

29 August 2022
Job No: 1012540.1000

Bay Of Plenty Regional Council
PO Box 364
Whakatane 3158

Attention: Jacob Steens

Dear Jacob

Alpine Export Discharges to Air - Review of Updated Air Quality Effects Assessment Information

1 Introduction

This document sets out the findings of a technical review of updated air quality effects assessment information submitted in relation to resource consent application RM19-0557 conducted for the Bay of Plenty Regional Council (BOPRC) by Tonkin & Taylor Ltd (T+T) ¹.

Alpine Export NZ Ltd (AENZL) lodged application RM19-0557 for resource consent for discharges to air from its pet food manufacturing operation located at 32B Koromiko Street, Judea, Tauranga in 2019. T+T reviewed the adequacy of information submitted with the 2019 application on behalf of BOPRC and recommended that further information be supplied to understand the effects of the emissions to air on the environment ("2019 Review")².

AENZL has subsequently modified the operation and engaged Pattle Delamore Partners Limited (PDP) to prepare an updated Assessment of Environmental Effects (AEE) report and an updated air quality effects assessment for the resource consent application. The updated assessment information was provided to BOPRC in March and June 2022.

The scope of this document is to describe our review of the completeness of the air quality effects assessment information provided in the updated application documents lodged in 2022. The updated application documents we have reviewed are as follows:

- "Assessment of Environmental Effects – Air Discharges, Alpine Export NZ Ltd", prepared by PDP for AENZL, dated March 2022 ("PDP AEE").
- "Alpine Export NZ – Air Discharge Assessment", prepared by PDP for AENZL, dated March 2022 ("PDP Air Assessment").
- "Draft Odour Management Plan", prepared by PDP for AENZL, dated June 2022 ("Draft OMP").
- "Alpine Export Odour Survey Analysis", letter report prepared by PDP for AENZL, dated 2 June 2022 ("Odour Survey Analysis").

¹ In accordance with purchase order PUR028799, as a variation to our initial letter of engagement dated 17/08/2020.

² T+T. 2019. "Review of Alpine Export NZ Ltd Air Quality Assessment".

The methodology of assessment is reviewed in section 2, details of the assessment are reviewed in section 3 and further information we recommend be requested from the applicant is set out in section 4.

2 Review of assessment method

As with our 2019 Review, we have compared the assessment methodology of the PDP Air Assessment against the recommendations or tools/techniques available for the assessment of existing activities published in the Ministry for the Environment (MfE) Good Practice Guide for Assessing and Managing Odour³ (Odour GPG) in Table 1.

Table 1: Consideration of MfE guidance on selection of odour assessment tools

Assessment tool	Relevance in relation to this assessment
Community consultation	The assessment has considered feedback in the form of complaints and a community odour annoyance survey (discussed in this table below).
Complaints record	A reasonably comprehensive analysis of the odour complaints received from 1 January 2021 to 15 March 2022 is provided in section 5.0 of the PDP Air Assessment. This follows on from a less comprehensive review of complaints in 2019 in the previous AECOM Assessment. Incidences of offensive/objectionable odour confirmed during investigations by BOPRC officers were confirmed on 12 dates over this period and are discussed in section 5.2 of the PDP Air Assessment. Comments on the analysis are provided in section 3.4 below.
Industry/council experience	BOPRC's confirmation of offensive or objectionable odour from the operation on multiple occasions in recent years is acknowledged in section 5.2 of the PDP Air Assessment. Further incidences of offensive or objectionable odour have been confirmed since the updated application information was submitted.
Meteorology and terrain assessment	Analysis of wind observation data from Tauranga Airport approximately 5 km to the northeast of the site is provided in section 2.4 of the PDP Air Assessment. Comments on the meteorological analysis are provided in section 3.2.2. The topography of the area is briefly discussed in section 6.2 of the PDP AEE. The potential for impingement of stack emission plumes from the site on higher adjacent terrain is acknowledged in the Location consideration of the FIDOL assessment provided in section 8.1 of the PDP Air Assessment.
Odour annoyance survey	An odour annoyance survey has been conducted via in person interviews, the results of which are described in the Odour Survey Analysis.
Review emission control system(s)	Upgrades to the emission control system have been detailed in the application though as noted in section 3.2.2 below, further detail of the ozone treatment system and its efficacy in treating the odour generated from the process is required.
Odour diaries and weather monitoring	An odour diary programme has not been implemented in the area. Direct community feedback has instead been considered in the form of a community odour annoyance survey.

³MfE. 2016 "Good Practice Guide for Assessing and Managing Odour". Table A2.1 of Appendix 2.

Assessment tool	Relevance in relation to this assessment
Review of odour management plan and contingency procedures, risk assessment	An updated odour management plan has been provided with the updated assessment information. This includes a Failure Mode and Effects Assessment (FMEA) manual prepared by AENZL, which provides additional detail of how plant and equipment will be operated and monitored.
Olfactometry and modelling of odour sources	Olfactometry and modelling of odour sources has not been used in PDP Air Assessment. As indicated in the MfE Odour GPG, use of this method for assessment of existing discharges is of a low priority.
Other tools not discussed in the MfE GPG recommendations	
Odour observations	The PDP Air Assessment describes a programme of observations has been carried out by PDP and AENZL.

Overall, a reasonably comprehensive methodology has been employed to assess the odour impacts of emissions from the operation. Details of the assessment are reviewed in section 3.

3 Review of assessment details

3.1 Activity description

3.1.1 Production rates/capacity

The scale of the pet food production activity is likely to influence the scale of associated emissions to air.

The number of air-drying ovens operated at the site does not appear to be stated in the PDP AEE or Air Assessment. The 2019 AECOM Air Assessment submitted with the initial application indicated that there were seven ovens at the time with a potential addition of two further ovens in future. The number of ovens currently operated (and potential operated over the duration of consent sought (25 years) should be confirmed.

The PDP AEE states that the existing operation has capacity to produce 30 tonnes per day of pet food products. Any increase in this production rate anticipated to occur over the duration of consent sought should also be stated and assessed.

We recommend that the following further information be requested:

- The number of air-drying ovens currently operated at the site and proposed to be operated over the consent duration sought in the application.
- Whether the current pet food production capacity of 30 tonnes per day is anticipated to increase over the consent duration sought in the application.
- If any increases in ovens or production capacity are proposed over the proposed duration of consent, an assessment in any associated changes to the nature and scale of the emissions and effects on air quality will be required.

3.1.2 Meteorological monitoring station

Reference is made in the PDP Air Assessment to installation of an on-site weather station, which in principle should provide useful information for on-going monitoring and management of potential odour impacts. The following details would aid understanding of how effective the station is for this purpose:

- The type, make and model of the wind instrument(s).
- Location of the weather station and height of the monitoring instruments above ground level.

- Summary of buildings, structures and other obstructions within a distance of ten times the height of the instruments.
- Photographs of the monitoring instruments and surrounds.
- The date that logging of data is due to be implemented.
- If logging has already been implemented a comparison of available wind speed and direction data with corresponding data from the Tauranga Airport weather station.

3.2 Receiving environment/environmental setting

3.2.1 Sensitive receptors

Sensitive receptors within 1 km of the site are listed in section 2.5 of the PDP Air Assessment.

However, the listed receptors do not include activities within the adjacent Judea industrial area. The Argos Gymnastic Club appears to be located on an adjoining property at 34 Koromiko St. Gymnasiums are included in the sensitive area definition in Proposed Plan Change 13 (Air Quality) to the Regional Natural Resources Plan. Other religious and educational activities also appear to be located within the adjacent Judea industrial area.

The following information is required to understand the sensitivity of the receiving environment of the discharges to air:

- Confirmation of any activities meeting the sensitive area definition of the Proposed Plan Change 13 (Air Quality) within adjacent areas of the Judea industrial area.

3.2.2 Meteorological analysis

Analysis of wind observation data from Tauranga Airport approximately 5 km to the northeast of the site is provided in section 2.4 of the PDP Air Assessment. As discussed in our 2019 Review, wind measurements from the airport may misrepresent wind speeds in the area of the site but should broadly represent overlying, regional wind directions.

Local wind conditions are likely to be influenced by the following (and may differ from overlying regional wind flows as a result):

- the reasonably steep rise in terrain to the east of the site as illustrated in Figure 1;
- the increased surface roughness in the area surrounding the discharge created by buildings in the Judea industrial area and vegetation on the opposite side of State Highway 2 to the east; and
- the orientation of the site in relation to the tidal estuaries that make up Tauranga Harbour.

As a result, local wind conditions are likely to differ from those observed at Tauranga Airport to some degree.



Figure 1: 0.5 m terrain contours in the vicinity of the Application Site (Source: BOPRC)

BOPRC operates an air quality monitoring site at Otumoetai School, approximately 2.3 km to the northwest of the site. Wind speed and direction are measured at a height of 6 m at this site. In order to provide further understanding of local wind conditions, the following information is recommended to be provided:

- A comparison of frequency of wind speed and direction measured at the BOPRC Otumoetai air quality monitoring site with corresponding data from Tauranga Airport.
- A consideration of whether wind data from the Otumoetai site or another weather station may better reflect local wind conditions for the purposes of complaint analysis than data from Tauranga Airport.

3.3 Odour mitigation measures

3.3.1 Control of stack odour emissions

A number of improvements to the ozone treatment system that have been implemented since lodgement of the application in 2019 are noted in the application. The effectiveness of the system in reducing odour emissions should in theory be improved by improving the rate of ozone dosing and increasing the contact time.

However, the following details that are relevant to understanding the effectiveness of the system are still unclear:

- The dosing rate of ozone to each oven exhaust (or alternatively the theoretical ozone concentration in the exhaust flow at the point of dosing).
- The residence/contact/dwell time of exposure of the exhaust stream to ozone prior to discharge.
- Whether the above parameters are sufficient to oxidise the odorous components of the exhaust stream to minimise the potential for off-site nuisance effects.
- How ozone dosing and the extent of oxidation of odorants is monitored on an ongoing basis.

Guidance on odour management published by the Environmental Protection Agency of Ireland⁴ states the following in relation to ozone odour treatment of exhaust air streams:

Volatile fatty acids and ammonia concentrations are not affected by ozonation to any great degree.

Ammonia and volatile fatty acids may be generated from degradation of meat and fish materials and if these contaminants are present in the oven exhaust, the Irish EPA guidance indicates they may not be effectively treated.

The following information would aid understanding of the effectiveness of this type of control for the manufacturing process exhaust discharge:

- Odorants likely to be present in the exhaust stream and whether there are odorants that are not pre-disposed to ozone oxidation.

In our 2019 Review of the previous application prepared by AECOM for the Applicant, we recommended that the following information be provided:

Further information to support the efficacy of ozone treatment as a means of controlling odour from this type of process including research papers referred to in the AENZL Memo or odour emission measurements and comparison of measured systems with the system employed.

Specifically, the memorandum stated the following:

One consultant claimed dwell time should be 10 seconds, but this statement does not appear to be supported by any of the research papers that we have reviewed

Copies of the research papers referred to by the Applicant in the memorandum should be requested again.

3.4 Complaint and compliance record

The complaint record from 1 January 2021 to 15 March 2022 has been analysed in section 5.0 of the PDP Air Assessment. The analysis concludes that "*complaints dramatically dropped off in February 2022 when the upgrades to the O₃ system were fully commissioned and functioning*" and that "*the analysis shows that the upgrades are working*".

However, since March 2022, a number of complaints have been received. The numbers of complaints received from March to June 2022 are as follows:

Month	Complaints
March 2022	7
April 2022	22
May 2022	29
June 2022	20

BOPRC officers have also confirmed further instances of offensive or objectionable odour from the site during investigation of complaints on 24 March 2022, 10 May 2022 and 9 June 2022.

In light of the increases in recent complaints and confirmed incidences of offensive or objectionable odour, we recommend the following information be requested:

⁴ Environmental Protection Agency of Ireland, Office of Environmental Enforcement. 2019. "Odour Emissions Guidance Note (Air Guidance Note AG9)"

- Any change to the analysis and conclusions of section 5.0 of the PDP Air Assessment that would result from the subsequent increase in complaints and confirmed offensive or objectionable odour.
- Details of the causes of the offensive or objectionable odour incidences on 24 March 2022, 10 May 2022 and 9 June 2022 and how similar incidents will be avoided over the duration of the consent.

4 Recommendations for provision of further application information

To aid the understanding of the emissions and their potential effects the following information is recommended to be requested from the applicant:

Production rates/capacity

- 1 The number of air-drying ovens currently operated at the site and proposed to be operated over the consent duration sought in the application.
- 2 Whether the pet food production capacity is anticipated to increase
- 3 If any increases in ovens or production capacity are proposed over the proposed duration of consent, an assessment in any associated changes to the nature and scale of the emissions and effects on air quality will be required.

On-site meteorological monitoring station

- 4 The type, make and model of the installed wind monitoring instrument(s).
- 5 Location of the weather station and height of the monitoring instruments above ground level.
- 6 Summary of buildings, structures and other obstructions within a distance of ten times the height of the instruments.
- 7 Photographs of the monitoring instruments and surrounds
- 8 Date that logging of data is due to be implemented.
- 9 If logging has already been implemented a comparison of available wind speed and direction data with corresponding data from the Tauranga Airport weather station.

Sensitive receptors

- 10 Confirmation of any activities meeting the sensitive area definition of the Proposed Plan Change 13 (Air Quality) within adjacent areas of the Judea industrial area.

Meteorological analysis

- 11 A comparison of frequency of wind speed and direction measured at the BOPRC Otumoetai air quality monitoring site with corresponding data from Tauranga Airport.
- 12 A consideration of whether wind data from the Otumoetai site or another weather station may better reflect local wind conditions for the purposes of complaint analysis than data from Tauranga Airport.

Odour mitigation measures

- 13 The dosing rate of ozone to each oven exhaust (or alternatively the theoretical ozone concentration in the exhaust flow at the point of dosing).
- 14 The residence/contact/dwell time of exposure of the exhaust stream to ozone prior to discharge.
- 15 Whether the above parameters are sufficient to oxidise the odorous components of the exhaust stream to minimise the potential for off-site nuisance effects.

- 16 How ozone dosing and the extent of oxidation of odorants is monitored on an ongoing basis (including monitored parameters and control set points or expected ranges for the parameters). Where proxy indicator parameters are used to monitor oxidation, the relationship between the indicator parameter and ozone dosing or the extent of oxidation should be provided.
- 17 Odorants likely to be present in the exhaust stream and whether there are odorants that are not pre-disposed to ozone oxidation.
- 18 Copies of the research papers referred to in the memorandum from Ron Russell, AENZL, entitled "*Review of options available for increasing OZONE dwell time & OZONE concentration*", dated 26 September 2019.

Complaint and compliance record

- 19 Any change to the conclusions of section 5.0 of the PDP Air Assessment in light of the subsequent increase in complaints and confirmed offensive or objectionable odour.
- 20 Details of the causes of the offensive or objectionable odour incidences on 24 March 2022, 10 May 2022 and 9 June 2022 and how similar incidents will be avoided over the duration of the consent.

5 Applicability

This report has been prepared for the exclusive use of our client Bay Of Plenty Regional Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that this report will be used by Bay of Plenty Regional Council in undertaking its regulatory functions in connection with resource consent application RM19-0557.

Tonkin & Taylor Ltd

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:

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