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Dear Michelle

RESENE PAINTS LIMITED RESOURCE CONSENT VARIATION APPLICATION - DISCHARGE TO AIR: TECHNICAL REVIEW OF ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

1.0 Background

Resene Paints Limited (Resene) has applied to vary the one of the conditions of the Company's existing discharge to air permit (GWRC consent number WGN160337). Resene operates a solvent paint manufacturing plant located at the corner of Fergusson Drive and Montgomery Crescent, Upper Hutt. These processes result in the discharge of volatile organic compounds (VOCs), particulate (PM_{10}) and odour to air. Emission testing has shown that the concentration of VOCs discharged from the site is higher than allowed for by condition 15 of the consent. Resene is therefore seeking a variation to condition 15 to allow an increase in the discharge limit of VOCs. This increase will represent an almost ten-fold increase to the consented limit. The Greater Wellington Regional Council (GWRC) has engaged Pattle Delamore Partners Limited (PDP) to undertake a technical review of the assessment of environment effects submitted as part of Resene's application to vary the resource consent under Section 127 of the Resource Management Act.

Resene submitted the AEE[1] to GWRC in August 2019. In Stage 1 of the review PDP considered if the information provided by Resene was complete, robust and adequate to support the AEE. The following specific issues were addressed in PDP's review:

- Matters identified in pre-application consultation;
- Contaminant monitoring;
- Dispersion modelling and the assumptions/inputs used in the model;
- Odour assessment approach; and
- AEE conclusions.

Following the Stage 1 review of the AEE and modelling reports, PDP issued GWRC a memorandum that detailed further information (as per section 92(1) of the Act (RMA)) required to allow PDP to complete

[1] Resource Consent Variation Application and Assessment of Effect on the Environment, Resene Paints Limited. Brent Kennedy, Industrial Compliance Solutions Limited. July 2019.

Stage 2 of the AEE review (See Section 2.0 below). In response to the RFI Resene provided a letter[2] which contained answers to the questions posed, emission monitoring reports, CALPUFF input files and clarified their methodology for calculating emission rates.

2.0 Scope of Technical Review

GWRC defined the scope of Stage 2 – Technical review of the AEE as reviewing the technical aspects of the application, including any further information that relates to the AEE of a discharge of contaminants to air. GWRC noted that matters of particular relevance included potential human health effects, odour generation and effects, use of particular assessment tools, methods, techniques and assumptions (including dispersion modelling; odour-assessment; mitigation and monitoring) and the relevant legislative requirements (including NESAQ) and guidelines.

Specially GWRC sought PDP's opinion on the following issues:

- Is the receiving environment described accurately and in sufficient detail?
- Is the process described accurately and in sufficient detail?
- Has the proposed change to the discharge been accurately described and robustly quantified?
- Is the list of contaminants discharged complete and is the estimation of discharge rate accurate?
- Is the method of discharge described accurately and in sufficient detail?
- Are the potential impacts of the contaminants described accurately and in sufficient detail?
- Is the assessment method used appropriate for the scale and significance of the potential impacts of the discharge and the receiving environment?
- Does the type and quality of data used for the assessment match the potential scale and significance of the potential impacts?
- Is the Air Quality Assessment Criteria used appropriate for the activity and receiving environment?
- Have the cumulative effects of the discharge of contaminants to air have been adequately assessed?
- Are the assessment's conclusions robust and accurate?
- Is the discharge likely to have effects beyond the site boundary that are either minor or more than minor?
- Is the current mitigation adequate and will it minimise the effects associated with the proposed increase in VOC discharges?
- Is there additional monitoring that should be undertaken as a result of the application?
- Comment on the suitability of the proposed changes to the conditions and recommendations for additional conditions (if required).

This letter presents the outcomes of PDP's technical peer review of the assessment of environment effects.

[2] Resene Application for Variation of Discharge to Air Consent: Response to Section 92 Request, Resene Paints Limited. Brent Kennedy, Industrial Compliance Solutions Limited. November 2019.

3.0 Description of the Process and Emission of Contaminants

The applicant has identified three key steps to their process:

- Raw material batching, where materials are collected from warehouses.
- Paint mixing, where raw materials are combined to produce the product; and
- Packaging of the final product.

The applicant identified the key contaminants produced during paint production to be PM_{10} and volatile organic components (VOC's). Subsequent to being requested to in the S92 request, the applicant has included an additional assessment of the effects resulting from the discharge of odour.

The facility includes active and passive ventilation. The passive ventilation (roof vents) provide thermal control on the building. The active ventilation extracts fumes from key, such as raw material preparation areas, mixing vats, and packaging stations. The extracted air, containing odorous compounds, VOCs and dust (including PM_{10}) are directed to a cartridge filter, before being discharged up a 12m high stack. The cartridge filter has an estimated removal efficiency for particulate of >95%.

Resene have used emission testing results from Source Testing New Zealand[3] to identify the key VOCs present in the discharge. This testing provides good quality contaminant and exhaust flow information during product manufacture. The emission and exhaust flow data were then used to configure the dispersion model used for the assessment. The screening testing from 2014 was used to identify the proportional composition of various VOCs in the discharge. The more recent testing (2017-2019) which only reported total VOC was used to identify the total VOC concentration of the discharge. This is a good approach, with a transparent and logical technical basis.

In summary, the applicant has provided a comprehensive and robust description of the processes undertaken and the type and amounts of contaminants discharged into air from the site.

4.0 Description and Sensitivity of the Receiving Environment

The applicant describes the land use categories (commercial, industrial, rural, residential and recreational) in Section 2.2 of the AEE and notes that the land-use to the north (across the road) is more sensitive being residential. PDP agree that the receiving environment is of moderate (industrial area) to high (residential area) sensitivity to the discharge of contaminants discharged from the plant. The occurrence of a number of odour complaints in the area (see Section 6.0) may indicate an elevated sensitivity to odour in the existing community.

5.0 Method Used to Assess the Effects of the Discharge

The applicant used dispersion modelling to assess the ground level concentrations (GLCs) of VOCs, PM_{10} and odour discharged from the manufacturing processes. The dispersion model chosen for the project (CALPUFF) and the applicant's configuration and running of the model matches PDPs expectations of accepted good practice. The data used to configure the model for emissions from the manufacturing processes was sourced from the stack testing programme and is considered good quality by PDP.

PDP's review confirms the applicant has compared the modelled GLCs of PM_{10} and VOCs against the correct assessment criteria sourced from New Zealand's air quality standards, guidelines and relevant good practice guidance. The assessment criteria used for the VOCs were sourced from overseas regulatory

[3] Air Discharge Monitoring of the Factory Extraction System, January 2019, Source Testing New Zealand, March 2019

bodies. PDP concurs with this approach and the hierarchy of sources used by the applicant to identify relevant assessment criteria.

The GLCs of modelled odorous compounds were individually compared to screening levels[4] for odorous effects. This approach does not consider the cumulative effect of all the odorous compounds in the discharge, and likely does not consider every odorous compound in the discharge. A common approach in New Zealand when assessing odour is to establish the stack discharge concentration of odorous compounds in terms of an odour unit (identified experimentally). This would allow the cumulative effect of all odorous compounds to be quantitatively assessed in modelling. In this case, we are not aware of any 'standard' emission rates that would be readily applicable to the activity, and the stack discharge odour concentration has not been determined through laboratory analysis. As such, the applicant has not been able to undertake this approach.

The impact of odour emissions from the site was also assessed by undertaking an analysis of the odour complaints made to GWRC in the area. The complaints considered in the assessment occurred from 2016 to 2019. These complaints were considered alongside wind data recorded from the NIWA Trentham and NCI Packaging sites. The applicant identified the NIWA Trentham meteorological site to be approximately 3.5km to the southwest the NCI Packaging site meteorological site to be approximately 300m to the east.

The odour model results should not be given a strong credence as they do not consider the cumulative effects of multiple odorous compounds. PDP consider that the analysis of complaints is a more robust assessment methodology in this case.

6.0 Assessment of Potential Effects of Discharge

The applicant's modelling files and results data for VOCs, odour and combustion products were reviewed by PDP and checks completed on the following aspects of the assessment:

- Emission rate calculations;
- Meteorological data;
- Dispersion model configuration files; and
- Results analysis spreadsheets.

These checks confirmed that the model had been configured accurately to represent the site's emission sources and that the results presented in the report reflected those contained in the results files.

6.1 Impact Assessment: Odour

PDP note that the use of the odour complaints to assess the impact of odour emissions was undertaken in a way that is consistent with the recommendations provided in the Ministry for the Environment's (MfE) Good Practice Guide on Assessing and Managing Odour. PDP consider complaints analysis added significant value to the AEE. This analysis is useful as the applicant has been operating the discharge at the proposed scale for a number of years, so the complaints register represents an accurate picture of the actual effects of the discharge. This analysis is complicated by the fact there are other industries in the area discharging similar odorous compounds, making the attribution of an effect to a single source difficult.

The applicant identified four events where the odour complaint was probably attributed to Resene (the factory was in production and the wind is in the direction of the complaint). There were additional

[4] Texas Commission on Environmental Quality, Effects Screening Levels (TCEQ ESLs)

complaints where variable wind direction made it difficult to assess whether Resene was directly responsible for the odour complaint.

The majority of complaints centre on Mountbatten Grove. This is coincident with elevated 1-hour average concentrations caused by the grounding of the plume from the Resene discharge. Figure 1[5] demonstrates the location of this elevated grounding (the 200µg/m³ isopleth line to the north-west) for Toluene. The same plume behaviour and relative high concentrations will occur for odour discharged from the site.

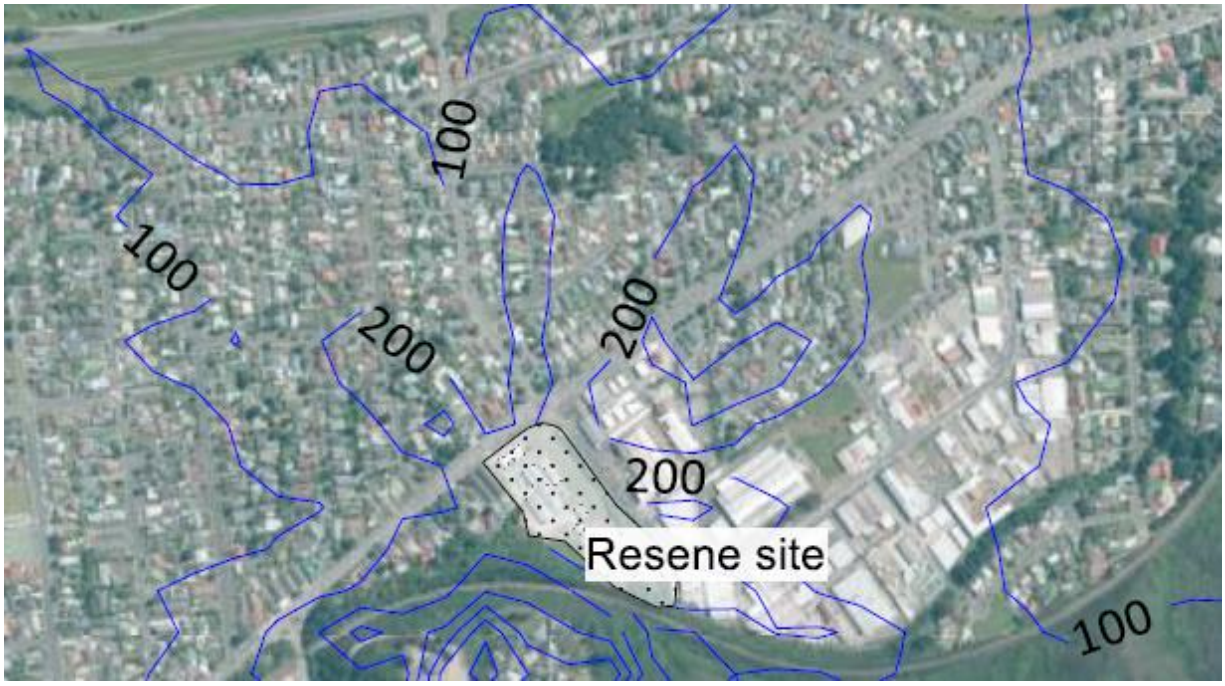

Figure 1: 1-hour Average MGLC Contours (Toluene)

PDP disagree with the applicant's assessment which points to a different or closer source as the cause of the complaints. While it is likely that complaints may arise due to a number of sources in the area, there are demonstrable events where:

- Resene were in production.
- The complaint was downwind; and
- The location of the complaint is consistent with the general location of elevated contaminant concentrations in the 1-hour model scenario.

As such, we cannot agree with the applicant's assessment that the effects of odour will be less than minor.

6.2 Health Impact Assessment: PM_{10}

The applicant has adequately assessed the cumulative impacts of the PM_{10} discharge using ambient air quality monitoring and modelled GLC data. We would agree with their conclusion relating to PM_{10} that the effects will be less than minor.

6.3 Health Impact Assessment: VOCs

The applicant did not qualitatively assess cumulative impacts of VOCs (site point discharge plus background contaminants, contributed to by nearby sources). They have stated that cumulative impacts

[5] Resource Consent Variation Application and Assessment of Effect on the Environment, Appendix E: Concentration Contour Plots

associated with existing background levels are likely to be low. This seems to contradict the complaints history which would indicate periods of time where elevated concentrations of odorous compounds (VOCs) are present. Additionally, there are a number of nearby sites identified by the applicant to be sources of similar contaminants. Unfortunately, the applicant is limited by availability of VOC ambient monitoring data to better assess the cumulative effects of VOCs in a qualitative manner.

A number of VOCs in the model have predicted concentrations close to 33% of their assessment criterion - when no background concentrations have been added. Modelled maximum ground level concentrations (MGLCs) of m, p & o xylene are 85% of the assessment criteria, also without inclusion of a background concentration. PDP would not consider these levels to be support the applicant's conclusion that the effects are less than minor.

7.0 Conclusion on the Effects of the Discharge

PDP conclude that potential effects of the discharged of contaminants to air from the NCI site:

- Are less than minor for PM_{10}, in line with the applicant's conclusions.
- That there are odour effects (complaints) in the wider community that are more than minor. Attribution to the applicant's discharge is difficult, but the location of some complaints is consistent with the location and conditions in which a plume grounding is predicted by the modelling.
- That MGLCs of VOCs (notably 24-hour xylene) are of a level that we would consider more than minor.

In summary PDP conclude that the effects of the discharge of PM_{10} will be less than minor, while the discharge of odour and VOCs on occasions may cause effects than are minor or more than minor.

8.0 Mitigation, Monitoring and Reporting

The applicant is proposing no additional mitigation measures beyond the existing cartridge filter.

Given the outcomes of the review of odour and health impacts from the discharge of VOCs PDP consider that it may be beneficial for the applicant to consider additional mitigation measures.

PDP's experience with similar size and type sites operated in the Wellington Region is that developing and implementing a site environmental management plan (EMP) which focuses on controlling and monitoring the discharge of odour and VOCs is demonstrably beneficial to reducing the impacts of the discharge. PDP recommend that GWRC require Resene to develop an EMP and that be submitted to GWRC for review and approval.

9.0 Proposed Amendment to Consent Condition

The applicant has proposed a change to condition of their current consent (WGN160337). The proposed changes to consent condition 15 are technically correct, and the modelling has assessed the effects of the concentration proposed in the modified condition. If the application for amending consent condition 15 is approved, the proposed changes to the condition are worded correctly to reflect the changes sought.

10.0 Summary of Review Outcomes

PDP has undertaken a technical review of Resene's assessment of effects from the discharge of contaminants to air from the manufacture of solvent paint products. Matters of particular relevance to the review included the methods, data and guidelines used to undertake the assessment, potential human

health effects of the discharge of PM_{10}, VOCs and potential odour impacts. The key findings of PDPs review are:

- The applicant has robustly described the site, the discharge and the proposed changes to their consent conditions.
- The applicant has correctly identified nearby sensitive receptors.
- Good experimental data has been used to characterise the health impacts of contaminants in the discharge and quantify those contaminant GLCs for modelling analysis.
- The applicant's approach to the assessment of effects generally matches accepted good practice for the scale and potential adverse effects of the proposed activity. Where best practice is not followed, this is due to a lack of available data (VOC background monitoring data, dynamic olfactometry analysis of the odour level of the source).
- Considering the point above, the methods of analysis used are sufficient for the scale and significance of the potential impacts of the discharge and the receiving environment.
- The model software used represents good practice and is suitable for the complex hill climate of the area.
- The Air Quality Assessment Criteria used are appropriate and in line with the hierarchy identified in the Good Practice Guides published by the MfE.
- The discharge may have effects (VOC/human health and odour) beyond the site boundary that are minor or more than minor to limited areas.
- The current mitigation measures do not appear to be sufficiently effective to ensure the effects from the discharge of VOCs and odour are less than minor.

In summary, PDP's view is that the effect of the discharge of VOC's and odour from Resene are minor or greater than minor. This view differs from the applicant's conclusion that the effects are less than minor.

11.0 Closing

Thank you for the opportunity for PDP to assist GWRC with the review of Resene's air discharge AEE. We trust the review meets GWRC's needs, expectations and will be helpful to the decision-making process. Please let us know if you have any questions or comments on the review.

12.0 Limitations

This report has been prepared by PDP on the specific instructions of Greater Wellington Regional Council for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

Yours sincerely

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