

Waste Management Plan

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1. Introduction

The purpose of the Waste Management Plan is to describe the principles, procedures and management of the waste generated by the Justice Brewing. Justice Brewing has developed this Plan to ensure wastes are reduced, reused and recycled wherever possible.

The Waste Management Plan outlines measures to manage and mitigate waste generation and resource consumption during the operation of the business.

The Plan includes details on the following:

- The types and quantities of waste generated during operation;
- Procedures to collect and dispose of waste;
- Measures that will be implemented to minimise waste generation associated with the development; and
- A program for monitoring the effectiveness of these measures.

The Waste Management Plan is designed to support an ecological based management approach underpinned by adaptive management principles.

Surplus or waste materials arise from either the materials imported to the site or from those generated on the site. Imported materials are those which are brought to the site for inclusion in the operations. Generated materials are those that occur during the daily operations of the site i.e. damaged stock and waste water.

This Plan also considers other aspects to waste management such as waste reduction, segregation of waste, disposal of waste, financial impacts of waste disposal and recording, monitoring, education and reviewing. This Plan outlines the waste management procedures that have been put in place and demonstrate the benefits to the environment, how we can measure the effects and how these procedures and practices are sustainable.

2. Waste Types

The operation of the Justice Brewing will generate a range of wastes, including organic wastes (Spent grain), general waste (e.g. plastic, containers and bags), recyclable items (e.g paper and certain plastics) and obsolete/worn infrastructure (e.g. replacement parts)

- The microbrewery produces waste primarily through the brewing, fermenting and cleaning processes

2.1 Waste Categories

Waste Categories Table 1 provides an overview of the potential wastes, their classification (NWC) and avenues of disposal.

Table 1: Waste types and waste management practices
(National Waste Classification codes)

Waste Type	NWC Code	Waste Origin Code	Description	Storage & Handling	Collection Method
Spent Grain	19 08 11	02 03 01	Organic waste from the mashing process.	Stored in sealed bins and kept in a cool, dry location.	Collected by local farmers
Spent Yeast / Sediment	19 08 12	02 03 01	Leftover yeast slurry from fermentation.	Stored in sealed containers.	Collected by general waste service.
Hop Residue	19 08 13	02 03 01	Spent hops from the brewing process.	Stored in green waste bins.	Collected with organic waste.
Brewing Wastewater	06 04 99	06 04 99	Wastewater from cleaning and washing equipment.	Stored in bunded areas (if needed) or sent to trade waste.	Sydney Water
Packaging Waste	03 01 02	03 01 02	Packaging materials such as glass bottles, cans, and cardboard.	Segregated into designated recycling bins.	Recycled through council's recycling collection service.
General Waste	20 03 01	03 01 02	General waste such as food scraps, office paper, broken items.	Stored in general waste bins.	Collected by general waste service.

Waste materials fall into four categories for management, which include:

- Reuse;
- Recycle;
- Residual wastes; and
- Landfill.

2.1.1 Re-use

If surplus materials can be used in future operations they are classified as materials which can be reused. Materials that can be reused in their present form are surplus to requirements and need to be stored in a storage area and labelled for future reference.

2.1.2 Recycling

If surplus materials cannot be reused in their present form but could be used in a different form, they will be sent to recycling or labelled as future recycling i.e. damaged stock and biofouling may be composted as potential fertilisers.

2.1.3 Residual Waste

Residual waste can come in several forms including:

- Waste that cannot be disposed of due to its category, class or material (e.g. old tyres, metals and contaminated waste). Ways of reusing or disposing of the waste from the site needs to found; and
- Unused machinery, spare parts or discarded parts. All items of this nature will be identified and dated. These items will be assessed quarterly to gauge their importance for potential future use. Once an item is deemed to have little or no future potential to be utilised, it will be either assessed for reuse in another form or disposed of from the site.

Residual waste can be an eyesore, fire hazard and has potential to impact on the environment through leachates. All residual wastes will be identified and new residual wastes will be added to the residual waste catalogue for quarterly review. Residual wastes that are deemed essential or have the potential for future use will be stored in a neat and tidy manner and where possible under cover to avoid or reduce the potential for further corrosion or damage to the product.

2.1.4 Landfill

If the above options cannot be satisfied then the only alternative left is to send the surplus materials to landfill. Under no circumstances will biological (except biofouling) or non-biological waste be dumped into the ocean.

3. Waste Collection & Disposal

Waste collection, segregation and disposal types:

- a) General waste - Local waste contractors (e.g. URM) for general and recyclable waste
- b) Putrescible solid wastes - Passed to farmers for composting/reuse
- c) Waste water - Sydney water for liquid waste associated with brewing and cleaning

3.1 Solid waste management

All recyclable solid wastes to be segregated and recycled. Separate coloured bins will define which type of waste is to be stored.

3.2 Putrescible solid wastes to be composted

- Filtration sludges
- trub/spent grain
- Tank sludges
- Yeast waste
- Fermentation solids
- Grain dusts

3.3 Sanitary, Grey and Black Water Wastes

Waste water will flow into the existing sewer outlets. Monitoring of PH levels and solid sedimentation process will follow the Trade Waste agreement with Sydney water. Inspections to be conducted as per requirements.

3.4 Chemicals

Storage of waste chemicals for cleaning will be held to an absolute minimum. Adequate absorption materials shall be readily available to collect and recover any liquid spillages. Chemical wastes, other than for the brewing process, will be disposed of through an approved waste contractor.

4. Waste Minimisation

Wastes from the Justice Brewing operation have the potential to impact on the environment and the viability of the aquaculture activities. The Waste Management Plan has been developed to manage the risk associated with the potential impacts including minimising waste generation. Justice Brewing will attempt to implement all possible waste minimisation procedures and therefore reduce the amount of waste to be removed from sites. Management, staff, design teams, contractors and suppliers will all be encouraged to look at ways to minimise the amount of waste generated at the work sites.

Category	Waste minimization opportunities
Solid waste reduction	• Buy materials (e.g. cleaning chemicals, additives) in bulk containers where possible. • Use reusable, returnable, refillable or recyclable containers. • Segregate waste streams to enable more efficient disposal. For example separate plastics from cardboard packaging to enable recycling. • Compact waste to reduce disposal volumes and costs. • Divert organic solid wastes such as yeast wastes, trub, grain dusts, spillages from general waste to animal feed, or compost applications
Waste water volume reduction	• Dry sweep spills where possible using brooms, scrubbers and squeegees. This reduces both water use and organic load of the wastewater. • Ensure that storage bins and tanks are not overfilled; • For areas where there is a high risk of a spill occurring have equipment close at hand to divert and collect product spills; • When evaluating different fining agents, select the one that produces the most compact trub for the desired quality improvement. • Install mesh sieves over drainage channels and pits to prevent solid wastes from entering the effluent stream. • Spot mop and clean up spills promptly before they spread over a larger area. • Install shut off valves on hose outlets. This will reduce water wastage as hoses will not run when not required. • Do not clean tanks and vessels by overflowing with water for extended periods. • Repair water leaks in a timely manner. • Eliminate unnecessary production runs. This will reduce cleaning requirements. • Segregate tank solids and incorporate into composting activities. This will reduce solid loading of the liquid effluent stream.
Recovery	• recovery of spent grain for animal feed; • recover CIP chemicals (acids or alkali solutions) for reuse • recover CIP rinses for use in other operations such as neutralisation of wastewater; • improve the wort recovery with membrane filtration techniques; • heat exchange hot waste water streams with incoming water;

4.1 Industry Best Practice

Justice Brewing will follow industry best practice guidelines such as:

- Waste materials will be reduced, reused and recycled where possible;
- All sewage wastes will be disposed of through an approved vessel sewage discharge; and
- Residual materials that cannot be reused or recycled will be disposed of at an approved waste management facility.

Justice Brewing or appointed delegate will be responsible for ensuring the instruction of workers and contractors, implementation and overseeing of the Waste Management Plan during induction processes. The onsite induction relating to waste management will include advice on appropriate separation, handling, recycling, reuse methods to be used by all parties conducting operations onsite where applicable. Regular toolbox meetings may include discussion of waste management issues and updates on how to minimise wastes.

The monitoring of wastes generated will provide an opportunity to review the wastes being generated and ways in which they can be reduced (See Section 5).

4.2 Training

Justice Brewing recognises the need for staff and contractors to be appropriately trained in the tasks that they are to undertake to reduce the chance of wastes being produced.

5. Monitoring

Justice Brewing are committed to minimising the risks associated with the generation of wastes in the operation of the business.

The monitoring of the quantity and types of wastes being generated by the Justice Brewing operations will be recorded in the wastes log book and kept on site at all times so that regular reviews can be undertaken.

All products that are considered to be of a concern in relation to the waste being generated will be replaced, where possible, for products that are less wasteful and/or considered to be environmentally friendly.

All waste storage containers will be inspected monthly to ensure that they are maintained in a condition appropriate for their use and containment of the specific waste.

Skips and/or bins will need to be monitored regularly to ensure that cross contamination doesn't occur. All waste removed from site including products for reuse will also be monitored to ensure no cross contamination.

Justice Brewing will continue to review the type of surplus materials produced and where possible change the site design and operation to minimise products that go to landfill. Recycling or reuse of wastes are a priority.

The Waste Management Plan and its importance will be communicated to the whole team regularly. Business wide updates including improved recycling amounts will be communicated and discussed at management and toolbox meetings.

The Waste Management Plan will be analysed to produce key performance indicators and it will be the individual site manager's responsibility to develop best practice solutions throughout the Justice Brewing operations and monitor them. Results will be recorded in the annual site audit.

Consultation

In the preparation of the Waste Management Plan the following personnel were consulted

- Architect - Watermark Planning
- Professional brewer employed at another brewery
- Plumber and Sydney water relating to TradeWaste