenuation Coefficient (c)	As above. Comparison to Black Disc Viewer.	Comparison as per Davies-Colley, 1988.
	As above	As above	As above	As above @ surface	Modified Black Disc Viewer	Colour (Munsell)	Monthly Return for the first 12 months. Annual Return thereafter. Full data set with statistical summaries including comparison of observed values to historic data when collated.	Black Disc Viewer as per Davies-Colley et al, 1997
	As above	As above	As above	As above, vertical transect to benthos	Light penetration in the water column – up and downwelling (Reflectance) Photosynthetic Active Radiation (PAR) by 2 simultaneous sensors	Ratio of upwelling PAR to downwelling to determine reflectance coefficient.	As above	Meter calibration records to be maintained and made available to The Director of Environmental Management on request.

Section 3.2.2.1 Marine Water Quality Summary Tables V4.0.doc
Pulp Mill Project Environmental Monitoring Program



Sub Program	Objective	Period	Frequency	Location(s)	Methodology	Parameters	Interpretation & reporting	Other details
	As above	As above	As above	As above vertical transect to benthos	Single PAR Sensor as above	Light levels in the water column- transect to bottom. ($\mu\text{Em}^2\text{s}^{-1}$)	As above. (With % of surface radiation at approximately 1m depth classes)	Establish euphotic depth if less than total depth.
	Assess operational physico-chemical properties including spatial characteristics of Bass Strait waters in the region of the proposed outfall	As above	As above	Surveyed area to extend until parameters return to background (control) levels.	A suitable Water Quality Meter, maintained and operated in accordance with manufacturers instructions.	Mean value for 5m depth classes of: pH (pH scale), Salinity (by electrical conductivity and expressed as ppt) Dissolved Oxygen (% saturation), Temperature (deg C), Oxidation Reduction Potential (mV)	Monthly Return for the first 12 months. Annual Return thereafter. Full data set with statistical summaries including comparison of observed values to historic data when collated. Survey results to be provided in map form for each parameter and depth strata within 14 days of each survey.	Meter calibration records to be maintained and made available to The Director of Environmental Management on request.
Water Quality (Surveillance)	Assess operational chemical properties of Bass Strait waters in the region of the proposed outfall. Compare observed parameters to the applicable Interim Water Quality Objectives as defined by the Board of Environmental Management & Pollution Control.	As above	As above	Sample site defined as NE500, SW500, NW500, SE500 , EOP, WOP on Figure 3.2.2.1 Or other sites as required by the Director	Paired separate marine water samples taken from the top (<1m) & at 1 m above the bottom (only surface water sample necessary at site D)	Analytes from Table 3.2.2.1.3	Monthly Return for the first 12 months. Annual Return thereafter. Full data set with statistical summaries including comparison of observed values to historic data when collated.	Sampling and storage protocols to be undertaken in accordance with a documented Standard Operating Procedure (SOP) approved by the Director of Environmental Management.