BEFORE THE COMMISSIONERS
AT NEW PLYMOUTH

IN THE MATTER	of the Resource Management Act 1991 ("RMA")
AND	
IN THE MATTER	an application to renew existing resource consents associated with a composting operation at Uruti
BETWEEN	**Remediation New Zealand Limited** Applicant
AND	**Taranaki Regional Council** Consent Authority

STATEMENT OF EVIDENCE OF
DUNCAN BACKSHALL
ON BEHALF OF DAWN & GLEN GENDALL AND JENNIFER BAKER
Dated: 16TH MARCH 2021

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1. INTRODUCTION

1.1 My full name is Duncan Backshall. I am currently a director of Air Quality NZ, a company that provides air quality consulting and technical services.

1.2 This evidence is given in respect of the application by Remediation (NZ) Ltd to operate a composting facility at 1460 Mokau Road, Uruti.

Qualifications and experience

1.3 I am an Air Quality Consultant and hold the qualification of Master of Science (Hons) from Auckland University in 1982.

1.4 I have 38 years' experience in environmental science and have been primarily involved in environmental air quality for 26 years. I have gained experience in many aspects of this field, including atmospheric dispersion modelling, assessment of effects of emissions to air, ambient air monitoring and source emission testing. I am a member of the Clean Air Society of Australia and New Zealand.

1.5 I have been involved in a variety of work regarding the effects of odour. These include odour monitoring, atmospheric dispersion modelling, assessment of effects and the provision of specialist advice to clients. This work has involved many different industries and operations including wastewater treatment plants, commercial composting, mushroom production, carpet underlay manufacturing, packaging production and spray painting operations.

Involvement in project

1.6 I was engaged by the North Taranaki Awa Protection Society on behalf of Dawn & Glen Bendall and Jennifer Baker (submitters) in February 2021 to review the application by Remediation (NZ) Ltd (RNZ) to renew the resource consents for a composting operation at 1460 Mokau Road, Uruti, and provide a statement on the effects on air quality at this hearing.

1.7 I visited the surrounding area on 1 March 2021 and the site itself on 9 March. I also visited the area during the evening of 28 February and stayed overnight at the house at 1358 Mokau Road on 8 March.

Purpose and scope of evidence

1.8 The principal purpose of my evidence is to outline the assessment I have undertaken in regard to effects from discharges to air of odour from the

operations at the RNZ composting plant. I have reviewed the evidence on odour prepared by Mr Curtis on behalf of the applicant, and the section 42a report from the Taranaki Regional Council.

1.9 My evidence is structured as follows:

(a) Relevant planning context (Section 2);

(b) Existing environment (Section 3);

(c) Odour from composting operations (Section 4);

(d) Odour effects (Section 5);

(e) Comments on the section 42a report (Section 6);

(f) Summary and conclusions (Section 7);

(g) Attachments.

Expert Witness Code of Conduct

1.10 I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's 2014 Practice Note. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

2. RELEVANT PLANNING CONTEXT

Taranaki Regional Air Quality Management Plan

2.1 As noted in 7.2 of the Taranaki Regional Council (TRC) officers' report, there is no specific rule in the plan for composting operations. The application was therefore assessed under rule 55 as a discretionary activity.

3. EXISTING ENVIRONMENT

3.1 A brief description of the terrain of the site is presented in the June 2019 AECOM odour assessment. This notes that operations are carried out on the river flats in the valley, which is surrounded by steep-sided hills. The site

location map in Figure 1 does not show the entire property, although Figure 1 of the June 2020 application does show the full boundary.

3.2 This total area of the site is 637 hectares. The ridgelines around the valley generally form the boundary, along with the Mokau Road (SH3) to the north. This entrance is the only vehicle access to the valley and is approximately 160 m wide at the narrowest point. There are a number of smaller valleys mostly to the east of the main valley. Although the composting operations are 1.2 km from SH3 towards the head of the valley, grassed areas close to the road are used for irrigation with wastewater.

3.3 The entrance to the property opens out into a larger valley, the Mimitangiatua Valley, that is aligned approximately south-west towards Uruti to the north-east. SH3 follows the south-east side of this valley. There are a number of houses along this road, with the closest about 200 m to the west of the site north of SH3.

3.4 The AECOM report does not discuss the climate of the area, although it does present wind data from the weather station at the site.

3.5 Both the RNZ site and the larger valley are well sheltered by high, steep hills. The wind data from the site for the period of 2 years from 1 May 2017 included calm conditions (wind speed less than 0.5 m/s) for 35% of the time.

3.6 While higher wind speeds would be expected in the Mimitangiatua Valley, I expect this would also have a high percentage of calms.

4. ODOUR FROM COMPOSTING OPERATIONS

Sensitivity of the existing environment

4.1 Activities in the area are predominantly rural, with a few houses and a school in Uruti township. The main activity is pastoral farming with some small blocks of pine trees on the lower hills of the Mimitangiatua Valley.

4.2 Nearby houses on SH3 were identified in the AECOM report and listed in Table 1. This did not include the Bendall residence at 1540 Mokau Road. A map showing the location of RNZ and the nearby houses is included as Attachment 1 to my evidence.

4.3 There are further houses within the valley along SH3 in both directions every few hundred metres.

4.4 While the area would be considered rural, background levels of odour will be low given the predominant activity is pastoral farming. AECOM has identified the receptor types in Table 1 as residential, and I agree that this is an appropriate sensitivity for the houses in the area.

Odour sources at the RNZ site

4.5 Operations at the site are described in the June 2020 application for renewal of the consents. My discussion of odour sources at the site is based on my site visit and the evidence of Mr Curtis on air quality.

4.6 David Gibson of RNZ drove me around the site on the morning of 9 March between 10 and 11 AM. Weather conditions at the time were fine with light winds. The wind direction was towards the head of the valley and there was no discernible odour at the site entrance or office.

4.7 We did not leave his vehicle, so my descriptions of odour are based on observations from inside the vehicle with an open window.

4.8 The strongest odour at the time was from the compost windrow on the organic pad (Pad 1). Waste visible in the freshest compost included sheepskins and chicken mortalities. The odour was very strong and had a manure / dead animal character.

4.9 Strong odour was apparent when driving past the drilling waste pad (Pad 3) and the associated leachate ponds. This was more like a manure odour with some chemical smells also present. I noted a very large number of seagulls on one of the stockpiles.

4.10 There was little odour from the vermiculture beds. I understand that there can be some odour from paunch after it is delivered, but there was no new material present at the time of my visit. The only odour apparent from the wetland treatment system for runoff from the process was that typical of natural wetlands.

4.11 My observations are from a single visit, and odour from the site will vary depending on the waste streams being processed and the operations in progress. There was no irrigation of the grassed areas being undertaken at the time.

4.12 Mr Curtis in his evidence has assessed the odour sources at the site. In addition to the sources I observed, he notes that the leachate pond appears to have become anaerobic and assesses this to be *"one of the more odorous locations on site"*. As this is adjacent to the drilling waste pad, this may be

the source of the odour I observed. He also discusses the irrigation of the wastewater from this pond to land as this could also be a source of odour, especially if the leachate is anaerobic.

4.13 He also discusses the material drop-off area and comments that "*the drop-off areas, particularly the area near the drilling mud pad and the organic pad animal waste, have a higher level of odour than other areas of the site.*" I did not observe fresh material at either location. The site stopped receiving drilling waste from 31 December 2020.

Odour control and mitigation

4.14 A factor to be considered when considering odour controls is the non-linear response of the human nose to changes in odour concentrations. This is a logarithmic relationship so that a 10-fold decrease in odour will result in a much lower perceived change in odour intensity. This means that while controls may reduce odour emissions significantly, odour effects in the community may not decrease as expected.

4.15 Mr Curtis discusses odour control and mitigation at some length in his evidence (5.1 to 5.35) and sets out a series of recommended mitigation measures. He considers these to be key measures important in reducing the potential for off-site odour.

4.16 In a footnote to 5.5 he notes that *"the OMP (Odour Management Plan) will require significant modification in order in order to meet the requirements of proposed condition 30"*, and for this reason has not prepared a draft OMP prior to the hearing. Considering this comment, I assume that the proposed control and mitigation measures will form the basis of the OMP as required by this condition.

4.17 I have reviewed the proposed control measures and agree that if fully and properly implemented (see commentary below [4.18]-[4.22]), these should significantly reduce the potential for off-site, intermittent odours. Continuous odours may prove more difficult to control because large amounts of unremediated drilling waste are stockpiled on Pad 3. There is also the potential for odour from the composting of some waste streams currently received at the site, for example poultry industry waste.

4.18 The proposed consent conditions do not directly address practices at the site, apart from requiring an OMP. I suggest the key recommendations should be incorporated into the consent as conditions, for example aerating the

leachate ponds to maintain a minimum dissolved oxygen (DO) level. Specific comments on the recommendations in the evidence of Mr Curtis follow.

4.19 **Leachate ponds, 5.8** DO levels should be monitored continuously and transmitted to the site office.

4.20 **Organic composting pad, 5.15** Acceptable ranges for temperature and moisture should be included as a condition.

4.21 **Organic composting pad, 5.16** A number of the recommendations require favourable meteorological conditions during certain operations. I suggest that these should be standardised and also recommend that certain operations, such as turning fresh compost, be undertaken during the middle of the day to ensure that most of the odour is dispersed before the conditions for katabatic flow down the valley become established.

4.22 **Drill mud composting pad, 5.29** Given that remediating this waste may require several years, I recommend that the piles be covered as soon as possible to reduce odour and minimise the amount of contaminated stormwater runoff into the ponds. If this material is unable to be remediated to a B1 standard for use within the site, then it should be removed from the site as soon as possible.

4.23 **Cold air drainage, 5.30** I have reservations about the likely effectiveness of this measure as described by Mr Curtis. The property covers a large area, even though RNZ operations occupy only a small part of the site. Depending on the meteorological conditions, it is likely that there will be drainage flows down most of the valleys, which will combine within the main valley and then flow through a 160-metre-wide gap at the entrance.

4.24 The bund may slow the flow initially, but once the drainage flows are established, the resulting volume of cold air will simply flow over the bunds, rendering the odour neutraliser in the gap between them ineffective.

4.25 The system described by Mr Curtis appears to be an update to the present cold air bunds at the site, which are described by Mr Gibson in (27) of his evidence. The bunds are designed to guide cold air to one side of the valley, where RNZ has installed an odour neutralising system. This is located at the site office and generates a mist using a spray cannon towards the west side of the valley.

4.26 The chemical neutraliser supplied by BioX appears to be based on their fogging system used for dust control. It relies on odour molecules becoming

absorbed onto fine water droplets, which I assume deposit out from the mist as this travels downwind. The neutraliser contains chemicals which are intended to aid absorption of the odour particles onto the water droplets and neutralise organic odours.

4.27 While the manufacturer has evaluated the diluted product in terms of HSNO classifications, no information is provided on likely downwind concentrations in ambient air.

4.28 Although such systems may be of some value when used at the source of an odour, they are unlikely to be effective when treating the large volume of air that could flow down the valley during katabatic conditions.

4.29 Mr Curtis states in 5.35 that while the bund with the misting system is a useful tool, most improvements will come from reducing the odours at source. I agree that reducing odours at source will be the key measures to reduce odour effects.

Odour monitoring

4.30 I agree that a comprehensive monitoring plan should be implemented considering the current potential for off-site odour effects and the level of complaints to Council in recent months. Regarding the recommendations in Table 1, I would suggest that boundary monitoring at the site entrance also be conducted when the meteorological conditions indicate that cold air drainage could occur.

5. ODOUR EFFECTS

5.1 On 1 March, I visited the Uruti area and met with several residents in their homes. All had experienced effects from odour from the RNZ site to some extent.

5.2 I have reviewed draft witness statements of evidence for:

(a) Dawn and Glen Bendall, 1540 Mokau Road;

(b) Jennifer Baker (Dawn's mother), 1358 Mokau Road;

(c) Johnny Oxenhale: 1415 Mokau Road;

(d) Trent Agent & Kimberlee Williams: 1530 Mokau Road;

5.3 And odour diaries for:

(a) Dawn and Glen Bendall, 1540 Mokau Road; and

(b) Trent Agent & Kimberlee Williams: 1530 Mokau Road;

5.4 **Attachment A** sets out the location of these houses relative to the Remediation NZ site.

5.5 I have also reviewed Council complaint record presented in the Council Officers' report.

5.6 I returned on 9 March to visit the remediation site and was able to carry out an odour survey at the site entrance at 6:40 AM.

Cold air drainage flow

5.7 This is referred to as katabatic conditions by Mr Curtis in his evidence, or katabatic air flows in the AECOM report. I shall refer to such flows as katabatic flows. These occur as a result of the air mass above elevated terrain cooling faster than at lower altitudes, creating a pressure differential which causes the colder air to flow downslope.

5.8 Katabatic flows will generally occur during calm, clear conditions at night. Because of the high, steep sided hills surrounding the site and the frequent calm wind conditions in the valley, I would expect katabatic flows to occur reasonably frequently.

5.9 I note that the AECOM report states that katabatic flows will only occur during calm conditions when the air temperature is less than 10 °C. However, the driver of this phenomenon is the temperature differential between the high and low points of the terrain, not temperature at ground level.

5.10 Given the distance from most of the operations at the site to the nearest houses, it is unlikely that there would be significant odour effects from composting activities during daytime atmospheric conditions, provided operations are well managed. This is because of normal mixing in the atmosphere due to solar heating and surface winds.

5.11 However, katabatic flows during calm conditions will transport odour from the operational areas along the valley floor without significant mixing. The valley floor slopes slightly downhill towards the entrance, which will enhance the air movement.

5.12 Once the cold air has flowed into the Mimitangiatua valley it would be expected to follow the terrain under calm conditions. The map in Attachment 1 shows the terrain of the area near the site. A ridge from the north side of the valley ends approximately 200 m from the entrance to the RNZ valley, splitting the katabatic flow in both directions.

5.13 I visited the Bendall property at 1540 Mokau Road on the evening of 28 February. No odour was apparent when I passed the quarry entrance at about 9 PM, however there was a distinct odour when I drove past about an hour later.

5.14 I stayed the overnight at the house at 1358 Mokau Road before visiting the RNZ site on 9 March. I stopped at the site entrance at about 9 PM on 8 March but did not observe any air movement or odour coming from the valley then. I returned to the site entrance at 6:40 AM the following morning to find a light, cool breeze from the site entrance and a variable, distinct to strong odour. This had an unpleasant, manure character with a weak ammonia smell. The odour was similar when I left 15 minutes later, although by then there was an occasional, light wind from the south-east during which resulted in variations in the odour from the site.

5.15 I would consider the odour to be offensive and objectionable given the character and intensity.

5.16 I note from the AECOM report that calm condition, that is winds less than 0.5 m/s, occur for 35% of the time at the site weather station, which is about 430 m from the site entrance at a wider point in the valley. I would expect the velocity of a katabatic flow to be lower here than at the narrower entrance to the valley.

5.17 Mr Gibson in (27) of his evidence states that cold air drainage occurs during winter and spring. However, 6 odour complaints were received by TRC during December 2020 and January 2021, one of which resulted in an infringement notice. The odour diaries kept by the residents in recent months also indicate that strong odours have been experienced during the evening and early morning, which are the periods when katabatic flows would be expected.

5.18 In November 2010 TRC published an annual report[1] of the monitoring programme carried out at the RNZ sites in Taranaki for the period July 2009

[1] Remediation NZ Limited Monitoring Programme Annual Report 2009-2010 (Taranaki Regional Council, 2010) Technical Report 2010-44

– June 2010. This included the details of the 116 complaints regarding odour from the RNZ site In Uruti.

5.19 Almost all the complaints were received by TRC either in the late afternoon / evening, or early morning. This is a strong indication that the complaints occurred during periods of katabatic flow.

Odour effects on the community

5.20 Offensive and objectionable effects can result from either chronic or acute exposure to odour. Acute effects arise from short-term (a few minutes to an hour) exposure to intense and unpleasant odour. However, long-term exposure to lower levels of even moderately unpleasant odour can also result in adverse effects.

5.21 The same assessment tools can be used to assess each type of odour exposure. Duration is included as a factor in a FIDOL assessment, although I note that there can be practical difficulties in determining the duration of chronic odour during a survey. Odour diaries are therefore invaluable when assessing chronic odour.

5.22 I understand that odour from the RNZ site has been an ongoing issue for residents since operations began in 2001. Neither the AECOM report nor Mr Curtis in his evidence have considered actual odour effects on the community in any detail. There are also no details of any complaints received by RNZ directly.

5.23 The AECOM assessment did include an odour survey of the site but did not include the four sensitive receptors identified in the study. A FIDOL analysis was carried out, and based on the assumptions made, concluded that "*odours are unlikely to be offensive*". The AECOM odour survey was carried out in June, when odour emissions from operations at the site would be expected to be at a minimum due to cool temperatures. There were no odour complaints received by TRC during 2019.

5.24 Mr Curtis discusses historical odour complaints in 3.7 and 3.8 of his evidence and concludes that site has been operating with relatively few complaints since the site stopped accepting dairy waste in 2010 until frequent complaints began in June 2020. Although he has made extensive recommendations for control and mitigation measures, the cause(s) of the increased complaints since last June has not been identified.

5.25 The Council officers' report in section 11.1.5.2 discusses odour complaints and presents these for the period from 1 June 2014 to 31 January 2021 in table 14. Paragraphs 293 to 296 discuss the reasons why a complaint may not be upheld, including the time it can take for an officer to respond, especially for the RNZ site which is about 1.5 hours from the Council offices. I would expect this in the case where complaints are received in the evening or early morning, as the officer may not arrive until daytime hours when the katabatic flow transporting the odour to the complainant's property has ceased.

5.26 The complaints listed in table 14 have occurred during three periods:

- June 2013 – April 2015
- March 2018 – Sept. 2018
- June 2020 to date

5.27 The pattern of complaints prior to June 2020 has not been discussed in the evidence of Mr Curtis, or the reports from AECOM and the council officers.

5.28 There have been 17 complaints received since 22 June 2020, four of which have been upheld. Given the difficulties in responding to these complaints for council officers, this indicates that there is a significant level of non-compliance with the odour condition in the 2010 consent, which requires no offensive or objectionable odour at or beyond the site boundary.

5.29 I note that officers did enter the RNZ site on 3 occasions and determined the sources to be:

- 18 Aug. 2020: composting windrows on pad 1
- 2 October 2020: irrigation pond
- 30 October 2020: sheepskin windrow composting on pad 1

5.30 These observations are consistent with the findings of Mr Curtis in his evidence, and my site visit on 9 March.

5.31 Mr Curtis has not determined a cause(s) for the increased level of complaints since June 2020. In his evidence, Mr Gibson discusses the "cold air bund" and odour neutraliser as mitigation measures, which I consider are unlikely to result in a significant reduction in odour from the site during periods of katabatic flow. Mr Gibson has not stated when the current system of cold air bunds and the odour neutraliser was commissioned, but it has not adequately mitigated the current odour emissions from the site.

5.32 While I agree that the control and mitigation measures proposed by Mr Curtis in his evidence are likely to reduce odour from the operations, I remain concerned that a specific cause(s) of the increase in complaints has not been identified.

Statements of evidence and odour diaries

5.33 I have read the draft statements of evidence from the following residents, and reviewed odour diaries for 1530 and 1540 Mokau Road. During my visit on 1 March 2021, I visited the locations listed below. I also met with Spence Radcliff at his property on Uruti Road, and Jess and Dylan Weeks who live at 25 Uruti Road.

- Dawn and Glen Bendall — 1540 Mokau Road
- John Oxenham — 1415 Mokau Road
- Jenifer Baker — 1358 and 1540 Mokau Road
- Trent Agent and Kimberlee Williams — 1530 Mokau Road

5.34 The residents on Mokau Road all state that they have experienced offensive odour, often for periods of hours or overnight. All report health effects and are generally concerned whether exposure to the odour from the RNZ site has or could cause serious effects on their health. Spence Radcliff had experienced odour from the site at his property, although this is about 1.9 km from the composting operations at the RNZ site.

5.35 Jess and Dylan Weeks mentioned that they experience strong odours at times and are also concerned about effects on their health.

5.36 The odour diaries from 1530 and 1540 Mokau Road document the odour experienced during recent months. These were recorded using the template in Appendix 5 of the MfE Good Practice Guide for Assessing and Managing Odour (Odour GPG), which has standard descriptors for odour character and a scale for odour intensity ranging from very weak to extremely strong. Wind speed is recorded using the Beaufort scale.

5.37 At 1530 Mokau Road, odour was noted on 12 days during January and February this year, generally during the evening and occasionally early morning. Odour intensity varied from weak to extremely strong and the character described as “faecal (like manure)”. Wind speed was recorded from 0 – 3, which correspond to calm to a gentle breeze.

5.38 The house at this property is located on a hill and is about 20 m above the elevation at the quarry entrance, which indicates that the katabatic flow at this point in the Mimitangiatua valley is substantial.

5.39 The odour diary for 1540 Mokau Road for the same dates recorded odour on a total of 20 days. Periods were generally in the early morning or evening, but also all day on a few occasions. Odour character was recorded as "chemical, like gasoline", "solvent" and "putrid, foul decayed". Wind strength was not recorded.

5.40 I would classify the recorded odour effects as resulting from acute exposure.

Health effects from odour

5.41 Effects of ongoing exposure to odour are described in section 2.3 of the Odour GPG. A more detailed discussion of health effects was provided in a letter from Dr Jonathan Jarman of the Taranaki DHB to Dawn Bendall dated 14 September 2020. I have reproduced this as Attachment B to my evidence.

5.42 Dr Jarman concluded that "it is unlikely that toxic emissions from Remediation Limited are making your family unwell (moderate level of certainty)." With regard to odour, the letter states that "the odours beyond the boundary of Remediation Limited are unnecessarily offensive at times (high level of certainty)."

5.43 Dr Jarman made four recommendations for RNZ, which are as follows:

1. Remediation Limited engages an air quality specialist who can provide independent evidence-based advice on the odour issue and provide a high level of certainty that toxic gases are not being injurious to health.

2. The advice from this independent air quality assessment is considered by the Taranaki Regional Council and if appropriate is incorporated into the new resource consent.

3. Remediation Limited pays for staff at Uruti to have a health assessment by an occupational health specialist. I understand that Remediation Limited has proactively organised this to happen.

4. Remediation Limited carries out an annual odour annoyance survey of the affected community. This survey along with data from the Taranaki Regional Council should show that the level of dissatisfaction about both the acute and chronic odours coming from the site is significantly declining compared with current levels of dissatisfaction.

5.44 I note the recommendation for TRC to consider the advice from an air quality specialist and incorporate this into the new resource consent if appropriate.

5.45 A significant issue of concern to some residents is the possibility that airborne toxic compounds from the site are affecting their health. Mr Curtis has addressed this to a limited extent in his evidence, where he considers the potential effects of BTEX emissions from the drilling waste, hydrogen sulphide (H2S) from anaerobic decomposition and pathogens from the irrigation of wastewater. He concludes that effects from these airborne exposure to these is unlikely.

5.46 However, given that higher levels of odour than expected are experienced by residents due to katabatic flows, there may be the potential for toxic compounds to be present at higher concentrations than would normally be expected given the distance from operations at the site. This was also a concern raised by Dr Jarman in his letter, who recommended that "*Remediation Limited engages an air quality specialist who can provide independent evidence-based advice on the odour issue and provide a high level of certainty that toxic gases are not being injurious to health."*

5.47 While Mr Curtis has assessed odour sources at the site and provided an extensive list of recommendations, I do not consider that his assessment of the emissions of toxic compounds provides a high level of certainty regarding the possible health effects of toxic gases.

5.48 Given that this recommendation has not been met to date, an appropriate condition requiring such a study should be included in the consent.

5.49 If all of the recommendations made by Mr Curtis are fully implemented, both odour from the site and any toxic discharges to air should be reduced. However, this could take some time and in the meantime the residents should have a high level of certainty as to their exposure to airborne toxic compounds.

6. COMMENTS ON THE SECTION 42A REPORT

11.1.5.2. Odour

6.1 In general, I agree with the officers' comments on odour effects in section 11.1.5.2 (Clauses 289 – 302). My comments on this section follow and also include comments on the draft resource consent conditions.

6.2 In (299) the officers note that the Odour GPG states that the requirement for no objectionable odour beyond the boundary will require supporting conditions such as control equipment and operating requirements. There are

no such conditions in the 2010 consent or proposed for the new consent, apart from a requirement for an OMP.

6.3 Paragraph (300) acknowledges that even with the use of mitigation measures to control odour, odour will still be generated and other factors, including katabatic flows, may influence whether odour is contained within the site boundary or dispersed. This is a key issue as odour mitigation alone may be inadequate to sufficiently reduce odour beyond the site boundary to a level that avoids offensive or objectionable effects.

6.4 The one odour control measure noted in the report is discussed in (302), which requires that the only waste received should be that which can be composted to solid, organic material. While I agree with this condition, I suggest that this be changed to exclude waste streams that are likely to result in high levels of odour from the fresh compost, including animal waste such as chicken carcasses, and be included under the odour conditions.

13. Summary and Conclusions

6.5 Following a discussion of operations at the site, (436) presents a list of measures that the officers consider should be included as consent conditions. None of these relate to odour, and I would recommend that the key odour control measures recommended by Mr Curtis be included as conditions of consent.

16. Monitoring

6.6 Similarly, there are no requirements proposed for odour monitoring. I would suggest that as a minimum these should include the following:

- daily monitoring of odour from all composting processes within the site, including irrigation with wastewater when this is undertaken,
- daily inspections to ensure that all odour control measures required by the consent and OMP are correctly implemented,
- daily monitoring of odour at the site boundary on Mokau Road, especially during periods of katabatic flow, and
- engaging an air quality specialist to carry out regular odour assessments in the community following the guidance in the Odour GPG. I suggest that these initially be carried out monthly with provision to reduce the frequency if effects are minor. This would be generally in line with recommendation (4) in Dr Jarman's letter of 14 September 2020.

7. SUMMARY AND CONCLUSIONS

7.1 Since July 2020, odour discharges from the RNZ site near Uruti have resulted in many complaints to TRC. Despite the difficulties for council officers to investigate these complaints, 5 of the 26 were verified as offensive or objectionable during the period from June 2020 to January 2021.

7.2 Before my visit to the RNZ site on 9 March 2021, I observed offensive and objectionable odour at the boundary with Mokau Road in the early morning. This odour was no longer discernible when I arrived at 9:30 AM for the site visit.

7.3 In addition to the complaint history, the statements of evidence prepared by the local residents document the effects experienced as a result of odour from the RNZ site. A health risk assessment by the Taranaki DHB concluded the odours beyond the site boundary are “unnecessarily offensive at times”.

7.4 The assessment also found that exposure to offensive odour is likely to be the cause of the health effects experienced by one family. While it was concluded that toxic emissions were unlikely to be the cause, a recommendation was made that RNZ engage an air quality specialist to investigate this issue and “provide a high degree of certainty” that toxic gases are not being injurious to health.

7.5 The results of recent investigation of odour discharges from the site is presented by Mr Curtis in his evidence. While no specific cause of the recent complaints was determined, many recommendations have been made to reduce odour discharges from operations at the site. I agree that these measures should reduce odour emissions and recommend some additional actions.

7.6 Katabatic (cold air drainage) flows appear to occur frequently along the valleys at the site during stable, meteorological conditions. These result in odour from composting operations being transported to the site entrance on Mokau Road without significant dispersion, which then flow into the Mimitangiatua Valley.

7.7 Cold air bunds and an odour neutralising system have been installed to mitigate odour effects during cold air drainage. The application does not state when these measures were completed, but recent complaints indicate that odour discharges from the site continue to result in offensive odour at

the nearby houses. In my opinion, these measures are unlikely to significantly reduce odour at the site entrance.

7.8 While the TRC officers' report does consider odour from operations at the site, only one specific condition covering waste to be received at the site is discussed as an odour control measure. Mr Curtis has recommended a number of odour control measures in his evidence, and I recommend that the key measures be included as enforceable consent conditions along with the additional suggestions presented in 4.18 to 4.21 of my evidence.

7.9 However, I have two serious reservations as to whether implementation of these control measures will result in no offensive or objectionable odour beyond the site boundary. The first is the poor compliance history of RNZ at the site, as described at length in section 10 of the officers' report. This reduces confidence that the control measures to reduce odour will be successfully implemented and monitored.

7.10 The other issue is the cold air drainage from the site which results in adverse odour effects at a number of properties in the Mimitangiatua Valley. Because there has been no routine monitoring of odour at the site boundary or community surveys, it is unclear whether operations at the site have been able to meet the condition for no offensive or objectionable odour at the boundary, or whether there have been periods when there have not been adverse odour effects in the surrounding area.

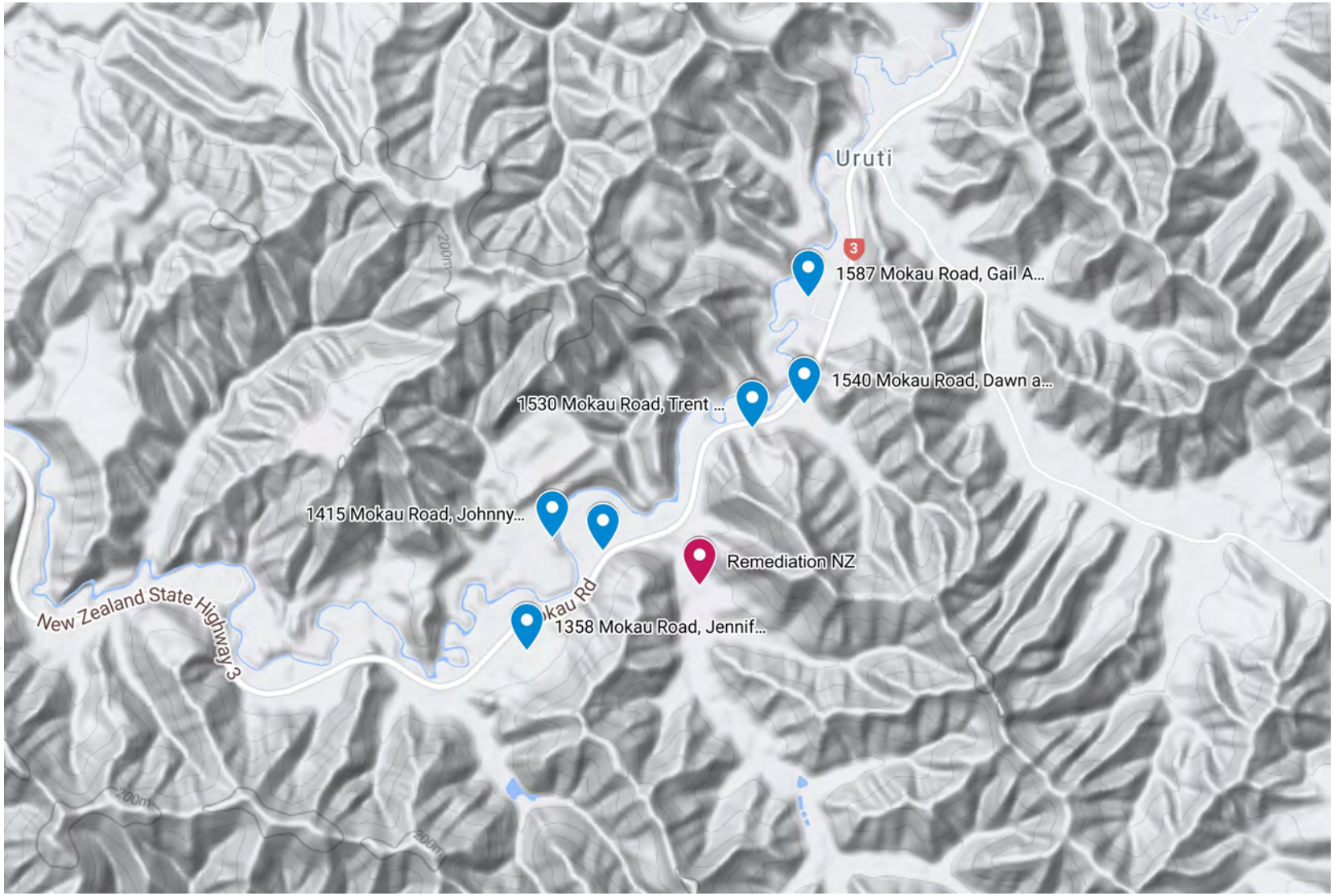
Duncan Backshall
16 March 2021

Attachment A

Remediation (NZ) location

Nearby houses

- 1540 Mokau Road, Dawn and Glen Bendall
- 1358 Mokau Road, Jennifer Baker
- 1587 Mokau Road, Gail Alison
- 1530 Mokau Road, Trent Agent and Kimberlee Williams
- 1415 Mokau Road, Johnny Oxendale
- Remediation NZ
- 1429 Mokau Road



Attachment B

Taranaki District Health Board
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New Plymouth 4342
New Zealand
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Fax: 06 753 7770
Email: corporate@tdhb.org.nz
www.tdhb.org.nz

Taranaki Base Hospital
Private Bag 2016
New Plymouth 4342
New Zealand
Phone: 06 753 6139
Fax: 06 753 7710

Hāwera Hospital
Post Office Box 98
Hāwera
New Zealand
Phone: 06 278-9929
Fax: 06 278 9910

Stratford Health Centre
Phone: 06 765 7189

Opunake Medical Centre (CoastalCare)
Phone: 06 761 7324

Pātea Health Centre
Phone: 06 273 8088

Waitara Health Centre
Phone: 06 754 7150

Mōkau Health Centre
Phone: 06 752 9723

14 September 2020

Dawn Bendall
1540 Mokau Road,
Uruti 4379

Dear Dawn

Health concerns about smell and odour from Remediation Limited at Uruti

Thank you for contacting our service with health concerns about the odours coming from Composting and Vermiculture Facility at Uruti. On 30th June 2020 you called the Taranaki Public Health Unit and said that that your family had "Issues with smell/odour, experiencing headaches, nausea, tiredness, skin/throat irritation, son experiencing a skin rash (seen by a Dr), eye irritation. All get headaches - happens all the time. Next door neighbours also experience this… neighbouring cows are having eye irritations…. there is a lot of cancers around Uruti". During the discussion with the trainee Health Protection Officer you mentioned that you believed that 'ethyl mercaptan' was the cause "as Remediation Ltd accept oil/gas drilling waste".

It was decided to investigate further with the objective of assessing whether the odours were a statutory nuisance under the Health Act 1956 and likely to be injurious to health through poisoning arising from chemical contamination of the environment.

Information was gathered from the following sources:

- your general practitioner
- other people who live adjacent to Remediation Limited at Uruti
- odour complaints made to the Taranaki Regional Council and the New Plymouth District Council
- data sheets about the toxicity of ethyl mercaptan
- an air monitoring survey carried out by the Taranaki Regional Council for hydrocarbon compounds (BTEX) in the Taranaki Region in 2019
- the revised Assessment of Environmental Effects dated June 2020, the Assessment of Odour Effects by AECOM Limited dated 28 June 2019 and submissions received in 2019 by the Taranaki Regional Council about the renewal of the resource consent https://www.trc.govt.nz/environment/resource-consents/notified-consents/
- the amount of sick leave taken by staff at Remediation Limited (the group of people with the highest risk of exposure to potentially toxic fumes) – we were informed that the staff rarely took sick leave
- previous news media reports
- a visit to the site and interview of David Gibson (Revital Group General Manager, Special Projects and Resource Consents) by public health staff on Tuesday 25 August 2020

TARANAKI
District Health Board

Our health risk assessment based on this evidence is that it is **unlikely** that toxic emissions from Remediation Limited are making your family unwell (moderate level of certainty).

However the evidence suggests that the **odours** beyond the boundary of Remediation Limited are **unnecessarily offensive at times** (high level of certainty).

Offensive odours are known to be capable of causing a variety of non-specific multi-system adverse health effects which include headaches, nausea, gastro-intestinal distress, retching, reduced appetite, fatigue, eye irritation, throat irritation, shortness of breath, runny nose, sleep disturbance, inability to concentrate, depression, tearfulness and classical stress response. These adverse health effects are mediated through the olfactory system and vary from person to person.

Unpleasant odours can occur acutely or chronically. The 2016 Ministry for the Environment *Good Practice Guide for Assessing and Managing Odour* defines acute odours as "high-intensity and/or highly unpleasant odours occurring infrequently or for short periods of time" and chronic odours as "low-intensity and/or moderately unpleasant odours occurring frequently or continuously over a long period … cumulatively these low-level odours can have an adverse effect even though no single odour event in isolation could reasonably be considered offensive or objectionable".

It appears that both types of odour effects are operating at Uruti. It seems likely that your symptoms are being caused by odour pollution from Remediation Limited. Your doctor said that your health improves when you are out of the area on holiday.

The Assessment of Odour Effects report by AECOM Limited concluded that nearby neighbours at Uruti were most likely to be affected when there were certain weather conditions. These weather condition events occur approximately 4.5 percent of the time. This adds up to 394 hours per year which is not an insignificant amount of time.

There is considerable overlap between the nuisance section (S.29) of the Health Act 1956 and the Resource Management Act 1991 in this situation. Territorial local authorities have duties and responsibilities in relation to the abatement of statutory nuisances under the Health Act 1956 but I understand that the New Plymouth District Council has not been recently involved. In my opinion the Resource Management Act 1991 should be considered to be the primary legislation as the resource consent discharge permit (expired 1 June 2018) states:

The discharges authorised by this consent shall not give rise to an odour at or beyond the boundary of the consent holder's site that is offensive or objectionable.

The ongoing nature of the odour complaints over many years and the high level of community dissatisfaction concern me as well as not having a high level of certainty that toxic discharges to air at the site are not injurious to health.

TARANAKI
District Health Board

With your permission I would like to share my findings with the Taranaki Regional Council, the New Plymouth District Council and David Gibson from Revital Group.

In summary it appears likely that your symptoms are being caused by odour pollution from Remediation Limited. However based on the present evidence it is unlikely that the symptoms are caused by poisoning arising from toxic gases.

My recommendations for Remediation Limited are as follows:

1. Remediation Limited engages an air quality specialist who can provide independent evidence-based advice on the odour issue and provide a high level of certainty that toxic gases are not being injurious to health.
2. The advice from this independent air quality assessment is considered by the Taranaki Regional Council and if appropriate is incorporated into the new resource consent.
3. Remediation Limited pays for staff at Uruti to have a health assessment by an occupational health specialist. I understand that Remediation Limited has proactively organised this to happen.
4. Remediation Limited carries out an annual odour annoyance survey of the affected community. This survey along with data from the Taranaki Regional Council should show that the level of dissatisfaction about both the acute and chronic odours coming from the site is significantly declining compared with current levels of dissatisfaction.

Yours sincerely

Dr Jonathan Jarman
Medical Officer of Health