

DUST & WOOD RESIDUE MONITORING & MANAGEMENT PLAN

**Bombala Sawmill Project
September 2021**



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DOCUMENT CONTROL

Title	Dust & Wood Residue Management and Monitoring Plan			
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GLOSSARY AND ABBREVIATIONS

AMMAAP	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW
BOM	Bureau of Meteorology
DWAU	Dongwha Australia
DWRMMP	Dust and Wood Residue Management and Monitoring Plan
DPIE	Department of Planning, Industry and Environment
ECO	Emergency Control Organisation
EMS	Environmental Management Strategy
EPA	Environment Protection Authority
EPC	Emergency Planning Committee
EPL	Environment Protection Licence
NGER	National Greenhouse and Energy Reporting
NPI	National Pollutant Inventory
NRC	Natural Resources Commission
NOW	New South Wales Office of Water
NSW	New South Wales
OSD	On-site detention
PIRMP	Pollution Incident Response Management Plan
PM ₁₀	Particulate matter of size 10 µm
RAP	Remediation Action Plan
RNP	NSW EPA Road Noise Policy
SEPP	State Environmental Planning Policy
WHS	Work, Health and Safety

1. INTRODUCTION

This Dust and Wood Residue Management and Monitoring Plan (DWRMMP) has been revised in accordance with Condition 4 of Schedule 3 of the Project Approval MP07_0161 (MOD4) of the Dongwha Australia (DWAU) (*formerly Dongwha Timbers & Willmott Timbers*) Sawmill in Bombala. The condition for the plan is reproduced in Table 1-1:

Table 1-1: Project Approval MP07_0161 (MOD4) – Schedule 3, Condition 4

Condition	Section of Document Addressing Condition
The Proponent must prepare and implement a Dust and Wood Residue Monitoring and Management Plan to the satisfaction of the Secretary. The plan must:	
(a) be prepared in consultation with EPA and approved by the Secretary prior to the commencement of operation of the 15 MW Wood-fired Boiler;	Section 1.1
(b) provide a detailed program for management of the existing wood residue stockpile:	Section 2.1
i. describing how the stockpile would be monitored and managed;	
ii. describing the disposal options and progress achieved to date;	
iii. setting out the disposal strategy to be implemented, with detailed staging, linking to the stages of the mill expansion, and timing for complete removal of the stockpile;	
iv. outlining the contingency measures that would be implemented should the management of the stockpile prove insufficient, or the disposal strategy be delayed;	
(c) quantify the volumes of wood residue to be produced once operating at full capacity;	Section 2.2.6
(d) demonstrate that these volumes can be appropriately stored and disposed of;	Section 2.3
(e) provide a monitoring strategy to identify:	Section 2.5
i. any potential or actual failings in the management of dust and wood residue;	
ii. when excess wood residue is being produced and when milling is required to cease to avoid exceeding the capacity of the storage area; and	
(f) outline the contingency measures that would be implemented should:	Section 2.4
i. the management measures prove insufficient;	
ii. the disposal options change; or	
iii. the wood residue produced exceed the storage capacity on site	

The DWRMMP specifically addresses the management and monitoring of wood residues generated by the current daily operations of the sawmill. These wood residues include bark, woodchip, sawdust and shavings. Pole waste is no longer generated as pole production ceased in 2013 with the start of the new Green Mill facility. The legacy wood residue stockpile referred to in Condition

4(b) in Schedule 3 of the Project Approval was removed from site and the area rehabilitated in 2018 and therefore this condition no longer applies.

Furthermore, following the commissioning of the 15MW biomass boiler as part of MOD4 to the Project Approval, much of the sawdust can now be reused on site as a fuel in the boiler. Revised annual quantities of wood residues in relation to current production capacity and other minor improvements have been made.

This DWRMMP has been revised accordingly.

1.1 CONSULTATION

In accordance with Condition 4 (a), this plan has been revised in consultation with the Environmental Protection Authority (EPA). The EPA were sent a draft of the revised plan prior to a phone discussion which was undertaken on 14 September 2021. EPA requested that the plan include or provide a reference to measures used to control wind blown dust in the legacy area. In addition, EPA suggested the plan also include dust management in general to ensure environmental management of the site is undertaken in a proper and efficient manner. Section 1.2 addresses this request.

The first draft of this plan was provided to the regional EPA office on 30 August 2011. On September 2011, the EPA advised there were no comments on the plan. Revision 2 of plan was finalised on 30 September 2011.

The plan was revised in July 2021 and a draft revision issued to the DPIE on 9 August 2021. Upon feedback from DPIE, Benbow Environmental were engaged to revise the plan in September 2021. This report presents revision 3 of the plan.

The 15 MW boiler was installed and commissioned in June 2019.

1.2 DUST MANAGEMENT

General dust management at the site is covered in the Air Emission Management Plan (AEMP). This includes control measures for process dust sources and fugitive dust controls. A dust suppressant “dustex” is used in the watercart for additional dust control of the general site area. This is shown in the photograph below:

Figure 1-1: Watercart containing “Dustex” providing dust suppression to the site



Dust control measures for the legacy area are addressed in the Landscape Management Plan. Revegetation of this area has been designed to maximise the effect and benefits of dust suppression.

2. MANAGEMENT OF RESIDUE AND CURRENT OPERATION

2.1 LEGACY STOCKPILES OF WOOD RESIDUE

The operational and environmental impacts resulting from the stockpiles of wood residues on site created by the former owner are well documented by DWAU and the EPA. The issues arising from the stockpiles culminated in the EPA issuing Pollution Reduction Program U2, Wood Waste and Residue Management Plan.

The plan addressed the current generation of wood waste on the site and outlined the management measures which have been implemented to manage both it and the legacy wood waste. The key outcome of the plan was that the legacy stockpiles were fully removed by early 2018.

DWAU submitted the plan to the EPA in mid-2010, and in September 2010, the Pollution Reduction Program was noted as being fulfilled.

The specific elements of the Plan which relate to Condition 4(b) are no longer relevant as the stockpile referred to no longer exists and was removed in early 2018. This area has now been rehabilitated in accordance with the Landscape Management Plan.

2.2 DESCRIPTION OF WOOD RESIDUE

Wood residues including bark, untreated and treated damaged boards, chips and sawdust, and wood shavings are generated by several manufacturing processes during the sawmill operations. Wood residues generated by the mill are continuously reused or removed from the site for reuse. The wood residues are described and a summary of the annual quantities of wood residues are provided below.

2.2.1 Bark Waste

Pine logs are delivered to the site bark-on, and are de-barked on site. This bark is sold as landscape mulch for further processing, for which there is a ready market. The current production of bark waste is 17,000 tpa.

2.2.2 Untreated and Treated Damaged Boards

Prior to the timber treatment process, timber off-cuts and damaged boards are generated during the timber optimization and quality control process. Quality control checks are performed throughout the various production processes. Any damaged product identified is returned to its original production point to be replaced and unrecoverable items sent to the chippers to be converted into pine woodchips ready for sales into the cardboard and pulp industry.

The treatment plant operators are the last quality control point in the production process. Any treated timber waste identified at this point is segregated and sent to an approved disposal facility registered to accept this type of waste. Management of treated timber waste is undertaken in accordance with the Site's Product Management Plan and this waste is not discussed further in this plan.

2.2.3 Chips

Woodchips are generated by wood chipping and trimming processes in the Green Mill. The current wood residue volume is 100,000 tpa (chips)

2.2.4 Sawdust

Sawdust is generated in the sawing and milling processes in the Green Mill. The current wood residue volume for sawdust is 39,000 tpa. 25,000 tpa of sawdust is reused on site as a fuel in the 15MW biomass boiler. The remaining sawdust is sold the external market.

Figure 2-1: Sawdust used in Biomass Boiler



2.2.5 Shavings

Approximately 11,000 tpa of shavings is generated in the current operation. The wood shavings are generated by planing or routing and can be used in several applications. DWAU sells the product to a remanufacturer based in Bombala who processes the product into animal bedding (for use in turkey farms).

Shavings produced from the current mill are collected in a fully sealed system. An extraction process removes the shavings from the planer and is captured by a collector/filter. The shavings are then blown into a special-purpose semi-trailer. In order to fully seal the system, a return air pipe is fitted to the back door of the semi-trailer to draw positive air out. The system has the capacity to have 4 semi-trailers online at one time, and when a semi-trailer is filled to capacity the trap door is automatically shut and the next semi-trailer commences filling. Once full the semi-trailers are removed offsite for reuse by agreed contractor. Shavings that are not immediately removed from the site are stored in the semi-trailers within the dry mill area. There are no shavings stored in open areas.

2.2.6 Wood Residues Summary

A summary of the wood residues generated at the DWAU and the density of the wood residues is shown in the table below:

Table 2-1: Summary of Wood Residue Generated

Residue Type	Approximate Current Volume (tpa) Based on current intake of 106,000 T
Bark	17,000
Chips	100,000
Sawdust	39,000
Shavings	11,000
Untreated damaged timber boards	1,500 (Converted to chip)
Total	168,500

There are differing bulk densities of residues generated by this project, which determines handling and storage of these materials onsite and during transportation. To clarify for the reader, the densities of the main materials associated with the project are shown below.

Table 2-2: Density of Wood Residues

Product	Density (tonnes/m3)
Bark	0.29
Chips and saw dust (including untreated timber and damaged boards)	0.29
Shavings	0.10

2.3 MANAGEMENT & STORAGE OF WOOD RESIDUES

The current DWAU's implementation of optimization measures and automated systems means that although there was a large increase in timber produced at the site, the production of wood residue waste is proportionally less, with all waste having management measures in place so that it can be removed from the site for reuse as it is produced.

Methods for addressing the ongoing generation of wood residue products on site include:

- Using a debarker, so that clean bark products can be separated from other wood residue products as a more desirable product with ready markets.
- Design of the sawmill line to minimise waste production;
- Implementation of biomass boilers which enables the onsite reuse of sawdust;
- Establishment of off-take agreements for wood residues for reuse off site. The volume of contracts are matched with production volumes to prevent build up.

The contracts for each of the wood residue products are described below.

2.3.1 Residue Contracts

Different contracts are in place for different types of residue materials, due to their different applications as end products.

All contracts are entered into with the overarching principle that the off-take volume over a given period (e.g. week or month) is sufficient to remove all of the waste produced by the sawmill. This means that each customer of residues has a contractual liability to remove all of the material as it is produced by DWAU, thereby minimising the risk of build-up of any residue product on site.

The specific off-take contracts for each residue type are discussed below.

2.3.1.1 Bark Waste/ De-barking

Pine logs delivered to the site bark-on, are currently de-barked on site under contract, with all bark collected sold to the contractor. The Agreement requires the contractor to remove the bark as soon as practical and ongoing monitoring indicates volumes stored on site to be below 80 tonne at any given time.

2.3.1.2 Chips

Chips are reused in the 2.5MW boiler. The remaining are sold under the current Sale Agreement with a well-known participant - Visy. The Agreement requires limited stockpiling of product on site due to pick ups being undertaken regularly throughout the day. The current agreement incorporates the increase in production as the expansion of operations evolves.

2.3.1.3 Saw-Dust

Approximately 50% of the sawdust generated on site is used as fuel in the 15MW Biomass boiler, with the remaining being sold to businesses trading in the cardboard and animal bedding industries. Two enclosed storage bunkers have been constructed for storage to feed the boiler.

The current sawdust quantity from the production site is 39,000 tpa. 25,000 tpa of this is reused in the biomass boiler to power five kilns for drying purposes.

2.3.1.4 Shavings

Currently, the shavings generated on the site are collected in trailers and removed from site by Straw Services Company.

2.3.2 Storage of Wood Residues

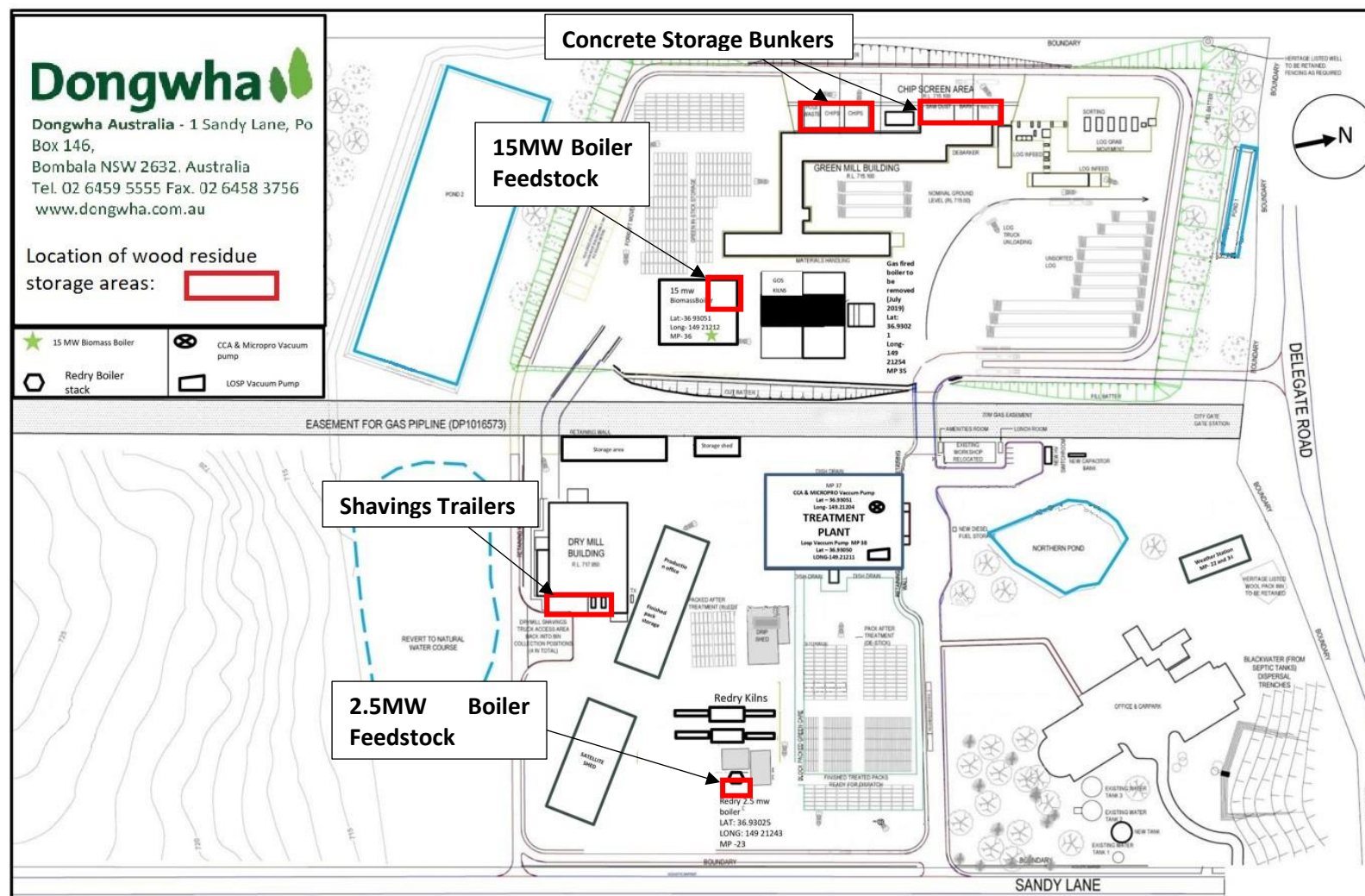
All wood waste streams apart from wood shavings are stored in concrete bunkers and at times alternative approved collection points up to a total of 1,500 tonnes. The majority of concrete bunkers are located in the western portion of the site adjacent to the Green Mill. Details of wood residue storage are as follows:

- Bark waste is stored temporarily in the concrete bunkers near the Green Mill.

- Chips are initially stored in the concrete bunkers near the Green Mill and are collected regularly throughout the day by Visy. This reduces the storage requirement for chips on site. Chips to be reused in the 2.5MW boiler and stored in a covered bunker adjacent to the boiler.
- Sawdust is initially captured in collection bunkers near the Green Mill. Quantities required for boiler feed is then transferred to two bunkers adjacent to the 15MW biomass boiler. Each bunker has a capacity of 350 cubic metres (total of 700 cubic metres) of storage.
- Shavings are collected in enclosed trailers. Four (4) trailers are located on site, each with a capacity of 80 cubic metres (total of 320 cubic metres). Shavings are collected regularly throughout the day by Straw Service .

Indicative storage locations are shown in Figure 2-2.

Figure 2-2: Wood Residue Storage Locations



2.4 CONTINGENCY PLAN

Factors which would trigger contingency management are listed below.

- Material can't be removed as contracted due to road closure during snow events
- Industrial Action
- Reneging of contract
- Breakdown of boiler

2.4.1 Road Closure/ Industrial Action

The overall operation of the facility is heavily reliant on road transportation to provide raw materials (logs) as well as removal of residues and the distribution of finished timber products to customers along the Eastern seaboard of Australia. The sizing of the log storage area is sufficient to supply the sawmill with enough log to enable it to run for approximately 5 days. If there were to be any event that should exceed this 5 day period, residue holding capacities would be closely monitored to ensure compliance and if necessary the operations would be either reduced or stopped.

It is noted that if transport stopped, logs would not be delivered to site, which would result in a stoppage of processing in any case; thus also stopping the production of residue materials. The storage capacity for both log input and residue output was aligned for this purpose to minimise disruption to site while providing for efficient land utilisation.

Companies contracted to remove residues from the site have indicated that they have sufficient capacity to remove additional build-up of wood residue should any event cause maximum storage capacity to be reached.

2.4.2 Contracts

The overall viability of the mill to process sustainable plantation pine logs into finished timber products is highly reliant on the removal of all residues in a timely and efficient manner. Contracts are in place to provide a degree of certainty of this crucial exercise. These contracts have been raised with particular detail to the urgency of the removal process and also contain a process that needs to be adhered to should either party become in dispute.

The first contingency measure would be for DWAU to approach alternative companies who have expressed an interest in taking the material. For several of the residue streams, DWAU has received expressions of interest from other remanufacturers and export companies to remove residues under contract, which would be actively pursued should the opportunity arise.

As an alternative, through Dongwha Australia's sister companies, woodchips and sawdust could be sold for utilization in the production of MDF and particleboard in countries such as South Korea and Malaysia. Utilisation of the multi- purpose wharf in Eden would assist in the facilitation of overseas freight.

Due to the above DWAU feels that these alternate arrangements would allow the company to continue production without breaching its obligations under the EPL.

2.4.3 Storage Capacity

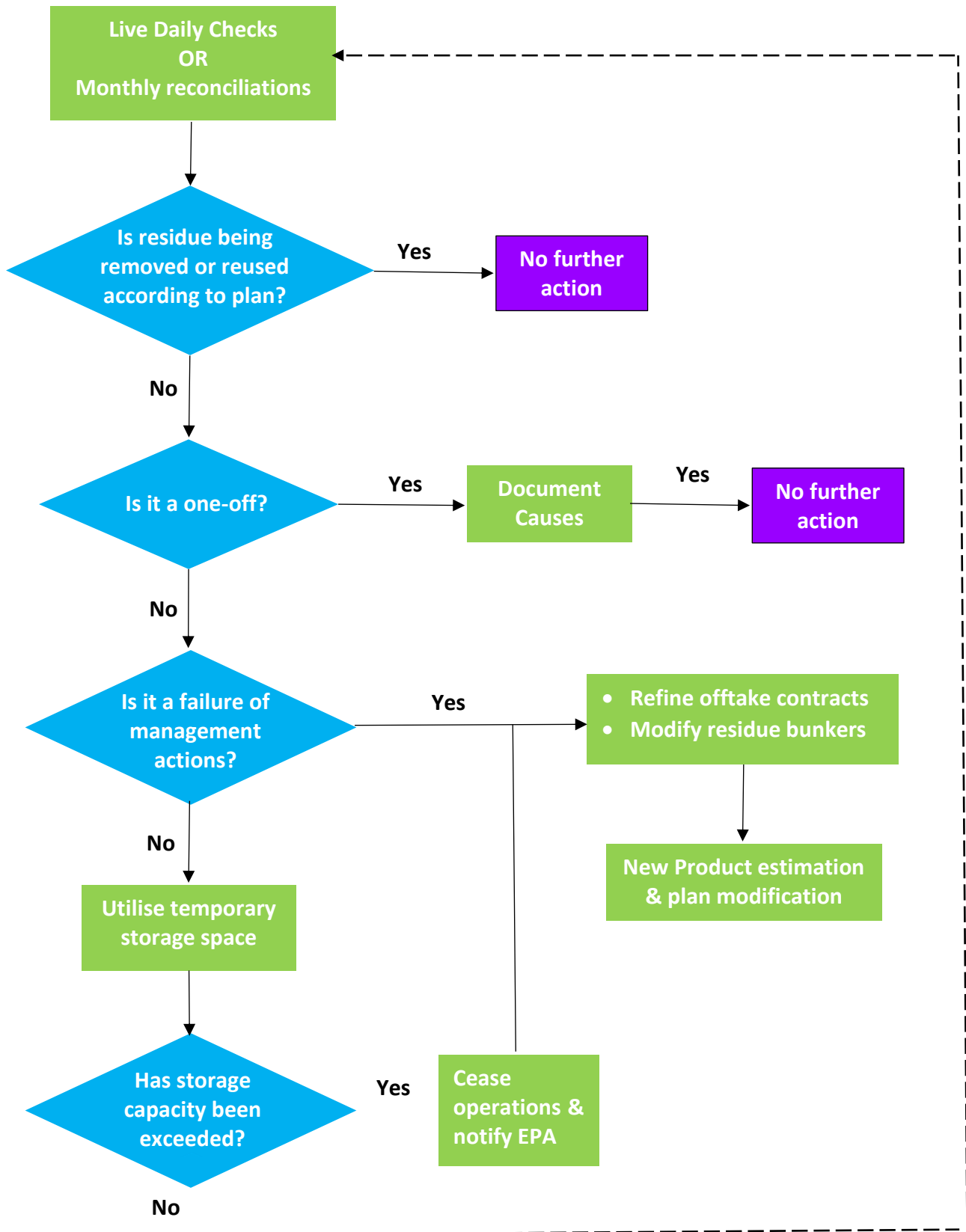
The residue storage bunkers have storage capacity of 3 days. However, the bunkers have been designed so that there is an excess of room directly behind the bunkers in the loading area. This area could be used to extend the bunkers on a temporary basis to accommodate approximately five days of production.

Throughout monitoring, should the company find it difficult to contain the volumes expected, a permanent extension of the bunkers would be feasible in their current location. Should this also fail, alternative locations for residue storage would be explored and utilised, subject to planning permission and the operational constraints of the site.

2.5 MONITORING STRATEGY

The following diagram summarises the monitoring strategy.

Figure 2-3: Monitoring Strategy



Residues removed or reused from site are reconciled against actual residues produced; this information is drawn from production records that are maintained on a daily basis through a computerised inventory system that has the ability to track the movements at any given point with the information being live on the system. The close monitoring allows quick and decisive action in stopping any exceeding of the site limit for residue holding.

Each month, removal and reuse of wood residues is tracked against plan. If a discrepancy arises action is taken immediately to rectify any problem identified. Excess storage space can be utilised as a contingency measure. If there is a failure in this plan that exceeds the site storage capacity for residue holding, the EPA is notified immediately.

Site wide residue reports are compiled on a monthly basis and as part of these reports any contingency events and their management is listed in the report.

Annual reviews are carried out as required to ensure adequacy of the management strategy in line with the increases in production volumes. Amendments made during these reviews will be forwarded to the appropriate agencies and bodies.

3. CONCLUSION

The current sawmill produces more wood residues than the previous operation as a direct result of the increased log volumes being processed. Advances in product management and technology for value-adding residues into saleable products as well as use of sawdust in the 15MW boiler, all of the wood residues are beneficially reused.

There are some events outside DWAU's control which may affect the timing of wood residue removal, and when these events occur, contingency plans have been developed to minimise the disruption to ensure compliance with limits as per the commitments made by DWAU.

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