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Level 2, Wynn Williams Building
47 Hereford Street
Christchurch Central 8013
PO Box 1147
Christchurch 8140
New Zealand
T +64 3 940 4900
F +64 3 940 4901
www.jacobs.com

10 June 2024

Attn: Shay McDonald
Senior Consents Planner
Otago Regional Council

by email: Shay.McDonald@orc.govt.nz

Project name: Green Island RRPP Consent Applications
Project no: IS452400

Subject: RM24.143 – GREEN ISLAND RRPP – TECHNICAL AUDIT RESPONSES; AIR DISCHARGES

Dear Shay

Jacobs New Zealand Ltd (Jacobs) was engaged by Otago Regional Council (ORC) to complete a technical audit of a Resource Consent application for air discharges submitted by Dunedin City Council (DCC) for the proposed Green Island Resource Recovery Park Precinct (RRPP). The proposed RRPP includes an organics processing (composting) facility (OPF).

Further information was requested in accordance with Section 92 of the Resource Management Act to enable us to make a full assessment of the application, and was supplied by the DCC in May 2024.

The author of this review conducted a site visit to the Green Island Landfill (where the proposed RRPP will be constructed) in April 2023, and also visited a similar OPF operating at the Hampton Downs Landfill in Waikato on 17 January 2024.

In conducting this audit, we have reviewed the technical information related to air discharges from the RRPP as detailed in the following reports:

- Green Island Resource Recovery Park Precinct – Applications for Resource Consent and Assessment of Environmental Effects Prepared for Dunedin City Council; report prepared by Boffa Miskell dated 15 March 2024, herein referred to as the "AEE".
- Green Island Resource Recovery Park Precinct – Air Quality Assessment, prepared for Enviro NZ Services Ltd; report prepared by Pattle Delamore Partners Ltd (PDP) dated February 2024. Appendix 12 of the AEE, herein referred to as the "AQA".
- Response to Section 92 Request for Further Information; memorandum prepared by PDP dated 18 April 2024, herein referred to as the "PDP Memo".
- Response to Section 92 Request for Further Information; air quality responses spreadsheet prepared by DCC consultants dated May 2024, herein referred to as the "RFI spreadsheet".
- Odour and Litter Monitoring Work Instruction; Enviro NZ document number ENV-50-025 dated 15/4/24 submitted with the RFI spreadsheet.

- Draft Construction Environmental Management Plan; Appendix 5A of AEE, prepared by GHD revision 01 (Draft) dated 28/2/24, herein referred to as the “Draft CEMP”.
- Draft Green Island Composting Facility Management Plan; Appendix 5F of AEE, prepared by Enviro NZ Draft 2 dated February 2024.
- Draft Conditions of Consent; Appendix 20 of AEE.

We have also referred briefly to the following documents but have not conducted a full review as that is beyond the scope of the air quality assessment:

- Draft Operations Management Plan; Appendix 5D of AEE, prepared by Enviro NZ dated February 2024.

Our technical audit of the air discharge consent application is detailed on the following pages, following the question and response framework requested by ORC.

We note that the new organics receipt building (ORB) which is part of the proposed RRPP and will receive and shred the organic feedstocks for the composting operation, is subject of a separate resource consent application and as such the potential odour emissions from the ORB are not within the scope of this review. However, odour emissions from the ORB may contribute to the cumulative odour emission from the RRPP and have been included within this context in this review.

General	
Q1:	Is the technical information provided in support of the application robust, including being clear about uncertainties and any assumptions? Yes, or no. If not, what are the flaws?

Yes, the most part the technical information provided in support of the application, including the S92 responses, is robust.

Q2:	Are there any other matters that appear relevant to you that have not been included? Or is additional information needed? Please specify what additional info you require and why [please explain]
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No further information is required.

Q3:	If granted, are there any specific conditions that you recommend should be included in the consent?
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Yes, Jacobs recommends some specific conditions as well as edits to the proposed conditions. This question will be addressed at the end of this letter.

Air Quality	
Q4:	Are all relevant sensitive receptors correctly identified and described in the PDP report?

Sensitive receptors are discussed in Section 2.2 of the AQA. Jacobs is not aware of any relevant sensitive receptors that have not been identified in the AQA.

Representative sensitive receptors are listed in Table 1 of the AQA, along with the closest RRPP odour source and separation distances to the RRPP. The distances given appear to be to the closest source within the RRPP, not the RRPP boundary, which is appropriate.

Q5:	The PDP report considers that the commonly used separation distances of 500 m (for composting activities) and 300 m (for BWTS) are not appropriate radii in which to consider potential effects on sensitive receptors for this site. Do you agree? Please explain.
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Composting activities separation distance

The proposed activity at the OPF is composting of up to 20,000 tonnes per year of green waste and food waste by aerated static pile (ASP) composting system.

PDP relies on a separation distance proposed in a 2012 discussion document prepared for Auckland Council (Emission Impossible, 2012)¹ which recommends a 500 m separation distance that is not dependent on type of feedstock, processing methodology or mitigation. The rationale provided by PDP is that if a 500 m separation distance for composting is not site-specific to production throughput, methodology or mitigation, then the composting system proposed for the RRPP with its associated odour mitigation would have a lower odour potential than the generic composting that could potentially fall within the scope of the 500 m separation distance requirement. Jacobs agrees in general with this rationale.

However, this highlights the limited usefulness of that Auckland Council guideline, which is based on a 2011-published separation distances policy in Tasmania. It is not clear why Emission Impossible (2012) recommends adopting the Tasmania approach and does not consider the EPA Victoria approach which the same discussion document recommends should have a higher priority than the Tasmanian guidelines.

EPA Victoria has produced several updates to recommended separation distances since the Emission Impossible (2012) discussion document was published. The current (draft) recommended separation distances for composting plants (EPA Victoria, 2022)² are based on feedstock, composting throughput, and mitigation measures applied. For a throughput of 20,000 tonnes per year of the type of feedstock and processing methodology proposed for the RRPP, a separation distance in the range of 750m – 1100m is applicable.

Whilst the recommended separation distances in EPA Victoria (2022) are still in draft status, the previous separation distances for composting facilities (EPA Victoria, 2012)³ recommended 1000 m for production of up to 50,000 tonnes per year for a facility handling green waste and kerbside organics with enclosed in-vessel composting and odour control equipment. Whilst that 2012 publication also has draft status, it was the reference guideline for composting facilities in Victoria since 2012 (as stated in EPA Victoria (2013)⁴).

Therefore, there is precedent and context for a recommended separation distance of approximately 1000 m. The ORP proposed at Green Island does not meet these separation distances.

If a proposal does not comply with a separation distance, this does not mean the proposal cannot proceed. It does however mean that a site-specific odour risk assessment is needed, which has been provided in the AQA.

BWTS separation distance

Jacobs agrees that a 300 m separation distance is likely to be appropriate for the BWTS, based on the various references quoted in Section 2.6.2 of the AQA.

¹ Wickham, L (2012). Separation Distances for Industry, A discussion document prepared for Auckland Council, July 2012. Prepared by Emission Impossible Ltd

² EPA Victoria (2022). Separation distance guideline (draft). Publication 1949, December 2022.

³ EPA Victoria (2012). Draft Guidelines for Separation Distances for Composting Facilities. Publication 1445, March 2012.

⁴ EPA Victoria (2013). Recommended Separation Distances for Industrial Residual Air Emissions. Publication 1518, March 2013.

Q6: Is the assessment methodology appropriate and in line with best practice? Please explain.

The odour assessment methodology focused on three elements:

1. Identification of potential emissions, and associated mitigations/controls and contingency measures,
2. Field surveillance at existing similar operations, and
3. A cumulative risk assessment approach, considering the FIDOL factors (frequency, intensity, duration, offensiveness and location) to identify receptors at highest risk of odour impacts.

These odour assessment tools are in line with best practice, and have been carried out appropriately.

The dust assessment methodology also focused on elements (1) and (3) from the list above, which is also in line with best practice.

Q7: Are all relevant air emission sources considered and are the proposed mitigation measures for each appropriate? Please explain.

Odour and dust emissions, control measures and contingency measures for the BWTS and MRF are listed in Sections 4.2.3 and 4.2.4 of the AQA. All relevant air emission sources appear to have been considered. Jacobs agrees that with these measures in place, the risk of odour emissions from the BWTS and MRF is minimized.

Odour emissions for the ORB are listed in Section 4.4 of the AQA. The potential odour sources appear to have been correctly identified. A key stated mitigation measure is that *"there is no ventilation on this building and the door to the ORB will be closed, when practicable, in-between deposits and load-outs. (At times it will be necessary to have doors open when diesel machinery is operating)."* In the RFI Spreadsheet, DCC also confirmed that the ORB doors may need to be open at times to load the shredder safely and efficiently, and that the shredder will be running during loading. Therefore, it appears that the ORB doors may be open during operational hours for a number of reasons, and therefore closed doors should not be relied upon as a mitigation measure for the ORB. However, Jacobs notes again that emissions from the ORB are not subject to this consent application, except as a background odour source that may contribute to the overall cumulative odour effect.

Odour emissions for the OPF are discussed in Sections 4.5 and 4.6 of the AQA. All relevant odour emission sources appear to have been considered. Dust emissions from the OPF are not discussed; however this is appropriate. Jacobs agrees that the potential for dust emissions from the OPF is minor as the composting material has large particle sizes and will be kept moist.

Q8: Have the potential adverse effects relating to odour and dust been adequately described and assessed? Do you agree that there is a low likelihood of offsite odour and dust being categorised as offensive or objectionable at nearby receptor locations? Please explain.

In responding to this question, Jacobs has reviewed the field surveillance and cumulative risk assessment elements of the assessment methodology.

1. Field surveillance (experience with other sites)
 - a. Composting
 - i. Site investigations downwind of the Hampton Downs compost facility are discussed in Section 5.1.3 of the AQA. The AQA states that compost odours are unlikely to be experienced at distances of more than 200 m from the proposed composting operations at Green Island.

- ii. Jacobs is unable to independently verify the field investigation that is detailed in the AQA. It is noted that the nearest sensitive receptor to the Hampton Downs composting plant is more than a kilometre from the composting plant site, and even if any compost odours carried far enough downwind to those receptors it would probably be masked by the adjacent landfill odours in any case. On the day of our site visit to Hampton Downs, the wind direction was not suitable for conducting observations downwind of the composting plant. In addition, the main biofilter was not operating at the time of the site visit due to a breakage in the main inlet duct, so it would not have been possible to assess odour from the composting plant under normal operating conditions.
 - iii. Jacobs notes that a new ASP composting plant is being built by Enviro NZ in Timaru. However, no operational experiences are yet available for this site.
 - iv. Jacobs also agrees with the discussion in the AQA in Section 5.5 about “Bromley Odour Issues” and the rationale for concluding that the proposal for the RRPP at Green Island will not result in the same level of odour effects.
- b. BWTS and MRF
- i. Site investigations downwind of the Sunshine Avenue waste transfer station and MRF are discussed in Section 5.2 of the AQA. However, odours from these activities are highly dependent on the amount of putrescible material included in the waste streams, and it is possible that the field surveillance downwind of the Sunshine Avenue site may not reflect worst-case operations at the RRPP.
 - ii. Based on PDP’s stated experience with odour observations from transfer stations in Section 5.2 of the AQA, and Jacobs’ own experiences with similar activities, Jacobs agrees that the proposed BWTS and MRF operations could result in weak odours up to approximately 100 m from the source on occasions.

2. FIDOL assessment

- a. The risk assessment relies on site-specific FIDOL characteristics for the RRPP. The frequency part of the FIDOL assessment detailed in Section 5.3.1 of the AQA relies on wind speed and direction frequency data measured at the landfill which is appropriate. Jacobs also notes that there is an error in the AQA in Table 3, where all direction-dependent wind speeds above 5 m/s are listed as 0.0% frequency. This omission is not critical to the assessment.
- b. Jacobs agrees with the approach taken in the AQA to focus on the low wind speeds (below 3 m/s). Table 6 of the AQA provides a frequency rating for each receptor based on their upwind direction under low wind speeds. This frequency rating comes from a United Kingdom guideline for dust impacts published in 2016. Most of the receptors are assessed as being downwind “infrequently” based on a definition of “infrequent” of <5%, however Jacobs considers that this frequency could be increased to allow for wind meander under low wind speeds. The use of this frequency rating system, and the assumptions needed to determine the frequency assignments in Table 6, could be investigated further but are not critical to the overall assessment.
- c. The second factor in FIDOL is “intensity”. For the BWTS and MRF, Jacobs agrees with the discussion in paragraph 1 of Section 5.3.2 of the AQA report that BWTS and MRF odours are likely to be weak up to 100 m or so from the source.
- d. For intensity of the composting odours, the statement in the second paragraph of Section 5.3.2 of the AQA states that odours associated with aerobic conditions are not usually detected more than 150 to 200 m from the site, and if they are detected the intensity of odours at this distance would be described as weak. As discussed above, Jacobs is not able to independently verify this conclusion, however agrees based on the findings from the PDP odour surveillance that if odours are more intense than “weak” at a distance of more than 200 m from the composting site, it is likely that something has gone wrong with the design or operation of the OPF.

- e. The fourth paragraph of Section 5.3.2 of the AQA states that *“for the majority of the time any odours that are generated are expected to be weak at or beyond the Site boundary”*. Jacobs notes that the proposed composting site is close to the north boundary of the RRPP, and therefore disagrees with this statement. However, there are no sensitive receptors at or near that boundary.
 - f. The third factor in FIDOL is “duration”. Jacobs agrees that most odours noticeable outside the site boundary are likely to be short and intermittent. Longer duration events (up to a few hours) might occur during unloading of bunkers to the maturation pad, or bunker-to-bunker transfers.
 - g. The fourth factor in FIDOL is “offensiveness”, or the degree of unpleasantness or “hedonic tone” of the odour which is subjective to the individual experiencing the odour. Jacobs agrees that under normal operations, odours from the RRPP including the composting operation are likely to have a relatively low offensiveness rating (least degree of unpleasantness) compared to if the operations were poorly operated or controlled. Maintaining aerobic operating conditions, limiting controls on acceptance of odorous loads, and having mitigation and contingency measures in place will be important for the operation of the RRPP if consent is granted.
 - h. The last factor in FIDOL is “location”. Jacobs agrees that the site and proposed activities have a reasonable separation distance to nearby receptors.
 - i. Section 5.3.5 of the AQA states that at the distances to nearby sensitive receptors, *“it is unlikely that any odour from the proposed RRPP will be detectable”*. In Jacobs’ opinion, this statement cannot be supported because a “no detectable odour” threshold is very high standard and is difficult to predict.
3. Conclusions – likelihood of odour and dust from proposed RRPP:
- a. The AQA combines the FIDOL analysis with the experience from other sites and the proposed odour mitigation measures to conclude that there is a low likelihood of off-site odour and dust from the proposed RRPP being categorized as objectionable and offensive. Jacobs agrees with this conclusion based on the assessment provided. If any odours are detected at sensitive receptors, these odours are likely to be weak, infrequent, and of short duration.
 - b. This conclusion is contingent on operation of the mitigation controls and contingency measures proposed in the application, and on the field surveillance findings reported by PDP that cannot be independently verified. If consent is granted, Jacobs recommends that conditions be included in the consent(s) to ensure that these mitigation controls and contingency measures are implemented and supported, and that appropriate monitoring is carried out.

Q9:	Have the cumulative effects of the discharges to air been appropriately assessed? Please explain. In your answer please clearly indicate whether, in your expert opinion, the odour effects of the RRPP and the odour effects of the landfill are additive, or whether they can be separated or distinguished or if they provide any ‘masking’ effect for each other.
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The AQA acknowledges the presence of the Green Island landfill as a background odour source. This landfill is proposed for closure in a few years, although the timing of closure is subject to other resource consent proceedings currently underway.

The potential also exists for cumulative impacts with odour emissions from the ORB, if controls at that building are not adequate.

As stated in response to Q8, if any odours from the BWTS, MRF or OPF are detected at sensitive receptors, these odours are likely to be weak, infrequent, and of short duration. On their own, these are unlikely to cause an odour that would be considered offensive or objectionable.

Combination with other background sources can change the frequency, intensity, duration or offensiveness of the odour experience. In this case Jacobs notes the following:

- Landfill-related odours from Green Island are known to cause occasional odour nuisance and complaint for nearby residents.
- Composting odours will have a markedly different odour character to landfill odours, and should be easily differentiated.
- Combined effects are more likely to increase the frequency of odour occurrences at nearby receptors, rather than the intensity or offensiveness.
- Odours from the landfill may mask weak odours from the RRPP, but this would only be a factor for receptors that are simultaneously downwind of the RRPP and the landfill.

If compost-related odours are noticeable on regular occasions at sensitive receptors near the RRPP that also experience odours from the landfill, then there is a risk that the increased frequency of odours could increase the overall objectionable odour experience for those receptors.

Based on the FIDOL assessment for the BWTS, MRF and OPF and the field surveillance experience from similar sites, Jacobs mostly agrees with the conclusions in the AQA - that the presence of any weak, infrequent and short-duration odours from the BWTS, MRF or OPF are unlikely to change the overall risk of offensive or objectionable odours for nearby residents due to operations from the landfill.

However, there is a lower degree of certainty in this conclusion for residents in the Brighton Road and Clariton Avenue areas (represented by Receptors R3 and R4 in the AQA Figure 4), as these areas are already moderately affected by landfill odours and may be more sensitive to any increased frequency of unpleasant odours. R3 is 290 m from the MRF, 350 m from the BWTS, and 450 m from the OPF. R4 is 130 m from the MRF, 210 m from the BWTS, and 360 m from the OPF. Therefore, odours from the RRPP should not be detectable at locations R3 or R4 based on the findings in the AQA. Nevertheless, if odour from the RRPP is noticeable further downwind than predicted in the AQA, these locations have the potential to be affected by odour from the RRPP, at least to a minor degree, due to cumulative impact with the landfill odours.

Q10:	Taking into account your answers above, in your opinion, are there any offsite receptors that are affected by (RRPP operational-phase) odour or dust to a minor or more than minor degree? Please clearly identify which receptors you consider to be affected, to what degree, and why
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As discussed above in the answer to Q9, residents in the areas represented by R3 and R4 are considered to have the potential to be affected by odour to a minor degree if odour from the RRPP is noticeable further downwind than predicted in the AQA, even if that odour from the RRPP is not offensive or objectionable in its own capacity.

There are no receptors that are likely to be affected by dust to a minor or more than minor degree.

Q11:	Does the draft CEMP (Appendix 7) adequately describe and assess the potential adverse effects of landfill gases and odour during the construction phase, and are the proposed mitigation measures appropriate to ensure that adverse effects on persons and the environment are less than minor? Please explain.
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The odour emission risks, monitoring and mitigation measures are described in Section 10 of the CEMP. The description and proposed mitigation measures are appropriate. However, it is not possible to say for certain that the measures will ensure that adverse effects on persons and the environment will be less than minor, as this will depend on the cause of the odour, whether it is possible to adequately mitigate that odour, and how long it takes to complete the mitigation action.

Jacobs recommends that supplies needed for mitigation measures should be held on standby at the construction site or at the adjacent landfill for rapid deployment – such as a stockpile of clean cover material, odour suppression foam spray, and an odour suppressant misting cannon.

Q3: If granted, are there any specific conditions that you recommend should be included in the consent?
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Jacobs recommends conditions relating to the following:

1. Limiting the size of the OPF to six bunkers to start with, with expansion to 10 bunkers following an odour review which would include independent field odour surveillance, and community engagement.
 - a. This would allow DCC to demonstrate that the OPF can be operated as described in the AQA, before scaling up to full design capacity.
2. Limiting bunker-to-bunker transfers to material that has been in a bunker for at least 9 days.
3. Requiring a Solvita test score of 6 and a minimum of 21 days active composting before compost can be removed from a bunker to the maturation pile. This would be an amendment to proposed condition 11 of the air discharge consent for composting activities.
4. Requiring each bunker pile to be capped with approximately 300mm layer of unscreened mature compost.
5. Composting Management Plan should require the following:
 - a. Good record keeping of bunker ventilation status (positive/negative aeration), when loading/unloading operations at the bunkers occur, and when bunker-to-bunker transfers occur. This would allow subsequent analysis of potential causes of odour detected during odour surveys or due to odour complaints.
 - b. Emptying of bunkers not to be started if the weather conditions are conducive to poor dispersion (as per response by DCC in RFI spreadsheet comment 8a).
 - c. Winds to be monitored during loading/unloading and transfer operations at the OPF, so that operations can be completed as quickly as possible if wind speeds reduce to levels of concern for dispersion towards a sensitive receptor.
 - d. Protocols for biofilter media replacement.
6. Biofilter monitoring (as per draft Composting Management Plan), noting that this is already provided in proposed condition 20 of the air discharge consent for composting activities.
7. Provide detailed design of bunker aeration system and biofilter design to ORC for certification.
 - a. Jacobs notes the certification process clauses in the proposed General conditions, and recommends that the requirement in condition 4(c) for a response within 10 days be extended to a longer time period, or deleted altogether, to ensure that the need for a certification is not overlooked.
8. For the BWTS, the following time restrictions are recommended: All putrescible waste will be removed from the site within 72 hours. If waste is to be held on site longer than 12 hours (ie. overnight or longer), putrescible waste will be covered and deodorising spray used as required to prevent off-site effects. This is a modification to the proposed wording in condition 4 of the air discharge consent for discharge from buildings.

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Jacobs

9. Monitoring of odour at the site boundary and at sensitive receptors by odour scouts, both by independent contractors and by site-staff, with adaptive management of on-site operations and mitigation measures in response to monitoring outcomes.
 - a. Jacobs agrees with the proposal by DCC to monitor odour at the site boundary by odour scouts. However, the methodology described in ENV-50-25 indicates that the monitoring would be conducted by on-site staff. These staff would not be independent and are likely to have a low sensitivity to interpret findings of compost, other RRPP, and landfill odour and therefore any findings of “no odour” or “weak odour” would have low credibility.
 - b. Jacobs considers it appropriate to have some independent odour scouting in addition to the site-sourced odour scouting proposed by the applicant.
10. Periodic independent review of compost operations, such as on a 2-yearly basis.
11. Maintaining wind monitoring at the site, even after the landfill is closed. This is included by proposed condition 3 of the proposed consent conditions for air discharges for composting activities.
12. Ensuring that the full range of odour and dust mitigation measures detailed in the AQA are carried through into the Operations Management Plan and the Composting Management Plan. This could be achieved through proposed condition 23 of the consent for air discharges for composting activities, however some of the initiatives proposed need to be incorporated into the facility design and it would be too late to identify any deficiencies in the proposed measures at the time frame referred to in proposed condition 23 (ie. no less than 15 working days prior to commencement of operations).
13. Annual environmental report describing operations conducted at the RRPP over the previous year. A report of this type is included in condition 24 of the proposed general consent conditions. However, Jacobs recommends that the report should also include a summary of all monitoring at the RRPP related to the biofilter and odour scouting, mitigation/corrective measures initiated, and complaint assessment.

Finally, Jacobs notes proposed condition 6 of the General conditions which states that the amount of raw material received on the site for the production of compost must not exceed 30,000 tonnes per year. However, the AQA is based on a composting system “capable of composting up to 20,000 tonnes per year of green waste and food waste”. Therefore, we recommend that condition 6 be modified to reflect the capacity assessed in the AQA, which is 20,000 tonnes of raw material.

Yours sincerely,



Tracy Freeman
Principal Air Quality Specialist

tracy.freeman@jacobs.com