

Memorandum



Date: 29 July 2019
To: Greater Wellington Regional Council
From: Rhys Kevern
Subject: Air Discharge Permit Application Summary

1 Introduction

NCI Packaging (NZ) Limited (NCI) currently operate a metal packaging (tinplate and aluminium Cans) manufacturing factory at 62-66 Montgomery Crescent, Clouston Park in Upper Hutt. The discharges to air are authorised by discharge permit number WGN110219 issued by the Greater Wellington Regional Council (GWRC) which expires on 2 August 2019. As the application was applied for 6 months prior to expiry the current consent continues in place until a new consent is granted. The air discharge permit relates predominantly to the production and coating of aluminium aerosol Cans. The site is zoned "Business Industrial Area" in the Operative City of Upper Hutt District Plan (UHDP).

2 Processes

There are three main operations carried out at the NCI plant. These are:

- Drawing Aluminium Cans
- Printing and Lacquer Application
- Forming Steel Paint Cans

The main discharges to air come from the printing and lacquer application processes, which are discussed in detail in the following sections. Figure 1 shows the process flow diagram of the NCI plant.

2.1 Drawing Aluminium Cans

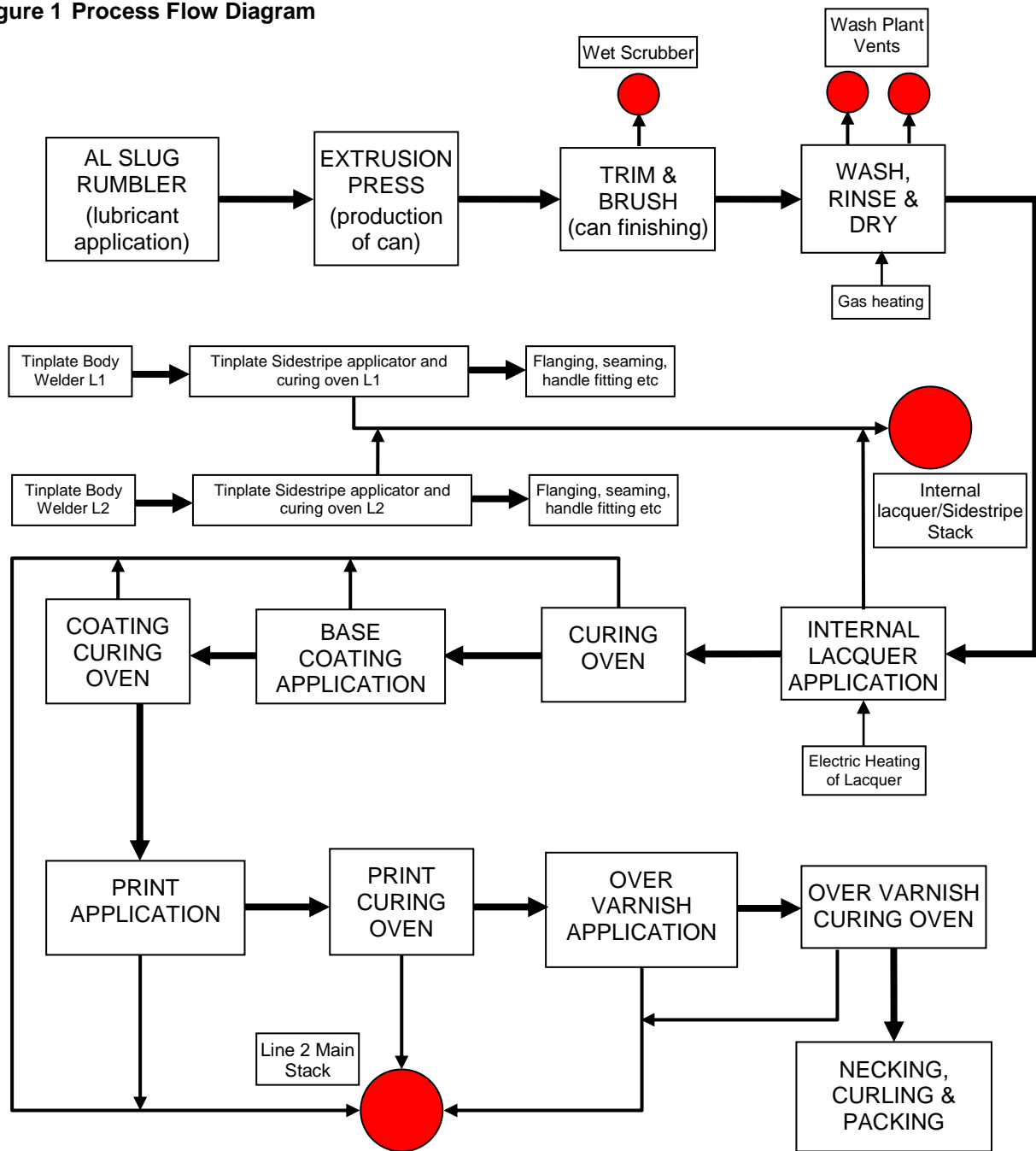
The process of manufacturing aluminium cans consists of striking a lubricated disc of aluminium with enough force to plasticise it whereby the aluminium is forced up the sides of a die to produce a one ended cylinder (tube). The top edge of the can is trimmed, and for some products the sides are brushed to create a distinct texture. A wet scrubber is used to collect aluminium dust from the brushing operation. To allow the coatings to be applied in later stages, the drawing lubricant is washed off in the Wash Plant and the Can dried. The washing plant is heated by a natural gas fired burner and there is a separate stack for discharging water vapour.

2.2 Printing and Lacquer Application

The dried aluminium cans are sprayed with an internal coating of solvent based lacquer to protect the metal from the intended material to be stored in the can. Following this, a solvent based external basecoat, print and external lacquer is applied by rollers. At each stage the coatings are dried in an oven prior to the next coat.

Previously NCI had two coating and printing lines however now only Line 2 is used. Line 2 internal lacquer emissions, and emissions from the tinplate sidestripe ovens, are discharged from the main ventilation stack of the previous Line 1 aluminium aerosol line which is fully decommissioned. The Line 1 main stack (450 mm dia., 325 mm exit dia.) extends 25 metres above floor level. One main extraction fan and ducting system collects the emissions from the curing ovens and coating and lacquering processes of Line 2. These are discharged via a 450 mm diameter flue (325 mm exit dia) which also terminates at 25 m above ground level. Line two only uses electricity to heat and maintain the temperature of the ovens.

Figure 1 Process Flow Diagram



2.3 Forming Steel Paint Cans

There are two tinplate assembly lines one for 1 & 2 L Cans and one for 4 & 5 L Cans. A Can is made up of coated tin plated steel sheet metal formed into a cylinder and welded. A circular End is double seamed onto one end of the cylinder and either a Top or Ring is double seamed on the other end.

Just after the body of the Can (cylinder) is formed a solvent based resin (acrylic with a small amount of epoxy) is sprayed on the inside of the weld area. This lacquer is dried/cured using a gas fired curing oven which discharges through the old L1 AAe Main stack as mentioned already.

3 Discharges to Air

There are three main potential emissions from the site:

- Volatile Organic Compounds (VOC) (mainly solvents);
- Odour associated with the VOC; and
- Products of Combustion (considered to be minor and not assessed further)

4 Modelling Results

Air dispersion modelling was undertaken using the Calpuff model. The predicted 99.9%ile 1 hour average and maximum predicted annual average concentrations of the VOCs were all less than 5% of the relevant ambient air quality criteria and are considered to be less than minor.

The highest predicted 99.5%ile 1 hour average odour concentrations of odour have been estimated for both the industrial and residential zoning for comparison against the relevant Ministry for the Environment (MfE) guideline values. The highest predicted ground level concentrations for odour are well within the MfE guideline of 10 OU/m³ for industrial areas (3.8 OU/m³).

The MfE guideline for residential property is exceeded to the north of the NCI site, specifically at the Mountbatten Grove cul-de-sac 2.6 OU/m³ compared to the guideline of (2.0 OU/m³). The area of exceedance is relatively small however and is restricted to an area of around 10 metres beyond the boundary to the residential zone. An isopleth diagram of the odour modelling results is provided as Figure 2 below, with the highest predicted MGLCs in the industrial and residential areas indicated.

5 Fugitive Emissions

Although the majority of VOC are captured through process ventilation and dispersed at around 25 m above ground level, there is a low concentration of VOC inside the factory. During the warmer periods of the year some doors or windows may be open for ventilation. An ambient monitoring exercise has been undertaken at the site around machinery that uses materials with a VOC content mainly for hazardous substance compliance related to flammability.

The ambient VOC concentration within the whole building will be less than the specific measurements around the equipment (which are already low ~20 – 40 ppm) due to dilution through the building volume.

6 Meteorology and Odour Complaints

6.1 Meteorology

NCI operates a 10 m meteorological monitoring mast in the field beside the main plant building which collects wind direction and velocity data from an ultrasonic anemometer on a 1 minute average basis. The data is collected by "Harvest" and viewable via an internet site.

6.2 Complaints

The land-use to the northwest of the site along Mountbatten Grove is more sensitive being residential. Two residences at the lower end of Mountbatten Grove have detected odour at their site on occasion which they consider to be from NCI. Wind directions between about 150° and 200° cover directions that would potentially line up NCI with Mountbatten Grove, see Figure 2. There are however other sources of solvents in the area such as Wedgelock who spray paint heavy machinery and Resene who manufacture industrial and automotive paints.

Figure 2 Local Wind Directions



Table 1 Amount of Time the Wind was Blowing Towards Mountbatten Grove and NCI Could be Operating

Month	Minutes (2016)	Hours (2016)	Minutes (2017)	Hours (2017)	Minutes (2018)	Hours (2018)
January	1,827	30.5	805	13.4	1,693	28.2
February	831	13.9	900	15.0	1,485	24.8
March	1,809	30.2	2,398	40.0	2,888	48.1
April	1,349	22.5	1,557	26.0	1,006	16.8
May	888	14.8	2,017	33.6	1,006	16.8
June	1,621	27.0	1,689	28.2	2,610	43.5
July	1,321	22.0	2,157	36.0	1,822	30.4
August	2,382	39.7	2,585	43.1	2,467	41.1
September	2,993	49.9	1,279	21.3	3,701	61.7
October	1,461	24.4	1,709	28.5	1,493	24.9
November	742	12.4	2,283	38.1	2,151	35.9
December	747	12.5	1,636	27.3	1,901	31.7
Total	17,971	299.5	21,015	350.3	24,223	403.7

Over the last three years there have been between ~300 - 400 hours throughout the year that air emissions from NCI could reach Mountbatten Grove. Compliant details are typically of a short term 10 – 15 min odour whereas there is over 750 minutes every month to over 3,000 minutes for some months that emissions are in the direction of Mountbatten Grove. NCI has visited Mountbatten Grove on many occasions and not

detected a strong odour ever and typically there is either no odour or it is very weak. Using the FIDOL¹ odour assessment, regardless of where the alleged odour comes from, the frequency, duration and intensity are all low and therefore the odour is not offensive.

There were 4 notifications of odour from Mountbatten Grove in 2016, 12 in 2017 and 4 in 2018. There is a lot of time that wind directions are from NCI towards Mountbatten Grove and there are no odour concerns highlighted. The aerosol manufacture process is continuous once started as split shifts are used to cover breaks.

7 Conclusion

NCI Packaging Limited operates a Can manufacturing plant in Montgomery Crescent, Upper Hutt, Wellington and are required to apply for a replacement air discharge permit as the current permit will expire in 2 August 2019.

The emissions are mainly solvent based volatile organic compounds which have an associated odour and minor seasonal combustion emissions. A modelling assessment has been undertaken which shows VOC emissions comply with national or international guidelines due to the low emission rates and therefore off-site effects are not expected. The odour modelling results show a minor exceedence of the 95%ile 1 hour average however if the predicted odour level was a concern it should be present in the Mountbatten Grove area for around 1,000 minutes every month and this does not appear to be the case. It is requested that the permit be granted for a minimum of 20 years. The Council also has the option of reviews in the permit, which allows for any issues that may arise to be dealt with at a later stage. NCI's proposed consent conditions changes are attached in Appendix A of the full Assessment of Environmental Effects.

¹ FIDOL = an odour assessment criteria related to the frequency, intensity, duration, offensiveness and location.