



Newood

**Southwood Integrated Timber
Processing Site**

Wastewater Management Plan

Fifth Edition

October 2003



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Preface

The first stage of the Southwood development (known as the Early Works Contract) comprises the construction of the merchandising yard, sawmill pad, Rotary peeled veneer mill pad, process water storage pond, sedimentation pond, access road and fire pump station facilities. This is to enable construction and implementation of the green sawmill only.

Construction of this stage will commence in May 2003 and be completed in November 2003. Application for Building Approval was made to the Huon Valley Council in January 2003. The green sawmill is expected to be operational in March 2004.

Subsequent stages of construction for the centre will be undertaken in 2003/04 as agreements with the various proponents operating on the site are confirmed, infrastructure requirements are specified and design development is progressed.

The first edition of the plan set in place the approach to be adopted for wastewater management for the full development, and detailed the specific requirements and measures for the first stage of development (plan issued in October 2002).

The second edition of the plan incorporated data from site studies detailed in GEO1 and GEO2 and comments from the director on the first draft (plan issued in March 2003).

The third edition of the plan updated the approach adopted for the wastewater management of the full development using updated conceptual layouts for each facility and made comment on the measures proposed for the completion and implementation of the project in stages (issued in July 2003).

The fourth edition was an abridged version of the plan reflecting the completion of stage 1 infrastructure and the commissioning of the green sawmill only. It also incorporated further comments from the director on the third edition (issued on 28 August 2003).

This fifth edition is in response to an EPN issued by DPIWE requiring the Wastewater Management Plan to include a draft Wastewater Reuse Site Management Plan, prepared to satisfy the requirements of Condition WR2.

1. *Future Editions*

Updated editions will be submitted prior to the commencement of construction of each additional facility: Rotary peeled veneer mill, power station and wood fibre mill.

Next edition Planned to be submitted in late 2003 but may require further staging depending on when the proponents are signed on.

2. *Final Edition*

After completion of the Final Wastewater Reuse Site Management Plan (WR2) planned for the start of 2004.



1. Introduction

This wastewater management plan has been prepared for the Southwood Resources Huon, Wood Centre Development in accordance with condition E4, Schedule 2, Environmental Conditions, of the Planning Permit, dated 12 December 2001, issued by the Huon Valley Council.

Condition E4 is as follows:

Prior to an application being made to the Planning Authority for building approval and at least 30 days prior to commencement of construction activities on the land, or at a time otherwise approved by the Director in writing, a Wastewater Management Plan must be submitted to the Director for approval, and a copy of the Wastewater Management Plan must be forwarded to the Huon Valley Council.

The Wastewater Management Plan must include, but should not necessarily be limited to, the following information:

- (a) Estimates of the quality and quantity of wastewater produced for each production facility;*
- (b) A detailed water budget for the activity;*
- (c) A description of wastewater management practices for all identified wastewater streams, including reuse and / or recycling within and between production facilities;*
- (d) Identification of discharge points for emergency wastewater discharges from the land;*
- (e) A sampling program to be implemented in relation to emergency wastewater discharges from the land;*
- (f) An incident response protocol in relation to wastewater discharges from the land other than discharges of treated effluent for the purpose of irrigation in accordance with a Wastewater Reuse Site Management Plan approved by the Director.*
- (g) A draft Wastewater Reuse Site Management Plan prepared to satisfy the requirements of Condition WR2.*

The Permit Conditions E1 to E17 details the conditions applicable to wastewater management for the Wood Centre Development.

The wastewater management plan is for management of wastewater on a site wide basis. Each wood centre facility will be required to provide pre-treatment prior to discharge if wastewater quality does not meet conditions imposed by Newwood through a service agreement with the proponent. Management of these pre-treatment facilities is not covered by this plan.

This plan has been prepared to enable the first of these facilities – a green regrowth sawmill to be constructed. At this point in time of the Project, the designs of the major water users and wastewater emitters (such as the power station and the Rotary peeled veneer mill) are still at concept stage only. The water and wastewater data for these facilities are still to be confirmed. This edition of the plan has been issued to indicate the proposed method of wastewater management should the works not proceed beyond Stage 1 infrastructure and the commissioning of the green sawmill. This plan will be amended to reflect the actual design water and wastewater data from the rotary peeled veneer mill and power station once it is available. The Plan will be resubmitted to the Director each time an amendment or update occurs.



2. Wood Centre Site Description and Operation

2.1 General

The site location and general description are as per Chapter 2 of the Development Proposal and Environmental Management Plan for the Integrated Timber Processing Site, Weld Road Lonnvale (DPEMP).

The site layout is as indicated on Drawing No. 3210741-C018, "John Holland Development & Investment Pty Ltd, Southwood Processing Centre, Site Drainage Plan". This drawing has been included in Appendix C of this Plan.

The facilities to be established at the site are:

- ▶ Saw Mill;
- ▶ Rotary Peeled Veneer Mill;
- ▶ Wood Fibre Mill;
- ▶ Power Station;
- ▶ Merchandising Yard;
- ▶ Administration Centre;
- ▶ Future Truck Servicing;
- ▶ Associated site wide wastewater management; and,
- ▶ Water supply and pumping.

The operation of each facility is described in Chapter 2 of the DPEMP.

The Truck Washing Facility and Visitor Centre, as described in the DPEMP are no longer included in the development. Provision for Future Truck Servicing facility has been added. This facility will be used to service log trucks and other heavy equipment used on site and if developed, will be outlined in detail in a separate Development Application.

It is proposed that the wood fibre mill be integral with the merchandising yard and, as a consequence, it will be considerably smaller than the facility proposed in the DPEMP. This plan has been developed assuming the wastewater flows from the wood fibre mill are integral with those of the merchandising yard.

2.2 Staging of the Works

This project will be constructed in stages to match in with the time frames of each proponent.

The current programme for the works is as follows:

Stage 1

The proposed infrastructure for stage 1 includes:

- ▶ site security fence;
- ▶ access roads;



- ▶ sawmill, Rotary peeled veneer mill and merchandising yard pads to subgrade level;
- ▶ site drains and the stormwater settling pond;
- ▶ the process water pond;
- ▶ limited site pipe network;
- ▶ the fire water pump station; and
- ▶ if the saw mill commences operation prior to completion of stage 2 - a small reuse scheme including a small stormwater collection pond (stage 1 collection pond).

This work is currently underway and is programmed for completion at the end of December 2003.

At the completion of Stage 1 it is proposed that the green sawmill be commissioned and ready for operation. This is expected to be by March 2004.

This plan reflects the proposed wastewater management strategy for the completion of stage 1 infrastructure plus the commissioning of the green sawmill and the stage 1 reuse scheme (if required).

Stage 2

This will work the site to a stage suitable for operation of the Rotary peeled veneer mill, the dry sawmill and the merchandising yard, plus wood fibre mill. This will involve the construction of the following infrastructure:

- ▶ the remainder of the site pipe network including process water, fire water, wastewater, irrigation water and stormwater pipes;
- ▶ the ultimate reuse scheme, including a new larger stormwater collection pond and winter storage;
- ▶ the site wastewater treatment plant;
- ▶ all pump stations excluding the raw water pump station; and,
- ▶ weighbridge and entrance facilities.

This work is programmed to start in early November 2003 with the commissioning and operation of the proposed processing facilities in December 2004.

Stage 3

This will work the site to its final development for construction of the power station and will involve the construction of:

- ▶ the power station and fuel processing area pads;
- ▶ the raw water pump station and rising main; and,
- ▶ all other miscellaneous services.

This work is programmed to start in January 2004 with the final commissioning of the power station programmed for mid 2005.



3. Wastewater Production

Stormwater and process wastewater collection systems will be established on each processing site and directed to a communal system. The communal collection system and treatment facilities for all wastewater streams, including contaminated stormwater, are to be established and managed on a site wide basis. Figure 1 in Appendix A is a schematic diagram of the total water circuit.

This schematic is for the ultimate development.

3.1 Wastewater Classification

The wastewater will be classified into five principal streams:

Process wastewater

- The permit classifies processing wastewater into two sub streams with different characteristics:
 - “Type 1”
 - boiler water treatment bleed stream and boiler blowdown from the sawmill heat plant; and
 - boiler water treatment bleed stream and boiler blowdown from the Rotary peeled veneer mill heat plant (Boiler water treatment bleed streams and boiler blowdown are effectively the same and are referred to as simply “boiler blowdown” in this Wastewater Management Plan); and
 - power station wastewater (cooling tower bleed stream, boiler water treatment wastewater and boiler blowdown).
 - “Type 2”

includes log wash and sprinkler runoff water discharged from the Merchandising Yard, Sawmill and Wood Fibre Mill sites.
- Contaminated stormwater – collected from all developed areas of the site.
- Domestic wastewater – sewage effluent discharged from amenities such as toilets, lunchrooms and showers.
- Run-off from undeveloped area of the prepared Stage 1 pad

For the implementation of Stage 1 Infrastructure plus the green sawmill there will be no “Type 1” wastewater streams (the green mill does not require a boiler). There will be a “Type 2” stream along with contaminated stormwater and domestic wastewater.

3.2 Wood Centre Facility Wastewater

Each operator of the facilities will be responsible for all wastewater generated on-site until crossing their respective boundaries. Discharge control and waste minimisation requirements will be modelled on those found in normal local government trade waste agreements. The trade waste standards will be designed to apply the responsibility for high-level house keeping and stormwater management systems on the site to the individual facilities.

Contaminated stormwater will also be required to have all gross solids removed by means of screens and grit traps and to have no visible oil or grease.



In some instances this may require the operator of the sites to establish triple interceptor traps on site. All operators will be required to develop quick response procedures to contaminated spills on hardstand areas.

All facilities will be required to install sanitary systems in accordance with the *Tasmanian Plumbing Regulations 1994* to ensure domestic wastewater is of acceptable quality.

3.3 Wastewater Quantities

3.3.1 Types 1 and 2 and Domestic Wastewater Quantities

Sources of wastewater and average flows, excluding contaminated stormwater, are indicated in Table 1.

Table 1 Wastewater Quantities

Process Facility	Wastewater Type		
	Type 1	Type 2	Domestic
Saw Mill	Nil	2.0 kL/week	2.4 kL/day
Rotary Peeled Veneer Mill			
Wood Fibre Mill			
Power Station			
Merchandising Yard			
Administration			
Truck Servicing (future)			
TOTALS	Nil	2.0 kL/week	2.4 kL/day

Domestic wastewater quantities are based on an average daily discharge of 0.15 kL per person. This figure is considered to be conservative and is based on data provided by the NSW State Pollution Control Commission (1978). There are other sources that indicate a flow of 30 – 50 L per person per day might be more appropriate.

'Type 2' wastewater will only be intermittently generated, as a closed circuit log sprinkling system will be installed. It has been assumed that about a 2 kL discharge to the site wide infrastructure will occur on average about once every week during dry periods only.

3.3.2 Contaminated Stormwater Quantities

If the wood centre commences operation prior to the completion of stage 2 infrastructure works and the commissioning of the associated facilities then the following temporary measures will be implemented;

- ▶ undeveloped land will be stabilised;
- ▶ the catchment containing the green sawmill will be diverted into a standalone stormwater collection system;



- ▶ a temporary stormwater pond will be constructed; and,
- ▶ a temporary approved irrigation scheme will be prepared to take advantage of the stormwater collected.

The total catchment area draining into the contaminated stormwater pond for Stage 1 is 1.60 Ha, with an equivalent area of 1.19 Ha.

A breakdown of each catchment stormwater source and contributing areas are indicated in Table 2.

Table 2 Contaminated Stormwater Contributing Areas

Process Facility	Area (Ha)			Total
	Roof	Hardstand	Grassed	
Merchandising yard				0.0
Rotary Peeled Veneer Mill				0.0
Sawmill	0.50	0.5 (0.45)	0.60 (0.24)	1.60 (1.19)
Wood Fibre Mill				0.0
Fuel Processing				0.0
Power Station				0.0
Administration				0.0
Truck Servicing (future)				0.0
Car Parks and Roads etc				0.0
Total	0.50	0.5 (0.45)	0.60 (0.24)	1.60 (1.19)

The above areas include all car parks and site roads within the sawmill development. Perimeter roads will not form part of the site stormwater catchment for this stage of the development. These roads will be lightly trafficked, as all timber loaded vehicles will enter the site from the existing access road to the south.

All roof water runoff will be contained in tanks for reuse.

The numbers in brackets are equivalent areas, where the coefficients of runoff for various surfaces are assumed as follows:



Table 3 Coefficients of runoffs used for Stormwater Analysis

Surface	Coefficient of Runoff
Roof	C = 1.0
Hardstand areas	C = 0.9
Unpaved area	C = 0.4

The coefficients of runoff for the roofed and hardstand areas are based on Figure 1.13 of Australian Rainfall and Runoff, Book 8 and are considered conservative. There is no data in Australian Rainfall and runoff for grassed areas in Tasmania. The coefficient of runoff for unpaved areas has been determined using engineering judgement and reflects the type of terrain and the soil conditions encountered on site. The figure of 0.4 is considered conservative.

For the monthly water balance modelling, it has been assumed that 80% of rainfall falling on impervious areas is transferred to the stormwater drains. The remainder is lost through evaporation or absorption. This is based on engineering assessment, as there is limited data available to quantify this. Australian Water Association (July 2003 p 35) suggests all rainfall less than 1 mm/hr is lost to absorption and evaporation. Australian Rainfall and runoff suggest that it may be as low as 30%-40% for grassed surfaces.

For an average rainfall of 900 mm per year the total runoff from the stage 1 infrastructure development plus green sawmill is expected to be 8.6 ML/year. Approximately 3.6 ML (if 80% factor included) of this will be collected by the green sawmill roof and diverted to a stormwater tank for non-potable domestic use on site.

3.3.3 Run-off from Undeveloped Area of the Prepared Stage 1 Pad

A site of approximately 10 hectares of the site has been cleared and levelled for future development. At the completion of stage 1, water from the western side will flow to a holding/settling pond before overflowing into a depression and thence to Kings Creek. On the eastern, northern and southern edges the runoff will flow into a number of small holding ponds from where the water will pass through geotextile sediment traps before flowing into the surrounding landscape. The Sawmill will occupy approximately 1.6 Ha of the 10 Ha prepared site, which is considered to be a developed area.

3.3.4 Stormwater Buffer Storage

Commitment No. 21 of the DPEMP is as follows:

A capacity of 6ML will be maintained at all times for a 72 hour, 1 in 10 year storm event.

Condition E10 of The Permit is as follows:

“The discharge of effluent from any of the three communal storage ponds is not permitted, except during a 1 in 10 year, 72-hour rainfall event. In the event”

The intent of Commitment No. 21 and Condition E10 is to contain the site runoff from a 72 hour, 1 in 10 year storm event.



The developed sealed and hard stand areas for stage 1 infrastructure plus the green mill are substantially less than the catchment area quoted in the DPMP and the volume required to contain the 72 hour, 1 in 10 year storm event is only 1.25 ML. The rainfall intensity for this storm event has been calculated using data from Australian Rainfall and Runoff – Volume 2 as follows:

Table 4 Rainfall Intensity Parameters for Site

Parameter	Value
Map 1: 2i1 =	13.80
Map 2: 2i12 =	3.50
Map 3: 2i72 =	0.90
Map 4: 50i1 =	25.00
Map 5: 50i12 =	5.50
Map 6: 50i72 =	2.00
Map 7: G =	0.61
Map 8: F2 =	3.85
Map 9: F50 =	15.20

This results in a rainfall intensity of 1.44 mm/hr for a 72 hour 1 in 10 year.

A buffer of 1.25 ML will be provided at stage 1 – including provision for roof stormwater, which is diverted to the process water pond.

3.4 Wastewater Quality

3.4.1 Process Wastewater

Type 1 – resulting from boiler blowdown and cooling water bleed stream

There will be no Type 1 wastewater flows from the wood centre at the completion of stage 1 infrastructure and the commissioning of the green sawmill.

Type 2 - resulting from log sprinkler runoff

As the Type 2 Process Wastewater will enter the contaminated stormwater stream the quality of this is assessed in the following section.

3.4.2 Contaminated Stormwater

This will contain predominantly the following contaminants:

- ▶ Suspended solids – mainly wood fibre and soil;
- ▶ Tannins;
- ▶ BOD;
- ▶ Nutrients – nitrogen and phosphorous;



- ▶ Weed seeds; and
- ▶ Soil and plant pathogens.

It has not been possible to characterise untreated stormwater and spray drainage from the sawmill's log handling yard. A conservative characterisation of spray drainage wastewater from a wood yard is provided below and is based on similar data used by Forestry Tasmania for their Smithton operations.

These are contained in Table 5.

Table 5 Contaminated Sprinkler Quality - Sawmill

Contaminant	Likely Concentration
NFR	12 to 1,800 mg/L (typical)
BOD	2 to 90 mg/L (typical)
Oil/grease	2 to 23 mg/L (typical)
TDS	up to 1,900 mg/L (typical)
EC (25 ⁰ C)	up to 150 uS/cm (typical)
PH	6.2 to 7.3 (typical)
Phosphorous	up to 1 mg/L (est.)
Nitrogen	up to 10 mg/L (est.)
Pesticides	occasional minute levels
Colour	up to 100 tcu (est.)

The level of suspended solids from storm and process water runoff from paved and hardstand areas is dependent on the rainfall intensity, surface slope and the particle distribution of the surface material. The only relevant reference source for this type of water contamination is the Manual for Managing Urban Stormwater Quality in Western Australia. This manual is not suitable for hardstand industrial applications and may not reflect Tasmania's lower intensity rainfall. It does suggest an annual sediment load of 5 tonnes per year from the site, which is equivalent to an average sediment load of less than 1 mg/L. As it expected that the sediment load from the site would be several orders of magnitude higher than this an average figure of 100 mg/L has been adopted. This is considered conservative.

Log sprinklers will only operate on dry days from an on site sump with a recirculating pump. The log stand area will be constructed from hardstand material.

Each wood centre facility will be required to provide pre-treatment for removal of hydrocarbons and coarse solids prior to discharge to the site stormwater collection system.



3.4.3 Domestic wastewater

Domestic wastewater will be sewage and greywater and contaminants will be in the normal range expected from domestic wastewater. Typical contaminant loads for domestic wastewater are indicated in Table 6.

Table 6 Domestic Wastewater Loading

Contaminant	Concentration Range mg/L
BOD	110 – 400
COD	250 – 1000
NFR	100 – 350
TP	4 – 15
NH ³ -N	12 – 50
TN	20 – 85
Faecal Coliforms (org/100mL)	10 ⁴ -10 ⁵

3.4.4 Clean Storm Water

This will comprise stormwater runoff collected from roofed areas and stored in site-specific rainwater tanks for non-potable domestic use.

For the green sawmill the amount of clean water collected is over three times the predicted non-potable water consumption. The 3.1 ML of excess runoff will be diverted to the process water pond for use elsewhere in the wood centre. This will reduce consumption of water from the Huon River.

Typical uses for non-potable water consumption include:

- ▶ Showers and safety showers;
- ▶ Toilet flushing;
- ▶ Wash basins;
- ▶ Landscape garden watering; and,
- ▶ Cleaning or hosing down work areas.

It has been assumed that domestic wastewater production will arise mainly from the clean stormwater consumption.

3.5 Facility Activities Generating Wastewater

The source of wastewater from green sawmill facility and likely contamination are described in the relevant sections of the DPEMP and are listed again in this section.

3.5.1 Saw Mill

Ref: Chapter 7 of the DPEMP.



The sources of wastewater from the Saw Mill are contaminated stormwater, wastewater from the log sprinkler sump and domestic wastewater. Activities that have potential to result in stormwater contamination and/or generation of contaminated process wastewater are as follows:

- ▶ Vehicular and log movements (low level TPH contamination, silts);
- ▶ Log storage, and temporary wood waste and fuel wood product storage (tannins, nutrients);
- ▶ Log sprinklers (tannins, nutrients); and
- ▶ Log cutting and docking (sawdust).

The log sprinklers will comprise a recycle system from an on site sump. Log sprinkler system top up water has been assumed to be of the order of 20 kL/day and will occur only on dry days or days with limited daylight rainfall. This has been assessed assuming log sprinklers will operate on all but 60% of the days when historical records say rainfall is recorded on site. Using data from Cemetery Road, the actual number of days in a mean rainfall year requiring log sprinklers is 267.

Periodic drawing of the sump will occur to allow water quality to be maintained. This is expected to occur about once per week. It has been assumed that approximately 2.0 kL/week of log sprinkler water will be discharged as Type 2 Wastewater. A sensitivity analysis of this assumption is contained in Section 4.

The quality of this discharge will be monitored to ensure contamination levels will be in accordance with the Wastewater Reuse Site Management Plan (WR2). Preliminary assessment suggests that this will involve a TDS less than 1,500 mg/L.

The number of employees will be up to 16 and domestic wastewater is estimated at approximately 2.4 kL/day. The sawmill will operate 5 days per week, 52 weeks per year.

3.5.2 Rotary Peeled Veneer Mill

Ref: Chapter 8 of the DPEMP.

There will be no Rotary peeled veneer mill on site for this stage of the development.

3.5.3 Wood Fibre Mill

Ref: Chapter 9 of the DPEMP.

There will be no wood fibre mill on site for this stage of the development.

3.5.4 Power Station

Ref: Chapter 10 of the DPEMP.

There will be no power station in operation for this stage of the development.

3.5.5 Merchandising Yard

Ref: Chapter 6 of the DPEMP.

There will be no merchandising yard for this stage of the development.

3.5.6 Administration

There will be no administration building for this stage of the development.



3.5.7 Truck Servicing

There will be no truck servicing facility for this stage of the development.

3.5.8 Site Roads

Ref: Chapter 5 of the DPEMP.

Surface runoff from perimeter roads will not be collected and directed to the stormwater collection pond. The total collection area comprising roads is estimated at 1.0 Ha. Unpaved, natural grassed areas comprise 3.0 Ha of the catchment.

The perimeter roads will not be heavily trafficked for stage 1, as all of the wood loaded trucks will enter the site from the south.



4. Water Budget

The site water budget is described schematically in Figure 1 with a detailed flow diagram in Figure 2 in Appendix A.

The detailed flow diagram is for Stage 1 Infrastructure plus the green sawmill only and is based on following key parameters and assumptions:

- (i) All non-potable domestic water will be provided from site-specific water storage tanks that will collect clean rainwater from building roofs. It is estimated that, in an average rainfall year, there will be 3.5 ML of surplus water for process water use. Overflows will be diverted to the process water pond. A non potable domestic water budget for the 90% ile wet year and the average rainfall year are contained in Table 9 of Appendix A;
- (ii) Non potable domestic water consumption (and as a consequence domestic wastewater generation) will only occur for 5 working days per week;
- (iii) Potable water for domestic consumption will be delivered to site in bottles or by treating roof storm water at each facility;
- (iv) Process water will be supplied from the excess non potable domestic water stream and supplemented from two sources, the Huon River and from a site stormwater collection pond. For Stage 1 infrastructure plus the green sawmill it is expected that the water consumption will be more than the stormwater runoff and that the average quantity of extra water will be of the order of 2.2 ML/year. Where water is required from the Huon River, it will be pumped into a tanker and trucked to the site process water pond;
- (v) All stormwater from the green mill site will be collected in the stage 1 stormwater collection pond and used for irrigation on the site;
- (vi) The domestic wastewater stream will be diverted to a communal pump out pit and trucked off site for treatment at a municipal facility. This is an interim measure only and once further proponents are brought on site, a communal treatment plant will be constructed;
- (vii) It has been assumed that log sprinklers will only operate on dry days (which have been defined as all days excluding 60% of the average number of wet days). It has also been assumed that 90% of log spray water will pass from the site as evaporation. The remainder will be returned to a recycle system that will be topped up at a rate of 20 kL/day and drained to the stormwater pond at a rate of 0.3 kL/day. A sensitivity analysis of this assumption is contained in Table 7; and
- (viii) It has been assumed that only 80% of rainfall falling on a fully impermeable surface will result in runoff. The remaining rainfall will be in such light intensity that it will evaporate or be absorbed before entering the site drainage systems.

The flow balance shows the expected volumes for the irrigation area and winter storage. Details of how these were derived are outlined in Appendix A, Table 8. Full details of the irrigation system calculations will be contained in the Wastewater Reuse Site Management Plan, prepared in accordance with Condition WR2 of the Permit. The analysis for this study uses rainfall data for 1975 from Cemetery Road. This year best matches the 90% wet year for this area. Evaporation data is based on mean figures from Four Foot Road as there was no information from the Cemetery Road Site.



The average annual rainfall for the site is 900 mm.

Table 7 Sensitivity Analysis of Log Sprinkler Demand and Evaporation

	Total Number of Effective Wet Days						
	50	100	150	200	250	300	350
Process Water Demand [ML]	6	5	4	3	2	1	0

Runoff to Stormwater Collection Pond [ML]								
Percentage Sprinkler Water to Stormwater System	10%	10	10	11	11	12	13	14
	20%	10	11	11	11	12	13	14
	30%	11	11	11	12	12	13	14
	40%	12	12	12	12	12	13	14
	50%	12	12	12	12	13	13	14
	60%	13	13	13	13	13	13	14
	70%	13	13	13	13	13	13	14



5. Wastewater Management

5.1 Collection Systems

5.1.1 Process Wastewater

There will be no Process Water (Type 1) generated from the site at this stage of its development.

5.1.2 Contaminated Stormwater

The stormwater collection system will comprise a series of open drains and culverts to collect storm water and wash down water runoff from the site and divert it to the stormwater collection pond. The drains will be designed in accordance with the rational method outlined in Australian Rainfall and Runoff for a 1 in 10 year storm of critical duration.

The estimated peak stormwater flow from the site during a 1 in 10 year event is 170 L/s with a time of concentration of 20 minutes.

On site buffering of storm flows will be provided using retention basins where necessary.

Steeply graded drains will be stone pitched.

For a catchment area of 1.6 Ha (equivalent area 1.19 Ha) and an average annual rainfall it has been estimated that the average annual runoff will be of the order of 8.6 ML/year. Of this 3.6 ML will be clean stormwater from roofs – which will be used for domestic purposes with the surplus sent to the process water pond. This assumes that 80% of all rain falling on impervious area will enter the stormwater system. The remainder, which will fall during light showers, will be lost through evaporation or absorption.

5.1.3 Domestic Wastewater

For stage 1 only, the domestic wastewater will be collected in a pit that will be pumped out by a licensed septic tank cleaning service and transported to a municipal wastewater treatment plant. The pump out pit will comprise a 3,000 mm diameter shaft constructed 2.44 m into the ground. Using the conservative figures used in this study, this will have a capacity of 17.0 kL or 7 working days domestic wastewater generation. It is expected that the pump out contractor will be asked to attend the site twice a week, thus providing 4.5 days emergency buffer in the pit.

An ultrasonic level detector will monitor the level in the pump out pit and an alarm will be activated if the buffer level falls below two full days wastewater generation.

5.2 Treatment Systems

5.2.1 Type 1: Process Wastewater

There will be no Type 1 process wastewater generated for Stage 1 of the development.



5.2.2 Type 2: Process Wastewater and Contaminated Stormwater

All storm water and 'Type 2' process water will be diverted to a stormwater collection pond for reuse within the wood centre or for irrigation on adjacent land.

There will be no sedimentation pond for Stage 1. The following information will refer to the ultimate development of the site.

The purpose of the settlement pond is to prevent accumulation of silts in the stormwater collection pond, which will be extremely difficult and expensive to clean out. The intention is that, once it becomes evident that some solids are passing through the settlement pond (i.e. there are some solids accumulating at the stormwater collection pond inlet) then the settlement pond will be decommissioned and a new facility constructed to replace it.

The sedimentation pond will be designed to drop out 99% of all particles of nominal size 0.1 mm diameter and larger during a 1 in 10 year 12 hour storm. The basic configuration will be in accordance with the concept designs described in the Quarry Code of Practice, Section 6.9.

Floating contaminants collected on the upstream side of the baffles will be skimmed of and trucked off site to an approved disposal site.

Solids in the decommissioned settlement pond will be left to dry out and then collected and disposed off site to an approved disposal site.

The stormwater collection pond will be constructed with a shallow water depth to assist in the reduction of any BOD levels resulting from stormwater runoff from wood storage areas.

As the process water stream is a closed cycle and there is a risk of salt accumulation from surface runoff and evaporation, a bleed to the irrigation system will be included. It is estimated that, during prolonged dry periods, up to 20 kL/day of process water may need to be diverted to the irrigation system. The quality of this water will be monitored to ensure the TDS and BOD levels are within the limits set by the Wastewater Reuse Management Plan (WR2).

5.2.3 Domestic Wastewater

Domestic wastewater will be treated offsite.

5.3 Reuse Systems

5.3.1 General

For stage 1, reuse will be limited to irrigation of adjacent land and the non-potable domestic consumption. Refer to Appendix D of this Plan. The balance of this discussion is for the ultimate development.

5.3.2 Stormwater Return

This section applies to the ultimate development.

Contaminated stormwater will be collected from roads and hardstand areas and diverted through a treatment system and into the stormwater collection pond for reuse within the wood centre for log sprinkling, dust control, fire water and the power station cooling water. The collected stormwater will be



pumped via a dedicated pump and pipeline system up to the Process Water Storage Pond for inclusion in the process water system.

The estimated stormwater collected from an average year is 185 ML, which is approximately 16% of the total process water usage expected from the site.

5.3.3 Roofed Stormwater Reuse

The following is applicable to stage 1 of the development.

All stormwater from roofed areas will be collected in onsite storages and used for non-potable domestic use.. It is envisaged that each site specific clean stormwater collection system will comprise a series of storage tanks with appropriate pressure pumps. Excess stormwater will be overflowed to the process water pond for reuse in the process water stream. In the event of a prolonged dry period, the roofed stormwater system will be supplemented by river water from the Huon River (via the process water stream).

It is estimated that a total of 3.5 ML of clean stormwater will be collected and used in an average rainfall year. This is approximately 550% of the predicted non-potable domestic demand but only 60% of the combined domestic and process water consumption.

5.3.4 Irrigation

The following is applicable to the ultimate development.

The irrigation system is outlined in detail as in the Wastewater Reuse Site Management Plan WR2.

For the ultimate development, the water balances prepared for this report have assumed a maximum TDS concentration of the reuse wastewater of 1,500 mg/L. This is based on advice from Forestry Tasmania as a suitable limit for irrigation of Eucalypts.

For Stage 1, it is considered that the TDS concentration will be less than 500 mg/L.

5.4 Monitoring

5.4.1 General

For stage 1 the water level monitoring system will comprise visual inspection of the water storages (clean water holding tank, stormwater collection pond and the process water storage pond) and an ultrasonic level detector in the domestic wastewater pump out pit.

The daily stormwater and process water pond water levels, rainfall and water consumption data will be recorded and used to monitor the assumption made in the preparation of this plan.

A wastewater monitoring program for wastewater streams will be developed and submitted to the Director for approval, in accordance with Condition E13 of the Permit. Attachment 7 of the Permit indicates the monitoring requirements for the Wood Centre Development. These requirements are expanded in more detail in Appendix B, Wastewater Monitoring Requirements.

In addition run-off from undeveloped area of the prepared Stage 1 pad flowing out of the sedimentation pond on the Western side will be analysed for total suspended solids on a regular weekly basis for the next 3 months.



For the ultimate development, a site wide telemetry system will be installed for the purpose of control and alarm monitoring. Each and every alarm will initiate a unique SMS message to be sent to a roster of mobile phones operated by the Site Manager.

5.4.2 Operational Control

For the ultimate development the stormwater and irrigation pump stations will have alarm inputs to the telemetry system for the following:

- ▶ Pump fault;
- ▶ High level alarm;
- ▶ Low level alarm; and
- ▶ Power supply failure.

The package wastewater treatment plant will incorporate alarm inputs to the telemetry for the following:

- ▶ Motor faults; and
- ▶ Critical tank and pit water levels.

Sewer pump stations will incorporate alarm inputs to the telemetry in accordance with DPIWE Sewage Pumping Station Environmental Guidelines. This will include:

- ▶ High level alarm;
- ▶ Pump 1 fault;
- ▶ Pump 2 fault; and
- ▶ Power supply failure.

For the ultimate development, the stormwater, winter storage and process water ponds will contain an analogue level sensor connected to the telemetry system. This will provide an ongoing indication of the actual water level in each pond and will enable the site manager to take early action to correct any potential overflows before they occur. The level detector will also be used to measure any actual overflows using a basic weir formula.



6. Emergency Wastewater Discharges

6.1 Discharge Points

6.1.1 General

The following overflow provisions will be incorporated into the water management system.

Expected points of emergency discharges are depicted in Appendix C.

6.1.2 Process Water System

There will be no process wastewater (Type 2) flows from this stage of the development.

6.1.3 Site Stormwater System

All drains will be designed for a 1 in 10 year critical storm event. Flows exceeding this will surcharge the drain and spill to the adjacent landscape. There will be little or no adverse impact as the site generally would be flooded during a storm event greater than the design storm. No monitoring or control of surcharges to the site storm water drains will be undertaken.

The stormwater collection pond will be designed with a surplus storage of a 72 hour 1 in 10 year storm event. For situations where the capacity of the storage is exceeded then the excess water will be spilled to an adjacent watercourse via a spillway in the pond. This spillway will be designed for a 1 in 50 year storm of critical duration. The volume of discharges will be monitored via a regular manual level measurement in the storage pond, which will be used to estimate continuous flows by use of a weir formula.

Manual level measurements will be used to monitor the spare capacity in the stormwater collection pond and in the event that the 72 hour 1 in 10 year storm buffer is starting to be filled then the following steps will be taken:

- ▶ Temporarily raising the pond spillway to add additional storage (to only be done if the system can be continuously monitored to prevent overlapping of the dam embankment);
- ▶ Transfer surplus water to the process water pond by means of a temporary drains or pump and pipe arrangements;
- ▶ Identification of additional land areas for irrigation or disposal by evaporation (ideally this additional land will be located within the limits of the current wastewater reuse site management plan; and
- ▶ Water quality data will be obtained and approval sought to discharge the surplus to the environment.

It is recognised that early identification of a potential problem with the storage capacity of the stormwater collection pond is essential to minimising the risk of an overflow. To this end it is proposed to monitor rainfall, water consumption and stormwater collection pond volume to assist in this process.

A continuous rain gauge is incorporated in the automatic weather station and will be used to calibrate the hydrology parameters used in the preparation of this management plan.



The TDS and BOD levels in the stormwater collection pond and at the spillway outlet during an overflow event will be monitored regularly.

6.1.4 Domestic Wastewater System

An ultrasonic level detector will monitor the level in the domestic wastewater pump out pit. The system has been designed to contain 4.5 days buffer storage at average dry weather flow. The pit will contain an overflow to the stormwater system but it is intended that this be used only in an absolute emergency event. Should a situation occur where an overflow of stored wastewater is expected to occur then the following measures will be taken to prevent a discharge to the stormwater system:

- ▶ Implementation of a domestic wastewater reduction programme, including limitation on the number and length of showers, reduction in the amount of toilet flushing water consumed and stopping all but vital site cleaning activities;
- ▶ Sourcing an alternative pump out contractor;
- ▶ Implementing additional site storage by sourcing temporary tanks or tankers and pumping wastewater to these.

Any stormwater containing overflows from the domestic system will be tankered from site and treated at an approved wastewater treatment plant.

6.1.5 Roof Stormwater system

All site specific storages will have a controlled overflow to the process water pond. No monitoring or control of overflows will take place.

6.2 Sampling Program

A wastewater monitoring program for wastewater streams will be developed and submitted to the Director for approval, in accordance with Condition E13 of the Permit. Attachment 7 of the Permit indicates the monitoring requirements for the Wood Centre Development. These requirements are expanded in more detail in Appendix B, Wastewater Monitoring Requirements.

6.3 Incident Response Protocol

6.3.1 General

An incidence response protocol will be developed as an integral part of the site management plan.

6.3.2 Identification of Emergency Situations

The site management plan will incorporate standard operating procedures for identifying emergency situations. These procedures will include:

- ▶ identification of all alarms on site including those that are sent to the main administration building via the site wide telemetry system;



- ▶ Development of site wide inspection programmes for early identification of potential and actual emergency situations such as pond embankment seepage, pipe blockages and pump failures;
- ▶ Development of a site wide monitoring programme to identify unusual contaminant levels in waste streams. These will include monitoring to identify matters such as high salt levels in process water, domestic wastewater present in process water streams or a noticeable change in ground water levels or quality.

6.3.3 Standard Operating Procedures

Standard operating procedures will be prepared and introduced to ensure all relevant personnel are adequately briefed on how to respond to emergency situations. This will include means of identifying and contacting emergency contacts and procedures for communicating incidents.

All personnel on site will be under go site safety and environmental management inductions to increase awareness of the emergency protocols. Regular toolbox meetings will be used to supplement this, as well as instruction/advice relating to emergency issues.

6.3.4 Action Plans

Standard response procedures will be developed to ensure prompt action to address and manage emergency situations. These action plans will include:

- ▶ Identification of potential temporary pumping arrangements;
- ▶ Means of diverting flows to other contained areas;
- ▶ Reducing flows or emissions from sources;
- ▶ Cleanup procedures

6.3.5 Incidence Response Reporting

Condition E10 of the Permit indicates the incident response protocol required for unintended discharge of effluent. The incident response protocol and response reporting requirements will be written into the Site Management Plan and into the Operation and Maintenance manuals for the wastewater facilities at the Wood Centre.

Condition E10 is as follows:

The discharge of effluent from any of the three communal storage ponds is not permitted, except during a 1 in 10 year, 72-hour rainfall event. In the event of such a discharge, the person responsible for the activity must take the following actions:

- 1. as soon as reasonably practicable, but not later than 24 hours after becoming aware of the discharge, notify the Site Manager, the Planning Authority and the Director of the discharge; the last mentioned by a telephone call to the 24-hour emergency telephone number 1800 005 171; and*
- 2. not later than 24 hours after the cessation of the discharge, provide a written report to the Director by facsimile to (03) 6233 3800 or by hand delivery, outlining the nature and duration of the discharge, and the circumstances in which it occurred and any action taken to deal with the discharge. (This report must be provided irrespective of whether the person responsible for the activity has reasonable*



grounds for believing that the incident has already come to the notice of the Director or any officer in the administration or enforcement of the EMPCA.);

3. *conduct water sampling in accordance with the Wastewater Management Plan as amended from time to time in accordance with condition E7;*
4. *within 7 days of the cessation of the discharge, provide the Director with records from the Bureau of Meteorology in order to demonstrate whether the circumstances under which the discharge occurred was equivalent to or greater than a 1 in 10 year, 72-hour rainfall event.*

6.3.6 Monitoring

Monitoring during emergency situations will be conducted in accordance with the guidelines outlined in this Wastewater Management Plan.

6.4 Discharges from the Land

The provision of controlled overflows from each wastewater stream to the storm water collection system provides a situation where the most likely point of discharge from the land will be from the stormwater collection pond over flow weir. This would occur when, say the stormwater return pump fails or there is an extremely high recurrence interval storm. Other points of potential emergency discharge could be from overtopping stormwater collection drains or from uncontrolled seepage through embankments.

In the event of an emergency discharge from the land the following sampling programme will be implemented at the discharge point:

1. Discharge flow and volume
For a discharge from the stormwater collection pond, this will be monitored via the overflow weir using the pond level monitoring system. For other discharge points a temporary V notch weir plate will be installed. In this instance, the rate of monitoring will depend on the size and variation of the flow. The duration of the overflow will also be recorded.
2. Dissolved oxygen, conductivity, turbidity, pH and Temperature
Dissolved oxygen, conductivity, turbidity, pH and temperature will be monitored at regular intervals by suitably calibrated hand held probes. The monitoring interval will be determined on site, based on the magnitude of the discharge and on historical data collected during the event.
3. BOD, Suspended Solids and Oil/Grease
Samples from the discharge point and natural watercourses, upstream and downstream of the point of discharge, will be taken and analysis for BOD, suspended solids and oil/grease.
4. Nutrients
Samples from the point of discharge and natural waster courses upstream and downstream of the point of discharge, will be taken and analysis for total nitrogen, nitrate, ammonia and total phosphorous.
5. Bacteria
Samples from the point of discharge and natural waster courses upstream and downstream of the point of discharge, will be taken and analysis for bacteria levels.



7. Management Plan Review

The Planning Permit Condition E6 is as follows:

The Waste Water Management Plan must be reviewed and a revised plan submitted to the Director for approval within 12 months of the date of commencement of construction activities on the land, and at yearly intervals thereafter for the next two years, and as otherwise requested in writing by the Director. A copy of the revised plan is to be forwarded to the Huon Valley Council.

The Site Manager will arrange the reviews and revised plans in accordance with this condition.



Appendix A

Site Water Budget

Figure 1 – Water and Wastewater Circuit Schematic

Figure 2 – Detailed Flow Diagram – Stage 1

Table 8 – Water Balance Analysis – Stage 1 Development

Table 9 – Domestic Non Potable Water Budget – Stage 1



Calculation Basis for Water Balance Spreadsheet

- (a) Factored No. of Wet Days – assumes 60% of all days where rainfall has occurred (taken from median rainfall data for Cemetery Road, Geeveston from Bureau of Meteorology).
- (b) Factored No of Dry Days – No of Days that are not Factored Wet Days
- (c) Mean evaporation – taken from median evaporation data for Four foot Road Geeveston from the Bureau of Meteorology.
- (d) 90% Precipitation – taken from monthly rainfall data for Cemetery Road for 1975 (year that best matches 90% annual rainfall of 1,032 mm).
- (e) Nett evaporation = 0.80 mean evaporation (c) – 90% precipitation (d).
- (f) effective precipitation = 0.5 x 90% Precipitation (d) for monthly total less than 12 mm
or = 0.7 x 90% precipitation for monthly total more than 12 mm.
- (g) Process Water Inflow = 0.30 kL/day x number of dry days (b).
- (h) Process Water Demand = assumes no process (log sprinkler) water is taken from stormwater pond.
- (i) Stormwater Runoff = 90% Precipitation (d) x 80% x Equivalent Catchment Area (excludes roof area)
- (j) Roof Stormwater Surplus – taken directly from the non potable water balance and assumes that all make up water will be from the Huon River (conservative assumption)
- (k) Make up required = Process water demand (h) – Stormwater Runoff (i) – Process Water Inflow (g) – Roof Stormwater Surplus (j)
- (l) Extracted Water from River = Make up required if stormwater collection pond volume (v) – Makeup Required (k) < 0, if so equals difference between (v) and (k)
- (m) Storage Loss = Storage Surface Area times Nett Evaporation (e)
- (n) Nett Flow From Storage = Process Water Inflow (g) + Stormwater Runoff (i) + Roof Stormwater Surplus (j) – Process Water demand (h) – Storage Loss (m)
- (o) Crop Factor – taken from Table 7.1 of DPIWE – Environmental Guidelines for the Use of Recycled Water in Tasmania
- (p) Application Efficiency – taken from Table 7.8 of DPIWE – Environmental Guidelines for the Use of Recycled Water in Tasmania for permanent sprinklers
- (q) Gross Irrigation Demand = maximum of zero and Mean Evaporation (c) x Application Efficiency (p) x Crop Factor (o) – Effective Precipitation (f)
- (r) Irrigation Volume Used = Gross Irrigation Demand (q) x Irrigation Area
- (s) Storage Nett Inflow = Nett Flow from Storage (n)
- (t) Less Irrigation = Irrigation Volume Used (r)
- (u) Increase in volume = Storage Nett Inflow (n) – Irrigation Volume Used (r)
- (v) Volume at End = Volume at end for previous month + Increase in Volume (u)

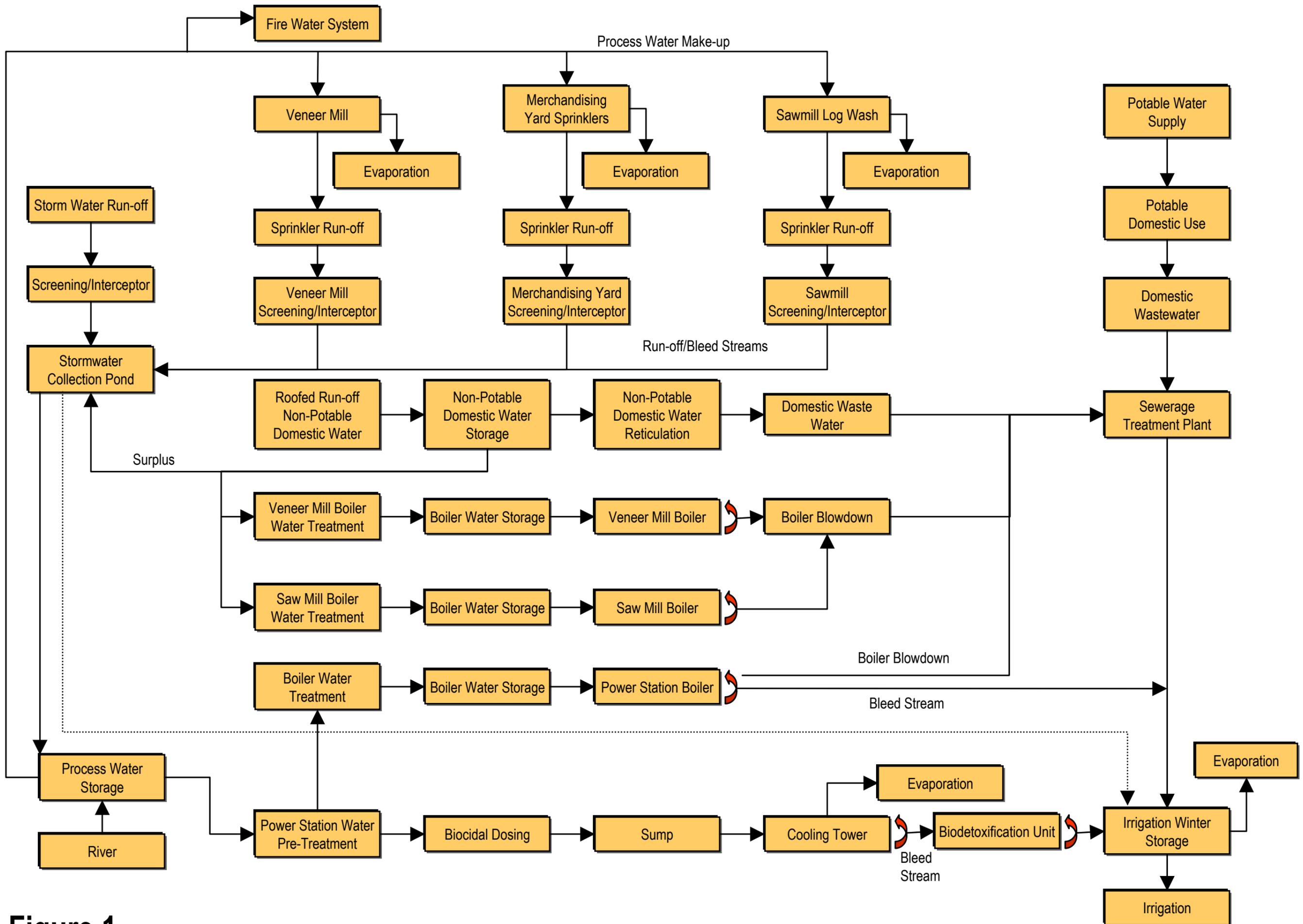
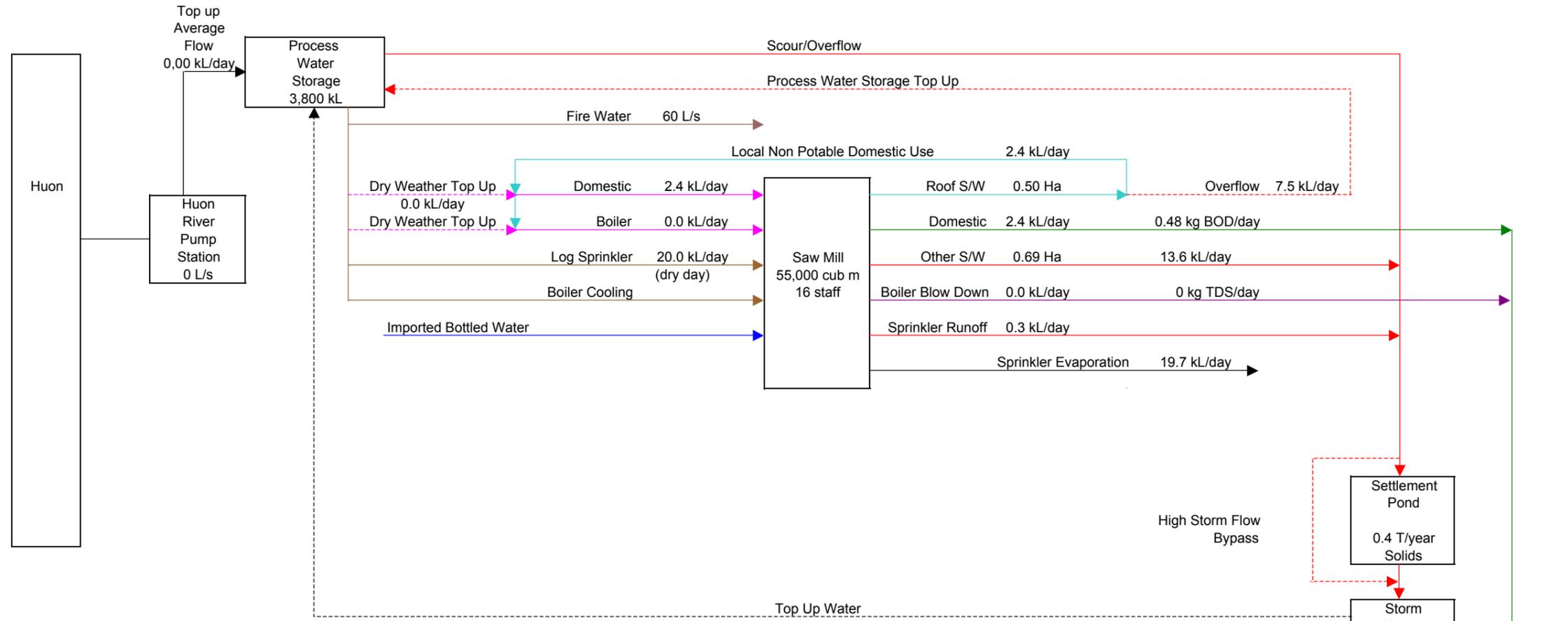


Figure 1
Water & Wastewater Circuit Schematic – Ultimate Development



Summary of Stormwater Flows to Pond

Saw Mill 21.1 kL/day

Summary of Process Water Supply Flows

Saw Mill 20.0 kL/day

Summary of Non Potable Water Flows

Saw Mill (Domestic) 2.4 kL/day
Saw Mill (Boiler) 0.0 kL/day
2.4 kL/day

Summary of Clean Stormwater In Flows

Saw Mill 2.4 kL/day

Summary of Evaporation Discharges

Saw Mill 19.7 kL/day

Summary of Irrigation System Flows

High TDS Bleed 0.0 kL/day

Summary of Non Domestic Top Up Flows

Saw Mill 0.0 kL/day

Summary of WWTP Flows

Saw Mill 2.4 kL/day

Summary of Process Flows to Pond

Saw Mill 0.3 kL/day

- Raw Water Stream
- Potable Water Stream
- Process Water Stream
- Clean Stormwater Stream
- Contaminated Stormwater Stream
- Wastewater Treatment Plant Stream
- Wastewater Irrigation Stream
- Non Potable Domestic Water Stream

Note: Areas shown are equivalent areas

Key Design Parameters

Fire water peak flow	60 L/s	
Fire water site storage	4 hours at	60 L/s
Raw Water TDS	100 mg/L	
Domestic Wastewater TDS	600 mg/L	
WTP Washwater TDS	200 mg/L	
Boiler blow down Maximum TDS	1,250 mg/L	
Domestic wastewater BOD	200 mg/L	
Capacity of Site Storages	1 Days average supply	
Solids Content of Contaminated Stormwater	100 mg/L of soil particles	
Veneer Preconditioning Flow	0.4 kL per m ³ of raw timber	
Veneer Preconditioning BOD	0.86 kg per kL of water	
Domestic Water ADWF	150 L per person per day	
Proportion of runoff from log sprinkler water	1.4%	
Days that log sprinklers do not operate	100 days per year	
Average Annual Rainfall	900 mm/year	
% Rainfall converted to runoff	80%	

Figure 2 - Southwood Flow Schematic - Stage 1

Table 8
Water Balance Analysis - Stage 1

<u>Process Water Inflow</u> (into storage pond)			<u>Process Water Demand</u> (out of storage pond)		
WWTP	0.0 kL per day		Mechandising yard	0.0 kL per day ⁽¹⁾	9.8
Mechandising yard	0.0 kL per day ⁽¹⁾		Veneer mill	0.0 kL per day	5
Veneer mill	0.0 kL per day		Sawmill	20.0 kL per day ⁽¹⁾	
Sawmill	0.3 kL per day ⁽¹⁾		Fibre plant	0.0 kL per day	
Fibre plant	0.0 kL per day		Power Station	0.0 kL per day	100% of total flow
Power Station	0.0 kL per day		TDS Bleed System	0.0 kL per day	
WTP	0.0 kL per day		Total	20.0 kL per dry day	
Total	0.3 kL per dry day			0 kL per wet day	

Note (1) occurs on dry days only

Storm Water Runoff	Area			Total
	Roof	Hardstand	Unpaved	
Mechandising yard				0.00 Ha
Veneer mill				0.00 Ha
Sawmill	0.50	0.50	0.6	1.60 Ha
Fuel Processing				0.00 Ha
Power Station				0.00 Ha
Administration				0.00 Ha
Irrigation			0	0.00 Ha
Car Parks and Roads				0.00 Ha
Total	0.50	0.50	0.60	1.60 Ha
Coefficient of runoff				
Effective area	1.0	0.9	0.4	

Percentage rainfall entering the system **80%**
 Proportion of stormwater used in process top up **0%**
 Annual Rainfall **90%ile** (mean or 90%ile)

Lagoon Areas

Settlement ponds	0.0	Ha
Maturation ponds	0.0	Ha
Total	0.0	Ha

Winter Storage Volume

Irrigation winter storage	8.6	ML		
72 hour 10 year storm	1.2	ML		
Minimum Process Storage	0.0	ML	Days Storage	0
Total Volume	9.8	ML		
Storage Depth	2.5	m		
Storage Area	0.4	Ha		

**Table 9
Domestic Non Potable Water Budget - Stage 1**

Facility	Roof Area	Staff	Process Water Consumption
Mechandising yard	Ha	persons	
Truckwash	Ha	persons	
Veneer mill	Ha	persons	
Sawmill	0.5 Ha	16 persons	20 kL per dry day
Fibre plant	Ha	persons	
Power Station	Ha	persons	
Total	0.5 Ha	16 persons	20 kL per dry day

Percentage rainfall entering the system	80%
---	-----

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Number of days	31	28	31	30	31	30	31	31	30	31	30	31	365
Number of dry days	23	22	23	21	21	21	21	20	19	21	21	22	255

Climatic Data	mm per Month	55.80	50.80	56.90	64.20	75.90	65.30	94.10	92.50	83.50	90.90	74.30	76.30	880.5	Mean	Cemetery Rd
Average Precipitation	mm per Month	55.80	50.80	56.90	64.20	75.90	65.30	94.10	92.50	83.50	90.90	74.30	76.30	880.5	Mean	Cemetery Rd
90% precipitation	mm per Month	62.60	11.40	101.00	44.00	175.80	75.80	144.20	178.00	46.00	144.60	99.80	24.20	1107.4	1975	Cemetery Rd

Saw Mill

Water Balance - Average Year															
Working Days	22	20	22	21	22	21	22	22	21	22	21	22	261	5	Days per week
Domestic Consumption ML per Month	0.053	0.048	0.053	0.051	0.053	0.051	0.053	0.053	0.051	0.053	0.051	0.053	0.626		
Process Water Consumption ML per Month	0.460	0.440	0.460	0.420	0.420	0.420	0.420	0.400	0.380	0.420	0.420	0.440	5.100		
Stormwater inflow ML per Month	0.223	0.203	0.228	0.257	0.304	0.261	0.376	0.370	0.334	0.364	0.297	0.305	3.522		
Surplus (makeup) ML per Month	-0.290	-0.285	-0.286	-0.215	-0.170	-0.210	-0.097	-0.083	-0.097	-0.110	-0.174	-0.188	-2.204		

Water Balance - 90% ile Year															
Working Days	22	20	22	21	22	21	22	22	21	22	21	22	261	5	Days per week
Domestic Consumption ML per Month	0.053	0.048	0.053	0.051	0.053	0.051	0.053	0.053	0.051	0.053	0.051	0.053	0.626		
Non domestic consumption ML per Month	0.460	0.440	0.460	0.420	0.420	0.420	0.420	0.400	0.380	0.420	0.420	0.440	5.100		
Stormwater inflow ML per Month	0.250	0.046	0.404	0.176	0.703	0.303	0.577	0.712	0.184	0.578	0.399	0.097	4.430		
Surplus (makeup) ML per Month	-0.263	-0.442	-0.109	-0.295	0.230	-0.168	0.104	0.259	-0.247	0.105	-0.072	-0.396	-1.296		



Appendix B

Wastewater Monitoring Requirements



Table 10 Wastewater Monitoring Requirements

Wastewater stream	Monitoring Parameter	Units of Measurement	Monitoring Frequency	Reporting Frequency	Location of Monitoring Point	Sampling method
TYPE 1 PROCESSING WASTEWATER	TDS	mg/L	TBA	TBA	Outlet from on-site treatment system at each production facility	Outlet from on-site treatment system at each production facility
	pH	-	TBA	TBA		
	Temp	degrees C	TBA	TBA		
	Phosphates	mg/L	TBA	TBA		
	Chlorine	mg/L	TBA	TBA		
	O ₂ Scavenger	mg/L	TBA	TBA		
	Metals Suite	mg/L	TBA	TBA		
TYPE 2 PROCESSING WASTEWATER / CONTAMINATED STORMWATER	TDS	mg/L	Monthly	Annual	Outlet from on-site treatment system at each production facility	Outlet from on-site treatment system at each production facility
	BOD	mg/L	Monthly	Annual		
	NFR	mg/L	Monthly	Annual		
	pH	-	Monthly	Annual		
	Temp	degrees C	Monthly	Annual		
	Metals Suite	mg/L	Annual	Annual		
	Nutrients	mg/L	Monthly	Annual		
	TPHC	mg/L	Monthly	Annual		
TREATED SEWAGE	BOD	mg/L	Weekly	Annual	Outlet of treatment plant	Representative grab sample
	NFR	mg/L	Weekly	Annual		
	pH	-	Weekly	Annual		
	Metals Suite	mg/L	Weekly	Annual		
	Thermo tolerant coliforms	count /100 mL	Weekly	Annual		
	Faecal Streptococci	count /100 mL	Weekly	Annual		

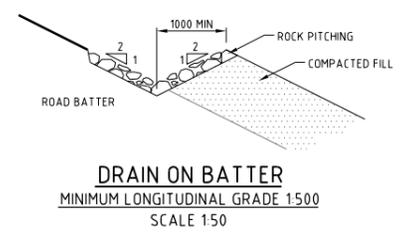
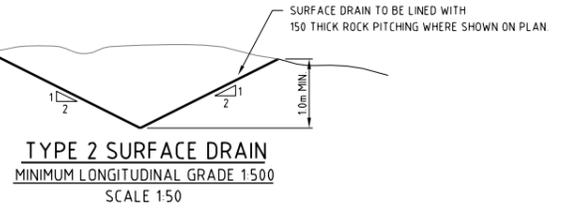
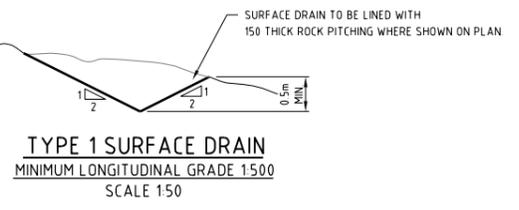
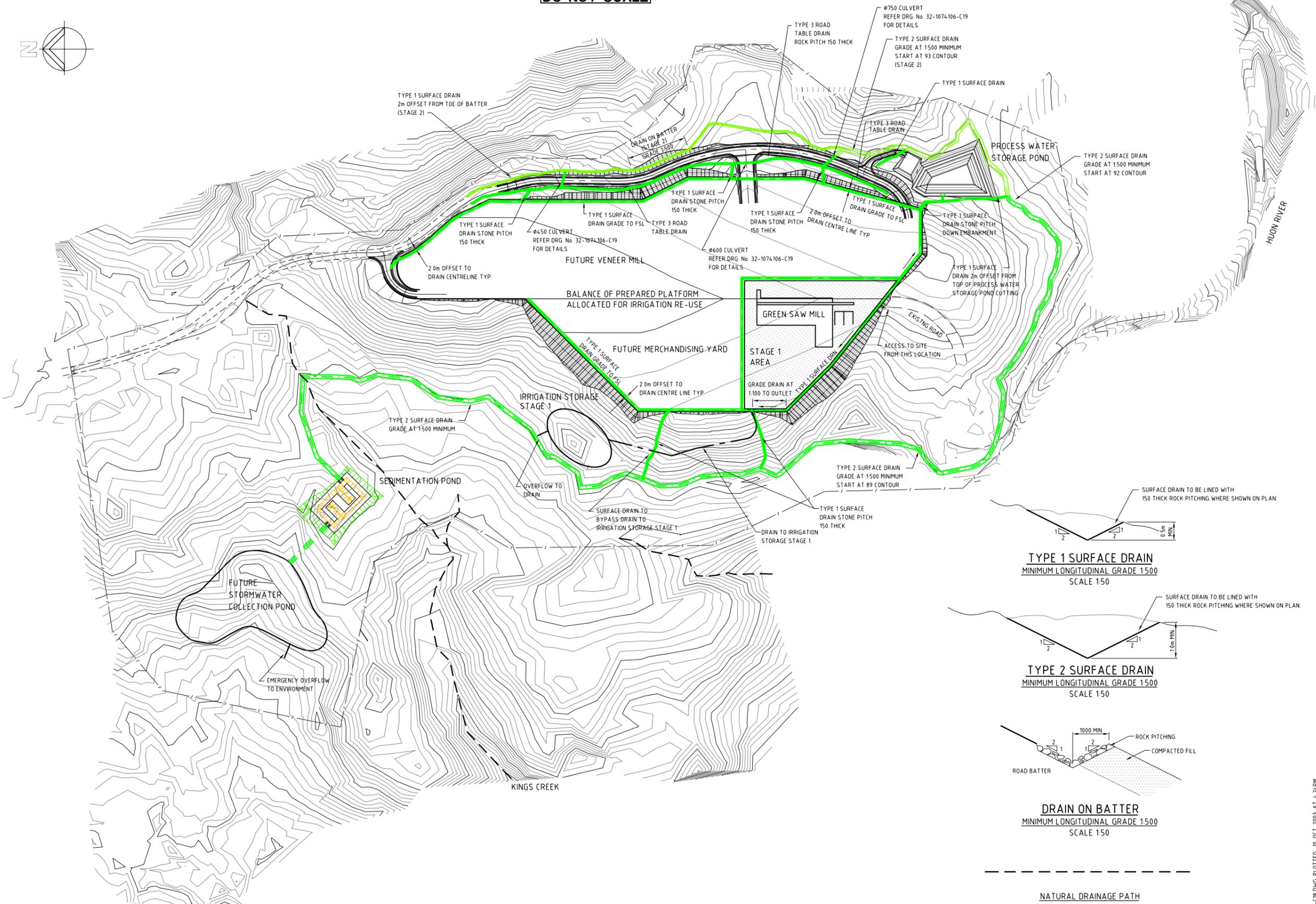
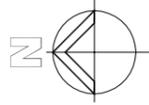
Note: This table is subject to confirmation once the actual wastewater quality and quantity data has been confirmed by each proponent of the wood centre.



Appendix C
Service Plan

No	Description
3210741-C018	Site Drainage Plan

DO NOT SCALE



NATURAL DRAINAGE PATH

PRELIMINARY

NOTE
SURVEY PROVIDED BY FORESTRY TASMANIA



No.	Revision	Checked	Approved	Date	M/Film
2	MODIFIED FOR ISSUE WITH E4 PLAN REV 5	*RAC	*TVB	10/10/03	
1	MODIFIED FOR ISSUE WITH E4 PLAN REV 4	*RAC	*TVB	13/8/03	
0	CONSTRUCTION ISSUE	*R.A.C.	*T.V.B.	28/5/03	

NOTE * INDICATES SIGNATURES ON ORIGINAL ISSUE OF DRAWING OR LAST REVISION OF DRAWING

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Approved *T.V. BURBURY 28/5/03	

Client and Job	JOHN HOLLAND CONSTRUCTION SOUTHWOOD - STAGE 1	
Title	STORMWATER PLAN	
Size	A1	Drg. No. 32-1074106-C18
Rev	2	

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Appendix D

Draft Wastewater Reuse Management Plan



D.1 General Description

For Stage 1 all stormwater and log sprinkler wastewater bleed discharge will be sent to the stage 1 stormwater collection pond. From there it will be pumped to the land based irrigation scheme, which will be located on the Wood Centre pad to the north of the saw mill.

Key features of the proposed reuse scheme include:

1. provision of a 9.8 ML stormwater holding pond with sufficient capacity to contain the surplus water from a 90 percentile wet year plus a buffer to contain the 1 in 10 year 72 hour storm event;
2. a temporary pump station to the effluent to the reuse scheme;
3. a total of 7.6 Ha of suitable irrigation reuse land on the earth worked site available to provide the 5.3 Ha required area for a 90 percentile wet year;
4. an irrigation system comprising a pipe network and fixed irrigators; and
5. a pasture crop cultivated in accordance with the Site Landscape Plan.

It should be noted that there are no introduced pathogens or similar contaminants in the water proposed for irrigation.

The following outlines the specific management requirements for the above.

D.2 Hydrogeology

A detailed hydrogeological study of the site has been undertaken by Coffey's (refer to their report dated 30 August 2002).

The study identified a perched aquifer on the site, most likely as a result of a cemented coffee rock layer approximately 1.0m below the surface. This aquifer followed the natural surface and drained into the nearby watercourses. This layer has been removed from a large portion of the earth worked site and has been intercepted by perimeter catch drains. The presence of this perched aquifer within the reuse scheme site is considered unlikely.

Deeper boreholes on the site have indicated that there is also a perched aquifer at a depth of around 2.4m below the natural surface level. This is considered to be a result of sandy aquifers overlying clayey alluvium. These perched aquifers drain through the bedrock to the natural water table. Boreholes on site were unable to locate the natural water table, which is expected to be more than 30 m below the natural surface level.

With the removal of the perched aquifer above the coffee rock layer it is considered that there will be no groundwater issues associated with the stage 1 reuse scheme.

D.3 Soils

Soils for the reuse scheme will be obtained from surplus topsoil removed from the site during the bulk earthworks.



Test holes from Coffee's site geotechnical investigations indicate that this topsoil is a sandy peat material and appears suitable for the proposed reuse scheme. This will be laid over the reuse scheme site at a uniform thickness of 150 mm.

As part of a detailed Wastewater Reuse Management Plan the following soil parameters will be investigated and determined by an experienced soils scientist:

1. Soil Salinity Hazard
2. Soil Permeability Hazard including the following:
 - Gypsum Response Class
 - Soil dispersion
 - Soil Sodidity
1. Cation Exchange Capacity
2. Phosphorous Absorption Capacity
3. pH
4. Organic Matter Loading

These will be used to quantify the following key soil characteristic risks associated with the stage 1 reuse scheme:

1. Soil Salinity Hazard.
2. Gypsum Response Requirements
3. Soil Dispersion.
4. Soil Sodidity Issues
5. Cation Exchange Capacity
6. Phosphorus Adsorption Capacity
7. Organic Matter Loading

It should be noted that the soils in this area are very low in nutrient levels and it is expected that the implementation of this reuse scheme should be beneficial to the overall soil structure.

D.4 Adjacent Water Courses

The nearest natural water courses to the proposed reuse scheme are Kings Creek (that runs along the western boundary of the site) and the Huon River. These are marked on the site plan shown in Appendix C along with other dry natural depressions/valleys on the site.

There are no natural water course within close proximity to the proposed stage 1 reuse scheme.

D.5 Adjoining Sensitive Uses

The DP&EMP for the Southwood Project has identified no adjoining sensitive uses around the site.



D.6 Flora and Fauna Values

The proposed stage 1 reuse scheme will be located on a completely reworked site and there will be no direct impact on natural flora and fauna.

The DP&EMP for the Southwood Project has not identified any other potential flora and fauna issues that will be impacted (directly or indirectly) by this stage 1 reuse scheme.

D.7 Aboriginal and European Heritage

The DP&EMP for the Southwood Project has not identified any potential Aboriginal or European heritage issues that will be impacted by this stage 1 reuse scheme.

D.8 Wastewater Quality Requirements

The wastewater used in the irrigation scheme will primarily comprise site stormwater runoff and some bleed from the log sprinkler spray system. The latter is expected to constitute less than 2% of the total flow.

Expected wastewater quality requirements are contained in Section 3.4 of the Wastewater Management Plan. The numbers quoted in Table 5 are for the sprinkler water bleed system. The quality of the stormwater is expected to be on the extreme low end of the ranges quoted.

The irrigation reuse scheme has been designed for Class 2 effluent, which has a TDS less than 500 m/L. The actual TDS is expected to be much lower than this with most of the salts comprising dissolved log residue. Levels of trace elements and heavy metals are expected to be low.

All stormwater from the site will be directed via an oil interceptor pit to minimise the levels of hydrocarbons.

The wastewater will not contain any domestic effluent and is expected to not contain high levels of viruses, pathogenic bacteria, protozoa or parasitic helminths.

D.9 Storage Pond Volume and Irrigation Area

Refer to Section 4 of the Wastewater Management Plan.

D.10 Stormwater Pond Lining

The Stage 1 stormwater collection pond will be lined with a 500 mm thick clay liner compacted to achieve a permeability of 10^{-3} m/day.

Geotechnical investigations have identified a suitable source of sandy clay north west of the sedimentation pond. Laboratory tests on this material have indicated that it has the following characteristics.

Liquid Limit	28 – 37%
Plastic Limit	19 – 26%
Plasticity Index	10
Linear Shrinkage	6 - 10



It is considered that if correctly placed and adequately compacted, this material will achieve the permeability required.

D.11 Soil Sustainability

The issue of soil sustainability should not be a concern for the stage 1 reuse scheme because of the following:

1. the facility is only a temporary measure to manage site wastewater until stage 2 of the Project is implemented; and
2. The soils to be used in this irrigation scheme will have been placed from a surplus stock pile constructed as part of the bulk earthworks (they are not intended to be used for long term agricultural purposes).

D.12 Soil Moisture Monitoring

The rate of irrigation needs to vary to take account of climatic conditions, topographical conditions, varying soil types and soil moisture content. To achieve this the irrigation system will be programmable and will incorporate soil moisture monitoring information from soil moisture sensors. There will be a manual stop override to enable irrigation to stop in the event of high winds or predicted imminent high rainfall.

D.13 Potential Health Risks

The proposed irrigation site is in a remote location and is fully enclosed within the wood centre security fence.

The crop from the reuse scheme will not be harvested for animal fodder to minimise health risks – it is proposed to use any harvested crop for compost for landscaping the site.

It is considered that the potential health risks from this stage 1 reuse scheme are extremely low.



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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
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3	RA Casimaty	M Lonergan	On File	T Burbury	On File	7/7/03
4	RA Casimaty	K Trebilco	On File	K Trebilco	On File	13/9/03
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