

1. INTRODUCTION

The report has been prepared by Daniel Fiest of Brewxconsulting in conjunction with Justin Fox of The Grain Keeper for Daniel Simpson, Owner / Operator of The Rod N Reel Hotel Woodburn.

The Rod'n'Reel Hotel propose to install and operate a small Microbrewery (500 litre capacity) within the existing Hotel at 99-103 River St, Woodburn.

2. THE PROJECT

2.1 Environmental Setting

The location of the proposed Microbrewery is 99/103 River St, Woodburn the proposed layout for the Brewery is presented as attachment 12 in the associated documents.

The proposal is to install a Two Vessel, Electric Heated 500L Brewing Kit, 5 x 500L Conical Based Stainless Steel Fermenting Vessels, 1 x 1000L Hot Liquor Tank (electric heated), 1 x 800L Cold Liquor Tank, 1 x Semi-Auto, 1 Head Keg Washer, & Glycol Chilling System (for temperature control of fermentation and cold liquor tanks)

The Hotel and land at 99-103 River St Woodburn is zoned RU5 Village within the Richmond Valley Local Environmental Plan 2012.

This assessment has been based upon a capacity and expected throughput of 500 litres per week. This has been determined by the anticipated demand for the product through the adjoining hotel and the throughput capacity of the installed equipment (principally the volume of the fermentation vessel). Any throughput above 500 liters per week would not be achievable until demand is sufficient to warrant additional production. Any additional production is limited to a Brew cycle of 3 times per fortnight.

The throughput of 500 litres per week is considered to be beneficial to the Development Approval process, as it would allow a period of process settling-in, and demonstration that the microbrewery is capable of being operated and managed so as not to give rise to unreasonable odour emissions.

2.2 The Process

The brewing process typically involves a number of stages or processes, including the following:

- Raw materials storage and handling
- Grain cracking and milling
- Grain mashing
- Boiling
- Fermentation
- Conditioning and maturation;
- Filtration, keggling / bottling
- Waste water and solid waste management

Whilst the beer brewing process is relatively standardised, there are some variations between brewing processes in the composition of the grain bill, mashing and boiling temperature and duration, depending upon the brewing style and the type of product intended.

2.3 Sources of Odour and Control

Primary Sources of Odour

- *Vapours produced from the Brew Kettle during the Wort Boiling Process*

Typically, the most significant potential source of odour from brewery operations is the evaporation of volatile organic compounds derived from wort boiling, also producing a small quantity of steam.

Wort boiling occurs for 1 hour during each Brew Cycle. The proposed operation will Brew initially once per week with a maximum capacity of 3 times per fortnight. This means the potential for Primary sources of Odour exist at maximum capacity for 3 hours per fortnight.

Quantities of steam per batch will be in the order of 25 Litres (500 Litres x 5% Evaporation = 25 Litres of water). Wort boiling occurs in brew kettles, during which the boil vapour may be discharged via stack emissions to atmosphere or condensed, cooled and disposed of as a liquid effluent.

The location of the Brewing equipment, namely the whirlpool / kettle is within the confines of the Hotel Building and is unlikely to have any impact at all outside of the building.

Additionally For this project, as part of the brewery design and management of emissions during this process, **the brewing kettle will have a vapour condenser installed to liquify the steam to water.** The working principle being that **no odour** is emitted as a result of the steam vapour volatiles condensing and being captured within the brewery wastewater system. In addition, the odour from wort boiling is typically not considered to be noxious and is generally described as exhibiting a bread-like odour.

- *Waste Water Treatment*

Wastewater collection, handling, treatment, and discharge may potentially be a significant source of odour at breweries. The design of the waste water treatment system will facilitate the control and reduction of odour. The treatment tank will be equipped with pH control via caustic dosing which is proven in odour reduction. Tank contents will be recirculated to main ensure consistent oxygenation of the contents and prevent anaerobic processes. The system will ensure that water is treated and discharged to sewer as promptly as possible (i.e. daily procedure) to prevent excessive residence time. The drains will be maintained appropriately and in accordance with the requirements of council policy and the discharge point will be controlled and direct, thus eliminating any potential for surface water pooling or run-off.

Secondary Sources of Odour

- *Storage and Handling of Co-Products and By-Products*

The secondary odour sources detailed below and have the potential to contribute to odour effects, but not to the same extent as those deemed primary sources of odour. The brewing process will generate a variety of co-products and by-products. A range of co-products will be generated that will include brewer's grain and surplus yeast, packaging materials and general solid wastes, which may include:

- Malt and adjuncts
- Grains
- Carbon Dioxide
- Yeast
- Waste products including: i) Plastic Containers ii) Cardboard iii) Paper

All raw materials will be stored in appropriate and suitable storage drums / containers, and spilled materials will be contained and cleaned up immediately.

In terms of waste materials, recyclable materials (including plastics, glass, paper etc.) will be separated from the waste stream for recycling. Some co-products and by-products may be re-used directly, including waste malt, brewer's grain and surplus yeast which will be utilised as animal feed for local farmers.

The handling and storage of raw materials, co products and by-products will be performed in accordance with the relevant council policy(s) and waste materials will be appropriately managed by an appropriate commercial

waste contractor. If implemented and operated appropriately, the impact magnitude would be reduced from slight to negligible.

Sources Not Considered Odorous

The following air emissions sources are not considered as significant odour sources at most breweries, including this Brewery Project

- Handling and storage of dry grains and brewing raw materials
- Fermentation Vessels
- Chillers and refrigeration equipment

Odour Management

Whilst it is acknowledged that if managed correctly the potential sources of odour from the proposed brewing Operation are negligible. It is recommended that the Rod N Reel operate an odour complaints procedure which will, as a minimum, record the number and details of complaints received regarding the environmental impacts and any action taken in response to the complaint. The odour complaint procedure and associated complaint forms will be maintained in a proper fashion by the Hotel and will be made available for inspection by Council upon request. An example odour complaint record form is provided in **Appendix A**.

Appendix A: Odour Complaint Form

Contact details			
Date and time complaint received:			
Name & address of complainant:			
Telephone number of complainant:			
Complaint details			
Odour start date & time:	/ /	:	am pm
Odour stop date & time:	/ /	:	am pm
Location of the odour:			
Description of the odour:			
Persistence: <i>see note 1</i>	<input type="checkbox"/> Constant <input type="checkbox"/> Intermittent		
Intensity: <i>see note 2</i>	<input type="checkbox"/> 6 Extremely strong <input type="checkbox"/> 5 Very strong	<input type="checkbox"/> 4 Strong <input type="checkbox"/> 3 Distinct	<input type="checkbox"/> Weak <input type="checkbox"/> Very weak
<input type="checkbox"/> generally <input type="checkbox"/> at its worst			
Prevailing weather conditions at the time of the complaint			
Description: (dry, rain, windy, still etc)			
Temperature:			
Wind direction:	<i>see note 3</i>		
Wind strength:	<i>see note 4</i>		
Operational details, actions and resolution			
Operations during odour complaint:	<input type="checkbox"/> Operating <input type="checkbox"/> Not operating		
Identified causes:			
Actions taken:			
Cause resolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Follow up required:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Complainant informed of outcome:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Signed:			
Date:	/ /		